Speedfax™ 2011-2012

Product Catalog



Electrical, Commercial, and Industrial Power Distribution and Control Products

www.usa.siemens.com/lowvoltage

SIEMENS

SIEMENS



www.usa.siemens.com/residential

Multi-family options create value in multiple ways

Siemens provides the broadest product portfolio related to multi-family applications. The Power Mod™ line of multi-family metering offers key labor savings and flexibility by using the QuickSystem™ features. Setting standards for product quality with robust design and new solutions, Siemens now offers new custom color options for Power Mod, eliminating dangerous over spray conditions.

The new ES™ and PL™ load center series are providing more flexibility and innovative features. While the ES Series is designed for most basic applications the PL Series features robust design and labor saving features. High rise applications can utilize the riser load center which features higher ratings and more circuitries than most manufacturers. Known for its rich tradition and high quality products, Murray continues to meet our customer needs every day.

Our ground-breaking GenReady Load Center is the only load center to incorporate generator power transfer inside of the load center enclosure. Siemens helps to improve productivity with our industry leading arc-fault detection technology and features. Our patented LED indicators let installers and home owners know whether a tripping event is related to an overload or arcing condition.

Flexibility, innovation, and quality are the hallmarks of Siemens' products for multi-family applications providing the customer with un-matched value.

Building Technologies - Low Voltage

Reliable Products From The Technology Leader

Technology Enabling Reliability.
When it comes to ready availability, easy installation, and fewer callbacks, you need a manufacturer you can trust. Our products and systems are engineered to take on the most demanding conditions, always available day after day. Combined with a world-class service and maintenance network, complete support is always there, 24/7.

RESIDENTIAL



For product offerings see
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COMMERCIAL



For product offerings see
Sections 1 – 15

INDUSTRIAL



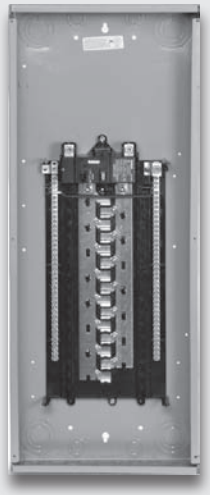
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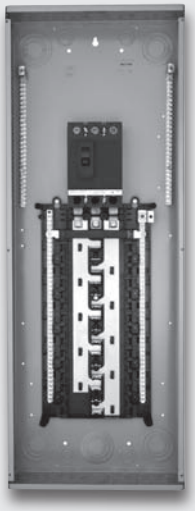
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Your single point of contact for general inquiries, customer service, sales office information, and product inquiries:
Siemens 24/7 Call Center: 1-800-964-4114 | email: info.us@siemens.com | www.usa.siemens.com/lowvoltage

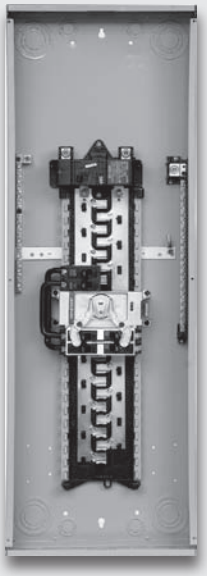
Important
These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the local Siemens sales office. The contents of this catalog shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.



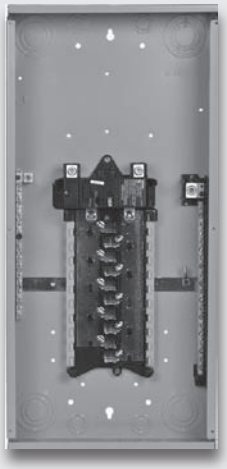
ES Series Load Center



PL Series Load Center



Generator Ready Load Center



Murray Load Center



Riser Load Center

Get the highest standard

Siemens is proud to offer one of the highest quality and broadest and most flexible load center lines in the industry. From single family to multi-family applications, Siemens can offer a high-quality, labor-saving load center for your application.

Siemens PL Series Load Center
- Exclusive labor saving features
- Most flexible load center in the industry
- Copper bus
- Lifetime warranty

Siemens ES Series Load Center
- Rugged and durable design
- Aluminum bus
- 10 year warranty

Generator Ready Load Center
- Automatic transfer switch ready
- Power only critical circuits to minimize generator size
- Indoor/outdoor/main lug/main breaker versions

Murray Load Center
- For those that prefer a high quality outboard neutral design
- Exclusive labor-saving features
- Single-phase, Indoor/Outdoor
- Rugged metal base pan

Riser Load Center
- 125 and 200 Amp models for high rise applications
- High quality interior – CU bus and metal hook rails
- Available in 16, 24, 30 space versions

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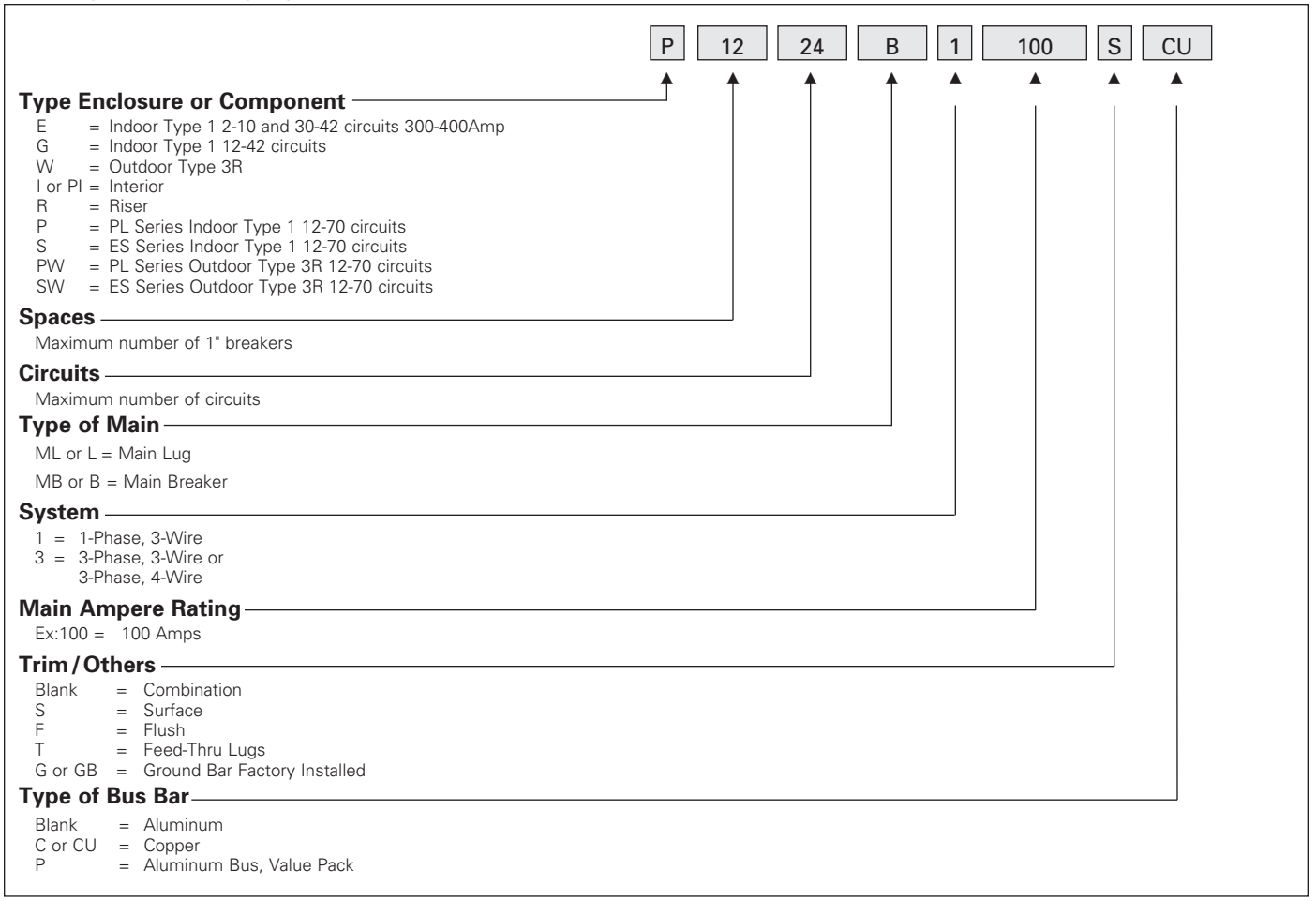
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Load Centers

Catalog Numbering System

Catalog Numbering System



Products Shown In Sections 1 of this Speedfax Meet or Exceed the Following Standards.

- UL50 — Electric Cabinets and Boxes
- UL67 — Electric Panelboards
- UL486 — Wire Connectors
- UL489 — Molded-Case Circuit Breakers
- UL869 — Service Equipment
- UL943 — Ground Fault interrupters (Class A — Personnel Protection)
- Federal Specification W-P-115b — Panel Power Distribution
- Federal Specification W-C-375B — Circuit Breakers
- NEC
- NEMA 250

Underwriters' Laboratories, Inc. Reference File Numbers:

- Series Connected Circuit Breaker Information is recognized by UL under file #E10848(N)
- Load Centers Listed by UL under file #E10703
- Load Centers UL recognized components found under file #E10703, Volume 6 and 7. (Also referenced under the recognized components directory — section QEUY2)
- EQ Circuit Breakers are Listed by UL under file #E82615

Load Centers

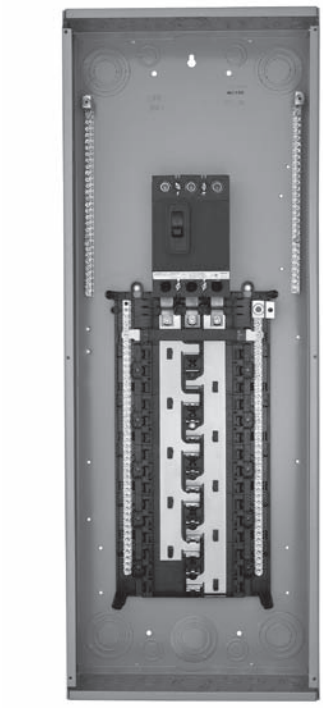
Siemens PL and ES Series Load Centers™ Overview

PL Series:

- Convertible
- Invertible
- Insta-wire neutrals & grounds
- Ground bars included
- Copper busbars
- Dual neutrals on all configurations
- Carton-in-carton packaging
- Lifetime warranty



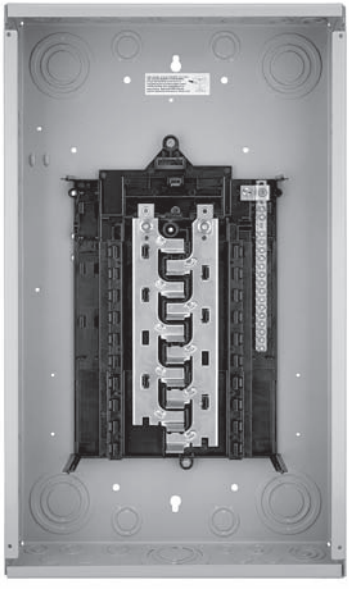
PL Series 1-phase



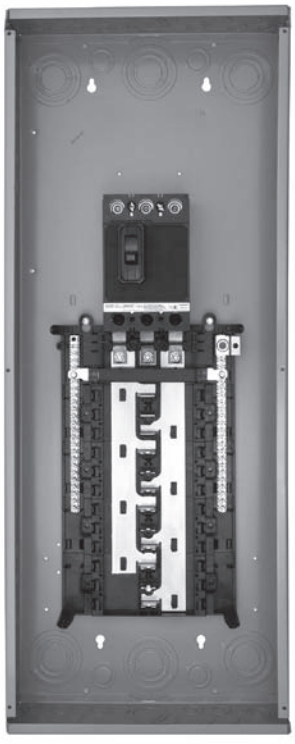
PL Series 3-phase

ES Series:

- Invertible
- Insta-wire neutrals & grounds
- Aluminum busbars
- Single sided neutral on 24 circuits and below
- Single piece carton packaging
- 10 year warranty



ES Series 1-phase



ES Series 3-phase

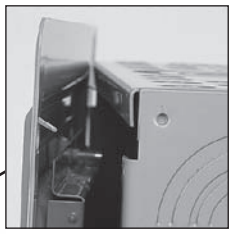
PL Series Load Centers

Features



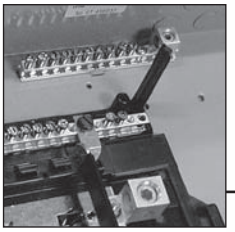
All devices convertible from main lug to main breaker and vice versa.

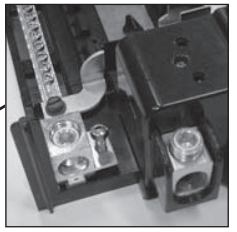
Invertible for bottom feed application.



Mounting tabs on the trim hold it in place on the load center, freeing up both hands to drive the trim screws.

All devices are provided with 2 factory installed ground bars.

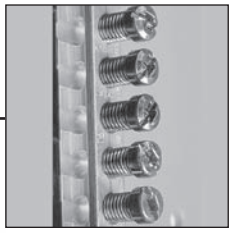




The pre-positioned bond screw eliminates bond strap/ screw assemblies, and reduces the risk of losing components in the field.

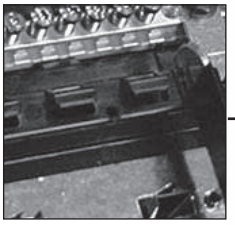
Combination head screw on the neutrals, ground, trim, upper pan, and bond screw provide installation flexibility.

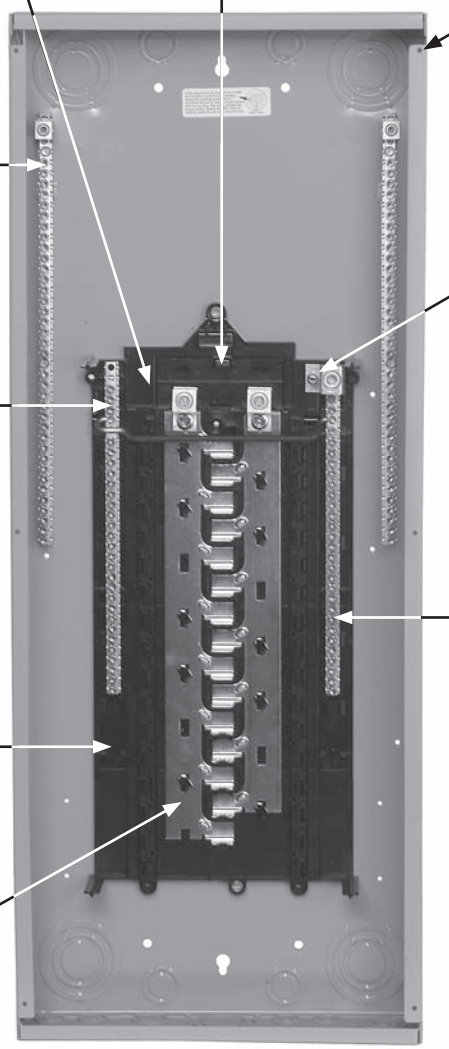




The patented INSTA-WIRE™ neutral/ground system allows for faster installation because screws are backed out, ready for wire insertion. The visible neutral and grounds system aids in the insertion of conductors.

A rigid, sturdy base pan provides the ruggedness required for the most harsh applications.





Copper Bus



The outdoor enclosure has a slide hinge door for the easiest installation and can be removed by backing out only one screw.

PL Series Load Centers ship with trims packaged separately.



PL Series Load Centers

Product Offering

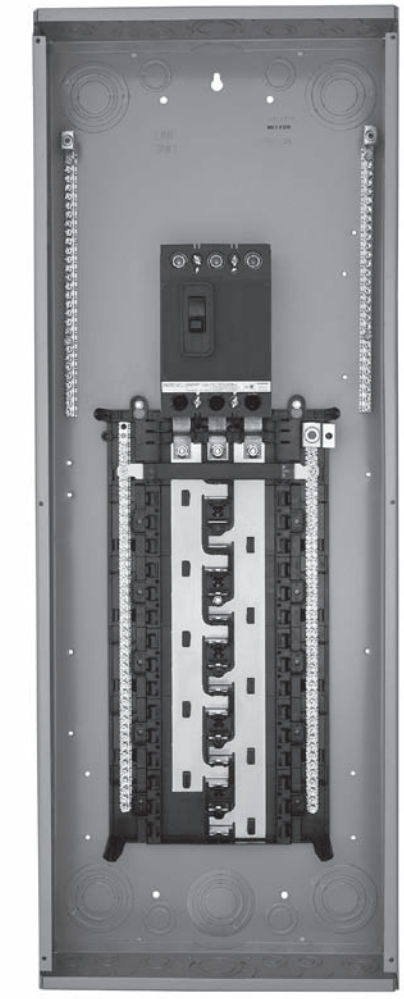
The PL Series Load Center product line provides a wide array of variation to meet any application need.

The following offering is available in the PL Series product line:

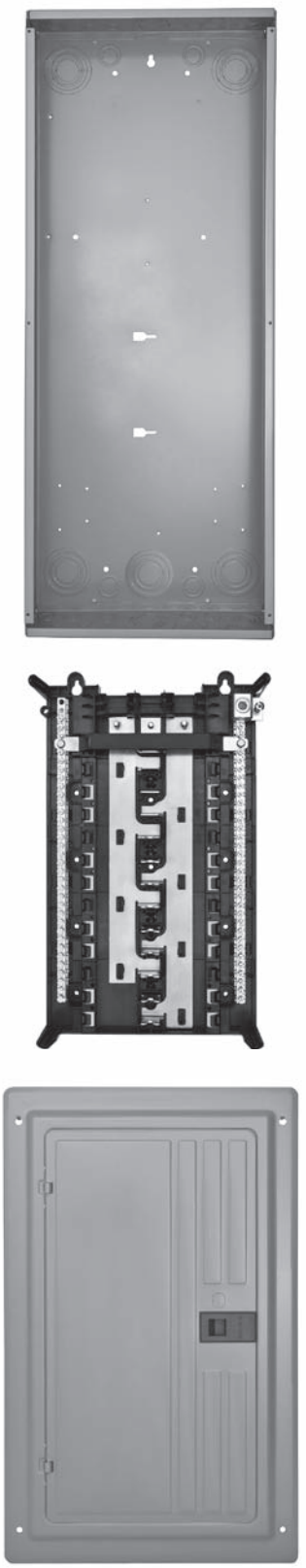
- 12-70 Circuits/Spaces
- Indoor and Outdoor enclosures
- 100 to 225 Amp
- Main Lug and Main Breakers
- Un-assembled offering in 3-phase



PL Series
1-phase Main Lug



PL Series
3-phase Main Breaker



Un-assembled 3-phase

PL Series 1-Phase Main Lug & Main Breaker Load Centers

• Revised •
06/13/14

1-phase, 3-wire SN, 120/240 Volts AC

Main Breaker/Convertible Load Centers①

Copper Bus⑦

12-70 Circuits / 100-225 Amperes

60/75°C Rated 22,000A IR②

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
100	12	24	**P1224B1100CU**	18	**PW1224B1100CU**	21
100	16	24	**P1624B1100CU**	21	**PW1624B1100CU**	23
100	20	20	**P2020B1100CU**	24	**PW2020B1100CU**	27
100	20	24	**P2024B1100CU**	24	—	—
100	24	24	**P2424B1100CU**	24	—	—
100	30	30	**P3030B1100CU**	30	—	—
100	30	40	—	—	**PW3040B1100CU**	35
125	30	30	**P3030B1125CU**	30	**PW3040B1125CU**	35
150	20	30	**P2030B1150CU**	24	—	—
150	20	30	—	—	**PW2030B1150CU**	27
150	30	30	**P3030B1150CU**	30	—	—
150	30	40	—	—	**PW3040B1150CU**	35
200	20	40	**P2040B1200CU**	30	**PW2040B1200CU**	27
200	30	40	**P3040B1200CU**	36	**PW3040B1200CU**	35
200	30	40	**P3040B1200⑧**	36	—	—
200	40	40	**P4040B1200CU**	36	**PW4040B1200CU**	38
200	40	40	**P4040B1200⑧**	36	—	—
200	54	70	**P5470B1200CU**	44	—	—
225	42	60	**P4260B1225CU**	39	**PW4260B1225CU**	42
225	54	70	**P5470B1225CU**	44	—	—

Single phase factory installed 22kA IR main circuit breaker offers 22/10kA IR series combination rating when using 10kA type QP, QT, QPF, QE, QN, and QAF2/QAF2C branch breakers.

Main Lug/Convertible Load Centers⑥

Copper Bus⑦

12-70 Circuits / 125-225 Amperes

60/75° Rated 100,000A IR

Branch Circuits			Indoor Enclosure - NEMA Type 1		Outdoor Enclosure - NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
125	12	12	**P1212L1125CU⑤**	18	**PW1212L1125CU⑤**	21
125	12	24	**P1224L1125CU⑤**	18	**PW1224L1125CU⑤**	21
125	16	24	**P1624L1125CU**	21	**PW1624L1125CU**	23
125	20	20	**P2020L1125CU**	24	—	—
125	20	24	**P2024L1125CU**	24	—	—
125	24	40	**P2440L1125CU**	24	—	—
125	30	40	**P3040L1125CU**	30	**PW3040L1125CU**	35
125	40	40	**P4040L1125CU**	36	—	—
150	20	30	**P2030L1150CU**	24	**PW2030L1150CU**	27
200	12	24	**P1224L1200CU**	24	**PW1224L1200CU⑤**	23
200	20	40	**P2040L1200CU**	30	**PW2040L1200CU**	27
200	24	40	**P2440L1200CU**	30	—	—
200	30	30	**P3030L1200CU**	36	—	—
200	30	40	**P3040L1200CU**	36	**PW3040L1200CU**	35
200	30	40	**P3040L1200⑧**	36	—	—
200	30	54	**P3054L1200CU**	36	**PW3054L1200CU**	35
200	40	40	**P4040L1200CU**	36	**PW4040L1200CU**	38
200	40	40	**P4040L1200⑧**	36	—	—
225	12	24	—	—	**PW1224L1225CU**	23
225	42	60	**P4260L1225CU**	39	**PW4260L1225CU**	42
225	54	70	**P5470L1225CU**	44	—	—

① Suitable for use as service equipment.
② May be installed on higher rated systems when protected by a circuit breaker with a higher AIR rating.
③ Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
④ Outdoor enclosures are 14 1/2" wide by 4 1/4" deep.
⑤ Suitable for use as service entrance equipment when not more than six main disconnecting means are provided. See article 230.71 of the NEC®.
⑥ 125A load centers will accept MBK100A and MBK125A. 150A load centers will accept MBK150A. 200A load centers will accept MBK200A and MBK150A. 225A load centers will accept MBK225A, MBK200A, MBK150A.
⑦ Copper bus load centers are recommended for those applications where the environment may be severe (i.e. far and coastal areas).
⑧ Includes all PL Series features with aluminum bussing.

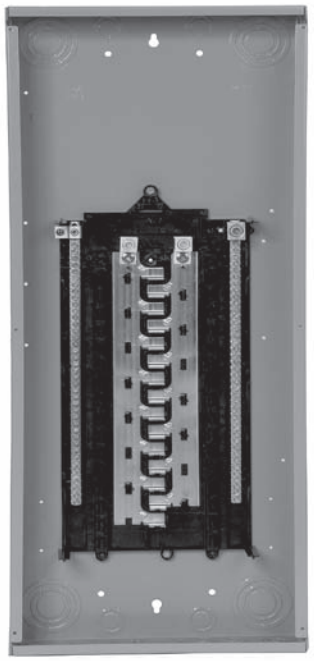
• Revised •
02/26/12

PL Series 1-Phase Special Application Load Centers

1-phase, 3-wire SN, 120/240 Volts AC

Split Ground Series Main Lug Convertible Load Centers — Copper Bus
12-60 Circuits / 125-200 Amperes — 60/75° Rated, 100,000A IR

Branch Circuits			Indoor Enclosure – NEMA Type 1	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)②
125	12	24	**P1224L1125CUSG**	18
125	16	24	**P1624L1125CUSG**	21
125	20	30	**P2030L1125CUSG**	24
125	24	30	**P2430L1125CUSG**	24
150	20	30	**P2030L1150CUSG**	24
200	30	40	**P3040L1200CUSG**	36
200	30	40	**P3040L1200SG**①	36
200	40	40	**P4040L1200CUSG**	36
200	40	40	**P4040L1200SG**①	36
225	40	60	**P4260L1225CUSG**	39



Split Ground Load Centers have factory installed 100% neutral with factory bonded 75% ground. No neutral tie strap.

Split Ground Series Main Breaker Convertible Load Centers — Copper Bus
40 Circuits / 200 Amperes — 60/75° Rated, 22,000A IR③

Branch Circuits			Indoor Enclosure – NEMA Type 1	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)②
200	40	40	**P4040B1200CUSG**	36

Outdoor Trailer Panels — Copper Bus
16 Circuits / 200 Amperes — 60/75° Rated, 22,000A IR⑤

Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Main Breaker		Enclosure Height (inches)④
200	8	16	**PW0816L1200TC**	MBK150A or MBK200A	Field Installed	23
200	8	16	**PW0816B1200TC**	MBK200A	Factory Installed	23

Load Centers with White Trim⑥ — Copper or Aluminum Bus⑦
40 Circuits / 200 Amperes — 60/75° Rated 22,000A IR

Branch Circuits			Indoor Enclosure - NEMA Type 1		
Amp Rating	Main Lug / Main Breaker	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)②
200	Main Breaker	30	40	**P3040B1200W**	36
200	Main Breaker	40	40	**P4040B1200W**	36
200	Main Breaker	40	40	**P4040B1200CUW**	36

① Includes all PL Series features with aluminum bussing.
② Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
③ May be installed on higher rated systems when protected by a circuit breaker with a higher AIR rating.
④ Outdoor enclosures are 14 1/2" wide by 4 1/4" deep.
⑤ Main lug panel rated 100,000A IR.
⑥ Load centers with white trim have increased lead time of 3-4 weeks. Sold in pallet quantites only.
⑦ Load centers with CUW suffix indicates copper bus with white trim. Load centers with W suffix only indicates aluminum bus with white trim.

PL Series 3-Phase Main Lug & Main Breaker Load Centers

• Revised • 02/26/12

3-phase, 3-wire, 240 Volt AC or 3-phase, 4-wire, 120/240 or 120/208 Volts AC

Main Breaker/Convertible Load Centers — Copper Bus⑧⑩

30-70 Circuits / 100-225 Amperes — 60/75°C Rated 22,000A IR①

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
100	12	24	**P1224B3100CU②**	24	—	—
100	30	42	**P3042B3100CU②**	30	—	—
125	30	30	**P3030B3125CU**	39	—	—
150	24	42	**P2442B3150CU**	36	—	—
150	42	42	**P4242B3150CU**	42	—	—
200	30	54	**P3054B3200CU**	39	**PW3054B3200CU**	38
200	42	60	**P4260B3200CU**	42	**PW4260B3200CU**	42
225	42	60	**P4260B3225CU**	42	—	—
225	42	60	**P4260B3225TCU⑥**	49	—	—
225	54	70	**P5470B3225CU**	49	—	—

Main Lug/Convertible Load Centers⑤ — Copper Bus⑧⑩

12-70 Circuits / 125-225 Amperes — 60/75° Rated 100,000A IR⑨

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
125	12	24	**P1224L3125CU⑦**	21	**PW1224L3125CU⑦**	21
200	24	42	**P2442L3200CU**	36	**PW2442L3200CU**	35
200	30	54	**P3054L3200CU**	39	**PW3054L3200CU**	38
225	42	60	**P4260L3225CU**	42	**PW4260L3225CU⑩**	42
225	54	70	**P5470L3225CU**	49	—	—

① May be installed on higher rated systems when protected by a circuit breaker with a higher AIR rating.
② Back fed main breaker.
③ Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
④ Outdoor enclosures are 14 1/2" wide by 4 1/4" deep.
⑤ Suitable for use as service entrance equipment when not more than six main disconnecting means are provided. See article 230.71 of the NEC®.
⑥ Includes factory installed feed through lugs and is also non-convertible.
⑦ Non-convertible to main breaker.
⑧ All load centers are provided with tin plated copper bus bars.
⑨ Rated 100,000A IR in series with breakers listed on wiring diagram.
⑩ All load centers are provided with tin-plated copper bus bars.

PL Series 3-Phase Unassembled Load Centers

3-phase, 3-wire, 240 Volt AC or 3-phase, 4-wire, 120/240 or 120/208 Volts AC







Main Breaker Convertible Unassembled Load Centers — Copper Bus⑤

24-70 Circuits / 100-225 Amperes — 60/75°C Rated 22,000A IR①

Interiors				Enclosure		Trim Kit	
Amp Rating	No. of Spaces	No. of Circuits	Interior Catalog Number	Enclosure Height (inches)③	Enclosure Catalog Number	No. Breaker Spaces	Trim Catalog Number⑤
100	30	42	**PI3042B3100CU②**	30	**3PE30**	30	**PT3042B3100**
150	24	42	**PI2442B3150CU**	36	**3PE36**	24	**PT2442X3150**
200	30	54	**PI3054B3200CU**	39	**3PE39**	30	**PT3054X3200**
200	42	60	**PI4260B3200CU**	42	**3PE42**	42	**PT4260X3200**
225	54	70	**PI5470B3225CU**	49	**3PE49**	54	**PT5470X3225**

Main Lug Convertible Unassembled Load Centers — Copper Bus⑤

12-70 Circuits / 125-225 Amperes — 60/75° Rated 100,000A IR⑥

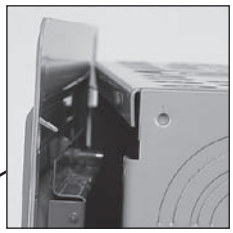
Interiors				Enclosure		Trim Kit	
Amp Rating	No. of Spaces	No. of Circuits	Interior Catalog Number	Enclosure Height (inches)③	Enclosure Catalog Number	No. Breaker Spaces	Trim Catalog Number④
125	12	24	**PI1224L3125CU**	21	**3PE21**	12	**PT1224L3125**
200	24	42	**PI2442L3200CU**	36	**3PE36**	24	**PT2442X3200**
200	30	54	**PI3054L3200CU**	39	**3PE39**	30	**PT3054X3200**
225	42	60	**PI4260L3225CU**	42	**3PE42**	42	**PT4260X3225**
225	54	70	**PI5470L3225CU**	49	**3PE49**	54	**PT5470X3225**

① May be installed on higher rated systems when protected by a circuit breaker with a higher AIR rating.
② Back fed main breaker.
③ Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
④ Trim catalog numbers with a "B" indicate for use with main breaker and is not convertible. "L" indicates for use with main lug and is not convertible. "X" indicates can be used with convertible interior.
⑤ All load center interiors are provided with tin plated copper bus bars.
⑥ Rated 100,000A IR in series with breakers listed on wiring diagram.

ES Series Load Centers

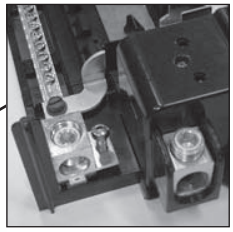
Features

Invertible for bottom feed application.



Mounting tabs on the trim hold it in place on the load center, freeing up both hands to drive the trim screws.

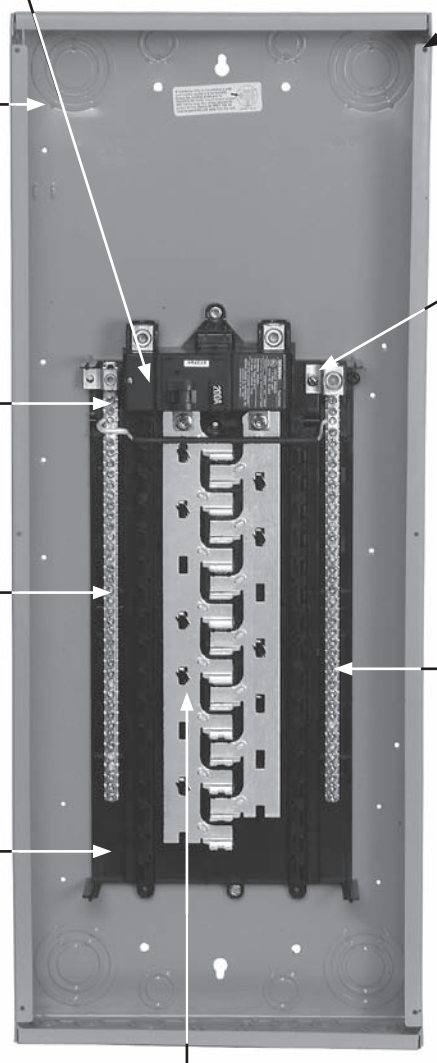
Ground bar field installed (select skus with "G" suffix will have ground bar factory installed).



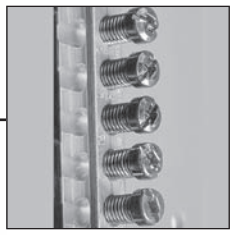
The pre-positioned bond screw eliminates bond strap/ screw assemblies, and reduces the risk of losing components in the field.

Combination head screw on the neutrals, ground, trim, upper pan, and bond screw provide installation flexibility.



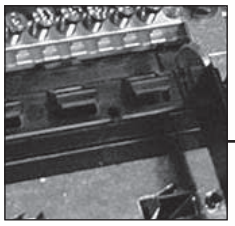


Single side inboard neutral on 24 circuits and below; dual on 30 circuits and above.



The patented INSTA-WIRE™ neutral/ground system allows for faster installation because screws are backed out, ready for wire insertion. The visible neutral and grounds system aids in the insertion of conductors.

A rigid, sturdy base pan provides the ruggedness required for the most harsh applications.

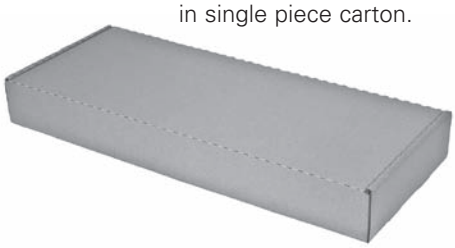




Aluminum bus.

The outdoor enclosure has a slide hinge door for the easiest installation and can be removed by backing out only one screw.

ES Series Load Centers ship in single piece carton.



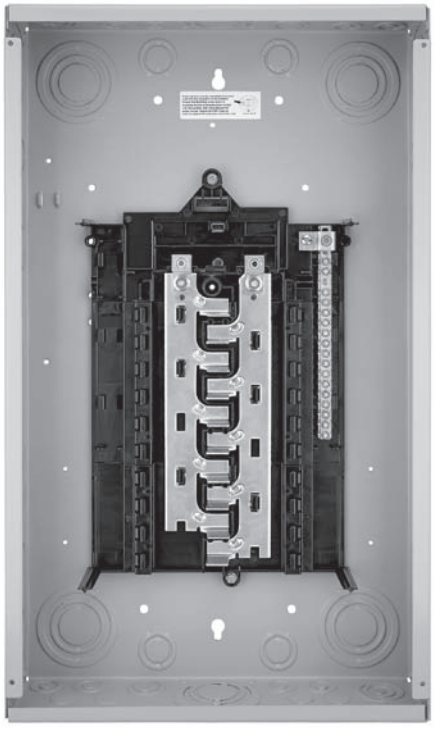
ES Series Load Centers

Product Offering

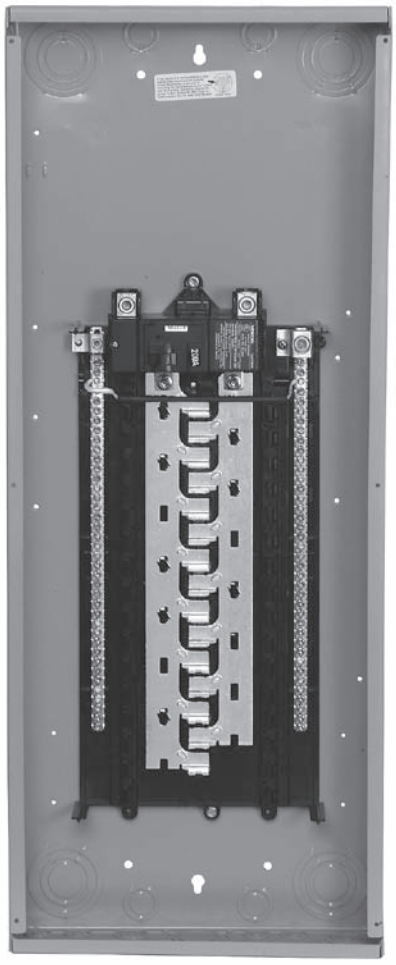
The ES Series Load Center product line provides a wide array of variation to meet any application need.

The following offering is available in the ES Series product line:

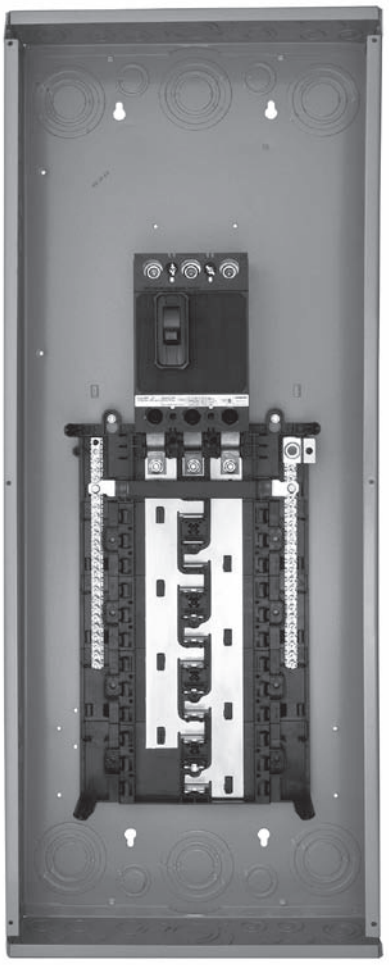
- 12-70 Circuits/Spaces
- Indoor and Outdoor enclosures
- 100 to 225 Amp
- Main Lug and Main Breakers
- Value packs – a mix of branch breakers provided with the load center.



ES Series
1-phase Main Lug
125A, 12-24 circuits



ES Series
1- phase Main Breaker
125- 225A, 30-70 circuits



ES Series
3-phase Main Breaker

ES Series 1-Phase Main Lug & Main Breaker Load Centers

• Revised • 04/28/15

1-phase, 3-wire SN, 120/240 Volts AC

Main Breaker①

Aluminum Bus

12-70 Circuits / 100-225 Amperes

60/75°C Rated 22,000A IR②

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
100	10	20	**S1020B1100**	18	—	—
100	12	24	**S1224B1100**	18	**SW1224B1100**	21
100	16	24	**S1624B1100**	21	**SW1624B1100**	23
100	20	20	**S2020B1100**	24	**SW2020B1100**	27
100	20	24	**S2024B1100**	24	—	—
100	30	30	**S3030B1100**	30	—	—
125	12	24	—	—	**SW1224B1125**	21
125	16	24	**S1624B1125**	21	**—**	-
125	16	32	—	—	**SW2024B1125**	27
125	24	24	**S2424B1125**	24	**SW2424B1125**	27
125	30	30	**S3030B1125**	30	—	—
125	30	40	**S3040B1125**	30	**SW3040B1125**	35
150	16	30	**S1630B1150**	24	—	—
150	20	30	**S2030B1150**	24	—	—
150	24	30	**S2430B1150**	30	—	—
150	30	30	**S3030B1150**	30	—	—
150	30	40	**S3040B1150**	30	**SW3040B1150**	35
150	40	40	—	—	**SW4040B1150**	38
200	16	32	**S1632B1200**	24	**—**	—
200	20	40	**S2040B1200**	30	**SW2040B1200**	27
200	24	40	**S2440B1200**	30	—	—
200	30	40	**S3040B1200**	36	**SW3040B1200**	35
200	40	40	**S4040B1200**	36	**SW4040B1200**	38
200	54	70	**S5470B1200**	44	—	—
225	42	60	**S4260B1225**	39	**SW4260B1225**	42
225	54	70	**S5470B1225**	44	—	—

Main Lug

Aluminum Bus

12-70 Circuits / 125-225 Amperes

60/75° Rated 100,000A IR

Branch Circuits			Indoor Enclosure - NEMA Type 1		Outdoor Enclosure - NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
125	12	12	**S1212L1125⑤**	18	**SW1212L1125⑤**	21
125	12	24	**S1224L1125⑤**	18	**SW1224L1125⑤**	21
125	16	24	**S1624L1125**	21	**SW1624L1125**	21
125	20	20	**S2020L1125**	21	**—**	—
125	20	20	**S2020L1125G⑥**	21	**—**	—
125	20	24	**S2024L1125**	21	**—**	—
125	20	24	**S2024L1125G⑥**	21	**—**	—
125	24	24	**S2424L1125**	24	**SW2424L1125**	27
125	24	24	**S2424L1125G⑥**	24	**—**	—
125	24	40	**S2440L1125**	24	**—**	—
125	30	40	**S3040L1125**	30	**SW3040L1125**	29
125	30	40	**S3040L1125G⑥**	30	**—**	—
125	40	40	**S4040L1125**	36	**—**	—
150	20	30	**S2030L1150**	24	**SW2030L1150**	27
200	12	24	**S1224L1200⑤**	21	**SW1224L1200⑤**	21
200	20	40	**S2040L1200**	24	**SW2040L1200**	27
200	24	40	**S2440L1200**	30	**—**	—
200	30	30	**S3030L1200**	30	**—**	—
200	30	40	**S3040L1200**	30	**SW3040L1200**	35
200	30	54	**S3054L1200**	30	**SW3054L1200**	35
200	40	40	**S4040L1200**	36	**SW4040L1200**	35
225	12	24	**—**	—	**SW1224L1225**	23
225	42	60	**S4260L1225**	36	**SW4260L1225**	38
225	54	70	**S5470L1225**	42	**—**	—

① Suitable for use as service equipment.
② May be installed on higher rated systems when protected by a circuit breaker with a higher AIR rating.
③ Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
④ Outdoor enclosures are 14 1/2" wide by 4 1/4" deep.
⑤ Suitable for use as service entrance equipment when not more than six main disconnecting means are provided. See article 230.71 of the NEC®.
⑥ ES Series single phase skus with a "G" suffix have ground bar included (factory installed).

ES Series 1-Phase Special Load Centers

1-phase, 3-wire SN, 120/240 Volts AC

Load Centers with White Trim①

Aluminum Bus

16-40 Circuits / 100 – 200 Amperes

60/75° Rated 100,000A IR

Branch Circuits			Indoor Enclosure – NEMA Type 1		
Amp Rating	Main Lug / Main Breaker	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)②
100	Main Breaker	16	24	**S1624B1100W⑤**	21
125	Main Lug	20	20	**S2020L1125W**	21
125	Main Lug	24	24	**S2424L1125W**	24
200	Main Lug	30	30	**S3030L1200W**	30
200	Main Lug	40	40	**S4040L1200W**	35
125	Main Lug	30	40	**S3040L1125W**	30
200	Main Breaker	40	40	**S4040B1200W⑤**	36

Outdoor Trailer Panels

Aluminum Bus

16 Circuits / 200 Amperes

60/75° Rated 100,000A IR

Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Main Breaker		Enclosure Height (inches)④
200	8	16	**SW0816L1200T**	N/A	N/A	23
200	8	16	**SW0816B1200T⑤**	MBK200A	Factory Installed	23

Value Pack Load Centers③

Aluminum Bus

Catalog Number	Load Center	Breakers Included	Amp	N0. of Spaces	No. of Circuits
S2020B1100P	S2020B1100	(3) Q120, (1) Q230	100	20	20
S3040B1200P	S3040B1200	(3) Q120, (1) Q230	200	30	40
S3040L1200P	S3040L1200	(3) Q120, (1) Q230	200	30	40
S4040B1200P	S4040B1200	(3) Q120, (1) Q230	200	30	40
S3054B1200P	N/A	(3) Q120, (1) Q230	200	30	54

Split Ground Series Load Centers⑥

30-40 Circuits / 125-200 Amperes

16 Circuits / 200 Amperes

Aluminum Bus

Branch Circuits			Indoor Enclosure – NEMA Type 1	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)②
125	20	30	**S2030L1125SG**	21
150	30	30	**S3030B1150SG**	30
200	40	40	**S4040B1200SG**	36

Selectable Main Load Centers⑦

24-40 Circuits / 125-200 Amperes

Aluminum Bus

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R		Available Kits	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)②	Catalog Number	Enclosure Height (inches)④	Main Lug	Main Breaker
125	24	24	**S2424C1125**	24	**SW2424C1125**	27	ECMLK125	MBK100A, MBK125A
200	20	40	**S2040C1200**	35	**SW2040C1200**	35	ECMLK225	MBK200A
200	30	40	**S3040C1200**	36	**SW3040C1200**	35	ECMLK225	MBK150A, MBK200A, MBK225A
200	40	40	**S4040C1200**	36	**SW4040C1200**	38	ECMLK225	MBK150A, MBK200A, MBK225A

① Load centers with white trim have increased lead time of 3-4 weeks. Sold in pallet quantities only. Additional charge will apply. Contact sales office for details.
② Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
③ Breakers are shipped inside a sleeve located inside the load center.
④ Outdoor enclosures are 14 1/2" wide by 4 1/4" deep.
⑤ Main breaker rated 22,000A IR.
⑥ Split Ground load centers have factory installed 100% neutral with factory bonded 75% ground.
⑦ Selectable main load centers do not come with main lugs or main breakers. Those kits are sold separately.

ES Series 3-Phase Main Lug & Main Breaker Load Centers

• Revised • 04/28/15

3-phase, 3-wire, 240 Volt AC or 3-phase, 4-wire, 120/240 or 120/208 Volts AC

Main Breaker — Aluminum Bus

30-60 Circuits / 100-225 Amperes — 60/75°C Rated 10,000A IR①

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
100	12	24	**S1224B3100②**	24	—	—
100	30	30	**S3030B3100②**	30	—	—
100	30	42	**S3042B3100②**	30	—	—
125	30	42	**S3042B3125**	35	—	—
150	24	42	**S2442B3150**	36	**SW2442B3150**	35
150	42	42	**S4242B3150**	42	—	—
150	30	54	**S3054B3150**	35	—	—
200	30	54	**S3054B3200**	39	**SW3054B3200**	38
200	42	60	**S4260B3200**	42	**SW4260B3200**	42
225	42	42	**S4242B3225**	42	**SW4242B3225**	42

Main Lug⑤ — Aluminum Bus

12-70 Circuits / 125-225 Amperes — 60/75° Rated 100,000A IR⑥

Branch Circuits			Indoor Enclosure – NEMA Type 1		Outdoor Enclosure – NEMA Type 3R	
Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Enclosure Height (inches)③	Catalog Number	Enclosure Height (inches)④
125	12	24	**S1224L3125**	21	**SW1224L3125**	21
150	18	36	**S1836L3150**	24	**SW1836L3150**	23
150	24	42	**S2442L3150**	30	**SW2442L3150**	27
200	12	24	**S1224L3200**	21	**SW1224L3200**	21
200	24	42	**S2442L3200**	30	**SW2442L3200**	27
200	30	54	**S3054L3200**	30	**SW3054L3200**	35
225	42	60	**S4260L3225**	36	**SW4260L3225**	38
225	54	70	**S5470L3225**	42	—	—

① May be installed on higher rated systems when protected by a circuit breaker with a higher AIR rating.
② Back fed main breaker.
③ Indoor enclosures are 14 1/4" wide by 3 7/8" deep.
④ Outdoor enclosures are 14 1/2" wide by 4 1/4" deep.
⑤ Suitable for use as service entrance equipment when not more than six main disconnecting means are provided. See article 230.71 of the NEC®.
⑥ Rated 100,000A IR in series with breakers listed on wiring diagram.

EQ® Load Centers—300-400Amp

1-Phase, 3-Wire/3-Phase, 3-Wire, 4-Wire

Features

- UL listed for 60/75°C conductors. See equipment markings for applications.
- Copper bus standard.
- Factory installed lock on indoor enclosure.
- Outdoor enclosures use HV type hubs. See page 1-21.

E3030MB1400SCU



Main Breaker 300-400 Ampere

1Ø, 3-Wire — **120/240 Volts AC**

Ampere Rating	Branch Circuits Type QP		Indoor Enclosure — NEMA Type 1 (65,000A IR)						Outdoor Enclosure — NEMA Type 3R (65,000A IR)				
	Max. 1-Pole	Max. 2-Poles	Catalog Number③	Std. Pkg.	Dimensions (inches)			Trim Style	Catalog Number	Std. Pkg.	Dimensions (inches)		
					Height	Width	Depth				Height	Width	Depth④
300	42	20	**E4242MB1300FCU**	1	58	20	6	Flush	**—**	—	—	—	—
300	42	20	**E4242MB1300SCU**	1	58	20	6	Surface	**—**	—	—	—	—
400	30	14	**E3030MB1400SCU**	1	52	20	6	Surface	**W3030MB1400CU**	1	52	20	6
400	42	20	**E4242MB1400FCU**	1	58	20	6	Flush	**W4242MB1400CU**	1	58	20	6
400	42	20	**E4242MB1400SCU**	1	58	20	6	Surface	**—**	—	—	—	—

3Ø, 3-Wire, 4-Wire — **240 Volts AC**

Ampere Rating	Branch Circuits Type QP		Indoor Enclosure — NEMA Type 1 (65,000A IR)						Outdoor Enclosure — NEMA Type 3R (65,000A IR)				
	Max. 1-Pole	Max. 2-Poles	Catalog Number③	Std. Pkg.	Dimensions (inches)			Trim Style	Catalog Number	Std. Pkg.	Dimensions (inches)		
					Height	Width	Depth				Height	Width	Depth④
300	42	20	**E4242MB3300SCU**	1	58	20	6	Surface	**—**	—	—	—	—
400	30	14	**E3030MB3400SCU**	1	52	20	6	Surface	**—**	—	—	—	—
400	42	20	**E4242MB3400FCU**	1	58	20	6	Flush	**W4242MB3400CU**	1	58	20	6
400	42	20	**E4242MB3400SCU**	1	58	20	6	Surface	**—**	—	—	—	—

Main Lug 400 Ampere

1Ø, 3-Wire — **120/240 Volts AC**

Ampere Rating	Branch Circuits Type QP		Indoor Enclosure — NEMA Type 1 (65,000A IR)						Outdoor Enclosure — NEMA Type 3R (65,000A IR)				
	Max. 1-Pole	Max. 2-Poles	Catalog Number③	Std. Pkg.	Dimensions (inches)			Trim Style	Catalog Number	Std. Pkg.	Dimensions (inches)		
					Height	Width	Depth				Height	Width	Depth④
400	24	12	**—**	—	—	—	—	—	**W0606ML1400CU②⑤⑥**	1	43	20	6
400	30	14	**E3030ML1400SCU**	1	41	20	6	Surface	**W3030ML1400CU**	1	43	20	6
400	42	20	**E4242ML1400SCU**	1	47	20	6	Surface	**—**	—			
400	42	20	**E4242ML1400FCU**	1	47	20	6	Flush	**W4242ML1400CU**	—	47	20	6

3Ø, 3-Wire, 4-Wire — **240 Volts AC**

Ampere Rating	Branch Circuits Type QP		Indoor Enclosure — NEMA Type 1 (22,000A IR)						Outdoor Enclosure — NEMA Type 3R (22,000A IR)				
	Max. 1-Pole	Max. 2-Poles	Catalog Number	Std. Pkg.	Dimensions (inches)			Trim Style	Catalog Number	Std. Pkg.	Dimensions (inches)		
					Height	Width	Depth				Height	Width	Depth④
400	30	14	**E3030ML3400SCU**	1	41	20	6	Surface	**—**	—	—	—	—
400	42	20	**E4242ML3400FCU**	1	47	20	6	Flush	**W4242ML3400CU**	1	47	20	6
400	42	20	**E4242ML3400SCU**	1	47	20	6	Surface	**—**	—	—	—	—

① UL listed as suitable for use as service equipment.
② W0606ML14000CU rated at 22,000A IR.
③ Where noted suffix S = Surface, F = Flush.
④ Does not include 2" rainhead overhang.
⑤ Accepts up to six QN style breakers.
⑥ Suitable for use as service entrance equipment when not more than six main disconnecting means are provided.

• Revised •
04/28/15

Generator Ready Load Centers

1-Phase, 3-Wire SN, 120/240Volts AC

Generator Ready Load Centers

The Siemens generator ready load center can save thousands of dollars in future generator installation expenses while keeping initial expenses to a minimum. Works with an automatic standby generator or a portable generator.

Load Center Features

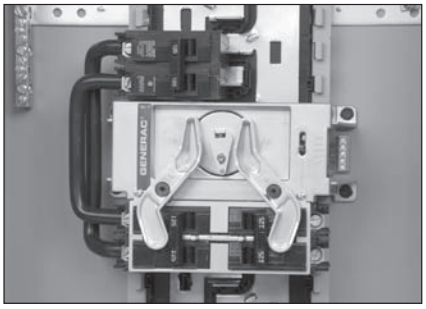
- UL Listed
- Indoor Type 1 and outdoor Type 3R
- 225A max rated
- Flush or surface mounting
- Fits between standard stud centers
- Tin plated copper bus bars
- 22 kAIC rated
- 120/240V ~
- Main lug – convertible to main breaker with addition of MBK150A, MBK200A, or MBK225A
- Main breaker – convertible to main lug with use of lug kit part no. ECMLK225
- Installation of transfer mechanism can be performed at time of generator installation.

Automatic transfer switch features:

- UL Listed
- Operates automatically when connected to generator
- Transfers load from utility to generator and back to utility
- Transfer switch (sold separately) catalog number: GENTFRSWTCH①③



NEMA 1



GENTFRSWTCH



NEMA 3R

Indoor Enclosure – NEMA Type 1

Amp Rating	No. of Spaces②	No. of Circuits②	Catalog Number	Dimensions (inches)		
				Height	Width	Depth
200	30	42	**G3042B1200GEN**	42	14.25	4
225	30	42	**G3042L1225GEN**	42	14.25	4
200	42	54	**G4254B1200GEN**	44	14.25	4
225	42	54	**G4254L1225GEN**	44	14.25	4

Outdoor Enclosure – NEMA Type 3R

Amp Rating	No. of Spaces②	No. of Circuits②	Catalog Number	Dimensions (inches)		
				Height	Width	Depth
200	30	42	**W3042B1200GEN**	42	14.63	4
225	30	42	**W3042L1225GEN**	42	14.63	4

① Q2125S provided with GENTFRSWTCH for use with automatic transfer mechanism.

② 2 spaces and 2 circuits are reserved for standby generator installation.

③ Field install breaker for voltage sensing required.

Riser Panel Load Centers

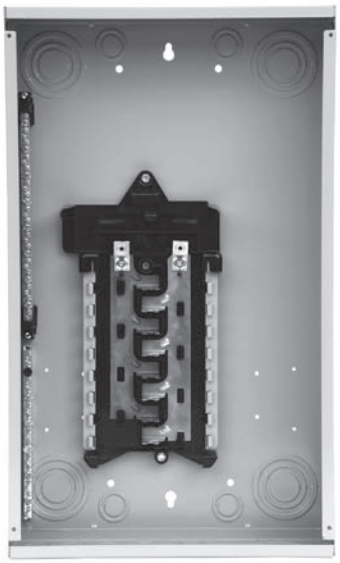
1-Phase, 3-Wire SN, 120/240Volts AC

Riser Panel Load Centers①

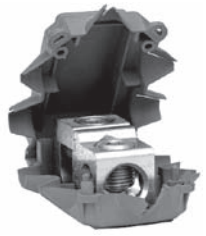
Riser panel load centers are ideal for high rise applications. The shifted interior provides room for conductors to pass through the load center. The tap kits allow the installer to tap off from those conductors to power the panel.

Features

- UL Listed for use in 1Ø and 3Ø riser gutter applications.
- Copper bus standard.
- Main lug factory standard - convertible to main breaker.
- Neutrals aligned on left side- keeps way clear for riser cables.
- Available in 125 and 200 amp models.
- Invertible for left and right hand applications.



R1632L1125CU



ECRLK250

Riser Gutter Tap Kit②③

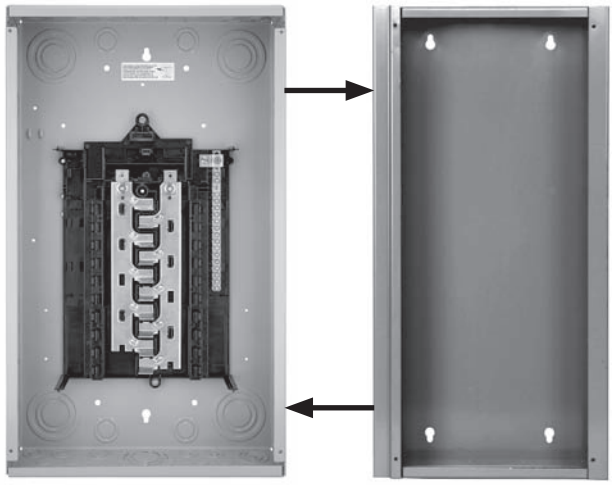
The riser gutter tap kit (ECRLK250) allows the installer to tap off the main conductors, eliminating the need to cut completely through the conductor. The tap kit accepts 250 -1/0 on the main conductor side and 250-#6 on the tap side.

Riser Gutter

The riser gutter (RAG24) is used to convert any load center 24" or larger into a riser panel.

Features

- Single and 3-phase applications
- Compatible with any single or 3-phase Siemens load center 24" or higher
- Flush trim included
- Load center mounting hardware and pass through brush included (Catalog no. RAG24)



Any Load Center 24" or larger

RAG24

1-phase, 3-wire SN, 120/240 Volts AC

Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Dimensions (inches)			Acceptable Main Breaker Kits
				Height	Width	Depth	
125	16	32	**R1632L1125CU**	24	14.25	3.88	MBK100A, MBK125A
125	24	24	**R2424L1125CU**	30	14.25	3.88	MBK100A, MBK125A
125	24	42	**R2442L1125CU**	30	14.25	3.88	MBK100A, MBK125A
200	30	42	**R3042L1200CU**	36	14.25	3.88	MBK150A, MBK200A

① The riser panels are single phase only, but can be fed from 1-phase or 3-phase systems running through the gutter trough area.

② ECRLK250 must be ordered in multiples of 3. Each kit contains 3 lugs, however, these are priced per lug not per kit.

③ ECRLK250 is sold separately

• Revised •
02/26/12

EQ® Load Centers—Small Circuit Load Centers

1-Phase, 3-Wire SN, 120/240Volts AC

Features/Applications

EQ Load Centers with main lugs feature a combination trim box in one package.

- Interiors offer removal in seconds
- Single phase
- One piece bus bar construction designed for use only with circuit breakers
- UL Listed
- UL listed on 60/75°C conductors (see equipment markings for applications)
- Positive load side circuit breaker hook rails
- Outdoor Type 3R devices use HS Type hubs. See page 1-21.



Small Circuit Load Centers
Ideal for subfeed applications



Renovation Panel
Ideal for older home renovation projects where the distance between the studs is narrower than current construction practices. The narrower panel eliminates the need to 'notch' out the existing studs.



Spa Panels
Spa Panels are ideal for outdoor applications requiring the use of ground fault protection, such as hot tubs. A factory installed 2-Pole GFCI breaker is provided, along with 2 extra circuits.

Main Lugs with Aluminum Bus⑥

100,000A IR

4–16 circuits, 100–125 Amperes

1-Phase, 3-Wire, SN 120/240 Volts AC

Branch Circuits				Indoor Enclosure — NEMA Type 1					Outdoor Enclosure — NEMA Type 3R				
Amp Rating	Max. 1-Pole No. of Spaces	No. of Circuits	QP Max. 2-Poles	Catalog Number— Replace Suffix F (Flush) with S for Surface Mounting	Std. Pkg.	Dimensions (inches) H	W	D	Catalog Number	Std Pkg.	Dimensions (inches) H	W	D
100	12	24	6	**E1224ML1100FG**①	1	14 3/4	12 3/8	3 7/8	—	—	—	—	—
125	4	8	2	**E0408ML1125F**②④⑤	5	12 5/8	6 5/8	3 1/2	**W0408ML1125**②④⑫	5	12 1/4	6	4 1/4
125	4	8	2	—	—	—	—	—	**W0408L1125SPA50**③④⑧	1	12 1/4	6	4 1/4
125	4	8	2	—	—	—	—	—	**W0408L1125SPA60**③④⑧	1	12 1/4	6	4 1/4
125	8	16	4	**E0816ML1125F**⑤	1	14 3/4	12 3/8	3 7/8	—	—	—	—	—

Main Lug and Main Breaker with Copper Bus⑥⑨

100,000A IR

4–16 circuits, 100–225 Amperes

1-Phase, 3-Wire, SN 120/240 Volts AC

Branch Circuits				Indoor Enclosure — NEMA Type 1					Outdoor Enclosure — NEMA Type 3R				
Amp Rating	Max. 1-Pole No. of Spaces	No. of Circuits	QP Max. 2-Poles	Catalog Number	Std. Pkg.	Dimensions (inches) H	W	D	Catalog Number	Std. Pkg.	Dimensions (inches) H	W	D
100	10	20	4	**E1020MB1100FCGP**⑦	1	14 3/4	12 3/8	3 7/8	—	—	—	—	—
100	12	24	6	**E1224ML1100FCU**	1	14 3/4	12 3/8	3 7/8	—	—	—	—	—
125	8	16	4	**E0816ML1125FCU**⑤	1	14 3/4	12 3/8	3 7/8	**W0816ML1125CU**⑤	1	14 3/4	12 1/8	4 1/4
125	8	16	4	**E0816ML1125SCU**	1	14 3/4	12 3/8	3 7/8	—	—	—	—	—
225	4	6	2	—	1	—	—	—	**W0406ML1225CU**②	1	23	10	4 1/8
200	4	4	2	—	1	—	—	—	**W0404MB1200CT**⑩⑪	1	20	11 1/8	4 3/4
150	4	4	2	—	1	—	—	—	**W0404MB1150CTS**⑪⑬	1	20	11 1/8	4 3/4
200	4	4	2	—	1	—	—	—	**W0404MB1200CTS**⑪⑬	1	20	11 1/8	4 3/4

① 70 amp maximum breaker.
② Will not accommodate 2-pole GFCI or circuit breaker with shunt trip.
③ Can accommodate 2-pole GFCI breaker up to 50A. For 2-pole 60A GFCI, a restriction of #6 wire applies due to wire bend space of the enclosure. Will not accommodate circuit breaker with shunt trip.
④ 100 amp maximum breaker.
⑤ Suitable for use as service entrance equipment when a main breaker (125A maximum) is back-fed in a branch position and used with main breaker retainer clip (Cat. No. ECMBR1).
⑥ Suitable for use as service entrance when not more than six main disconnecting means are provided. Check local codes and restrictions.
⑦ Two Q115 and one Q230 breaker included.
⑧ W0408L1125SPA50 provided with factory installed QF50 and ground bar. W0408L1125SPA60 provided with factory installed QF260 and ground bar.
⑨ Copper Bus load centers are recommended for those applications where the environment may be severe (i.e. farm and coastal areas).
⑩ 2" HS Type hub provided.
⑪ Type QNR main breaker factory installed.
⑫ CSA Listed
⑬ Cover plate included

• Revised •
01/22/13

EQ® Load Centers—Circuit Breaker Enclosures

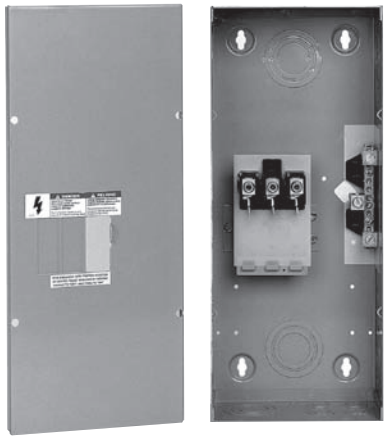
1-Phase and 3-Phase, 240V AC Max.

Features

- Circuit breaker enclosures range from 60A to 225A, indoor and outdoor models
- Designed for use exclusively with QP, QT, QPH, HQP, BQ, BQH, HBQ, QPP, QPPH, HQPP, QJ2, QJH2 and QJ2-H circuit breakers
- UL listed
- Suitable for use as service entrance equipment
- UL listed for 60/75°C conductors (See equipment markings for applications)
- Outdoor type 3R devices use HS type hubs (pg. 1-21) except for the W0204ML1060 which uses the HA type hub



W0202MB1200CU



E0303ML3100CU

Breaker Used			Indoor Enclosure — NEMA Type 1					Outdoor Enclosure — NEMA Type 3R				
Frame Type	Ampere Rating	No. of Poles	Catalog Number	Std. Pkg.	Dimensions (inches) Height	Width	Depth	Catalog Number	Std. Pkg.	Dimensions (inches) Height	Width	Depth
1-Phase, 3-Wire SN — 120/240 Volts AC												
	60	2	**E0204ML1060S**①	5	9 7/8	5 1/8	2 5/8	**W0204ML1060**①⑥	5	8	5	4 1/4
QP, QPH,	60	2	**E0204ML1060F**	5	9 7/8	5 1/8	2 5/8	—	—	—	—	—
HQP	100	2	**E0202MB1100**④	1	17 1/8	7 3/8	4 5/16	**W0202MB1100CU**④	1	17.4	7.3	4.3
	125	2	**E0204ML1125SCU**	1	17 1/8	7 1/8	4 1/4	**W0204ML1125CU**	1	17 1/8	7 3/8	4 5/16
QN, QNH,	150	2	—	—	—	—	—	**W0202MB1150CU**④	1	19 3/4	8.4	4.6
HQN	200	2	—	—	—	—	—	**W0202ML1200CU**	1	19 3/4	8.4	4.6
	200	2	**E0202MB1200**④	—	19 3/8	8 1/2	4	**W0202MB1200CU**④	1	19 3/4	8.4	4.6
QPP, QPPH, HQPP, QP	225	1-4	—	—	—	—	—	**W0406ML1225CU**②	1	23	10	4 1/8
QJ2,	150	2	—	—	—	—	—	**WB2150B**⑤	1	27	7 3/8	4 15/16
QJH2,	200	2	—	—	—	—	—	**WB2200B**⑤	1	27	7 3/8	4 15/16
QJ2-H	225	2	—	—	—	—	—	**WB2225**②	1	27	7 3/8	4 5/16
3-Phase, 3-Wire 240 Volts AC or 3-Phase, 4-Wire SN — 120/208 Volts AC, 120/240, 240 Volts AC												
QP, QPH,HQP	100	2-3	**E0303ML3100S**③	1	17 1/8	7 1/8	4 1/4	**W0303ML3100**③	1	17 1/8	7 3/8	4 5/16
BQ, BQH, HBQ	100	2-3	**EB3100S**③	1	17 1/8	7 1/8	4 1/4	**WB3100**③	1	17 1/8	7 3/8	4 5/16
QJ2, QJH2, QJ2-H	225	2-3	**EB3225F**②	1	27	10 1/8	5 1/8	**WB3225**②	1	27	10 1/8	5 9/16

① Will not accommodate 2-pole GFCI or circuit breaker with shunt trip.
② 42,000A IR maximum. Copper wire only at 225A.
③ Can accommodate 2-pole GFCI breaker up to 50A. For 2-pole GFCI, a restriction of #6 wire applies due to wire bend space of the enclosure. Will not accommodate circuit breaker with shunt trip.
④ Main breaker factory installed.
⑤ QJ2 frame circuit breaker installed, rated 10,000A IR.
⑥ CSA Listed.

• Revised •
01/22/13

Load Centers

Load Center OEM Interiors①

1Ø: Small Circuit Main Lug Interiors

Amps	Catalog Number②	Spaces	Circuits	Dimensions	
				Height	Width
60	I0204ML1125	2	2	5.06	2.12
60	I0303ML3100	3	3	5.06	3.12
125	I0408ML1125	4	8	4.51	6.61
125	I0816ML1125CU	8	16	6.19	6.81
125	I0816ML1125CUSP	8	16	6.19	6.81
200	I0202L1200	4	4	3.88	7.13
200	I1220L1200CT	12	20	9.00	7.00

1Ø: High Circuit Main Lug Interiors with Neutral Bars④

Amps	Catalog Number②	Spaces	Circuits	Dimensions	
				Height	Width
125	I1224L1125CU	12	24	10.80	9.80
125	I1624L1125CU	16	24	12.80	9.80
125	I3040L1125CU	30	40	20.80	9.80
200	I0816L1200CT④	8	16	10.80	9.80
200	I1224L1200CU	12	24	10.80	9.80
200	I1632L1200CU	16	32	12.80	9.80
200	I2040L1200CU	20	40	14.80	9.80
200	I3040L1200CU	30	40	14.80	9.80
200	I4040L1200CU	40	40	24.80	9.80
225	I4242L1225CU	42	42	26.80	9.80

3Ø: Main Lug Interiors②

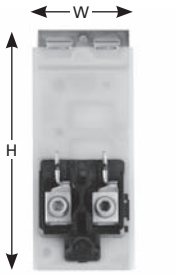
Amps	Catalog Number	Spaces	Circuits	Dimensions	
				Height	Width
125	SI1224L3125B	12	24	10.04	9.95
200	SI1224L3200B	12	24	10.04	9.95
200	SI2442L3200B	24	42	16.04	9.95
200	SI3054L3200B	30	54	19.04	9.95
225	SI4242L3225B	42	42	25.04	9.95
125	PI1224L3125CUB	12	24	10.04	9.95
200	PI1224L3200CUB	12	24	10.04	9.95
200	PI1836L3200CUB	18	36	13.04	9.95
125	PI1836L3125CUB	18	36	13.04	9.95
200	PI2442L3200CUB	24	42	10.04	9.95
200	PI3054L3200CUB	30	54	19.04	9.95
225	PI4242L3225CUB	42	42	25.04	9.95

1Ø: Parallel Lug Interiors with Neutral Bars

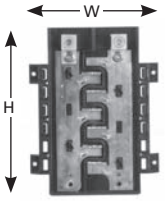
Amps	Catalog Number②	Spaces	Circuits	Dimensions	
				Height	Width
200	CTI2040L1200CU	20	40	14.80	9.80
200	CTI2440L1200CU	24	40	16.80	9.80
200	CTI3040L1200CU	30	40	20.80	9.80

Lug Data

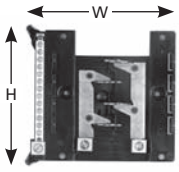
Interior	Amperage	Wire range	Torque
I0204ML1060	60	2/0 - 4 AWG	45 lb. - ins.
I0303ML3100	100	2/0 - 4 AWG	45 lb. - ins.
I1224ML1100	100	2/0 - 4 AWG	45 lb. - ins.
I0408ML1125	125	2/0 - 4 AWG	45 lb. - ins.
I0816ML1125CU/CUSP	60	2/0 - 4 AWG	45 lb. - ins.
Single Phase	125	2/0 - 4 AWG	110 lb. - ins.
Single Phase	200/225	300 kcmil - 4 AWG	250 lb. - ins.
Three Phase	125	300 kcmil - 6 AWG	340 lb. - ins.
Three Phase	200/225	300 kcmil - 6 AWG	340 lb. - ins.



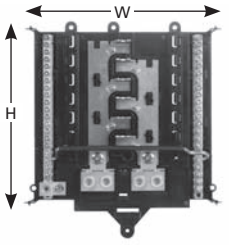
I0204ML1125



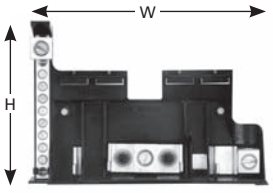
I1220L1200CT



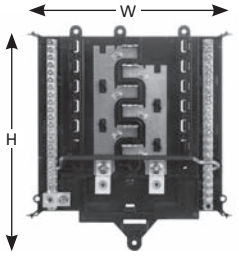
I0816ML1125CU



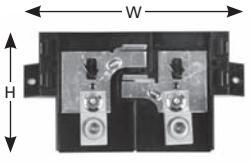
Parallel Lug



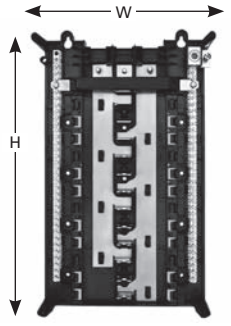
I0408ML1125



1 Phase



I0202L1200



3 Phase

① UL Recognized Components.
② The letters "CU" in any catalog number represent copper bus bars.
③ Feed thru lugs provided.
④ Convertible to main breaker using the MBK main breaker kits.

Load Centers

Load Center Accessories①

Ground Bar Kits (For ES and PL Load Centers)

Catalog Number	Description	Pack Qty
EC1GB8	GROUND BAR KIT-8 POS	1
EC1GB82	GROUND BAR KIT-8 POS, 2/0 LUG	1
EC2GB12	GROUND BAR KIT-12 POS	1
EC2GB122	GROUND BAR KIT-12 POS, 2/0 LUG	1
EC2GB15	GROUND BAR KIT-15 POS	1
EC2GB152	GROUND BAR KIT-15 POS, 2/0 LUG	1
EC3GB21	GROUND BAR KIT-21 POS	1
EC3GB212	GROUND BAR KIT-21 POS, 2/0 LUG	1
EC3GB27	GROUND BAR KIT-27 POS	1
EC3GB272	GROUND BAR KIT-27 POS, 2/0 LUG	1
EC3GB30	GROUND BAR KIT-30 POS	1
EC3GB302	GROUND BAR KIT-30 POS, 2/0 LUG	1
EC3GB352	GROUND BAR KIT-35 POS, 2/0 LUG	1
EC3GB352G	GROUND BAR KIT-35 POS, 2/0 LUG②	1

Ground Bar Kits (For Legacy Load Centers)

ECGB5	GROUND BAR KIT-5 POS	1
ECGB10	GROUND BAR KIT-10 POS	1
ECGB101	GROUND BAR KIT-10 POS, 1/0 LUG	1
ECGB14	GROUND BAR KIT-14 POS	1
ECGB141	GROUND BAR KIT-14 POS, 1/0 LUG	1
ECGB142	GROUND BAR KIT-14 POS, 2/0 LUG	1
ECGB20	GROUND BAR KIT-20 POS	1
ECGB201	GROUND BAR KIT-20 POS, 1/0 LUG	1
ECGB202	GROUND BAR KIT-20 POS, 2/0 LUG	1
ECINSGB5	INSULATED GROUND BAR KIT-5 POS	1
ECINSGB14	INSULATED GROUND BAR KIT-14 POS	1
ECINSGB20	INSULATED GROUND BAR KIT-20 POS	1

Hubs

ECHS000	HS TYPE CLOSURE PLATE	1
ECHS075	HS TYPE HUB - 3/4"	1
ECHS100	HS TYPE HUB - 1"	1
ECHS125	HS TYPE HUB - 1 1/4"	1
ECHS150	HS TYPE HUB - 1 1/2"	1
ECHS200	HS TYPE HUB - 2"	1
ECHS250	HS TYPE HUB - 2 1/2"	1
ECHA000	HA TYPE CLOSURE PLATE	1
ECHA075	HA TYPE HUB - 3/4'	1
ECHA100	HA TYPE HUB - 1"	1
ECHA125	HA TYPE HUB - 1 1/4"	1
ECHA150	HA TYPE HUB - 1 1/2"	1
ECHV000	HV TYPE CLOSURE PLATE	1
ECHV200	HV TYPE HUB - 2"	1
ECHV250	HV TYPE HUB - 2.5"	1
ECHV300	HV TYPE HUB 3"	1
ECHV350	HV TYPE HUB - 3.5"	1
ECHV400	HV TYPE HUB - 4"	1

Lock Kits

ECQFL2	FLUSH LOCK KIT FOR ULT., PL, ES, 3PH 100A-225A	1
ECQFL1	FLUSH LOCK KIT-REPLACEMENT FOR EQ LC	1
ECQFL3	ADD-A-LOCK (FLUSH LOCK) FOR 300-400A LC	1

Load Center Conversion Kits

MBK100A	MAIN BREAKER KIT 100-125A 1PH 22K	1
MBK125A	MAIN BREAKER KIT 125A 1PH 22K	1
MBK150A	MAIN BREAKER KIT 150A-225A 1PH 22K	1
MBK200A	MAIN BREAKER KIT 200A-225A 1PH 22K	1
MBK225A	MAIN BREAKER KIT 225A 1PH 22K	1
MBK3100	MAIN BREAKER KIT 100A 3PH QP 240V 10K	1
MBK3125	MAIN BREAKER KIT 125A 3PH QP 240V 10K	1
MBK3150	MAIN BREAKER KIT 150A 3PH 240V 10K	1
MBK3175	MAIN BREAKER KIT 175A 3PH 240V 10K	1
MBK3200	MAIN BREAKER KIT 200A 3PH 240V 10K	1
MBK3225	MAIN BREAKER KIT 225A 3PH 240V 10K	1
MBK3125H	MAIN BREAKER KIT 125A 3PH 240V 22K	1
MBK3150H	MAIN BREAKER KIT 150A 3PH 240V 22K	1
MBK3175H	MAIN BREAKER KIT 175A 3PH 240V 22K	1
MBK3200H	MAIN BREAKER KIT 200A 3PH 240V 22K	1
MBK3225H	MAIN BREAKER KIT 225A 3PH 240V 22K	1
MBK3125HH	MAIN BREAKER KIT 125A 3PH 240V 42K	1
MBK3150HH	MAIN BREAKER KIT 150A 3PH 240V 42K	1
MBK3175HH	MAIN BREAKER KIT 175A 3PH 240V 42K	1
MBK3200HH	MAIN BREAKER KIT 200A 3PH 240V 42K	1
MBK3225HH	MAIN BREAKER KIT 225A 3PH 240V 42K	1
ECMLK125	1 PH MAIN LUG CONVERSION KIT 100-125A	1
ECMLK225	1 PH MAIN LUG CONVERSION KIT 150-225A	1
ECMLK3125	3 PH MAIN LUG CONVERSION KIT 100-125A	1
ECMLK3225	3 PH MAIN LUG CONVERSION KIT 150-225A	1

Lug Kits

ECCS1	COLLAR STRAP FOR GRD BARS #14-1/0	1
ECCS2	COLLAR STRAP FOR GRD BARS #6-250	1
ECLKB1	NEUTRAL LUG KIT WITH BOND TAB	1
ECLK3	NEUTRAL LUG KIT #1-300 FOR EQIII LC	1
ECLK1-2	NEURTAL LUG KIT #2 TO 1/0 FOR EQIII LC	1
ECLK2	NEUTRAL LUG KIT #4-2/0 FOR EQIII LC, PL, ES	1
ECLK2SC	2/0 LUG FOR 125AMP NEUTRAL FEEDER	1
ECLK2125	125A SUB FEED LUGS-USES 2 SPACES	1
ECLK2225	150A-225A SUB FEED LUGS-USES 4 SPACES	1
ECLK3225	3P SUB FEED LUGS-USES 6 SPACES	1
ECRLK250	RISER LUG KIT 250 KCMIL	3

Miscellaneous Load Center Accessories

ECCP1	PKG OF 100 CIRCUIT DIRECTORY	100
ECQF3	QP/BQ/ED2 FILLER PLATE	5
ECMBF125	1 PH 100&125A MAIN BREAKER FILLER PLATE	1
EC3PMFP1	3 POLE MAIN FILLER PLATE	1
ECSMK1	SURFACE MOUNT 1/4" SPACE KIT FOR LC'S	4
ECTS2	LC TRIM SCREWS	6
ECTS2W	LC TRIM SCREWS WHITE	6
ECLCHINGE	GREY LC HINGES	100
ECADHLCDIRLBL	ADHESIVE LC DIRECTORY LABELS	100
ECSIELATCH	SIEMENS LC LATCHES	25
ECBONDSCRW	LC BOND SCREW	10
ECSN1	SCREWS & NUTS FOR HC HUB-BOTTOM USE	4
RAG24	RISER AUX GUTTER 24"	1
ECAFL	ARC FLASH LABEL	10

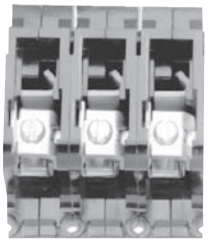
Neutral Bar Kits

ECLNB14	MLO NEUTRAL BAR KIT-14 POS	1
ECLNB16	CONVERTIBLE LC NEUTRAL BAR KIT-16 POS	1

① The pack quantity is the number that is sold in a pack. Items listed on this page must be ordered in multipiles of pack quantities but items are priced per each. For example, ECRLK250 come 3 to a pack so must be ordered in multiples of 3 but pricing would be individual unit price times 3.
② Bar has green-colored screws.

Load Centers

Load Center Accessories



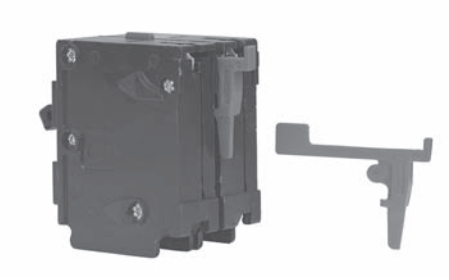
Lug Kit, 3-Pole, Subfeed or Feed thru Applications
ECLK3225



3-Pole Main Breaker Kit
MBK3200



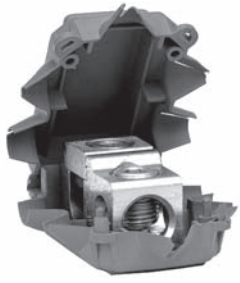
Neutral Bar Kit
ECLNB14



Main Breaker Retainer Kit for EQ Load Centers
ECMBR1



Main Breaker Retainer kit for Ultimate, ES, & PL Load Centers
ECMBR2



Riser Lug Kit
ECRLK250



Ground Bar Kit, **EC2GB15**



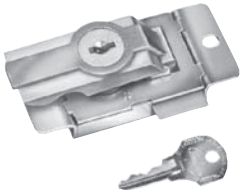
Neutral Lug Kit, **ECLK1-2**
wire range — #2-1 AWG
Cu or Al



Neutral Lug Kit, **ECLK3**
wire range — #1-300 MCM
Neutral Lug Kit, **ECLK2**
wire range — #4-#2/0 AWG
Cu or Al



For use on Ground Bar only
Collar Strap, Wire Range;
ECCS1; ECCS2



Add-A-Lock
(Flush Lock) **ECQFL1**
For EQ load centers



Filler Plate, **ECQF3**



Add-A-Lock
(Flush Lock), **ECQFL2**
for Ultimate, ES & PL Load Centers and 3-phase up to 225A

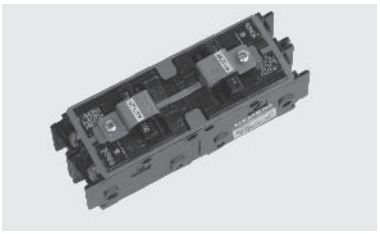


Add-A-Lock
(Flush Lock), **ECQFL3**
300-400A Load Centers

Load Centers

Manual Transfer Interlock Kits for Load Centers and Meter Combinations

Convert load centers or meter combinations into standby power panels



Standard features

- UL listed for use in most Siemens load centers and meter combinations
- Suitable for use with optional standby systems in accordance with article 702 of the National Electric Code
- Corrosion resistant finish
- Easy assembly requiring no modifications to the load center or meter combination
- Remains attached to the main breakers when load center cover

Panels in which the bussing or wire forms from the meter socket land on main lugs are not acceptable for use in standby systems because turning the main breaker to "OFF" does not prevent feedback to the utility power lines. Examples of such panels include catalog numbers that start with the following letters.

MC0606L1200*

MM0406L1*

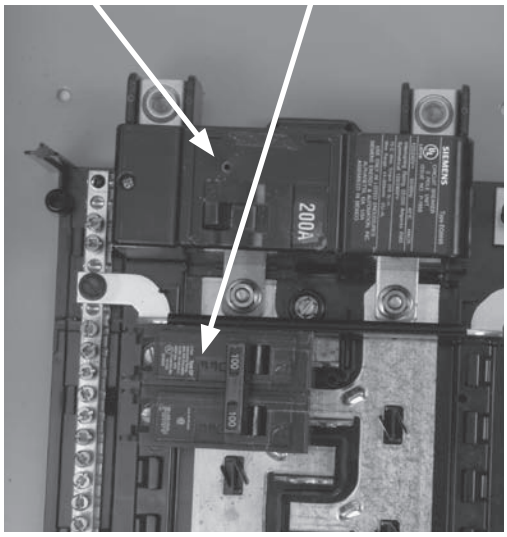
MC1212L1200*



Wire forms or bussing



Utility main breaker **Standby power main breaker**



To activate standby power the utility main breaker must be in the "OFF" position to prevent dangerous feedback between the power sources.

Acceptable usage of Interlock Kits by load center/meter combination catalog numbers

ES Series Load Centers can utilize interlock kits: 1, 2, 5, 6, 7. Kits 3 and 4 can also be used on main breaker panels.

PL Series Load Centers can utilize interlock kits: 1, 2, 3, 4, 5, 6, 7.

Numbers 1 through 9 in these tables represent the last digit in each interlock kit catalog number. Example: 1 = ECSBPK01

When used in horizontal positions as typical in most load centers, ECSBPK07 is recommended for use only with QNR type circuit breakers.

Standby power interlock kits are not intended for use with AFCI, GFCI, 3-pole or 1/2" frame circuit breakers and 4 space, 125 amp load centers.

Siemens type EQ load centers using a "4-pole" main breaker do not have a kit available to interlock this main to branch circuits. Branch circuit positions can be interlocked.

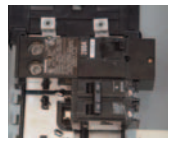
Siemens Meter Combinations①			
MC0816B1150RTH	5 7	MC2040S1200JLC	9
MC0816B1150T	5 7	MC2442B1225EFC	2
MC0816B1150TH	5 7	MC2442B1225ESC	2
MC0816B1200EFN	2	MC3040S1200SC	5 7
MC0816B1200RT	5 7	MC3042B1200FED	3
MC0816B1200RTB	5 7	MC3042B1200SED	3
MC0816B1200RTH	5 7	MC3042B1225FED	3
MC0816B1200ESN	2	MC3042B1225SED	3
MC0816B1200T	7	MC4040B1200SECW	5 7
MC0816B1200TH	5 7	MC4040S1200SC	5 7
MC0816B1350RLTM	5 7	MC0816B1200RJBT	8
MC0816B1400RLTM	5 7	MC0816B1150RJBT	8
MC1224B1100EFC	2	MC0816B1200RCT	8
MC1224B1100ESC	2	MC0816B1150RCT	8
MC1224B1125	1 2	MC0816B1200CT	8
MC1224B1125EFC	2	MC0816B1150CT	8
MC1224B1125ESC	2	MC2040B1150RCT	9
MC2040B1150	5 7	MC2040B1150CT	9
MC2040B1200	5 7	MC2040B1200RCT	9
MC2040B1200R	5 7	MC2040B1200CT	9

① No interlock kit available for MC0816S1200SCT, MC2442S1200SC, MC2442S1200FC, MC2040S1200SZ, MM02025S1200H, MM0202S1200RHJ, MM0202S1200RJB

Load Centers

Manual Transfer Interlock Kits for Load Centers and Meter Combinations①

Prevents dangerous feedback between two sources of power

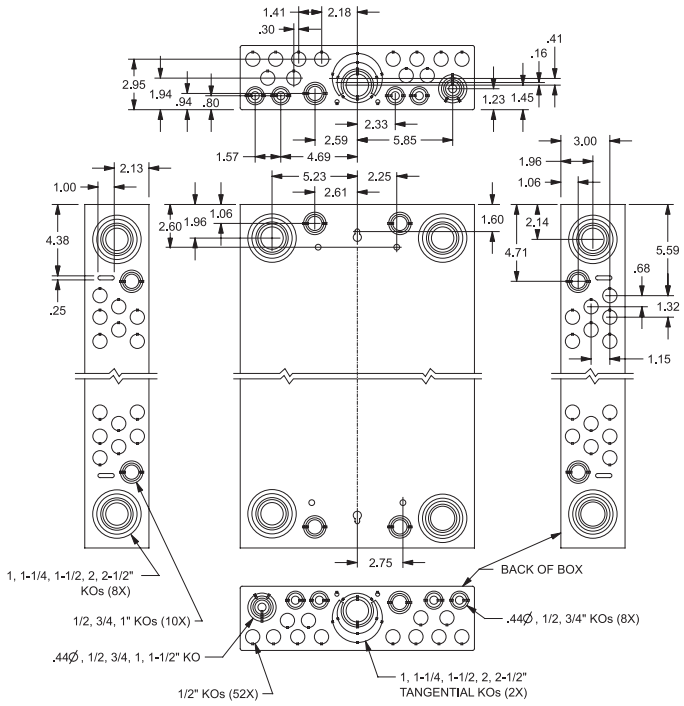
Catalog number	Usage Information	Utility main breaker types	Standby main breaker types	Interlock number
ECSBPK01 	For use on load centers or meter combinations that will accept 2-pole circuit breakers opposite one another as shown.	QP, QPH, HQPH	QP, QPH, HQPH	1 
ECSBPK02 	For use on load centers or meter combinations that will accept 2- or 4-pole next to a 2-pole circuit breaker side by side as shown.	QP, QPH, HQPH	QP, QPH, HQPH	2 
ECSBPK03② 	For use on UltimateTM and Rock Solid load centers, 150 amp and higher, to connect the main breaker to a 2-pole circuit breaker.	MBK150A, MBK200A, OR MBK225A	QP, QPH, HQPH	3 
ECSBPK04② 	For use on Ultimate and Rock Solid load centers, 125 amp and lower, to connect the main breaker to a 2-pole circuit breaker.	MBK100A or MBK125A	QP, QPH, HQPH	4 
ECSBPK05 	For use on load centers or meter meter combinations that will accept a QNR (MD-TR) frame circuit breaker next to a 2-pole circuit breaker as shown.	QNR, QNRH, HQNR	QP, QPH, HQPH	5 
ECSBPK06② 	For use on load centers or meter combinations that will accept a QN (MD-T) frame circuit breaker next to a 2-pole circuit breaker as shown.	QN, QNH, HQN	QP, QPH, HQPH	6 
ECSBPK07 	For use on load centers or meter combinations that will accept two QNR (MD--TR) circuit breakers side by side as shown OR will accept two QN (MD--T) circuit breakers side by side as shown.	QNR, QNRH, HQNR, QN, QNH, HQN	QNR, QNRH, HQNR QN, QNH, HQN	7 
ECSBPK08② 	For use on 8 space, over/under, OH/UG feed meter combinations as shown. Limited application to specific catalog numbers.	QPP, QPPH	QP, QPH, HQPH	8 
ECSBPK09② 	For use on 20 space, over/under, OH/UG feed meter combinations as shown. Limited application to specific catalog numbers.	QPP, QPPH	QP, QPH, HQPH	9 

① Manual breaker interlock kits are attached to the breakers not the trim of the load center.

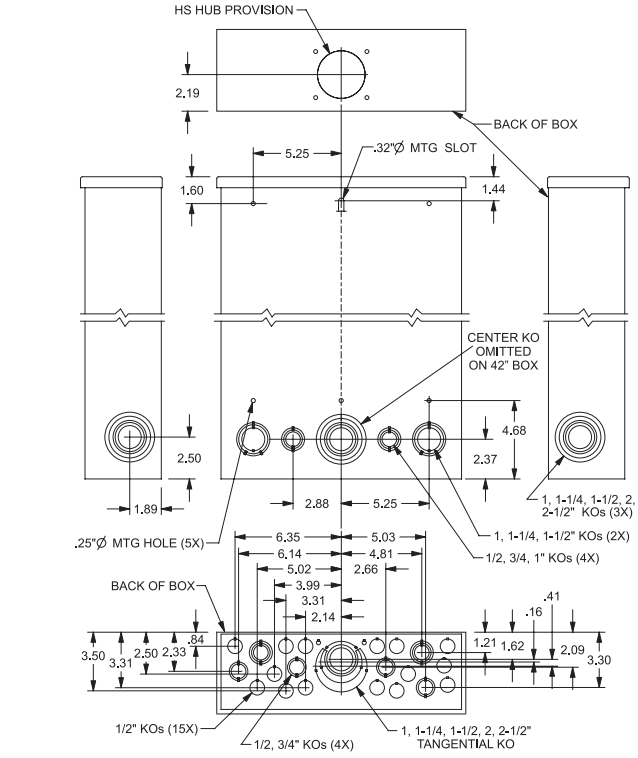
② These kits take up 2 spaces adjacent to the 2 pole breaker being interlocked. Those spaces cannot accommodate filler plates.

Load Centers

1-Phase Indoor and 1-Phase & 3-Phase Outdoor Enclosures—Knockout Diagrams



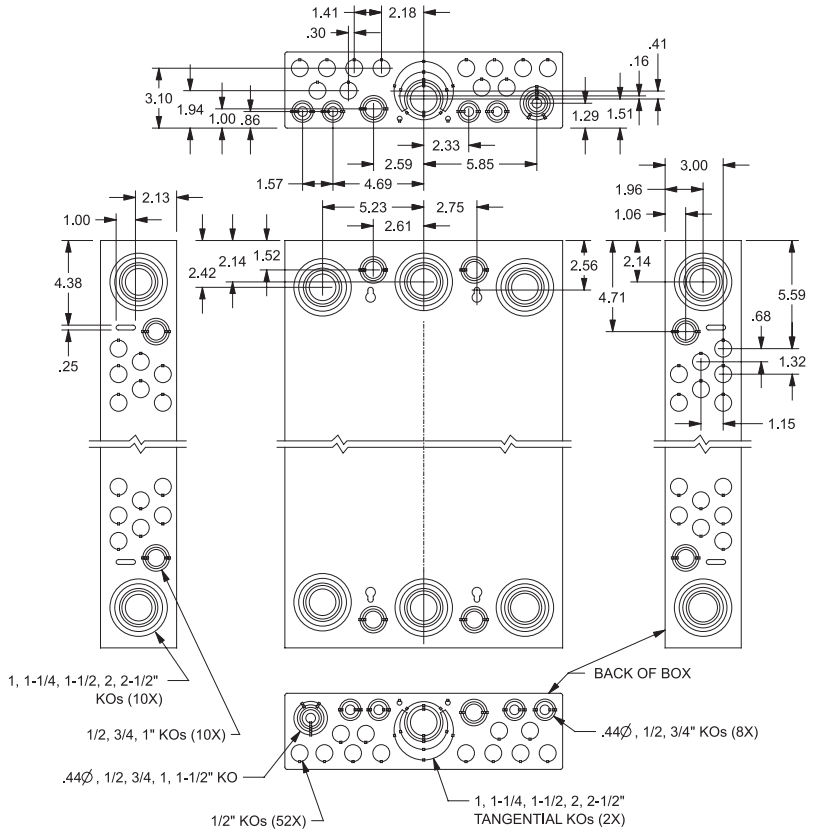
ES, PL, and Generator Ready
1 Phase Load Centers
Indoor



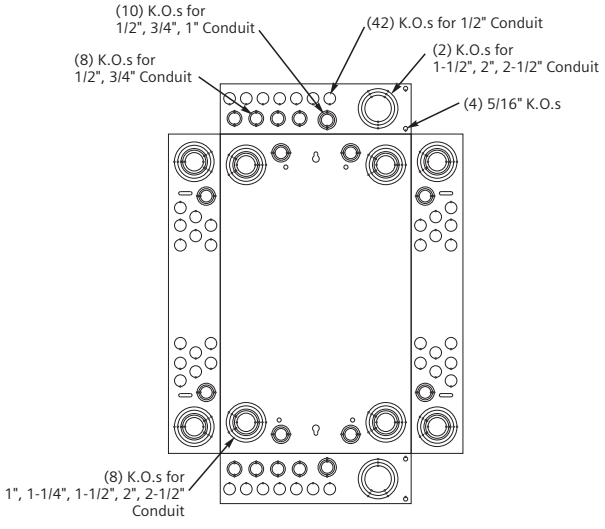
ES, PL, and Generator Ready
1 and 3 Phase Load Centers
Outdoor

Load Centers

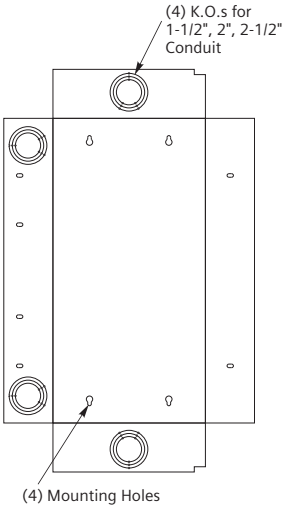
3-Phase Indoor and Riser Enclosures—Knockout Diagrams



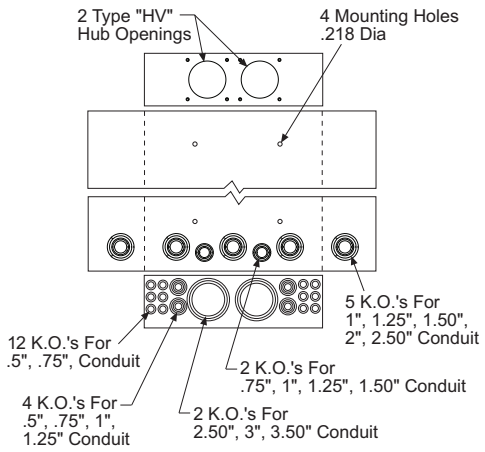
ES and PL
3 Phase Load Centers



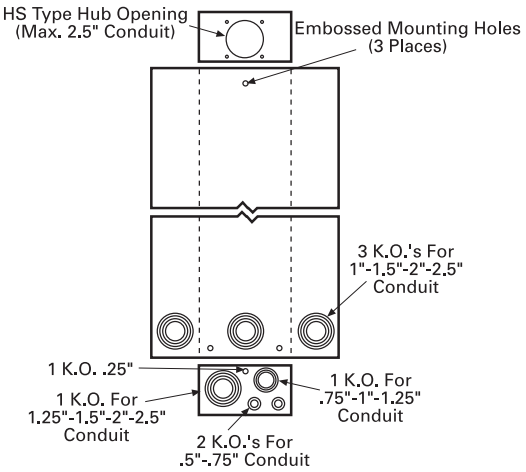
All Riser Panels



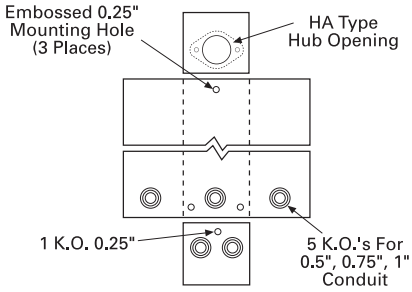
RAG24



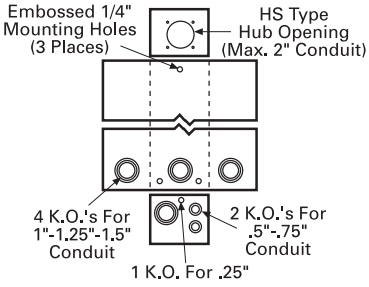
Outdoor 400A Load Center



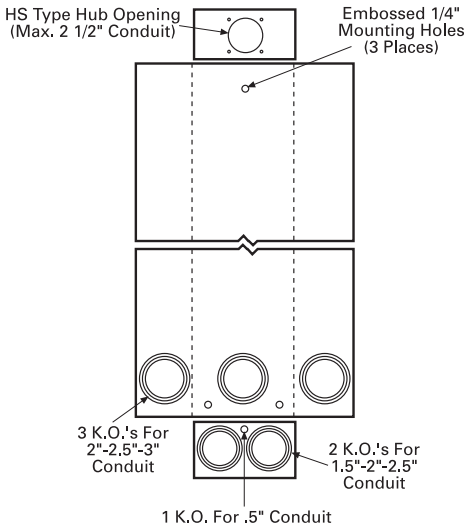
W0406ML1125CU



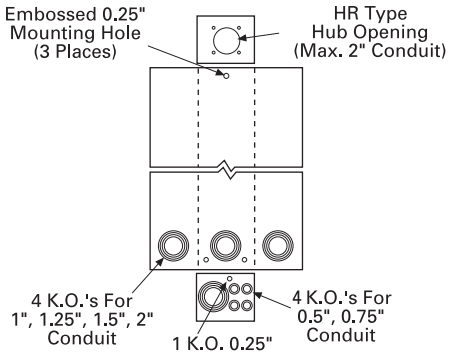
W0204ML1060



W0408ML1125



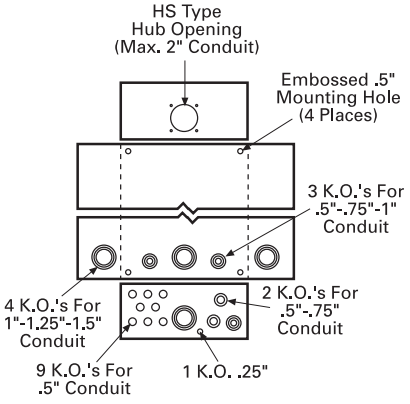
WB2225 and WB32225



W0204ML1125

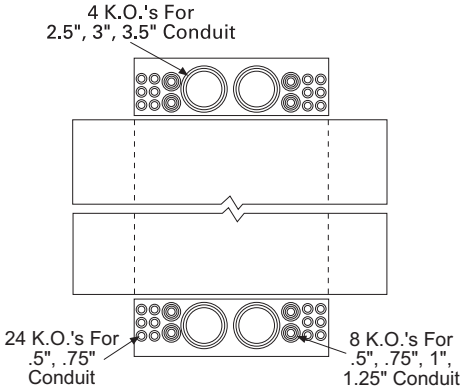
W0303ML3100

WB3100

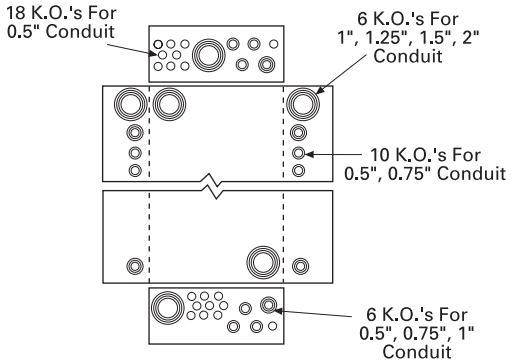


W0612ML1125

W0816ML1125



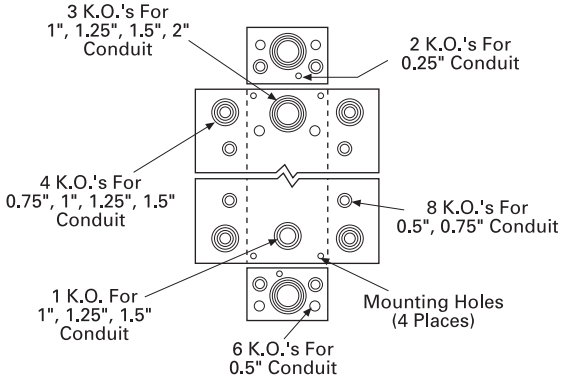
Indoor 300-400A Load Center



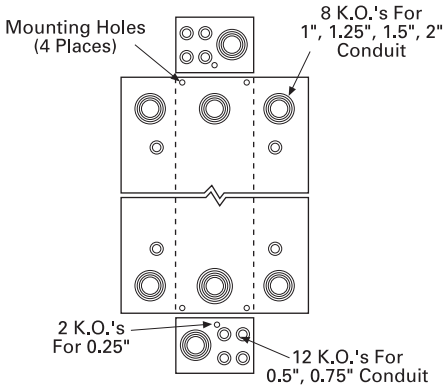
E0612ML1125

E0816ML1125

E1224ML1100F

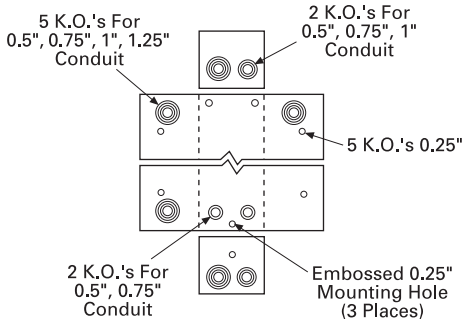


E0408ML1125



E0303ML3100SCU

EB3100



E0204ML1060

Load Centers

Cross Reference

Ultimate Load Center Cross Reference to ES Series and PL Series

Phase	Type	Current Sku	ES Series	PL Series
1 Phase	Indoor	New	—	P3040L1200SG
		New	—	P4040L1200SG
		New - Higher Circuits	—	P4260L1225CUSG
		New - Higher Circuits	S3054L1200	P3054L1200CU
		New - Higher Circuits	S5470B1225	P5470B1225CU
		New - Higher Circuits	S5470L1225	P5470L1225CU
		New - Higher Circuits	SW3054L1200	PW3054L1200CU
		G1212L1125	S1212L1125	-
		G1212L1125CU	—	P1212L1125CU
		G1224B1100	S1224B1100	-
		G1224B1100CU	—	P1224B1100CU
		G1224L1125	S1224L1125	-
		G1224L1125CU	—	P1224L1125CU
		G1224L1125CUSG	—	P1224L1125CUSG
		G1224L1200CU	S1224L1200	P1224L1200CU
		G1624B1100	S1624B1100	-
		G1624B1100CU	—	P1624B1100CU
		G1624B1100W	S1624B1100W	-
		G1624L1125	S1624L1125	-
		G1624L1125CU	—	P1624L1125CU
		G1624L1125CUSG	—	P1624L1125CUSG
		G1630B1150	S1630B1150	-
		G2020B1100	S2020B1100	-
		G2020B1100CP	S2020B1100P	-
		G2020B1100CU	—	P2020B1100CU
		G2020L1125	S2020L1125	-
		G2020L1125CU	—	P2020L1125CU
		G2020L1125CUW	S2020L1125W	—
		G2030B1150	S2030B1150	—
		G2030B1150CU	—	P2030B1150CU
		G2030L1125CUSG	—	P2030L1125CUSG
		G2030L1150	S2030L1150	—
		G2030L1150CU	—	P2030L1150CU
		G2030L1150CUSG	—	P2030L1150CUSG
		G2040B1200	S2040B1200	—
		G2040B1200CU	—	P2040B1200CU
		G2040L1200	S2040L1200	—
		G2040L1200CU	—	P2040L1200CU
		G2424B1100CU	—	P2424B1100CU
		G2424B1125	S2424B1125	—
		G2424L1125	S2424L1125	—
		G2424L1125W	S2424L1125W	—
		G2430B1150	S2430B1150	—
		G2430L1125CUSG	—	P2430L1125CUSG
		G2440B1200	S2440B1200	—
		G2440L1125CU	S2440L1125	P2440L1125CU
		G2440L1200	S2440L1200	—
		G2440L1200CU	—	P2440L1200CU
		G3030B1100CU	S3030B1100	P3030B1100CU
		G3030B1150	S3030B1150	—
		G3030B1150CU	—	P3030B1150CU
		G3030L1200	S3030L1200	—
		G3030L1200CU	—	P3030L1200CU
		G3030L1200W	S3030L1200W	—
		G3040B1200	S3040B1200	P3040B1200
		G3040B1200CP	S3040B1200P	—
		G3040B1200CU	—	P3040B1200CU
		G3040L1125CU	—	P3040L1125CU
		G3040L1125CUW	S3040L1125W	—
		G3040L1200	S3040L1200	P3040L1200
		G3040L1200CP	S3040L1200P	—
		G3040L1200CU	—	P3040L1200CU
		G3040L1200CUSG	—	P3040L1200CUSG
		G4040B1200	S4040B1200	P4040B1200
		G4040B1200CP	S4040B1200P	—
		G4040B1200CU	—	P4040B1200CU
		G4040B1200W	S4040B1200W	P4040B1200W
		G4040L1125CU	S4040L1125	P4040L1125CU
		G4040L1200	S4040L1200	P4040L1200
		G4040L1200CU	—	P4040L1200CU
		G4040L1200CUSG	—	P4040L1200CUSG
		G4242B1225CU	S4260B1225	P4260B1225CU
		G4242L1225CU	S4260L1225	P4260L1225CU
		G2020B1100SP	S2024B1100	P2024B1100CU
		G2020L1125SP	S2020L1125G	—
		G2024L1125SP	S2024L1125/S2024L1125G	P2024L1125CU
		G2424L1125SP	S2424L1125G	—
		G3030B1125CU	S3030B1125	P3030B1125CU
		G3040L1125	S3040L1125/S3040L1125G	—
		G4040B1200CUSG	—	P4040B1200CUSG

Load Centers

Cross Reference

Ultimate Load Center Cross Reference to ES Series and PL Series

Phase	Type	Current Sku	ES Series	PL Series
1 Phase	Outdoor	W0816B1200CT	SW0816B1200T	PW0816B1200TC
		W0816L1200CT	SW0816L1200T	PW0816L1200TC
		W1212L1125CU	SW1212L1125	PW1212L1125CU
		W1224B1100CU	SW1224B1100	PW1224B1100CU
		W1224L1125CU	SW1224L1125	PW1224L1125CU
		W1224L1200CU	SW1224L1200	PW1224L1200CU
		W1224L1225CU	SW1224L1225	PW1224L1225CU
		W1624B1100CU	SW1624B1100	PW1624B1100CU
		W1624L1125CU	SW1624L1125	PW1624L1125CU
		W2020B1100CU	SW2020B1100	PW2020B1100CU
		W2030L1150CU	SW2030L1150	PW2030L1150CU
		W2040B1200CU	SW2040B1200	PW2040B1200CU
		W2040L1200CU	SW2040L1200	PW2040L1200CU
		W2424L1125CU	SW2424L1125	—
		W3040B1200CU	SW3040B1200	PW3040B1200CU
		W3040L1125CU	SW3040L1125	PW3040L1125CU
		W3040L1200CU	SW3040L1200	PW3040L1200CU
		W4040B1200CU	SW4040B1200	PW4040B1200CU
		W4040L1200CU	SW4040L1200	PW4040L1200CU
		W4242B1225CU	SW4260B1225	PW4260B1225CU
		W4242L1225CU	SW4260L1225	PW4260L1225CU
3 Phase	Indoor	New	S4242B3150	—
		New – Higher Circuits	—	P5470B3225CU
		New – Higher Circuits	S5470L3225	P5470L3225CU
		G1224L3125CU	S1224L3125	P1224L3125CU
		G1224L3200CU	S1224L3200	—
		G1836L3150CU	S1836L3150	—
		G2442B3150CU	S2442B3150	P2442B3150CU
		G2442B3150CU22	—	P2442B3150CU
		G2442L3150CU	S2442L3150	—
		G2442L3200CU	S2442L3200	P2442L3200CU
		G3030B3100CU	S3030B3100	P3042B3100CU
		G3030B3100CU22	—	P3042B3100CU
		G3042B3200CU	S3054B3200	P3054B3200CU
		G3042L3200CU	S3054L3200	P3054L3200CU
		G4242B3200CU	S4260B3200	P4260B3200CU
		G4242B3225CU	S4242B3225	P4260B3225TCU/ P4260B3225CU
		G4242L3225CU	S4260L3225	P4260L3225CU
	Outdoor	W1224L3125CU	SW1224L3125	PW1224L3125CU
		W1224L3200CU	SW1224L3200	—
		W1836L3150CU	SW1836L3150	—
		W2442B3150CU	SW2442B3150	—
		W2442L3150CU	SW2442L3150	—
		W2442L3200CU	SW2442L3200	PW2442L3200CU
		W3042B3200CU	SW3054B3200	PW3054B3200CU
		W3042B3200CU22	—	PW3054B3200CU
		W3042L3200CU	SW3054L3200	PW3054L3200CU
		W4242B3200CU	SW4260B3200	PW4260B3200CU
		W4242B3200CU22	—	PW4260B3200CU
		W4242B3225CU	SW4242B3225	PW4260L3225CU
		W4242L3225CU	SW4260L3225	—

• Revised •
01/20/15

Circuit Breakers

Arc-Fault and Ground-Fault Breakers

Arc-Fault Circuit Interrupters (AFCI)

AFCI's detect arcing faults (an unintentional arcing condition in a circuit) that standard circuit breakers are unable to detect. The device is intended to mitigate the effects of arcing faults by functioning to de-energize the circuit when an arc-fault is detected.

Combination Type AFCI

Detects all three possible types of arc fault: line-to-ground, line-to-neutral, and series.

Breaker Type	Ampere Rating	10,000 A IR Catalog Number	22,000 A IR Catalog Number	65,000 A IR Catalog Number
QAF2/QAFH2/HQAF2 **1-Pole 120V AC**	15 20	QA115AFC① QA120AFC①	QA115AFCH■① QA120AFCH■①	QA115AFCHH QA120AFCHH
QAF2/QAFH2 **2-Pole 120/240V AC**	15 20	Q215AFC① Q220AFC①	Q215AFCH■① Q220AFCH■①	— —

Branch-Feeder AFCI

Detects line-to-ground and line-to neutral arcs.

QAF2/QAFH2/HQAF2 **1-Pole 120V AC**	15 20	QA115AF① QA120AF①	QA115AFH■① QA120AFH■①	QA115AFHH QA120AFHH

NEW Dual Function AFCI/GFCI

The Dual Function Circuit Breaker combines Combination Type AFCI and GFCI, protecting against both Arc Faults and Ground Faults. The device includes the Self Test and Lockout feature, making it the first in class in electrical safety for homeowners.

QFGA2/QFGAH2/ HQFGA2 **1-Pole 120V AC**	15 20	Q115DF Q120DF	Q115DFH Q120DFH	Q115DFHH Q120DFHH

Ground-Fault Circuit Interrupters (GFCI)

Provides Class A (5mA) ground fault protection. Intended for personnel protection. De-energizes the circuit for all ungrounded conductors of the circuit.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
QPF/ QPHF **1-Pole 120V AC Plug-in**	15 20 25 30	QF115① QF120① QF125■ QF130	QF115H① QF120H■① — QF130H
QPF/ QPHF **2-Pole 120/ 240V AC Plug-in**	15 20 30 40 50 60	QF215 QF220 QF230 QF240 QF250 QF260	QF215H QF220H QF230H QF240H QF250H QF260H

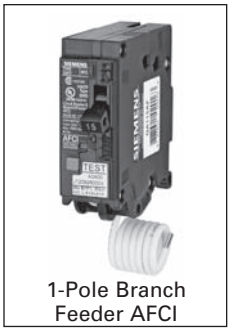
Ground Fault Equipment Protection (30mA)

Provides protection of equipment from damaging line-to-ground faults currents. De-energizes the circuit for all ungrounded conductors of the circuit.

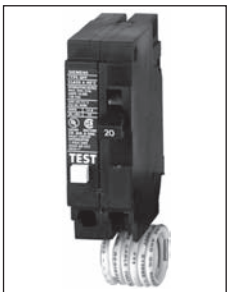
Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
QE/ QEH **1-Pole 120V AC Plug-in**	15 20 30	QE115① QE120① QE130	QE115H① QE120H① QE130H
QE/ QEH **2-Pole 120/ 240V AC Plug-in**	15 20 30 40 50 60	QE215 QE220 QE230 QE240 QE250 QE260■	QE215H QE220H QE230H QE240H QE250H QE260H■


1-Pole Combination Type AFCI


2-Pole Combination Type AFCI


1-Pole Branch Feeder AFCI


1-Pole Dual Function AFCI/GFC


1-Pole GFCI


2-Pole GFCI

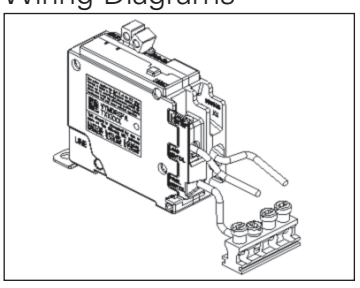

1-Pole Equipment Protection

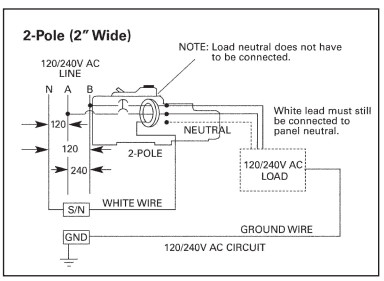

2-Pole Equipment Protection

QAF2/QPF/QE Accessories

Description	Catalog Number
Padlocking Device 1-Pole	ECPLD1
Padlocking Device 2-Pole	ECPLD2
Handle Block	ECBX231M

Wiring Diagrams





■ Built to order. Allow 2–3 weeks for delivery.
① UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

Circuit Breakers

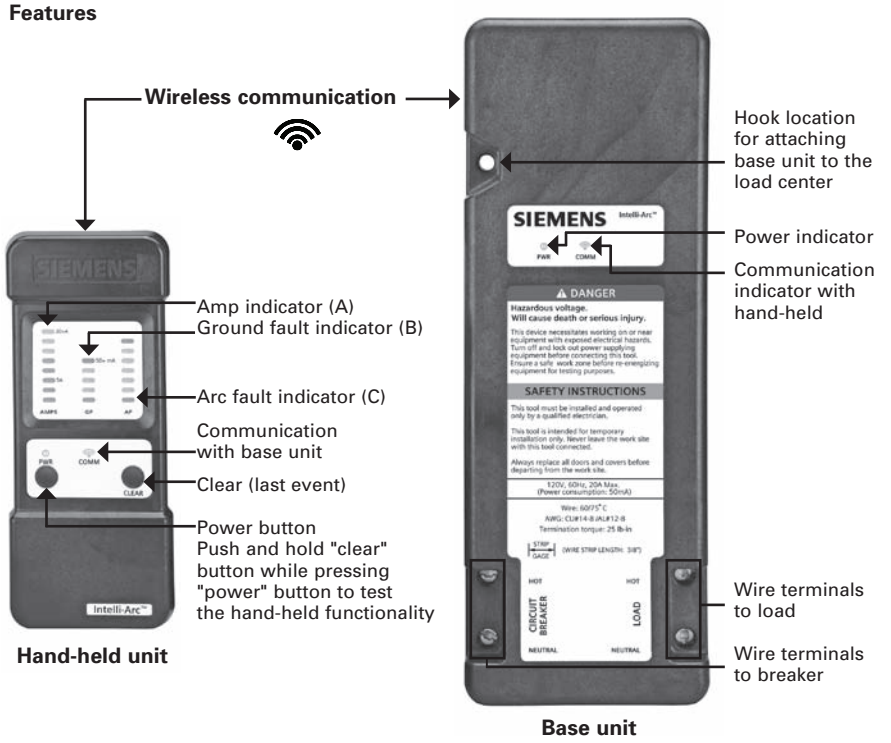
Intelli-Arc Diagnostic Tool

Intelli-Arc Diagnostic Tool, Part Number: **IDT5000**

The Siemens Intelli-Arc Diagnostic Tool helps to accurately diagnose the circuit in which a fault has occurred. When used in conjunction with good troubleshooting techniques, this tool allows the electrical contractor to determine and locate the root cause or source of the fault. The Intelli-Arc Diagnostic Tool presents information as to the type and magnitude of fault. Since the fault may not cause an AFCI to trip for various reasons, i.e. duration too short, current level too low, the tool provides an indication showing how close an event is to causing an AFCI to trip.

The goal of the diagnostic tool is to speed the troubleshooting process for the electrical contractor. The device drastically improves the accuracy of the troubleshooting process. This, in turn, will significantly reduce the number of visits to the problem site. Every intent of this device is directed as saving the electrical contractor time for each branch circuit that must be evaluated. The Intelli-Arc Diagnostic Tool can be used with any circuit breaker regardless of brand.

Features



Two state-of-the-art technologies combined in one device!
Dual Function Circuit Breakers: **QFGA2/QFGAH2/HQFGA2**

Introducing the Dual Function Circuit Breaker that provides Arc Fault and Ground Fault protection in one device. The 2014 National Electric Code requires Arc Fault protection on Kitchen and Laundry circuits where Ground fault protection is currently a requirement. One solution to meet this code is to pair an AFCI circuit breaker with a GFCI receptacle. The Dual function breaker will replace the Arc fault breaker and the Ground Fault receptacle. Additionally, the breaker will help eliminate the use of two separate devices and improve cost savings.

Features

- Plug-in or bolt-on branch circuit breakers for Siemens single phase load centers
- Self Test and Lockout feature as required by UL 1699 effective June 2015
- Saving time – ease of installation – only One product to install vs. Two
- Saving money – Two safety devices combined into One.
- LED trip indicator – a Siemens exclusive!
- Available with interrupting rating of 10kA, 22kA or 65kA
- UL Listed
- Torque rating: 25 lb. in.
- Padlocking device available, use catalog number ECPLD1
- Both lugs at the same angle - for easier wiring



1-Pole Dual Function Circuit Breaker

• Revised •
03/06/13

Circuit Breakers

Type QP with INSTA-WIRE

Continuous Current Rating @ 40° C	Type QP① 10,000A IR Catalog Number	Type QPH 22,000A IR Catalog Number	Type HQP 65,000A IR Catalog Number
1-Pole Plug-In (120V AC)⑤			
10	Q110⑨	—	—
15	Q115③	Q115H③	Q115HH■③
20	Q120③	Q120H③	Q120HH■③
25	Q125	Q125H■	Q125HH■
30	Q130	Q130H	Q130HH■
35	Q135■	Q135H■	Q135HH■
40	Q140	Q140H	Q140HH■
45	Q145■	Q145H■	Q145HH■
50	Q150	Q150H	Q150HH■
60	Q160	Q160H■	Q160HH■
70	Q170	Q170H■	Q170HH■
2-Pole Plug-In (Common-Trip 120/240V AC)⑥			
10	Q210⑨	—	—
15	Q215	Q215H	Q215HH
20	Q220	Q220H	Q220HH
25	Q225	Q225H■	Q225HH■
30	Q230	Q230H	Q230HH
35	Q235	Q235H■	Q235HH■
40	Q240	Q240H	Q240HH■
45	Q245	Q245H■	Q245HH■
50	Q250	Q250H	Q250HH
60	Q260	Q260H	Q260HH
70	Q270	Q270H	Q270HH
80	Q280	Q280H■	Q280HH■
90	Q290	Q290H	Q290HH■
100	Q2100	Q2100H	Q2100HH
110	Q2110	Q2110H	Q2110HH■
125	Q2125	Q2125H	Q2125HH
2-Pole Plug-In (Common-Trip 240V AC)④⑥			
15	Q215R	—	—
20	Q220R	—	—
30	Q230R	—	—
40	Q240R	—	—
50	Q250R	—	—
60	Q260R	—	—
70	Q270R	—	—
100	Q2100R■	—	—
3-Pole Plug-In (Common-Trip 240V AC)⑦			
15	Q315	Q315H	Q315HH■
20	Q320	Q320H	Q320HH
25	Q325	Q325H■	Q325HH■
30	Q330	Q330H	Q330HH
35	Q335	Q335H■	Q335HH■
40	Q340	Q340H	Q340HH
45	Q345	Q345H■	Q345HH■
50	Q350	Q350H	Q350HH
60	Q360	Q360H	Q360HH
70	Q370	Q370H	Q370HH■
80	Q380	Q380H	Q380HH■
90	Q390	Q390H	Q390HH■
100	Q3100	Q3100H	Q3100HH







QP / QPH / HQP Internal Accessories

Control Voltage AC	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■②	Factory

Modifications

Description	Catalog Number
400 Hz Calibration	add suffix ...Y⑧
Marine 50°C Ambient Calibration	add suffix ...M
Fungus Proofing	add suffix ...F

For external accessories please refer to page 1-42.

■ 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 frequent switching applications (SWD). 120V AC Fluorescent Lighting.
④ UL Listed for use on 3-phase grounded "B" systems — 10,000 for this application.
⑤ Shipped 12 per sleeve.
⑥ Shipped 6 per sleeve.
⑦ Shipped 4 per sleeve.
⑧ UL Listed 5 KA IR.
⑨ Type QP1, UL listed for 16 AWG conductors and multiple wires.

Circuit Breakers

Duplex, Triplex and Quadplex Plug-In Breakers

Duplex Circuit Breakers

Breaker Type	Ampere Rating	Catalog Number	Catalog Number
QT **1-Pole** **10K AIC** **120V AC**	15–15	**Q1515**	**Q1515NC**①
	15–20	**Q1520**	**Q1520NC**①
	20–20	**Q2020**	**Q2020NC**①
	20–30	**Q2030**	—
	30–15■	**Q3015**	—
	30–20	**Q3020**	—
	30–30	**Q3030**	**Q3030NC**①
	SHIPPING: 12 per carton, (Wt. 4.8 lbs.)		





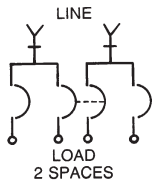
QT Duplex

These space saver duplex breakers combine two independent 1/2" breaker poles in a common unit. This unit plugs into one load center stab and requires one panel space. HACR rated.

Triplex Circuit Breakers

Breaker Type	Ampere Rating: Single Pole	Ampere Rating: Common-Trip 2-Pole	Catalog Number
QT **2-Pole** **10K AIC** **120/240V AC** **Inner Poles** **Common Trip**	15	15	**Q21515CT**
	15	20	**Q21520CT**
	15	25	**Q21525CT**■
	15	30	**Q21530CT**
	15	35	**Q21535CT**■
	15	40	**Q21540CT**
	15	45	**Q21545CT**■
	15	50	**Q21550CT**
	20	20	**Q22020CT**
	20	25	**Q22025CT**■
	20	30	**Q22030CT**
	20	35	**Q22035CT**■
	20	40	**Q22040CT**
	20	45	**Q22045CT**■
	20	50	**Q22050CT**
	30	30	**Q23030CT**
	SHIPPING: 6 per carton, (Wt. 4.9 lbs.)		





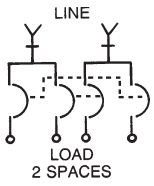
QT Triplex

These space saver triplex breakers provide a 2-pole common trip breaker for 120/240V AC circuits and two single poles for 120V AC circuits. Triplex require two panel spaces. HACR rated.

Quadplex Circuit Breakers

Breaker Type	Ampere Rating: Common-Trip 2-Pole Inside	Ampere Rating: Common-Trip 2-Pole Outside	Catalog Number
QT **2-Pole** **10K AIC** **120/240V AC** **Inner and** **Outter 2 Poles** **Common Trip**	15	15	**Q21515CT2**
	20	20	**Q22020CT2**
	20	30	**Q23020CT2**
	20	40	**Q24020CT2**
	30	30	**Q23030CT2**
	30	40	**Q24030CT2**
	40	40	**Q24040CT2**
	50	30	**Q23050CT2**
	SHIPPING: 6 per carton, (Wt. 4.8 lbs.)		





QT Quadplex

These space saver quadplex breakers provide two sets of common trip, two-pole breakers for 120/240V AC circuits, and require two panel spaces. HACR rated.

For external accessories please refer to page 1-42.

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

① Non-CTL. For replacement use only in panels manufactured before 1968

Circuit Breakers

Special Application Breakers

HID Lighting

For high-intensity discharge lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker.

Breaker Type	Wiring Diagram	Complete Breaker UL Unenclosed	
		Ampere Rating	Catalog Number
QP 1-Pole 120V AC	Figure 1	15	Q115HID①■
		20	Q120HID①
		30	Q130HID
QP 2-Pole 120/240V AC	Figure 2	15	Q215HID
		20	Q220HID■
		30	Q230HID■

Molded Case Switch

For applications that do not require overcurrent protection.

QP 1-Pole 120V AC	Figure 1	100	Q1100S
QP 2-Pole 120/240V AC	Figure 2	30	Q230S
		60	Q260S
		125	Q2125S

No-Noise

For applications that require a reduction in the 60-cycle hum of a standard breaker.

QP 2-Pole 120/240V AC	Figure 2	50	Q250NN■
		60	Q260NN
		70	Q270NN
		90	Q290NN■

Switching Neutrals

Used where all conductors are required to be disconnected. Neutral pole of the circuit breaker does not connect to load center bus. One side is wired to neutral and the other side to the device.

QG 2-Wire Common Trip 120V AC	Figure 3	15	QG215
		20	QG220
		30	QG230■
QG 3-Wire Common Trip 120/240V AC	Figure 4	15	QG315■
		20	QG320
		30	QG330■

Tungsten Lighting

For high wattage, tungsten-lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker.

QP 1-Pole 120V AC	Figure 1	15	Q115T①■
		20	Q120T①

Water Heater

When installed in a loadcenter, the water heater circuit breaker does not make electrical connection with the loadcenter bussing. Separate metered circuit is connected to line terminals of the breaker. Used in special rate water heating areas.

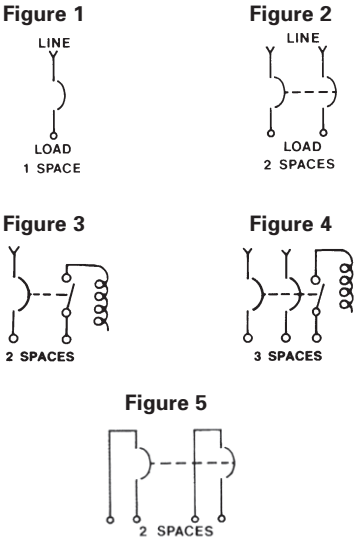
QW 2-Pole 120/40V AC Plug-In	Figure 5	15	QW215
		20	QW220
		30	QW230



Switching Neutral



Water Heater



Wiring Diagrams

■ Built to order. Allow 2–3 weeks for delivery.
Note: All circuit breakers on this page are 10K AIC

① UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

Circuit Breakers

3/4 Inch Plug-In Breakers

Features

- 3/4" format
- HACR Rated
- UL Classified for use in certain Square D load centers

Type QD Circuit Breakers

The Type QD circuit breaker line is available in 1-pole and 2-pole common trip versions listed on this page.

The circuit breakers are UL Classified and UL Listed.

All QD breakers are supplied with load side connectors suitable for 60/75°C wire and are calibrated for 40°C maximum ambient applications.

UL Classified

Siemens Type QD circuit breakers are UL Classified for use in specific Square D load centers in place of Square D Type QO® circuit breakers. A Panelboard Compatibility List packaged with each QD breaker shows which type QD circuit breakers are acceptable for use in Square D load centers.

The interrupting rating on these circuit breakers is 10,000A IR maximum and they are ***not*** series rated with Square D circuit breakers or equipment. This UL Classification allows a Siemens Type QD circuit breaker to be used in place of a Square D Type QO circuit breaker in those load centers that are specifically shown on the Panelboard Compatibility list. For additional information, contact your local Siemens sales engineer.





Continuous Current Rating @ 40°C	1-Pole	2-Pole
	120V	120/240V Common Trip
	Catalog Number	Catalog Number
15	D115①	D215
20	D120①	D220
30	D130	D230
40	D140	D240
50	D150	D250
60	D160	D260

Shipping Weights

Number of Poles	Number Per Carton	Shipping Weight (lbs.)
1	16	3.8
2	8	4.2

Panelboard Compatibility List

Listed Panelboards—Square D—Catalog Numbers

QO2L30F/S	QO12M100/RB	QO120-30M150/RB	QO130-40M200
QO2-4L70F/S	QO16-20M100/RB	QO124L150G	QO130200/RB
QO2-4L70TS	QO16M100/RB	QO124M150	QO130-40L200G/RB
QO2-4L70RB	QO20M100/RB	QO130L150G/RB	QO140M200/RB
QO6-12L100F/S	QO112L125G/RB	QO130M150/RB	QO16L200/RB
QO6-12L100DF/S	QO112-24L125/RB	QO16L150/RB	QO16M200/RB
QO6-12L100TF/S	QO112-24L125GWGC	QO16M150/RB	QO18-16M200FTRB
QO6-12L100DTF/S	QO116L125G	QO16-30L150/RB	QO20-40L200/RB
QO6-12L100RB	QO116-24L125G/RB	QO18-16M150FTRB	QO20-40M200TF/S
QO8-16L100F/S	QO12-24L125/RB	QO20-30M150/RB	QO20-40M200/RB
QO8-16L100DF/S	QO120-24L125G	QO20-30M150TF/S	QO24L200/RB
QO8-16L100TF/S	QO120-24L125GWGC	QO20-30L150	QO24M200/RB
QO-16L100DTF/S	QO120L125G	QO24L150/RB	QO30L200/RB
QO8-16L100RB	QO124L125G/RB	QO24M150/RB	QO30M200/RB
QO112M100/RB	QO124M125/RB	QO30L150/RB	QO30-40L200/RB
QO116M100/RB	QO16L125/RB	QO30M150/RB	QO30-40M200/RB
QO120M100/RB	QO16-12M125FTRB	QO8-16M200FT/RB	QO40M200/RB
QO124M100	QO16-24L125/RB	QO112L200G/RB	QO140M225
QO12L100DF/S	QO20L125/RB	QO120-40M200/RB	QO142L225G/RB
QO12L100RB	QO20-24L125/RB	QO120-40M200TC	
QO12-20M100/RB	QO24L125/RB	QO124M200	
QO12-20M100TF/S	QO120-30L150G	QO130L200G/RB	

For inches / millimeters conversion, see Application Data section.

① UL Listed for frequent switching applications (SWD). 120V AC Fluorescent Lighting. One or two load conductors.

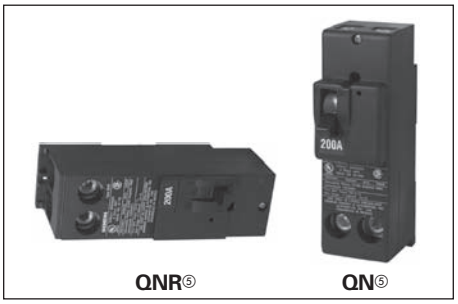
• Revised •
11/05/13

Circuit Breakers

Main and Branch Circuit Breakers①

Breaker Type	Ampere Rating	Catalog Number	Catalog Number	UL Interrupting Ratings (kA)
QN 2-Pole 120/240V AC	150	**QN2150**	**QN2150R**②	10
	175	**QN2175■**	**QN2175R**②**■**	10
	200	**QN2200**	**QN2200R**②	10
QNH 2-Pole 120/240V AC	150	**QN2150H**	**QN2150RH**②	22
	175	**QN2175H■**	**QN2175RH**②**■**	22
	200	**QN2200H**	**QN2200RH**②	22
HQN 2-Pole 120/240V AC	150	**HQN2150**	**HQN2150R**②	65
	175	**HQN2175■**	—	65
	200	**HQN2200**	**HQN2200R**②	65

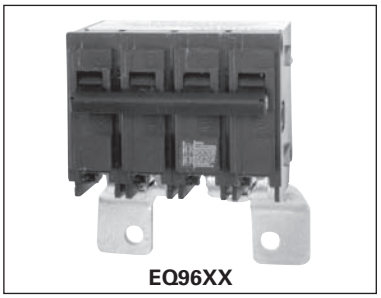
Requires 4 panel spaces, 2 adjacent and 2 opposite. **SHIPPING:** 1 per carton (Wt. 3 lbs.)



QNR⑤ **QN**⑤

Main Breaker Kits

For use in Ultimate Load Centers④			For use in EQIII Load Centers			
UL Type	Ampere Rating	Catalog Number	UL Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
EQ8681	100	**MBK100A**	EQ9675	100	**MBK100**	22
EQ8682	125	**MBK125A**	EQ9677	125	**MBK125**	22
EQ8693	150	**MBK150A**	EQ9683	150	**MBK150**	22
—	—	—	EQ9684	175	**MBK175■**	22
EQ8695	200	**MBK200A**	EQ9685	200	**MBK200**	22
EQ8696	225	**MBK225A**	EQ9686	225	**MBK225**	22



EQ96XX

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
QPJ③ 3-Pole 240V AC	125	**QPJ3125**	10
	150	**QPJ3150**	10
	200	**QPJ3200**	10

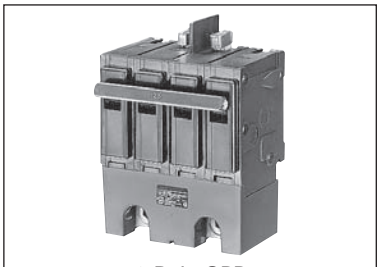
Requires 6 spaces due to cross over design. Fits only EQIII 125-400A 3-phase load centers

SHIPPING: 5 per carton (Wt. 17 lbs.)

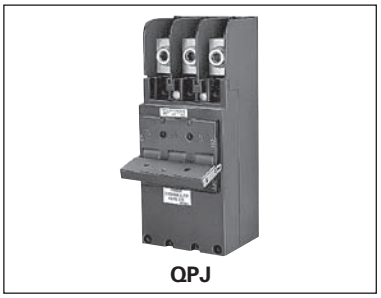


MBK (100,125)A **MBK** (150,200,225)A

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Breaker Ratings (kA) Volts AC 120/240
QPP 2-Pole 120/240V AC	125	**Q2125B**	10
	150	**Q2150B**	10
	175	**Q2175B■**	10
	200	**Q2200B**	10
	225	**Q2225B**	10
QPPH 2-Pole 120/240V AC	125	**Q2125BH**	22
	150	**Q2150BH**	22
	175	**Q2175BH■**	22
	200	**Q2200BH**	22
	225	**Q2225BH■**	22
HQPP 2-Pole 120/240V AC	125	**Q2125BHH■**	65
	150	**Q2150BHH**	65
	175	**Q2175BHH■**	65
	200	**Q2200BHH**	65
	225	**Q2225BHH■**	65
HQPPH 2-Pole 120/240V AC	100	**HQ2100BH■**	100
	125	**HQ2125BH■**	100
	150	**HQ2150BH■**	100
	175	**HQ2175BH■**	100
	200	**HQ2200BH■**	100
	225	**HQ2225BH■**	100



2-Pole **QPP**



QPJ

For inches / millimeters conversion, see Application Data section.
■ Built to order. Allow 2–3 weeks for delivery.

① All circuit breakers on this page are common trip.
② Reverse handle.
③ CSA Listed.
④ MBK100A for use in 100 and 125A load centers.
MBK125A for use in 125A load centers.
MBK150A for use in 150, 200 and 225A load centers.
MBK200A for use in 200 and 225A load centers.
MBK225A for use in 225A load centers.
MBK175A for use in 200 and 225A load centers.
⑤ QNR required for horizontal applications or vertical applications where the lugs are facing up. The QN breaker is required for vertical applications where the lugs are facing down as shown.

QS Breaker[1]

PowerMod's core offering of residential Meter Stacks, type WMM, offers the widest product offering & flexibility in the industry. Each meter stack houses the QuickSystem features to maximize productivity and minimize labor costs. To further simplify installation, our 225 Amp meter stacks feature the QS breaker. The QS breaker adds to the Siemens exclusive feature set in our Power Mod product line. Benefits and part numbers include:

- An exclusive side wired design saves wiring space and eliminates difficult "S bends"
- No need for costly filler plates — QS 225 Amp breaker takes the same space as standard 100 Amp QPs
- Single right hand bend wiring - saves time and wire
- Provides 100K AIC flexibility from 100 up to 225 Amps
- 10K to 100K AIC Series Rating

Front View

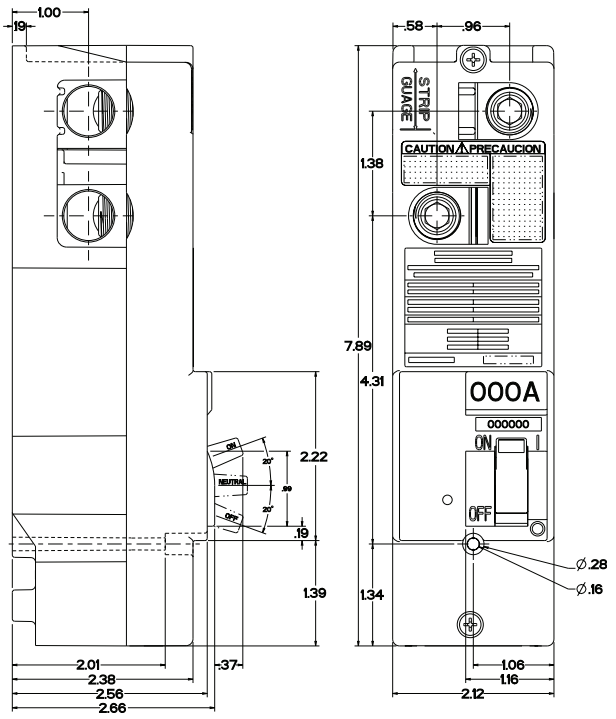




QS Breaker

Amperage	10K AIC	22K AIC	42K AIC	65K AIC	100K AIC
100	QS2100	QS2100H	QSH2100	QS2100HH	HQS2100H
125	QS2125	QS2125H	QSH2125	QS2125HH	HQS2125H
150	QS2150	QS2150H	QSH2150	QS2150HH	HQS2150H
175	QS2175	QS2175H	QSH2175	QS2175HH	HQS2175H
200	QS2200	QS2200H	QSH2200	QS2200HH	HQS2200H
225	QS2225	QS2225H	QSH2225	QS2225HH	HQS2225H

QS Breaker Dimension Drawing

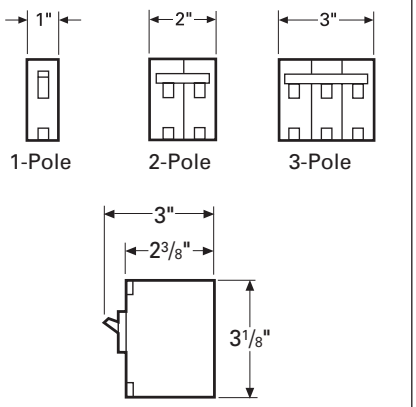


[1] For PowerMod information, please refer to Section 2, page 2-45

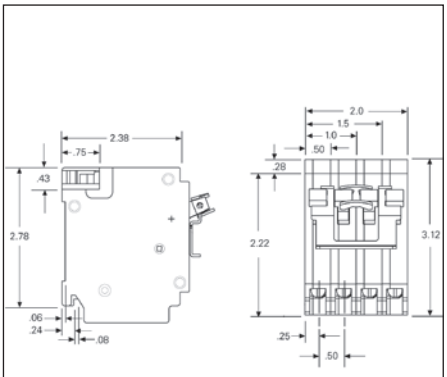
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06/13/14

Circuit Breakers

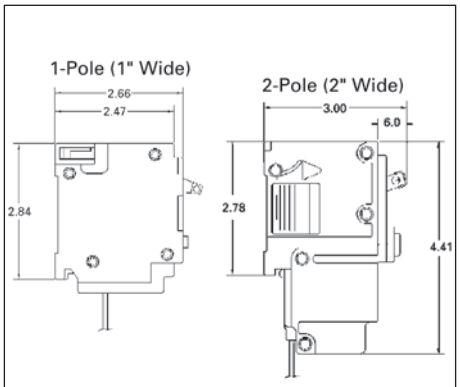
Line Diagrams/Dimension Drawings



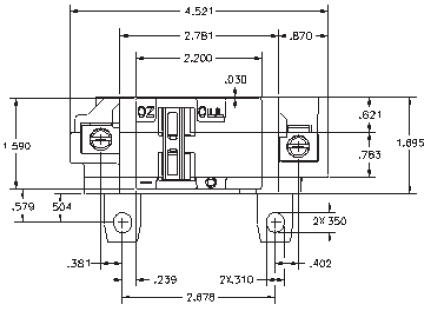
QP, QPH, HQP



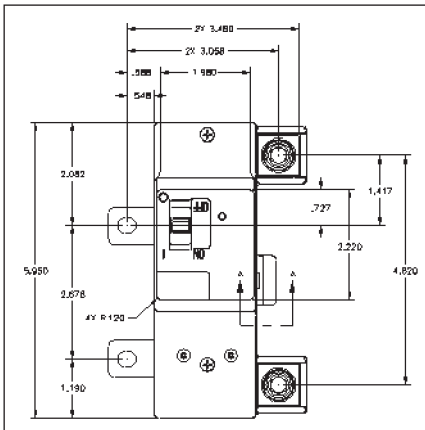
Type **QT**



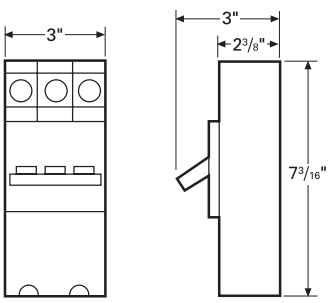
Type **QPF, QPHF, QE, QAF2, QAF2H**



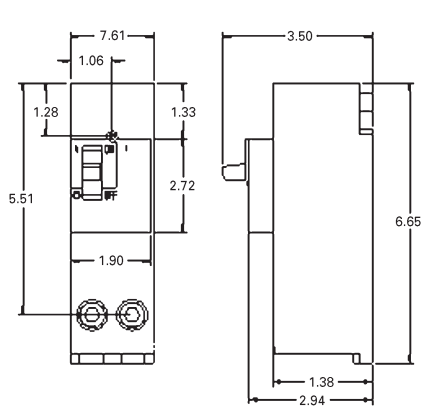
Type **EQ8681, EQ8682**



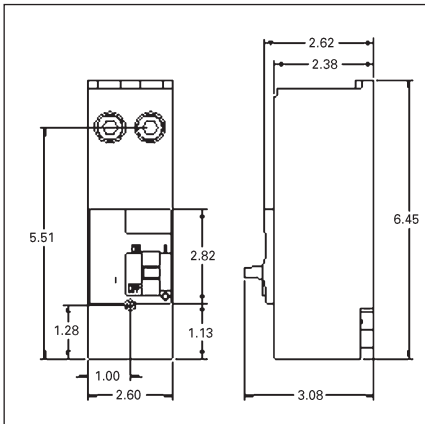
Type **EQ8693, EQ8695, EQ8696**



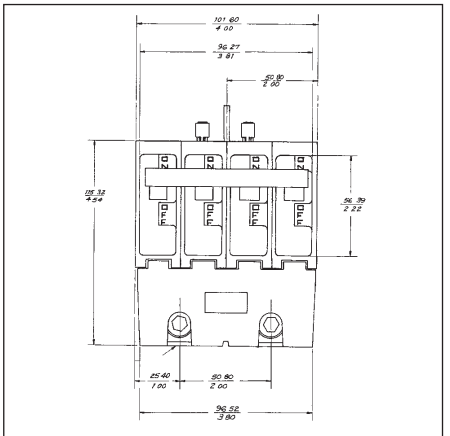
Type **QPJ**



Type **QN, QNH, HQN**



Type **QNR, QNRH, HQNR**



Type **QPP, QPPH, HQPP, HQPPH**

① All standard circuit breakers are calibrated to 40°C maximum ambient application.

Circuit Breakers

Lug Data

Circuit Breaker Type	Circuit Breaker Ampere Rating	Cables Per Connector	Connector Wire Range
	LOAD SIDE		
QP, QPH, HQP, Plug-in	10	2	#14-#16 AWG Cu
	15–35	1 1	#14–#6 AWG Cu #14–#6 AWG Al
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al
	55-125	1 1	#8-#2/0 AWG Cu #8-#2/0 AWG Al
QT	15–35	1 1	#14–#6 AWG Cu #14–#6 AWG Al
	40	1	#8 AWG CU-Al
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al
QPF, QPHF	15–30	1 1	#14–#10 AWG Cu #12–#8 AWG Al
	40–60	1 1	#8–#6 AWG Cu #8–#4 AWG Al
QAF2, QAFH2, QFGA2, QFGAH2	15–20	1 1	#14–#12 AWG Cu #12–#10 AWG Al
QD	15–20	2	#14–#8 AWG Cu Only
	15–20	1 1	#14–#12 AWG Cu #12–#10 AWG Al
	25–35	1 1	#10–#8 AWG Cu #10–#6 AWG Al
	40–60	1 1	#8–#6 AWG Cu #8–#4 AWG Al
QN, QNH, HQN	150–200	1	#1–300kcmil Cu-Al
QS, QSH, QSHH, HQS, HQSH	100–225	1	#3–300kcmil Cu-Al
EQ8681-Ultimate	100	1	#4–3/0 AWG Cu-Al
EQ8682-Ultimate	125	1	#4–3/0 AWG Cu-Al
EQ8693-Ultimate	150	1	#1–300kcmil Cu-Al
EQ8695-Ultimate	200	1	#1–300kcmil Cu-Al
EQ8696-Ultimate	225	1	#1–300kcmil Cu-Al
QPP, QPPH, HQPP, HQPPH	125	1 1	#1 AWG Cu #2/0 AWG Al
	150	1 1	#1/0 AWG Cu #3/0 AWG Al
	175	1 1	#2/0 AWG Cu #4/0 AWG Al
	200	1 1	#3/0 AWG Cu 250kcmil AWG Al
	225	1 1	#4/0 AWG Cu 300kcmil AWG Al
EQ9675-EQIII	100	1 1	#8-#2/0 AWG Cu #8-#2/0 AWG Al
EQ9677-EQIII	125	1 1	#8-#2/0 AWG Cu #8-#2/0 AWG Al
EQ9683-EQIII	150	1 1	#1/0 AWG Cu #3/0 AWG Al
EQ9684	175	1 1	#3/0 AWG Cu 250kcmil AWG AL
EQ9685-EQIII	200	1 1	#3/0 AWG Cu 250kcmil AWG Al
EQ9686-EQIII	225	1 1	#4/0 AWG Cu 300kcmil AWG Al
QPJ	125–200	1	#2–300kcmil Cu-Al

Circuit Breakers

Circuit Breaker Accessories

Circuit Breaker Accessories ④⑤⑥⑦⑧⑨

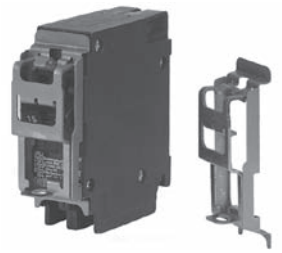
Catalog Number	For Use With Breaker Type	Number of Poles	Standard Package
Padlocking Device For locking breaker in "OFF" position. Note "ON" position does not affect breaker fuctionally			
ECPLD1	Type QP, BL, QAF2, QPF, QE, QT-Duplex, BQ, BQXD	1P	3 Pieces
ECPLD2	Type QP, BL, QAF2, QPF, QE, QT-Triplex & 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 swiching 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 Al Cu LGS	n/a	6 Pieces
TC1Q1	Type BQ, NGG 40A Al 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

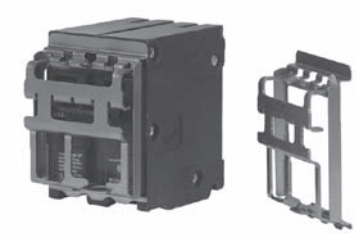
① For a complete list of standby power mechanical interlock kits, see page 1-23
② For use with Ultimate Load Center Main Breakers
③ Not suitable for use on 15-50A, 10 AIC Type QP Circuit Breakers
④ QP Type includes QPH, HQP
⑤ BL Type includes BLH, HBL
⑥ BQ Type includes BQH, HBQ
⑦ QAF2 Type includes QAFH2, BAF2, BAFH2, QFGA2, QFGAH2, BFGA2, BFGAH2
⑧ QPF Type includes QPHF, BLF, BLHF
⑨ QE Type includes QEH, BLE, BLEH

Circuit Breakers

Circuit Breaker Accessories

Padlocking Device


ECPLD1


ECPLD2


ECQLD3


ECQLD4


ECQTH4

Handle Tie


ECQTH2

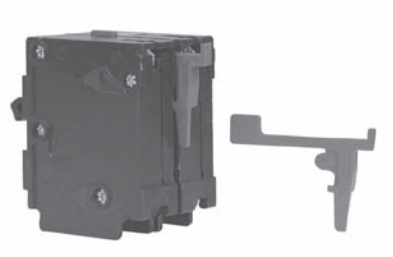

ECQTH3

Handle Blocking Device


ECQL1


ECBX231M

Main Breaker Retainer


ECMBR1


ECMBR2

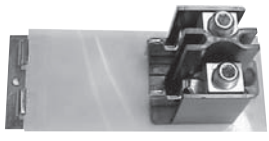
Mechanical Interlock

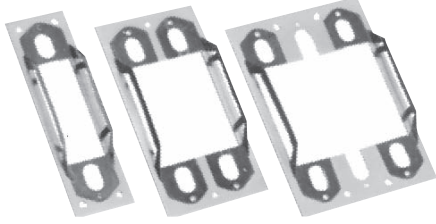

ECQML12

Mounting Accessories


MB120


SMB6R


I0204ML1125


FP9508 FP9555 FP9556

Surge Protection

Circuit Breaker and Surge Protective Device (SPD)

Features

- 2 inch wide plug-on design
  - — Includes (2) 1 Pole circuits breakers
  - — No loss of load center spaces
- Easy to install and perfect for retrofit
- LEDs provide protection status

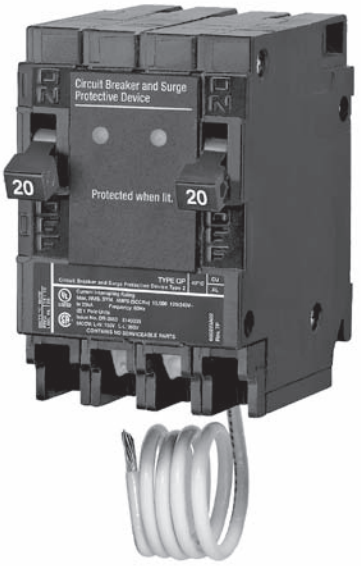
Benefits

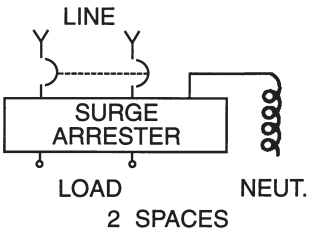
By installing a Siemens Circuit Breaker and Surge Protective Device (SPD) in the load center of the residence, surge protection is provided for all branch circuits①.

Two green LED indicator lights are provided to show that surge protection is provided for all circuits connected to the load center. These breakers should be used for circuit protection of frequently used household or facility circuits because the lights and devices connected to these circuits provide an effective indication that surge protection is being provided.

The circuit breaker and SPD utilize Siemens-built 150V AC, 40mm, metal oxide varistors (MOVs). The maximum impulse rating for the SPD module is 40kA. The standard interrupting rating for the circuit breakers is 10k AIC. All Type QP circuit breakers and SPD are plug-on style, with load terminals provided. The devices are rated for 120/240V AC and are calibrated for 40 degrees C maximum ambient applications.

Circuit Breaker and Surge Protective Device (SPD)





Breaker Type	Ampere Rating	Catalog Number	Surge Type
QP 1- Pole 120/240V AC 10K AIC	(2) 15	**QSA1515SPD**	SPD
	(2) 20	**QSA2020SPD**	SPD

Catalog Number	QSA1515SPD QSA2020SPD
Amperage	15 or 20 Amp
Number of Poles	(2) 1-Pole Circuit Breakers
Initial Clamping Level	240 Volts
Transient Energy Rating	360 Joules line-to-neutral 720 Joules line-to-line
Transient Suppression	500 volts peak, line-to-neutral
Voltage Rating	1000 volts peak, line-to-line
Peak Current Rating (impulse)	40,000 amperes
Discharge Voltage Characteristic	@ 1,500A, 600 volts @ 5,000A, 800 volts (both line-to-neutral)
Discharge Current Withstand Rating	10,000 amperes line-to-neutral
Circuit Breaker Interrupting Rating	10,000A, 120/240V AC
Listings/Certifications	UL, CSA Meets UL 1449 3rd Edition

① For warranty information please refer to the surge website www.usa.siemens.com/surge

Surge Protection

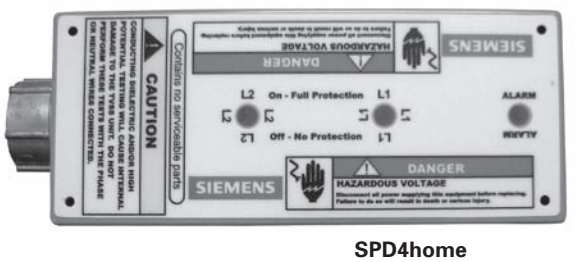
Power Service Entrance Surge Protection

SPD4home

- UL 1449 3rd Edition Listed
- Rated for single phase panels up to 400 amps
- Installation Flexibility
- LED Indicators
- Audible Alarm
- Ground Integrity Monitoring (GIM) circuit
- 10 year product warranty*

* See website for warranty terms and conditions.

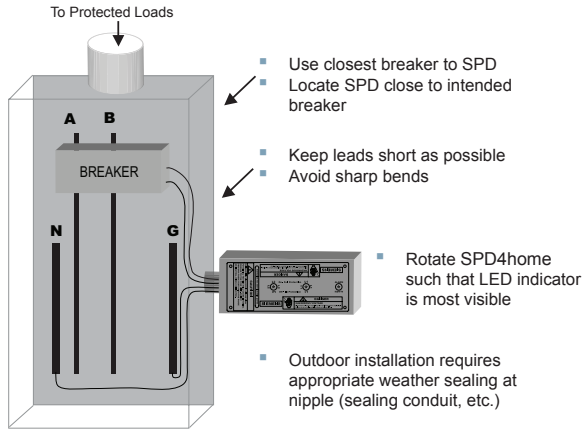
Siemens SPD4home stops power surges from entering your home when installed at the main incoming service load center connected via a 20A breaker. An additional power quality feature we include within this unit is Ground Integrity Monitoring circuit, which monitors the health of the electrical systems neutral to ground bond.



SPD4home

Surge Type	Catalog Number
SPD	**SPD4HOME**

AC Surge Protection	
Inominal (I_n) Rating	5kA
SPD Type Rating	Type 2
Thermal Fusing	Yes
Single Current Rating per Phase	40kA
Line Voltage	120/240 1 Phase 50/60 Hz
UL 1449 3rd Edition VPR	700V
MCOV	150V
Response Time	<1 nanosecond
NEMA 4X Enclosure	Standard
UL/cUL Listings	1449 SPD
Product Warranty	10 years



Type 1, I_n=20kA SPD, Surge Arrestor Replacement

TPS3 03

- UL 1449 3rd Edition – 2009, cUL
- Type 1 SPD (Type 2 cUL)
- Mounts external to electrical distribution equipment
  - — Recommended for Line or Load Side Applications
- Mounting options – chase nipple, bracket, or DIN RAIL
- 20kA I_n (most models)
- 200kA SCCR (most models)
- All UL required OCP & safety coordination included
- UL96A Lightning Protection Master Label compliant (@20kA I_n)

Per Phase	L-N (L-G: Delta)
50kA	50kA

When UL 1449 3rd Edition went into effect in 2009, low voltage surge and lightning arrestors were obsoleted. They were replaced with a TPS3 03 style surge protector, which is Type 1 Surge Protective Device (SPD) having an I-nominal of 20kA for most models.

Phase	Catalog Number
1	**TPS3A03050**
3	**TPS3C03050**



TPS3 03

Ordering Information

Catalog # TPS3 ☐ 03 ☐☐ ☐

Voltage Code
A = 120/240V, 1Ø, 3W
B = 120/240V, 3Ø, 4W
C = 120/208V, 3Ø, 4W
D = 240V, 3Ø, 3W
E = 277/480V, 3Ø, 4W
F = 480V, 3Ø, 3W
G = 600V, 3Ø, 3W
K = 380/220V, 3Ø, 4W
L = 600/347V, 3Ø, 4W

Surge Current (kA)
05 = 50kA per phase

Options
D = Dry contact & Audible Alarm

Example - TPS3C0305D = Type 1 SPD for a 208/120V application with a surge current capacity of 50kA per phase, in a standard NEMA 4X enclosure with dry contacts and audible alarm option.

When an option is not selected, include a zero (0) in the field.

Available Accessories: Ordered Separately
RMSIE - Remote monitor

Surge Protection

Telephone Service Entrance Surge Protection

SPD4tel & SPD4telkit

- UL and cUL listed
- Hardwired Telephone/Modem/Fax/DSL protection
- Exceptionally fast response time
- Low insertion loss
- Available with or without enclosure
- 5 Year product warranty*

* See website for warranty terms and conditions.

SPD4tel is a 2-pair hardwired telephone service entrance surge protector designed to stop surges from entering your home via your incoming telephone service. The SPD4tel is designed for indoor applications or can be mounted inside another weatherproof enclosure for outdoor mounting applications when housed within the SPD4telkit.

When combined with the SPD4home and SPD4coax, all primary surge entry points into the home are protected providing comprehensive whole house protection.



SPD4tel



SPD4telkit

AC Surge Protection	
Catastrophic Surge Circuit	Yes
Spike Capacity	200 Amps
Let Through Voltage	<270V
Overcurrent Protection	Yes
Response Time	<1 nanosecond
Environmentally Sealed	Yes
UL/cUL Listings	497A
Meets Telcordia (formallly Bellcore) GR-974-CORE Requirements for Telecommunications Line Protectors	Yes
Product Warranty	5 years

Surge Type	Catalog Number
Telco	**SPD4TEL**
Telco	**SPD4TELKIT**

Coaxial Service Entrance Surge Protection

SPD4coax

- UL and cUL listed
- Rated for CATV, DSS, TV, VCR, and Cable Modem
- Easy to install
- Standard Female to Female F connector
- Low insertion loss
- Automatic recovery
- 5 Year product warranty*

* See website for warranty terms and conditions.

SPD4coax is a coaxial service entrance surge protector designed to stop surges from entering your home via your incoming coax TV service. SPD4coax includes a section of coaxial cable with female to female splice for line side application.

When combined with the SPD4home and SPD4tel, all primary surge entry points into the home are protected providing comprehensive whole house protection.



SPD4coax

AC Surge Protection	
Frequency Range	DC thru 1.5 GHz
Catastrophic Surge Circuit	Yes
Spike Capacity	5000 Amps, 8/20 µSec
Impedance	75 Ohms
Overcurrent Protection	Yes
Return Loss	30dB @ 1 GHz
Insertion Loss	<0.1dB
UL/cUL Listings	497B
Meets IEEE C62.41.1 Requirements	Yes
Product Warranty	5 Years

Surge Type	Catalog Number
Coaxial	**SPD4COAX**

Temporary Power Outlet Panels

Power Outlet Panel Types Available

ATTENTION PLEASE
Siemens is proud to present our new line of temporary power products. This section describes our new product line that that will be **available to order in September 2011**. In order to keep the Speedfax as up to date as possible these items were included ahead of their availability date.

Please see page 1-50 for a cross reference from our existing product line to our new product line.



Surface

- Unmetered
- Ring Type Metered (Meter at top or bottom)
- Ringless Metered (Meter at top or bottom)
- Lighted



Earth Mount Pedestals

- Unmetered
- Ring Type (Metered)
- Ringless Type (Metered)
- Lighted with photocell option



Pad Mount Pedestals

- Unmetered
- Ring Type (Metered)
- Ringless Type (Metered)
- Lighted with photocell option



Back to Back Earth Mount Pedestals

- Unmetered
- Ring Type (Metered)
- Ringless Type (Metered)
- Lighted with photocell option



Back to Back Pad Mount Pedestals

- Unmetered
- Ring Type (Metered)
- Ringless Type (Metered)
- Lighted with photocell option

Additional Accessories

- Cable television & Phone connection
- Water Connection

Temporary Power Outlet Panels

Product Features

Enclosures

❶ **Rainproof**
Rainproof NEMA Type 3R construction.

❷ **Quality Finish**
All sheet metal components are powder coated with the highest quality finish and fabricated with G90 galvanized steel.

❸ **Installation Ease**
Three raised mounting embosses make installation a snap.

❹ **Removable Deadfronts**
Easily removable upper and lower deadfronts allow easy access to internal components for ease of installation.

❺ **Theft Resistant**
The padlock provisions and elevated upper deadfront design prevent unauthorized removal of the plugs or access to the circuit breakers.

❻ **Meters Top or Bottom**
Metered units are available with meters at the top or bottom.

- Ring and ringless type meter covers available.
- Utility grade, meter socket base.
- Units with meter at bottom are ideally suited for underground feeds.
- Meter sockets available to 125 amps maximum.

❼ **Easy Access Door**
Door allows additional room for plugs and is designed to open & close easily

❽ **Overhead/Underground Feeds**
Surface devices have provisions for overhead and underground feeds.

- For an overhead feed, use a readily available Type RX interchangeable hub. Closure plate is factory included.
- For an underground feed, an extensive variety of easily removable knockouts are provided.

❾ **Light Option**
Lighted option to assist with nighttime site location and operation. Light provisions are the longest lasting and have the lowest operating cost in the industry. Light can be wired in conjunction with a 120V photocell to minimize energy use.

Pedestals

❿ **One-Piece Construction**
Rigid, one-piece pedestal construction for all earth and pad mounted devices. Thoroughly tested for torsion and flexing resistance.

⓫ **Block Assembly**
Loop-feed block assembly provides connectors capable of accepting up to 350 kcmil conductors.
(Standard option on pedestal devices. Available option on un-metered devices.)

⓬ **Pad Mount**
Pad mounted devices are available. (not shown)

Interiors

⓭ **Bus Bars**
Plated bus bars provide the best protection against corrosion.

⓮ **Copper Conductors**
Ready to use! All internal components are factory prewired with copper conductors.

⓯ **Circuit Protection**
All receptacles are protected by lifetime warranted Siemens circuit breakers.

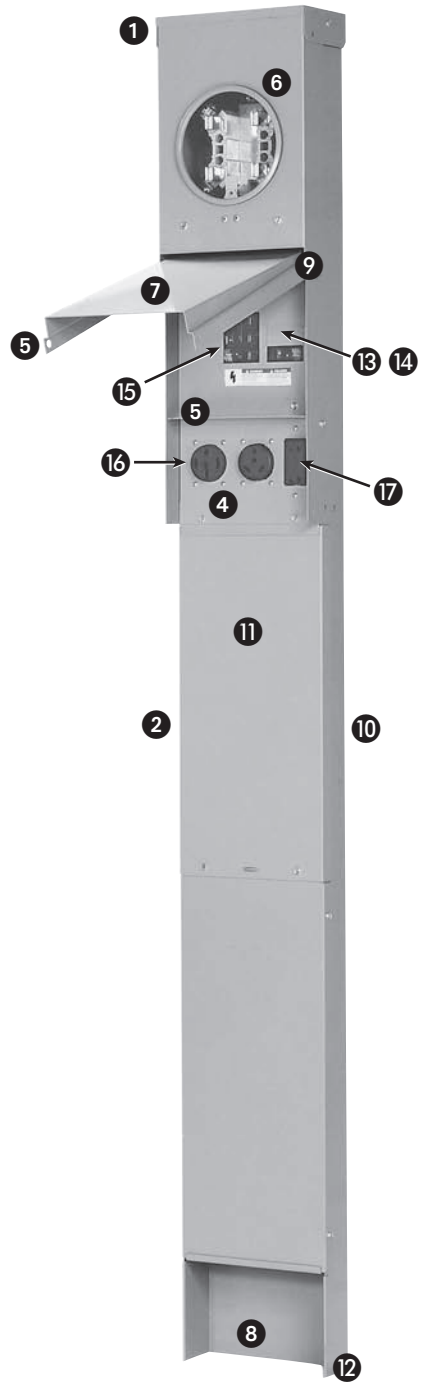
⓰ **Receptacles**
Impact-resistant, thermoplastic, commercial grade receptacles.

⓱ **GFCI Protection**
All 125 volt, 20amp receptacles offer a GFCI protection option. Weather resistant receptacles are also available. Siemens GFCI circuit breakers are available to provide protection for all receptacles.



Interiors (continued)

⓲ **Wire Connectors**
All wire connectors are suitable for use with copper or aluminum wire. (not shown)



Temporary Power Outlet Panels

Build Your Own Catalog Numbering System

T ① [ ] ① [ ] ①② [ ] ③ [ ] [ ] ① [ ] ① – ⑤ [ ] ⑦

Talon Temporary Power

Main Type	
L	Main Lugs, 125A
B	Main Breaker, 125A
D	Main Breaker, 100A

Receptacles (3 max)				
1		14-50R	125/250V	50A
1F		Designates GFCI Circuit Breaker Protection		
2		14-30R	125/250V	30A
2F		Designates GFCI Circuit Breaker Protection		
3		TT30R	125V	30A
3F		Designates GFCI Circuit Breaker Protection		
4		L6-30R	250V	30A
4F		Designates GFCI Circuit Breaker Protection		
5		6-20R	250V	20A
5F		Designates GFCI Circuit Breaker Protection		
6		L5-20R	125V	20A
6F		Designates GFCI Circuit Breaker Protection		
7		5-20R2GFI	125V	20A
7X		Designates non-weather-resistant GFCI receptacle		
8		5-20R2	125V	20A
8F		Designates GFCI Circuit Breaker Protection		
8G		Designates weather resistant receptacle with GFCI Circuit Breaker Protection		
9		L-530R	125V	30A
9F		Designates GFCI Circuit Breaker Protection		

Meter/Bypass	
U	Unmetered
R	Ringless, No Bypass
N	Ring, No Bypass
L	Ringless, Lever Bypass
H	Ringless, Horn Bypass

Enclosure Type	
S	Surface mount, un-metered
S2②	Surface mount, un-metered, loop feed lugs
T	surface mount, top feed-metered
B	surface mount, bottom feed-metered
P	Direct burial pedestal
M	Pad mount pedestal
2P	Direct burial pedestal, double-sided
2M	Pad mount pedestal, double sided

Custom Options	
L⑥	Light kit factory installed
LP⑧	Light kit with photocell factory installed
X⑨	Alternate receptacle configuration on double-sided pedestal
Cx	Custom color configuration

① Required fields.
② A minimum of 1 receptacle must be selected. A maximum of 3 receptacles, with up to 125amps total, may be selected. UL does not allow field installation of receptacle kits.
③ Two receptacle devices ship in a 7" wide enclosure and are wired with a 3 circuit interior. Depending on the receptacle configuration selected an additional circuit may or may not be available
④ Enclosure includes same loop feed lugs as the pedestal devices. Enclosure is larger. Please see knockout diagrams for details.
⑤ Dash is only present if one of the options listed after the dash is needed.
⑥ Light kits are installed by the factory and require either a 120V GFCI breaker or 5-20RGFI receptacle to power the light fixture.
⑦ Cable TV, phone, & water accessories are purchased separately and are not configured as part of the device.
⑧ Photocell is factory wired and is mounted internally. 120V AC photocell only.
⑨ "X" designates alternate receptacle configuration on each side. Contact sales office for pricing.

Custom Color Guidelines:

- "Cx" designates custom color. Contact sales office for color code to insert into part number to replace the "x" in this designation.
- Additional charges apply and depend on the color needed.
- Custom color matching available: Customer must signoff on painted sample prior to production of order.
- Order cancellations will involve a fee after custom paint is ordered.

Example: Catalog Number: TL1F37NT-LP

Given specifications:

- 125A Main Lugs
- 50A, 125/250V receptacle with GFCI circuit breaker
- 30A, 125V receptacle with a standard circuit breaker
- 20A, 125V GFCI weather resistant receptacle
- Ring type meter at the top
- Pedestal mount device
- Light option with photocell

Step 1
Start with the power receptacle product line prefix identifier: **(T)**

Step 2
Choose main type: **(L)**

Step 3
Choose the first receptacle and its circuit breaker type: **(1F)**

Step 4
Choose the second receptacle and its circuit breaker type: **(3)**

Step 5
Choose the third receptacle and its circuit breaker type: **(7)**

Step 6
Choose utility meter & bypass type required: **(N)**

Step 7
Choose enclosure type: **(T)**

Step 8
Add dash and select light option with photocell: **(-LP)**

Temporary Power Outlet Panels

Most Common Items—See Previous Page to Build Your Own Catalog Number①

Old Catalog Number	New Catalog Number	Mains Type	Enclosure Type	Meter Provision	Receptacle #1	Receptacle #2	Receptacle #3	Options
Surface Mount, Un-Metered								
P17US	**TL17US**	125A Main Lug	Surface Mount	Un-Metered	14-50R	5-20R2 GFI W.R.	N/A	N/A
P37US	**TL37US**	125A Main Lug	Surface Mount	Un-Metered	TT30R	5-20R2 GFI W.R.	N/A	N/A
P77US	**TL77US**	125A Main Lug	Surface Mount	Un-Metered	5-20RGFI W.R.	5-20R2 GFI W.R.	N/A	N/A
P137US	**TL137US**	125A Main Lug	Surface Mount	Un-Metered	14-50R	TT30R	5-20R2 GFI W.R.	N/A
P577US	**TL577US**	125A Main Lug	Surface Mount	Un-Metered	6-20R	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
P1F7US	**TL1F7US**	125A Main Lug	Surface Mount	Un-Metered	14-50R, GFCI Brkr	5-20R2 GFI W.R.	N/A	N/A
P1F3F7US	**TL1F3F7US**	125A Main Lug	Surface Mount	Un-Metered	14-50R, GFCI Brkr	TT30R, GFCI Brkr	5-20R2 GFI W.R.	N/A
P5F8F8FUS	**P5F8G8GUS**	125A Main Lug	Surface Mount	Un-Metered	6-20R, GFCI Brkr	5-20R2, GFCI Brkr, W.R.	5-20R2, GFCI Brkr, W.R.	N/A
NA	**TL1F3F7US2**	125A Main Lug	Surface Mount	Un-Metered	14-50R, GFCI Brkr	TT30R, GFCI Brkr	5-20R2 GFI W.R.	Loop Feed Lugs
Surface Mount, Metered								
P137UP	**TL137UP**	125A Main Lug	Burial Pedestal	Un-Metered	14-50R	TT30R	5-20R2 GFI W.R.	N/A
P137TP	**TL137NP**	125A Main Lug	Burial Pedestal	Un-Metered	14-50R	TT30R	5-20R2 GFI W.R.	N/A
P1F3F7UP	**TL1F3F7UP**	125A Main Lug	Burial Pedestal	Un-Metered	14-50R, GFCI Brkr	TT30R, GFCI Brkr	5-20R2 GFI W.R.	N/A
P138FUP	**TL138GUP**	125A Main Lug	Burial Pedestal	Un-Metered	14-50R	TT30R	5-20R2, GFCI Brkr, W.R.	N/A
NA	**TL137UP-LP**	125A Main Lug	Burial Pedestal	Un-Metered	14-50R	TT30R	5-20R2 GFI W.R.	Light & Photocell
P137U2B	**TL137U2P**	125A Main Lug	Burial Pedestal-Double Sided	Un-Metered	14-50R	TT30R	5-20R2 GFI W.R.	N/A
Pedestal Mount, Metered & Un-Metered								
P77TS	**TL77NT**	125A Main Lug	Top Feed	Metered- Ring	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A	N/A
P77BS	**TL77NB**	125A Main Lug	Bottom Feed	Metered- Ring	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A	N/A
P77RTS	**TL77RT**	125A Main Lug	Top Feed	Metered- Ringless	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A	N/A
P77RBS	**TL77RB**	125A Main Lug	Bottom Feed	Metered- Ringless	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A	N/A
P137RTS	**TL137RT**	125A Main Lug	Top Feed	Metered- Ringless	14-50R	TT30R	5-20R2 GFI W.R.	N/A
P577TS	**TL577NT**	125A Main Lug	Top Feed	Metered- Ring	6-20R	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
P1F77TS	**TL1F77NT**	125A Main Lug	Top Feed	Metered- Ring	14-50R, GFCI Brkr	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
P1F77RBS	**TL1F77RB**	125A Main Lug	Bottom Feed	Metered- Ringless	14-50R, GFCI Brkr	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
P5F77TS	**TL5F77NT**	125A Main Lug	Top Feed	Metered- Ring	6-20R, GFCI Brkr	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
P5F77RTS	**TL5F77RT**	125A Main Lug	Top Feed	Metered- Ringless	6-20R, GFCI Brkr	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
P5F77RBS	**TL5F77RB**	125A Main Lug	Bottom Feed	Metered- Ringless	6-20R, GFCI Brkr	5-20R2 GFI W.R.	5-20R2 GFI W.R.	N/A
NA	**TB137HT**	125A Main Breaker	Top Feed	Metered- Ringless with Horn Bypass	14-50R	TT30R	5-20R2 GFI W.R.	N/A

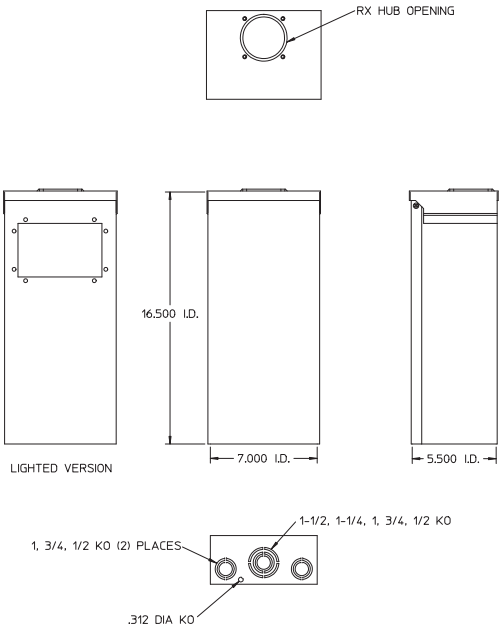
Special Accessories

Catalog Number	Description	Notes
TLAWATER	Water Connection Accessory	Accessories are intended to mount on each side of a direct burial or pad mount pedestal. These accessories can be used independently provided they are mounted on a flat surface. Mounting these accessories to round poles is not recommended.
TLATVP	Television & Phone Connection Accessory	

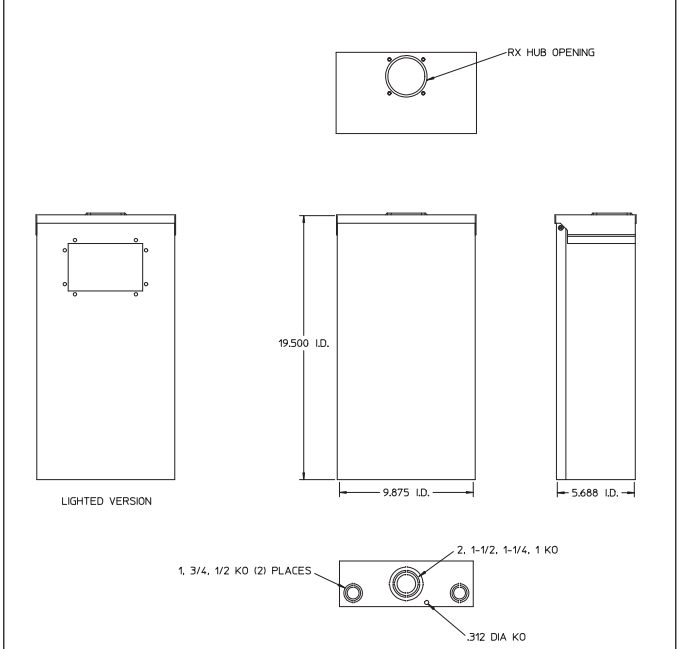
① New catalog numbers will be available September 2011.
Old catalog numbers will be phased out during this time.

Temporary Power Outlet Panels

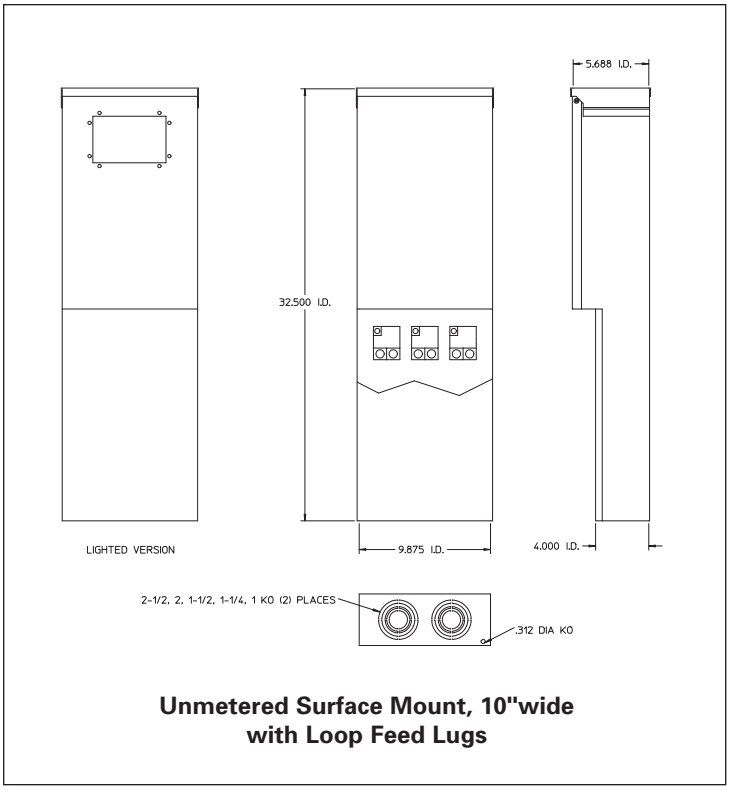
Dimension Drawings



Unmetered Surface Mount, 7"wide
Enclosure size for un-metered devices with two receptacles only.



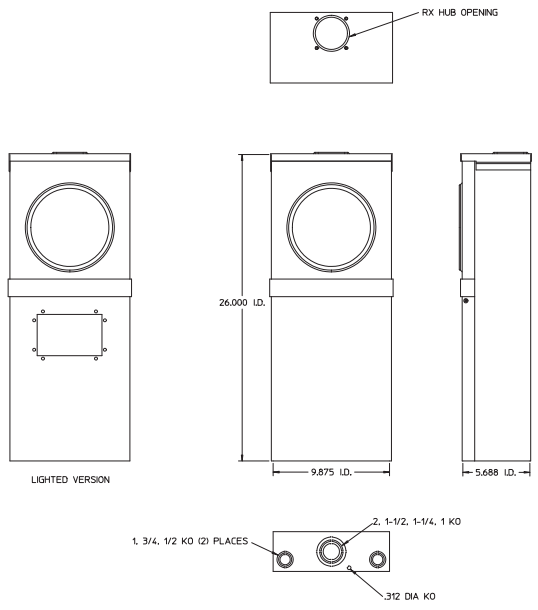
Unmetered Surface Mount, 10" wide



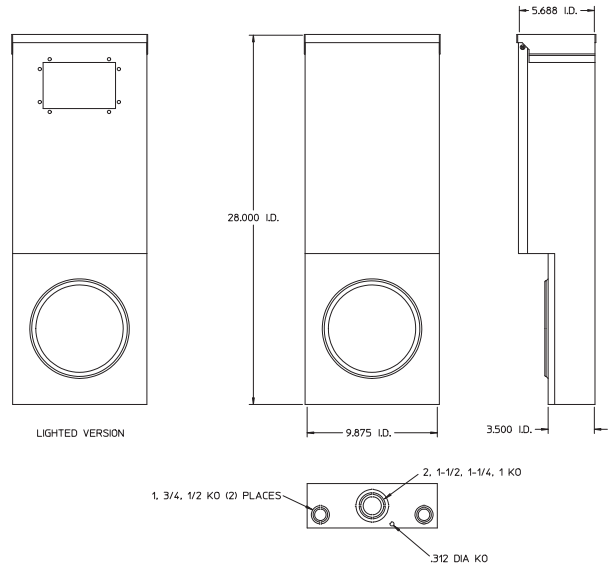
Unmetered Surface Mount, 10"wide with Loop Feed Lugs

Temporary Power Outlet Panels

Dimension Drawings



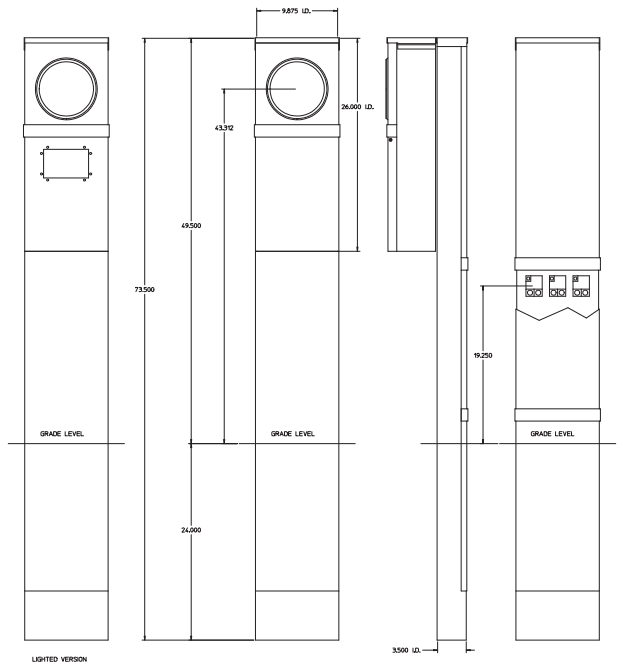
Metered Top Feed Surface Mount



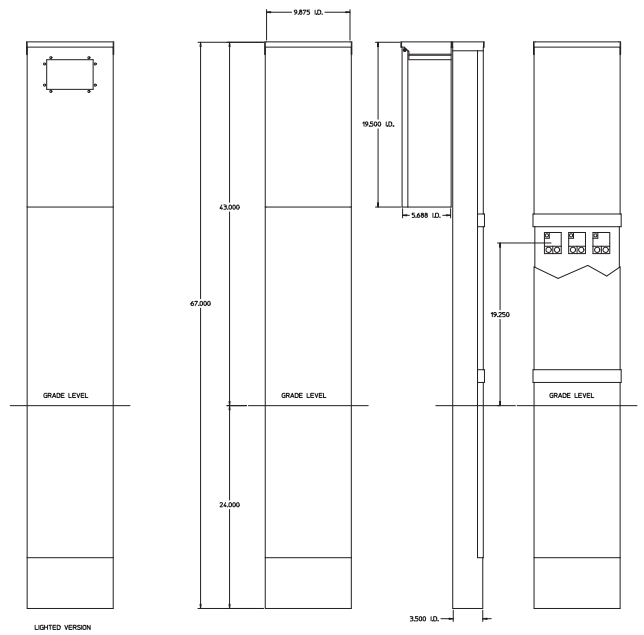
Metered Bottom Feed Surface Mount

Temporary Power Outlet Panels

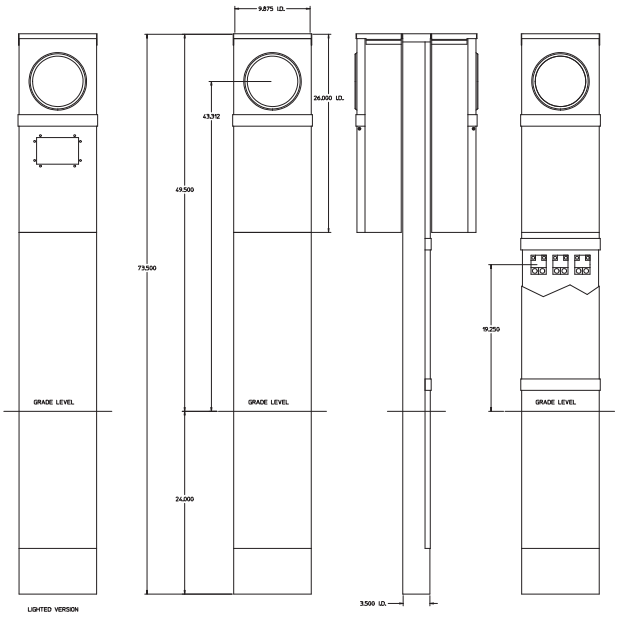
Dimension Drawings



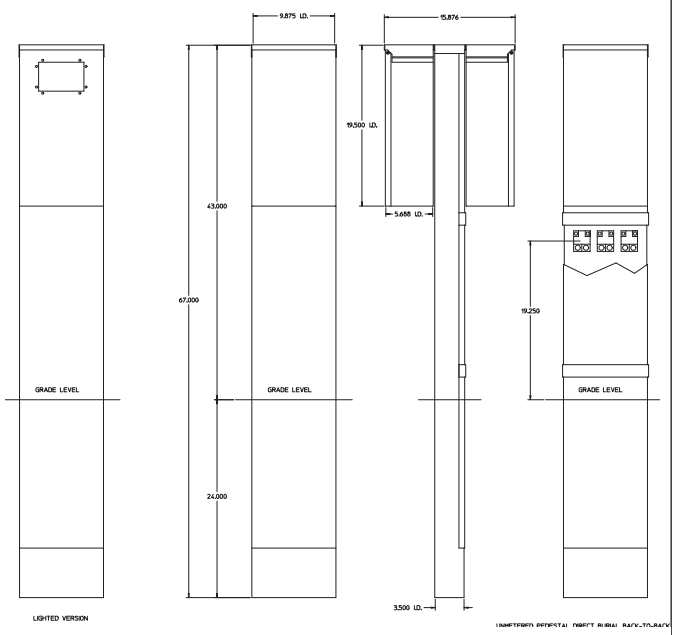
Metered Pedastal Direct Burial



Unmetered Pedastal Direct Burial



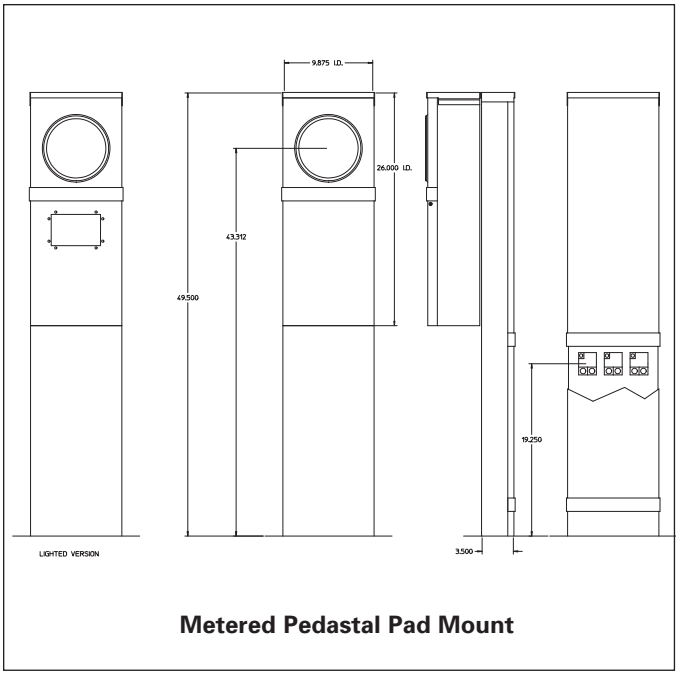
Metered Pedastal Direct Burial Back to Back



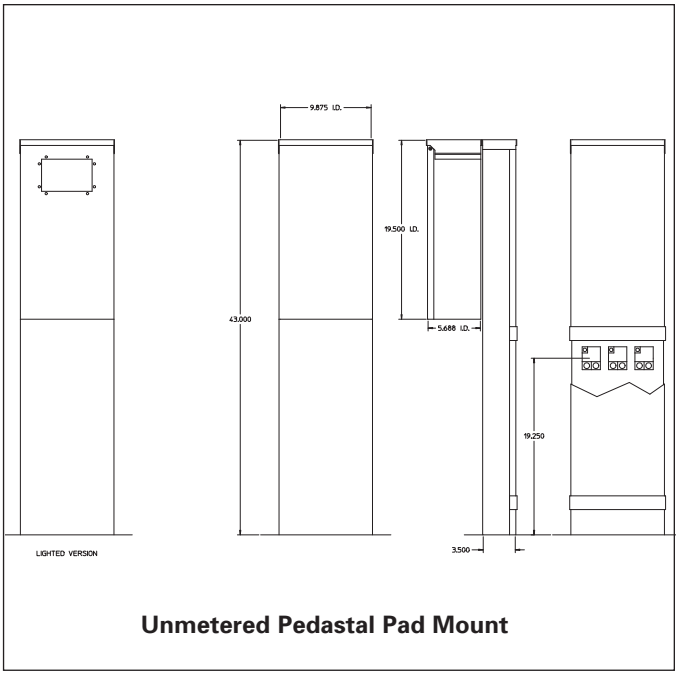
Unmetered Pedastal Direct Burial Back to Back

Temporary Power Outlet Panels

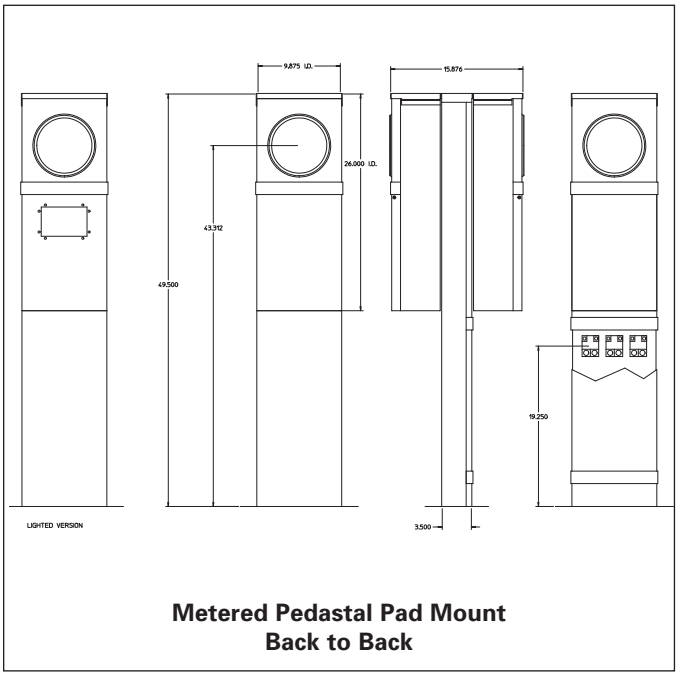
Dimension Drawings



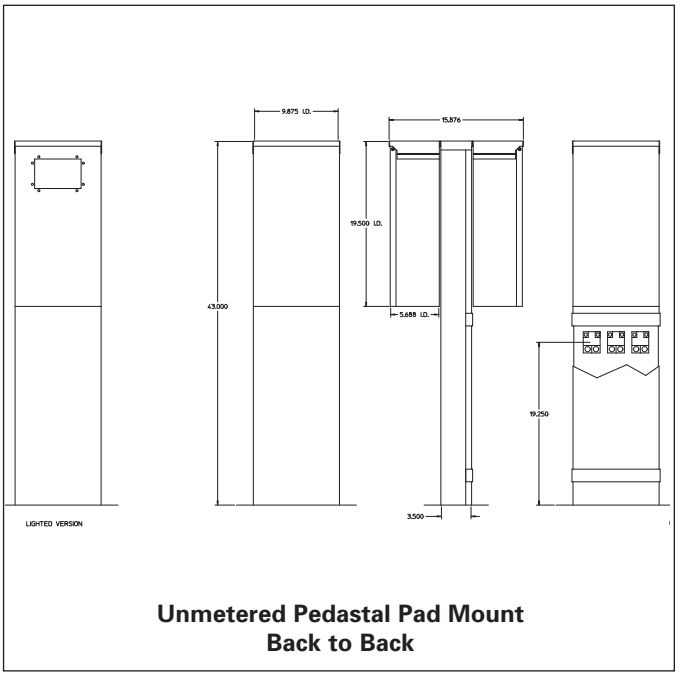
Metered Pedastal Pad Mount



Unmetered Pedastal Pad Mount



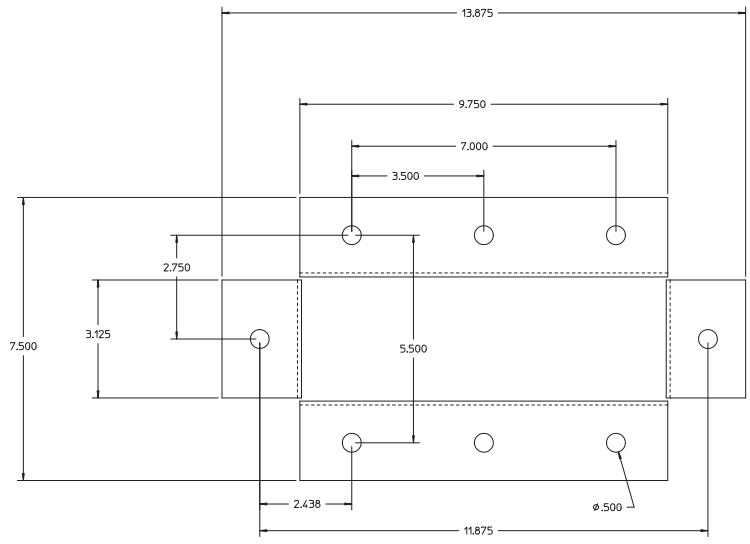
Metered Pedastal Pad Mount Back to Back



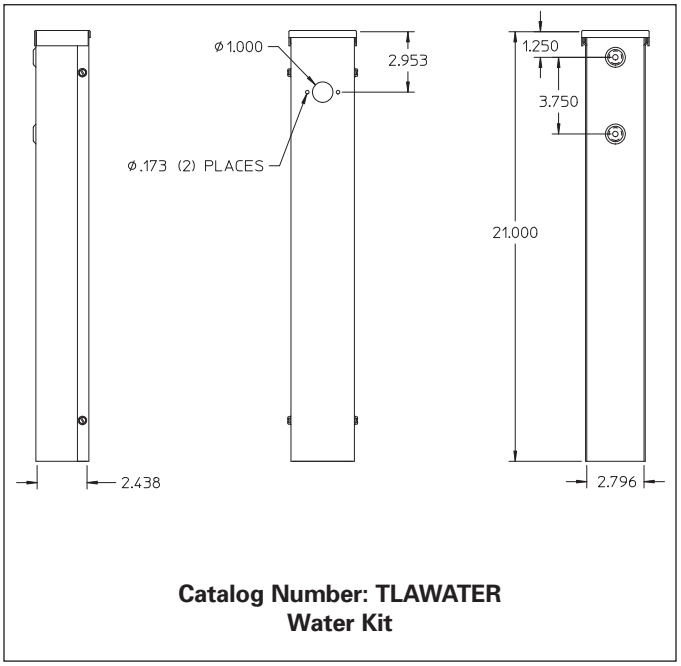
Unmetered Pedastal Pad Mount Back to Back

Temporary Power Outlet Panels

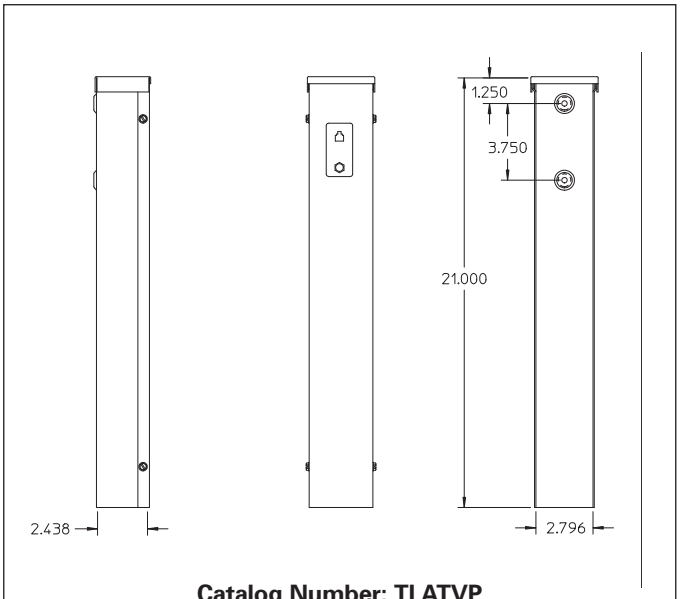
Dimension Drawings



Pad Mount Bolt Pattern



Catalog Number: TLAWATER
Water Kit



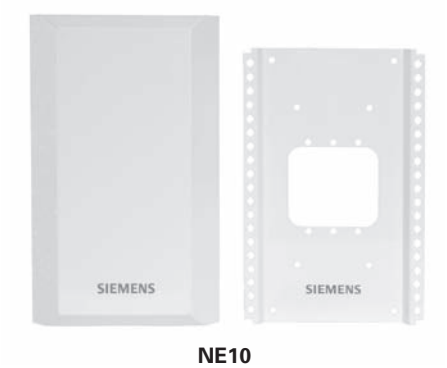
Catalog Number: TLATVP
Television & Phone Combination

Structured Wiring

Network Centers

Network Enclosures

- Serves as the central hub for distribution and management of data signals
- Modules can be mounted on either side of the grid and upside down
- Modular design allows for expansion of telephone, fax, modem, cable TV, computer networking, audio distribution, high-speed Internet service and home control modules
- Painted white steel
- Side mounting tabs
- Receptacle knockout



NE10
10" enclosure plate with cover



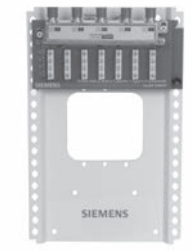
NE18
18" enclosure with cover



NE36
36" enclosure

Network Centers

- Provides connection to services used today
- Allows for expansion and enhancement in the future
- Telecom modules distribute phone service to any outlet in the home, each with up to four phone lines
- Video modules distribute video service to any outlet in the home



NC106T4V
10" enclosure plate with 1x6 telephone and 1x4 video combination module



NC186T8V
18" enclosure with 1x6 telephone and 1x8 video distribution module

Network Enclosures and Network Centers

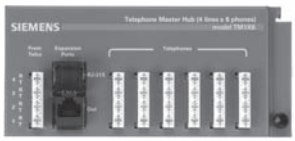
Catalog Number	Description	Dimensions (in.) Enclosure			Dimensions (in.) Cover			Mounting
		H	W	D	H	W	D	
NE10	10" Enclosure with cover	10.00	6.50	0.35	11.00	6.70	4.50	Surface
NE18	18" Enclosure with cover	18.00	14.25	3.50	19.50	15.75	—	Flush/Surface
NE18E	18" Enclosure	18.00	14.25	3.50				Flush/Surface
NE36	36" Enclosure	36.00	14.25	3.50	—	—	—	Flush/Surface
NE18C	18" Enclosure cover				19.50	15.75	—	
NE36C	36" Enclosure cover	—	—	—	37.50	15.75	—	—
NC106T4V	10" Enclosure w/cover & Combination Telcom/Video Module	10.00	6.50	0.35	11.00	6.70	4.50	Surface
NC186T8V	18" Enclosure w/cover & 1x6 Telcom Module & 1x8 Video Module	18.00	14.25	3.50	19.50	15.75	—	Flush/Surface

Structured Wiring

Telephone & Data Modules

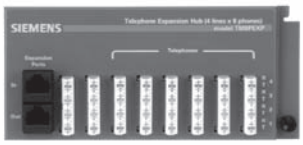
Telephone Modules

- Siemens telephone modules serve as the incoming telephone service connection point
- Supports four incoming telephone lines
- RJ-31X security system connection for seizure of line one
- High-quality cable termination on 110 punch-down blocks
- RJ-45 telephone distribution jacks provide flexibility
- Expansion modules allow you to add additional telephone outlets easily and economically



TM1X6
telephone interface hub

- Phone service for up to 4 lines
- Connects to 6 outlet wall plates
- RJ-31X jack for connection to security system
- 110 punch-down connectors
- RJ-45 jack for connection to TM8PEXP expansion hub



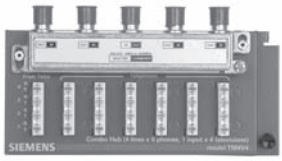
TM8PEXP
telephone expansion module

- Phone service for up to 4 lines
- Connects to 8 outlet wall plates
- RJ-45 jack for connection to additional TM8PEXP expansion hubs
- Includes Cat-5 patch cord for connection to telephone master hub



TM1X12RJ45
1 x 12 telecom module

- Phone service for up to 4 lines
- Connects to 12 outlet wall plates
- RJ-45 connectors
- RJ-45 jack for connection to additional TM1X12RJ45 interface modules



TM4V4
combination telephone and video module

- Phone service for up to 4 lines
- Connects to 6 outlet wall plates
- 110 punch-down connectors
- Distributes CATV or antenna signal to 4 televisions



TM2V4
combination telephone and video module

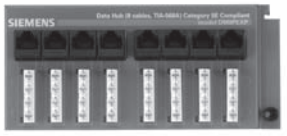
- Phone service for up to 2 lines
- Connects to 6 outlet wall plates
- 110 punch-down connectors
- Distributes CATV or antenna signal to 4 televisions

Telephone Modules

Catalog Number	Description	Connectors	Dimensions (in.)		
			H	W	D
TM1X6	Telephone Interface Hub	110 punch-down	2.75	6.25	1.00
TM8PEXP	1x8 Telecom Expansion Module	110 punch-down	2.75	6.25	1.00
TM1X12RJ45	1x12 Telecom Module	RJ-45	2.75	6.25	1.00
TM2V4	Combination 2x6 Telephone and 1x4 Video Module	110 punch-down	2.75	6.25	1.00
TM4V4	Combination 4x6 Telephone and 1x4 Video Module	110 punch-down	2.75	6.25	1.00

Data Modules

- Siemens data modules support the creation of a high-speed, expandable home network
- Enables users to share files, printers, scanners and other peripheral devices
- High-speed Cat-5 termination point for cable, ISDN or DSL digital data services
- 100 Base-T performance
- Plug and play RJ-45 capability
- Expandable to add additional devices easily and economically



DM8PEXP
8-port network expansion module

- Terminates 8 Cat 5e cables connected to oulet wall plates
- Utilizes AJ12 or AJ24 patch cords to route services through RJ-45 connectors
- Facilitates "plug and play" installation
- Certified 100 Base-T performance
- 110 punch-down connectors



DM8PSWT
8-port network ethernet switch

- 8-port 10/100 Base-T switch creates a home network with 8 connections for computers and peripheral devices
- Cable/DSL modem compatible
- Activity LEDs for network status and diagnosis
- RJ-45 connections
- Expand your network with additional DM8PSWTs for more than 8 connections

Data Modules

Catalog Number	Description	Dimensions (in.)		
		H	W	D
DM8PSWT	8-Port Ethernet Switch	3.75	6.25	1.25
DM8PEXP	8-Port Network Expansion Module	3.75	6.25	1.00

Structured Wiring

Passive and Amplified Video Modules

Passive Video Modules

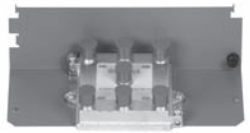
- Siemens passive video modules serve as the incoming video service connection point
- Distributes a CATV or antenna signal to 3, 4, 6 or 8 television outlets
- Vertical cable access provides easy installation
- -130 dB RFI rejection
- Balanced splitter 5-1000 MHz



VM1X3
1 x 3 video module



VM1X4
1 x 4 video module



VM1X6
1 x 6 video module



VM1X8
1 x 8 video module

Passive Video Modules

Catalog Number	Description	Number of Outputs	Dimensions (in.)		
			H	W	D
VM1X3	1x3 Video Module	3	2.75	6.25	1.00
VM1X4	1x4 Video Module	4	2.75	6.25	1.00
VM1X6	1x6 Video Module	6	2.25	6.25	2.25
VM1X8	1x8 Video Module	8	2.25	6.25	2.25

Amplified Video Modules

- Siemens amplified video modules serve as the incoming video service connection point
- Modulator inputs allow you to view locally generated channels from DVD, VCR, satellite receivers, cable boxes, CCTVs and more on any TV in the house
- 3x8 modules have built-in IR engines which allow infra-red remote control of video equipment
- Bi-directional modules are perfect for use with cable modems and pay-per-view boxes
- High-headroom modules handle signal differences between high-powered analog VHF and low-powered UHF stations



VM1X6A
1 x 6 bi-directional amplified video module

- CATV or antenna distribution to 6 outlet wall plates
- Four connections up to 75 feet in length
- Two connections up to 150 feet in length
- Bi-directional amplifier
- 5-42 MHz return path for cable modems, pay-per-view boxes and interactive applications



VM3X8AB
3 x 8 bi-directional amplified video module

- CATV video distribution to 8 outlet wall plates
- Two modular inputs to add locally generated channels (CCTV, DVD, VCR, etc.)
- Bi-directional amplifier
- 5-42 MHz return path for cable modems, pay-per-view boxes and interactive applications



VM3X8AH
3 x 8 high-headroom amplified video module

- Antenna video distribution to 8 outlet wall plates
- Two modular inputs to add locally generated channels (CCTV, DVD, VCR, etc.)
- High-headroom amplifier

Amplified Video Modules

Catalog Number	Description	Bandwidth	Modulator Inputs	Number of Outputs	Dimensions (in.)		
					H	W	D
VM1X6A	1x6 Bi-Directional Amplified Video Module	40 MHz - 1 GHz	0	6	2.75	6.25	1.25
VM3X8AB	3x8 Bi-Directional Amplified Video Module	54 MHz - 860 MHz	2	8	2.25	6.25	3.25
VM3X8AH	3x8 High-Headroom Amplified Video Module	54 MHz - 860 MHz	2	8	2.25	6.25	3.25

Structured Wiring

Accessories



ACP4
ac power - 4 openings



ACP8
ac power - 8 openings
(outlets not included)



AJ12
1" patch cord



AMK12
module mounting kit



ASL10
replacement snap
locks



AGROM2
2" network enclosure
snap-in grommets



ACTUBE2
2" coupling tube for
network enclosures



ALK2K
lock kit



AJ24
2" patch cord

Accessories

Catalog Number	Description	Standard Package Qty.
ACP4	AC Power - 4 openings	1
ACP8	AC Power - 8 openings	1
AJ12	1" Patch Cord	1
AJ24	2" Patch Cord	1
ACTUBE2	2" Coupling Tube for Network Enclosures	2
AGROM2	2" Snap-In Grommet for Network Enclosures	5
ASC7CM	7" Serial Cable for Home Control Module	1
ASC9T	9" Serial Cable for Thermostats	1
AMBHD	Isolation Mounting Brackets (Heavy Duty)	2
AMBLD	Isolation Mounting Brackets (Light Duty)	2
ALK2K	Lock Kit	1
AMK12	Module Mounting Kit	12
ASL10	Replacement Snap Locks	10
AP8RJ6F	RJ-45 or F-Connector Adapter Plate	1
AWS18	Wire Spacer	1

AC Disconnects

1-Phase, NEMA 3R Rated



WN2060



WN2060GFCI



WF2060PL



WNAS2060GFCI

Steel AC Disconnects①

Ampere Rating	Disconnect Type	Catalog Number	Horse Power Rating	Dimensions			Pallet Qty.
				Height	Width	Depth	
30	Fused Pullout	**WF2030**	3	7¼	5	2⅛	360
60	Fused Pullout	**WF2060**	10	9	5	2⅛	360
60	Non-fused Pullout	**WN2060**	10	7¼	5	2⅛	360
60	Non-automatic Switch	**WNAS2060**	10	7¼	5	2⅛	360

Plastic AC Disconnects①

Ampere Rating	Disconnect Type	Catalog Number	Horse Power Rating	Dimensions			Pallet Qty.
				Height	Width	Depth	
30	Fused Pullout	**WF2030PL**	3	7¼	5	2½	216
60	Fused Pullout	**WF2060PL**	10	7¼	5	2½	216
60	Non-fused Pullout	**WN2060PL**	10	7¼	5	2½	360
60	Non-Fused Pullout	**WN2060PLX**	10	8	5¾	3½	288
60	Non-automatic switch	**WNAS2060PL**	10	7¼	5	2½	360

Steel AC Disconnects with 15 Amp GFCI Receptacle①

Ampere Rating	Disconnect Type	Catalog Number	Horse Power Rating	Dimensions			Pallet Qty.
				Height	Width	Depth	
30	Fused Pullout	**WF2030GFCI**	3	9	6⅛	5 3/16	112
60	Fused Pullout	**WF2060GFCI**	10	9	6⅛	5 3/16	112
60	Non-fused Pullout	**WN2060GFCI**	10	7⅛	5¾	5 3/16	144
60	Non-automatic Switch	**WNAS2060GFCI**	10	7⅛	5¾	5 3/16	144

Wire Range Table

Connector	Copper		Aluminum	
	Solid	Stranded	Solid	Stranded
Line	#14-8	#14-3	#12-8	#12-3
Load	#14-8	#14-3	#12-8	#12-3
Neutral	#12-8	#12-2	#12-8	#12-2
Equip. Grnd	#12-8	#12-2	#12-8	#12-2

① Accepts Class H Fuse

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Meter Centers

Meter Mounting Devices: Introduction

General Information

Materials:
16 gauge, galvanized steel, G-90

Enclosures:
NEMA 3R

Finish:
Steel - Light gray, baked on powder polyester

Latches:
All swing latches are stainless steel

Block Material:
Glass reinforced polyester

Terminals:
Residential - Tin-plated aluminum extrusions 6061-T6
Commercial - Tin-plated copper and or tin plated aluminum

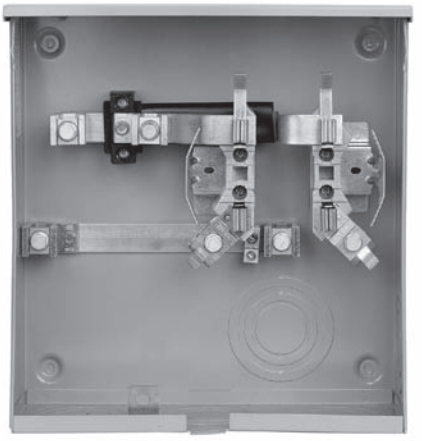
Accessories:
All hubs, closure plates, and 5th terminals, if included, are factory installed.

Standards:
Products cataloged herein meet or exceed the following standards: UL 486B, UL 414, NEMA 250, ANSI C12.7 UL File #30413

Siemens meter socket designs have been in the industry for more than 60 years. No one knows metering installations like Siemens. Our meter sockets set the standard for quality, design, & workmanship. This is why we use stainless steel hardware; polyester powder-coat paint for long-lasting protection and appearance; type G90 galvanized steel or 3003 grade aluminum enclosures and, in our commercial sockets, an all-plated copper current path. This is why Siemens meter sockets are seen in so many utility specifications.

Features:

- Residential single position sockets (types UAT) feature a quad neutral as a standard feature.
- Most commercial sockets include a ground lug & some models are available with line & load lugs installed.
- Lever bypass sockets feature the type HQ socket which is recognized by utilities as the industry standard for durability & quality.
- Siemens features one of the most complete and comprehensive Meter socket lines available from any manufacturer.



SUAS877-PPZA
4-Jaw 1Ø 3W 200 Amp Residential Horn Bypass - Sidewire Design



S40407-02CO
7-Jaw 3Ø 4W 200 Amp Lever Bypass Type "HQ"



S48707-82GP
7-Jaw 3Ø 4W 320 Amp Lever Bypass Type HQ - Sidewire Design

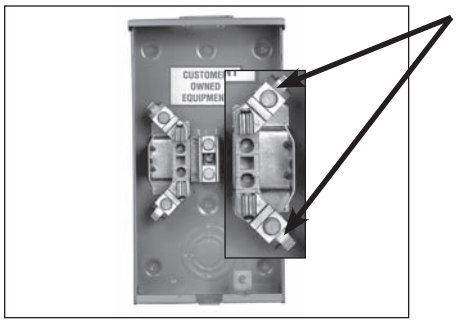


SUAT417-XG
4-Jaw 1Ø 3W 200 Amp Residential - No Bypass

Meter Centers

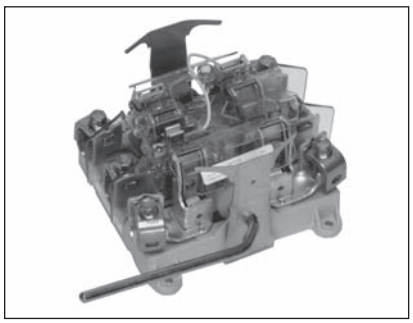
Meter Socket Bypass Types

There are several different bypass types used in the meter socket industry. The type of bypass used is dependent upon each individual utilities' requirements for that application. The illustrations and photos below will explain some of the basic bypass types seen in section 2 of the Siemens' Speedfax. This page is meant for informative purposes only and is not meant to imply or convey the use of any particular bypass or inter-changing of any types of bypass for any application. The local utility should always be contacted to ensure approval of equipment prior to installation. The types of bypasses listed below are for utility use only.



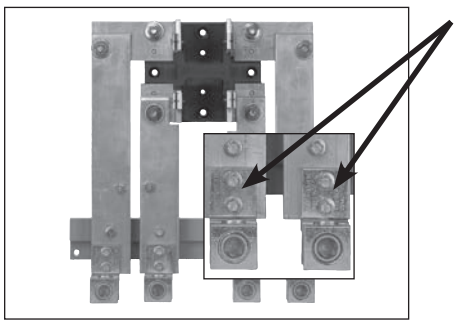
Horn Bypass:

Small tabs or "horns" on the line and load side of the meter socket act as electrical connection points for the utility to install a bypassing means- usually a specially produced wire or "jumper" designed for this specific application.



Lever Bypass:

A lever is used to rotate a plated copper blade between the line and load jaws. The lever bypass HQ socket also clamps on the meter when the bypass is dis-engaged. The bypass must be engaged to remove the meter then dis-engaged after the meter is installed. The bypass acts as an alternate path for current flow which helps to mitigate any arcing if the meter is being removed. This also ensures a constant current flow should the meter need to be removed.



Test Block Bypass:

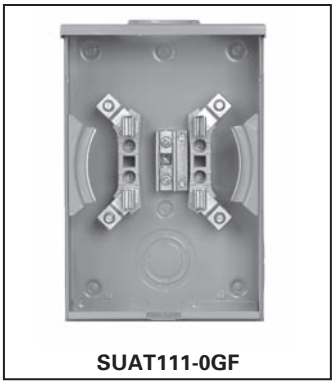
Test Block Bypass sockets (TBB) have the line and load connectors mounted parallel to one another. This provides for a provision to bypass the meter by placing a jumper on the line and load bus. Note that this type of bypass is used primarily by those utilities subscribing to the EUSERC metering standards.

Meter Centers

Single Position Meter Sockets—Residential Types⑥



SUAT111-0PGP



SUAT111-0GF



SUAT111-0MXA

135 Amp Continuous Meter Mounting Equipment, Ringless, 1-Phase, 3-Wire 600V 1 Position

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	5th Jaw	Hub Provision	KO Fig.
HORN BYPASS										
SUAT111-0PDN④	11.7	8.0	3.7	135	OH/UG	#14-2/0	4	EC659-0121	RX Opening	1A
SUAT111-0PGP②										
SUAT111-0PQG										
SUAT111-0PZA①										
SUAT111-0PV								Installed		
NO BYPASS										
SUAT111-0G	11.7	8.0	3.7	135	OH/UG	#14-2/0	4	EC659-0121	RX Opening	1A
SUAT111-0GF③										
SUAT111-0JCA										
SUAT111-0MXA①							5	Installed		
SUAT111-PG					UG		4	EC659-0121	None	1B

135 Amp Continuous Meter Mounting Equipment, Ring Type, 1-Phase, 3-Wire 600V 1 Position

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	5th Jaw	Hub Provision	KO Fig.
NO BYPASS										
SUAT121-0BCO⑤	11.7	8.0	3.7	135	OH/UG	#14-2/0	5	Installed	RX Opening	1A
SUAT121-0GWR⑤							4	EC659-0121		
SUAT121-BBCO⑤					OH		5	Installed	EC38597 Inst.	
SUAT121-BGWR⑤							4	EC659-0121		
SUAT121-BM							5	Installed		
SUAT121-PBCO⑤					UG		5	Installed	None	1B
SUAT121-PGWR⑤							4	EC659-0121		

Contact utility or sales office for approval by your local utility prior to installation.
① 7/16″ Barrel lock knockout
② 7/8″ Barrel lock knockout
③ Stainless Steel latch and hasp
④ Labeled for use on Duquense Light Company
⑤ Sealing ring included
⑥ All devices include a quad ground

Meter Centers

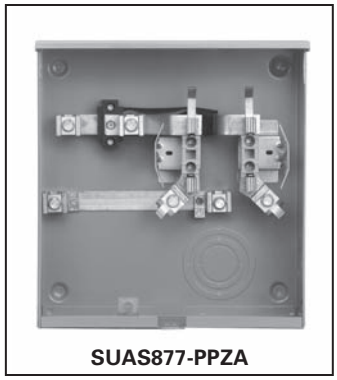
Single Position Meter Sockets—Residential Types ④



SUAT417-XGF



SUAT317-0PGP



SUAS877-PPZA

200 Amp Continuous/250 Amp Max Meter Mounting Equipment, Ringless, 1-Phase, 3-Wire 600V 1 Position

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	5th Jaw	Hub Provision	KO Fig.
HORN BYPASS										
SUAT317-0FP②	14.8	8.0	4.5	200	OH	#6-350	5	Installed	RX Opening	2
SUAT317-0PDN							4			
SUAT317-0PGP②										
SUAT317-0PQG										
SUAT317-0PZA①										
SUAT417-0PQG	14.8	11.4	4.5	200	OH/UG	#6-350	4	EC659-0121	RX Opening	3A
SUAT417-XFP②							5	Installed	RX CL. Plate	
SUAT417-XPCV⑤							4	EC659-0121	RX CL. Plate	
SUAT417-XPQG										
SUAS817-PPGP②	14.0	13.0	5.2	200	UG-SW	#6-350	4	EC659-0121	None	8
SUAS877-PPCV⑤										6A
SUAS877-PPDN⑦										
SUAS877-PPGP②										
SUAS877-PPZ										
SUAS877-PPZA①										
NO BYPASS										
SUAT317-0G	14.8	8.0	4.5	200	OH	#6-350	4	EC659-0121	RX Opening	2
SUAT317-0GF③							4	EC659-0121		
SUAT317-0MXA①							5	Installed		
SUAT317-DGZ							4	EC659-0121	EC38599 Inst.	
SUAT417-PG	14.8	11.4	4.5	200	UG	#6-350	4	EC659-0121	None	3B
SUAT417-XG					OH/UG				RX CL. Plate	3A
SUAT417-XGDU										
SUAT417-XGF③										
SUAT517-PDG①	18.0	13.0	5.2	200	UG	#6-350	4	EC659-0121	None	3B
SUAT618-XGNM⑧	22.0	11.4	4.5		OH/UG				RX CL. Plate	3A
SUAS818-PGNM⑧	14.0	13.0	5.2		UG-SW				None	8
SUAS877-PG										6A
SUAS917-XJCA	17.0	13.0	5.2		OH/UG-SW				RX CL. Plate	7

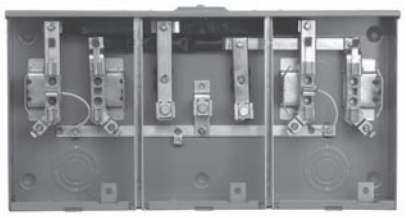
200 Amp Continuous/250 Amp Max Meter Mounting Equipment, Ring Type, 1-Phase, 3-Wire 600V 1 Position

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	5th Jaw	Hub Provision	KO Fig.
NO BYPASS										
SUAT327-0GWR⑥	14.8	8.0	4.5	200	OH	#6-350	4	EC659-0121	RX Opening	2
SUAT327-0MCO⑥							5	Installed		
SUAT427-PMCO⑥	14.8	11.4	4.5	200	UG	#6-350	5	Installed	None	3B
SUAT427-XMWR⑥					OH/UG		4	EC659-0121	RX CL. Plate	3A

Contact utility or sales office for approval by your local utility prior to installation.
① 7/16″ Barrel lock knockout
② 7/8″ Barrel lock knockout
③ Stainless Steel latch and hasp
④ All devices include a ground lug
⑤ Labeled for use on Delmarva Power and Atlantic City Electric
⑥ Sealing ring included
⑦ Labeled for use on Duquense Light Company
⑧ Line side studs

Meter Centers

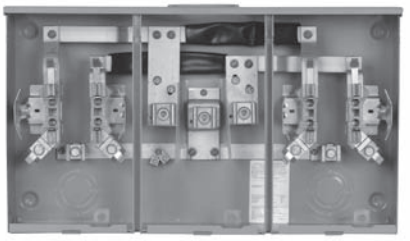
Single & Multiple Position Meter Sockets—Residential Types



SUA2311-0PGP with EC659-0121 installed



WSC250C



SUA2717-YPGP

100 Amp/Position Meter Mounting Equipment, Ringless, 1-Phase, 3-Wire 300V Multi-Position⑧

Catalog Number	Dimensions (inches) H	W	D	Bus Amps	Cont. Amps	Service	No. of Pos.	No. of Jaws	5th Jaw	Hub Provision	KO Fig.	Line Lugs	Load Lugs
HORN BYPASS													
SUA2311-0PGP②④	12.4	24.0	4.5	100	100	OH/UG	2	4	EC659-0121	RX Opening	16A	#6-350 KCMIL	#14-2/0
SUA2311-0PQG⑤											16B		
SUA3311-0PGP②④	12.4	32.0	4.5	135	100	OH/UG	3	4	EC659-0121	RX Opening	17A	#6-350 KCMIL	#14-2/0
SUA3311-0PQG⑤											17B		
SUA4311-0PGP②④	12.4	40.0	4.5	180	100	OH/UG	4	4	EC659-0121	RX Opening	18A	#6-350 KCMIL	#14-2/0
SUA4311-0PQG⑤											18B		

200 Amp/Position Meter Mounting Equipment, Ringless, 1-Phase, 3-Wire 300V Multi-Position⑧

HORN BYPASS													
SUA2717-YPDN④⑩	13.9	24.0	5.2	200	200	OH/UG	2	4	EC659-0121	HD Opening	19A	#1/0-600 KCMIL	#6-350 KCMIL
SUA2717-YPGP②④								5	Installed	HD CL. Plate			
SUA2717-YPQG⑤								4	EC659-0121	HD Opening			
SUA2717-YPZA①④								4	EC659-0121	HD Opening			
SUA3717-YPDN④⑩	13.9	32.0	5.2	270	200	OH/UG	3	4	EC659-0121	HD Opening	20A	#1/0-600 KCMIL	#6-350 KCMIL
SUA3717-YPGP②④								5	Installed	HD CL. Plate			
SUA3717-YPZA①④								4	EC659-0121	HD Opening			
SUA4719-YPDN④⑩	13.9	43.4	5.2	360	200	OH/UG	4	4	EC659-0121	HD Opening	21A	(2)#1/0-600 KCMIL	#6-350 KCMIL
SUA4719-YPGP②④								5	Installed	HD CL. Plate			
SUA4719-YPQG①⑤								4	EC659-0121	HD Opening			
SUA4719-YPZA④								4	EC659-0121	HD Opening			
SUA5719-KPGP②④	13.9	51.4	5.2	450	200	OH/UG	5	4	EC659-0121	2-HD Opening	22	(2)#1/0-600 KCMIL	#6-350 KCMIL
SUA5719-KPDN④⑩										2-HD Opening			
SUA6719-KPQG⑤	13.9	59.4	5.2	528	200	OH/UG	6	4	EC659-0121	2-HD Opening	23	(2)#1/0-600 KCMIL	#6-350 KCMIL
SUA6719-KPZA①④										2-HD Opening			

100/80 Amp/Position Meter Mounting Equipment, Ring Type, 1-Phase, 3-Wire 300V Multi-Position

NO BYPASS													
WSC150C⑦	11.3	15.3	3.8	—	80	OH/UG	1	5	Installed	1.25" KO in Top	24	#6-4/0	#8-2/0
WSC250C⑦		30.5					2				25		
WSC350C⑦		45.5					3				26		
WSN251CR⑥⑨	15.5	19.6	4.1	200	100	OH/UG	2	5	Installed	RX CL. Plate	30	#6-250 KCMIL	#8-2/0
WSN351CR⑥⑨		29.6					3				31		
WSN451CR⑥⑨		39.6					4				32		

Contact utility or sales office for approval by your local utility prior to installation.
① 7/16″ Barrel lock knockout
② 7/8″ Barrel lock knockout
③ Stainless Steel latch and hasp
④ Ground lug included
⑤ 2 Ground lugs included
⑥ Sealing ring included
⑦ Unit is unbussed and indoor
⑧ Center feed
⑨ End feed
⑩ Labeled for use on Duquense Light Company

Meter Centers

Murray Branded Multiple Position Ring Type



SC250C



SN251CR



SS251CR

80 Amp/Position Meter Mounting Equipment
1 Phase, 3 Wire, 300V Multi-Position Residential End Feed

Catalog Number	Dimensions (inches) H	W	D	Bus Amps	Cont. Amps	Service	No. of Pos.	No. of Jaws	5th Jaw	Hub	Line Lugs	Load Lugs	KO Fig.
SC150C①		15.3					1						24
SC250C①	11.3	30.5	3.9	n/a	80	OH/UG	2	5	Installed	1.25″ KO Top	#6-4/0	#8-2/0	25
SC350C①		45.6					3						26

100 Amp/Position Meter Mounting Equipment
1 Phase, 3 Wire, 300V Multi-Position Residential End Feed

Catalog Number	Dimensions (inches) H	W	D	Bus Amps	Cont. Amps	Service	No. of Pos.	No. of Jaws	5th Jaw	Hub	Line Lugs	Load Lugs	KO Fig.
NO BYPASS													
SN211AR		27.6					2						27
SN311AR	14.1	35.8	5.3	200	100	OH/UG	3	4	EC659-0121	RX Opening	#6-250	#8-2/0	28
SN411AR		44.0					4						29
SN251CR		19.6					2						30
SN351CR	15.5	29.6	4.1	200	100	OH	3	5	Installed	RX CL. Plate	#6-250	#8-2/0	31
SN451CR		39.6					4						32

100 Amp/Position Meter Mounting Equipment
1 Phase, 3 Wire, 300V Multi-Position Vertical Mounting

Catalog Number	Dimensions (inches) H	W	D	Bus Amps	Cont. Amps	Service	No. of Pos.	No. of Jaws	5th Jaw	Hub	Line Lugs	Load Lugs	KO Fig.
NO BYPASS													
SN205CX	25.6	8.0	4.4	200	100	OH	2	5	Installed	RX Opening	#8-350	#8-2/0	44
SN305CX	35.9	8.0	4.4	200	100	OH	3	5	Installed	RX Opening	#8-350	#8-2/0	45

200 Amp/Position Meter Mounting Equipment
1 Phase, 3 Wire, 300V Multi-Position Residential Center Feed

Catalog Number	Dimensions (inches) H	W	D	Bus Amps	Cont. Amps	Service	No. of Pos.	No. of Jaws	5th Jaw	Hub	Line Lugs	Load Lugs	KO Fig.
SS251CR		28.0		200			2						19B
SS351CR	14.1	38.0	5.4	270	200	OH/UG	3	5	Installed	HD Opening	#1/0-500	#8-250 KCMIL	20B
SS451CR		48.0		360			4						21B

Contact utility or sales office for approval by your local utility prior to installation.

①Unit is unbussed, indoor, and gangable.

Meter Centers

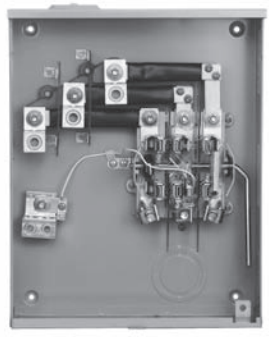
Single Position Meter Sockets—Commercial/Industrial Types⑩



S40405-02CO



S40407-02CO



S9804-9142

200 Amp Continuous Meter Mounting Equipment, Ringless, Lever Bypass, 1-Phase, 3-Wire 600V

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	Hub Provision	KO Fig.
4 OR 5 TERMINAL									
S40404-02QG⑤	19.0	12.8	5.0	200	OH/UG	#6-350 KCMIL	4	RX CL. PLATE	9A
S40405-02QG⑤⑥							5	RX CL. PLATE	9A
S40405-015F③④⑥									
S40405-025⑥									
S40405-02CO②④⑦									
RH173CR②⑦⑨									
RH173CRF②③④⑦⑨									
RH173CRJNU①⑦⑨	19.0	12.8	5.0	200	OH/UG	#6-350 KCMIL	5	RX OPENING	9A
S40405-0BNU①⑦									
S42505-02RG④⑥	19.0	12.8	5.0	200	OH/UG	3/8-24 STUD	5	RX CL. PLATE	9A
S44305-02CV⑦⑧						#6-350 KCMIL		HD CL. PLATE	9B
S48805-0BNU①④⑦	22.0	16.0	5.0	200	OH/UG	#6-350 KCMIL	5	RX CL. PLATE	6B

200 Amp Continuous Meter Mounting Equipment, Ringless, Lever Bypass, 3-Phase, 4-Wire 600V

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	Hub Provision	KO Fig.
7 TERMINAL									
S40007-01GP②④	17.5	10.0	5.0	200	OH	#6-350 KCMIL	7	RX OPENING	10
S40407-02QG⑤	19.0	12.8	5.0	200	OH/UG	#6-350 KCMIL	7	RX CL. PLATE	9A
S40407-025									
S40407-015F②③④									
S40407-02CO②④									
RH173GR②⑨									
RH173GRF②③⑨									
RH173GRJNU①④⑨	19.0	12.8	5.0	200	OH/UG	#6-350 KCMIL	7	RX OPENING	9A
S40407-01NU①④									
S44307-02CV⑧								HD CL. PLATE	9B
S48807-02NU①④	22.0	16.0	5.0	200	OH/UG	#6-350 KCMIL	7	RX CL. PLATE	6B
S9804-9142②④	20.0	16.1			UG-SW				33

Contact utility or sales office for approval by your local utility prior to installation.
① 7/16″ Barrel lock knockout
② 7/8″ Barrel lock knockout
③ Stainless Steel latch and hasp
④ Ground lug included
⑤ 2 Ground lugs included
⑥ 5th jaw installed at 6:00 position
⑦ 5th jaw installed at 9:00 position
⑧ Labeled for use on Delmarva Power and Atlantic City Electric
⑨ Murray brand labeled device
⑩ Clamp jaw lever bypass type HQ

Meter Centers

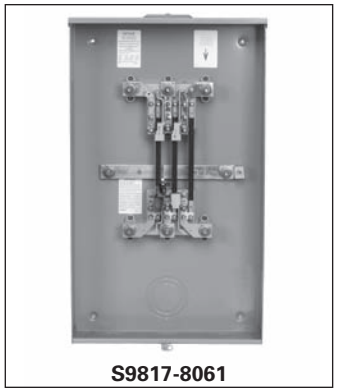
Single Position Meter Sockets—Commercial/Industrial Types



S47704-02



S48104-02



S9817-8061

320 Amp Continuous/400 Amp Max Meter Mounting Equipment, Ringless, Lever Bypass, 1-Phase, 3-Wire 600V④

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	Hub Provision	KO Fig.
4 OR 5 TERMINAL									
S44704-8265②⑦	34.0	20.2	6.2	320	OH/ UG-SW	#4-600	4	HD CL. PLATE	11A
S47604-81GP②	28.0	12.8	5.0	320	OH/UG	#4-600	4	HD OPENING	12
S47605-02SP⑥⑧						3/8-24 STUD	5	HD CL. PLATE	
S47704-01NU①⑥⑧	28.0	13.8	6.0	320	OH/UG	1/2-20 STUD	4	HD OPENING	13
S47704-02⑥							4	HD CL. PLATE	
S47705-01NU①⑥⑧							5	HD OPENING	
S48104-02⑥	31.0	16.2	5.0	320	OH/ UG-SW	3/8-24 STUD	4	HD CL. PLATE	14
S48105-83BU②⑧						#4-600	5		
S48504-92⑥	28.0	12.8	5.0	320	UG	3/8-24 STUD	4	NONE	35
S48704-82GP②	34.0	20.2	6.2		OH/ UG-SW	#4-600		HD CL. PLATE	11B
S9804-9144①⑥	25.0	16.0	6.0	320	OH/UG	3/8-24 STUD	4	HD OPENING	13
S9804-9146①⑥	34.0	20.2	6.2						11C

320 Amp Continuous/400 Amp Max Meter Mounting Equipment, Ringless, Lever Bypass, 3-Phase, 4-Wire 600V④

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	Hub Provision	KO Fig.
7 TERMINAL									
S47707-01NU①⑥	28.0	13.8	6.0	320	OH/UG	1/2-20 STUD	7	HD OPENING	13
S47707-02⑥						3/8-24 STUD		HD CL. PLATE	
S48707-82GP②	34.0	20.2	6.2	320	OH/ UG-SW	#4-600	7	HD CL. PLATE	11B
S9804-9145①⑥	25.0	16.0	6.0	320	OH/UG	3/8-24 STUD	7	HD OPENING	13
S9804-9147①⑥	34.0	20.2	6.2					HD CL. PLATE	11C

400 Amp Continuous/400 Amp Max Meter Mounting Equipment, K7 Bolt-in, No Bypass, 3-Phase, 4-Wire 600V

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	Hub Provision	KO Fig.
7 TERMINAL									
S9817-8061③④⑤⑥	34.0	20.0	6.2	400	UG	1/2-20 Stud	7	HD CL. PLATE	15

Contact utility or sales office for approval by your local utility prior to installation.
① 7/16″ Barrel lock knockout
② 7/8″ Barrel lock knockout
③ Stainless Steel latch and hasp
④ Ground lug included
⑤ Bolt-in meter socket
⑥ Lugs not included, order separately
⑦ Anti-inversion clip included
⑧ 5th Jaw installed at 9:00

Meter Centers

Special Application Meter Sockets



MS44UTB



MS14TB

100-320 Amp Continuous EUSERC-Approved Meter Mounting Equipment, Ring Type, Test Block Bypass, 1-Phase & 3-Phase

Catalog Number	Dimensions (inches) H	W	D	Cont. Amps	Service	Lugs	No. of Jaws	5th Jaw	Hub Provision	KO Fig.
MS14TB	24.1	12.4	4.8	100	1-Ph/3-Wire	#6-2/0	4	EC5J	RX	39
MS15TB					3-Ph/3-Wire	#6-2/0	5	Installed		
MS17TB					3-Ph/4-Wire	#6-2/0	7	—		
MS24TB	30.1	14.1	6.1	200	1-Ph/3-Wire	#1/0-250 lay-in	4	UX005B	(2x) RX-top (1x) HD-bot.	40
MS25TB					3-Ph/3-Wire	#1/0-250 lay-in	5	Installed	(2x) RX-top (3x) HC-bot.	41
MS27TB					3-Ph/4-Wire	#1/0-250 lay-in	7	—	(2x) RX-top (1x) HD-bot.	40
MS44UTB	34.5	15.4	6.3	320	1-Ph/3-Wire	(2)#1/0-250 or (1)#4-600	4	—	—	44

200 Amp Mobile Home Meter Pedestal
Pad or Earth Mount, Ring or Ringless Design, 4 Jaw for 1 Phase 240V AC

Continuous Duty Amps Per Position	Catalog Number	Cover Type	Line Connectors (installed)	Dimensions H	W	D
200	MP0406B1200R	Ringless	(2) #6-350 kcmil	55.00	10.00	4.00
	MP0606L1200R	Ringless	(2) #6-350 kcmil	55.00	10.00	4.00
	MP0606L1200	Ring	(2) #6-350 kcmil	55.00	10.00	4.00

200 Amp Mobile Home Lever Bypass Meter Pedestal
Pad or Earth Mount, Ringless, 5 Jaw for 1 Phase, 240V AC

200	MP0406B1200RJL	Ringless	(2) #6-350 kcmil	55.00	10.00	4.00
200	MP0606L1200RJL	Ringless	(2) #6-350 kcmil	55.00	10.00	4.00

Breakers: Units will accept up to (3) 2 pole breakers or (6) 1 pole breakers - Siemens type QP or Murray type MP for up to 125amps and Siemens type QN for 200amp.

Filler Plates: Un-used openings that have had the factory twist-outs removed can use part the ECQF3 filler plate.

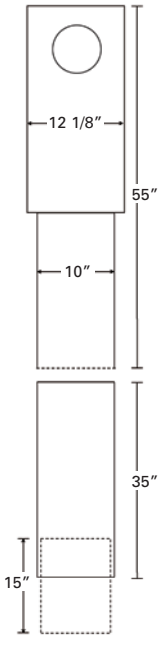
Required Accessories:

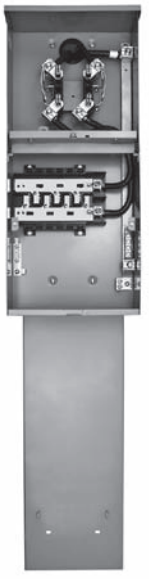
Direct Burial Kit: Use catalog number MPEXT. This lengthens the device to 84", 90", or 96" depending on adjustment of the stabilizer foot.

Pad Mount Kit: Use catalog number MPFLANGE. This kit bolts to the bottom of the MPEXT and will add 11" in length.

MP0606: accomodates (3) 2 pole breakers or (6) 1 pole breakers types Siemens QP/Murray MP-T (125amp max) and types Siemens QN/Murray MPD (150-200amp)

MP0406: Siemens type QN 200amp breaker factory installed. Additional space for 4 one pole or 2 two pole breakers types Siemens QP/ Murray MP-T. Branch circuits run in parallel to 200amp main breaker





MP0606L1200R (Front)



MP0606L1200RJL (Reverse)



MP0606L1200RJL (Front)

Contact utility or sales office for approval by your local utility prior to installation.

Meter Centers

Meter Socket Accessories



RX Hub



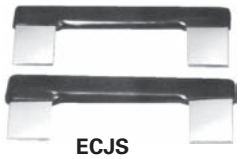
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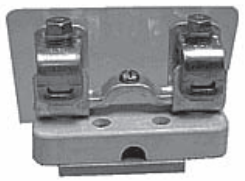
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H56476



ECJS



S64685-1 Neutral Kit



H58022



EC659-0121



S35815-2



SRSTD



SRSS



SRSW

5TH & 6TH Jaw Assemblies

For Use With	Catalog Number
All SUAxxxx single and multiple position sockets	**EC659-0121** (grounded)
All SUAxxxx single and multiple position sockets	**EC659-0120** (insulated)
All Lever Bypass single position sockets	**S35815-2**
SC and SD Unbussed Multiple-5th Jaw	**WSX019**
100A Test Block bypass sockets	**EC5J**
200A Test Block bypass sockets	**UX005B**
Anti-Inversion clip for use with 320amp sockets	**H59676** when required

Miscellaneous Accessories

Description	Catalog Number
Insulated Neutral Kit for "S404xx" sockets	**EC64685**
Isolated Neutral Kit for S9817-8061	**S69685-1**
Bypass Kit for S9817-8061	**S69623**
Jumper-200 Amp Rated-use on SUAxxx sockets only (temporary use only)	**ECJS**
Plastic Meter Cover- Ring	**ECPP**
Plastic Meter Cover- Ringless	**ECCP3**
Neutral Isolation kit for 200amp lever bypass sockets	**64690-1**

Interchangeable Hubs

Description	Catalog Number	Hub Size (Inches)
RX CONDUIT HUBS		
	EC38594	¾
	EC38596	1
	EC38597	1¼
	EC38598	1½
	EC38599	2
	EC38600	2½
Closure Plate	**EC38595**	—
HD CONDUIT HUBS		
	EC56856	3
	EC56857	3½
	EC56858	4
Adapter Plate convert HD to RX	**EC9747-1113**	—
Closure Plate	**EC56933S**	—

Sealing Rings

Description	Catalog Number
Snap-On Type, aluminum	**SRSTD**
Snap-On Type, steel	**SRSS**
Screw Type, aluminum	**SRSW**

Lugs for Sockets with Stud Terminals①

Catalog Number	For Use With	Wire Range
H58852	Line side of S9817 Socket on UG Applications	(1) 3/0-800 kcmil
H56732	Line & Load of S477 & Load/Neutral of S9817 Sockets	(2) #4-350 kcmil
H56476	Line & Load of S477 & Load/Neutral of S9817 Sockets	(1) 3/0-750 kcmil
H58022	Any socket with 3/8" Stud Terminals	(2) #6-250 kcmil
H55890	Any socket with 3/8" Stud Terminals	(1) #6-350 kcmil

① Each lug catalog number contains one lug unless otherwise noted. Order enough lugs to cover all terminations.

Meter Centers

Meter Socket Knockout Diagrams

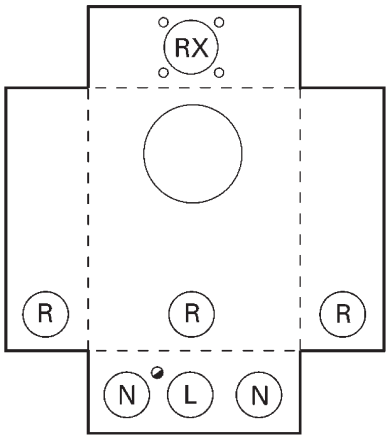


Figure 1A

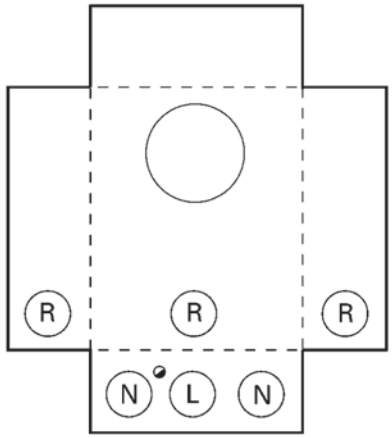


Figure 1B

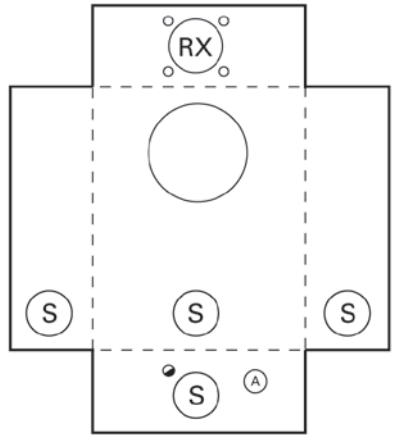


Figure 2

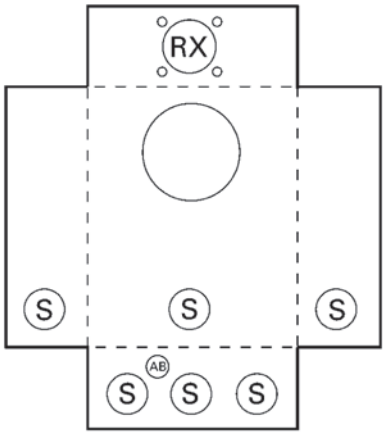


Figure 3A

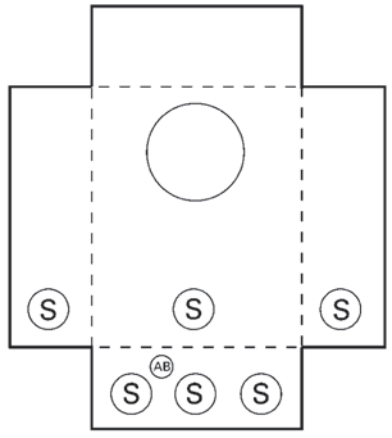


Figure 3B

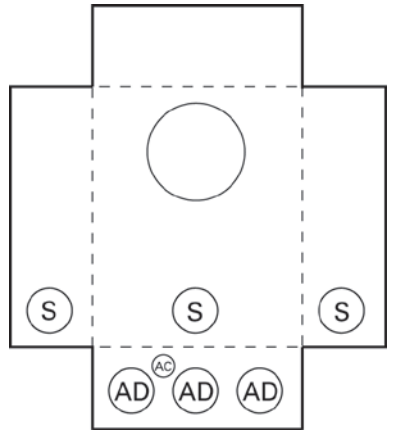


Figure 4

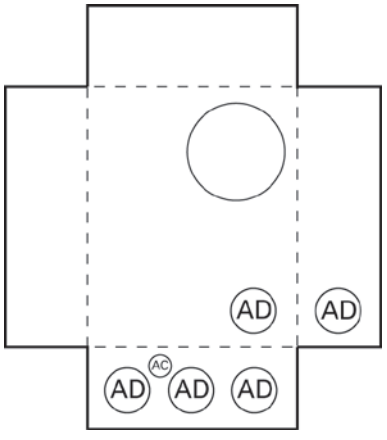


Figure 6A

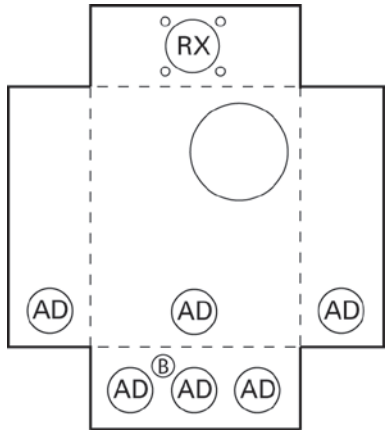


Figure 6B

KNOCKOUTS (inches):

◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

Meter Centers

Meter Socket Knockout Diagrams

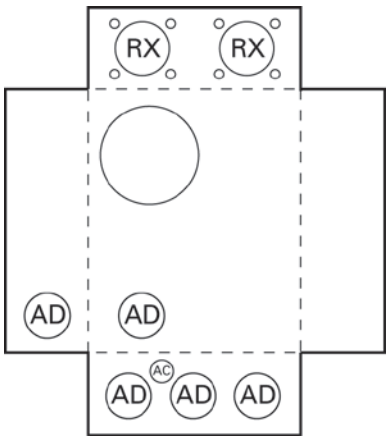


Figure 7

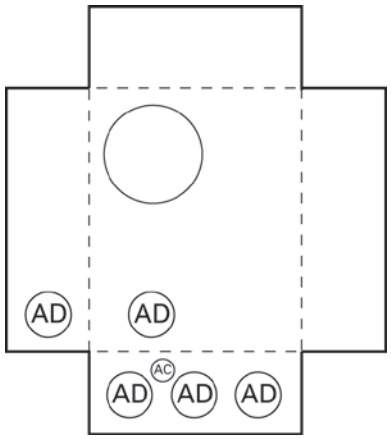


Figure 8

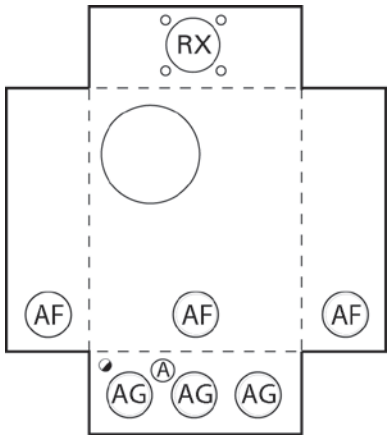


Figure 9A

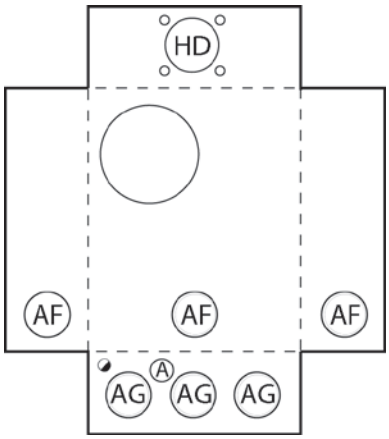


Figure 9B

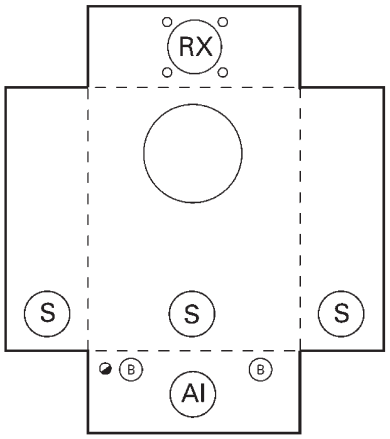


Figure 10

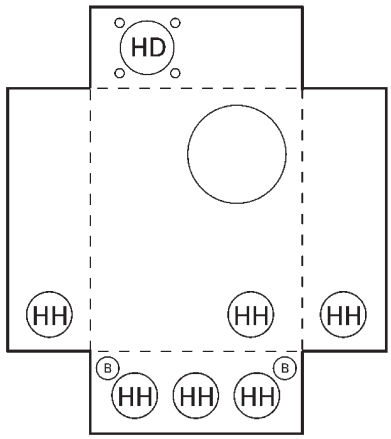


Figure 11A

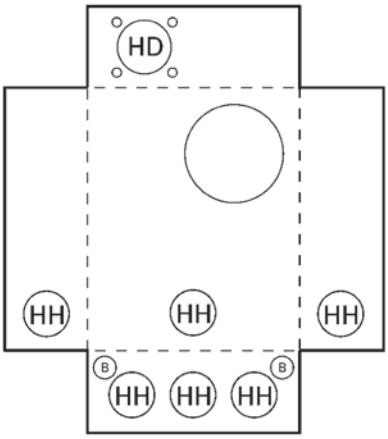


Figure 11B

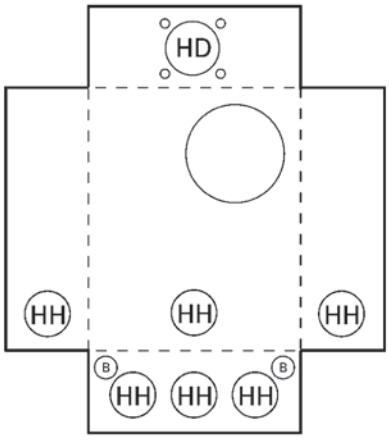


Figure 11C

KNOCKOUTS (inches):

◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

Meter Centers

Meter Socket Knockout Diagrams

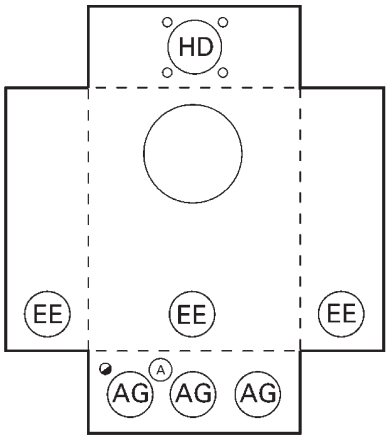


Figure 12

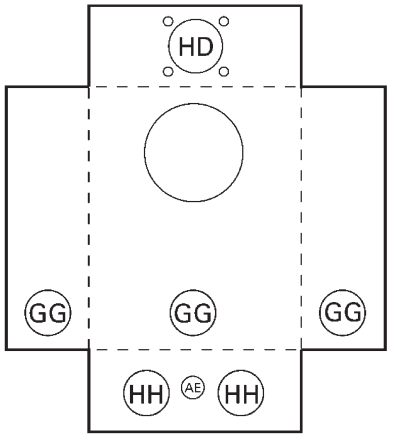


Figure 13

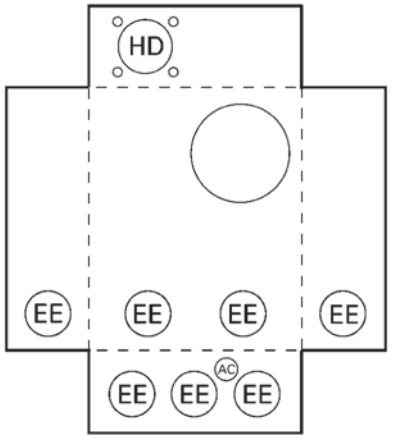


Figure 14

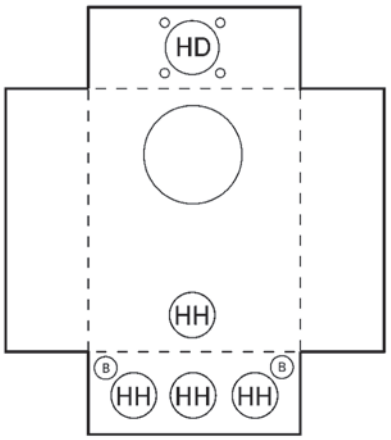


Figure 15

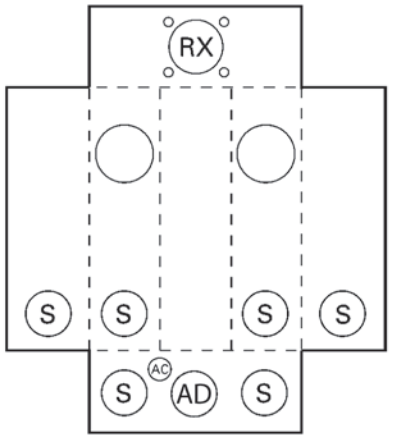


Figure 16A

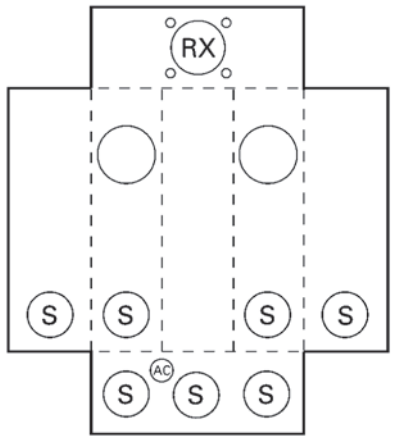


Figure 16B

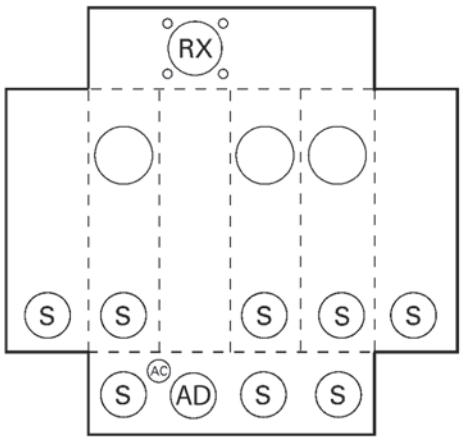


Figure 17A

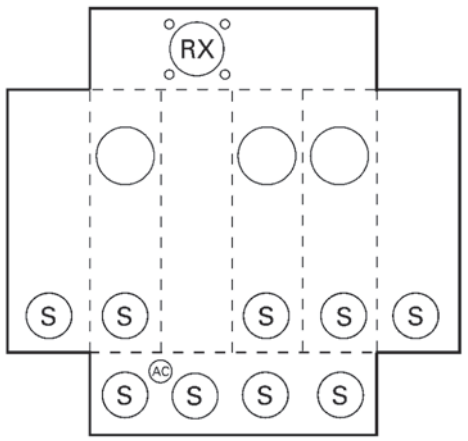


Figure 17B

KNOCKOUTS (inches):

◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

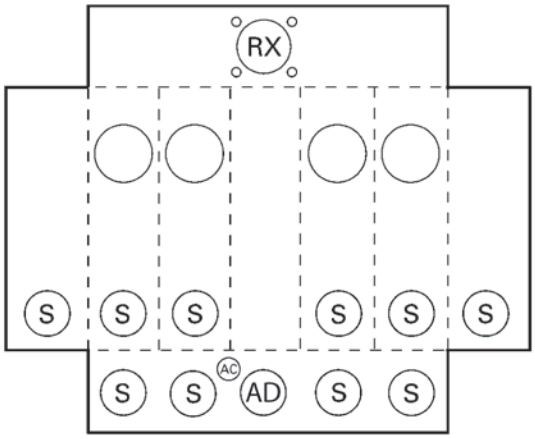


Figure 18A

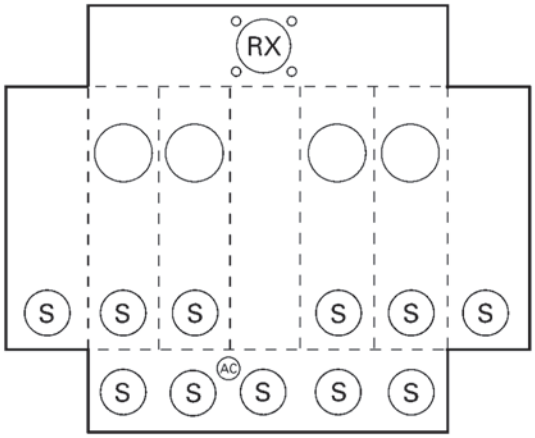


Figure 18B

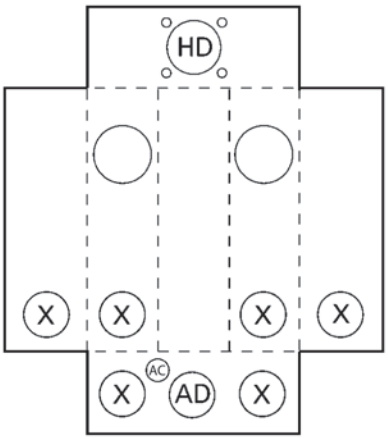


Figure 19A

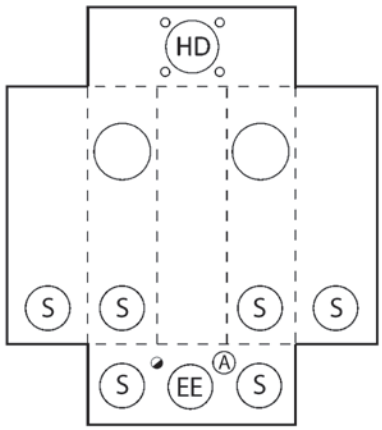


Figure 19B

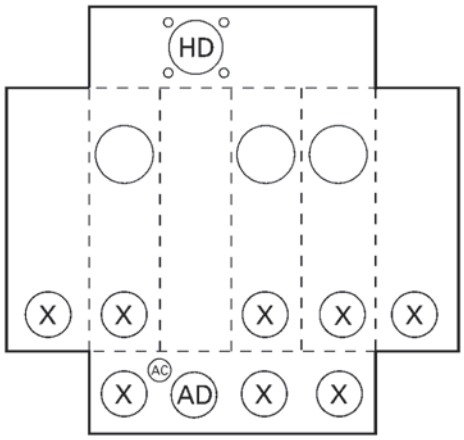


Figure 20A

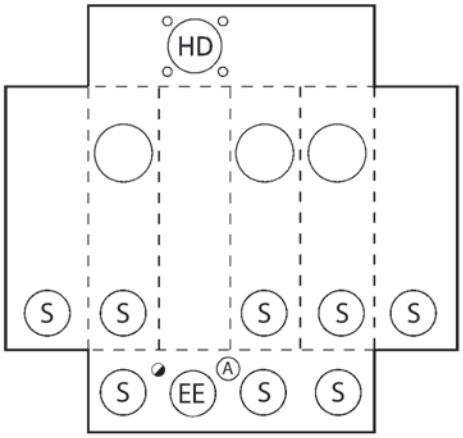


Figure 20B

KNOCKOUTS (inches):

◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

Meter Centers

Meter Socket Knockout Diagrams

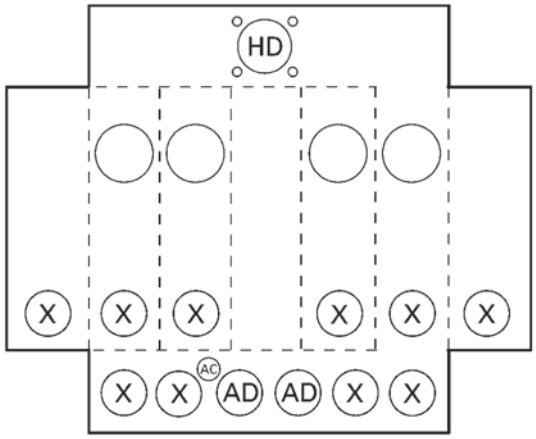


Figure 21A

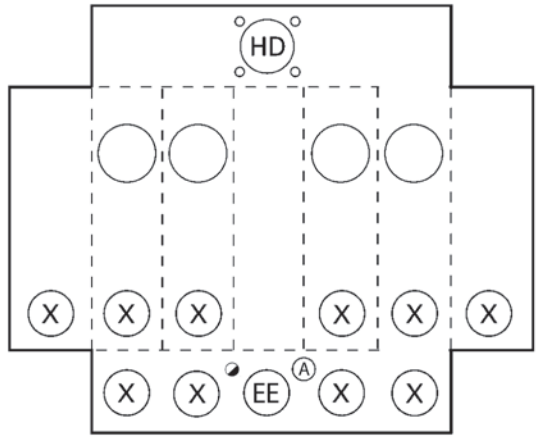


Figure 21B

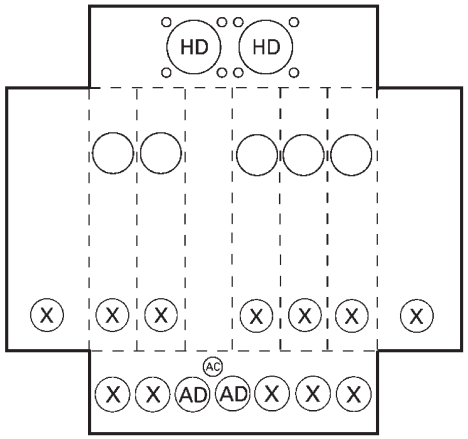


Figure 22

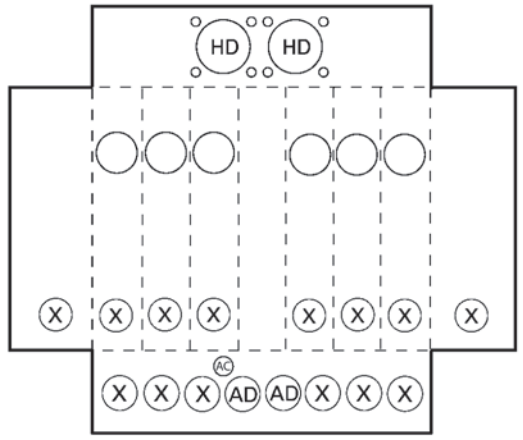


Figure 23

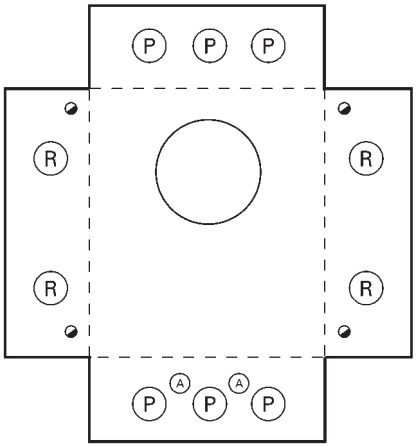


Figure 24

KNOCKOUTS (inches):.	
◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

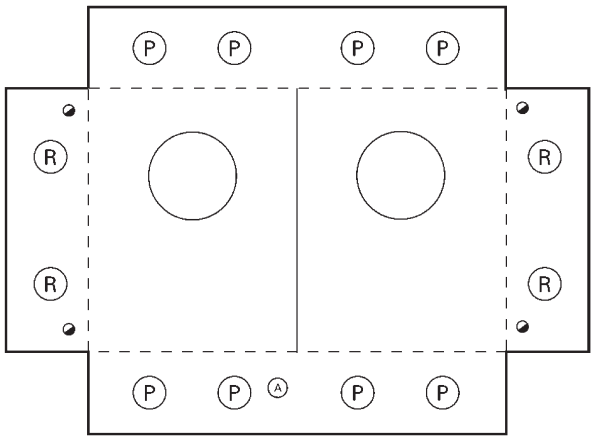


Figure 25

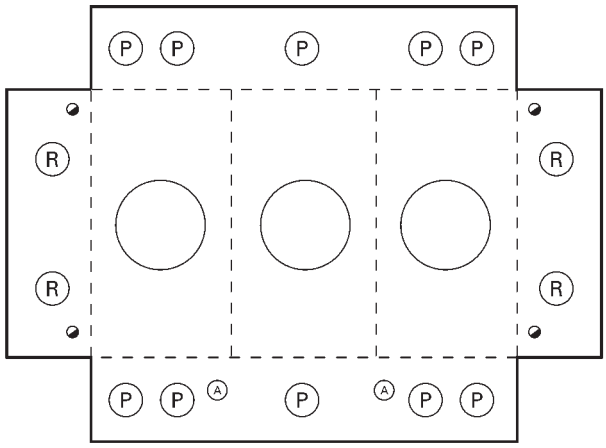


Figure 26

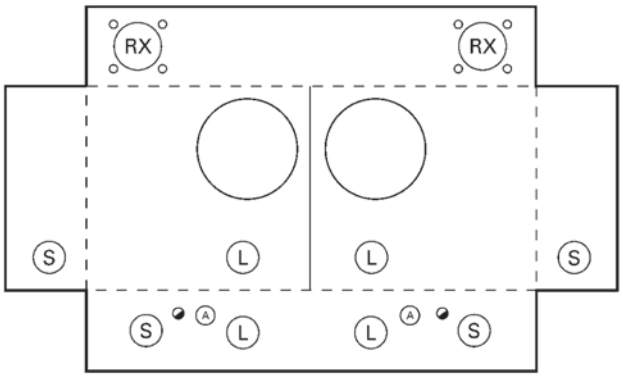


Figure 27

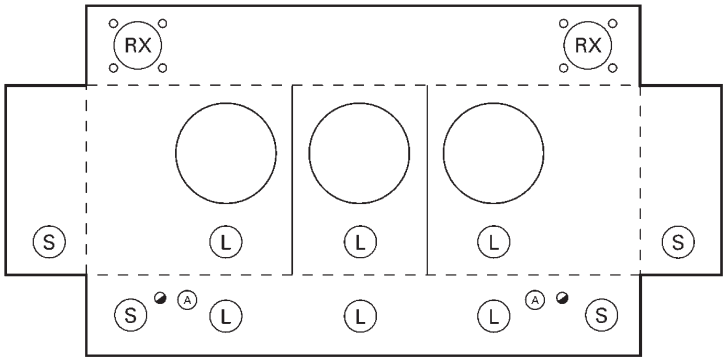


Figure 28

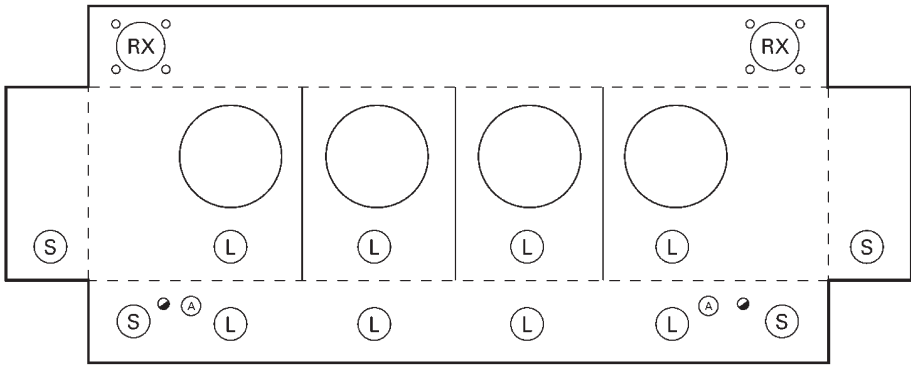


Figure 29

KNOCKOUTS (inches):.	
◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

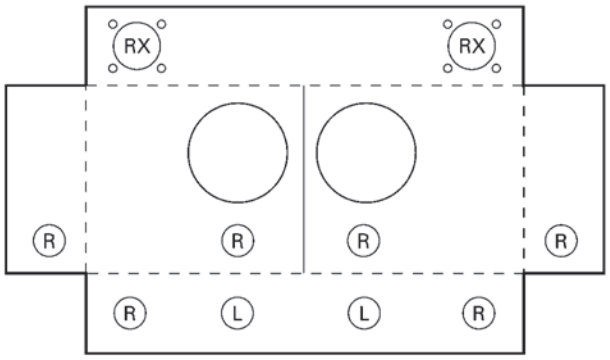


Figure 30

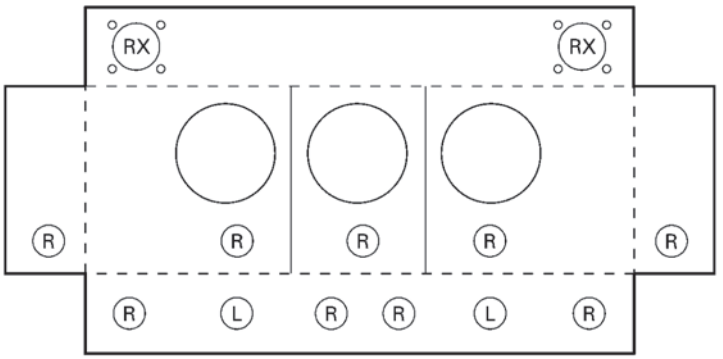


Figure 31

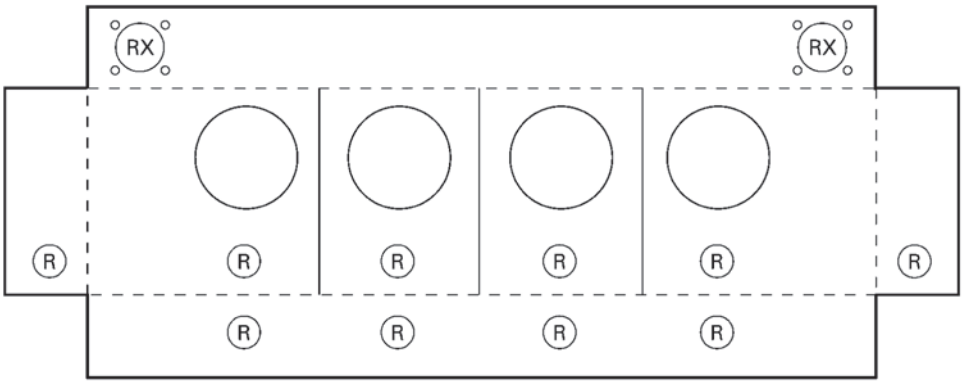


Figure 32

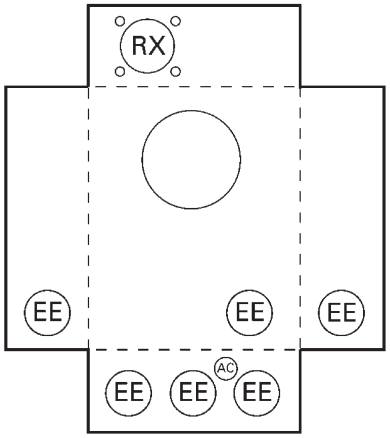


Figure 33

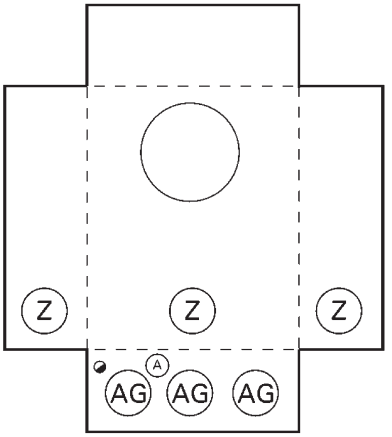


Figure 35

KNOCKOUTS (inches):.	
◑:	1/4
A:	1/2
B:	1/2, 3/4
L:	1/2, 3/4, 1, 1-1/4, 1-1/2
N:	3/4, 1, 1-1/4, 1-1/2, 2
P:	1, 1-1/4
R:	1, 1-1/4, 1-1/2, 2
S:	1, 1-1/4, 1-1/2, 2, 2-1/2
X:	1-1/4, 1-1/2, 2, 2-1/2
Z:	1-1/2, 2, 2-1/2
EE:	2, 2-1/2, 3
GG:	2-1/2, 3, 3-1/2
HH:	2-1/2, 3, 3-1/2, 4
AB:	1/4, 1/2, 7/8
AC:	1/4, 1/2
AD:	1-1/4, 1-1/2, 2, 2-1/2, 3
AE:	1/4, 1/2, 3/4, 1, 1-1/4
AF:	1, 1-1/2, 2, 2-1/2, 3
AG:	3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3
AH:	1/4, 1/2, 3/4
AI:	1, 1-1/4, 1-1/2, 2, 2-1/2, 3
HD:	∅4.281 HUB 0P
RX:	∅2.750 HUB 0P

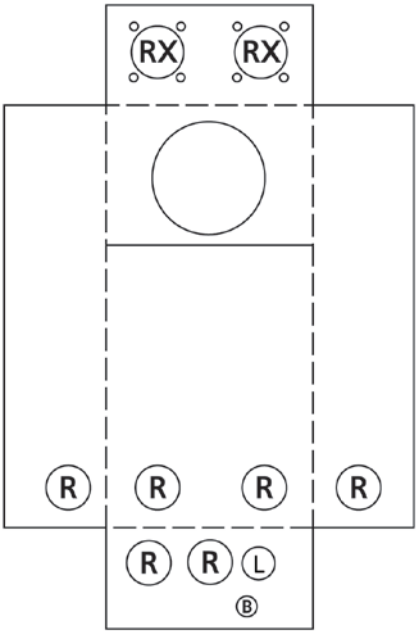


Figure 39

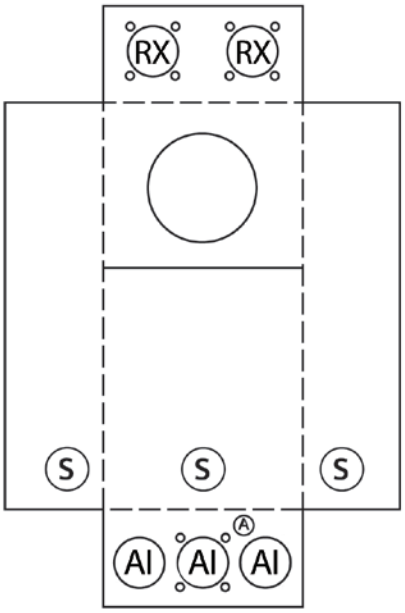


Figure 40

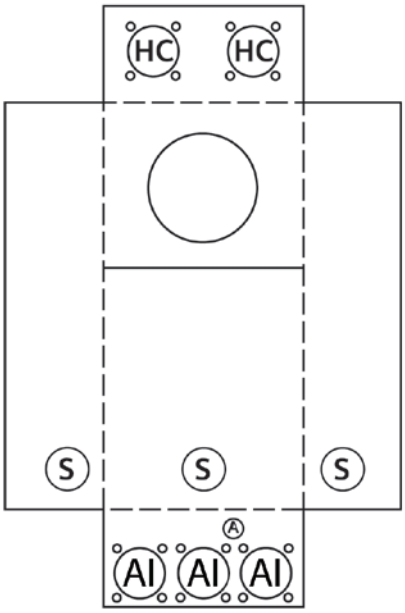


Figure 41

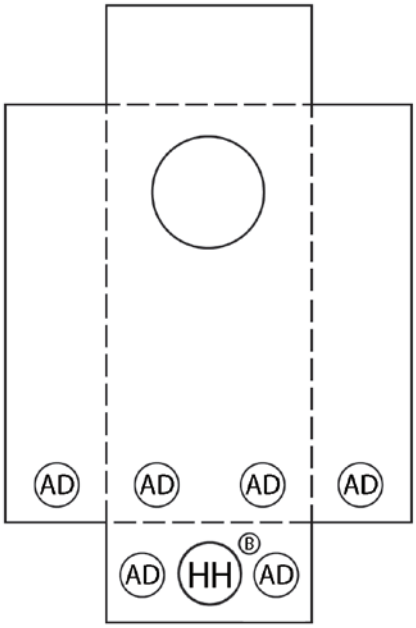


Figure 44

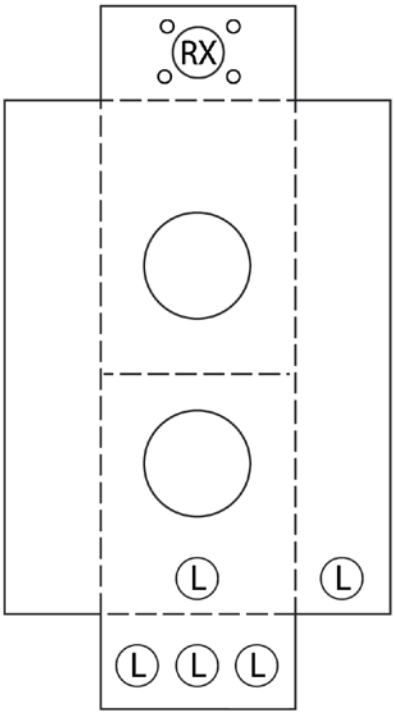


Figure 45

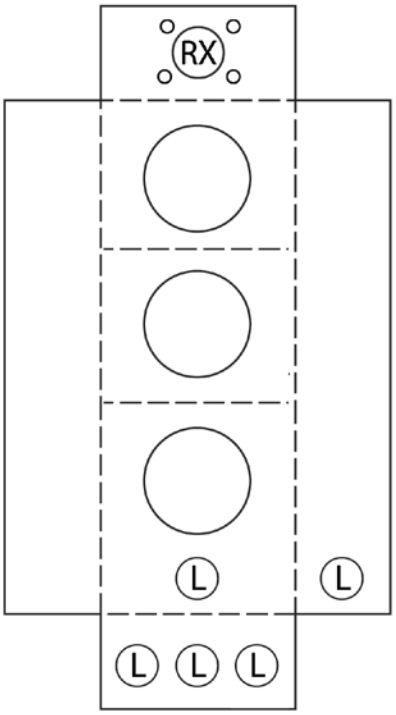
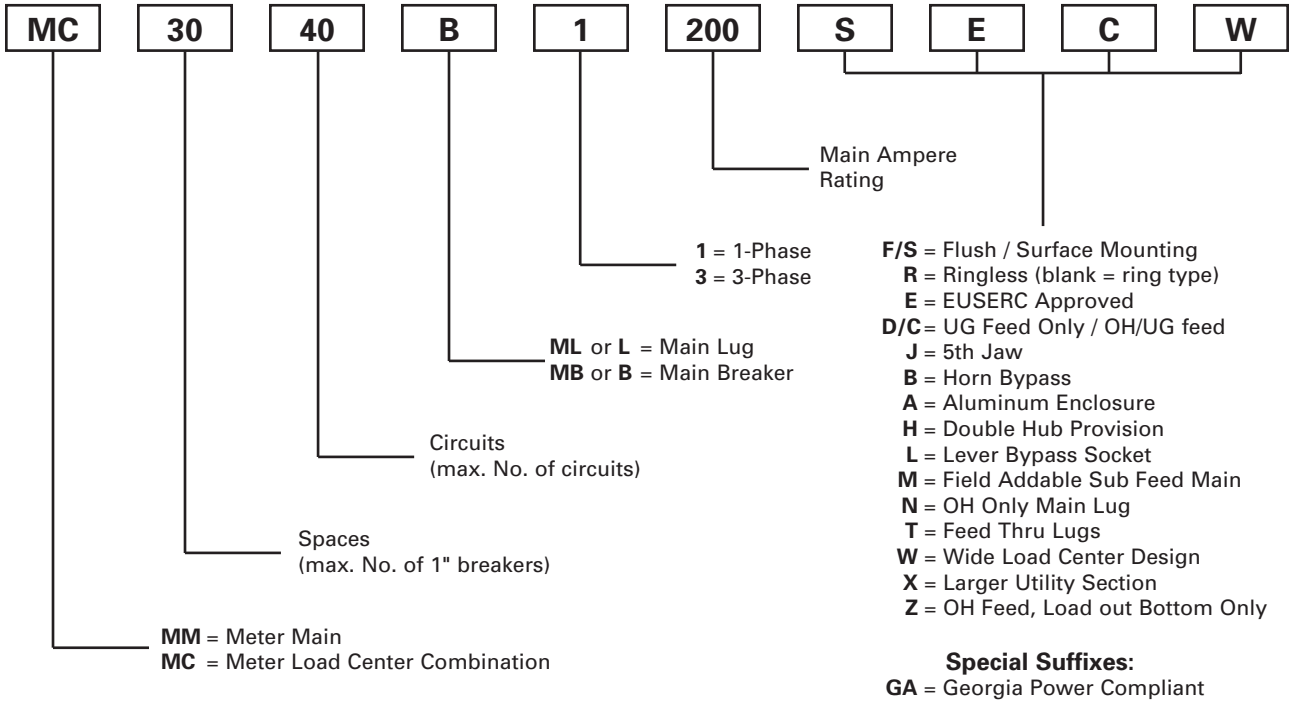


Figure 46

Meter Centers

Meter Combination Catalog Number Logic

Combination Meter Sockets



Special Suffixes:

GA = Georgia Power Compliant
CS = Comb. Feed with Test Block Bypass
DS = UG only Feed with Test Block Bypass
E2 = Back-to-back EUSERC with External Disconnect and Internal Load Center
EY = Commercial Test Block Bypass with OH only Feed
CEY = Commercial Test Block Bypass with OH and UG Feed

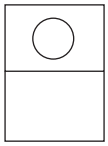
Meter Centers

Meter Combination Introduction

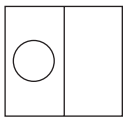
Welcome to the Combination Meter Socket Section. This section includes 4 product categories, which each include their own set of featured products. Look for the icons below to help explain the application and design of products on that page.

Meter Mains

Siemens Meter Mains are UL Listed and available from 100A to 400A services. These Meter Mains utilize a cost effective construction that is preferable in non-EUSERC areas.



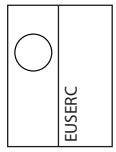
Over-Under Construction
These Siemens Meter Mains feature a classic over-under construction. Available in 100A and 125A versions.



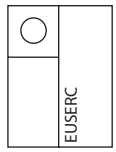
Side-By-Side Construction
These Meter Mains utilize a cost effective side-by-side construction. Meter Mains combine a socket to the left and main circuit breaker section to the right. The main breaker section includes 2 to 6 circuits.

EUSERC Meter Mains

Siemens EUSERC Meter Mains are UL Listed and available from 100A to 400A services. These meter mains utilize designs that meet EUSERC requirements. Two constructions are available.



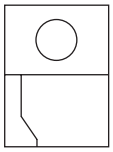
Side-By-Side Construction
These Siemens Meter Mains have a side-by-side construction that is slightly larger in order to meet EUSERC requirements.



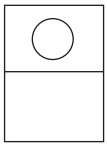
Side-By-Side 400A Construction
These Siemens Meter Mains have side-by-side construction that meets EUSERC design, and provide 400A service.

Meter Load Center Combinations

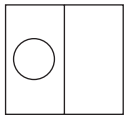
Siemens Meter Load Center Combinations offer several different configurations and include a meter socket section and a load center section. These combos feature a cost effective construction that is preferable in non-EUSERC areas.



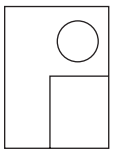
Over-Under Combination Construction
These Siemens Meter Load Center Combinations feature a over-under configuration with a unique trough allowing service from either overhead or underground to the device.



Over-Under Construction
These Siemens Meter Load Center Combinations feature a classic over-under construction, but are for overhead feed only.



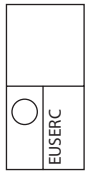
Side-By-Side Construction
These Siemens Meter Load Center Combinations have a side-by-side configuration.



Off-set Meter Constuction
These Siemens Meter Load Center Combinations feature an offset meter to increase room for pulling conductors.

EUSERC Meter Load Center Combinations

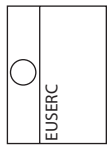
Siemens Meter Load Center Combinations offer several different configurations to meet a variety of installer demands. These Siemens combos feature designs that meet EUSERC requirements.



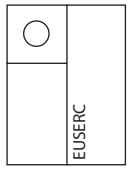
Over-Under Between the Studs Construction
These Combos have a full width load center section above, and a meter socket section below, in a 14.3" wide configuration that allows flush mounting between typical 16" on center stud construction. Surface mounting options available.



Side-By-Side Between the Studs Construction
These combos have a half width load center section to the right and a meter socket section to the left, in a 14.2" wide configuration that allows flush mounting between typical 16" on center stud construction. Surface mounting options available.



Side-By-Side Full Load Center Construction
These Siemens Meter Load Center Combinations have a full width load center section to the right, and a meter socket section to the left. The overall width make this combo best suited for surface mounting.



Side-By-Side 400A Construction
These Siemens Meter Mains have side-by-side construction that meets EUSERC design, and provide 400A service. Available with 16 to 42 circuits.

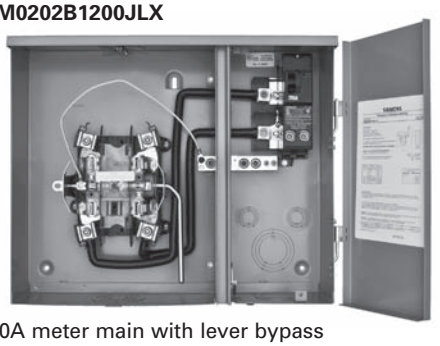
Meter Centers

• Revised •
03/20/12

Surface Mount Meter-Mains, 1-Phase, 3-Wire 120/240V AC

- UL listed
- Pad locking provisions on all devices
- Horn bypass and 5th jaw available as noted
- Side hinged door with one screw removal where shown
- Suitable for use only as service entrance equipment
- 22,000 AIC rated, or as noted
- RX type (or) HD type hub provision on top end wall as noted
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for dimensions and wiring diagrams

MM0202B1200JLX



200A meter main with lever bypass

MM0202B1200RJBX



125, 150, and 200A meter main (factory installed), side hinge door.

MM0406L1200H



200A meter main (field added), side hinge door

MM0202B1200



125 and 200A meter mains, side hinge door

MM0404L1400RLM



400A meter main, side hinge door, provisions for two field installed mains

Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Hub Provision	5th Jaw	Cover Type
Meter-Main Breaker with Field Installed Breaker, Ring Style, 100-125amp													
MM0202ML1100S①	100	OH	None	2	2	18.0	7.4	4.0	QP type	10,000	RX	—	Ring
MM0202ML1125H②	125	OH/UG				17.0	16.0	5.0	QP(H) type	22,000	2-RX	EC5J	Ring
Meter-Main Breaker with Factory Installed Breaker, 125-200amp (Side-by-Side construction)													
MM0202B1150	150	OH/UG	None	2	2	17.0	16.0	5.0	QN2150H	22,000	RX	EMC5J	Ring
MM0202B1150R													Ringless
MM0202B1200	200								QN2200H				Ring
MM0202B1200R													Ringless
MM0202B1125RJB	125	OH/UG	Horn Bypass	2	2	17.0	16.0	5.0	Q2125H	22,000	RX	Installed	Ringless
MM0202B1150RJB	150								QN2150H				Ringless
MM0202B1200RJB	200								QN2200H				Ringless
MM0202B1125RJBX	125						18.5	5.2	Q2125H				Ringless
MM0202B1150RJBX	150								QN2150H				Ringless
MM0202B1200RJBX	200								QN2200H				Ringless
Meter-Main Breaker with Field Installed Main & Subfeed Breaker up to 200amp (Side-by-Side construction)													
MM0406L1200H	200	OH/UG	None	4	6	19.8	17.2	5.0	1-QN or 2-QP type	22,000	2-RX	EMC5J	Ring
MM0406L1200RH													Ringless
MM0406L1200RGA							21.8	5.0					Ringless
MM0406L1200RHJB③			Horn Bypass				17.2	5.0				Installed	Ringless
Meter-Main Breaker with Lever Bypass, Ringless, 200-400amp (Side-by-Side construction)													
MM0202B1200JLX	200	OH/UG	HQ Lever Bypass	2	2	21.1	17.2	5.3	QN2200H	22,000	RX-top, HC-bot	Installed	Ringless
MM0202L1200JLX									200A max Provision				
MM0404L1400RLM	320					29.0	27.0	6.0	(2) QN(R), QN(R)H, QP, QPH		HD	H35815-2	Ringless
MM0404L1400SDL						40.0	30.0	6.5	(2) Provisions for QN or QP type			—	Ringless

① Over/Under ② Side-by-Side ③ Georgia Power approved

Meter Centers

Surface Mount, Over/Under Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

- UL listed
- Overhead and underground feed applications
- Load wires bottom or back exit only
- 22,000 AIC rated, or as noted
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for dimensions and wiring diagrams

MC0606L1200R



200A, main lug, 6 circuit (Twelve 1" spaces), for use with up to six 2-pole breakers

MC0408B1150T



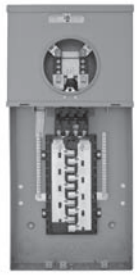
150 or 200A, main breaker, four 1" spaces, feed thru lugs provided

MC1020B1100S



100 or 200A, main breaker, 10 space, 20 circuit, overhead feed

MC2040B1200S



100 or 200A, main breaker, 20 space, 40 circuit, overhead feed

Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Hub Provision	5th Jaw	Cover Type
Meter-Load Center Combination, 150-200amp③													
MC0408B1150T⑤	150	OH/UG	None	4	8	30.0	14.0	5.0	MBK150	22,000	RX	EC5J2	Ring
MC0408B1150RT⑤													Ringless
MC0408B1200T⑤	200								MBK200				Ring
MC0408B1200RT⑤													Ringless
MC0816B1150CT⑤	150	OH/UG	None	8	16	32.0	14.0	5.0	MBK150	22,000	RX	EC5J2	Ring
MC0816B1200CT⑤	200								MBK200				
MC0816B1150RCT⑤	150								MBK150				Ringless
MC0816B1200RCT⑤	200								MBK200				
MC0816B1150RJBT⑤	150		Horn						MBK150		RX-top, HC-bot	Installed	Ringless
MC0816B1200RJBT⑤	200								MBK200				
MC0816B1150T⑤	150	OH	None	8	16	29.0	12.0	5.2	QN2150RH	22,000	RX	EMC5J	Ring
MC0816B1200T⑤	200								QN2200RH				
MC0816B1200RT⑤									QN2200RH				Ringless
MC2040B1150RC	150	OH/UG	None	20	40	36.0	14.0	5.0	MBK150	22,000	RX	EC5J2	Ringless
MC2040B1200RC	200								MBK200				
MC2040B1150RJBC	150		Horn Bypass						MBK150			Installed	
MC2040B1200RJBC	200								MBK200				
MC0606L1200R①②	200	OH/UG	None	12	6	27.0	14.0	5.0	Main Lug	22,000	RX	EC5J2	Ringless
MC0606L1200RA①②④													
MC0606L1200RJB①②			Horn									Installed	
MC0606L1200RN			None			29.0	12.0	5.2				EC5J2	

Over-Under Construction Meter Load Center Combinations⑥⑧

Old Catalog Number	New Catalog Number	Amps Max	No. of Spaces	No. of Circuits	Cover Type	Mounting	Service	Bypass Type	Dimensions H	W	D	Figure
JA1020B1100F	MC1020B1100F	100	10	20	Ring	Flush	OH	none	19.4	12.1	4.4	4
JA1020B1100S	MC1020B1100S					Surface						
—	MC1020B1100FZ⑦					Flush						
—	MC1020B1100SZ⑦					Surface						
JA2040B1200F	MC2040B1200F	200	20	40	Ring	Flush	OH	none	30.5	14.3	5.1	5
JA2040B1200S	MC2040B1200S					Surface					4.4	
—	MC2040B1200FZ⑦					Flush					5.1	
—	MC2040B1200SZ⑦					Surface					4.4	

① No main breaker provided. Accepts QN or QP type 2 or 4-pole breakers.
② Suitable for use as service entrance equipment when not more than six disconnecting means are provided and when not used as a lighting an appliance panel board.
③ Due to wire space restrictions on the trough side, the left side of the interior is limited to a 60A max branch.
④ Aluminum enclosure.
⑤ Feed thru lugs included.
⑥ Dimensional and other technical data is applicable for "New Catalog Numbers" ONLY.
⑦ Horizontal barrier installed—no top exit of load conductors allowed. Check with sales office for utility approved.
⑧ UL Listed for Siemens and Murray breakers.
⑨ Old Catalog Numbers JA1020B1100SP and JA2040B1200SP are obsolete with no replacement.

Meter Centers

• Revised •
01/22/13

Utility Specific, Over/Under Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

- UL listed
- Overhead and underground feed applications
- Load wires bottom or back exit only
- 22,000 AIC rated, or as noted
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for dimensions and wiring diagrams

MC0816B1200RTD



200A offset design with feed thru lugs

Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Hub Provision	5th Jaw	Cover Type
Meter-Load Center Combination, 150-200amp, Sidewire (Underground Feed Only)②													
MC0606L1200RAD③	200	UG	None	6	6	25.0	17.0	5.2	Main Lug	10,000	HC-bot	EC5J2	Ringless
MC0816B1200RTD④			None	8	16	29.0			MBK200	22,000			
Meter-Load Center Combination Approved for Georgia Power, 150-200A													
MC0408B1150RGA④	150	OH/UG	None	4	8	33.5	15.0	5.1	MBK150	22,000	RX-top, HC-bot	EC5J2	Ringless
MC0408B1200RGA④	200								MBK200				
MC0606L1200RGA				12	6	30.5			Main Lug				
MC0816B1150RGA①④	150			8	16	35.5			MBK150				
MC0816B1200RGA④	200								MBK200				

① Suitable for use as service entrance equipment when not more than six disconnecting means are provided and when not used as a lighting an appliance panel board.

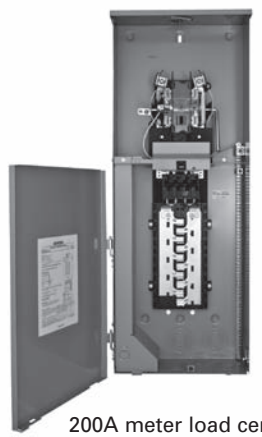
② Due to wire space restrictions on the trough side, the left side of the interior is limited to a 60A max branch.
③ Aluminum enclosure.
④ Feed thru lugs included.

Meter Centers

Lever Bypass, Over/Under Meter-Load Center Combo, 1-Phase, 3-Wire 120/240V AC

- UL listed
- Talon HQ lever bypass (heavy duty)
- 125-200 amp
- Overhead and underground feed applications
- Load wires bottom or back exit only
- 22,000 AIC rated, or as noted
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for dimensions and wiring diagrams
- See page 2-27 for Solar Ready lever bypass
- See page 2-29 for 300-400A lever bypass

MC2040B1200JLC



200A meter load center wtih lever bypass

Meter-Load Center Combination, 125-200amp, Lever Bypass①

Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Hub Provision	5th Jaw	Cover Type
MC0816B1150JLT②	150	OH/UG	HQ Lever Bypass	8	16	32.1	14.3	5.2	MBK150	22,000	RX-top, HC-bot	Installed	Ringless
MC0816B1200JLT②	200								MBK200				
MC1224B1125JLC	125			12	24				MBK125				
MC1224B1200JLC	200								MBK200				
MC2040B1150JLC	150	OH/UG	HQ Lever Bypass	20	40	36.1	14.3	5.2	MBK150				
MC2040B1200JLC	200								MBK200				
MC3042B1200JLC				30	42	42.1							

① Due to wire space restrictions on the trough side, the left side of the interior is limited to a 60A max branch.

② Feed thru lugs included.

Meter Centers

Surface Mount, Side-by-Side Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

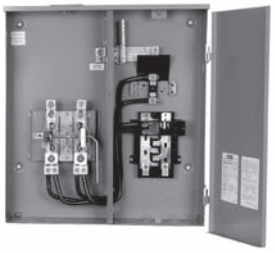
- UL listed
- 22,000 AIC Rated
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket approval prior to installation
- See end of section for dimensions and wiring diagrams

MC0816B1200TH (shown)
MC0816B1XXX(R)TH



200A OH/UG feed, 8 circuit, with feed thru lugs.

MC0816B1400RLTM
MC0816B1350RLTM



One factory installed main, provisions for up to 200A field installed main, 8 circuits, lever bypass.

MC3042B1400SDL



400A meter load center combination, 30 space/ 40 circuit lever bypass

MC2442B1400SDB



400A bolt in K4 socket with 400A main

Catagory Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Hub Provision	5th Jaw	Cover Type
Meter-Load Center Combination, 150-200amp, Full Loadcenter Width													
MC0816B1150TH①	150	OH/UG	None	8	16	21.0	22.9	5.0	QN2150RH	22,000	2-RX	EMC5J	Ring
MC0816B1200TH①	200								QN2200RH				
MC0816B1150RTH①	150								QN2150RH				Ringless
MC0816B1200RTH①	200								QN2200RH				
MC2040B1150	150	OH/UG	None	20	40	18.0	22.9	5.0	QN2150RH	22,000	RX	EMC5J	Ring
MC2040B1200	200								QN2200RH				
MC2040B1150R	150								QN2150RH				Ringless
MC2040B1200R	200								QN2200RH				
Meter-Load Center Combination, 350-400amp, Lever Bypass													
MC0408B1400RLTM①	320	OH/UG	HQ Lever By-pass	4	8	29.0	27.0	6.0	QN2200H	22,000	HD	H35815-2	Ringless
MC0816B1350RLTM①				8	16				QN2150H				
MC0816B1400RLTM①				8	16				QN2200H				
Meter-Load Center Combination, 400amp, Lever Bypass, Underground Feed Only													
MC0816B1400SDL	320	UG	HQ Lever By-pass	8	16	39.7	30.2	6.4	(1) QN & Provisions for (1)QN or (1)QP	22,000	HD	H35815-2	Ringless
MC3042B1400SDL				30	42								
Meter-Load Center Combination, 400amp, *K4 Bolt-In Meter Socket*, Underground Feed Only													
MC2442B1400SDB	400②	UG	Bolt In K4 No By-pass	24	42	39.7	30.2	6.4	Factory JXD6	22,000	HD	—	Ringless
MC3042B1400SDB				30	42				Factory QN2200RH Field QP(H), QNR(H)			—	

① Feed thru lugs included.

② Bolt-in meter socket. This device should not be confused with class 320amp lever bypass devices. Device can not be converted to lever bypass. Installer should ensure device approval prior to installation.

Meter Centers

• Revised •
01/22/13

EUSERC Compliant Side-by-Side Meter-Main Breaker, 1-Phase, 3-Wire 120/240V AC

- UL listed
- Designed to meet EUSERC standards
- Underground Feed Applications (some with OH provisions)
- Load wiring may exit top or bottom
- 22,000 AIC Rated
- Pad locking provisions on all devices
- Surface and semi-flush units available
- Side hinge door removable by backing out only one screw
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket approval prior to installation
- See end of section for dimensions and wiring diagrams

MM0202B1100ESC



100A factory installed main breaker

MM0202B1200ESC



200A factory installed main breaker

MM0404L1400SC



400A with provisions for up to (2) 200A disconnects

MM0404L1400SCS



400A with provisions for up to (2) 200A disconnects with bypass

EUSERC Compliant Meter-Main Breaker, Factory and Field Options listed, 125-200amp③④

Old Cat Number	New Cat Number	Utility Incoming	By-pass Type	No. of Spaces	No. of Circuits	Dimensions H	W	D	Main Breaker	Short Circuit Rating	Mounting	Hub Provisions	5th Jaw	Cover Type
MM0406L1125FEC	MM0202L1125EFC①②	OH/UG	none	2	2	23.6	14.5	5	—	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MM0406L1125SEC	MM0202L1125ESC①										Surface			
MM0406L1200FEC	MM0202L1200EFC①	OH/UG	none	2	2	28.6	14.5	7	—	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MM0406L1200SEC	MM0202L1200ESC①							5			Surface			
N/A	MM0202B1100ESC	OH/UG	none	2	2	23.6	14.5	5	Q2100H	22,000	Surface	RX (top) / HC (bot)	EMC5J	Ring
N/A	MM0202B1200ESC								QN2200H					

Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimensions (inches) H	W	D	Main Breaker	Short Circuit Rating	Mounting	Hub Provision	5th Jaw	Cover Type

EUSERC Compliant Meter-Main Breaker, Field Installed Main Main Breakers, 400amp max.①

MM0404L1400SC	320	OH/UG	None	4	2	39.7	33.2	6.4	(2) Field QP(H), QNR(H)	22,000	Surface	HD (top) HC (bot)	—	Ring
MM0404L1400FD		UG		4	2	39.7	30.2	7.4			Flush	None (top)/ HC (bot)	—	

EUSERC Compliant Meter-Main Breaker, with Test Block Bypass & Field Installed Main Main Breakers, 400amp max.①

MM0404L1400SCS	320	OH/UG	Test Block	4	2	39.7	33.2	6.4	(2) Field QP(H), QNR(H)	22,000	Surface	HD (top) HC (bot)	—	Ring
MM0404L1400FDS		UG		4	2	39.7	30.2	7.4			Flush	None (top)/ HC (bot)	—	

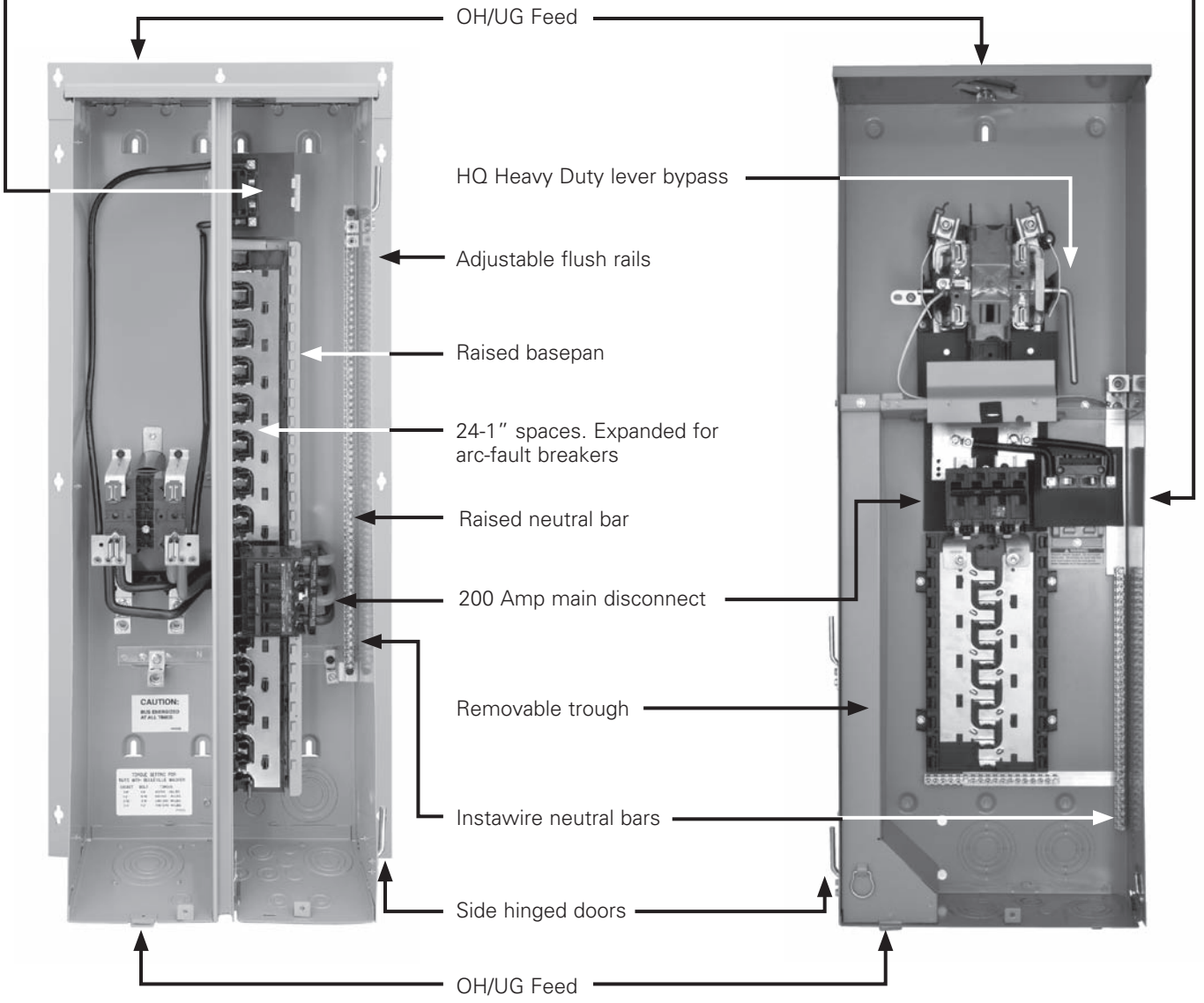
① Main breaker not included.
② Flush adjustable for 2x4 walls only.
③ Dimensional and other technical data is applicable for "New Catalog Numbers" ONLY.
④ UL Listed for Siemens and Murray breakers.

Meter Centers

SOLAR Ready, Meter-Load Center Combination Overview

Wide Variety of meter socket configurations are available.
Lever Bypass and EUSERC configurations shown.

- 60 amp maximum input
- Dedicated alternative energy input
- Power feeds ahead of service disconnect on load side of meter socket
- Eliminates need to de-rate main breaker/bussing

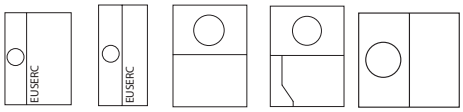


MC2442S1200FC
EUSERC

MC2040S1200JLC
Lever Bypass

Meter Centers

• Revised •
07/06/12



SOLAR Ready, Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

- UL listed
- For overhead and underground feed applications
- 22,000 AIC Rated
- Pad locking provisions on all devices
- Surface and semi-flush units available - semi flush rails are depth adjustable for 2x6 studs
- Side hinge door removable by backing out only one screw
- Load wiring may exit top or bottom
- Suitable for use only as service entrance equipment
- Ring and Ringless type meter covers
- Contact local utility to confirm meter socket approval prior to installation
- See end of section for dimensions and wiring diagrams
- Devices accept Siemens & Murray circuit breakers

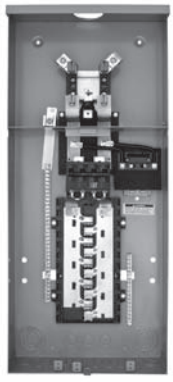
MC3040S1200SC
MC4040S1200SC



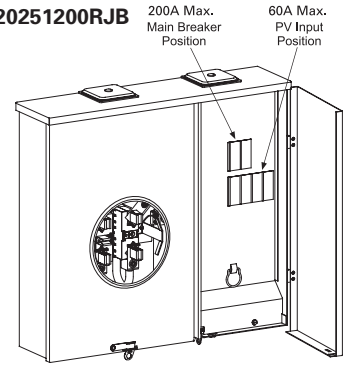
MC0816S1200SCT



MC2040S1200SZ



MM020251200H
MM020251200RHJ
MM020251200RJB



Catalog Number	Amp Rating (Cont.)	Aux.Input Max./ Breaker Type	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Hub Provision	5th Jaw	Cover Type
EUSERC Compliant Meter-Load Center Combination, 200amp with Alternate Energy Input & Full Load Center Width (Side-by-Side Construction)														
MC3040S1200SC	200	60A / QP(H) MP-(H)T	OH/UG	None	30	40	35.7	21.0	5.1	QN2200RH	22,000	RX-top, HC-bot	EMC5J	Ring
MC4040S1200SC					40	40								
EUSERC Compliant Meter-Load Center Combination, 200amp with Alternate Energy Input, Between Studs Width (Side-by-Side Construction)														
MC0816S1200SCT②	200	60A / QP(H) MP-(H)T	OH/UG	None	8	16	40.7	14.5	7.1	MBK200	22,000	RX-top, HC-bot	EMC5J	Ring
MC2442S1200SC					24	42	40.7	14.5	7.1					
MC2442S1200FC①														
Meter-Load Center Combination, 200amp with Alternate Energy Input, Overhead Feed Only (Over/Under Construction)														
MC2040S1200SZ	200	60A / QP(H) MP-(H)T	OH	None	20	40	32.7	14.4	4.3	MBK200	22,000	RX	EC659-0121	Ring
Meter-Load Center Combination, 200amp, Lever Bypass with Alternate Energy Input (Over/Under Construction)														
MC2040S1200JLC	200	60A / QP(H) MP-(H)T	OH/UG	HQ Lever Bypass	20	40	40.1	14.4	5.2	MBK200	22,000	RX-top, HC-bot	Installed	Ring-less
Mains Mains – Non-EURSERC, 200amp with Alternate Energy Input (60A max) and Ring Type Cover (Side-by-Side Construction)														
MM0202S1200H	200	QP, QPH & others	OH/UG	None	2	2	19.7	21.3	5.2	QN, QP & others	22,000	RX-top, HC-bot	EMC5J	Ring
Mains Mains – Non-EURSERC, 200amp with Alternate Energy Input (60A max) and Ringless Type Cover (Side-by-Side Construction)														
MM0202S1200RHJ	200	QP, QPH & others	OH/UG	None	2	2	19.7	21.3	5.2	QN, QP & others	22,000	RX-top, HC-bot	EMC5J	Ring-less
MM0202S1200RJB				Horn										

① Semi flush device.

② Feed thru lugs included.

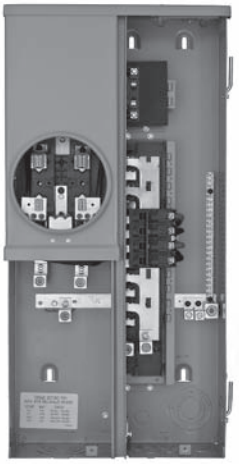
Meter Centers

• Revised •
01/22/13

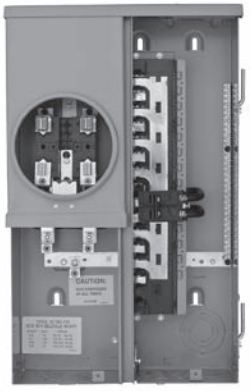
EUSERC Compliant Side-by-Side Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

- UL Listed
- 100A-225A Continuous Rating as noted
- Load center options include 8 space panel with feed through lugs and 12, 16, 24, 30 and 40 space panels
- 22,000 AIC Rated
- 5th Jaw available as noted
- Factory installed semi flush mount option
- Suitable for use only as service entrance equipment
- Raised interior for ease of wiring
- Raised neutral for ease of wiring
- Convertable OH/UG
- Contact local utility to confirm meter socket acceptance prior to installation
- See end of section for knock out diagrams and wiring schematics
- See page 2-27 for Solar Ready options

MC0816B1200ESN



MC1224B1125ESC



EUSERC Compliant Meter-Load Center Combination, 100-125amp②④⑥⑧

Old Cat Number	New Cat Number	Utility Incoming	By-pass Type	No. of Spaces	No. of Circuits	Dimensions H	W	D	Main Breaker	Short Circuit Rating	Mounting	Hub Provisions	5th Jaw	Cover Type
MC1224B1100FEC	MC1224B1100EFC	OH/UG	none	12	24	23.6	14.5	5	Q2100H	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MC1224B1100SEC	MC1224B1100ESC										Surface			
MC1224B1125FEC	MC1224B1125EFC	OH/UG	none	12	24	23.6	14.5	5	Q2125H	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MC1224B1125SEC	MC1224B1125ESC										Surface			

EUSERC Compliant Meter-Load Center Combination, 200-225amp②⑥⑦⑧

MC2442B1200FEC	MC2040B1200EFC⑤	OH/UG	none	20	40	31	14.5	7	EQ9985	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MC2442B1200SEC	MC2040B1200ESC							5			Surface	RX (top) / HC (bot)		
MC2442B1225FEC	MC2442B1225EFC⑤	OH/UG	none	24	42	35	14.5	7	EQ9986	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MC2442B1225SEC	MC2442B1225ESC							5			Surface	RX (top) / HC (bot)		

EUSERC Compliant Meter-Load Center Combination, 200 amp with 50amp Subfeed Provision⑥⑧

MC0816B1200FCTM	MC0816B1200EFN⑤	OH/UG	none	8	16	29.75	14.5	7	EQ9985	22,000	Flush	RX (top) / HC (bot)	EMC5J	Ring
MC0816B1200SCTM	MC0816B1200ESN							5			Surface			
MC0816B1200SCT	MC0816B1200EST①										Surface			

EUSERC Compliant Meter-Load Center Combination, 200amp, Full Load Center Width③

Catalog Number	Utility Incoming	By-pass Type	No. of Spaces	No. of Circuits	Dimensions H	W	D	Main Breaker	Short Circuit Rating	Mounting	Hub Provisions	5th Jaw	Cover Type
MC3040B1200SECW	OH/UG	none	30	40	32.3	21.0	5.2	QN2200RH	22,000	Surface	RX (top)/ HC (bot)	EMC5J	Ring
MC4040B1200SECW			40	40	32.3	21.0	5.2						

① Feed thru lugs included.
② Devices are EUSERC compliant for field modification from factory UG to OH feed.
③ Flush rail kits available.
④ Flush rails adjustable for 2x4 walls only.
⑤ Flush rails adjustable for up to 2x6 walls.
⑥ Dimensional and other technical data is applicable for "New Catalog Numbers" ONLY.
⑦ Old Catalog Numbers MC1632B1100FEC, MC1632B1100SEC, MC1632B1125FEC and MC0816B1200FCT are obsolete with no replacement.
⑧ UL Listed for Siemens and Murray breakers.

Meter Centers

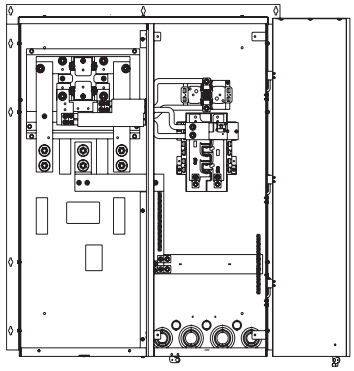
EUSERC Compliant Side-by-Side Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

- UL Listed
- 400A Max, 320A Continuous
- Meter socket options include 320A (400A max), non-bypass and test block bypass
- Load center options include 8 space panel and 24-30 space panels
- 22,000 AIC Rated
- Factory installed flush mount option
- Surface mount devices accept field added flush rails
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket acceptance prior to installation
- See end of section for knock out diagrams and wiring schematics

MC3042B1400SC



MC0816B1400FD



Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimentions (inches) H	W	D	Main Breaker	Short Circuit Rating	Mounting	Hub Provision	5th Jaw	Cover Type
EUSERC Compliant Meter-Load Center Combination, 400amp max. with 200amp Subfeed Provision②														
MC0816B1400SC①	320	OH/UG	None	8	16	39.7	33.2	6.4	Factory installed QN2200RH & Field Installed secondary QP(H) or QNR(H)	22,000	Surface	HD (top) HC (bot)	—	Ring
MC0816B1400FD①		UG					30.2	7.4			Flush	HC (bot)	—	
MC3042B1400SC	320	OH/UG	None	30	42	39.7	33.2	6.4		22,000	Surface	HD (top) HC (bot)	—	
MC3042B1400SD		UG					30.2	6.4					—	
MC3042B1400FD							30.2	7.4			Flush	HC (bot)	—	
EUSERC Compliant Meter-Load Center Combination, 400amp max. with 400amp Main Breaker②														
MC2442B1400SD	320	UG	None	24	42	39.7	30.2	6.4	Factory JXD6	22,000	Surface	HD (top) HC (bot)	—	Ring
EUSERC Compliant Meter-Load Center Combination with Test Block Bypass, 400amp max. with 200amp Subfeed Provision②														
MC0816B1400SCS①	320	OH/UG	Test Block	8	16	39.7	33.2	6.4	Factory installed QN2200RH & Field Installed secondary QP(H) or QNR(H)	22,000	Surface	HD (top) HC (bot)	—	Ring
MC0816B1400FDS①		UG					30.2	7.4			Flush	HC (bot)	—	
MC3042B1400SCS	320	OH/UG	Test Block	30	42	39.7	33.2	6.4		22,000	Surface	HD (top) HC (bot)	—	
MC3042B1400SDS		UG					30.2	6.4					—	
MC3042B1400FDS							30.2	7.4			Flush	HC (bot)	—	

① Feed thru lugs included.
② Line side lugs not included.

Meter Combinations

EUSERC Compliant Over/Under Meter-Load Center Combination, 1-Phase, 3-Wire 120/240V AC

General

- UL Listed
- Back to Back design – Meter section faces outdoor, load center faces indoor
- 22,000 AIC rated
- Suitable for use only as service entrance equipment
- See end of section for dimensions and wiring diagrams

Meter Section

- Designed to meet EUSERC standards
- Flush mounting enclosure, adjustable for 2x4 or 2x6 stud applications
- Underground feed applications only
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Contact local utility to confirm meter socket approval prior to installation

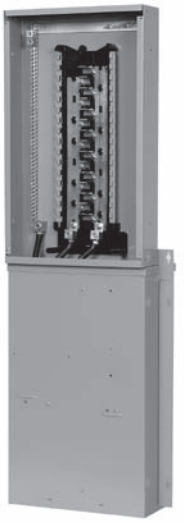
MC1212L1200SED



MC3042B1200FED
MC3042B1225FED



MC3042B1250FE2



Load Center View

MC3042B1250FE2



Meter Main View

Catalog Number	Amp Rating (Cont.)	Utility Incoming	Bypass Type	No. of Spaces	No. of Circuits	Dimensions (inches) H	W	D	Main Breaker	Short Circuit Rating	Mounting	Hub Provision	5th Jaw	Cover Type
EUSERC Compliant Meter-Load Center Combination, 200-225amp (Over/Under Construction)④														
MC1212L1200SED①②	200	UG	None	12	12	38.4	14.4	7.4	NA	22,000	Surface	RX (top) HC (bot)	EMC5J	Ring
MC1212L1200FED①②											Flush	HC (bot)		
MC2040B1200SED	200	UG	None	20	40	41.9	14.4	7.4	MBK200A		Surface	RX (top) HC (bot)		
MC2040B1200FED											Flush	HC (bot)		
MC3042B1200SED	200	UG	None	30	42	48.4	14.4	7.4	MBK200A		Surface	RX (top) HC (bot)		
MC3042B1200FED											Flush	HC (bot)		
MC3042B1225SED	225								MBK225A		Surface	RX (top) HC (bot)		
MC3042B1225FED											Flush	HC (bot)		
EUSERC Compliant Meter-Load Center Combination with Interior Load Center, 250amp (Back-to-Back Construction)③⑤														
MC2442B1250FE2	200	UG	None	24	42	47.4	14.4	7.8	QNH	22,000	Flush	HC	—	Ring
MC3042B1250FE2				30									—	

① No main breaker provided. Accept QN or QP type 2 or 4-pole breakers.

② Suitable for use as service entrance equipment when not more than six disconnecting means are provided and when not used as a lighting an appliance panel board.

③ Load wires exit top only.
④ Load wires exit top or back.
⑤ Provisions for up to 50A secondary main breaker.

EUSERC Commercial Metering

Commercial Type BY Meter-Main Combinations



Design/Performance Features

- Outdoor/Indoor—one design for either installation.
- Ring Type—meets requirements for various ring type locking provisions.
- Test Block Bypass Installed—easy servicing without interruption.
- Main Breaker Field Installed—adaptable to the job.
- Main T-Fuse puller factory installed (less fuses)—adaptable to the job.
- Contact local utility to confirm meter socket approval prior to installation

Industry Specifications

- EUSERC – SEC #300
- 240V rated
- 100A and 200A models
- Up to 100,000 AIC when using fuses

Ring Type Commercial Meter-Disconnect Combinations with Test Block Bypass

240V AC Max								Dimensions (inches)					
Amps Cont. Duty	Max AIC	Tenant Main①	CB or Fuse Provision	Service	Jaws	Catalog Number	Service Feed	Height	Width	Depth	KO Fig.	Wire Range AL/CU	Hub Provision
100	65,000	Circuit Breaker Provision	QP/ QPH/ HQP	1Phase-3 Wire	4	**MM0202L1100EY**	OH	37.0	12.5	4.9	BY-1	#6-2/0	RX
				3 Phase-4 Wire	7	**MM0303L3100EY**	OH	37.0	12.5	4.9	BY-1	#6-2/0	
	100,000	T-Fuse Puller	Class T 300V	1 Phase-3 Wire	4	**MM0202F1100EY**	OH	37.0	12.5	4.9	BY-1	#6-2/0	RX
						MM0202F1100CEY	OH/UG	24.0	20.2	4.9	BY-3	#6-2/0	
				3Phase-4 Wire	7	**MM0303F3100EY**	OH	37.0	12.5	4.9	BY-1	#6-2/0	
						MM0303F3100CEY	OH/UG	24.0	20.2	4.9	BY-3	#6-2/0	
200	35,000	Circuit Breaker Provision	QJ2/ QJH2/ QJ2H/ HQJ2H	1 Phase-3 Wire	4	**MM0202L1200EY**	OH	45.0	14.3	6.4	BY-2	#1/0-250 kcmil	HC
						MM0202L1200CEY	OH/UG	30.0	24.3	6.4	BY-4	#1/0-250 kcmil	
				3 Phase-4 Wire	7	**MM0303L3200EY**	OH	45.0	14.3	6.4	BY-2	#1/0-250 kcmil	
						MM0303L3200CEY	OH/UG	30.0	24.3	6.4	BY-4	#1/0-250 kcmil	
	100,000	T-Fuse Puller	Class T 300V	1 Phase-3 Wire	4	**MM0202F1200EY**	OH	45.0	14.3	6.4	BY-2	#1/0-250 kcmil	HC
						MM0202F1200CEY	OH/UG	30.0	24.3	6.4	BY-4	#1/0-250 kcmil	
				3 Phase-4 Wire	7	**MM0303F3200EY**	OH	45.0	14.3	6.4	BY-2	#1/0-250 kcmil	
						MM0303F3200CEY	OH/UG	30.0	24.3	6.4	BY-4	#1/0-250 kcmil	

① Breaker/fuses not included.

EUSERC Commercial Metering

Commercial Type BY Meter-Load Center Combinations

MC1224B1100CEY



MC2442F3200CEY



Design/Performance Features

- Outdoor/Indoor—one design for either installation.
- Ring Type—meets requirements for various ring type locking provisions.
- Test Block Bypass Installed—easy servicing without interruption.
- Main Breakers Factory Installed.
- Main T-Fuse Pullers Factory Installed (less fuses).
- Compact wall-hung design reduces material and labor costs.
- 240V rated
- 100A and 200A models
- Contact local utility to confirm meter socket approval prior to installation

Ring Type Commercial Meter-Load Center Combinations with Test Block Bypass

240 V AC Max.													
Amps Cont. Duty	Main Type	No. of Spaces	Max. Circuits	Service	Catalog Number	AIC Rating STD. AIC	AIC Rating MAX AIC	Dimensions (inches)① Height	Dimensions (inches)① Width	Dimensions (inches)① Depth	Hub Prov.	Wire Range AL/CU	KO Fig.
1 Phase—3 Wire, 4 Jaws, Factory Installed Main Breaker①													
100	Q2100 installed	10	20	OH	**MC1020B1100EY②**	10,000	65,000	36.0	12.5	4.9	RX	#6-2/0	BY-7
		12	24	OH/UG	**MC1224B1100CEY②**	10,000	42,000	24.0	20.2	4.9	RX	#6-2/0	BY-8
200	QN2200RH installed	24	40	OH/UG	**MC2440B1200CEY②**	10,000	22,000	30.0	25.8	6.4	HC	#1/0-250 kcmil	BY-9
3 Phase—4 Wire, 7 Jaws, Factory Installed T-Fuse Puller③													
100	Class T 300V Provision	18	30	OH/UG	**MC1830F3100CEY**	100,000	100,000	26.0	24.3	4.9	RX	#6-2/0	BY-10
200		24	42	OHUG	**MC2442F3200CEY**	100,000	100,000	42.0	27.3	6.4	HC	#1/0-250 kcmil	BY-9

BY Combo Accessories

Description	Catalog Number
Hubs	
Conduit Size	
1"	**EC38596**
1¼"	**EC38597**
1½"	**EC38598**
2"	**EC38599**
2"	**ECHC200**
2½"	**EC38600**
2½"	**ECHC250**
3"	**ECHC300**
Closure Plates	**EC38595** **ECHC000**
Adapter Plates Bottom Only	**ECHCRXA**

Description	Catalog Number
Fifth Jaw	
100A	**UX001WL**
200A	**UX005B**

① See accessories above for available 5th jaws.
② UL Listed to field change main breaker to higher AIC.
③ Fuses not included.

RX Type Hub



EC5J





SRSTD

HS Type Hub



EMC5J





SRSW

Interchangeable Hubs

Conduit Size (Inches) Lbs.	Catalog Number
RX Type Hubs	
¾	**EC38594**
1	**EC38596**
1¼	**EC38597**
1½	**EC38598**
2	**EC38599**
2½	**EC38600**
HD Type Hubs	
2	**EC56854**
2½	**EC56855**
3	**EC56856**
3½	**EC56857**
4	**EC56858**
HC Type Hubs	
2	**ECHC200**
2½	**ECHC250**
3	**ECHC300**
Accessories and Closure Plates	
Adapter Plate	**ECHCRXA** **EC9747-1113** (HD to RX)
Closure Plates	**ECHC000** **EC38595** (RX Type) **EC56933S** (HD Type)

Sealing Rings

Description	Catalog Number
Snap-on type, aluminum	**SRSTD**
Screw type, aluminum	**SRSW**

Grounding Bars (Al/Cu — except where noted)

Grounding bars are for use where grounding of electrical outlets and devices is by means of conductors. Each bar is equipped with large connectors rated for one #14-1/0 or, two or three #14-10 Cu/Al and small connectors rated for one #14-6 or, two #14-12 Cu/Al. (May be restricted by wire bending space.)

	Number of Connectors			
Length	Total	Large	Small	Catalog Number
1⅝	4	0	4	**ECLX068M**
2⁵⁄₁₆	7	2	5	**ECLX069M**
3½	11	3	8	**ECLX071M**
4⅝	15	4	11	**ECLX072M**
5¾	19	5	14	**ECLX073M**
7	23	6	17	**ECLX074M**
8⅛	27	7	20	**ECLX075M**

Miscellaneous Accessories

Description	Catalog Number
Plastic Meter Opening Cover	**ECPP**
Plastic Meter Cover Ringless	**ECCP3**
NEMA Stud Mechanical Lugs①	
(2) #6-350 kcmil	**UK350TA**
(1) #2-600 kcmil Al/Cu	**UK600TA**
(2) #500-1000 kcmil Al/Cu	**UK1000TA**
5th Jaws②	**EC5J** **EC5J2** **EC659-0121** **EMC5J** **H35815-2**
Neutral Feeder Lugs	
#2-1/0	**ECLK1-2**
#4-2/0	**ECLK2**
#1-350 kcmil	**ECLK3**

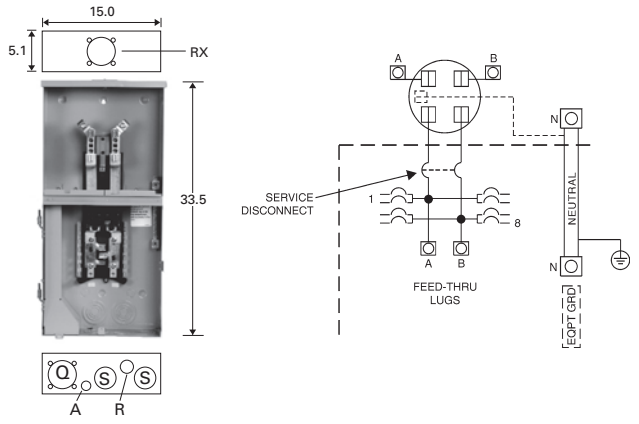
① Order one for each phase and neutral. For use on EUSERC 400A combinations.

② See individual product pages for 5th jaw selection.

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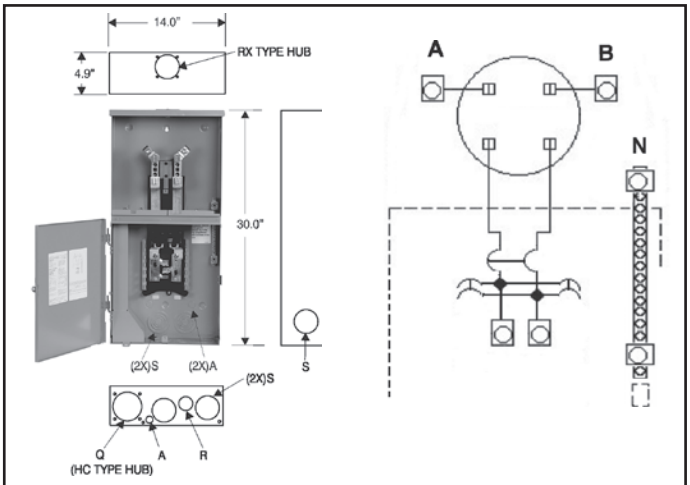
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



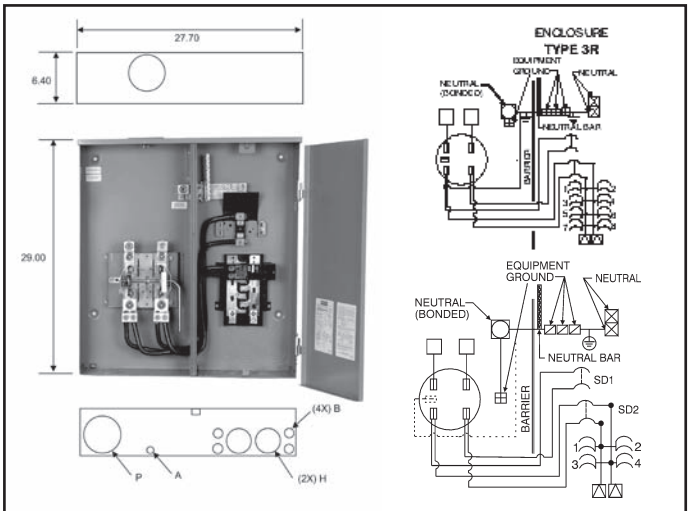
MC0408B1150RGA / MC0408B1200RGA

■ Product tables for above on page 2-24



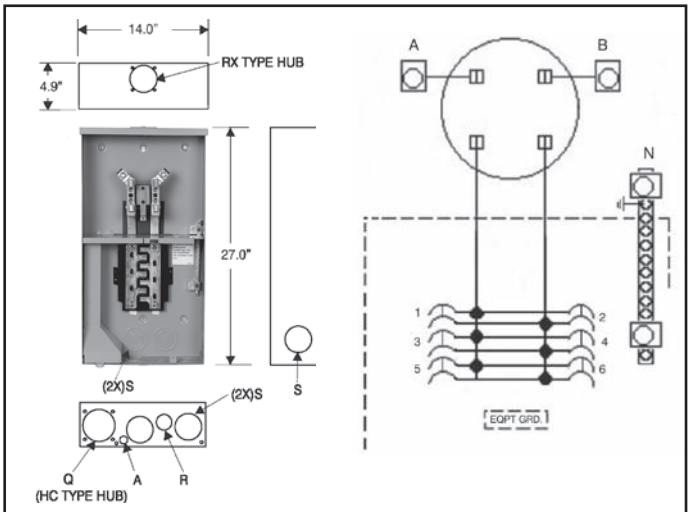
MC0408B1150T / MC0408B1200T / MC0408B1150RT / MC0408B1200RT

■ Product tables for above on pages 2-23 and 3-28



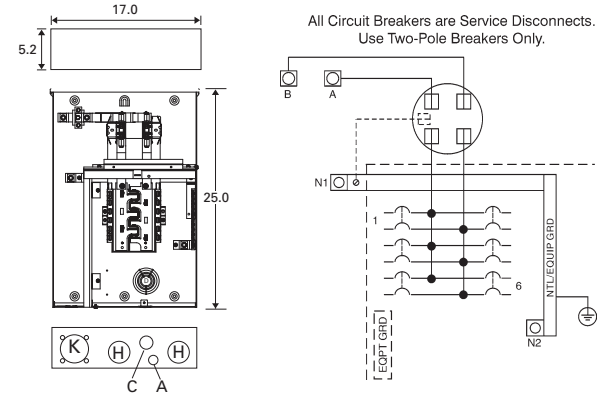
MC0408B1400RLTM / MC0816B1350RLTM / MC0816B1400RLTM

■ Product tables for above on pages 2-26 and 3-29



MC0606L1200R / MC0606L1200RA / MC0606L1200RJB

■ Product tables for above on pages 2-23 and 3-28



MC0606L1200RAD

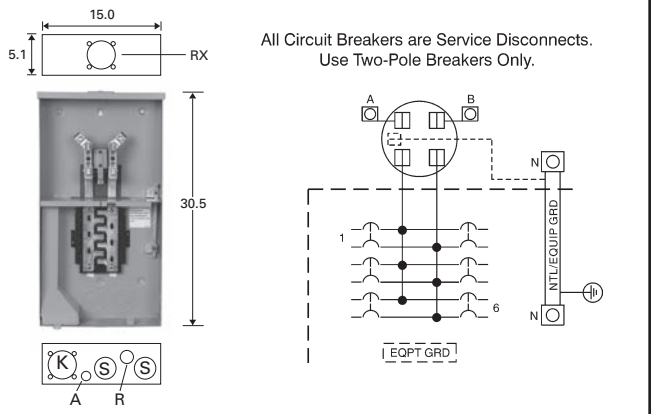
■ Product tables for above on page 2-24

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

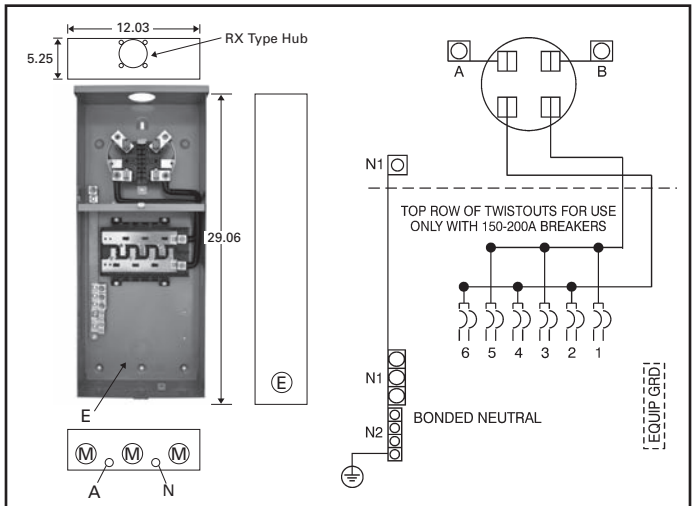
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



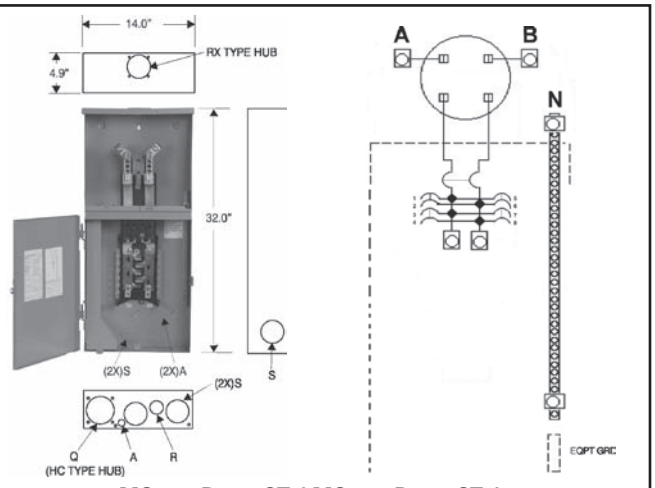
MC0606L1200RGA

■ Product tables for above on page 2-24



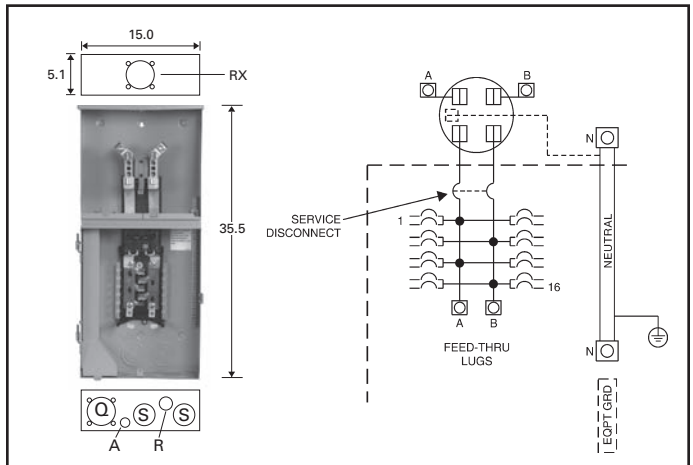
MC0606L1200RN

■ Product tables for above on page 2-23



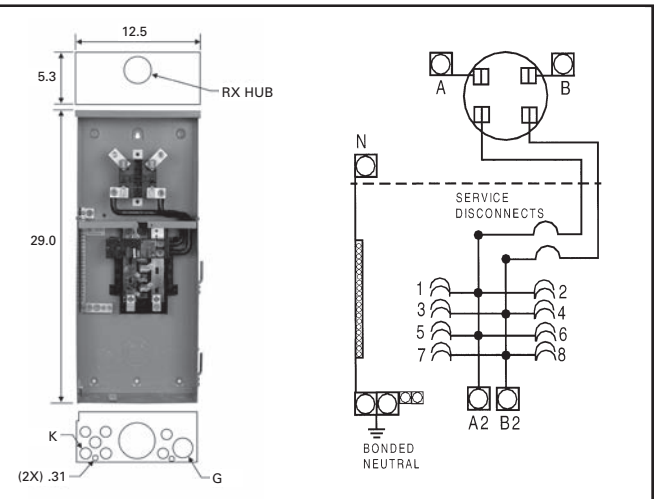
MC0816B1150CT / MC0816B1200CT /
MC0816B1150RCT / MC0816B1200RCT

■ Product tables for above on pages 2-23 and 3-28



MC0816B1150RGA / MC0816B1200RGA

■ Product tables for above on page 2-24



MC0816B1150T / MC0816B1200T / MC0816B1200RT

■ Product tables for above on pages 2-23 and 3-29

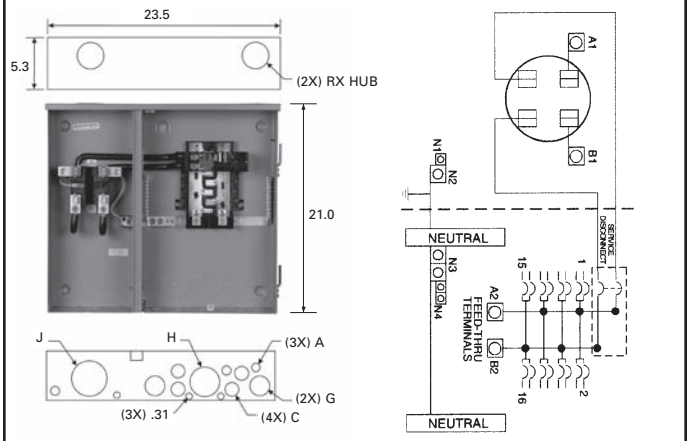
Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

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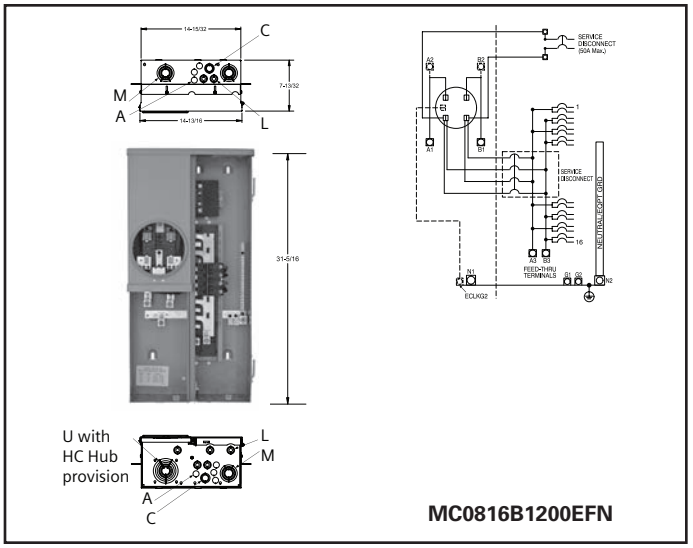
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



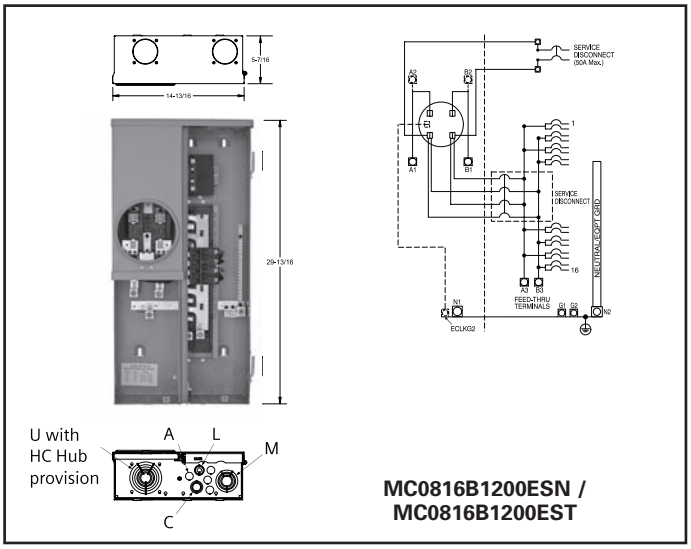
MC0816B1150TH / MC0816B1200TH / MC0816B1150RTH / MC0816B1200RTH

■ Product tables for above on pages 2-26 and 3-29



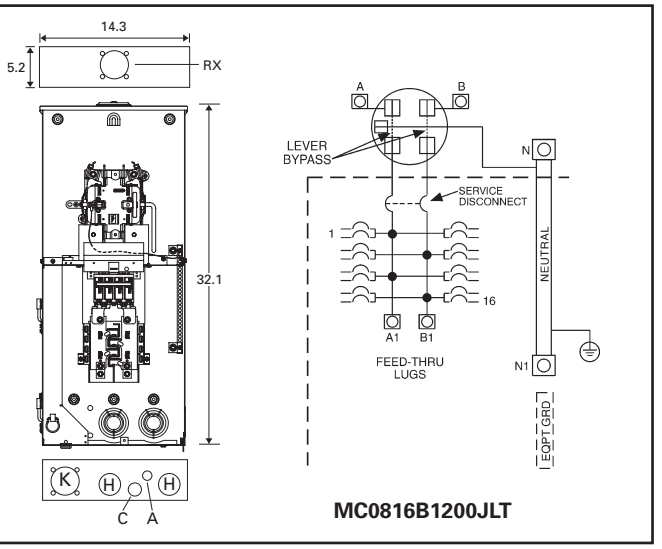
MC0816B1200EFN

■ Product tables for above on pages 2-30 and 2-109



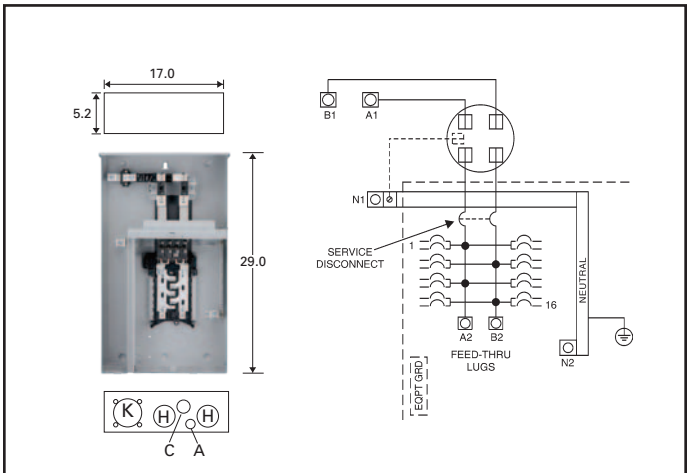
MC0816B1200ESN / MC0816B1200EST

■ Product tables for above on pages 2-30 and 2-109



MC0816B1200JLT

■ Product tables for above on page 2-25



MC0816B1200RTD

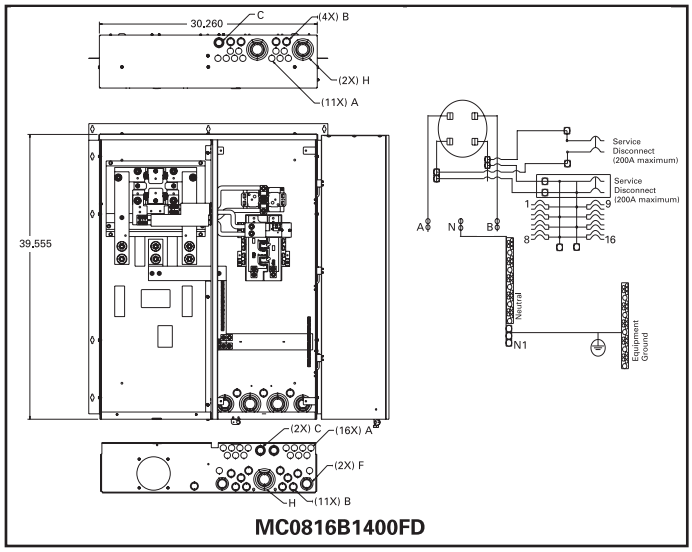
■ Product tables for above on page 2-24

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

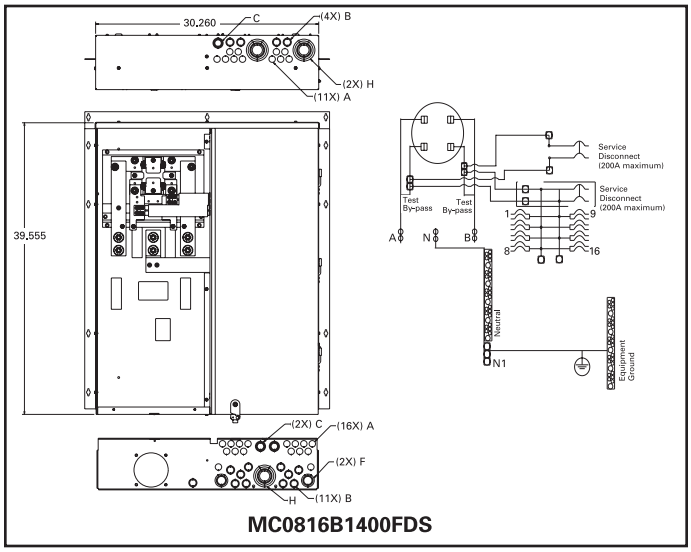
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



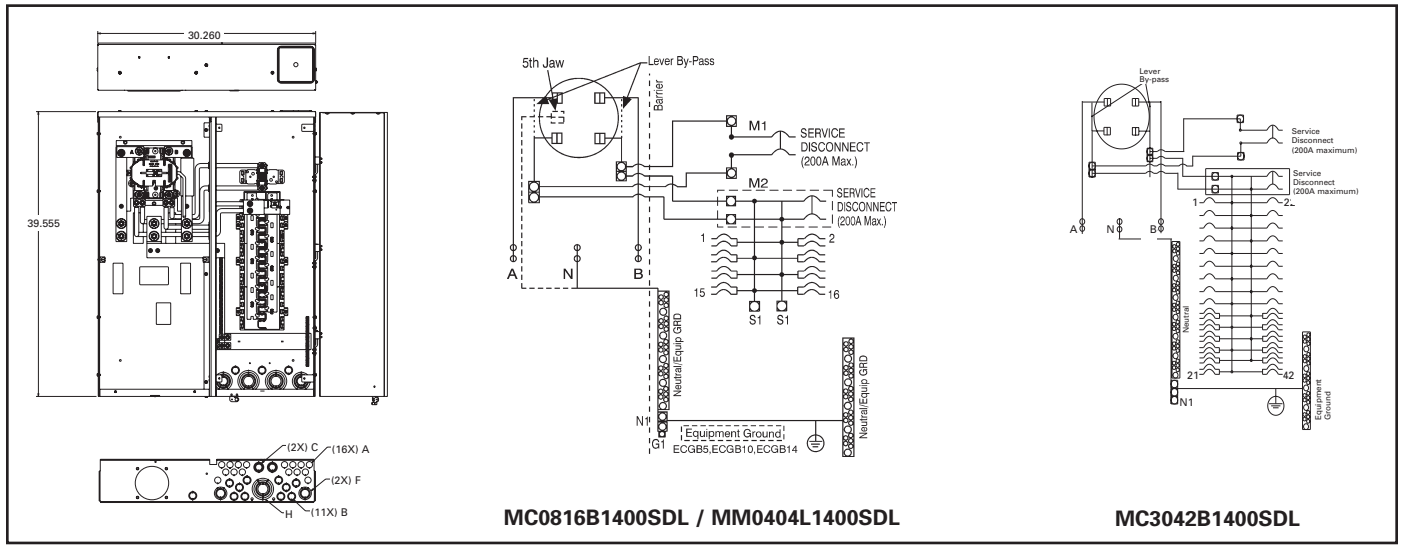
MC0816B1400FD

■ Product tables for above on pages 2-31 and 3-32



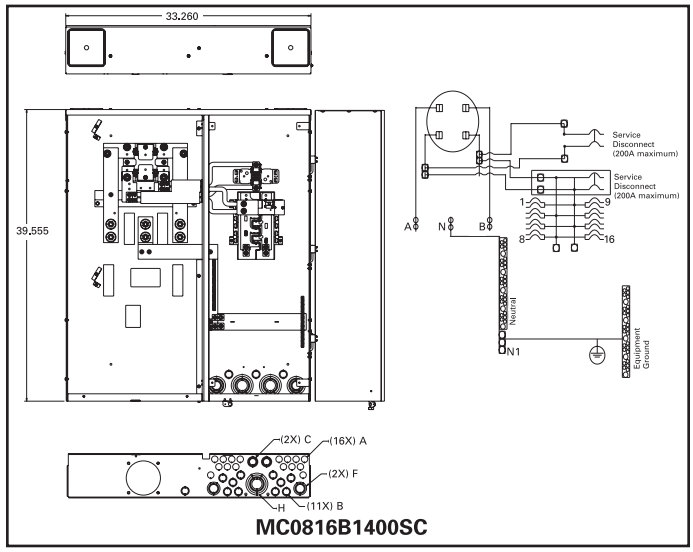
MC0816B1400FDS

■ Product tables for above on pages 2-31 and 3-32



MC0816B1400SDL / MM0404L1400SDL **MC3042B1400SDL**

■ Product tables for above on pages 2-22, 2-26, 3-29 and 3-32



MC0816B1400SC

■ Product tables for above on pages 2-31 and 3-32

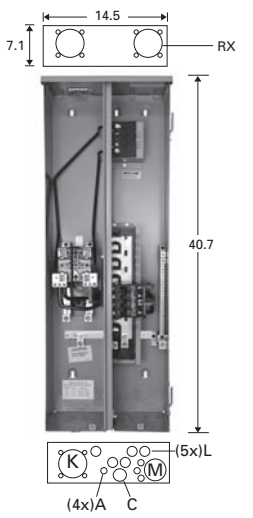
Knockout Code — Conduit Sizes

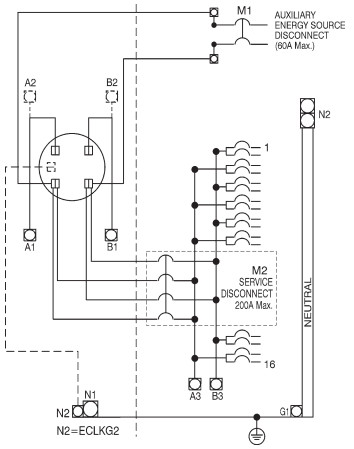
A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

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01/22/13

Meter Centers

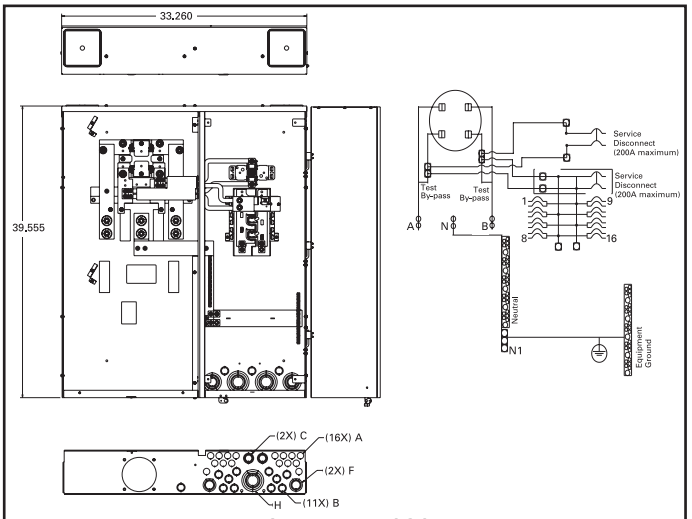
Meter Combinations Dimensions and Wiring Schematics





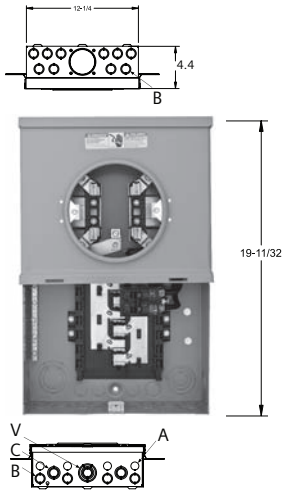
MC0816S1200SCT (shown) / **MC2442S1200SC**

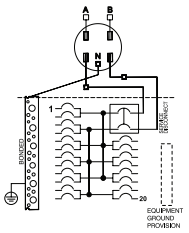
■ Product tables for above on page 2-29



MC0816B1400SCS

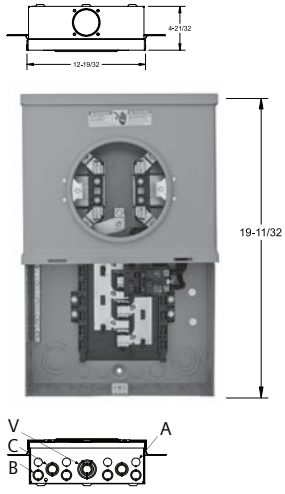
■ Product tables for above on pages 2-31 and 3-32

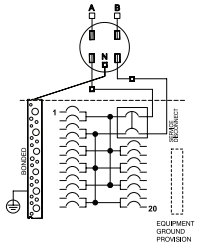




MC1020B1100F / MC1020B1100S

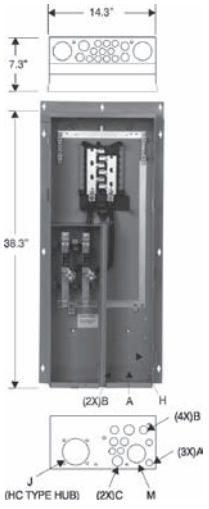
■ Product tables for above on pages 2-23 and 3-29

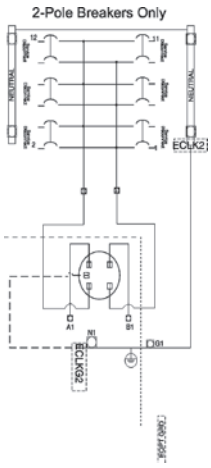




MC1020B1100FZ/ MC1020B1100SZ

■ Product tables for above on pages 2-23 and 3-29





MC1212L1200FED

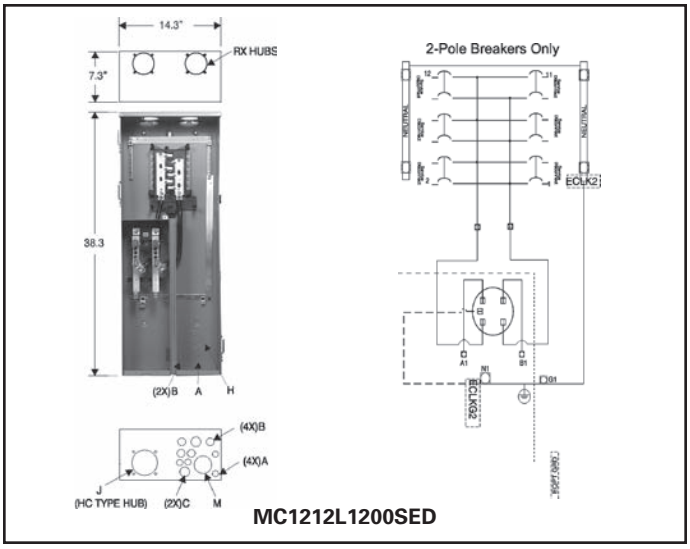
■ Product tables for above on pages 2-32 and 2-109

Knockout Code — Conduit Sizes

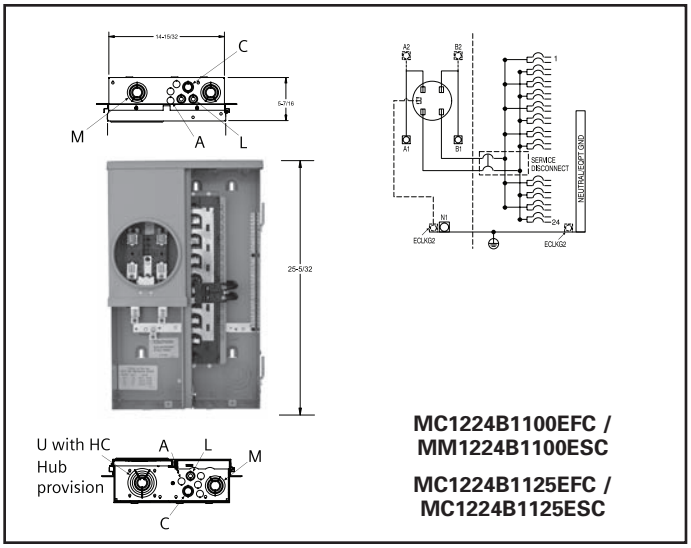
A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

Meter Centers

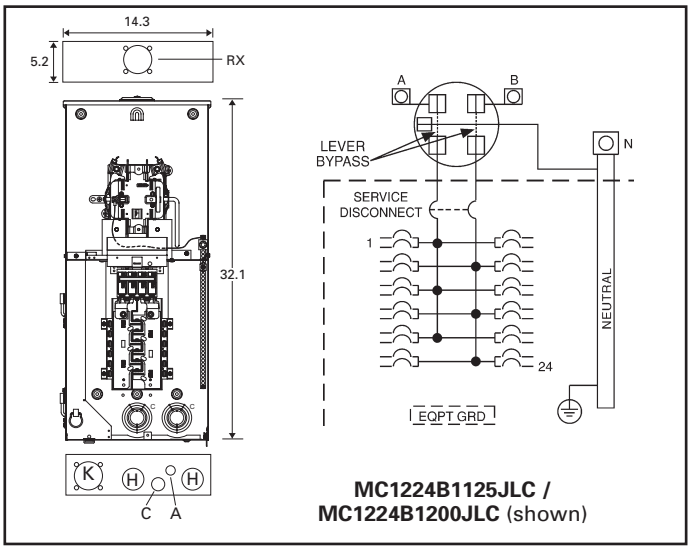
Meter Combinations Dimensions and Wiring Schematics



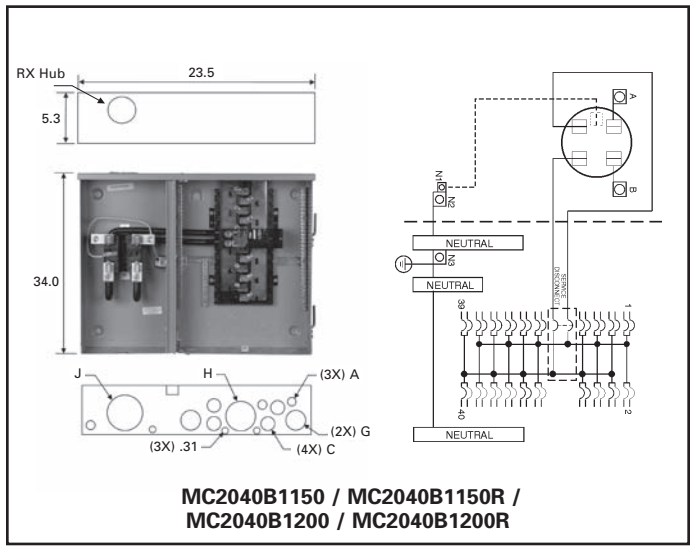
■ Product tables for above on pages 2-32 and 3-32



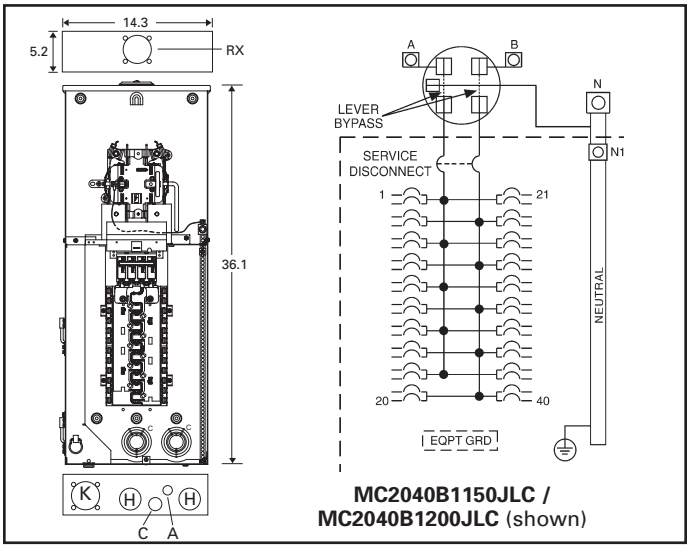
■ Product tables for above on pages 2-30 and 2-109



■ Product tables for above on page 2-25



■ Product tables for above on pages 2-26 and 3-29



■ Product tables for above on page 2-25

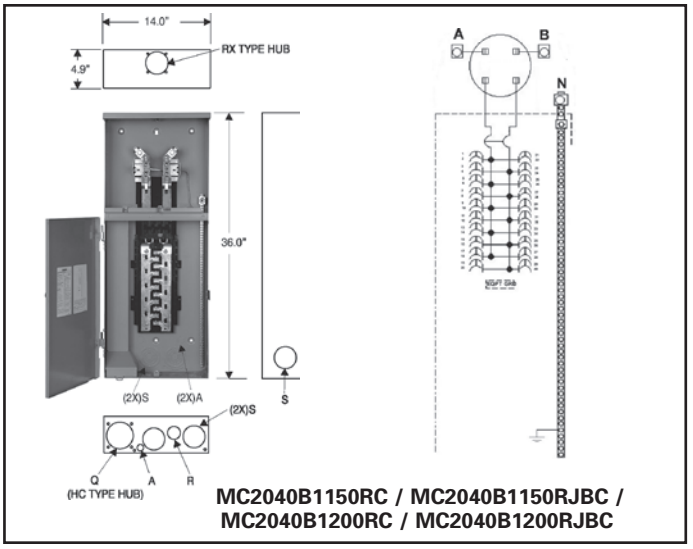
Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

• Revised •
01/22/13

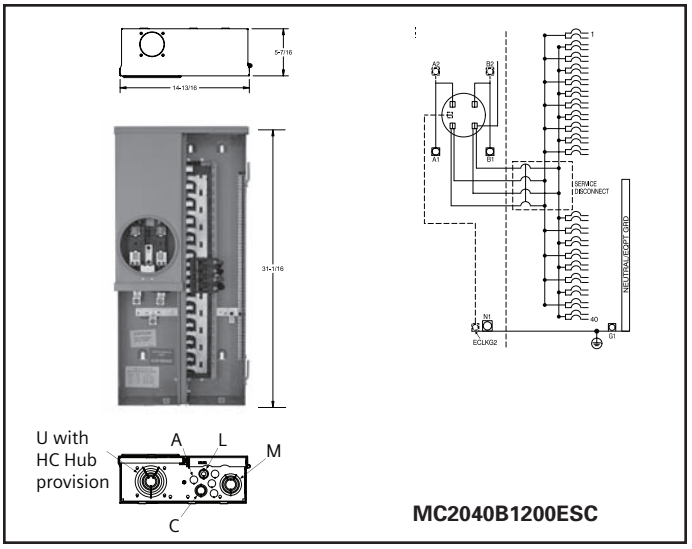
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



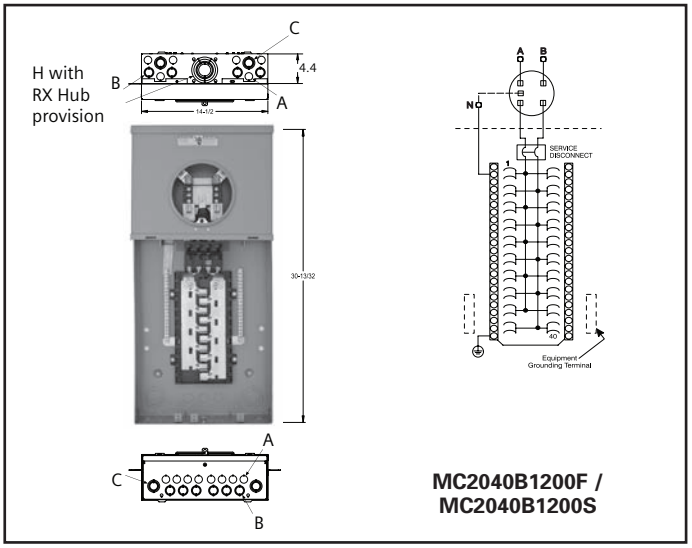
MC2040B1150RC / MC2040B1150RJBC / MC2040B1200RC / MC2040B1200RJBC

■ Product tables for above on page 2-23



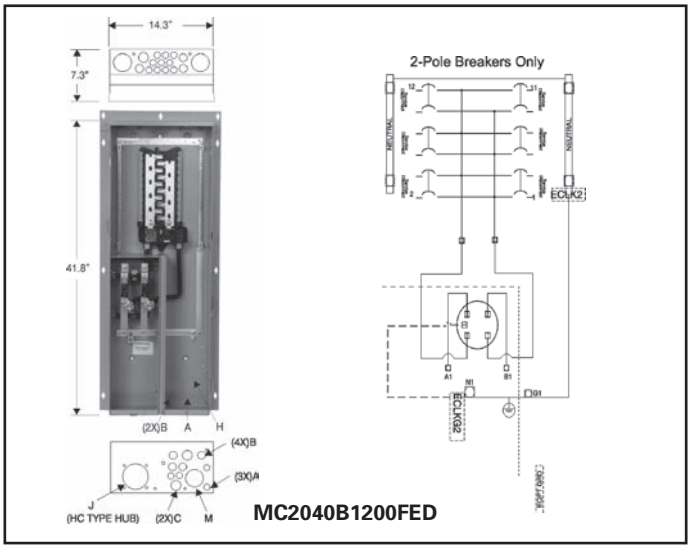
MC2040B1200ESC

■ Product tables for above on pages 2-30 and 2-109



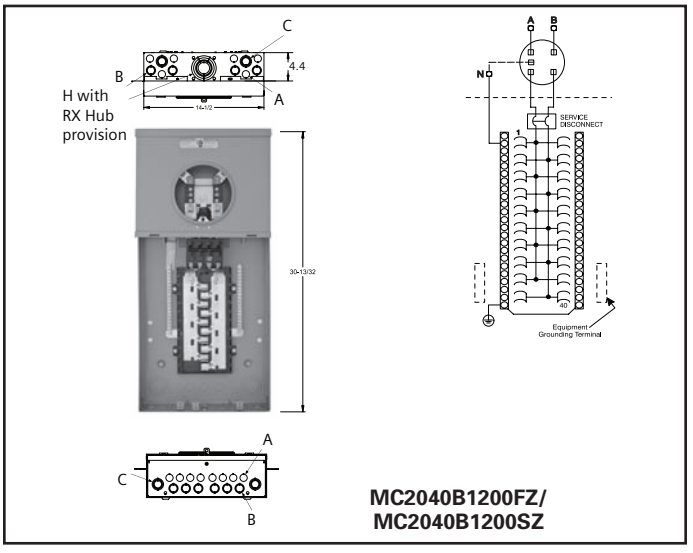
MC2040B1200F / MC2040B1200S

■ Product tables for above on pages 2-23 and 3-29



MC2040B1200FED

■ Product tables for above on pages 2-32 and 2-109



MC2040B1200FZ/ MC2040B1200SZ

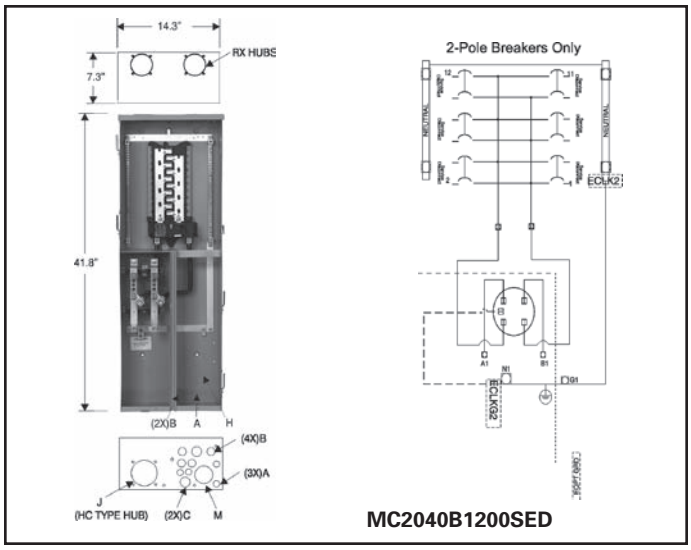
■ Product tables for above on pages 2-23 and 3-29

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

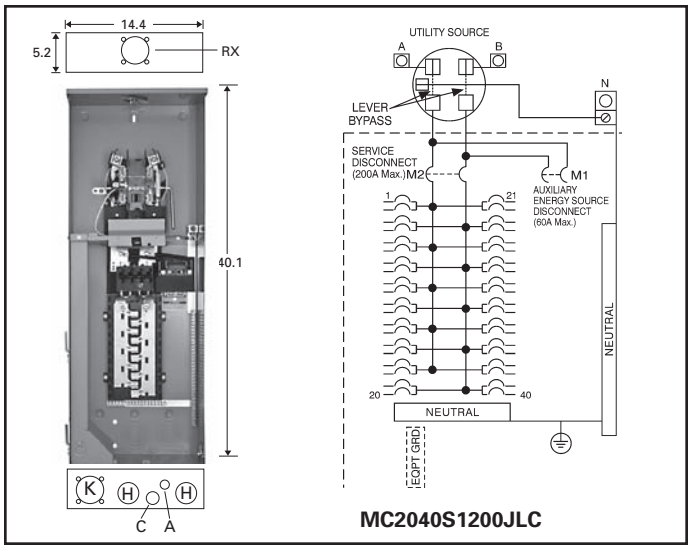
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



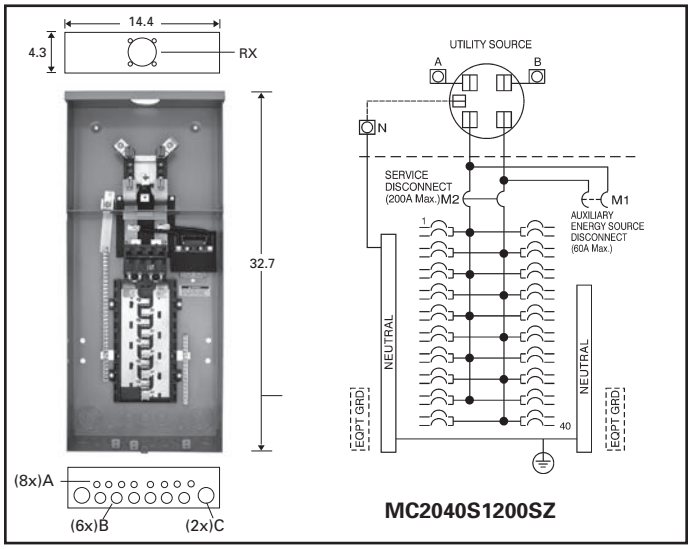
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■ Product tables for above on pages 2-32 and 2-109



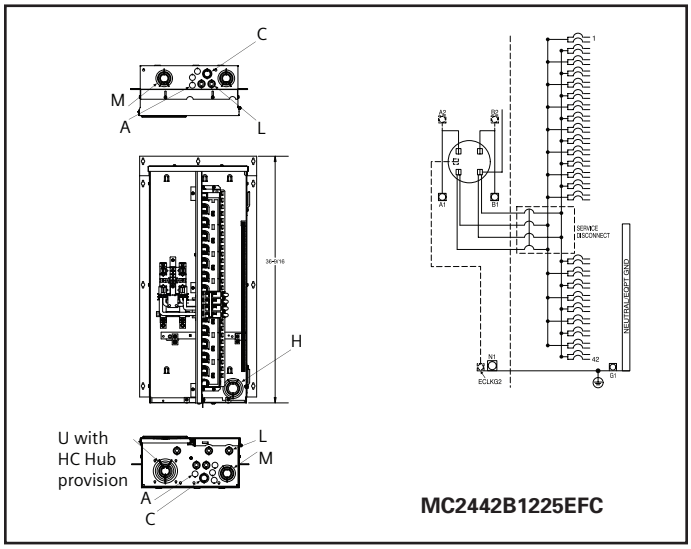
MC2040S1200JLC

■ Product tables for above on page 2-29



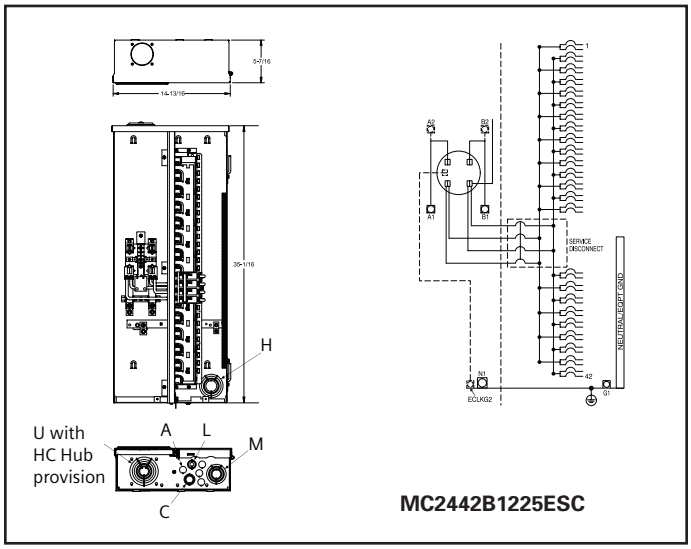
MC2040S1200SZ

■ Product tables for above on page 2-29



MC2442B1225EFC

■ Product tables for above on pages 2-30 and 2-109



MC2442B1225ESC

■ Product tables for above on pages 2-30 and 2-109

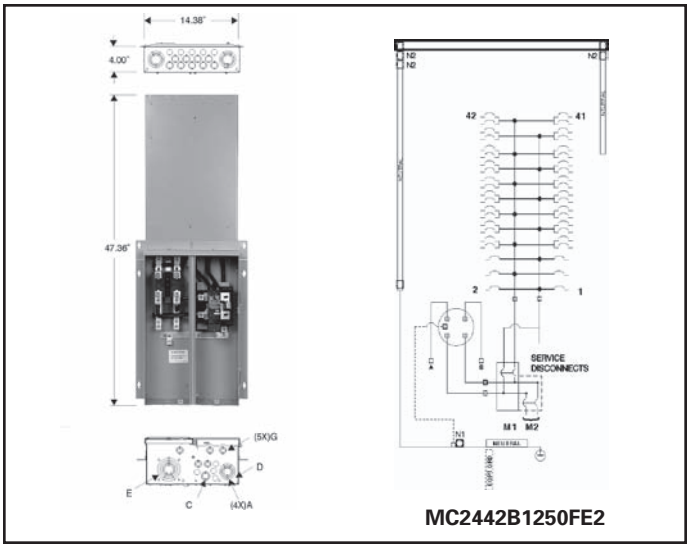
Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

• Revised •
01/22/13

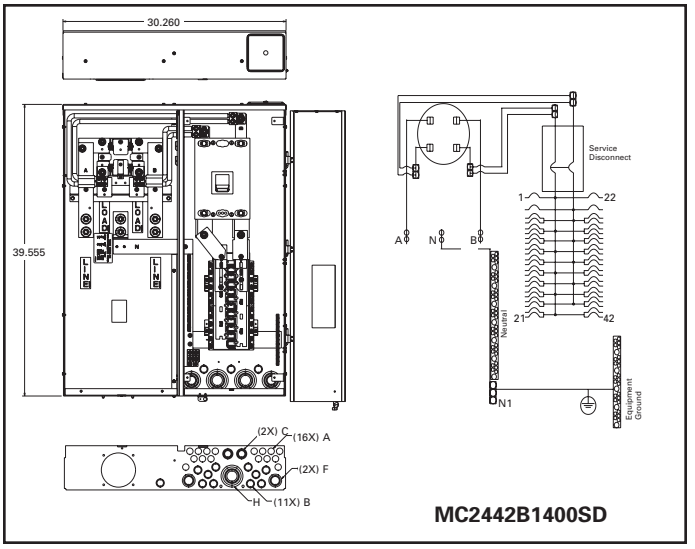
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



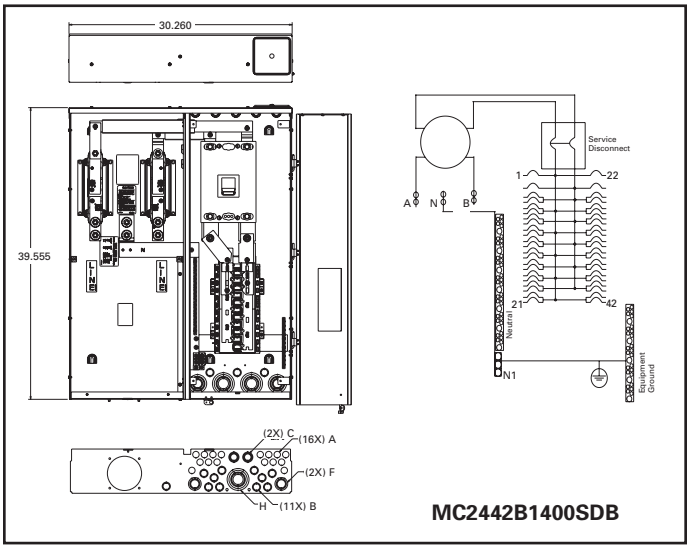
MC2442B1250FE2

■ Product tables for above on page 2-32



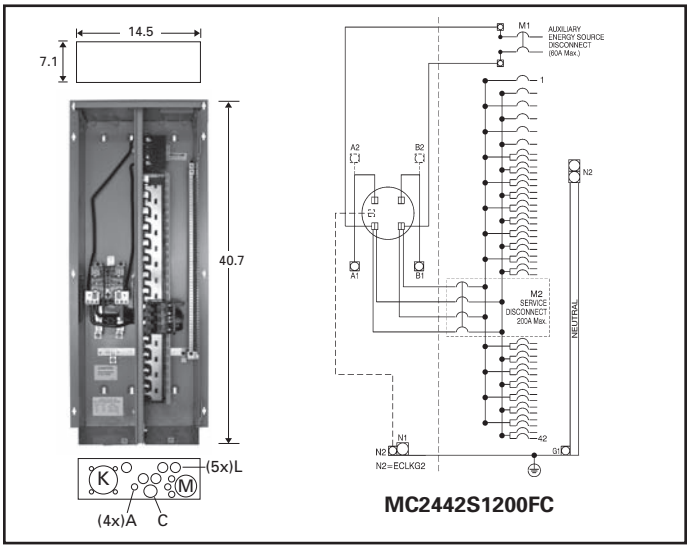
MC2442B1400SD

■ Product tables for above on page 2-31



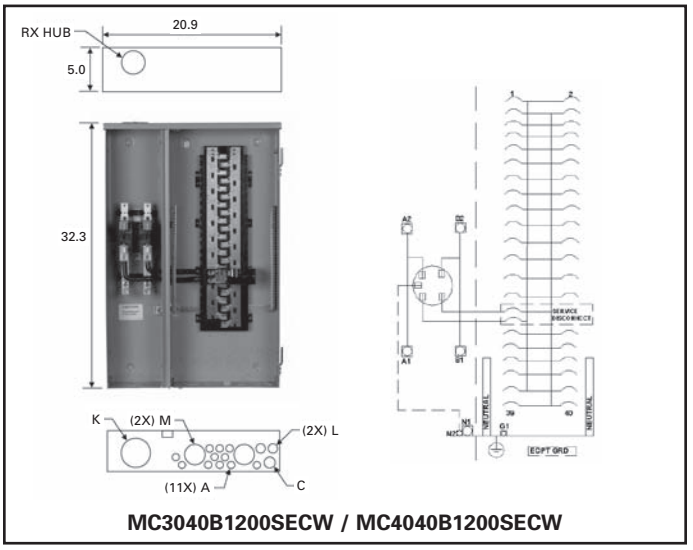
MC2442B1400SDB

■ Product tables for above on page 2-26



MC2442S1200FC

■ Product tables for above on page 2-29



MC3040B1200SECW / MC4040B1200SECW

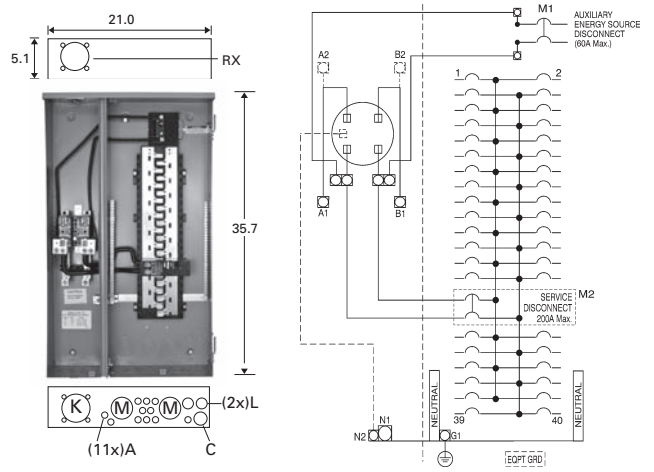
■ Product tables for above on pages 2-30 and 2-109

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

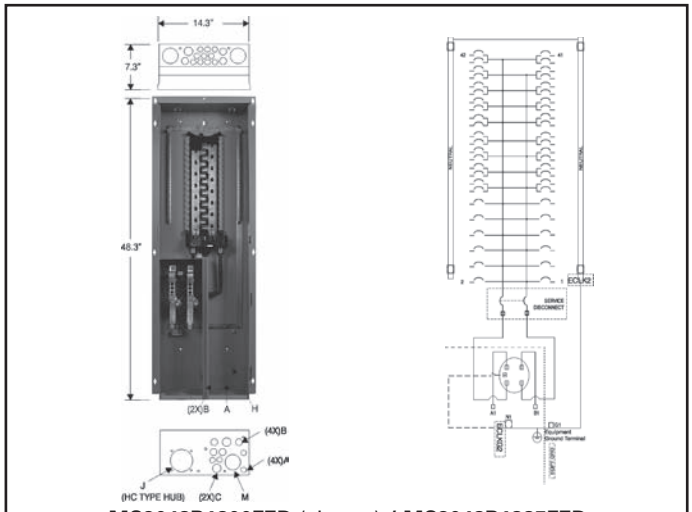
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



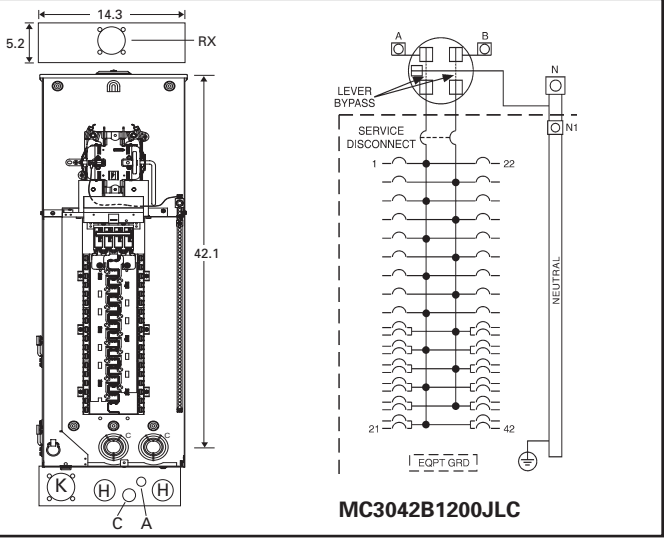
MC3040S1200SC / MC4040S1200SC

■ Product tables for above on page 2-29



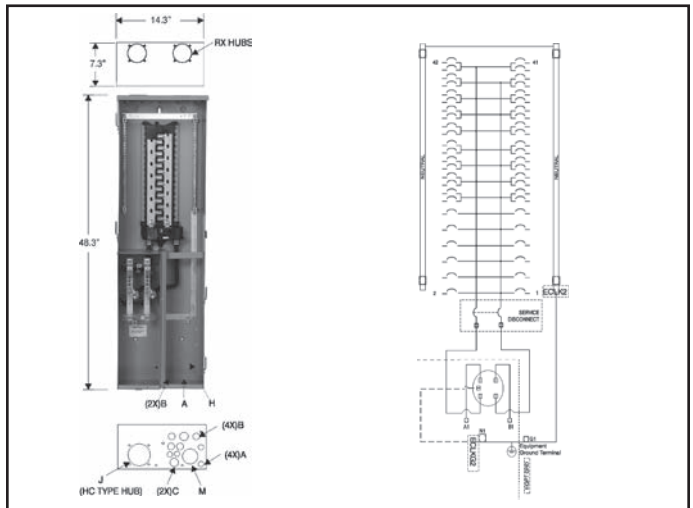
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■ Product tables for above on pages 2-32 and 2-109



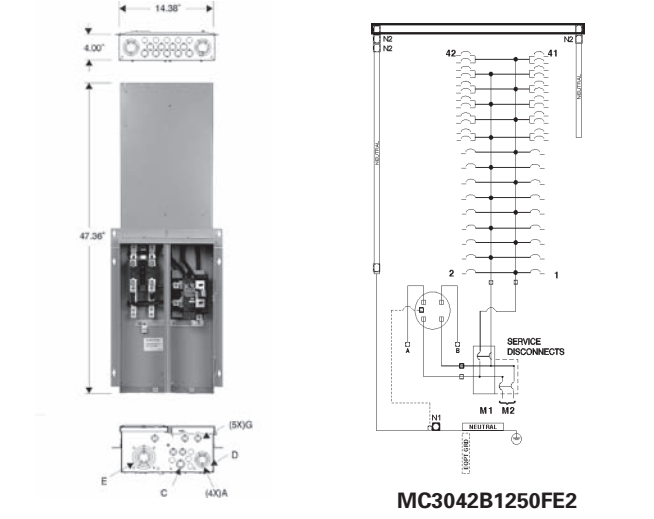
MC3042B1200JLC

■ Product tables for above on page 2-25



MC3042B1200SED / MC3042B1225SED

■ Product tables for above on pages 2-32 and 2-109



MC3042B1250FE2

■ Product tables for above on page 2-32

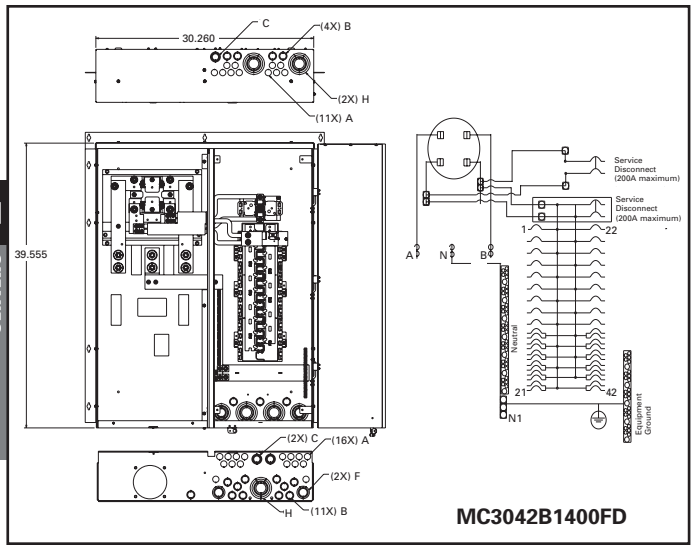
Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

• Revised •
01/22/13

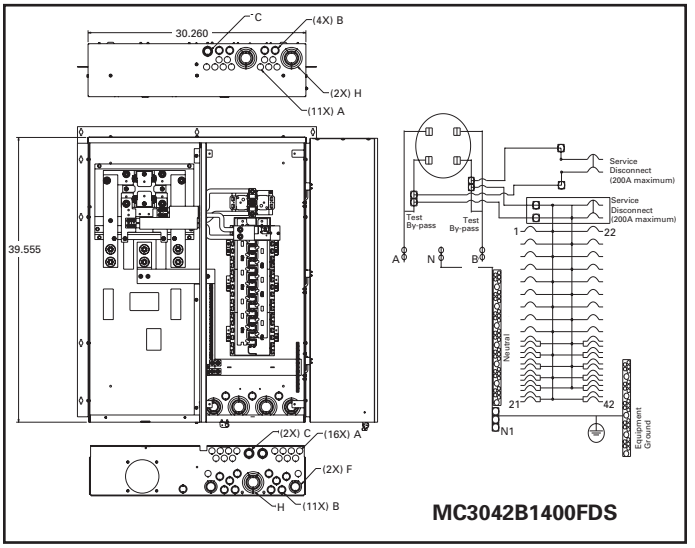
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



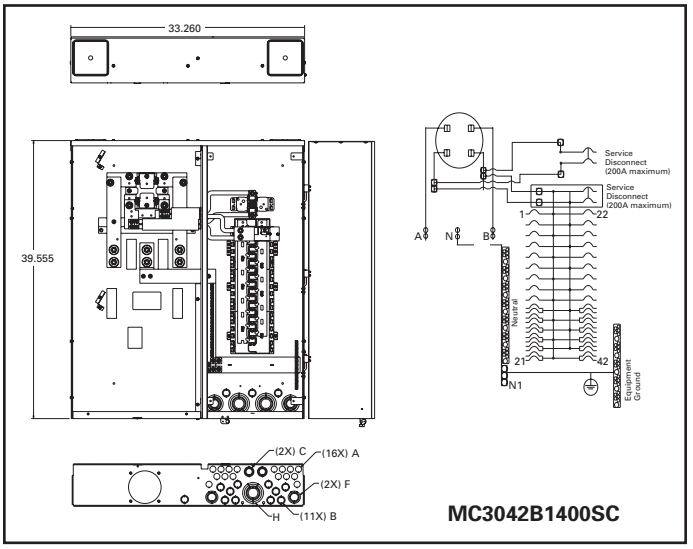
MC3042B1400FD

■ Product tables for above on pages 2-31 and 3-32



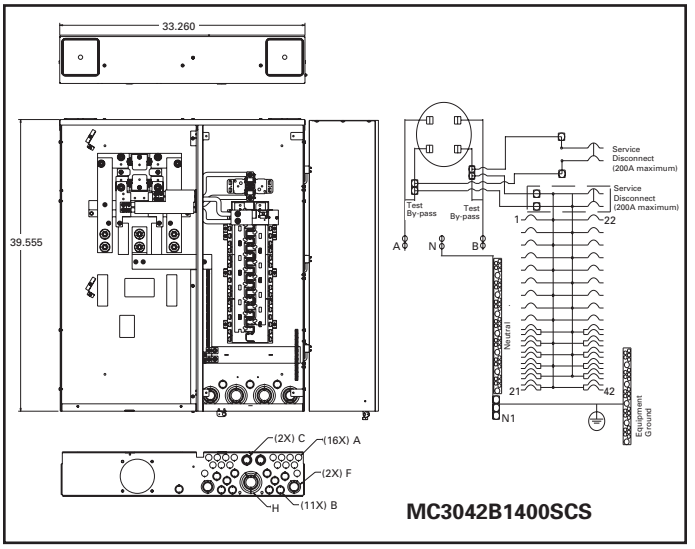
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■ Product tables for above on pages 2-31 and 3-32



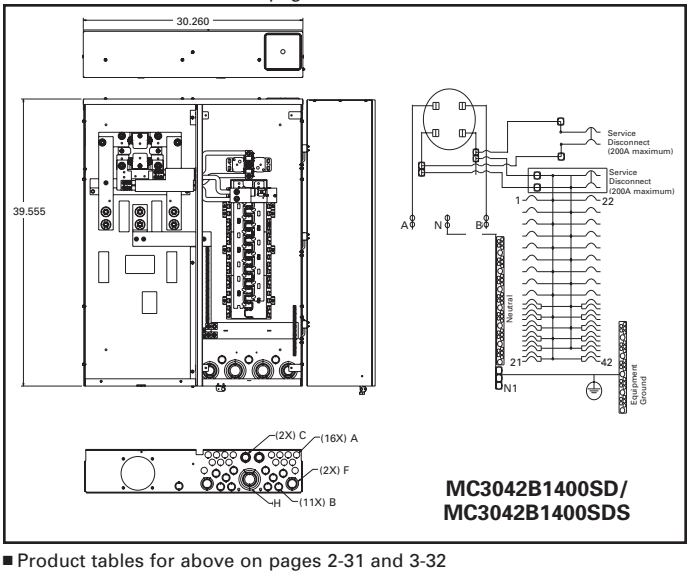
MC3042B1400SC

■ Product tables for above on pages 2-31 and 3-32



MC3042B1400SCS

■ Product tables for above on pages 2-31 and 3-32



MC3042B1400SD/
MC3042B1400SDS

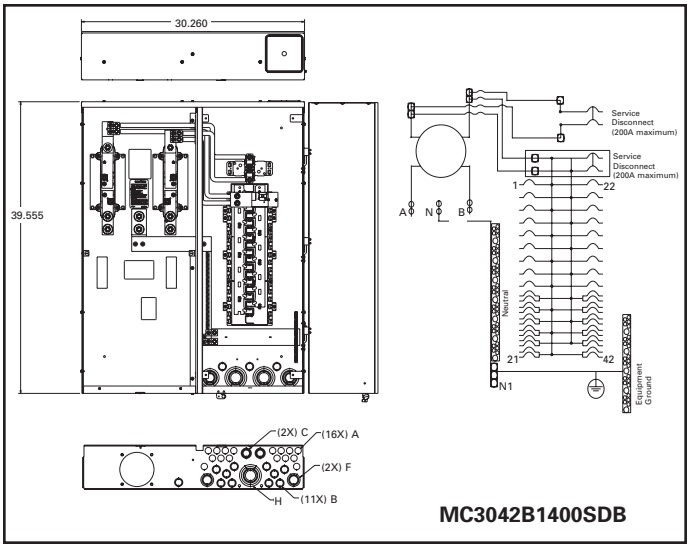
■ Product tables for above on pages 2-31 and 3-32

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

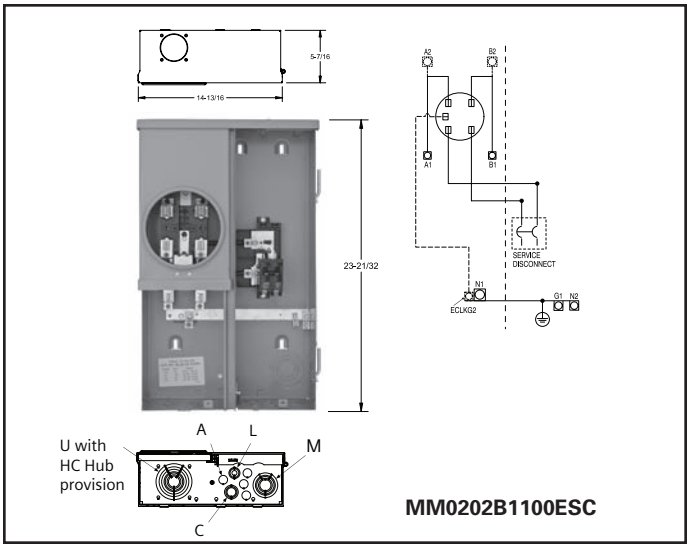
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



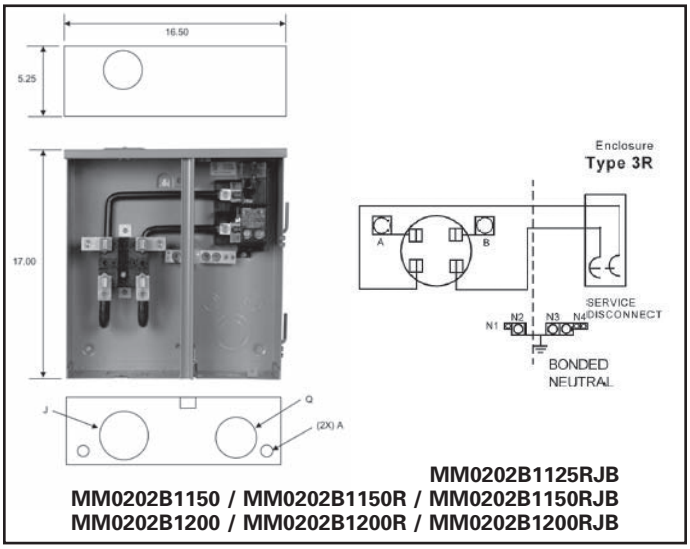
MC3042B1400SDB

■ Product tables for above on pages 2-26 and 2-32



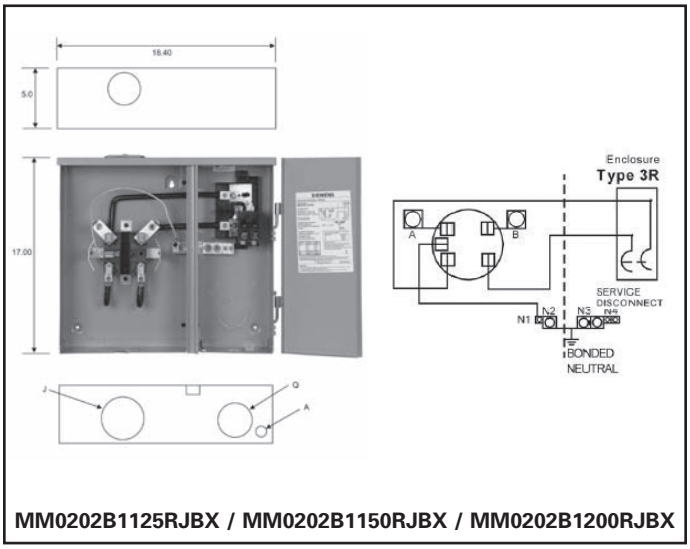
MM0202B1100ESC

■ Product tables for above on pages 2-27 and 3-30



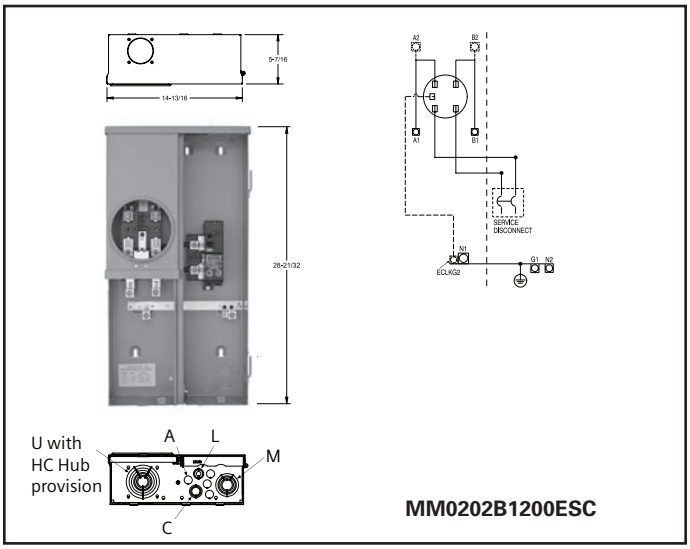
MM0202B1125RJB
MM0202B1150 / MM0202B1150R / MM0202B1150RJB
MM0202B1200 / MM0202B1200R / MM0202B1200RJB

■ Product tables for above on pages 2-22 and 3-27



MM0202B1125RJBX / MM0202B1150RJBX / MM0202B1200RJBX

■ Product tables for above on page 2-22,



MM0202B1200ESC

■ Product tables for above on pages 2-27 and 3-30

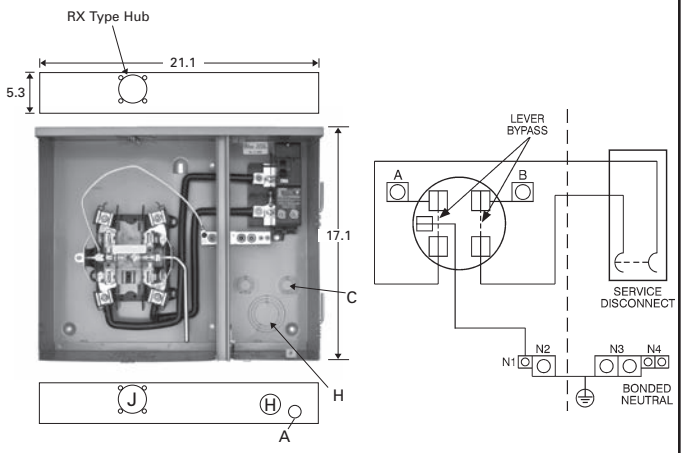
Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

• Revised •
01/22/13

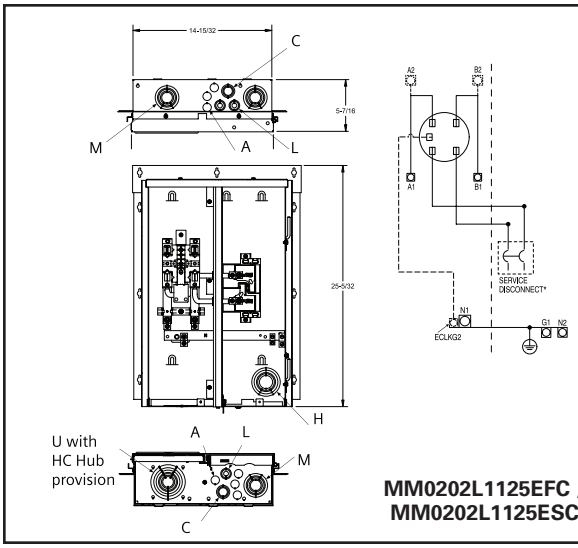
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



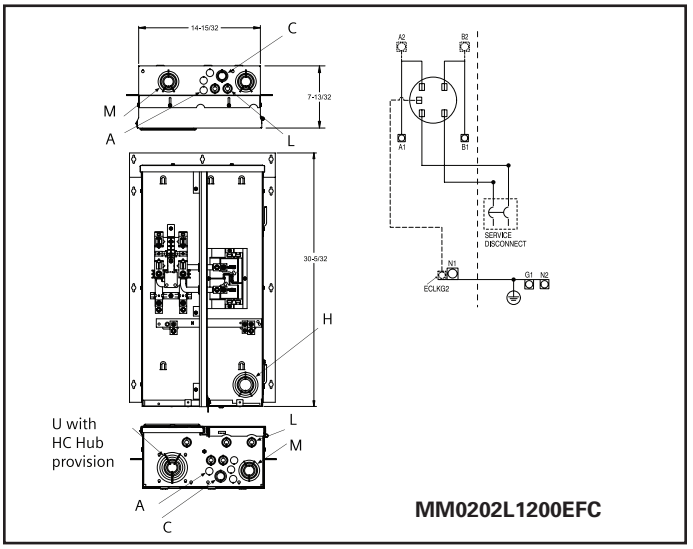
MM0202B1200JLX / MM0202L1200JLX

■ Product tables for above on page 2-22



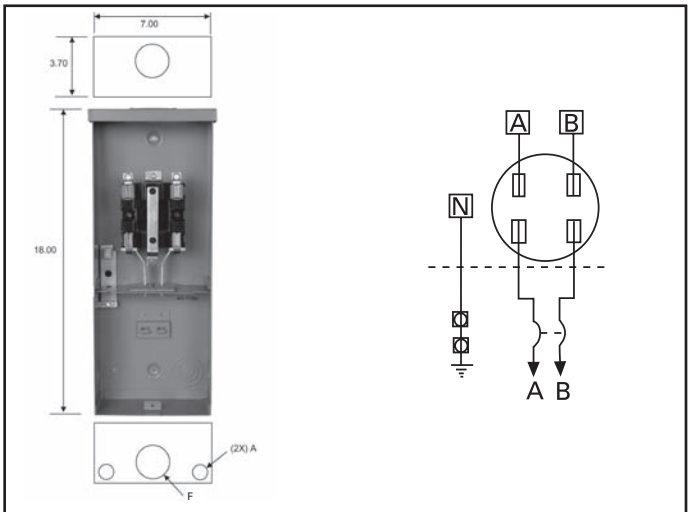
MM0202L1125EFC / MM0202L1125ESC

■ Product tables for above on pages 2-27 and 3-30



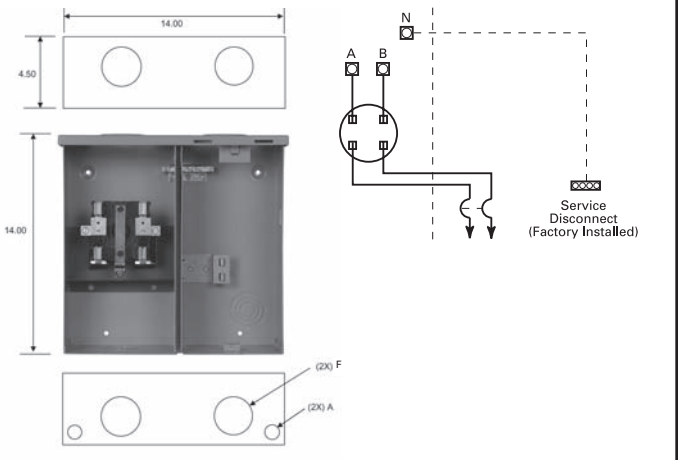
MM0202L1200EFC

■ Product tables for above on pages 2-27 and 3-30



MM0202ML1100S / JC002AR / JC002CS

■ Product tables for above on pages 2-22 and 3-27



MM0202ML1125H / JC002CZ

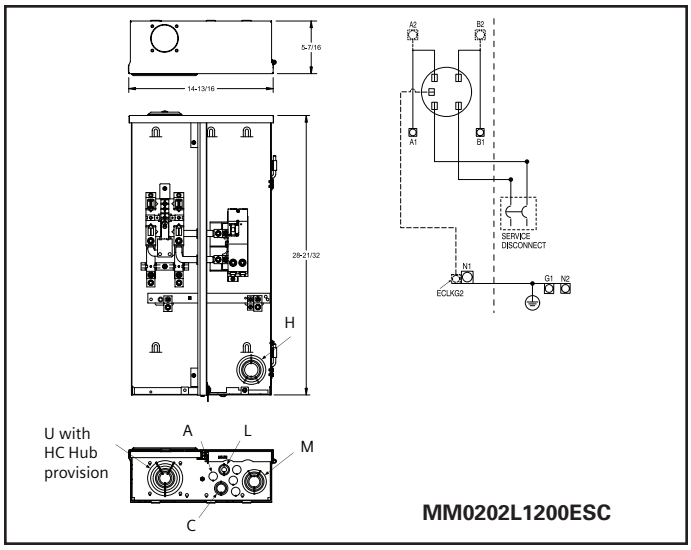
■ Product tables for above on pages 2-22 and 3-27

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

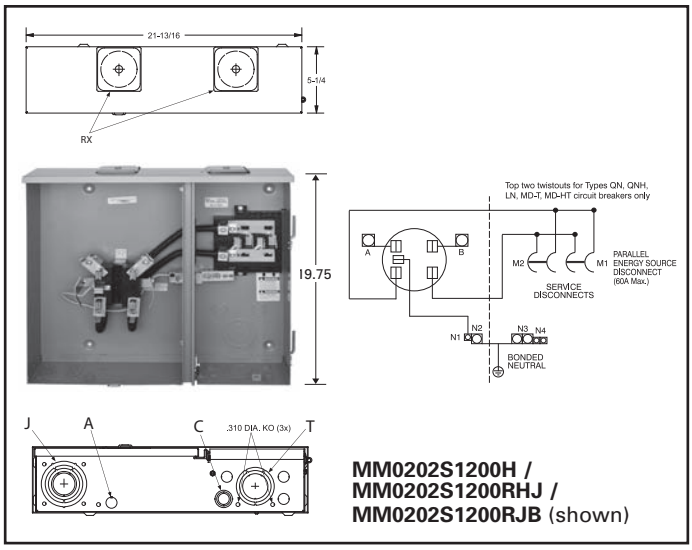
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



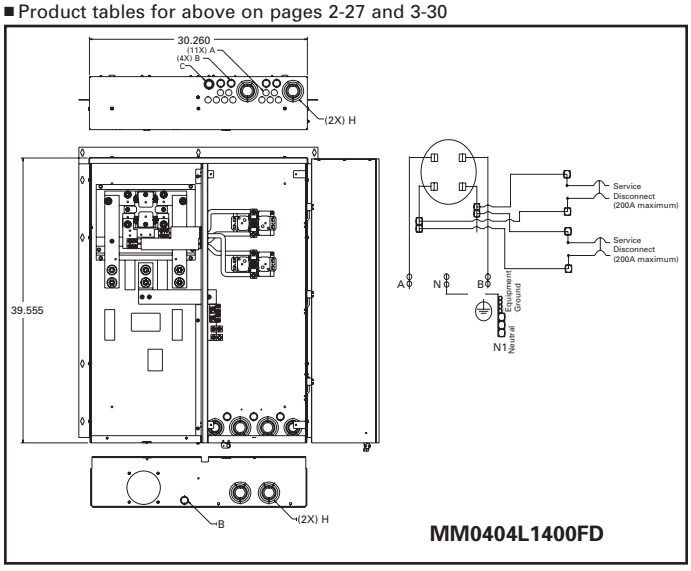
MM0202L1200ESC

■ Product tables for above on pages 2-27 and 3-30



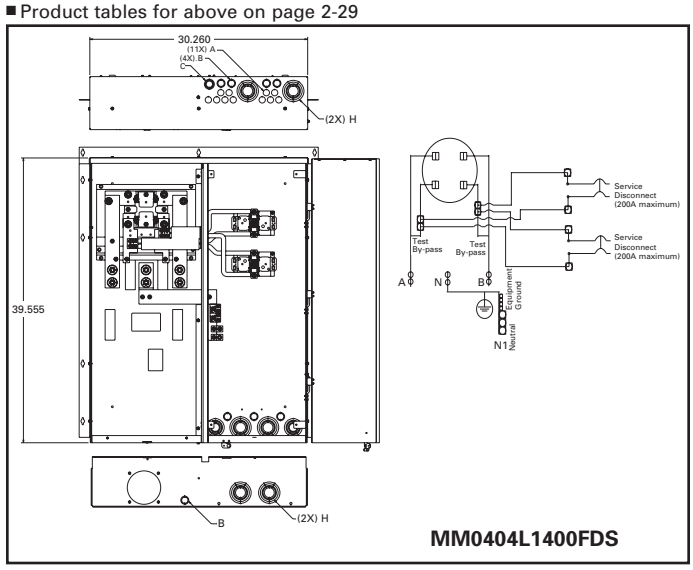
MM0202S1200H / MM0202S1200RHJ / MM0202S1200RJB (shown)

■ Product tables for above on page 2-29



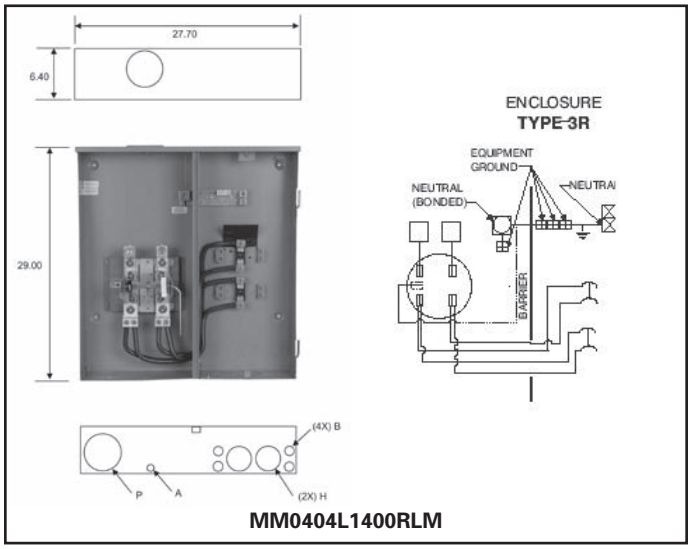
MM0404L1400FD

■ Product tables for above on pages 2-27 and 3-30



MM0404L1400FDS

■ Product tables for above on pages 2-27 and 3-30



MM0404L1400RLM

■ Product tables for above on pages 2-22 and 3-27

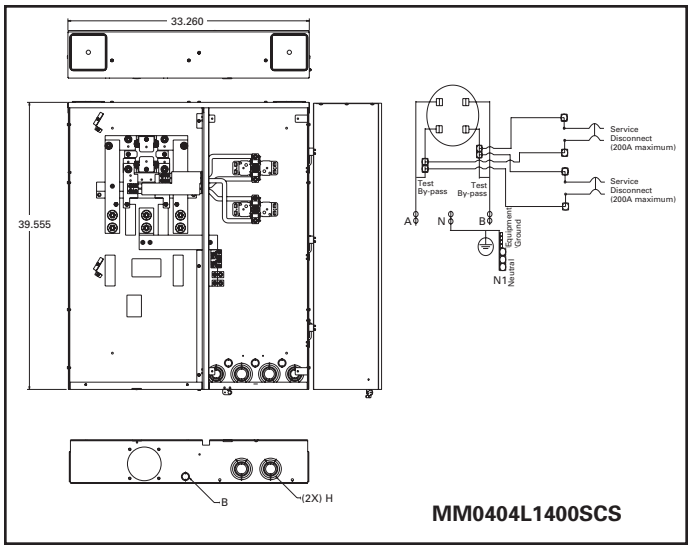
Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

• Revised •
01/22/13

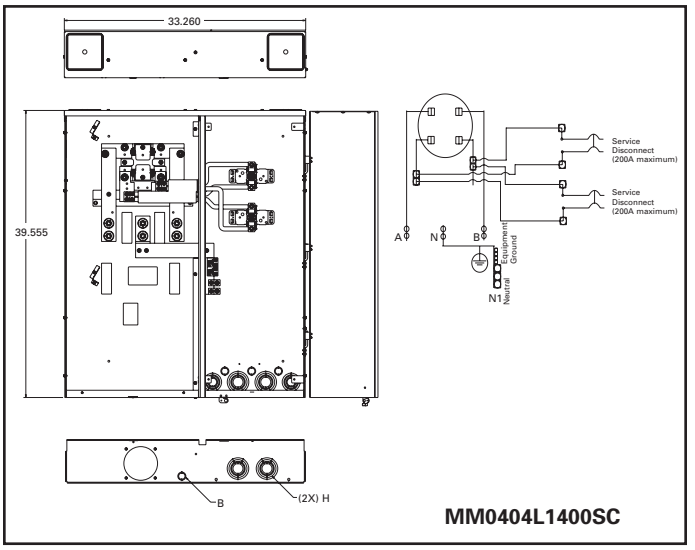
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



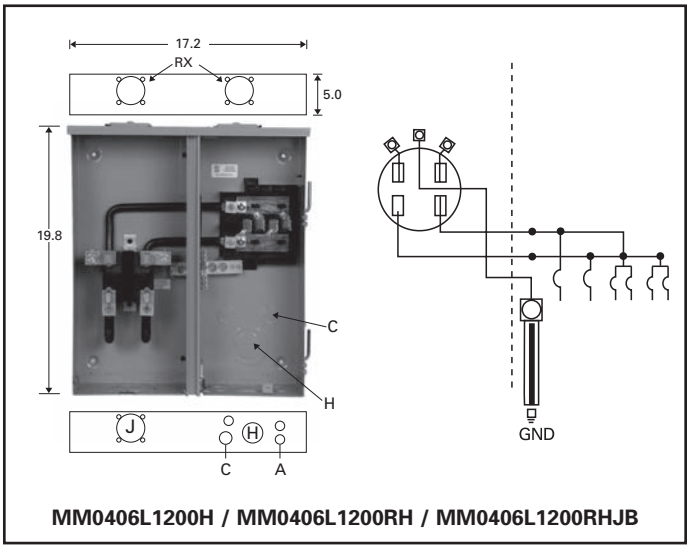
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■ Product tables for above on pages 2-27 and 3-30



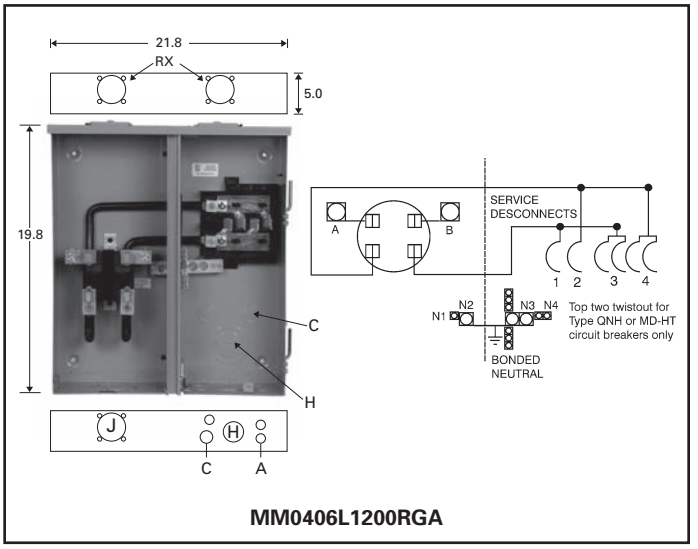
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■ Product tables for above on pages 2-27 and 3-30



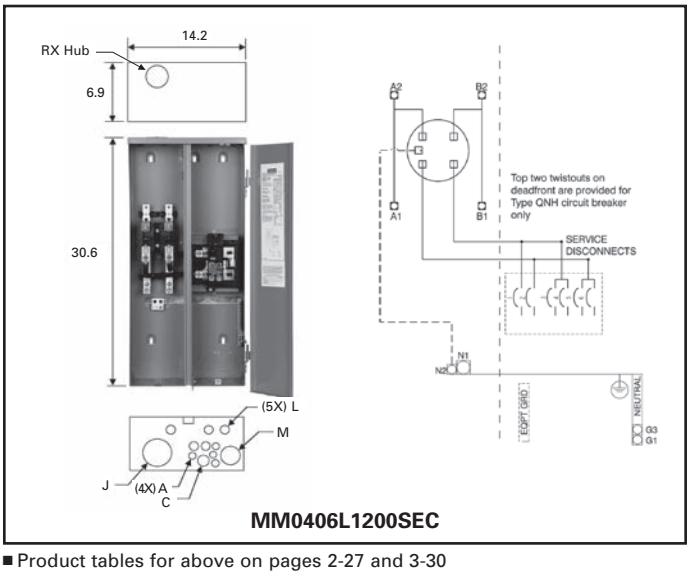
MM0406L1200H / MM0406L1200RH / MM0406L1200RHJB

■ Product tables for above on pages 2-22 and 3-27



MM0406L1200RGA

■ Product tables for above on page 2-22



MM0406L1200SEC

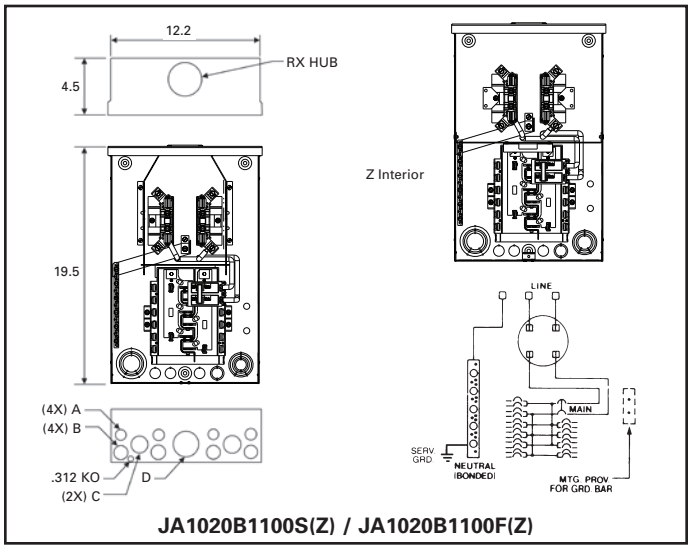
■ Product tables for above on pages 2-27 and 3-30

Knockout Code — Conduit Sizes

A = ½	L = ⅜, ½, ¾
B = ½, ¾	M = ¾, 1, 1¼, 1½, 2
C = ½, ¾, 1	N = ¼
D = ¾, 1¼, 1½	P = 2, 2½, 3, 3½, 4
E = 1, 1¼, 1½, 2	Q = 2½, 3
F = ¾, 1, 1¼	R = ½, ¾, 1, 1¼
G = 1, 1¼, 1½	S = ½, ¾, 1, 1¼, 1½, 2, 2½
H = 1, 1¼, 1½, 2, 2½	T = 1½, 2, 2½
J = 1¼, 1½, 2, 2½, 3	U = ¾, 1, 1¼, 1½, 2, 2½, 3
K = 1, 1¼, 2, 2½, 3	V = ¾, 1, 1¼, 1½

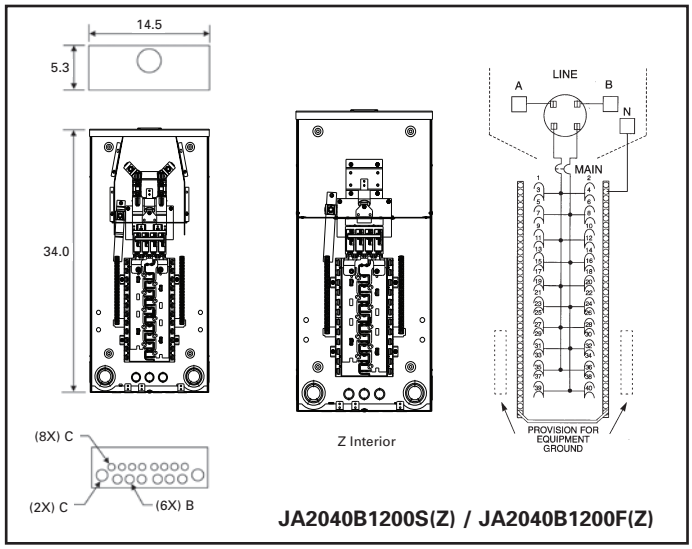
Meter Centers

Meter Combinations Dimensions and Wiring Schematics



JA1020B1100S(Z) / JA1020B1100F(Z)

■ Product tables for above on page 3-29



JA2040B1200S(Z) / JA2040B1200F(Z)

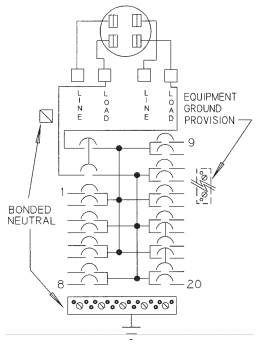
■ Product tables for above on page 3-29

EUSERC Commercial Metering

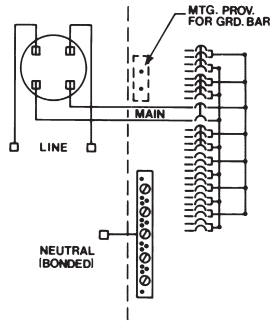
Type BY Wiring Diagrams

Commercial All-In-Ones

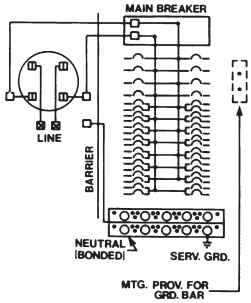
MC1020B1100EY



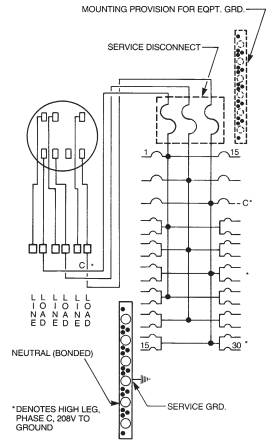
MC1224B1100CEY



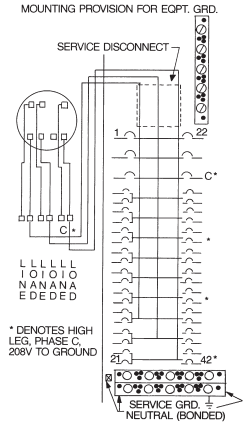
MC2440B1200CEY



MC1830F3100CEY



MC2442F3200CEY



■ Product tables for above on page 2-32

EUSERC Commercial Metering

Type BY Knockout Diagrams

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Figure BY-1

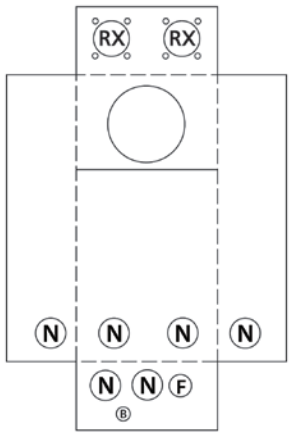


Figure BY-2

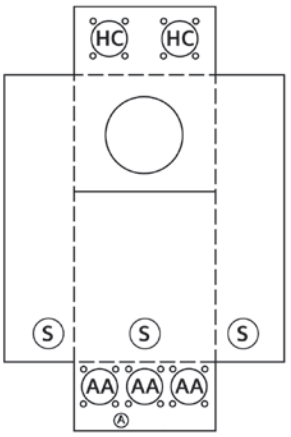


Figure BY-3

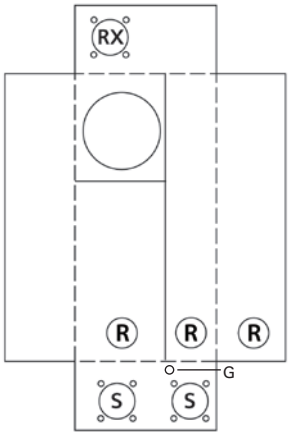


Figure BY-4

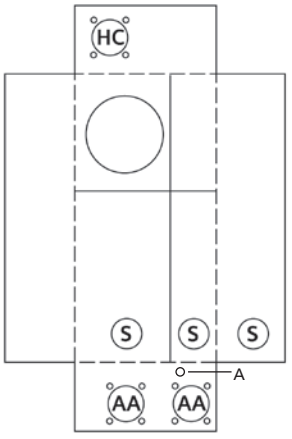


Figure BY-7

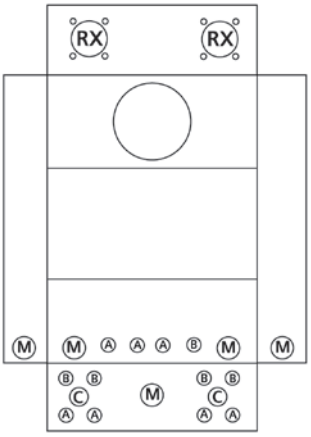


Figure BY-8

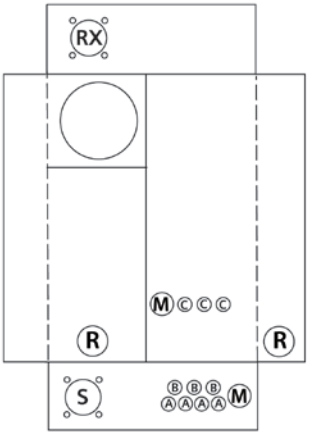


Figure BY-9

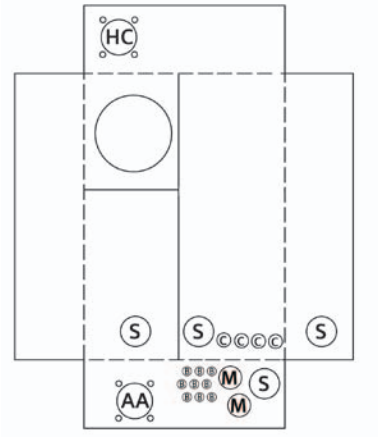
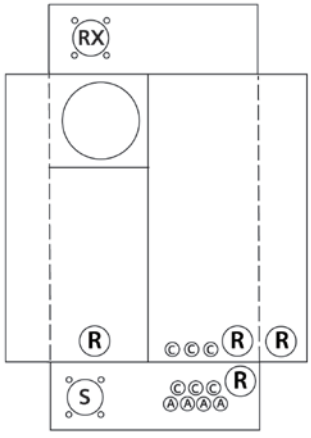


Figure BY-10



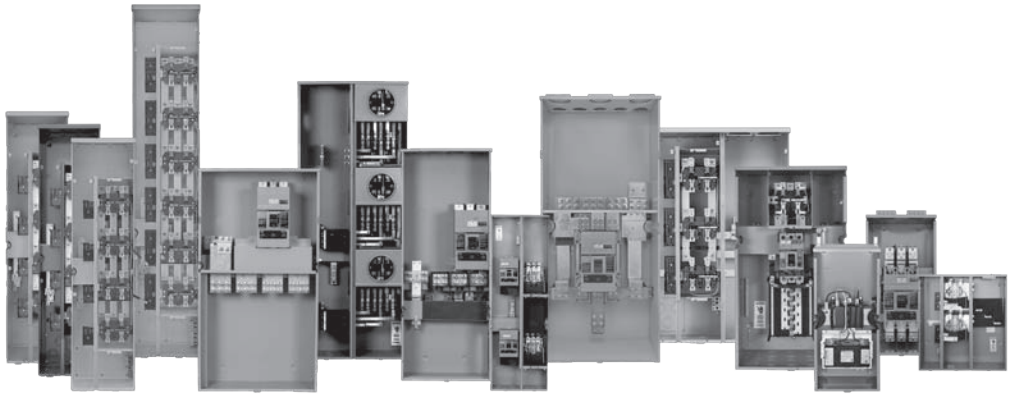
Knockout Code—Conduit Sizes

◕ = ¼
A = ½
B = ½, ¾
C = ½, ¾, 1
D = ½, 1
E = ½, ¾, 1, 1¼
F = ½, 1¼, 1½
G = ¾
H = ¾, 1
J = ¾, 1, 1¼
K = ¾, 1¼
M = ¾, 1, 1¼, 1½
N = ¾, 1, 1¼, 1½, 2
P = 1, 1¼
Q = 1, 1¼, 1½
R = 1, 1¼, 1½, 2
S = 1, 1¼, 1½, 2, 2½
T = 1¼
U = 1¼, 1½
V = 1¼, 1½, 2
W = 1¼, 2
X = 1¼, 1½, 2, 2½
Y = 1½, 2
Z = 1½, 2, 2½
AA = 1½, 2, 2½, 3
BB = 1½, 2, 2½, 3, 3½
CC = 2, 2½, 3, 3½
EE = 2, 2½, 3
FF = 2½, 3
GG = 2½, 3, 3½
HH = 2½, 3, 3½, 4
JJ = 3½, 4
LL = 3
VV = 2

• Revised •
02/18/14

Power Mod

Introduction and Contents



Siemens' Power Mod is a robust, flexible, and feature-rich line of modular metering designed to exceed today's market demands. Power Mod's exclusive QuickSystem has been proven to reduce labor by as much as 43% over comparable solutions while exclusive products, such as the WXB family of cross bus mains, allow for lower material cost and incredible flexibility.

Power Mod is built upon service, quality, and flexibility:

Service: every order is made to order and shipped within a competitive lead time. This means all products arrive at the job site on time and together avoiding multiple shipment delays and confusion.

Quality: Power Mod has been tested to all applicable UL and ANSI standards as well as Siemens own rigorous internal specifications. Power Mod only offers 1200amp thru bussing and fully rated vertical bussing in our WMM, WML, and WMT stacks is fully rated. All of this is delivered at a competitive lead time and price to other, lower rated products.

Flexibility: for Power Mod flexibility goes well beyond exclusive QuickSystem features. For Siemens this means allowing a variety of solutions to any application that can focus on labor savings, material savings, or both! This also means allowing options like custom colors, factory installed tenant breakers, lugs, etc.., and the ability to configure Power Mod within the COMPAS configuration tool which allows the user to receive a PDF or DXF file of any custom line up.

Power Mod, when combined with Siemens broad line of load centers and exclusive feature arc fault circuit breakers, offers multiple solutions for any application utilizing the industry's broadest portfolio of multi-family metering solutions.

Quick System Features	2-54 to 2-55
Overview of Power Mod Families	2-56 to 2-61
Power Mod Configuration Tips	2-62
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WET - Tapbox Pullbox Combinations	2-92 to 2-94
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WMM - Residential Meter Stacks	2-98 to 2-103
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Meter Stack Rating Charts	2-142 to 2-144
Accessories	2-167 to 2-170
Tenant Circuit Breakers	2-171

Power Mod

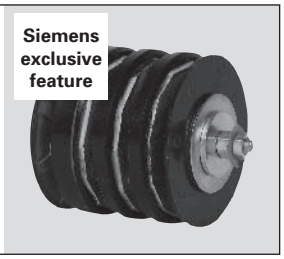
Introduction to QuickSystem™ Features

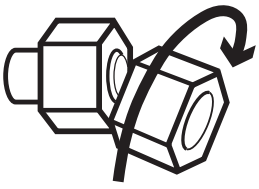
Contractor-focused features, robust quality, dependable service, and exclusive products define Siemens Power Mod. The new standard in multi family metering. QuickSystem showcases the key strengths of Power Mod through five labor saving features:



QuickConnect™

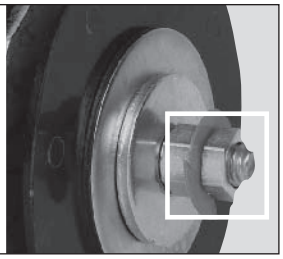
A Siemens exclusive feature, QuickConnect reduces bussing connections from many to one – ensuring a single reliable connection instead of multiple connections.





QuickTorque™

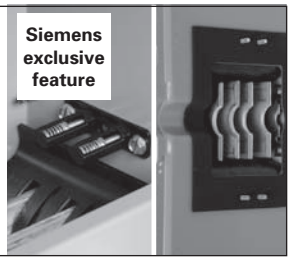
QuickTorque eliminates the need for time consuming torque readings. This breakaway nut provides a visual indicator of torque for the QuickConnect. When tightened, the outer head twists off at the proper torque for connection, leaving a single nut for future maintenance.





QuickBolt™

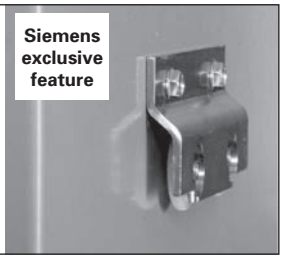
A Siemens exclusive feature, QuickBolt eliminates the requirement to line up mechanical connections – instead bolts remain retracted until the openings line up – allowing the bolts to protrude through automatically. Springs push the bolts through and provide positive pressure to keep bolts in place while wingnuts are attached and tightened.

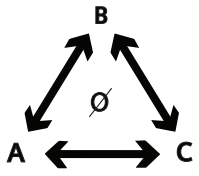




QuickRoll™

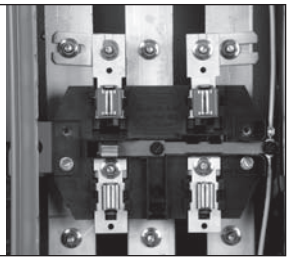
A Siemens exclusive feature, QuickRoll eliminates typical metal brackets for mounting modules on the wall. Instead of metal scraping metal, QuickRoll allows the module to glide down the mounting rail via a durable nylon wheel inside a mounting bracket.

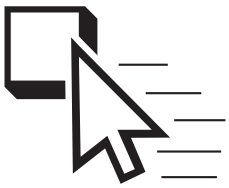




QuickPhase™

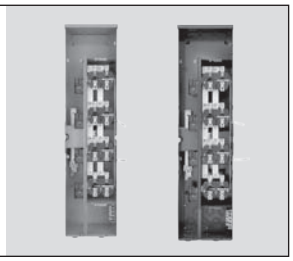
Each individual meter position can be phased independently according to the users needs. QuickPhase allows the user the ultimate flexibility to adjust to each individual application.





QuickOption™

Unique to the industry, QuickOption provides the ultimate flexibility in multifamily metering installations. QuickOption enables contractors to meet local specifications and Buy American/ARRA requirements. Custom colors and factory installed options meet needs in virtually every application.



Power Mod

Introduction to Basic Features

Siemens Modular Metering includes an assortment of module types that can be configured to meet a wide range of residential and commercial group metering applications.

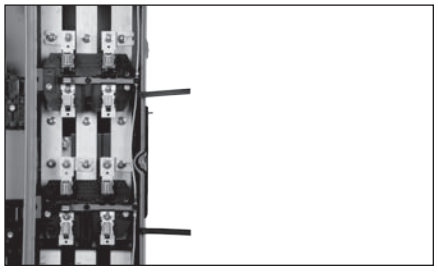
Siemens modular metering provides for single phase, three wire, 120/240V AC; three phase, four wire 120/208Y applications, and three phase in/out, 240 Volt max delta systems. The cross bus that connects devices is aluminum and has a 1200 Amp continuous current rating.

A typical application requires a main device module and one or more residential or commercial meter stacks. Depending on the application additional modules such as pullbox, tap box, or a spacer may be required.



QuickConnect™

The time-saving QuickConnect™ (QC) provides a single connection for phase, neutral, and ground – all tightened by a single nut that is externally accessible. Beveled edges on the QC allow for easy positioning of the joint. Factory installed QuickBolt™ spring loaded bolts are located just above and below the QC opening to compress the surrounding gaskets together to form a water-tight seal. For extra stability additional nuts and bolts above and below QuickBolts are included as a means of physically joining the meter stacks together both above and below the QC opening.



Bus Construction

Unmetered bus is surrounded by a barrier and all inaccessible bus connections are welded for maximum strength. All other connections- QuickConnect™ and meter socket connections, are bolted and accessible.



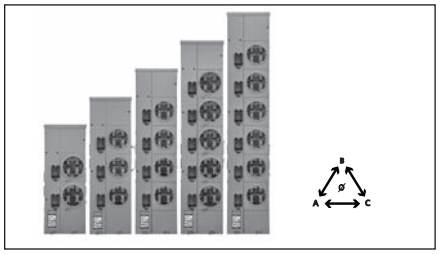
Neutral & Ground Provisions

WMM Module Neutral & Ground Provisions are located on the bottom end of the meter modules. All grounds and neutrals may be relocated to the top of the enclosure if a top-exit is needed. Each meter module has halfshears to help locate a field-cut knockout if a top exit is preferred



Tenant Breaker Provisions

Each 225 Amp meter socket has a provision for a 2-pole 225A max plug-in type QS circuit breaker. The compact QS breaker fits in two inches and reduces enclosure size limited total mounting space required. Single right hand bend wiring saves time and wire. Insert a 125A QP into a 225 Amp QS slot without conversion kits or filler plates. Generous gutter space allows for wiring for top, bottom, or back of the meter module. Each meter cover is embossed to provide a location for the unit (apartment) number.



WMM Module factory phasing is as follows:

2 Gang: AB, BC

3 Gang: AB, BC, CA

4 Gang: AB, BC, CA, AB

5 Gang: AB, BC, CA, AB, BC

6 Gang: AB, BC, CA, AB, BC, CA

Any position can be adjusted to any phase.

Power Mod

Overview of Families



WB – Standard Circuit Breaker Mains

Standard breaker modules (type WB) offer a balance between functionality, feature, and size constraints.

Features include:

- QuickSystem™ features
- Compression lug landing pads (field install up to 1200 Amps, standard feature up to 2000 Amps)
- Combination overhead and underground feed up to1200 Amps, dedicated overhead or under ground feed up to 2000 Amps
- 750kcmil AL wire options
- 65K AIC standard, 100K AIC available for all models
- Removable blank bottom endwall
- Externally accessible breaker handle with padlock capability
- Broad ampacity ratings up to 2000 Amps with non-standard amperages available (such as 700, 900, etc.)
- Field installable shunt trips

Standard Circuit Breaker Mains quick reference

- 200-2000A
- 1200A thru-bus rating
- UL Standard # 67
- UL file # E27100
- AIC rating (65k & 100k)
- Voltage:
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint



WEB – Circuit Breaker-Pullbox Combinations

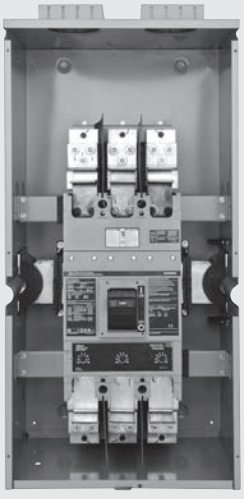
EUSERC - compliant breaker - pullbox combination modules (type WEB) offer EUSERC compatibility, a wider range of lug options, and extra space for pulling in conductors.

Features include:

- QuickSystem™ features
- Factory installed NEMA II studs
- 750 kcmil AL wire options
- 65K AIC standard, 100K AIC available for all models
- Removable blank bottom endwall
- Externally accessible breaker handle with padlock capability
- Field installable shunt trips
- Large removable ground wire trough with generous space for grounding conductors

Circuit Breaker-Pullbox Combinations quick reference

- 200-1200A
- 1200A thru-bus
- UL standard # 67
- UL file # E27100
- AIC rating (65k & 100k)
- Voltage
  - Single phase 120/240V AC Max
  - Three phase 240V AC Max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- EUSERC drawing number 347



WXB – main breaker devices utilizing an incoming bus connection

The WXB family of main breaker devices features incoming and out-going thru bus connections (no incoming lugs). This patented design allows the user to utilize the WXB family to connect to Siemens Sentron Busway or connect to a tap box (or other main) to lower the overall ampacity of the service disconnect. In addition users can now utilize incoming tap boxes to split the service between multiple mains. This can save the end-user on the material cost of the meter bank. Please see the applications pages for more information.

Features include:

- QuickSystem™ features
- Incoming & Outgoing Power Mod thru bus
- 65K AIC standard, 100K AIC available for all models
- Broad ampacity ratings up to 1200 amps with non-standard amperages available (such as 700, 900, etc…)
- Field installable shunt trip

Cross Bus Mains quick reference

- 400-1200A
- 1200A thru-bus rating
- UL Standard #67
- UL file # E27100
- AIC rating (65k & 100k)
- Voltage:
  - Single phase 120/240V AC max
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R (outdoor)
- G90 Galvanized Steel
- ANSI 61 Paint

Power Mod

Overview of Families



WS – Standard Switch Mains

Standard switch modules (type WS) are designed for flexibility, space savings, & durability.

Features include:

- QuickSystem™ features
- Standard compression lug capability
- Invertibility: 400-800 Amp devices can be rotated to accommodate the desired incoming feed direction
- 750 kcmil AL wire options for most models
- 100K AIC standard for all models
- Class T fuse provisions
- Front mounted handle - removes the need for spacers on the side
- Broad ampacity ratings up to 1200 Amps

Standard Switch Mains quick reference

- 400-1200A
- 1200A thru-bus
- UL Standard # 98
- UL file #E25506
- AIC rating (100k AIC)
- Voltage:
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint



WES – Switch-Pullbox Combinations

EUSERC - compliant switch-pullbox combination modules (type WES) offer EUSERC compatibility, a wider range of lug options, and extra space for pulling in conductors.

Features include:

- QuickSystem™ features
- Factory installed NEMA II studs
- Broad ampacity ratings up to 1200 Amps
- 750kcmil AL wire options
- 100K AIC standard for all models
- Removable blank bottom endwall
- Front mounted handle - removes the need for spacers on the side
- Class T fuse provisions
- Large removable ground wire trough with generous space for grounding conductors
- Extra ground lugs in each device

Switch-Pullbox Combinations quick reference

- 400-1200A
- 1200A thru-bus
- UL standard # 98
- UL file # E25506
- AIC Rating (100k AIC)
- Voltage:
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- EUSERC drawing numbers 315, 343, and 347

MS_UBD- standardized busway connections for Power Mod switch modules

The MS_UBD family of switches offers a standardized means of connecting Siemens Sentron busway to Power Mod for mid & high-rise applications. The switch features two sets of thru bus (top and bottom) that allows the user to connect Siemens Sentron Busway (on the top) while the switch powers the Power Mod thru bus (connected on the bottom). The Sentron Busway is connected via the TapStack which converts Sentron busway connections over to Power Mod thru bus connections. This enables the user to connect to Power Mod in as little as 9" of wall space.

Features include:

- Fast connection of end-feed busway to Power Mod meter banks
- Class T fuse provisions
- 100K AIC standard for all models

Pull Box quick reference

- 400,600,800 Amp
- 1200 Amp thru-bus rating
- UL Standard #98
- UL file # E25506
- AIC rating: 100K
- Voltage
  - Single phase 120/240V AC max
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 1 construction, G90 Galvanized Steel with ANSI 61 Paint

Power Mod

Overview of Families



WTB - Standard Tapboxes
Standard tapbox modules (type WTB) are designed for versatility, space savings, and flexibility.

Features include:
- QuickSystem™ features
- Standard compression lug capability
- Invertibility: devices can be rotated to accommodate the desired incoming feed direction
- 750 kcmil AL wire options for most models
- 100K AIC standard for all models
- Broad ampacity ratings from 400 to 2400 Amps
- Line and load capability- service entrance and sub-feed rated

Standard Tapbox quick reference
- 400-2400A
- 1200A thru-bus rating
- UL Standard # 67
- UL file # E27100
- AIC rating (100K AIC)
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint

Restrictions for 1600-2400amp type WTB Power Mod Tap Boxes:

When the 1600, 2000, or 2400amp tap boxes are used as service entrance equipment (fed directly from utility transformer) or when the supply originates from a Class L fuse or Siemens WL circuit breaker there are restrictions on the use of an additional down-stream (thru-bus connected) WTBN, WTB, WET, or WT type Power Mod tap boxes. In these instances a type "WXB" module must be used as protection for the down- stream tap box. box (placed between the incoming WTB tap box and the downstream outgoing tap box). See page 2-69 for an example. This restriction does NOT apply if the tap box is fed from a Siemens Sentron or VL series molded case circuit breaker. Note that the maximum amperage for a Siemens Sentron circuit breaker is 2,000amps.



WET - Tapbox - Pullbox Combinations
EUSERC - compliant Tapbox-Pullbox Combination modules (type WET) offer EUSERC compatibility, a wider range of lug options, and extra space for pulling in conductors.

Features include:
- QuickSystem™ features
- Standard compression lug capability
- 750 kcmil AL wire options for most models
- 100K AIC standard for all models
- Broad ampacity ratings from 400 to 1200 Amps
- Removable bottom endwall

Tapbox- Pullbox Combination quick reference
- 400-1200A
- 1200 Amp thru-bus rating
- UL Standard #'s 67
- UL file # E27100
- AIC Rating (100k)
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61paint
- EUSERC drawing numbers 343, 343A, 347 (Pullbox)



WT - Feed Thru Tapbox
Feed-thru tap boxes (type WT) offer the ability to pull conductors in and out of the enclosure for riser cable or loop feed applications.

Features include:
- QuickSystem™ features
- Standard compression lug capability
- 750kcmil Al wire options
- 100k AIC standard
- Removable bottom endwall
- Broad ampacity ratings from 400 to 2400 Amps

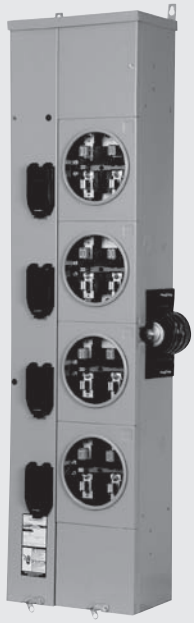
Feed Thru Tapbox quick reference
- 400-2400A
- 1200A thru bus
- UL Standard #67
- UL file no. E27100
- AIC rating (100k AIC)
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 stainless steel
- ANSI 61 paint

Restrictions for 1600-2400amp type WT Power Mod Pull-Thru Tap Boxes:

When the 1600, 2000, or 2400amp tap boxes are used as service entrance equipment (fed directly from utility transformer) or when the supply originates from a Class L fuse there are restrictions on the use of an additional down-stream (thru-bus connected) WTBN, WTB, WET, or WT type Power Mod tap boxes. In these instances a type "WXB" module must be used as protection for the downstream tap box (placed between the incoming WT tap box and the downstream outgoing tap box). See page 2-70 for an example. This restriction does NOT apply if the tap box is fed from a Siemens Sentron or VL series molded case circuit breaker. Note that the maximum amperage for a Siemens Sentron circuit breaker is 2,000amps. Please note that Siemens type WL circuit breakers can NOT be used to feed WT Power Mod tap boxes.

Power Mod

Overview of Families



WMM – Residential Meter Stacks

Power Mod's core offering of Residential Meter Stacks, type WMM, offers the widest product offering and flexibility in the industry. Each meter stack houses the QuickSystem™ features to maximize productivity and minimize labor costs. To aid in productivity and labor cost reductions our 225 Amp meter stacks feature a new breaker - the "QS". The QS breaker adds to the Siemens exclusive feature set on our new 225 Amp Residential Meter Stacks.

Benefits of the "QS" include:

- An exclusive 6 high 225 Amp meter stack at the same height as our 125 Amp meter stack - 225 to 125 conversion: No conversion kit needed.
- Single right hand bend wiring - saves time and wire
- 100K AIC offered from 100 up to 225 Amps

Siemens Residential Meter Stacks are packed with features inside and out: our exclusive knock out plate offers flexibility when pulling wires to the stack, new breaker supports keep breakers level and straight, moveable neutrals and grounds to save wire, and all of the QuickSystem features all designed with the contractor in mind.

Residential Meter Stacks quick reference

- 2-6 gang
- 125/225 Amp per position
- 1200 Amp thru-bus rating
- UL Standard #67 & #414
- UL file no. E27100
- AIC rating (65k & 100k)
- Voltage:
  - Single phase 120/240V AC max.
  - Three phase in single phase out
    - 120/208V AC max.
    - 240/120V AC max.
- All swing latches and rivets are stainless steel.
- Outdoor= NEMA 3R rated
- Indoor= NEMA 1 rated
- G90 galvanized steel
- ANSI 61 paint



WML – Lever Bypass Meter Stacks

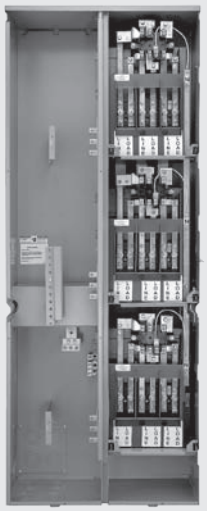
Commercial Lever Bypass meter stacks (type WML) are designed to meet the requirements of those utilities specifying lever bypass meter sockets for residential and commercial applications.

Features include:

- QuickSystem™ features
- High-quality, time-proven Talon HQ sockets
- A line of 3-phase 100 Amp meter stacks to minimize tenant main cost
- Removable back knockout plate to facilitate wiring
- 225 Amp capability in single and three phase designs
- Up to 4 positions with 225 Amp tenant mains, up to 2 positions with 400 Amp tenant mains
- Ease of wiring – tenant mains require only a single bend

Lever Bypass quick reference

- 100A/225A 1-4 position
- 400A 1-2 position
- 1200A thru-bus rating
- UL Standard # UL67
- UL file # E27100
- AIC rating (25K, 65K & 100K)
- Voltage
  - Single phase 120/240V AC max
  - Three in single phase out 208Y/120V AC
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel.
- Outdoor = NEMA 3R rated
- Indoor = NEMA 1 rated
- G90 Galvanized Steel
- ANSI 61 Paint



WMT – Test Block Bypass Meter Stacks

Commercial Test Block Bypass Meter Stacks (type WMT) are designed to meet the requirements of those utilities specifying test block bypass meter sockets for commercial applications in areas subscribing to the EUSERC standards.

Features include:

- QuickSystem™ features
- High-quality, time-proven Siemens SMM switchboard meter socket
- Removable back knockout plate to facilitate wiring
- 225 Amp capability in single and three phase designs
- Up to 3 positions with 225 Amp tenant mains
- Wiring flexibility - tenant mains require only a single bend
- Three phase input, single phase output modules
- In line wiring: side knockouts allow wiring for adjacent units to pass through

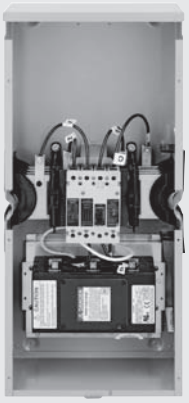
Test Block Bypass quick reference

- 225A 1-3 positions
- 1200A thru-bus rating
- UL Standard #'s 67
- UL file # E27100
- AIC Rating (100k)
- Voltage
  - Single phase 120/240V AC max
  - 3 phase in single phase out 120Y/208V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- Outdoor= NEMA 3R rated
- Indoor= NEMA 1 rated
- G90 galvanized steel
- ANSI 61 paint
- EUSERC drawing numbers 312 and 353

• Revised •
06/01/13

Power Mod

Overview of Families



WSPD – Integral surge protection device for multi-family applications

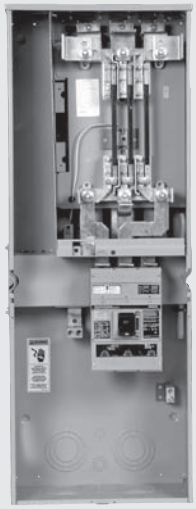
Surge protection modules for Power Mod (type WSPD) are thru-bus connected modules that allow the user to view surge status as well as access the SPD control panel without breaking the utility seal on the enclosure. An optional breaker disconnect is available to enable the end user to replace the SPD (surge protection device) without having to disconnect utility power to the Power Mod installation.

Features include:

- QuickSystem™ features
- 100,200,300,400,500kA ratings available
- External, vandal resistant & lockable clear cover over SPD control panel
- Single phase thru bus and three phase thru bus
- Optional breaker disconnect that opens phase & neutral to make SPD replacement quick and easy

Surge Module quick reference

- 100-500kA ratings available
- 1200A thru-bus rating
- UL Standard #67
- UL file # E27100
- AIC rating: 100K
- Voltage
  - Single phase 120/240V AC max
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint



WMK – K-Base Meter Stacks

Commercial K-Base Meter Stacks (type WMK) are designed to meet the requirements of those utilities specifying bolt-in meter sockets for 400 and 600 Amp residential and commercial applications.

Features include:

- QuickSystem™ features
- Exclusive Talon K4, K5, & K7 meter sockets
- 1 position K4, K5, K7 modules with 400 & 600 Amp tenant mains
- 2 position K7 module with 400 Amp tenant main
- Space saving design

K-Base quick reference

- 400A & 600A 1-2 positions
- 1200A Thru bus-rating
- UL Standard # 67
- UL file # E27100
- AIC Rating (25k)
- Voltage
  - Single Phase 120/240V AC Max
  - Three In Single Phase Out 208Y/120V AC
  - Three Phase 240V AC Max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint



WMMB – auxillary pull boxes for use with WB, WTB, and WS Power Mod modules

Auxillary pull boxes are used in cases where WEB, WES, or WET modules were not or cannot be used, but the user still needs to comply with the EUSERC standard. These modules feature incoming NEMA II stud pattern lugs for underground feed and allow the user to pull wire from the lug landing in the pull box thru a 6" knockout and into: 400-1200amp WB, WTB and 400-800amp WS modules. Note this family does NOT have any thru bus.

Features include:

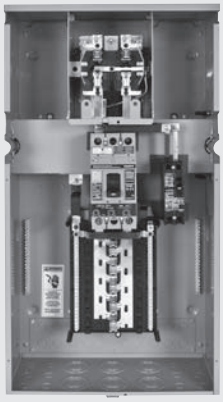
- 6" side opening (right or left) with available gasket to help mitigate wire insulation damage
- EUSERC compliant incoming pull section
- Dual cover handles
- Single and three phase models

Pull Box quick reference

- 400, 800,1200 Amp
- UL Standard #67
- UL file # E27100
- AIC rating: 100K
- Voltage
  - Single phse 120/240V AC max
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint

Power Mod

Overview of Families

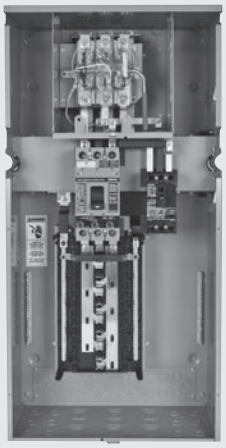


WC – Residential meter socket with load center distribution panel

The meter-load center combination offered by the WC series is unique and exclusive to the Siemens Power Mod family. This product offers the ability to combine house power applications with a meter socket thereby reducing material (pipe and wire) and installation time (separate load center or panel board).

Features include:
- QuickSystem™ features
- Ring or ringless style covers. Ringless available with horn bypass
- Single phase thru bus and three phase thru bus
- 20 space - 40 circuit interior for single phase out put devices
- 24 space - 42 circuit interior for three phase out put devices
- Copper bus PL Series Siemens load center interior
- Dual neutral & ground provisions with Siemens patented Instawire technology
- Optional subfeed breaker for elevator applications
- 250 Amp overall device rating

WC House Power Panel quick reference:
- 250 Amp, 1 position
- 1200 Amp thru-bus rating
- UL Standard #67
- UL Standard #414
- UL file # E27100
- AIC rating: 100K
- Voltage
  - Single phase 120/240V AC max
  - Three in single phase out 208Y120V AC
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint
- Copper load center bus bars
- 125Amp MAX subfeed breaker- factory installed (type HED4)
- 225Amp MAX main breaker- factory installed (type HFD6)

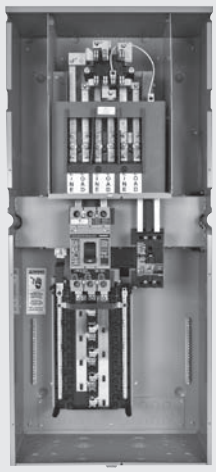


WCL – Commercial Lever Bypass meter socket with load center distribution panel

The meter-load center combination offered by the WCL series is unique and exclusive to the Siemens Power Mod family. This product offers the ability to combine house power applications with a meter socket thereby reducing material (pipe and wire) and installation time (separate load center or panel board). WCL modules feature the Talon HQ lever bypass for those utilities that specify lever bypass for residential and commercial applications.

Features include:
- QuickSystem™ features
- Ringless style covers with high-quality, time-proven Talon HQ meter socket
- Single phase thru bus and three phase thru bus
- 20 space - 40 circuit interior for single phase out put devices
- 24 space - 42 circuit interior for three phase out put devices
- Copper bus PL Series Siemens load center interior
- Dual neutral & ground provisions with Siemens patented Instawire technology
- Optional subfeed breaker for elevator applications
- 250 Amp overall device rating

WCL House Power Panel quick reference:
- 250 Amp, 1 position
- 1200A thru-bus rating
- UL Standard #67
- UL Standard #414
- UL file # E27100
- AIC rating: 100K
- Voltage
  - Single phase 120/240V AC max
  - Three in single phase out 208Y120V AC
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint
- Copper load center bus bars
- 125Amp MAX subfeed breaker- factory installed (type HED4)
- 225Amp MAX main breaker- factory installed (type HFD6)



WCT – Commercial Test Block Bypass meter socket with load center distribution panel

The meter-load center combination offered by the WCT series is unique and exclusive to the Siemens Power Mod family. This product offers the ability to combine house power applications with a meter socket thereby reducing material (pipe and wire) and installation time (separate load center or panel board). WCT modules feature a test block bypass socket for utilities subscribing to the EUSERC standard.

Features include:
- QuickSystem™ features
- Ring style covers with high-quality, time-proven Siemens SMM switchboard meter socket
- Single phase thru bus and three phase thru bus
- 20 space - 40 circuit interior for single phase out put devices
- 24 space - 42 circuit interior for three phase out put devices
- Copper bus PL Series Siemens load center interior
- Dual neutral & ground provisions with Siemens patented Instawire technology
- Optional subfeed breaker for elevator applications
- 250amp overall device rating

WCT House Power Panel quick reference:
- 250 Amp, 1 position
- 1200 Amp thru-bus rating
- UL Standard #67
- UL Standard #414
- UL file # E27100
- AIC rating: 100K
- Voltage
  - Single phase 120/240V AC max
  - Three in single phase out 208Y120V AC
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint
- Copper load center bus bars
- 125Amp MAX subfeed breaker- factory installed (type HED4)
- 225Amp MAX main breaker- factory installed (type HFD6)

Power Mod

Introduction: Configuration Tips

The breadth of the Power Mod product line is un-matched in the industry today. The available options result in many different ways to configure the same project with some solutions focusing on material cost and other solutions that create the opportunity for labor savings. The following pages contain examples and tips for using Power Mod in common multi-family metering applications including, but not limited to high rise buildings, mixed use, and garden style apartment complexes.

The following items are configuration tips and rules to keep in mind:

Ampacity & Bussing

Configurations are limited by the continuous current ratings for the main device (service entrance) and the thru bus. The Power Mod thru bus is always rated for 1200amps from the factory. Siemens does not offer low 800amp rated thru bus. All thru bus within the same meter bank must be single phase or three phase. Single and three phase thru bus cannot be mixed within the same meter bank.

Connections

A QuickConnect is required for each thru bus connection and is supplied with all WMM, WML, WMT, WC, WCL, WCT, WSPD, and WMK meter stacks. The QuickConnect houses all phase, neutral, ground/bonding connections between Power Mod modules.

Utility Requirements

Utilities have varying requirements for equipment height, cover types, and bypass types. Therefore, utility acceptance should be verified prior to installation of any equipment. The COMPAS configuration tool can be utilized by any authorized Siemens sales or distributor representative to show critical dimensions of any installation.

Service Entrance Modules & Requirements

- Modules over 1200amps: Mains over 1200amps are required to be center fed (IE main must have a module on both sides). The current out of any given side cannot exceed 1200amps. For a 2000amp WB style main, for example, the user can elect to feed 1200amps out of the right or left, but not both.
- EUSERC-compliant service entrance modules (families WEB, WES, WET) are underground feed only and offer a wider range of lug options due to the larger enclosure size. These devices are also setup for compression lug installations from the factory.
- Tapboxes (families WTB, WT, WET) provide a direct connection to the thru bus and do not provide any overcurrent protection. These families should never be used to feed other main devices that have incoming lugs (families WB, WEB, WS, WES). A tapbox CAN be used with the WXB cross bus main family. All tapbox families can be used as a service entrance point or a load side feed for remote equipment. An additional QuickConnect must be ordered separately when using a tap box on the load side. The WTB family features invertibility on 400–1600amp models. Each item from this family includes two sets of QuickBolts. The eventual left side must be removed prior to installation.
- WB service entrance breaker modules: 200 thru 1200amp modules are combination feed allowing service entrance conductors to enter the top or bottom of the enclosure. 1400-1600amp WB modules come in top or bottom feed (combination feed is not available). 2000amp WB modules are available in dedicated bottom feed or combination feed configurations.
- WS service entrance switch modules: 400 to 800amp modules are invertible for top or bottom feed. Each includes two sets of QuickBolts. The eventual left side must be removed prior to installation. 1200amp WS modules are bottom feed only and utilize a molded case switch (looks like a breaker) for the switching mechanism.

Spacing Requirements

A spacer is commonly required between a meter stack and a service entrance module. This is usually due to the need to have a minimum distance (left or right) from the meter to any obstruction. TIP: when the service entrance main is on the LEFT and you need a 125amp tenant main WMM stack use a 225amp WMM meter stack instead. The extra width of the 225amp stack will provide 10" of clearance from the main and, since you can use a standard Q2100 or Q2125 in the stack, the cost increase from 125 to 225amp is still less than adding a spacer (type WSP). This also saves the installation labor of the spacer.

Breaker Provisions

A tenant breaker must be ordered separately for each tenant position or configured as factory installed within the COMPAS configuration tool. Blank filler plates are not available thus un-used positions must have a breaker installed or the access cover must be locked.

Space Savings

Utilize the WC-WCL-WCT families to save space. These devices allow for consolidating the typical setup of a meter stack + separate panel into a single device if the application. This allows for less wall space, increased material savings, and a lower install cost. Please see the configurations on the following pages for examples.

Material Savings

utilize the WXB cross bus mains to lower your overall material cost. When a large ampacity main is needed (1200amps or above) utilizing a tap box and a WXB main can lower the overall cost by eliminating costly large frame breakers from the installation. As shown in figures 3 & 4 the installation does require more wall space, but the overall dollars are lower.

Power Mod

Applications: Typical Congurations

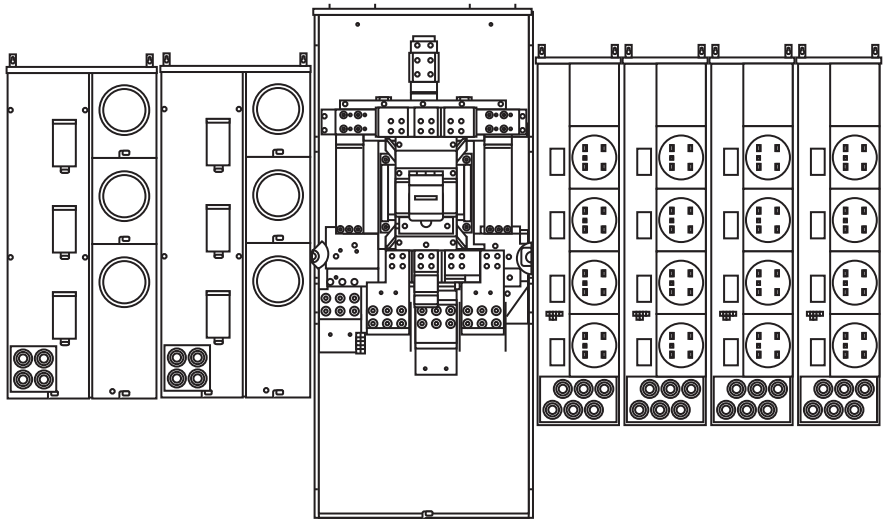


Figure 1
Incoming Service: 1600amps
Details: This installation requires a center fed main because the incoming service is over the thru bus rating of 1200amps.

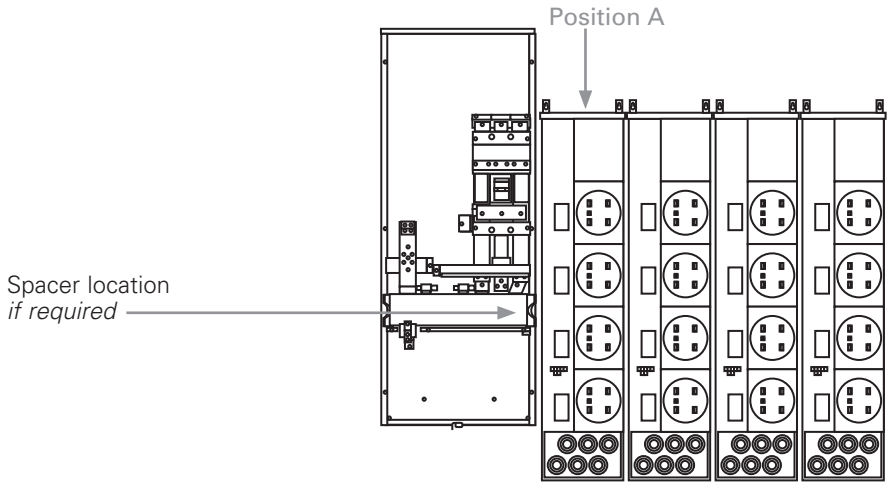


Figure 2
Incoming Service: 1200amps
Details: This installation is shown as end feed from the left, but could be right or center fed as well since the main service does not exceed 1200amps. In this case if a spacer (family WSP) were required it would go between the WB module and the WMM stack labeled "Position A". Another option would be to utilize a 225amp WMM stack in position A thereby eliminating the need for the spacer and lowering the overall cost.

Power Mod

Applications: WXB Family of Cross Bus Mains

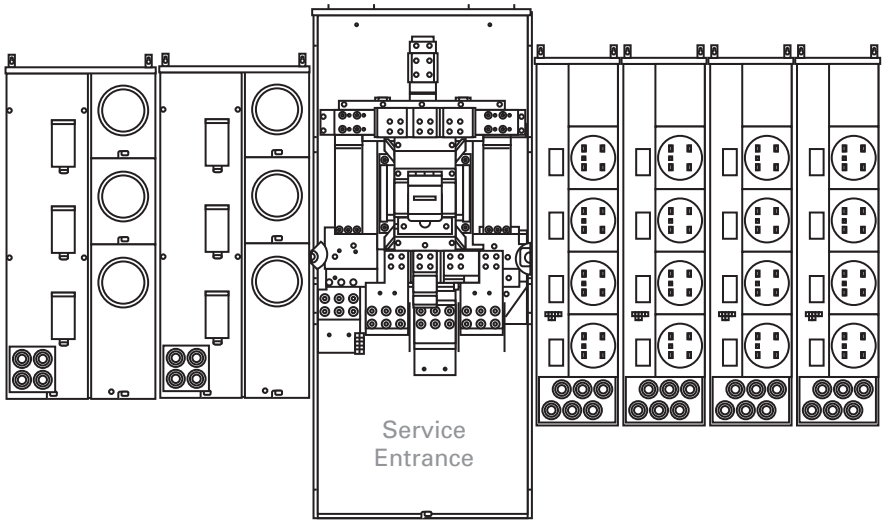


Figure 3
Incoming Service: 1600amps
Details: The installation above has a 1600amp 3 phase WB main (WB31600B) which is feeding WML321225RJ stacks to the left and WMM42125RJ stacks to the right. Overall it has a width of 130.7" and has a list price of $15,366.①

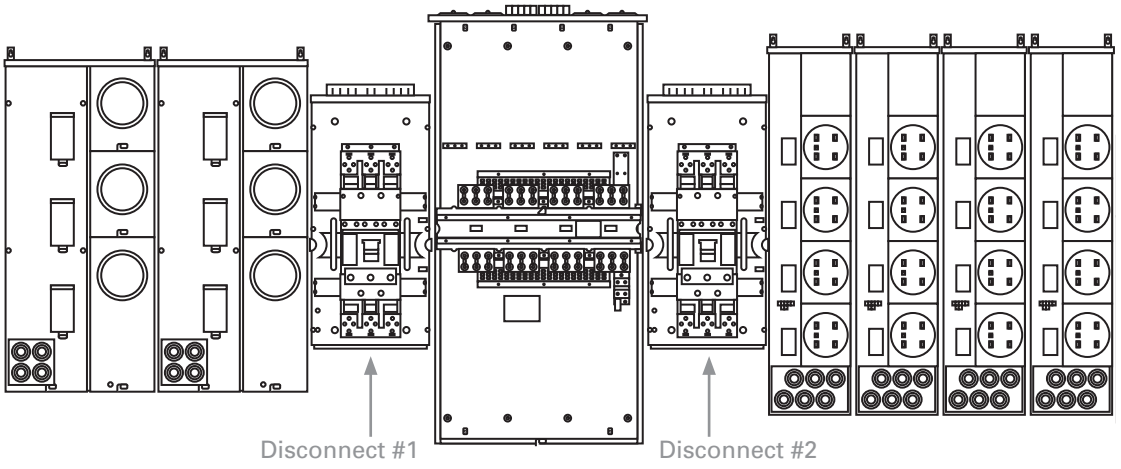


Figure 4
Incoming Service: 1600amps
Details: This installation can meet the same application as Figure 3 above, but replaces the 1600amp WB main with a tap box (WT31600PU in this case). The service disconnects are labeled #1 and #2 above. By dividing the incoming current into 2 mains- even though more modules were added- the overall list price DROPS to $13,982. Width grows by 31", BUT there is now a 9% savings on material! ①

① Pricing subject to change without notice.

Power Mod

Applications: WXB Family of Cross Bus Mains

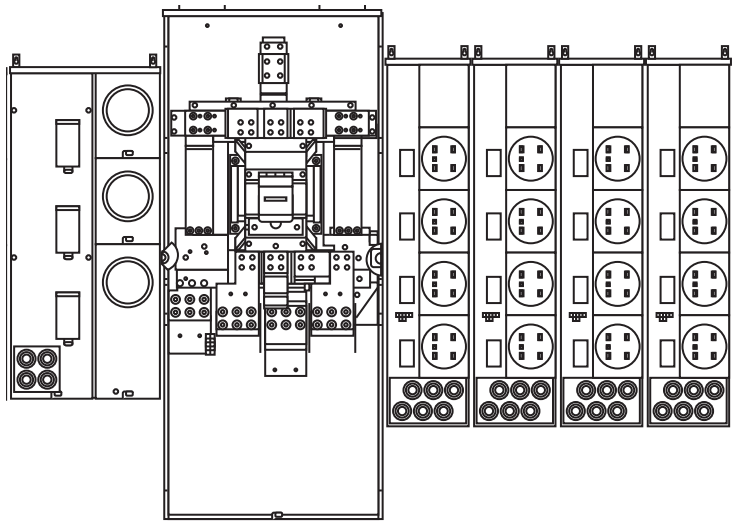


Figure 5
Incoming Service: 1600amps
Details: The installation above has a 1600amp 3 phase WB main (WB31600B) which is feeding a WML321225RJ stack to the left and WMM42125RJ stacks to the right.

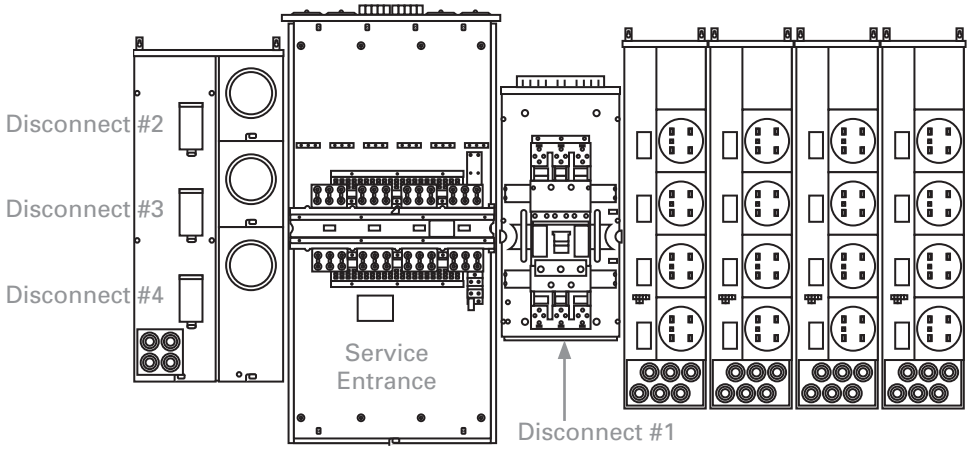


Figure 6
Incoming Service: 1600amps
Details: This installation can meet the same application as Figure 5 above, but replaces the 1600amp WB main with a tap box (WT31600PU in this case). The right side utilizes the new WXB31200N cross bus main. The left side works off of the six disconnect rule. In removing the 1600amp WB and adding the WXB the width grew by 8", but the list price drops by over 20% offering a tremendous savings on material. Another option would be to utilize a WB main breaker to feed a remotely mounted CT cabinet. The overall application remains the same- taking the large 1600amp incoming service and splitting it between 2 main disconnects.

Power Mod

Applications: WC-WCT-WCL House Power Modules

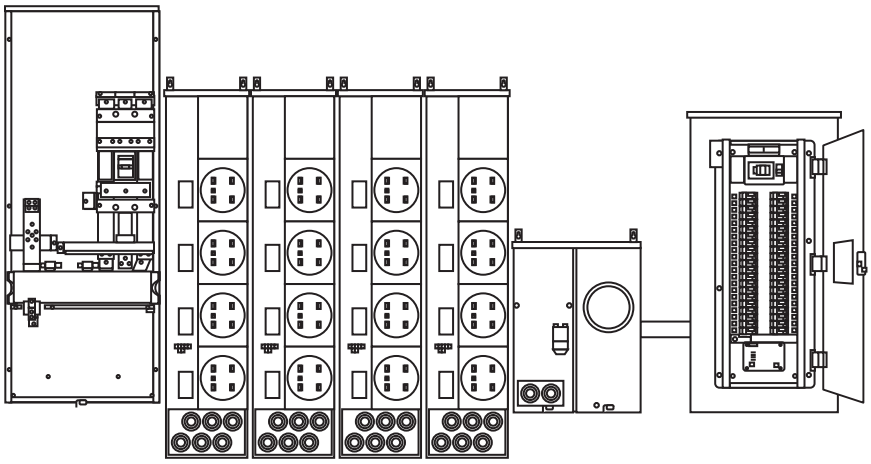


Figure 7
Incoming Service: 1200amps
Details: The installation above has a has a 1200amp 3 phase WB main (WB31200C) feeding WMM residential stacks and a WML13225RJ (1) position commercial meter stack. The WML is feeding a P1 lighting panel approximately 2' away. The P1 is the house power panel.

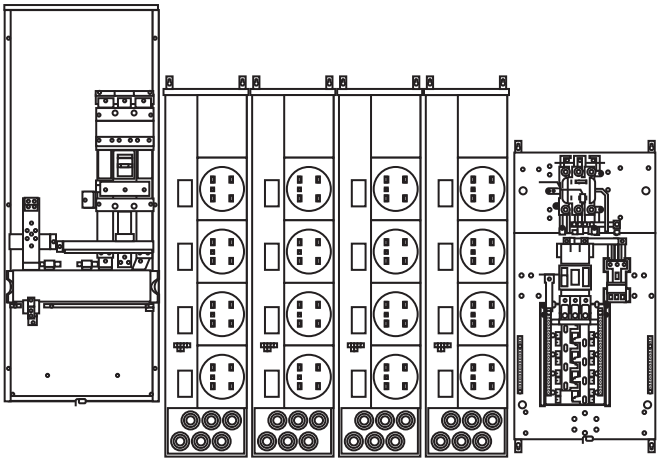


Figure 8
Incoming Service: 1200amps
Details: This is the same application as figure 7 shown above, however the WCL house power module now takes the place of both the WML and the P1. The WCL is rated for up to 250amps and can accommodate 40 circuits + 1 subfeed breaker of up to 125amps. The WCL, in this application, saves over 4 FEET of wallspace plus lowers the material cost for the application by 15%! The WCL in this case could also be a WCT or WC. This application simplifies smaller house power needs such as parking lot lighting, common area lighting, or club houses.

Power Mod

Applications: Bus Duct Connections

Busway application

Siemens Power Mod offers an efficient and standardized means of connecting Sentron Busway to Power Mod utilizing the TapStack module. This module connects to a joint in the busway and converts the bus structure over to that of the Power Mod thru bus in only nine inches.

TapStacks are configured, priced, built, and shipped with the Sentron Busway. They require an additional QuickConnect coupler and are for indoor use on end-feed applications. TapStacks can connect to any Power Mod thru bus. Options for the user are:

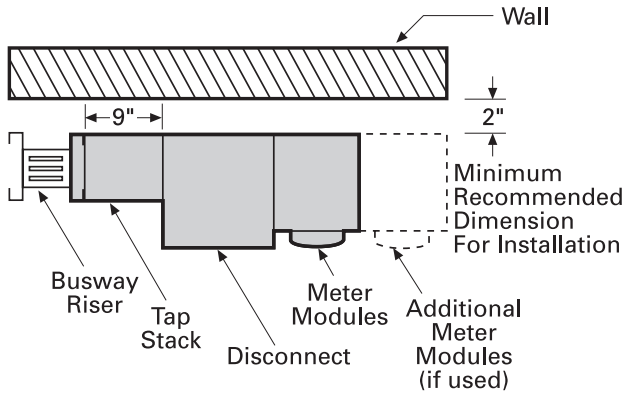
Direct Connection: in this option (below) the connection is made directly to any meter stack family. This application is for use when the service disconnect is located at the beginning of the busway.

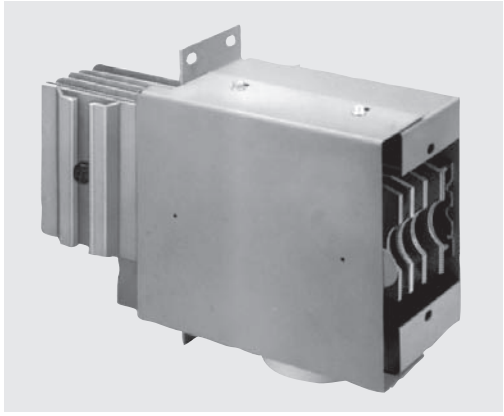
Connection to a service disconnect: in this option (see figure 9) a connection is made to either a WXB cross bus main or a MS_UBD switch main. Please note that ANY other mains (WB, WEB, WS, WES) cannot act as a service disconnect for downstream meter stacks. The WB, WEB, WS, WES mains CAN be used as tenant mains on the load-side of a service disconnect for use in feeding large remote loads such as a CT cabinet. WXB mains are available up to 1200amps and MS_UBD mains are available up to 800amps. Both families have 100K AIC options.

Connection to a load-side main: In applications where branch circuit monitoring is used in lieu of Power Mod a tap stack plus Power Mod main (WB, WS) can be used where the installer cables out of the main over to a distribution panel (Siemens P3, P4, and P5 panel types). This essentially replaces a bus plug function. See Figure 11.

For Center feed bus duct application please contact your Siemens representative.

Critical & recommended dimensions for Sentron Busway to Power Mod connections





Tap Stack Module

Power Mod

Applications: Bus Duct Solutions

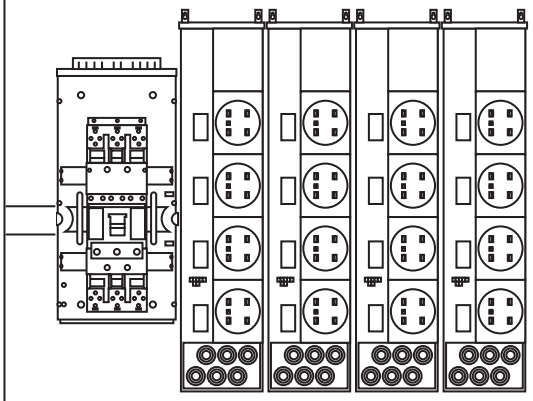


Figure 9
Incoming Service: 1200amps
Details: The drawing to the left shows how a WXB main can be utilized in bus duct applications. Using the Sentron Busway TapStack the contractor can easily bus directly to PowerMod in as little as 9".

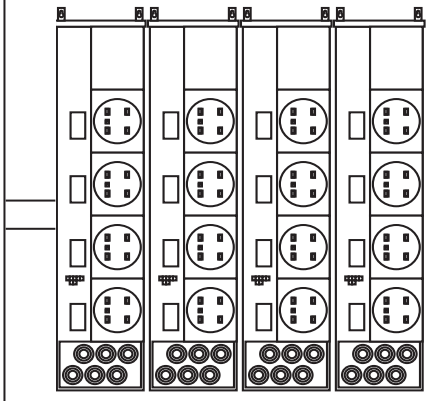


Figure 10
Incoming Service: up to 1200amps
Details: The drawing to the left shows how the Siemens Sentron Busway TapStack can be connected directly to Power Mod WMM stacks when approved by the local inspection authorities.

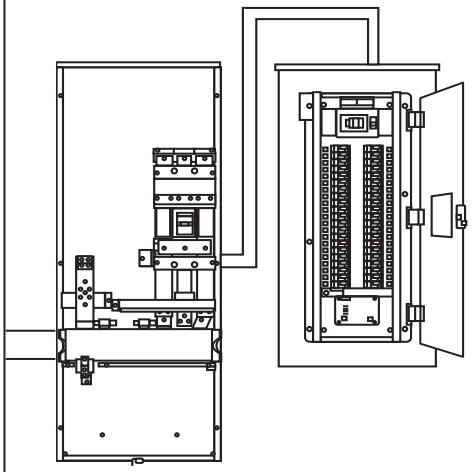
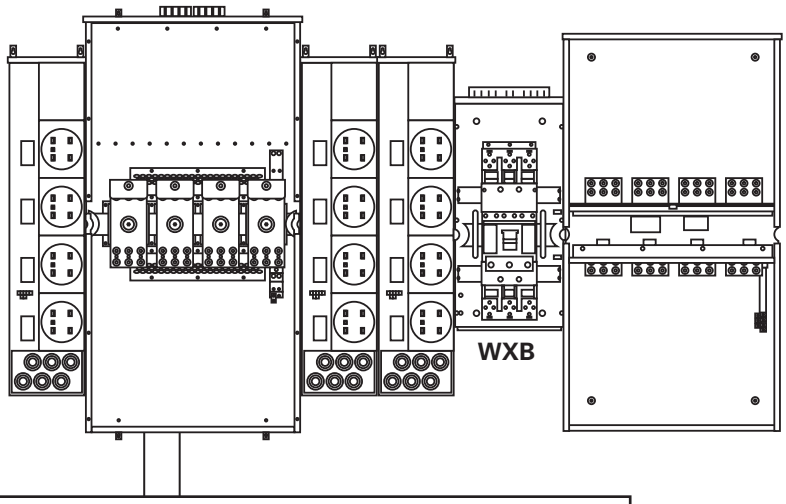


Figure 11
Incoming Service: 1200amps
Details: Some applications require tapping off of the busway to provide power to a panel. In these cases a TapStack and WB Power Mod main can offer a lower cost alternative to busplugs. This allows the user to order riser duct instead of plug-in duct and avoid having to seal un-used openings.

Power Mod

Applications: WTB Tap Boxes 1600-2400 amps (when used with load side tap boxes WT or WTB)

Figure 12

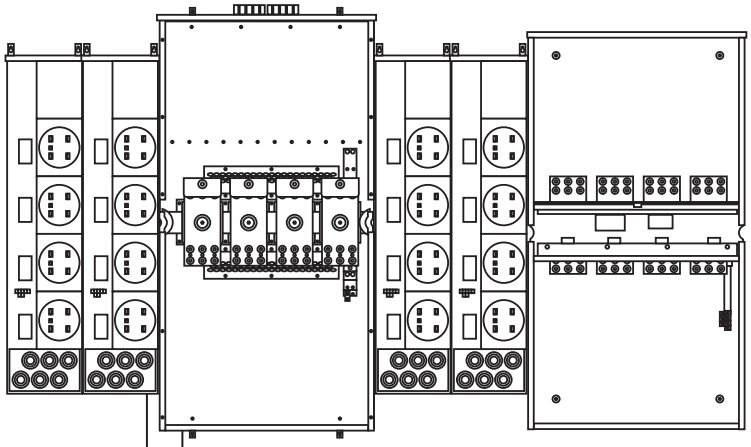


- Siemens Type WL Circuit Breaker
- Class L fuse
- Service Entrance (direct from utility transformer)①

✓

This application shown **IS** allowed because the tap box has circuit protection via the WXB main.

Figure 13



- Siemens Type WL Circuit Breaker
- Class L fuse
- Service Entrance (direct from utility transformer)①

✗

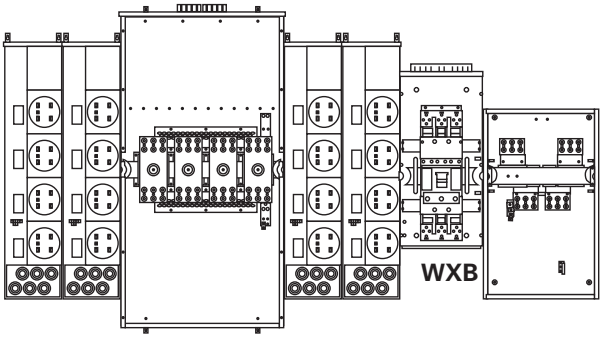
The application shown is **NOT** allowed. A down stream WT or WTB tap box requires circuit protection in the form of a WXB Main.

① **Drawings are for illustrative purposes only.**

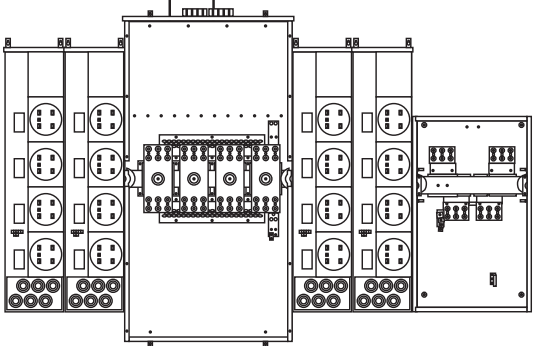
Power Mod

Applications: WT Tap Boxes 1600-2400 amps

Figure 14



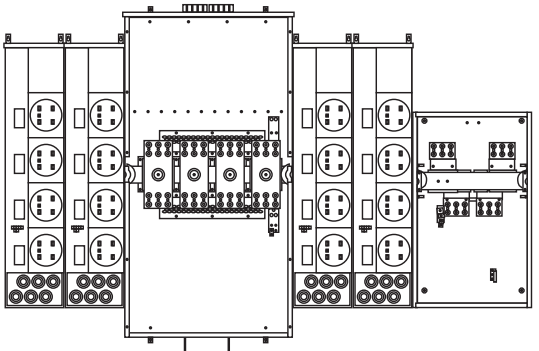
• Siemens Sentron or VL MCCB



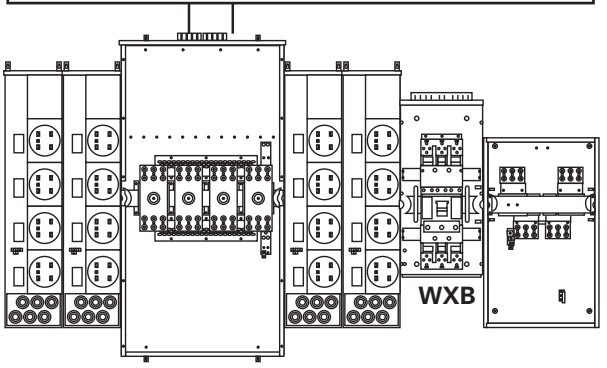
✗ Either of the applications shown are acceptable due to the presence of the VL or Sentron MCBB

Figure 15

✗ The application shown is **NOT** allowed. A down stream WT or WTB tap box requires circuit protection in the form of a WXB Main.

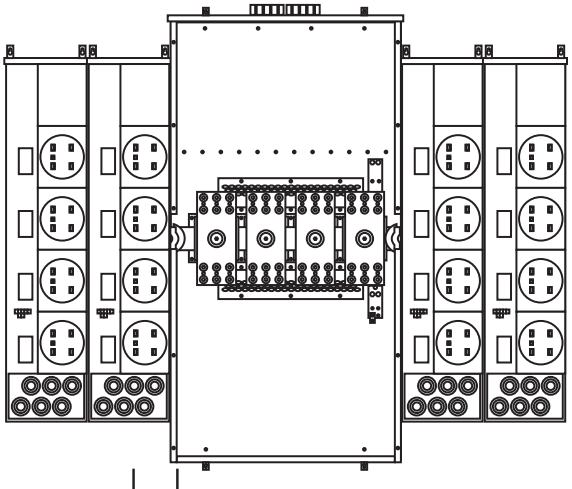


• Class L Fuse



✓ This application shown **IS** allowed because the tap box has circuit protection via the WXB main.

Figure 16



• Service Entrance (direct from utility transformer)①
• Siemens Type WL circuit breaker

✗ A type WL circuit breaker cannot be used to feed a WT series tap box. Additionally WT tap boxes are not rated for service entrance.

⚠ To make this application compliant feed the WT tap box with a class L fuse instead.

① **Drawings are for illustrative purposes only.**

Power Mod

Type WB Standard Circuit Breaker Mains

Standard Circuit Breaker Mains

Standard breaker modules (type WB) offer a balance between functionality, feature, and size constraints.

Features include:

- QuickSystem™ features
- Compression lug landing pads (field install up to 1200 Amps, standard feature up to 2000 Amps)
- Combination overhead and underground feed up to 1200 Amps, dedicated overhead or underground feed up to 2000 Amps
- 750kcmil AL wire options
- 65K AIC standard, 100K AIC available for all models
- Removable blank bottom endwall
- Externally accessible breaker handle with padlock capability
- Broad ampacity ratings up to 2000 Amps with non-standard amperages available (such as 700, 900, etc.)
- Field installable shunt trips

Standard Circuit Breaker Mains Quick Reference

- 200-2000A
- 1200A thru-bus rating
- UL Standard # UL67
- UL file # E27100
- AIC rating (65k & 100k)
- Voltage:
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- Custom options now available!
- G90 galvanized steel
- ANSI 61 paint
- Custom options available! Details on page 2-141.



Power Mod

Type WB Standard Circuit Breaker Mains

Factory installed lugs are standard on 200-1200A standard breaker main modules. Additional lug kit options are available for 750 conductor size. Refer to pages 2-139–2-140 for lug kit options on 200-1200A standard main breakers. In addition, a field installable compression lug landing pad is also available. Refer to pages 2-139–2-140 & 2-168 for lug landing pad options. NEMA II Stud Pattern compression lugs must be installed by user or utility.

Lugs are NOT included on 1400A-2000A standard breaker main modules and must be ordered separately. Refer to page 2-139–2-140 for lug size options.



Circuit breaker service entrance modules: 1-phase, 3-wire SN, 120/240V AC

Catalog number (65k AIC)③	Catalog number (100k AIC)②③	Ampere rating	Service feed	Breaker type⑤	Dimensions (inches)①			Factory installed line side connections	Knockout Diagram
					Height	Width	Depth		
WB1200C②	**WB1200CU**	200	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	KB-1
WB1250C②	**WB1250CU**	250	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1300C②	**WB1300CU**	300	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1350C②	**WB1350CU**	350	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1400C	**WB1400CU**	400	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1450C②	**WB1450CU**	450	OH/UG	LXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1500C②	**WB1500CU**	500	OH/UG	LXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1600C	**WB1600CU**	600	OH/UG	LXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB1700C②	**WB1700CU**	700	OH/UG	MXD6	61.19	24.19	11.03	(3) 1/0-500 kcmil	KB-2
WB1800C	**WB1800CU**	800	OH/UG	MXD6	61.19	24.19	11.03	(3) 1/0-500 kcmil	
WB1900C②	**WB1900CU**	900	OH/UG	NXD6	61.19	24.19	11.03	(4) 1/0-500 kcmil	KB-3
WB11000C	**WB11000CU**	1000	OH/UG	NXD6	61.19	24.19	11.03	(4) 1/0-500 kcmil	
WB11200C	**WB11200CU**	1200	OH/UG	NXD6	61.19	24.19	11.03	(4) 1/0-500 kcmil	
WB11400T②④	**WB11400TU**④	1400	OH	PXD6	72.06	31.34	14.66	3 Sets of 2 Studs  (lugs not included)	KB-4
WB11400B②④	**WB11400BU**④		UG	PXD6	72.06	31.34	14.66		KB-5
WB11600T④	**WB11600TU**④	1600	OH	PXD6	72.06	31.34	14.66		KB-4
WB11600B④	**WB11600BU**④		UG	PXD6	72.06	31.34	14.66		KB-5
WB11800B②④	**WB11800BU**④	1800	UG	RXD6	72.06	31.34	14.66		
WB11800W	**WB11800WU**		OH/UG	RXD6	72.06	50.56	14.66		KB-6
WB12000B④	**WB12000BU**④	2000	UG	RXD6	72.06	31.34	14.66		KB-5
WB12000W②④	**WB12000WU**④		OH/UG	RXD6	72.06	50.56	14.66		KB-6

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Additional lead time required. Contact sales office for details. 100K and non-standard amperage modules.

③ Factory installed lugs standard on 200-1200A standard breaker main modules. Additional lug kit options available for 750 conductor size. Refer to pages 2-139–2-140 for lug kit options on 200-1200A standard main breakers. Field installable compression lug landing pad also available. Refer to page 2-161 for lug landing pad options. NEMA II Stud Pattern compression lugs must be installed by user or utility. Lugs NOT included on 1400A-2000A standard breaker main modules and must be ordered separately. Refer to pages 2-139–2-140 for lug size options.

④ 1200 amp maximum feed per side-must be used as a center fed main.

⑤ All breakers have a non-interchangeable trip unit.

Power Mod

Type WB Standard Circuit Breaker Mains

Factory installed lugs are standard on 200-1200A standard breaker main modules. Additional lug kit options are available for 750 conductor size. Refer to page 2-139–2-140 for lug kit options on 200-1200A standard main breakers. In addition, a field installable compression lug landing pad is also available. Refer to pages 2-139–2-140 & 2-168 for lug landing pad options. NEMA II Stud Pattern compression lugs must be installed by user or utility.

Lugs are NOT included on 1400A-2000A standard breaker main modules and must be ordered separately. Refer to page 2-139–2-140 for lug size options.



Circuit breaker service entrance modules: 3-phase, 4-wire SN, 240V AC max

Catalog number (65k AIC)③	Catalog number (100k AIC)②③	Ampere rating	Service feed	Breaker type⑤	Dimensions (inches)①			Factory installed line side connections	Knockout Diagram
					Height	Width	Depth		
WB3200C②	**WB3200CU**	200	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	KB-1
WB3250C②	**WB3250CU**	250	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3300C②	**WB3300CU**	300	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3350C②	**WB3350CU**	350	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3400C	**WB3400CU**	400	OH/UG	JXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3450C②	**WB3450CU**	450	OH/UG	LXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3500C②	**WB3500CU**	500	OH/UG	LXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3600C	**WB3600CU**	600	OH/UG	LXD6	39.19	15.20	11.03	(2) 3/0-500 kcmil CU (2)4/0-500 kcmil AL	
WB3700C②	**WB3700CU**	700	OH/UG	MXD6	61.19	24.19	11.03	(3) 1/0-500 kcmil	KB-2
WB3800C	**WB3800CU**	800	OH/UG	MXD6	61.19	24.19	11.03	(3) 1/0-500 kcmil	
WB3900C②	**WB3900CU**	900	OH/UG	NXD6	61.19	24.19	11.03	(4) 1/0-500 kcmil	KB-3
WB31000C	**WB31000CU**	1000	OH/UG	NXD6	61.19	24.19	11.03	(4) 1/0-500 kcmil	
WB31200C	**WB31200CU**	1200	OH/UG	NXD6	61.19	24.19	11.03	(4) 1/0-500 kcmil	
WB31400T②④	**WB31400TU**④	1400	OH	PXD6	72.06	31.34	14.66	3 Sets of 2 Studs (lugs not included)	KB-4
WB31400B②④	**WB31400BU**④		UG	PXD6	72.06	31.34	14.66		KB-5
WB31600T④	**WB31600TU**④	1600	OH	PXD6	72.06	31.34	14.66		KB-4
WB31600B④	**WB31600BU**④		UG	PXD6	72.06	31.34	14.66		KB-5
WB31800B②④	**WB31800BU**④	1800	UG	RXD6	72.06	31.34	14.66		
WB31800W	**WB31800WU**		OH/UG	RXD6	72.06	50.56	14.66		KB-6
WB32000B③④	**WB32000BU**④	2000	UG	RXD6	72.06	31.34	14.66		KB-5
WB32000W②④	**WB32000WU**④		OH/UG	RXD6	72.06	50.56	14.66		KB-6

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Additional lead time required. Contact sales office for details. 100K and non-standard amperage modules.

③ Factory installed lugs standard on 200-1200A standard breaker main modules. Additional lug kit options available for 750 conductor size. Refer to pages 2-139–2-140 for lug kit options on 200-1200A standard main breakers. Field installable compression lug landing pad also available. Refer to page 2-161 for lug landing pad options. NEMA II Stud Pattern compression lugs must be installed by user or utility. Lugs NOT included on 1400A-2000A standard breaker main modules and must be ordered separately. Refer to pages 2-139–2-140 for lug size options.

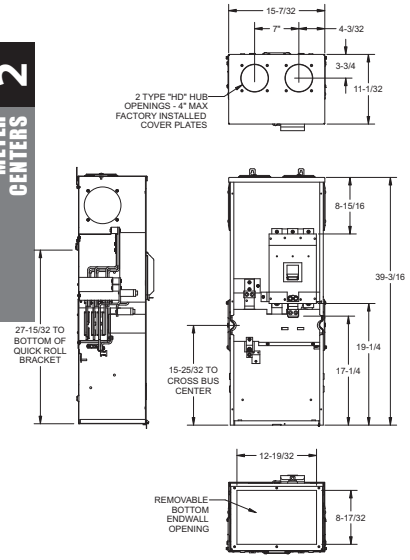
④ 1200 amp maximum feed per side-must be used as a center fed main.

⑤ All breakers have a non-interchangeable trip unit.

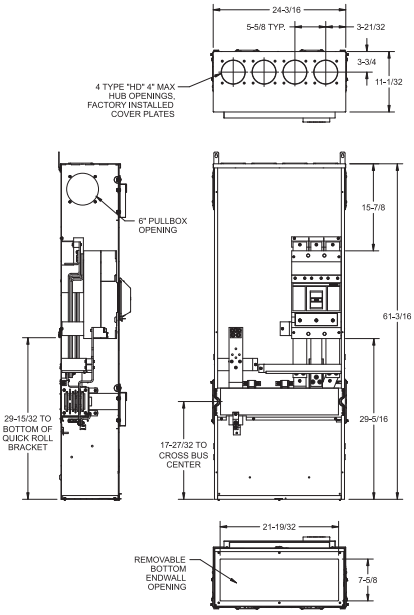
Power Mod

• Revised •
05/09/12

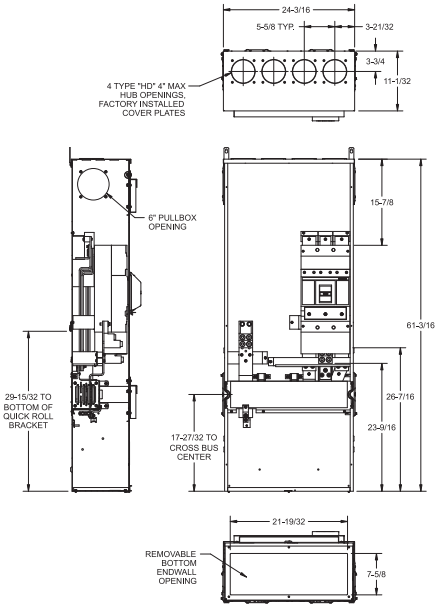
Type WB Standard Circuit Breaker Mains Knockout Diagrams



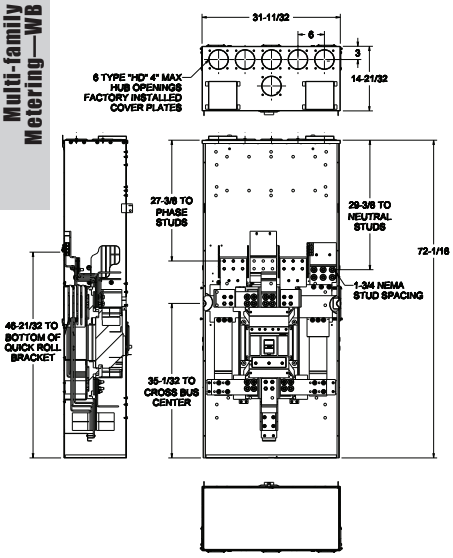
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WB3250XX	WB1250XX
WB3300XX	WB1300XX
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WB3400XX	WB1400XX
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WB3500XX	WB1500XX
WB3600XX	WB1600XX



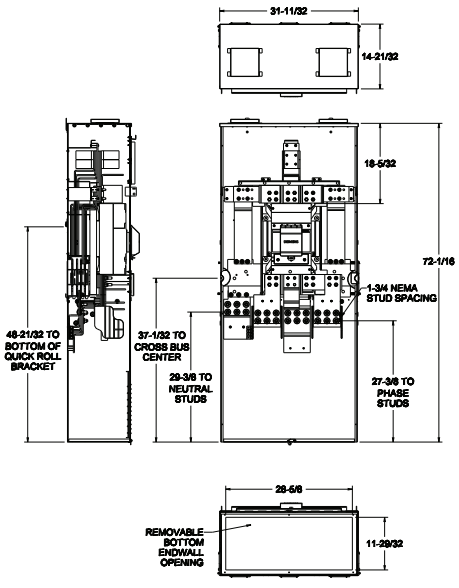
KB-2	
WB3700XX	WB1700XX
WB3800XX	WB1800XX



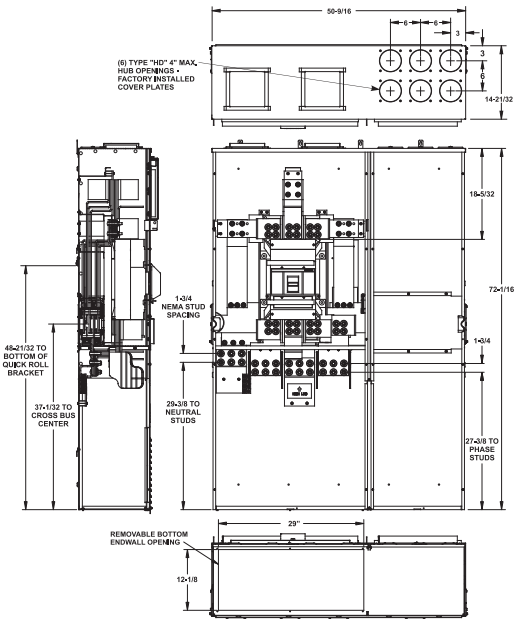
KB-3	
WB3900XX	WB1900XX
WB31000XX	WB11000XX
WB31200XX	WB11200XX



KB-4	
WB31400TX	WB11400TX
WB31600TX	WB11600TX
WB32000TX	WB12000TX



KB-5	
WB31400BX	WB11400BX
WB31600BX	WB11600BX
WB31800BX	WB11800BX
WB32000BX	WB12000BX



KB-6	
WB12000W	WB31800W
WB12000WU	WB31800WU
WB11800W	WB32000W
WB11800WU	WB32000WU

Power Mod

Type WEB Circuit Breaker – Pullbox Combinations

Circuit Breaker – Pullbox Combinations

EUSERC – compliant breaker – pullbox combination modules (type WEB) offer EUSERC compatibility, a wider range of lug options, and extra space for pulling in conductors.

Features include:

- QuickSystem™ features
- Factory installed NEMA II studs
- 750 kcmil AL wire options
- 65K AIC standard, 100K AIC available for all models
- Removable blank bottom endwall
- Externally accessible breaker handle with padlock capability
- Field installable shunt trips
- Large removable ground wire trough with generous space for grounding conductors



Circuit Breaker-Pullbox Combinations Quick Reference

- 200-1200A
- 1200A thru-bus
- UL standard # UL67
- UL file # E27100
- AIC rating (65k & 100k)
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- EUSERC drawing number 347
- Custom options available! Details on page 2-141.

• Revised •
06/01/13

Power Mod

Type WEB Circuit Breaker – Pullbox Combinations

Lugs are NOT included on 1400A-2000A standard breaker main modules and must be ordered separately. Refer to page 2-139–2-140 for lug size options.



Combination circuit breaker and pullbox modules:
1-phase, 3-wire SN, 120/240V AC max, meets EUSERC requirements

Catalog number (65k AIC)	Catalog number (100k AIC)②	Ampere rating	Service feed	Breaker type④	Dimensions (inches)①			Line side③ connections (lugs not included)	Knockout Diagram
					Height	Width	Depth		
WEB1200B②	**WEB1200BU**	200	UG	JXD6	54.88	28.28	13.06	1 set of 2 studs 	EB-1
WEB1250B②	**WEB1250BU**	250	UG	JXD6	54.88	28.28	13.06		
WEB1300B②	**WEB1300BU**	300	UG	JXD6	54.88	28.28	13.06		
WEB1350B②	**WEB1350BU**	350	UG	JXD6	54.88	28.28	13.06		
WEB1400B	**WEB1400BU**	400	UG	JXD6	54.88	28.28	13.06		
WEB1500B②	**WEB1500BU**	500	UG	LXD6	54.88	28.88	13.06	2 sets of 2 studs 	EB-2
WEB1600B	**WEB1600BU**	600	UG	LXD6	54.88	28.28	13.06		
WEB1700B②	**WEB1700BU**	700	UG	MXD6	59.34	34.22	12.47		EB-3
WEB1800B	**WEB1800BU**	800	UG	MXD6	59.34	34.22	12.47		
WEB1900B②	**WEB1900BU**	900	UG	NXD6	59.34	34.22	12.47	3 sets of 2 studs 	EB-4
WEB11000B	**WEB11000BU**	1000	UG	NXD6	59.34	34.22	12.47		
WEB11200B	**WEB11200BU**	1200	UG	NXD6	59.34	34.22	12.47		

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Additional lead time required. Contact sales office for details. Non-standard modules

③ Lugs not included. Refer to page 2-139–2-140 for lug size options. 750 conductor size available. NEMA II stud pattern compression lugs must be installed by user or utility.

④ All breakers have a non-interchangeable trip unit.

Power Mod

Type WEB Circuit Breaker - Pullbox Combinations

Lugs are NOT included on 1400A-2000A standard breaker main modules and must be ordered separately. Refer to page 2-139–2-140 for lug size options.



Combination circuit breaker and pullbox modules:
3-phase, 4-wire SN, 240V AC max, meets EUSERC requirements

Catalog number (65k AIC)	Catalog number (100k AIC)②	Ampere rating	Service feed	Breaker type④	Dimensions (inches)①			Line side③ connections (lugs not included)	Knockout Diagram
					Height	Width	Depth		
WEB3200B②	**WEB3200BU**	200	UG	JXD6	54.88	28.28	13.06	1 set of 2 studs	EB-1
WEB3250B②	**WEB3250BU**	250	UG	JXD6	54.88	28.28	13.06		
WEB3300B②	**WEB3300BU**	300	UG	JXD6	54.88	28.28	13.06		
WEB3350B②	**WEB3350BU**	350	UG	JXD6	54.88	28.28	13.06		
WEB3400B	**WEB3400BU**	400	UG	JXD6	54.88	28.28	13.06		
WEB3500B②	**WEB3500BU**	500	UG	LXD6	54.88	28.28	13.06	2 sets of 2 studs	EB-2
WEB3600B	**WEB3600BU**	600	UG	LXD6	54.88	28.28	13.06		
WEB3700B②	**WEB3700BU**	700	UG	MXD6	59.34	34.22	12.47		EB-3
WEB3800B	**WEB3800BU**	800	UG	MXD6	59.34	34.22	12.47		
WEB3900B②	**WEB3900BU**	900	UG	NXD6	59.34	34.22	12.47	3 sets of 2 studs	EB-4
WEB31000B	**WEB31000BU**	1000	UG	NXD6	59.34	34.22	12.47		
WEB31200B	**WEB31200BU**	1200	UG	NXD6	59.34	34.22	12.47		

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

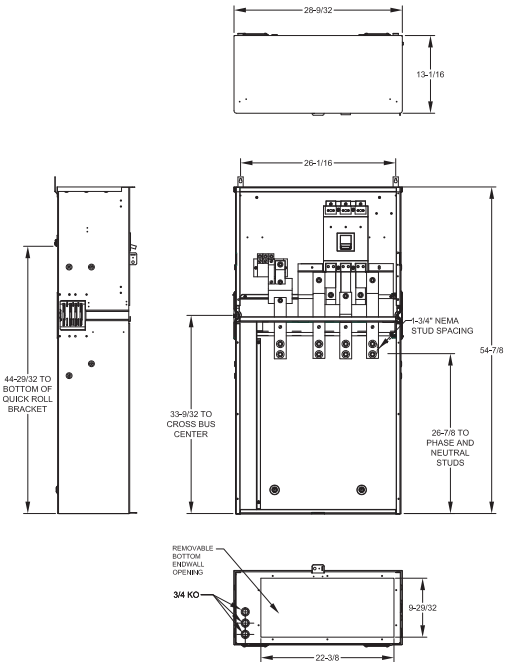
② Additional lead time required. Contact sales office for details. Non-standard modules

③ Lugs not included. Refer to page2-139–2-140 for lug size options. 750 conductor size available. NEMA II stud pattern compression lugs must be installed by user or utility.

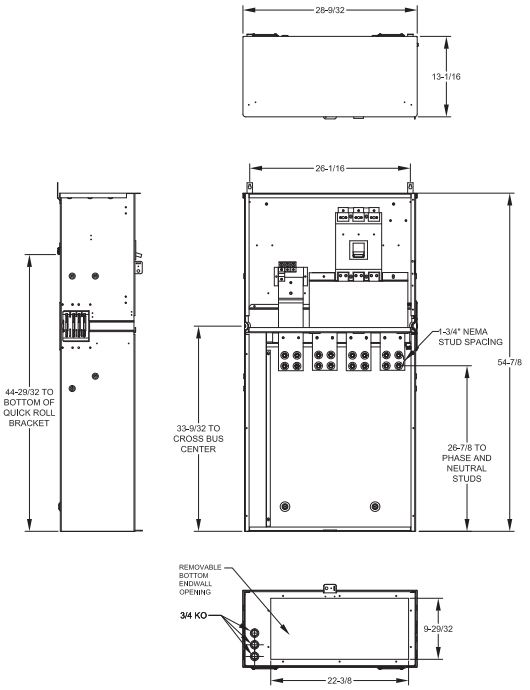
④ All breakers have a non-interchangeable trip unit.

Power Mod

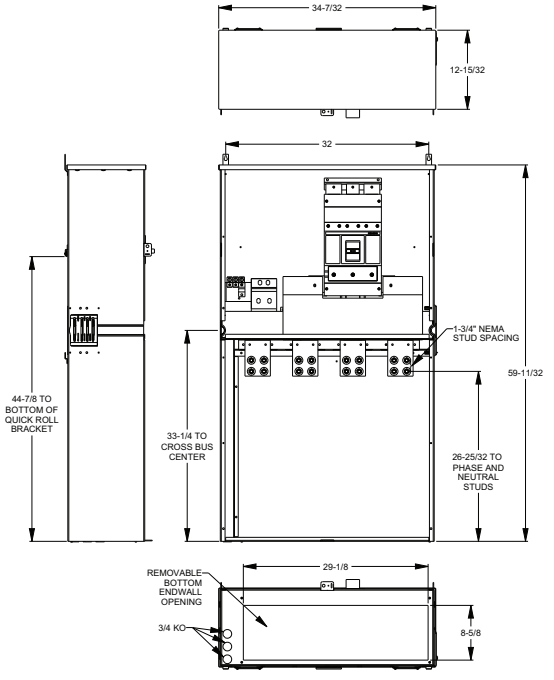
Type WEB Circuit Breaker – Pullbox Combinations: Knockout Diagrams



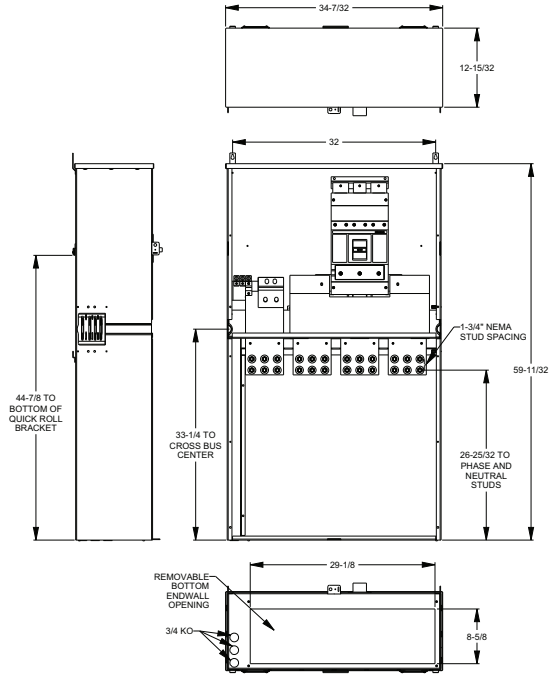
EB-1			
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WEB3200B	WEB1350B	WEB3200BU	WEB1350BU
WEB1250B	WEB3350B	WEB1250BU	WEB3350BU
WEB3250B	WEB1400B	WEB3250BU	WEB1400BU
WEB1300B	WEB3400B	WEB1300BU	WEB3400BU



EB-2	
WEB1500B	WEB3500B
WEB1500BU	WEB3500BU
WEB1600B	WEB3600B
WEB1600B	WEB3600BU



EB-3	
WEB1700B	WEB1700BU
WEB3700B	WEB3700BU
WEB1800B	WEB1800BU
WEB3800B	WEB3800BU



EB-4		
WEB1900B	WEB11000B	WEB11000BU
WEB1900BU	WEB11200B	WEB11200BU
WEB3900B	WEB31000B	WEB31000BU
WEB3900BU	WEB31200B	WEB31200BU

Power Mod

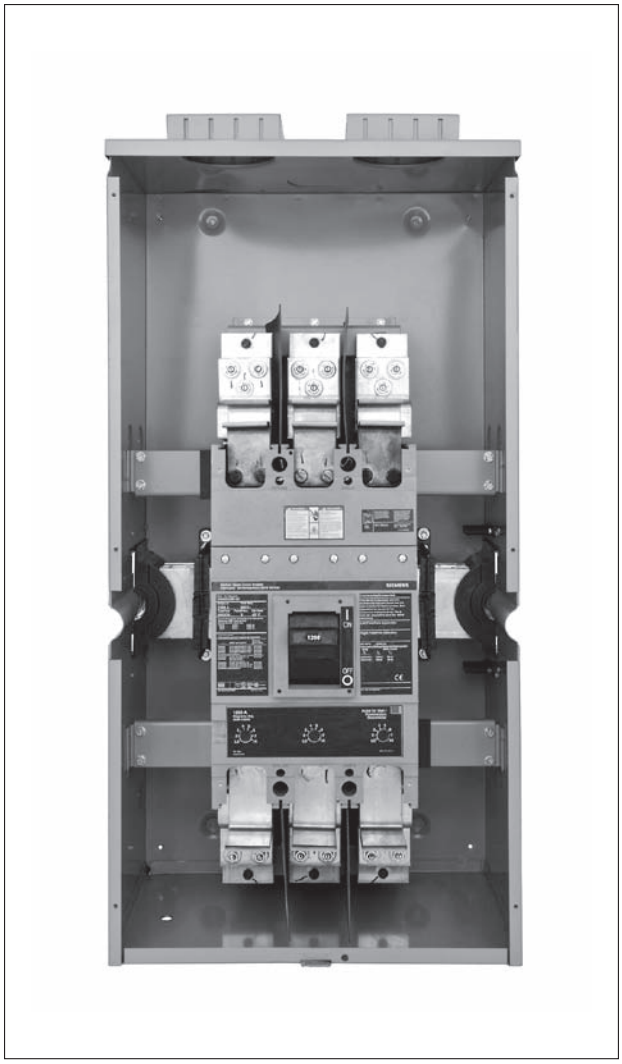
Type WXB Main Units

Cross Bus Main modules

Cross Bus Main modules (type WXB) offer two distinct functions: first they can be used to connect Siemens Sentron Busway to a Power Mod line-up. Second they can be utilized to offer lower service sdisconnect ampacities or unique configurations where an incoming tapbox is preferred. See application pages for examples.

Features include:

- QuickSystem™ features
- Incoming & outgoing bus connections (right to left or left to right)
- Standardized connection points to Siemens Sentron Busway
- 65K AIC standard, 100K AIC available for all models
- Externally accessible breaker handle with padlock capability
- Broad ampacity ratings up to 1200 Amps with non-standard amperages available (such as 700, 900, etc.)
- Field installable shunt trips



Circuit Breaker-Pullbox Combinations Quick Reference

- 400-1200A
- 1200A thru-bus rating
- UL Standard # UL67
- UL file # E27100
- AIC rating (65k & 100k)
- Voltage:
  - – Single phase 120/240V AC max
  - –Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- Custom options available! Details on page 2-141.

• Revised •
02/18/14

Power Mod

Type WXB Main Units

Connects via thru bussing only - NO LUGS and NOT SERVICE ENTRANCE RATED





1-phase, 3-wire SN, 120/240V AC②

Catalog number (65k AIC)	Catalog number (100k AIC)①	Ampere rating	Service Feed	Breaker Type	Dimensions①			Knockout diagram
					Height	Width	Depth	
WXB1200N③	WXB1200NU	200	Thru Bus	JXD6	27.05	15.59	10.82	WXB-1
WXB1250N③	WXB1250NU	250	Thru Bus	JXD6	27.05	15.59	10.82	
WXB1300N③	WXB1300NU	300	Thru Bus	JXD6	27.05	15.59	10.82	
WXB1350N③	WXB1350NU	350	Thru Bus	JXD6	27.05	15.59	10.82	
WXB1400N	WXB1400NU	400	Thru Bus	JXD6	27.05	15.59	10.82	
WXB1450N③	WXB1450NU	450	Thru Bus	LXD6	27.05	15.59	10.82	
WXB1500N③	WXB1500NU	500	Thru Bus	LXD6	27.05	15.59	10.82	
WXB1600N	WXB1600NU	600	Thru Bus	LXD6	27.05	15.59	10.82	
WXB1700N③	WXB1700NU	700	Thru Bus	MXD6	36.05	18.70	12.63	WXB-2
WXB1800N	WXB1800NU	800	Thru Bus	MXD6	36.05	18.70	12.63	
WXB1900N③	WXB1900NU	900	Thru Bus	NXD6	36.05	18.70	12.63	WXB-3
WXB11000N	WXB11000NU	1000	Thru Bus	NXD6	36.05	18.70	12.63	
WXB11200N	WXB11200NU	1200	Thru Bus	NXD6	36.05	18.70	12.63	

3-phase, 4-wire SN, 240V AC max②

Catalog number (65k AIC)	Catalog Number (100k AIC)③	Ampere rating	Service Feed	Breaker Type	Dimensions①			Knockout diagram
					Height	Width	Depth	
WXB3200N③	WXB3200NU	200	Thru Bus	JXD6	27.05	15.59	10.82	WXB-1
WXB3250N③	WXB3250NU	250	Thru Bus	JXD6	27.05	15.59	10.82	
WXB3300N③	WXB3300NU	300	Thru Bus	JXD6	27.05	15.59	10.82	
WXB3350N③	WXB3350NU	350	Thru Bus	JXD6	27.05	15.59	10.82	
WXB3400N	WXB3400NU	400	Thru Bus	JXD6	27.05	15.59	10.82	
WXB3450N③	WXB3450NU	450	Thru Bus	LXD6	27.05	15.59	10.82	
WXB3500N③	WXB3500NU	500	Thru Bus	LXD6	27.05	15.59	10.82	
WXB3600N	WXB3600NU	600	Thru Bus	LXD6	27.05	15.59	10.82	
WXB3700N③	WXB3700NU	700	Thru Bus	MXD6	36.05	18.70	12.63	WXB-2
WXB3800N	WXB3800NU	800	Thru Bus	MXD6	36.05	18.70	12.63	
WXB3900N③	WXB3900NU	900	Thru Bus	NXD6	36.05	18.70	12.63	WXB-3
WXB31000N	WXB31000NU	1000	Thru Bus	NXD6	36.05	18.70	12.63	
WXB31200N	WXB31200NU	1200	Thru Bus	NXD6	36.05	18.70	12.63	

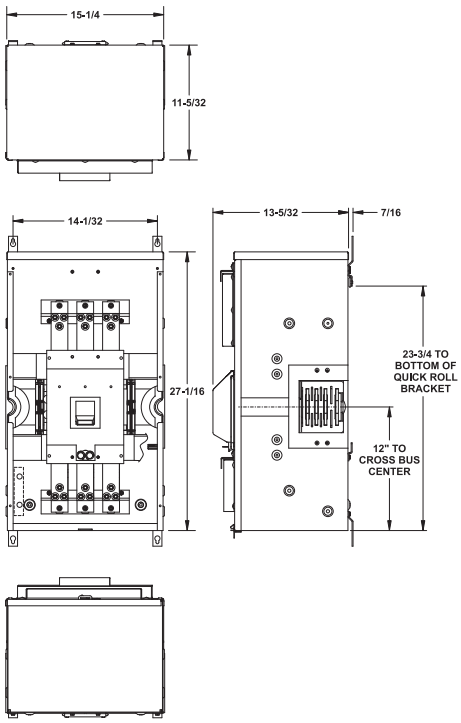
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

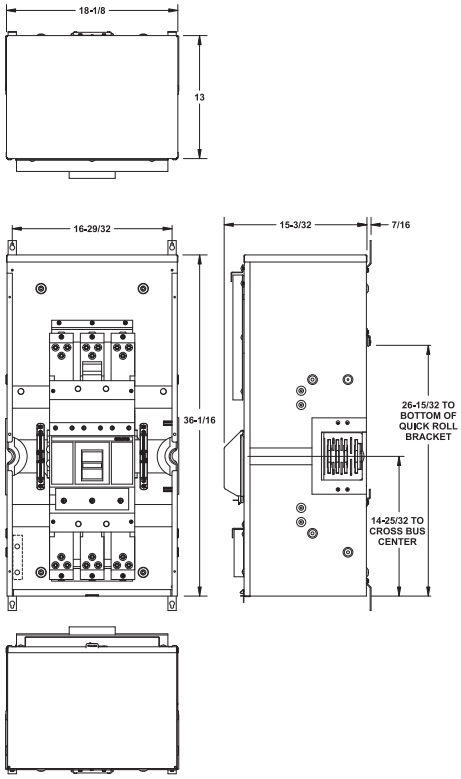
② Connects via thru bussing only – NO LUGS and NOT SERVICE ENTRANCE RATED

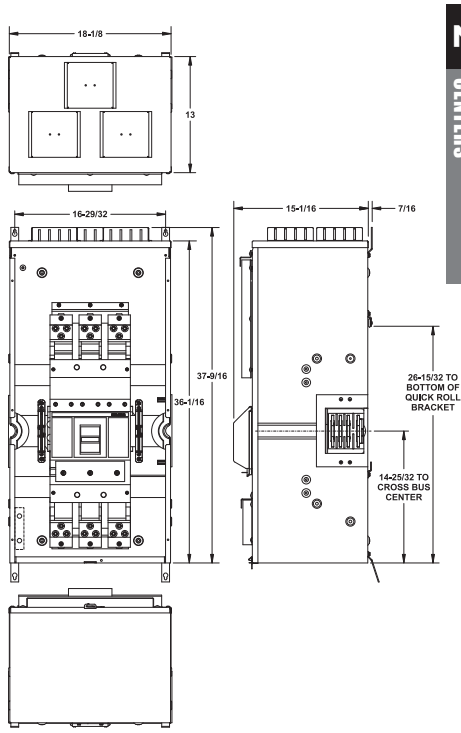
③ Non Standard item – extended lead time applies

Power Mod

Type WXB Main Units: Knockout Diagrams







WXB-1	
WXB1200N	WXB3200N
WXB1200NU	WXB3200NU
WXB1250N	WXB3250N
WXB1250NU	WXB3250NU
WXB1300N	WXB3300N
WXB1300NU	WXB3300NU
WXB1350N	WXB3350N
WXB1350NU	WXB3350NU
WXB1400N	WXB3400N
WXB1400NU	WXB3400NU
WXB1450N	WXB3450N
WXB1450NU	WXB3450NU
WXB1500N	WXB3500N
WXB1500NU	WXB3500NU
WXB1600N	WXB3600N
WXB1600NU	WXB3600NU

WXB-2	
WXB1700N	WXB3700N
WXB1700NU	WXB3700NU
WXB1800N	WXB3800N
WXB1800NU	WXB3800NU

WXB-3	
WXB1900N	WXB3900N
WXB1900NU	WXB3900NU
WXB11000N	WXB31000N
WXB11000NU	WXB31000NU
WXB11200N	WXB31200N
WXB11200NU	WXB31200NU

Power Mod

Type WS Standard Switch Mains

Standard Switch Mains

Standard switch modules (type WS) are designed for flexibility, space savings, & durability.

Features include:

- QuickSystem™ features
- Standard compression lug capability
- Invertibility: 400-800 Amp devices can be rotated to accommodate the desired incoming feed direction
- 750 kcmil AL wire options for most models
- 100K AIC standard for all models
- Class T fuse provisions
- Front mounted handle – removes the need for spacers on the side
- Broad ampacity ratings up to 1200 Amps

Standard Switch Mains quick reference

- 200-1200A
- 1200A thru-bus
- UL Standard # UL98
- UL file #E25506
- AIC rating (100k AIC)
- Voltage:
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- Custom options available! Details on page 2-141.



Power Mod

Type WS Standard Switch Mains

Lugs not included on most models. NEMA II stud pattern lugs must be installed by user or utility. Refer to page 2-139–2-140 for lug size options.





Fusible switch service entrance modules: 1-phase, 3-wire SN, 120/240V AC⑥

Catalog number (100k AIC)	Rating amps	Service feed	Fuse type⑥	Dimensions (inches)①			Line side connections	Knockout Diagrams
				Height	Width	Depth		
WMP02U②	200	OH/UG	T	33.00	12.00	13.00	(1) #6 - 250 KCMIL	S-0
WS1400CU③	400	OH/UG④	T	50.13	15.19	16.31	1 set of 2 studs  (lugs not included)	S-1
WS1600CU③	600	OH/UG④	T	50.13	15.19	16.31		
WS1800CU③	800	OH/UG④	T	50.13	15.19	16.31	2 sets of 2 studs  (lugs not included)	S-2
WS11200BU⑤⑦	1200	UG	T	50.06	20.22	16.06	(4) 250- 500 kcmil	S-3

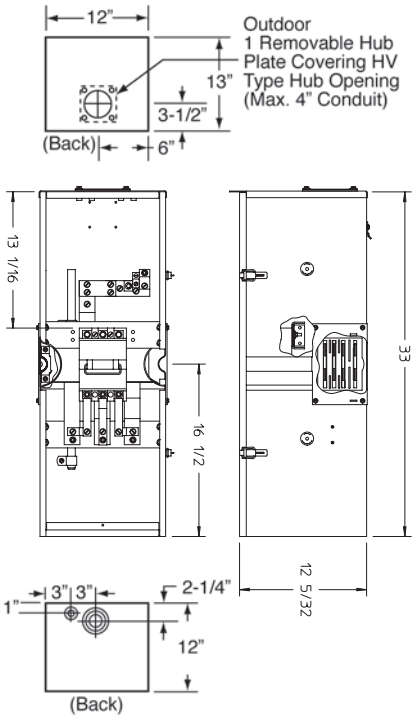
Fusible switch service entrance modules: 3-phase, 4-wire WN, 240V AC Max.⑥

Catalog number (100k AIC)	Rating amps	Service feed	Fuse type⑥	Dimensions (inches)①			Line side connections	Knockout Diagrams
				Height	Width	Depth		
WMP024U②	200	OH/UG	T	33.00	12.00	13.00	(1) #6 - 250 KCMIL	S-0
WS3400CU③	400	OH/UG④	T	50.13	15.19	16.31	1 set of 2 studs  (lugs not included)	S-1
WS3600CU③	600	OH/UG④	T	50.13	15.19	16.31		
WS3800CU③	800	OH/UG④	T	50.13	15.19	16.31	2 sets of 2 studs  (lugs not included)	S-2
WS31200BU⑤⑦	1200	UG	T	50.06	20.22	16.06	(4) 250-500 kcmil	S-3

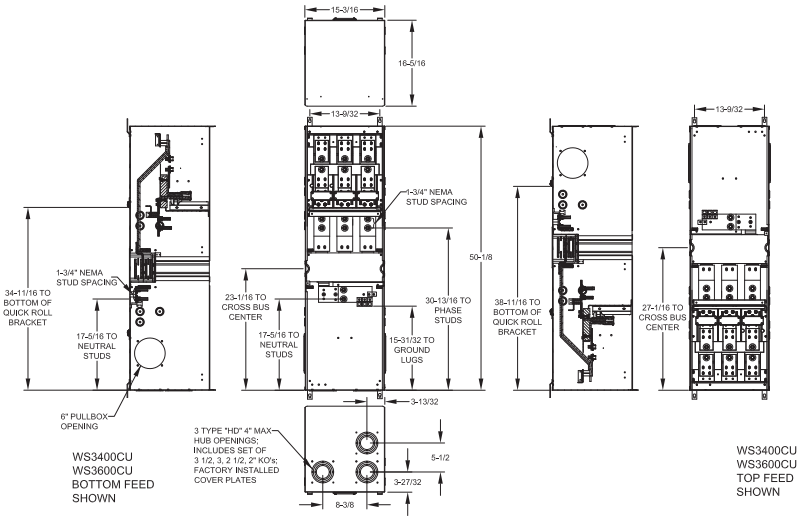
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.
② Additional lead time required. Contact sales office for details. Fusible pull-out switch. No QuickSystem features offered for this catalog number.
③ Lugs not included. Refer to page 2-139–2-140 for lug size options. NEMA II stud pattern compression lugs must be installed by user or utility.
④ Module is invertible – rotate device to point hub openings to appropriate feed direction.
⑤ 500 kcmil max wire range size.
⑥ Fuses not included.
⑦ Device uses a molded case switch (looks like a breaker). Class T fuses must be installed in conjunction with the molded case switch for proper operation.

Power Mod

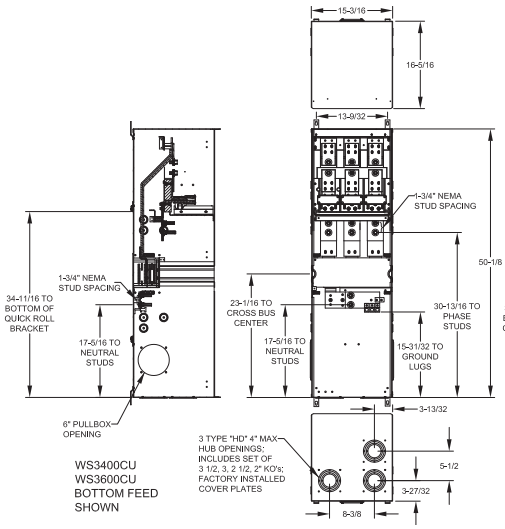
Type WS Standard Switch Mains: Knockout Diagrams

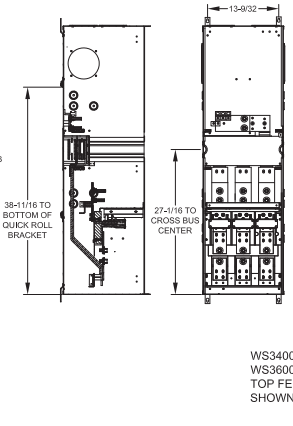


S-0	
WMP02U	WMP024U

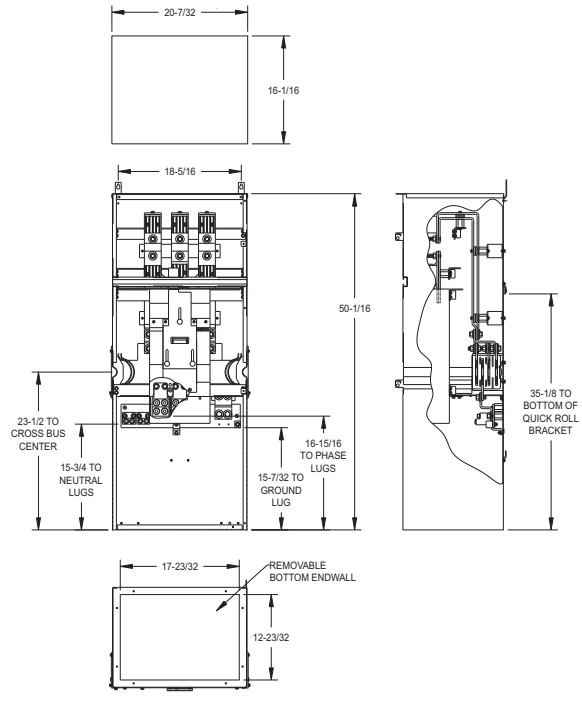


S-1	
WS1400CU WS1600CU	WS3400CU WS3600CU





S-2	
WS1800CU	WS3800CU



S-3	
WS11200BU	WS31200BU

Power Mod

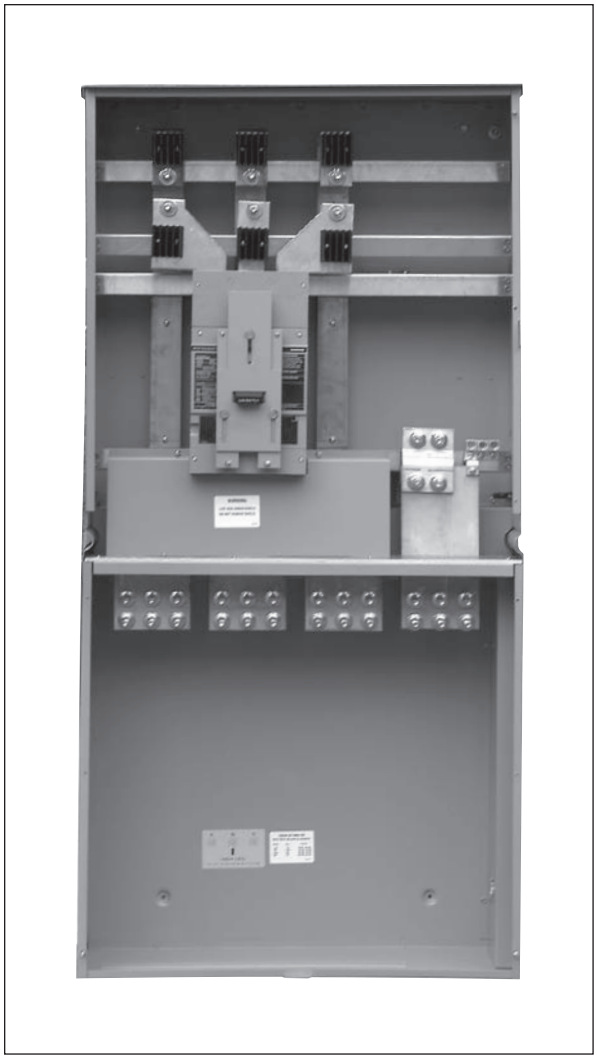
Type WES Switch-Pullbox Combinations

Switch-Pullbox Combinations

EUSERC - compliant switch-pullbox combination modules (type WES) offer EUSERC compatibility, a wider range of lug options, and extra space for pulling in conductors.

Features include:

- QuickSystem™ features
- Factory installed NEMA II studs
- Broad ampacity ratings up to 1200 Amps
- 750kcmil AL wire options
- 100K AIC standard for all models
- Removable blank bottom endwall
- Front mounted handle - removes the need for spacers on the side
- Class T fuse provisions
- Large removable ground wire trough with generous space for grounding conductors
- Extra ground lugs in each device



Switch-Pullbox Combinations quick reference

- 400-1200A
- 1200A thru-bus
- UL standard # UL98
- UL file # E25506
- AIC Rating (100k AIC)
- Voltage:
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- EUSERC drawing number 347
- Custom options available! Details on page 2-141.

Power Mod

Type WES Switch-Pullbox Combinations

Lugs not included. NEMA II Stud Pattern lugs must be installed by user or utility. Refer to page 2-139–2-140 for lug size options.





Combination fusible switch and pullbox modules: 1-phase, 3-wire SN, 120/240V AC
Meets EUSERC requirements③

Catalog number (100k AIC)	Rating Amps	Service feed	Fuse type ②	Dimensions (inches) ①			Line side② connections (lugs not included)	Knockout Diagram
				Height	Width	Depth		
WES1400BU	400	UG	T	54.06	29.19	15.94	1 set of 2 studs	ES-1
WES1600BU	600	UG	T	54.06	29.19	15.94	2 sets of 2 studs	ES-2
WES1800BU	800	UG	T	54.06	29.19	15.94		
WES11200BU④	1200	UG	T	68.97	34.25	13.47	3 sets of 2 studs	ES-3

Combination fusible switch and pullbox modules: 3-phase, 4-wire SN, 240V AC max.
Meets EUSERC requirements③

Catalog number (100k AIC)	Rating Amps	Service feed	Fuse type	Dimensions (inches) ①			Line side② connections (lugs not included)	Knockout Diagram
				Height	Width	Depth		
WES3400BU	400	UG	T	54.06	29.19	15.94	1 set of 2 studs	ES-1
WES3600BU	600	UG	T	54.06	29.19	15.94	2 sets of 2 studs	ES-2
WES3800BU	800	UG	T	54.06	29.19	15.94		
WES31200BU④	1200	UG	T	68.97	34.25	13.47	3 sets of 2 studs	ES-3

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

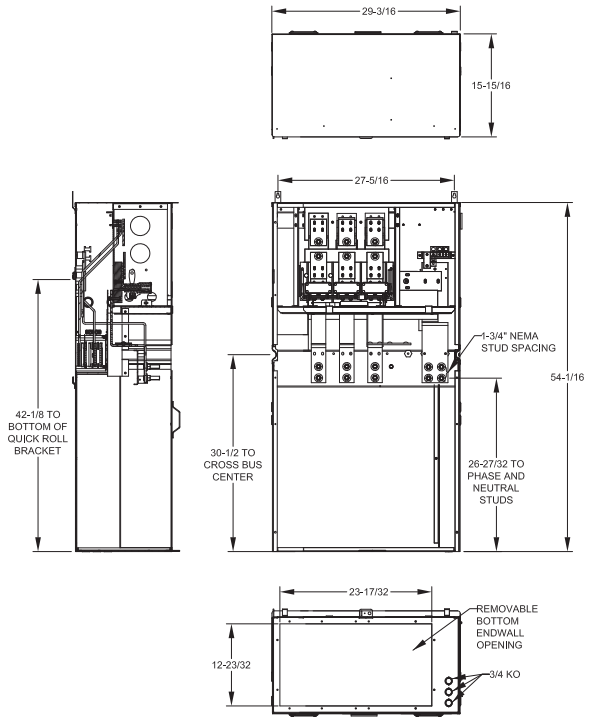
② Lugs not included. Refer to page 2-139–2-140 for lug size options. NEMA II stud pattern compression lugs must be installed by user or utility.

③ Fuses not included.

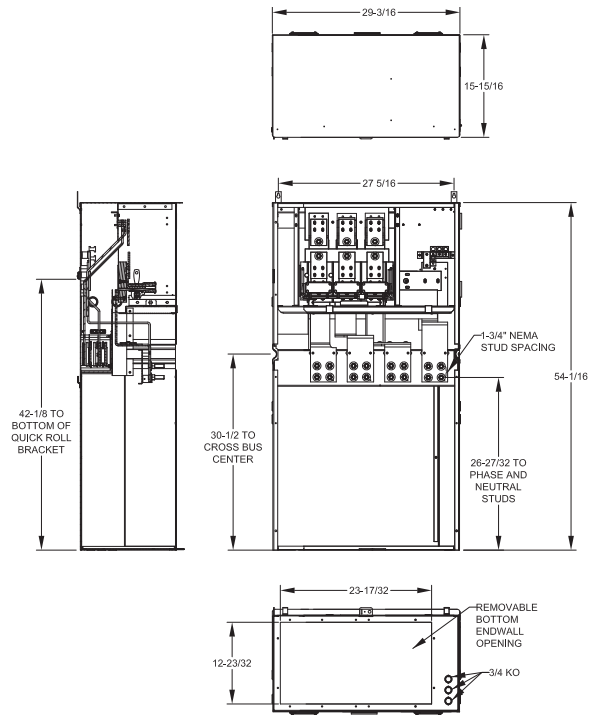
④ Device uses a molded case switch (looks like a breaker). Class T fuses must be installed in conjunction with the molded case switch for proper operation.

Power Mod

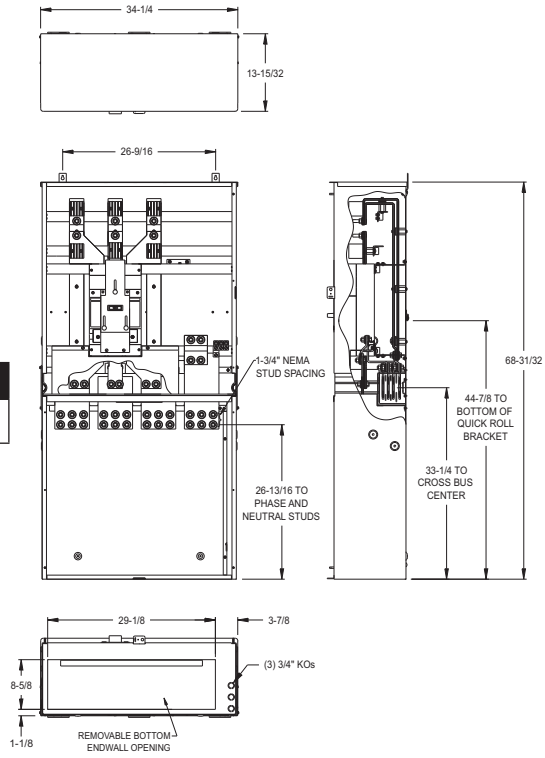
Type WES Switch-Pullbox Combinations: Knockout Diagrams



ES-1	
WES1400BU	WES3400BU



ES-2	
WES1600BU WES1800BU	WES3600BU WES3800BU



ES-3	
WES11200BU	WES31200BU

Power Mod

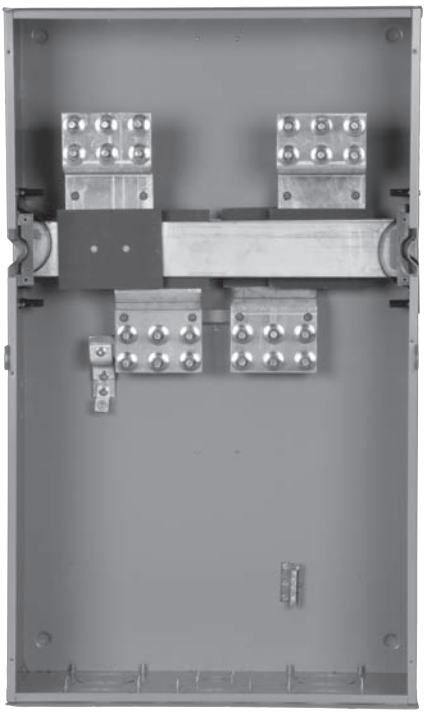
Type WTB Standard Tapboxes

Standard Tapboxes

Standard tapbox modules (type WTB) are designed for versatility, space savings, and flexibility.

Features include:

- QuickSystem™ features
- Standard compression lug capability
- Invertibility: devices can be rotated to accommodate the desired incoming feed direction
- 750 kcmil AL wire options for most models
- 100K AIC standard for all models
- Broad ampacity ratings from 400 to 2400 Amps
- Line and load capability- service entrance and sub feed rated



Standard Tapbox quick reference

- 400-2400A
- 1200A thru-bus rating
- UL Standard # UL67
- UL file # E27100
- AIC rating (100K AIC)
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- Custom options available! Details on page 2-141

Restrictions for 1600-2400amp type WTB Power Mod Tap Boxes:

When the 1600, 2000, or 2400amp tap boxes are used as service entrance equipment (fed directly from utility transformer) or when the supply originates from a Class L fuse or Siemens WL circuit breaker there are restrictions on the use of an additional down-stream (thru-bus connected) WTBN, WTB, WET, or WT type Power Mod tap boxes. In these instances a type "WXB" module must be used as protection for the downstream tap box. box (placed between the incoming WTB tap box and the downstream outgoing tap box). See page 2-69 for an example. This restriction does ***NOT*** apply if the tap box is fed from a Siemens Sentron or VL series molded case circuit breaker. Note that the maximum amperage for a Siemens Sentron circuit breaker is 2,000 amps.

Power Mod

Type WTB Standard Tapboxes

Restrictions for 1600-2400amp type WTB Power Mod Tap Boxes:

When the 1600, 2000, or 2400amp tap boxes are used as service entrance equipment (fed directly from utility transformer) or when the supply originates from a Class L fuse or Siemens WL circuit breaker there are restrictions on the use of an additional down-stream (thru-bus connected) WTBN, WTB, WET, or WT type Power Mod tap boxes. In these instances a type "WXB" module must be used as protection for the downstream tap box. box (placed between the incoming WTB tap box and the downstream outgoing tap box). See page 2-69 for an example. This restriction does NOT apply if the tap box is fed from a Siemens Sentron or VL series molded case circuit breaker. Note that the maximum amperage for a Siemens Sentron circuit breaker is 2,000amps.

Lugs not included. Refer to pages 2-139 to 2-140 for lug size options. NEMA II Stud Pattern lugs must be installed by user or utility.



Tap box modules: 1-phase, 3-wire WN, 120/240V AC⑤

Catalog no. (100k AIC)	Ampere rating	Service feed④	Dimensions (inches)①			Line side connections② (lugs not included)	KO Diagram
			Height	Width	Depth		
WTB1400CU	400	OH/UG	40.13	12.22	13.19	1 set of 2 studs	T-1
WTB1800CU	800	OH/UG	40.13	12.22	13.19	2 sets of 2 studs	T-2
WTB11200CU	1200	OH/UG	47.13	15.61	13.31	2 sets of 2 studs	T-3
WTB11600CU③⑥	1600	OH/UG	49.09	25.09	13.81	3 sets of 2 studs	T-4
WTB12000TU⑥	2000	OH	67.94	35.00	14.78	3 sets of 2 studs	T-5
WTB12000BU⑥		UG					
WTB12400TU⑥	2400	OH				3 sets of 2 studs	
WTB12400BU⑥		UG				Optional 4 sets of 2 studs⑦⑧	

Tap box modules: 3-phase, 4-wire SN, 240V AC Max.⑤

Catalog number (100k AIC)	Ampere rating	Service feed④	Dimensions (inches)①			Line side connections② (lugs not included)	KO Diagram
			Height	Width	Depth		
WTB3400CU	400	OH/UG	40.13	12.22	13.19	1 set of 2 studs	T-1
WTB3800CU	800	OH/UG	40.13	12.22	13.19	2 sets of 2 studs	T-2
WTB31200CU	1200	OH/UG	60.31	15.61	17.75	2 sets of 2 studs	T-3
WTB31600CU③⑥	1600	OH/UG	49.09	25.09	13.81	3 sets of 2 studs	T-4
WTB32000TU⑥	2000	OH	67.94	35.00	14.78	3 sets of 2 studs	T-5
WTB32000BU⑥		UG					
WTB32400TU⑥	2400	OH				3 sets of 2 studs	
WTB32400BU⑥		UG				Optional 4 sets of 2 studs⑦⑧	

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.
② Lugs not included. Refer to page 2-139–2-140 for lug size options. 750 conductor size available NEMA II stud pattern compression lugs must be installed by user or utility.
③ 1200 amp maximum feed per side-must be used as a center fed main.
④ Module is invertible- rotate device to point hub openings to appropriate feed direction.
⑤ QuickConnect not included. If used for load side application an additional coupler must be ordered.
⑥ Please see restriction note above.
⑦ Please see lug kit number LK18500N2C on pages 2-139 – 2-140. For use with 500kcmil ONLY!
⑧ Fits 2400amp models ONLY!

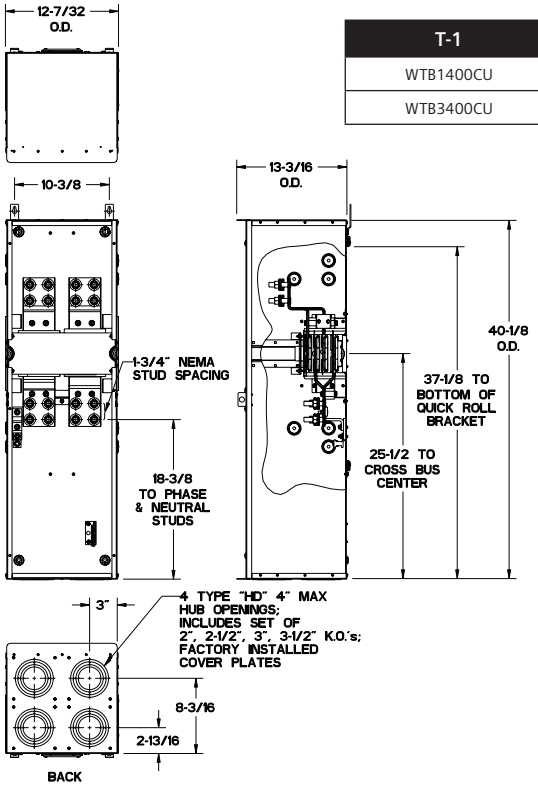
Power Mod

Type WTB Standard Tapboxes: Knockout Diagrams

T-1

WTB1400CU

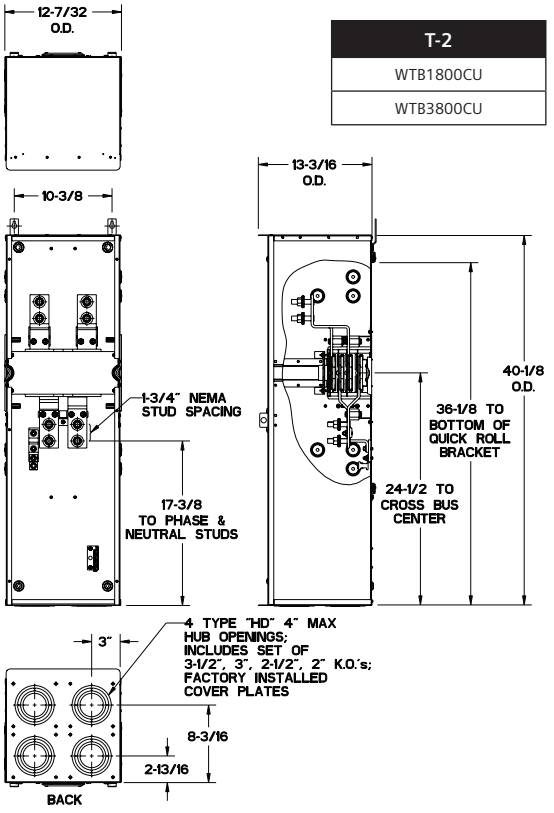
WTB3400CU



T-2

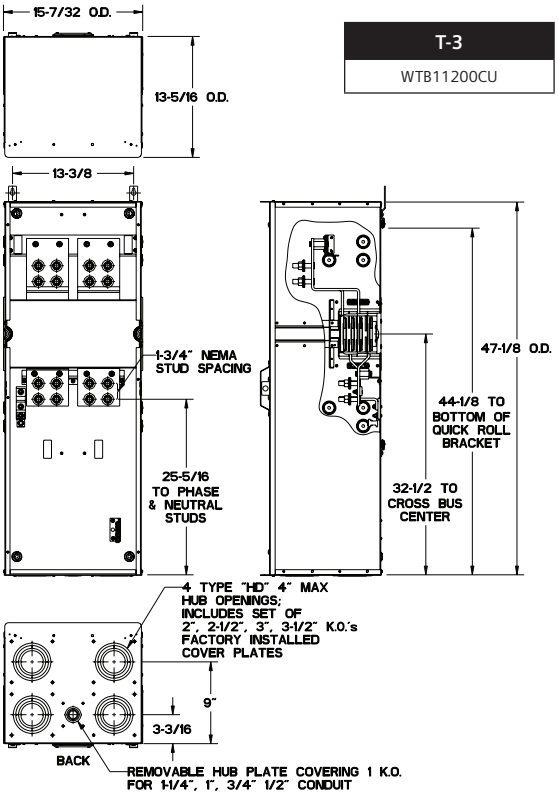
WTB1800CU

WTB3800CU



T-3

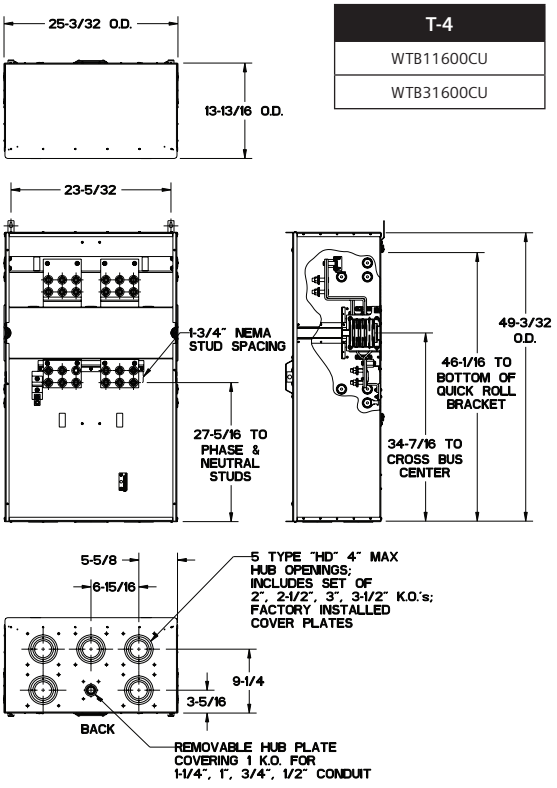
WTB11200CU



T-4

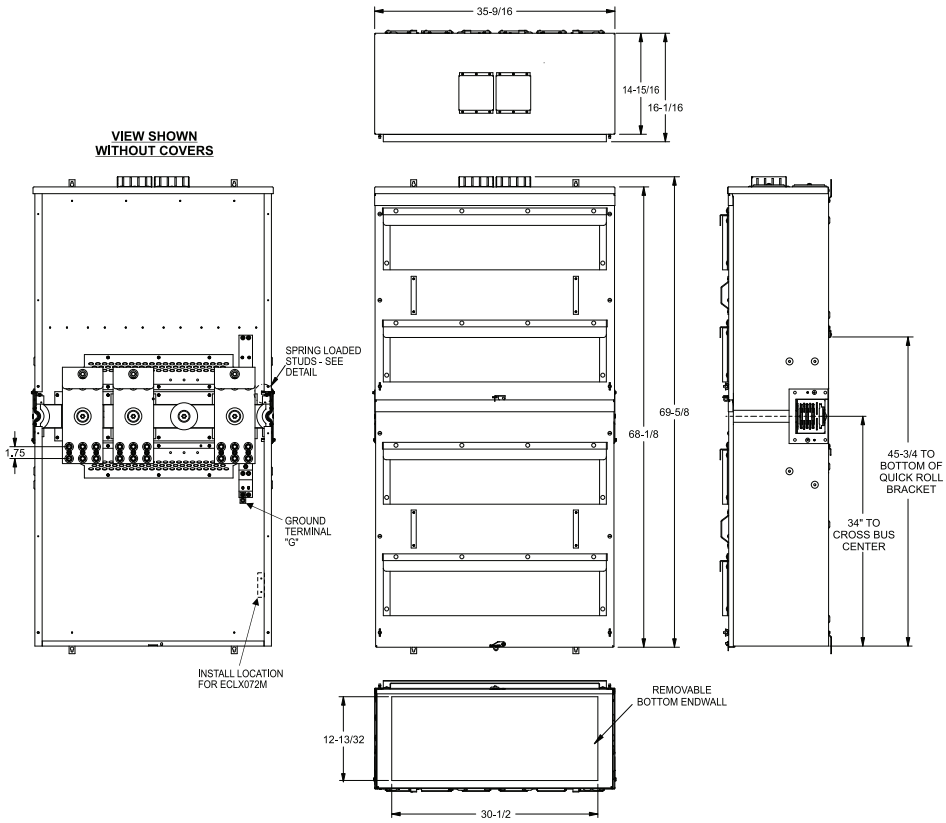
WTB11600CU

WTB31600CU

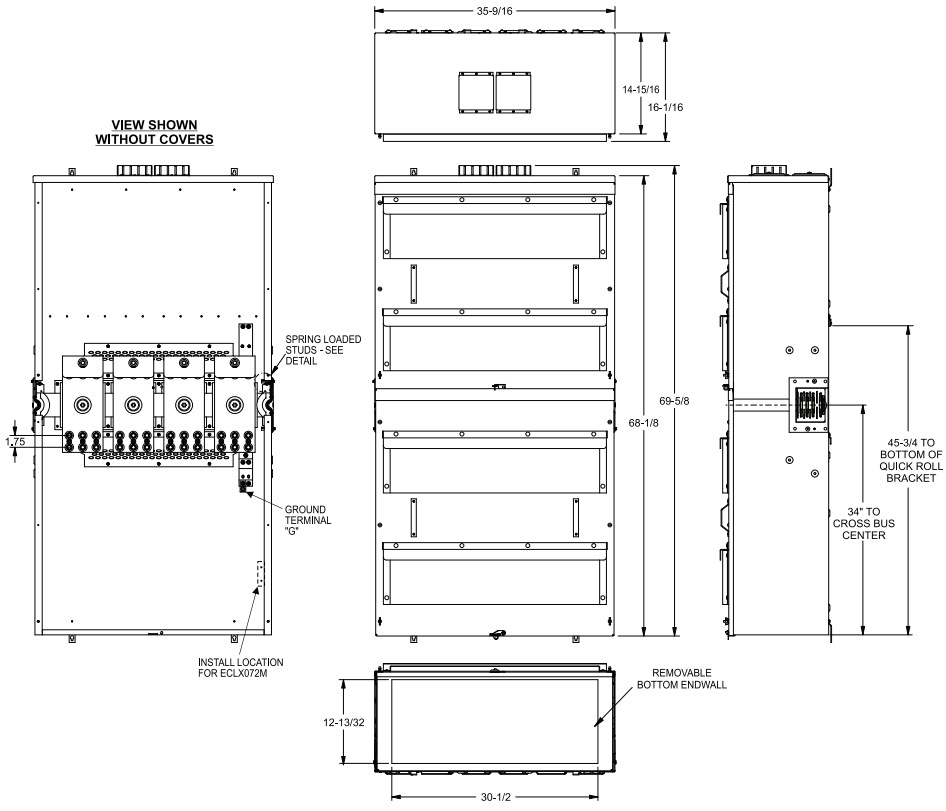


Power Mod

Type WTB Standard Tapboxes: Knockout Diagrams



T-5
WTB12000TU
WTB12000BU
WTB12400TU
WTB12400BU



T-6
WTB32000TU
WTB32000BU
WTB32400TU
WTB32400BU

Power Mod

Type WET Tapbox - Pullbox Combinations

Tapbox – Pullbox Combinations

EUSERC – compliant Tapbox – Pullbox Combination modules (type WET) offer EUSERC compatibility, a wider range of lug options, and extra space for pulling in conductors.

Features include:

- QuickSystem™ features
- Standard compression lug capability
- 750 kcmil AL wire options for most models
- 100K AIC standard for all models
- Broad ampacity ratings from 400 to 1200 Amps
- Removable bottom endwall

Tapbox – Pullbox Combination quick reference

- 400-1200A
- 1200 Amp thru-bus rating
- UL Standard #'s UL67
- UL file # E27100
- AIC Rating (100k)
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint
- EUSERC drawing number 315
- Custom options available! Details on page 2-141.



Power Mod

Type WET Tapbox - Pullbox Combinations

Lugs not included. Refer to page 2-139–2-140 for lug size options. NEMA II Stud Pattern lugs must be installed by user or utility.



EUSERC tap box modules: 1-phase, 3-wire SN, incoming, 120/240V AC③
Meets EUSERC requirements

Catalog number (100k AIC)③	Ampere rating	Service feed②	Dimensions (inches)①			Line side connections② (lugs not included)	Knockout Diagram
			Height	Width	Depth		
WET1400BU	400	UG	46.19	17.63	8.56	1 set of 2 studs	ET-1
WET1800BU	800	UG	50.19	27.13	11.38	2 sets of 2 studs	ET-2
WET11200BU	1200	UG	50.19	35.19	11.38	3 sets of 2 studs	ET-3

EUSERC tap box modules: 3-phase, 4-wire SN, incoming, 240V AC max.③
Meets EUSERC requirements

Catalog number (100k AIC)③	Ampere rating	Service feed	Dimensions (inches)①			Line side connections② (lugs not included)	Knockout Diagram
			Height	Width	Depth		
WET3400BU	400	UG	46.19	17.63	8.56	1 set of 2 studs	ET-1
WET3800BU	800	UG	50.19	27.13	11.38	2 sets of 2 studs	ET-2
WET31200BU	1200	UG	50.19	35.19	11.38	3 sets of 2 studs	ET-3

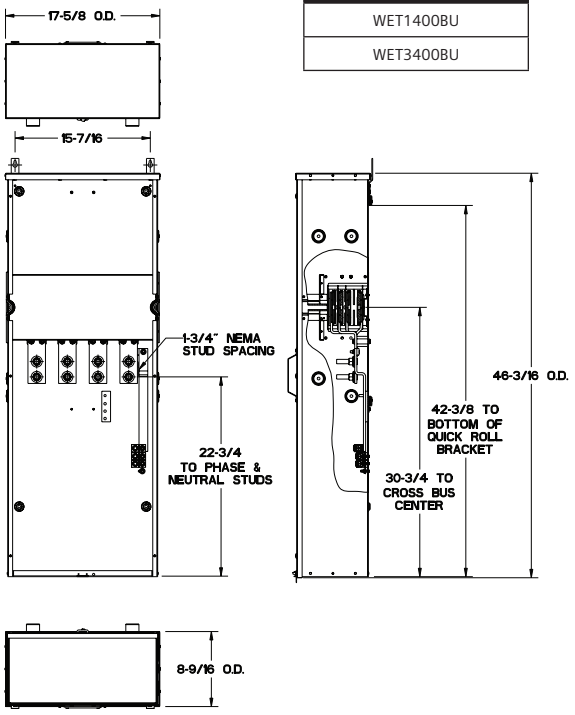
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Lugs not included. Refer to page 2-139–2-140 for lug size options. NEMA II stud pattern compression lugs must be installed by user or utility.

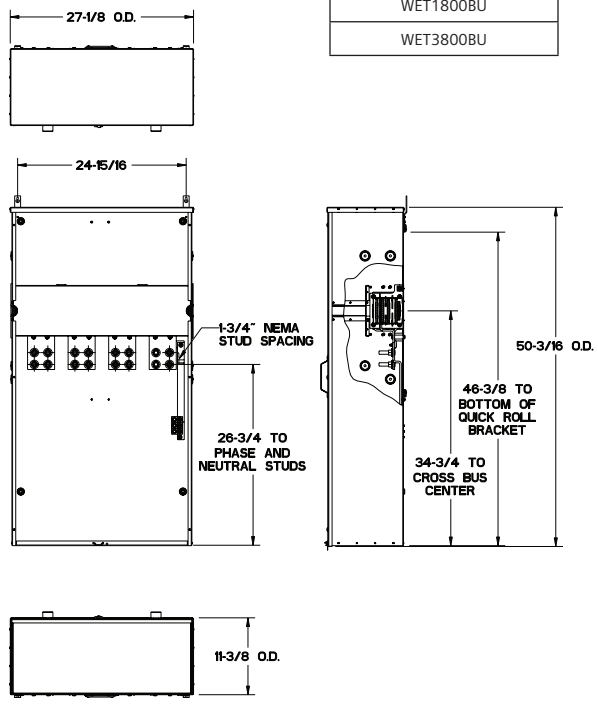
③ QuickConnect not included. Service entrance rated only.

Type WET Tapbox - Pullbox Combinations: Knockout Diagrams

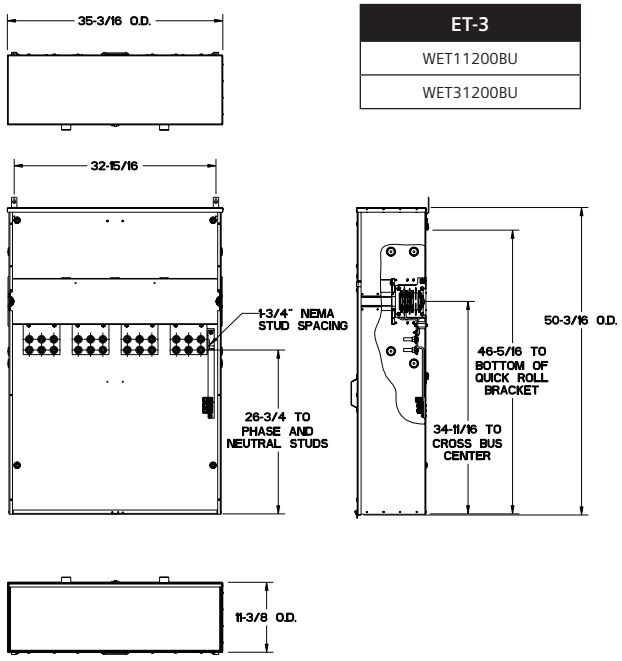
ET-1
WET1400BU
WET3400BU



ET-2
WET1800BU
WET3800BU



ET-3
WET11200BU
WET31200BU



Power Mod

Type WT Feed Thru Tapbox



Feed Thru Tapbox

Family (type WT), the Feed Thru Tapbox features cable in cable out lugs. Valuable for use in mid rise and high rise projects.

Features include:

- QuickSystem features
- Standard compression lug capability
- 250kcmil Al wire options
- 100k AIC standard
- Removable bottom endwell

Feed Thru Tapbox quick reference

- 400 - 2400A
- 1200A thru bus
- UL standard 67
- UL file no. E27100
- AIC rating (100k AIC)
- Voltage:
  - Single phase 120/240V AC max.
  - Three phase, 240V AC max
- All swing latches and rivets are stainless steel.
- NEMA 3R rated
- G90 stainless steel
- ANSI 61 paint
- Custom options available! Details on p. 2-134
- Broad ampacity ratings from 400 to 2400 Amps
- Not Service entrance rated

⚠ Restrictions for 1600-2400amp type WT Power Mod Pull-Thru Tap Boxes: ⚠

When the 1600, 2000, or 2400amp tap boxes are used as service entrance equipment (fed directly from utility transformer) or when the supply originates from a Class L fuse there are restrictions on the use of an additional down-stream (thru-bus connected) WTBN, WTB, WET, or WT type Power Mod tap boxes. In these instances a type "WXB" module must be used as protection for the downstream tap box (placed between the incoming WT tap box and the downstream outgoing tap box). See page 2-70 for an example. This restriction does NOT apply if the tap box is fed from a Siemens Sentron or VL series molded case circuit breaker. Note that the maximum amperage for a Siemens Sentron circuit breaker is 2,000amps. Please note that Siemens type WL circuit breakers can NOT be used to feed WT Power Mod tap boxes.

• Revised •
02/18/14

Power Mod

Type WT Feed Thru Tapbox

⚠ Restrictions for 1600-2400amp type WT Power Mod Pull-Thru Tap Boxes: ⚠

When the 1600, 2000, or 2400amp tap boxes are used as service entrance equipment (fed directly from utility transformer) or when the supply originates from a Class L fuse there are restrictions on the use of an additional down-stream (thru-bus connected) WTBN, WTB, WET, or WT type Power Mod tap boxes. In these instances a type "WXB" module must be used as protection for the downstream tap box (placed between the incoming WT tap box and the downstream outgoing tap box). See page 2-70 for an example. This restriction does NOT apply if the tap box is fed from a Siemens Sentron or VL series molded case circuit breaker. Note that the maximum amperage for a Siemens Sentron circuit breaker is 2,000amps. Please note that Siemens type WL circuit breakers can NOT be used to feed WT Power Mod tap boxes.

Lug kits not included.
(2) Lug kits must be ordered separately per module.
Refer to page 2-139–2-140 for lug size options.



Feed Thru Tapbox modules: 1-phase, 120/240V AC④

Catalog number (100k AIC)	Ampere rating	Service feed	Dimensions (inches)① Height	Width	Depth	Line side conections②	KO Diagram
WT1400PU	400	OH/UG	59.25	17.25	8.13	1 set of 2 studs	
WT1800PU	800		62.25	26.75	11.13	2 sets of 2 studs	
WT11200PU	1200		68.34	35.19	11.41		WP-1
WT11600PU③⑤	1600		67.94	35	14.78	3 sets of 2 studs	WP-2
WT12000PU③⑤	2000						
WT12400PU③⑤⑥	2400					3 sets of 2 studs Optional 4 sets of 2 studs⑥⑦	

Feed Thru Tapbox modules: 3-phase, 240V AC④

Catalog number (100k AIC)	Ampere rating	Service feed	Dimensions (inches)① Height	Width	Depth	Line side conections②	KO Diagram
WT3400PU	400	OH/UG	59.25	17.25	8.13	1 set of 2 studs	
WT3800PU	800		62.25	26.75	11.13	2 sets of 2 studs	
WT31200PU	1200		68.34	35.19	11.41		WP-1
WT31600PU③⑤	1600		67.94	35	14.78	3 sets of 2 studs	WP-2
WT32000PU③⑤	2000						
WT32400PU③⑤	2400					3 sets of 2 studs Optional 4 sets of 2 studs⑥⑦	

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Lugs not included. Refer to page 2-139–2-140 for lug size options. (2) Lug kits must be ordered separately per module. Refer to page 2-139 – 2-140 for lug size options.

③ 1200 amp maximum feed per side-must be used as a center fed main.

④ QuickConnect not included. If used for load side application an additional coupler must be ordered.

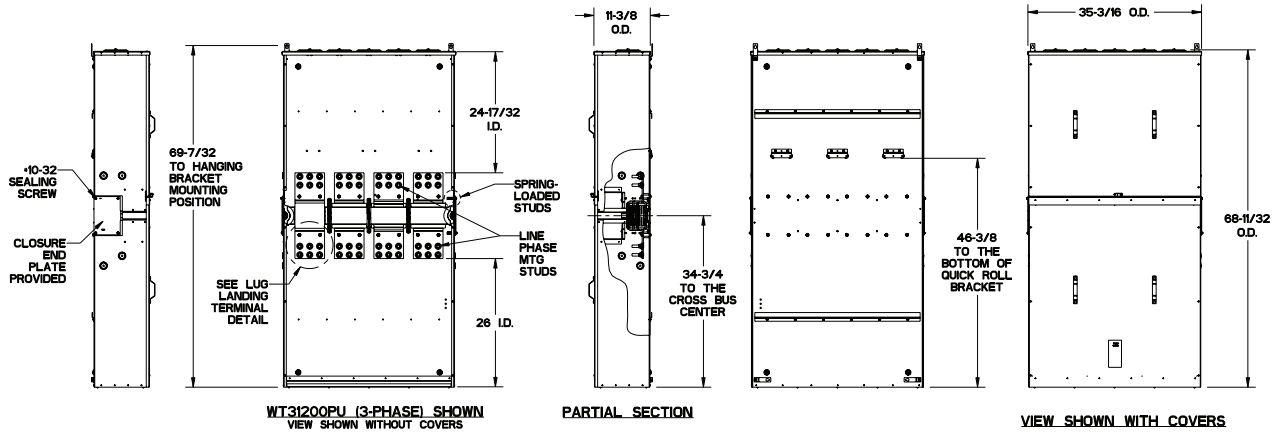
⑤ Please see restriction note above.

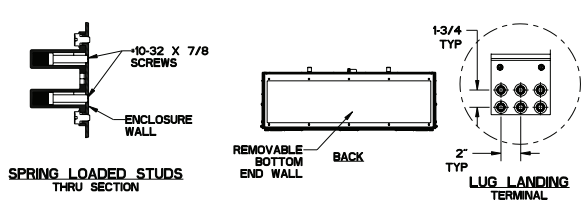
⑥ Please see lug kit number LK18500N2C on pages 2-139 – 2-140. For use with 500kcmil ONLY!

⑦ Fits 2400amp models ONLY!

Power Mod

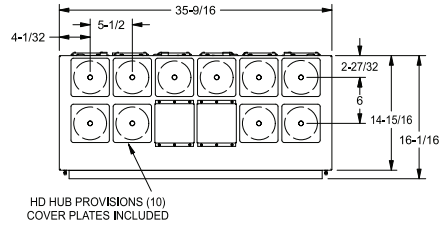
Type WT Feed Thru Tapbox: Knockout Diagrams

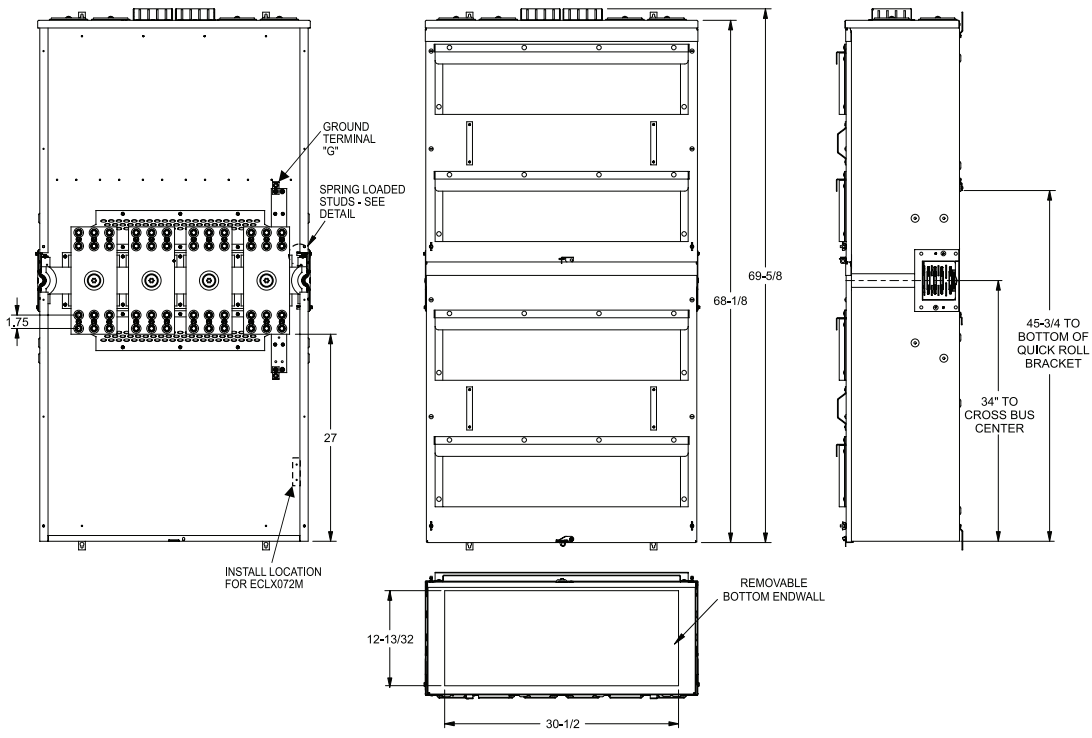




WP-1
WT11200PU
WT31200PU

WP-2	
WT11600PU	WT31600PU
WT12000PU	WT32000PU
WT12400PU	WT32400PU





Power Mod

Type WMM Residential Meter Stacks

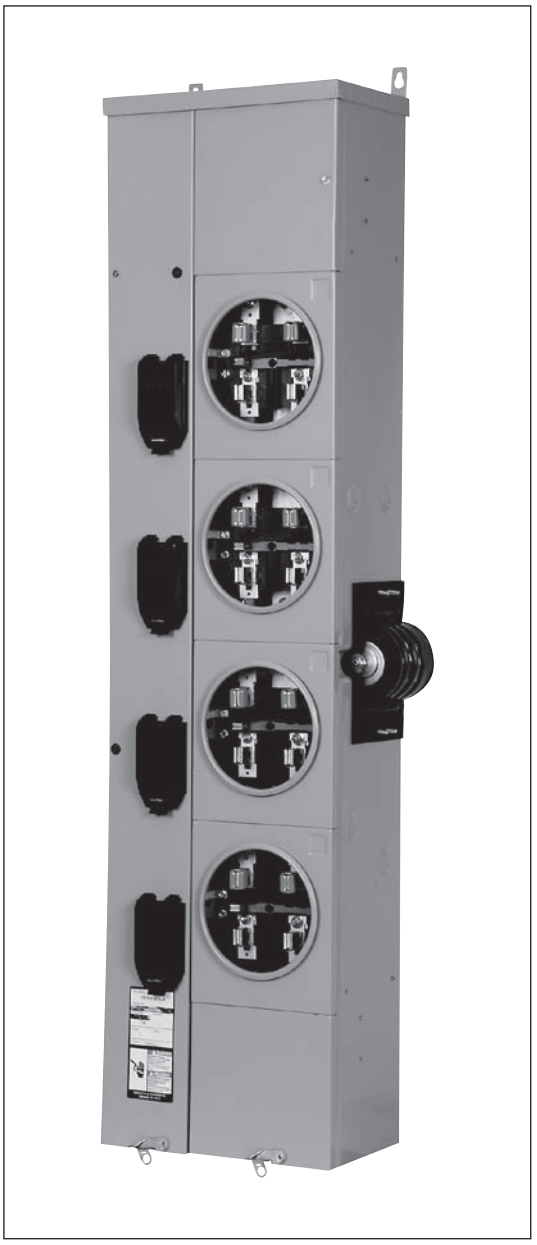
Residential Meter Stacks

Power Mod's core offering of Residential Meter Stacks, type WMM, offers the widest product offering and flexibility in the industry. Each meter stack houses the QuickSystem™ features to maximize productivity and minimize labor costs. To aid in productivity and labor cost reductions our 225 Amp meter stacks feature a new breaker - the "QS". The QS breaker adds to the Siemens exclusive feature set on our new 225 Amp Residential Meter Stacks.

Benefits of the "QS" include:

- An exclusive 6 high 225 Amp meter stack at the same height as our 125 Amp meter stack - 225 to 125 conversion: No conversion kit needed.
- Single right hand bend wiring - saves time and wire
- 100K AIC offered from 100 up to 225 Amps

Siemens Residential Meter Stacks are packed with features inside and out: our exclusive knock out plate offers flexibility when pulling wires to the stack, new breaker supports keep breakers level and straight, moveable neutrals and grounds to save wire, and all of the QuickSystem features all designed with the contractor in mind.



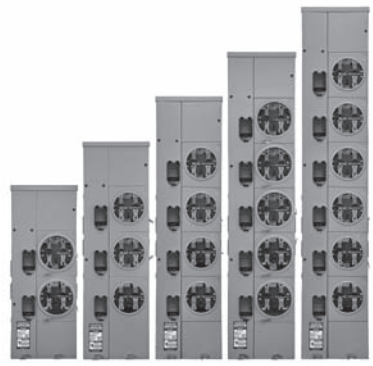
Residential Meter Stacks quick reference

- 2-6 gang
- 125/225 Amp per position
- 1200 Amp thru-bus rating
- UL standard 67
- UL file no. E27100
- AIC rating (65k & 100k)
- Voltage:
  - Single phase 120/240V AC max.
  - Three phase in single phase out
    - 120/208V AC max.
    - 240/120V AC max.
- All swing latches and rivets are stainless steel.
- Outdoor= NEMA 3R rated
- Indoor= NEMA 1R rated
- G90 galvanized steel
- ANSI 61 paint
- Custom options available! Details on page 2-141.

Power Mod

Type WMM Residential Meter Stacks – 1 phase 4J

- 2-6 gang
- 125/225 Amp per position
- 1200 Amp thru-bus rating



Residential 4-jaw ring type meter stacks: 1-phase, 3-wire SN, incoming and outgoing③④

Outdoor catalog number	Indoor catalog number	Meter positions per stack	Breaker provision	Maximum AIC⑤	Dimensions (inches) ①			Knockout diagram
					Height	Width	Depth	
Max. tenant breaker (Amps): 125								
WMM21125	**MM21125**	2 Position	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65k	34.31	13.09	8.09	KA-12
WMM31125	**MM31125**	3 Position		65k	43.31	13.09	8.09	KA-13
WMM41125	**MM41125**	4 Position		65k	52.31	13.09	8.09	KA-14
WMM51125	**MM51125**	5 Position		65k	61.31	13.09	8.09	KA-15
WMM61125	**MM61125**	6 Position		65k	70.31	13.09	8.09	KA-16
Max. tenant breaker (Amps): 225②⑥								
WMM21225	**MM21225**	2 Position	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	34.31	16.22	8.09	KA-22
WMM31225	**MM31225**	3 Position		100k	43.31	16.22	8.09	KA-23
WMM41225	**MM41225**	4 Position		100k	52.31	16.22	8.09	KA-24
WMM51225	**MM51225**	5 Position		100k	61.31	16.22	8.09	KA-25
WMM61225	**MM61225**	6 Position		100k	70.31	16.22	8.09	KA-26

Residential 4-jaw ringless type meter stacks: 1-phase, 3-wire SN, incoming and outgoing③④

Outdoor catalog number (no bypass)	Outdoor catalog number (horn bypass)	Indoor catalog number (no bypass)	Indoor catalog number (horn bypass)	Meter positions per stack	Breaker provision	Max. AIC ⑤	Dimensions (inches) ①			Knockout diagram
							Height	Width	Depth	
Max. tenant breaker (Amps): 125										
WMM21125R	**WMM21125RB**	**MM21125R**	**MM21125RB**	2 Position	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65k	34.31	13.09	8.09	KA-12
WMM31125R	**WMM31125RB**	**MM31125R**	**MM31125RB**	3 Position		65k	43.31	13.09	8.09	KA-13
WMM41125R	**WMM41125RB**	**MM41125R**	**MM41125RB**	4 Position		65k	52.31	13.09	8.09	KA-14
WMM51125R	**WMM51125RB**	**MM51125R**	**MM51125RB**	5 Position		65k	61.31	13.09	8.09	KA-15
WMM61125R	**WMM61125RB**	**MM61125R**	**MM61125RB**	6 Position		65k	70.31	13.09	8.09	KA-16
Max. tenant breaker (Amps): 225②⑥										
WMM21225R	**WMM21225RB**	**MM21225R**	**MM21225RB**	2 Position	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	34.31	16.22	8.09	KA-22
WMM31225R	**WMM31225RB**	**MM31225R**	**MM31225RB**	3 Position		100k	43.31	16.22	8.09	KA-23
WMM41225R	**WMM41225RB**	**MM41225R**	**MM41225RB**	4 Position		100k	52.31	16.22	8.09	KA-24
WMM51225R	**WMM51225RB**	**MM51225R**	**MM51225RB**	5 Position		100k	61.31	16.22	8.09	KA-25
WMM61225R	**WMM61225RB**	**MM61225R**	**MM61225RB**	6 Position		100k	70.31	16.22	8.09	KA-26

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② 225A available in lower three positions only. 200A continuous for all other positions.

③ NOT for use on 3-phase, 4-wire delta systems.

④ Field installed 5th jaw ECMF5. 5th jaw can be isolated if needed.

⑤ Max AIC determined by maximum AIC of tenant breakers. Higher ratings may be achieved through approved series rating combinations.

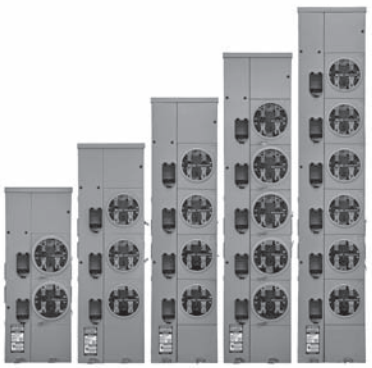
⑥ Install QP breakers below QS breakers.

• Revised •
02/18/14

Power Mod

Type WMM Residential Meter Stacks – 1 phase 5J

- 2-6 gang
- 125/225 Amp per position
- 1200 Amp thru-bus rating



Residential 5-jaw ring type meter stacks: 1-phase, 3-wire SN, incoming and outgoing③④

Outdoor catalog number	Indoor catalog number	Meter positions per stack	Breaker provision	Maximum AIC⑤	Dimensions (inches) ①			Knockout diagram
					Height	Width	Depth	
Max. tenant breaker (Amps): 125								
WMM21125J	MM21125J	2 Position	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65k	34.31	13.09	8.09	KA-12
WMM31125J	MM31125J	3 Position		65k	43.31	13.09	8.09	KA-13
WMM41125J	MM41125J	4 Position		65k	52.31	13.09	8.09	KA-14
WMM51125J	MM51125J	5 Position		65k	61.31	13.09	8.09	KA-15
WMM61125J	MM61125J	6 Position		65k	70.31	13.09	8.09	KA-16
Max. tenant breaker (Amps): 225②⑥								
WMM21225J	MM21225J	2 Position	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	34.31	16.22	8.09	KA-22
WMM31225J	MM31225J	3 Position		100k	43.31	16.22	8.09	KA-23
WMM41225J	MM41225J	4 Position		100k	52.31	16.22	8.09	KA-24
WMM51225J	MM51225J	5 Position		100k	61.31	16.22	8.09	KA-25
WMM61225J	MM61225J	6 Position		100k	70.31	16.22	8.09	KA-26

Residential 5-jaw ringless type meter stacks: 1-phase, 3-wire SN, incoming and outgoing③④

Outdoor catalog number (no bypass)	Outdoor catalog number (horn bypass)	Indoor catalog number (no bypass)	Indoor catalog number (horn bypass)	Meter positions per stack	Breaker provision	Max. AIC ⑤	Dimensions (inches) ①			Knockout diagram
							Height	Width	Depth	
Max. tenant breaker (Amps): 125										
WMM21125RJ	WMM21125RJB	MM21125RJ	MM21125RJB	2 Position	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65k	34.31	13.09	8.09	KA-12
WMM31125RJ	WMM31125RJB	MM31125RJ	MM31125RJB	3 Position		65k	43.31	13.09	8.09	KA-13
WMM41125RJ	WMM41125RJB	MM41125RJ	MM41125RJB	4 Position		65k	52.31	13.09	8.09	KA-14
WMM51125RJ	WMM51125RJB	MM51125RJ	MM51125RJB	5 Position		65k	61.31	13.09	8.09	KA-15
WMM61125RJ	WMM61125RJB	MM61125RJ	MM61125RJB	6 Position		65k	70.31	13.09	8.09	KA-16
Max. tenant breaker (Amps): 225②⑥										
WMM21225RJ	WMM21225RJB	MM21225RJ	MM21225RJB	2 Position	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	34.31	16.22	8.09	KA-22
WMM31225RJ	WMM31225RJB	MM31225RJ	MM31225RJB	3 Position		100k	43.31	16.22	8.09	KA-23
WMM41225RJ	WMM41225RJB	MM41225RJ	MM41225RJB	4 Position		100k	52.31	16.22	8.09	KA-24
WMM51225RJ	WMM51225RJB	MM51225RJ	MM51225RJB	5 Position		100k	61.31	16.22	8.09	KA-25
WMM61225RJ	WMM61225RJB	MM61225RJ	MM61225RJB	6 Position		100k	70.31	16.22	8.09	KA-26

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② 225A available in lower three positions only. 200A continuous for all other positions.

③ NOT for use on 3-phase, 4-wire delta systems.

④ Field installed 5th jaw ECMF5. 5th jaw can be isolated if needed.

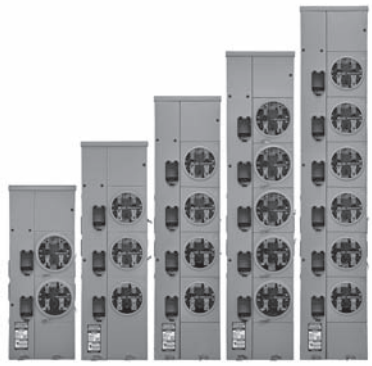
⑤ Max AIC determined by maximum AIC of tenant breakers. Higher ratings may be achieved through approved series rating combinations.

⑥ Install QP breakers below QS breakers.

Power Mod

Type WMM Residential Meter Stacks – 3 phase in 1 phase out 5J

- 2-6 gang
- 125/225 Amp per position
- 1200 Amp thru-bus rating



Residential 5-jaw ring type meter stacks: 3-phase, 4-wire SN, incoming and 1-phase, 3 wire SN outgoing③④⑦

Outdoor catalog number	Indoor catalog number	Meter positions per stack	Breaker provision	Maximum AIC⑤	Dimensions (inches)①			Knockout diagram
					Height	Width	Depth	
Max. tenant breaker (Amps): 125								
WMM22125J	MM22125J	2 Position	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65k	34.31	13.09	8.09	KA-12
WMM32125J	MM32125J	3 Position		65k	43.31	13.09	8.09	KA-13
WMM42125J	MM42125J	4 Position		65k	52.31	13.09	8.09	KA-14
WMM52125J	MM52125J	5 Position		65k	61.31	13.09	8.09	KA-15
WMM62125J	MM62125J	6 Position		65k	70.31	13.09	8.09	KA-16
Max. tenant breaker (Amps): 225②⑥								
WMM22225J	MM22225J	2 Position	QS, QSH, QSHH, HQS, HQSH, QP,QPH, HQP, MP-T, MP-HT, MP-MT	100k	34.31	16.22	8.09	KA-22
WMM32225J	MM32225J	3 Position		100k	43.31	16.22	8.09	KA-23
WMM42225J	MM42225J	4 Position		100k	52.31	16.22	8.09	KA-24
WMM52225J	MM52225J	5 Position		100k	61.31	16.22	8.09	KA-25
WMM62225J	MM62225J	6 Position		100k	70.31	16.22	8.09	KA-26

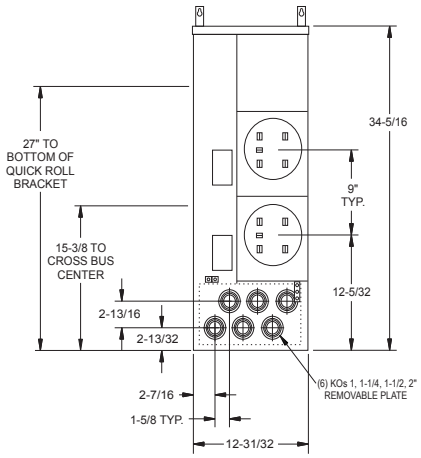
Residential 5-jaw ringless type meter stacks: 3-phase, 4-wire SN, incoming and 1-phase, 3 wire SN outgoing③④⑦

Outdoor catalog number (no bypass)	Outdoor catalog number (horn Bypass)	Indoor catalog number (no bypass)	Indoor catalog number (horn bypass)	Meter positions per stack	Breaker provision	Max. AIC ⑤	Dimensions (inches)①			Knockout diagram
							Height	Width	Depth	
Max. tenant breaker (Amps): 125										
WMM22125RJ	WMM22125RJB	MM22125RJ	MM22125RJB	2 Position	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65k	34.31	13.09	8.09	KA-12
WMM32125RJ	WMM32125RJB	MM32125RJ	MM32125RJB	3 Position		65k	43.31	13.09	8.09	KA-13
WMM42125RJ	WMM42125RJB	MM42125RJ	MM42125RJB	4 Position		65k	52.31	13.09	8.09	KA-14
WMM52125RJ	WMM52125RJB	MM52125RJ	MM52125RJB	5 Position		65k	61.31	13.09	8.09	KA-15
WMM62125RJ	WMM62125RJB	MM62125RJ	MM62125RJB	6 Position		65k	70.31	13.09	8.09	KA-16
Max. tenant breaker (Amps): 225②⑥										
WMM22225RJ	WMM22225RJB	MM22225RJ	MM22225RJB	2 Position	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	34.31	16.22	8.09	KA-22
WMM32225RJ	WMM32225RJB	MM32225RJ	MM32225RJB	3 Position		100k	43.31	16.22	8.09	KA-23
WMM42225RJ	WMM42225RJB	MM42225RJ	MM42225RJB	4 Position		100k	52.31	16.22	8.09	KA-24
WMM52225RJ	WMM52225RJB	MM52225RJ	MM52225RJB	5 Position		100k	61.31	16.22	8.09	KA-25
WMM62225RJ	WMM62225RJB	MM62225RJ	MM62225RJB	6 Position		100k	70.31	16.22	8.09	KA-26

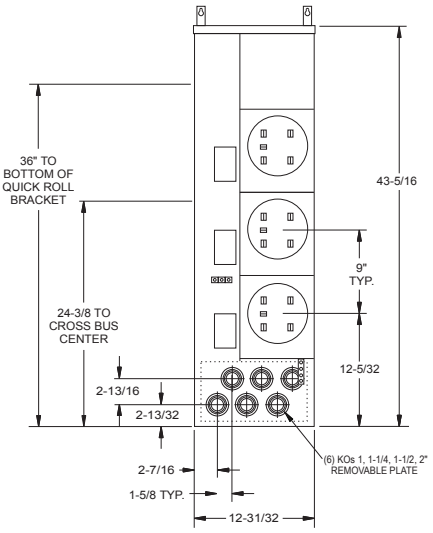
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.
② 225A available in lower three positions only. 200A continuous for all other positions.
③ Approved for use on 3-phase, 4-wire delta systems. Must field phase away from B phase (A & C phase only).
④ 5th jaw can be isolated if needed.
⑤ Max AIC determined by maximum AIC of tenant breakers. Higher ratings may be achieved through approved series rating combinations.
⑥ Install QP breakers below QS breakers.
⑦ Stacks come factory phased as AB, BC, AC... top to bottom

Power Mod

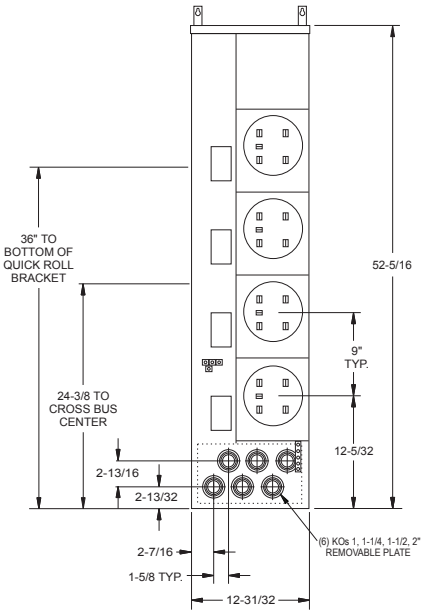
Type WMM Residential Meter Stacks: Knockout Diagrams



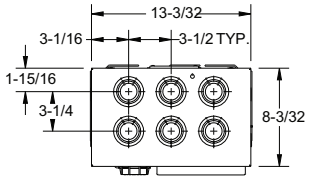
KA-12	
WMM21125XX	MM21125XX
WMM22125XXX	MM22125XXX



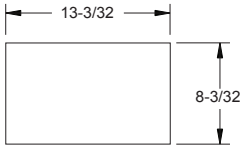
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WMM32125XXX	MM32125XXX



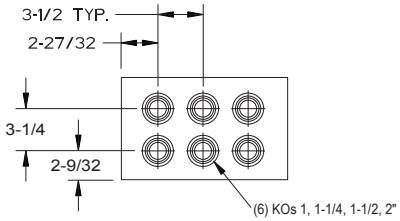
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WMM42125XXX	MM42125XXX



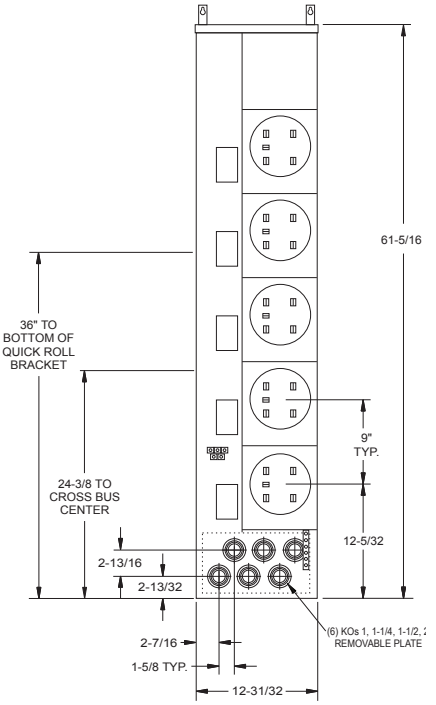
125 Amp Typical Top View for NEMA 1



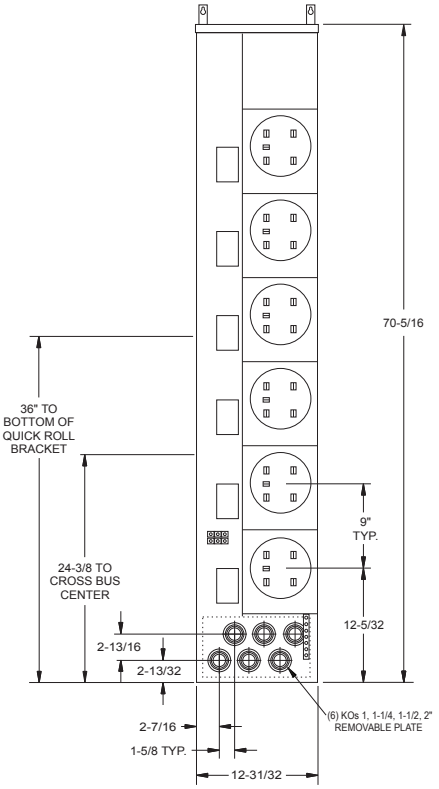
125 Amp Typical Top View



125 Amp Typical Bottom View



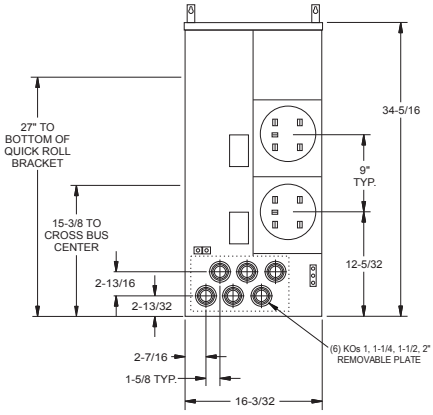
KA-15	
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WMM52125XXX	MM52125XXX



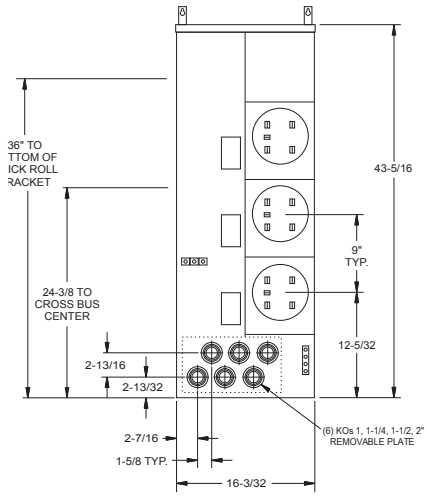
KA-16	
WMM61125XX	MM61125XX
WMM62125XXX	MM62125XXX

Power Mod

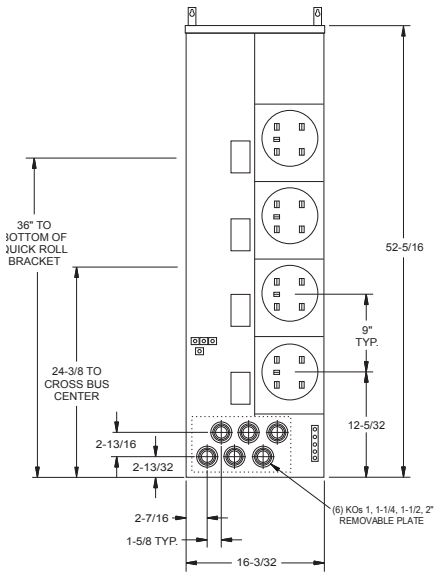
Type WMM Residential Meter Stacks: Knockout Diagrams



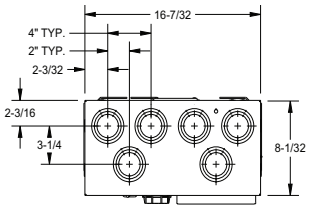
KA-22	
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WMM22225XXX	MM22225XXX



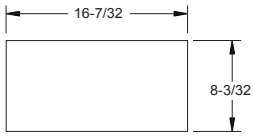
KA-23	
WMM31225XX	MM31225XX
WMM32225XXX	MM32225XXX



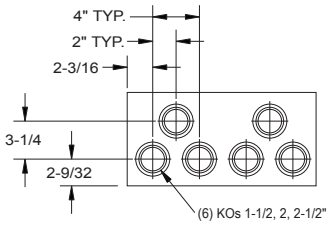
KA-24	
WMM41225XX	MM41225XX
WMM42225XXX	MM42225XXX



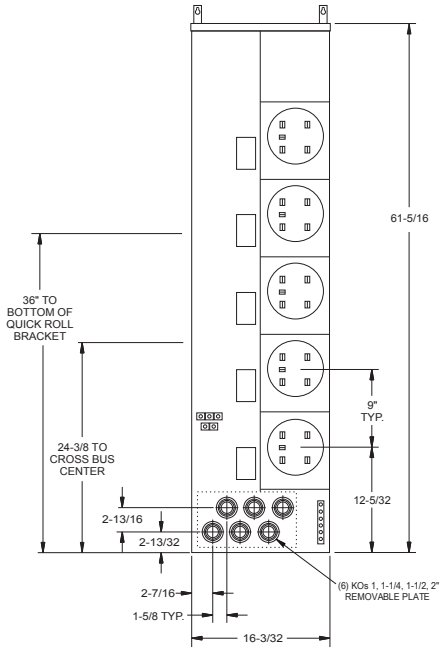
225 Amp Typical Top View for NEMA 1



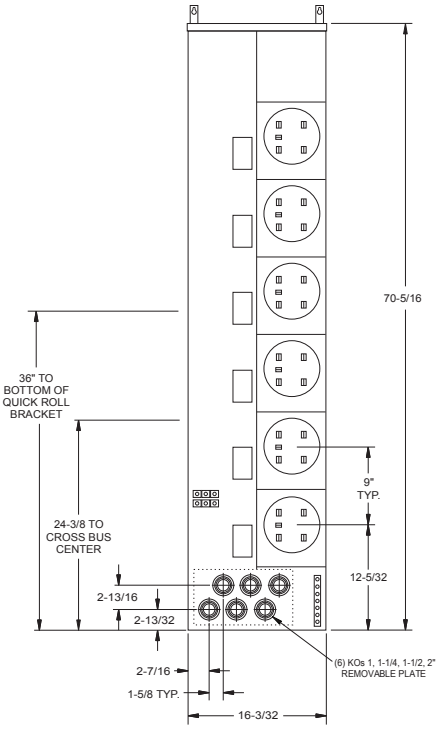
225 Amp Typical Top View



225 Amp Typical Bottom View



KA-25	
WMM51225XX	MM51225XX
WMM52225XXX	MM52225XXX



KA-26	
WMM61225XX	MM61225XX
WMM62225XXX	MM62225XXX

Power Mod

Type WML Lever Bypass Meter Stacks

Lever Bypass Meter Stacks

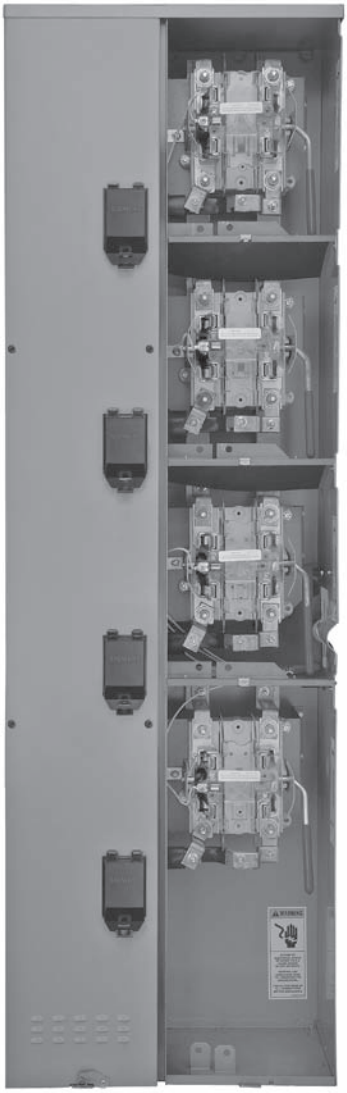
Commercial Lever Bypass meter stacks (type WML) are designed to meet the requirements of those utilities specifying lever bypass meter sockets for residential and commercial applications.

Features include:

- QuickSystem™ features
- High-quality, time-proven Talon HQ sockets
- A line of 3-phase 100 Amp meter stacks to minimize tenant main cost
- Removable back knockout plate to facilitate wiring
- 225 Amp capability in single and three phase designs
- Up to 4 positions with 225 Amp tenant mains, up to 2 positions with 400 Amp tenant mains
- Ease of wiring – tenant mains require only a single bend

Lever Bypass quick reference

- 100A/225A 1-4 position
- 400A 1-2 position
- 1200A thru-bus rating
- UL Standard # UL67
- UL file # E27100
- AIC rating (25K, 65K & 100K)
- Voltage
  - Single phase 120/240V AC max
  - Three in single phase out 208Y/120V AC
  - Three Phase 240V AC max
- All swing latches and rivets are stainless steel.
- Outdoor= NEMA 3R rated
- Indoor= NEMA 1R rated
- G90 Galvanized Steel
- ANSI 61 Paint
- Custom options available! Details on page 2-141.



Power Mod

Type WML Lever Bypass Meter Stacks

- 225A 1-4 position
- 400A 1-2 position
- 1200A thru-bus rating



Commercial ringless type meter stacks: Lever Bypass

Outdoor catalog number	Indoor catalog number	Meter positions per stack	Breaker Provisions	Maximum AIC③	Dimensions (inches)①			Stack phasing phases/sockets	Knockout diagram
					Height	Width	Depth		
1-phase, 3-wire SN, incoming and outgoing, lever bypass, 5-jaw sockets②									
Max. tenant breaker (Amps): 225									
WML11225RJ	ML11225RJ	1	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	27.75	19.50	9.00	—	L-1
WML21225RJ	ML21225RJ	2		100k	40.75	19.50	9.00	—	L-2
WML31225RJ	ML31225RJ	3		100k	49.75	19.50	9.00	—	L-3
WML41225RJ	ML41225RJ	4		100k	62.75	19.50	9.00	—	L-4
Max. tenant breaker (Amps): 400									
WML11400RJ④	ML11400RJ④	1	JXD62B400 Factory inst	25k	44.00	16.31	9.69	—	L-5
WML21400RJ④	ML21400RJ④	2		25k	70.38	23.00	9.69	—	L-6
3-phase, 4-wire SN, incoming and 1-phase, 3-wire SN outgoing, lever bypass, 5-jaw sockets② ⑤									
Max. tenant breaker (Amps): 225									
WML12225RJ	ML12225RJ	1	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	27.75	19.50	9.00	1-AB	L-1
WML22AB225RJ	ML22AB225RJ	2		100k	40.75	19.50	9.00	1-AC, 1-BC	L-2
WML22BC225RJ	ML22BC225RJ	2		100k	40.75	19.50	9.00	1-AC, 1-AB	
WML22CA225RJ	ML22CA225RJ	2		100k	40.75	19.50	9.00	1-AB, 1-BC	
WML32225RL	ML32225RL	3		100k	49.75	19.50	9.00	1-AB, 1-BC, 1-CA	L-3
WML42AB225RJ	ML42AB225RJ	4		100k	62.75	19.50	9.00	2-AB, 1-BC, 1-CA	L-4
WML42BC225RJ	ML42BC225RJ	4		100k	62.75	19.50	9.00	1-AB, 2-BC, 1-CA	
WML42CA225RJ	ML42CA225RJ	4		100k	62.75	19.50	9.00	1-AB, 1-BC, 2-CA	
Max. tenant breaker (Amps): 400									
WML12400RJ④	ML12400RJ④	1	JXD62B400 Factory Inst	25k	44.00	16.31	9.69	1-AB	L-5
WML22400RJ④	ML22400RJ④	2		25k	70.38	23.00	9.69	1-AB, 1-BC	L-6

Alternate amperage breakers

Ad Suffix ➔	1 Meter Position Per Stack	Breaker Amperage
	T1	200A
	T2	250A
	T3	300A
	T4	350A
	T19	225A

Ad Suffix ➔	2 Meter Position Per Stack	Breaker Amperage
	T5	200A/200A
	T6	200A/250A
	T7	200A/300A
	T8	200A/350A
	T9	200A/400A
	T10	250A/300A
	T11	250A/350A
	T12	250A/400A
	T13	300A/300A
	T14	300A/350A
	T15	300A/400A
	T16	350A/350A
	T17	350A/400A
	T18	250A/250A
	T20	200A/225A
	T21	225A/225A
	T22	225A/250A
	T23	225A/300A
	T24	225A/350A
	T25	225A/400A

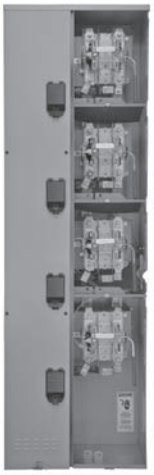
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, hubs, or hardware protrusions.
② Not for use on 3-phase, 4-wire delta systems.
③ Max AIC determined by maximum AIC of tenant breakers when used in conjuntion with a meter socket. Higher overall ratings may be achieved through approved series rating combinations.
④ Alternate amperage breakers are available. Please see table on right for suffix that needs to be added. Additional lead time may apply. Contact sales office for details.
⑤ Commerical Stacks are not field phaseable.

• Revised •
06/01/13

Power Mod

Type WML Lever Bypass Meter Stacks

- 100A/225A 1-4 position
- 400A 1-2 position
- 1200A thru-bus rating



Commercial ringless type meter stacks: Lever Bypass

Outdoor catalog number	Indoor catalog number	Meter positions per stack	Breaker provisions	Maximum AIC③	Dimensions (inches)①			Knockout diagram
					Height	Width	Depth	
3-phase, 4-wire SN, incoming and outgoing, lever bypass, 7-jaw sockets⑤								
Max. tenant breaker (Amps)③ : 100								
WML13100RJ②	**ML13100RJ②**	1	QP, MP-T, QPH, MP-HT, HQP, MP-MT	65k	27.75	23.50	9.00	L-7
WML23100RJ②	**ML23100RJ②**	2		65k	40.75	23.50	9.00	L-8
WML33100RJ②	**ML33100RJ②**	3		65k	49.75	23.50	9.00	L-9
WML43100RJ②	**ML43100RJ②**	4		65k	62.75	23.50	9.00	L-10
Max. tenant breaker (Amps)③ : 225								
WML13225RJ	**ML13225RJ**	1	QJ2, QJH2, QJ2H,MQ, MQH,MQL	100k	27.75	23.50	9.00	L-11
WML23225RJ	**ML23225RJ**	2		100k	40.75	23.50	9.00	L-12
WML33225RJ	**ML33225RJ**	3		100k	49.75	23.50	9.00	L-13
WML43225RJ	**ML43225RJ**	4		100k	62.75	23.50	9.00	L-14
Max. tenant breaker (Amps)③ : 400								
WML13400RJ④	**ML13400RJ④**	1	JXD63B400 Factory Inst	25k	44.00	16.31	9.69	L-5
WML23400RJ④	**ML23400RJ④**	2		25k	70.38	23.00	9.69	L-6

Alternate amperage breakers

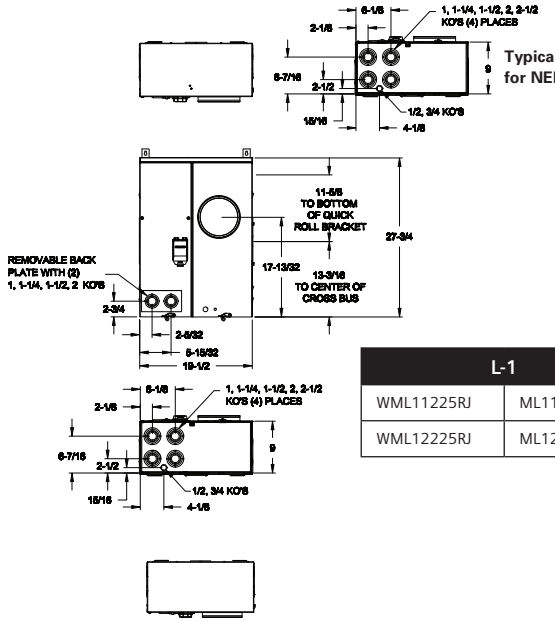
Ad Suffix ➔	1 Meter Position Per Stack	Breaker Amperage
	T1	200A
	T2	250A
	T3	300A
	T4	350A
	T19	225A

Ad Suffix ➔	2 Meter Position Per Stack	Breaker Amperage
	T5	200A/200A
	T6	200A/250A
	T7	200A/300A
	T8	200A/350A
	T9	200A/400A
	T10	250A/300A
	T11	250A/350A
	T12	250A/400A
	T13	300A/300A
	T14	300A/350A
	T15	300A/400A
	T16	350A/350A
	T17	350A/400A
	T18	250A/250A
	T20	200A/225A
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	T23	225A/300A
	T24	225A/350A
	T25	225A/400A

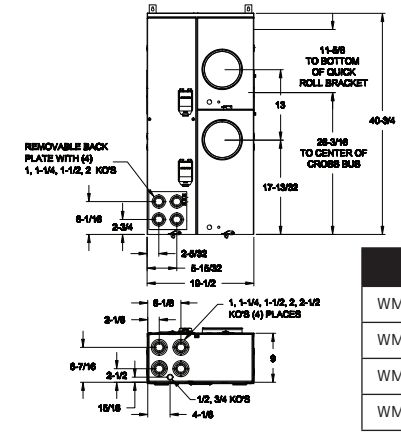
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, hubs, or hardware protrusions.
② 3-pole breakers only.
③ Max AIC determined by maximum AIC of tenant breakers when used in conjunction with a meter socket. Higher overall ratings may be achieved through approved series rating combinations.
④ Alternate amperage breakers are available. Please see below table for suffix that needs to be added. Additional lead time may apply. Contact sales office for details.
⑤ Rated for use with 240/120V Delta systems.

Power Mod

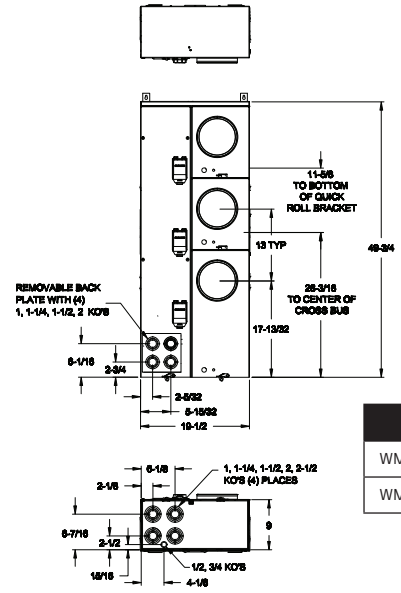
Meter Stacks: WML Lever Bypass Stacks Knockout Diagrams



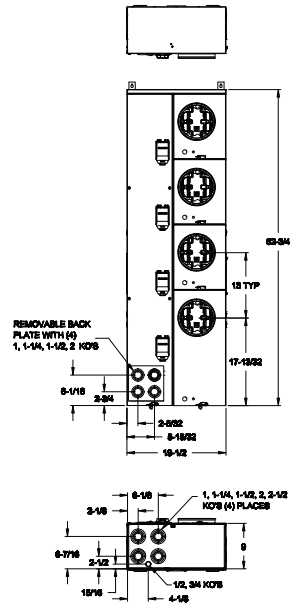
L-1	
WML11225RJ	ML11225RJ
WML12225RJ	ML12225RJ



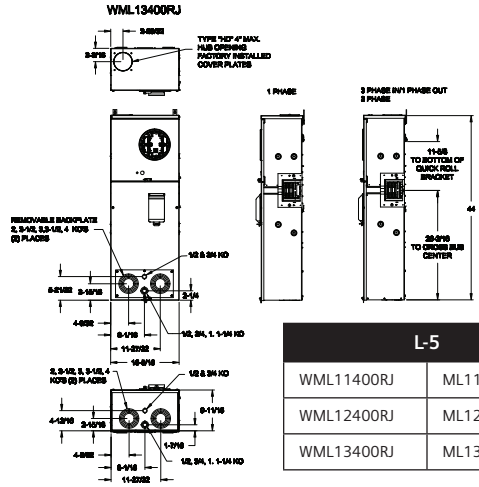
L-2	
WML21225RJ	ML21225RJ
WML22AB225RJ	ML22AB225RJ
WML22BC225RJ	ML22BC225RJ
WML22CA225RJ	ML22CA225RJ



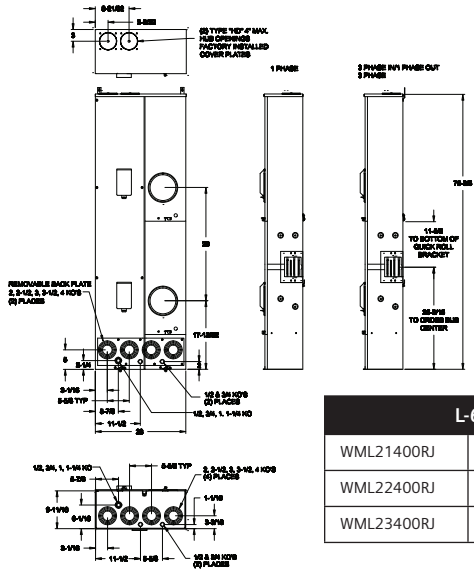
L-3	
WML31225RJ	ML31225RJ
WML32225RJ	ML32225RJ



L-4	
WML41225RJ	ML41225RJ
WML42AB225RJ	ML42AB225RJ
WML42BC225RJ	ML42BC225RJ
WML42CA225RJ	ML42CA225RJ



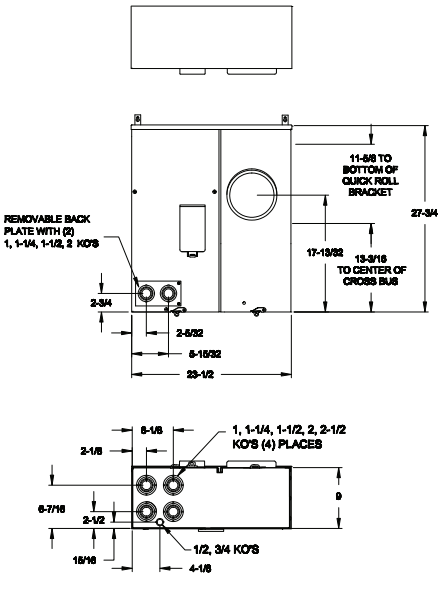
L-5	
WML11400RJ	ML11400RJ
WML12400RJ	ML12400RJ
WML13400RJ	ML13400RJ



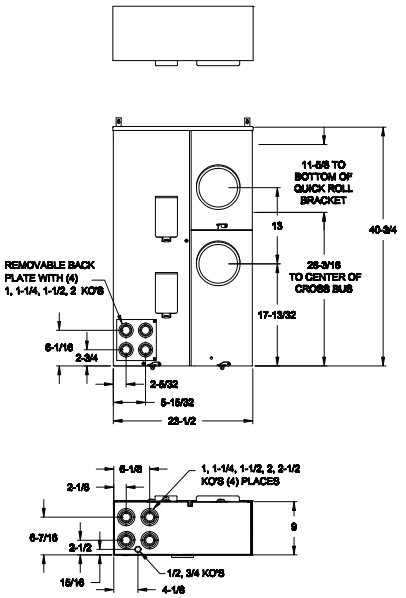
L-6	
WML21400RJ	ML21400RJ
WML22400RJ	ML22400RJ
WML23400RJ	ML23400RJ

Power Mod

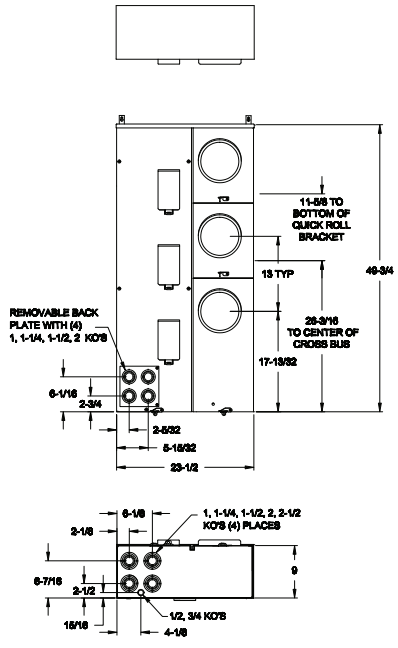
Meter Stacks: WML Lever Bypass Stacks Knockout Diagrams



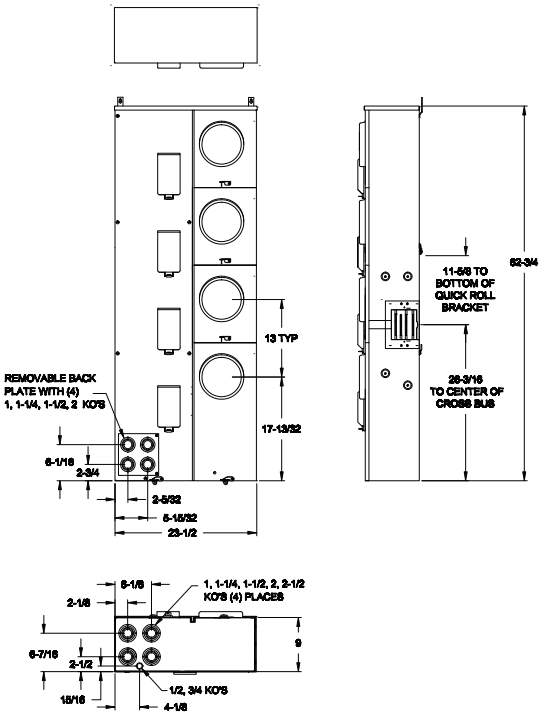
L-7	
WML13100RJ	ML13100RJ



L-8	
WML23100RJ	ML23100RJ



L-9	
WML33100RJ	ML33100RJ

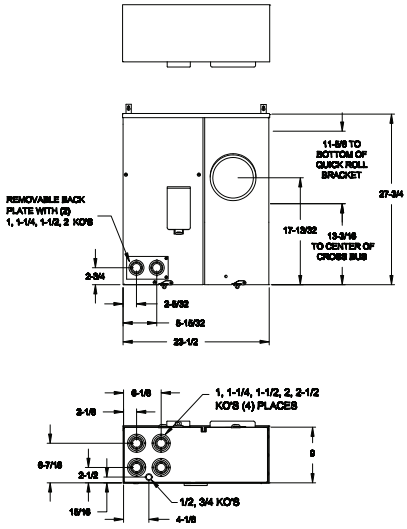


L-10	
WML43100RJ	ML43100RJ

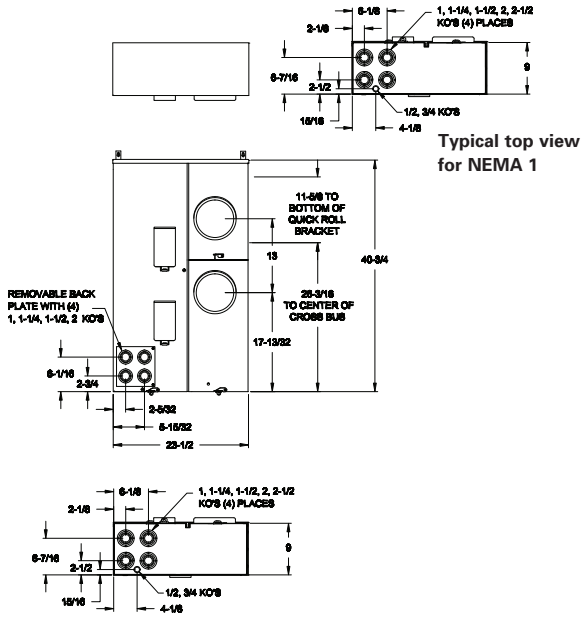
Power Mod

Meter Stacks: WML Lever Bypass Stacks Knockout Diagrams

L-11	
WML13225RJ	ML13225RJ

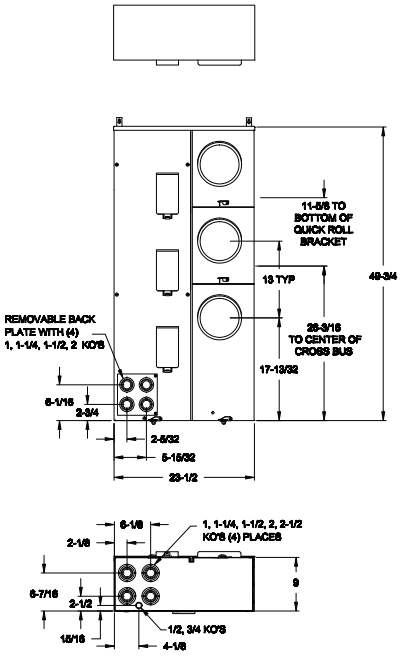


L-12	
WML23225RJ	ML23225RJ

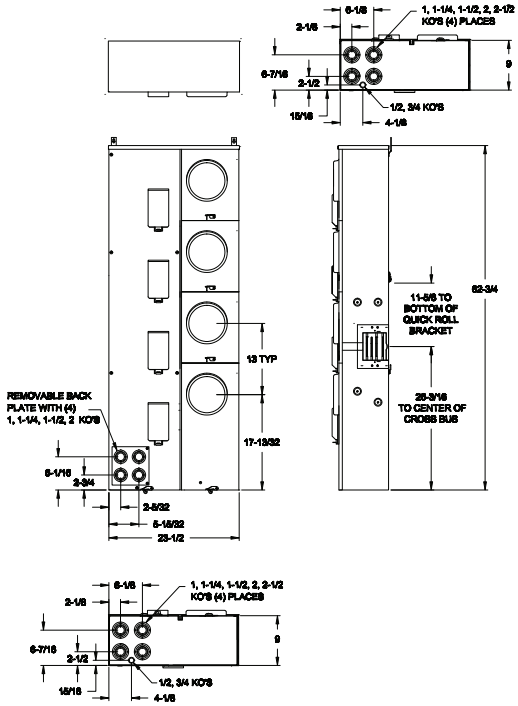


Typical top view for NEMA 1

L-13	
WML33225RJ	ML33225RJ



L-14	
WML43225RJ	ML43225RJ



Power Mod

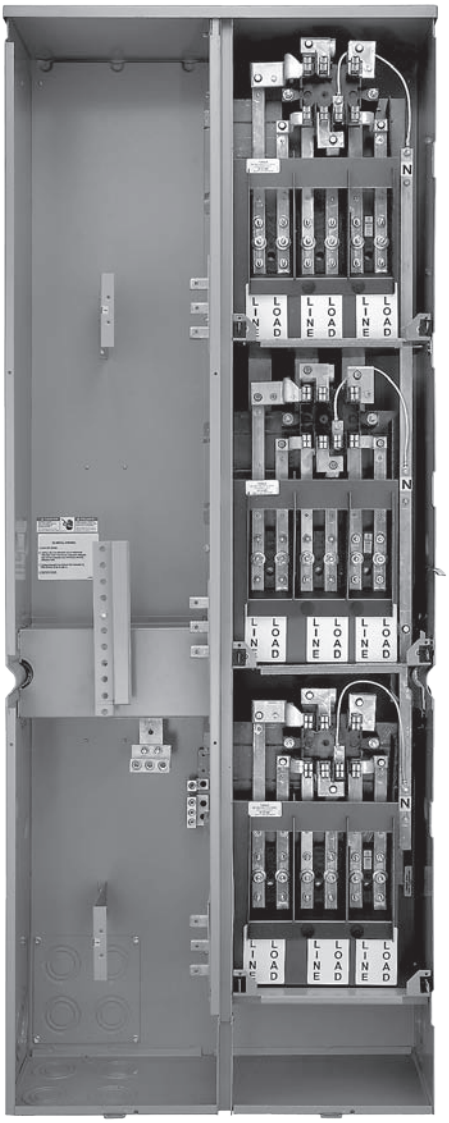
Type WMT Test Block Bypass Meter Stacks

Test Block Bypass Meter Stacks

Commercial Test Block Bypass Meter Stacks (type WMT) are designed to meet the requirements of those utilities specifying test block bypass meter sockets for commercial applications in areas subscribing to the EUSERC standards.

Features include:

- QuickSystem™ features
- High-quality, time-proven Siemens SMM switchboard meter socket
- Removable back knockout plate to facilitate wiring
- 225 Amp capability in single and three phase designs
- Up to 3 positions with 225 Amp tenant mains
- Wiring flexibility - tenant mains require only a single bend
- Three phase input, single phase output modules
- In line wiring: side knockouts allow wiring for adjacent units to pass through



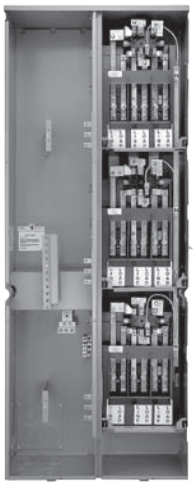
Test Block Bypass Quick Reference

- 225A 1-3 positions
- 1200A thru-bus rating
- UL Standard #'s UL67
- UL file # E27100
- AIC rating (100K)
- Voltage
  - 1 phase 120/240V AC Max
  - 3 phase in 1 phase out 120Y/208V AC Max
  - 3 phase 240V AC Max
- All swing latches and rivets are stainless steel.
- Outdoor= NEMA 3R rated
- Indoor= NEMA 1R rated
- G90 galvanized Steel
- ANSI 61 Paint
- EUSERC drawing #'s 312 and 353
- Custom options available! Details on page 2-141.

Power Mod

Type WMT Test Block Bypass Meter Stacks

- 225A 1-3 positions
- 1200A thru-bus rating
- AIC Rating (100k)



Commercial ring type meter stacks: Test Block Bypass③

Outdoor Catalog number	Indoor Catalog number	Meter positions per stack	Breaker provisions	Maximum AIC	Dimensions (inches)①			Phase	Knockout diagram
					Height	Width	Depth		
1-phase, 3-wire SN, incoming and outgoing, test block bypass, 4-jaw sockets②									
Max. tenant breaker (Amps): 225									
WMT11225	**MT11225**	1	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	40.50	21.50	9.00	—	TB-1
WMT21225	**MT21225**	2			46.00	21.50	9.00	—	TB-2
WMT31225	**MT31225**	3			65.50	21.50	9.00	—	TB-3
3-phase, 4-wire SN, incoming and 1-phase, 3-wire SN outgoing, test block bypass, 5-jaw sockets②⑤									
Max. tenant breaker (Amps): 225									
WMT12225J	**MT12225J**	1	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MP-MT	100k	40.50	21.50	9.00	AB	TB-1
WMT22AB225J	**MT22AB225J**	2			46.00	21.50	9.00	1-BC, 1-CA	TB-2
WMT22BC225J	**MT22BC225J**	2			46.00	21.50	9.00	1-AB, 1-CA	
WMT22CA225J	**MT22CA225J**	2			46.00	21.50	9.00	1-AB, 1-BC	
WMT32225J	**MT32225J**	3			65.50	21.50	9.00	1-AB, 1-BC, 1-CA	TB-3
3-phase, 4-wire SN, incoming and outgoing, test block bypass, 7-jaw sockets④									
Max. tenant breaker (Amps): 225									
WMT13225J	**MT13225J**	1	QJ2, QJH2, QJ2H, MQ, MQH, MQL	100k	40.50	25.50	9.00	—	TB-4
WMT23225J	**MT23225J**	2			46.00	25.50	9.00	—	TB-5
WMT33225J	**MT33225J**	3			65.50	25.50	9.00	—	TB-6

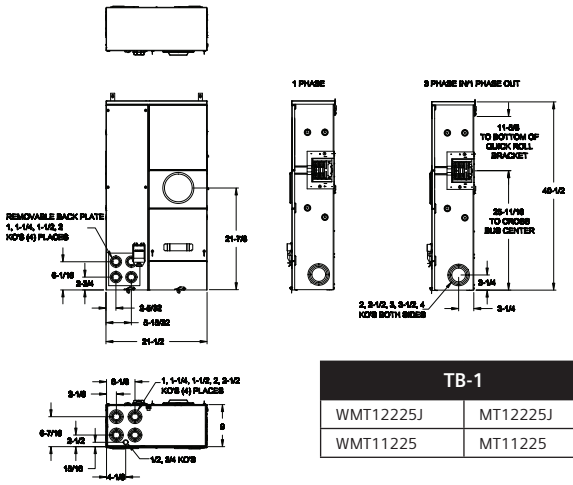
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, hubs, or hardware protrusions.

② Not for use on 3-phase,4-wire delta systems.
③ Max AIC determined by maximum AIC of tenant breakers when used in conjunction with a meter socket.

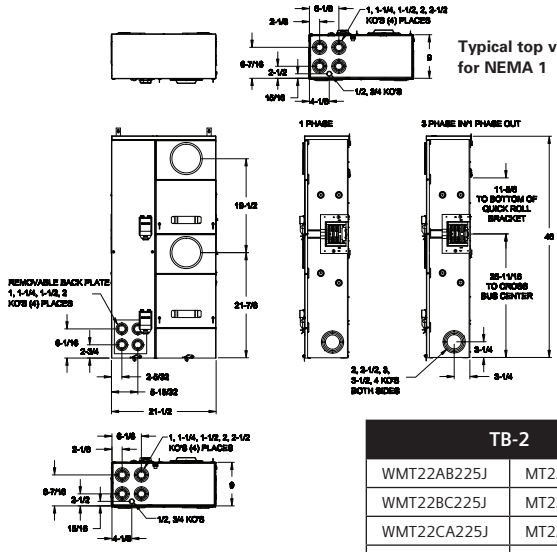
④ Rated for use with 240/120V Delta systems.
⑤ Commercial Stacks are not field phaseable.

Power Mod

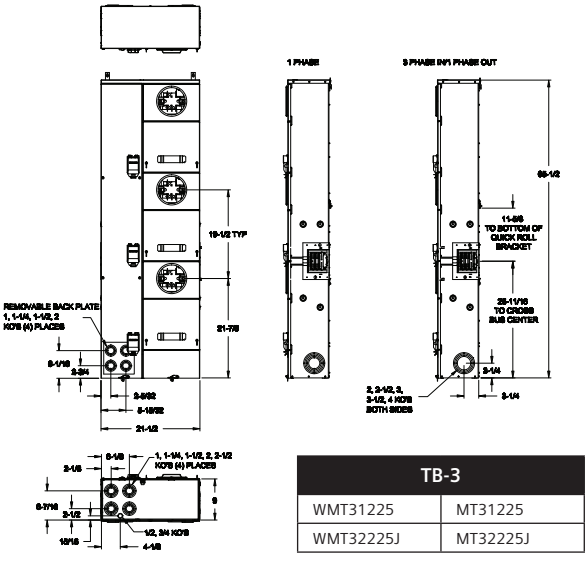
Type WMT Test Block Bypass Meter Stacks: Knockout Diagrams



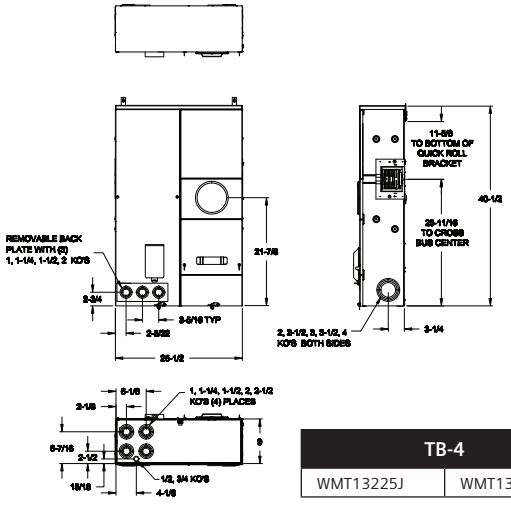
TB-1	
WMT12225J	MT12225J
WMT11225	MT11225



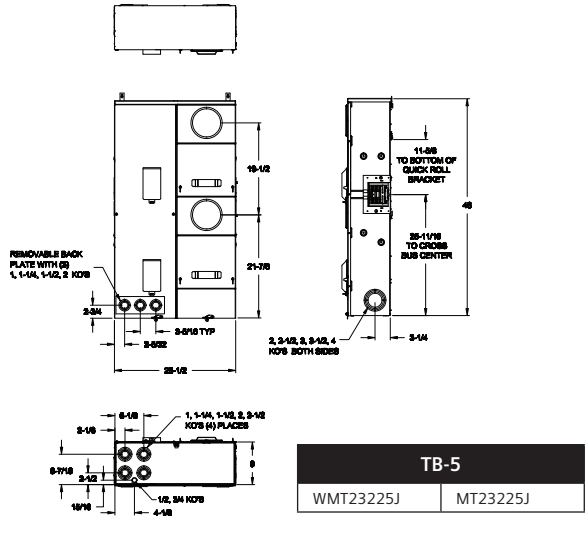
TB-2	
WMT22AB225J	MT22AB225J
WMT22BC225J	MT22BC225J
WMT22CA225J	MT22CA225J
WMT11225	MT11225



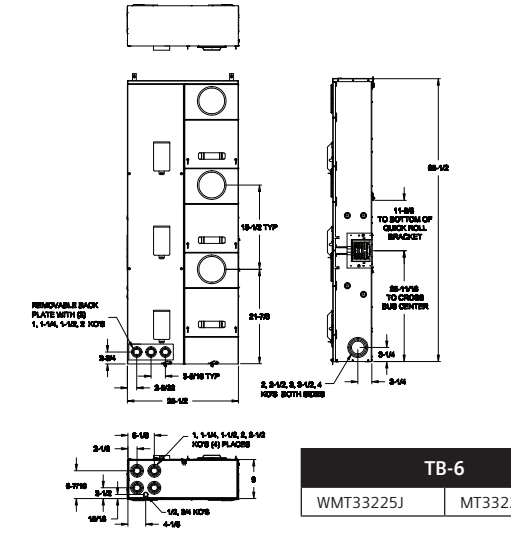
TB-3	
WMT31225	MT31225
WMT32225J	MT32225J



TB-4	
WMT13225J	WMT13225J



TB-5	
WMT23225J	MT23225J



TB-6	
WMT33225J	MT33225J

Power Mod

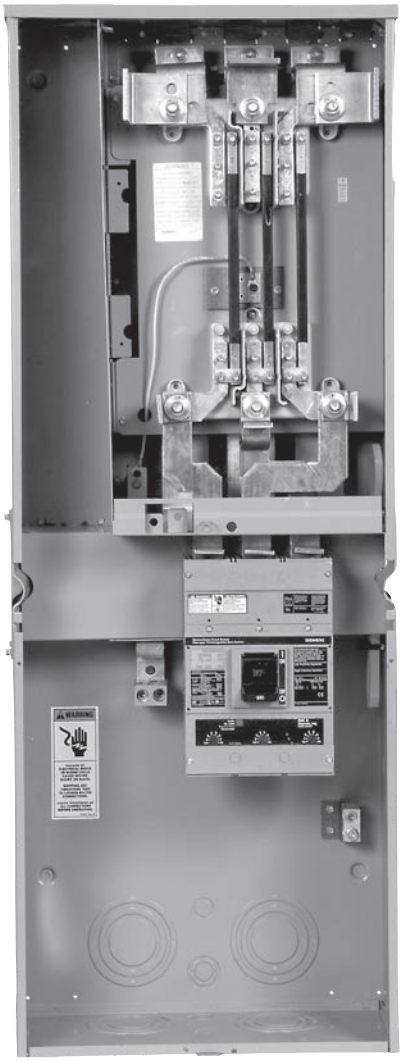
Type WMK K-Base Meter Stacks

K-Base Meter Stacks

Commercial K-Base Meter Stacks (type WMK) are designed to meet the requirements of those utilities specifying bolt-in meter sockets for 400 and 600 Amp residential and commercial applications.

Features include:

- QuickSystem™ features
- Exclusive Landis & Gyr K4, K5, & K7 meter sockets
- 1 position K4, K5, K7 modules with 400 & 600 Amp tenant mains
- 2 position K7 module with 400 Amp tenant main
- Space saving design



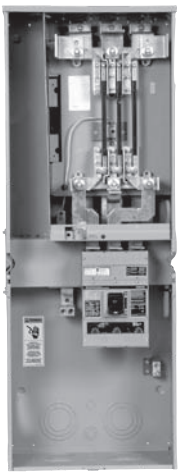
K-Base quick reference

- 400A & 600A 1-2 positions
- 1200A Thru bus-rating
- UL Standard # UL67
- UL file # E27100
- AIC Rating (25k)
- Voltage
  - Single Phase 120/240V AC Max
  - Three In Single Phase Out 208Y/120V AC
  - Three Phase 240V AC Max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 Galvanized Steel
- ANSI 61 Paint
- Custom options available! Details on page 2-141.

Power Mod

Type WMK K-Base Meter Stacks

- 400A & 600A 1-2 positions
- 1200A Thru bus-rating
- AIC Rating (25k)



Commercial ringless type meter stacks: K-Base bolt-in, 25k AIC③ ⑥

Catalog number	Meter positions per stack	Max. tenant breaker (Amps)	Breaker provision④	Maximum AIC Rating	Dimensions (inches)①			Phase	Knockout Diagram
					Height	Width	Depth		
1-phase, 3-wire SN, incoming and outgoing, K4 K-Base bolt-in									
WMK11400R④	1	400	JXD62B400 Factory Inst.	25k	54.00	19.25	10.00	—	KB-1
WMK11600R⑦	1	600	LXD62B600 Factory Inst.	25k	54.00	19.25	10.00	—	
3-phase, 4-wire SN, incoming and 1-phase, 3-wire SN outgoing, K5 K-Base bolt-in② ⑥									
WMK12400RJ④	1	400	JXD62B400 Factory Inst.	25k	54.00	19.25	10.00	AB	KB-2
WMK22400RJ	2	400	JXD62B400 Factory Inst.	25k	72.87	27.00	11.00	AC	KB-3
3-phase, 4-wire SN, incoming and outgoing, K7 K-Base bolt-in⑤									
WMK13400RJ④	1	400	JXD63B400 Factory Inst.	25k	54.00	19.25	10.00	—	KB-2
WMK23400RJ④	2				72.88	27.00	11.00	—	KB-3
WMK13600RJ⑦	1	600	LXD63B600 Factory Inst.	25k	54.00	19.25	10.00	—	KB-2

Alternate amperage breakers

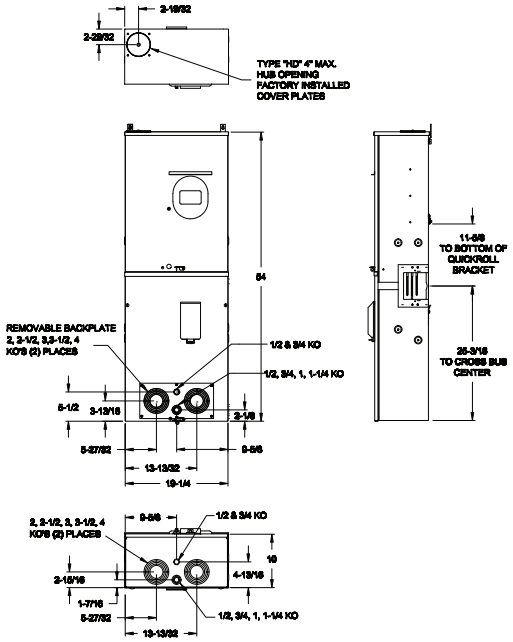
Ad Suffix ➔	1 Meter Position Per Stack	Breaker Amperage
	T1	200A
	T2	250A
	T3	300A
	T4	350A
	T19	450A
	T20	500A

Ad Suffix ➔	1 Meter Position Per Stack	Breaker Amperage
	T5	200A/200A
	T6	200A/250A
	T7	200A/300A
	T8	200A/350A
	T9	200A/400A
	T10	250A/300A
	T11	250A/350A
	T12	250A/400A
	T13	300A/300A
	T14	300A/350A
	T15	300A/400A
	T16	350A/350A
	T17	350A/400A
	T18	250A/250A

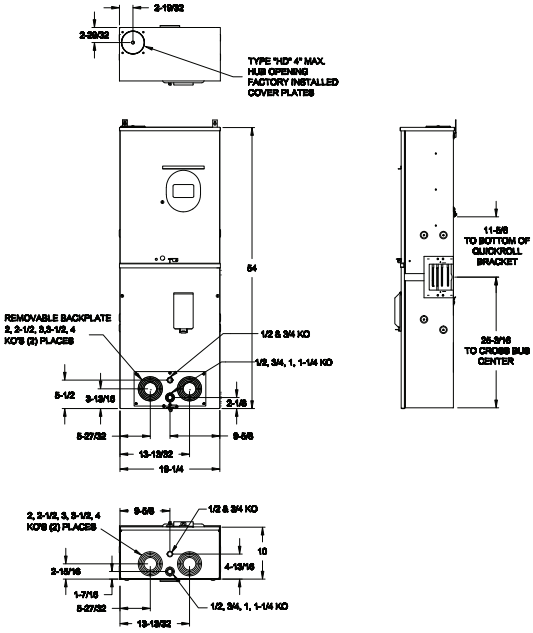
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, hubs, or hardware protrusions.
② Not for use on 3-Phase 4-wire delta systems.
③ Max AIC determined by maximum AIC of tenant breakers when used in conjunction with a meter socket. Higher overall ratings may be achieved through approved series rating combinations.
④ Alternate amperage breakers are available. Please see table below for suffix that needs to be added for ordering. Extended leadtime may apply. Contact sales office for more details.
⑤ Rated for use with 240/120V Delta systems
⑥ Commerical Stacks are not field phaseable
⑦ Alternate amperage breakers are available (T19 and T20). Please see table below for suffix that needs to be added for ordering. Extended leadtime may apply. Contact sales office for more details.

Power Mod

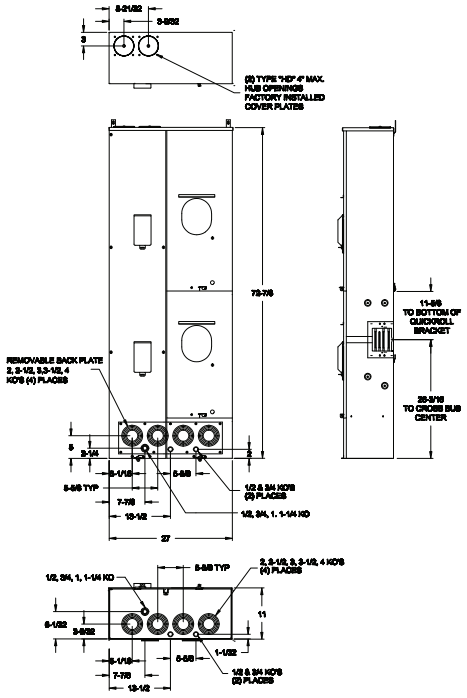
Type WMK K-Base Meter Stacks: Knockout Diagrams



KB-1
WMK11400R WMK11600R



KB-2	
WMK12400RJ WMK13400RJ	WMK13600RJ



KB-3
WMK22400RJ WMK23400RJ

Power Mod

Type WC House Power Module

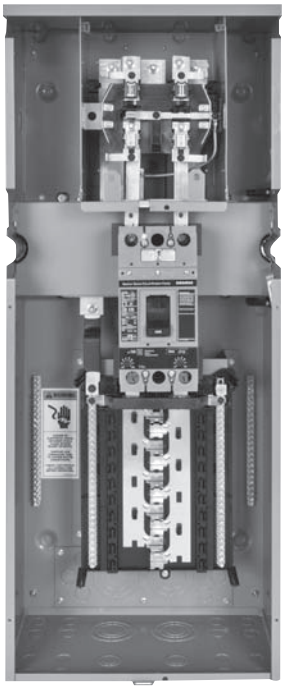
WC Series House Power Module

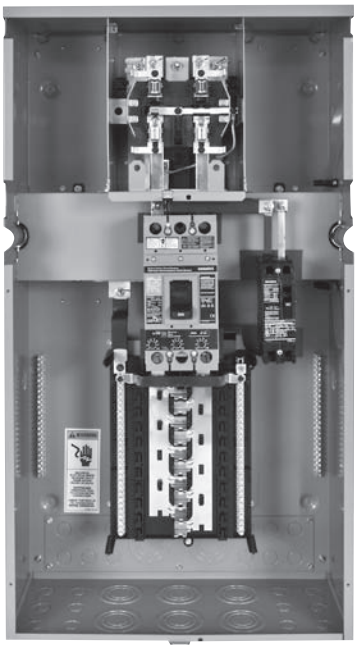
Power Mod's patented WC family of house power modules offers the ability to combine power distribution to branch circuits within a module that is connected directly to the thru bus. This reduces wall space needed, decreases labor and material cost (for installing a separate panel), and simplifies the electrical distribution system.

Key Features of the WC family are:

- Ring or Ringless Covers (horn bypass available with ringless)
- Three or single phase thru bus with single phase output
- 20 space, 40 circuit 100K AIC rated interior
- Available subfeed breaker which can be used for large remote loads (such as elevators) or alternative energy inputs (solar)
- Removable knock out plate
- Load wires can exit out of the top, back, or bottom

The line of WC house power modules allow for un-precedented flexibility and savings. All of this while featuring the industry-leading QuickSystem that allows for the fastest install time.





Series House Power Module quick reference

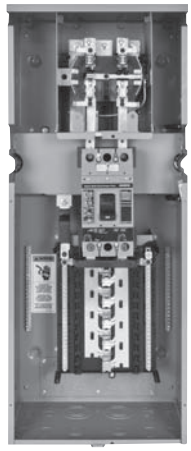
- 1 Position, Single Phase Meter Socket
- 250 Amp maximum rating per device. Load center interior limited to 225amps max.1200 Amp thru-bus rating
- UL standard 67
- UL file no. E27100
- AIC rating: 100k
- Voltage:
  - Single phase 120/240V AC max.
  - Three phase in single phase out
    - 120/208V AC max.
    - 240/120V AC max.
- All swing latches and rivets are stainless steel.
- Outdoor= NEMA 3R rated
- 20 space, 40 circuit PL Series copper bus interior
- G90 galvanized steel
- ANSI 61 paint
- Optional subfeed or alternative energy input (solar) up to 125amps.
- Custom options available! Details on page 2-141.

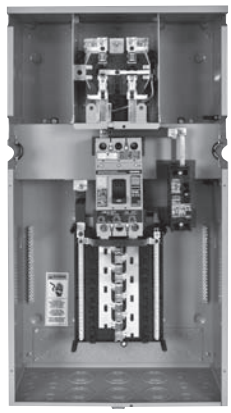
Power Mod

Type WC House Power Module: Ring Style

Main Features:

- 1 Position, Single Phase Meter Socket
- 250 Amp maximum rating per device. Load center interior limited to 225amps max.
- 1200 Amp thru-bus rating





Residential 4-Jaw Ring Type Meter-Loadcenter Stacks: 1-Phase, 3-wire, SN, Thru Bus, Distribution, & Subfeed

Catalog Number	Main Breaker - Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Maximum AIC	Dimensions (inches)①			Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth	
WC2040B1T1	225	HFXD6	20	40	N/A	100k	39.10	16.22	12.14	WC-1
WC2040B1T2	200	HFXD6	20	40	50	100k	39.10	21.75	12.14	WC-2
WC2040B1T3	175	HFXD6	20	40	60	100k	39.10	21.75	12.14	
WC2040B1T4	175	HFXD6	20	40	70	100k	39.10	21.75	12.14	
WC2040B1T5	150	HFXD6	20	40	80	100k	39.10	21.75	12.14	
WC2040B1T6	150	HFXD6	20	40	90	100k	39.10	21.75	12.14	
WC2040B1T7	150	HFXD6	20	40	100	100k	39.10	21.75	12.14	
WC2040B1T8	150	HFXD6	20	40	110	100k	39.10	21.75	12.14	
WC2040B1T9	125	HFXD6	20	40	125	100k	39.10	21.75	12.14	

Residential 5-Jaw Ring Type Meter-Loadcenter Stacks: 3-Phase, 4-wire SN, Thru Bus and 1-Phase, 3-wire, SN, Distribution & Subfeed

Catalog Number	Main Breaker - Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions (inches)①			Phasing③	Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth		
WC2040B2T1J	225	HFXD6	20	40	N/A	100k	39.10	16.22	12.14	AC	WC-1
WC2040B2T2J	200	HFXD6	20	40	50	100k	39.10	21.75	12.14	AC	WC-2
WC2040B2T3J	175	HFXD6	20	40	60	100k	39.10	21.75	12.14	AC	
WC2040B2T4J	175	HFXD6	20	40	70	100k	39.10	21.75	12.14	AC	
WC2040B2T5J	150	HFXD6	20	40	80	100k	39.10	21.75	12.14	AC	
WC2040B2T6J	150	HFXD6	20	40	90	100k	39.10	21.75	12.14	AC	
WC2040B2T7J	150	HFXD6	20	40	100	100k	39.10	21.75	12.14	AC	
WC2040B2T8J	150	HFXD6	20	40	110	100k	39.10	21.75	12.14	AC	
WC2040B2T9J	125	HFXD6	20	40	125	100k	39.10	21.75	12.14	AC	

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Breakers are factory installed.
③ Can be re-phased in the field.

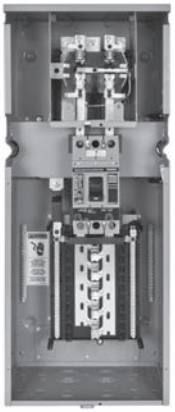
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06/01/13

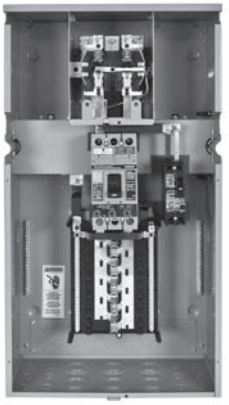
Power Mod

Type WC House Power Module: Ringless Style

Main Features:

- 1 Position, Single Phase Meter Socket
- 250 Amp maximum rating per device. Load center interior limited to 225amps max.
- 1200 Amp thru-bus rating





Residential 4 or 5-Jaw Ringless Type Meter-Loadcenter Stacks: 1-Phase, 3-wire, SN, Thru Bus, Distribution, & Subfeed

Catalog Number			Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Knockout Diagram
No bypass, 4J	No bypass, 5J	Horn Bypass, 5J	Amp.	Type	Spaces	Circuits	Amperage		Height	Width	Depth	
WC2040B1T1R	WC2040B1T1RJ	WC2040B1T1RJB	225	HFXD6	20	40	N/A	100k	39.10	16.22	12.14	WC-1
WC2040B1T2R	WC2040B1T2RJ	WC2040B1T2RJB	200	HFXD6	20	40	50	100k	39.10	21.75	12.14	WC-2
WC2040B1T3R	WC2040B1T3RJ	WC2040B1T3RJB	175	HFXD6	20	40	60	100k	39.10	21.75	12.14	
WC2040B1T4R	WC2040B1T4RJ	WC2040B1T4RJB	175	HFXD6	20	40	70	100k	39.10	21.75	12.14	
WC2040B1T5R	WC2040B1T5RJ	WC2040B1T5RJB	150	HFXD6	20	40	80	100k	39.10	21.75	12.14	
WC2040B1T6R	WC2040B1T6RJ	WC2040B1T6RJB	150	HFXD6	20	40	90	100k	39.10	21.75	12.14	
WC2040B1T7R	WC2040B1T7RJ	WC2040B1T7RJB	150	HFXD6	20	40	100	100k	39.10	21.75	12.14	
WC2040B1T8R	WC2040B1T8RJ	WC2040B1T8RJB	150	HFXD6	20	40	110	100k	39.10	21.75	12.14	
WC2040B1T9R	WC2040B1T9RJ	WC2040B1T9RJB	125	HFXD6	20	40	125	100k	39.10	21.75	12.14	

Residential 5-Jaw Ringless Type Meter-Loadcenter Stacks: 3-Phase, 4-wire SN, Thru Bus and 1-Phase, 3-wire, SN, Distribution & Subfeed

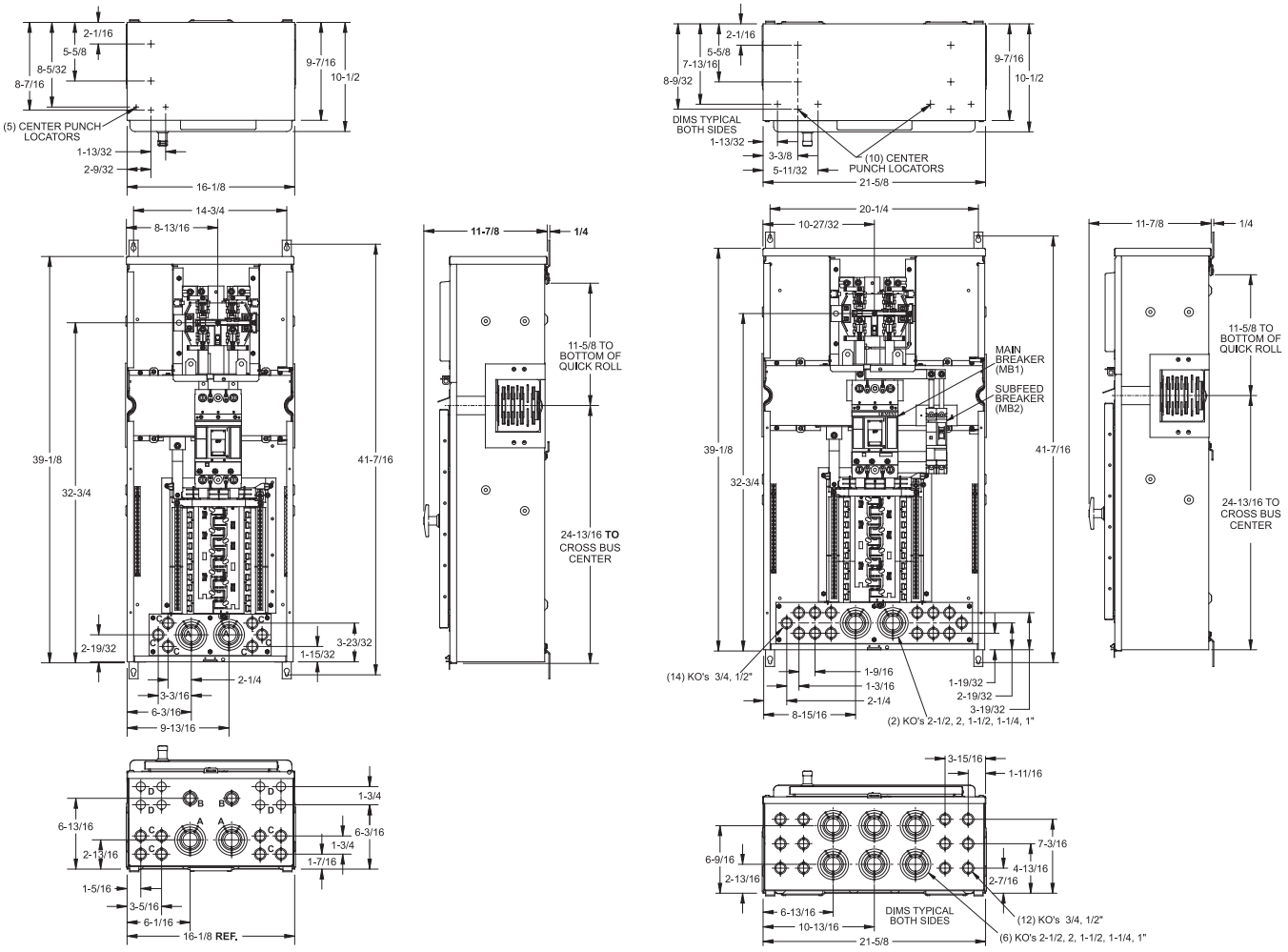
Catalog Number		Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Phasing③	Knockout Diagram
No bypass	Horn Bypass	Amp.	Type	Spaces	Circuits	Amperage		Height	Width	Depth		
WC2040B2T1RJ	WC2040B2T1RJB	225	HFXD6	20	40	N/A	100k	39.10	16.22	12.14	AC	WC-1
WC2040B2T2RJ	WC2040B2T2RJB	200	HFXD6	20	40	50	100k	39.10	21.75	12.14	AC	WC-2
WC2040B2T3RJ	WC2040B2T3RJB	175	HFXD6	20	40	60	100k	39.10	21.75	12.14	AC	
WC2040B2T4RJ	WC2040B2T4RJB	175	HFXD6	20	40	70	100k	39.10	21.75	12.14	AC	
WC2040B2T5RJ	WC2040B2T5RJB	150	HFXD6	20	40	80	100k	39.10	21.75	12.14	AC	
WC2040B2T6RJ	WC2040B2T6RJB	150	HFXD6	20	40	90	100k	39.10	21.75	12.14	AC	
WC2040B2T7RJ	WC2040B2T7RJB	150	HFXD6	20	40	100	100k	39.10	21.75	12.14	AC	
WC2040B2T8RJ	WC2040B2T8RJB	150	HFXD6	20	40	110	100k	39.10	21.75	12.14	AC	
WC2040B2T9RJ	WC2040B2T9RJB	125	HFXD6	20	40	125	100k	39.10	21.75	12.14	AC	

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Breakers are factory installed.
③ Can be re-phased in the field.

Power Mod

Type WC House Power Module: Knockout Diagrams



WC-1	
WC2040B1T1	WC2040B2T1J
WC2040B1T1R	WC2040B2T1RJ
WC2040B1T1RJ	WC2040B2T1RJB
WC2040B1T1RJB	

KO Chart		
DESIGNATION	KO SIZE	QTY
A	2-1/2, 2, 1-1/2, 1-1/4, 1"	4
B	1, 3/4, 1/2"	2
C	3/4, 1/2"	14
D	1/2"	8

WC-2		
WC2040B1T2	WC2040B1T2RJJ	WC2040B2T2J
WC2040B1T2R	WC2040B1T2RJB	WC2040B2T2RJ
WC2040B1T3	WC2040B1T3RJ	WC2040B2T2RJB
WC2040B1T3R	WC2040B1T3RJB	WC2040B2T3J
WC2040B1T4	WC2040B1T4RJ	WC2040B2T3RJ
WC2040B1T4R	WC2040B1T4RJB	WC2040B2T3RJB
WC2040B1T5	WC2040B1T5RJ	WC2040B2T4J
WC2040B1T5R	WC2040B1T5RJB	WC2040B2T4RJ
WC2040B1T6	WC2040B1T6RJ	WC2040B2T4RJB
WC2040B1T6R	WC2040B1T6RJB	WC2040B2T5J
WC2040B1T7	WC2040B1T7RJ	WC2040B2T5RJ
WC2040B1T7R	WC2040B1T7RJB	WC2040B2T5RJB
WC2040B1T8	WC2040B1T8RJ	WC2040B2T6J
WC2040B1T8R	WC2040B1T8RJB	WC2040B2T6RJ
WC2040B1T9	WC2040B1T9RJ	WC2040B2T6RJB
WC2040B1T9R	WC2040B1T9RJB	WC2040B2T7J
		WC2040B2T7RJ
		WC2040B2T7RJB
		WC2040B2T8J
		WC2040B2T8RJ
		WC2040B2T8RJB
		WC2040B2T9J
		WC2040B2T9RJ
		WC2040B2T9RJB

Power Mod

Type WCL Lever Bypass House Power Module

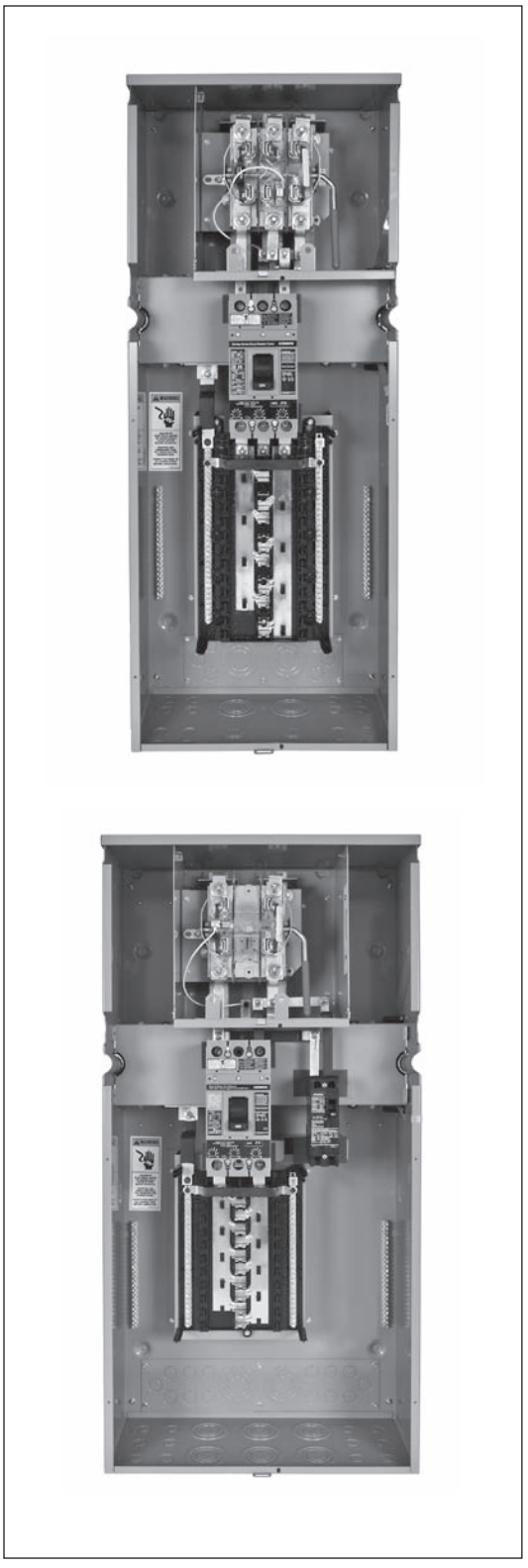
WCL Series House Power Module

Power Mod's patented WCL (lever bypass) family of house power modules offers the ability to combine power distribution to branch circuits within a module that is connected directly to the thru bus. This reduces wall space needed, decreases labor and material cost (for installing a separate panel), and simplifies the electrical distribution system.

Key Features of the WCL family are:

- Talon HQ Lever Bypass ringless meter socket
- Phasing:
  - Single phase thru bus with single phase HQ socket and 20 space 40 circuit PL Series copper interior
  - Three phase thru bus with single phase HQ socket (phased AC) and 20 space 40 circuit PL Series copper interior
  - Three phase thru bus with three phase HQ socket and 24 space 42 circuit PL Series copper interior
- 100K AIC
- Available subfeed breaker which can be used for large remote loads (such as elevators) or alternative energy inputs (solar)
- Removable knock out plate
- Load wires can exit out of the top, back, or bottom

The line of WCL house power modules allow for un-precedented flexibility and savings. All of this while featuring the industry-leading QuickSystem that allows for the fastest install time.



Lever Bypass Series House Power Module quick reference

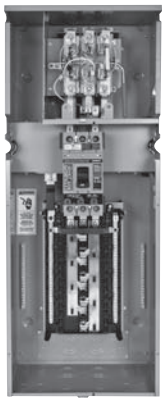
- Talon HQ Lever Bypass Meter Socket
- 1 Position, Single Phase Meter Socket
- 250amp maximum rating per device. Load center interior limited to 225 Amps max.1200A thru-bus rating
- UL Standard # UL67
- UL file # E27100
- AIC rating 100K
- Voltage
  - Single phase 120/240V AC max
  - Three phase
    - 120/208V AC max.
    - 240/120V AC max.
- All swing latches and rivets are stainless steel.
- Outdoor= NEMA 3R rated
- Interiors: 20 space/40 circuit single phase or 24 space 42 circuit three phase PL Series copper bus
- G90 Galvanized Steel
- ANSI 61 Paint
- Optional subfeed or alternative energy input (solar) up to 125amps.
- Custom options available! Details on page 2-141.

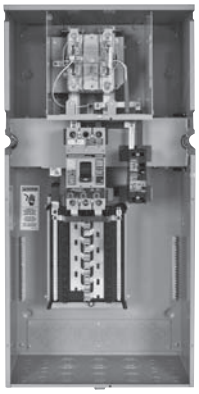
Power Mod

Type WCL Lever Bypass House Power Module

Main Features:

- Talon HQ Lever Bypass Meter Socket
- 1 Position, Single Phase Meter Socket
- 250amp maximum rating per device. Load center interior limited to 225 Amps max.
- 1200A thru-bus rating





Residential 4 or 5-Jaw Ringless Type Meter-Loadcenter Stacks: 1-Phase, 3-wire, SN, Thru Bus, Distribution, & Subfeed

Catalog Number	Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth	
WCL2040B1T1RJ	225	HFXD6	20	40	N/A	100k	44.63	17.93	12.14	WCL-1
WCL2040B1T2RJ	200	HFXD6	20	40	50	100k	44.63	22.35	12.14	WCL-2
WCL2040B1T3RJ	175	HFXD6	20	40	60	100k	44.63	22.35	12.14	
WCL2040B1T4RJ	175	HFXD6	20	40	70	100k	44.63	22.35	12.14	
WCL2040B1T5RJ	150	HFXD6	20	40	80	100k	44.63	22.35	12.14	
WCL2040B1T6RJ	150	HFXD6	20	40	90	100k	44.63	22.35	12.14	
WCL2040B1T7RJ	150	HFXD6	20	40	100	100k	44.63	22.35	12.14	
WCL2040B1T8RJ	150	HFXD6	20	40	110	100k	44.63	22.35	12.14	
WCL2040B1T9RJ	125	HFXD6	20	40	125	100k	44.63	22.35	12.14	

Commercial 5-Jaw Ringless Type-Lever Bypass Meter-Loadcenter Stacks: 3-Phase, 4-wire SN, Thru Bus and 1-Phase, 3-wire, SN, Distribution & Subfeed

Catalog Number	Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Phasing③	Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth		
WCL2040B2T1RJ	225	HFXD6	20	40	N/A	100k	44.63	17.93	12.14	AC	WCL-1
WCL2040B2T2RJ	200	HFXD6	20	40	50	100k	44.63	22.35	12.14	AC	WCL-2
WCL2040B2T3RJ	175	HFXD6	20	40	60	100k	44.63	22.35	12.14	AC	
WCL2040B2T4RJ	175	HFXD6	20	40	70	100k	44.63	22.35	12.14	AC	
WCL2040B2T5RJ	150	HFXD6	20	40	80	100k	44.63	22.35	12.14	AC	
WCL2040B2T6RJ	150	HFXD6	20	40	90	100k	44.63	22.35	12.14	AC	
WCL2040B2T7RJ	150	HFXD6	20	40	100	100k	44.63	22.35	12.14	AC	
WCL2040B2T8RJ	150	HFXD6	20	40	110	100k	44.63	22.35	12.14	AC	
WCL2040B2T9RJ	125	HFXD6	20	40	125	100k	44.63	22.35	12.14	AC	

Commercial 7-Jaw Ringless Type-Lever Bypass Meter-Loadcenter Stacks: 3-Phase, 4-wire SN, Thru Bus, Distribution & Subfeed

Catalog Number	Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Phasing③	Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth		
WCL2442B3T1RJ	225	HFXD6	24	42	N/A	100k	44.63	17.93	12.14	AC	WCL-1
WCL2442B3T2RJ	200	HFXD6	24	42	50	100k	44.63	22.35	12.14	AC	WCL-2
WCL2442B3T3RJ	175	HFXD6	24	42	60	100k	44.63	22.35	12.14	AC	
WCL2442B3T4RJ	175	HFXD6	24	42	70	100k	44.63	22.35	12.14	AC	
WCL2442B3T5RJ	150	HFXD6	24	42	80	100k	44.63	22.35	12.14	AC	
WCL2442B3T6RJ	150	HFXD6	24	42	90	100k	44.63	22.35	12.14	AC	
WCL2442B3T7RJ	150	HFXD6	24	42	100	100k	44.63	22.35	12.14	AC	
WCL2442B3T8RJ	150	HFXD6	24	42	110	100k	44.63	22.35	12.14	AC	
WCL2442B3T9RJ	125	HFXD6	24	42	125	100k	44.63	22.35	12.14	AC	

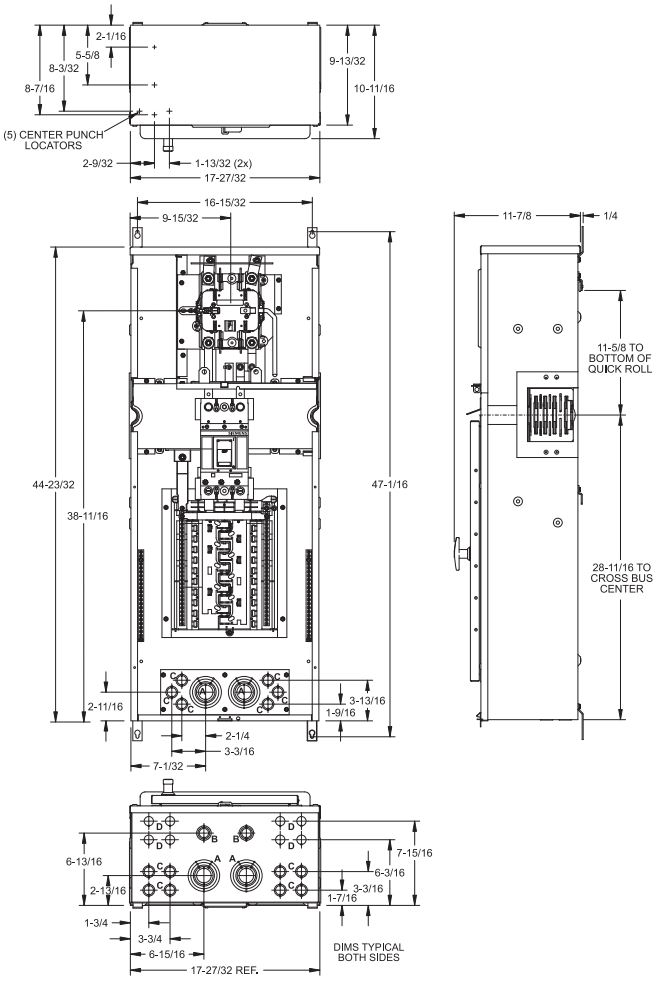
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

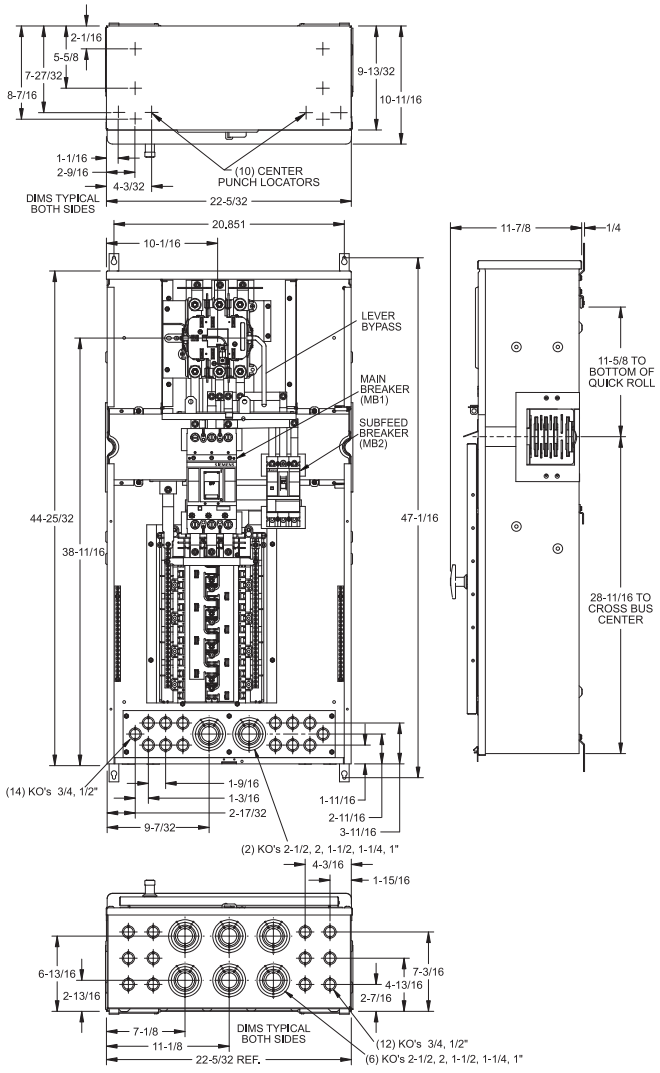
② Breakers are factory installed.

③ Cannot be re-phased in the field.

Power Mod

Type WCL Lever Bypass House Power Module: Knockout Diagrams





WCL-1
WCL2040B1T1RJ
WCL2040B2T1RJ
WCL2040B3T1RJ

Knockout Chart		
DESIGNATION	KO SIZE	QTY
A	2-1/2, 2, 1-1/2, 1-1/4, 1"	4
B	1, 3/4, 1/2"	2
C	3/4, 1/2"	14
D	1/2"	8

WCL-2		
WCL2040B1T2RJ	WCL2040B2T2RJ	WCL2040B3T2RJ
WCL2040B1T3RJ	WCL2040B2T3RJ	WCL2040B3T3RJ
WCL2040B1T4RJ	WCL2040B2T4RJ	WCL2040B3T4RJ
WCL2040B1T5RJ	WCL2040B2T5RJ	WCL2040B3T5RJ
WCL2040B1T6RJ	WCL2040B2T6RJ	WCL2040B3T6RJ
WCL2040B1T7RJ	WCL2040B2T7RJ	WCL2040B3T7RJ
WCL2040B1T8RJ	WCL2040B2T8RJ	WCL2040B3T8RJ
WCL2040B1T9RJ	WCL2040B2T9RJ	WCL2040B3T9RJ

Power Mod

Type WCT Test Block Bypass House Power Module

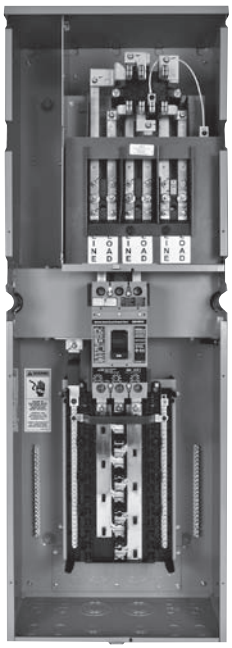
WCT Series House Power Module

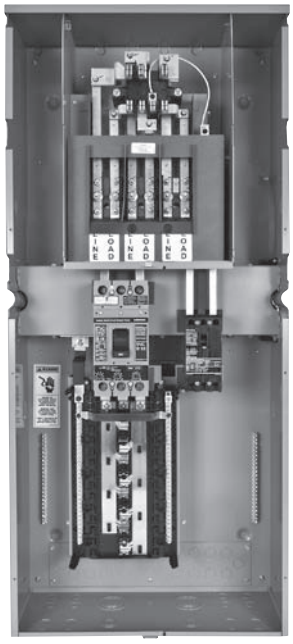
Power Mod's patented WCT (test-block bypass) family of house power modules offers the ability to combine power distribution to branch circuits within a module that is connected directly to the thru bus. This reduces wall space needed, decreases labor and material cost (for installing a separate panel), and simplifies the electrical distribution system.

Key Features of the WCT family are:

- Siemens SMM Switchboard ring-style meter socket
- Phasing:
  - Single phase thru bus with a single phase meter socket and 20 space 40 circuit PL Series copper interior
  - Three phase thru bus with a single phase meter socket (phased AC) and 20 space 40 circuit PL Series copper interior
  - Three phase thru bus with three phase meter socket and 24 space 42 circuit PL Series copper interior
- 100K AIC
- Available subfeed breaker which can be used for large remote loads (such as elevators) or alternative energy inputs (solar)
- Removable knock out plate
- Load wires can exit out of the top, back, or bottom

The line of WCT house power modules allow for un-precedented flexibility and savings. All of this while featuring the industry-leading QuickSystem that allows for the fastest install time.





Test Block Bypass Series House Power Module Quick Reference

- Siemens SMM Switchboard ring-style
- 1 position, Single Phase Meter Socket
- 250amp, maximum rating per device
- Load Center interior limited to 225amp max.
- 1200amp thru-bus rating
- UL standard #'s UL 67
- UL file # E270100
- AIC rating 100K
- Voltage
  - 1 phase 120/240V AC max
  - 3 phase 120/208V AC max
  - 3 phase 240/120V AC max
- All swing latches and rivets are stainless steel
- Outdoor= NEMA 3R rated
- Interiors:
  - 20 spaces/40 circuits single phase
  - 24 spaces/42 circuits 3 phase PL Series copper bus
- G90 galvanized steel
- ANSI 61 paint
- Optional subfeed or alternative energy input (solar) up to 125amps
- EUSERC drawing #'s 312 & 353
- Custom options available! Details on page 2-141.

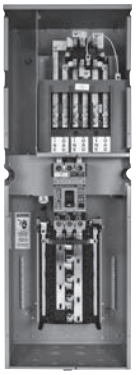
• Revised •
02/18/14

Power Mod

Type WCT Test Block Bypass House Power Module

Main Features:

- Siemens SMM Switchboard ring-style
- 1 Position, Single Phase Meter Socket
- 250amp maximum rating per device. Load center interior limited to 225amps max.
- 1200 Amp thru-bus rating.





Commercial 4-Jaw Ring Type-Test Block Bypass Meter-Loadcenter Stacks: 1-Phase, 3-wire, SN, Thru Bus, Distribution, & Subfeed

Catalog Number	Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth	
WCT2040B1T1	225	HFXD6	20	40	N/A	100k	52.1	18.42	12.14	WCT-1
WCT2040B1T2	200	HFXD6	20	40	50	100k	52.1	18.42	12.14	WCT-2
WCT2040B1T3	175	HFXD6	20	40	60	100k	52.1	18.42	12.14	
WCT2040B1T4	175	HFXD6	20	40	70	100k	52.1	18.42	12.14	
WCT2040B1T5	150	HFXD6	20	40	80	100k	52.1	18.42	12.14	
WCT2040B1T6	150	HFXD6	20	40	90	100k	52.1	18.42	12.14	
WCT2040B1T7	150	HFXD6	20	40	100	100k	52.1	18.42	12.14	
WCT2040B1T8	150	HFXD6	20	40	110	100k	52.1	18.42	12.14	
WCT2040B1T9	125	HFXD6	20	40	125	100k	52.1	18.42	12.14	

Commercial 5-Jaw Ring Type-Test Block Bypass Meter-Loadcenter Stacks: 3-Phase, 4-wire SN, Thru Bus and 1-Phase, 3-wire, SN, Distribution & Subfeed

Catalog Number	Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Phasing③	Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth		
WCT2040B2T1J	225	HFXD6	20	40	N/A	100k	52.1	18.42	12.14	AC	WCT-1
WCT2040B2T2J	200	HFXD6	20	40	50	100k	52.1	18.42	12.14	AC	WCT-2
WCT2040B2T3J	175	HFXD6	20	40	60	100k	52.1	18.42	12.14	AC	
WCT2040B2T4J	175	HFXD6	20	40	70	100k	52.1	18.42	12.14	AC	
WCT2040B2T5J	150	HFXD6	20	40	80	100k	52.1	18.42	12.14	AC	
WCT2040B2T6J	150	HFXD6	20	40	90	100k	52.1	18.42	12.14	AC	
WCT2040B2T7J	150	HFXD6	20	40	100	100k	52.1	18.42	12.14	AC	
WCT2040B2T8J	150	HFXD6	20	40	110	100k	52.1	18.42	12.14	AC	
WCT2040B2T9J	125	HFXD6	20	40	125	100k	52.1	18.42	12.14	AC	

Commercial 7-Jaw Ring Type-Test Block Bypass Meter-Loadcenter Stacks: 3-Phase, 4-wire SN, Thru Bus, Distribution & Subfeed

Catalog Number	Main Breaker-Distribution②		Distribution		Subfeed Breaker (Type HED4)②	Max. AIC	Dimensions①			Phasing③	Knockout Diagram
	Amperage	Type	Spaces	Circuits	Amperage		Height	Width	Depth		
WCT2442B3T1J	225	HFXD6	24	42	N/A	100k	52.1	18.42	12.14	AC	WCT-1
WCT2442B3T2J	200	HFXD6	24	42	50	100k	52.1	18.42	12.14	AC	WCT-2
WCT2442B3T3J	175	HFXD6	24	42	60	100k	52.1	18.42	12.14	AC	
WCT2442B3T4J	175	HFXD6	24	42	70	100k	52.1	18.42	12.14	AC	
WCT2442B3T5J	150	HFXD6	24	42	80	100k	52.1	18.42	12.14	AC	
WCT2442B3T6J	150	HFXD6	24	42	90	100k	52.1	18.42	12.14	AC	
WCT2442B3T7J	150	HFXD6	24	42	100	100k	52.1	18.42	12.14	AC	
WCT2442B3T8J	150	HFXD6	24	42	110	100k	52.1	18.42	12.14	AC	
WCT2442B3T9J	125	HFXD6	24	42	125	100k	52.1	18.42	12.14	AC	

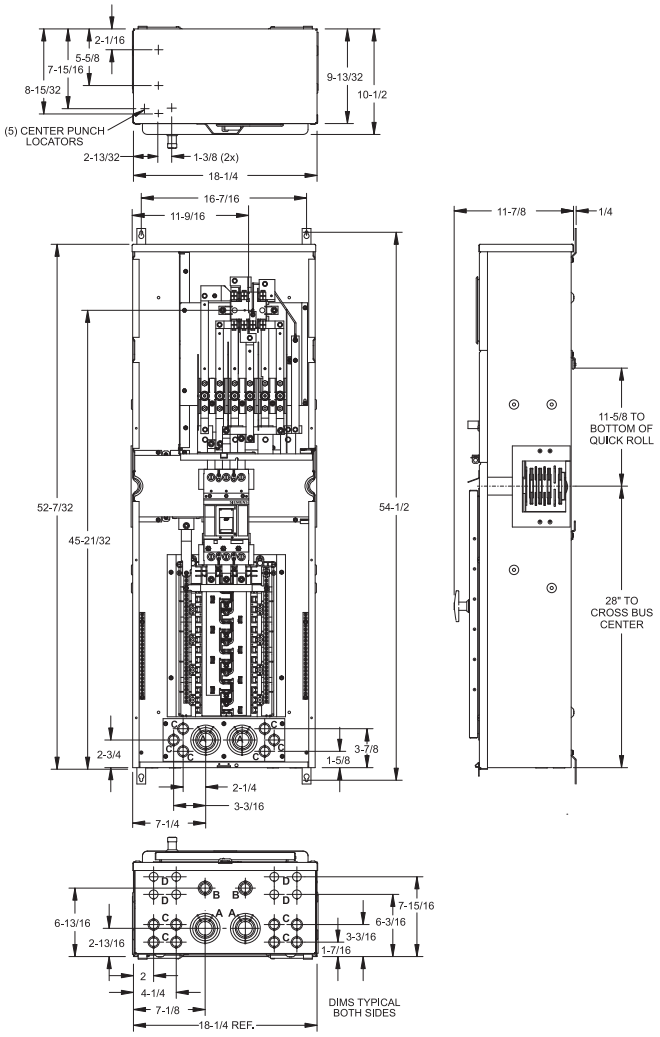
① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

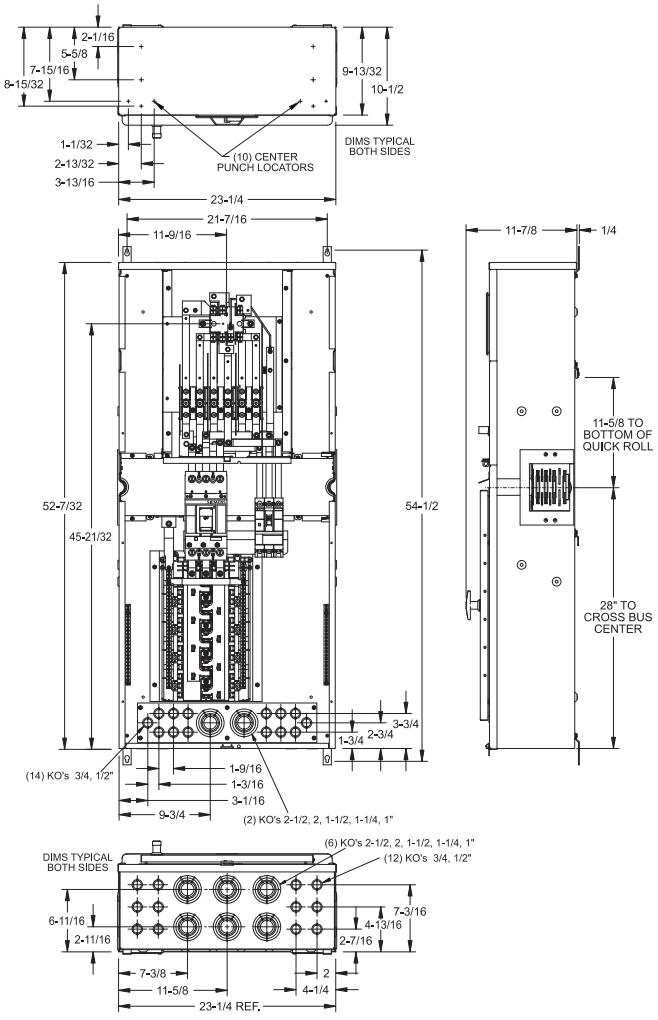
② Breakers are factory installed.

③ Cannot be re-phased in the field.

Power Mod

Type WCT Test Block Bypass House Power Module: Knockout Diagrams





WCT-1
WCT2040B1T1
WCT2040B2T1J
WCT2040B3T1J

Knockout Chart		
DESIGNATION	KO SIZE	QTY
A	2-1/2, 2, 1-1/2, 1-1/4, 1"	4
B	1, 3/4, 1/2"	2
C	3/4, 1/2"	14
D	1/2"	8

WCT-2		
WCT2040B1T2	WCT2040B2T2J	WCT2442B3T2J
WCT2040B1T3	WCT2040B2T3J	WCT2442B3T3J
WCT2040B1T4	WCT2040B2T4J	WCT2442B3T4J
WCT2040B1T5	WCT2040B2T5J	WCT2442B3T5J
WCT2040B1T6	WCT2040B2T6J	WCT2442B3T6J
WCT2040B1T7	WCT2040B2T7J	WCT2442B3T7J
WCT2040B1T8	WCT2040B2T8J	WCT2442B3T8J
WCT2040B1T9	WCT2040B2T9J	WCT2442B3T9J

Power Mod

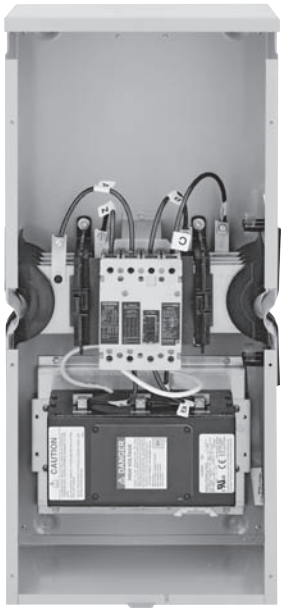
Type WSPD Surge Protection Modules

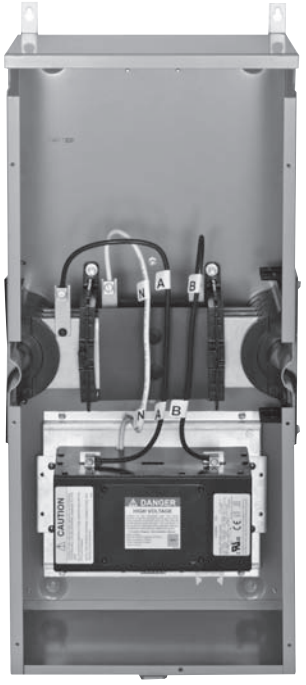
WSPD Surge Protection Modules

Surge protection modules for Power Mod (type WSPD) are thru-bus connected modules that allow the user to view surge status as well as access the SPD control panel without breaking the utility seal on the enclosure. An optional breaker disconnect is available to enable the end user to replace the SPD (surge protection device) without having to disconnect utility power to the Power Mod installation.

Features include:

- QuickSystem™ features
- 100, 200, 300, 400, 500kA ratings available
- External, vandal resistant & lockable clear cover over SPD control panel
- Single phase thru bus and three phase thru bus
- Optional breaker disconnect that opens phase & neutral to make SPD replacement quick and easy





Surge Protection Module quick reference

- 100-500 kA rating
- 1200amp thru-bus rating
- UL standard #67
- UL file # E27100
- AIC rating: 100K
- Voltage
  - Single phase 120/240V AC max
  - Three phase 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- ANSI 61 paint
- Custom options available! Details on page 2-141.

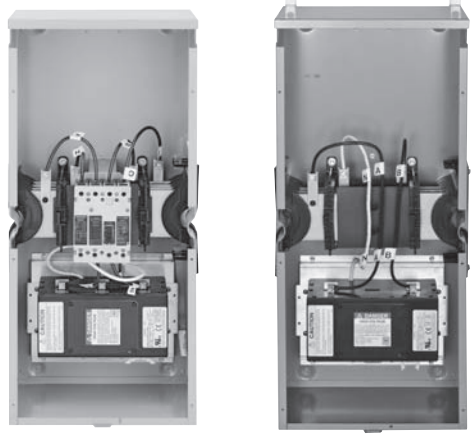
Power Mod

Type WSPD Surge Protection Modules

Main Features:

- 100-500kA ratings
- 1200 amp thru-bus
- Suitable for 100k AIC applications

Lugs not required. Quick Connect sold separately.



1-phase, 3-wire SN, 120/240V AC

Catalog Number (with HEG Breaker Disconnect)	Catalog Number (no disconnect)	Breaker Type	kA Surge Current②	Dimensions (inches)①			Knockout Diagram
				Height	Width	Depth	
WSPD1B10A	WSPD1N10A	HEG	100	29.19	13.38	7.91	WSPD-B = Breaker WSPD-N = No breaker
WSPD1B20A	WSPD1N20A	HEG	200	29.19	13.38	7.91	
WSPD1B30A	WSPD1N30A	HEG	300	29.19	13.38	7.91	
WSPD1B40A	WSPD1N40A	HEG	400	29.19	13.38	7.91	
WSPD1B50A	WSPD1N50A	HEG	500	29.19	13.38	7.91	

3-phase, 4-wire SN, Delta 240/120V AC

Catalog Number (with HEG Breaker Disconnect)	Catalog Number (no disconnect)	Breaker Type	kA Surge Current②	Dimensions (inches)①			Knockout Diagram
				Height	Width	Depth	
WSPD3B10B	WSPD3N10B	HEG	100	29.19	13.38	7.91	WSPD-B = Breaker WSPD-N = No breaker
WSPD3B20B	WSPD3N20B	HEG	200	29.19	13.38	7.91	
WSPD3B30B	WSPD3N30B	HEG	300	29.19	13.38	7.91	
WSPD3B40B	WSPD3N40B	HEG	400	29.19	13.38	7.91	
WSPD3B50B	WSPD3N50B	HEG	500	29.19	13.38	7.91	

3-phase, 4-wire SN, Wye 208/120V AC

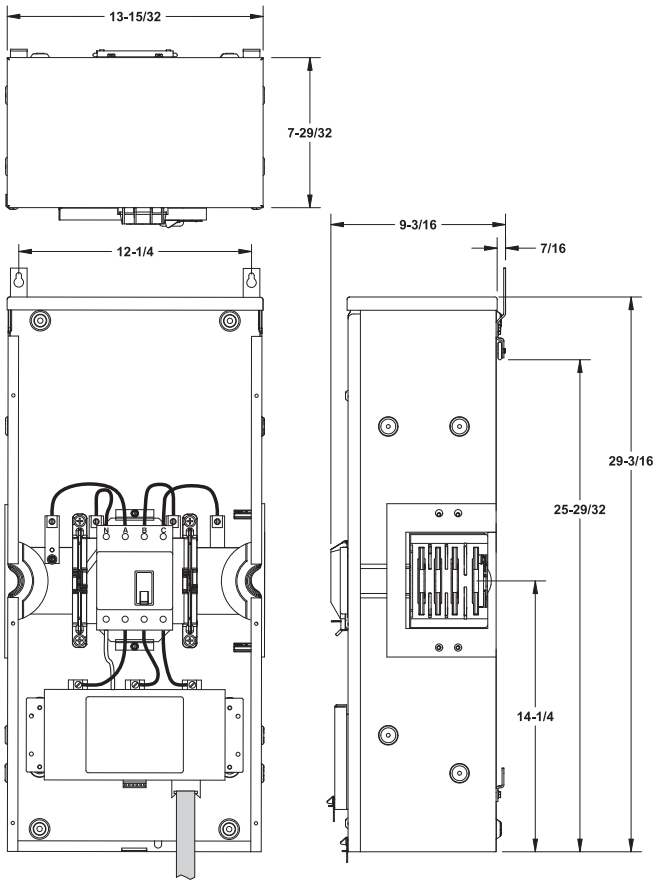
Catalog Number (with HEG Breaker Disconnect)	Catalog Number (no disconnect)	Breaker Type	kA Surge Current②	Dimensions (inches)①			Knockout Diagram
				Height	Width	Depth	
WSPD3B10C	WSPD3N10C	HEG	100	29.19	13.38	7.91	WSPD-B = Breaker WSPD-N = No breaker
WSPD3B20C	WSPD3N20C	HEG	200	29.19	13.38	7.91	
WSPD3B30C	WSPD3N30C	HEG	300	29.19	13.38	7.91	
WSPD3B40C	WSPD3N40C	HEG	400	29.19	13.38	7.91	
WSPD3B50C	WSPD3N50C	HEG	500	29.19	13.38	7.91	

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② 200 - 500kA devices requite additional lead time. Please contact sales office for details on lead time.

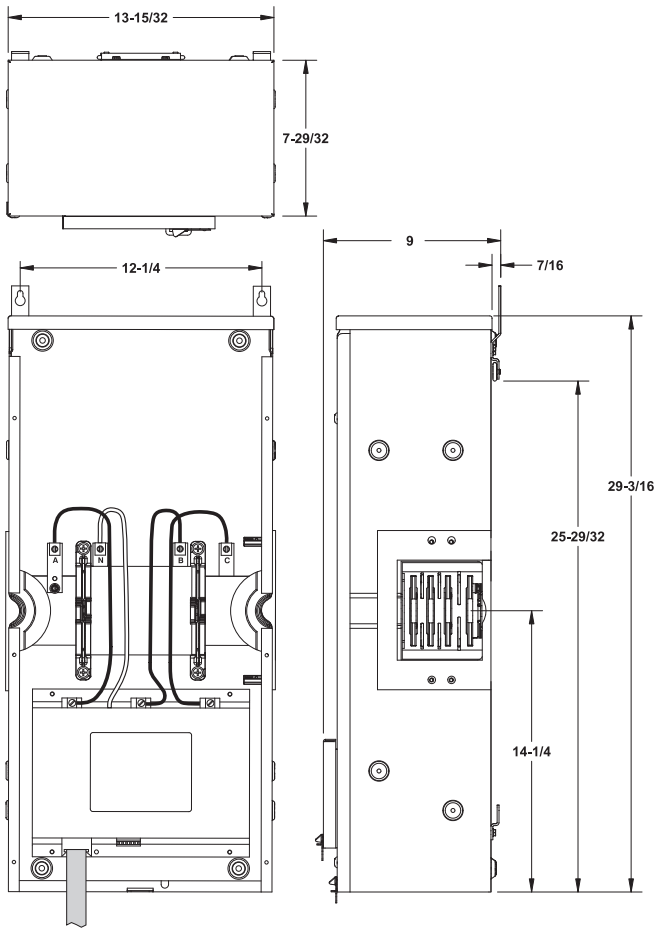
Power Mod

Type WSPD Surge Protection Modules: Knockout Diagrams



WSPD-B	
WSPD1B10A	WSPD3B10B
WSPD1B20A	WSPD3B10C
WSPD1B30A	WSPD3B20B
WSPD1B40A	WSPD3B20C
WSPD1B50A	WSPD3B30B
	WSPD3B30C
	WSPD3B40B
	WSPD3B40C
	WSPD3B50B
	WSPD3B50C

With breaker disconnect



WSPD-N	
WSPD1N10A	WSPD3N10B
WSPD1N20A	WSPD3N10C
WSPD1N30A	WSPD3N20B
WSPD1N40A	WSPD3N20C
WSPD1N50A	WSPD3N30B
	WSPD3N30C
	WSPD3N40B
	WSPD3N40C
	WSPD3N50B
	WSPD3N50C

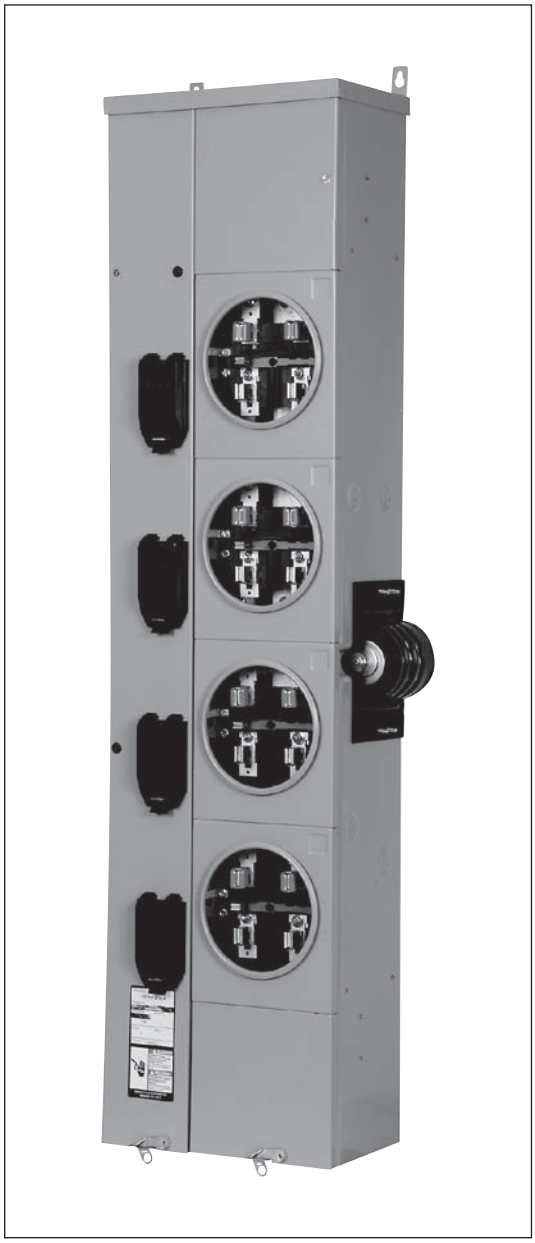
No breaker disconnect

Power Mod

Type WMN ConEd Residential Meter Stacks

WMN ConEd Residential Meter Stacks

Siemens Consolidated Edison Residential Meter Stacks are packed with features inside and out; our exclusive knock out plate offers flexibility when pulling wires to the stack, moveable neutrals and grounds to save wire, and all of the QuickSystem features all designed with the contractor in mind.



Surge Protection Module quick reference

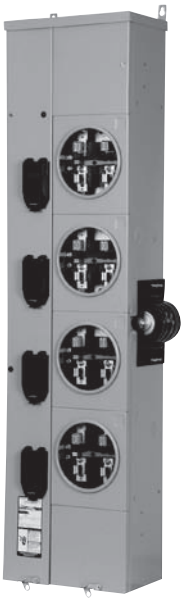
- 2-6 gang
- 125/225 Amp per position
- 1200Amp thru-bus rating
- UL standard 67
- UL file no. E27100
- AIC rating: (65k & 100K)
- Voltage
  - 3 phase in single phase out
  - 240V AC max
- All swing latches and rivets are stainless steel
- Outdoor = NEMA 3R rated
- Indoor = NEMA 1R rated
- G90 galvanized steel
- ANSI 61 paint

• Revised •
02/18/14

Power Mod

Type WMN ConEd Residential Meter Stacks

Main Features:
- 2-6 gang
- 1200 amp thru-bus
- Suitable for 65k &100k AIC applications



Residential 5-jaw ring type meter stacks; 3-phase, 4-wire SN, incoming and 1-phase, 3 wire SN outgoing

Outdoor Catalog number	Indoor Catalog number	Meter positions per stack	Breaker provision	Maximum AIC	Dimensions (inches)			Knockout Diagram
					Height	Width	Depth	
Max. tenant breaker (Amps): 125								
WMN22125J	**MN22125J**	2	QP, QPH, HQP, MP-T, MP-HT, MPMT	65k	35.31	12.97	8.09	WMN-1
WMN32125J	**MN32125J**	3		65k	46.31	12.97	8.09	WMN-2
WMN42125J	**MN42125J**	4		65k	56.31	12.97	8.09	WMN-3
WMN52125J	**MN52125J**	5		65k	66.31	12.97	8.09	WMN-4
WMN62125J	**MN62125J**	6		65k	76.31	12.97	8.09	WMN-5
Max. tenant breaker (Amps): 225								
WMN22225J	**MN22225J**	2	QS, QSH, QSHH, HQS, HQSH, QP, QPH, HQP, MP-T, MP-HT, MPMT	100k	35.31	16.09	8.09	WMN-6
WMN32225J	**MN32225J**	3		100k	46.31	16.09	8.09	WMN-7
WMN42225J	**MN42225J**	4		100k	56.31	16.09	8.09	WMN-8
WMN52225J	**MN52225J**	5		100k	66.31	16.09	8.09	WMN-9
WMN62225J	**MN62225J**	6		100k	76.31	16.09	8.09	WMN-10

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② 225A available in lower three positions only. 200A continuous for all other positions.

③ Must use QuickPhase features to route all sockets AWAY from high-leg when 240/120 Delta voltage is used.

④ Max AIC determined by maximum AIC of tenant breakers.

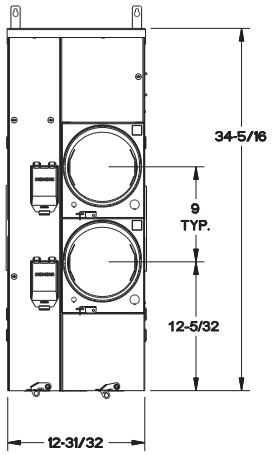
⑤ Install QP breakers below QS.

Power Mod

Type WMN ConEd Residential Meter Stacks: Knockout Diagrams

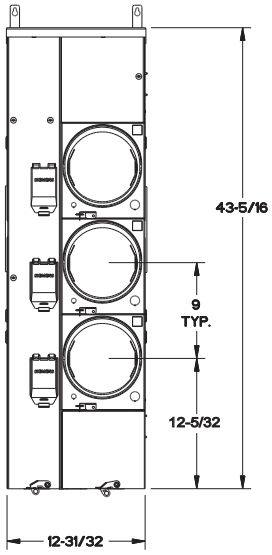
WMN-1

WMN22125J
MN22125J



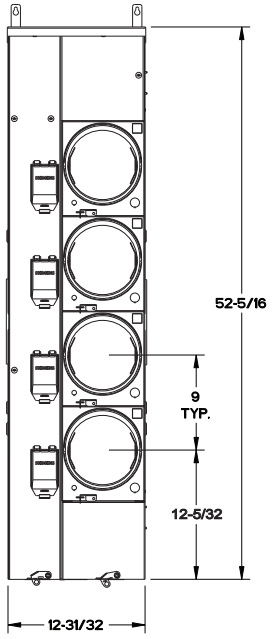
WMN-2

WMN32125J
MN32125J

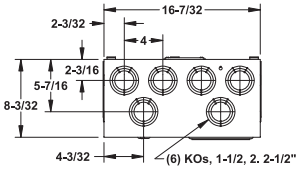


WMN-3

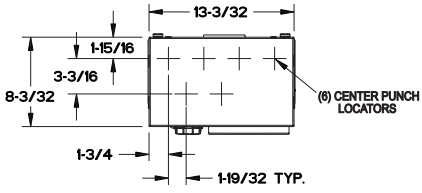
WMN42125J
MN42125J



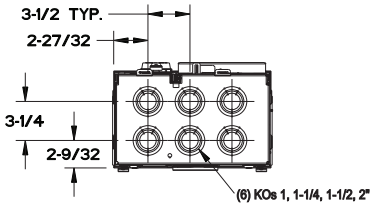
125 Amp Typical Top View for NEMA 1



125 Amp Typical Top View

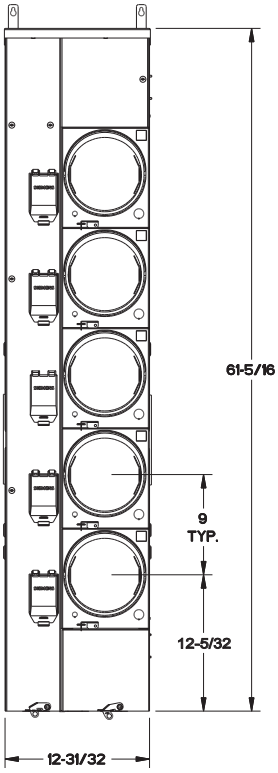


125 Amp Typical Bottom View



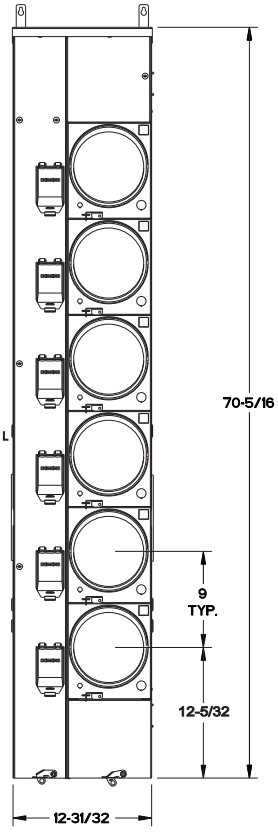
WMN-4

WMN52125J
MN52125J



WMN-5

WMN52125J
MN62125J

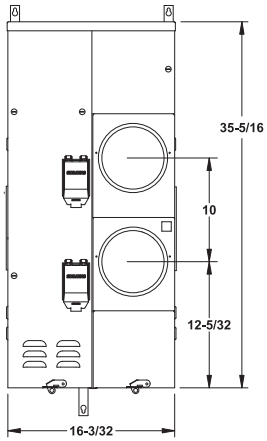


Power Mod

Type WMN ConEd Residential Meter Stacks: Knockout Diagrams

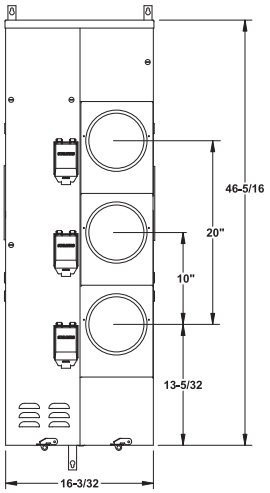
WMN-6

WMN22225J
MN22225J



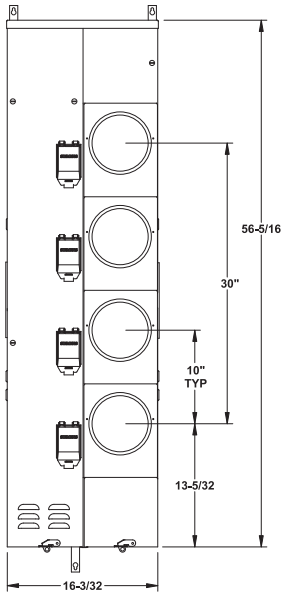
WMN-7

WMN32225J
MN32225J

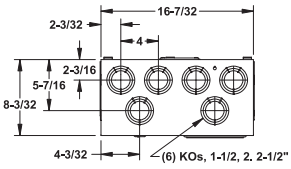


WMN-8

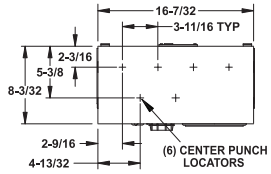
WMN42225J
MN42225J



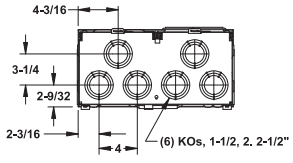
225 Amp Typical Top View for NEMA 1



225 Amp Typical Top View

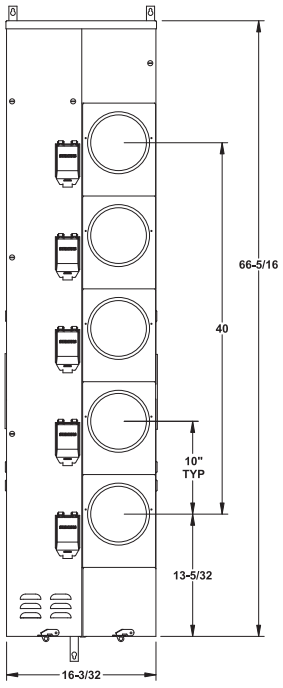


225 Amp Typical Bottom View



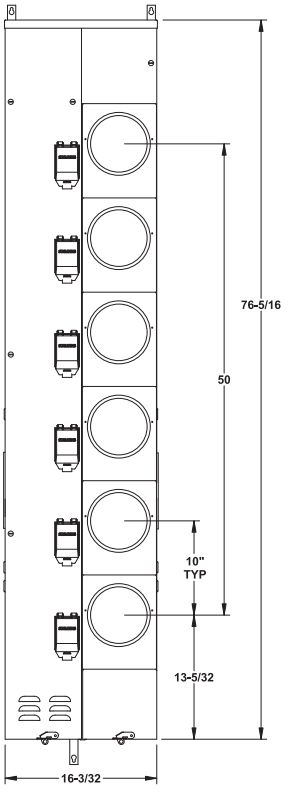
WMN-9

WMN52225J
MN52225J



WMN-10

WMN62225J
MN62225J



Power Mod

Type WTBN ConEd Tapboxes

Type WTBN ConEd Tapboxes

ConEd Tap Boxes (type WTBN) are designed to meet the requirements of the Consolidated Edison Utility service area. WTBN tap boxes feature a shallow depth for front and rear alignment with WMN stacks.



ConEd Tapboxes

- 400-1200A
- 1200Amp thru-bus rating
- UL standard # UL67
- UL file no. E27100
- AIC rating: (100K AIC)
- Voltage
  - 3 phase in single phase out
  - 240V AC max
- All swing latches and rivets are stainless steel
- NEMA 3R rated
- G90 galvanized steel
- ANSI 61 paint

Power Mod

Type WTBN ConEd Tapboxes

Main Features:
- 400-1200A
- 1200 amp thru-bus
- Suitable for 100k AIC applications



Tap Box modules: 3-phase, 4 wire SN, 208/120V AC Max

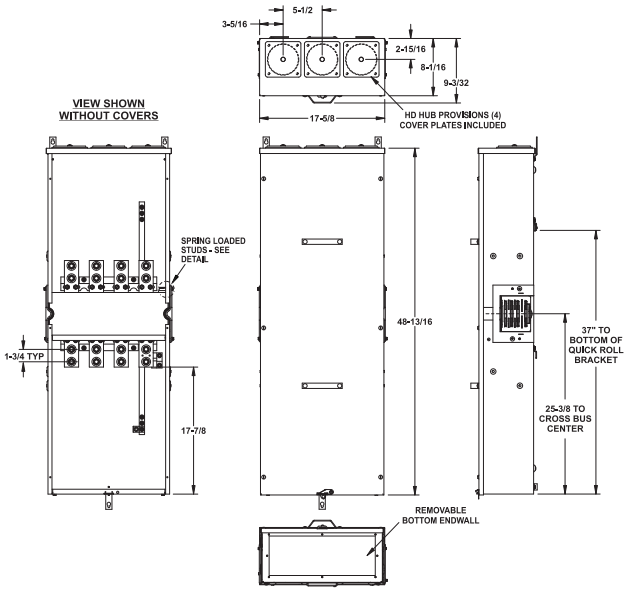
Outdoor number (100k AC)	Ampere Rating	Service feed②	Dimensions (inches)①			Line Side Connections (Lugs)	Knockout Diagram
			Height	Width	Depth		
WTBN3400CU	400	OH/UG	35.31	12.97	8.09	1 Set Of 2 Studs	WTBN-1
WTBN3600CU	600	OH/UG	46.31	12.97	8.09	1 Set Of 2 Studs	WTBN-2
WTBN3800CU	800	OH/UG	56.31	12.97	8.09	2 Sets Of 2 Studs	WTBN-3
WTBN31200CU	1200	OH/UG	66.31	12.97	8.09	2 Sets Of 2 Studs	WTBN-4

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

② Devices have studs on top and bottom, but onlymone side should be used.

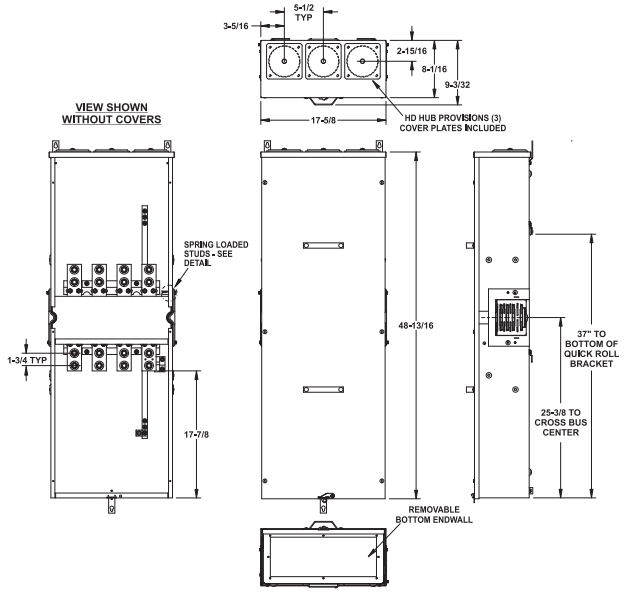
Power Mod

Type WTBN ConEd Tapboxes



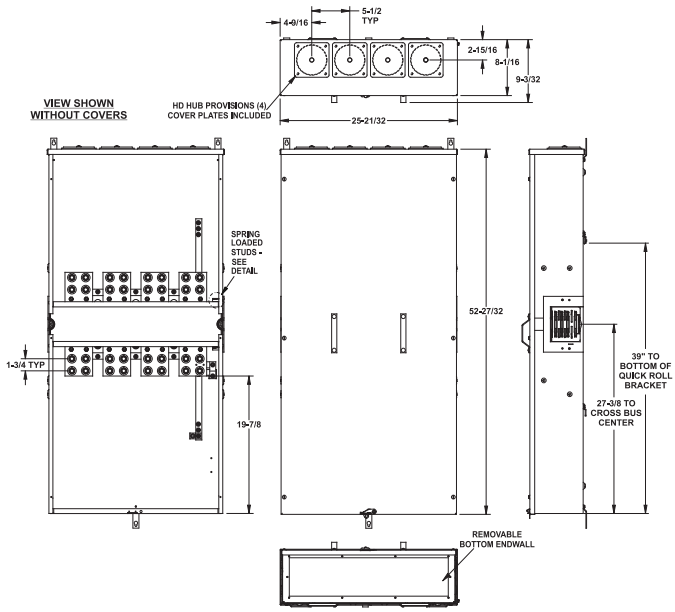
WTBN-1

WTBN3400CU



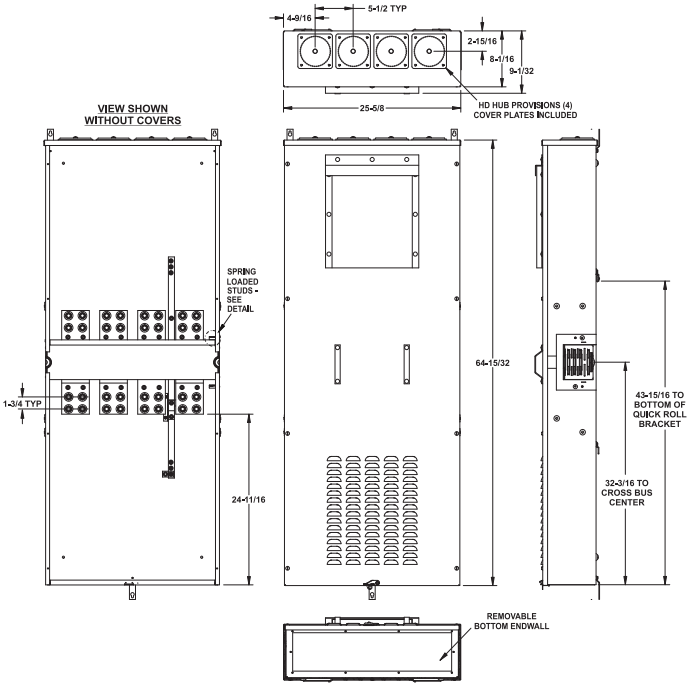
WTBN-2

WTBN3600CU



WTBN-3

WTBN3800CU



WTBN-4

WTBN31200CU

Power Mod

WMMB Aux Pull Box & MS_UBD Switches

Main Features:

- EUSERC compliant incoming pull section
- Dual cover handles
- Single and three phase models



EUSERC compliant pullbox modules: 1-phase, 3-wire SN, incoming , 120/240V AC max.③

Catalog number	Ampere rating	Withstand rating②	Service feed	Dimensions (inches)①			KO drawing no.	Line terminal lugs no. and size per line and netural	Knockout Diagrams
				Height	Width	Depth			
WMMB1400	400	65,000	UG	37.50	16.69	9.34	P-1	1 set of 2 studs	P-1
WMMB1800	800	65,000	UG	45.50	19.44	12.72	P-2	1 set of 2 studs	P-2
WMMB11200	1200	65,000	UG	47.50	25.94	12.72	P-3	3 sets of 2 studs	P-3

EUSERC compliant pullbox modules: 3-phase, 4-wire SN, incoming, 240V AC max.③

Catalog number	Ampere rating	Withstand rating②	Service feed	Dimensions (inches)①			KO drawing no.	Line terminal lugs no. and size per line and netural	Knockout Diagrams
				Height	Width	Depth			
WMMB3400	400	65,000	UG	37.50	16.69	9.34	P-1	1 set of 2 studs	P-1
WMMB3800	800	65,000	UG	45.50	25.94	12.72	P-2	2 set of 2 studs	P-2
WMMB31200	1200	65,000	UG	47.50	33.83	12.72	P-3	3 sets of 2 studs	P-3

MS_UBD Bus Duct connected switch mains ④

Catalog number	Ampere rating	Dimensions (Inches)①			Mechanism type	AIC rating	Knockout Diagrams
		Height	Width	Depth			
MS44UBD	400	33.00	15.00	14.94	Class T fuse	100,000	BD-1
MS64UBD	600	33.00	15.00	14.94			BD-2
MS84UBD	800	33.00	15.00	14.94			BD-3

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

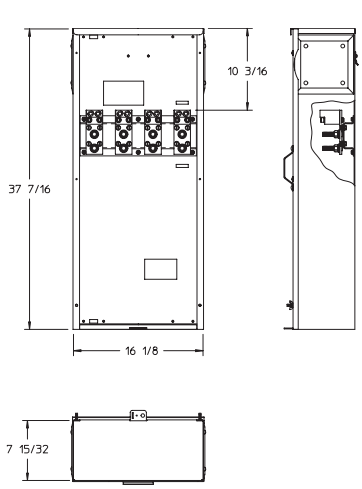
② Devices rated for 22,000. 65,000 rating requires cables to be tied together. Please see instructions with pullbox for details.

③ Devices do not have thru bus.

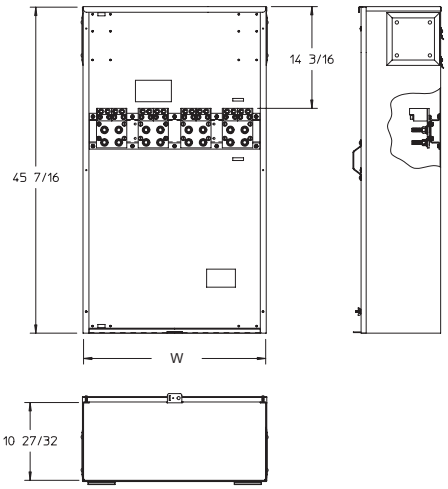
④ All devices are build to order. Tap stack and QuickConnect sold separately.

Power Mod

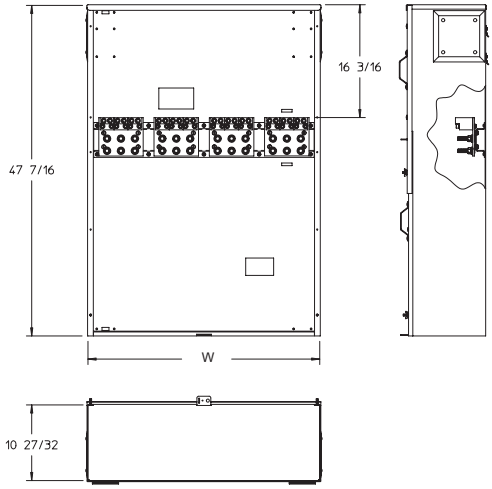
WMMB Aux Pull Box & MS_UBD Switches: Knockout Diagrams



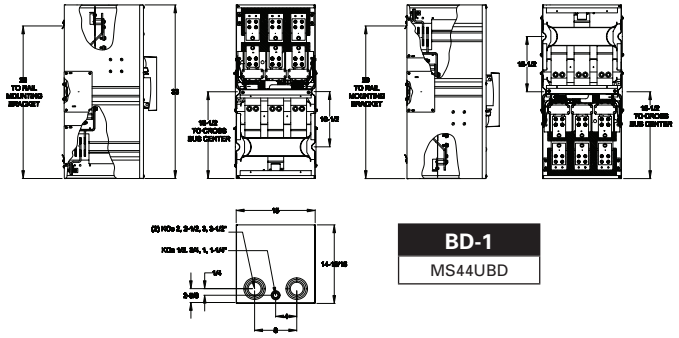
P-1
WMMB1400 WMMB3400



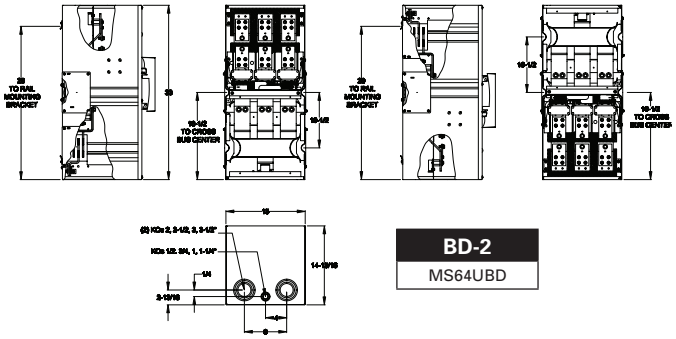
P-2	
	Width
WMMB1800 WMMB3800	19.44 25.94



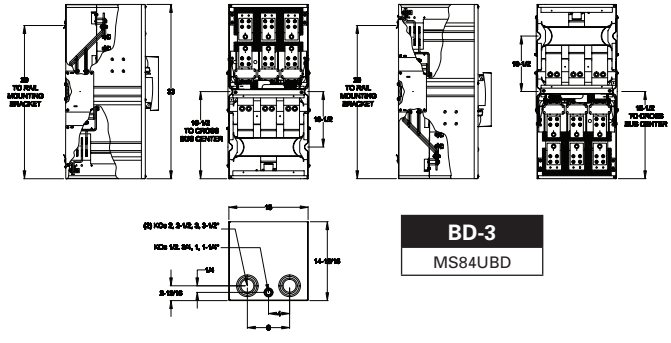
P-3	
	Width
WMMB11200 WMMB31200	25.94 33.83



BD-1
MS44UBD



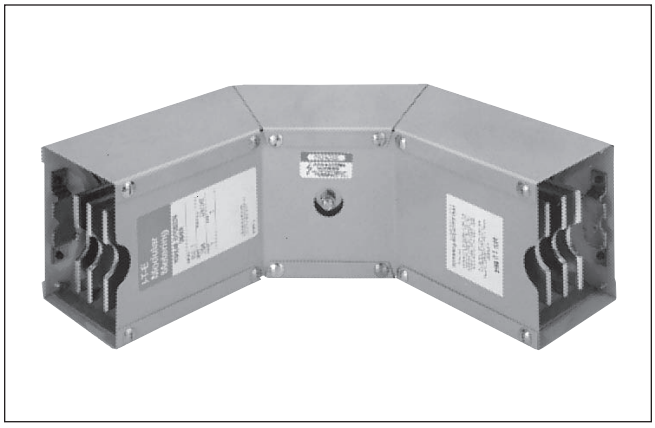
BD-2
MS64UBD



BD-3
MS84UBD

Power Mod

Lug Kits, Custom Options, Elbows, & Spacers



Lug Kits, Custom Options, Elbows, & Spacers

Siemens offers a wide range of accessories and custom options to help product fit your application. Eliminate the need for special orders with replacement part kits available for your convenience. All kits come with appropriate hardware and instruction sheets for safe installation.

Meet local requirements and save on labor with custom factory installed options and custom paint colors.

Quick reference

For lugs:
- UL486A/B
- 750 kcmil maximum wire size (may vary by catalog number)
- Tin plated aluminum extrusions

For QS Breaker:

For Elbow & Spacers:
- NEMA 1R Elbows
- 9" Spacers

Custom options

Factory installed:
- Tenant breakers
- 5th jaw
- Lugs and Lug Landing Pad
- Shunt Trips

Custom Colors:
- Desert tan
- Forest Green
- Custom Match Options

Power Mod

Lug Kits: Lug selector

Lug kits are available to meet the growing demand for multiple wiring configurations using aluminum and copper conductors in today's market. PowerModTM offers a variety of lug configurations for every breaker, switch, and tap box module. Lugs are factory installed on standard breaker modules 200A-1200A. Alternate lug kits options (including 750kcmil) are available.

A field installable compression lug landing pad is available as an accessory for standard breaker module 250A-1200A. Compression lug kits must be ordered in addition to the lug landing pad accessory.

Lug kits must be ordered separately for standard breaker modules 1400A-2000A.

All EUSERC breaker main, standard switch, EUSERC switch, standard tapbox, and EUSERC tapbox require lugs to be ordered separately and field installed.

Use the chart below to identify the proper lug kit based on the conductor size required.

For example, if you have (1) 1200 single phase tapbox, and are running (3) 750 kcmil wires per phase, you would order (1) LK13750N2

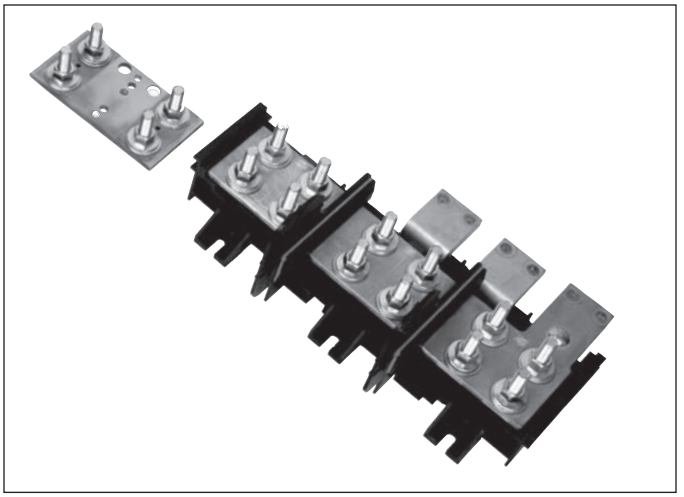
Power Mod Lug Selector Table

			Type WTB			Type WB		
	Amperage	Conductors	Standard tapbox			Standard breaker		
1 Phase	Wire size		500	600	750	500	600	750
	200 - 400	1	n/a	LK11600N2	n/a	n/a	n/a	LK11750①
		2	LK12500N2	n/a	n/a	LK12500①②	n/a	n/a
	500 - 600	2	n/a	n/a	n/a	LK12500①②	n/a	n/a
	700 - 800	2	n/a	LK12600N2	LK12750N2	n/a	n/a	n/a
		3	LK13500N2	n/a	n/a	LK13500①②	n/a	LK13750①
	900 - 1200	3	n/a	n/a	LK13750N2	n/a	n/a	LK13750①
		4	LK14500N2	n/a	n/a	LK14500①②	n/a	n/a
	1400 - 1600	5	n/a	LK15600N2	LK15750N2	n/a	LK15600N2	LK15750N2
	2000	6	n/a	n/a	n/a	n/a	n/a	LK16750N2
	2400	8	LK18500N2C[c]	n/a	LK18750N2A[c]	n/a	n/a	n/a
3 Phase	200 - 400	1	n/a	LK31600N2	n/a	n/a	n/a	LK31750[a]
		2	LK32500N2	n/a	n/a	LK32500[ab]	n/a	n/a
	500 - 600	2	n/a	n/a	n/a	LK32500[ab]	n/a	n/a
	700 - 800	2	n/a	LK32600N2	LK32750N2	n/a	n/a	n/a
		3	LK33500N2	n/a	n/a	LK33500[ab]	n/a	LK33750[a]
	900 - 1200	3	n/a	n/a	LK33750N2	n/a	n/a	LK33750[a]
		4	LK34500N2	n/a	n/a	LK34500[ab]	n/a	n/a
	1400 - 1600	5	n/a	LK35600N2	LK35750N2	n/a	LK35600N2	LK35750N2
	2000	6	n/a	n/a	n/a	n/a	n/a	LK36750N2
	2400	8	LK38500N2C[c]	n/a	LK38750N2A[c]	n/a	n/a	n/a

① Lug kits -Sentron mechanical breaker lugs
② Factory installed lugs

Power Mod

Lug Kits: Lug selector



How to use the Power Mod lug selector:

1. Select enclosure from top
2. Choose applicable wire size
3. Select number of conductors being run beside appropriate amperage and phase to find correct lug kit part number

Power Mod Lug Selector Table (cont.)

		Type WB + Lug Landing Pad				Type WS			Types WET, WES, WEB, WT④		
Amperage	Conductors	Lug kits for Lug Landing Pad on Standard Breaker Module③				Standard fusible switch			Pullbox combination units		
Wire size		350	500	600	750	500	600	750	500	600	750
200–400	1	n/a	n/a	LK11600N2	n/a	n/a	LK11600N2	LK11750N2	n/a	n/a	LK11750N2
	2	LK12350N2	n/a	n/a	n/a	LK12500N2	n/a	n/a	LK12500N2	n/a	n/a
500-600	2	LK12350N2	n/a	n/a	n/a	LK12500N2	n/a	n/a	LK12500N2E	n/a	LK12750N2
700-800	2	n/a	n/a	LK12600N2	LK12750N2	n/a	LK12600N2	LK12750N2	n/a	LK12600N2	LK12750N2
	3	n/a	LK13500N2	n/a	n/a	LK13500N2	n/a	n/a	LK13500N2	n/a	n/a
900-1200	3	n/a	n/a	n/a	LK13750N2	n/a	n/a	n/a	n/a	n/a	LK13750N2E
	4	n/a	LK14500N2	n/a	n/a	LK14500[ab]	n/a	n/a	LK14500N2E	n/a	n/a
1400-1600	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	LK15600N2[e]	LK15750N2[e]
2000	6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2400	8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	LK18500N2C[e]	n/a	LK18750N2A[e]
200-400	1	n/a	n/a	LK31600N2	n/a	n/a	LK31600N2	LK31750N2	n/a	n/a	LK31750N2
	2	LK32350N2	n/a	n/a	n/a	LK32500N2	n/a	n/a	LK32500N2	n/a	n/a
500-600	2	LK32350N2	n/a	n/a	n/a	LK32500N2	n/a	n/a	LK32500N2E	n/a	LK32750N2
700-800	2	n/a	n/a	LK32600N2	LK32750N2	n/a	LK32600N2	LK32750N2	n/a	LK32600N2	LK32750N2
	3	n/a	LK33500N2	n/a	n/a	LK33500N2	n/a	n/a	LK33500N2	n/a	n/a
900-1200	3	n/a	n/a	n/a	LK33750N2	n/a	n/a	n/a	n/a	n/a	LK33750N2E
	4	n/a	LK34500N2	n/a	n/a	LK34500[ab]	n/a	n/a	LK34500N2E	n/a	n/a
1400-1600	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	LK35600N2[e]	LK35750N2[e]
2000	6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2400	8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	LK38500N2C[e]	n/a	LK38750N2A[e]

① Lug kits - Sentron mechanical breaker lugs
② Factory installed lugs

③ Lug landing pad must be ordered in addition to lug kit. Refer to 2-168 for lug landing pad options.

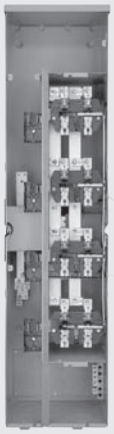
④ WT tapboxes require 2 lug kits when used on feed thru applications.

Power Mod

Custom Options, Elbows, & Spacers

Custom options

Power Mod offers custom options exclusive to the industry. Avoid time consuming field modifications and realize labor savings through factory installed options. Meet local aesthetic requirements with custom color paint options. Eliminate the need to repaint enclosures and risk splattering paint on bus or meter socket components①:



Desert Tan



Forest Green

Description

Custom colors:

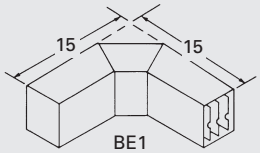
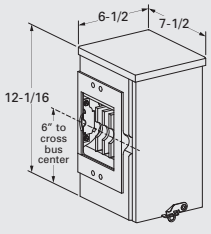
- Desert tan
- Forest Green
- Color match available upon request

Configure in COMPAS



① Contact sales office for ordering instructions and lead time

Bussed Elbow and Bussed Extensions/Spacers

		Catalog number	Description	Dimensions (inches)①		
				Height	Length	Width
Bussed Elbows	  BE1 BE4	**BE1**	Indoor Bussed Elbow, 1-phase, 3-wire, 1200 Amp maximum	15.06	15.06	4.87
		BE4	Indoor Bussed Elbow, 3-phase, 4-wire, 1200 Amp maximum	15.06	15.06	4.87
		BE112	Indoor Bussed Elbow,12", 1-phase, 3-wire, 1200 Amp maximum	12.00	12.00	4.87
		BE412	Indoor Bussed Elbow, 12", 3-phase, 4-wire, 1200 Amp maximum	12.00	12.00	4.87
Bussed Extensions/ Spacers	 **WSP1** **WSP3**	**WSP1**	Outdoor Bussed Extension, 1-phase, 3-wire, 1200 Amp maximum	12.00	7.25	6.25
		WSP3	Outdoor Bussed Extension, 3-phase, 4-wire, 1200 Amp maximum	12.00	7.25	6.25

① Dimensions shown are representative of outside box dimensions and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions. Dimensions are subject to change.

Power Mod

WMM Residential Meter Stacks Rating Charts

Use the tables below to determine the correct combination of equipment and circuit breakers for the available fault current. This chart provides series rating information for the most common applications. For a complete series rating chart please contact your local sales office.

Available fault current RMS symmetrical amps at 120/240 volts maximum	Service entrance modules①	Meter module branch circuit breakers	Load center branch circuit breakers
to 10,000	Series WB, WB_U WEB, WEB_U WS_U, WES_U WTB_U, WET_U	QP, QPH, HQP (2 pole, 15–125A)②	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
to 22,000	Series WB, WB_U WEB, WEB_U	QPH, HQP (2 pole, 15–125A)②	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
	Series WS_U, WES_U	QPH, HQP (2 pole, 15–125A)②	
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
	Series WTB_U, WET_U	QPH, HQP (2 pole, 15–125A)②	
		QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
to 42,000	Series WB, WB_U WEB, WEB_U	QPH, HQP (2 pole, 15–125A)②	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
	Series WS_U, WES_U	QPH, HQP (2 pole, 15–125A)②	
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
	Series WTB_U, WET_U	HQP (2 pole, 15–125A)②	
		QSHH, HQS, HQSH (2 pole, 100–225A)③	
to 65,000	Series WB, WB_U WEB, WEB_U	QPH, HQP (2 pole, 15–125A)②	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
	Series WS_U, WES_U	QPH, HQP (2 pole, 15–125A)②	
		QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	
	Series WTB_U, WET_U	HQP (2 pole, 15–125A)②	
		HQS, HQSH (100–225A)③	
to 100,000	Series WB_U, WEB_U WS_U, WES_U	QS, QSH, QSHH, HQS, HQSH (2 pole, 100–225A)③	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
	Series WTB_U, WET_U	HQSH (100–225A)③	

① Service Entrance Modules:
WB and WEB have 65k AIC breakers factory installed [(JXD2-A, JXD6-A) (LXD6-A) (MXD6) (NXD6) (PXD6) (RXD6)]
WB_U and WEB_U have 100k AIC breakers factory installed [(HJXD6-A) (HLXD6-A) (HMXD6) (HNXD6) (HPXD6) (HRXD6)]
WS_U and WES_U are fused switches (Class T – 300 volt)
WTB_U and WET_U have NO overcurrent protection
② WMM 125 amp, single phase
③ WMM 225 amp, single phase (accepts QS or QP breakers)

Power Mod

WML and WMT Commercial Meter Stacks Rating Charts

Use the tables below to determine the correct combination of equipment and circuit breakers for the available fault current. This chart provides series rating information for the most common applications. For a complete series rating chart please contact your local sales office.

Available fault current RMS symmetrical amps at 120/240V max 1-phase, 240V max 3-Phase	Service entrance modules①	Meter module branch circuit breakers	Load center branch circuit breakers
to 10,000	Series WB, WB_U WEB, WEB_U WS_U, WES_U WTB_U, WET_U	QP, QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100-225A)③	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QP, QPH, HQP (3 pole,15–100A)④	
		QJ2, QJH2, QJ2H, HQJ2H (3 Pole, 60–225A)⑤	
		JXD2-A, JD6-A, JXD6-A (2 & 3 pole, 200–400A)⑥	
		LD6-A, LXD6-A⑦	
to 22,000	Series WB, WB_U WEB, WEB_U	QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100–225A)③	≠≠QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QPH, HQP (3 pole,15–100A)④	
		QJH2, QJ2H, HQJ2H (3 pole, 60–225A)⑤	
	Series WS_U, WES_U	QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100–225A)③	
		QPH, HQP (3 pole,15–100A)④	
		QJH2, QJ2H, HQJ2H (3 pole, 60–225A)⑤	
	Series WTB_U WET_U	QPH, HQP (2 pole,15–125A)③ QSH, QSHH, HQS, HQSH (2 pole,100–225A)③	
		QPH, HQP (3 pole,15–100A)④	
		QJH2, QJ2H, HQJ2H (3 Pole, 60–225A)⑤	
to 25,000	Series WB, WB_U WEB, WEB_U WS_U, WES_U WTB_U, WET_U	JXD2-A, JD6-A, JXD6-A (2 & 3 pole, 200–400A)⑥	QPH, HQP
		LD6-A, LXD6-A⑦	
to 42,000	Series WB, WB_U WEB, WEB_U	QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100–225A)③	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QPH, HQP (3 pole,15–100A)④	
		QJ2H, HQJ2H (3 pole, 60–225A)⑤	
	Series WS_U, WES_U	QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100–225A)③	
		QPH, HQP (3 pole,15–100A)④	
		QJ2H, HQJ2H (3 pole, 60–225A)⑤	
	Series WTB_U WET_U	HQP (2 pole,15–125A)③ QSHH, HQS, HQSH (2 pole,100–225A)③	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		HQP (3 pole,15–100A)④	
		QJ2H, HQJ2H (3 pole 60–225A)⑤	QP, QPH, HQP

• Revised •
04/28/15

Power Mod

WML and WMT Commercial Meter Stacks Rating Charts

Use the tables below to determine the correct combination of equipment and circuit breakers for the available fault current. This chart provides series rating information for the most common applications. For a complete series rating chart please contact your local sales office.

Available fault current RMS symmetrical amps at 120/240V max 1-phase, 240V max 3-Phase	Service entrance modules①	Meter module branch circuit breakers	Load center branch circuit breakers to 10,000
to 65,000	Series WB, WB_U WEB, WEB_U	QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100-225A)③	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		QPH,HQP (3 pole,15–100A)④	
		QJH2② QJ2H②, HQJ2H (3 pole, 60-225A)⑤	
	Series WS_U, WES_U	QPH, HQP (2 pole,15–125A)③ QS, QSH, QSHH, HQS, HQSH (2 pole,100-225A)③	
		QPH, HQP (3 pole,15–100A)④	
		HQJ2H (3 pole, 60-225A)⑤	
	Series WTB_U WET_U	HQP (2 pole,15–125A)③ HQS, HQSH (2 pole,100–225A)③	
		HQP (3 pole,15–100A)④	
		HQJ2H (3 pole, 60–225A)⑤	
to 100,000	Series WB_U, WEB_U WS_U, WES_U	QS, QSH, QSHH, HQS, HQSH (2 pole,100–225A)③	QP, QPH, HQP, QT, QAF, QAFH, QPF, QPHF, QE, QEH
		HQJ2H (3 pole, 60–225A)⑤	
	Series WTB_U, WET_U	HQSH (2 pole,100–225A)③	
		HQJ2H (3 pole, 60–225A)⑤	

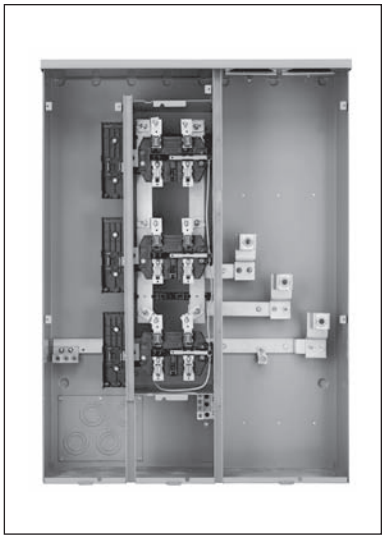
① Service Entrance Modules:
WB and WEB have 65k AIC breakers factory installed [(JXD2-A, JXD6-A) (LXD6-A) (MXD6) (NXD6) (PXD6) (RXD6)]
WB_U and WEB_U have 100k AIC breakers factory installed [(HJXD6-A) (HLXD6-A) (HMXD6) (HNXD6) (HPXD6) (HRXD6)]
WS_U , WES_U and WMLZF are fused switches (Class T - 300 volt) - Series ratings are applicable to all switches with Class T – 300V fuses
WTB_U and WET_U have NO overcurrent protection
② Applicable only with JXD2-A (200-400 amp), (H)JXD6-A (200-400 amp) or (H)LXD6-A (450-600 amp) breaker in main
③ WML & WMT 225 amp, single phase
④ WML 100 amp, 3 phase
⑤ WML & WMT 225 amp, 3 phase
⑥ WML & WMK 400 amp, single and 3 phase
⑦ WMK 600 amp, single and 3 phase

Meter Centers

Uni-PAK Metering: Introduction







Siemens' new line of Uni-PAK Metering will be available in September 2011, but has been included to keep your copy of the Siemens Speedfax as up-to-date as possible. For your convienience both current and future catalog numbers are listed on the following pages. All technical information, including dimensions, ratings, & accessories, are relevant to the new style products only.

General Information

Siemens all new Uni-PAK Metering offers maximum flexibility and ease of installation to meet the service requirements of multiple position metering projects. The outdoor/indoor devices are available in two through six gang set-ups which consist of a pull section with main lugs or stud terminations, and 4/5 jaw meter sockets with tenant circuit breaker provisions.

The units operate on 120/240V AC 1Ø-3W systems and are available with either 125 or 200 ampere meter sockets to meet a wide variety of small apartment and commercial building applications. A fifth jaw accessory kit is available for use on 120/208YV AC 1Ø-3W network systems.

The attractive Uni-PAK devices accept overhead or underground service terminations and are designed for wall-hung surface or semi-flush mounting.

The devices are factory pre-bussed in a compact enclosure to ensure ease of handling and installation and to maximize wall-space efficiency.

Design/Performance Features

- Siemens' exclusive 200 ampere/position feature the QS breaker for faster & easier installations
- Removable knock-out plate for back exit
- Mounting rail for wall hanging
- UL Listed for Service Equipment
- UL Listed for use with 60/75°C wire
- UL Listed for short circuit ratings up to 100,000 RMS symmetrical amps at 240V AC
- Outdoor/indoor construction
- Overhead or underground service; load top, bottom or back
- Front accessible 4 or 5-jaw sockets with individual ring or ringless type meter covers
- 125 amp sockets feed plug-in tenant breakers through 125 amperes
- 200 amp sockets feed plug-in tenant breakers through 225 amps
- All unmetered bus is barriered and sealable to prevent unauthorized access
- Compact design for ease of handling and installation
- Fifth jaw field installable at 6 or 9 o'clock
- Lever Bypass models
- Electrodeposited paint provides uniform coverage for long-lasting protection and sharp appearance
- Meets EUSERC specifications when NEMA stud kit and flange kit (if required) are field-added (not available for lever bypass versions)

Technical Information

Uni-PAK devices are UL listed under file #E10703 as service entrance equipment.

Complete Selection

Number of Meter Jaws	4 or 5
Voltage	240V AC Maximum
Amperes (per Meter position)	125 amp or 200 amp Maximum
Amperes (Bus)	1000 amps Maximum
Tenant Main Breakers	Provisions for plug-in tenant circuit breakers through 200A
Number of Meter Positions	2, 3, 4, 5 or 6
Service	Overhead or underground with load top, bottom or back

Industry Specifications

Uni-PAK metering units comply with the following industry standards.

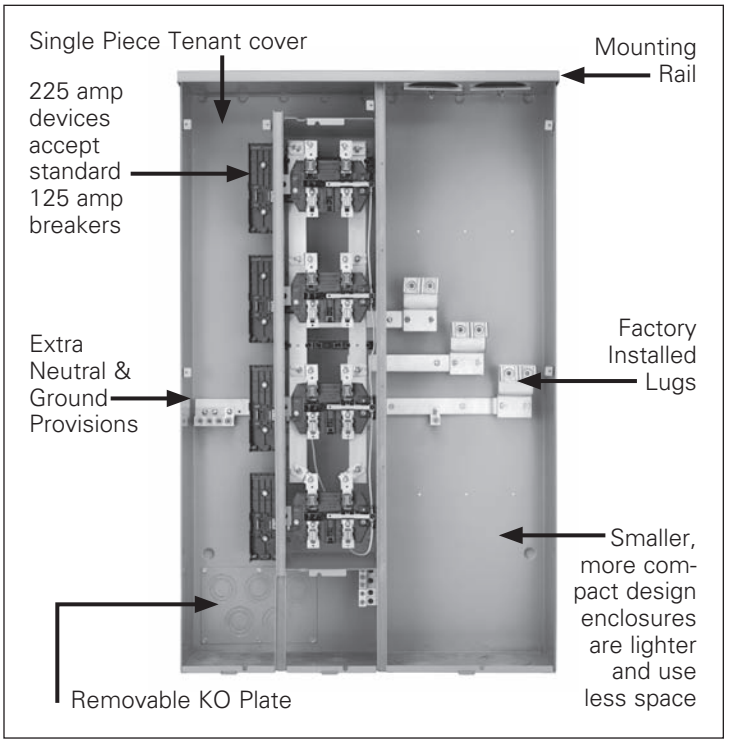
ANSI — Standard #C 12.7-1987
NEMA — Standard #250-1985
UL — File #E10703
UL — Standard #50, 67, 414

In addition to local code and National Electrical Code requirements, the serving utility may have special requirements for metering devices. Confirm utility acceptance prior to order placement.

• Revised •
05/09/12

Meter Centers

Uni-PAK Metering: WP Ring Style



Features

- Individual split covers
- Ring style meter construction
- UL Listed for 60 / 75°C conductors. See equipment markings for applications
- For small apartment buildings, small professional and commercial buildings
- Completely self-contained meter centers
- Two to six 125A and 225A sockets breaker positions
- Outdoor surface mounted enclosures
- Compact, pre-bussed, easy to handle, hang and wire
- Barriered, sealable compartment for unmetered current-carrying parts
- Al/Cu lay-in lugs, except two position 125A units
- Top or bottom feed
- Bottom and rear branch wiring exits (Neutral and ground at bottom only)
- ANSI #61 light gray electrodeposited paint on zinc-coated G90 steel
- Field installable 5th jaw kit

Ring Style Uni-PAK 120/240V 1 Phase, 3 Wire

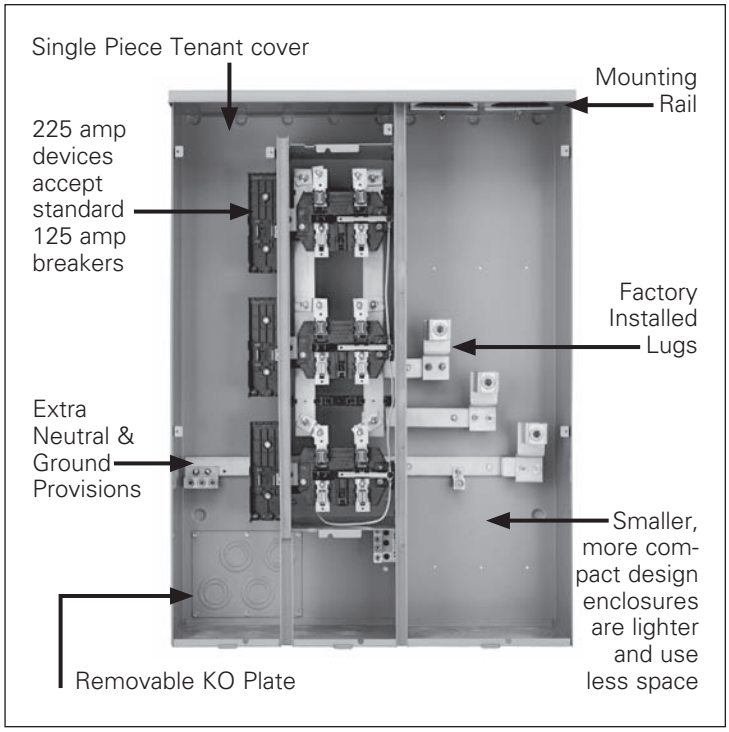
Maximum Tenant Main①	Bus Ampe-rage	Meter Positions Per Pak	Old Catalog Number②	NEW Catalog Number Available Sept. 2011	Breaker Provision	Max. AIC	Dimensions① Height	Width	Depth	5th Jaw① Assembly	Line Lugs Wire Range①
125	200	2	SP2211	WP2211	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65,000	26.26	13.80	5.81	ECMF5 6:00 or 9:00	#6-300 kcmil
	300	3	SP3311	WP3311			38.75	25.42	7.56		#2-600 kcmil
	400	4	SP4411	WP4411			47.75				1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU
		5	SP4511	WP4511			38.75	38.95			
		6	SP4611	WP4611							
	500	4	SP5411	WP5411			47.75	26.47			(2) #2-600 kcmil
	600	5	SP6511	WP6511			38.75	39.01			
		6	SP6611	WP6611				40.01			
225	400	2	SP4212	WP4212	QP, QPH, HQP, MP-T, MP-HT, MP-MT, QS, QSH, QSHH, HQS, HQSH	100,000	29.75	28.53			1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU
		3	SP4312	WP4312			38.75				
		4	SP4412	WP4412			47.75				
	600		SP6412	WP6412				29.59			(2) #2-600 kcmil
		5	SP6512	WP6512			38.75	46.22			
		6	SP6612	WP6612							
	800		SP8612	WP8612				51.03			(2) 1/0-750 kcmil or (4) 1/0-250 AL or (4) 1/0-3/0 CU
	1000		NA	WP10612							(3) #2-500 kcmil

① Dimensions and information shown are for WPXXX units. For old style information, please see the 2008 Speedfax.

② Dimensions, ratings, and technical information shown are WP series PAK only. Consult the 2007-2008 Speedfax for information on SP series.

Meter Centers

Uni-PAK Metering: WP Ringless Style, No Bypass



Features

- Ringless meter construction
- Individual split covers with barrel lock compatibility
- Available with horn bypass factory installed
- UL Listed for 60/75° C conductors See equipment markings for applications
- For small apartment buildings, small professional and commercial buildings
- Completely self-contained meter centers
- Two to six 125A and 225A breaker positions
- Compact, pre-bussed, easy to handle, hang and wire
- Barriered, sealable compartment for unmetered current-carrying parts
- Al/Cu lay-in lugs, except two position 125A units
- Top or bottom feed
- Bottom and rear branch wiring exits (Neutral and ground at bottom only)
- ANSI #61 light grey electrodeposited paint on zinc-coated steel
- 5th jaw kit included with each unit
- Outdoor surface mounted enclosures

Ringless Style Uni-PAK 120/240V 1 Phase, 3 Wire

Max. Tenant Main①	Bus Ampe-rage	Meter Positions Per Pak	Old Catalog Number②	NEW Catalog Number Available Sept. 2011	Breaker Provision	Max. AIC	Dimensions① Height	Width	Depth	5th Jaw① Assembly	Horn Bypass① Kit	Line Lugs Wire Range①
No Bypass												
125	200	2	**SP2211RJ**	**WP2211RJ**	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65,000	26.26	13.80	5.81	INCL. 9:00 factory 6:00 field	ECMFH	#6-300 kcmil
	300	3	**SP3311RJ**	**WP3311RJ**			38.75	25.42	7.56			#2-600 kcmil
	400	4	**SP4411RJ**	**WP4411RJ**			47.75					1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU
		5	**SP4511RJ**	**WP4511RJ**			38.75	38.95				
		6	**SP4611RJ**	**WP4611RJ**								
	500	4	**NA**	**WP5411RJ**			47.75	26.47				(2) #2-600 kcmil
	600	5	**SP6511RJ**	**WP6511RJ**			38.75	39.01				
		6	**SP6611RJ**	**WP6611RJ**				40.01				
225	400	2	**SP4212RJ**	**WP4212RJ**	QP, QPH, HQP, MP-T, MP-HT, MP-MT, QS, QSH, QSHH, HQS, HQSH	100,000	29.75	28.53				1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU
		3	**SP4312RJ**	**WP4312RJ**			38.75					
		4	**SP4412RJ**	**WP4412RJ**			47.75					
	600		**NA**	**WP6412RJ**				29.59				(2) #2-600 kcmil
		5	**SP6512RJ**	**WP6512RJ**			38.75	46.22				
		6	**SP6612RJ**	**WP6612RJ**								
	800		**NA**	**WP8612RJ**				51.03				(2) 1/0-750 kcmil or (4) 1/0-250 AL or (4) 1/0-3/0 CU
	1000		**NA**	**WP10612RJ**								(3) #2-500 kcmil

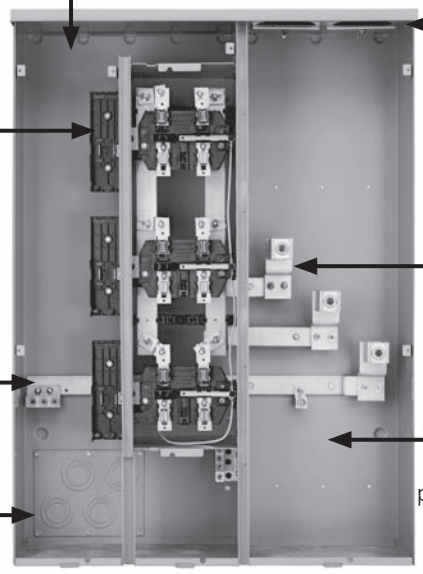
① Dimensions and information shown are for WPXXX units. For old style information, please see the 2008 Speedfax.

② Dimensions, ratings, and technical information shown are WP series PAK only. Consult the 2007-2008 Speedfax for information on SP series.

• Revised •
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Meter Centers

Uni-PAK Metering: WP Ringless Style, Horn Bypass



Features

- Ringless meter construction
- Individual split covers with barrel lock compatibility
- Horn bypass factory installed
- UL Listed for 60/75°C conductors See equipment markings for applications
- For small apartment buildings, small professional and commercial buildings
- Completely self-contained meter centers
- Two to six 125A and 225A breaker positions
- Compact, pre-bussed, easy to handle, hang and wire
- Barriered, sealable compartment for unmetered current-carrying parts
- Al/Cu lay-in lugs, except two position 125A units
- Top or bottom feed
- Bottom and rear branch wiring exits (Neutral and ground at bottom only)
- ANSI #61 light grey electrodeposited paint on zinc-coated steel
- 5th jaw kit included with each unit
- Outdoor surface mounted enclosures

Ringless Style Uni-PAK 120/240V 1 Phase, 3 Wire

Max. Tenant Main①	Bus Ampe-rage	Meter Positions Per Pak	Old Catalog Number③	NEW Catalog Number Available Sept. 2011	Breaker Provision	Max. AIC	Dimensions① Height	Width	Depth	5th Jaw① Assembly	Line Lugs Wire Range①
Horn Bypass											
125	200	2	**SP2211RJB**	**WP2211RJB**	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65,000	26.26	13.80	5.81	INCL. 9:00 factory 6:00 field	#6-300 kcmil
	300	3	**SP3311RJB**	**WP3311RJB**			38.75	25.42	7.56		#2-600 kcmil
	400	4	**SP4411RJB**	**WP4411RJB**			47.75				1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU
		5	**SP4511RJB**	**WP4511RJB**			38.75	38.95			
		6	**SP4611RJB**	**WP4611RJB**							
	500	4	**NA**	**WP5411RJB**			47.75	26.47			(2) #2-600 kcmil
	600	5	**SP6511RJB**	**WP6511RJB**			38.75	40.00			
		6	**SP6611RJB**	**WP6611RJB**							
225	400	2	**SP4212RJB**	**WP4212RJB**	QP, QPH, HQP, MP-T, MP-HT, MP-MT, QS, QSH, QSHH, HQS, HQSH	100,000	29.75	28.53			1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU
		3	**SP4312RJB**	**WP4312RJB**			38.75				
		4	**SP4412RJB**	**WP4412RJB**			47.75				
	600		**NA**	**WP6412RJB**				29.59			(2) #2-600 kcmil
		5	**SP6512RJB**	**WP6512RJB**			38.75	46.22			
		6	**SP6612RJB**	**WP6612RJB**							
	800	6	**NA**	**WP8612RJB**				51.03			(2) 1/0-750 kcmil or (4) 1/0-250 AL or (4) 1/0-3/0 CU
	1000	6	**NA**	**WP10612RJB**							(3) #2-500 kcmil
Horn Bypass, Alternate Enclosure Size & Lug Configuration②											
125	200	2	**NA**	**WPC2211RJB**	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65,000	32.44	13.80	5.81	INCL. 9:00 factory 6:00 field	#6-300 kcmil
225	400	2	**NA**	**WPC4212RJB**	QP, QPH, HQP, MP-T, MP-HT, MP-MT, QS, QSH, QSHH, HQS, HQSH	100,000	29.69	28.53	7.56		#6-350 kcmil
225	400	3	**NA**	**WPC4312RJB**		100,000	38.69				

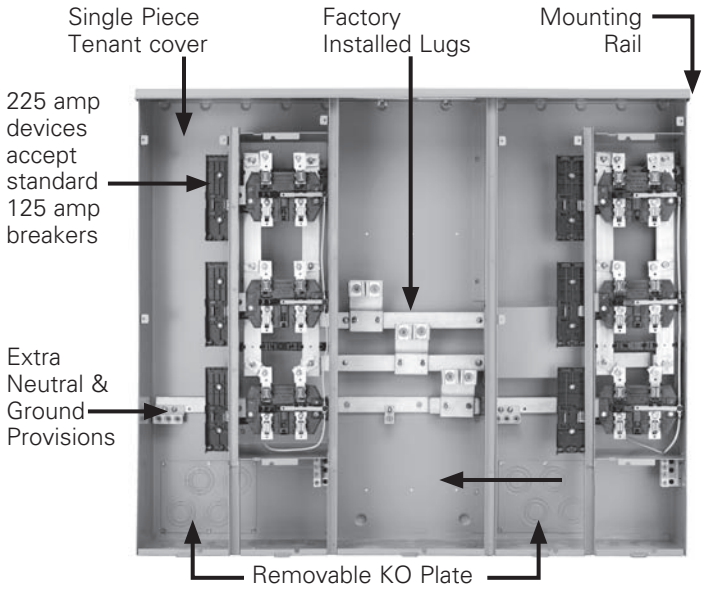
① Dimensions and information shown are for WPXXX units. For old style information, please see the 2008 Speedfax.

② These units are for specific utilities only. Please contact sales office for more information.

Dimensions, ratings, and technical information shown are WP series PAK only. Consult the 2007-2008 Speedfax for information on SP series.

Meter Centers

Uni-PAK Metering: WEP Ringstyle EUSERC



Features

- Individual split covers
- UL Listed for 60 / 75°C conductors. See equipment markings for applications
- For small apartment buildings, small professional and commercial buildings
- Completely self-contained meter centers
- Two to six 125A and 225A breaker positions
- Outdoor surface mounted enclosures
- Semi flush with applicable field installed kit
- Compact, pre-bussed, easy to handle, hang and wire
- Barriered, sealable compartment for unmetered current-carrying parts
- Al/Cu lay-in lugs, except two socket units
- Top or bottom feed
- Bottom and rear branch wiring exits (Neutral and ground at bottom only)
- ANSI #61 light gray electrodeposited paint on zinc-coated G90 steel
- Meets EUSERC specifications when NEMA stud kit and flushing ring (if required) is field added

EUSERC Compliant Ring Style Uni-PAK 120/240V 1 Phase, 3 Wire

Max. Tenant Main①	Bus Ampe-rage	Meter Positions Per Pak	Old Catalog Number②	NEW Catalog Number Available Sept. 2011	Breaker Provision	Max. AIC	Dimensions① Height	Width	Depth	5th Jaw① Assembly	Line Lugs Wire Range①	Semi-Flush Kit #	EUSERC Drawing #342
125	200	2	**SP2211**	**WEP2211**	QP, QPH, HQP, MP-T, MP-HT, MP-MT	65,000	32.52	13.80	7.56	ECMF5 6:00 or 9:00	#6-300 kcmil	WPFK1	figure 1
	300	3	**SP3311**	**WEP3311**			38.75	25.42			#2-600 kcmil	WPFK2	figure 3
	400	4	**SP4411**	**WEP4411**			47.75				1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU	WPFK3	
		5	**SP4511**	**WEP4511**			38.75	38.94				WPFK4	
	500	4	**SP5411**	**WP5411**			47.75	31.28			(2) #2-600 kcmil		
	400	6	**SP4611**	**WEP4611**			38.75	44.82					
	600	5	**SP6511**	**WEP6511**								WPFK5	
		6	**SP6611**	**WEP6611**									
225	400	2	**SP4212**	**WEP4212**	QP, QPH, HQP, MP-T, MP-HT, MP-MT, QS, QSH, QSHH, HQS, HQSH	100,000	29.75	28.53			1/0-750 kcmil CU-AL or (2) 1/0-250 AL or (2) 1/0-3/0 CU	WPFK6	figure 2
		3	**SP4312**	**WEP4312**			38.75					WPFK7	figure 3
		4	**SP4412**	**WEP4412**			47.75					WPFK8	
	600		**SP6412**	**WEP6412**				34.41				WPFK9	
		5	**SP6512**	**WEP6512**			38.75	51.04			(2) #2-600 kcmil	WPFK10	
		6	**SP6612**	**WEP6612**									
	800		**SP8612**	**WEP8612**							(2) 1/0-750 kcmil or (4) 1/0-250 AL or (4) 1/0-3/0 CU		N/A
	1000		**NA**	**WEP10612**				57.53			(3) #2-500 kcmil	WPFK11	

NEMA Stud Kits

Catalog Number	Amperage	Note
WPSK400	400A	fits 300-400
WPSK600	600A	fits 500-600
WPSK800	800A	—
WPSK1000	1000A	—

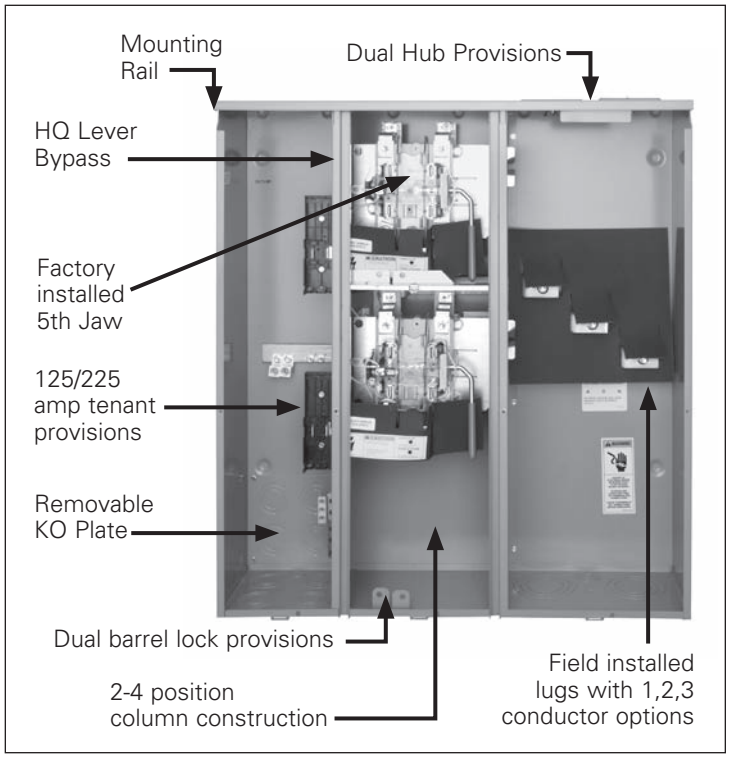
① Dimensions and information shown are for WPXXX units. For old style information, please see the 2008 Speedfax.

① Dimensions, ratings, and technical information shown are for WP series PAK only. Consult the 2007-2008 Speedfax for information on SP series.

③ Please not the EUSERC standard currently only covers up to 600 amp devices. Please consult utility prior to installation.

Meter Centers

Uni-PAK Metering: WPL Ringless Style, Lever Bypass



Features:

- Side mounted handles to help in lifting
- Provisions for one, two, or three incoming conductors per have and neutral (lugs field installed)
- 225 amp branch tenant provisions @ 100,000 AIC
- Full line of 2-6 position devices
- Light and compact design
- Individual split cover
- UL Listed for 60/75 degrees C conductors. See equipment markings for applications
- For small apartment buildings, small professional and commercial buildings
- Completely self-contained meter centers
- Outdoor surface mounted enclosures
- Barriered, sealable compartment for unmetered current-carrying parts
- Top or bottom fed
- Bottom and rear branch wiring exits (Neutral and ground at bottom only)
- ANSI #61 light gray electrodeposited paint on zinc-coated G90 steel.

Ringless Style Uni-PAK 120/240V 1 Phase, 3 Wire, Lever Bypass

Max. Tenant Main①	Bus Ampe-rage	Meter Positions Per Pak	Old Catalog Number③	NEW Catalog Number Available Sept. 2011	Breaker Provision	Max. AIC	Dimensions①			5th Jaw① Assembly	Line Lugs Wire Range
							Height	Width	Depth		
225	400	2	SP4212RJL	WPL4212RJ	QP, QPH, HQP, MP-T, MP-HT, MP-MT, QS, QSH, QSHH, HQS, HQSH	100,000	36.88	33.72	9.84	INCL. 9:00 position	3/8" Stud – Field installed lugs②
		3	SP4312RJL	WPL4312RJ			49.88				
		4	SP4412RJL	WPL4412RJ			62.88				
	600		N/A	WPL6412RJ							
		5	SP6512RJL	WPL6512RJ			49.75	53.56			
		6	SP6612RJL	WPL6612RJ							
	800		N/A	WPL8612RJ				57.81			
	1000		N/A	WPL10612RJ							

Lug Kits②

Catalog Number	Wire Range
H56476	3/0-800/94 kcmil
H60162	(2) 1/0-250 kcmil OR (1) #4-600 kcmil
H68752-1	(3) #6-250 kcmil
H56732-2	(2) #4-350 kcmil
H56732-M	(2) #4-500 kcmil

① Dimensions and information shown are for WPXXX units. For old style information, please see the 2008 Speedfax.

② Lug kits should be chosen based on the wire size being run to the unit. Wire should be sized according to the National Electrical Code. A total of 3 lugs are required to wire the line side of the device.

② Dimensions, ratings, and technical information shown are for WP series PSK only. Consult the 2007-2008 Speedfax for information on SP series.

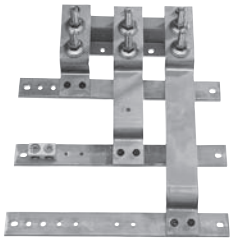
Meter Centers

Uni-PAK Metering: Accessories

Selection



ECHS125



NSK400



SUK350TA

Uni-PAK Lug Kits

Catalog Number	Description
Mechanical Lugs for NEMA Stud Kits	
SUK350TA	(2) #6-350 kcmil
SUK600TA	(1) #2-600 kcmil
SUK1000TA	(2) 500-1000 kcmil
Uni-PAK NEMA Stud Kits (WEP ONLY)④	
WPSK400	Fits 300 - 400A
WPSK600	Fits 500 - 600A
WPSK800	800A
WPSK1000	1000A
Uni-PAK Alternate Lug Kits (WP ONLY)	
WPLK2400	400A Bus Lug Kit (2) #4-250
WPLK2600	600A Bus Lug Kit (3) #6-250

Old PAK Accessories

Description		Catalog Number
5th Jaw Kit①		
All Types	Grounded	**ECMM5J**
	Insulated	**ECMMI5J**
Bypass Kits①		
Horn Bypass Kit		**ECHBK**
NEMA Stud Kits (Meets EUSERC Requirements)①		
400 Amp Bus NEMA Stud Kit		**NSK400**
600 Amp Bus NEMA Stud Kit②		**NSK600**
Alternate Lug Kits①		
400 Amp Bus Lug Kit (2) #4-250		**PLK400**
600 Amp Bus Lug Kit (3) #6-250		**PLK600**

Accessories for All-In-One Units

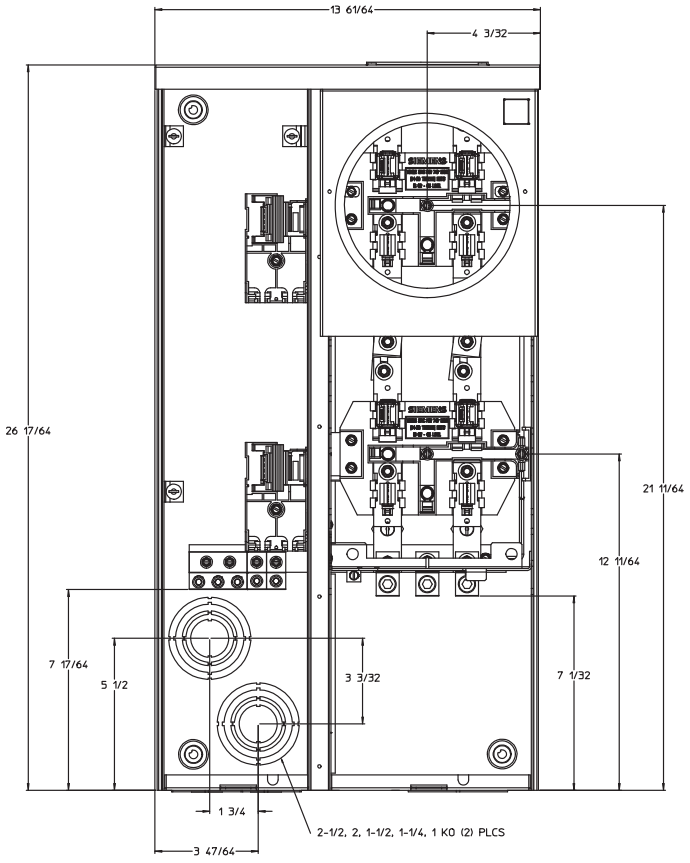
Description	Catalog Number
Lugs for NEMA Stud Kits①	
(2) #6-350 kcmil	**SUK350TA**
(1) #2-600 kcmil	**SUK600TA**
(2) #500-1000 kcmil	**SUK1000TA**
NEMA Stud Kits⑤	
400 Amp Bus NEMA Stud Kit	**WPSK400**
600 Amp Bus NEMA Stud Kit	**WPSK600**
800 Amp Bus NEMA Stud Kit	**WPSK800**
1000 Amp Bus NEMA Stud Kit	**WPK1000**
Type "HD" Conduit Hubs	
2" Conduit Hub④	**EC56854**
2½" Conduit Hub④	**EC56855**
3" Conduit Hub	**EC56856**
3½" Conduit Hub	**EC56857**
4" Conduit Hub	**EC56858**
Closure Plate	**EC56933S**
Type "RX" Conduit Hubs	
¾" Conduit Hub	**EC38594**
1" Conduit Hub	**EC38596**
1¼" Conduit Hub	**EC38597**
1½" Conduit Hub	**EC38598**
2" Conduit Hub	**EC38599**
2½" Conduit Hub	**EC38600**
Closure Plate	**EC38595**
Adapter plate for HD/RX③	**EC9747-1113**
Cover Plate	
Plastic Ring Style①	**ECPP**
Plastic Ringless Style	**ECCP3**
Filler Plates	
1" Filler Plate	**ECQF3**
4" to 2" Filler Plate	**ECCP3U①**

① Not for use on lever bypass units.
② Order NSK600 and PLK600 kits for use with 800 Amp PAK. CU Cable only approved with 800A device.
③ Use Adapter plate with RX hubs for PAK units.
④ These items made of Adapter plate and equivalent RX hub.
⑤ For use on WEP units only

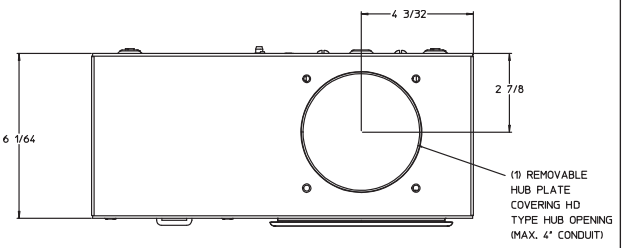
Meter Centers

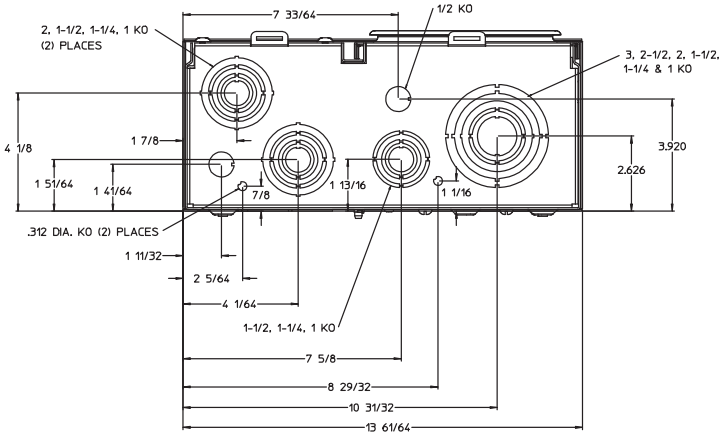
Uni-PAK Metering: Dimensional & Knockout Diagrams

WP2211

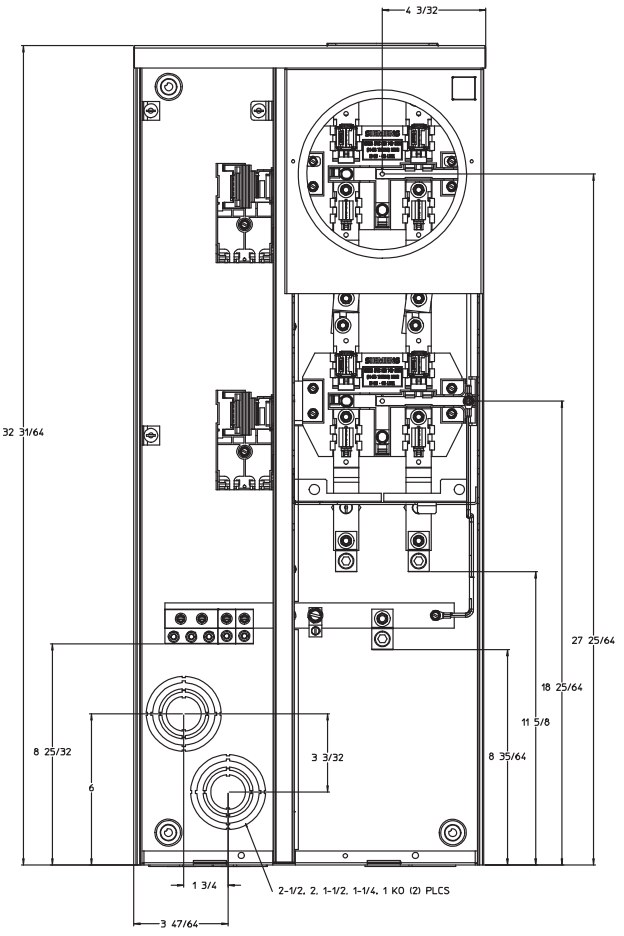


Top view for WP2211 and WEP2211





Bottom view for WP2211 and WEP2211

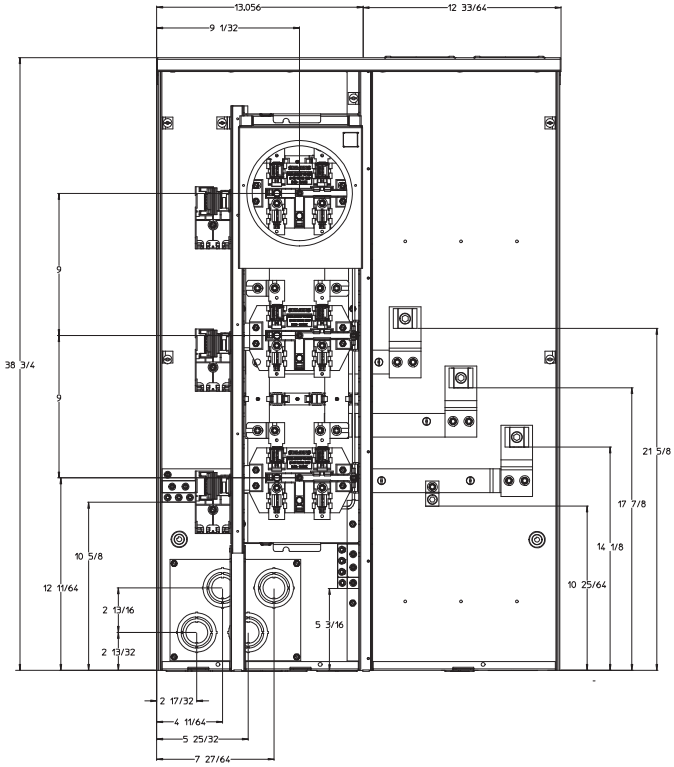


WEP2211

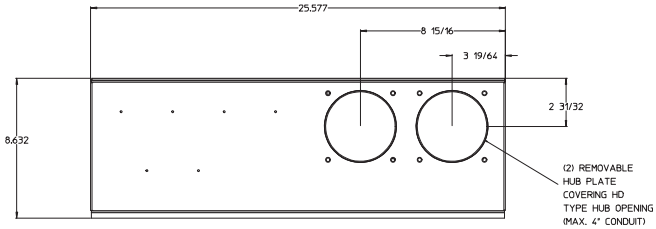
Meter Centers

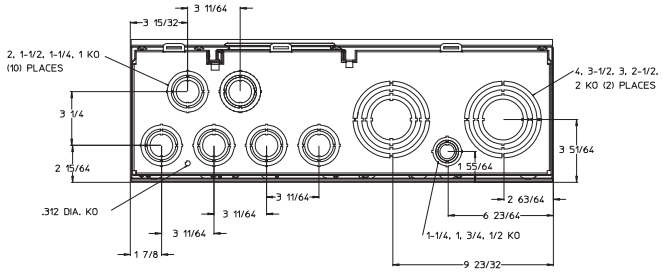
Uni-PAK Metering: Dimensional & Knockout Diagrams

WP3311
WEP3311

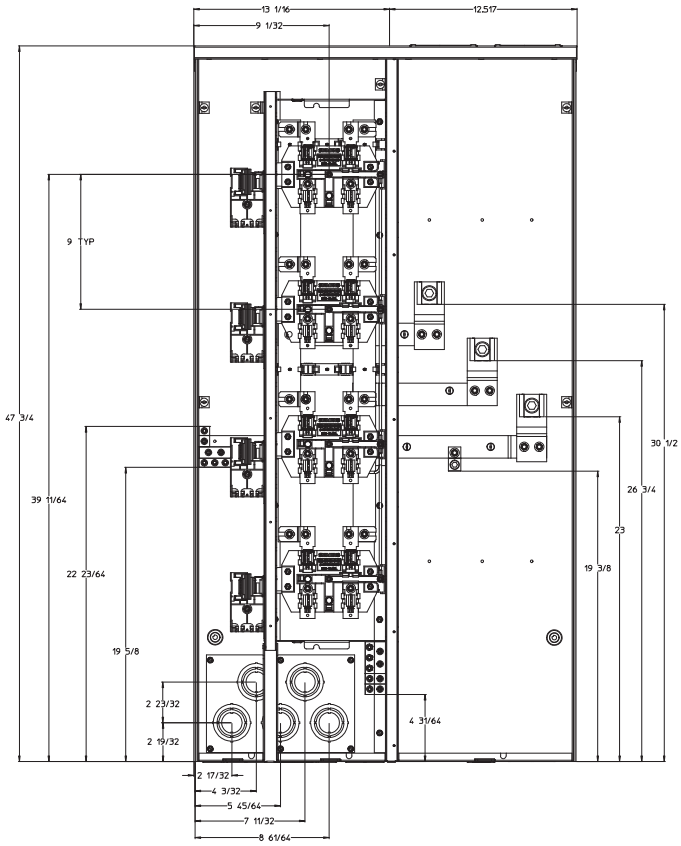


Top view for
WP3311, WP4411, WEP3311 and WEP4411





Bottom view for
WP3311, WP4411, WEP3311 and WEP4411

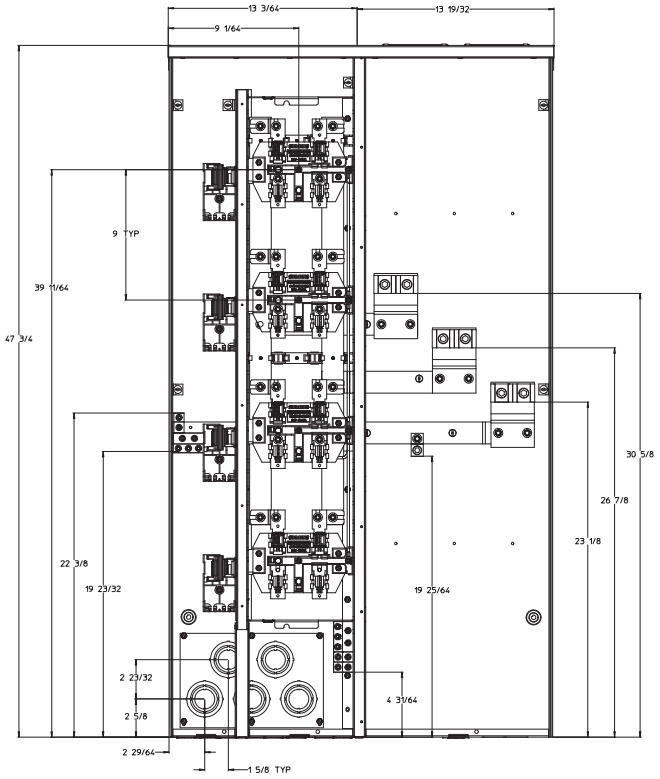


WP4411
WEP4411

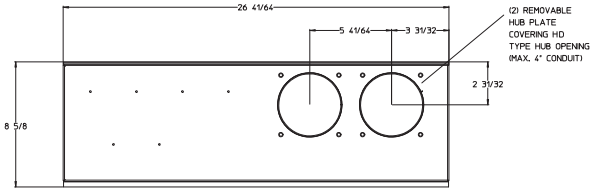
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

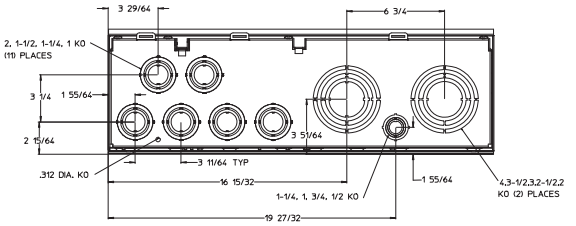
WP5411



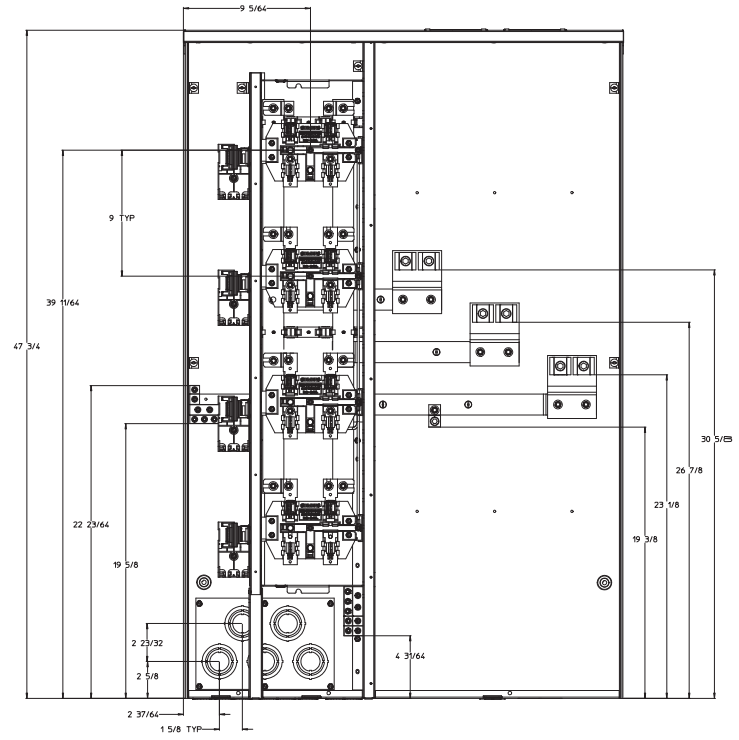
Top view for WP5411



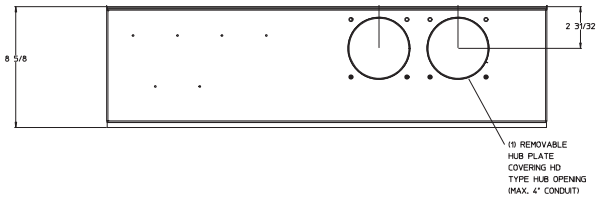
Bottom view for WP5411



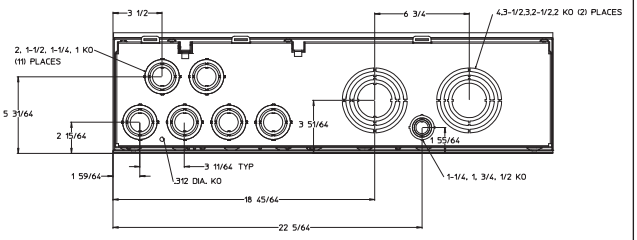
WEP5411



Top view for WEP5411



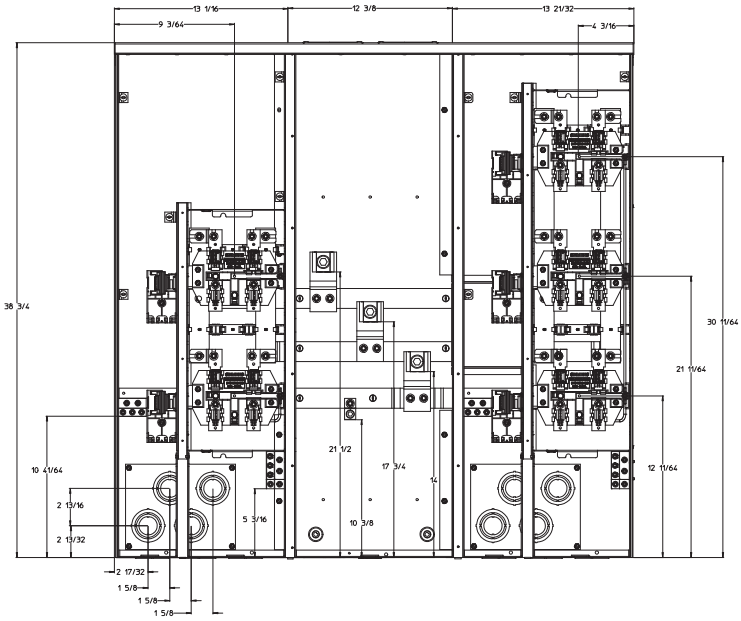
Bottom view for WEP5411



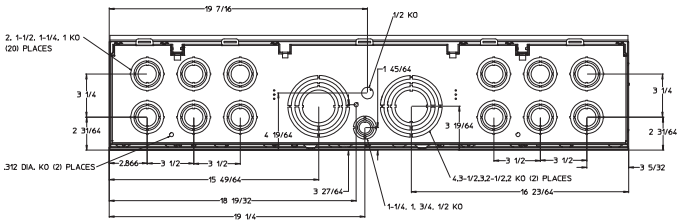
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

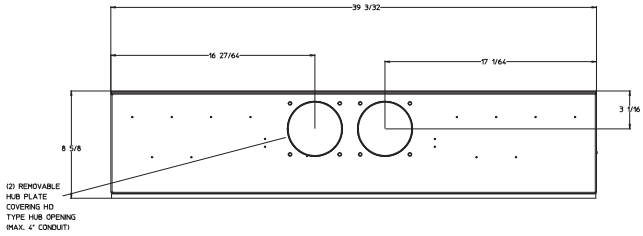
WP4511
WEP4511



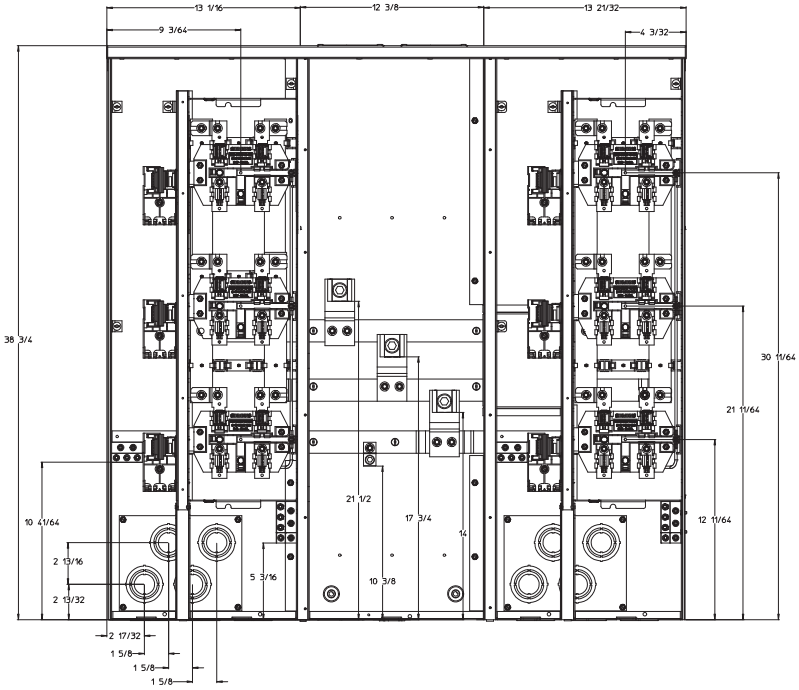
Bottom view for
WP4511, WP4611, WEP4511 and WEP4611



Top view for
WP4511, WP4611, WEP4511 and WEP4611



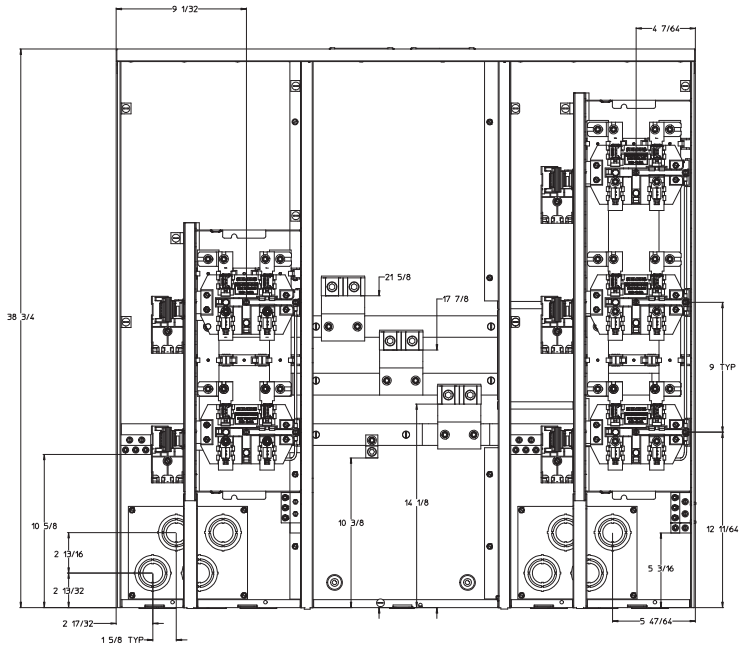
WP4611
WEP4611



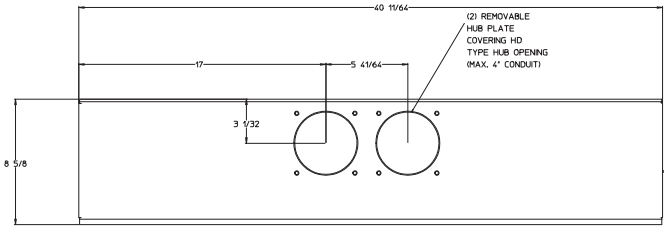
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

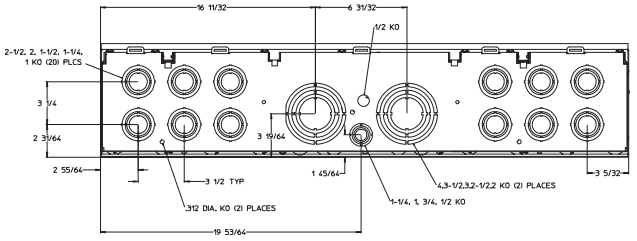
WP6511



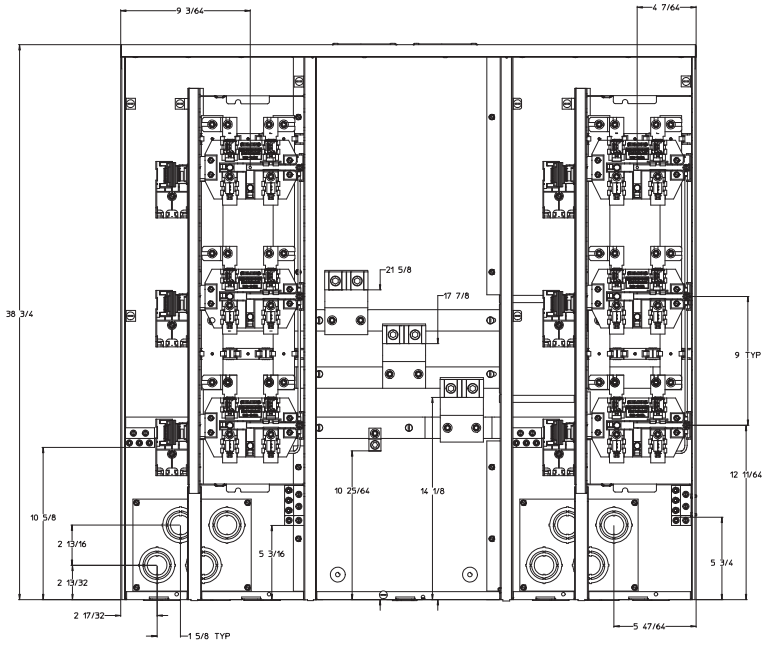
Top view for WP6511 and WP6611



Bottom view for WP6511 and WP6611



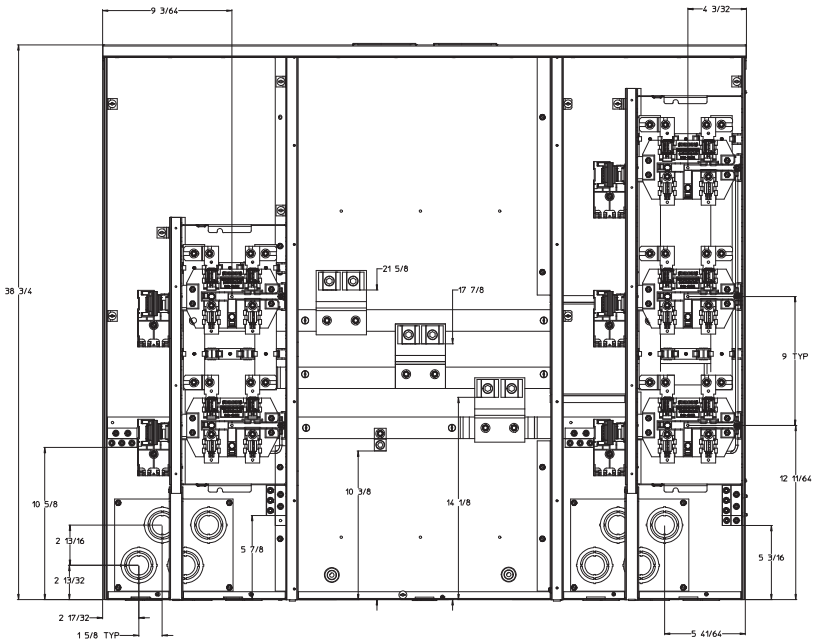
WP6611



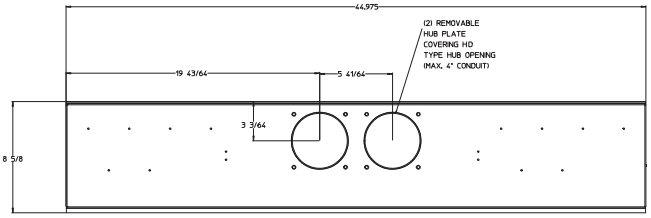
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

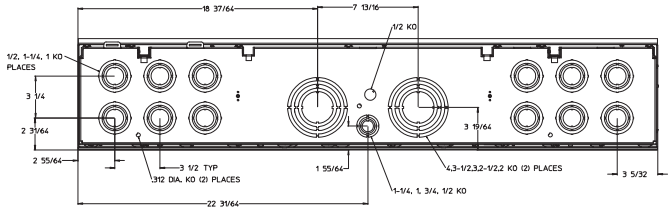
WEP6511



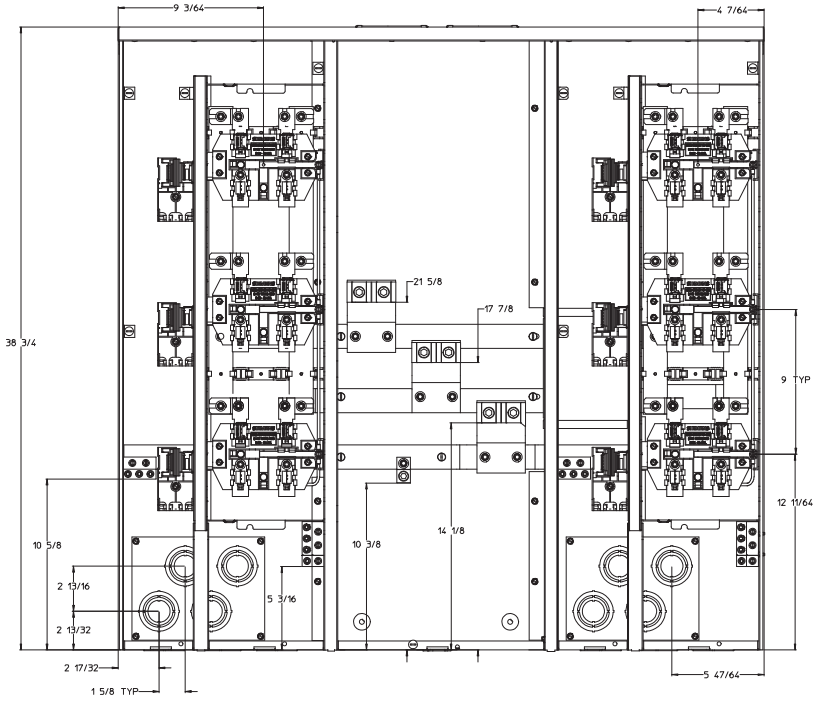
Top view for WEP6511 and WEP6611



Bottom view for WEP6511 and WEP6611



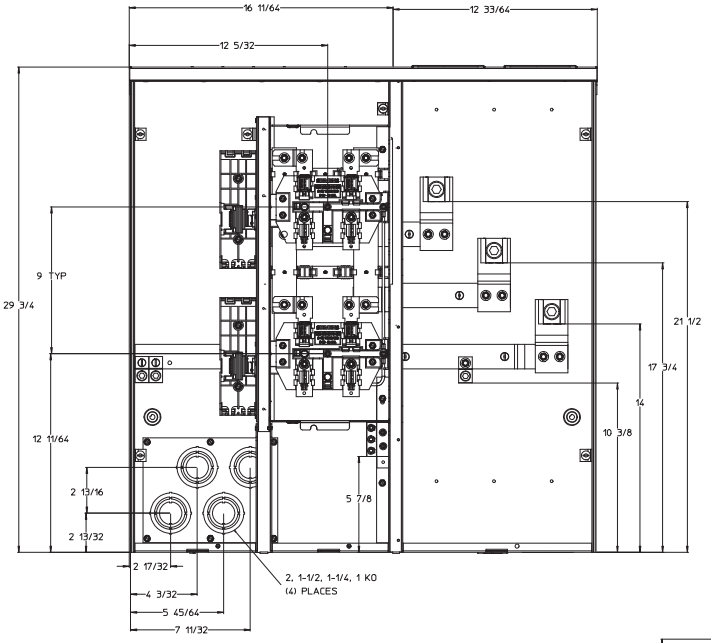
WEP6611



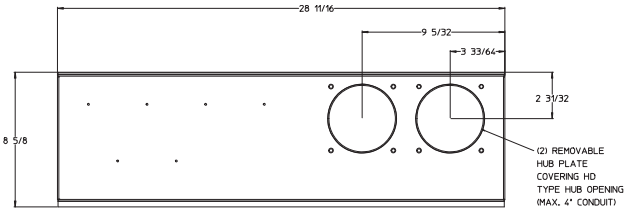
Meter Centers

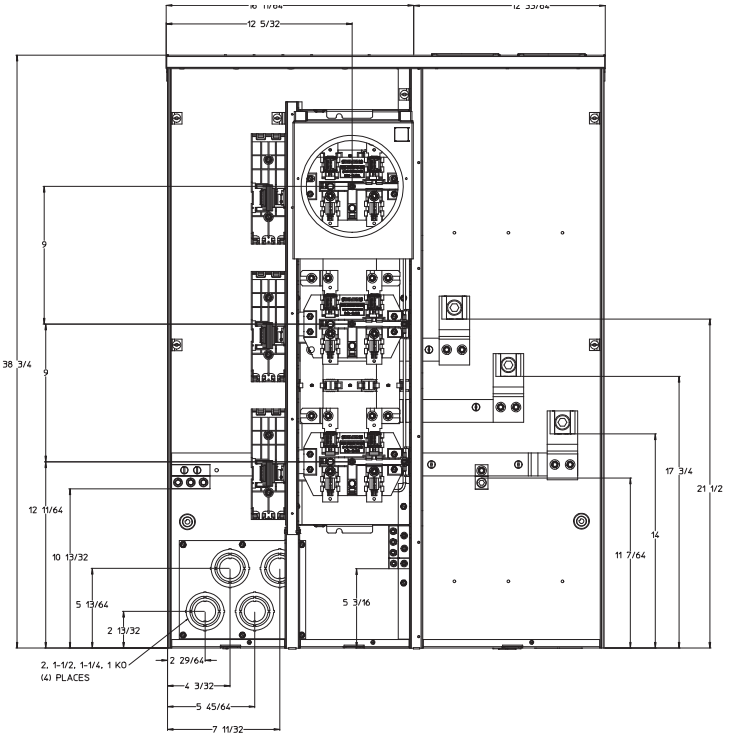
Uni-PAK Metering: Dimensional & Knockout Diagrams

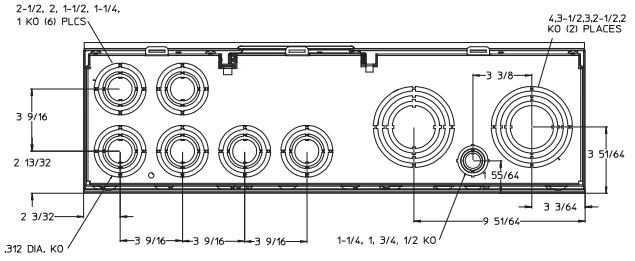
WP4212
WEP4212



Top view for
WP4212, WEP4212, WP4312 and WEP4312







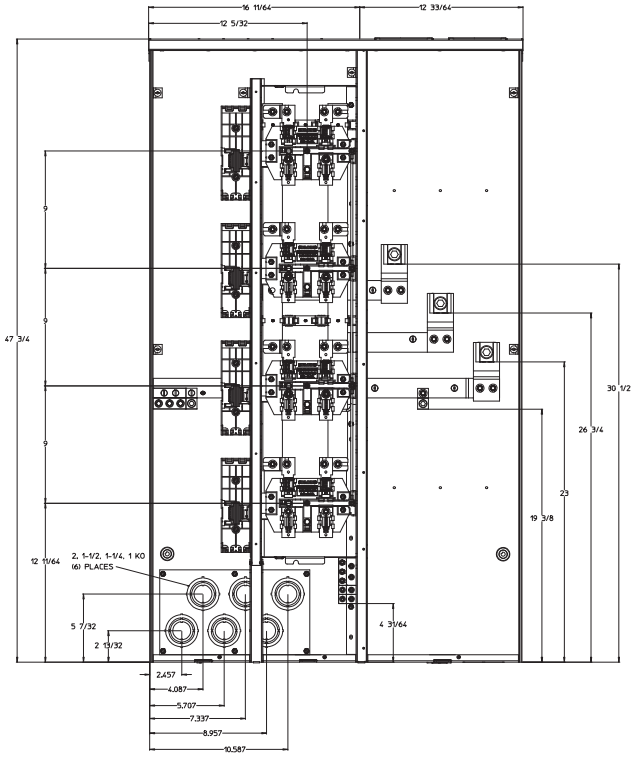
Bottom view for
WP4212, WEP4212, WP4312 and WEP4312

WP4312
WEP4312

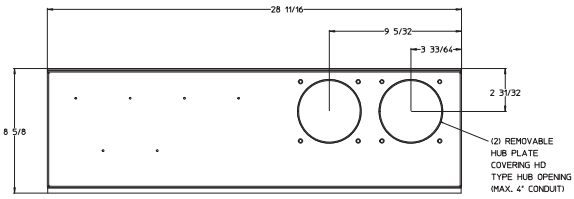
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

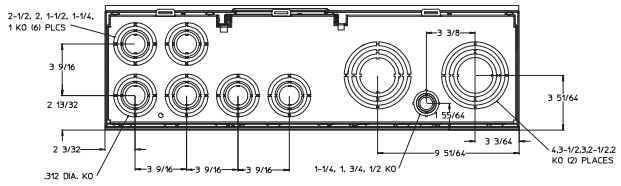
WP4412
WEP4412



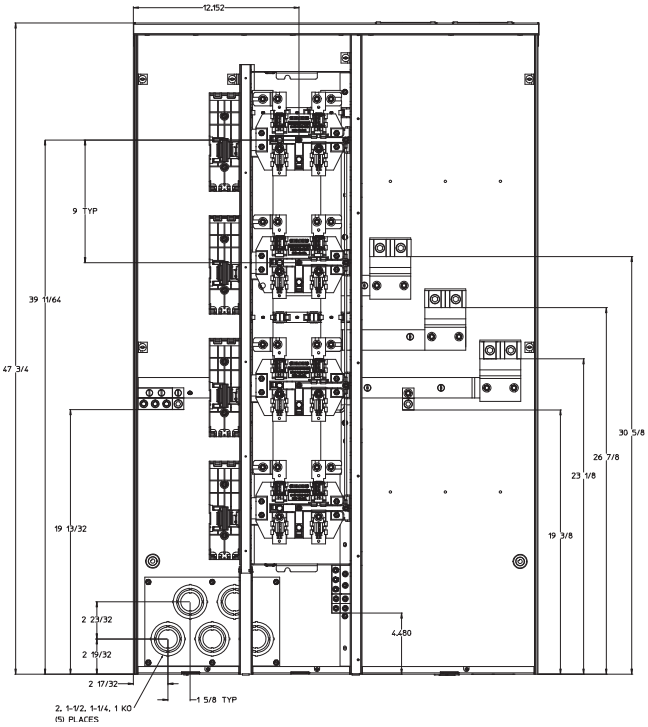
Top view for WP4412 and WEP4412



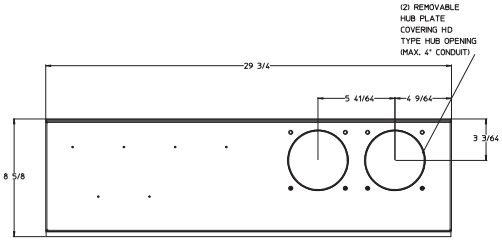
Bottom view for WP4412 and WEP4412



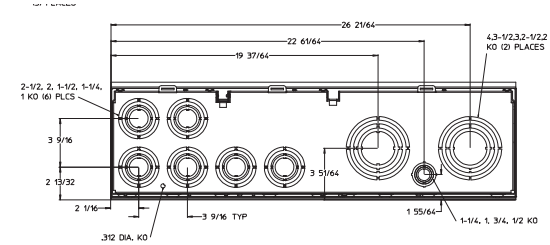
WP6412



Top view for WP6412



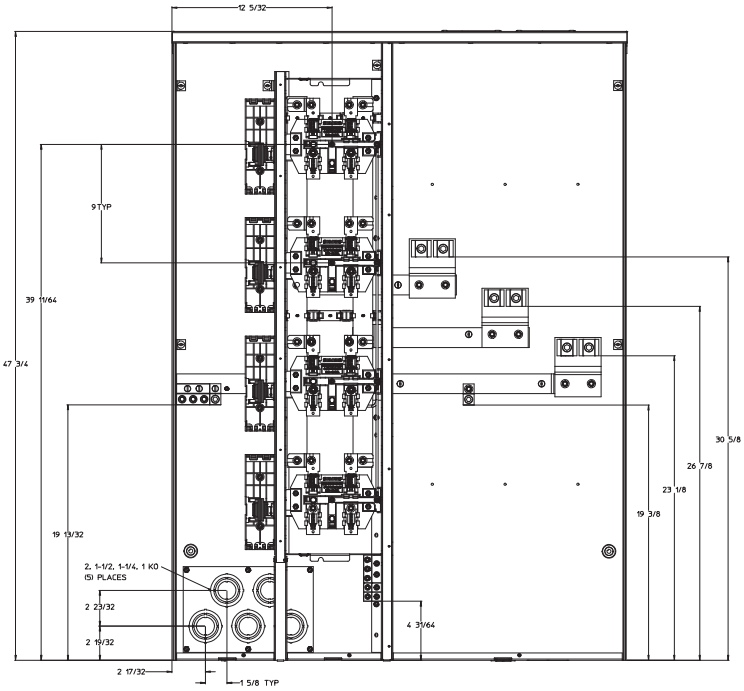
Bottom view for WP6412



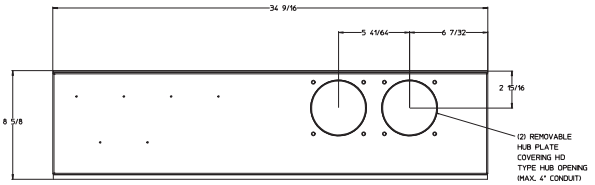
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

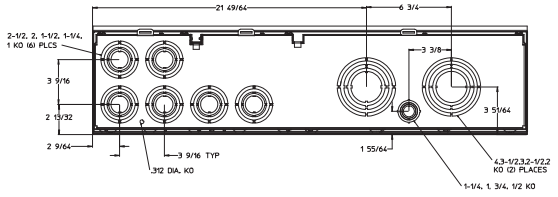
WEP6412



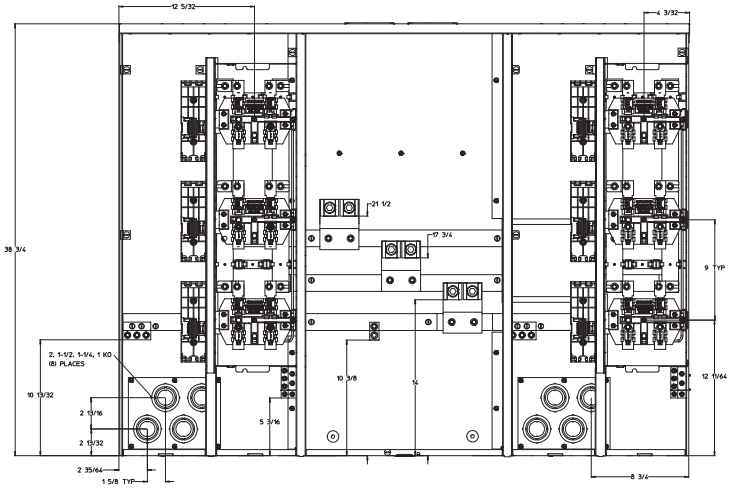
Top view for WEP6412



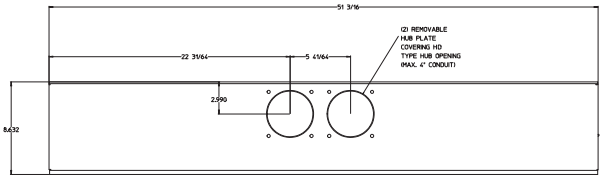
Bottom view for WEP6412



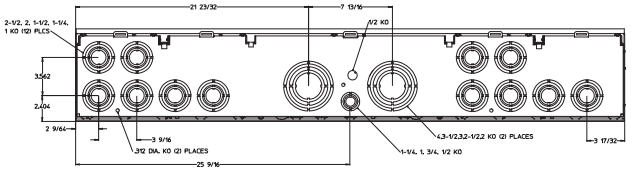
WP8612
WEP8612



Top view for WP8612 and WEP8612



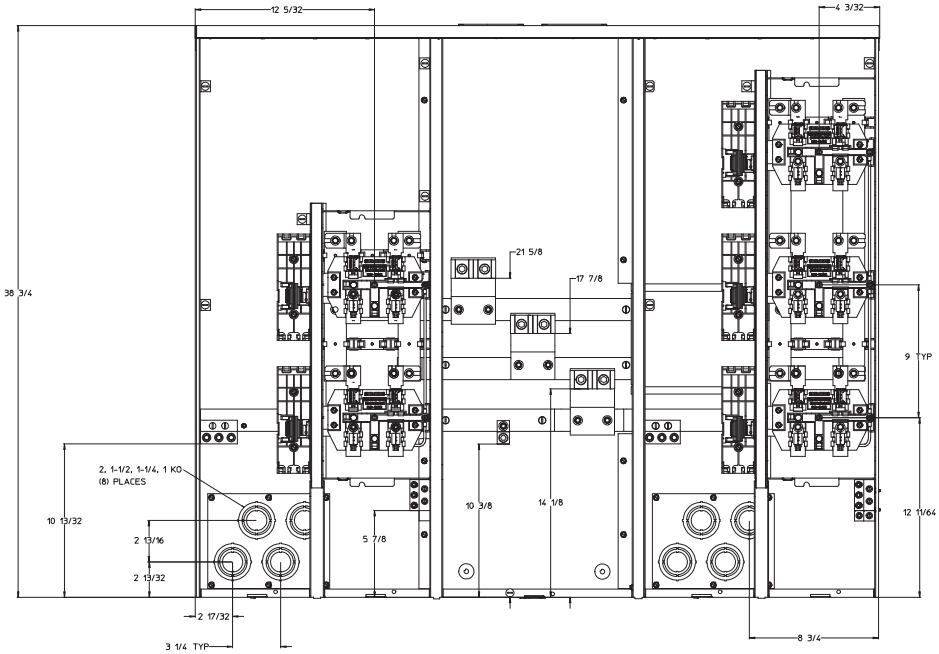
Bottom view for WP8612 and WEP8612



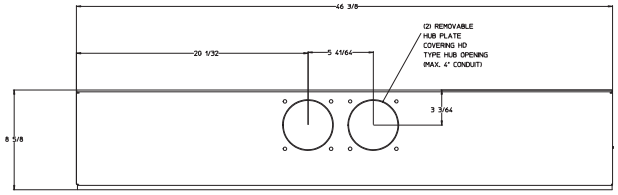
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

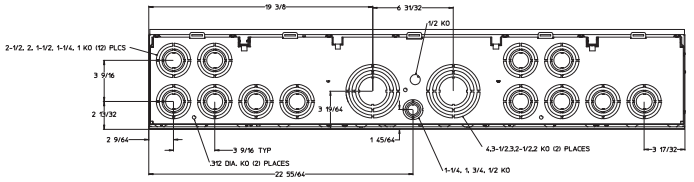
WP6512



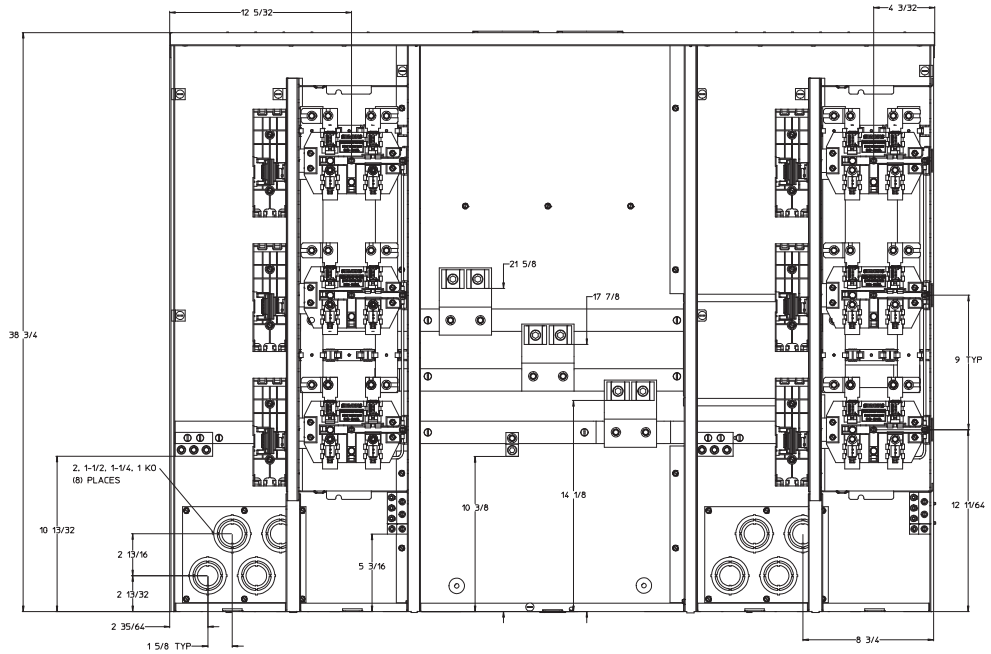
Top view for WP6512 and WP6612



Bottom view for WP6512 and WP6612



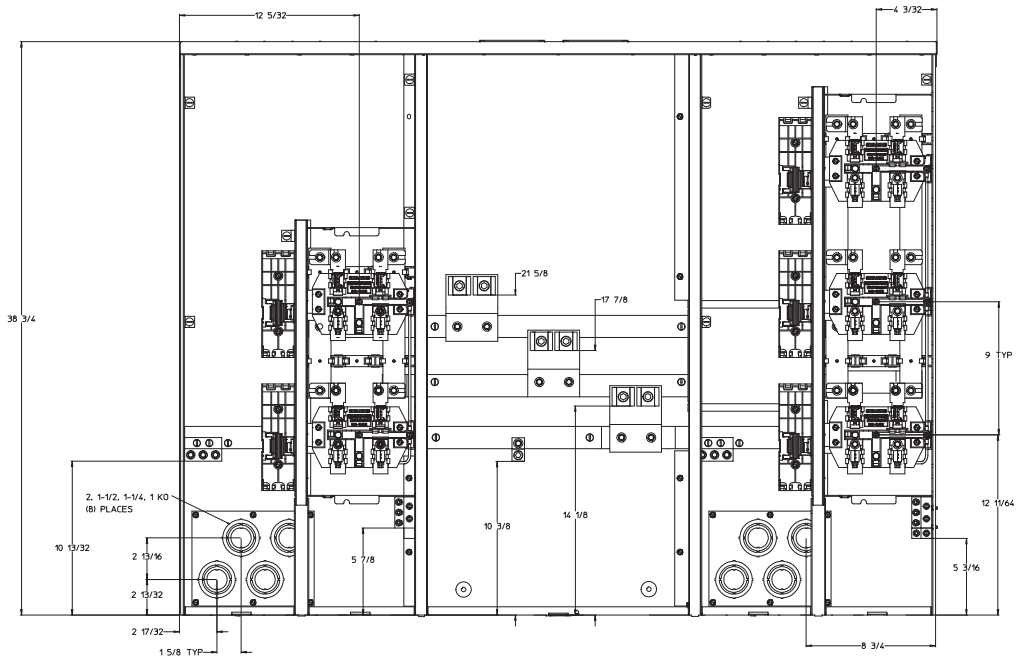
WP6612



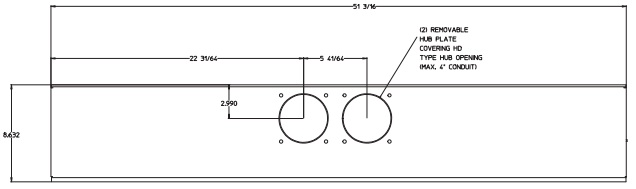
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

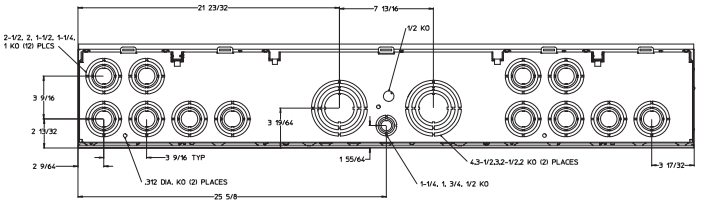
WEP6512



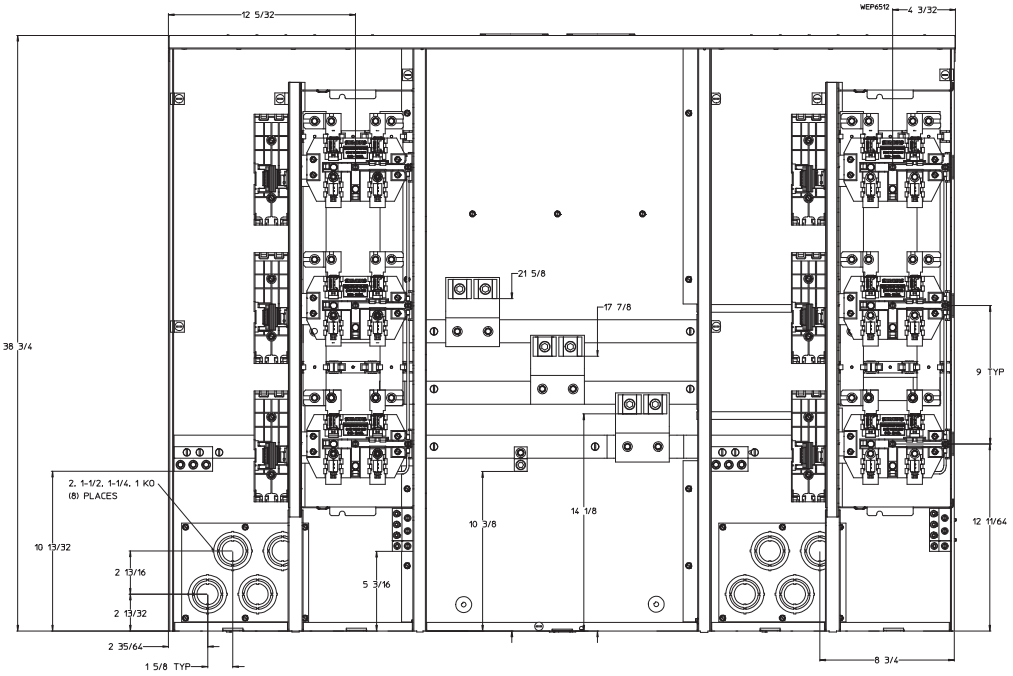
Top view for WEP6512 and WEP6612



Bottom view for WEP6512 and WEP6612



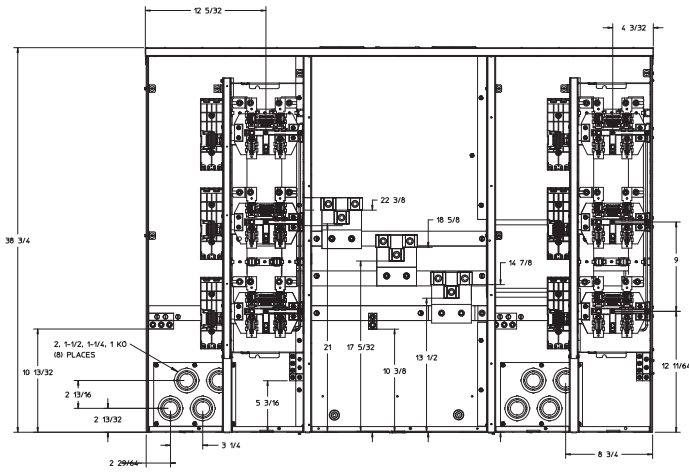
WEP6612



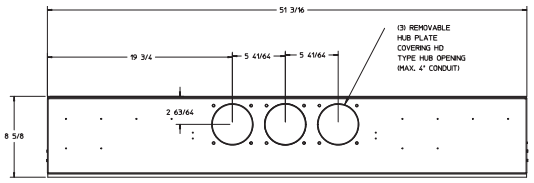
Meter Centers

Uni-PAK Metering: Dimensional & Knockout Diagrams

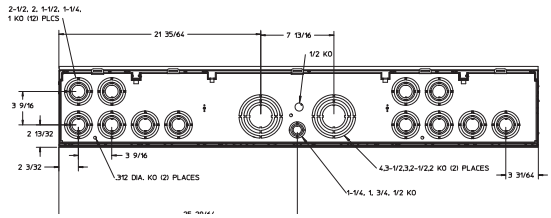
WP10612
WEP10612



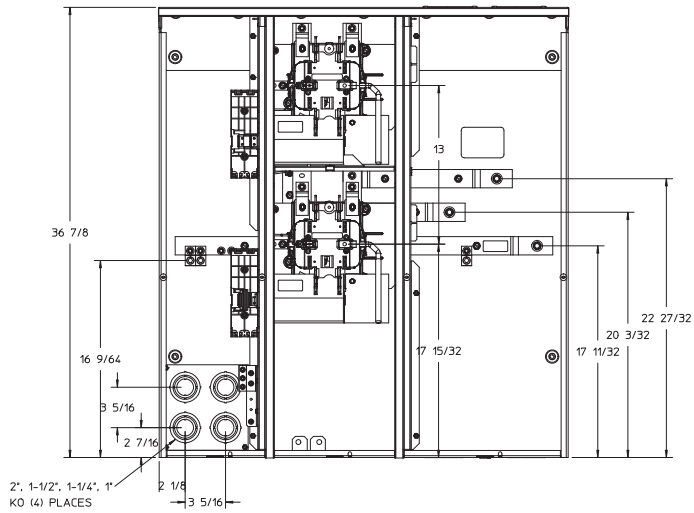
Top view for WP10612



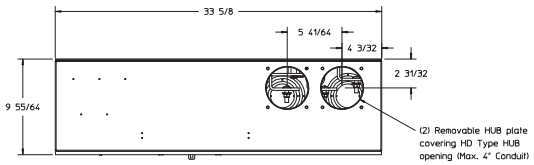
Bottom view for WP10612



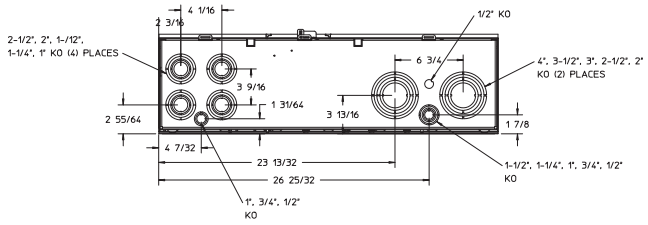
WPL4212



Top view for WPL4212



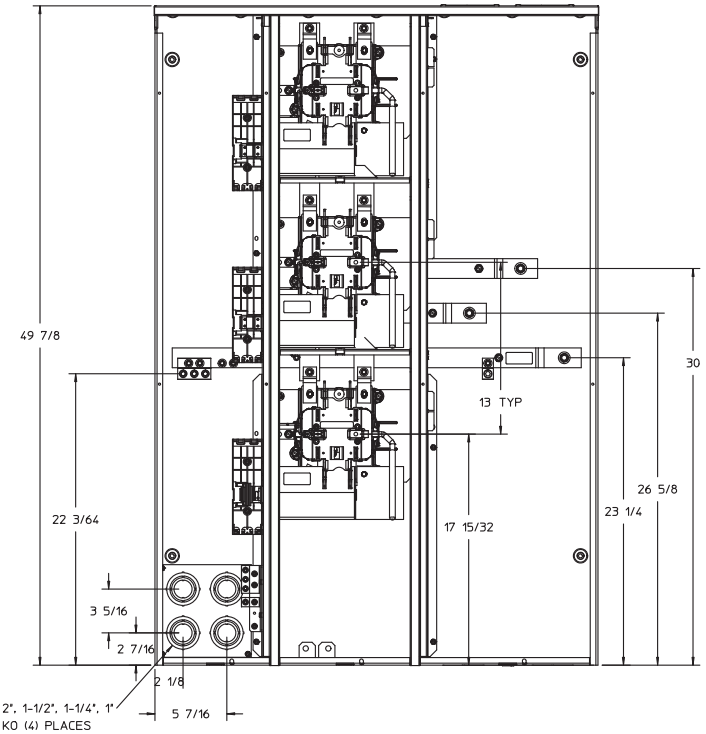
Bottom view for WPL4212



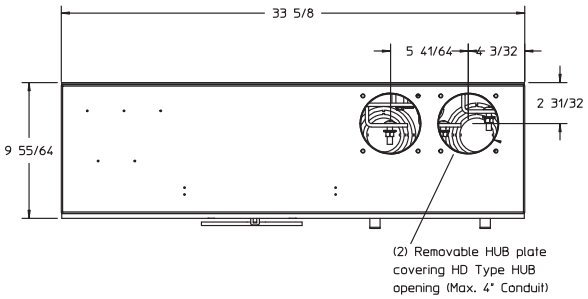
Meter Centers

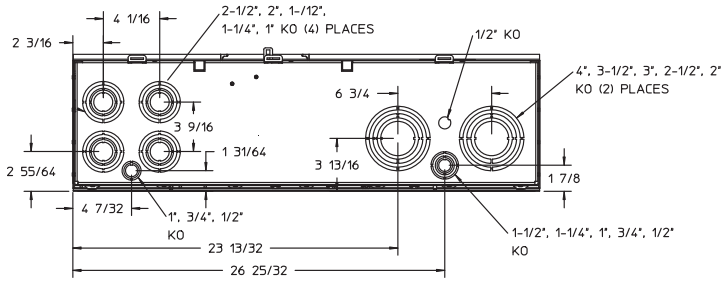
Uni-PAK Metering: Dimensional & Knockout Diagrams

WPL4312

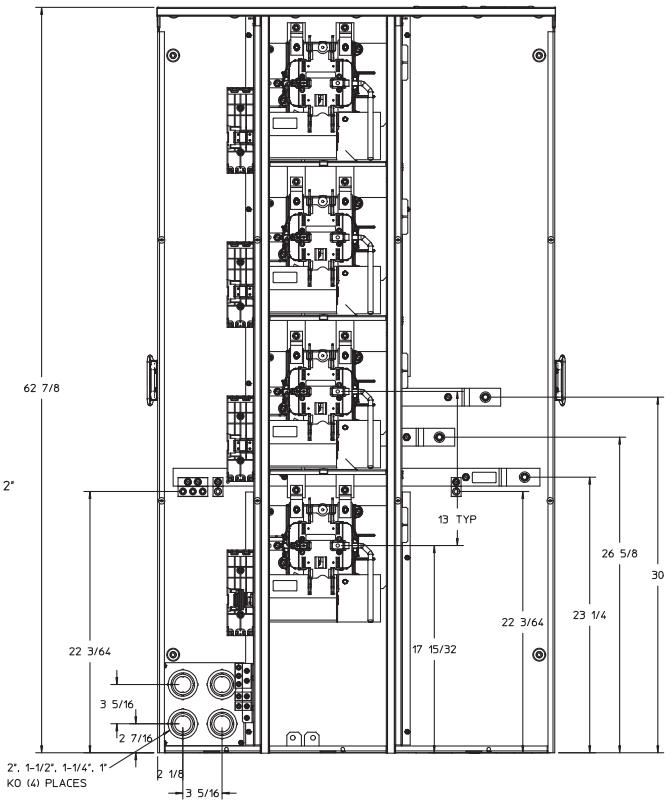


Top view for WPL4312 and WPL4412



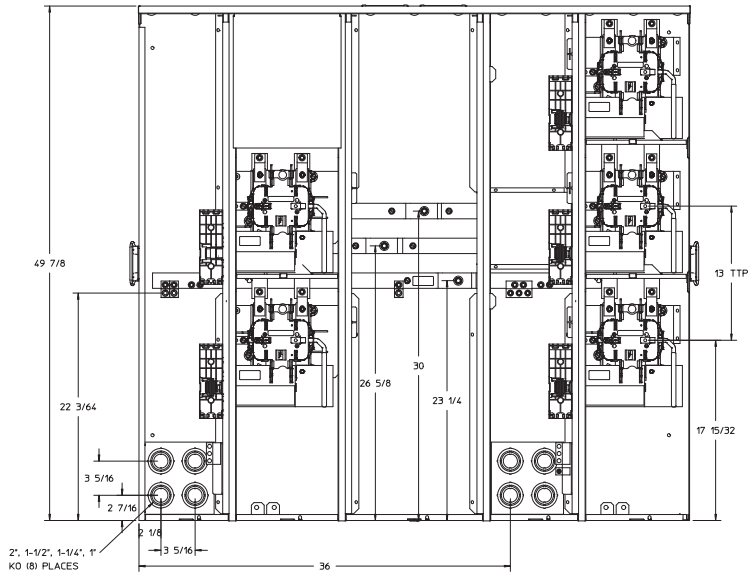


Bottom view for WPL4312 and WPL4412

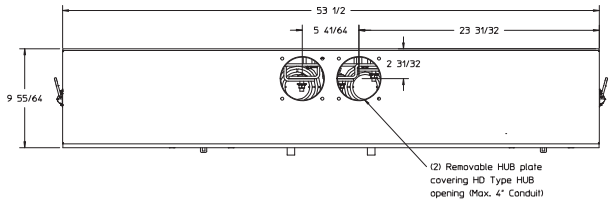


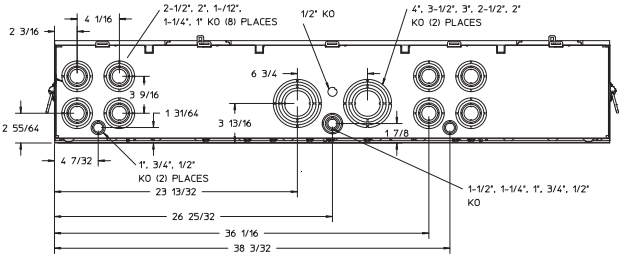
WPL4412

WPL6512

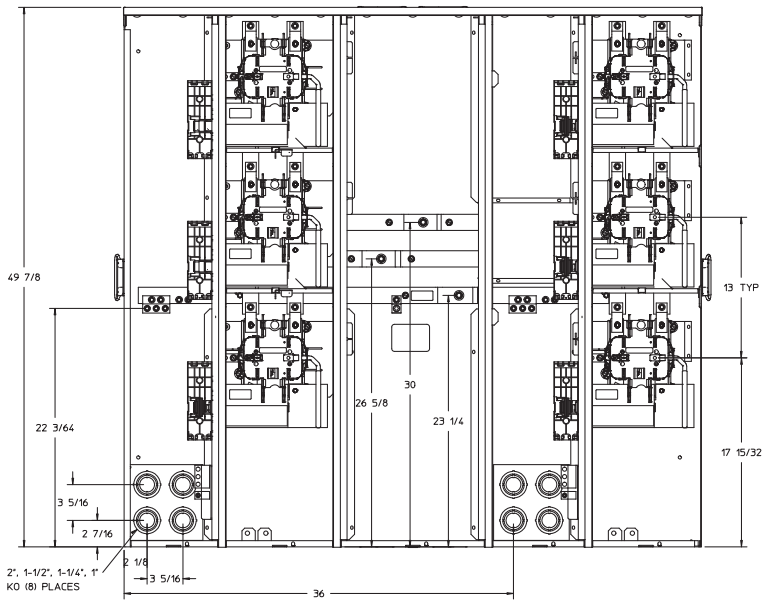


Top view for WPL6512 and WPL6612



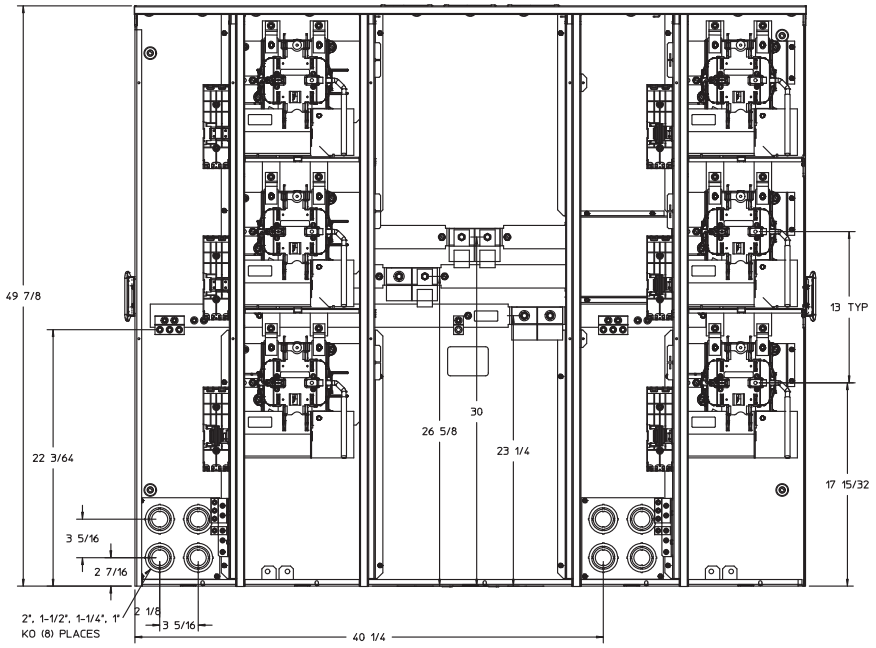


Bottom view for WPL6512 and WPL6612

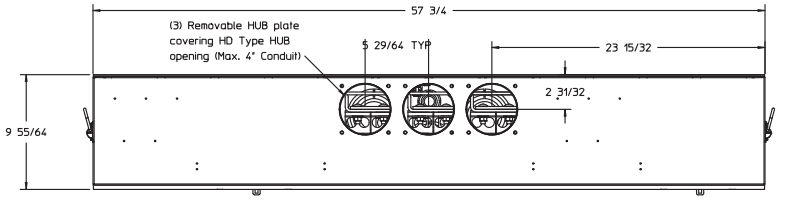


WPL6612

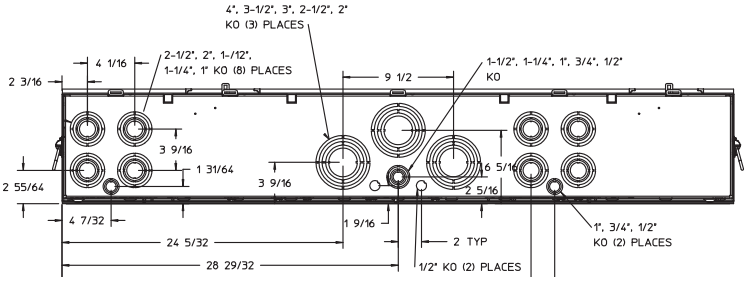
WPL8612
WPL10612



Top view for
WPL8612 and WPL10612

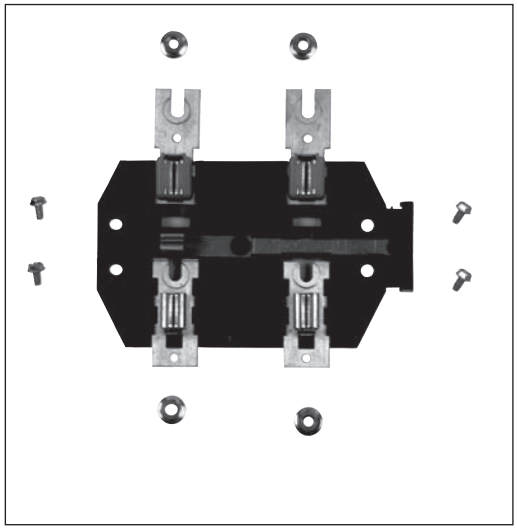


Bottom view for
WPL8612 and WPL10612



Accessories and custom options

Siemens offers a wide range of accessories and custom options to help product fit your application. Eliminate the need for special orders with replacement part kits available for your convenience. All kits come with appropriate hardware and instruction sheets for installation.



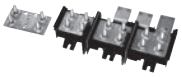


Power Mod & Uni-PAK

Multifamily Metering Accessories & Replacement Parts

Conduit Hubs

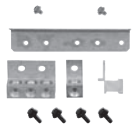
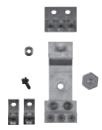
Catalog Number	Description
Type RX	
EC38594	3/4" Conduit Hub
EC38596	1" Conduit Hub
EC38597	1 1/4" Conduit Hub
EC38598	1 1/2" Conduit Hub
EC9747-1113	Adapter plate for HD/RX
Type HD	
EC56854②	2" Conduit Hub
EC56855②	2 1/2" Conduit Hub
EC56856	3" Conduit Hub
EC56857	3 1/2" Conduit Hub
EC56858	4" Conduit Hub
EC56933S	Closure Plate

Accessory	Catalog number	Description
	**QC1**	QuickConnect 1-phase, 3-wire, 1200 Amp maximum
	**QC4**	QuickConnect 3-phase, 4-wire, 1200 Amp maximum
	**LLP600**	Lug Landing Pad for 200-600 Amp Standard Breaker modules (WB) only
	**LLP1200**	Lug Landing Pad for 800-1200 Amp Standard Breaker modules (WB) only
	WMMBK①	Pass-thru bussing - for use with underground pull box (WMMB modules)
	WMEP	Plastic end enclosure plate for thru bussing
	**SRSS**	Sealing ring - snap-on, stainless steel
	**SRSW**	Sealing ring - screw type, stainless steel
	**SRSTD**	Sealing ring - snap on, aluminum
	**ECJS**③	Meter bypass jumper 4 AND 5 JAW - not for use with lever bypass. For temporary use ONLY.
	ECPP	Plastic Ring Style cover plate
	ECCP3	Plastic Ringless Style cover plate

① One pass thru bushing supplied with each WMMB device.
② Item is a kit consisting of adapter plate and RX Type Hub
③ (2) Required per 1-phase meter socket. Residential type ring and ringless - 200 Amp max. Meter cannot be installed while in use. For use with ECPP cover plate.
④ No kits are available for WEP2211.

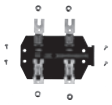
Power Mod & Uni-PAK

Multifamily Metering Accessories & Replacement Parts

	Catalog number	Description
	**ECMMRS**	Power Mod mini ratchet set Includes: ■ 2" T-25 Torx Bit - Eases removal and re-installing of cover screws ■ 5/16" Magnetic Nut Setter - Eases the installation of Tap Boxes, when QuickBolt assembly is required from one side to the other. In addition, quickly install or reposition the 5th jaw. ■ 3/8" x 1/4" drive deep well socket - Eases connection of adjacent module using hardware provided.
	**ECMFTAB**	Mounting tabs or "ears" for top of Power Mod devices
	**ECMFGN125**	Ground/neutral Bar kit for 125 Amp type WMM Residential Stacks, ground only for 225 Amp type WMM Residential Stacks
	**ECMFN225**	Neutral bar kit for 225 Amp Residential stacks (type WMM Power Mod only)
	**ECMFWLCLIP**	Rail/clip located on back of unit with wheels (Power Mod only)
	ECMFPK	Power Mod loose parts replacement kit (parts shipped loose include labels and hardware, QuickConnect™ not included.)
	**ECMMBCM**	Power Mod plastic breaker cover for type WB & WEB main breaker units
	ECMMNKOP	Power Mod knock-out plate without knock-outs for Type WMM Residential Stacks
	**ECMMKOP**	Power Mod knock-out plate with knock-outs for type WMM Residential Stacks
	MMRAIL	12" Standard wall mounting rail (Power Mod only)
	MMCLIP	Rail/clip that comes on back of unit (no wheels) (Power Mod only)
	MMZR24	24" long mounting "Z" rail for wall mounting (Power Mod only)
	MMZR36	36" long mounting "Z" rail for wall mounting (Power Mod only)
	MMZR48	48" long mounting "Z" rail for wall mounting (Power Mod only)
	MMZR60	60" long mounting "Z" rail for wall mounting (Power Mod only)

Power Mod & Uni-PAK

Multifamily Metering Accessories & Replacement Parts

	Catalog number	Description
	**ECMFH**	Horn bypass kit for field replacement or addition on ringless type WMM meter stacks and ringless series WP & WPC Uni-PAK.
	**ECMF5**	5th jaw replacement for Power Mod type WMM meter stacks & Series WP, WEP, & WPC Uni-PAK.
	**ECMFS**	Meter Socket replacement for Power Mod type WMM meter stacks & Series WP, WEP, & WPC Uni-PAK.
	**ECMFBM1**	Breaker mounting replacement for 125 Amp Power Mod Type WMM, WML, WMT 1 Phase Meter Stacks & Series WP, WEP, WPL & WPC Uni-PAK.
	**ECMFBM2**	Breaker Mounting replacement for 225 Amp Power Mod Type WMM, WML, WMT 1 Phase Meter Stacks & Series WP, WEP, WPL & WPC Uni-PAK.
	**ECMFMC**	Ringtype Meter cover replacement for Power Mod Type WMM Ringstyle Residential Meter stacks & WP, WEP, & WPC Series Ringstyle Uni-PAK.
	**ECMFMCR**	Ringless Meter cover replacement for Power Mod Type WMM Ringless Residential Meter stacks & WP & WPC Series ringless Uni-PAK.
	**ECMMRLCK**	Power Mod Uni-PAK ring to ringless cover conversion kit for Type WMM Meter stacks & WP Series Uni-PAK.
	ECMMRCK	Power Mod Uni-PAK ringless to ring cover conversion kit for Type WMM Meter stacks & WP Series Uni-PAK
	ECMFCS	Cover screw replacement (quantity 10) for Power Mod & Uni-PAK devices.
	**ECMFPS**	Quick phase "Z" strap replacement for Power Mod Type WMM Meter stacks & Series WP, WEP, & WPC Uni-PAK.
	**ECBC**	Breaker cover replacement for Type WMM, WML, WMT 1 Phase Meter stacks & Series WP, WEP, WPL, & WPC Uni-PAK.

Power Mod & Uni-PAK

Multifamily Metering Accessories & Replacement Parts









Amperage	10K AIC Siemens Type QP	Murray Type MP-T	22K AIC Siemens Type QPH	Murray Type MP-HT	42K AIC Siemens —	Murray —	65K AIC Siemens Type HQP	Murray Type MP-MT	100K AIC Siemens —	Murray —
For use in 125 Amp and 225② Amp single phase output WMM, WML, WMT, WP, WPC, WEP, WPL metering④										
60	Q260	MP260	Q260H	MP260KH	Q260HH	MP260KM	Q260HH	MP260KM	—	—
70	Q270	MP270	Q270H	MP270KH	Q270HH	MP270KM	Q270HH	MP270KM	—	—
80	Q280	MP280	Q280H	MP280KH	Q280HH	MP280KM	Q280HH	MP280KM	—	—
90	Q290	MP290	Q290H	MP290KH	Q290HH	MP290KM	Q290HH	MP290KM	—	—
100	Q2100	MP2100	Q2100H	MP2100KH	Q2100HH	MP2100KM	Q2100HH	MP2100KM	HQS2100H①	HQS2100H①
110	Q2110	MP2110	Q2110H	MP2110KH	Q2110HH	MP2110KM	Q2110HH	MP2110KM	HQS2110H	HQS2110H
125	Q2125	MP2125	Q2125H	MP2125KH	Q2125HH	MP2125KM	Q2125HH	MP2125KM	HQS2125H①	HQS2125H①
For use in 100 Amp, 3- phase output WML meter stacks only										
60	Q360	MP360	Q360H	MP360KH	Q360HH	MP360KM	Q360HH	MP360KM	—	—
70	Q370	MP370	Q370H	MP370KH	Q370HH	MP370KM	Q370HH	MP370KM	—	—
80	Q380	MP380	Q380H	MP380KH	Q380HH	MP380KM	Q380HH	MP380KM	—	—
90	Q390	MP390	Q390H	MP390KH	Q390HH	MP390KM	Q390HH	MP390KM	—	—
100	Q3100	MP3100	Q3100H	MP3100KH	Q3100HH	MP3100KM	Q3100HH	MP3100KM	—	—

For use in 225② Amp single phase output WMM, WML, WMT, WP, WPC, WEP, WPL metering④

	Type QS③	(Use QS)	Type QSH③	(Use QSH)	Type QSHH	(Use QSHH)	Type HQS③	(Use HQS)	Type HQSH③	(Use HQSH)
100	QS2100	QS2100	QS2100H	QS2100H	QSH2100	QSH2100	QS2100HH	QS2100HH	HQS2100H	HQS2100H
125	QS2125	QS2125	QS2125H	QS2125H	QSH2125	QSH2125	QS2125HH	QS2125HH	HQS2125H	HQS2125H
150	QS2150	QS2150	QS2150H	QS2150H	QSH2150	QSH2150	QS2150HH	QS2150HH	HQS2150H	HQS2150H
175	QS2175	QS2175	QS2175H	QS2175H	QSH2175	QSH2175	QS2175HH	QS2175HH	HQS2175H	HQS2175H
200	QS2200	QS2200	QS2200H	QS2200H	QSH2200	QSH2200	QS2200HH	QS2200HH	HQS2200H	HQS2200H
225	QS2225	QS2225	QS2225H	QS2225H	QSH2225	QSH2225	QS2225HH	QS2225HH	HQS2225H	HQS2225H

For use in 225 Amp 3-phase output WML & WMT meter stacks only

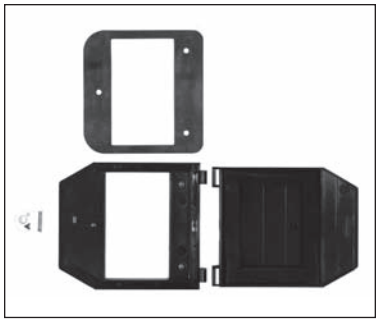
	Type QJ2	Type MQ	Type QJH2	Type MQH	Type QJ2H	Type MQL
60	QJ23B060	MQJ360	QJH23B060	MQJ360KH	QJ23B060H	MQJ360KL
70	QJ23B070	MQJ370	QJH23B070	MQJ370KH	QJ23B070H	MQJ370KL
80	QJ23B080	MQJ380	QJH23B080	MQJ380KH	QJ23B080H	MQJ380KL
90	QJ23B090	MQJ390	QJH23B090	MQJ390KH	QJ23B090H	MQJ390KL
100	QJ23B100	MQJ3100	QJH23B100	MQJ3100KH	QJ23B100H	MQJ3100KL
110	QJ23B110	MQJ3110	QJH23B110	MQJ3110KH	QJ23B110H	MQJ3110KL
125	QJ23B125	MQJ3125	QJH23B125	MQJ3125KH	QJ23B125H	MQJ3125KL
150	QJ23B150	MQJ3150	QJH23B150	MQJ3150KH	QJ23B150H	MQJ3150KL
175	QJ23B175	MQJ3175	QJH23B175	MQJ3175KH	QJ23B175H	MQJ3175KL
200	QJ23B200	MQJ3200	QJH23B200	MQJ3200KH	QJ23B200H	MQJ3200KL
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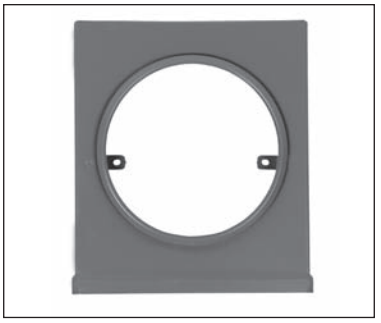
① HQSH breakers require the use of 225 Amp WMM meter stacks or 225 Amp per position Uni-PAK metering.
② QP Breakers will fit in 225A WMM, WML, & WMT meter stacks.
③ QS series rates with Murray circuit breakers.
④ Breaker selection (when applied to Uni-PAK) applies to WP, WPC, WEP, WPL, Uni-PAK metering only. QS breakers will not nit in SP or MP series.

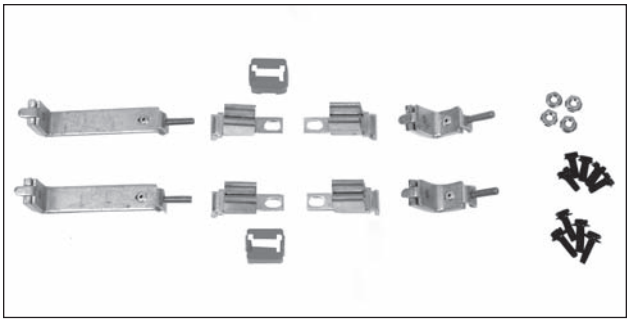
Meter Centers

OBSOLETE Modular Metering Replacement Parts Kits

Selection







- All kits come with appropriate hardware and instruction sheet for safe installation
- Packages are stocked in specified Quantities and cannot be substituted or changed

Part Number	Description	Contents
Breaker Covers		
GMBC1①②	Group Metering Breaker Cover - 125Amp Positions	One Top and bottom black plastic breaker cover piece, 1 gasket, and a locking clip
GMBC2①②	Group Metering Breaker Cover - 200Amp Positions	Top and bottom black plastic breaker cover pieces, gasket, and locking clip
Meter Covers		
MMCVR1①	Modular Metering Tenant Covers 125A Ring Style	1 Ringstyle meter cover welded with support brackets and painted
MMCVR1R①	Modular Metering Tenant Covers 125A Ringless	1 Ringless style meter cover welded with support brackets and painted
MMCVR2①	Modular Metering Tenant Covers 200A Ring Style	1 Ringstyle meter cover welded with support brackets and painted
MMCVR2R①	Modular Metering Tenant Covers 200A Ringless	1 Ringless style meter cover welded with support brackets and painted
PAKMCVRR②	Tenant cover for Ring Style Uni-Pak Meter Center	1 Ringstyle meter cover welded with support brackets and painted
PAKMCVRL②	Tenant cover for RingLess Uni-Pak Meter Center	1 Ringless style meter cover welded with support brackets and painted
Meter Socket/Breaker Mounting		
MMBMT1① **MMSCK1**①② **MMBMT2**① **MMSCK2**①② **MMSRPK**③	Modular Metering Breaker Mounting S/A 125A Modular Metering Meter Socket Assembly 125A Modular Metering Breaker Mounting S/A 200A Modular Metering Meter Socket Assembly 200A Replacement parts for 125A pre-1991 modular metering	Breaker Mounting assembly includes provision for 125 or 200A breaker Meter Socket assembly includes jaws, straps, and hardware - see picture 3 above 1 red plastic base, 4 jaws and connecting line straps
Loose Parts Kits①		
MMPK11	Modular Metering Loose Parts Kit 125A 1 PHASE	All loose screw bags, labels, instruction sheet and aluminum sealing ring (No SBJ)
MMPK13	Modular Metering Loose Parts Kit 125A 3 PHASE	All loose screw bags, labels, instruction sheet and aluminum sealing ring (No SBJ)
MMPK21	Modular Metering Loose Parts Kit 200A 1 PHASE	All loose screw bags, labels, instruction sheet and aluminum sealing ring (No SBJ)
MMPK23	Modular Metering Loose Parts Kit 200A 3 PHASE	All loose screw bags, labels, instruction sheet and aluminum sealing ring (No SBJ)

① Fits modular metering made from 1992-2009 and PAK devices from 1992-2003.
② Fits PAK devices from 2004-2011
③ Fits 125A modular metering made from 1980-1991 ONLY. No other replacement parts available.

Siemens would like to welcome the Murray Electrical Products into the Speedfax. The Murray Electrical Products catalog and Siemens Speedfax has been combined for our customer's convienience. All of the Murray-branded product is located in section 3 so Murray customers will not have to sort thru the entire Speedfax to find associated products. Customers can now select Murray and Siemens products without having to flip between catalogs.

Murray products have a rich tradition of quality & reliability that still lives on today. At the heart of the Murray offering is the Rock Solid load center—designed for those customers that prefer an out-board neutral design & metal basepan for installing breakers. The Rock Solid load center & Murray products remain an important part of the Siemens portfolio. Siemens is proud to carry on the tradition Murray started in 1899.

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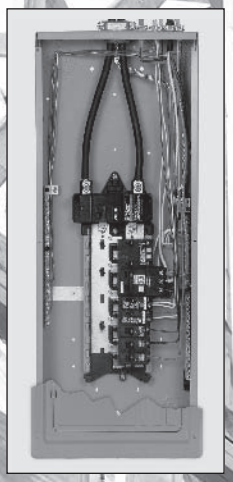
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Accessories & Lug Data	3-48–3-49
Dimensions and Knockout Diagrams	3-50–3-54

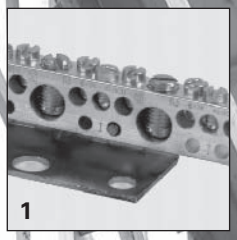
Rock Solid Load Centers

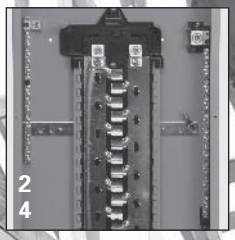
Features

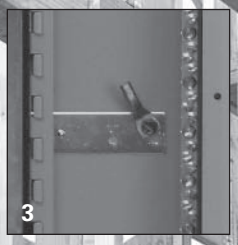
The Murray Rock Solid Load Center is the highest quality, most versatile design in the industry. Features on the Rock Solid Load Center include:

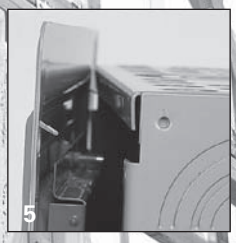
1. "Swiss Cheese" style neutral bars provide multiple 1/0 connection points.
2. All units include factory installed ground bar and isolated neutral.
3. With the use of the included bonding strap, ground bars and neutral bars can be bonded for service entrance applications.
4. Outboard neutral and groundbars allow for all neutral and ground connections to be located away from breaker connections, making for a neat, clean installation.
5. Mounting tabs on the trim hold it in place on the load center, freeing up both hands to drive the trim screws.
6. Combination head screw on trim and upper pan screws provide installation flexibility.
7. All devices are convertible from main lug to main breaker or vice versa with the addition of main breaker or main lug kits.
8. All main breakers are straight in wired – no back feeding required.
9. A rigid, sturdy base pan with metal hook rails provides the most rugged breaker connection in the industry.
10. The outdoor enclosure has a slide hinge door for the easiest of installation and can be removed by backing out only one screw.
11. All indoor Rock Solid Load Centers are invertible for bottom feed applications.

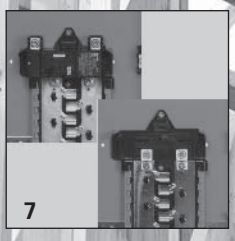


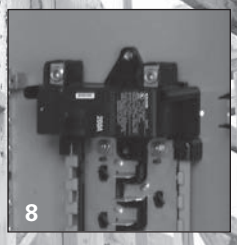


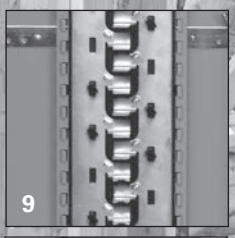




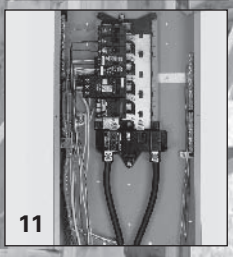












The following offering is available in the Murray line:

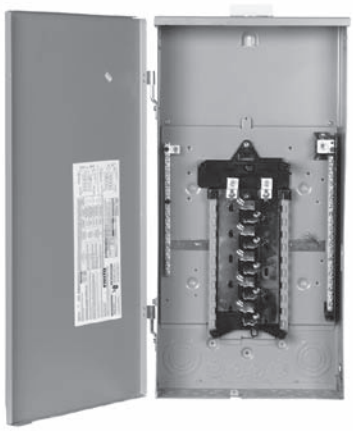
- 12-60 Circuits/Spaces
- Indoor and outdoor enclosures
- 100 to 225 Amp
- Main lug and main breaker
- Value packs - a mix of branch breakers provided with the load center

Rock Solid Load Centers①

• Revised •
02/26/12

MURRAY

Main Lug Only, 1Ø, 65,000 AIC②, Main Lug Panels 3-Wire 120/240V AC or 208Y/120V AC, Insulated and Bonded Split Neutrals



LW2040L1200

Load centers on this page through 225 amp feature a split neutral insulated bars. For service entrance applications, install bonding strap, and use both bars for neutral and ground conductors. For non service entrance applications, do not install bonding strap and use insulated bars for neutral conductors and bonded bar for ground conductors.

12-42 Circuit, 125–225 Amperes

Amps Max.	No. of Spaces	Max. Circuit	Indoor Type 1③	Dimensions④			Outdoor Type 3R③③	Dimensions④		
			Catalog Number	Height	Width	Depth	Catalog Number	Height	Width	Depth
125	12	24	**LC1224L1125**	21	14⅜	4	**LW1224L1125**	20	14¼	4½
125	16	32	**LC1632L1125**	21	14⅜	4	**LW1632L1125**	29	14¼	4½
125	20	40	**LC2040L1125**	24	14⅜	4	**LW2040L1125**	29	14¼	4½
125	30	40	**LC3040L1125**	30	14⅜	4	—	—	—	—
150	16	32	**LC1632L1150**	24	14⅜	4	—	—	—	—
150	24	40	**LC2440L1150**	30	14⅜	4	—	—	—	—
200	12	24	—	—	—	—	**LW1224L1200**	29	14¼	4½
200	20	40	**LC2040L1200**	30	14⅜	4	**LW2040L1200**	29	14¼	4½
200	24	40	**LC2440L1200**	30	14⅜	4	—	—	—	—
200	30	40	**LC3040L1200**	36	14⅜	4	**LW3040L1200**	38	14¼	4½
200	40	40	**LC4040L1200**	39	14⅜	4	—	—	—	—
225	40	60	**LC4060L1225**	39	14⅜	4	—	—	—	—

Copper Bus⑥

Amps Max.	No. of Spaces	Max. Circuit	Indoor Type 1③	Dimensions④			Outdoor Type 3R③	Dimensions④		
			Catalog Number	Height	Width	Depth	Catalog Number	Height	Width	Depth
125	20	40	**LC2040L1125CU**	24	14⅜	4	—	—	—	—
200	20	40	**LC2040L1200CU**	30	14⅜	4	—	—	—	—
200	30	40	**LC3040L1200CU**	36	14⅜	4	—	—	—	—
200	40	40	**LC4040L1200CU**	39	14⅜	4	—	—	—	—
225	12	24	—	—	—	—	**LW1224L1225CU**	29	14¼	4½
225	42	42	**LC4242L1225CU**	42	14⅜	4	**LW4242L1225CU**	42	14¼	4½

①Convertible to main breaker by using the following main breaker kits:
100A load centers: MBK100M only.
125A load centers: MBK100M and MBK125M only.
150A load centers: MBK150M only.
200A load centers: MBK150M and MBK200M only.
225A load centers: MBK150M, MBK200M, and MBK225M only.

②100-225A only.

③Standard package quantity equal to 1.

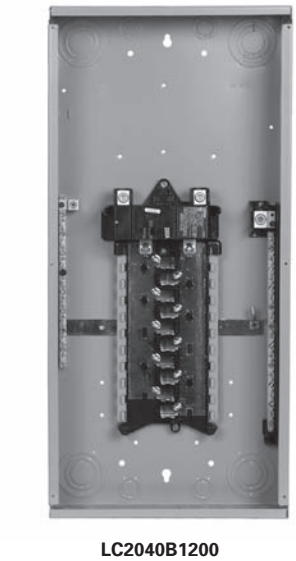
④Dimensions shown are representative of outside box length, width & depth (± ⅛") and do not include allowance for mounting bumps, endwalls, hubs or hardware protrusions. Allow approximately 1¼" additional in length and width dimensions for surface or combination overhang. Consult factory for specific details if required.

⑤Hub provision only. Closure plate included. Panels through 225A require HS type hub; panels over 225A require HV type hub. See accessories page 3-8 for hub selection.

⑥Copper bus load centers are recommended for those applications where the environment may be severe (ie farm and coastal areas).

Rock Solid Load Centers

Main Breaker, 1Ø, 22,000 AIC①



LC2040B1200

Load centers on this page through 200 amp feature a new split neutral with one bonded and one insulated bar. For service entrance applications, install bonding strap, and use both bars for neutral and ground conductors. For non service entrance applications, do not install bonding strap and use insulated bar for neutral conductors and bonded bar for ground conductors.

Load Center Short Circuit Current Rating

Murray load centers have UL recognized short circuit current ratings up to 100,000 Amps, when used with appropriate main or feeder (remote or internal) overcurrent devices. Load center ratings are shown below. For load center applications with residential or commercial metering equipment, refer to the appropriate catalog section.

1Ø, main breaker load centers are Underwriter's Laboratories Listed for use with 60/75°C conductors and accept Murray branch circuit breakers which are also UL Listed for use with 60/75°C conductors. Type 3R load centers are furnished with a hub opening closure plate.

Load Center Short Circuit Current Rating

Load Center Short Circuit Current Rating②	Load Center Main Rating	Internal or Remote Main or Feeder Circuit Breaker Type
10,000 AIC	Any	Any
22,000 AIC	100/125A	MP-HT, MQH③④
	150/200/225A	MD-H, MQH②④, MPP-HT③
42,000 AIC	100/125A	MQL③④
	150/200/225A	MQL②④
65,000 AIC	100/125A	MP-MT, MPP-MT③
	150/200/225A	MPP-MT③
100,000 AIC	100/125A	100A, 300V AC, Class "T" Fuse③
100,000 AIC	150/200/225A	200A, 300V AC, Class "T" Fuse③

12-42 Circuit, 100-200 Amperes

Amps Max.	No. of Spaces	Max. Circuit	Catalog Number	Dimensions⑤			Outdoor Type 3R⑥⑦	Dimensions⑤		
			Indoor Type 1⑦	Height	Width	Depth	Catalog Number	Height	Width	Depth
100	12	24	**LC1224B1100**	18	14⅜	4	**LW1224B1100**	23	14¼	4½
100	16	32	—	—	—	—	**LW1632B1100**	23	14¼	4½
100	20	40	**LC2040B1100**	24	14⅜	4	—	—	—	—
100	24	40	**LC2440B1100**	24	14⅜	4	—	—	—	—
100	30	40	**LC3040B1100**	30	14⅜	4	—	—	—	—
150	16	32	**LC1632B1150**	24	14⅜	4	—	—	—	—
150	20	40	**LC2040B1150**	30	14⅜	4	**LW2040B1150**	29	14¼	4½
150	24	40	**LC2440B1150**	30	14⅜	4	—	—	—	—
150	30	40	**LC3040B1150**	36	14⅜	4	—	—	—	—
200	12	24	—	—	—	—	**LW1224B1200**	29	14¼	4½
200	16	32	**LC1632B1200**	30	14⅜	4	—	—	—	—
200	20	40	**LC2040B1200**	30	14⅜	4	**LW2040B1200**	29	14¼	4½
200	24	40	**LC2440B1200**	30	14⅜	4	—	—	—	—
200	30	40	**LC3040B1200**	36	14⅜	4	**LW3040B1200**	38	14¼	4½
200	40	40	**LC4040B1200**	39	14⅜	4	**LW4040B1200**	38	14¼	4½
200	30	54	**LC3054B1200**	36	14⅜	4	—	—	—	—
200	40	40	**LC4040B1200**	39	14⅜	4	—	—	—	—
200	40	60	**LC4060B1200**	40½	15⅞	5	—	—	—	—

Copper Bus⑧

Amps Max.	No. of Spaces	Max. Circuit	Indoor Type 1⑦ Catalog Number	Dimensions⑤		
				Height	Width	Depth
100	20	40	**LC2040B1100CU**	24	14⅜	4
200	20	40	**LC2040B1200CU**	30	14⅜	4
200	30	40	**LC3040B1200CU**	36	14⅜	4
200	40	40	**LC4040B1200CU**	39	14⅜	4

① 100-225A only.

②This information is based on use of 10,000 AIC rated branch circuit breakers in load center (MP-T, MH-T, MP-GT, MG). Most series ratings exclude MH-T above 40 Amp. Consult device wiring diagram for specific data.

③ Remote Only

④Types MQH & MQL may be mounted internal in 150-225 amp 3Ø main breaker load centers.

⑤ Dimensions shown are representative of outside box length, width & depth (±⅛") and do not include allowance for mounting bumps, endwalls, hubs or hardware protrusions. Allow approximately 1¼" additional in length and width dimensions for surface or combination overhang. Consult factory for specific details if required.

⑥Hub provision only. Closure plate included. Panels through 225A require HS type hub; panels over 225A require HV type hub.

⑦ Standard package quantity equal to 1.

⑧ Copper bus load centers are recommended for those applications where the environment may be severe (ie farm and coastal areas).

Load Centers

Generator Ready, Riser, & 400A Load Centers



NEMA 1 Generator Ready



NEMA 3R Generator Ready

Generator Ready Load Center Features

- UL Listed
- Indoor Type 1 and outdoor Type 3R
- 225A max rated
- Flush or surface mounting
- Fits between standard stud centers
- Tin plated copper bus bars
- 22 kAIC rated
- 120/240V ~
- Main lug – convertible to main breaker with addition of MBK150M, MBK200M, or MBK225M
- Main breaker – convertible to main lug with use of lug kit part no. ECMLK225
- Installation of transfer mechanism can be performed at time of generator installation

Generator Ready Load Centers (1phase)

Branch Circuits			Indoor Enclosure - NEMA Type 1				Outdoor Enclosure - NEMA Type 3R			
				Dimensions (inches)				Dimensions		
Amp Rating	No. of Spaces①	No. of Circuits①	Catalog Number	H	W	D	Catalog Number	H	W	D
200	30	42	**LC3042B1200GEN**	42	14.25	4	**LW3042B1200GEN**	42.00	14.63	4.00
225	30	42	**LC3042L1225GEN**	42	14.25	4	**LW3042L1225GEN**	42.00	14.63	4.00

Riser Load Centers③

Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Dimensions (inches)			Acceptable Main Breaker Kits
				H	W	D	
125	16	32	**RC1632L1125CU**	24	14.25	3.88	MBK100M, MBK125M
125	24	24	**RC2424L1125CU**	30	14.25	3.88	MBK100M, MBK125M
125	24	42	**RC2442L1125CU**	30	14.25	3.88	MBK100M, MBK125M
200	30	42	**RC3042L1200CU**	36	14.25	3.88	MBK150M, MBK200M

400A Main Breaker Load Centers (1phase & 3phase)②

No. of Phases	Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Dimensions (inches)			Catalog Number	Dimensions		
					H	W	D		H	W	D
1	400	30	40	**LC330SS**	47.00	20.00	6.00	—	—	—	—
1	400	42	42	—	—	—	—	**LW442SR**	44.00	20.00	6.00
3	400	42	42	**LP442SS**	58.00	20.00	6.00	**LZ442SR**	58.00	20.00	6.00

400A Main Lug Load Centers (1phase & 3phase)②

No. of Phases	Amp Rating	No. of Spaces	No. of Circuits	Catalog Number	Dimensions (inches)			Catalog Number	Dimensions		
					H	W	D		H	W	D
1	400	42	42	—	—	—	—	**LW042SR**	47.00	20.50	6.50
3	400	42	42	**LC042SS**	47.00	20.00	6.00	**LW942SR**	52.00	22.00	8.00



LC042SS

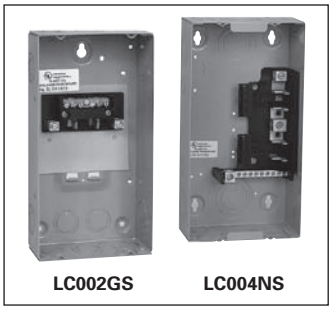
① 2 spaces and 2 circuits are reserved for standby generator installation.

② 400 amp load centers have insulated groundable center-mounted neutrals.

③ See Section 1 for knock-out diagram.

Load Centers

Circuit Breaker Enclosures & Small Load Centers

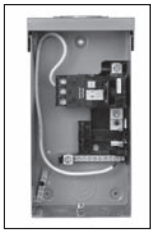


LC002GS LC004NS



- Ideal for Narrow stud applications
- Eliminated "notching" needed for standard Load Centers
- Outdoor Load Center with factory installed Ground Fault Breaker
- Two extra circuits
- Factory installed feed-through lugs
- Main Breaker or Main Lug panels available





Spa Panels

Ampere Rating	No. of Spaces	Max. Circuits	Catalog Number	Dimensions③ Height	Width	Depth
125	2	4	**LW004NRSPA50**⑬	12¼	6⅛	4¼
125	2	4	**LW004NRSPA60**⑭	12¼	6⅛	4¼

Renovation Panels - 3 Wire 120/240V AC

200	24	40	**LC024PFR**	30	14	3⅞
100	10	20	**LC110DFCGP**⑫	14¾	12⅜	3⅛

Outdoor① Trailer Panels - 120/240V AC 208Y/120V AC

Amps Max	No. of Spaces	Max. Circuits	Indoor Type 1 Catalog No.	Dimensions③ Height	Width	Depth	Main Breaker	
100	2	4	**LW102NL**⑪	12½	6	4¼	MP2100	Factory
200	4	8	**LW204TL**⑪	20	11⅛	4¾	MPD2200R	Factory
200	4	8	**LW004TR**⑩	20	11⅛	4¾	MD-T(R), MD-HT(R)	Field
200	8	16	**LW0816L1200TR**⑩	29	14¼	4½	MBK150M or MBK200M	Field

2-8 Circuit, 60-125 Amperes (no door)

Amps Max.	No. of Spaces	Max. Circuit	Indoor Type 1 Catalog Number②	Dimensions③ Height	Width	Depth	Outdoor Type 3R① Catalog Number	Dimensions③ Height	Width	Depth
60	2	4	**LC002GS**	9⅞	5⅛	2⅝	**LW002GR**⑮	8¼	5⅜	4½
100	3	3	**LP003CS**	17⅜	7½	5⅜	—	—	—	—
125	2	4	**LC002HS**	17⅛	7⅛	4¼	**LW002HR**	8¼	5⅜	4½
125	4	8	**LC004NF**	12⅝	6⅝	3½	—	—	—	—
125	4	8	**LC004NS**	12⅝	6⅝	3½	**LW004NR**	12¼	6⅛	4¼
200	2	4	**LC004VS**	19¾	8½	4	**LW004VR**	19⅞	8⅜	4⅝
225	2	4	—	—	—	—	**LW002QR**	27	10⅜	5⅝

8-16 Circuit, 125 Amperes (with door)

125	8	16	**LC008DF**	14¾	12⅜	3⅞	—	—	—	—
125	8	16	**LC008DS**	14¾	12⅜	3⅞	**LW008NR**	14¾	12⅛	4⅛
125	8	16	**LC008DFG**	14¾	12⅜	3⅞	—	—	—	—
125	8	16	**LC008DSG**	14¾	12⅜	3⅞	—	—	—	—

Enclosed Breakers

100	2	4	**LC100CS**	17⅛	7⅛	4¼	**LW100CR**	17⅜	7⅜	4⅜
200	2	4	**LC200VS**	19¾	8½	4	**LW200VR**	19⅞	8⅜	4⅝
225	3	3	—	—	—	—	**LW903QR**	27	10⅜	5⅝

① Hub provision only. Closure plate included. Panels through 225A require HS type hub.

② Cover type is specified by character in 7th (usually last) position, as follows:
S = Surface
F = Flush
C = Combination Surface/Flush

③ Dimensions shown are representative of outside box length, width & depth (±⅛") and do not include allowance for mounting bumps, endwalls, hubs or hardware protrusions. Allow approximately 1¼" additional in length and width dimensions for surface or combination overhang. Consult factory for specific details if required.

④ Use of 60A GFCI requires use of 75°C copper wire.

⑤ Use neutral lug kit ECLK1 or ECLK2 as required.

⑥ Panel includes factory-installed ground bar.

⑦ Maximum breaker 100A.

⑧ Uses HA type hub. Closure plate included. For KO diagram, see Section 1 KO diagram for W0204ML1060

⑨ Accepts type MQ breakers.

⑩ For service entrance use only 200A max. main breaker. Main breaker must be field added.

⑪ LW102NL shipped with ECHS125 hub instead of closure plate. LW204TL shipped with ECHS200 hub instead of closure plate.

⑫ Two MP115 and one MP230 provided.

⑬ 50 Amp, 2-pole GFCI breaker installed.

⑭ 60 Amp, 2-pole GFCI breaker installed.

⑮ Uses ECHA hub type.

Load Center OEM Interiors

1Ø: Small Circuit Main Lug Interiors

Amps	Catalog Number①	Circuits	Spaces	Dimensions	
				Height	Width
60	**I0204ML1125**	2	2	5.06	2.12
60	**I0303ML3100**	3	3	5.06	3.12
125	**I0408ML1125**	4	8	4.51	6.61
125	**I0816ML1125CU**	8	16	6.19	6.81
125	**I0816ML1125CUSP**	8	16	6.19	6.81
200	**I0202L1200**	4	4	3.88	7.13

Rock Solid 1Ø: High Circuit Main Lug Interiors (no neutrals)③

Amps	Catalog Number①	Circuits	Spaces	Dimensions	
				Height	Width
125	**IR1224L1125**	12	24	10.80	7.40
125	**IR1632L1125**	16	32	12.80	7.40
125	**IR2040L1125CU**	20	40	14.80	7.40
125	**IR3040L1125**	30	40	20.80	7.40
200	**IR0816L1200TR②**	8	16	10.80	7.40
200	**IR2040L1200CU**	20	40	14.80	7.40
200	**IR2440L1200**	24	40	16.80	7.40
200	**IR3040L1200CU**	30	40	20.80	7.40
200	**IR4040L1200CU**	40	40	24.80	7.40
225	**IR4242L1225CU**	42	42	26.80	7.40

Lug Data

Interior	Amperage	Wire range	Torque
I0204ML1060	60	2/0 - 4 AWG	45 lb. - ins.
I0303ML3100	100	2/0 - 4 AWG	45 lb. - ins.
I1224ML1100	100	2/0 - 4 AWG	45 lb. - ins.
I0408ML1125	125	2/0 - 4 AWG	45 lb. - ins.
I0816ML1125CU/CUSP	60	2/0 - 4 AWG	45 lb. - ins.
Rock Solid	125	2/0 - 4 AWG	110 lb. - ins.
Rock Solid	200/225	300 kcmil - 4 AWG	275 lb. - ins.

Small circuit Interiors

The small circuit interiors are ideal for OEM applications requiring only a few circuits. They can also be purchased as replacement items for:

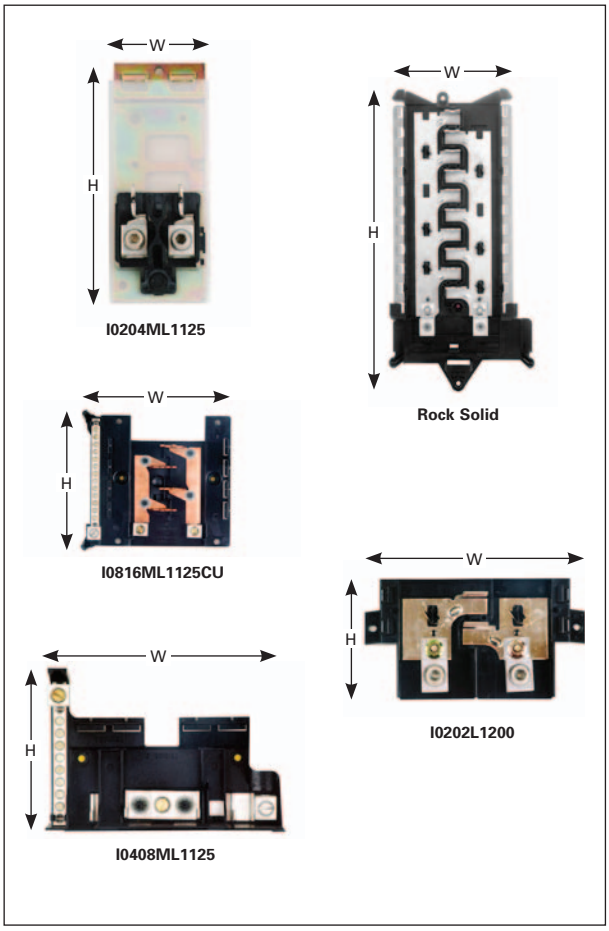
I0204ML1125 – Interior for LC100CS, LW100CR

I0303ML3100 – Interior for LP003CS

I0408ML1125 – Interior for L(C,W)004N(F,S,R)

I0816ML1125CU – Interior for L(C,W)008D(F,S,R)

I0202L1200 – Interior for JC0202 Meter Mains



① The letters "CU" in any catalog number represent copper bus bars.
② Feed thru lugs provided
③ Convertible to main breaker using the MBK main breaker kits

Load Centers

Electricenter Accessories

Hubs



ECHS125

Catalog Number	Description	Pack Quanity
ECHS075	3/4" Hub	10
ECHS100	1" Hub	10
ECHS125	1 1/4" Hub	10
ECHS150	1 1/2" Hub	10
ECHS200	2" Hub	10
ECHS250	2 1/2" Hub	10

Backfed Main Breaker Hold Down Kits



ECMBR2



ECMBR1



ECLX386HD



ECLX387HD



ECLX388HD

Catalog Number	Description	Pack Quanity
ECMBR2	For use on MP-T, MP-HT, & MP-MT breakers in Rock Solid Load Centers	25
ECMBR1	For use on MP-T, MP-HT, & MP-MT breakersin 2–8 circuit Load Centers	25
ECLX378M	For use on MD-T, MD-HT, & MD-MT breakers on old style (pre 2003) load centers (12–42 circuit)	25
ECLX386HD	For use on MP-T, MP-HT, & MP-MT breakers (15–60A) on old style (pre 2003) load centers (12–42 circuit)	25
ECLX387HD	For use on MP-T, MP-HT, & MP-MT breakers (70–125A) on old style (pre 2003) load centers (12–42 circuit)	25
ECLX388HD	For use on MP-T, MP-HT, & MP-MT breakers (100–125A) on old style (pre 2003) load centers (12–42 circuit)	25

Miscellaneous



ECQFL2



QF3/ECQF3

Catalog Number	Description	Pack Quanity
ECQFL2	Door lock for Rock Solid Load Centers	10
ECQF3	Filler plate (1")	10
ECMBF125	Filler plate for main breaker opening on 100–125A Rock Solid Load Centers. Use two QF3 filler plates for 150–225A load centers	25
LX077SF	Flush installation cover for 400A panels	1
ECTS2	6 Cover screws, combination cover	50 Bags
ECSMK1	Surface mount spacer kit provides 1/4" space between load center and wall	25

Main Breaker Kits



MBK100M



MBK200M

Catalog Number	Description	Pack Quanity
MBK100M	100A—For use on 100 & 125A Rock Solid Load Centers only	1
MBK125M	125A—For use on 125A Rock Solid Load Centers only	1
MBK150M	150A—For use on 150, 200, & 225A Rock Solid Load Centers only	1
MBK200M	200A—For use on 200 & 225A Rock Solid Load Centers only	1
MBK225M	225A—For use on 225A Rock Solid Load Centers only	1
ECMLK125	1 PH Main Lug Conversion Kit 100-125A	1
ECMLK225	1 PH Main Lug Conversion Kit 150-225A	1

Lug Kits

Catalog Number	Description	Pack Quanity
ECLK2SC	#2/0 max. lug for 125 amp neutral feeder for 12–42 circuit devices	50
ECLX384M	CB enclosure ground lug	20

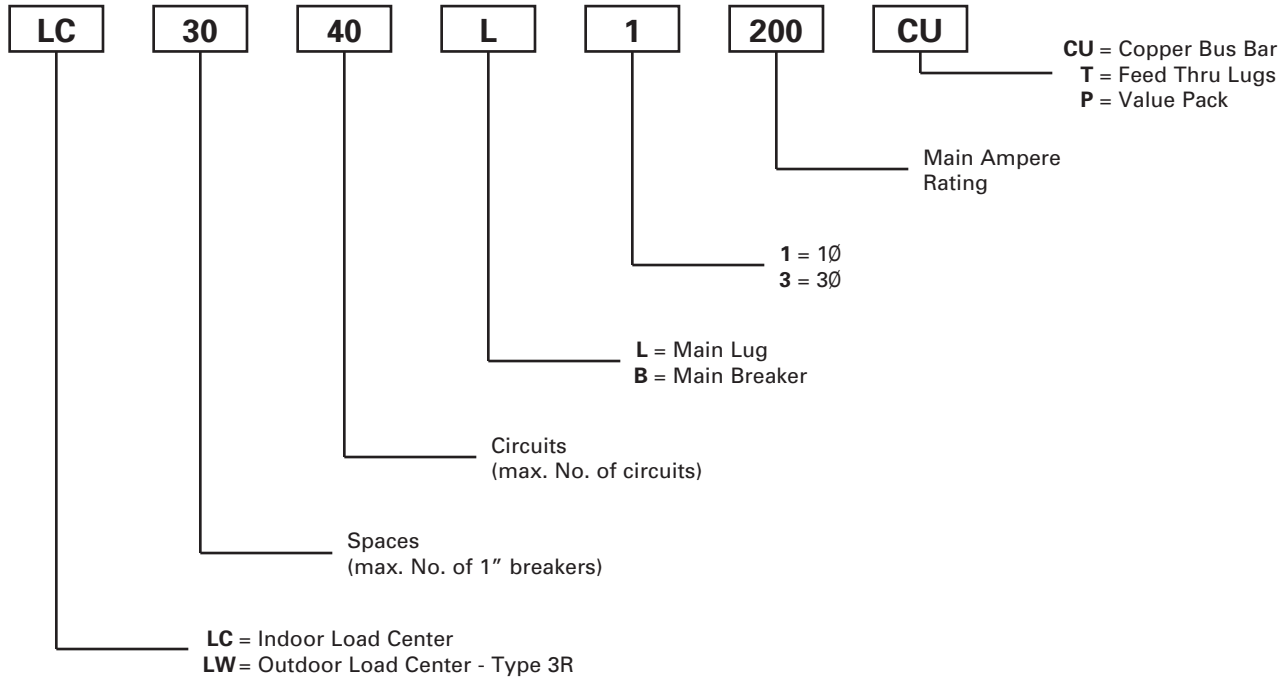
Ground Bars and Insulated Neutral Kits



Insulated Neutral Kit

Catalog Number	Description	Pack Quanity
ECLX068M	4 small terminals—15/8" long	10
ECLX069M	5 small and 2 large terminals—3" long	10
ECLX071M	8 small and 3 large terminals—31/2" long	10
ECLX072M	11 small and 4 large terminals—45/8" long	10
ECLX073M	14 small amd 5 large terminals—53/4" long	10
ECLX074M	17 small amd 6 large terminals—7" long	10
ECLX075M	21 small amd 7 large terminals—8" long	10
ECINSNB27	Insulated neutral bar with 27 positions	10
ECINSNB32	Insulated neutral bar with 32 positions	10
ECINSNB33	Insulated neutral bar with 33 positions and a 300 MCM lug	10
ECINSNB41	Insulated neutral bar with 41 positions and a 300 MCM lug	10
ECINSNB43	Insulated neutral bar with 43 positions	10

Rock Solid Load Centers



Lug Data

Amps	Phase	Wire Range① Main Lug Load Centers	Main Breaker Load Centers
60	1Ø	14-4	
100	1Ø	—	3-1/0
125 (4 CKT)	1Ø	14-2/0	—
(6 CKT & Above)	1Ø	4-2/0	4-2/0
150	1Ø	1/0-4/0	4-250 kcmil

Amps	Phase	Wire Range① Main Lug Load Centers	Main Breaker Load Centers
200	1Ø	4-250 kcmil	4-250 kcmil
225	1Ø	4-300 kcmil	4-300 kcmil
400 (24 and 42 CKT)	1Ø	(1)3/0-500 kcmil② (2)3/0-250 kcmil	(1or2)3/0-250 kcmil
400 (30 CKT Only)	1Ø	—	(1)3/0-500 kcmil (2)3/0-250 kcmil
400 (24 and 42 CKT)	3Ø	(1)3/0-500 kcmil② (2)3/0-250 kcmil	

① All lugs are rated for Cu or Al wire. Wire rang shown is maximum allowable for bending space provided. Lug may accommodate larger wire. Refer to National Electric Code for specific wire size requirements.

② 500 kcmil must be top side entry.

Murray 3phase

Cross Reference to New SKUs

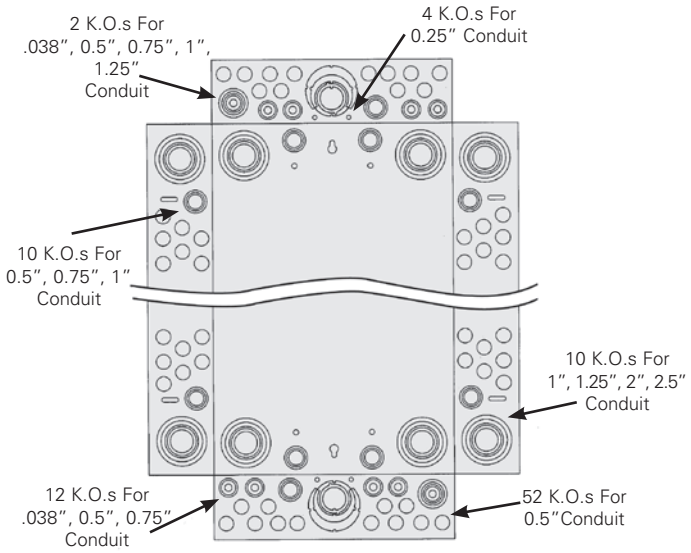
Murray 3-Phase Cross Reference to New SKUs

(See Section 1 for full offering)		
Legacy Murray SKU	**ES™ Series Part No.**	**PL™ Series Part No.**
LC1224B3100CU	S1224B3100	P1224B3100CU
LC1224L3125CU	S1224L3125	P1224L3125CU
LC1224L3200CU	S1224L3200	No equivalent
LC1836B3100CU	No equivalent	No equivalent
LC1836L3150CU	S1836L3150	No equivalent
LC1836L3200CU	S2442L3200	No equivalent
LC2442L3150CU	S2442L3150	P2442L3200CU
LC3042B3150CU	S4242B3150	P4242B3150CU
LC3042B3200CU	S3054B3200	P3054B3200CU
LC3042L3200CU	S3054L3200	P3054L3200CU
LC4242B3200CU	S4260B3200	P4260B3200CU
LC4242B3225CU	S4242B3225	P4260B3225TCU/P4260B3225CU
LC4242L3225CU	S4260L3225	P4260L3225CU
LW1224L3125CU	SW1224L3125	PW1224L3125CU
LW1836L3150CU	SW1836L3150	No equivalent
LW3042B3200CU	SW3054B3200	PW3054B3200CU
LW3042L3200CU	SW3054L3200	PW3054L3200CU
New	S3042B3100	—
New	S5470L3225	—
New	SW1224L3200	—
New	SW2442L3150	—
New	SW2442L3200	—
New	SW4260L3225	—
New	S3030B3100	—
New	SW2442B3150	—
New	SW4260B3200	—
New	SW4242B3225	—
New	—	P3042B3100CU

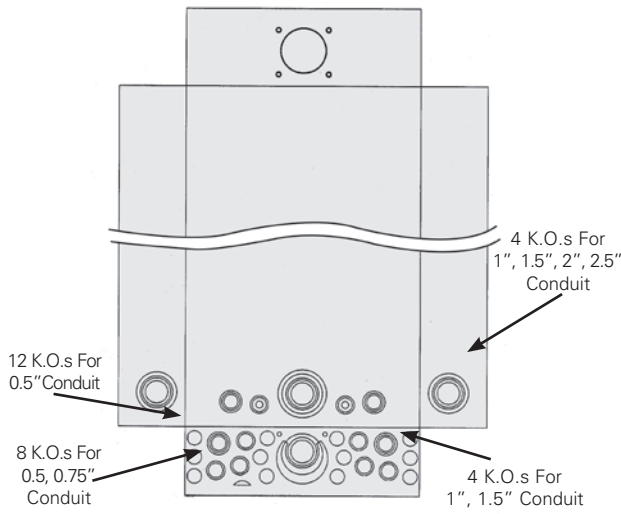
Knockout Diagrams

Rock Solid Load Centers (including Generator Ready)

Indoor Main Breaker and Main Lug Enclosures

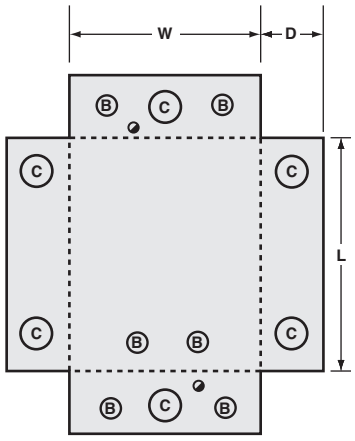


Outdoor Main Breaker and Main Lug Enclosures

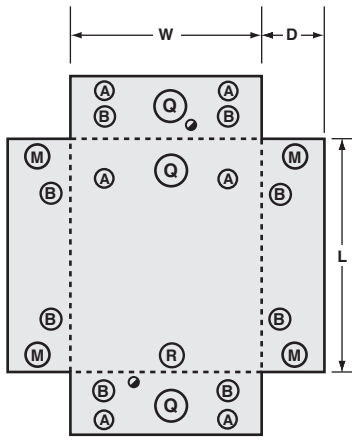


K.O. dimensions refer to conduit trade size, not actual diameter.

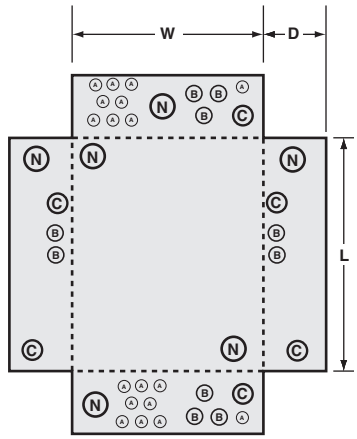
4 Circuit Indoor



8 Circuit Indoor



16 Circuit Indoor



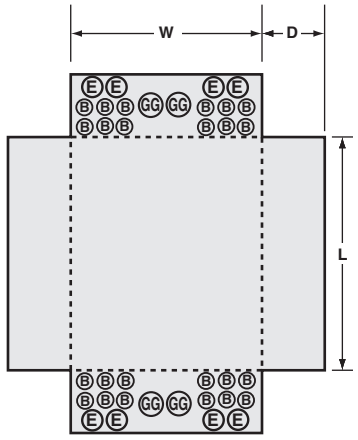
Knockout Code—Conduit Sizes

◑ = ¼
A = ½
B = ½, ¾
C = ½, ¾, 1
D = ½, 1
E = ½, ¾, 1, 1¼
F = ½, 1¼, 1½
G = ¾
H = ¾, 1
J = ¾, 1, 1¼
K = ¾, 1¼
L = ½, ¾, 1, 1¼, 1½
M = ¾, 1, 1¼, 1½
N = ¾, 1, 1¼, 1½, 2
P = 1, 1¼
Q = 1, 1¼,1½
R = 1, 1¼, 1½, 2
S = 1, 1¼, 1½, 2, 2½
T = 1¼
U = 1¼, 1½
V = 1¼, 1½, 2
W = 1¼, 2
X = 1¼, 1½, 2, 2½
Y = 1½, 2
Z = 1½, 2, 2½
AA = 1½, 2, 2½, 3
BB = 1½, 2, 2½, 3, 3½
CC = 2, 2½, 3, 3½
EE = 2, 2½, 3
FF = 2½, 3
GG = 2½, 3, 3½
HH = 2½, 3, 3½, 4
JJ = 3½, 4
LL = 3
VV = 2

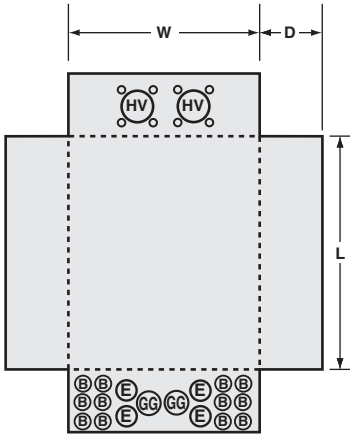
Knockout Diagrams

Indoor and Outdoor Enclosures

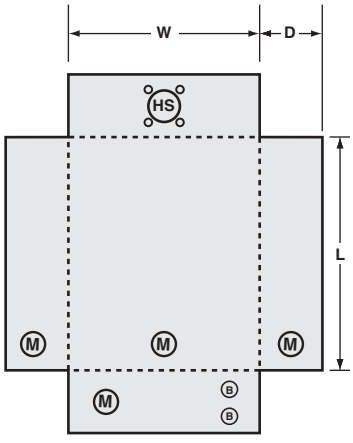
400A Indoor



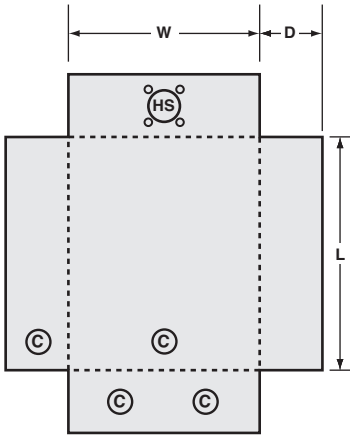
400A Outdoor



8 Circuit Outdoor



4 Circuit Outdoor



Knockout Code—Conduit Sizes

◑ = ¼
A = ½
B = ½, ¾
C = ½, ¾, 1
D = ½, 1
E = ½, ¾, 1, 1¼
F = ½, 1¼, 1½
G = ¾
H = ¾, 1
J = ¾, 1, 1¼
K = ¾, 1¼
L = ½, ¾, 1, 1¼, 1½
M = ¾, 1, 1¼, 1½
N = ¾, 1, 1¼, 1½, 2
P = 1, 1¼
Q = 1, 1¼,1½
R = 1, 1¼, 1½, 2
S = 1, 1¼, 1½, 2, 2½
T = 1¼
U = 1¼, 1½
V = 1¼, 1½, 2
W = 1¼, 2
X = 1¼, 1½, 2, 2½
Y = 1½, 2
Z = 1½, 2, 2½
AA = 1½, 2, 2½, 3
BB = 1½, 2, 2½, 3, 3½
CC = 2, 2½, 3, 3½
EE = 2, 2½, 3
FF = 2½, 3
GG = 2½, 3, 3½
HH = 2½, 3, 3½, 4
JJ = 3½, 4
LL = 3
VV = 2

Arc-Fault Circuit Interrupters (AFCI)

Combination Type AFCI[2]

AFCI's detect arcing faults (an unintentional arcing condition in a circuit) that standard circuit breakers are unable to detect. The Combination Type AFCI detects all three possible types of arc fault: line-to-ground, line-to-neutral, and series. The device is intended to mitigate the effects of arcing faults by functioning to de-energize the circuit when an arc-fault is detected.

Breaker Type	Ampere Rating	10,000 A IR Catalog Number	22,000 A IR Catalog Number	65,000 A IR Catalog Number
MP-AT2/MP-HAT2/ MP-MAT2 1-Pole 120V AC	15 20	MPA115AFC① MPA120AFC①	MPA115AFCH■① MPA120AFCH■①	MPA115AFCHH MPA120AFCHH
MP-AT2/MP-HAT2 2-Pole 120/240V AC	15 20	MP215AFC① MP220AFC①	MP215AFCH■① MP220AFCH■①	— —

Branch-Feeder AFCI

AFCI's detect arcing faults (an unintentional arcing condition in a circuit) that standard circuit breakers are unable to detect. The Branch-Feeder AFCI detects line-to-ground and line-to-neutral arcs. The device is intended to mitigate the effects of arcing faults by functioning to de-energize the circuit when an arc-fault is detected.

MP-AT2/MP-HAT2/ MP-MAT2 1-Pole 120V AC	15 20	MPA115AF① MPA120AF①	MPA115AFH■① MPA120AFH■①	MPA115AFHH MPA120AFHH

NEW Dual Function AFCI/GFCI

The Dual Function Circuit Breaker combines Combination Type AFCI and GFCI, protecting against both Arc Faults and Ground Faults. The device includes the Self Test and Lockout feature, making it the fist in class in electrical safety for homeowners.

MP-GAT2/MP-HGAT2/ MP-MGAT2 1-Pole 120V AC	15 20	MP115DF MP120DF	MP115DFH MP120DFH	MP115DFM MP120DFM

Ground-Fault Circuit Interrupters (Class A - 5mA)[2]

Ground-fault circuit interrupters (GFCI) provide Class A ground fault protection. A GFCI is a device intended for personnel protection and will de-energize the circuit when a fault current to ground is 6 milliamperes or more.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
MP-GT/ MP-HGT 1-Pole 120V AC	15 20 25 30	MP115GF① MP120GF① MP125GF■ MP130GF	MP115GFH■① MP120GFH■① — MP130GFH■
MP-GT/ MP-HGT 2-Pole 120/240V AC	15 20 30 40 50 60	MP215GF MP220GF MP230GF MP240GF MP250GF MP260GF	MP215GFH■ MP220GFH■ MP230GFH■ MP240GFH■ MP250GFH■ MP260GFH■

Ground Fault Equipment Protection (30mA)[2]

Type EQF circuit breakers provide protection of equipment from damaging line-to-ground fault currents by de-energizing the circuit for all ungrounded conductors of the faulted circuit.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
MP-ET/ MP-HET 1-Pole 120V AC	15 20 30	MP115EG① MP120EG① MP130EG	MP115EGH■① MP120EGH■① MP130EGH■
MP-ET/ MP-HET 2-Pole 120/240V AC	15 20 30 40 50 60	MP215EG MP220EG MP230EG MP240EG MP250EG MP260EG■	MP215EGH■ MP220EGH■ MP230EGH■ MP240EGH■ MP250EGH■ MP260EGH■

AFCI and GFCI Accessories

Description	Catalog Number
Padlocking Device for 1" & Twin Breakers	ECPLD1
Padlocking Device for 2" & Quad Breakers	ECPLD2
Handle Blocking Device for 1/2" Circuit Breakers	ECBX231M

■ Built to order. Allow 2–3 weeks for delivery.
①UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

②White line neutral (pigtail) must be connected to the panel neutral for the device to function.

- UL Listed
- HACR & SWD Rated
- Standard 1 inch per pole format with plug-in design



1-Pole Combination Type AFCI



2-Pole Combination Type AFCI



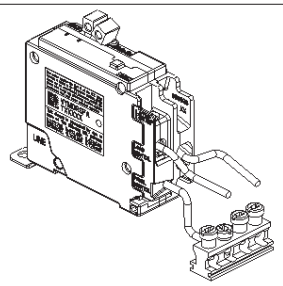
1-Pole Branch Feeder AFCI



1-Pole GFCI



2-Pole GFCI



Circuit Breakers

Full Size (1" per Pole) with INSTA-WIRE

Continuous Current Rating @ 40° C	Type MP-T① 10,000A IR Catalog Number	Type MP-HT 22,000A IR Catalog Number	Type MP-MT 65,000A IR Catalog Number
1-Pole Plug-In (120V AC)⑤			
10	MP110	—	—
15	MP115④	MP115KH④	MP115KM■④
20	MP120④	MP120KH④	MP120KM■④
25	MP125	MP125KH■	MP125KM■
30	MP130	MP130KH	MP130KM■
35	MP135■	MP135KH■	MP135KM■
40	MP140	MP140KH	MP140KM■
45	MP145■	MP145KH■	MP145KM■
50	MP150	MP150KH	MP15KKM■
60	MP160■	MP160KH■	MP160KM■
70	MP170■	MP170KH■	MP170KM■
2-Pole Plug-In (Common-Trip 120/240V AC)⑥			
15	MP215	MP215KH	MP215KM■
20	MP220	MP220KH	MP220KM■
25	MP225	MP225KH■	MP225KM■
30	MP230	MP230KH	MP230KM■
35	MP235	MP235KH■	MP235KM■
40	MP240	MP240KH	MP240KM■
45	MP245	MP245KH■	MP245KM■
50	MP250	MP250KH	MP250KM■
60	MP260	MP260KH	MP260KM■
70	MP270	MP270KH■	MP270KM■
80	MP280	MP280KH■	—
90	MP290	MP290KH■	MP290KM■
100	MP2100	MP2100KH	MP2100KM
110	MP2110	MP2110KH	MP2110KM■
125	MP2125	MP2125KH	MP2125KM
2-Pole Plug-In (Common-Trip 240V AC)③⑥			
15	MPH215	—	—
20	MPH220	—	—
30	MPH230	—	—
40	MPH240■	—	—
50	MPH250	—	—
60	MPH260	—	—
70	MPH270■	—	—
100	MPH2100■	—	—
3-Pole Plug-In (Common-Trip 240V AC)⑦			
15	MP315	MP315KH	MP315KM■
20	MP320	MP320KH	MP320KM■
25	MP325■	MP325KH■	—
30	MP330	MP330KH	MP330KM
35	MP335■	—	—
40	MP340	MP340KH	MP340KM
45	MP345■	—	—
50	MP350	MP350KH	MP350KM
60	MP360	MP360KH	MP360KM
70	MP370	MP370KH	MP370KM■
80	MP380	MP380KH■	MP380KM■
90	MP390	MP390KH■	MP390KM■
100	MP3100	MP3100KH	MP3100KM



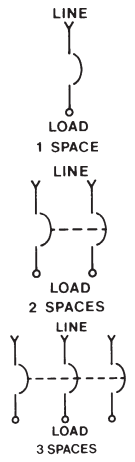
1-Pole



2-Pole



3-Pole



Wiring Diagrams

MP-T / MP-HT / MP-MT Internal Accessories

Description	Catalog Number	Field/Factory Installed
120V Shunt Trip	add suffix...ST■	Factory
24V Shunt Trip	add suffix...ST24V■	Factory
120V Auxiliary Switch	add suffix...AS■②	Factory

Modifications

Description	Catalog Number
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 3-20.

■ 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. 120V AC Fluorescent Lighting.

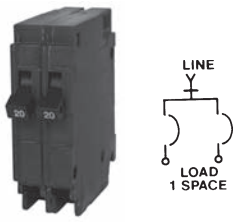
② 1A and 1B contacts.
③ UL Listed for use on 3 phase grounded "B" systems — 10,000 for this application.
④ UL Listed for frequent switching applications (SWD).
⑤ Shipped 12 per sleeve.

⑥ Shipped 6 per sleeve.
⑦ Shipped 4 per sleeve.
⑧ UL Listed 5KA IR.
⑨ Not UL Listed.
⑩ 1 & 2 Poles only.

Duplex Circuit Breakers

Breaker Type	Ampere Rating	Catalog Number	Catalog Number
MH-T **1-Pole** **10K AIC** **120V AC**	15–15	**MP1515**	**MP1515N**①
	15–20	**MP1520**	**MP1520N■**①
	20–20	**MP2020**	**MP2020N**①
	20–30	**MP2030**	**MP2030N■**①
	15–30	**MP3015■**	**MP3015N■**①
	30–30	**MP3030**	**MP3030N■**①
	SHIPPING: 12 per carton, (Wt. 4.8 lbs.)		

MH-T Duplex

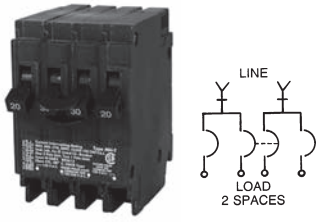


These space saver duplex breakers combine two independent 1/2" breaker poles in a common unit. This unit plugs into one load center stab and requires one panel space. HACR rated.

Triplex Circuit Breakers

Breaker Type	Ampere Rating		Catalog Number
	Single Pole	Common-Trip 2-Pole	
MH-T **2-Pole** **10K AIC** **120/240V AC** **Inner Poles** **Common Trip.** **Outter Poles** **1 Pole Units**	15	15	**MP21515**
	15	20	**MP22015**
	15	25	**MP22515■**
	15	30	**MP23015**
	15	35	**MP23515■**
	15	40	**MP24015**
	15	45	**MP24515■**
	15	50	**MP25015**
	20	20	**MP22020**
	20	25	**MP22520■**
	20	30	**MP23020**
	20	35	**MP23520■**
	20	40	**MP24020**
	20	45	**MP24520■**
	20	50	**MP25020**
	SHIPPING: 6 per carton, (Wt. 4.9 lbs.)		

MH-T Triplex

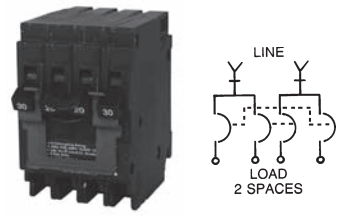


These space saver triplex breakers provide a 2-pole common trip breaker for 120/240V AC circuits and two single poles for 120V AC circuits. Triplex require two panel spaces. HACR rated.

Quadplex Circuit Breakers

Breaker Type	Ampere Rating		Catalog Number
	Single Pole	Common-Trip 2-Pole	
MH-T **2-Pole** **10K AIC** **120/240V AC** **Outter and** **Inner 2 Poles** **Common Trip**	15	15	**MP215215CT2**
	15	20	**MP220220CT2**
	20	30	**MP220230CT2**
	20	40	**MP220240CT2**
	30	30	**MP230230CT2**
	30	40	**MP230240CT2**
	40	40	**MP240240CT2**
	50	30	**MP250230CT2**
	SHIPPING: 6 per carton, (Wt. 4.8 lbs.)		

MH-T Quadplex



These space saver quadplex breakers provide two sets of common trip, two-pole breakers for 120/240V AC circuits, and require two panel spaces. HACR rated.

For external accessories please refer to page 3-20.

■ Built to order. Allow 2–3 weeks for delivery.

①Non-CTL.. For replacement use only in panels manufactured before 1968.

Circuit Breaker and Surge Protective Device (SPD)

Features

- 2 inch wide plug-on design
  - — Includes (2) 1 Pole circuits breakers
  - — No loss of load center spaces
- Easy to install and perfect for retrofit
- LEDs provide protection status

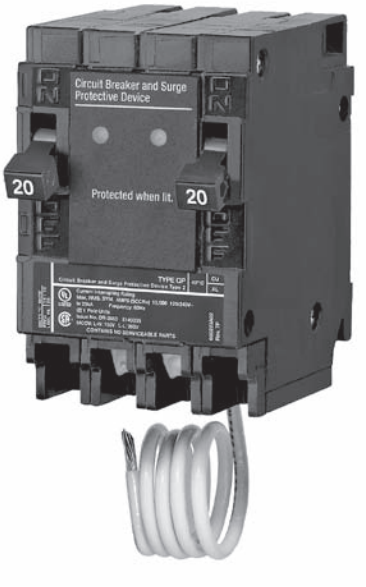
Benefits

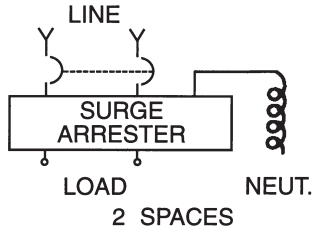
By installing a Siemens Circuit Breaker and Surge Protective Device (SPD) in the load center of the residence, surge protection is provided for all branch circuits①.

Two green LED indicator lights are provided to show that surge protection is provided for all circuits connected to the load center. These breakers should be used for circuit protection of frequently used household or facility circuits because the lights and devices connected to these circuits provide an effective indication that surge protection is being provided.

The circuit breaker and SPD utilize Siemens-built 150V AC, 40mm, metal oxide varistors (MOVs). The maximum impulse rating for the SPD module is 40kA. The standard interrupting rating for the circuit breakers is 10k AIC. All Type QP circuit breakers and SPD are plug-on style, with load terminals provided. The devices are rated for 120/240V AC and are calibrated for 40 degrees C maximum ambient applications.

Circuit Breaker and Surge Protective Device (SPD)





Breaker Type	Ampere Rating	Catalog Number	Surge Type
QP 1- Pole 120/240V AC 10K AIC	(2) 15	**MSA1515SPD**	SPD
	(2) 20	**MSA2020SPD**	SPD

Catalog Number	MSA1515SPD MSA2020SPD
Amperage	15 or 20 Amp
Number of Poles	(2) 1-Pole Circuit Breakers
Initial Clamping Level	240 Volts
Transient Energy Rating	360 Joules line-to-neutral 720 Joules line-to-line
Transient Suppression	500 volts peak, line-to-neutral
Voltage Rating	1000 volts peak, line-to-line
Peak Current Rating (impulse)	40,000 amperes
Discharge Voltage Characteristic	@ 1,500A, 600 volts @ 5,000A, 800 volts (both line-to-neutral)
Discharge Current Withstand Rating	10,000 amperes line-to-neutral
Circuit Breaker Interrupting Rating	10,000A, 120/240V AC
Listings/Certifications	UL, CSA Meets UL 1449 3rd Edition

① For warranty information please refer to the surge website www.usa.siemens.com/surge

HID Lighting

For high-intensity discharge lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker..

Breaker Type	Wiring Diagram	Complete Breaker UL Unenclosed	
		Ampere Rating	Catalog Number
MP-T **1-Pole** **120V AC**	**Figure 1**	15 20 30	**MP115HID■**① **MP120HID■**① **MP130HID■**
QP **2-Pole** **120/240V AC**	**Figure 1**	15 20 30	**MP215HID■** **MP220HID■** **MP230HID■**

Molded Case Switch

Molded case non-automatic switch does not provide overload protection.

MP-T **2-Pole** **240V AC** **Plug-In**	**Figure 2**	30 60	**MP260NA** **MP230NA**

Switched Neutrals

For use where all conductors are required to be disconnected. Neutral pole of breaker does not connect to loadcenter bus. One side is wired to neutral and the other to the device.

MG **2-Wire** **Common Trip** **120V AC**	**Figure 3**	15 20 30	**MP215SN** **MP220SN** **MP230SN■**
MG **3-Wire** **Common Trip** **120/240V AC**	**Figure 4**	15 20 30	**MP315SN■** **MP320SN** **MP330SN■**

Tungsten Lighting

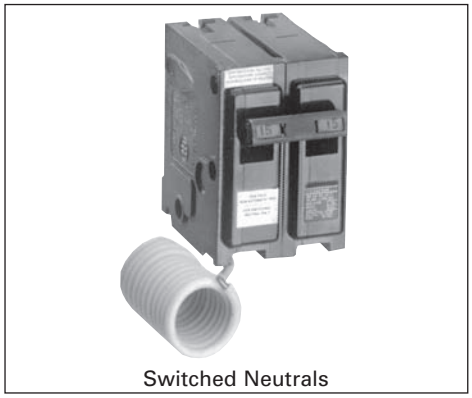
For high wattage, tungsten-lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker.

MP-T **1-Pole** **120V AC**	**Figure 1**	15 20	**MP115T■** **MP120T■**

Water Heater

Circuit breaker does not make electrical connection with loadcenter bus. Separate metered circuit is connected to the line terminals of the breaker. Used in special rate water heating areas.

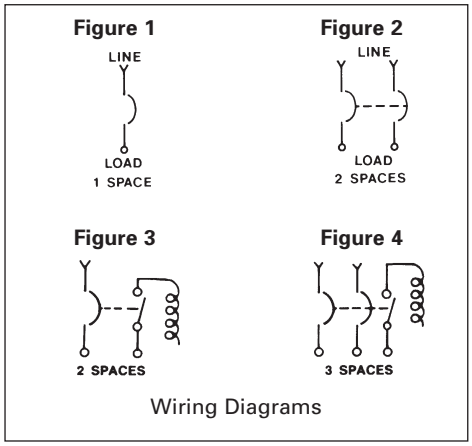
MW **2-Pole** **120/40V AC** **Plug-In**	**Figure 4**	15 20 30	**MP215WH■** **MP220WH** **MP230WH**



Switched Neutrals



Water Heater



Wiring Diagrams

■ Built to order. Allow 2–3 weeks for delivery.
Note: All circuit breakers on this page are 10K AIC

① UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

Circuit Breakers

Type MSQ, 3/4 Inch Plug-In Breakers





Features

- 3/4" format.
- HACR Rated.
- UL Classified for use in certain Square D② load centers.

Type MSQ Circuit Breakers

The Type MSQ circuit breaker line is available in 1-pole and 2-pole common trip versions listed on this page.

The circuit breakers are UL Classified and UL Listed.

All MSQ breakers are supplied with load side connectors suitable for 60/75°C wire and are calibrated for 40°C maximum ambient applications.

UL Classified

Murray Type MSQ circuit breakers are UL Classified for use in specific Square D② load-centers in place of Square D② Type QO® circuit breakers. A Panelboard Compatibility List packaged with each QD breaker shows which type MSQ circuit breakers are acceptable for use in Square D② load centers.

The interrupting rating on these circuit breakers is 10,000A IR maximum and they are ***not*** series rated with Square D② circuit breakers or equipment. This UL Classification allows a Murray Type MSQ circuit breaker to be used in place of a Square D② Type QO circuit breaker in those load centers that are specifically shown on the Panelboard Compatibility list. For additional information, contact your local Murray sales engineer.

1-Pole 2-Pole
Wiring Diagrams



Continuous Current Rating @ 40°C	1-Pole	2-Pole
	120V	120/240V Common Trip
	Catalog Number	Catalog Number
15	MQ115①	MQ215
20	MQ120①	MQ220
30	MQ130	MQ230
40	MQ140	MQ240
50	MQ150	MQ250
60	MQ160	MQ260

Shipping Weights

Number of Poles	Number Per Carton	Shipping Weight (lbs.)
1	16	3.8
2	8	4.2

Panelboard Compatibility List

Listed Panelboards—Square D②—Catalog Numbers

QO2L30F/S	QO12M100/RB	QO120-30M150/RB	QO130-40M200
QO2-4L70F/S	QO16-20M100/RB	QO124L150G	QO130200/RB
QO2-4L70TS	QO16M100/RB	QO124M150	QO130-40L200G/RB
QO2-4L70RB	QO20M100/RB	QO130L150G/RB	QO140M200/RB
QO6-12L100F/S	QO112L125G/RB	QO130M150/RB	QO16L200/RB
QO6-12L100DF/S	QO112-24L125/RB	QO16L150/RB	QO16M200/RB
QO6-12L100TF/S	QO112-24L125GWGC	QO16M150/RB	QO18-16M200FTRB
QO6-12L100DTF/S	QO116L125G	QO16-30L150/RB	QO20-40L200/RB
QO6-12L100RB	QO116-24L125G/RB	QO18-16M150FTRB	QO20-40M200TF/S
QO8-16L100F/S	QO12-24L125/RB	QO20-30M150/RB	QO20-40M200/RB
QO8-16L100DF/S	QO120-24L125G	QO20-30M150TF/S	QO24L200/RB
QO8-16L100TF/S	QO120-24L125GWGC	QO20-30L150	QO24M200/RB
QO-16L100DTF/S	QO120L125G	QO24L150/RB	QO30L200/RB
QO8-16L100RB	QO124L125G/RB	QO24M150/RB	QO30M200/RB
QO112M100/RB	QO124M125/RB	QO30L150/RB	QO30-40L200/RB
QO116M100/RB	QO16L125/RB	QO30M150/RB	QO30-40M200/RB
QO120M100/RB	QO16-12M125FTRB	QO8-16M200FT/RB	QO40M200/RB
QO124M100	QO16-24L125/RB	QO112L200G/RB	QO140M225
QO12L100DF/S	QO20L125/RB	QO120-40M200/RB	QO142L225G/RB
QO12L100RB	QO20-24L125/RB	QO120-40M200TC	
QO12-20M100/RB	QO24L125/RB	QO124M200	
QO12-20M100TF/S	QO120-30L150G	QO130L200G/RB	

①UL Listed for frequent switching applications (SWD). 120V AC Fluorescent Lighting. One or two load conductors.
②Square D is a registered trademark of Schneider Electric.

MURRAY

Main and Branch Circuit Breakers①

Breaker Type	Ampere Rating	Catalog Number	Catalog Number②④	UL Interrupting Ratings (kA)
MD-T③ 2-Pole 120/240V AC	150	MPD2150	MPD2150R	10
	175	MPD2175■	MPD2175R■	10
	200	MPD2200	MPD2200R	10
MD-HT③ 2-Pole 120/240V AC	150	MPD2150KH	MPD2150RH	22
	175	MPD2175KH■	MPD2175RH■	22
	200	MPD2200KH	MPD2200RH	22
MD-MT③ 2-Pole 120/240V AC	150	MPD2150KM	MPD2150RM	65
	175	MPD2175KM■	MPD2175RM■	65
	200	MPD2200KM	MPD2200RM	65



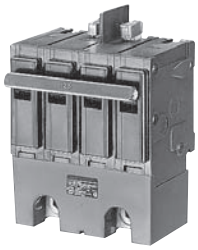
MD-T, MD-HT, MD-MT⑨ MD-TR, MD-HTR, MD-MTR⑨

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
M1⑤ 2-Pole 120/240V AC	100	MBK100M⑩	22
	125	MBK125M⑩	22
M2⑤ 2-Pole 120/240V AC	150	MBK150M⑪	22
	175	MBK175M⑪	22
	200	MBK200M⑪	22
	225	MBK225M⑪	22



M1 M2

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
ED-A⑥ 3-Pole 240V AC	125	EP3125	10
	150	EP3150	10
	200	EP3200	10
	175	EP3175	10
	225	EP3225	10



Type MPP-T, MPP-HT, MPP-MT, MPP-PT

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
MPP⑦ 2-Pole 120/240V AC	125	MPP2125	10
	150	MPP2150	10
	175	MPP2175■	10
	200	MPP2200	10
	225	MPP2225	10
MPP-HT⑦ 2-Pole 120/240V AC	125	MPP2125KH	22
	150	MPP2150KH	22
	175	MPP2175KH■	22
	200	MPP2200KH	22
	225	MPP2225KH■	22
MPP-MT⑦ 2-Pole 120/240V AC	125	MPP2125KM■	65
	150	MPP2150KM	65
	175	MPP2175KM■	65
	200	MPP2200KM	65
	225	MPP2225KM■	65
MPP-PT⑦ 2-Pole 120/240V AC	100	MPP2100KP■	100
	125	MPP2125KP■	100
	150	MPP2150KP■	100
	175	MPP2175KP■	100
	200	MPP2200KP■	100
	225	MPP2225KP■	100



Type ED-A, ED-HA

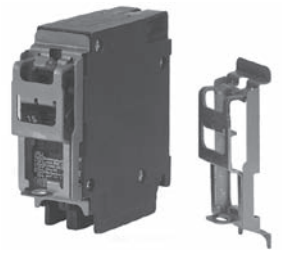
■ Built to order. Allow 2–3 weeks for delivery.
① All circuit breakers on this page are common trip.
② Reverse handle, ON toward lugs. See page 2-23.
③ Requires 4 panel spaces, 2 adjacent, and 2 opposite.
④ For use as load center branch and/or replacement main for old-style load center.
⑤ Main breaker kit for Rock Solid load center
⑥ Requires 6 spaces due to cross over design.
⑦ 4-poles wide for use with 200A modular and Uni-Pak metering
⑧ For use with breaker types MD-T(R), MD-HT(R), MD-MT(R)
⑨ MD-TR required for horizontal mounting applications as shown, or for vertical applications when the lugs are on top. MD-T required for vertical mounting applications with the lugs on the bottom as shown.
⑩ MBK100M for use with 100A and 125A Rock Solid load centers only. MBK125M for use with 125A Rock Solid load centers only.
⑪ MBK150M for use with 150A, 200A, and 225A Rock Solid load centers only. MBK200M for use with 200A and 225A Rock Solid load centers only. MBK225M for use with 225A Rock Solid load centers only.

Circuit Breaker Accessories ④⑤⑥⑦

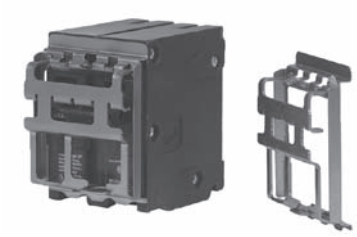
Catalog Number	For Use With Breaker Type	Number of Poles	Standard Package
Padlocking Device For locking breaker in "OFF" position. Note "ON" position does not affect breaker fuctionally			
ECPLD1	Type MP-T, MP-AT2, MP-GT, MP-ET, MH-T-Duplex	1P	3 Pieces
ECPLD2	Type MP-T, MP-AT2, MP-GT, MP-ET, MH-T-Triplex & Quadplex	2P	3 Pieces
ECPLD2R	Type MP-T, MP-AT2, MP-GT, MP-ET, MH-T-Triplex & Quadplex, (Red Color)	2P	3 Pieces
ECPLD3	Type MP-T, MP-AT2, MP-GT, MP-ET	3P	1 Piece
ECPLD3R	Type MP-T, MP-AT2, MP-GT, MP-ET (Red Color)	3P	1 Piece
ECQLD3	Type MP-T	1P	10 Pieces
ECQLD4	Type MH-T-Duplex	QT-Duplex Breakers	10 Pieces
ECQLN3②	150-225 M2, MD-T	n/a	1 Piece
ECQTH4	Type MP-T, BL, BQH	Designed for (3) 1P Breakers	1 Piece
Handle Tie Provide simultaneous swiching of 2 adjacent handles.			
ECQTH2	Type MH-T Duplex	Designed for (2) QT Duplex Breakers	25 Pieces
ECQTH3	Type MP-T, BL	2P	50 Pieces
Mechanical Interlock①			
ECQML12	Type MP-T, 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 MP-T	1P	10 Pieces
ECBX231M	Type MH-T-Duplex	1/2" Breakers	10 Pieces
Main Breaker Retainer			
ECMBR2	Rock Solid Load Centers		1 Piece
Mounting Accessories			
I0204ML1125	Type MP-T, Back Mounting Plates	1P, 2P	10 Pieces
I0303ML3100	Type MP-T, Back Mounting Plates	3P	10 Pieces
Filler Plate			
ECQF3	1" Filler Plate	n/a	5 Pieces

■ Built to order. Allow 2-3 weeks for delivery
① For a complete list of standby power mechanical interlock kits, see the Standby Generator Section XXXX
② For use with Murray Rock Solid Center Main Breakers
③ Not suitable for use on 15-50A, 10 AIC Type MP-T Circuit Breakers
④ MP-T Type includes MP-HT, MP-MT
⑤ MP-AT2 Type includes MP-HAT2
⑥ MP-GT Type includes MP-HGT
⑦ MP-ET Type includes MP-HET

Padlocking Device



ECPLD1



ECPLD2



ECQLD3



ECQLD4



ECQTH4

Handle Tie



ECQTH2



ECQTH3

Handle Blocking Device



ECQL1



ECBX231M

Main Breaker Retainer



ECMBR2

Mechanical Interlock



ECQML12



MQJ3225

Wire range is lug capacity. Permissible maximum wire size in an enclosure may be limited by wire bending space.

Required wire sizes by ampere rating are given in National Electric Code or other local codes.

Accessories—See page 3-20.
Line Diagrams—See page 3-23.

Figure 1

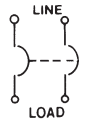
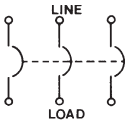


Figure 2



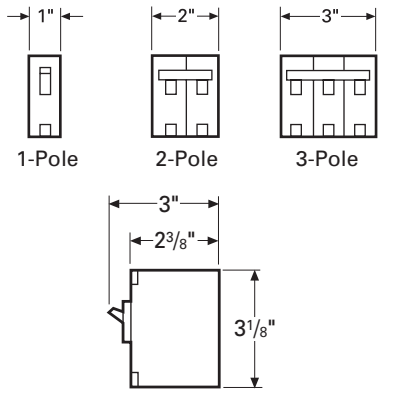
Amps	2 Pole Common Trip 240V AC (Fig. 1) Catalog #	Std. Pkg.- 1 Approx. Wgt. Lbs.	3 Pole Common Trip 240V AC (Fig. 2) Catalog #	Std. Pkg. - 1 Approx. Wgt. Lbs.	Wire Range Cu	Wire Range Al
Type MQ 10,000 AIC						
060	MQJ260■	3.00	MQJ360■	4.10	#6-300 kcmil	#4-300 kcmil
070	MQJ270■	3.00	MQJ370■	4.10	#6-300 kcmil	#4-300 kcmil
080	MQJ280■	3.00	MQJ380■	4.10	#6-300 kcmil	#4-300 kcmil
090	MQJ290■	3.00	MQJ390■	4.10	#6-300 kcmil	#4-300 kcmil
100	MQJ2100■	3.00	MQJ3100■	4.10	#6-300 kcmil	#4-300 kcmil
110	MQJ2110■	3.00	MQJ3110■	4.10	#6-300 kcmil	#4-300 kcmil
125	MQJ2125■	3.00	MQJ3125■	4.10	#6-300 kcmil	#4-300 kcmil
150	MQJ2150■	3.00	MQJ3150■	4.10	#6-300 kcmil	#4-300 kcmil
175	MQJ2175■	3.00	MQJ3175■	4.10	#6-300 kcmil	#4-300 kcmil
200	MQJ2200	3.00	MQJ3200	4.10	#6-300 kcmil	#4-300 kcmil
225	MQJ2225■	3.00	MQJ3225■	4.10	#6-300 kcmil	#4-300 kcmil
Type MQH 22,000 AIC						
060	MQJ260KH■	3.00	MQJ360KH■	4.10	#6-300 kcmil	#4-300 kcmil
070	MQJ270KH■	3.00	MQJ370KH■	4.10	#6-300 kcmil	#4-300 kcmil
080	MQJ280KH■	3.00	MQJ380KH■	4.10	#6-300 kcmil	#4-300 kcmil
090	MQJ290KH■	3.00	MQJ390KH■	4.10	#6-300 kcmil	#4-300 kcmil
100	MQJ2100KH■	3.00	MQJ3100KH■	4.10	#6-300 kcmil	#4-300 kcmil
110	MQJ2110KH■	3.00	MQJ3110KH■	4.10	#6-300 kcmil	#4-300 kcmil
125	MQJ2125KH■	3.00	MQJ3125KH■	4.10	#6-300 kcmil	#4-300 kcmil
150	MQJ2150KH■	3.00	MQJ3150KH■	4.10	#6-300 kcmil	#4-300 kcmil
175	MQJ2175KH■	3.00	MQJ3175KH■	4.10	#6-300 kcmil	#4-300 kcmil
200	MQJ2200KH■	3.00	MQJ3200KH■	4.10	#6-300 kcmil	#4-300 kcmil
225	MQJ2225KH■	3.00	MQJ3225KH■	4.10	#6-300 kcmil	#4-300 kcmil
Type MQL 42,000 AIC						
60	MQJ260KL■	3.00	MQJ360KL■	4.10	#6-300 kcmil	#4-300 kcmil
070	MQJ270KL■	3.00	MQJ370KL■	4.10	#6-300 kcmil	#4-300 kcmil
080	MQJ280KL■	3.00	MQJ380KL■	4.10	#6-300 kcmil	#4-300 kcmil
090	MQJ290KL■	3.00	MQJ390KL■	4.10	#6-300 kcmil	#4-300 kcmil
100	MQJ2100KL■	3.00	MQJ3100KL■	4.10	#6-300 kcmil	#4-300 kcmil
110	MQJ2110KL■	3.00	MQJ3110KL■	4.10	#6-300 kcmil	#4-300 kcmil
125	MQJ2125KL■	3.00	MQJ3125KL■	4.10	#6-300 kcmil	#4-300 kcmil
150	MQJ2150KL■	3.00	MQJ3150KL■	4.10	#6-300 kcmil	#4-300 kcmil
175	MQJ2175KL■	3.00	MQJ3175KL■	4.10	#6-300 kcmil	#4-300 kcmil
200	MQJ2200KL■	3.00	MQJ3200KL■	4.10	#6-300 kcmil	#4-300 kcmil
225	MQJ2225KL■	3.00	MQJ3225KL■	4.10	#6-300 kcmil	#4-300 kcmil

Type QJ2/QJH2/QJ2H

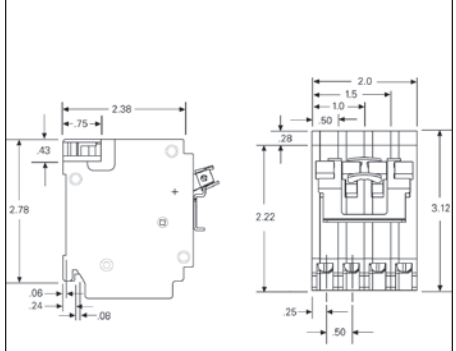
Continuous Current Rating @ 40° C	Type QJ2 10,000A IR Catalog Number	Type QJH2 22,000A IR Catalog Number	Type QJ2H 65,000A IR Catalog Number
2-Pole (240V AC)			
60	QJ2060■	QJ2060KH■	QJ2060KL■
70	QJ2070■	QJ2070KH■	QJ2070KL■
80	QJ2080■	QJ2080KH■	QJ2080KL■
90	QJ2090■	QJ2090KH■	QJ2090KL■
100	QJ2100	QJ2100KH■	QJ2100KL■
110	QJ2110■	QJ2110KH■	QJ2110KL■
125	QJ2125	QJ2125KH	QJ2125KL
150	QJ2150	QJ2150KH	QJ2150KL
175	QJ2175	QJ2175KH■	QJ2175KL■
200	QJ2200	QJ2200KH	QJ2200KL
225	QJ2225	QJ2225KH	QJ2225KL
3-Pole (240V AC)			
60	QJ3060	QJ3060KH■	QJ3060KL■
70	QJ3070	QJ3070KH■	QJ3070KL■
80	QJ3080■	QJ3080KH■	QJ3080KL■
90	QJ3090■	QJ3090KH■	QJ3090KL■
100	QJ3100	QJ3100KH	QJ3100KL
110	QJ3110	QJ3110KH	QJ3110KL■
125	QJ3125	QJ3125KH	QJ3125KL
150	QJ3150	QJ3150KH	QJ3150KL
175	QJ3175	QJ3175KH	QJ3175KL
200	QJ3200	QJ3200KH	QJ3200KL
225	QJ3225	QJ3225KH	QJ3225KL

■ Built to order. Allow 2-3 weeks for delivery.

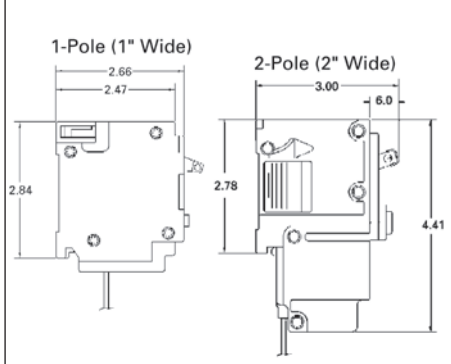
Line Diagrams



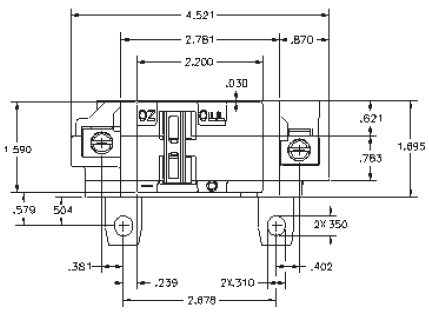
Type MP-T, MP-HT, MP-MT



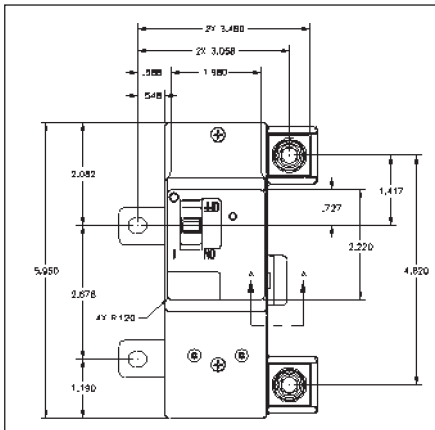
Type MH-T



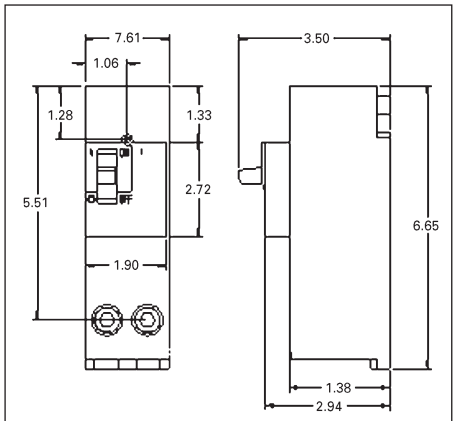
Type MP-GT, MP-HGT, MP-ET, MP-HET



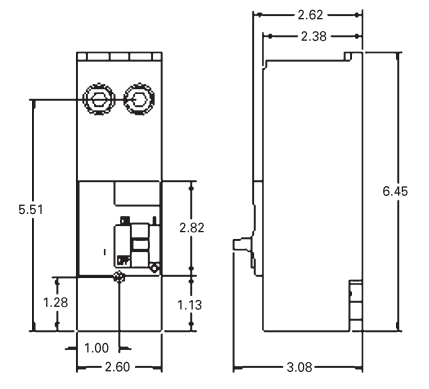
Type M1



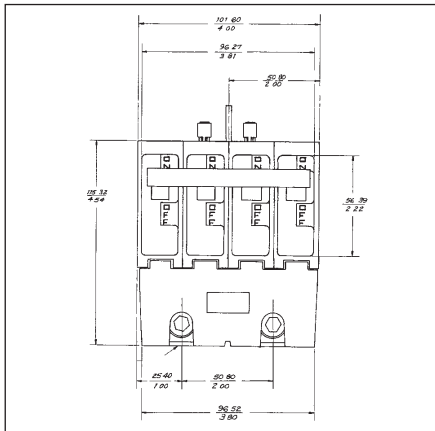
Type M2



Type MD-T, MD-HT, MD-MT



Type MD-TR, MD-HTR, MD-MTR



Type MPP-T, MPP-HT, MPP-MT, MPP-PT

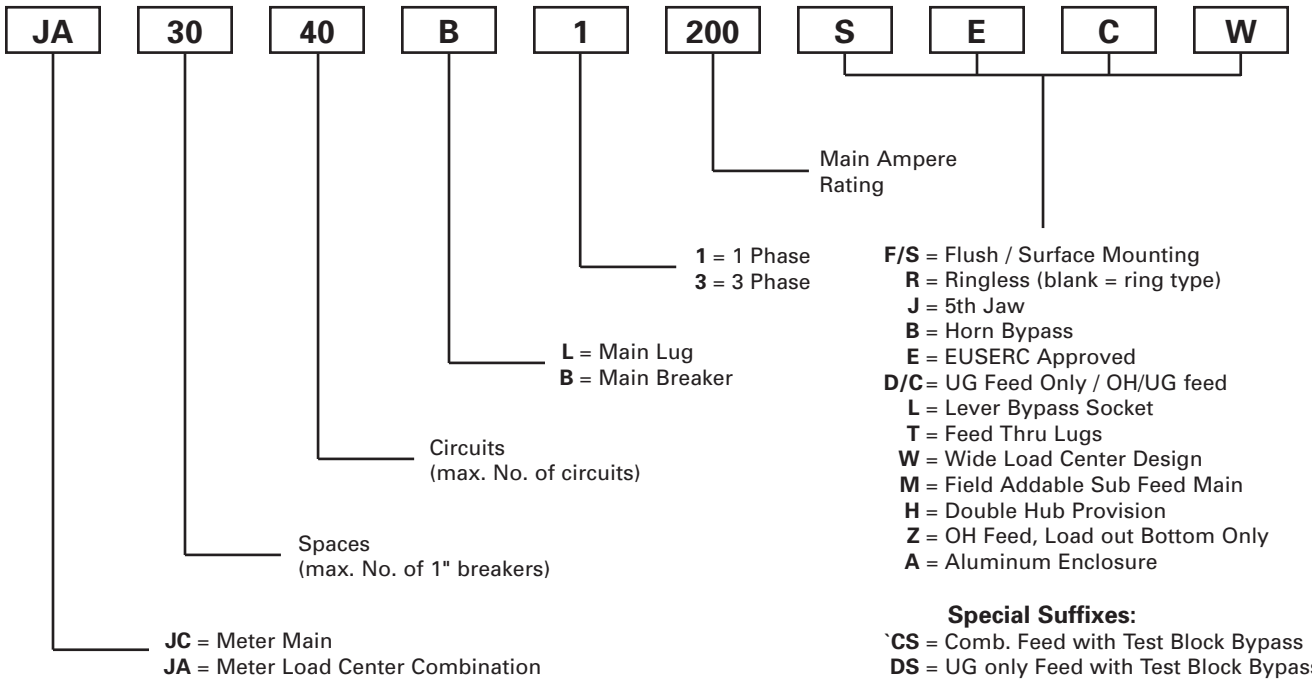
①All standard circuit breakers are calibrated to 40°C maximum ambient application.

Circuit Breakers

Lug Data

Circuit Breaker Type	Circuit Breaker Ampere Rating	Cables Per Connector	Connector Wire Range
	LOAD SIDE		
MP-T, MP-HT, MP-MT	7	2	#18–#14 CU
	10	2	#16–#14 CU
	15–35	1 1	#14–#16 AWG Cu #14–#16 AWG Al
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al
	55–125	1 1	#8-#2/0 Cu #8-#2/0 Al
MH-T	15–35	1 1	#14–#8 AWG Cu #12–#8 AWG Al
	40	1	#8 AWG CU-Al
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al
MP-GT, MP-HGT, MP-ET, MP-HET BLF, BLHF, BLE, BLEH	15–30	1 1	#14–#10 AWG Cu #12–#8 AWG Al
	40–60	1 1	#8–#6 AWG Cu #8–#4 AWG Al
MP-AT2, MP-HAT, BAF, BAFH	15–20	1 1	#14–#12 AWG Cu #12–#10 AWG Al
MSQ	15–20	2	#14–#8 AWG Cu Only
	15–20	1 1	#14–#12 AWG Cu #12–#10 AWG Al
	25–35	1 1	#10–#8 AWG Cu #10–#6 AWG Al
	40–60	1 1	#8–#6 AWG Cu #8–#4 AWG Al
MD-T, MD-HT, MD-MT, MD-PT, MD-TR, MD-HTR, MD-MTR, MD-PTR	150–200	1	#1–300kcmil Cu-Al
M1	100	1	#4-3/0 AWG Cu #4-3/0 AWG Al
		1	#4-3/0 AWG Cu #4-3/0 AWG Al
	125	1	#4–3/0 AWG Cu-Al
M2	150	1	#1–300kcmil Cu-Al
	200	1	#1–300kcmil Cu-Al
	225	1	#1–300kcmil Cu-Al
MPP-T, MPP-HT, MPP-MT, MPP-PT	125	1 1	#1 AWG Cu #2/0 AWG Al
	150	1 1	#1/0 AWG Cu #3/0 AWG Al
	175	1 1	#2/0 AWG Cu #4/0 AWG Al
	200	1 1	#3/0 AWG Cu 250kcmil AWG Al
	225	1 1	#4/0 AWG Cu 300kcmil AWG Al
MQ, MQH, MQL	60–225	1	#6–300kcmil Cu #4–300kcmil Al

New Style Combination Meter Sockets



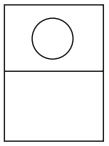
Combination Meter Sockets

Introduction

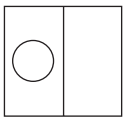
This section includes 4 product categories, which each include their own set of featured products:

Meter Mains

Murray Meter Mains are UL Listed and available from 100A to 400A services. These Meter Mains utilize a cost effective construction that is preferable in non-EUSERC areas.



Over-Under Construction – These Murray Meter Mains feature a classic over-under construction. Available in 100A and 125A versions.

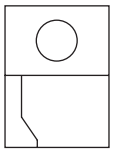


Side-By-Side Construction – These Meter Mains utilize a cost effective side-by-side construction. Meter Mains combine a socket to the left and main circuit breaker section to the right. The main breaker section includes 2 to 6 circuits.

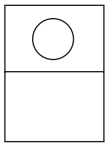
Meter Load Center Combcombinations

Murray Meter Load Center Combinations offer several different configurations and include a meter socket section and a load center section. These Murray combos feature a cost effective construction that is preferable in non-EUSERC areas.

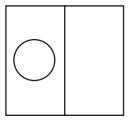
Over-Under Combination Construction – These Murray Meter Load Center Combinations feature a over-under configuration with a unique trough allowing service from either overhead or underground to the device.



Over-Under Construction – These Murray Meter Load Center Combinations feature a classic over-under construction.

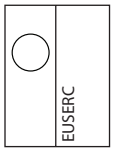


Side-By-Side Construction – These Murray Meter Load Center Combinations have a side-by-side configuration.

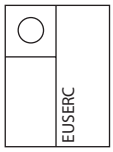


EUSERC Meter Mains

Murray EUSERC Meter Mains are UL Listed and available from 100A to 400A services. These meter mains utilize designs that meet EUSERC requirements. Two constructions are available.



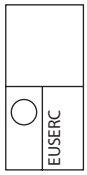
Side-By-Side Construction – These Murray Meter Mains have a side-by-side construction that is slightly larger in order to meet EUSERC requirements.



Side-By-Side 400A Construction – These Murray Meter Mains have side-by-side construction that meets EUSERC design, and provide 400A service.

EUSERC Meter Load Center Combinations

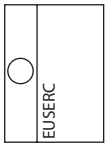
Murray Meter Load Center Combinations offer several different configurations to meet a variety of installer demands. These Murray combos feature designs that meet EUSERC requirements.



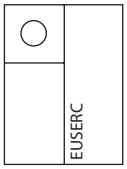
Over-Under Between the Studs Construction – These Combos have a full width load center section above, and a meter socket section below, in a 14.3" wide configuration that allows flush mounting between typical 16" on center stud construction. Surface mounting options available.



Side-By-Side Between the Studs Construction – These combos have a half width load center section to the right and a meter socket section to the left, in a 14.2" wide configuration that allows flush mounting between typical 16" on center stud construction. Surface mounting options available.



Side-By-Side Full Load Center Construction – These Murray Meter Load Center Combinations have a full width load center section to the right, and a meter socket section to the left. The overall width make this combo best suited for surface mounting.



Side-By-Side 400A Construction – These Murray Meter Mains have side-by-side construction that meets EUSERC design, and provide 400A service. Available with 16 to 42 circuits.

Meter Mains

Meter Mains, 100A-400A

- UL listed
- Pad locking provisions on all devices
- Horn bypass and 5th jaw available as noted
- Side hinged door with one screw removal where shown
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for 5th jaw and main breaker
- See Section 2, pages 2-44 thru 2-46 for wiring diagrams and knockout details. For Murray devices, replace "MM" with "JC" details if JC number is not shown.

Figure 1



JC0202B1125RJB
meter mains, side hinge door

Figure 2



JC0406L1200RHJB
200A meter main, 6 circuits

Figure 3



JC0404L1400RLM
400A meter main, two field installed mains

Figure 4



JC002CZ
125A meter main

Figure 5



JC002CS
meter main, OH feed only

Side-By-Side Construction Meter Mains

Amps Max.	No. of Spaces	Max. Circuits	Cover Type	Mounting	Service	Bypass Type	Catalog Number	Dimensions①			Figure
								Height	Width	Depth	
125	2	2	Ring	Surface	OH	—	**JC002CZ**②④	14.1	14.1	4.6	4
125	2	2	Ringless	Surface	OH/UG	Horn	**JC0202B1125RJB**③	17.0	16.0	5.0	1
200	2	2	Ring	Surface	OH/UG	—	**JC0202B1200**③	17.0	16.0	5.0	1
			Ringless			—	**JC0202B1200R**③				
			Ringless			Horn	**JC0202B1200RJB**③				
200	4	6	Ring	Surface	OH/UG	—	**JC0406L1200H**③	19.8	17.2	5.0	2
			Ringless			—	**JC0406L1200RH**③				
			Ringless			Horn	**JC0406L1200RHJB**③				
400	2	2	Ringless	Surface	OH/UG	Lever	**JC0404L1400RLM**③	29.0	27.0	6.0	3

Over-Under Construction Meter Mains

Amps Max.	No. of Spaces	Max. Circuits	Cover Type	Mounting	Service	Bypass Type	Catalog Number	Dimensions①			Figure
								Height	Width	Depth	
100	2	2	Ring	Surface	OH	—	**JC002CS**②④	18.1	7.0	3.6	5
125	2	2	Ring	Surface	OH	—	**JC002AR**②④	22.1	7.0	3.6	5

① Dimensions shown are representative of outside box length, width, & depth and do not include allowances for mounting bumps, endwalls, covers, hubs or hardware protrusions. Dimensions are subject to change.

② Not suitable for 5th jaw applications.
③ Closure plate included.
④ Provisions for MP-T Main Breaker.

Meter Load Center Combinations

MURRAY

Over-Under Construction Meter Load Center Combinations, 150A-200A

- UL listed
- Overhead and underground feed applications
- Underground feed accomplished by use of removable gutter trough
- Load wires bottom or back exit only
- 22,000 AIC rated
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Suitable for use only as service entrance equipment
- RX type hub provision on top end wall
- HC type hub provision on bottom end wall
- Field addable 5th Jaw (EC5J2)
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for 5th jaw and main breaker
- See Section 2, pages 2-34 thru 2-42 for wiring diagrams and knockout details. For Murray devices, replace "MC" with "JA" details if JA number is not shown.



Figure 1



JA0606L1200
200A, main lug, 6 circuit

Figure 2



JA0408B1150T
150A or 200A main breaker, four 1" spaces, feed thru lugs

Figure 3



JA0816B1150CT
150A or 200A main breaker, eight 1" spaces, feed thru lugs

Figure 4



JA0816B1120RT
OH feed only, feed thru lugs, trailer panel

Over-Under Combination Construction Meter Load Center Combinations

Amps Max.	No. of Spaces	Max. Circuits	Cover Type	Mounting	Service	Bypass Type	Catalog Number	Dimensions Height	Width	Depth	Figure
150	4	8	Ringless	Surface	OH/UG	—	**JA0408B1150RT**③	30.0	14.0	5.0	2
			Ring			—	**JA0408B1150T**③				
150	8	16	Ring			—	**JA0816B1150CT**③	32.0			3
			Ringless			—	**JA0816B1150RCT**③				
200	12	6	Ring			—	**JA0606L1200**①②③⑤	27.0			1
			Ringless			—	**JA0606L1200R**①②③⑤				
			Ringless			—	**JA0606L1200RA**①②③④⑤				
200	4	8	Ringless			—	**JA0408B1200RT**③	30.0			2
			Ring			—	**JA0408B1200T**③				
200	8	16	Ring			—	**JA0816B1200CT**③	32.0			3
			Ringless			—	**JA0816B1200RCT**③				

Over-Under Construction Meter Load Center Combinations

Amps Max.	No. of Spaces	Max. Circuits	Cover Type	Mounting	Service	Bypass Type	Catalog Number	Dimensions Height	Width	Depth	Figure
200	8	16	Ringless	Surface	OH	—	**JA0816B1200RT**	29.0	12.0	5.2	4
			Ring			—	**JA0816B1200T**				

① No main breaker provided. Accept MD-T or MP-T type 2 or 4-pole breakers.
② Suitable for use as service entrance equipment when not more than six disconnecting means are provided and when not used as a lighting an appliance panel board.
③ Due to wire space restrictions on the trough side, the left side of the interior is limited to a 60A max branch.
④ Aluminum enclosure.
⑤ Suitable for use as service entrance equipment when not more than six disconnecting means are provided and when not used as a lighting and appliance panel branch circuit panel board.

Meter Load Center Combinations

• Revised •
01/22/13

MURRAY

Meter Load Center Combinations, 100A-400A

- UL listed
- 22,000 AIC Rated
- Pad locking provisions on all devices
- Side hinge doors removable by backing out only one screw
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket approval prior to installation
- See end of section for 5th jaw and main breaker
- See Section 2, pages 2-36 thru 2-50 for wiring diagrams and knockout details. For Murray devices, replace "MC" with "JA" details if JA number is not shown.

Figure 1



JA0816B1200TH
OH/UG feed, with feed thru lugs

Figure 2



JA0816B1400RLTM
factory installed 200A main and provision for 2nd 60A-200A main

Figure 3



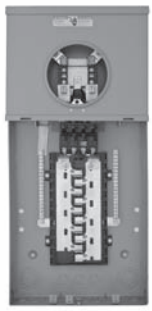
JA3042B1400SDL
400A, factory installed 200A main and provision for 2nd 60A-200A main

Figure 4



MC1020B1100S
100A, OH feed only, 20 circuits

Figure 5



MC2040B1200S
200A, OH feed only, 40 circuits

Side-By-Side Construction Meter Load Center Combinations②

Amps Max.	No. of Spaces	Max. Circuits	Cover Type	Mounting	Service	Bypass Type	Catalog Number	Dimensions Height	Width	Depth	Figure
150	8	16	Ringless	Surface	OH/UG	—	JA0816B1150RTH①③	21.0	22.9	5.0	1
			Ring			—	JA0816B1150TH①③				
200			Ringless			—	JA0816B1200RTH①②				
			Ring			—	JA0816B1200TH①②				
200	20	40	Ring			—	JA2040B1200②	18.0			
350	8	16	Ringless			Lever	JA0816B1350RLTM①	29.0	27.0	6.0	2
400	4	8					JA0408B1400RLTM①				
400	8	16					JA0816B1400RLTM①				

Side-By-Side 400A Construction Meter Load Center Combinations

Amps Max.	No. of Spaces	Max. Circuits	Cover Type	Mounting	Service	Bypass Type	Catalog Number	Dimensions Height	Width	Depth	Figure
400	30	42	Ring	Surface	UG	Lever	JA3042B1400SDL	40.0	30.0	6.5	3

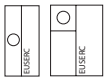
Over-Under Construction Meter Load Center Combinations③⑥⑦⑧

Amps Max	No. of Spaces	No. of Circuits	Cover Type	Mounting	Service	Bypass Type	Old Catalog Number	New Catalog Number	Dimensions H	W	D	Figure
100	10	20	Ring	Flush	OH	none	JA1020B1100F	MC1020B1100F④	19.4	12.1	4.4	4
				Surface			JA1020B1100S	MC1020B1100S				
				Flush			—	MC1020B1100FZ⑤				
				Surface			—	MC1020B1100SZ⑤				
200	20	40	Ring	Flush	OH	none	JA2040B1200F	MC2040B1200F	30.5	14.3	5.1	5
				Surface			JA2040B1200S	MC2040B1200S			4.4	
				Flush			—	MC2040B1200FZ⑤			5.1	
				Surface			—	MC2040B1200SZ⑤			4.4	

① Feed thru lugs included.
② Side by side design for OH/UG applications.
③ Over/under design for OH applications.
④ Semi-Flush mounting only.
⑤ Z=Solid horizontal barrier. Load wires exit back or bottom only.
⑥ Dimensional and other technical data is applicable for "New Catalog Numbers" ONLY.
⑦ UL Listed for Siemens and Murray breakers.
⑧ Old Catalog Numbers JA1020B1100SP and JA2040B1200SP are obsolete with no replacement.

EUSERC Meter Mains

EUSERC Side-By-Side Construction Meter Mains, 125A-400A



- UL listed
- For overhead and underground feed applications
- Designed to meet EUSERC standards
- 22,000 AIC Rated
- Pad locking provisions on all devices
- Surface and semi-flush units available - semi flush rails are depth adjustable for 2x6 studs
- Side hinge door removable by backing out only one screw
- Load wiring may exit top or bottom
- Suitable for use only as service entrance equipment
- RX type hub provision on top endwall, HC type hub provision on bottom endwall
- 5th jaw accessory available (EMC5J)
- Ring type meter covers
- Contact local utility to confirm meter socket approval prior to installation
- See end of section for 5th jaw and main breaker
- See Section 2, pages 2-36 thru 2-50 for wiring diagrams and knockout details. For Murray devices, replace "MM" with "JC" details if JC number is not shown.

Figure 1



MM0202B1100ESC

Figure 2



JC0404L1400SC
400A meter main

Side-By-Side Construction Meter Mains⑥⑦

Amps Max	No. of Spaces	No. of Circuits	Cover Type	Mounting	Service	Bypass Type	Old Catalog Number	New Catalog Number	Deminsions H	Deminsions W	Deminsions D	Figure
125	2	2	Ring	Flush	OH/UG	none	JC0406L1125FEC	MM0202L1125EFC	23.6	14.5	5	1
125				Surface			JC0406L1125SEC	MM0202L1125ESC				
200	2	2	Ring	Flush	OH/UG	none	—	MM0202L1200EFC	28.6	14.5	7	
200				Surface			JC0406L1200FEC	MM0202L1200ESC			5	
100	2	2	Ring	Surface	OH/UG	none	JC0406L1200SEC	MM0202B1100ESC	23.6	14.5	5	
200				Surface			—	MM0202B1200ESC	28.6			

Side-By-Side 400A Construction Meter Mains②

Amps Max.	No. of Spaces	Max. Circuits	Mounting	Service	Catalog Number	Dimensions① Height	Dimensions① Width	Dimensions① Depth	Figure
400	4	2	Surface	OH/UG	JC0404L1400SC④⑤	39.7	33.2	6.4	2
			Flush	UG	JC0404L1400FD④⑤		30.2	7.4	
400	4	2	Surface	OH/UG	JC0404L1400SCS③④⑤	39.7	33.2	6.4	2
			Flush	UG	JC0404L1400FDS③④⑤		30.2	7.4	

① Dimensions shown are representative of outside box length, width, and depth and do not include allowances for mounting bumps, endwalls, covers, hubs or hardware protrusions. Dimensions are subject to change.
② Main breaker not included.
③ Test block bypass.
④ Main breaker: (2) Field QP(H) or QNR(H).
⑤ No 5th Jaw available.
⑥ Dimensional and other technical data is applicable for "New Catalog Numbers" ONLY.
⑦ UL Listed for Siemens and Murray breakers.

EUSERC Meter Load Center Combos

• Revised •
01/22/13

MURRAY

EUSERC Meter Load Center Combinations, 100A-225A

- UL listed
- For overhead and underground feed applications
- Designed to meet EUSERC standards
- 22,000 AIC Rated
- Pad locking provisions on all devices
- Surface and semi-flush units available - semi flush rails are depth adjustable for 2x6 studs
- Side hinge door removable by backing out only one screw
- Load wiring may exit top or bottom
- Suitable for use only as service entrance equipment
- RX type hub provision on top endwall, HC type hub provision on bottom endwall
- Ring type meter covers
- Contact local utility to confirm meter socket approval prior to installation
- 5th jaw accessory available
- See end of section for 5th jaw and main breaker
- See Section 2, pages 2-36 thru 2-50 for wiring diagrams and knockout details. For Murray devices, replace "MC" with "JA" details if JA number is not shown.

Fig. 1



JA1212L1200SED

Fig. 2



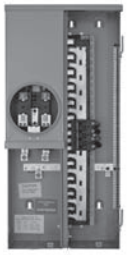
JA3042B1200FED

Fig. 3



MC1224B1125EFC

Fig. 4



MC2040B1200ESC

Over-Under Between the Studs Construction Meter Load Center Combinations

Amps Max.	No. of Spaces	Max. Circuits	Mounting	Service	Catalog Number	Dimensions① Height	Width	Depth	Figure
200	12	12	Flush	UG	**JA1212L1200FED①**	38.4	14.4	7.4	1
			Surface		**JA1212L1200SED①**				
200	20	40	Surface	UG	**JA2040B1200SED**	41.9	14.4	7.4	2
			Flush		**JA2040B1200FED**				
200	30	42	Surface	UG	**JA3042B1200SED**	48.8	14.4	7.4	2
			Flush		**JA3042B1200FED**				
225			Surface		**JA3042B1225SED**				
			Flush		**JA3042B1225FED**				

Fig. 5



JA4040B1200SECW

Side-By-Side Full Load Center Construction Meter Load Center Combinations

200	30	40	Surface	OH/UG	**JA3040B1200SECW②**	32.3	21.0	5.2	5
	40				**JA4040B1200SECW②**				

Side-By-Side Between the Studs Construction Meter Load Center Combinations③④⑤

Amps Max	No. of Spaces	No. of Circuits	Cover Type	Mounting	Service	Bypass Type	Old Catalog Number	New Catalog Number	Dimensions H	W	D	Figure
100	12	24	Ring	Flush	OH/UG	none	**JA1224B1100FEC**	**MC1224B1100EFC**	23.6	14.5	5	3
				Surface			**JA1224B1100SEC**	**MC1224B1100ESC**				
125	12	24	Ring	Flush	OH/UG	none	**JA1224B1125FEC**	**MC1224B1125EFC**				
				Surface			**JA1224B1125SEC**	**MC1224B1125ESC**				
200	20	40	Ring	Flush	OH/UG	none	**JA2442B1200FEC**	**MC2040B1200EFC**	31	14.5	7	4
				Surface			**JA2442B1200SEC**	**MC2040B1200ESC**			5	
225	24	42	Ring	Surface	OH/UG	none	—	**MC2442B1225ESC**	35	14.5	5	
				Flush			—	**MC2442B1225EFC**			7	
200	24	42	Ring	Surface	OH/UG	none	—	**MC2442B1200ESC**	35	14.5	5	
				Flush			—	**MC2442B1200EFC**			7	
	8	16	Ring	Flush	OH/UG	none	—	**MC0816B1200EFN**	29.75	14.5	7	
				Surface			**JA0816B1200SCTM**	**MC0816B1200ESN**			5	

① Suitable for use as service entrance equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance panel board.

② FRK1 - Flush rail kit.

③ Dimensional and other technical data is applicable for "New Catalog Numbers" ONLY.

④ Old Catalog Numbers JA1632B1100FEC, JA1632B1100SEC and JA1632B1125FEC are obsolete with no replacement.

⑤ UL Listed for Siemens and Murray breakers.

EUSERC Meter Load Center Combinations

EUSERC Side-By-Side Construction Meter Load Center Combinations, 400A

- UL Listed
- 400A Max, 320A Continuous
- Meter socket options include 320A (400A max) lever bypass, non-bypass, test block bypass, and bolt on
- Load center options include a meter main, 8 space panel with feed through lugs, 30 space panels
- 22,000 AIC Rated
- Accepts HD Type Hubs
- Factory installed flush mount option
- Surface mount devices accept field added flush rails
- Suitable for use only as service entrance equipment
- Contact local utility to confirm meter socket acceptance prior to installation
- Designed to meet EUSERC
- See Section 2, pages 2-36 thru 2-50 for wiring diagrams and knockout details. For Murray devices, replace "MC" with "JA" details if JA number is not shown.



Flush Mount Front View

Figure 1



JA0816B1400SCS
meter combo with feed thru lugs, factory installed 200A main and provision for 2nd

Figure 2



JA3042B1400SC
400A meter combo, factory installed 200A main and provision for 2nd

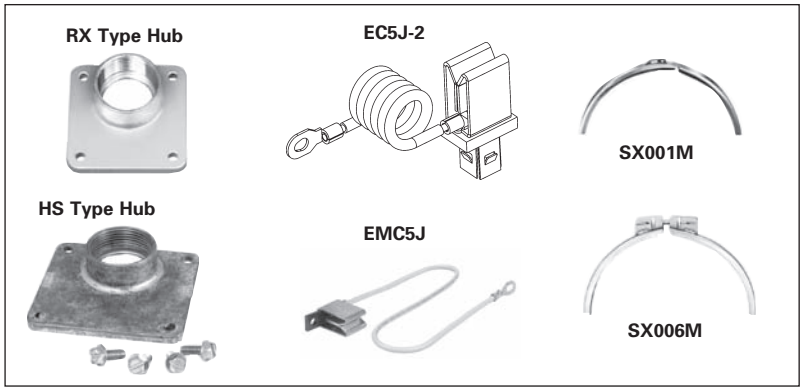
Accessories

Description	Catalog Number
Flush Rail Kit for UG only devices	**ECFRK1**
Flush Rail Kit for OH/UG feed devices	**ECFRK2**
2" HD Type Hub	**EC56854**
2 1/2" HD Type Hub	**EC56855**
3" HD Type Hub	**EC56856**
3 1/2" HD Type Hub	**EC56857**
4" HD Type Hub	**EC56858**
HD Closure Plate	**EC56933S**
Snap on Sealing Ring	**SRSS**
Stainless Steel Screw Type Sealing Ring	**SRSW**
(2) #6-350 kcmil	**UK350TA**
(1) #2-600 kcmil	**UK600TA**
(2) 500-1000 kcmil	**UK1000TA**

Side-By-Side 400A Construction Meter Load Center Combinations

Amps Max.	No. of Spaces	Max. Circuits	Mounting	Service	Meter Socket	Catalog Number	Main Breaker	Dimensions		
								Height	Width	Depth
400	8	16	Surface	OH/UG	Plug In	**JA0816B1400SC**	Factory QN2200RH, Field QP(H), QNR(H)	39.7	33.2	6.4
			Flush	UG		**JA0816B1400FD**			30.2	7.4
400	8	16	Surface	OH/UG	Test Blk	**JA0816B1400SCS**	Factory QN2200RH, Field QP(H), QNR(H)	39.7	33.2	6.4
			Flush	UG		**JA0816B1400FDS**			30.2	7.4
400	30	42	Surface	UG	Plug In	**JA3042B1400SD**	Factory QN2200RH, Field QP(H), QNR(H)	39.7	30.2	6.4
					Test Blk	**JA3042B1400SDS**				
					Bolt In	**JA3042B1400SDB**				
400	30	42	Flush	UG	Plug In	**JA3042B1400FD**	Factory QN2200RH, Field QP(H), QNR(H)	39.7	30.2	7.4
			Surface	OH/UG		**JA3042B1400SC**			33.2	6.4
400	30	42	Flush	UG	Test Blk	**JA3042B1400FDS**	Factory QN2200RH, Field QP(H), QNR(H)	39.7	30.2	7.4
			Surface	OH/UG		**JA3042B1400SCS**			33.2	6.4

① 5th Jaw available. Use H35815-2.



Interchangeable Hubs

Conduit Size (Inches) Lbs.	Catalog Number
RX Type Hubs	
¾	**EC38594**
1	**EC38596**
1¼	**EC38597**
1½	**EC38598**
2	**EC38599**
2½	**EC38600**
HC Type Hubs	
2	**ECHC200**
2½	**ECHC250**
3	**ECHC300**
Accessories and Closure Plates	
Adapter Plate HD to RX	**EC9747-1113**
Adapter Plate HC to RX	**HCRXA**
Closure Plates	**ECHC000** (HC) **ECHS000** (HS) **ECHV000** (HV) **EC38595** (RX)

Grounding Bars (Al/Cu — except where noted)

Grounding bars are for use where grounding of electrical outlets and devices is by means of conductors. Each bar is equipped with large connectors rated for one #14-1/0 or, two or three #14-10 Cu/Al and small connectors rated for one #14-6 or, two #14-12 Cu/Al. (May be restricted by wire bending space.)

Length	Number of Connectors			Catalog Number
	Total	Large	Small	
1⅝	4	0	4	**ECLX068M**
2⁵⁄₁₆	7	2	5	**ECLX069M**
3½	11	3	8	**ECLX071M**
4⅝	15	4	11	**ECLX072M**
5¾	19	5	14	**ECLX073M**
7	23	6	17	**ECLX074M**
8⅛	27	7	20	**ECLX075M**

Sealing Rings

Description	Catalog Number
Snap-on type, aluminum	**SRSTD**
Screw type, aluminum	**SRSW**

Miscellaneous Accessories

Description	Catalog Number
Plastic Meter Opening Cover (JA, JC)	**ECPP**
Plastic Meter Cover Ringless (JB)	**ECCP3**
Fifth Jaw (for old style JA & JC units only)	**EC5J**
5th Jaw for new style JA & JC devices	**EMC5J / EC5J2**
5th Jaw for 400A @ 9:00 with shield (see chart)	**H35815-2**
NEMA Stud Mechanical Lugs for JB, JK and JL units① (2) #6-350 kcmil (1) #2-600 kcmil Al/Cu (2) #500-1000 kcmil Al/Cu	 **UK350TA** **UK600TA** **UK1000TA**
Neutral Feeder Lugs #2-1/0 #4-2/0 #1-350 kcmil	 **ECLK1** **ECLK2** **ECLK3**

Catalog Number	Main Breaker	5th Jaw
JC0406L1200H	Provision for (1) MD-T, MD-HT or (2) MP-T, MP-HT	EMC5J
JC0406L1200RH		EMC5J
JC0406L1200RHJB		Included
JC0404L1400RLM	Provision for (2) MD-T(R), MD-HT(R), MP-T, MP-HT	H35815-2
JC0202B1125RJB	MP2125KH	Included
JC0202B1200	MPD2200KH	EMC5J
JC0202B1200R	MPD2200KH	EMC5J
JC0202B1200RJB	MPD2200KH	Included
JA0408B1150T	ME9683	EC5J2
JA0408B1150RT	ME9683	EC5J2
JA0816B1150CT	ME9683	EC5J2
JA0816B1150RCT	ME9683	EC5J2
JA0606L1200	②	EC5J2
JA0606L1200R	②	EC5J2
JA0606L1200RA	ME9683	EC5J2
JA0408B1200T	ME9683	EC5J2
JA0408B1200RT	ME9683	EC5J2
JA0816B1200CT	ME9683	EC5J2
JA0816B1200RCT	ME9683	EC5J2
JA0816B1200RT	QN2200RH	NA
JA0816B1200T	QN2200RH	NA
JA0816B1150RTH	MPD2150RH	EMC5J
JA0816B1150TH	MPD2150RH	EMC5J
JA0816B1200RTH	MPD2200RH	EMC5J
JA0816B1200TH	MPD2200RH	EMC5J
JA2040B1200	MPD2200RH	EMC5J
JA0816B1350RLTM	MPD2150RH	EMC5J
JA0408B1400RLTM	MPD2200RH	EMC5J
JA0816B1400RLTM	MPD2200RH	EMC5J
JA3042B1400SDL	MPD2200RH	EC35815
JA1020B1100S(Z)	MP2100KH	EC5J2
JA1020B1100F	MP2100KH	EC5J2
JA2040B1200S(Z)	EQ9685	EC5J2
JA2040B1200F	EQ9685	EC5J2
JA1212L1200FED	NA	EC5J2
JA1212L1200SED	NA	EC5J2
JA2040B1200FED	MBK200M	EC5J2
JA2040B1200SED	MBK200M	EC5J2
JA3042B1200FED	MBK200M	EC5J2
JA3042B1200SED	MBK200M	EC5J2
JA3042B1225FED	MBK225M	EC5J2
JA3042B1225SED	MBK225M	EC5J2
JA1224B1100FEC	MP2100KH	EMC5J
JA1224B1100SEC	MP2100KH	EMC5J
JA1632B1100FEC	MP2100KH	EMC5J
JA1632B1100SEC	MP2100KH	EMC5J
JA1224B1125FEC	MP2125KH	EMC5J
JA1224B1125SEC	MP2125KH	EMC5J
JA1632B1125FEC	MP2125KH	EMC5J
JC0406L1125FEC	MP2125KH	EMC5J
JC0406L1125SEC	MP2125KH	EMC5J
JA2442B1200FEC	MEQ9985	EMC5J
JA2442B1200SEC	MEQ9985	EMC5J
JC0406L1200FEC	MEQ9985	EMC5J
JC0406L1200SEC	MEQ9985	EMC5J
JA0816B1200SCTM		EMC5J
JA3040B1200SECW	MPD2200RH	EMC5J
JA4040B1200SECW	MPD2200RH	EMC5J

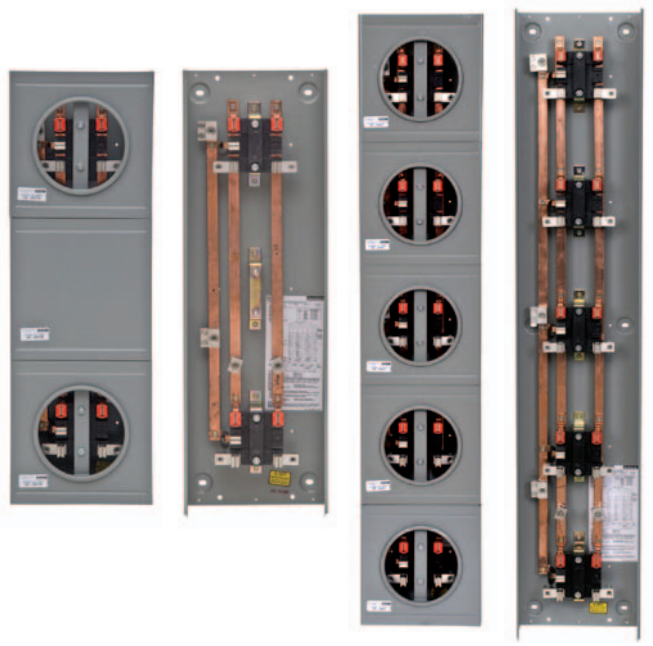
① Order one for each phase and neutral.
② No main breaker provided. Accept MD-T or MP-T type 2 or 4-pole breakers.

Group Metering: NYC Gangable Metering

General Information

Product Descriptions

Murray New York City Apartment Metering is a versatile, unassembled modular metering product comprised of separate modules that may be assembled to produce a variety of configurations. Only those standard modules shown in this publication will be sold. Installation instructions are shipped with the product. The modules are:



Meter Stacks

Meter Stacks are available from 2 to 5 meter positions, arranged vertically and pre-bussed on the line side. Each meter position is rated 100 amps continuous (125 amps maximum), 5 jaw, with the 5th jaw located at 9 o'clock and connected to the stack neutral bus. Indoor mounting only.

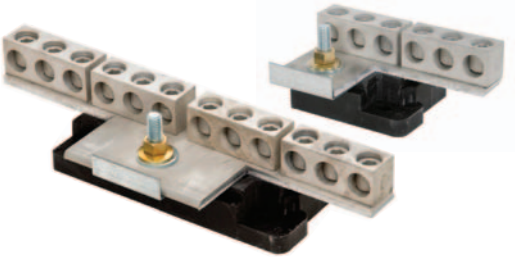
Line Troughs

Line troughs are indoor horizontal wireways that support the meter stacks and supply unmetered line power to meter stack bus. Line trough is available from 2 to 5 stack positions and may be ganged by means of couplers to accommodate 6 or more stacks. Phase blocks and line terminals are required to terminate line conductors and to provide means to field wire each stack. Trough end walls are ordered separately.



Phase Blocks

Phase blocks are required to terminate line conductors and provide terminals for field connection to each stack bus. Phase blocks are available with 3, 6 or 12 take-off lugs.



System Parameters

- Mounting: Indoor only
- Input: 208Y/120V AC, 3 Phase, 4 Wire or 120/240V AC, 1 Phase, 3 Wire
- Maximum line terminal- (2) 500 kcmil/phase
- Output: 120Y/208V AC, 1 Phase, 3 wire or 120/240V AC, 1 Phase, 3 Wire 100 Amps continuous/meter position (125 amps maximum)
- Meter Sockets: 5 jaw, with 5th jaw located at 9 o'clock and electrically connected to neutral bus
- Tenant Circuit Breakers: Use Murray Type MP-T 2 pole plug-on circuit breakers, (100 amps maximum)

General Information

Getting Started

Before ordering components, the following should be known:

- Installation instructions are shipped with the product
- Number of meter positions
- Amp rating of each meter position
- Voltage and phase of incoming line
- Line conductor size and quantity
- Vertical and horizontal space limitations, if any

Meter stacks are 10" wide and are 10" high for each meter position, or blank position. (A 3-high stack with no blank postions would be 10" wide and 30" high). When considering the overall height of an installation, you must add the height of the line trough (12") and the breaker trough (16") to the stack height.

An installation of 3-high stacks would be 58" in overall height (30" + 12" + 16" = 58").

All meter stacks in the same meter bank must be the same height to allow the breaker trough to fit on top of the stacks.

Line Terminal Kits

Line terminals are available in kits of 4 terminals each. The terminals are tang lugs which mount on threaded studs provided on the phase blocks. Terminals are available in 3 sizes:

- (1) 350 kcmil
- (1) 500 kcmil
- (2) 500 kcmil maximum



Breaker Troughs

Breaker troughs are horizontal indoor wireways that contain provisions for plug-in circuit breakers used as tenant mains. The trough bolt to the top of the meter stacks. Field wiring connects each meter socket to a circuit breaker mounting block. Breaker troughs are available in 2 to 5 stack postitions and can be ganged to accommodate 6 or more stacks. Trough end walls are ordered separately.



End Wall Kits

These kits contain 4 end walls; 2 end walls for the line trough and 2 end walls for the breaker trough.

Circuit Breakers

New York City Apartment Metering uses standard 2-pole plug-on circuit breakers, Murray Type MP-T, 100 amps maximum.



Coupler Kits

These kits each contain 2 trough coupler straps; one for the line trough and one for the breaker trough. These couplers mount using the same mounting screw holes as the end walls.

Line Trough Spacer Kits

These kits may be used to increase wire bend space between the first phase block and line entrance end wall, if necessary. They connect to line troughs with a standard coupling kit. Trough end walls are ordered separately.

Use Selection Chart #1 and Specification Chart #1

Knowing the number of meter positions, and the height and width requirements, select quantity and catalog number of stacks from Selection Chart #1. The height dimension in this chart includes line and breaker troughs. For specs, refer to Specification Chart #1.

Specification Chart #1—Meter Stacks 300V AC max., 100 Amps/Position Continuous Duty, 1 or 3 Phase Network

Meter Positions	Height① (Inches)	Catalog Number	Wire Range Line Terminals
2	20	**UVS210**	#6-4/0
2	30	**UVS311B**	#6-4/0
3	30	**UVS310**	#6-4/0
3	40	**UVS411B**	#6-4/0
4	40	**UVS410**	#6-4/0
4	50	**UVS511B**	#6-4/0
5	50	**UVS510**	#6-4/0

① All stacks are 10″ wide.

Selection Chart #1—Meter Bank Height and Width Meter Stack Combinations for Various Heights and Widths, by Number of Meter Positions

No. of Meter Positions	58″ High			68″ High			78″ High		
	Use this Quantity of:		Width (Inches)	Use this Quantity of:		Width (Inches)	Use this Quantity of:		Width (Inches)
	UVS310	UVS311B		UVS410	UVS411B		UVS510	UVS511B	
9	3	0	30	Not Practical①		—	1	1	20
10	2	2	40	1	2	30	2	0	20
11	3	1	40	2	1	30	Not Possible②		—
12	4	0	40	3	0	30	Not Practical②		—
13	3	2	50	1	3	40	1	2	30
14	4	1	50	2	2	40	2	1	30
15	5	0	50	3	1	40	3	0	30
16	4	2	60	4	0	40	Not Practical②		—
17	5	1	60	2	3	50	1	3	40
18	6	0	60	3	2	50	2	2	40
19	5	2	70	4	1	50	3	1	40
20	6	1	70	5	0	50	4	0	40
21	7	0	70	3	3	60	1	4	50
22	6	2	80	4	2	60	2	3	50
23	7	1	80	5	1	60	3	2	50
24	8	0	80	6	1	60	4	1	50
25	7	2	90	4	3	70	5	0	50
26	8	1	90	5	2	70	2	4	60
27	9	0	90	6	1	70	3	3	60
28	8	2	100	7	0	70	4	2	60
29	9	1	100	5	3	80	5	1	60
30	10	0	100	6	2	80	6	0	60
31	9	2	110	7	1	80	3	4	70
32	10	1	110	8	0	80	4	3	70
33	11	0	110	6	3	90	5	2	70
34	10	2	120	7	2	90	6	1	70
35	11	1	120	8	1	90	7	0	70
36	12	0	120	9	0	90	4	4	80
37	11	2	130	7	3	100	5	3	80
38	12	1	130	8	2	100	6	2	80
39	13	0	130	9	1	100	7	1	80
40	12	2	140	10	0	100	8	0	80

① Use (3) UVS310 instead of (3) UVS411B.
② Use 3-high or 4-high stacks.

Line Troughs

(Use Selection Chart #2 and Specification Chart #2)

Knowing the number of meter ***stacks***, (not meter positions!) and the height and width requirements, select quantity and catalog number of stacks from Selection Chart #2. For specs, refer to Specification Chart #2

Breaker Troughs

(Use Selection Chart #2 and Specification Chart #3)

Using the total number of meter ***stacks***, (not meter positions!), select the quantity and catalog number of breaker troughs from Selection Chart #2 and spec from Specification Chart #3. Use MP-T style breakers only. Breakers not included.

Phase Blocks

(Use Selection Chart #2 and Specification Chart #4)

Using the number of meter stacks and the incoming power supply, use Selection Chart #2 to determine the quantity and catalog number of phase blocks for line and neutral termination. Spec these from Specification Chart #4.

Selection Chart #2—Line Trough, Breaker Trough and Phase Block Selection

No. of Meter Stacks in Bank	Line Trough Selection			Breaker Trough Selection			Phase Block Section			
							3 Phase, 4 Wire System		1 Phase, 3 Wire System	
	Left Trough	Middle Trough	Right Trough	Left Trough	Middle Trough	Right Trough	Line Blocks	Neutral Block	Line Blocks	Neutral Block
3	ULT30①	—	—	UBT30	—	—	(3) UPB3	(1) UPB3	(2) UPB3	(1) UPB3
4	ULT40②	—	—	UBT40	—	—	(3) UPB3	(1) UPB6	(2) UPB6	(1) UPB6
5	ULT50	—	—	UBT50	—	—	(3) UPB6	(1) UPB6	(2) UPB6	(1) UPB6
6	ULT30③	—	ULT30	UBT30③	—	UBT30	(3) UPB6	(1) UPB6	(2) UPB6	(1) UPB6
7	ULT40③	—	ULT30	UBT40③	—	UBT30	(3) UPB6	(1) UPB12	(2) UPB12	(1) UPB12
8	ULT40③	—	ULT40	UBT40③	—	UBT40	(3) UPB6	(1) UPB12	(2) UPB12	(1) UPB12
9	ULT50③	—	ULT40	UBT50③	—	UBT40	(3) UPB6	(1) UPB12	(2) UPB12	(1) UPB12
10	ULT50③	—	ULT50	UBT50③	—	UBT50	(3) UPB12	(1) UPB12	(2) UPB12	(1) UPB12
11	ULT40④	ULT40	ULT30	UBT40④	UBT40	UBT30	(3) UPB12	(1) UPB12	(2) UPB12	(1) UPB12
12	ULT40④	ULT40	ULT40	UBT40④	UBT40	UBT40	(3) UPB12	(1) UPB12	(2) UPB12	(1) UPB12

① Spacer ULT10SP is required if line conductors exceed #6 AWG.
② Spacer ULT10SP is required if line conductors exceed #350 kcmil.
③ Requires (1) UCP1216 Coupler Kit. Kit provides coupling straps for both line and breaker troughs.
④ Requires (2) UCP1216 Coupler Kits. Kit provides coupling straps for both line and breaker troughs.

Specification Chart #2—Line Troughs 240V AC max. 1 Phase or 3 Phase

Stack Positions	Width① (Inches)	Catalog Number
2	20	**ULT20②**
3	30	**ULT30**
4	40	**ULT40**
5	50	**ULT50**

① Line troughs are 12″ high.
② Will not accommodate Phase Blocks.

Specification Chart #3—Breaker Troughs①

Stack Positions	Width① (Inches)	Catalog Number
2	20	**UBT20**
3	30	**UBT30**
4	40	**UBT40**
5	50	**UBT50**

① Use Murray Type MP-T circuit breakers. Breakers not included.
② Height is 16″.

Specification Chart #4—Phase Blocks 240V AC max. 1 Phase or 3 Phase

Number of Take-off Lugs	Catalog Number	Wire Range	
		Line①	Load
3	**UPB3**	3/8 x 16 Stud	#6 - #4/0
6	**UPB6**	3/8 x 16 Stud	#6 - #4/0
12	**UPB12**	3/8 x 16 Stud	#6 - #4/0

① Requires separate line lug kit.

Line Terminals

(Use Specification Chart #5)

Knowing the size and quantity per phase of the line conductors, select and spec these from Specification Chart #5. Line terminals come in kits of four terminal each. One kit will supply line terminals for three phase legs and neutral.

End Walls

(Use Specification Chart #6)

NOTE: Each installation MUST have an end wall kit! The kit provides end walls for each end of the line and breaker troughs. (Four end walls). Use Specification Chart #6.

Coupling Kits

(Use Selection Chart #2 and Specification Chart #6)

When more than one line trough is needed to support the number of meter stacks on a job, or when a line trough spacer is required, coupling straps are required to connect the troughs. Use Selection Chart #2 footnotes 3 and 4 to determine quantity of coupling kits required. Each kit provides one strap for line trough and one strap for breaker trough. Spec from Specification Chart #6.

Line Trough Spacer Kits

(Use Selection Chart #2 and Specification Chart #6)

In some applications, the first phase block may be too close to the end wall of the line trough to provide proper wire bend space for the line conductors being used. Selection Chart #2 footnotes 1 and 2 will show when spacer kits are required.

Tenant Circuit Breakers

Each meter position in use requires a tenant circuit breaker. Use standard Murray Type MP-T circuit breakers from the Murray Catalog.

Specification Chart #5—Line Terminals

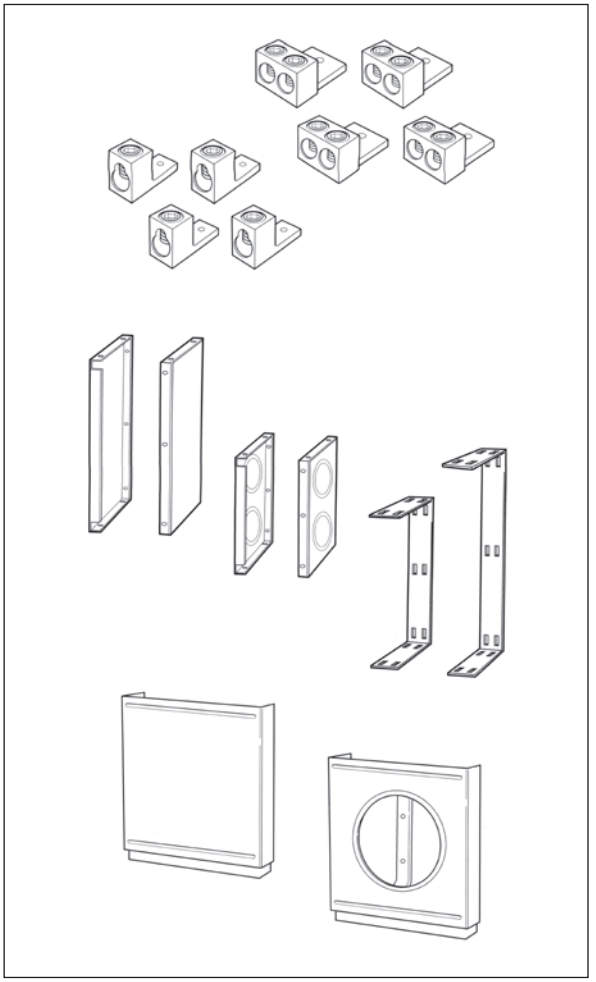
Wire Range	Catalog Number
(1) #6-350 kcmil	**ULK1350**
(1) #4-500 kcmil or (2) #1/0-250 kcmil	**ULK1500**
(2) #2-600 kcmil	**ULK2500**

Specification Chart #6—End Wall and Coupling Kits

Item	Catalog Number
End Wall Kit Contains 4 end walls; 2 for line trough and 2 for breaker trough.	**UEW1216**
Coupling Kit Contains 2 coupling straps; 1 for line trough and 1 for breaker trough.	**UCP1216**

Specification Chart #7—Accessories

Item	Catalog Number
Spacer 10″ spacer for use with line trough to provide wire bend space where required	**ULT10SP**
Meter Cover	**UMCVR**
Blank Position Cover	**UMBCVR**
Plastic Meter Cover (Ring Type)	**SX087M**
Breaker Filler Plate	**LX100FP**



GHN424NW



HHN426N



HUN361AW



Passed The Test of Time
All Murray safety switches have passed rigid testing requirements to assure reliable performance. In addition to tests designed and conducted during the development and manufacturing processes, switches have performed successfully in tests witnessed by Underwriters' Laboratories. These tests include those for general purpose safety switches and those designed for more specialized purposes where applicable.

Handle Lock-Off
Heavy duty, "H" series safety switches have a provision to lock the handle in the "OFF" position with a maximum of three padlocks. Doors may be locked closed with a padlock. General duty, "G" series switches may be locked in the "OFF" position with one padlock. There is also a padlock feature for locking the door.

General and Heavy Duty Switches Feature a Time Proven Design
A fast, long lasting switch design with a clean, continuous contact. That's the switching system that gives you on-going reliability. The concept is simple: split the arc to shorten the break distance. Uncomplicated mechanics and common sense design assure reliable performance time after time. All switches through 1200A feature visible blade contruction.

Load Break Ratings
All Murray safety switches are UL Listed for load break applications. Included in this process is a series of repeated make and break tests of the switch contacts while carrying the full rated nameplate current and rated voltage.

Horsepower Ratings
Where permitted, all Murray safety switches are UL horsepower Listed. The switch ratings are determined by tests that have been performed successfully in the UL overload test series, including repeated make and break tests of the stalled motor current of the motor for which it is being rated.

Some switches have two or more ratings for a particular voltage and current, and additional ratings if designed for multi-pole applications.

Depending on the switch and its application, various ratings may be assigned. All switches list the ratings on the inside of the cover or the door. The ampere rating and maximum AC voltage rating are always shown on the nameplate on the front of the switch.

Fault Current Performance
Murray Heavy Duty safety switches have successfully passed UL high level fault current tests. This means the risk of mechanical and thermal damage due to high level short circuit currents is minimized due to the reliable switch design.

Suitability tests for service with Class H, R, J, L, and T fuses have been conducted on heavy duty safety switches. Representative switches, with test fuses connected in series with each switch, were subjected to let-throughs in excess of the capacities of the largest fuses acceptable by the switches.

To pass the test, the switch must remain operable after being closed into a high amp available short circuit current. The test fuse is sized so that higher levels of let-through current and energy will be reached than would ever occur during normal usage in the field.

Murray General Duty safety switches have been tested to allow installation on circuits capable of delivering 100,000 AIC of fault current at 240V AC max. with Class R fuses and also with both Class J and T fuses in 100-600A ratings.

Fuse Interchangeability
General Duty Switches, Prefix G,* will accept the following UL class fuses:
Class H
Class K
Class R — Requires class "R" fuse kit to maintain UL listing.
Class J — 100–600A — field convertible.
Class T — with proper adapter kit (100–600A).
*Except 30 amp plug style switches.

Heavy Duty Switches, Prefix H, will accept the following UL class fuses:
Class H
Class K
Class R — Requires class "R" fuse kit to maintain UL listing.
Class J — All 30–600A, 600V and 100–600A, 240V switches — field convertible.
Class L — 800 and 1200A switches only.
Class T — 100–1200A switches with proper adapter kit.

Gutter Space
"G" and "H" series safety switch gutter dimensions conform to 2008 NEC Article #312.6(A). Top and bottom gutters conform to Table #312.6(B).

General Duty Switches; Prefix "G"

General duty switches are available in indoor TYPE 1 and outdoor TYPE 3R enclosures. Enclosures can be locked closed and operating handles can be locked "OFF". Series "G" switches have a quick-make, quick-break mechanism. Fusible switches are available in 1 pole S/N, 2 pole S/N and 3 pole S/N configurations. Non-fusible switches are available in 3 pole configurations. General duty switches are limited to 240V AC, 600 Amps max. rating.

All 30 Amp compact fusible and non-fusible "G" prefix switches are rated 10,000 Amp maximum withstand.

All 30–600 Amp "GF" and "GU" prefix switches are suitable for use on systems capable of delivering not more than 100,000 RMS symmetrical Amps of fault current with Class "R" fuses and the appropriate adapter kit installed. These 100–600 Amp "G" prefix switches may also be used on systems capable of delivering not more than 100,000 RMS symmetrical Amps of fault current with "T" fuses and the appropriate adapter kit installed. In addition, 100–600 general duty switches may also be used with J fuses on systems not capable of delivering more than 100,000 RMS symmetrical amperes of fault current. General duty switches are UL Listed for use as service equipment and are horsepower rated for use with motor loads.

General duty enclosed switches are used for light duty applications where loading and switching operations are not excessive.

Heavy Duty Switches, Single Throw; Prefix "H"

Heavy duty switches are available in indoor TYPE 1, outdoor TYPE 3R, Watertight Type 4/4X, and industrial TYPE 12 enclosures. Dual cover interlocks are provided, such that the door cannot be opened with the switch "ON" and the switch cannot be turned "ON" with the door open. A defeat mechanism allows servicing by authorized personnel. Handles may be locked "OFF" with up to 3 padlocks, and doors may be padlocked closed. Mechanism is "TEASE-PROOF" quick-make, quick-break. Fusible switches are available in 2 pole S/N, 3 pole and 3 pole S/N. Non-fusible switches are available in 3 pole.

Suitable for use on systems capable of delivering not more than 200,000 RMS symmetrical amperes of fault current when Class "J" or "R" fuses are installed except the 800 and 1200A switches, which are suitable for use on circuits capable of delivering not more than 200,000 RMS symmetrical amperes of fault current when Class "L" fuses are installed. 100–1200A switches with Class "T" fuses and field adapter kit 200,000 RMS symmetrical rated.

Heavy duty switches are dual horsepower rated and are listed by UL for use as service entrance equipment.

Heavy duty switches are intended for applications where rugged construction, reliable performance, continuity of service and ease of maintenance are required.

Protector-Lock® Switches; Prefix "H"

The Murray Protector-Lock® switch is designed to eliminate shock hazard due to disconnecting heavy duty portable electrical equipment under load. When the switch is in the "ON" position, the safety bar blocks the self-contained receptacle and prevents insertion or removal of the plug. When the switch is "OFF", the bar retracts, allowing insertion or removal of the plug.

Protector-Lock® switches consist of a heavy duty, 30 or 60 Amp, 600V AC, 3 pole fusible or non-fusible enclosed switch, and either Crouse-Hinds® or Arrow Hart® Industrial receptacles.

Applications include industrial plants where portable conveyors and welders are used, and truck terminals where on-board refrigeration units require stand-by power.

Double Throw Switches; Prefix "HD"

Double throw switches are available in TYPE 1 and TYPE 3R enclosures. Covers are dual interlocked with the operating mechanism such that the cover cannot be opened when the switch is in either "ON" position, and the switch handle cannot be moved to either "ON" position if the cover is open. Handle may be padlocked in the "OFF" position. Switching action is quick-make, quick-break in both "ON" positions.

They are available in 30–600 Amp ratings, 240V AC, fusible and non-fusible, two and three pole.

Double throw switches are usually applied as transfer switches to switch a load from one power source to another, but can be field converted to switch one power source between two loads. Switching mechanism is located on line side of fuses allowing for a safer fuse replacement. All are suitable for use as service equipment.

Industry and Government Specifications

Murray enclosed switches meet or exceed the latest revision of the following specifications:

Industry
NEMA
Standard #KS-1-2001

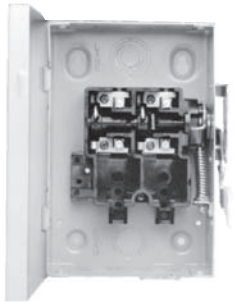
UL-Standard #98

U.S. Government
HD single throw, prefix "H":
Standard #WS-865c type "HD"
HD double throw, prefix "HD":
Standard #WS865c type "NDD"
GD 60–600 Amp, prefix "G":
Standard #WS 865c type "ND"; except where interlock is required.
GD 30 Amp, prefix "G":
Standard #WS-865c type "ND"; except where interlock is required.

Arrow Hart® and Crouse-Hinds® are registered trademarks of Cooper Industries, Inc.
Protector-Lock® is a registered trademark of Siemens Energy & Automation Inc.

General Duty Compact — 10,000 Amp Withstand Plug Fuse Type 1 & Type 3R

GU221



GP321N



General Duty Compact Safety Switches

Symbol	Fuse Type	Indoor TYPE 1 Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Outdoor TYPE 3R Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Hub	Horsepower Rating: Single Phase 120V AC Std	Max①	Single Phase 240V AC Std	Max①	Three Phase 240V AC Std	Max①
30 AMP FUSIBLE 1 POLE 2 WIRE S/N 120V AC (INSULATED GROUNDABLE NEUTRAL)														
Fig-1	Plug	**GP211N**	10	33.60	—	—	—	—	½	2	—	—	—	—
30 AMP FUSIBLE 2 POLE 3 WIRE S/N 240V AC (INSULATED GROUNDABLE NEUTRAL)														
Fig-2	Plug	**GP321N**	10	37.00	**GP321NW**	5	35.00	ECHA	½	2	1½	3	—	—
Fig-3	None	**GU221**	10	33.00	**GU221AW**	5	35.00	ECHA	—	2	—	3	—	—
60 AMP NON-FUSIBLE 2 POLE 240V AC SPECIAL APPLICATION SWITCH														
Fig-4	None	—	—	—	**GU222AW**	10	36.00	—②	—	—	—	10	—	—

Accessories and Lug Data —
See pages 3-48 and 3-49.
Dimensions —
See pages 3-50, 3-51 and 3-52.
Knockout Drawings —
See page 3-53.

Figure 1

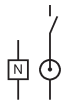


Figure 2

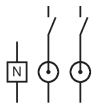


Figure 3



Figure 4

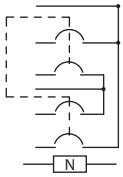


Hubs

Conduit Size (Inches)	Catalog Number	Approx. Wgt. Lbs. (Std. Pkg. — 1)
¾	**ECHA075**	.10
1	**ECHA100**	.10
1¼	**ECHA125**	.10

General Duty Stand-by Power Panel





This unique device provides an economical means to transfer from normal to an alternate source of power. It contains two 100A, 2-pole circuit breakers interlocked in a "double throw" configuration and supplies both overload and short circuit protection (10,000 AIC max.). The external handle is padlockable in the OFF position.

Outdoor TYPE Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Hub
100A 2 POLE 3 WIRE S/N 120/240V AC OUTDOOR TYPE 3R④			
DUL313NW③⑤	1	19.00	ECHS

①Starting current of motors above standard horsepower rating may require use of time delay fuses.
②Bottom cable entry & exit only.
③Suitable for service entrance application. Neutral factory installed. UL1008 listed as a non-automatic transfer switch under file #E315030. Suitable for use as Transfer Equipment on optional stand-by systems as defined by Article 702 of the NEC.
④Wire ranges (75°C Cu/Al) Line, load & neutral (1) #14-1 Service ground (1) #14-4
⑤Discount Schedule HDSM.

Safety Switches

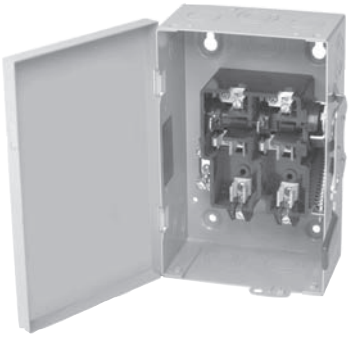
MURRAY

General Duty — 30–600 Amp, 10,000 & 100,000 Amp Withstand Cartridge Fuse Type 1 & Type 3R

GUN322



GHN321N



GHN423NW



Switch Selection with Class "H" Fuse Holders 30–600 Amps (Convertible to Class "R")①

Symbol	Amps	Indoor TYPE 1 Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Outdoor TYPE 3R Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Hub	Horsepower Rating Single Phase 240V AC Std	Single Phase 240V AC Max②	Three Phase 240V AC Std	Three Phase 240V AC Max②	Three Phase 250V DC Std
FUSIBLE 2 POLE 3 WIRE S/N 240V AC (INSULATED GROUNDABLE NEUTRAL)③④⑤													
Fig-1	30	**GHN321N**③	10	35.00	**GHN321NW**③	10	35.00	ECHA	1½	3	3	7½	5
	60	**GHN322N**③	1	14.00	**GHN322NW**③	1	14.00	ECHS	3	10	7½	15	10
	100	**GHN323N**③	1	23.00	**GHN323NW**③	1	24.00	ECHS	7½	15	15	30	20
	200	**GHN324N**③	1	47.00	**GHN324NW**③	1	48.00	ECHS	15	—	25	60	40
	400	**GHN325NH**⑦	1	128.00	**GHN325NWH**⑦	1	130.00	ECHV⑥	15	—	50	125	50
	400	**GHN325N**	1	153.00	**GHN325NW**	1	157.00	ECHV⑥	15	—	50	125	50
	600	**GHN326NH**⑦	1	133.00	**GHN326NWH**⑦	1	135.00	ECHV⑥	15	—	75	200	—
	600	**GHN326N**	1	159.00	**GHN326NW**	1	159.00	ECHV⑥	15	—	75	200	—
FUSIBLE 3 POLE 4 WIRE S/N 240V AC (INSULATED GROUNDABLE NEUTRAL)⑤													
Fig-2	30	**GHN421N**	5	24.00	**GHN421NW**	5	24.00	ECHA	1½	3	3	7½	5
	60	**GHN422N**	1	15.00	**GHN422NW**	1	15.00	ECHS	3	10	7½	15	10
	100	**GHN423N**	1	25.00	**GHN423NW**	1	25.00	ECHS	7½	15	15	30	20
	200	**GHN424N**	1	49.00	**GHN424NW**	1	50.00	ECHS	15	—	25	60	40
	400	**GHN425NH**⑦	1	136.00	**GHN425NWH**⑦	1	138.00	ECHV⑥	15	—	50	125	50
	400	**GHN425N**	1	158.00	**GHN425NW**	1	162.00	ECHV⑥	15	—	50	125	50
	600	**GHN426NH**⑦	1	138.00	**GHN426NWH**⑦	1	141.00	ECHV⑥	15	—	75	200	—
	600	**GHN426N**	1	161.00	**GHN426NW**	1	165.00	ECHV⑥	15	—	75	200	—
NON-FUSIBLE 3 POLE 240V AC (SEE PREVIOUS PAGE FOR 2 POLE, 30 AMPS; USE 3 POLE FOR 2 POLE APPLICATION FOR 60–200 AMPS)													
Fig-3	30	**GUN321**	5	24.00	**GUN321AW**	5	24.00	ECHA	—	3	—	7½	5
	60	**GUN322**	1	12.00	**GUN322AW**	1	13.00	ECHS	—	10	—	15	10
	100	**GUN323**	1	23.00	**GUN323AW**	1	24.00	ECHS	—	15	—	30	20
	200	**GUN324**	1	46.00	**GUN324AW**	1	47.00	ECHS	—	15	—	60	40

Accessories and Lug Data —
See pages 3-48 and 3-49.
Dimensions —
See pages 3-50, 3-51 and 3-52.
Knockout Drawings —
See page 3-53 and 3-54.

Figure 1

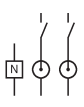


Figure 2

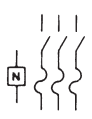


Figure 3



①"G" Series switches are UL Listed for use on circuits capable of delivering up to 100,000 Amps RMS symmetrical fault currents, provided Class "R" or "T" fuses and appropriate rejection or adapter kits are installed. T-fuses can only be used on 100–600 Amp. 100–600A switches can also be used with Class J fuses.

②Starting current of motors above standard horsepower rating may require use of time delay fuses.

③These switches are UL Listed for application on grounded B systems.

④Suitable for 3-pole motor loads.

⑤Has service entrance label, neutral factory installed.

⑥400A and larger Type 3R switches have no provisions for mounting hubs. Drill or punch hole in the field to accommodate hub size desired.

⑦Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

HHN422N



HHN323NW



HHN421NW



Switch Selection with Class "H" Fuse Holders (Convertible to Class "J", "R" or "T")①

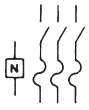
Symbol	Amps	Indoor TYPE 1 Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Outdoor TYPE 3R Catalog Number	Std. Pkg.	Approx. Wgt. Lbs.	Hub	Horsepower Rating: Single Phase 240V AC Std	Single Phase 240V AC Max③	Three Phase 240V AC Std	Three Phase 240V AC Max③	Three Phase 250V DC Std
FUSIBLE 2 POLE 3 WIRE S/N 240V AC (INSULATED GROUNDABLE NEUTRAL)④⑤⑧													
Fig-1	30	**HHN321N**	1	12.00	**HHN321NW**	1	13.00	ECHS	1½	3	3	7½	5
	60	**HHN322N**	1	18.00	**HHN322NW**	1	19.00	ECHS	3	10	7½	15	10
	100	**HHN323N**	1	23.00	**HHN323NW**	1	24.00	ECHS	7½	15	15	30	20
	200	**HHN324N**	1	47.00	**HHN324NW**	1	48.00	ECHS	15	—	25	60	40
	400	**HHN325NH⑨**	1	129.00	**HHN325NWH⑨**	1	131.00	ECHV⑦	15	—	50	125	50
	400	**HHN325N**	1	153.00	**HHN325NW**	1	157.00	ECHV⑦	15	—	50	125	50
	600	**HHN326NH⑨**	1	133.00	**HHN326NWH⑨**	1	135.00	ECHV⑦	15	—	75	200	—
	600	**HHN326N**	1	155.00	**HHN326NW**	1	159.00	ECHV⑦	15	—	75	200	—
	800	**HLN327N②⑥**	1	360.00	—	—	—	—	—	—	100	250	—
	1200	**HLN328N②⑥**	1	362.00	—	—	—	—	—	—	100	250	—
FUSIBLE 3 POLE 4 WIRE S/N 240V AC (INSULATED GROUNDABLE NEUTRAL)⑤⑧													
Fig-2	30	**HHN421N**	1	14.00	**HHN421NW**	1	15.00	ECHS	1½	3	3	7½	5
	60	**HHN422N**	1	19.00	**HHN422NW**	1	20.00	ECHS	3	10	7½	15	10
	100	**HHN423N**	1	25.00	**HHN423NW**	1	26.00	ECHS	7½	15	15	30	20
	200	**HHN424N**	1	49.00	**HHN424NW**	1	50.00	ECHS	15	—	25	60	40
	400	**HHN425NH⑨**	1	137.00	**HHN425NWH⑨**	1	138.00	ECHV⑦	15	—	50	125	50
	400	**HHN425N**	1	158.00	**HHN425NW**	1	162.00	ECHV⑦	15	—	50	125	50
	600	**HHN426NH⑨**	1	139.00	**HHN426NW H⑨**	1	142.00	ECHV⑦	15	—	75	200	—
	600	**HHN426N**	1	161.00	**HHN426NW**	1	165.00	ECHV⑦	15	—	75	200	—
	800	**HLN427N②⑥**	1	380.00	**HLN427NW②⑥**	1	383.00	ECHV⑦	—	—	100	250	—
	1200	**HLN428N②⑥**	1	382.00	**HLN428NW②⑥**	1	385.00	ECHV⑦	—	—	100	250	—

Accessories and Lug Data — See pages 3-48 and 3-49.
Dimensions — See pages 3-51 and 3-52.
Knockout Drawings — See pages 3-53 and 3-54.

Figure 1



Figure 2



①Switches through 1200 Amps listed by Underwriters' Laboratories for use on circuits delivering up to 200,000 Amps RMS symmetrical fault current, provided class "R", "J", "L", or "T" fuses are used. Rejection kits must be installed for "R" fuse application. "T" fuse adapter kit required for "T" fuse application. See Accessory Page.
"J" fuses can only be used on 100–600A ratings.
"T" fuses can only be used on 100–1200A ratings.

②Factory set for use with class "L" fuses.

③Starting current of motors above standard horsepower rating may require use of time delay fuses.

④Suitable for 3-pole motor loads.

⑤Suitable for service entrance application. Neutral factory-installed.

⑥Supplied without knockouts.

⑦400A and larger Type 3R switches have no provisions for mounting hubs. Drill or punch hole in the field to accommodate hub size desired.

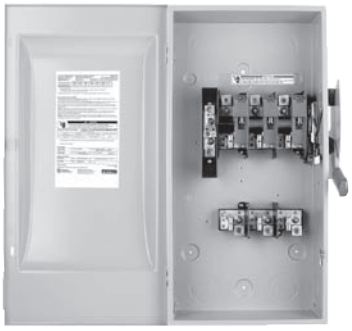
⑧Also rated 250V DC

⑨Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

HHN361AW



HHN364 Plus Neutral HN64M



Switch Selection with Class "H" Fuse Holders (Convertible to Class "J", "R" or "T")①

Symbol	Amps	Indoor TYPE 1 Catalog Number	Indoor TYPE 1 Approx. Wgt. Lbs. (Std. Pkg. 1)	Outdoor TYPE 3R Catalog Number	Outdoor TYPE 3R Approx. Wgt. Lbs. (Std. Pkg. 1)	Hub	Horsepower Rating 480V AC 1Ø Std	480V AC 1Ø Max④	480V AC 3Ø Std	480V AC 3Ø Max④	600V AC 1Ø Std	600V AC 1Ø Max④	600V AC 3Ø Std	600V AC 3Ø Max④	250V DC	600V DC
FUSIBLE 3 POLE 600V AC (NO NEUTRAL)⑤⑥																
Fig-1	30	**HHN361**	14.00	**HHN361AW**	15.00	ECHS	3	7½	5	15	3	10	7½	20	5	—
	60	**HHN362**	19.00	**HHN362AW**	20.00	ECHS	5	20	15	30	10	25	15	50	10	25
	100	**HHN363**	24.00	**HHN363AW**	25.00	ECHS	10	30	25	60	15	40	30	75	20	25
	200	**HHN364**	48.00	**HHN364AW**	49.00	ECHS	25	50	50	125	30	50	60	150	40	50
	400	**HHN365H⑧**	136.00	**HHN365AWH⑧**	137.00	ECHV⑦	—	—	100	250	—	—	350	50	—	—
	400	**HHN365**	154.00	**HHN365AW**	157.00	ECHV⑦	—	—	100	250	—	—	125	350	50	—
	600	**HHN366H⑧**	138.00	**HHN366AWH⑧**	141.00	ECHV⑦	—	—	150	400	—	—	500	50	—	—
	600	**HHN366**	157.00	**HHN366AW**	217.00	ECHV⑦	—	—	150	400	—	—	200	500	50	—
	800	**HLN367②**	380.00	**HLN367AW②**	382.00	ECHV⑦	—	—	200	500	—	—	200	500	—	—
	1200	**HLN368②**	383.00	**HLN368AW②**	385.00	ECHV⑦	—	—	200	500	—	—	200	500	—	—
FUSIBLE 3 POLE 4 WIRE S/N 480Y / 277V AC (INSULATED GROUNDABLE NEUTRAL)⑥																
Fig-2	30	③	—	**HHN461NW**	15.00	ECHS	3	7½	5	15	3	10	7½	20	5	—
	60	③	—	**HHN462NW**	20.00	ECHS	5	20	15	30	10	25	15	50	10	25
NON-FUSIBLE 3 POLE 600V AC (USE FOR 2 POLE)⑤⑥⑨																
Fig-3	30	**HUN361**	12.00	**HUN361AW**	13.00	ECHS	7½	—	—	15	—	10	—	20	5	—
	60	**HUN362**	18.00	**HUN362AW**	19.00	ECHS	20	—	—	30	—	25	—	50	10	25
	100	**HUN363**	23.00	**HUN363AW**	24.00	ECHS	30	—	—	60	—	40	—	75	20	25
	200	**HUN364**	46.00	**HUN364AW**	47.00	ECHS	50	—	—	125	—	50	—	150	40	50
	400	**HUN365**	114.00	**HUN365AW**	118.00	ECHV⑦	—	—	—	250	—	—	—	350	50	—
	600	**HUN366**	116.00	**HUN366AW**	120.00	ECHV⑦	—	—	—	400	—	—	—	500	—	—

Accessories and Lug Data — See pages 3-48 and 3-49.
Dimensions — See pages 3-51 and 3-52.
Knockout Drawings — See pages 3-53 and 3-54.

Figure 1



Figure 2

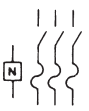


Figure 3



①Switches through 1200 Amps listed by Underwriters' Laboratories for use on circuits delivering up to 200,000 Amps RMS symmetrical fault current, provided class "R", "J", "L", or "T" fuses are used. Rejection kits must be installed for "R" fuse applications.

②Class "L" fuse provision. Single fuse per pole. Supplied without knockouts.

③Order 3 pole switch from chart above, and neutral from accessory page.

④Starting current of motors above standard horsepower rating may require use of time delay fuses.

⑤For service equipment or applications requiring a solid neutral, order neutral kit as an accessory, page 3-8.

⑥60-200A switches are also rated 600V DC when 2 poles are connected in series.

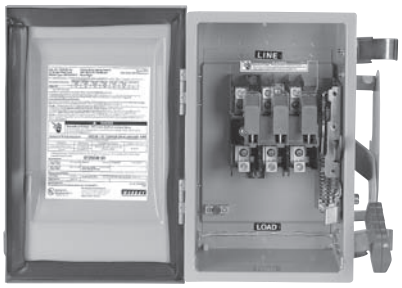
⑦400A and larger Type 3R switches have no provisions for mounting hubs. Drill or punch hole in the field to accommodate hub size desired.

⑧Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

⑨Non-fusible switches also have the following max. HP ratings.

Amps	1Ø 240V AC	3Ø 240V AC
30	5	10
60	10	20
100	15	40
200	15	60
400	15	125
600	15	200

HUN361AJ



Accessories and Lug Data —
See pages 3-48 and 3-49.
Dimensions —
See pages 3-51 and 3-52.

Figure 1



Figure 2



Switch Selection With Class "H" Fuse Holders (Convertible To Class "J", "R" or "T")①

Symbol	Amps	Industrial Type 12 Catalog Number	Approx. Wgt. Lbs. (Std. Pkg. 1)	Horsepower Rating 480V AC 3Ø Std	480V AC 3Ø Max②	600V AC 3Ø Std	600V AC 3Ø Max②	250V DC	600V DC
FUSIBLE 3 POLE 600V AC (NO NEUTRAL)③⑥									
Fig-1	30	**HHN361AJ**	14.00	5	15	7½	20	5	—
	60	**HHN362AJ**	20.00	15	30	15	50	10	25
	100	**HHN363AJ**	25.00	25	60	30	75	20	25
	200	**HHN364AJ**	49.00	50	125	60	150	40	50
NON-FUSIBLE 3 POLE 600V AC (USE FOR 2 POLE)③⑤⑥									
Fig-2	30	**HUN361AJ**	13.00	—	20	—	30	5	—
	60	**HUN362AJ**	19.00	—	50	—	60	10	25
	100	**HUN363AJ**	24.00	—	75	—	100	20	25
	200	**HUN364AJ**	47.00	—	125	—	150	40	50
	400	**HUN365AJ**	119.00	—	250	—	350	50	—

Symbol	Amps	Type 4X Stainless Steel Catalog Number	Approx. Wgt. Lbs. (Std. Pkg. 1)	Horsepower Rating 480V AC 3Ø Std	480V AC 3Ø Max②	600V AC 3Ø Std	600V AC 3Ø Max②	250V DC	600V DC
FUSIBLE 3 POLE 240V AC (NO NEUTRAL)③④									
Fig-1	30	**HHN321AS**	14.00	⑤	⑤	—	—	5	—
	60	**HHN322AS**	20.00	⑤	⑤	—	—	10	—
FUSIBLE 3 POLE 600V AC (NO NEUTRAL)③⑥									
Fig-1	30	**HHN361AS**	13.00	5	15	7½	20	5	—
	60	**HHN362AS**	20.00	15	30	15	50	10	25
	100	**HHN363AS**	25.00	25	60	30	75	20	25
	200	**HHN364AS**	49.00	50	125	60	150	40	50
NON-FUSIBLE 3 POLE 600V AC (NO NEUTRAL)③④⑤⑥									
Fig-2	30	**HUN361AS**	13.00	—	20	—	30	5	—
	60	**HUN362AS**	19.00	—	50	—	60	10	25
	100	**HUN363AS**	24.00	—	75	—	100	20	25
	200	**HUN364AS**	47.00	—	125	—	150	40	50

①Switches through 400 Amps listed by Underwriters' Laboratories for use on circuits delivering up to 200,000 Amps RMS symmetrical fault current, provided class "J", "R" or "T" fuses are used. Rejection kits must be installed for "R" fuse applications.

②Starting current of motors above standard horsepower rating may require use of time delay fuses.

③For service equipment or applications requiring a solid neutral, order neutral kit as an accessory, page 3-8.

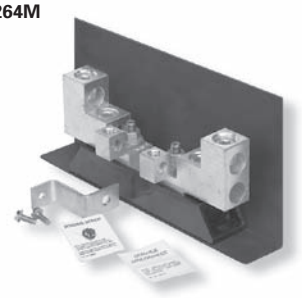
④Use 3 pole switch for 2 pole applications.

⑤240V 3Ø HP ratings are as follows:

Amps	HP Std	HP Max. Fusible	HP Max. Non-Fusible
30	3	7½	10
60	7½	15	20
100	15	30	40
200	25	60	60

⑥60-200A switches are also rated 600V DC when 2 poles are connected in series.

HNC264M



HDHN322



HDUN363AW



Double Throw Switches①⑧

Symbol	Amps	Indoor TYPE 1 Catalog Number	Indoor TYPE 1 Approx. Wgt. Lbs.	Outdoor TYPE 3R② Catalog Number	Outdoor TYPE 3R② Approx. Wgt. Lbs.	Hub	Horsepower Rating 1Ø Std	1Ø Max	3Ø Std	3Ø Max	250V DC
NON-FUSIBLE 2 POLE 240V AC											
Fig-1 ③	30	**HDUN221**	33.00	—	—	—	—	5	—	—	5
	60	**HDUN222**	35.00	—	—	—	—	10	—	—	10
	100	**HDUN223**	37.00	—⑦	—	—	—	15	—	—	20
	200	**HDUN224**	79.00	**HDUN224AW**⑦	79.00	ECHS	—	15	—	—	40
	400	**HDUN225**	180.00	**HDUN225AW**	185.00	②	—	—	—	—	50
NON-FUSIBLE 3 POLE 240V AC											
Fig-2 ③	30	**HDUN321**	34.00	—	—	—	—	5	—	10	5
	60	**HDUN322**	36.00	—	—	—	—	10	—	20	10
	100	**HDUN323**	37.00	**HDUN323AW**⑦	38.00	ECHS	—	15	—	40	20
	200	**HDUN324**	82.00	**HDUN324AW**⑦	82.00	ECHS	—	15	—	60	40
	400	**HDUN325**	190.00	—	—	—	—	—	—	125	50
FUSIBLE 3 POLE 240V AC											
Fig-3 ③	30	**HDHN321**	38.00	**HDHN321AW**	39.00	ECHS	—	3	—	7½	5
	60	**HDHN322**	43.00	**HDHN322AW**	44.00	ECHS	—	10	—	15	10
	100	**HDHN323**	45.00	**HDHN323AW**	46.00	ECHS	—	15	—	30	20
	200	**HDHN324**	92.00	—	—	—	—	15	—	60	40
	400	**HDHN325**④	230.00	—	—	—	—	—	—	125	50
NON-FUSIBLE 3 POLE 600V AC											
Fig-2 ③	30	**HDUN361**	34.00	**HDUN361AW**	35.00	ECHS	—	5	—	20 ⑤	5
	60	**HDUN362**	36.00	**HDUN362AW**	37.00	ECHS	—	10	—	50 ⑤	10
	100	**HDUN363**	37.00	**HDUN363AW**	38.00	ECHS	—	15	—	75 ⑤	20
	200	**HDUN364**	82.00	**HDUN364AW**	82.00	ECHS	—	15	—	125 ⑤	40
	400	**HDUN365**	—	**HDUN365AW**	195.00	②	—	—	—	250 ⑤	50
	600	**—**	—	**HDUN366AW**	200.00	②	—	—	—	250 ⑤	50

Neutral Kits

For use with Double Throw Switches

Switch Amps	Catalog Number
30	**HNC612M**
60-100	**HN263M**
200	**HNC264M**
400-600A	**HN678M**

Fuse Capabilities of Fusible Switches

Amp Rating	Fuse Type H	R	T	J
30 & 60 A	Std	Yes (kit)	No	No
100 & 200A	Std	Yes (kit)	Yes (kit)	Yes ⑥
400	No	No	Yes ⑥	Std.

Double Throw Switches – Lug Data

Switch Amp Range	Number of Cables Per Terminal	Cu and/or Al	Wire Range
30	1 pc.	Cu or Al	#14 to #6
60	1 pc.	Cu or Al	#14 to #2
100	1 pc.	Cu or Al	#14 to #1/0
200	1 pc.	Cu or Al	#6 to 250 kcmil
400	2 pcs.	Cu or Al	#1/0 to 250 kcmil
	1 pc.	Cu or Al	#1/0 to 750 kcmil
600	2 pcs.	Cu or Al	#1/0 to 500 kcmil

Figure 1

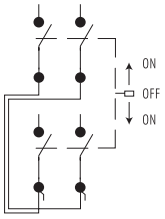


Figure 2

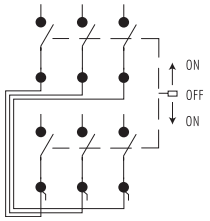
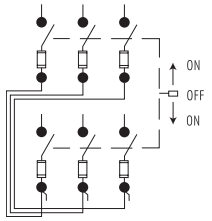


Figure 3



① Rated 10,000 AIC with Class H or 200,000 AIC when used with or protected by Class R, J or T fuses. Fuse rating must not exceed switch ampere rating.
② 400A and larger double throw switches do not have a hub provision.
③ Typical wiring diagrams for 30-200 amp switches are shown.
④ Switch accepts Class J or T fuses only.
⑤ HP ratings at 480V.
⑥ Move load side base.
⑦ General Duty Double Throw Switches are also available in 100 and 200A ratings. Contact sales for additional info.
⑧ A 100A 2P General Duty Stand-by Power Panel is also available on page 3-41.

HHN362CJ



Protector-Lock® Switches With Arrow Hart® Power Lock® Receptacles

Symbol	Switch Amps	Recept Amps	Industrial Enclosure Catalog Number	Industrial Enclosure Approx. Wgt. Lbs. (Std. Pkg. 1)	Use Plug #②	
FUSIBLE, 3 POLE 600V AC SWITCH						
Fig-1	30	30	**HHN361KJ**	17.00	AX103S	20415S
	60	30	**HHN362KJ**①	17.00	AX103S	20415S
	60	60	**HHN362LJ**	17.00		26415S

Protector-Lock® Switches With Crouse-Hinds® Receptacles

Symbol	Switch Amps	Recept Amps	Industrial Type 12 Catalog Number	Industrial Type 12 Approx. Wgt. Lbs. (Std. Pkg. 1)	Use Plug #②
FUSIBLE, 3 POLE 600V AC SWITCH (STYLE 2 RECEPTACLE, 4 WIRE, ONE WIRE GROUNDED)					
Fig-1	60	60	**HHN362CJ**	30.00	APJ6485
NON-FUSIBLE, 3 POLE 600V AC SWITCH (STYLE 2 RECEPTACLE, 4 WIRE, ONE WIRE GROUNDED)					
Fig-2	60	60	**HUN362CJ**	29.00	APJ6485

Figure 1

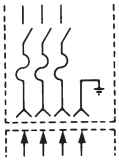
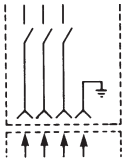


Figure 2



Accessories and Lug Data — See pages 3-48 and 3-49.
Dimensions — See pages 3-51 and 3-52.

①Not UL listed.
②See Accessories page 3-49 for plug selection.

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Protector-Lock® is a registered trademark of Siemens Energy & Automation, Inc.

Accessories



HN612M



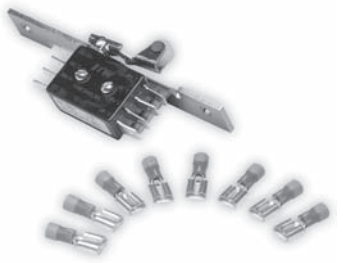
HT63M



HR612M



HA161234M



HA261234M

Neutral Kits①

Standard Neutral Kits can be field installed in General and Heavy Duty Switches.

Switch Ampere Rating	Kit Catalog Number
30 GD	**W410190M**
30 HD, 60 GD	**HN612M**
60, 100 HD, 100 GD	**HN623M**
200	**HN64M**
400 & 600	**HN656M**
800 & 1200 VBII	**HN678M**

Class T Fuse Adapter Kits③

All 200-600A, General Duty and 100-1200A Heavy Duty Switches are field convertible to accept Class T fuses. All new 400-600A switches are field convertible to accept Class T fuses by moving the load base to a pre-drilled T fuse position.

Catalog Number	Description
HT23M④	100A, 240V Kit
HT63M	100A, 600V Kit
HT24M④	200A, 240V Kit
HT64M	200A, 600V Kit
HX327TF	800A, 240V Kit
HX367TF	800A, 600V Kit
HX328TF	1200A, 240V Kit

Class R Fuse Clip Kits②

Catalog Number	Description
GSRK321M	30A, 240V Kit (GD only)
HR21M	30A, 240V Kit (HD only)
HR612M	30A, 600V Kit/60A, 240V Kit
HR62M	60A, 600V Kit
HR63M	100A Kit
HR64M	200A Kit
HR656M	400A/600A Kit

Equipment Ground Kits

Equipment Ground Lug Kits are available for all General Duty, Heavy Duty and Double Throw 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 Switches.

Switch Ampere Rating	Catalog Number	Number of Terminals	Wire Range Per Terminal (Cu/Al)
30A GD	**GSGK60M**	2	#14-8 AWG
60-200 GD	**HG61234M**	2	#14-4 AWG
30-200 HD	**HG61234M**	2	#14-4 AWG
400 & 600	**HG656M**	4	#6 AWG-250 Kcmil
800-1200	**HG678M**	8	#6 AWG-250 Kcmil

Class J Fuse

All 100-600A General Duty and 600V 30-600A Heavy Duty Switches are field convertible to accept Class J fuses by moving the load base to a pre-drilled J fuse position.

①All neutral kits are provided with a grounding lug and also contain a bonding provision.

②One kit per switch required for General and Heavy Duty switches. Two kits required per Doubble Throw Switch.

③(1) kit per pole required.

④100 and 200A Double Throw switches are also convertible from H to T fuses by using (6) kits per switch.

Type VBII 3R Hubs[1] (60–600A GD 30–1200A HD)

Conduit Size (Inches)	Catalog Number	Std. Pkg.	Ship. Wgt. (Std. Pkg.)	For Use on Switches Rated
¾	**ECHS075**	1	.50	30–200A HD, 60–200AGD
1	**ECHS100**	1	.50	30–200A HD, 60–200AGD
1¼	**ECHS125**	1	.50	30–200A HD, 60–200AGD
1½	**ECHS150**	1	.50	30–200A HD, 60–200AGD
2	**ECHS200**	1	.50	30–200A HD, 60–200AGD
2½	**ECHS250**	1	.50	30–200A HD, 60–200AGD
2½	**ECHV250**	1	1.00	400–1200A[3][5]
3	**ECHV300**	1	1.00	400–1200A[3][5]
3½	**ECHV350**	1	1.00	400–1200A[3][5]
4	**ECHV400**	1	1.00	400–1200A[3][5]

Auxiliary Contacts[7]

Auxiliary Contacts are available only for Heavy Duty and Double Throw Switches. The auxiliary contacts are available in 1 normally open and 1 normally closed or 2 normally open and 2 normally closed configurations. All auxiliary contacts make after and break before the main switch contacts.

Switch Ampere Rating	Aux. Switch Catalog Number	Kit Ampere Rating			Kit Horsepower Rating		
		125V AC	250V AC	28V DC	125V AC	250V AC	28V DC
		Max.	Max.	Max.	Max.	Max.	Max.
With 1 NO & 1 NC Isolated Contacts							
30-200	**HA161234M**	10	10	–	1/2	3/4	–
400-1200	**HA165678M**	10	10	–	1/2	3/4	–
With 2 NO & 2 NC Isolated Contacts							
30-200	**HA261234M**	10	10	7	1/2	3/4	–
400-1200	**HA265678M**	10	10	7	1/2	3/4	–

Compact & 30A GD Switch Hubs

Conduit Size (Inches)	Catalog Number	Approx. Wgt. Lbs. (Std. Pkg.—1)
¾	**ECHA075**	.10
1	**ECHA100**	.10
1¼	**ECHA125**	.10

Plugs for Protector-Lock® Switches

Catalog Number[2]	Approx. Wgt. Lbs. (Std. Pkg.—1)	Rating	Description
APJ6485	5.00	60A, 600V AC	High impact strength, copper-free aluminum. Accepts 0.64–1.37" diameter cord.
AX103S	.80	30A, 600V AC	Armored steel with cord grip. Accepts 0.562–1.000" diameter cord.

Closure Plates

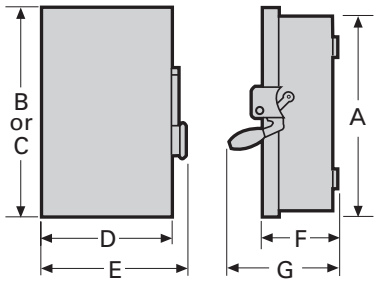
Catalog Number	Rating
ECHS000	[6]
ECHV000	400–1200A
HVHRA[4]	400–1200A

General & Heavy Duty Switches Lug Data

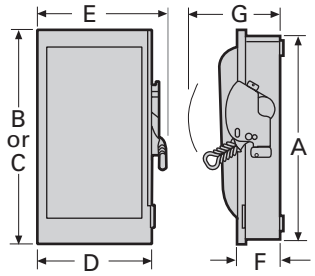
30-100A Switches are suitable for use with 60° or 75°C wire.
100-1200A are suitable for use with 75°C rated wire.

Wire Ranges (Line, Load and Standard Neutral)		
Switch Ampere Rating	**Wire Range with Wire-Bending Space Per NEC Table 373-6**	**Lug Range**
30 GD	#14-8 AWG (Cu/Al)[8]	#14-8 AWG (Cu/Al)[8]
30	#12-6 AWG (Al) or #14-6 AWG (Cu)	#14-2 AWG (Cu/Al)
60	#12-3 AWG (Al) or #14-3 AWG (Cu)	#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[9]	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[9]	(2) 3/0 AWG-750 Kcmil (Cu/Al) or (4) 3/0 -250 Kcmil (Cu/Al)	(2) 1/0 AWG-750 Kcmil (Cu/Al) or (4) 1/0 AWG-250 Kcmil (Cu/Al)
800	(3) 3/0 AWG-750 Kcmil (Cu/Al) Line and Load or (6) 3/0 AWG-250 Kcmil (Cu/Al) (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral	(3) 1/0 AWG-750 Kcmil (Cu/Al) Line and Load or (6) 1/0 AWG-600 Kcmil (Cu/Al) neutral (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral
1200	(4) 3/0 AWG-750 Kcmil (Cu/Al) or (4) 1/0 AWG-600 Kcmil (Cu/Al) neutral	(4) 1/0 AWG-750 Kcmil (Cu/Al) Line and Load (4) 1/0 AWG-600 Kcmil (Cu/Al) neutral

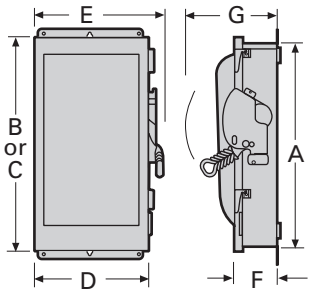
[1] Also for 30-200 double throw switches. Not for use on compact switches.
[2] Net Price. No discount.
[3] 400A and larger Type 3R switches have no provisions for mounting hubs. Drill or punch hole in the field to accommodate hub size desired.
[4] HV to HR adapter plate. Order ECHR series hub separately.
[5] For gasket kit for HV type hub order catalog number HVGKM.
[6] 60-200A GD, 30-200A HD
[7] Two auxiliary contacts required per double throw switch.
[8] Connector will accept up to #6; conductors on line side and retain UL listing. Also applies to 30 compact switches.
[9] Max. wire size for height reduced switches is 500 kcmil (Cu/Al).



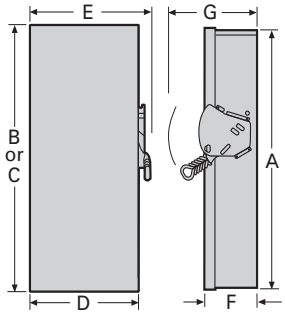
Type 1 or 3R
30A GD



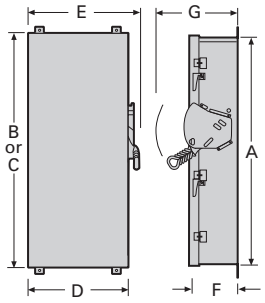
Type 1 or 3R
60-200A GD, 30-200A Type VBII



Type 4/4X or 12
30-200A Type VBII



Type 1 or 3R
400-1200A Type VBII



Type 4/4X or 12
400-600A Type VBII

Safety Switch Dimensions②

Catalog Number	Height			Width		Depth		Knockout Diagram①
	Box	With Door	With Rain Shed	Box	With Handle	Box	With Handle	
	A	B	C	D	E	F	G	
GHN321N	7.97	8.13	—	5.50	5.94	3.00	5.88	S1
GHN321NW	8.07	—	8.16	5.16	5.94	3.13	5.88	S3
GHN322N	14.26	15.45	—	6.64	8.70	5.05	8.63	S6
GHN322NW	14.39	—	15.76	6.64	8.70	5.05	8.63	S8
GHN323N	21.95	23.15	—	9.64	11.70	5.05	8.63	S10
GHN323NW	21.95	—	23.46	9.64	11.67	5.05	8.70	S11
GHN324N	29.90	31.07	—	14.62	16.68	6.36	10.92	S12
GHN324NW	29.90	—	31.42	14.61	16.68	6.36	10.92	S13
GHN325N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
GHN325NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
GHN325NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
GHN325NWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
GHN326N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
GHN326NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
GHN326NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
GHN326NWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
GHN421N	7.97	8.19	—	7.19	7.69	3.00	5.88	S2
GHN421NW	8.07	—	8.16	7.19	8.16	3.13	5.88	S4
GHN422N	14.26	15.45	—	6.64	8.70	5.05	8.63	S6
GHN422NW	14.39	—	15.76	6.64	8.70	5.05	8.63	S8
GHN423N	21.95	23.15	—	9.64	11.70	5.05	8.63	S10
GHN423NW	21.95	—	23.46	9.64	11.67	5.05	8.70	S11
GHN424N	29.90	31.07	—	14.62	16.68	6.36	10.92	S12
GHN424NW	29.90	—	31.42	14.61	16.68	6.36	10.92	S13
GHN425N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
GHN425NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
GHN425NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
GHN425NWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
GHN426N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
GHN426NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
GHN426NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
GHN426NWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
GP211N	7.97	8.13	—	5.50	5.94	3.00	5.38	S2
GP321N	7.97	8.13	—	5.50	5.94	3.00	5.38	S1
GP321NW	8.07	—	8.16	5.16	5.94	3.13	5.38	S3
GU221	7.97	8.13	—	5.50	5.94	3.00	5.88	S1

①Knocks not provided on Type 4/4X and 12 or in 800 & 1200A Switches.

②Accurate to ±⅛".

Dimensions — General & Heavy Duty Switches

Safety Switch Dimensions②

Catalog Number	Height④ Box A	With Door B	With Rain Shed C	Width Box D	With Handle E	Depth Box F	With Handle G	Knockout Diagram①
GU221AW	8.07	—	8.16	5.16	5.94	3.13	5.38	S5
GU222AW	8.07	—	8.16	5.22	5.94	2.94	5.38	S5
GUN321	7.97	8.19	—	7.19	7.69	3.00	5.88	S2
GUN321AW	8.07	—	8.16	7.19	7.69	3.13	5.88	S4
GUN322	11.11	12.31	—	6.64	8.71	5.05	8.61	S7
GUN322AW	11.11	—	12.62	6.64	8.71	5.05	8.61	S9
GUN323	21.95	23.15	—	9.64	11.70	5.05	8.63	S10
GUN323AW	21.95	—	23.46	9.64	11.67	5.05	8.70	S11
GUN324	29.90	31.07	—	14.62	16.68	6.36	10.92	S12
GUN324AW	29.90	—	31.42	14.61	16.68	6.36	10.92	S13
HHN321AS	14.27	15.45	—	6.65	9.02	5.32	10.46	—
HHN321N	14.26	15.45	—	6.64	9.01	5.05	10.17	S6
HHN321NW	14.39	—	15.77	6.64	9.01	5.05	10.17	S8
HHN322AS	16.27	19.31	—	9.17	11.47	5.33	10.46	—
HHN322N	16.26	17.46	—	9.15	11.53	5.05	10.17	S16
HHN322NW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17
HHN323N	21.95	23.15	—	9.64	12.01	5.05	10.17	S10
HHN323NW	21.95	—	23.46	9.64	11.97	5.05	10.17	S11
HHN324N	29.90	31.07	—	14.62	16.98	6.36	12.33	S12
HHN324NW	29.90	—	31.42	14.61	16.99	6.36	12.33	S13
HHN325N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
HHN325NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN325NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
HHN325NWH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN326N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
HHN326NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN326NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
HHN326NWH	45.25	45.82	—	24.64	26.21	9.23	14.68	S15
HHN361	14.26	15.45	—	6.64	9.01	5.05	10.17	S6
HHN361AJ	14.27	15.45	—	6.65	9.02	5.32	10.46	—
HHN361AS	14.27	15.45	—	6.65	9.02	5.32	10.46	—
HHN361AW	14.39	15.45	15.77	6.64	9.01	5.05	10.17	S8
HHN362	16.26	17.46	—	9.15	11.53	5.05	10.17	S16
HHN362AJ	16.27	17.46	—	9.17	11.47	5.33	10.46	—
HHN362AW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17
HHN362AS	16.27	17.46	—	9.17	11.47	5.33	10.46	—
HHN362CJ③	16.27	17.46	—	9.10	11.47	5.33	10.46	—
HHN361KJ③	14.27	15.45	—	6.65	9.02	5.32	10.46	—
HHN362KJ③	16.27	17.46	—	9.10	11.47	5.33	10.46	—
HHN362LJ③	16.27	17.46	—	9.10	11.47	5.33	10.46	—
HHN363	21.95	23.15	—	9.64	12.01	5.05	10.17	S10
HHN363AJ	21.96	23.16	—	9.65	12.02	5.34	10.46	—
HHN363AS	21.96	23.16	—	9.65	12.02	5.34	10.46	—
HHN363AW	21.95	—	23.46	9.64	11.97	5.05	10.17	S11
HHN364	29.90	31.07	—	14.62	16.98	6.36	12.33	S12
HHN364AJ	29.96	31.07	—	14.62	16.95	6.63	12.58	—
HHN364AS	29.96	31.07	—	14.62	16.95	6.63	12.58	—
HHN364AW	29.90	—	31.42	14.61	16.99	6.36	12.33	S13
HHN365	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
HHN365H	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN365AW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
HHN365AWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
HHN366	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
HHN366H	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN366AW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
HHN366AWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
HHN421N	14.26	15.45	—	6.64	9.01	5.05	10.17	S6
HHN421NW	14.39	—	15.77	6.64	9.01	5.05	10.17	S8
HHN422N	16.26	17.46	—	9.15	11.53	5.05	10.17	S16
HHN422NW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17
HHN423N	21.95	23.15	—	9.64	12.01	5.05	10.17	S10
HHN423NW	21.95	—	23.46	9.64	11.97	5.05	10.17	S11
HHN424N	29.90	31.07	—	14.62	16.98	6.36	12.33	S12
HHN424NW	29.90	—	31.42	14.61	16.99	6.36	12.33	S13
HHN425N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
HHN425NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN425NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
HHN425NWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
HHN426N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14
HHN426NH	45.25	45.82	—	24.64	26.21	9.23	14.68	S14
HHN426NW	56.07	—	57.19	24.64	26.70	9.23	14.68	S15
HHN426NWH	45.31	—	46.44	24.64	26.70	9.23	14.68	S15
HHN461NW	14.39	—	15.77	6.64	9.01	5.05	10.17	S8
HHN462NW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17
HLN327N	66.67	67.16	—	38.40	39.96	9.24	14.68	—
HLN328N	66.67	67.16	—	38.40	39.96	9.24	14.68	—
HLN367	66.67	67.16	—	38.40	39.96	9.24	14.68	—
HLN367AW	66.67	—	67.74	38.40	39.96	9.24	14.68	—

①Knocks not provided on Type 4/4X and 12 or in 800 & 1200A Switches.
②Accurate to ±⅛".
③Dimensions are for switch less receptacle and mounting feet.
④Dimensions are less mounting feet on Type 12 and 4X switches.

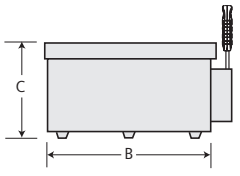
Dimensions — General & Heavy Duty Switches, Protector-Lock® Switches, Double Throw Switches

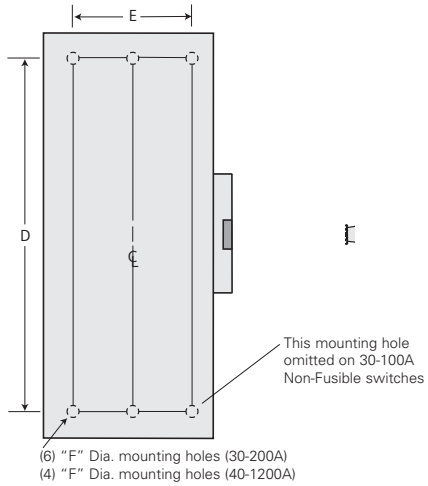
Safety Switch Dimensions③④

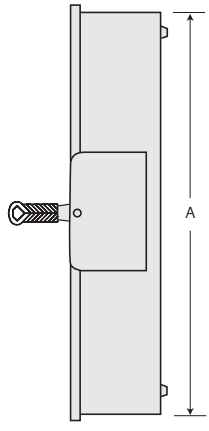
Catalog Number	Height			Width		Depth		Knockout Diagram①
	Box	With Door	With Rain Shed	Box	With Handle	Box	With Handle	
	A	B	C	D	E	F	G	
HLN368	66.67	67.16	—	38.40	39.96	9.24	14.68	—
HLN368AW	66.67	—	67.74	38.40	39.96	9.24	14.68	—
HLN427N	66.67	67.16	—	38.40	39.96	9.24	14.68	—
HLN427NW	66.67	—	67.74	38.40	39.96	9.24	14.68	—
HLN428N	66.67	67.16	—	38.40	39.96	9.24	14.68	—
HLN428NW	66.67	—	67.74	38.40	39.96	9.24	14.68	—
HUN361	11.11	12.31	—	6.64	9.01	5.05	10.17	S7
HUN361AJ	11.12	12.31	—	6.65	9.02	5.56	10.46	—
HUN361AW	11.11	—	12.63	6.64	9.01	5.05	10.17	S9
HUN361AS	11.12	12.31	—	6.65	9.02	5.56	10.46	—
HUN362	16.26	17.46	—	9.15	11.53	5.05	10.17	S16
HUN362AJ	16.27	17.46	—	9.17	11.47	5.33	10.46	—
HUN362AW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17
HUN362AS	16.27	17.46	—	9.17	11.47	5.33	10.46	—
HUN362CJ②	16.26	17.46	—	9.17	—	5.33	10.46	—
HUN363	21.95	23.15	—	9.64	12.01	5.05	10.17	S10
HUN363AJ	21.96	23.16	—	9.65	12.02	5.34	10.46	—
HUN363AS	21.96	23.16	—	9.65	12.02	5.34	10.46	—
HUN363AW	21.95	—	23.46	9.64	11.97	5.05	10.17	S11
HUN364	29.90	31.07	—	14.62	16.98	6.36	12.33	S12
HUN364AJ	29.96	31.07	—	14.62	16.95	6.63	12.58	—
HUN364AS	29.96	31.07	—	14.62	16.95	6.63	12.58	—
HUN364AW	29.90	—	31.42	14.61	16.99	6.36	12.33	S13
HUN365	44.00	44.57	—	24.64	26.21	9.23	14.68	S14
HUN365AJ	44.14	44.57	—	24.82	26.44	9.19	14.64	—
HUN365AW	44.07	—	45.19	24.64	26.95	9.23	14.68	S15
HUN366	44.00	44.57	—	24.64	26.21	9.23	14.68	S14
HUN366AW	44.07	—	45.19	24.64	26.95	9.23	14.68	S15

VBII Design Double Throw Dimensions (Inches)⑤

Catalog Number	Enclosure			Mounting		
	A	B	C	D	E	F
(30-600A Type 1 & 3R) ⑤						
HDUN221, HDUN321, HDUN361, HDUN361AW	24.50	9.53	6.09	19.00	6.75	0.268
HDHN321, HDHN321AW	29.12	9.53	6.09	23.50	6.75	0.268
HDUN222, HDUN322, HDUN362, HDUN362AW	24.88	11.50	6.09	19.00	9.38	0.268
HDHN322, HDHN322AW	33.53	11.50	6.09	27.50	9.38	0.268
HDUN223, HDUN323, HDUN323AW, HDUN363, HDUN363AW	27.62	12.18	6.09	19.36	8.00	0.268
HDHN323, HDHN323AW	36.44	12.18	6.09	28.11	8.00	0.268
HDUN224, HDUN324, HDUN224AW HDUN324AW, HDUN364, HDUN364AW	36.00	19.12	6.42	31.02	15.00	0.44
HDHN324	49.48	19.12	6.42	44.50	15.00	0.44
HDHN325	74.00	28.38	9.38	65.50	16.00	0.56
HDUN225, HDUN325, HDUN225AW HDUN365, HDUN365AW, HDUN366AW	57.78	28.38	9.38	49.75	16.00	0.56







① Knockouts not provided on Type 4/4X and 12 or on 800 & 1200A switches.

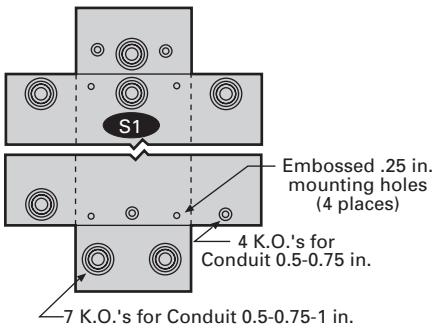
② Dimensions are for switch-less receptacle & mounting feet.

③ Accurate to ±1/8".

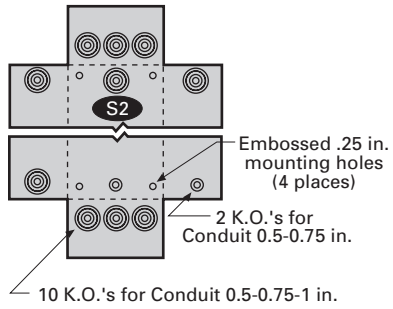
④ For dimensions in millimeters, multiply inches by 25.4.

⑤ Drip hood not shown but supplied on Type 3R enclosures.

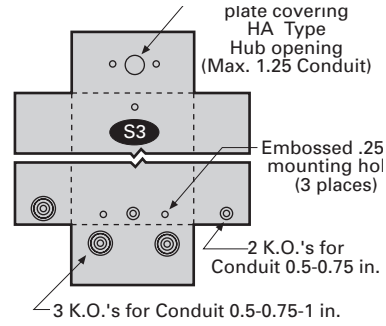
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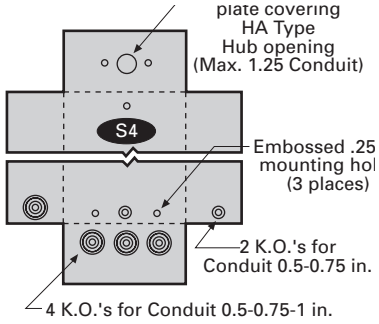
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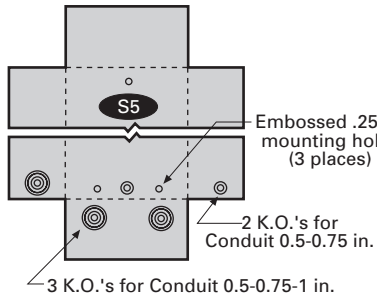
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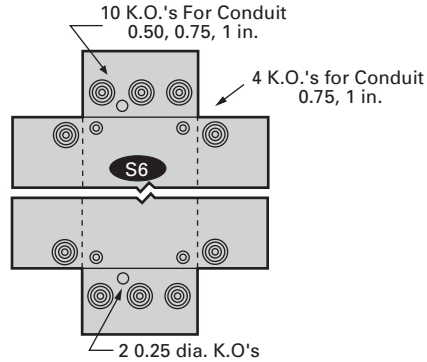
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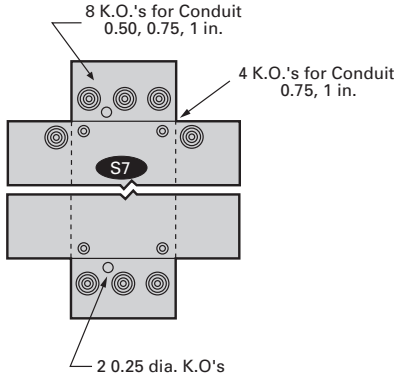
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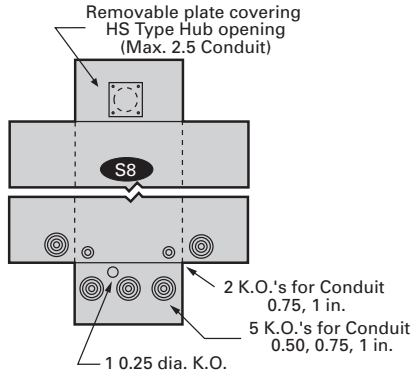
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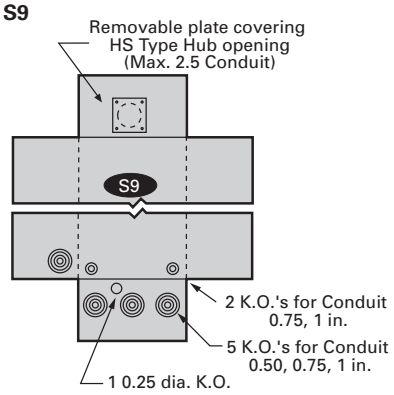


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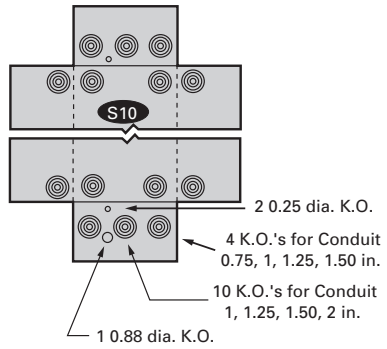


Knockout Drawings

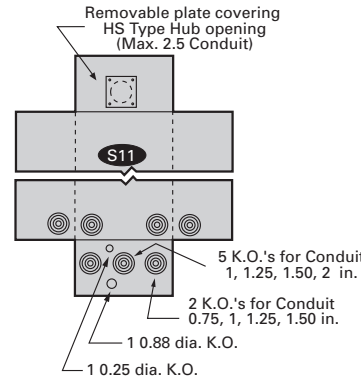
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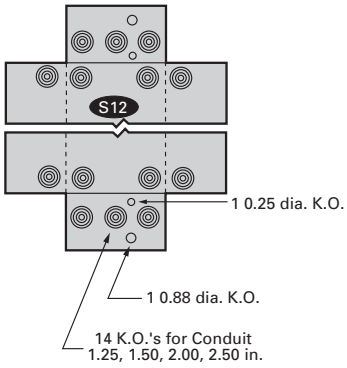
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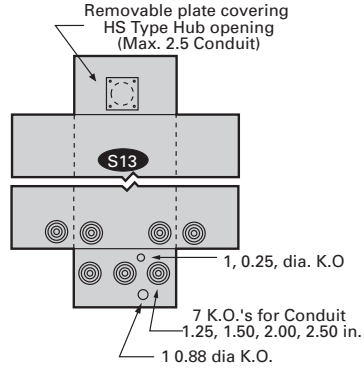
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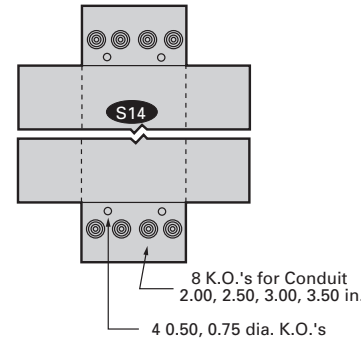
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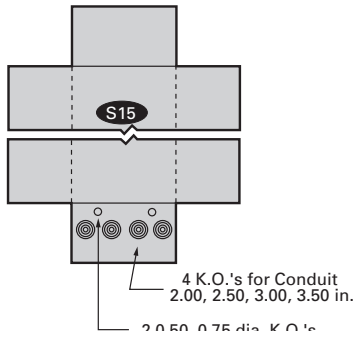
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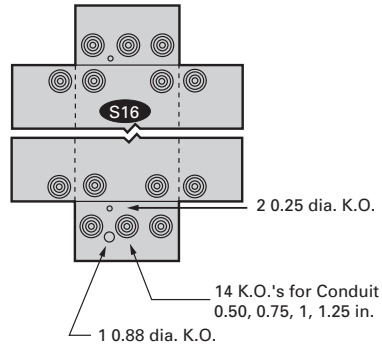
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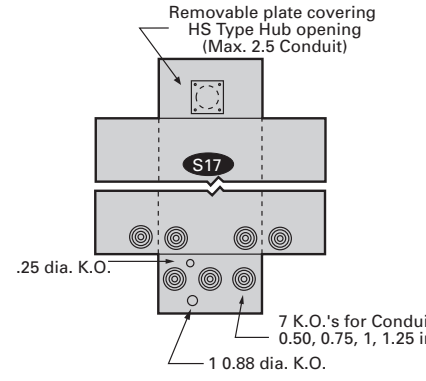
S15



S16



S17



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Type VBII Safety Switches

Guide Form Specifications

	General Duty	Heavy Duty	Double Throw
Application	General Duty Switches are intended for applications where reliable performance and continuity of service are needed, but where duty requirements are not severe and usual service conditions prevail. (These switches are intended for use primarily with supply circuits rated 240V AC or less where the available fault current is less than 100,000A when used with Class R or T fuses or 10,000A max. when used with Class H fuses.)	Heavy Duty Switches are intended for use in applications where: 1. Rugged construction, reliable performance, continuity of service and ease of maintenance are emphasized, or 2. Available fault currents higher than 10,000A are likely to be encountered, such as in manufacturing plants, mass production industries, and commercial, institution-al and other large buildings served by network systems or transformers of higher capacities. 3. System voltage is 600V AC or DC Max. 4. A Type 12 or 4 / 4X enclosure is required.	Double throw switches are intended to transfer loads from one power source to another. All 2 & 3 pole double throw switches are suitable for use as service equipment. All are UL Listed. Switches are rated for use on systems with an available fault current of up to 10,000 AIC when protected with Class H fuses or either 100,000 or 200,000 AIC when protected with Class R, J or Class T fuses. They can also be used to connect a single source of power to either of two loads, In this application it is necessary to field modify fusible switches so that the fuses are on the load side of the switching mechanism.
Short Circuit Withstand Ratings	Suitable for use on systems capable of delivering not more than 100,000 RMS symmetrical amperes of fault current as follows: Sw. Rating / AIC Rating / Protective Device① 30-600A / 10,000 / Circuit Breaker 30-600A / 10,000 / Class H Fuse 30-600A / 100,000 / Class R Fuse 100-600A / 100,000 / Class J or T Fuse	Suitable for use on systems capable of delivering not more than 200,000 RMS symmetrical amperes of fault current as follows: Sw. Rating & Tpye / AIC Rating / Protective Device① All Heavy Duty & DT / 10,000 / Circuit Breaker 30-600A HD & DT / 10,000 / Class H Fuse 60A Compact HD / 100,000 / Class R, J or T Fuse GD & 4P DT / 100,000 / Class R, J or T Fuse 30-600A HD / 200,000 / Class R, J or T Fuse 30-600A DTF & DTNF DT② / 200,000 / Class R, J or T Fuse 800 & 1200A HD & DT② / 200,000 / Class L or T Fuse	
Fuses	Fusible switches will accept the following UL class fuses: 30 "LF" - 30A max plug Fuses 30-600A "GF" Class H & K, Class R with kit 100-600A "GF" Class J-move base 100-200 "GF" Class T with kit 400-600A "GF" Class T-move bases	Fusible switches will accept the following UL class fuses: 30-600A "HF" Class H & K, Class R with kit 30-600A, 600V "HF" Class J-move base 100-600A, 240V "HF" Class J-move base 100-200A "HF" Class T with kit 400-600A "HF" Class T-move bases 800-1200A "HF" Class L, Class T with kit③	Fusible switches will accept the following UL class fuses: 30-200A "DT" & "F" Class H & K, Class R with kit 30 & 60A 600V "DT" Class J-move base 100-200A "DT" Class J-move base, Class T with kit 400-600A "DT" Class J-standard, Class T-move bases 400A 240v "F" Class H-standard 400A, 600V & 600A "F" Class T-Standard
Cover Interlocks	Voidable – cover interlocks on switches prevent the switch door from being opened when in the "ON" position. No cover interlock on 30A Type 3R or on plug fuse type switches.	Voidable dual cover interlocks standard on all heavy duty switches. Prevents cover from being opened when switch is in the "ON" position and prevents switch from being turned "ON" when door is opened.	Dual cover interlocks standard on all double throw switches. Prevents cover from being opened when switch is in the "ON" position and prevents switch from being turned "ON" when door is opened.
Underwriters' Laboratories, Inc.	Listed by UL under file #E4776 as enclosed switches and also suitable for use as service equipment (where applicable). UL98 Enclosed and Deadfront Switches.		
NEMA Specifications	Meet NEMA standard KS-1-2001 for type GD switches.	Meet NEMA standard KS-1-2001 for type HD switches.	Meet NEMA standard KS-1-2001 type GD for "DTG" & type HD for "DT", "F" & "NF" switches.
Seismic Qualifications	All GD & HD switches and "DT" type double throw switches have been tested and comply with the 2010 California Building Code (CBC) and with the 2009 International Building Code (IBC) - Compliance Level SDS = 1.85 g		
Groundable Neutral (All neutrals are bondable for service entrance use.)	Fusible switches have groundable neutral blocks factory installed. Non-fusible switches accept field addable neutrals.	All switches (both Fusible and Non-Fusible) are either supplied with factory installed neutrals or accept field addable neutrals.	All except 4 pole switches will accept field addable neutrals except that "DTG" 100 & 200A switches are also available with factory installed neutrals.
Padlocks	Padlockable cover latch. OFF padlock provisions on handle.	Padlockable cover latch and multiple OFF padlock provisions on handle.	Padlockable cover latch and multiple OFF padlock provisions on handle.
HP & Load Break Ratings	All General Duty, Heavy Duty and Double Throw Switches are both load break and horsepower rated.		

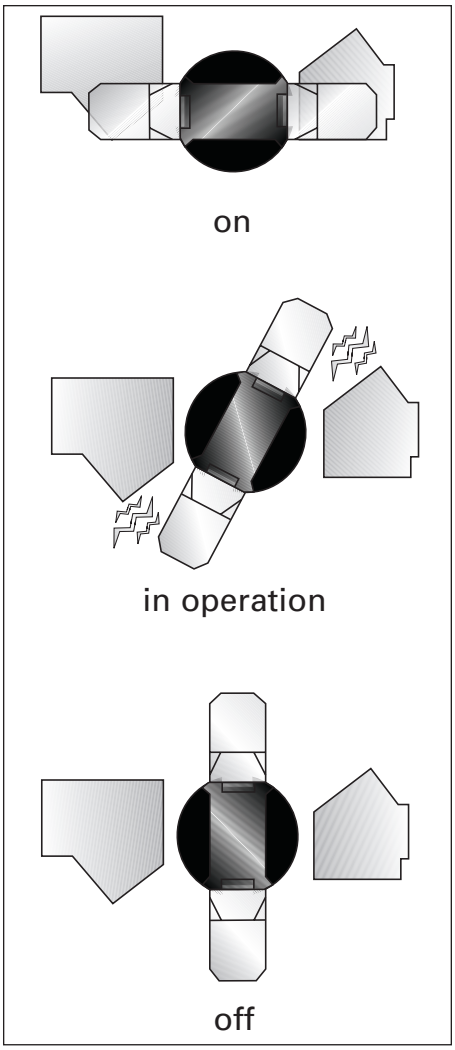
① The protective device can either be a fuse installed in a fusible switch or an upstream fuse or circuit breaker protecting a non-fusible switch. The ampere rating of the upstream protective device must not exceed the switch ampere rating.

② All 4 pole and fusible double switches with catalog numbers starting with "F" are rated 100,000 AIC max.

③ Class T kit available for 240V max. applications on 1200A switches.

Feature Comparison

General Duty	Heavy Duty	Double Throw	Features / Ratings
▪	▪	▪	30 thru 600 Amps
	▪	▪	800 and 1200 Amps
▪	▪	▪	240 Volt AC
	▪	▪	600 Volt AC
▪	▪	▪	250 Volt DC
	▪		600 Volt DC
▪	▪	▪	Double-break visible blade design (30-200A)
▪	▪	▪	Quick-make, quick-break switching action
▪	▪	▪	Highly visible ON/OFF handle indication
	▪		Handle design for hook stick operation
▪	▪	▪	Padlockable cover latch
▪	▪	▪	Padlockable handle
▪③		▪	Single voidable cover interlock
	▪	▪	Dual voidable cover interlock
▪	▪	▪	Type 1 enclosure
▪	▪	▪	Type 3R enclosure
	▪	▪	Type 12 enclosure
	▪	▪	Type 4 / 4X enclosures
▪	▪	▪	Generous wiring gutters that meet UL and NEC wire-bending space requirements
▪	▪	▪	Lugs suitable for copper or aluminum at 60˚ or 75˚C
▪	▪	▪	CU/AL wire lugs that meet UL 486B requirements
	▪	▪	Suitable for field-convertible compression connectors
▪⑥	▪	▪	All plated copper current carrying parts (except lugs)
▪	▪	▪	Spring reinforced Fuse Clips (except 30A general duty)②
	▪	▪	Clear pivoting line terminal shield
▪	▪	▪	Replacement parts
	▪		Field addable 200% neutral
▪⑦	▪①⑦	▪①⑦	Provisions for UL Class T, R and H Fuses
	▪	▪①	Provisions for UL Class J and L Fuses
	▪	▪	Metal nameplate
60-600A	▪	▪	Aux. switch kits
	▪④		Type 4X with stainless steel interior parts
▪⑤	▪		Rolled flange enclosure design (30-200A)
	▪	▪	Isolated ground kits



Double Break Switching Action

Like the time-proven Vacu-Break Design, the Siemens VBII double break switching action breaks the arc in two places in 30-200A ratings. This reduces heat generation and increases switching speed by doubling the breaking distance. The result is enhanced performance and increased longevity. We also provide the most visible blade design available today. Unlike conventional knife blade switches, the blades are self-aligning to ensure positive contact. In addition, they have no wear and friction point since the "electrical hinge" has been eliminated. The result is a very fast, positive and reliable switching action for even the most severe applications.

① 400, 600V & 600A fusible, double-throw switches accept only Class J or T fuses. Only 800 & 1200A HD switches will accept Class L fuses.
② 30A general duty switches have fuse clips constructed of spring type copper.
③ Not supplied on 30A outdoor & plug fuse switches.
④ 30-200A Type VBII in stainless steel enclosures.
⑤ 60-200A.
⑥ 200A general duty switches have aluminum neutral assemblies.
⑦ 100-600A GD & DT and 100-1200A HD switches will accept Class T fuses.

Enclosure Types

A **Type 1** enclosures are intended for indoor use primarily to provide protection against contact with the enclosed equipment in locations where unusual service conditions do not exist.

B **Type 3R** enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet and must remain undamaged by the formation of ice on the enclosure. They are not intended to provide protection against conditions such as dust, internal condensation, or internal icing.

C **Type 4, 4X** enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust, rain, splashing water and hose-directed water. They are not intended to provide protection against conditions such as internal condensation or internal icing. Also meets 4X definition by providing a high degree of protection against corrosion. Siemens 30-200A stainless steel 4X switches are supplied stainless interior parts and hardware as standard.

D **Type 4** enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust, rain, splashing water and hose-directed water. They are not intended to provide protection against conditions such as internal condensation or internal icing.

E **Type 12**① enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping water. They are not intended to provide protection against conditions such as internal condensation.

Type 7/9 enclosures for use in hazardous locations. Use with molded case switches listed in Section 7.



A



B



C D



E

Load Break Ratings

All Siemens safety switches are load break rated. The load break rating is assigned by UL after the switching unit has successfully performed the following tests:

Switch Ampere Rating	Number of ON/OFF Operations per Minute	Number of Operations		
		With Current	Without Current	Total
30–100	6	6000	4000	10000
200	5	6000	2000	8000
400	4	1000	5000	6000
600	3	1000	4000	5000
800	2	500	3000	3500
1200	1	500	2000	2500

Horsepower Ratings

All Siemens safety switches, where appropriate, are horsepower rated. Ratings are approved by UL only after the switching unit has undergone testing to determine its acceptability which includes repeated interruption of the locked rotor current of the motor for which it is to be rated as follows:

Max HP Rating	Number of ON/OFF Operations per minute	Number of Cycles of Operation
100	6	50
500	1	10

Non- Fusible Safety Switch AIC Ratings When Protected by a Circuit Breaker②③

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 VBII Type 12 switches are also rated 3R & 3S for outdoor use. Type 3R is defined in B above. 3S rated enclosures provide a degree of protection against windblown dust and allow operation when the enclosure is ice laden.
② All switches above are rated at 10 KA when protected by any UL Listed CB
③ Circuit breaker trip rating must not exceed switch ampere rating

Catalog Numbering System

Type VBII Safety Switch Catalog Numbering System

H	F	3	6	4	N	R	CU

Switch Type

- **L** = General Duty 10k AIC Max. (Plug Fused & 60A Max Non-Fused)
- **G** = Gen. Duty
- **H** = Heavy Duty
- **DT** = Double Throw
- **DTG** = General Duty DT

Fused or Non-Fused

- **F** = Fused
- **NF** = Non-Fused

Number of Poles

- **1** = 1
- **2** = 2
- **3** = 3
- **4** = 4
- **6** = 6

Voltage

- **1** = 120V or 120/240V
- **2** = 240V
- **6** = 600V

Special Applications With:

- **CH** = Crouse-Hinds Receptacle
- **CJ** = Factory J Fuse Spacings
- **CR** = Class R Clips Installed
- **CU** = Factory-Installed Copper Lugs
- **G** = Factory-Installed Ground Bar
- **H** = Height or Size Reduced
- **L** = Oversized Enclosure
- **PN** = Pyle-National Receptacle
- **PV** = Photovoltaic rated
- **PVPG** = Photovoltaic rated, Positive Ground
- **W** = Viewing Window

Enclosure Type

- **Omit** = Type 1, Indoor
- **R** = Type 3R, Outdoor
- **S** = Type 4 / 4X, Stainless Steel
- **SS** = Type 4 / 4X, 316 Grade Stainless Steel
- **X** = Type 4 / 4X, Non-Metallic
- **J** = Type 12, Industrial
- **XL** = Type 4/4X Non-Metallic Less Line & Load Lugs

With or Without Neutral

- **Omit** = Less Neutral
- **N** = With Neutral

Amperes

- **1** = 30A
- **2** = 60A
- **3** = 100A
- **4** = 200A
- **5** = 400A
- **6** = 600A
- **7** = 800A
- **8** = 1200A

Type VBII Accessories Catalog Numbering System

H	R	6	4

Switch Type

- **H** = Heavy Duty
- **G** = General Duty

Accessory Type

- **A1** = Auxiliary Switch 1/NO and 1/NC
- **A2** = Auxiliary Switch 2/NO and 2/NC
- **A3** = Auxiliary Switch Low Current
- **CL** = Compression Lug Barrier / Mounting Kit
- **G** = Ground Lug Kit
- **G2** = Insulated Ground Lug Kit
- **LC** = Copper Lug Kit
- **N** = Neutral
- **N2** = 200% Neutral
- **P** = Fuse Puller Kit
- **R** = Class R - Fuse Clip Kit
- **T** = Class T - Fuse Kit

Amperes

- **1** = 30A
- **2** = 60A
- **12** = 30/60A
- **3** = 100A
- **23** = 60/100A
- **123** = 30/60/100A
- **1234** = 30/60/100/200A
- **4** = 200A
- **56** = 400/600A
- **5678** = 400/600/800/1200A
- **78** = 800/1200A

Maximum Voltage

- **2** = 240V Max
- **6** = 600V Max

Note: Catalog numbering systems above do not apply to 4-pole & Type "F" & "FR" double throw switches & accessories.

General Duty Enclosed Switches

Plug Fuse and 60A Special Application Type

Selection

Features[5]

- Compact size
- Horsepower rated
- Indoor and outdoor enclosures
- Quick make-quick break mechanism
- Visible "ON"-"OFF" indications
- Padlock-off handle feature
- Door padlock provision
- Bondable neutral (where indicated)
- Lugs suitable for copper or aluminum wire
- UL Listed
- Fuses — not included
- Switches accept Edison base plug fuses
- Hubs — see page 4-20
- Lugs — see page 4-20



Dimensions (inches)

Type	Height	Width	Depth
1	8¼	5½	3
3R	8¼	5⅜	3⅛

Wire Range Table

Switch Type	Wire Range
120/240 Volt Fusible 30 Amp	Cu/Al #14 to #8 AWG[4]
120/240 Volt Non-Fusible 60 Amp	Cu/Al #14 to #3 AWG

Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 Ship. Wt. (lbs.) Pkg. of 10	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship Wt. (lbs.) Pkg. of 10	Horsepower Ratings[1] 1-Phase, 2-Wire Standard	Horsepower Ratings[1] 1-Phase, 2-Wire Maximum
120/240 Volt Fusible						
1-Pole and Solid Neutral[2]					**120 Volt — 1-Phase, 2-Wire**	
30	**LF111N**	35	**LF111NR**	35	½	2
2-Pole and No Neutral					**120/240 Volt — 1-Phase, 2-Wire**	
30	Use 2-Pole and Solid Neutral					
2-Pole and Solid Neutral[2]					**120/240 Volt — 1-Phase, 3-Wire**	
30	**LF211N**	35	**LF211NR**	35	1½	3
240 Volt Non-Fusible						
2-Pole Special Application Switch	**1 or 2-Pole — No Fuse**				**240 Volt — 1-Phase, 2-Wire**	
60	—	—	**LNF222R[3]**	35	—	10

For inches / millimeters conversion, multiply inches by 25.4.

[1] Dual horsepower ratings:
Std. — applies when non-time delay plug fuses are installed.
Max — applies when time-delay plug fuses are installed.

[2] Has service entrance label.
UL Listed as "Enclosed Switches" (suitable for use as service equipment where indicated) under File #E4776.
(NEMA) — Type G.D.
Federal Spec. — W-S-865C — type LD or type NDS

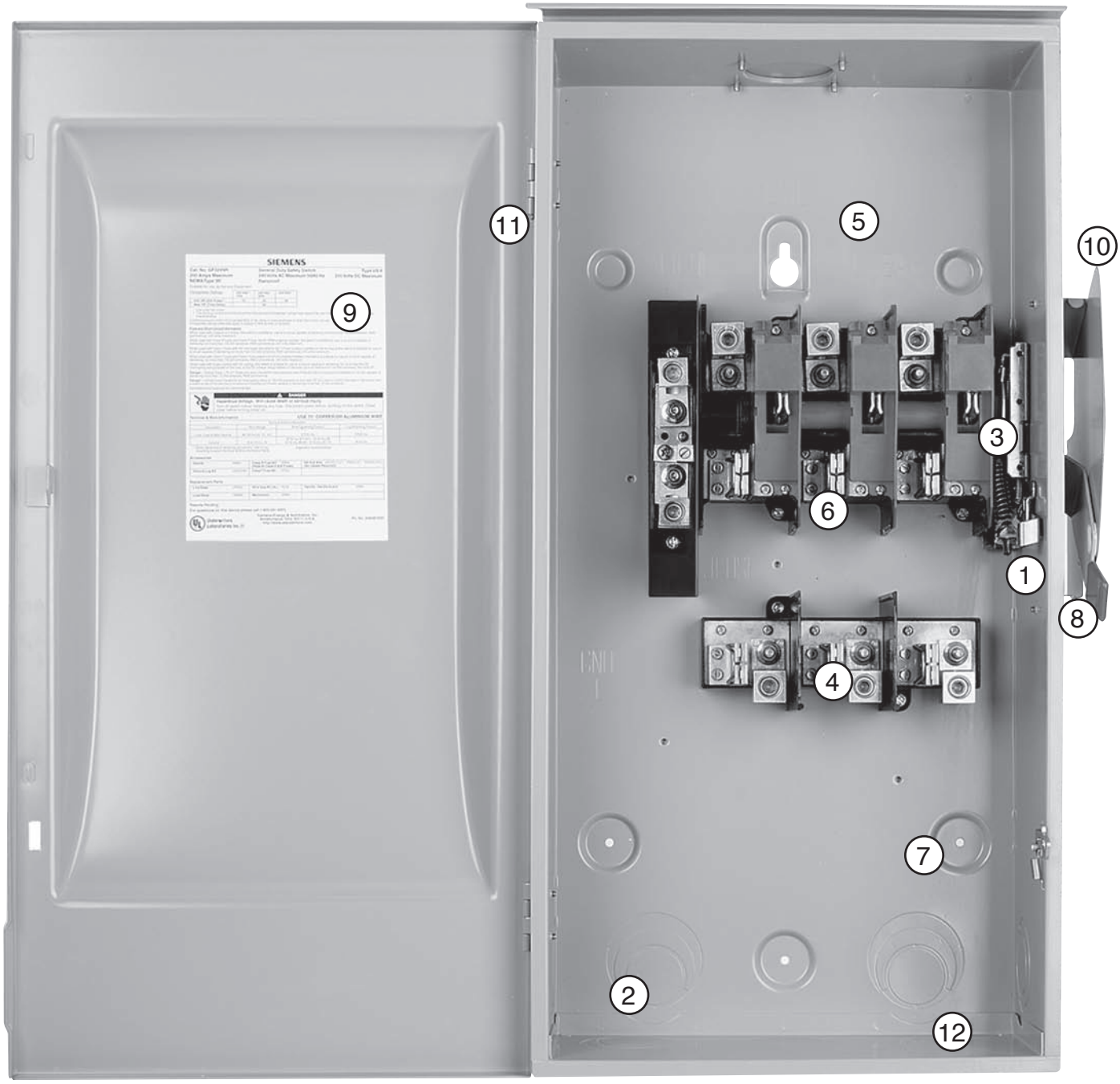
[3] Bottom cable entry and exit only. No hub provision supplied. **GSGK60** is included and factory installed.

[4] Line lugs will accept and are UL approved for #14 to #6 Cu/Al cable.

[5] Features also apply to 2- and 3-pole, 30A general duty switches on page 4-8.

General Duty Safety Switches

Features (60-600A)



1. Cover interlock
2. Tangential knockouts through 600A for easy conduit lineup
3. Quick-make, quick-break operating mechanism that ensures positive operation
4. Provisions for T, R, J, H, and K class fuses (T & J 100-600A)
5. Generous wiring gutters that meet or exceed NEC wire-bending space requirements
6. Visible blade, double-break switch action
7. Positive 2 or 3 point mounting
8. Highly visible red handle grip
9. Informative door labeling which includes replacement parts list
10. Handle and cover padlocking provisions
11. Side-hinged door that opens 180 degrees for easier wiring
12. A unique enclosure design that adds rigidity and strength. Its rolled edge prevents cuts and scrapes to conductors and to installer's hands

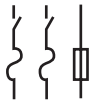
General Duty Safety Switches



System	Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 7 (lbs.) Std. Pkg.	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship. Wt. (lbs.) Std. Pkg.	Horsepower Ratings① 240V AC 1-Phase, 2-Wire Std.	1-Phase, 2-Wire Max.	2-Phase, 4-Wire Std.	2-Phase, 4-Wire Max.	3-Phase, 3-Wire Std.	3-Phase, 3-Wire Max.	250 Volt DC Std.

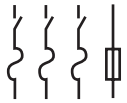
240 Volt Fusible

2-Pole, 2-Fuse, and Solid Neutral②③④ — 240 Volt AC/250 Volt DC



Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 7 (lbs.) Std. Pkg.	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship. Wt. (lbs.) Std. Pkg.	240V AC 1-Phase, 2-Wire Std.	1-Phase, 2-Wire Max.	2-Phase, 4-Wire Std.	2-Phase, 4-Wire Max.	3-Phase, 3-Wire Std.	3-Phase, 3-Wire Max.	250 Volt DC Std.
30	**GF221N**	35⑦	**GF221NR**⑤	35⑦	1½	3	—	—	3	7½	5
60	**GF222N**	14	**GF222NR**	14	3	10	—	—	7½	15	10
100	**GF223N**	23	**GF223NR**	24	7½	15	—	—	15	30	20
200	**GF224N**	47	**GF224NR**	48	15	—	—	—	25	60	40
400	**GF225NH**⑧	128	**GF225NRH**⑧	130	15	—	—	—	50	125	50
400	**GF225N**	153	**GF225NR**	157	15	—	—	—	50	125	50
600	**GF226NH**⑧	133	**GF226NRH**⑧	135	15	—	—	—	75	200	—
600	**GF226N**	159	**GF226NR**	159	15	—	—	—	75	200	—

3-Pole, 3-Fuse, and Solid Neutral④ — 240 Volt AC/250 Volt DC



Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 7 (lbs.) Std. Pkg.	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship. Wt. (lbs.) Std. Pkg.	240V AC 1-Phase, 2-Wire Std.	1-Phase, 2-Wire Max.	2-Phase, 4-Wire Std.	2-Phase, 4-Wire Max.	3-Phase, 3-Wire Std.	3-Phase, 3-Wire Max.	250 Volt DC Std.
30	**GF321N**	24⑥	**GF321NR**⑤	24⑥	1½	3	—	—	3	7½	5
60	**GF322N**	15	**GF322NR**	15	3	10	—	—	7½	15	10
100	**GF323N**	25	**GF323NR**	25	7½	15	—	—	15	30	20
200	**GF324N**	49	**GF324NR**	50	15	—	—	—	25	60	40
400	**GF325NH**⑧	136	**GF325NRH**⑧	138	15	—	—	—	50	125	50
400	**GF325N**	158	**GF325NR**	162	15	—	—	—	50	125	50
600	**GF326NH**⑧	138	**GF326NRH**⑧	141	15	—	—	—	75	200	—
600	**GF326N**	161	**GF326NR**	165	15	—	—	—	75	200	—

240 Volt Non-Fusible③④

2-Pole or 3-Pole — 240 Volt AC/250 Volt DC



Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 7 (lbs.) Std. Pkg.	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship. Wt. (lbs.) Std. Pkg.	240V AC 1-Phase, 2-Wire Std.	1-Phase, 2-Wire Max.	2-Phase, 4-Wire Std.	2-Phase, 4-Wire Max.	3-Phase, 3-Wire Std.	3-Phase, 3-Wire Max.	250 Volt DC Std.
30	**GNF321**	24⑥	**GNF321R**⑤	24⑥	—	3	—	—	7½	—	5
60	**GNF322**	12	**GNF322R**	13	—	10	—	—	15	—	10
100	**GNF323**	23	**GNF323R**	24	—	15	—	—	30	—	20
200	**GNF324**	46	**GNF324R**	47	—	15	—	—	60	—	40
400	**GNF325**	114	Use 600V Switch — **HNF365R**		—	15	—	—	125	—	50
600	**GNF326**	116	Use 600V Switch — **HNF366R**		—	15	—	—	200	—	—

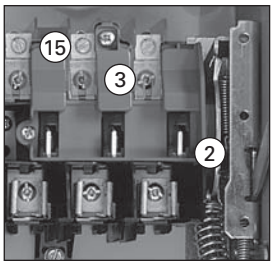
① Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

② These switches are UL-listed for application on grounded B-phase systems.
③ Suitable for use on 3-phase motor loads.
④ Service entrance labeled.
⑤ Has provision for ECHA type hub.

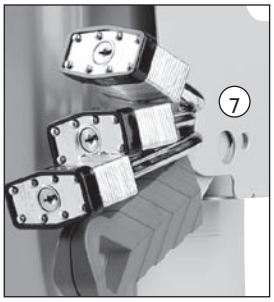
⑥ 5 switches per standard package.
⑦ 10 switches per standard package.
⑧ Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

Heavy Duty Safety Switches

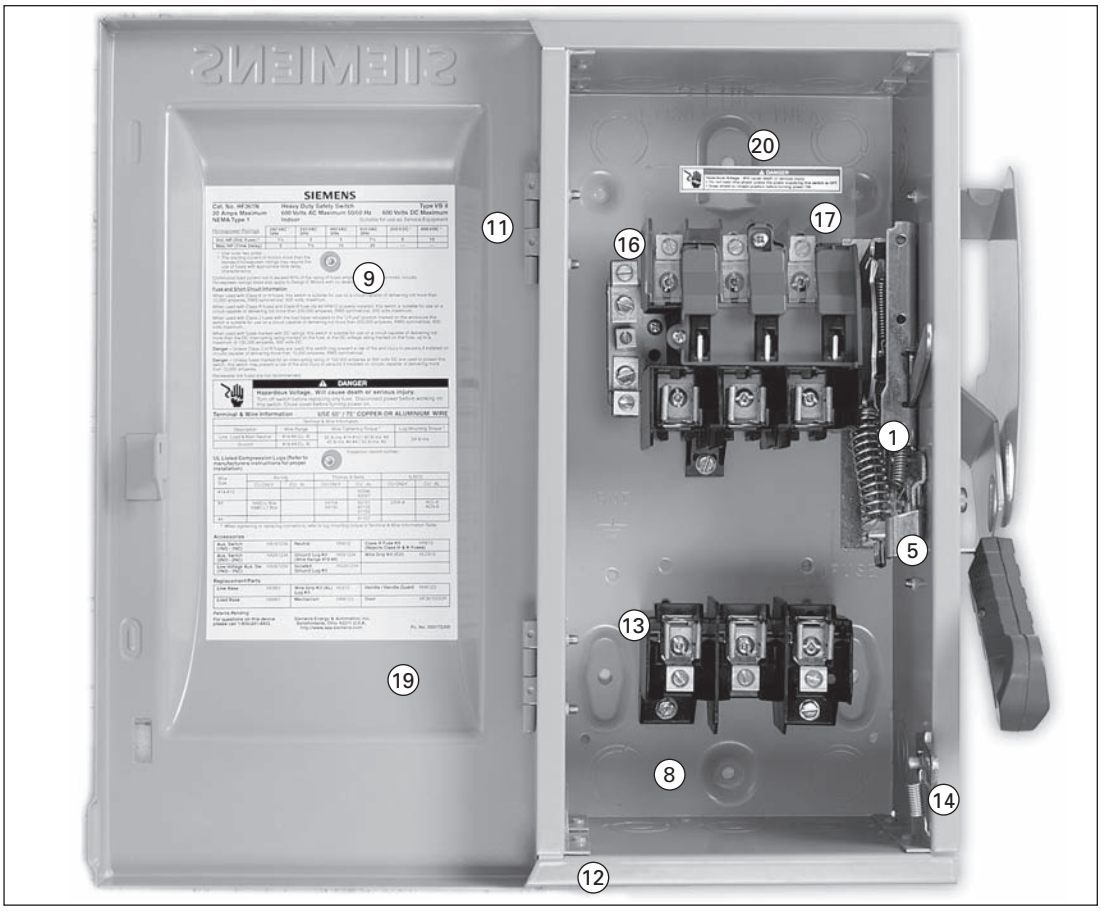
Features











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.

Heavy Duty Safety Switches

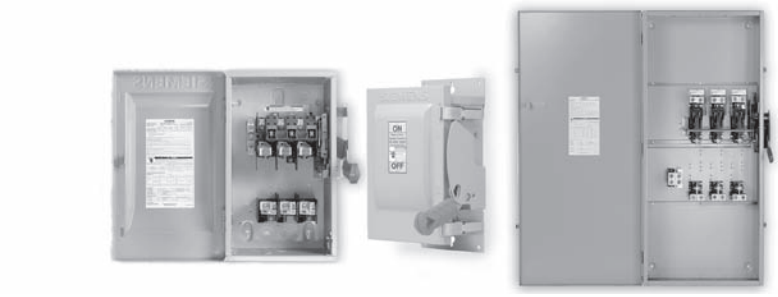
• Revised •
10/01/13

Selection



System	Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 Ship. Wt. (lbs.) Std. Pkg.	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship. Wt. (lbs.) Std. Pkg.	Horsepower Ratings② 240V AC 1-Phase, 2-Wire Std.	1-Phase, 2-Wire Max.	2-Phase, 4-Wire Std.	2-Phase, 4-Wire Max.	3-Phase, 3-Wire Std.	3-Phase, 3-Wire Max.	250 Volt DC
240 Volt Fusible⑤												
2-Pole, 2-Fuse, and Solid Neutral③ (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	HF225NH①	129	HF225NRH①	131	15	—	—	—	50	125	50
	400	HF225N	153	HF225NR	157	15	—	—	—	50	125	50
	600	HF226NH①	133	HF226NRH①	135	15	—	—	—	75	200	50
	600	HF226N	155	HF226NR	159	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	HF325NH①	137	HF325NRH①	138	15	—	—	—	50	125	50
	400	HF325N	158	HF325NR	162	15	—	—	—	50	125	50
	600	HF326NH①	139	HF326NRH①	142	15	—	—	—	75	200	50
	600	HF326N	161	HF326NR	165	15	—	—	—	75	200	50
	800	HF327N	375	HF327NR	375	—	—	—	—	100	250	50
	1200	HF328N	395	HF328NR	388	—	—	—	—	100	250	50
240 Volt Fusible⑤												
2-Pole, 2-Fuse④		Type 4/4X Stainless⑦		Type 12 Industrial⑥								**240 Volt AC/250 Volt DC**
	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-Fuse④ (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	HF325S	154	HF325J■	110	15	—	—	—	50	125	50
	600	HF326S	157	HF326J■	161	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 4-16.



System	Ampere Rating	Indoor — Type 1 Catalog Number	Indoor — Type 1 Ship. Wt. (lbs.) Std. Pkg.	Outdoor — Type 3R Catalog Number	Outdoor — Type 3R Ship. Wt. (lbs.) Std. Pkg.	Horsepower Ratings④ 480V AC 1-Phase, 2-Wire Std.	480V AC 1-Phase, 2-Wire Max.	480V AC 3-Phase, 3-Wire Std.	480V AC 3-Phase, 3-Wire Max.	600V AC 1-Phase, 2-Wire Std.	600V AC 1-Phase, 2-Wire Max.	600V AC 3-Phase, 3-Wire Std.	600V AC 3-Phase, 3-Wire Max.	250 Volt DC	600 Volt DC
600 Volt Fusible⑤															
2-Pole, 2-Fuse③														**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
	400	HF265■	149	HF265R■	152	—	50	—	—	50	—	—	—	40	50
	600	HF266■	150	HF266R■	155	—	50	—	—	50	—	—	—	50	50
3-Pole, 3-Fuse														**480 Volt AC/600 Volt AC/250 Volt DC①**	
	30	HF361	14	HF361R	15	3	7½	5	15	3	10	7½	20	5	—
	30	HF361L⑦	19	HF361RL⑦	20	3	7½	5	15	3	10	7½	20	5	—
	60	HF362	19	HF362R	20	5	20	15	30	10	25	15	50	10	30⑧
	60	— —	—	HF362RL⑦	25	5	20	15	30	10	25	15	50	10	30⑧
	100	HF363	24	HF363R	25	5	20	25	60	15	40	30	75	20	50⑧
	200	HF364	48	HF364R	49	25	50	50	125	30	50	60	150	40	50
	400	HF365H②	136	HF365RH②	137	—	—	100	250	—	—	125	350	50	—
	400	HF365	154	HF365R	157	—	—	100	250	—	—	125	350	50	—
	600	HF366H②	138	HF366RH②	141	—	—	150	400	—	—	200	500	50	—
	600	HF366	157	HF366R	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														**480 Volt AC/600 Volt AC/250 Volt DC①**	
	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	30⑧
	100	HF363N	25	HF363NR	26	10	30	25	60	15	40	30	75	20	50⑧
	200	HF364N	49	HF364NR	50	25	50	50	125	30	50	60	150	40	50
	400	HF365N	158	HF365NR	162	—	—	100	250	—	—	125	350	50	—
	600	HF366N	161	HF366NR	165	—	—	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 Fusible⑤ (For 2-Pole Applications use outside poles of 3-Pole Switches)															
2-Pole, 2-Fuse③														**480 Volt AC/600 Volt AC/600 Volt DC**	
		Type 4/4X Stainless⑨		Type 12 Industrial⑥											
	30	HF261S	15	HF261J■	15	3	7½	—	—	3	10	—	—	5	15
	60	HF262S	20	HF262J■	20	5	20	—	—	10	25	—	—	10	30
	100	HF263S■	27	HF263J■	27	10	30	—	—	15	40	—	—	20	50
	400	HF265S■	153	HF265J■	155	—	50	—	—	50	—	—	—	40	50
	600	HF266S■	156	HF266J■	156	—	50	—	—	50	—	—	—	50	50
3-Pole, 3-Fuse														**480 Volt AC/600 Volt AC/250 Volt DC①**	
	30	HF361S	13	HF361J	14	—	—	5	15	—	—	7½	20	5	—
	60	HF362S	20	HF362J	20	—	—	15	30	—	—	15	50	10	30⑧
	100	HF363S	25	HF363J	25	—	—	25	60	—	—	30	75	20	50⑧
	200	HF364S	49	HF364J	49	—	—	50	125	—	—	60	150	40	50
	400	HF365S	158	HF365J	160	—	—	100	250	—	—	125	350	50	—
	600	HF366S	161	HF366J	161	—	—	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 60-200A 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 4-16.

Heavy Duty Safety Switches

Selection



System	Ampere Rating	Indoor - Type 1 Catalog Number	Indoor - Type 1 Ship. Wt. (lbs.)	Outdoor - Type 3R Catalog Number	Outdoor - Type 3R Ship. Wt. (lbs.)	Horsepower Ratings 240 Volt 1-Phase	240 Volt 3-Phase	480 Volt 1-Phase	480 Volt 3-Phase	600 Volt 1-Phase	600 Volt 3-Phase	250V DC	600V DC

600 Volt Non-Fusible④

2-Pole③ — **480 Volt AC / 600 Volt AC / 600 Volt DC**

Ampere Rating	Catalog Number	Ship. Wt. (lbs.)	Outdoor - Type 3R Catalog Number	Outdoor - Type 3R Ship. Wt. (lbs.)	240 Volt 1-Phase	240 Volt 3-Phase	480 Volt 1-Phase	480 Volt 3-Phase	600 Volt 1-Phase	600 Volt 3-Phase	250V DC	600V DC
30	**HNF261**	12	**HNF261R**	13	—	—	7 1/2	—	10	—	5	15
60	**HNF262**	19	**HNF262R**	20	—	—	20	—	25	—	10	30
100	**HNF263**	24	**HNF263R**	25	—	—	30	—	40	—	20	50
400	**HNF265■**	109	**HNF265R**	113	15	—	50	—	50	—	40	50
600	**HNF266■**	111	**HNF266R■**	115	15	—	50	—	50	—	50	50

3-Pole — **480 Volt AC / 600 Volt AC / 250 Volt DC**

Ampere Rating	Catalog Number	Ship. Wt. (lbs.)	Outdoor - Type 3R Catalog Number	Outdoor - Type 3R Ship. Wt. (lbs.)	240 Volt 1-Phase	240 Volt 3-Phase	480 Volt 1-Phase	480 Volt 3-Phase	600 Volt 1-Phase	600 Volt 3-Phase	250V DC	600V DC
30	**HNF361**	12	**HNF361R**	13	5	10	7 1/2	20	10	30	5	—
30	**—**	—	**HNF361RL⑥**	19	5	10	7 1/2	20	10	30	5	—
60	**HNF362H②**	11	**HNF362RH②**	11	10	20	20	50	20	40	10	—
60	**HNF362①**	18	**HNF362R①**	19	10	20	20	50	25	60	10	30⑦
60	**—**	—	**HNF362RL⑥**	24	10	20	20	50	25	60	10	30⑦
100	**HNF363①**	23	**HNF363R①**	24	15	40	30	75	40	100	20	50⑦
200	**HNF364①**	46	**HNF364R①**	47	15	60	50	125	50	150	40	50
400	**HNF365**	114	**HNF365R**	118	15	125	50	250	50	350	50	—
600	**HNF366**	116	**HNF366R**	120	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-Fusible④

2-Pole③ — **480 Volt AC / 600 Volt AC / 600 Volt DC**

Ampere Rating	Type 4 / 4X Stainless⑧ Catalog Number	Type 4 / 4X Stainless⑧ Ship. Wt. (lbs.)	Type 12 Industrial⑤ Catalog Number	Type 12 Industrial⑤ Ship. Wt. (lbs.)	240 Volt 1-Phase	240 Volt 3-Phase	480 Volt 1-Phase	480 Volt 3-Phase	600 Volt 1-Phase	600 Volt 3-Phase	250V DC	600V DC
30	**HNF261S**	13	**HNF261J**	13	—	—	7 1/2	—	10	—	5	15
60	**HNF262S**	20	**HNF262J**	20	—	—	20	—	25	—	10	30
100	**HNF263S■**	25	**HNF263J■**	25	—	—	30	—	40	—	20	50
400	**HNF265S■**	113	**HNF265J■**	114	15	—	50	—	—	—	40	50
600	**HNF266S■**	115	**HNF266J■**	120	15	—	50	—	—	—	50	50

3-Pole — **480 Volt AC / 600 Volt AC / 250 Volt DC**

Ampere Rating	Type 4 / 4X Stainless⑧ Catalog Number	Type 4 / 4X Stainless⑧ Ship. Wt. (lbs.)	Type 12 Industrial⑤ Catalog Number	Type 12 Industrial⑤ Ship. Wt. (lbs.)	240 Volt 1-Phase	240 Volt 3-Phase	480 Volt 1-Phase	480 Volt 3-Phase	600 Volt 1-Phase	600 Volt 3-Phase	250V DC	600V DC
30	**HNF361S**	13	**HNF361J**	13	5	10	7 1/2	20	10	30	5	—
60	**HNF362SH②**	15	**HNF362JH②**	14	10	20	20	50	20	40	10	—
60	**HNF362S①**	19	**HNF362J①**	19	10	20	20	50	25	60	10	30⑦
100	**HNF363S①**	24	**HNF363J①**	24	15	40	30	75	40	100	20	50⑦
200	**HNF364S①**	47	**HNF364J①**	47	15	60	50	125	50	150	40	50
400	**HNF365S**	118	**HNF365J**	119	15	125	50	250	50	350	50	—
600	**HNF366S**	120	**HNF366J**	120	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 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 4-16.

Heavy Duty Safety Switches

Type 4/4X & 12 with Viewing Window

Description

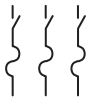
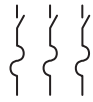
30–600A, 3-pole 600V max. in fusible and non-fusible versions in Type 4/4X stainless steel and Type 12 enclosures.

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 Ratings② 240V AC 1-Phase, 2-Wire	240V AC 3-Phase, 3-Wire	480V AC 3-Phase, 3-Wire	600V AC 3-Phase, 3-Wire	250V DC	600V DC
3-Pole, 3-Wire Fusible, Type 3R④									**600 Volt AC / 250 Volt DC①**
	30	**HF361RW**	17	3	7 1/2	15	20	5	—
	60	**HF362RW**	22	10	15	30	50	10	30⑤
3-Pole, 3-Wire Non-Fusible, Type 3R④									**600 Volt AC / 250 Volt DC①**
	30	**HNF361RW**	14	3	10	20	30	5	—
	60	**HNF362RW**	21	10	20	50	60	10	30⑤
3-Pole, 3-Wire Fusible, Type 12③④									**600 Volt AC / 250 Volt DC①**
	30	**HF361JW**	17	3	7 1/2	15	20	5	—
	60	**HF362JW**	22	10	15	30	50	10	30⑤
	100	**HF363JW**	26	15	30	60	75	20	50⑤
	200	**HF364JW**	53	—	60	125	150	40	50
	400	**HF365JW**	166	—	125	250	350	50	—
	600	**HF366JW**	168	—	200	400	500	50	—
3-Pole, 3-Wire Non-Fusible, Type 12③④									**600 Volt AC / 250 Volt DC①**
	30	**HNF361JW**	14	3	10	20	30	5	—
	60	**HNF362JW**	21	10	20	50	60	10	30⑤
	100	**HNF363JW**	25	15	40	75	100	20	50⑤
	200	**HNF364JW**	51	15	60	125	150	40	50
	400	**HNF365JW**	133	15	125	250	350	50	—
3-Pole, 3-Wire Fusible, Type 4X Stainless Steel④⑥									**600 Volt AC / 250 Volt DC①**
	30	**HF361SW**	17	3	7 1/2	15	20	5	—
	60	**HF362SW**	23	10	15	30	50	10	30⑤
	100	**HF363SW**	28	15	30	60	75	20	50⑤
	200	**HF364SW**	55	—	60	125	150	40	50
	400	**HF365SW**	168	15	125	250	350	50	—
3-Pole, 3-Wire Non-Fusible, Type 4X Stainless Steel④⑥									**600 Volt AC / 250 Volt DC①**
	30	**HNF361SW**	15	3	10	20	30	5	—
	60	**HNF362SW**	23	10	20	50	60	10	30⑤
	100	**HNF363SW**	27	15	40	75	100	20	50⑤
	200	**HNF364SW**	54	15	60	125	150	40	50
	400	**HNF365SW**	134	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 4-16.

Heavy Duty Safety Switches

Type VBII 4 & 6-Pole Heavy Duty Safety Switches

Selection

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

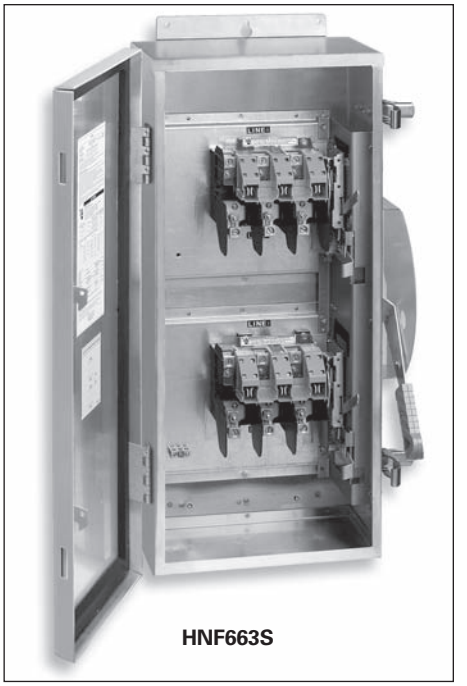
4 & 6-pole switches are available in 30-200A ratings and in both fusible and non-fusible versions. 4-pole switches are supplied with either Type 1 or Type12/3R enclosures.
6-pole switches are available with either Type 12/3R or Type 4X stainless steel enclosures.

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

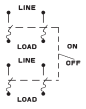
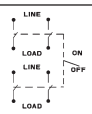
Features

- Visible blade, double break switching action
- Highly visible ON/OFF indication
- Defeatable dual cover interlock
- Padlock option in OFF position
- All copper current carrying parts①
- Tangenital knockouts (Type 1, 4-pole switches)

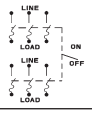
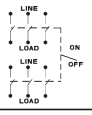


HNF663S

4-Pole Type VBII Switches①②

System	Amp Rating	Indoor Type 1 Catalog Number	Indoor Type 1 Ship Wt. (lbs.)	Type 12/3R Industrial⑤ Catalog Number	Type 12/3R Industrial⑤ Ship Wt. (lbs.)	Horsepower Ratings③ 240V, 2Ø, 4W Std.	240V, 2Ø, 4W Max.	240V 3Ø Std.	240V 3Ø Max.	480V, 3Ø Std.	480V, 3Ø Max.	600V, 3Ø Std.	600V, 3Ø Max.	250V DC
Fusible 600 Volt AC, 250 Volt DC — 4-Pole, 4 Fuse④														
	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 Switches①②⑤

System	Amp Rating	Type 12/3R Industrial Catalog Number	Type 12/3R Industrial Ship Wt. (lbs.)	Type 4X Stainless Steel Catalog Number	Type 4X Stainless Steel Ship Wt. (lbs.)	Horsepower Ratings③ 240V 3Ø Std.	240V 3Ø Max.	480V, 3Ø Std.	480V, 3Ø Max.	600V, 3Ø Std.	600V, 3Ø Max.	250V DC
Fusible 600 Volt AC, 250 Volt DC — 6-Pole, 6 Fuse④												
	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.

Application

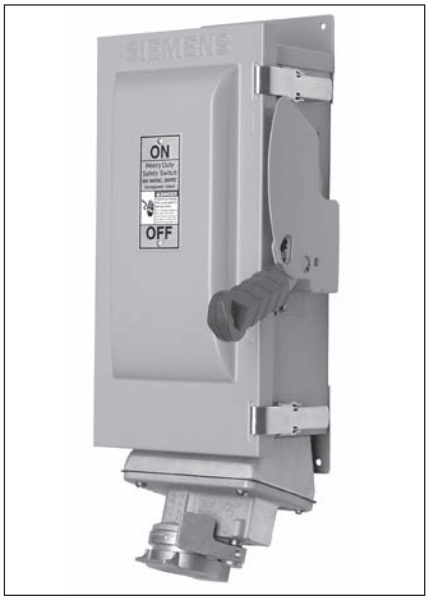
Receptacle Safety Switches provide cord connection protection of heavy-duty portable equipment (welders, infrared ovens, batch feeders, portable conveyors, assembly line fixtures and tools, refrigerator trucks, etc.) under load or fault conditions.

Standards

All receptacle switches are UL listed under file #E4776. Those with a viewing window are also CSA certified under file #1079316.

Description①②

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 Rating④	Type 12⑤ Catalog Number	Type 4/4X⑥ Catalog Number	Shipping Wt. (lbs.) Std. Pkg.	Accepts Crouse-Hinds Arktite① Plug 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 Number⑤	Type 12 Stainless Steel Catalog Number⑥	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 Arktite™ 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.

Heavy Duty

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 4X⑤										
30	**HF321NX**	21	3	7½	—	—	—	—	5	—
60	**HF322NX▲**	22	7½	15	—	—	—	—	10	—
3-Pole, 4-Wire, 600 Volt AC Fusible, Type 4X②③⑤										
30	**HF361NX**	21	3	7½	5	15	7½	20	5	15④
60	**HF362NX**	22	7½	15	15	30	15	50	10	30④
100	**HF363NX▲①**	39	15	30	25	60	30	75	20	50④
200	**HF364NX▲①**	83	25	60	50	125	60	150	40	50
3-Pole, 3-Wire, 600 AC Volt Non-Fusible,① Type 4X②③										
30	**HNF361X**	20	—	7½	—	20	—	30	5	15④
60	**HNF362X**	20	—	15	—	50	—	60	10	30④
100	**HNF363X▲**	38	—	30	—	75	—	100	20	50④
200	**HNF364X▲**	81	—	60	—	125	—	150	40	50

Type 4/4X 316 Grade Stainless Steel

Ampere Rating	Standard Catalog Number	With Viewing Window Catalog Number	Ship Weight (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.		
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-Wire③											
30	**HF361SS**	**HF361SSW**	17	3	7½	5	15	7½	20	5	—
60	**HF362SS**	**HF362SSW▲**	21	7½	15	10	30	15	50	10	30④
100	**HF363SS**	**HF363SSW▲**	28	15	30	25	60	30	75	20	50④
200	**HF364SS**	**HF364SSW▲**	54	25	60	50	125	60	150	40	50
600V AC, 250 V DC Non-Fusible 3-Pole, 3-Wire①③											
30	**HNF361SS**	**HNF361SSW**	15	—	10	—	20	—	30	5	—
60	**HNF362SS**	**HNF362SSW▲**	21	—	20	—	50	—	60	10	30④
100	**HNF363SS**	**HNF363SSW▲**	26	—	40	—	75	—	100	20	50④
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.

② 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.

Heavy Duty Safety Switches

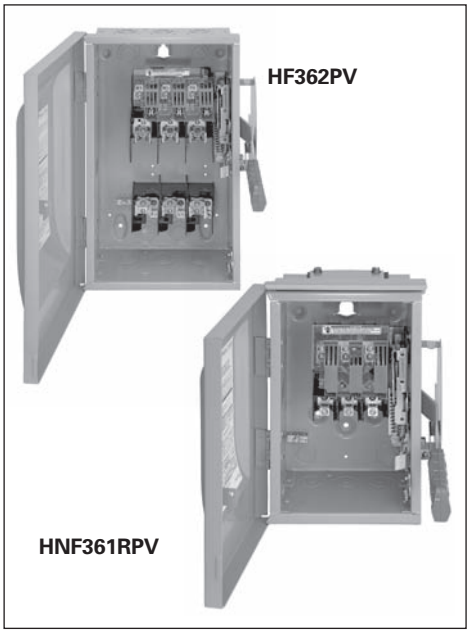
Enclosed Solar Photovoltaic (PV) Switches

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 VBII 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 Catalog Number	Indoor – Type 1 Ship Wt* Std. Pkg.	Outdoor – Type 3R Catalog Number	Outdoor – Type 3R Ship Wt* Std. Pkg.	Rated Isc Per NEC Article 690
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 Negative Ground, 1 Pole, Fusible 1000 Volt DC					
200	**HF1104NPV▲**	52	**HF1104NRPV▲**	53	128.0A
NEW 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.

General and Heavy Duty Safety Switches

Accessories



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
HR656	400A/600A Kit

Class J Fusing

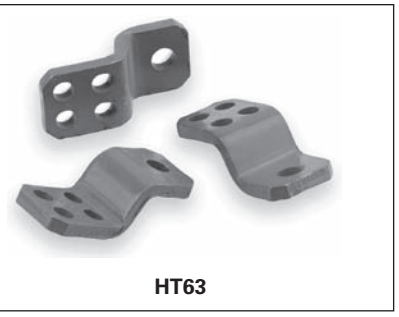
All 30-600A, 600V and 100-600A,240V fusible Heavy Duty Switches are field convertible to accept Class J fuses by moving the load base to a pre-drilled J fuse position. All 100-600A, 240V fusible General Duty switches can also be field converted to accept Class J fuses.

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



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. 400-800A 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

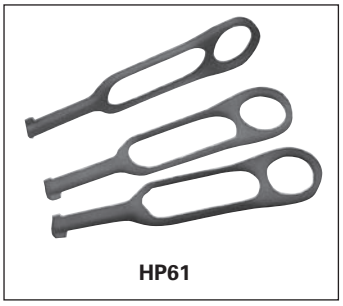
Catalog Number	Description
HT23	100A, 240V Kit
HT63	100A, 600V Kit
HT24	200A, 240V Kit
HT64▲	200A, 600V Kit
TFAK82	1200A, 240V Kit

Neutral Kits

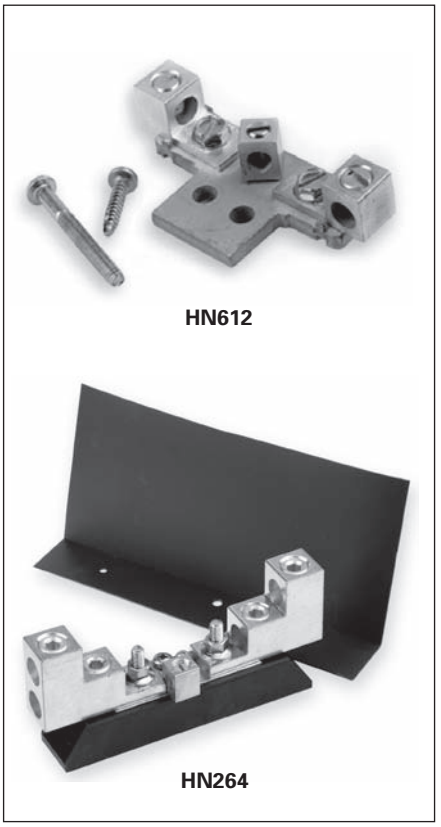
Standard Neutral Kits can be field installed in General and Heavy Duty Switches.

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	HN656
800 & 1200	HN678



HP61



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	HN656	(2) 1/0 AWG-750 Kcmil or (4) 1/0 AWG-250 Kcmil
600	HN678	(4) 1/0 AWG-750 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▲

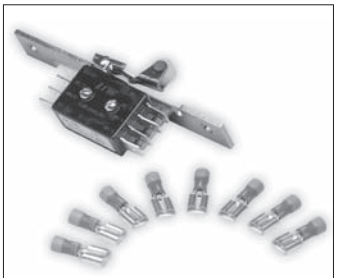
▲ Built to order. Allow 6–8 weeks for delivery.

① One kit per pole required.

② Not designed for use in Non-metallic 4X safety switches. Not designed for use with Auxiliary Contacts.

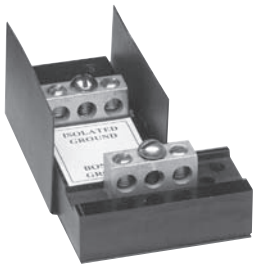


HA161234



HA261234

HLC612



HG261234

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						
30-200	**HA161234**	10	10	7	1/2	3/4
400-1200	**HA165678**	10	10	—	1/2	3/4
With 2 NO & 2 NC Isolated Contacts						
30-200	**HA261234**	10	10	7	1/2	3/4
400-1200	**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	7	1/2	3/4
400-1200	**HA365678**	10	10	—	1/2	3/4

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	**HG2656**	4	4	#14-2/0 AWG

▲ Built to order. Allow 6–8 weeks for delivery.

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

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
400–1200	**HLC65678**	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu

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	**HG656**	4	#14-2/0 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.

Hubs

Conduit Size (inches)	Catalog Number	Used On
Type 3R①		
Cover 3/4 1 1 1/4	**ECHA000** **ECHA075** **ECHA100** **ECHA125**	30A GD Only
Cover 3/4 1 1 1/4 1 1/2 2 2 1/2	**ECHS000** **ECHS075** **ECHS100** **ECHS125** **ECHS150** **ECHS200** **ECHS250**	60–200A GD 30–200A HD
2 1/2 3 3 1/2 4	**ECHV250** **ECHV300** **ECHV350** **ECHV400**	400–1200A
Type 4/4X②		
3/4 1 1 1/4 1 1/2 2	**SSH075** **SSH100** **SSH125** **SSH150** **SSH200**	30–200A

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.

Compression Lug Mounting & Neutral Barrier Kit

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.

Compression Lug Mounting③ and Neutral Barrier Kits

Switch Ampere Rating	Catalog Number	Kit Description
30	**HCL612**	Neutral Barrier Kit
60 & 100	**HCL623**	Neutral Barrier Kit
400④	**HCL65**	1 Pole, Compression Lug Mounting Kit
400 & 600⑤	**HCL65678■**	1 Pole, Compression Lug Mounting Kit
800 & 1200⑤	**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.



SSH150



ECHV300



ECHS200



SL0420

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)⑥	#14-6 AWG (Cu/Al)
30HD	#14-6 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
60⑧⑩	#14-3 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
100⑪	#14-1/0 AWG (Cu/Al)	#14-1/0 AWG (Cu/Al)
200⑨	#6 AWG-250 Kcmil (Cu/Al)	#6 AWG-300 Kcmil (Cu/Al)
400⑦	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)
600②	(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)
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

■ 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.

Safety Switch Dimensions (Inches)* & Shipping Weights

Catalog Number	Height			Width		Depth		Knockout Diagram ①	Shipping Weight (lbs.)
	Box A	With Door B	With Rain Shed C	Box D	With Handle E	Box F	With Handle G		
GF221N	7.97	8.13	—	5.50	5.94	3.00	5.88	S1	35 (10)
GF221NR	8.07	—	8.16	5.16	5.94	3.13	5.88	S3	35 (10)
GF222N	14.26	15.45	—	6.64	8.70	5.05	8.63	S6	14
GF222NR	14.39	—	15.76	6.64	8.70	5.05	8.63	S8	14
GF223N	21.95	23.15	—	9.64	11.70	5.05	8.63	S10	23
GF223NR	21.95	—	23.46	9.64	11.67	5.05	8.70	S11	24
GF224N	29.90	31.07	—	14.62	16.68	6.36	10.92	S12	47
GF224NR	29.90	—	31.42	14.61	16.68	6.36	10.92	S13	48
GF225N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	153
GF225NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	128
GF225NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	157
GF225NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	130
GF226N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14	155
GF226NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	133
GF226NR	56.07	—	57.19	24.64	26.70	9.23	14.68	S15	159
GF226NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	135
GF321N	7.97	8.19	—	7.19	7.69	3.00	5.88	S2	24 (5)
GF321NR	8.07	—	8.16	7.19	8.16	3.13	5.88	S4	24 (5)
GF322N	14.26	15.45	—	6.64	8.70	5.05	8.63	S6	15
GF322NR	14.39	—	15.76	6.64	8.70	5.05	8.63	S8	15
GF323N	21.95	23.15	—	9.64	11.70	5.05	8.63	S10	25
GF323NR	21.95	—	23.46	9.64	11.67	5.05	8.70	S11	25
GF324N	29.90	31.07	—	14.62	16.68	6.36	10.92	S12	49
GF324NR	29.90	—	31.42	14.61	16.68	6.36	10.92	S13	50
GF325N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	158
GF325NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	136
GF325NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	162
GF325NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	138
GF326N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	161
GF326NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	138
GF326NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	165
GF326NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	141
GNF321	7.97	8.19	—	7.19	7.69	3.00	5.88	S2	24 (5)
GNF321R	8.07	—	8.16	7.19	7.69	3.13	5.88	S4	24 (5)
GNF322	11.11	12.31	—	6.64	8.71	5.05	8.61	S7	12
GNF322R	11.11	—	12.62	6.64	8.71	5.05	8.61	S9	13
GNF323	21.95	23.15	—	9.64	11.70	5.05	8.63	S10	23
GNF323R	21.95	—	23.46	9.64	11.67	5.05	8.70	S11	24
GNF324	29.90	31.07	—	14.62	16.68	6.36	10.92	S12	46
GNF324R	29.90	—	31.42	14.61	16.68	6.36	10.92	S13	47
GNF325	44.00	44.57	—	24.65	26.21	9.23	14.68	S14	114
GNF326	44.00	44.57	—	24.65	26.21	9.23	14.68	S14	116
HF221J also **HF261J**	14.27	17.33	—	6.65	9.02	5.32	10.46	—	13
HF221N also **HF261**	14.26	15.45	—	6.64	9.01	5.05	10.17	S6	12
HF221NR also **HF261R**	14.39	—	15.77	6.64	9.01	5.05	10.17	S8	13
HF221S also **HF261S**	14.27	17.33	—	6.65	9.02	5.32	10.46	—	13
HF222J also **HF262J**	16.22	19.31	—	9.17	11.47	5.33	10.46	—	19
HF222N also **HF262**	16.26	17.46	—	9.15	11.53	5.05	10.17	S16	18
HF222NR also **HF262R**	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	19
HF222S also **HF262S**	16.22	19.31	—	9.17	11.47	5.33	10.46	—	19
HF223J also **HF263J**	21.96	23.16	—	9.65	12.02	5.34	10.46	—	24
HF223N also **HF263**	21.95	23.15	—	9.64	12.01	5.05	10.17	S10	23
HF223NR also **HF263R**	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	24

***For inches / millimeters conversion, multiply inches by 25.4.**

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

Safety Switch Dimensions (Inches)* & Shipping Weights

Catalog Number	Height			Width		Depth		Knockout Diagram ①	Shipping Weight (lbs.)
	Box A	With Door B	With Rain Shed C	Box D	With Handle E	Box F	With Handle G		
HF223S also **HF263S**	21.96	23.16	—	9.65	12.02	5.34	10.46	—	24
HF224J	29.96	31.07	—	14.62	16.95	6.63	12.58	—	48
HF224N	29.90	31.07	—	14.62	16.98	6.36	12.33	S12	47
HF224NR	29.90	—	31.42	14.61	16.99	6.36	12.33	S13	48
HF224S	29.96	31.07	—	14.62	16.95	6.63	12.58	—	48
HF225N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	153
HF225NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	129
HF225NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	162
HF225NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	131
HF226N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	155
HF226NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	133
HF226NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	159
HF226NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	135
HF227N	66.67	67.16	—	38.40	39.96	9.24	14.68	—	360
HF227NR	66.67	—	67.74	38.40	39.96	9.24	14.68	—	362
HF228N	66.67	67.16	—	38.40	39.96	9.24	14.68	—	362
HF228NR	66.67	—	67.74	38.40	39.96	9.24	14.68	—	364
HF265	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	149
HF265J	56.14	56.57	—	24.82	26.44	9.19	14.64	—	155
HF265R	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	152
HF265S	56.14	56.57	—	24.82	26.44	9.19	14.64	—	153
HF266	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	155
HF266J	56.14	56.57	—	24.82	26.44	9.19	14.68	—	156
HF266R	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	155
HF266S	56.14	56.57	—	24.82	26.44	9.19	14.68	—	161
HF321J	14.27	17.33	—	6.65	9.02	5.32	10.46	—	14
HF321N	14.26	15.45	—	6.64	9.01	5.05	10.17	S6	14
HF321NR	14.39	—	15.77	6.64	9.01	5.05	10.17	S8	15
HF321S, SS	14.27	17.33	—	6.65	9.02	5.32	10.46	—	14
HF322J	16.27	19.31	—	9.17	11.47	5.33	10.46	—	20
HF322N	16.26	17.46	—	9.15	11.53	5.05	10.17	S16	19
HF322NR	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	20
HF322S, SS	16.27	19.31	—	9.17	11.47	5.33	10.46	—	20
HF323J	21.96	23.16	—	9.65	12.02	5.34	10.46	—	25
HF323N	21.95	23.15	—	9.64	12.01	5.05	10.17	S10	25
HF323NR	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	26
HF323S, SS	21.96	23.16	—	9.65	12.02	5.34	10.46	—	25
HF324J	29.96	31.07	—	14.62	16.95	6.63	12.58	—	49
HF324N	29.90	31.07	—	14.62	16.98	6.36	12.33	S12	49
HF324NR	29.90	—	31.42	14.61	16.99	6.36	12.33	S13	50
HF324S, SS	21.96	31.07	—	14.62	16.95	6.63	12.58	—	49
HF325J	56.14	56.57	—	24.82	26.44	9.19	14.64	—	160
HF325N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	158
HF325NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	137
HF325NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	162
HF325NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	138
HF325S	56.14	56.57	—	24.82	26.44	9.19	14.64	—	158
HF326J	56.14	56.57	—	24.82	26.44	9.19	14.64	—	161
HF326N	56.00	56.57	—	24.64	26.21	9.23	14.68	S14	161
HF326NH	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	139
HF326NR	56.07	—	57.19	24.64	26.70	9.23	14.68	S15	165
HF326NRH	45.31	—	46.44	24.65	26.70	9.23	14.68	S15	142
HF326S	56.14	56.57	—	24.82	26.44	9.19	14.64	—	161
HF327J	66.67	67.16	—	38.40	39.96	9.24	14.68	—	367
HF327N	66.67	67.16	—	38.40	39.96	9.24	14.68	—	380
HF327NR	66.67	—	67.74	38.40	40.25	9.24	14.68	—	383
HF327S	66.67	67.16	—	38.40	39.96	9.24	14.68	—	367
HF328N	66.67	67.16	—	38.40	39.96	9.24	14.68	—	382
HF328NR	66.67	—	67.74	38.40	40.25	9.24	14.68	—	385
HF361, PV, PVPG	14.26	15.45	—	6.64	9.01	5.05	10.17	S6	14
HF361J, JW	14.27	17.33	—	6.65	9.02	5.32	10.46	—	14
HF361L	16.26	17.46	—	9.15	11.53	5.05	10.17	S16	19
HF361N	14.26	15.45	—	6.64	9.01	5.05	10.17	S6	14
HF361NR	14.39	—	15.77	6.64	9.01	5.05	10.17	S8	15
HF361R, RPV, RPVPG	14.39	—	15.77	6.64	9.01	5.05	10.17	S8	15
HF361RL, RW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	20
HF361S, SS, SSW, SW	14.27	17.33	—	6.65	9.02	5.32	10.46	—	15
HF362, PV, PVPG	16.26	17.46	—	9.15	11.53	5.05	10.17	S16	19

***For inches / millimeters conversion, multiply inches by 25.4.**

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

Safety Switch Dimensions (Inches)* & Shipping Weights

Catalog Number	Height			Width		Depth		Knockout Diagram ①	Shipping Weight (lbs.)
	Box A	With Door B	With Rain Shed C	Box D	With Handle E	Box F	With Handle G		
HF362J, JW	16.27	19.31	—	9.17	11.47	5.33	10.46	—	20
HF362N	16.26	17.46	—	9.15	11.53	5.05	10.17	S16	19
HF362NR	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	20
HF362R, RPV, RPVPG, RW	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	20
HF362RL	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	25
HF362S, SS, SSW, SW	16.27	19.31	—	9.17	11.47	5.33	10.46	—	20
HF363, PV, PVPG	21.95	23.15	—	9.64	12.01	5.05	10.17	S10	24
HF363J, JW	21.96	23.16	—	9.65	12.02	5.34	10.46	—	25
HF363N	21.95	23.15	—	9.64	12.01	5.05	10.17	S10	25
HF363NR	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	26
HF363R, RPV, RPVPG	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	25
HF363S, SS, SSW, SW	21.96	23.16	—	9.65	12.02	5.34	10.46	—	25
HF364, PV, PVPG	29.90	31.07	—	14.62	16.98	6.36	12.33	S12	48
HF364J, JW	29.96	31.07	—	14.62	16.95	6.63	12.58	—	49
HF364N	29.90	31.07	—	14.62	16.98	6.36	12.33	S12	49
HF364NR	29.90	—	31.42	14.61	16.99	6.36	12.33	S13	48
HF364R, RPV, RPVPG	29.90	—	31.42	14.61	16.99	6.36	12.33	S13	49
HF364S, SS, SSW, SW	29.96	31.07	—	14.62	16.95	6.63	12.58	—	49
HF365	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	154
HF365H	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	136
HF365J, JW	56.14	56.57	—	24.82	26.44	9.19	14.64	—	160
HF365N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	158
HF365NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	162
HF365R	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	157
HF365RH	45.25	45.82	—	24.65	26.70	9.23	14.68	S15	137
HF365S, SW	56.14	56.57	—	24.82	26.44	9.19	14.64	—	158
HF366	56.00	56.57	—	24.64	26.21	9.23	14.68	S14	157
HF366H	45.25	45.82	—	24.65	26.21	9.23	14.68	S14	138
HF366J, JW	56.14	56.57	—	24.82	26.44	9.19	14.64	—	161
HF366N	56.00	56.57	—	24.65	26.21	9.23	14.68	S14	161
HF366NR	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	165
HF366R	56.07	—	57.19	24.65	26.70	9.23	14.68	S15	161
HF366RH	45.25	45.82	—	24.65	26.70	9.23	14.68	S15	141
HF366S	56.14	56.57	—	24.82	26.44	9.19	14.64	—	161
HF367	66.67	67.16	—	38.40	39.96	9.24	14.68	—	380
HF367J	66.67	67.16	—	38.40	39.96	9.24	14.68	—	380
HF367N	66.67	67.16	—	38.40	39.96	9.24	14.68	—	382
HF367NR	66.67	—	67.74	38.40	40.25	9.24	14.68	—	386
HF367R	66.67	—	67.74	38.40	40.25	9.24	14.68	—	382
HF367S	66.67	67.16	—	38.40	39.96	9.24	14.68	—	380
HF368, J, S	66.67	67.16	—	38.40	39.96	9.24	14.68	—	383
HF368N	66.67	67.16	—	38.40	39.96	9.24	14.68	—	385
HF368NR	66.67	—	67.74	38.40	40.25	9.24	14.68	—	388
HF368R	66.67	—	67.74	38.40	40.25	9.24	14.68	—	385
HNF265	44.00	44.57	—	24.65	26.21	9.23	14.68	S14	109
HNF265J	44.14	44.57	—	24.82	26.44	9.19	14.64	—	119
HNF265R	44.07	—	45.19	24.65	26.70	9.23	14.68	S15	118
HNF265S	44.14	44.57	—	24.82	26.44	9.19	14.64	—	118
HNF266	44.00	44.57	—	24.65	26.21	9.23	14.68	S14	111
HNF266J	44.14	44.57	—	24.82	26.44	9.19	14.64	—	115
HNF266R	44.07	—	45.19	24.64	26.70	9.23	14.68	S15	120
HNF266S	44.14	44.57	—	24.82	26.44	9.19	14.64	—	115
HNF361, PV, PVPG also **HNF261 & HNF362H**	11.11	12.31	—	6.64	9.01	5.05	10.17	S7	12
HNF361J, JW also **HNF261J & HNF362JH**	11.12	14.14	—	6.65	9.02	5.56	10.46	—	13
HNF361R, RPV, RPVPG also **HNF261R & HNF362RH**	11.11	—	12.63	6.64	9.01	5.05	10.17	S9	13
HNF361RL	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	20
HNF361S, SS, SSW, SW also **HNF261S & HNF362SH**	11.12	14.14	—	6.65	9.02	5.56	10.46	—	13
HNF362, PV, PVPG also **HNF262**	16.26	17.46	—	9.15	11.53	5.05	10.17	S16	18
HNF362J, JW also **HNF262J**	16.27	17.46	—	9.17	11.47	5.33	10.46	—	19
HNF362R, RPV, RPVPG also **HNF262R**	16.26	—	17.77	9.16	11.53	5.05	10.17	S17	19
HNF362RL	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	24
HNF362S, SS, SSW, SW also **HNF262S**	16.27	17.46	—	9.17	11.47	5.33	10.46	—	19
HNF363, PV, PVPG also **HNF263**	21.95	23.15	—	9.64	12.01	5.05	10.17	S10	23
HNF363J, JW also **HNF263J**	21.96	23.16	—	9.65	12.02	5.34	10.46	—	24
HNF363R, RPV, RPVPG also **HNF263R**	21.95	—	23.46	9.64	11.97	5.05	10.17	S11	24
HNF363S, SS, SSW, SW also **HNF263S**	21.96	23.16	—	9.65	12.02	5.34	10.46	—	24
HNF364, PV, PVPG	29.90	31.07	—	14.62	16.98	6.36	12.33	S12	46
HNF364J, JW	29.96	31.07	—	14.62	16.95	6.63	12.58	—	47
HNF364R, RPV, RPVPG	29.90	—	31.42	14.61	16.99	6.36	12.33	S13	47
HNF364S, SS, SSW, SW	29.96	31.07	—	14.62	16.95	6.63	12.58	—	47

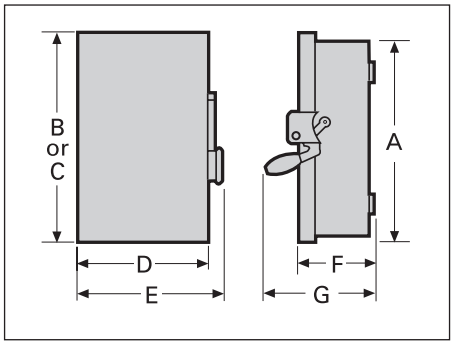
***For inches / millimeters conversion, multiply inches by 25.4.**

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

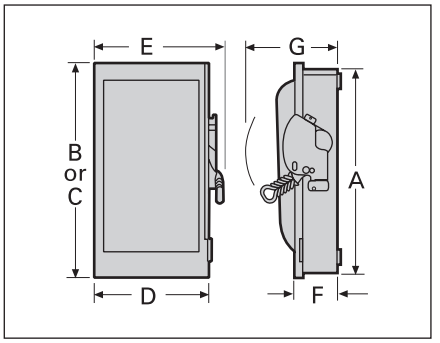
Safety Switch Dimensions (Inches)* & Shipping Weights

Catalog Number	Height			Width		Depth		Knockout Diagram ①	Shipping Weight (lbs.)
	Box A	With Door B	With Rain Shed C	Box D	With Handle E	Box F	With Handle G		
HNF365	44.00	44.57	—	24.65	26.21	9.23	14.68	S14	114
HNF365J, JW	44.14	44.57	—	24.82	26.44	9.19	14.64	—	114
HNF365R	44.07	—	45.19	24.65	26.95	9.23	14.68	S15	118
HNF365S, SW	44.14	44.57	—	24.82	26.44	9.19	14.64	—	118
HNF366	44.00	44.57	—	24.65	26.21	9.23	14.68	S14	116
HNF366J, S	44.14	44.57	—	24.82	26.44	9.19	14.64	—	115
HNF366R	44.07	—	45.19	24.65	26.95	9.23	14.68	S15	120
HNF367, J	54.67	55.16	—	38.40	39.96	9.24	14.68	—	302
HNF367R	54.67	—	55.70	38.40	40.25	9.24	14.68	—	304
HNF367S	54.67	55.16	—	38.40	39.96	9.24	14.68	—	302
HNF368, J, S	54.67	55.16	—	38.40	39.96	9.24	14.68	—	305
HNF368R	54.67	55.16	—	38.40	40.25	9.24	14.68	—	307
LF111N	7.97	8.13	—	5.50	5.94	3.00	5.38	S2	35 (10)
LF111NR	8.07	—	8.16	5.16	5.94	3.13	5.38	S3	35 (10)
LF211N	7.97	8.13	—	5.50	5.94	3.00	5.38	S1	35 (10)
LF211NR	8.07	—	8.16	5.16	5.94	3.13	5.38	S3	35 (10)
LNF222R	8.07	—	8.16	5.16	5.94	3.13	5.38	S5	35 (10)

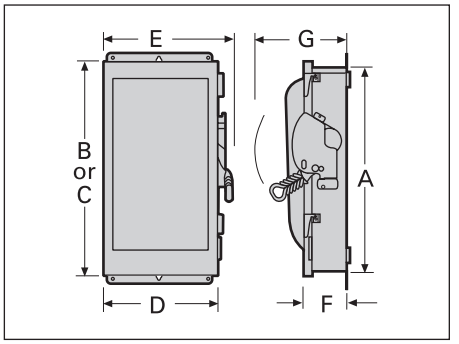
Type 1 or 3R
30A GD



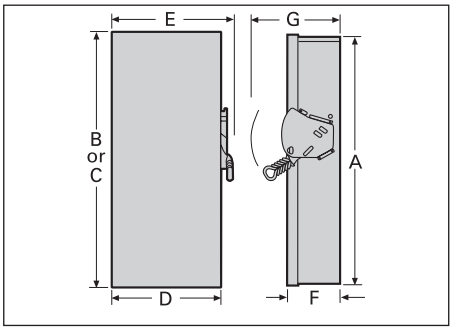
Type 1 or 3R
60-200A GD, 30-200A HD Type VBII



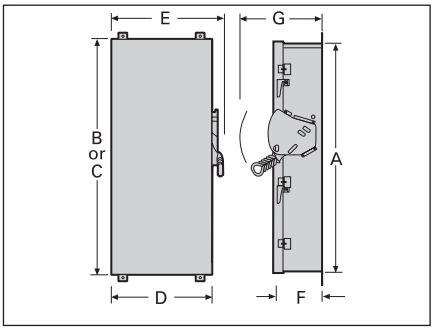
Type 4/4X or 12
30-200A HD Type VBII



Type 1 or 3R
400-1200A Type VBII (GD & HD)



Type 4/4X or 12
400-1200A HD Type VBII

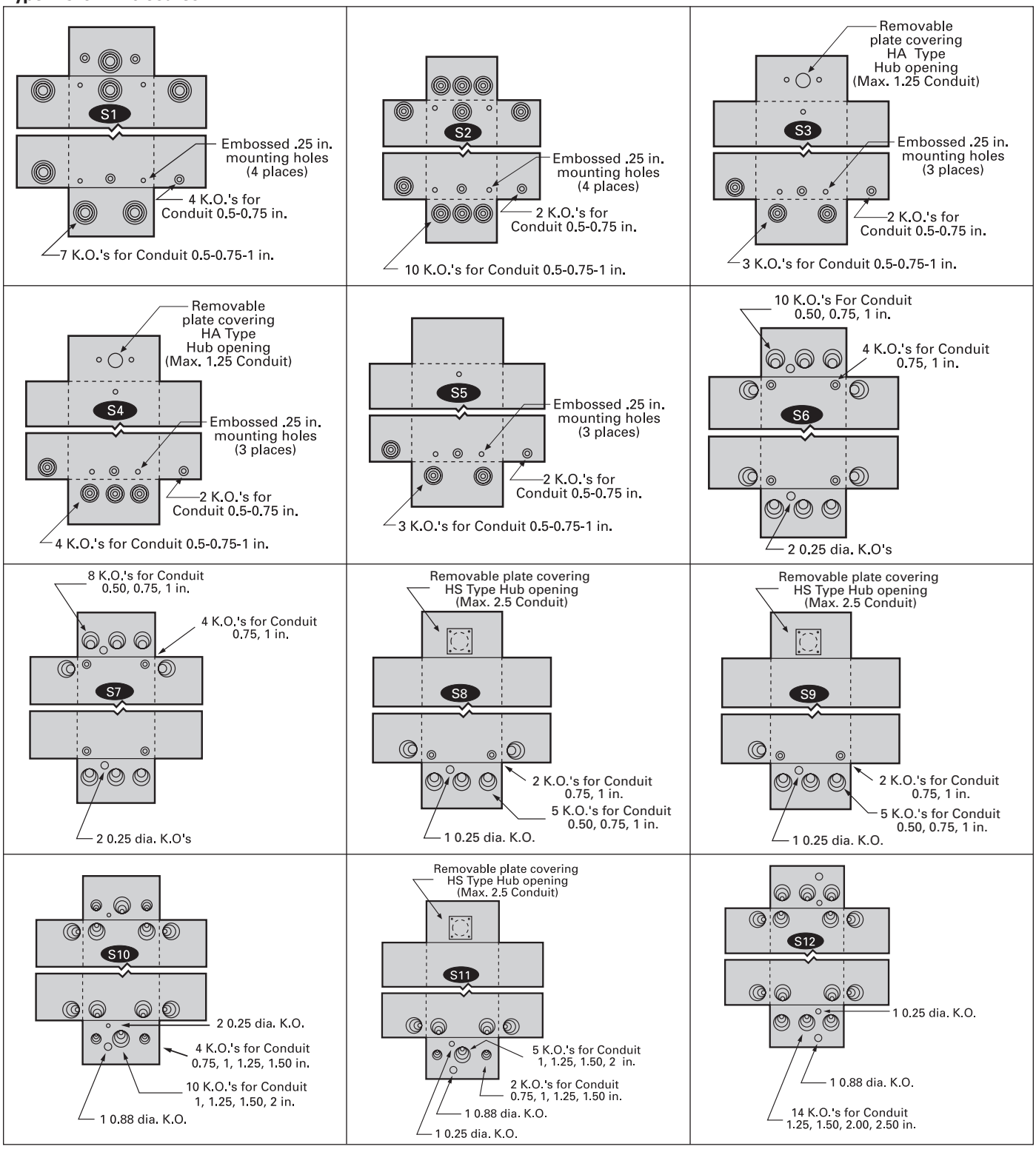


***For inches / millimeters conversion, multiply inches by 25.4.**

① Knocks not provided on Type 4 / 4X and 12 or in 800 & 1200A switches.

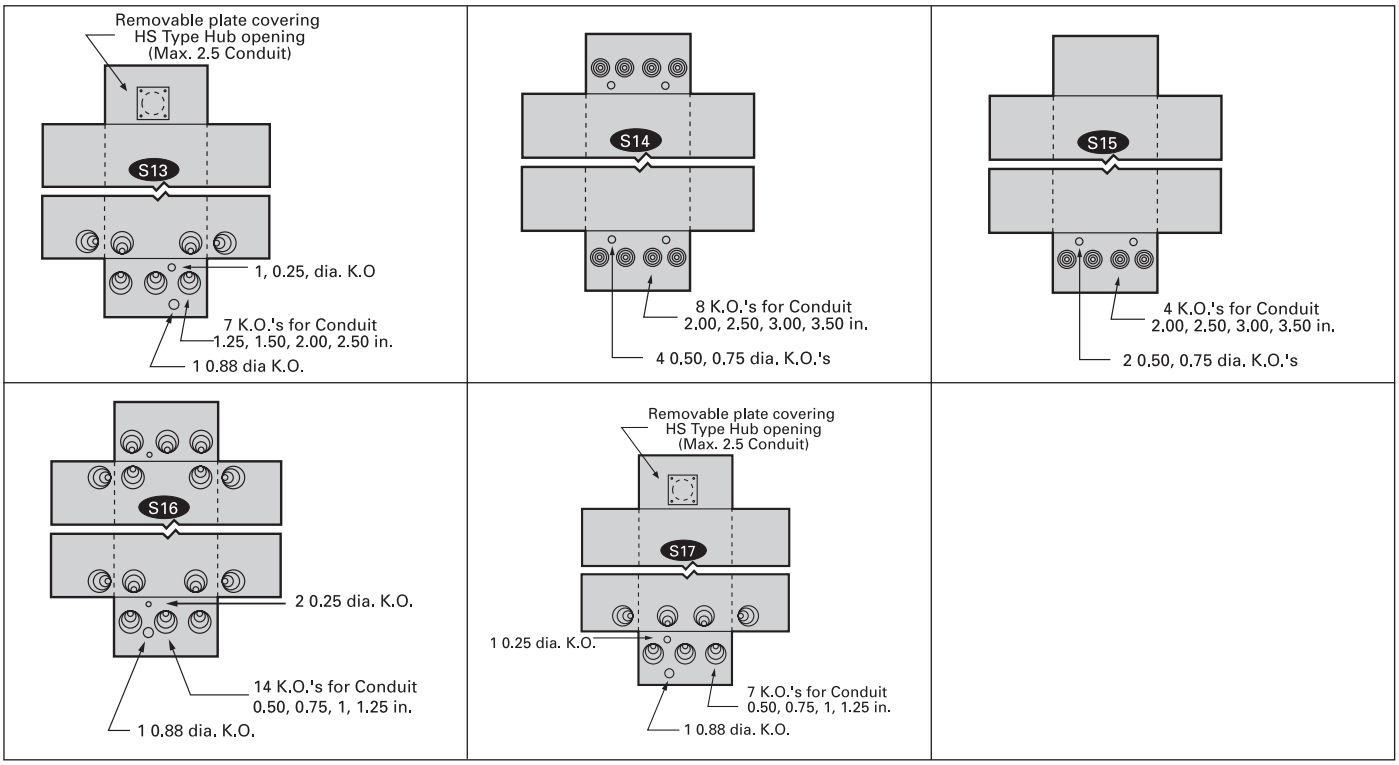
Knockout Diagrams

Type 1 & 3R Enclosures



***For inches / millimeters conversion, multiply inches by 25.4.**

Type 1 & 3R Enclosures

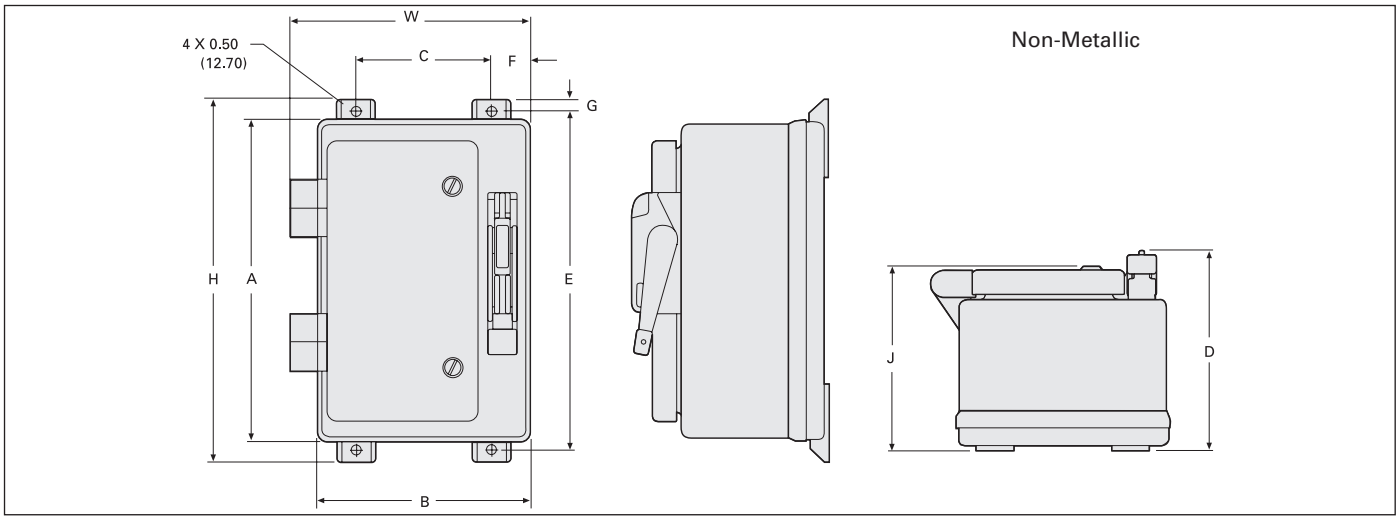


***For inches / millimeters conversion, multiply inches by 25.4.**

Special Application Safety Switches Dimension Drawings

Non-Metallic

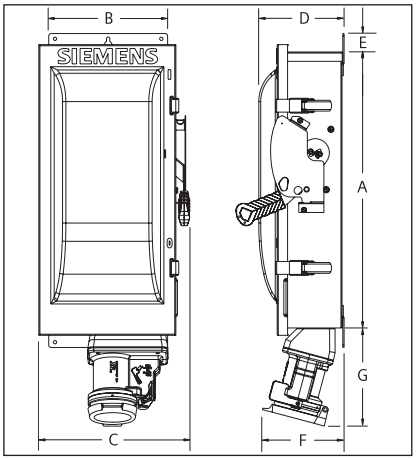
Dimensions



Catalog Number	Dimensions (Inches) Non-Metallic									
	H	W	D	A	B	C	E	F	G	J
HF321NX	18.75	12.11	10.25	16.59	10.97	7.00	17.50	1.98	.46	9.20
HF322NX	18.75	12.11	10.25	16.59	10.97	7.00	17.50	1.98	.46	9.20
HF361NX①	18.75	12.11	10.25	16.59	10.97	7.00	17.50	1.98	.46	9.20
HF362NX①	18.75	12.11	10.25	16.59	10.97	7.00	17.50	1.98	.46	9.20
HF363NX①	26.95	14.87	13.25	24.84	13.72	6.25	25.75	3.75	.46	12.15
HF364NX①	33.41	27.47	13.19	31.31	26.31	18.50	32.25	3.91	.47	12.10
HNF361X①	18.75	12.11	10.25	16.59	10.97	7.00	17.50	1.98	.46	9.20
HNF362X①	18.75	12.11	10.25	16.59	10.97	7.00	17.50	1.98	.46	9.20
HNF363X①	26.95	14.87	13.25	24.84	13.72	6.25	25.75	3.75	.46	12.15
HNF364X①	33.41	27.47	13.19	31.31	26.31	18.50	32.25	3.91	.47	12.10

VBII Interlocked Receptacle Switches

Ampere Rating	Dimensions (Inches)						
	A	B	C	D	E	F	G
Cr-H Type Fusible (240 & 600V)							
30	14.27	7.42	9.02	6.22	1.52	6.1	6.0
60	16.27	9.17	11.47	6.34	1.52	6.4	7.4
100	21.96	9.65	12.02	6.80	1.52	6.5	7.6
Cr-H Type Non-Fusible (600V max.)							
30	14.27	7.42	9.02	6.22	1.52	6.1	6.0
60	16.27	9.17	11.47	6.34	1.52	6.4	7.4
100	21.96	9.65	12.02	6.80	1.52	6.5	7.6
Pyle-National Type Fusible (240 & 600V)							
30	14.27	7.42	9.02	6.22	1.52	3.5	3.0
60	16.27	9.17	11.47	6.34	1.52	5.0	4.5
Pyle-National Type Non-Fusible (600V max.)							
30	14.27	7.42	9.02①	6.22	1.52	3.5	3.0
60	16.27	9.17	11.47①	6.34	1.52	5.0	4.5



***For inches / millimeters conversion, multiply inches by 25.4.**

① Dimensions also apply to "L" suffix switches (less lugs).

Special Application Safety Switches Dimension Drawings

4-Pole & 6-Pole

Dimensions

4 & 6-Pole Safety Switch Dimensions – Inches (mm)

Catalog Number	Enclosure			Mounting		
	A	B	C	D	E	F
Figure 1, 4-Pole Fusible and Non-fusible, Type 1						
HNF461	24.50 (622)	9.53 (242)	6.09 (155)	19.00 (483)	6.75 (171)	0.268 (7)
HF461	29.12 (740)	9.53 (242)	6.09 (155)	23.50 (597)	6.75 (171)	0.268 (7)
HNF462	24.88 (632)	11.50 (292)	6.09 (155)	19.00 (483)	9.38 (238)	0.268 (7)
HF462	33.53 (852)	11.50 (292)	6.09 (155)	27.50 (699)	9.38 (238)	0.268 (7)
HNF463	27.62 (702)	12.18 (309)	6.09 (155)	19.36 (492)	8.00 (203)	0.268 (7)
HF463	36.44 (926)	12.18 (309)	6.09 (155)	28.11 (714)	8.00 (203)	0.268 (7)
HNF464	36.00 (914)	19.12 (486)	6.42 (163)	30.88 (784)	15.00 (381)	0.44 (11)
HF464	49.48 (1257)	19.12 (486)	6.42 (163)	45.50 (1130)	15.00 (381)	0.44 (11)
Figure 2, 4 & 6-Pole Fusible Type 12/3R and 4X						
HF461J, HF661J, HF661S	29.50 (622)	9.53 (242)	6.48 (165)	31.65 (804)	5.47 (139)	0.27 (7)
HF462J, HF662J, HF662S	33.53 (852)	11.50 (292)	6.48 (165)	35.69 (907)	8.00 (203)	0.27 (7)
HF463J, HF663J, HF663S	36.44 (926)	12.18 (309)	6.48 (165)	38.67 (982)	8.47 (215)	0.27 (7)
HF464J, HF664J, HF664S	49.48 (1257)	19.12 (486)	6.78 (172)	51.64 (1312)	13.44 (341)	0.33 (8)
Figure 2, 4 & 6-Pole Non-fusible Type 12/3R and 4X						
HNF461J, HNF661J, HNF661S	24.50 (622)	9.53 (242)	6.48 (165)	26.65 (667)	5.47 (139)	0.27 (7)
HNF462J, HNF662J, HNF662S	24.88 (632)	11.50 (292)	6.48 (165)	27.03 (687)	8.00 (203)	0.27 (7)
HNF463J, HNF663J, HNF663S	27.54 (700)	12.18 (309)	6.48 (165)	29.77 (756)	8.47 (215)	0.27 (7)
HNF464J, HNF664J, HNF664S	36.00 (914)	19.12 (486)	6.78 (172)	38.16 (969)	13.44 (341)	0.33 (8)

Figure 1: Type 1

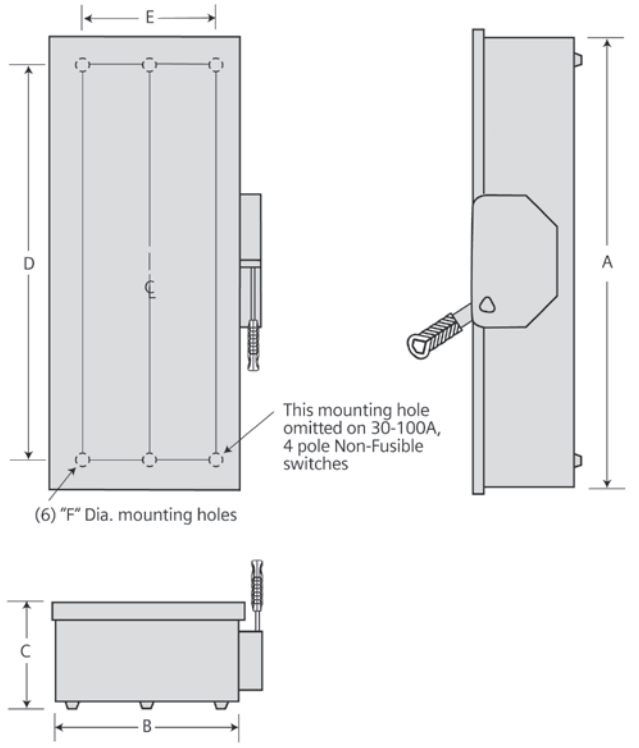
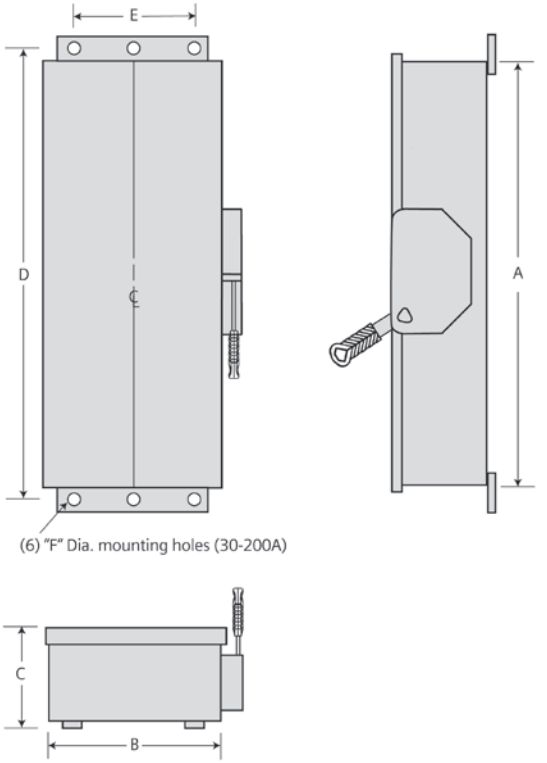


Figure 2 : Type 12/3R and 4X



Special Application Safety Switches Dimension Drawings

Double Throw

Selection

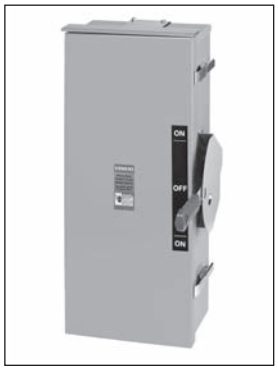
Description

Double throw switches are intended to transfer loads from one power source to another. All 2 & 3-pole double throw switches are suitable for use as service equipment including non-fusible versions when used in combination with a UL listed circuit breaker or fusible switch. All are UL Listed and both horsepower and load break rated. Switches are rated for use on systems up to 10,000A when protected with Class H fuses or 100,000A when protected with Class R or Class T fuses[2]. They can also be used to connect a single source of power to either of two loads. In this application it is necessary to field modify fusible switches so that the fuses are on the load side of the switching mechanism.

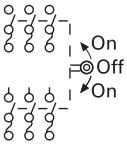
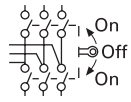
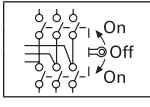
A cover interlock is provided on all ampere ratings. The operating handle may be padlocked in the off position.

Fuse Capabilities of Fusible DTF Switches

Amp Rating	Fuse Type			
	H	R	T	J
30 & 60A, 240V	Std	Yes (kit)	No	No
30 & 60A, 600V	Std	Yes (kit)	No	Yes[3]
100 & 200A	Std	Yes (kit)	Yes (kit)	Yes[3]
400 & 600A (DTF)	No	No	Yes[3]	Std



Double Throw Switches

System	Voltage	Number of Poles	Amps	Type 1 — Indoor Catalog Number	Type 3R — Outdoor[1] Catalog Number	Type 12/3R — Industrial Catalog Number	Type 4X — Stainless Steel Catalog Number
Heavy Duty Fusible (30-200A) with Class H fuse spacings —Less Neutral[2]							
	240 Volt AC or 250 Volt DC	2	200	DTF224▲	DTF224R	—	—
		3	30	DTF321	DTF321R▲	—	—
			60	DTF322	DTF322R▲	—	—
			100	DTF323▲	DTF323R	—	—
			200	DTF324	DTF324R	—	—
			400	DTF325	FR325DTK[6]▲	—	—
			600	DTF326▲	FR326DTK[4]▲	—	—
	600 Volt AC, 250 Volt DC	3	30	DTF361	—	—	—
			60	DTF362▲	—	—	—
			100	DTF363	DTF363R	—	F353SSDTK[6]▲
			200	DTF364	DTF364R	—	F354SSDTK[6]▲
			400	DTF365	FR355DTK[4]▲	—	F355SSDTK[4]▲
Heavy Duty Non-Fusible —Less Neutral[2]							
	240 Volt AC or 250 Volt DC	2	30	DTNF221	—	—	—
			60	DTNF222	—	—	—
			100	DTNF223	—	—	—
			200	DTNF224	DTNF224R	—	—
			400	DTNF225	DTNF225R	—	—
		3	30	DTNF321	—	—	—
			60	DTNF322	—	—	—
			100	DTNF323	DTNF323R	—	—
			200	DTNF324	DTNF324R	—	—
			400	DTNF325	—	—	—
			600	DTNF326	—	—	—
			800	DTNF327▲	—	—	—
	600 Volt AC, or 250 Volt DC	3	30	DTNF361	DTNF361R	DTNF361J	DTNF361S
			60	DTNF362	DTNF362R	DTNF362J	DTNF362S
			100	DTNF363	DTNF363R	DTNF363J	DTNF363S
			200	DTNF364	DTNF364R	DTNF364J▲	DTNF364S
			400	DTNF365	DTNF365R	NF355HDTK	NF355SSDTK
			600	DTNF366	DTNF366R	—	—
			800	DTNF367	DTNF367R	—	—
			1200	DTNF368▲	DTNF368R	—	—
		4[5]	30	—	NFR451DTK▲	—	—
			60	—	NFR452DTK▲	—	—
			100	—	NFR453DTK▲	—	—
			200	NF454DTK	NFR454DTK▲	—	NF454SSDTK▲
			400	NF455DTK▲	NFR455DTK▲	—	—
			600	NF456DTK▲	NFR456DTK▲	—	—
			800	NF457DTK▲	NFR457DTK▲	—	—
General Duty Non-Fusible				Type 3R — Outdoor[1] Less Neutral	Type 3R — Outdoor[1] With Neutral	Type 3R — Outdoor General Duty With Neutral[7]	
	240 Volt AC	2	100	DTGNF223R	DTGNF223NR	DTLNF213NR	—
			200	DTGNF224R	DTGNF224NR	—	—
		3	100	DTGNF323R	DTGNF323NR	—	—
			200	DTGNF324R	DTGNF324NR	—	—

▲ Built to order. Allow 3–4 weeks for delivery.

[1] Use HS Type hubs for 30–200A switches. 400A and larger switches do not have hub provisions.

[2] All Heavy Duty double throw switches with a catalog number starting with "DT" are rated 200,000 AIC max. when protected by Class R, J or T fuses. Fuse ampere rating must not exceed switch ampere rating.

[3] Move load base.

[4] Will accept class T Fuses only.

[5] 4-pole switches are not approved for service entrance.

[6] Will accept class H fuses only.

[7] General duty Stand-by Power Panel catalog number DTLNF213NR contains (2) 100A, 2P circuit breakers rated 120/240V AC & 10,000 AIC.

Accessories, Lug Data and Horsepower Ratings

Accessories – 2 and 3-Pole Switches Type "DT" Only①

Description			Catalog Number
Neutral Kits	30A 60 & 100A 200A 400 & 600A 800 & 1200A		**HNC612** **HN263** **HNC264** **HN678** **HND678**
Equipment Ground Kit	30-200A 400 & 600A 800-1200A	(2) #14-4 AWG (4) #14-2/0 (8) #6-350 Kcmil	**HG61234** **HG656** **HG678**
Auxiliary Contacts (HD only) (two required per switch)④	30-200A 30-200A 400-1200A 400-1200A	with (1) NO & (1) NC contact with (2) NO & (2) NC contacts with (1) NO & (1) NC contact with (2) NO & (2) NC contacts	**HA161234** **HA261234** **HA165678** **HA265678**
Class R Fuse Clip Kits (two required per switch)	30A, 240V Kit 30A, 600V Kit/60A, 240V Kit 60A, 600V Kit 100A Kit 200A Kit		**HR21** **HR612** **HR62** **HR63** **HR64**
Class T Fuse Adapter Kits (two required per pole)	100A, 240V Kit 100A, 600V Kit 200A, 240V Kit 200A, 600V Kit		**HT23** **HT63** **HT24** **HT64**
Type 3R Hubs (30-200A)	For ¾" Conduit For 1" Conduit For 1 ¼" Conduit For 1 ½" Conduit For 2" Conduit For 2 ½" Conduit		**ECHS075** **ECHS100** **ECHS125** **ECHS150** **ECHS200** **ECHS250**

Accessories – 4-Pole and Type "F" & "NF" 3-Pole Switches Only②

Description			Catalog Number
Auxiliary Switch (two required per switch)	30-800A	(1) NO, (1) NC④ (2) NO, (2) NC④	**DS200EK1** **DS200EK2**
Ground Lug Kit③	30-60-100A 200A 400-600-800A		**DS100GK** **DS200GK** **DS468GK**
Hubs	30-60-100A 200-400A 600-800A	Use Type HR Hubs Use Type SSH 4, 4X Hubs Use Type SSH 4, 4X Hubs	
Neutrals (3-pole only)	30-60-100A 200A 400 & 600A Fusible 400A 3P Non-Fusible		**DT100NK** **DT200NK** **DS800NK** **DT600NK**

Maximum Horsepower Ratings

Fused

Ampere Rating	1-Phase AC	3-Phase AC			250V DC
	240V	240V	480V	600V	
30	3	7½	15	20	5
60	10	15	30	50	10
100	15	30	60	75	20
200	15	60	125	150	40
400	—	125	125	125	50
600	—	125	—	—	50

Non-Fused

30	5	10	20	30	5
60	10	20	50	60	10
100	15	40	75	100	20
200	15	60	125	150	40
400-800	—	125	250	350	50

Wire Ranges (Line, Load and Neutral) per NEC Requirements

30-200A – 2, 3 & 4-Pole Switches

Switch Ampere Rating	Wire Range (Cu/Al) New VBII Design Line, Load and Neutral
30	(1) #14–6
60	(1) #14–2
100	(1) #14–1/0 AWG
100	(1) #14–1/0 AWG
200	(1) #6–250 kcmil

400-1200A – 2 & 3-Pole Switches

Switch Ampere Rating	Wire Range (Cu/Al) New VBII Design Line, Load and Neutral
400	(1) 1/0 AWG–750 kcmil or (2) 1/0 AWG–250 kcmil
600	(2) 1/0 AWG–500 kcmil
800	(2) 1/0 AWG–750 kcmil or (3) 1/0 AWG–500 kcmil
1200	(3) 1/0 AWG–600 kcmil or (4) 1/0 AWG–500 kcmil

400-800A – 4-Pole switches

Switch Ampere Rating	Wire Range (Cu/Al) New VBII Design Line, Load and Neutral
400	(1) 1/0 AWG–300 kcmil or (2) 1/0 AWG–750 kcmil
600	(2) 250-500 Kcmil
800	(3) 250-500 Kcmil

Replacement Parts – 2 and 3-Pole Switches Only①

Description		Catalog Number
Type 1, 3R & 12 Replacement Handle	30-200A	**HHD61234**
Type 4X Replacement Handle	30-200A	**HHD61234S**
Replacement Handle	400-1200A	**HHD656**

▲ Built to order. Allow 6–8 weeks for delivery.

① For "DT" VBII Type switches only.

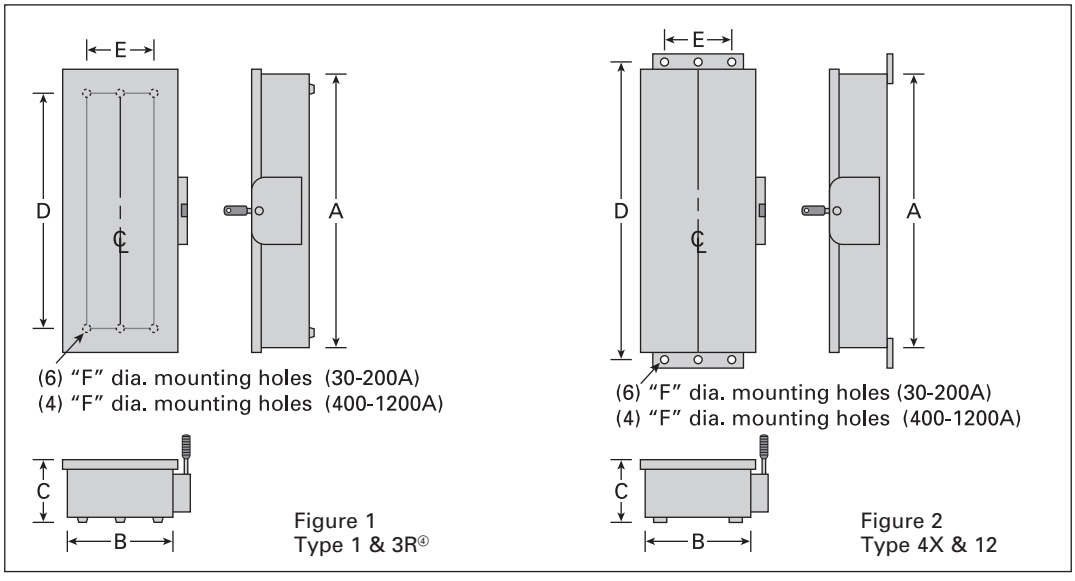
② Also for fusible stainless & 400A Type 12 & 4x switches.

③ The following ground lugs are provided as standard in 200A and larger switches 200-(1) #14-4 Cu/Al 400-800A-(3) #6-250MCM Cu/Al.

④ One aux. required for normal and one required for emergency switch line base.

VBII Design Double Throw Dimensions (Inches)

Catalog Number	Enclosure			Mounting		
	A	B	C	D	E	F
Figure 1 (30-1200A Type 1 & 3R)						
DTNF221, DTNF321, DTNF361, DTNF361R	24.50	9.53	6.09	19.00	6.75	0.268
DTF321, DTF321R, DTF361	29.12	9.53	6.09	23.50	6.75	0.268
DTNF222, DTNF322, DTNF362, DTNF362R	24.88	11.50	6.09	19.00	9.38	0.268
DTF322, DTF322R, DTF362	33.45	11.50	6.09	27.50	9.38	0.268
DTNF223, DTNF323, DTNF323R, DTNF363, DTNF363R, DTGNF223R, DTGNF223NR, DTGNF323R , DTGNF323NR	27.62	12.18	6.09	19.36	8.00	0.268
DTF323, DTF323R, DTF363, DTF363R	36.44	12.18	6.09	28.11	8.00	0.268
DTNF224, DTNF224R, DTNF324, DTNF324R, DTNF364, DTNF364R, DTGNF224R, DTGNF224NR, DTGNF324R, DTGNF324NR	36.00	19.12	6.42	31.00	15.00	0.44
DTF224, DTF224R, DTF324, DTF324R, DTF364, DTF364R	49.44	19.12	6.42	44.50	15.00	0.44
DTF325, DTF326, DTF365	73.54	28.22	9.44	65.50	16.00	0.56
DTNF225, DTNF225R, DTNF325, DTNF365, DTNF365R	57.71	28.22	9.44	49.75	16.00	0.56
DTNF326, DTNF366, DTNF366R	57.71	28.22	9.44	49.75	16.00	0.56
DTNF327, DTNF367, DTNF367R	71.65	41.60	9.44	63.70	32.00	0.56
DTNF368, DTNF368R	71.65	41.60	9.44	63.70	32.00	0.56
FR325DTK③, FR355DTK③	74.31	24.90	8.88	69.50	20.25	0.56
FR326DTK③	85.65	27.00	8.88	80.75	22.25	0.56
NFR451DTK③, NFR452DTK③, NFR453DTK③	24.63	11.63	4.78	21.50	9.25①	0.25①
NF454DTK②③, NFR454DTK②③	37.25	19.19	6.32	33.50	16.00②	0.56②
NF455DTK③, NF456DTK③, NF457DTK③, NFR455DTK③, NFR456DTK③, NFR457DTK③	63.31	27.00	8.88	58.50	22.25②	0.56②
Figure 2 (30-200A Type 12 & 4X)						
DTNF361J, DTNF361S	24.42	9.65	6.48	26.65	5.47	0.27
DTNF362J, DTNF362S	24.80	11.61	6.48	27.03	8.00	0.27
DTNF363J, DTNF363S	27.54	12.29	6.48	29.77	8.47	0.27
DTNF364J, DTNF364S	35.93	19.24	6.78	38.16	13.44	0.33
NF355HDTK①③, NF355SSDTK①③	53.82	22.66	7.25	56.20	18.00	0.56
NF454SSDTK③	37.47	19.16	6.48	39.75	15.75	0.50②
F353SSDTK②③	37.00	11.62	5.50	38.50	9.00	0.26
F354SSDTK②③	50.90	19.16	6.46	53.27	16.12	0.50
F355SSDTK②③	74.50	25.00	8.92	76.69	20.25	0.56



***For inches / millimeters conversion, multiply inches by 25.4.**

① (3) Mounting holes supplied (1 at top).
② (4) Mounting holes provided.
③ These switches are not Type VBII design.
④ Drip hood not shown but provided on Type 3R enclosures.

Enclosed Switches

Rotary Disconnect Switches in Non-Metallic Enclosures ⑤

Selection

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 Weight①	Horsepower Ratings			
				240V AC		480V AC	600V AC
	3 Pole, 3 Wire	3 Pole, 3 Wire with (1) NO & (1) NC Aux. Contact⑧⑨		1 Phase	3 Phase	3 Phase	3 Phase
Non-Fusible, Type 1, 4X & 12K② 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	—	3LD2264-1TS51-0US2⑥▲	1	3	7½	15	20
30	—	3LD2264-2TW51-0US2⑦▲	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 & 12K② 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	—	3LD2264-1TS53-0US2⑥▲	1	3	7½	15	20
30	—	3LD2264-2TW53-0US2⑦▲	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 Weight①	Horsepower Ratings					
				120V AC	240V AC		480V AC		600V AC
	3 Pole, 3 Wire	3 Pole, 3 Wire with (1) NO & (1) NC Aux. Contact⑧⑨		1 Phase	1 Phase	3 Phase	1 Phase	3 Phase	3 Phase
3 Pole, Non-Fusible, Type 12② with Screw Cover and Black Rotary Handle 480V AC Max③									
20	HNF3020CJ④	—	1	¾	2	5	5	10	—
30	HNF3030CJ④	—	2	2	3	7½	7½	15	20
60	HNF3060CJ⑤	—	4	3	10	15	20	40	50
100	HNF3100CJ⑤	—	5	5	15	25	30	50	—
3 Pole, Non-Fusible, Type 12② with Screw Cover and Red and Yellow Rotary Handle 480V AC Max③									
20	HNF3020CJE④	—	1	¾	2	5	7½	10	—
30	HNF3030CJE④	—	2	2	3	7½	20	15	20
60	HNF3060CJE⑤	—	4	3	10	15	30	40	50
100	HNF3100CJE⑤	—	5	5	15	25	30	50	—
3 Pole, Non-Fusible, Type 4, 4X⑥ 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	—

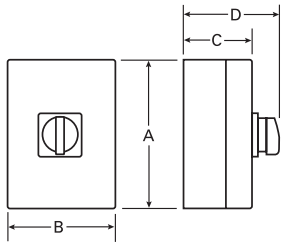
▲ Built to order. Allow 6–8 weeks for delivery.
① Carton quantity of (1). Shipping weight in pounds (lbs.).
② Approved for indoor/outdoor use. No cover interlock provided.
③ 30 and 60A switches are also rated 600V AC.
④ Also rated as Type 12 and UL approved for both indoor and outdoor use. Defeatable 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	5.52④	3.94	3.19	4.57
3LD2164-	25		5.52④	3.94	3.19	4.57
3LD2264-	30		5.52④	3.94	3.19	4.57
3LD2565-	63		6.93⑤	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 KOs as follows:
16-30A - 1/2" & 3/4", 63A - 3/4" & 1", 100 & 25A - 1" & 1 1/4"

Figure 1



UL and CUL Short Circuit Withstand Ratings

Ampere Rating	Short Circuit Withstand Rating and Fuse Class				
	With Line Side Fusing			With Load Side Fusing①	
	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 Switches⑧					
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	⑥	H, K & RK5 (150A Max)		H, K & RK5 (60A Max)	Ferraz Shawmut A50P or lower let-through semiconductor fuses (100A Max)
100		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. Ground lug not provided and is not available on catalog numbers 3LD2264-2TW51-0US2 and 3LD2264-2TW53-0US2.
④ 6.38 inches high including mounting feet.
⑤ 7.85 inches high including mounting feet.
⑥ 60 & 100A HNF switches are rated 10kA at 480V max. with line side Class H, K & RK5 150A max. fuses.
⑦ Wire range (1) #14-2 AWG 60/75 °C Cu only.
⑧ 16-63A 3LD switches are also rated 5kA at 600VAC max when protected by a 3RV type MSP of the same or lesser ampere rating.

***For inches / millimeters conversion, multiply inches by 25.4.**

Wire ranges 60/75°C Cu Only

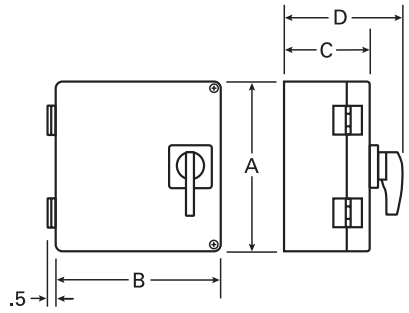
3LD2 Type Switches③

16 Amps 25–30 Amps 63 Amps 100–125 Amps	(1) #18-10 AWG (1) #14-10 AWG (1) #14-6 AWG (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

Figure 2



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 Switches③		
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 Kit②
30A	**LBRA1**	Auxiliary Contact Kit (1 NO-1 NC)
60–100A	**LBRA2**	Auxiliary Contact Kit (1 NO-1 NC)
30–100A	**HF63CX⑦**	Neutral Kit

Enclosed Switches

Enclosed Bolted Pressure Switches & Safety Switch Replacement Parts

Selection

For enclosed bolted pressure contact switches order as lug-in/lug-out single section BPS main switchboards using either the SPACE 2000 Switchboard EPM or COMPAS.

VBII Safety Switch Replacement Parts

Ampere Rating	Line Base Catalog Number	Load Base Catalog Number	Handle / Handle Guard General Duty Catalog Number	Handle / Handle Guard Heavy Duty Catalog Number
Fusible 2- and 3-Pole 60-600A General Duty & 30-1200A Heavy Duty⑤⑧				
30 HD 240V	**HFB21②**	**HBB21②**	—	**HH6123⑦**
60 GD	**HFB612②**	**HBB612②**	**GH223**	—
60 HD 240V	**HFB22②**	**HBB22②**	—	**HH6123⑦**
30 600V	**HFB612②**	**HBB612②**	—	**HH6123⑦**
60 600V	**HFB62②**	**HBB62②**	—	**HH6123⑦**
100	**HFB63②**	**HBB63②**	**GH223**	**HH6123⑦**
200	**HFB64②**	**HBB64②**	**GH24**	**HH64⑦**
400	**HFB65③⑥**	**HBB656③⑥**	**HH65678**	**HH65678⑦**
600	**HFB66③⑥**	**HBB656③⑥**	**HH65678**	**HH65678⑦**
800	**HFB67A②⑥**	**HBB67A②⑥**	—	**HH65678⑦**
1200	**HFB68②⑥**	**HBB68②⑥**	—	**HH68⑦**
Non-Fusible 3-Pole 60-600A General Duty & 30-1200A Heavy Duty⑤⑧				
30 HD	**HNB612②**	—	—	**HH6123⑦**
60 GD	**HNB612②**	—	**GH223**	—
60 HD	**HNB623②**	—	—	**HH6123⑦**
100	**HNB623②**	—	**GH223**	**HH6123⑦**
200	**HNB64②**	—	**GH24**	**HH64⑦**
400	**HNB65③⑥**	—	**HH65678**	**HH65678⑦**
600	**HNB66③⑥**	—	**HH65678**	**HH65678⑦**
800	**HNB67A②⑥**	—	—	**HH65678⑦**
1200	**HNB678⑥**	—	—	**HH68⑦**

Ampere Rating	Mechanism Assembly Catalog Number	Line & Load Lugs Catalog Number
Fusible 2- and 3-Pole 60-600A General Duty & 30-1200A Heavy Duty⑤⑧		
30 HD 240V	**HM6123⑦**	**HL612①**
60 GD	**HM6123**	**HL612①**
60 HD 240V	**HM6123⑦**	**HL612①**
30 600V	**HM6123⑦**	**HL612①**
60 600V	**HM6123⑦**	**HL612①**
100	**HM6123⑦**	**HL63①**
200	**HM64⑦**	**HL64①**
400	**HM65**	**HL65678④**
600	**HM66**	**HL65678④**
800	**HM67A**	**HL67A⑥⑨**
1200	**HM678**	⑨
Non-Fusible 3-Pole 60-600A General Duty & 30-1200A Heavy Duty⑤⑧		
30 HD	**HM6123⑦**	**HL612①**
60 GD	**HM6123**	**HL612①**
60 HD	**HM6123⑦**	**HL612①**
100	**HM6123⑦**	**HL63①**
200	**HM64⑦**	**HL64①**
400	**HM65**	**HL65678④**
600	**HM66**	**HL65678④**
800	**HM67A**	**HL67A⑥⑨**
1200	**HM678**	⑨

Internal Shield Kits

These kits provide an inner door on safety switches to prevent accidental contact with live parts. All kits are constructed from clear plastic, provide test probe holes and allow replacement of fuses without the removal of the kit.

Catalog Number	Switch Ampere Rating	UPC Code 040892_ _ _ _ _
For use with Fusible Type 1, 3R, 12 and 4X Stainless Steel Enclosed Safety Switches⑩		
HSK61SSW	30	79020
HSK62SSW	60	79021
HSK63SSW	100	79002
HSK64SSW	200	79023
For use with Fusible Type VBII Disconnect Switches		
HSK61	30	79024
HSK623	60 & 100	79025
HSK64	200	79026



HF362 with HSK62SSW installed



VBFS361F with HSK61 Installed

① Three lugs included in kit.
② Includes lugs.
③ Lugs not included.
④ One lug per kit.
⑤ One per switch required unless otherwise noted.
⑥ One required per pole.
⑦ For type 4/4X stainless steel switches add "S" to end of catalog number.
⑧ For replacement door for heavy duty switches add "DOOR" to end of switch catalog number.
⑨ Lugs included with line and load bases.
⑩ Not for use with Non-metallic safety switches

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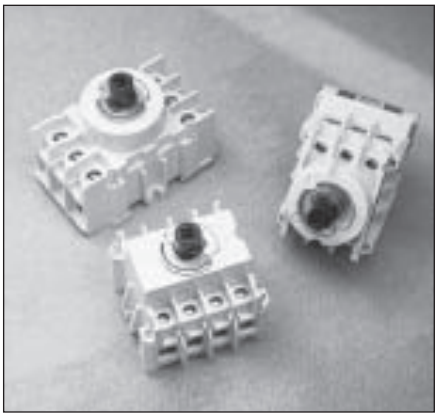
Disconnect Switches

Compact Non-Fusible — Rotary and Toggle

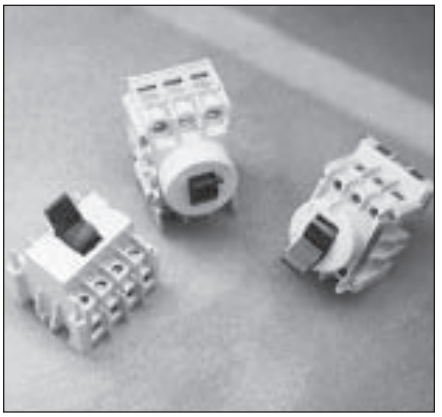
Selection

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



Type LBR Rotary Switches



Type LBT Toggle Switches



3LD2254-0TK51

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.

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
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 Fuses④	
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.

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			AC Horsepower Ratings				
		Number	Ampere	120V	240V		480V	600V
Catalog Number③	Catalog Number③	of Poles	Rating	1Ø	1Ø	3Ø	3Ø	3Ø
—	**3LD2003-1TP53①**	3	16	½	1½	3	7½	10
3LD2154-0TK **3LD2154-1TP** **3LD2154-1TL** **3LD2154-2EP**	**3LD2103-0TK** **3LD2103-1TP** **3LD2103-1TL** **3LD2103-2EP**	3 3① 3 + N 3 + N①	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.

Disconnect Switches

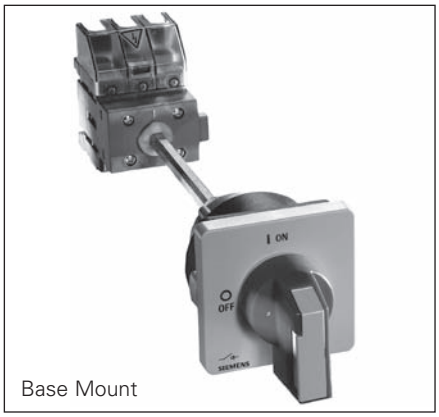
Compact Non-Fusible — Rotary and Toggle

Selection

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

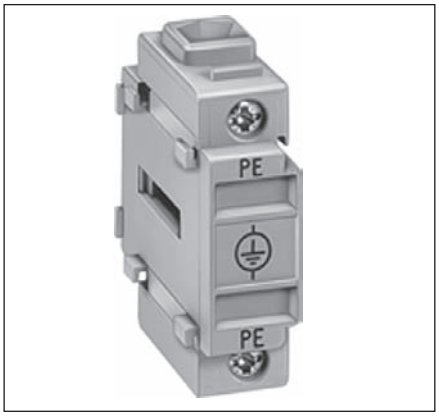


Base Mount

3LD2217-0TK13

Accessories for Front Mounted 3LD2 Switches

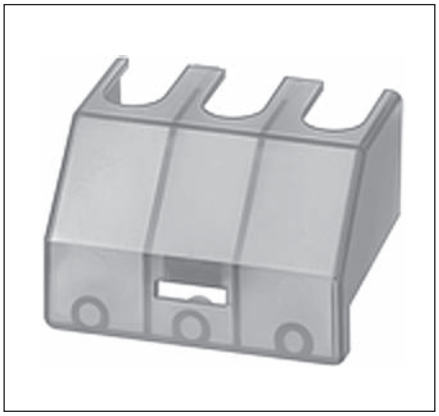
Catalog Number	Description	Switches Used With
3LD9200-5B③	1 NO, 1 NC Aux. Contact	25-125A
3LD9200-5BF③	1 NO, 1 NC Aux. with Gold Plated Contacts	25-125A
3LD9220-2B	Neutral/Ground Terminal	25 & 32A
3LD9250-2BA	Neutral/Ground Terminal	63A
3LD9280-2B	Neutral/Ground Terminal	100 & 125A
3LD9220-0B	4th Pole (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_② rated 160A and 3LD2430-0TK1_② rated 250).

Disconnect Switches

Compact Non-Fusible — Rotary and Toggle

Individual Components and Assemblies

Recommended for Basemount. For Door mounting only, use LBRD1.⑧

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	—
LBR3025D⑥	Rotary	3	25	480	¾	2	5	10	—
LBR3040⑦	Rotary	3	40	600	2	3	7½	20	25
LBR3060⑦	Rotary	3	60	480	2	5	10	25	—
LBR3080⑦	Rotary	3	80	600	3	10	20	40	50
LBR3100⑦	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



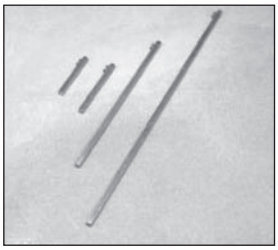
Heavy Duty Rotary Switch Door Handle

LBR Type Handles

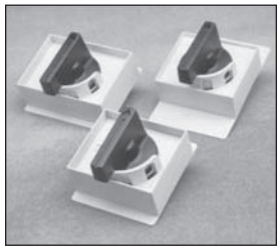
Catalog Number	Used on Rotary Switches	NEMA Type	Mounting	Marking	Color	Cover Interlock Supplied	Padlockable
Standard Duty							
LBRH2②	All	1	Door	ON/OFF	Black	No	No
LBRH3②	All	1, 3R, 12, 4X	Door	O/I, ON/OFF	Black	Yes①	Yes
LBRH4②	All	1, 3R, 12, 4X	Door	O/I, ON/OFF	Red/Yel	Yes①	Yes
LBRH9②	All (Pistol Grip Type)	1, 3R, 12, 4X	Door	O/I, ON/OFF	Black	Yes	Yes
LBRH10②	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

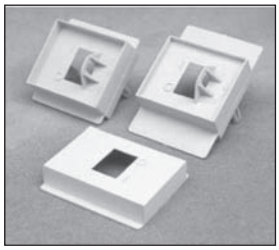
Catalog No	Length In. (mm)
For Standard Duty Handles	
LBRS040	1.57 (40)
LBRS050	1.97 (50)
LBRS055	2.17 (55)
LBRS080	3.15 (80)
LBRS120	4.72 (120)
LBRS180	7.09 (180)
LBRS305	12.00 (305)
For Heavy Duty Handles	
CFSS5200H	7.9 (200)
CFSS5400H	15.7 (400)



Rotary Shafts



Rotary Switch Direct Mount Handles



Toggle Switch Cover Plates

25 Amp, 4th Pole

Used on Catalog No	Catalog Number
LBR3025 LBR3025D	**LBRP25** **LBRP25D**

LBR Type Toggle Switch Cover Plate

Used on Toggle Switches	Catalog Number
LBT3040, LBT3060 LBT3080,LBT3100 LBT4040	**LBTCP1** **LBTCP2** **LBTCP3**

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 Rotary Switch Door Mounting Kit (For use with LBRH3 & LBRH4 only)

Used on Rotary Switch	Catalog Number
40-100 Amps	**LBRD1**⑧

LBR/LBT Neutral Kit⑤

Used with Catalog Number	Catalog Number
All	**HF63CX**

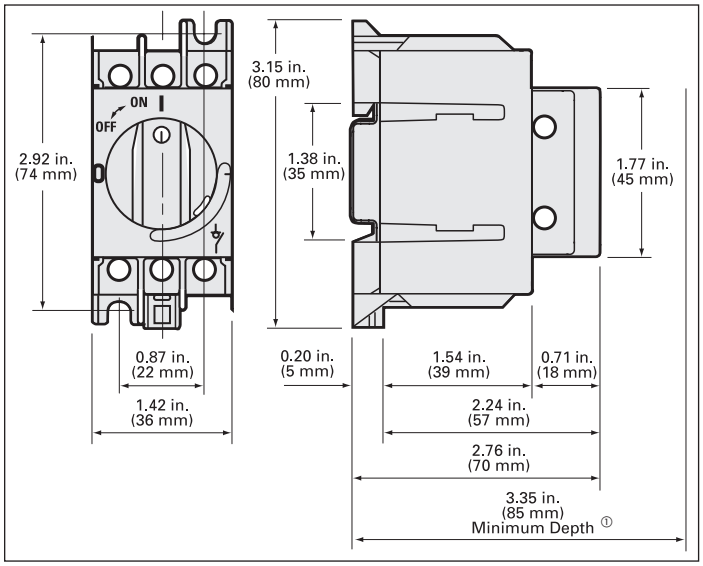
① No cover interlock defeat mechanism provided. To eliminate cover interlock, order additional catalog number LBRDC1.
② LBRH2 is IP54 rated. All others are IP65.
③ Ratings
15.1A resistive at 250V AC max.
.5A at 125V DC
.25A at 250V DC
.5 HP at 250V AC max.
④ Auxiliary switch contacts break about 30 Ms 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.

Disconnect Switches

Compact Non-Fusible — Rotary and Toggle

Dimensions

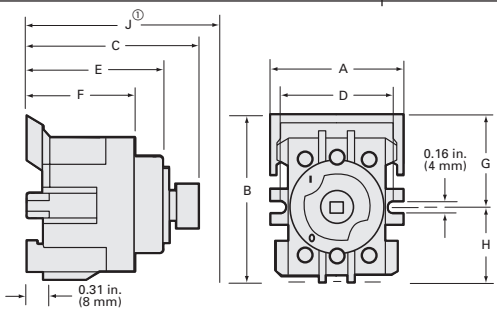
Dimension Drawings and Wire Ranges



LBR 3025

Dimension J Minimum Depth①

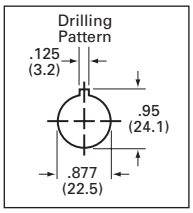
Switch	Dimension J
LBR 40-100A	3.35 (85)
3LD2 25 & 32A Front Shaft Mounted	3.07 (78)
3LD2 63 Front Shaft Mounted	3.35 (85)
3LD2 16-32A Front 4-hole Mounted	2.13 (54)
3LD2 63A Front 4-hole Mounted	2.48 (63)
3LD2 100 & 125A Front 4-hole Mounted	2.56 (65)
3LD2 25 & 32A Base w/shaft Mtg. Handle	6.46 (164)
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)



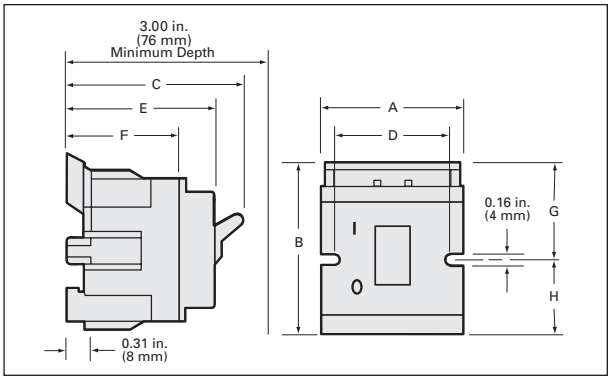
LBR 40-100 Amps & 3LD2 16-250A

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)



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.	**3LD20②**	1.89 (48)	1.97 (50)	1.97 (50)	—	—	—	—	—
Rotary Front Mtg.	**3LD21 & 2②**	1.81 (46)	2.17 (55)	1.97 (50)	—	—	—	—	—
Rotary Front Mtg.	**3LD25②**	2.36 (60)	2.52 (64)	2.32 (59)	—	—	—	—	—
Rotary Front Mtg.	**3LD27 & 8②**	2.40 (61)	3.27 (83)	2.40 (61)	—	—	—	—	—
Rotary Base Mtg.	**3LD20②**	1.89 (48)	1.97 (50)	2.29 (58)	—	—	—	—	—
Rotary Base Mtg.	**3LD21 & 2②**	1.81 (46)	2.17 (55)	2.29 (58)	—	—	—	—	—
Rotary Base Mtg.	**3LD25②**	2.36 (60)	2.52 (64)	2.68 (68)	—	—	—	—	—
Rotary Base Mtg.	**3LD27 & 8②**	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)

①Depth from outside of cover to back of switch.

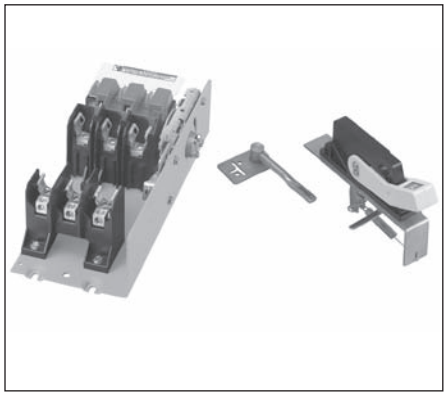
②Handle front plate dimensions:
3LD 16-32A—2.64 inches square
3LD 63-125—3.55 inches square

Disconnect Switches

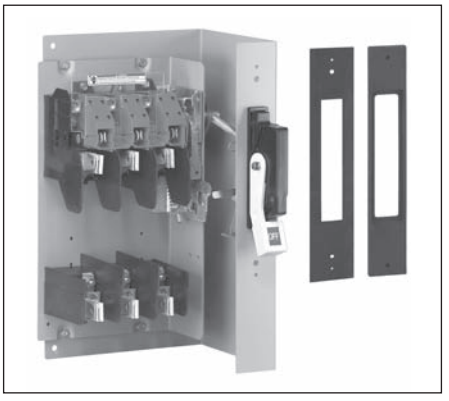
Type VBII (30-600A) with Flange Mounted Operating Handle *Features and Ordering Information*

Features

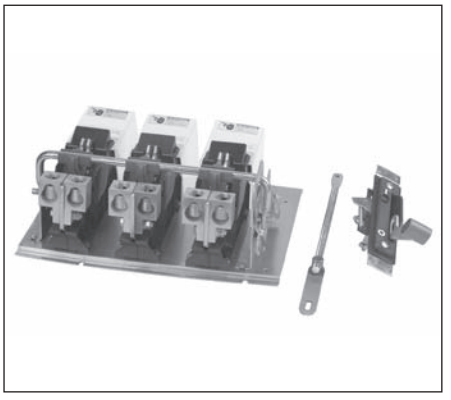
- 30-600A, 600VAC and DC ratings
- 240 & 600V AC switches are UL Recognized under file number E121152, Vol. 3 and CSA certified under file number 154852
- 600V DC Photovoltaic switches are UL Recognized under file number E335018, Vol. 3 and are rated to switch 3 separate 600V DC circuits
- Visible blade quick make and break switching action
- Panel and Flange mounted assemblies facilite 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.

Disconnect Switches

Type VBII (30-600A) with Flange Mounted Operating Handle

Switches—for Standard 600V Max AC or DC Applications

Switch Ampere Rating	Max. AC Voltage Rating	Catalog Number	Horsepower Rating, Switches and 3-Phase④						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-Pole⑤									
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-Pole⑤									
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-Pole⑥									
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-Pole⑥									
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 Pole⑤⑧		
30	**VBFS361PV**	19.2A
60	**VBFS362PV**	38.4A
100	**VBFS363PV**	64.0A
Non-Fusible Panel Mounted Variable Depth Switches—3 Pole⑤		
30	**VBNFS361PV**	24.0A
60	**VBNFS362PV**	48.0A
100	**VBNFS363PV**	80.0A
Fusible Flange Mounted Variable Depth Switches—3 Pole (Includes Type 1, 3R and 12 Rated Operating Handle)⑥⑧		
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)⑥		
30	**VBNFS361FPV**	24.0A
60	**VBNFS362FPV**	48.0A
100	**VBNFS363FPV**	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

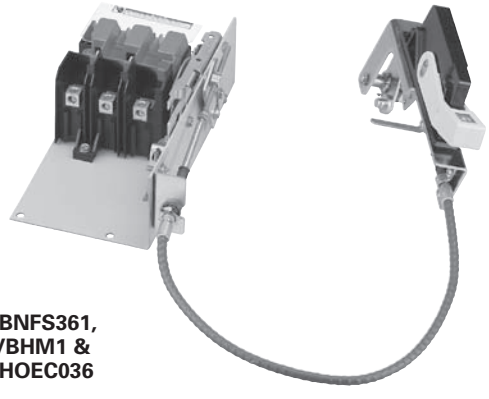
For use with 30-200A panel mounted switches and Max-Flex handle and adapter kit.

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	
VBH112	30-200A Type 1, 3R and 12
VBH14	30-200A Type 4X



VBNFS361, VBHM1 & FHOEC036

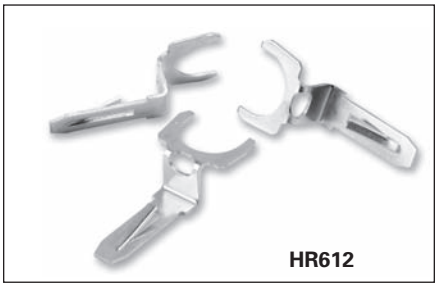
Disconnect Switches

Type VBII (30-600A) with Flange Mounted Operating Handle

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

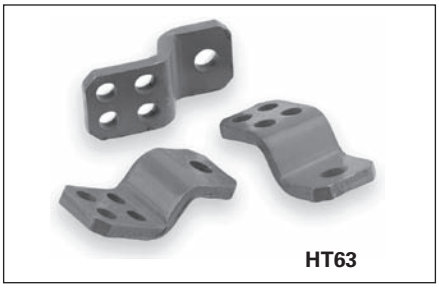
For use with enclosures with door mounted latching bar. Required when a flange mounted switch is mounted in a Hoffmann or Rittal enclosure provided with an AB cutout.

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 Depth① Min	Enclosure Depth① Max.
VBLK1	30-200	6.94②	6.94②
VBLK2	30-200	6.94②	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 Kits③

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)

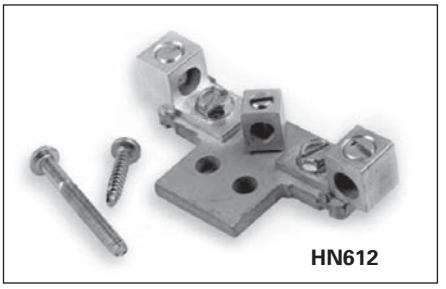
Allows viewing of visible blades and of indicating fuses through 200A.

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 Kits④

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 Kits④

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

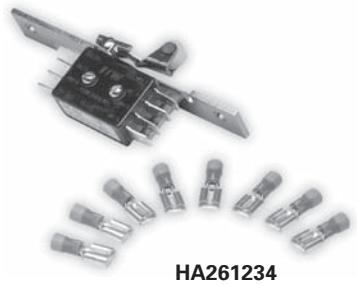
▲ Built to order. Allow 6–8 weeks for delivery.
① Dimensions (min. & max.) from enclosure mounting pan to outside surface of enclosure handle mounting flange.
② 7.12 for 200A switches.
③ One kit per pole required.
④ UL approved (not CSA certified).

Disconnect Switches

Type VBII (30-600A) with Flange Mounted Operating Handle



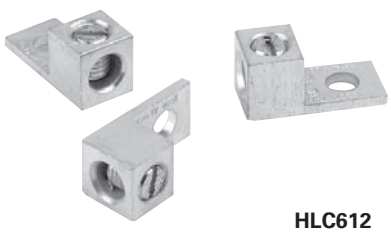
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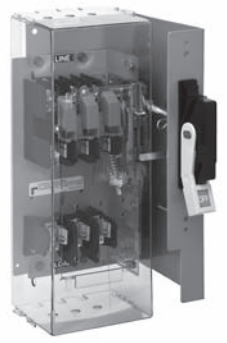
HA261234



HP61



HLC612



HSK61

▲ Built to order. Allow 6–8 weeks for delivery.

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**

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.

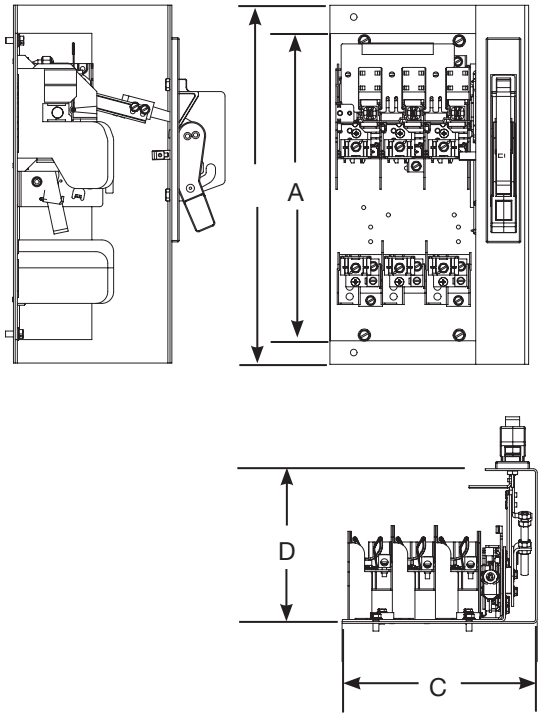
Wire Ranges (Line, Load and Standard Neutral)

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	C①	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.

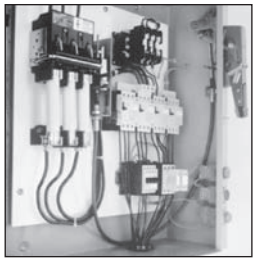
Disconnect Switches

Type MCS (30-200A) — Switches, Fuse and No Fuse Kits

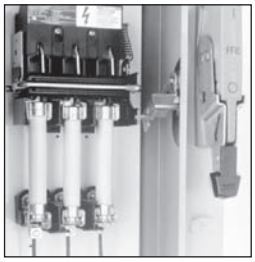
Selection

Features

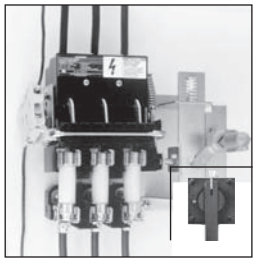
- 30, 60, 100 and 200 Ampere Switches
- UL Recognized (file # E121152 vol. 1 & 2) and CSA Certified
- Simple Mounting — with an integral switch and over center mechanism
- Horsepower & load break rated
- Compact Size
- Visible Blade Contacts
- Rugged Construction — with a short circuit current rating 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

1. Select the basic switch size you need (30, 60, 100 or 200 ampere).
2. 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.
3. Choose either fuse or no fuse kit from chart below.
4. Check "Minimum Dimensions" on page 18/26 for installation space requirements.
5. 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 Phase④						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 Only②				
			Catalog Number	Catalog Number	Catalog Number ①	Catalog Number ①	Catalog Number ①	
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**	
		100A, 250V	—	—	**OFCK661▲**	**OFCK661▲**	③	
		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.

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, 12①⑥

Switch Catalog Number	Complete Handle Mechanism Catalog Number	Handle Only Catalog Number	Switch Operator Only 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, 12②

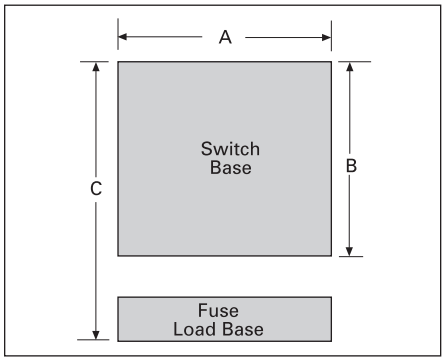
Switch Catalog Number	Complete Handle Mechanism Catalog Number	Handle Only Catalog Number	Switch Operator Only Catalog Number	Cable Only③ Catalog Number
MCS603R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS603L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS606R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS606L	FHOS06036L	FHOHS	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, 12④⑤

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



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

"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.

▲ 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**

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**

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.

Disconnect Switches

Type CFS Compact Fusible Switches

Features and Ordering Information

Features

- 30 - 800A ratings
- UL Listed under file #E121152 & CSA Certified under file #222227
- IEC 60947-3 Certified and CE marked
- 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) **CFSAUX1NO**

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 CFSAUXH1. 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.

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 series⑤

Switch ampere rating	Catalog number	Fuse provisions provided	Max horsepower ratings 240V 3Ø AC	480V 3Ø AC	600V 3Ø AC	250V DC	AC short circuit rating
Standard – with right hand mounted mechanism							
30①	CFS361C5	Class CC	7.5	15	20	5③	100kA
30①	CFS361J5	Class J	7.5	15	20	5③	100kA
30①	CFS361JN	Class J	7.5	15	20	5③	200kA
30①	CNFS361⑧⑪	None	7.5	15	20	5③	65kA
60①	CFS362JN1	Class J	15	30	50	10③	100kA
60①	CFS362JN		15	30	50	10③	
100①	CFS363JN		30	60	75	20③	
200②	CFS364JN④	Class J	60	125	150	–	200kA
400②	CFS365JN④		125	250	350	–	
600②	CFS366J⑨⑩		200	400	500	–	
800②	CFS367L⑨⑩	Class L	200	400	500	–	200kA
Optional – with left hand mounted mechanism④							
30①	CFS361JLN		7.5	15	20	5③	
60①	CFS362JLN	Class J	15	30	50	10③	200kA
100①	CFS363JLN		30	60	75	20③	



CFS361J5

Operating shafts for 30-400A switches⑤

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)	



CFSS5400N

Compact rotary operating handles – door mounted (for use with CFS361C5, CFS3361J5 & CNFS361 switches only)⑥

Catalog number	Color	UL Type	Operating shaft compatibility
CFSH5B12N CFSH5R12N	Blue & Black Yellow & Red	1, 3R & 12	CFSS5200N or CFSS5400N
CFSH5B4N CFSH5R4N	Blue & Black Yellow & Red	1, 3R, 12 & 4/4X	

Rotary operating handles - door mounted (for use with CFSS5200HN, CFSS5400HN, CFSS10200HN & CFSS10400HN)

Catalog number	Color	Description
Type 1, 3R & 12⑦		
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 & 12⑦		
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	



CFSH5B12N

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 180º 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.

Disconnect Switches

Type CFS Compact Fusible Switches

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
Terminals①	
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)	
CFSAUXH1②	Aux contact holder (CFS361J5, CFS361C5 & CNFS361)
CFSAUX1NO	Aux contact 1 NO (30-800A Sws)
CFSAUX1NC	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)	
CFSTS200N⑧	200A shroud kit (line or load 3-pole kit)
CFSTS400N⑧	400A shroud kit (line or load 3-pole kit for CFS365JN only)
CFSTS680⑥	600/800A 3-pole shroud kit
CFSTS6804⑥	600/800A 4-pole shroud kit
30A compact switch kits	
CFSPLK	Shaft padlocking kit for 30A compact switch when door is open③
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.

CFSNFPA1④	For use with CFS361C5, CFS361J5 & CNFS361
CFSNFPA2N⑤	For use with CFS361JN, CFS361CN, CFS362JN1, CFS362JN, CFS363JN & CFS364JN
CFSNFPA3N⑤	For use with CFS365JN only



CFSL200 & 400



CFSAUX1NC



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.

Disconnect Switches

Type CFS Compact Fusible Switches

Dimensions and Technical Characteristics

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	Depth①
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	65kA②	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)

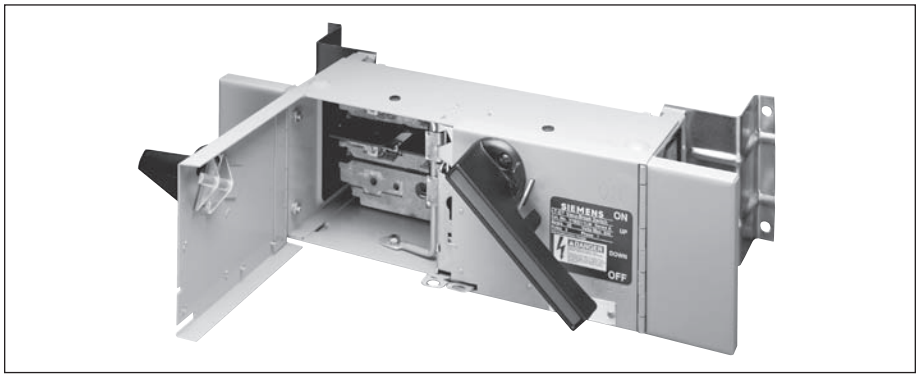
Wire ranges line & load lugs

Switch	Amperage Rating	UL approved wire size (75º 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, CFSAUX1NO or CFSAUX1NC
CFS361C5		
CFS361J5		(1) CFSAUX1NO or (1) CFSAUX1NC
CFS361JN	CFSNFPA2N	(2) Total, CFSAUX1NO or CFSAUX1NC③
CFS362JN1		
CFS362JN		
CFS363JN		
CFS364JN		
CFS365JN	CFSNFPA3N	(2) Total, CFSAUX1NO or CFSAUX1NC③

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.



Features

Exclusive Vacu-Break® Clampmatic Arc Control — Hazardous switching arcs are safely confined and controlled in the Vacu-Break chamber.

NEMA Phasing — All line connections are phased as per NEMA Standards, i.e., left to right and top to bottom as you face the unit.

Pressure Terminal Connectors — Suitable for aluminum or copper (100 Amps or larger). All Terminal Connectors 200 Amps and larger are removable.

Connection Screws — Bullet nosed for positive location and seating of screw.

Quick-Make Quick-Break — Assured by design of cam mechanism and powerful springs. Positive operation in "ON"or "OFF" position results from design of the cross arm and Vacu-Break head linkage.

Easy Mounting — Mounting feet have captive bullet nosed screws added, which seat quickly and positively, reducing installation time.

Padlocking Member — Provides locking of handle in the "ON"or "OFF" position.

Fibre End Barriers — Insulated End Barriers prevent damage to wire during installation and are designed with openings large enough to accommodate removable lugs (200 Amps and larger units).

High Pressure Spring Reinforced Copper Fuse Clips — Provided extra pressure at the contact points. Fuse clips are removable from the front in 7½" and 10" units and from the rear of 5" units.

Voidable Cover Interlock — Permits only authorized personnel to void the door interlock and open door with switch "on." "Fool proof" mechanism will not permit door to be closed unless handle is in the correct position.

Specifications

Application

VB Panelboard Switches are intended for use in applications where:

1. Rugged constructions, reliable performance, continuity of service and ease of maintenance are emphasized, or
2. Available fault currents higher than 10,000A are likely to be encountered, in manufacturing plants, mass production industries and commercial, institutional and other large buildings served by network systems or transformers of high capacities.

Short Circuit Withstand Ratings

Suitable for use on systems capable of delivering not more than 200,000 RMS symmetrical amperes of fault current when Class J or R fuses are installed. 1200A switches are the exception, which are suitable for use on circuits capable of delivering not more than 100,000 RMS symmetrical amperes of fault current when Class L fuses are installed. Also, 100–800A switches with Class T fuses and field adapter kit, which are 200,000 RMS symmetrical rated.

Fuses

Fusible switches will accept the following UL Class fuses:
Class H
Class K
Class R or J with proper adapter kit
Class L — 800 and 1200A switches
Class T — 100–800 switches with proper adapter kit

Cover Interlocks

Voidable cover interlocks standard on all switches. Prevents cover from being opened when switch is in the "ON" position.

UL Listing

Listed by UL under file #E6849 as miscellaneous switches and also suitable for use as service equipment (where applicable). Meets UL98 standard for enclosed and deadfront switches.

NEMA Specifications

Meets NEMA standard KS-1-2001 for type HD switches.

Federal Specifications

Meets previous federal specifications W-S-865C for heavy duty switches (Type HD) Type 1 switches — general purpose enclosed (Type 1).

Switch Rating	Maximum Withstand Ratings — 240V AC					Maximum Withstand Ratings — 600V AC				
	H, K Fuses	R Fuses	J Fuses	L Fuses	T Fuses	H, K Fuses	R Fuses	J Fuses	L Fuses	T Fuses
30–30	10,000	200,000①	—	—	—	10,000	200,000	200,000	—	—
30–60	10,000	200,000	200,000	—	—	10,000	200,000	200,000	—	—
60–60	10,000	200,000	200,000	—	—	10,000	200,000	200,000	—	—
60–100	10,000	200,000	200,000	—	—	10,000	200,000	200,000	—	200,000
100	10,000	200,000	200,000	—	200,000	10,000	200,000	200,000	—	200,000
100–100	10,000	200,000	200,000	—	200,000	10,000	200,000	200,000	—	200,000
200	10,000	200,000	200,000	—	200,000	10,000	200,000	200,000	—	200,000
200–200	10,000	200,000	200,000	—	200,000	10,000	—	200,000	—	—
400	10,000	200,000	200,000	—	200,000	10,000	200,000	200,000	—	200,000
600	10,000	200,000	200,000	—	200,000	10,000	200,000	200,000	—	200,000
800	—	—	—	200,000②	200,000②	—	—	—	200,000	200,000
1200	—	—	—	100,000②	—	—	—	—	100,000	—

① 2½" units will not accept Class R or J fuse clip kits and are rated 10,000 AIC max.

② Ratings are for 600V switches and fuses when used on a 240V max. AC system.

Disconnect Switches

Type VB Panelboard Units

Fusible Units For SB1, SB2 Switchboards and F1, F2 Panelboards

Catalog Numbering System

V	7	E	3	2	3	3

Vacu-Break
Unit

Width
2 = 12" 7 = 17" M = 17" (Main)

Height
A = 2½" B = 5" E = 7½" F = 10" H = 15" S = 18.75"

Number of Poles
2 3

Voltage Rating
2 = 240V 6 = 600V

Amperes
0 = Single Unit
Double 1 = 30A 2 = 60A 3 = 100A 4 = 200A

Ampere Rating
1 = 30A 2 = 60A 3 = 100A 4 = 200A 5 = 400A 6 = 600A

Example: V7E3233 = **Vacu-Break Unit, 17" Wide, 7½" High, 3-Pole, 240 Volts, Double Branch Unit with 100 Amp Rating each side. Suffix letters MS indicate Main Switch.**

Vacu-Break® Fusible Units

2-Pole①, 12" Wide — **240V AC, 250V DC**

Ampere Rating	Unit Height (inches)	Unit Depth (inches)	Horsepower Rating 240 Volt AC Standard	Horsepower Rating 240 Volt AC Maximum	Horsepower Rating 250 Volt DC	Unit Lug Wire Range (Cu/Al) and Cables Per Pole	Weight (pounds)	Catalog Number
30–30	2½②	4½	1½	3	5	(1)–#14 to #8 (Cu Only)	5	V2A2211LR■
30–30	5	4½	1½	3	5	(1)–#14 to #4	9	V2B2211LR■
30–60	5	4½	1½–3	3–10	5–10	(1)–#14 to #2	9	V2B2212LR■
60–60	5	4½	3	10	10	(1)–#14 to #2	9	V2B2222LR■
100	7½	6¾	7½	15	20	(1)–#14 to #1/0	14	V2E2203LR■
200	7½	6¾	15	—	40	(1)–#6 to 350 kcmil	19	V2E2204LR■

3-Pole — **240V AC, 250V DC**

Ampere Rating	Unit Height (inches)	Unit Depth (inches)	Horsepower Rating 240 Volt AC Standard	Horsepower Rating 240 Volt AC Maximum	Unit Lug Wire Range (Cu/Al) and Cables Per Pole	Weight (pounds)	Catalog Number
Branch Circuits, 12" Wide Units							
30–30	2½②	4½	3	7½	(1)–#14 to #8 (Cu Only)	5	V2A3211■
30–30	5	4½	3	7½	(1)–#14 to #4	9	V2B3211■
30–30	5	4½	3	7½	(1)–#14 to #4	9	V2B3211R③■
30–60	5	4½	3–7½	7½–15	(1)–#14 to #2	9	V2B3212■
30–60	5	4½	3–7½	7½–15	(1)–#14 to #2	9	V2B3212R③■
60–60	5	4½	7½	15	(1)–#14 to #2	9	V2B3222
60–60	5	4½	7½	15	(1)–#14 to #2	9	V2B3222R③■
100	7½	6¾	15	30	(1)–#14 to #1/0	14	V2E3203
200	10	6¾	25	60	(1)–#6 to 350 kcmil	21	V2F3204
Main Switch④, 12" Wide Units, Back Connected							
200	10	6¾	25	50	⑤	21	V2F3204MS■

For inches / millimeters conversion, multiply inches by 25.4.

■ Built to order. Allow 4–6 weeks for delivery.
① These units are available in LR (left, right) connection figurations only.
② This unit is not a Vacu-Break unit, but rather operates on a sliding contact, double break principle. Rated 10,000 AIC max. with either Class H or K fuses. Will not accept Class R fuse clip kits.
③ Units set up for R-fuse application only.
④ For 2-pole main switch (200A), use 3-pole main switch Vacu-Break unit.
⑤ Load-side furnished with spade type bolted terminal pads.

Disconnect Switches

Type VB Panel Units

Selection

Vacu-Break® Fusible Units for SB1, SB2 Switchboards and F1, F2 Panelboards

Ampere Rating	Unit Height (inches)	Unit Depth (inches)	Horsepower Rating 240 Volt AC Standard	Horsepower Rating 240 Volt AC Maximum	Horsepower Rating 250 Volt DC	Lug Wire Range (Cu/Al) and Cables Per Pole	Unit Weight (pounds)	Catalog Number
2-Pole①, Branch Circuits, 17" Wide Units								**240V AC, 250V DC**
30–30	2½②	6¾	1½	3	5	(1)–#14 to #8 (Cu Only)	5	**V7A2211__①③■**
30–30	5	6¾	1½	3	5	(1)–#14 to #4	9	**V7B2211LR①❍**
30–30	5	6¾	1½	3	5	(1)–#14 to #4	9	**V7B2211_①_R⑤**
30–60③	5	6¾	1½ –3	3–10	5–10	(1)–#14 to #2	9	**V7B2212LR④■**
30–60③	5	6¾	1½ –3	3–10	5–10	(1)–#14 to #4	9	**V7B2212LRR⑤■**
60–60	5	6¾	3	10	10	(1)–#14 to #2	9	**V7B2222__①③**
60–60	5	6¾	3	10	10	(1)–#14 to #2	9	**V7B2222_①_R⑤⑧**
60–100③	7½	6¾	3–7½	10–15	10–20	(1)–#14 to #1/0	18	**V7E2223LR④■**
100–100	7½	6¾	7½	15	20	(1)–#14 to #1/0	20	**V7E2233__①❍**
200	7½	6¾	15	__	40	(1)–#6 to 350 kcmil	21	**V7E2204__①❒**
400③	15	101⁄2	—	—	50	(2)–#4 to 500 kcmil	63	**V7H2205LR④**
600③	15	10½	—	—	—	(2)–#4/0 to 500 kcmil	63	**V7H2206LR④■**
2-Pole, Main Switch, 17" Wide Units, Back Connected								**240V AC, 250V DC**
200③	7½	6¾	15	—	40	⑦	21	**V7E2204MS④■**
400③	15	10½	—	—	50	⑦	63	**V7H2205MS④**
600③	15	10½	—	—	—	⑦	63	**V7H2206MS④**
3-Pole, Branch Circuits, 17" Wide Units								**240V AC**
30–30	2½②	6¾	3	7½	—	(1)–#14 to #8 (Cu Only)	5	**V7A3211**
30–30	5	6¾	3	7½	—	(1)–#14 to #4	9	**V7B3211**
30–30	5	6¾	3	7½	—	(1)–#14 to #4	9	**V7B3211R⑤**
30–60	5	6¾	3–7½	7½–15	—	(1)–#14 to #2	9	**V7B3212**
30–60	5	6¾	3–7½	7½–15	—	(1)–#14 to #2	9	**V7B3212R⑤**
60–60	5	6¾	7½	15	—	(1)–#14 to #2	9	**V7B3222**
60–60	5	6¾	7½	15	—	(1)–#14 to #2	9	**V7B3222R⑤**
60	7½	6¾	7½	15	—	(1)–#14 to #1/0	13	**V7E3202**
60–100	7½	6¾	7½–15	15–30	—	(1)–#14 to #1/0	18	**V7E3223**
100–100	7½	6¾	15	30	—	(1)–#14 to #1/0	20	**V7E3233**
100–100	7½	6¾	15	30	—	(1)–#14 to #1/0	20	**V7E3233R⑤**
100	7½	6¾	15	30	—	(1)–#14 to #1/0	14	**V7E3203**
200–200	10	6¾	25	60	—	(1)–#6 to 300 kcmil	40	**V7F3644⑥**
200–200	10	6¾	25	60	—	(1)–#6 to 300 kcmil	40	**V7F3244R⑤**
200	10	6¾	25	60	—	(1)–#6 to 350 kcmil	21	**V7F3204**
400	15	10½	50	125	—	(2)–#4 to 500 kcmil	63	**V7H3205**
400	15	10½	50	125	—	(1) 1/0 to 750 kcmil	63	**V7H3205750**
600	15	10½	75	200	—	(2)–#4 to 500 kcmil	63	**V7H3206**
3-Pole, Main Switch, 17" Wide Units (Vertical Mount, Top Feed, Front Connected)								**240V AC**
400	18.75	10⅜	50	125	—	—	—	**VMS325T**
600	18.75	10⅜	75	200	—	—	—	**VMS326T**
3-Pole, Main Switch, 17" Wide Units (Vertical Mount, Bottom Feed, Front Connected)								**240V AC**
400	18.75	10⅜	50	125	—	—	—	**VMS325B**
600	18.75	10⅜	75	200	—	—	—	**VMS326B**
3-Pole, Main Switch, 17" Wide Units, Back Connected								**240V AC**
100	7½	6¾	15	30	—	⑦	14	**V7E3203MS**
200	10	6¾	25	60	—	⑦	21	**V7F3204MS**
400	15	10½	50	125	—	⑦	63	**V7H3205MS**
600	15	10½	75	200	—	⑦	63	**V7H3206MS**

For inches / millimeters conversion, multiply inches by 25.4.

■ Built to order. Allow 4-6 weeks for delivery.
❒ MR suffix. Built to order. Allow 4-6 weeks for delivery.
❍ MR, LM suffix. Built to order. Allow 4-6 weeks for delivery.

①Order 2-pole branch circuit units by adding appropriate connection designation LM, LR or MR (indicating Left, Middle and Right, facing the panel).
②This unit is not a Vacu-Break unit, but rather operates on a sliding contact, double break principle. Rated 10,000 AIC max. with either Class H or K fuses. Will not accept Class R fuse clip kits.
③MR not available.
④Available as Type LR connection designation only.
⑤Switches set up for R-fuse applications only.
⑥Rated 600 Volts but factory configured to accept 250V Class H, K or R fuses. Field convertible for Class J fuses for 600V applications. Field convertible for 300V Class T fuse with TFAK42 kit.
⑦Load-side furnished with spade type bolted terminal pads.
⑧V7B2222MR not available

Disconnect Switches

Type VB Panel Units

Selection

Vacu-Break® Fusible Units For SB1, SB2 Switchboards and F1, F2 Panelboards

Ampere Rating	Unit Height (inches)	Unit Depth (inches)	Horsepower Rating 480 Volt AC Standard	480 Volt AC Maximum	600 Volt AC Standard	600 Volt AC Maximum	Lug Wire Range (Cu/Al) and Cables Per Pole	Unit Weight (pounds)	Catalog Number
2-Pole, Branch Circuits, 17" Wide Units①									**600V AC, 250V DC**
30–30	7½	6¾	3	7½	3	10	(1)–#14 to #4	14	**V7E2611LR⑧■**
30–60	7½	6¾	3–5	7½–20	3–5	20–25	(1)–#14 to #4	14	**V7E2612LR⑧■**
100	7½	6¾	10	20	15	40	(1)–#14 to #1/0	14	**V7E2603LR⑧■**
3-Pole, Branch Circuits, 17" Wide Units									**600V AC, 250V DC**
30–30	7½	6¾	5	15	7½	20	(1)–#14 to #4	14	**V7E3611**
30–30	7½	6¾	5	15	7½	20	(1)–#14 to #4	14	**V7E3611R⑦**
30	7½	6¾	5	15	7½	20	(1)–#14 to #4	14	**V7E3601**
30–60	7½	6¾	5–15	15–30	7½–15	20–50	(1)–#14 to #2	14	**V7E3612**
60–60	7½	6¾	15	30	15	50	(1)–#14 to #2	14	**V7E3622**
60–60	7½	6¾	15	30	15	50	(1)–#14 to #2	14	**V7E3622R⑦**
60	7½	6¾	15	30	15	30	(1)–#14 to #2	14	**V7E3602**
60–100	7½	6¾	15–25	30–60	15–30	50–75	(1)–#14 to #1/0	18	**V7E3623**
100–100	7½	6¾	25	60	30	75	(1)–#14 to #1/0	20	**V7E3633**
100–100	7½	6¾	25	60	30	75	(1)–#14 to #1/0	20	**V7E3633R⑦**
100	7½	6¾	25	60	30	75	(1)–#14 to #1/0	14	**V7E3603**
200–200	10	6¾	50	125	60	150	(1)–#6 to 300 kcmil	40	**V7F3644J②**
200	10	6¾	50	125	60	150	(1)–#6 to 350 kcmil	21	**V7F3604**
200	10	6¾	50	125	60	150	(1)–#6 to 350 kcmil	21	**V7F3604R⑦**
400	15	10½	100	250	125	350	(2)–#4 to 500 kcmil	63	**V7H3605**
400	15	10½	100	250	125	350	(1)–1/0 to 750 kcmil	63	**V7H3605750**
600	15	10½	150	400	200	500	(2)–#4/0 to 500 kcmil	63	**V7H3606**
3-Pole, Main Switch, 17" Wide Units (Vertical Mount, Top Feed, Front Connected)									**600V AC, 250V DC**
400	18.75	10⅜	100	250	125	350	③	—	**VMS365T**
600	18.75	10⅜	150	400	200	500	③	—	**VMS366T**
3-Pole, Main Switch, 17" Wide Units (Vertical Mount, Bottom Feed, Front Connected)									**600V AC, 250V DC**
400	18.75	17 11/16	100	250	125	350	③	—	**VMS365B**
600	18.75	17 11/16	150	400	200	500	③	—	**VMS366B**
3-Pole, Main Switch, 17" Wide Units, Back Connected									**600V AC, 250V DC**
100	7½	6¾	25	50	30	50	③	14	**V7E3603MS■**
200	10	6¾	50	125	60	150	③	21	**V7F3604MS■**
400	15	10½	100	250	125	350	③	63	**V7H3605MS**
600	15	10½	150	400	200	500	③	63	**V7H3606MS**
3-Pole, Switchboard Units, 21" Wide Units, Front Connected⑤									**600V AC, 250V DC**
800	25	12¾	200	500	250	500	—	160	**VF357TL** or BL④❍
1200	25	12¾	—	—	—	—	—	160	**VF358TL** or BL④
3-Pole, Switchboard Units, 21" Wide, Back Connected									**600V AC, 250V DC**
800	25	12¾	200	500	250	500	—	160	**VB357TL** or BL④■
1200	25	12¾	—	—	—	—	—	160	**VB358TL** or BL④■

■ Built to order. Allow 2–3 weeks for delivery.
◆ MR suffix only is available and built to order. Allow 2–3 weeks for delivery.
❍ BL suffix. Built to order. Allow 2–3 weeks for delivery.
①Catalog number for 2-pole branch circuit units indicate connection designation LM, LR or MR (indicating Left, Middle and Right, facing the panel).

②Unit configured to accept class J fuses only. Also accepts 300V Class T fuses when used with TFAK42 adapter kit.
③Load-side furnished with spade type bolted terminal pads.
④Suffix "T" or "TL" indicates Top Feed. Suffix "B" or "BL" indicates Bottom Feed.
⑤Back connected units are also available. Substitute the letter "B" (back connected) for the letter "F" (front connected) in the prefix of the catalog number. All other features are identical.

⑥Available as Type MR designation only.
⑦Switches set up for R-fuse applications only.
⑧Available as Type LR designation only.

Extension Kits

To extend Vacu-Break unit's depth, order the extension kit which meets the specifications of the unit to be extended. Specify by catalog number from the table to the right.

Unit Type	Unit Height (inches)	Normal Unit Depth (inches)	Extended Unit Depth (inches)	Catalog Number
V2A	2½	4⁹⁄₁₆	6¾	**W43000■**
V2B	5	4⁹⁄₁₆	6¾	**W43002**
V7A	2½	6¾	10½	**W48762**
V7B	5	6¾	10½	**W48763**
V7E	7½	6¾	10½	**W48764**
V7F	10	6¾	10½	**W48765**

Fuse Adapter Kits

Class R and Class J Fuse Kits are single unit part numbers. Order (2) kits for dual units. Class T Fuse Kits are single pole part numbers. Order (3) kits for a 3-pole unit. To order the kit which meets the specifications of the unit to be changed, specify by catalog number from the tables below.

240 Volt Fuse Adapter Kits

Switch Amperage	Class R Kits Catalog Number	Class J Kits Catalog Number	Class T Kits Catalog Number
30②	**Factory Inst.**	—	—
60	**W56628**	—	—
100	**W55365**	**W49827**	**TFAK32**
200	**W55366**	**W49819**	**TFAK42**
400	**W55367**	**W49814**	**TFAK52**
600	**W55368**	**W49813**	**TFAK62**

600 Volt Fuse Adapter Kits

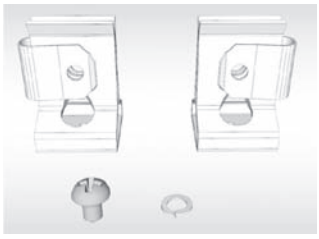
Switch Amperage	Class R Kits Catalog Number	Class J Kits Catalog Number	Class T Kits Catalog Number
30	**W56623**	**W49832**	—
60	**W56629**	**W49830**	—
100	**W55365**	**W49828**	**TFAK35**
200	**W55366**③	**W49818**①	**TFAK45**
400	**W55367**	**W49816**	**TFAK55**
600	**W55368**	**W49815**	**TFAK65**
800	—	—	**TFAK75**

Vacu-Break Connecting Strap Kits For Panelboards and Switchboards

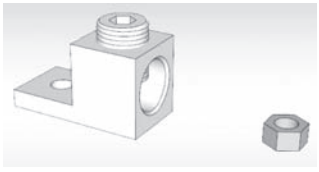
Ampere Rating	240V Unit Height (inches)	600V Unit Height (inches)	S4/F1, FPP (10" Deep) Strap Kit	S5/F2 (12.75" Deep) Strap Kit	SB1, SB2, SB3, FC-20, FC-1, VB-5, VB-6, Strap Kit
30–30	2.5	—	**F602**	**F602D**	—
30–30	5	7.5	**F657**	**F657D**	**VB657**
30-60	5	7.5	**F657**	**F657D**	**VB657**
60–60	5	7.5	**F657**	**F657D**	**VB657**
60-100	7.5	7.5	**F657**	**F657D**	**VB657**
100-100	7.5	7.5	**F657**	**F657D**	**VB657**
100	7.5	7.5	**F657**	**F657D**	**VB657**
200	7.5, 10	7.5, 10	**F671**	**F671D**	**VB671**
200–200	10	10	**F672**	**F672D**	**VB610**
400	15	15	—	—	**VB6150**
600	15	15	—	**F6150D**	**VB6150**

Ordering Information

Catalog Number	Description
Fuse Clip Kits	
VBFCL3④	100A for V2E & V7E units (6) fuse clips per kit
VBFCL4⑤	200A for V2E, V2F, V7E & V7F units (6) fuse clips per kit
VBFCL5④	400A for V7H & VMS units (3) fuse clips per kit
VBFCL6④	600A for V7H & VMS units (3) fuse clips per kit
Lug Kits	
VBRL4	200A for V2F, V7E & V7F units (3) lugs per kit
VBRL5	400A for V7H units (6) lugs per kit
VBRL6	600A for V7H units (6) lugs per kit
Handle Kits	
VBRHK1232	100A for twin V2E & V7E units (2) handles per kit
VBRHK41	200A for single V2E, V2F, V7E & V7F units (1) handle per kit
VBRHK42	200A for twin V7F units (2) handles per kit



VBFCL4



VBRL4



VBRHK41

For inches / millimeters conversion, multiply inches by 25.4.

■ Built to order. Allow 2–3 weeks for delivery.

①For 200 A single units only. Dual units are suitable for Class J only, when used above 240V.

②5″ unit height switches only.

③For single units only.

④Fuse clips provided can be used on both the line and load sides.

⑤Three line and three load fuse clips are provided.

Disconnect Switches

Type HCP Switchboard Units, Accessories

Selection

Features

- UL Listed under file number E6849 Vol 1, Sect. 8
- 400-1200A ratings
- Visible contacts
- Field installable shunt trip and auxiliary switch accessory kits
- Installs in existing Siemens switchboards and power panelboards
- Suitable for use on systems with up to 200,000A available fault current, RMS symmetrical when equipped with Class J or Class L fuses
- Group mounts with other 30A through 600A switches, and 100 through 1200 amp frame breakers
- Allows 800A and 1200A switches in standard 38" wide distribution sections in either main or branch configurations
- 16¼" mounting height is the smallest 1200A design in the industry, allowing up to 4 units in one vertical section
- Field reversible horizontal mounting design for left or right hand cabling
- Handle can be padlocked in the OFF position with up to three padlocks with 5/16" hasps. A cover padlocking provision is also supplied



3-Pole, Horizontal Mount①

Catalog Number	Maximum Ampere Rating	Maximum AC Voltage Rating②	Fuse Class	Dimensions (inches*)			Horsepower Rating						
							240V		480V		600V		250V DC
				H	W	D	Std	Max	Std	Max	Std	Max	
HCP367HJ400	400	600	J	16.25	17.22	7.38	50	125	100	250	125	350	40
HCP367HJ600	600	600	J	16.25	17.22	7.38	75	200	150	400	200	400	40
HCP327HT	800	240	T	16.25	17.22	7.38	100	250	—	—	—	—	50
HCP367H	800	600	L	16.25	17.22	7.38	100	250	200	500	250	500	50
HCP328HT	1200	240	T	16.25	17.22	7.38	100	250	—	—	—	—	50
HCP368H	1200	600	L	16.25	17.22	7.38	100	250	200	500	250	500	50

3-Pole, Vertical Mount

HCP367VJ400	400	600	J	17.00	16.25	7.38	50	125	100	250	125	350	40
HCP367VJ600▲	600	600	J	17.00	16.25	7.38	75	200	150	400	200	400	40
HCP327VT	800	240	T	17.00	16.25	7.38	100	250	—	—	—	—	50
HCP367V	800	600	L	17.00	16.25	7.38	100	250	200	500	250	500	50
HCP328VT	1200	240	T	17.00	16.25	7.38	100	250	—	—	—	—	50
HCP368V	1200	600	L	17.00	16.25	7.38	100	250	200	500	250	500	50

Accessories

Terminal Connectors (one lug per kit)

Ampere Rating	Catalog Number	Connector Wire Range
400–600A	**TA2K500**	(2) #1 AWG–500 kcmil (Cu or Al)
400–600A	**TC2K500**	(2) #1 AWG–500 kcmil (Cu only)
400–800A	**TA3K500**	(3) #1 AWG–500 kcmil (Cu or Al)
400–800A	**TC3K350**	(3) #1 AWG–350 kcmil (Cu only)
800-1200A	**TA4H500**	(4) #2 AWG–500 kcmil (Cu or Al)
800-1200A	**TA3H750**	(3) 500–750 kcmil (Cu or Al)

Auxiliary Switch Kits

Contact Ampere Rating	Maximum Voltage		Switch Mounting	Contacts	Catalog Number
	AC	DC			
15A	480	125	Left Pole	1NO/1NC	**A01HCPL4▲**
15A	480	125	Right Pole	1NO/1NC	**A01HCPR4**

Shunt Trip Kit

Control Voltage		
AC	DC	Catalog Number
120	—	**HCPST120**
240	—	**HCPST240▲**
277	—	**HCPST277**
480	—	**HCPST480▲**

Switchboard Connection Strap Kit①

Switch Ampere Rating	Catalog Number
400–1200A	**F6162D**

T Fuse Adapter Kits (one per pole)

Catalog Number	Description
TFAK72	800A, 300V AC
TFAK75	800A, 600V AC
TFAK82	1200A, 300V AC

HCP Replacement Handle Kit (For use on all HCP switches)

SW Ampere Rating	Catalog Number
400–1200A	**HCPHK**

Compression Lug Adapter Kit

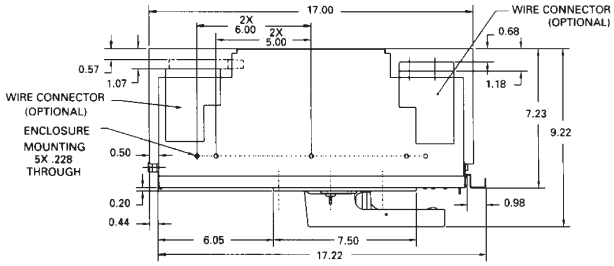
The use of this kit provides for the mounting of up to four lugs per phase. Each kit accepts lugs with (2) 3/8" diameter mounting holes on 1" centers. One kit per pole line or load is required. Lugs are not provided.

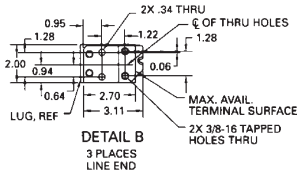
***For inches / millimeters conversion, multiply inches by 25.4.**

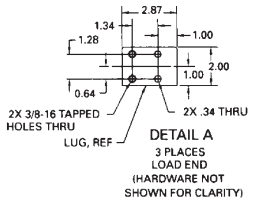
▲ Built to order. Allow 6–8 weeks for delivery.
① For horizontal mounting only in either 38" wide min switchboards or S5/F2 power panelboards.

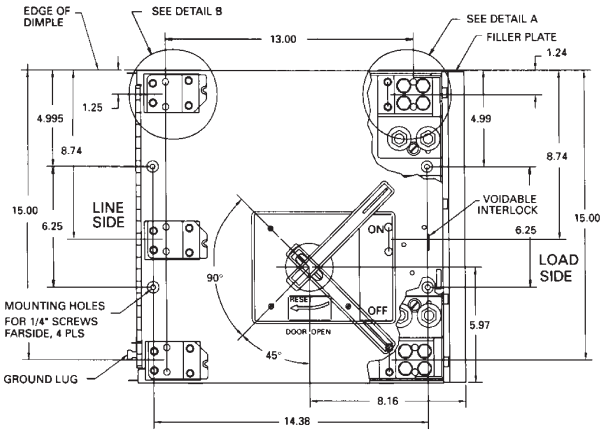
② Both 240 and 600V AC switches are also rated 250V DC max.

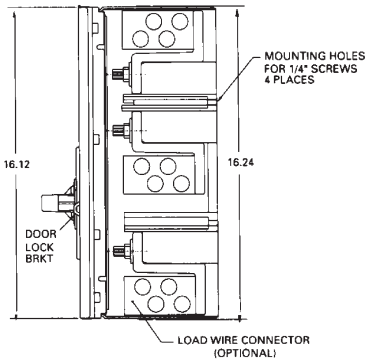
Horizontal Mount Drawing



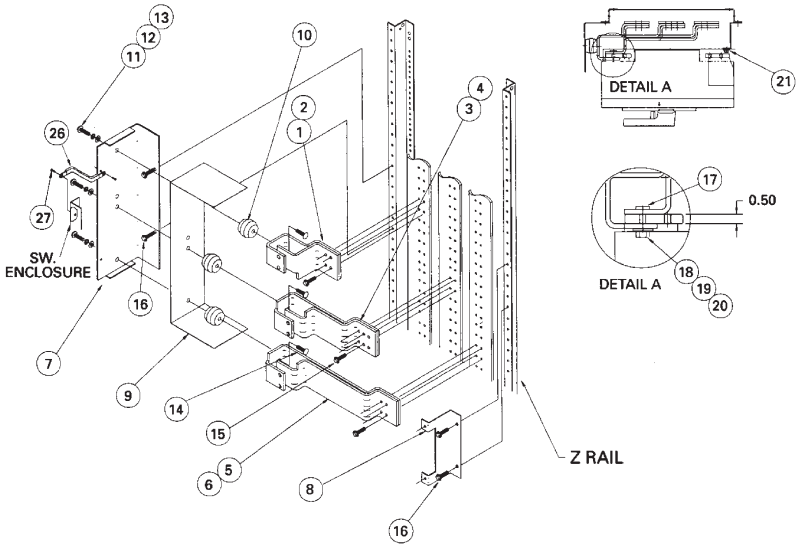








Group Mounting Assembly (Horizontal Mount Only)



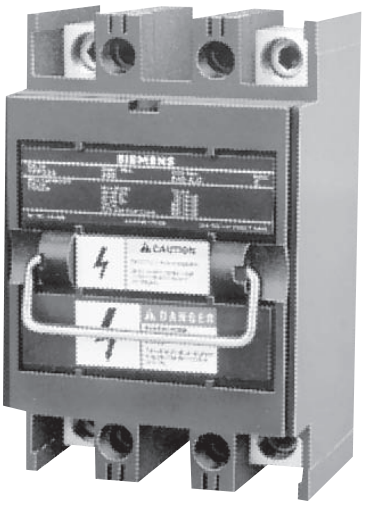
Note: Right exit shown, rotate 180° for left exit
Note: Items 26 & 27 are used to ground the switch enclosure (Route bonding wire along flange)

Item	Parts Supplied in Connection Strap Kit Cat. No. F6162D	Qty.
1-2	A/CØ Strap (Short)	1ea.
3-4	BØ Strap	1ea.
5-6	A/C Ø Strap (Long)	1ea.
7-8	Switch Mounting Bracket	1ea.
9	Insulation	1
10	1-3/8" Insulator	3
11	3/8-16 X 3/4" HHMS	3
12	3/8" Lock Washer	3
13	3/8" Flat Washer	3
14	3/8-16 X 3/4" RHSNB	3
15	Strap Bus Hardware Kit	2
16	1/4-28 X 3/8" SHWHSW	4
17	5/16-18 Insert	6
18	5/16-18 X 1" SRHMS	6
19	5/16 Flat Washer	6
20	5/16 Lock Washer	6
21	1/4-20 X 1" SRHMS	2
26	Ground Bracket	1
27	10-32 X 1/4" SHWHSW	2

Features

Type TFP Fusible Pullouts

- 100 and 200 Ampere Disconnects
- 240 Volt and 600 Volt Designs
- Class T Fuses
- Factory Installed Wire Connectors
- U.L. Listed for applications up to 200,000 Amps symmetrical at 600 Volts
- Physically interchangeable with Siemens Type QJ2, QJH2 and QJ2-H
- UL 1429, File No. E118778



T-Fuse Pullout
TFP223

T-Fuse Pullouts

2-Pole, 2-Fuse

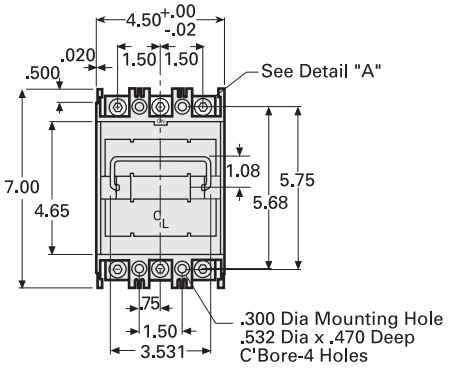
Maximum Voltage	Ampere Rating	Catalog Number	Connector Wire Range 60/75°C①
240②	100 200	**TFP223** **TFP224**	(1 pc.) #6-300 kcmil Cu (1 pc.) #4-300 kcmil Al

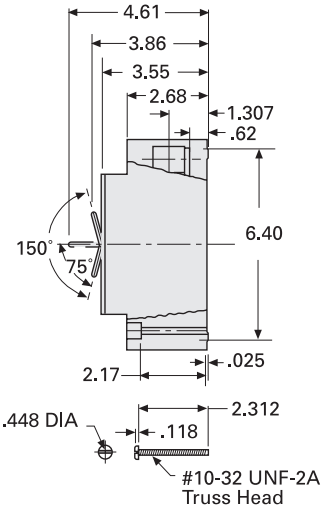
3-Pole, 3-Fuse

240②	100 200	**TFP323** **TFP324**	(1 pc.) #6-300 kcmil Cu (1 pc.) #4-300 kcmil Al
600	100 200	**TFP363** **TFP364**	

Fuses — Not included. Consult local sales office for replacement parts.

Fusible Pullouts Dimensions (inches*)





Class T Pullout Mounting Hardware
Catalog Number MSQJ (Includes 4 screws)

For inches / millimeters conversion, multiply inches by 25.4.

① Replacement terminal lug Catalog Number **TA1Q300**.
② 240 bolt pullouts require 300 volt Class T fuses.

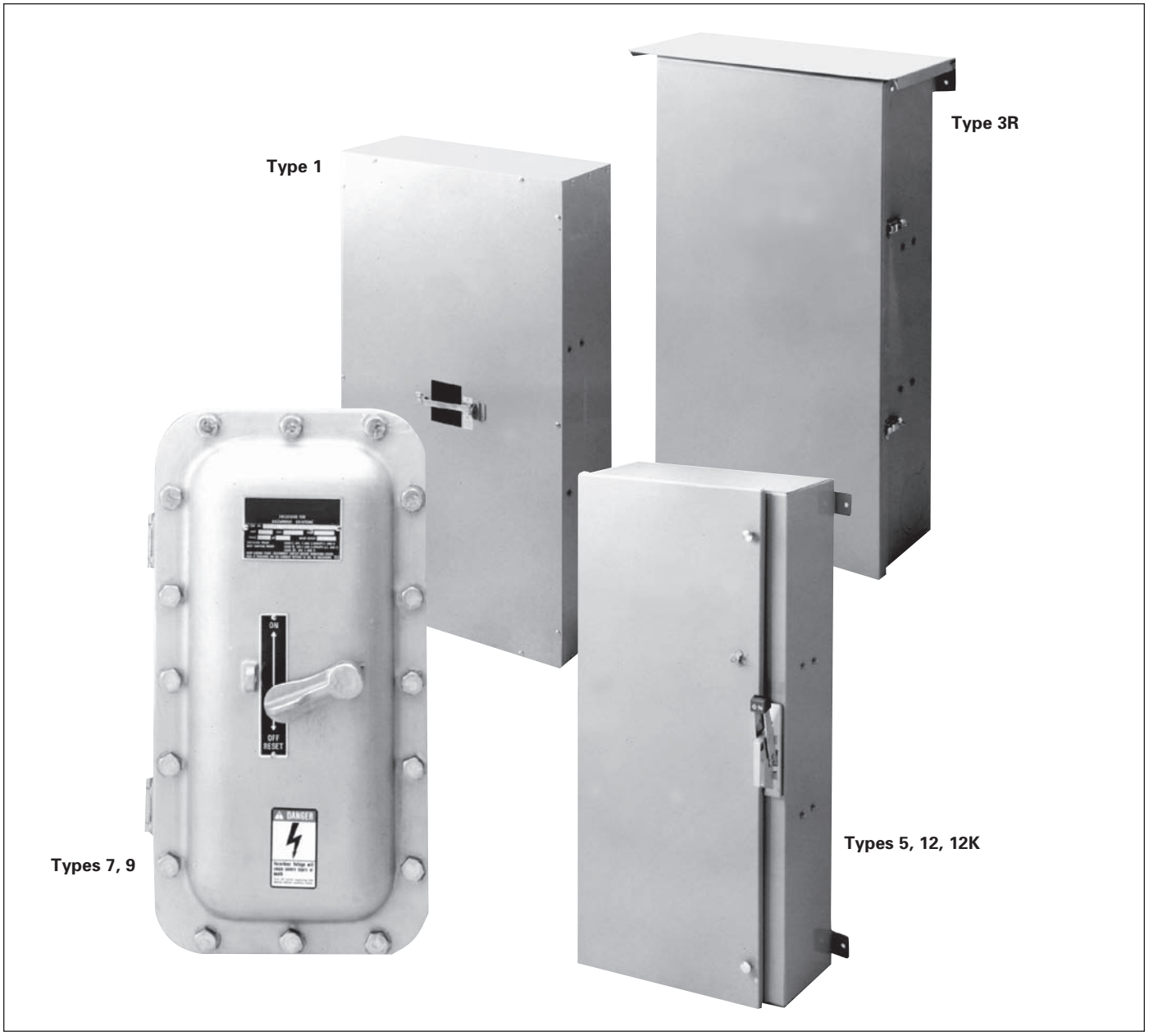
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Enclosed Circuit Breakers

Enclosure Types

General



Type 1 — A general indoor, sheet-steel enclosure for use in normal atmospheres. Listed as service entrance equipment.

Type 3R — An outdoor, sheet-steel enclosure providing protection against driving rain, sleet or snow. Listed as service entrance equipment.

Types 7, 9 — Cast aluminum enclosure classified for explosion and fire hazard. Only enclosure for use in hazardous location. Class I; Group D–Class II; Groups E, F, and G–Class III.

Types 4, 4X (not shown) — Stainless steel indoor or outdoor enclosure designed for use in areas where serious corrosion problems exist. They provide a degree of protection against windblown dust, rain, splashing water and hose-directed water. Meets NEMA Type 3, 4, 4X, 12 and 13 requirements and UL 508 Type 4 and 4X requirements.

Types 5, 12 — A special-industry, sheet-steel enclosure for use in atmospheres containing particles of lint, dust, dirt, sawdust and other foreign matter.

Type 12K — A semi-dusttight sheet-steel enclosure. Listed as service entrance equipment.

Enclosed Circuit Breakers

Complete Assemblies—Molded Case Circuit Breakers

Selection

Siemens Enclosed Circuit Breaker Complete Assemblies consist of a thermal magnetic molded case circuit breaker frame, trip unit, enclosure and standard line and load pressure wire connectors — assembled and shipped as one unit from the Siemens modification center. For service equipment or applications requiring a solid neutral, neutrals must be priced and ordered separately except as noted.

To order, select the appropriate prefix from the table below and place it in front of the desired non-interchangeable trip or interchangeable trip circuit breaker catalog number. For circuit breaker selection, refer to SpeedFax Section 7.

Note: Lead times are determined based on availability of components. Items marked with ■ in this section may contain components that are not normally stocked.

Catalog Numbering

Prefix	Enclosure Type
E1S	Type 1 Surface
E1F	Type 1 Flush
E3R	Type 3R
E12	Type 12
E4X	Type 4X Stainless Steel

Example: Catalog number E1SJD63B400 consists of:

(1) JD63F400 frame
(1) JD63T400 trip unit
(1) J6N1 enclosure
(6) TA2J6500 wire connectors

Selection by Enclosure Type

Circuit Breaker			Complete Assembly					Neutrals
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface or Flush	Type 3R	Type 12	Type 4, 4X	Lug Catalog Number (included)	Catalog Number
QJ2	2	60-225	√	√	—	—	**TA1Q300**	Included with enclosure
	3	60-225	√	√	—	—		
QJH2	2	60-225	√	√	—	—	**TA1Q300**	
	3	60-225	√	√	—	—		
QJ2-H	2	60-225	√	√	—	—	**TA1Q300**	
	3	60-225	√	√	—	—		
NGG	2, 3	15-30	√	√	√	√	**3TC1Q1**	**N125GG** included with enclosure
	2, 3	35-125	√	√	√	√	**3TC1GG20**	
ED2	2 2	15-60 70-100	√ √	√ √	√ √	√ √	15-25A SA1E025 30-60A Line LN1E100 Load LD1E060 70-100 LN1E100 110-125A TA1E6125	Catalog Number **W53045** included with enclosure
	3 3	15-60 70-100	√ √	√ √	√ √	√ √		
ED4	2 2 2	15-60 70-100 110-125	√ √ √	√ √ √	√ √ √	√ √ √		
	3 3 3	15-60 70-100 110-125	√ √ √	√ √ √	√ √ √	√ √ √		
ED6	2 2	15-60 70-100	√ √	√ √	√ √	√ √		
	3 3 3	15-60 70-100 110-125	√ √ √	√ √ √	√ √ √	√ √ √		

√ Available configuration
— Not available

Selection by Enclosure Type

Circuit Breaker			Complete Assembly				Lug Catalog Number (included)	Neutrals
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface or Flush	Type 3R	Type 12	Type 4, 4X		Catalog Number
HED4	2 2 2■	15-60 70-100 110-125	√ √ √	√ √ √	√ √ √	√ √ √	Refer to page 7-88	Catalog Number **W53045** included with enclosure
	3 3 3	15-60 70-100 110-125	√ √ √	√ √ √	√ √ √	√ √ √		
CED6	2■ 2■	15-100 110-125	√ √	√ √	√ √	— —	Refer to page 7-88	
	3 3■	15-100 110-125	√ √	√ √	√ √	— —		

Circuit Breaker			Complete Assembly				Lug Catalog Number (included)	Neutrals (not included)
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface or Flush	Type 3R	Type 12	Type 4, 4X		Catalog Number
FXD6, FD6	2■	70-225 250	√ √	√ √	√ √	√ √	**TA1FD350A**	**N250**②
	3	70-225 250	√ √	√ √	√ √	√ √		
HFD6	2■	70-225 250	√ √	√ √	√ √	√ √		
	3■	70-225 250	√ √	√ √	√ √	√ √		
CFD6	3■	70-225 250	√ √	√ √	√ √	— —		
JXD2	2■	200-400	√	√	√	√	**TA2J6500**	**W60992**①
	3	200-400	√	√	√	√		
JXD6, JD6	2■	200-400	√	√	√	√		
	3	200-400	√	√	√	√		
HJD6	2■	200-400	√	√	√	√		
	3	200-400	√	√	√	√		
HHJD6	2■	200-400	√	√	√	√		
	3■	200-400	√	√	√	√		
CJD6	3■	200-400	√	√	√	—		

■ Built to order. Allow 2–3 weeks for delivery.
√ Available configuration
— Not available

① Order catalog number **W60993** neutral for type 4, 4X enclosure or when a 200% neutral is required.

② For 200% neutral order catalog number **N2250**

Selection by Enclosure Type

Circuit Breaker			Complete Assembly				Lug Catalog Number (included)	Neutrals
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface	Type 3R	Type 12	Type 4, 4X		Catalog Number
LXD6, LD6	2■	450-600	√	√	√	√	TA2J6500	W60993①
	3	450-600	√	√	√	√		
HLD6, HLXD6	2■	250-600	√	√	√	√		
	3	250-600	√	√	√	√		
HHLXD6③, HHLD6	2■	450-600	√	√	√	√		
	3■	450-600	√	√	√	√		
CLD6	3■	450-600	√	√	√	—		
LMXD6, LMD6	2■	500-800	√	√	√	—	TA3K500	W63623②
	3■	500-800	√	√	√	—		
HLMXD6③, HLMD6	2■	500-800	√	√	√	—		
	3■	500-800	√	√	√	—		
MXD6, MD6	2■	500-800	√	√	√	—		
	3■	500-800	√	√	√	—		
HMXD6③, HMD6	2■	500-800	√	√	√	—		
	3■	500-800	√	√	√	—		
CMD6	3■	500-800	√	√	√	—		

■ Built to order. Allow 2–3 weeks for delivery.
√ Available configuration
— Not available
① For 200% neutral in Type 1, 3R & 12 enclosures use neutral catalog number **W63623**.
② For applications requiring 600MCM neutral conductors (max. 3 in & 3 out) use neutral catalog number **W411239**.
③ HHLXD6, HLMXD6 and HMXD6 are only available with 3-pole breakers.

Selection by Enclosure Type

Circuit Breaker			Complete Assembly				Lug Catalog Number (included)	Neutrals
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface	Type 3R	Type 12	Type 4, 4X		Catalog Number
NXD6	2■	900-1200	√	√	√	—		
	3	900-1200	√	√	√	—		
ND6	2■	800	√	√	√	—	**TA3K500** for 800A	
	2■	900-1200	√	√	√	—		
	3	800	√	√	√	—	**2TA4N8500** for 900-1200A 2-Pole	
	3	900-1200	√	√	√	—		
HNXD6	3	900-1200	√	√	√	—		**W63623**②
HND6	2■	800	√	√	√	—		
	2■	900-1200	√	√	√	—	**3TA4N8500** for 900-1200A 3-Pole	
	3	800	√	√	√	—		
	3	900-1200	√	√	√	—		
CND6	3■	900-1200	√	√	√	—		
PXD6①	3■	1200-1600	√	√	—	—	**TA5P600**	
PD6①	3■	1200-1600	√	√	—	—	**TA5P600**	
HPXD6①	3■	1200-1600	√	√	—	—	**TA5P600**	
HPD6①	3■	1200-1600	√	√	—	—	**TA5P600**	
CPD6①	3■	1200-1600	√	√	—	—	**TA5P600**	**N2000**
RXD6①	3	1600-2000	√	√	—	—	**TC5R600**	
RD6①	3■	1600-2000	√	√	—	—	**TC5R600**	
HRXD6①	3■	1600-2000	√	√	—	—	**TC5R600**	
HRD6①	3■	1600-2000	√	√	—	—	**TC5R600**	

Special Application Complete Enclosures with Ground Fault Protection

The following assemblies are suitable for use as service entrance devices on services which require ground fault protection.

Selection by Enclosure Type

Breaker Type	Ampere Rating	Catalog Number	Catalog Number	Circuit Breaker Installed	Terminal Connector Installed	Neutral Installed	Neutral Sensor Installed
SND6 w/ground fault■	1000A	**E1SSND69100GN**	**E3RSND69100GN**	SND69100AG	3TA4N8500	W63623	N10SNDA
	1200A	**E1SSND69120GN**	**E3RSND69120GN**	SND69120AG	3TA4N8500	W63623	N12SNDA
SHND6 w/ground fault■	1000A	**E1SSHND69100GN**	**E3RSHND69100GN**	SHND69100AG	3TA4N8500	W63623	N10SNDA
	1200A	**E1SSHND69120GN**	**E3RSHND69120GN**	SHND69120AG	3TA4N8500	W63623	N12SNDA

■ Built to order. Allow 2–3 weeks for delivery.
√ Available configuration
— Not available

① Not assembled — components shipped separately. Includes connect-all mounting assembly Catalog Number **MB9301**.

② For applications requiring 600MCM neutral conductors (max. 3 in & 3 out) use neutral catalog number **W411239**.

Selection by Enclosure Type

Molded Case Switch			Enclosure Type				Lug Catalog Number (included)	Neutrals
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface or Flush	Type 3R	Type 12	Type 4, 4X		Catalog Number
QJ2	2■	225	√	√	—	—	**TA1Q300**	Included with enclosure
	3	225	√	√	—	—		
ED2	2■	100	√	√	√	√	Refer to page 7-88	Catalog Number **W53045** included with enclosure
	3	100	√	√	√	√		
ED4	2■	100 125	√ √	√ √	√ √	√ √	Refer to page 7-88	
	3	100 125	√ √	√ √	√ √	√ √		
ED6	2■	100 125	√ —	√ —	√ —	√ —	Refer to page 7-88	
	3	100 125	√ √	√ √	√ √	√ √		
CED6	2■	100 125	√ √	√ √	√ √	— —	Refer to page 7-88	
	3■	100 125	√ √	√ √	√ √	— —		

Molded Case Switch			Enclosure Type					Lug Catalog Number (included)	Neutrals (not included)
Breaker Frame	Number of Poles	Ampere Rating	Type 1 Surface	Type 1 Flush	Type 3R	Type 12	Type 4, 4X		Catalog Number
FXD6	2	250	√	√	√	√	√	**TA1FD350A**	**N250**③
	3	250	√	√	√	√	√		
CFD6	3■	250	√	√	√	√	—		
JXD2	2■	400	√	—	√	√	√	**TA2J6500**	**W60992**②
	3	400	√	—	√	√	√		
JXD6	3	400	√	—	√	√	√	**TA2J6500**	**W60992**②
CJD6	3■	400	√	—	√	√	—	**TA2J6500**	**W60992**②
LXD6	3	600	√	—	√	√	√	**TA2J6500**	**W60993**④
CLD6	3■	600	√	—	√	√	—	**TA2J6500**	**W60993**④
MXD6	3	800	√	—	√	√	—	**TA3K500**	**W63623**⑤
CMD6	3■	800	√	—	—	√	—		
NXD6	3	1200	√	—	—	√	—	**3TA4N8500**	**W63623**⑤
CND6	3■	1200	√	—	—	√	—		
PXD6①	3■	1600	√	—	—	—	—	**TA5P500**	**N2000**
RXD6①	3■	2000	√	—	—	—	—	**TC5R600**	**N2000**

■ Built to order. Allow 2–3 weeks for delivery.
√ Available configuration
— Not available
① Not assembled — components shipped separately. Includes connect-all mounting assembly Catalog Number **MB9301**.
② Order Catalog Number **W60993** neutral for Type 4, 4X enclosure or when a 200% neutral is required.
③ For 200% neutral order catalog number **N2250**
④ For 200% neutral in Type 1, 3R & 12 enclosures use neutral catalog number **W63623**.
⑤ For applications requiring 600 MCM neutral conductors (Max. 3 in and 3 out) use neutral catalog number **W411239**.

Dimensions

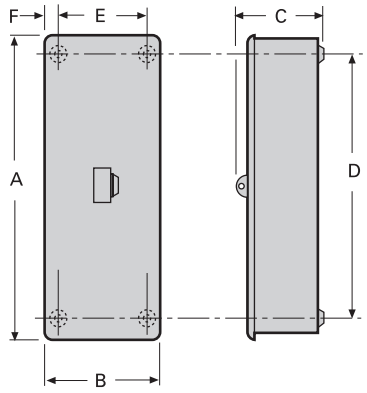


Figure 1

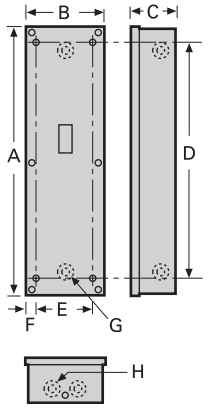


Figure 2

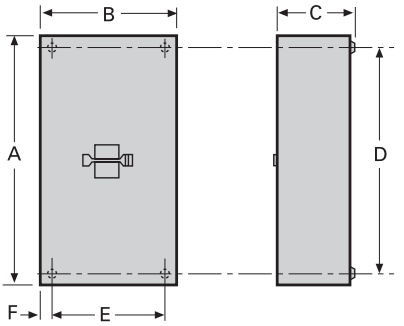


Figure 3

Type 1

Fig. No.	Breaker Frame	Number of Poles	Maximum Current Rating	Catalog Number	Weight Lb./Ship. Package	Dimensions (inches)						K.O. Dimensions 6 Plcs.	K.O. Dimensions 2 Plcs.
						A	B	C	D	E	F	G	H
1	QP, QPH, HQP	1–2	60	**E0204ML1060S**①③⑦	16	7⅛	5⅛	3⅜	5¾	3¾	1 1/16	—	—
1	QP, QPH, HQP	3	100	**E0303ML3100S**①③⑥	8	17⅛	7⅛	4¼	14⅛	4½	1 5/16	—	—
1	BQ, BQH, HBQ	3	100	**EB3100S**③⑥	32	17⅛	7⅛	4¾	14⅛	4½	1 5/16	—	—
1	NGG	2-3	125	**GG0121FN/SN**	12	20	8¾	4	16	6	1 3/16	—	—
2	ED2, ED4, ED6, HED4	2–3	100	**E2N1S**③⑨ **E2N1F**③⑨	8 8	16 23/32 17½	7½ 8½	5 1/16 5 1/16	13 45/64 13 45/64	5¼ 5¼	1 1	⅞, 1⅛, 1⅜,	⅞, 1⅛, 1⅜,
2	ED4, ED6, HED4, CED6	2–3	125	**CED6N1S**③⑤⑨ **CED6N1F**③⑤⑨	14 14	21 15/32 22¼	7 19/32 8½	5 7/64 5 7/64	18¼ 18¼	5¼ 5¼	1 1	1¾, 2	1¾, 2
2	FXD6, FD6, FXD6, FD6, HFD6, HFXD6, HHFD6, CFD6	2–3	250	**F6N1S**② **F6N1F**②	33	38 13/32	11 15/32	5 1/16	33	8	1 1 33/64	⅛, 1⅜, 1¾, 2, 2½, 3	1⅛, 1⅜, 1¾, 20, 2½, 3
3	JXD2, JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, SJD6, SHJD6 ⑧	2–3	400	**J6N1**②	120	41 3/16	22 27/64	10 45/64	37	18¼	2 5/64	—	—
3	LD6, LXD6, HLD6, HLXD6, HHLD6, HHLXD6, SLD6, SHLD6, SCJD6, SCLD6, CJD6, CLD6 ⑧	2–3	600	**LD6N1**②	101	46	22 27/64	10 45/64	42	18¼	2 5/64	—	—
3	LMXD6, LMD6, HLMXD6, HLMD6	2–3	800	**LMD1**②	202	60	22 27/64	10	55⅞	18¼	2 5/64	—	—
3	MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, ND6, NXD6, SND6, HND6, HNXD6, SHND6, CMD6, SCMD6, CND6, SCND6 ⑧	2–3	1200	**MND61**②	202	60	22 27/64	10	55⅞	18¼	2 5/64	—	—
—	PD6, PXD6, HPD6, HPXD6, CPD6, RD6, SPD6, SHPD6, RXD6, HRD6, HRXD6 ⑧	3	2000	**PRD6N1** ■	350	90	32	28	—	—	—	—	—

For inches / millimeters conversion, see Application Data section.
All above enclosures are suitable for use as service entrance devices
■ Built to order. Allow 2–3 weeks for delivery.

①Surface mounted, indoor. If flush mounting is required, replace suffix "S" in catalog number with suffix "F". Also, if outdoor model required, use prefix "W" instead of "E".
②Neutral not included. Order as separate item from table on next page.
③Neutral included in enclosure.
④Surface mounted, indoor. If outdoor model is required, use prefix "W" instead of "E". Not available in flush ("F") model.
⑤Use for 110-125 ampere ED4, ED6, or HED4 circuit breakers.
⑥Will not accept breaker with shunt trip.
⑦Will not accept 2-pole GFP or breaker with shunt trip.
⑧Includes 100% rated breakers.
⑨Enclosure will accept shunt trip and other internal accessories except GFP.

Dimensions

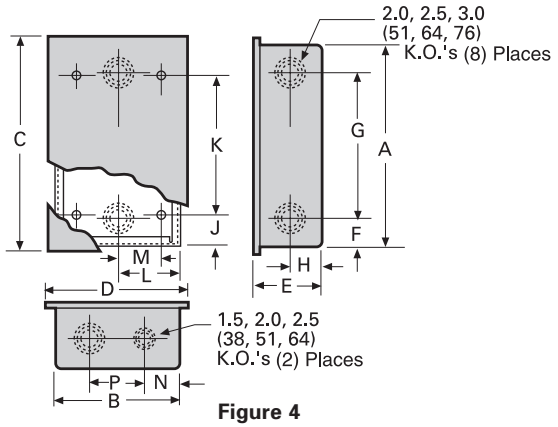


Figure 4

Figure Number	Breaker Frame	Number of Poles	Maximum Current Rating	Catalog Number	Weight Lb./Ship. Package	Dimensions (inches)													
						A	B	C	D	E	F	G	H	J	K	L	M	N	P
4	QJ2, QJH2, QH2-H	2–3	225	**EB3225S**	15	27	10⅛	27	10⅛	5¼	2 13/16	21⅜	2⅜	3	20	5 1/16	2¾	2¾	4½
				EB3225F		27	10⅛	28⅛	11¼	5¼	2 13/16	21⅜	2⅜	3	20	5 1/16	2¾	2¾	4½

Neutrals

Neutral Catalog Number	Enclosure Catalog Number	Neutral Cable Capacity and Wire Range
N225QJ	**EB3225**(S)(F)	(1 pc.) #4 - 2/0 Cu/Al (1 pc.) #1 - 300 kcmil Cu/Al Gnd. Lug (1pc.) #14 - #4 & (3 pcs.) #14 - #10 Cu or (1 pc.) #12 - #4 & (3 pcs.) #12 - #10 Al
N125GG	**GG0121SN/FN**	(1 pc.) #14-2/0 Cu/Al, (1 pc.) #1-300 kcmil Cu/Al Grd. Lug (1 pc.) #12 - #4 Cu/Al (3 pcs.)#12 - #10 Cu/Al
W53045	**E2N1**(S)(F)	(1 pc.) #14–2 Cu/Al Grd. Lug (1 pc.) #14–8 Cu/Al
	CED6N1(S)(F)④	
N250	**F6N1**(S)(F)	(1 pc.) #6–350 kcmil Cu/Al Grd. Lug (1 pc.) #14–2/0 Cu/Al
W60992	**J6N1**	(1 pc.) #1/0–750 kcmil Cu/Al or (2 pcs.) #1/0–300 kcmil Cu/Al Grd. Lug (1 pc.) #6–250 kcmil Cu/Al
W60993	**LD6N1**	(2 pcs.) #1/0–600 kcmil Grd. Lug (1 pc.) #6–250 kcmil Cu/Al
W63623	**LMD1**	(4 pcs.) 250 kcmil–500 kcmil Cu/Al⑨ Grd. Lug (1 pc.) #6–300 kcmil Cu/Al
	MND61	
N2000	**PRD6N1**	(6 pcs.) #3/0–750 kcmil Cu/Al Grd. Lug (2 pcs.) #3/0–750 Cu/Al

200% Neutrals (For Type 1, 3R, 4/4X and 12 Enclosures)

Neutral Catalog Number	Enclosure Catalog Number	Neutral Cable Capacity and Wire Range
N2250	**F6N1**(S)(F)⑥	(2 pcs.) #4–350 kcmil Cu/Al Grd. Lug (1 pc.) #14–2/0 Cu/Al
W60993	**J6N1**⑦	(2 pcs.) #1/0–600 kcmil Grd. Lug (1 pc.) #6-250 kcmil Cu/Al
W63623	**LD6N1**⑧	(4 pcs.) 250 kcmil–500 kcmil Cu/Al Grd. Lug (1 pc.) #6–300 kcmil Cu/Al

For inches / millimeters conversion, see Application Data section.

①Surface mounted, indoor. If flush mounting is required, replace suffix "S" in catalog number with suffix "F". Also, if outdoor model required, use prefix "W" instead of "E".

②Neutral not included. Order as separate item from table on next page.

③Surface mounted, indoor. If outdoor model is required, use prefix "W" instead of "E". Not available in flush ("F") model.

④Use for 110-125 ampere ED4, ED6, or HED4 circuit breakers.

⑤Will not accept breaker with shunt trip.

⑥Also for use with Type 3R, 12, 12K & 4X enclosures (Catalog numbers **F6N3R, F6N12, F6N12K & FD6SS4**).

⑦Also for use with Type 3R, 12 & 4X enclosures (Catalog numbers **J6N3R, J6N12, & LD6SS4**).

⑧Also for use with Types 3R and 12 enclosures (Catalog numbers **LD6N3R & LD6N12**).

⑨For 600 MCM neutral cable (3) in, (3) out (#4–600 kcmil Cu/Al) use catalog number **W411239**

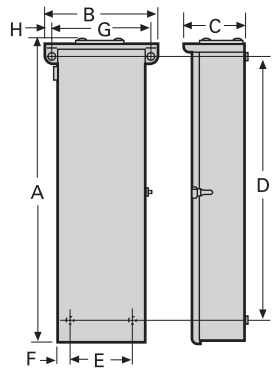


Figure 1

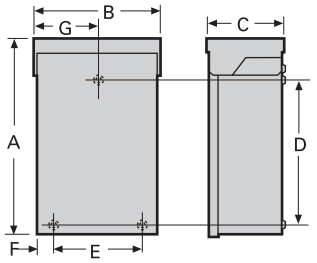


Figure 2

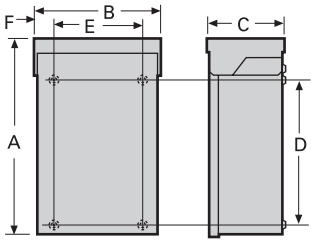


Figure 3

Type 3R

Figure Number	Breaker Frame	Number of Poles	Maximum Current Rating	Catalog Number	Weight Lb./Ship. Package	Dimensions (inches)							
						A	B	C	D	E	F	G	H
2	QP, QPH	1–2	60	**W0204ML1060**⑤	28	8⅛	5⅛	4⅜	—	—	—	—	—
2	QPP, QPPH, HQPP	1–4	225	**W0406ML1225CU**④	24	23⅛	10½	4⁵⁄₁₆	20	7½	1¹⁵⁄₁₆	5¼	—
2	QP, QPH, HQP	3	100	**W0303ML3100**④	9	17⅛	7⅜	4⁵⁄₁₆	14⅛	4½	1⅛	3¹¹⁄₁₆	—
2	BQ, BQH, HBQ	3 3	50 100	**WB3100**④	9	17⅛	7⅜	4⁵⁄₁₆	14⅛	4½	1⅛	3¹¹⁄₁₆	—
2	NGG	2-3	125	**GG0123RN**	15	19¾	9	5	16⁹⁄₁₆	6	1¼	4½	—
5	ED2, ED4, ED6, HED4, HED6	2–3	100	**E2N3R**③	12	17⁹⁄₁₆	7¼	5¼	12³⁹⁄₆₄	5¼	1	3	—
5	CED6, ED2, ED4, ED6	2–3	125	**CED6N3R**③	16	22²¹⁄₆₄	7¼	5¼	17⅜	5¼	1	3	—
1	FXD6, FD6, FXD6, FD6, HFD6, HFXD6, HHFD6, CFD6	2–3	250	**F6N3R**②	45	38⅛	14¹⁄₁₆	7¾	33⁹⁄₃₂	8	¹³⁄₁₆	13½	¹³⁄₁₆
1	JXD2, JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, SJD6, SHJD6 ⑥	2–3	400	**J6N3R**②	126	40⁶³⁄₆₄	26¾	11²³⁄₃₂	35¾	18¼	2⅛	24½	1⅛
1	LD6, LXD6, LXD6H, HLD6, HLXD6, HHLD6, HHLXD6, CJD6, CLD6, SCJD6, SLD6, SHLD6 ⑥	2–3	600	**LD6N3R**②	137	45⁶³⁄₆₄	26¾	11²³⁄₃₂	40¾	18¼	2⅛	24½	1⅛
4	LMXD6, LMD6, HLMXD6, HLMD6	2–3	800	**LMD3R**②	210	61⁹⁄₆₄	26¾	11²³⁄₃₂	57¹⁷⁄₃₂	18¼	2⅛	24⅝	1¹⁄₁₆
1	MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, ND6, NXD6, SND6, HND6, HNXD6, SHND6, CMD6, SCMD6, CND6,SCND6 ⑥	2–3	1200	**MND63**②	210	61⁹⁄₆₄	26¾	11²³⁄₃₂	57¹⁷⁄₃₂	18¼	2⅛	24⅝	1¹⁄₁₆

For inches / millimeters conversion, see Application Data section.

Note: All above enclosures are suitable for use as service enterance equipment.

①Does not include circuit breaker. Order circuit breaker separately.

②Neutral not included. Order as separate item from table on next page.

③Neutral included in enclosure.

④Will not accept breaker with shunt trip.

⑤Will not accept 2 pole GFP or breaker with shunt trip.

⑥Includes 100% rated breakers.

Dimensions

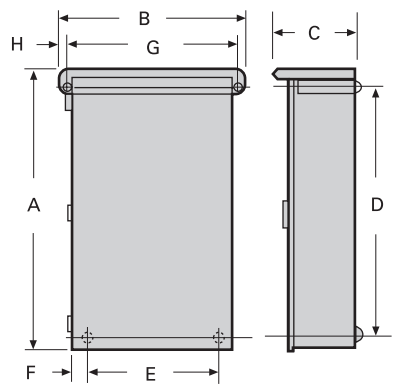


Figure 4

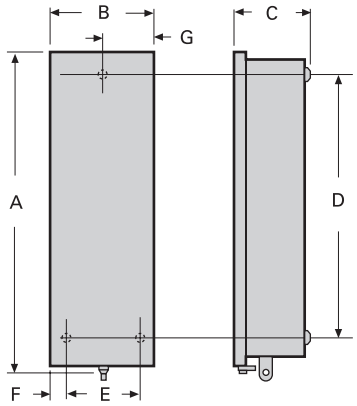


Figure 5

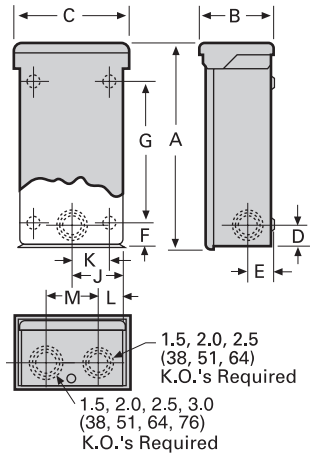


Figure Number	Breaker Frame	Number of Poles	Maximum Current Rating	Catalog Number	Weight Lb./Ship. Package	Dimensions (inches)											
						A	B	C	D	E	F	G	H	J	K	L	M
6	QJ2, QJH2, QJ2-H	2	225	**WB2225**	17	27	5	7 1/16	2 1/4	2	2 7/8	20	4 1/8	3 5/8	2 3/4	2 3/4	—
		3	225	**WB3225**	17	27	5 5/8	10 3/8	2 1/4	2	2 7/8	20	4 1/8	5 1/8	2 3/4	2 3/4	4 1/2

Neutrals④

Neutral Catalog Number	Enclosure Catalog Number	Neutral Cable Capacity and Wire Range
N125GG	**GG0123RN**	(1 PC.) #14-2/0 Cu/Al, (1 pc.) #1-300 kcmil Cu/Al Grd. Lug (1 pc.) #12 - #4 Cu/Al (3 pcs.)#12 - #10 Cu/Al
N225QJ	**WB2225**	(1 pc.) #4 - 2/0 Cu/Al (1 pc.) #1 - 300 kcmil Cu/Al Gnd. Lug (1pc.) #14 - #4 & (3 pcs.) #14 - #10 Cu or (1 pc.) #12 - #4 & (3 pcs.) #12 - #10 Al
	WB3225	
W53045②	**E2N3R**	(1 pc.) #14–2 Cu/Al Grd. Lug (1 pc.) #14–8 Cu/Al
	CED6N3R③	
N250④	**F6N3R**	(1 pc.) #6–350 kcmil Grd. Lug (1 pc.) #14–2/0 Cu/Al
W60992④	**J6N3R**	(1 pc.) #1/0–750 kcmil Cu/Al or (2 pcs.) #1/0–300 kcmil Cu/Al Grd. Lug (1 pc.) #6–250 kcmil Cu/Al
W60993④	**LD6N3R**	(2 pcs.) #1/0–600 kcmil Grd. Lug (1 pc.) #6–250 kcmil Cu/Al
W63623	**LMD3R**	(4 pcs.) 250 kcmil–500 kcmil Cu/Al⑤ Grd. Lug (1 pc.) #6–300 kcmil Cu/Al
	MND63	

Hubs — see page 6-14.

For inches / millimeters conversion, see Application Data section.

①Neutral not included. Order as separate item from table on next page.

②Neutral included in enclosure.

③Use CED enclosure for all ED-frame 110-125 ampere units.

④200% neutrals are also available. See listing on page 6-9.

⑤For applications requiring 600MCM neutral conductors (3) in, (3) out (#4-600 kcmil Cu/Al) use neutral catalog number **W41123**.

Enclosed Circuit Breakers

Enclosures — Types 4, 4X, 7, and 9

Dimensions

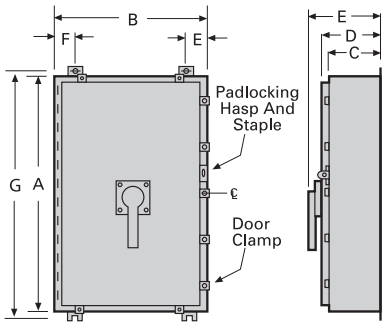


Figure 1A

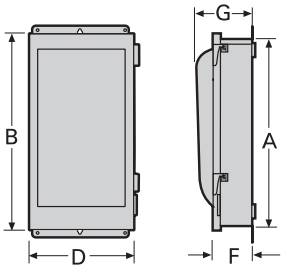


Figure 1B

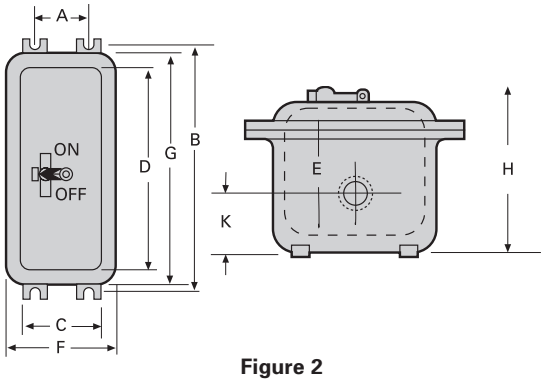


Figure 2

Figure 1 Types 4 and 4X

Breaker Frame	See Figure Drawing	Number of Poles	Maximum Current Rating	Catalog Number①	Weight Lb./Ship Package	Dimensions (inches)						
						A	B	C	D	E	F	G
NGG⑨	1A	2–3	125	**GG0124XN**		19¼	17¼	9½	—	3⅝	3⅝	18¾
ED2, ED4, ED6, HED4 ⑩	1A	3	125	**ED6SS4**⑦	44	20	16	6	7 5/32	9¾	3	—
ED2, ED4, ED6, HED4	1B	3	125	**ED6S4**⑩	19	16.27	17.46	—	9.17	—	5.33	6.12
ED2, ED4, ED6, HED4	1B	3	125	**ED6S4316**⑪	19	16.27	17.46	—	9.17	—	5.33	6.12
FXD6, FD6, HFD6, FXD6, FD6 ⑩	1A	2–3	250	**FD6SS4**⑦	106	36	24	8	9 5/32	11¾	3	—
JXD2, JXD6, JD6, HJD6, HJXD6, HHJD6,HHJXD6, SJD6, SHJD6, LXD6, LD6, HLD6, HLXD6, HHLD6, HHLXD6, SLD6, SHLD6 ⑧⑩	1A	2–3	600	**LD6SS4■**⑦	145	42	30	10	11 5/32	13¾	3	—

Neutrals

Neutral Catalog Number	Enclosure Catalog Number②	Neutral Cable Capacity and Wire Range
W53045③	**ED6SS4**	(1 pc.) #14–2 Cu/Al Grd. Lug (1 pc.) #14–8 Cu/Al
N250④⑥	**FD6SS4**	(1 pc.) #6–350 kcmil Grd. Lug (1 pc.) #14–2/0 Cu/Al
W60993④⑥	**LD6SS4**	(2 pcs.) #1/0–600 kcmil Grd. Lug (1 pc.) #6–250 kcmil Cu/Al

Figure 2 Types 7 and 9⑤

Breaker Frame	Number of Poles	Maximum Current Rating	Catalog Number④⑥	Weight Lb./Ship. Package	Dimensions (inches)									Knockouts	
					Mounting		Inside			Outside				Conduit Size	
					A	B	C	D	E	F	G	H	K	Std.	Max
ED2, ED4, ED6, HED4	2–3	15–60 70–100	**EA■** **EB■**	27 32	5½ 6	13⅛ 18	5 15/16 6½	10¾ 16	5 7/16 5 9/16	9 7/16 9⅞	14¼ 19⅜	6⅝ 6 1/16	1⅝ 2	1¼ 2	1¼ 2
CED6	2–3	100	**N/A**												
FXD6, FD6, HFD6, HFXD6, CFD6	2–3	250	**EC2■**	85	10¼	22⅝	11¾	20	6½	15⅜	23⅞	8¼	2¾	2½	2
JXD2, JXD6, JD6, SJD6, HJD6, HJXD6, HHJD6, HHJXD6, SHJD6	2–3	200–350 300–400	**EC4■** **EE■**	85 93	10¼ 8½	22⅝ 27⅛	11¾ 10¾	20 24⅛	6½ 7¾	15⅜ 13⅞	23⅞ 27¼	8¼ 9 9/16	2¾ 4	2½ 3	3 4
LXD6, LD6, SLD6, HLD6, HLXD6, HHLD6, HHLXD6, SHLD6	2–3	600	**ED6■**	190	11⅞	40¾	13⅜	37⅞	7⅞	18⅛	42⅝	9⅞	3⅝	4	4

For inches / millimeters conversion, see Application Data selection.

Note: Above enclosures are suitable for use as service entrance equipment.

■ Built to order. Allow 2–3 weeks for delivery.

①Does not include circuit breaker. Order circuit breaker separately.

②Enclosures shipped with handle and breaker hardware packaged within enclosure.

③Neutral included.

④Neutral not included. Order as separate item.

⑤Breather and drain option is by SPECIAL ORDER only — add **$70.00** to list price.

⑥For 400A max. 4/4x applications which require a 200% Neutral. See listing on page 6-9.

⑦Suitable for use as Service Entrance device.

⑧Includes 100% rated breakers.

⑨Non-metallic enclosure.

⑩304 Stainless Steel enclosures.

⑪316 Stainless Steel enclosures.

Types 5, 12 and 12K

Figure Number	Breaker Frame	Number of Poles	Maximum Current Rating	Catalog Number②	Weight Lb./Ship. Package	Dimensions (inches)					
						A	B	C	D	E	F
2	ED2, ED4, ED6, HED4	2–3	100	**E2N12**①④	12	18⅝	8 11/32	7 1/16	18	6 1/16	½
1	CED6, ED2, ED4, ED6	2–3	125	**CED6N12**①④■	16	23⅜	8 11/32	7 1/16	22¾	6 1/16	½
2	FXD6, FD6, FXD6, FD6, HFD6, CFD6	2–3	250	**F6N12**①③	40	38 19/32	14 29/64	8⅛	34	13	23/32
3	JXD2, JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, SJD6, SHJD6	2–3	400	**J6N12**	104	41½	21⅝	11⅞	37 5/32	20⅜	⅝
3	LD6, LXD6, HLD6, HLXD6, HHLD6, HHLXD6, SLD6, SHLD6, CJD6, CLD6, SCJD6, SCLD6	2–3	600	**LD6N12**■	104	46½	21⅝	11⅞	42 5/32	20⅜	⅝
4	LMXD6, LMD6, HLMXD6, HLMD6	2–3	800	**LMD12**■	220	60	37⅜	10	⅜	3	2
4	MD6, MXD6, SMD6, ⑧ HMD6, HMXD6, SHMD6, ND6, NXD6, SND6, HND6, HNXD6, SHND6, CMD6, SCMD6, CND6, SCND6	2–3	1200	**MND612**③■	220	60	37⅜	10	⅝	3	2

Dimensions

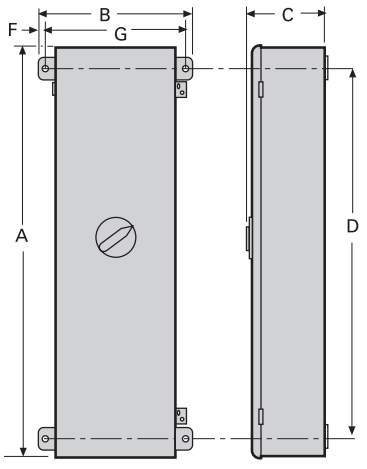


Figure 1

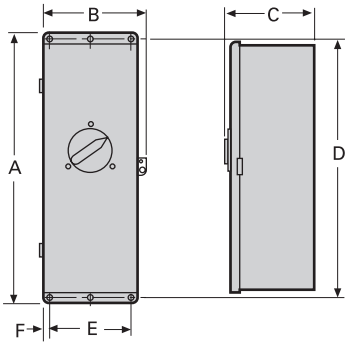


Figure 2

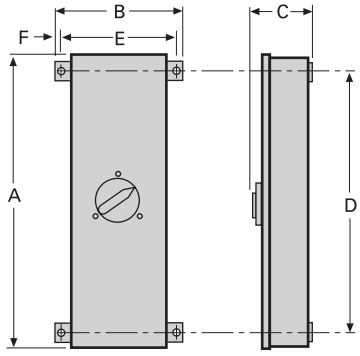


Figure 3

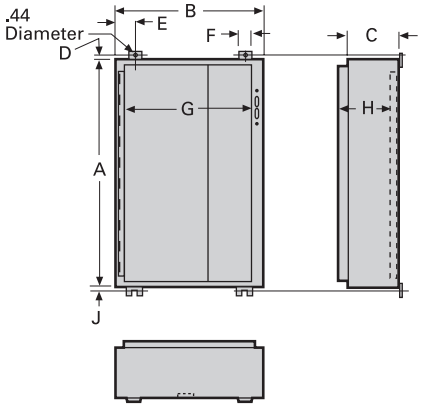


Figure 4

Neutrals

Neutral Catalog Number	Enclosure Catalog Number	Neutral Cable Capacity and Wire Range
W53045④	**E2N12**	(1 pc.) #14–2 Cu/Al
	CED6N12⑤	(1 pc.) #14–2 Cu/Al
N250③⑥	**F6N12**	(1 pc.) #6–350 kcmil Grd. Lug (1 pc.) #14–2/0 Cu/Al
W60992③⑥	**J6N12**	(1 pc.) #1/0–750 kcmil Cu/Al or (2 pc.) #1/0–300 kcmil Cu/Al Grd. Lug (1 pc.) #6–250 kcmil Cu/Al
W60993③⑥	**L6N12**	(2 pcs.) #1/0–600 kcmil Grd. Lug (1 pc.) #6–250 kcmil Cu/Al
W63623③	**LMD612**	(4 pcs.) 250 kcmil–500 kcmil Cu/Al Grd. Lug (1 pc.) #6–300 kcmil Cu/Al
	MND612	

For inches/millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

Note: All above enclosures are suitable for use as service entrance devices.

①Catalog Number is for Type 12. If Type 12K with knockouts is required, add suffix "K" to catalog number.
②Does not include circuit breaker. Order circuit breaker separately.
③Neutral not included. Order as separate item.
④Neutral included in enclosure.
⑤Use CED enclosure for all ED-frame 110–125 ampere units.
⑥200% neutrals are also available. See listing on page 6-9.
⑦For 600 MCM neutral cable (3) in, (3) out (#4-600 kcmil Cu/Al) use catalog number **W411239**
⑧Includes 100% rated breakers.

Knockouts & Wire Bending Space

Breaker Frame	Conduit Range Per Knockout Outside Dimensions (inches)	Types 1, 12 and 12K — Number of Knockouts Per Panel (Type 4, 4X, 12 have no KO's)				Type 3R — Number of Knockouts Per Panel (Type 4, 4X, 12 have no KO's)				Maximum Cable Sizes Recommended (Cu/Al) for Type 1, 3R, 4, 4X, 12 & 12K Enclosures⑤⑥
		Top	Bottom	Side	Back	Bottom	Side	Back	Maximum Hub Size (inches) Type 3R	
QP, QPH, HQP 15–125	½, ¾, 1, 1¼, 1½	4	4	4	4	3	1	1	2	7⅛" high encl. #6③
BQ, BQH, HBP 70–100	¾, 1, 1¼	1	1	2	2	8	1	3	2	④
QPP, QPPH, HQPP 125–225	½, ¾, 1, 1¼, 1½, 2, 2½	—	—	—	—	4	1	1	2½	250 kcmil
QJ	1½, 2, 2½, 3	2	2	2	2	3	1	1	2½	④
NGG	¾, 1, 1¼, 1½, 2, 2½	—	—	—	—	—	—	—	—	
ED2, ED4, ED6, HED4	⅞, 1⅛, 1⅜, 1¾, 2	2	2	2	2	2	1	1	2	④
CED6	⅞, 1⅛, 1⅜, 1¾, 2	2①	2①	—	—	2	—	—	2	④(CFD6 only 300 kcmil)
	⅞, 1⅛, 1⅜, 1¾, 2, 2½	2	2	2②	2②	—	1	1		
FXD6, FD6, FXD6, FD6 HFD6, CFD6	1⅛, 1⅜, 1¾, 2, 2½, 3	1	1	2②	2②	1	1	—	4	④
		1	1	—	—	1	—	—		
JXD2, JXD6, JD6, HJD6, HJXD6, HHJD6, HHJXD6, SJD6, SHJD6	1½, 2, 2½, 3, 3½, 4	1	1	2	4	—	—	—	4	(2) 600 kcmil
LXD6, LD6, HLXD6, HLD6, HHLD6, HHLXD6, SLD6, SHLD6	1½, 2, 2½, 3, 3½, 4	1	1	2	4	—	—	—	4	(2) 600 kcmil
LMXD6, LMD6 HLMXD6, HMLD6	—	—	—	—	—	—	—	—	4	(3) 600 kcmil
MD6, SMD6, HMD6 ND6, SND6, HND6	—	—	—	—	—	—	—	—	4	(3) 600 kcmil or (4) 500 kcmil

Hubs (Type 3R)

Breaker Frame	Conduit Size (inches)	Catalog Number
QP, QPH, HQP, BQ, BQH, HBQ, NGG	¾	**ECHS075**
	1	**ECHS100**
	1¼	**ECHS125**
	1½	**ECHS150**
	2	**ECHS200**
QPP, QPPH, HQPP, QJ2, QJH2, QJ2-H	1¼	**ECHS125**
	1½	**ECHS150**
	2	**ECHS200**
	2½	**ECHS250**
ED2, ED4, ED6, HED4, HED6, HHED6, CED6	¾	**ECHR075**
	1	**ECHR100**
	1¼	**ECHR125**
	1½	**ECHR150**
	2	**ECHR200**
FXD6, FD6, HFD6, HFXD6, CFD6, JXD2, JD6, JXD6, HJD6, HJXD6, LD6, LXD6, HLD6, HLXD6(A)	2	**ECHV200**
	2½	**ECHV250**
	3	**ECHV300**
	3½	**ECHV350**
	4	**ECHV400**



Note: Enclosures for 250A max breakers have a hub provision on the rainshed. Enclosures for larger breakers (J, L, M & N frame) have blank top rainsheds. Drill or punch hole in the field to accommodate hub size desired.

For inches / millimeters conversion, see Application Data section.

①Type 12K only.

②Type 12K enclosure has no knockouts this location.

③17⅛" high enclosure provides sufficient wire bending space for all available CB lugs.

④Sufficient wire bending space is provided for all available mechanical type CB lugs.

⑤The use of cables larger than those listed below may violate NEC & UL wire bending space requirements.

⑥The use of compression type connectors will violate NEC and UL wire bending space requirements.

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Superseded Circuit Breakers	7-169 – 7-171

Molded Case Circuit Breakers

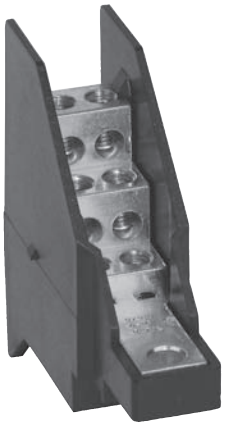
What's **new** in molded case circuit breakers:

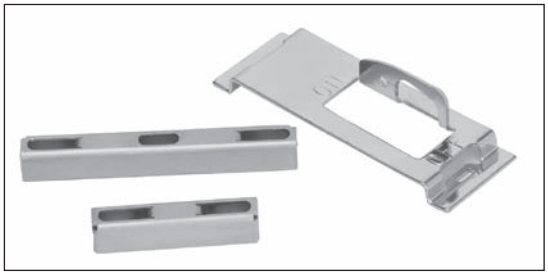
Siemens BL and NGB circuit breaker families are now eligible to be marked "NAVAL" for use on non-combat vessels. These breakers meet the requirements of UL 489 Supplement SB. Consult your local sales office for availability.



BL **NGB**

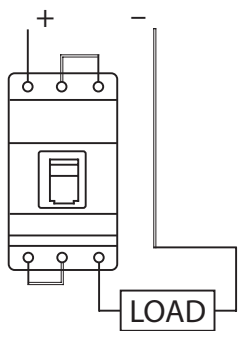
Now available from stock Siemens offers **distribution lugs for the NGG circuit breaker** family for use in UL 508A control panels. These lugs will accept up to (6) copper wires from #14 to #4 gauge or aluminum wires from #6 to #4 gauge.





BQD and NGB handle ties are now released for use where single pole breakers are using shared neutrals and must be locked out simultaneously.

Siemens now offers a line of **VL circuit breakers** which are rated for use at **600VDC** with interrupting ratings between 42KAIC and 65KAIC.





Circuit Breaker and Surge Protective Device (SPD)

By installing a Siemens Circuit Breaker and Surge Protective Device (SPD) in the load center of the residence, surge protection is provided for all branch circuits (1).

- UL and CSA, Meets UL 1449 3rd Edition
- Easy to install and perfect for retrofit
- Offer in 15 or 20 amps
- LEDs provide protection status

(1) See warranty for detailed coverage information. www.usa.siemens.com/surge

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.

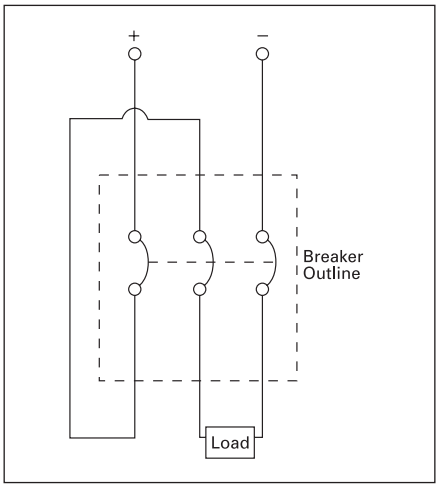
Frame, Trip Unit and Lugs Ordered Together

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.

Molded Case Circuit Breakers

Federal Specification Classification

Reference

W-C-375C/GEN

Class	Interrupting Rating: Symmetrical Amperes[1]	Interrupting Rating: Volts AC 60HZ	Poles	Range of Current Trip[3]	Breaker Type (All Circuit Breakers Meet or Exceed the Indicated Class Level)
10a[2]	5,000	120/240	1 or 2	15–100	QP, BQ, QT, BL
10b	5,000	240	2 or 3	15–100	QP, BQ, BQD, CQD, BL
11a	7,500	120	1	15–100	QP, BQ, BQD, CQD, BL
11b	7,500	240	2 or 3	15–100	QP, BQ, BQD, CQD, BL
12a[2]	10,000	120/240	1 or 2	15–100	QP, BQ, QT, ED2, BL
12b	10,000	240	2 or 3	15–225	QP, BQ, QJ2, ED2, BQD, CQD, BL
12c	10,000	277	1	15–100	BQD, CQD, NGG, NGB, NEG, NEB
13a	14,000	277	1	15–100	ED4, BQD, CQD, NGG, NGB, NEG, NEB
13b	14,000	277/480	1, 2, or 3	15–100	ED4, BQD, CQD
14a	22,000	120/240	1 or 2	15–100	QPH, BQH, BLH
14b	22,000	240	2 or 3	70–400	QJH2, QJ2-H, BQH, BQD, CQD, BLH
15a	65,000	120/240	1 or 2	15–100	HQP, HBQ, ED4, HED4, NGG, NGB, NEG, NEB
15b	65,000	240	2 or 3	15–225	ED6, ED4, FXD6, FD6, HED4, BQD, CQD, HQJ2H, NGG, NGB, NEG, NEB
16a	100,000	480	2 or 3	15–225	CFD6, CED6
16b	100,000	600	2 or 3	15–600	CED6, CFD6, CJD6, SCJD6, CLD6, SCLD6
17a	200,000	600	2 or 3	70–2000	—
18a	18,000 14,000 14,000	240 480 600	2 or 3	15–125	ED6, HED6, HHED6
19a	22,000 18,000 14,000	240 480 600	2 or 3	70–225	FXD6, FD6, CFD6, HFD6
20a	25,000 22,000 22,000	240 480 600	2 or 3	70–225	FXD6-A, FD6-A, CFD6, HFD6
21a	42,000 30,000 22,000	240 480 600	2 or 3	70–800	HFD6, CFD6, JXD6(A), JD6(A), SJD6(A), HJD(A), HJXD6(A), HHJD6, SHJD6(A), CJD6, SCJD6, LXD6(A), LD6(A), SLD6(A), HLD6(A), HLXD6(A), HHLD6, SLD6(A), SHLD6(A), CLD6, SCLD6, LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, CMD6, SCMD6
22a	65,000 25,000 18,000	240 480 600	2 or 3	15–125	CED6, ED6, HED6, HHED6, FXD6-A, FD6-A
23a	65,000 35,000 25,000	240 480 600	2 or 3	70–1200	HHED6, FXD6-A, FD6-A, HFD6, HHFD6, CFD6, JD6(A), JXD6(A), SJD6(A), HJD6(A), HJXD6(A), SHJD6(A), HHJD6, HHJXD6, CJD6, SCJD6, LXD6(A), LD6(A), SLD6(A), HLD6(A), HLXD6(A), SHLD6(A), HHLD6, HHLXD6, CLD6, SCLD6, LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, CMD6, SCMD6, ND6, NXD6, SND6, HND6, HNXD6, SHND6, CND6, SCND6
24a	65,000 50,000 42,000	240 480 600	2 or 3	1200–2000	PD6, PXD6, HPD6, HPXD6, CPD6 RD6, RXD6, HRD6, HRXD6, SPD6, SHPD6
25a	125,000 80,000 60,000	240 480 600	2 or 3	600–4000	HHLD6, CLD6, CMD6, CND6 SCLD6, SCMD6, SCND6, CPD6

Applicable Standards

UL489 — Molded Case Circuit Breakers and Circuit Breaker Enclosures.

UL486A — Wire Connectors and Solderless Lugs for use with copper wire

UL486B — Wire Connectors and Solderless Lugs for use with aluminum wire

UL943 — Ground Fault Interrupters (for personnel protectors)

UL1087 — Molded Case Switches

UL50 — Cabinets and Boxes

UL869 — Service Equipment

NEMA AB-1 — Molded Case Circuit Breakers and Molded Case Switches

CSA–C22.2 No. 5, C22.2 No. 14

Note:

(A) Molded case circuit breakers are designed and tested in accordance to applicable portions of UL489 and meet application requirements of the National Electric Code. Unless marked otherwise, circuit breakers are 80% duty rated.

(B) Molded case circuit breakers are to be connected with 60 or 75°C wire for circuit breakers having a rated ampacity of 100 amperes or less. Circuit breakers having a rated ampacity greater than 100 amperes shall only be cabled with 75°C cable unless otherwise indicated on the circuit breaker label. Exceptions to this rule are outlined in the article 110-14 C(1)(2) of the 2005 National Electric Code.

[1] Interrupting ratings are not limited to the values or groups of values listed. However, the values listed are minimum values for the class specified.

[2] Single-unit or duplex construction must be specified.

[3] Use minimum frame size for ampere rating.

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

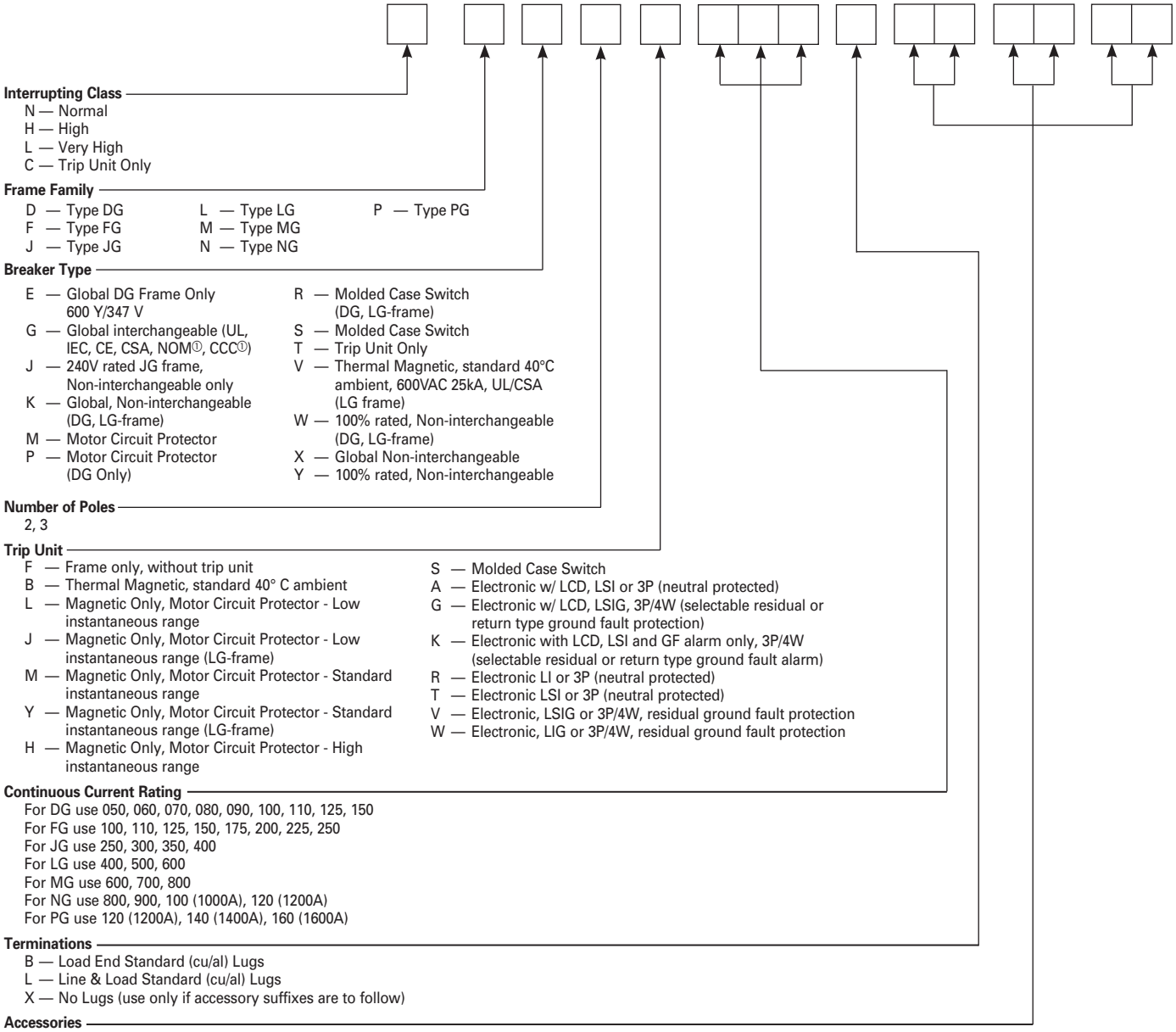
NOTE:

□ — Position omitted if not used.

VL Molded Case Circuit Breakers

Catalog Numbering System

Selection/Application



Interrupting Class
- N — Normal
- H — High
- L — Very High
- C — Trip Unit Only

Frame Family
- D — Type DG
- F — Type FG
- J — Type JG
- L — Type LG
- M — Type MG
- N — Type NG
- P — Type PG

Breaker Type
- E — Global DG Frame Only 600 Y/347 V
- G — Global interchangeable (UL, IEC, CE, CSA, NOM①, CCC①)
- J — 240V rated JG frame, Non-interchangeable only
- K — Global, Non-interchangeable (DG, LG-frame)
- M — Motor Circuit Protector
- P — Motor Circuit Protector (DG Only)
- R — Molded Case Switch (DG, LG-frame)
- S — Molded Case Switch
- T — Trip Unit Only
- V — Thermal Magnetic, standard 40°C ambient, 600VAC 25kA, UL/CSA (LG frame)
- W — 100% rated, Non-interchangeable (DG, LG-frame)
- X — Global Non-interchangeable
- Y — 100% rated, Non-interchangeable

Number of Poles
- 2, 3

Trip Unit
- F — Frame only, without trip unit
- B — Thermal Magnetic, standard 40° C ambient
- L — Magnetic Only, Motor Circuit Protector - Low instantaneous range
- J — Magnetic Only, Motor Circuit Protector - Low instantaneous range (LG-frame)
- M — Magnetic Only, Motor Circuit Protector - Standard instantaneous range
- Y — Magnetic Only, Motor Circuit Protector - Standard instantaneous range (LG-frame)
- H — Magnetic Only, Motor Circuit Protector - High instantaneous range
- S — Molded Case Switch
- A — Electronic w/ LCD, LSI or 3P (neutral protected)
- G — Electronic w/ LCD, LSIG, 3P/4W (selectable residual or return type ground fault protection)
- K — Electronic with LCD, LSI and GF alarm only, 3P/4W (selectable residual or return type ground fault alarm)
- R — Electronic LI or 3P (neutral protected)
- T — Electronic LSI or 3P (neutral protected)
- V — Electronic, LSIG or 3P/4W, residual ground fault protection
- W — Electronic, LIG or 3P/4W, residual ground fault protection

Continuous Current Rating
- For DG use 050, 060, 070, 080, 090, 100, 110, 125, 150
- For FG use 100, 110, 125, 150, 175, 200, 225, 250
- For JG use 250, 300, 350, 400
- For LG use 400, 500, 600
- For MG use 600, 700, 800
- For NG use 800, 900, 100 (1000A), 120 (1200A)
- For PG use 120 (1200A), 140 (1400A), 160 (1600A)

Terminations
- B — Load End Standard (cu/al) Lugs
- L — Line & Load Standard (cu/al) Lugs
- X — No Lugs (use only if accessory suffixes are to follow)

Accessories

Auxiliary and Alarm Switch Combinations

Suffix	Description
A1	1 Alarm (includes 1NO & 1NC switch with a 2 Aux./1 Alarm Base, for frames DG to LG)
A2	2 Aux (1NO & 1NC switch with a 3 Aux. Base, for frames DG to LG)
A3	2 Aux + 1 Alarm (2NO & 2NC switches with a 2 Aux./1 Alarm Base, for frames DG to LG)
A3	2 Aux + 2 Alarm (2NO & 2NC switches with a 2 Aux./2 Alarm Base, for frames MG to PG)
A4	4 Aux (2NO & 2NC switches with a 4 Aux. Base, for frames MG to PG)

Note: A1 and A3 include 1NO and 1NC switch for alarm purposes, only one of these switches may be used as there is only one space for an alarm.

Shunt Trips

RB — 24 VDC	RM — 48-60 VAC
RC — 48-60 VDC	RN — 110-127 VAC
RD — 110-127 VDC	RS — 208-277 VAC
RE — 250 VDC	RV — 380-600 VAC

Under Voltage Releases

UA — 12 VDC	UN — 110-127 VAC
UB — 24 VDC	UP — 208 VAC
UC — 48 VDC	UR — 220-250 VAC
UD — 110-127 VDC	US — 277 VAC
UE — 220-250 VDC	UT — 380-415 VAC
UG — 60 VDC	UU — 440-480 VAC
UK — 24 VAC	

LCD = Liquid Crystal Display
LI = Long Delay & Instantaneous trip functions
LSI = Long Delay, Short Delay, & Instantaneous trip functions
LSIG = Long Delay, Short Delay, Instantaneous, & Ground Fault trip functions
GF = Ground Fault
3P = 3-pole
4W = 4-wire

① Select Frames

VL Circuit Breakers

Catalog Numbering System

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

Molded Case Circuit Breakers

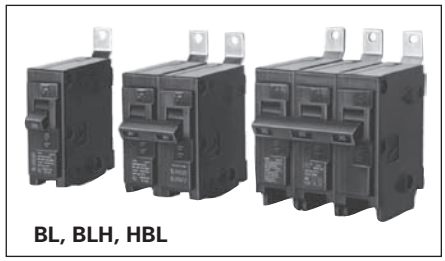
Reference Guide

Thermal-Magnetic Trip Breakers

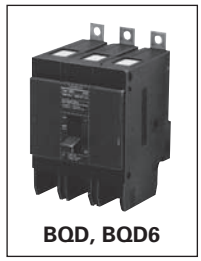
						Plug-In Breakers						Panelboard Breakers						
						QT	QP, QPP②	QPH, QPPH②	HQP, HQPP②	HQPPH②	QPJ⑨	BL	BLH	HBL	BQD, BQD6	NGB	NEB	HEB
Page						7-21	7-22, 7-24	7-22, 7-24	7-20, 7-24	7-20, 7-24	7-24	7-29	7-29	7-29	7-32	7-33	7-35	7-35
Ratings	AC	Poles				1, 2	1, 2, 3	1, 2, 3	1, 2, 3⑦	2	2, 3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3
		Amperes				15-50	10-125③④	10-125③④	10-125③⑦	100-225	150-200	10-125	15-125	15-100	15-100	15-125	15-125	15-125
		Volts (50/60 Hz)			1 Pole	120/240	120/240	120/240	120/240	120/240	120/240	120/240	120/240	120/240	277	347	347	347
					2 Pole							120/240	120/240	120/240	480/277	600/347	600/347	600/347
					3 Pole	—	240	240	240	240	240	240	240	240	480/277	600/347	600/347	600/347
		Interrupt Ratings	UL		120V	10,000	10,000	22,000	65,000	—	—	10000	22000	65000	65000	—	—	—
					240V	10,000	10,000	22,000	65,000	100,000	10,000	10000	22000	65000	65000	100000	85000	100000
					277V	—	—	—	—	—	—	—	—	—	14000	—	—	—
					347V	—	—	—	—	—	—	—	—	—	10000	—	—	—
					480/277V	—	—	—	—	—	—	—	—	—	14000	25000	—	—
					480V	—	—	—	—	—	—	—	—	—	—	—	35000	65000
					600/347V	—	—	—	—	—	—	—	—	—	10000	14000	—	—
					600V	—	—	—	—	—	—	—	—	—	—	—	22000	25000
			IEC 947-2 50/60 Hz	220/240V	I_{CU}	—	—	—	—	—	—	—	—	—	—	65000	85000	100000
					I_{CS}	—	—	—	—	—	—	—	—	—	—	32000	42000	50000
				380/415V	I_{CU}	—	—	—	—	—	—	—	—	—	—	25000	40000	70000
					I_{CS}	—	—	—	—	—	—	—	—	—	—	12000	20000	35000
				500V	I_{CU}	—	—	—	—	—	—	—	—	—	—	—	—	—
					I_{CS}	—	—	—	—	—	—	—	—	—	—	—	—	—
	DC	125/250 V DC Interrupting Rating			2-Pole	—	—	—	—	—	—	—	—	—	14000	14000	35000	42000
					3-Pole	—	—	—	—	—	—	—	—	—	—	—	35000	42000
Dimensions in Inches	Height				10-50A	—	2.87	2.87	—	—	—	3.56	3.56	3.75	4.50	5.00	5.50	5.50
					10-60A	3.12	—	—	—	—	—	—	—	—	—	—	—	—
					55-125A	—	3.12	3.12	3.12	3.12	3⑨	3.75	3.75	3.75	4.50	5.00	5.50	5.50
	Width				1-Pole	1.00	1.00	1.00	1.00	—	—	1.00	1.00	1.00	1.00	1.00	1.00	1.00
					2-Pole	2.00①	2.00②	2.00②	2.00	4.00②	⑨	2.00	2.00	2.00	2.00	2.00	2.00	2.00
					3-Pole	2.00①	3.00	3.00	3.00	—	3.00⑨	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Depth					2.06	2.37	2.37	2.37	2.37	2.34	2.37	2.37	2.37	2.69	2.71	3.00	3.00
Overcurrent Devices	Thermal and Fixed magnetic Trip					√	√	√	√	√	√	√	√	√	√	√	√	√
	Thermal and Adjustable Magnetic trip					—	—	—	—	—	—	—	—	—	—	—	—	—
	Adjustable Magnetic trip only					—	—	—	—	—	—	—	—	—	—	—	—	—
	Motor Circuit Protector					—	—	—	—	—	—	—	—	—	—	—	—	—
	Molded Case Switch					—	√⑥	—	—	—	—	—	—	—	—	—	√	√
Accessories & Modifications	Undervoltage Trip					—	—	—	—	—	—	—	—	—	√	—	√	√
	Shunt Trip					—	√⑥	√⑥	√⑧	√⑧	—	√	√	√	√	√	√	√
	Auxilary Switch					—	—	—	—	√⑧	—	√	√	√	√	√	√	√
	Alarm Switch					—	—	—	—	—	—	—	—	—	√	√	√	√
	Mechanical Interlock					—	—	—	—	—	—	—	—	—	—	—	√	√
	Fungus Proofing (ref. page 7-91)					—	—	—	—	—	—	√	√	√	√	√	√	√
Individual Enclosures	Type 1 - Indoor Surface					√	√	√	√	√	—							
	Type 1 - Indoor, Flush					—	√	√	√	√	—							
	Type 3R - Outdoor-Rainproof					—	√	√	√	√	—							



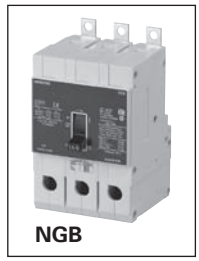
QP



BL, BLH, HBL



BQD, BQD6



NGB



NEB/HEB

For inches / millimeters conversion, see Application Data section.
For Plug-in Breakers, see Load Centers & Circuit Breakers section.

①BQD6 CSA certified 10,000A @ 600Y/347V 15–70A only.
②Types QPP, QPPH, HQPP and HQPPH are special 2-pole configurations for metering equipment. Amperage range = 125–225A, width = 4 in.
③Single pole breakers available in ratings 10–70A only.
④125A, 2-pole 120/240V AC only.
⑥Not applicable to types QPP and QPPH.
⑦Single pole circuit breakers available in ratings 15-70A only, 125A available as a 2-pole only.
⑧Not applicable to type HQPP and HQPPH.
⑨Fits only Siemens EQIII load centers. Breaker is 2 or 3 poles wide.

Molded Case Circuit Breakers

Reference Guide

Thermal-Magnetic Trip Breakers

				General Purpose Breakers								
				BQ	BQH	HBQ	QJ2	QJH2	QJ2-H	HQJ2④	CQD	NGG
Page				7-37	7-37	7-37	7-39	7-39	7-39	7-39	7-40	7-41
Ratings	AC	Poles		1, 2, 3	1, 2, 3	1, 2, 3	2, 3	2, 3	2, 3	3	1, 2, 3	1, 2, 3
		Amperes, Continuous	1-Pole	15–70	15–70	15–50	—	—	—	—	15–100	15–125
			2-Pole	15–125	15–100	15–70	60–225	60–225	60–225	—	15–100	15–125
			3-Pole	15–100	15–100	15–100				100–225	15–100	15-125
		Volts (50/60 Hertz)	1-Pole	120/240	120/240	120/240	—	—	—	—	277	347
			2-Pole				240	240	240	—	480/277	600/347
			3-Pole	240	240	240				240		
		UL Interrupting Rating — Symmetrical RMS Amperes	120V	10,000	22,000	65,000	—	—	—	—	65,000	65,000
			240V	10,000	22,000	65,000	10,000	22,000	42,000	65,000	65,000	65,000
			480V	—	—	—	—	—	—	—	14,000③	25,000
			600/347V	—	—	—	—	—	—	—	10,000②	14,000
	DC	Volts — 2-Pole		—	—	—	—	—	—	—	125/250	125/250
		Interrupting Rating — DC Amperes		—	—	—	—	—	—	—	14,000	14,000
Dimensions in inches		Height	15–50A	3.75	3.75	4.00	—	—	—	—	4.50	—
			55–125A	4.00	4.00	4.00	—	—	—	—	4.50	—
			60–225A	—	—	—	7.00	7.00	7.00	7.00	—	—
		Width	1-Pole	1.00	1.00	1.00	—	—	—	—	1.00	1.00
			2-Pole	2.00	2.00	2.00	3.00	3.00	3.00	—	2.00	2.00
			3-Pole	3.00	3.00	3.00	4.50	4.50	4.50	4.50	3.00	3.00
		Depth		2.37	2.37	2.37	2.34	2.34	2.53	2.53	2.87	2.90
Overcurrent Devices		Thermal and Fixed Magnetic Trip		√	√	√	√	√	√	√	√	√
		Molded Case Switch		√	—	—	√	—	—	—	—	—
Accessories & Modifications		Undervoltage Trip		—	—	—	—	—	—	—	√	—
		Shunt Trip		√	√	√	√①	√①	√①	√①	√	√
		Auxiliary Switch		√	√	√	√①	√①	√①	√①	√	√
		Alarm Switch		—	—	—	√	√	—	—	√	√
		Mechanical Interlock		—	—	—	√	√	√	√	—	—
		Fungus Proofing (ref. page 7-91)		√	√	√	√	√	√	√	√	√
Individual Enclosures		Type 1 — Indoor Surface		√	√	√	√	√	√	√	—	√
		Type 1 — Indoor, Flush		√	√	√	√	√	√	√	—	√
		Type 3R — Outdoor-Rainproof		√	√	√	√	√	√	√	—	√



BQ, BQH, HBQ



QJ2, QJH2, QJ2-H



CQD



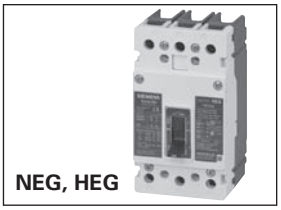
NGG

For inches / millimeters conversion, see Application Data section.

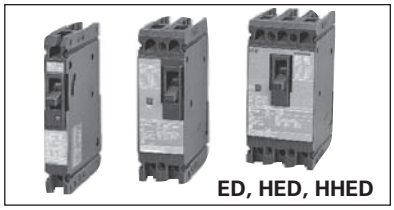
①3-pole breakers only (factory installed only).
②Type CQD6—CSA only.
③CQD breakers are rated 14,000 KAIC at 480/277V.
④HQJ2 breakers are also rated 100KAIC @ 208VAC.

Thermal-Magnetic Trip Breakers

						General Purpose Breakers							
						NEG	HEG	ED2	ED4	ED6	HED4	HHED6	CED6
Page						7-43	7-43	7-45	7-45	7-45	7-46	7-46	7-46
Ratings	AC	Poles				1, 2, 3, 4	1, 2, 3, 4	1, 2, 3	1, 2, 3	1④, 2, 3	1, 2, 3	2, 3	2, 3
		Amperes, Continuous				15–125	15–125	15–100	15–125	15–125	15–125	15–125	15–125
		Volts 50/60HZ			1-Pole	347⑦	347⑦	120	277	347	277	—	—
					2-Pole 3-Pole	600/347	600/347	240	480	600	480	600	600
		Interrupt Rating Symmetrical RMS Amperes	UL		120V	—	—	10,000	—	—	100,000	—	—
					240V	85,000	100,000	10,000	65,000	65,000	100,000⑤	100,000	200,000
					277V	—	—	—	22,000①	—	65,000②	—	—
					347V	—	—	—	—	30,000	—	—	—
					480V	35,000	65,000	—	18,000	25,000	42,000	65,000	200,000
					600V	22,000⑥	25,000⑥	—	—	18,000	—	18,000	100,000
			IEC 947-2 50/60HZ	220/240V	Icu	85,000	100,000	—		65,000	—	—	—
					Ics	42,000	50,000	—	—	17,000	—	—	—
				380/415V	Icu	40,000	70,000	—		35,000	—	—	—
					Ics	20,000	35,000	—	—	9,000	—	—	—
				500V	Icu	—	—	—	—	18,000	—	—	—
					Ics	—	—	—	—	5,000	—	—	—
	DC	2-Pole, 250V DC Interrupting Ratings				35,000	42,000	5,000	30,000	30,000	30,000	—	30,000
		3-Pole, 500V DC Interrupting Ratings③				—	—	—	—	18,000	—	—	50,000
Dimensions in inches		Height				5.5	5.5	6.34	6.34	6.34	6.34	6.58	9.26
		Width			1-Pole	1.00	1.00	1.00	1.00	1.00	1.00	—	—
					2-Pole 3-Pole	2.00 3.00	2.00 3.00	2.00 3.00	2.00 3.00	2.00 3.00	2.00 3.00	2.00 3.00	2.00 3.00
					4-Pole	4.00	4.00	—	—	—	—	—	—
		Depth				3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00
Overcurrent Devices		Thermal and Fixed Magnetic Trip				√	√	√	√	√	√	√	√
		Thermal and Adjustable Magnetic Trip				—	—	—	—	—	—	—	—
		Adjustable Magnetic Trip only Motor Circuit Protector				—	—	—	—	√	—	—	√
		Molded Case Switch				√	√	√	√	√	—	—	√
Accessories & Modifications		Undervoltage Trip				√	√	√	√	√	√	√	√
		Shunt Trip				√	√	√	√	√	√	√	√
		Auxiliary Switch				√	√	√	√	√	√	√	√
		Alarm Switch				√	√	√	√	√	√	√	√
		Mechanical Interlock				√	√	—	—	—	—	—	—
		Rear Connection Studs				√	√	√	√	√	√	√	√
		Electric Motor Operator				—	—	√	√	√	√	√	√
		Plug-In Mounting Assembly (3-4 Pole Only)				√	√	√	√	√	√	√	√
		Fungus Proofing (ref. page 7-91)				√	√	√	√	√	√	√	√
Individual Enclosures		Type 1 — Indoor Surface				—	—	√	√	√	√	√	√
		Type 1 — Indoor, Flush				—	—	√	√	√	√	√	√
		Type 3R — Outdoor-Rainproof				—	—	√	√	√	√	√	√
		Type 7 — Flammable Gas Atmosphere				—	—	√	√	√	√	√	—
		Type 9 — Combustion Dusttight				—	—	√	√	√	√	√	—
		Type 5, 12 — Lint, Fine Dust, Oils, Coolants				—	—	√	√	√	√	√	√
		Type 12K — Semi-Dusttight				—	—	√	√	√	√	√	√



NEG, HEG



ED, HED, HHED

For inches / millimeters conversion, see Application Data section.

① 1-pole only.
② 35-100A: 25,000 AIR at 277V AC/15-30A: 65,000 AIR at 277V AC.
③ For DC UPS system application.
④ Single pole ED6 (15–30A) 30kA, (35–100A) 18 kA. CSA Only.
⑤ Single pole HED4, 15-30A: 65,000 AIR at 240V AC; single pole HED4, 35-100A: 25,000 AIR at 240V AC.
⑥ NEG and HEG breakers are rated at 600/347V.
⑦ 1-pole NEG breaker is rated 85K @ 240V, 35K @ 277V and 22K @ 347V. 1-pole HEG breaker is rated 100K @ 240V, 65K @ 277V and 25K @ 347V.

Thermal-Magnetic Trip Breakers

						General Purpose Breakers								
						FD6A, FXD6A	HFD6, HFXD6	HHFD6, HHFXD6	CFD6	JXD2-A	JD6-A, JXD6-A	HJD6-A, HJXD6-A	HHJD6-A, HHJXD6-A	CJD6
Page						7-48	7-49	7-49	7-49	7-51	7-51	7-52	7-52	7-52
Ratings	**AC**	Poles				2, 3	2, 3	2, 3	3	2, 3	2, 3	2, 3	2, 3	3
		Amperes, Continuous				70–250	70-250	70-250	70–250	200-400	200-400	200-400	200-400	200-400
		Volts 50/60HZ			2-Pole 3-Pole	600	600	600	600	240	600	600	600	600
		Interrupt Rating Symmetrical RMS Amperes	UL		240V	65,000	100,000	200,000	200,000	65,000	65,000	100,000	200,000	200,000
					480V	35,000	65,000	100,000	200,000	—	35,000	65,000	100,000	150,000
					600V	22,000	25,000	25,000	100,000	—	25,000	35,000	50,000	100,000
			IEC60947-2 50/60HZ	220/240V	Icu	65,000	100,000	—	—	—	65,000	100,000	—	—
					Ics	33,000	50,000	—	—	—	33,000	50,000	—	—
				380/415V	Icu	35,000	65,000	—	—	—	40,000	65,000	—	—
					Ics	18,000	33,000	—	—	—	20,000	33,000	—	—
				500V	Icu	—	—	—	—	—	—	—	—	—
					Ics	—	—	—	—	—	—	—	—	—
	DC	2-Pole 250V DC Interrupting Ratings				30,000	30,000	—	50,000	30,000	30,000	30,000	—	50,000
		3-Pole, 500V DC Interrupting Ratings①				18,000	25,000	—	50,000	—	25,000	35,000	—	50,000
Dimensions in inches		Height				9.50	9.50	14.12	14.12	11.00	11.00	11.00	11.00	17.86
		Width			2-Pole 3-Pole	4.50	4.50	4.50	4.50	7.50	7.50	7.50	7.50	7.50
		Depth				4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Overcurrent Devices		Thermal and Fixed Magnetic Trip				—	—	—	—	—	—	—	—	—
		Thermal and Adjustable Magnetic Trip				√	√	√	√	√	√	√	√	√
		Adjustable Magnetic Trip Only Motor Circuit Protector				√	—	—	√	—	—	√	√	—
Accessories & Modifications		Molded Case Switch				√	—	—	√	√	√	—	—	√
		Undervoltage Trip				√	√	√	√	√	√	√	√	√
		Shunt Trip				√	√	√	√	√	√	√	√	√
		Auxiliary Switch				√	√	√	√	√	√	√	√	√
		Alarm Switch				√	√	√	√	√	√	√	√	√
		Mechanical Interlock				√	√	√	√	√	√	√	√	√
		Rear Connection Studs				√	√	√	√	√	√	√	√	√
		Electric Motor Operator				√	√	√	√	√	√	√	√	√
		Plug-In Mounting Assembly				√	√	√	√	√	√	√	√	√
		Fungus Proofing (ref. page 7-91)				√	√	√	√	—	√	√	√	√
Individual Enclosures		Type 1 — Indoor Surface				√	√	√	√	√	√	√	√	√
		Type 1 — Indoor, Flush				—	√	—	√	—	—	—	—	—
		Type 3R — Outdoor-Rainproof				√	√	√	√	√	√	√	√	—
		Type 7 — Flammable Gas Atmosphere				√	√	√	—	√	√	√	√	—
		Type 9 — Combustion Dusttight				√	√	√	—	√	√	√	√	—
		Type 5, 12 — Lint, Fine Dust, Oils, Coolants				√	√	√	√	√	√	√	√	√
		Type 12K — Semi-Dusttight				√	√	√	√	—	√	√	√	—

For inches / millimeters conversion, see Application Data section.

① For DC UPS application.

Thermal-Magnetic Trip Breakers

						General Purpose Breakers								
						LD6, LXD6	HLD6, HLXD6	HHLD6, HHLXD6	CLD6	LMD6, LMXD6	HLMD6, HLMXD6	MD6, MXD6	HMD6, HMXD6	CMD6
Page						7-55	7-56	7-56	7-56	7-59	7-60	7-62	7-63	7-63
Ratings	**AC**	Poles				2, 3	2, 3	2, 3	3	2, 3	2, 3	2, 3	2, 3	3
		Amperes, Continuous				250-600	250-600	250-600	450-600	500-800	500-800	500-800	500-800	400-800
		Volts 50/60 HZ			2-Pole	600	600	600	600	600	600	600	600	600
					3-Pole									
		Interrupt Rating Symmetrical RMS Amperes	UL		240V	65,000	100,000	200,000	200,000	65,000	100,000	65,000	100,000	200,000
					480V	35,000	65,000	100,000	150,000	50,000	65,000	50,000	65,000	100,000
					600V	25,000	35,000	50, 000	100,000	25,000	50,000	25,000	50,000	65,000
			IEC 947-2 50/60HZ	220/240V	Icu	65,000	100,000	—	—	65,000	100,000	65,000	100,000	—
					Ics	33,000	50,000	—	—	33,000	50,000	33,000	50,000	—
				380/415V	Icu	40,000	65,000	—	—	40,000	65,000	40,000	65,000	—
					Ics	20,000	33,000	—	—	20,000	33,000	20,000	33,000	—
				500V	Icu	—	—	—	—	—	—	—	—	—
					Ics	—	—	—	—	—	—	—	—	—
	DC	2-Pole 250V DC Interrupting Ratings				30,000	30,000	—	50, 000	30,000	30,000	30,000	30,000	30,000
		3-Pole, 500V DC Interrupting Ratings①				35,000		—	50, 000	25,000	50,000	25,000	50,000	50,000
		Height				11.00	11.00	11.00	17.86	16.00	16.00	16.00	16.00	16.00
		Width				7.50	7.50	7.50	7.50	7.50	7.50	9.00	9.00	9.00
		Depth				4.00	4.00	4.00	4.00	4.59	4.59	6.19	6.19	6.19
Overcurrent Devices		Thermal and Adjustable Magnetic Trip				√	√	√	√	√	√	√	√	√
		Adjustable Magnetic Trip Only Motor Circuit Protector				√	—	—	√	√	√	√	—	√
		Molded Case Switch				√	—	—	√	√	—	√	—	√
Accessories & Modifications		Undervoltage Trip				√	√	√	√	√	√	√	√	√
		Shunt Trip				√	√	√	√	√	√	√	√	√
		Auxiliary Switch				√	√	√	√	√	√	√	√	√
		Alarm Switch				√	√	√	√	√	√	√	√	√
		Mechanical Interlock				√	√	√	√	√	√	√	√	√
		Rear Connection Studs				√	√	√	√	√	√	√	√	√
		Electric Motor Operator				√	√	√	√	√	√	√	√	√
		Plug-In Mounting Assembly				√	√	√	√	—	—	√	√	√
		Fungus Proofing (ref. page 7-91)				√	√	√	√	√	√	√	√	√
Individual Enclosures		Type 1 — Indoor Surface				√	√	√	√	√	√	√	√	√
		Type 1 — Indoor, Flush				√	—	—	—	—	—	—	—	—
		Type 3R — Outdoor-Rainproof				√	√	√	—	√	√	√	√	√
		Type 5, 12 — Lint, Fine Dust, Oils, Coolants				√	√	√	—	√	√	√	√	√
		Type 7 — Flammable Gas Atmosphere				√	√	√	—	—	—	—	—	—
		Type 9 — Combustion Dusttight				√	√	√	√	—	—	—	—	—
		Type 12K — Semi-Dusttight				√	√	√	—	√	√	√	√	√

For inches / millimeters conversion, see Application Data section.

① For DC UPS application.

Thermal-Magnetic Trip Breakers

							General Purpose Breakers					
							ND6, NXD6	HND6, HNXD6	CND6	PD6,④ PXD6④	HPD6,④ HPXD6④	CPD6④
Page							7-66	7-67	7-67	7-70	7-70	7-70
Ratings	**AC**	Poles					2, 3	2, 3	3	3	3	3
		Amperes, Continuous					800-1200	800-1200	800-1200	1200-1600	1200-1600	1200-1600
		Volts 50/60 HZ				3-Pole	600	600	600	600	600	600
		Interrupt Rating Symmetrical RMS Amperes	UL			240V	65,000	100,000	200,000	65,000	100,000	200,000
						480V	50,000	65,000	100,000	50,000	65,000	100,000
						600V	25,000	50,000	65,000	25,000	50,000	65,000
			IEC 947-2 50/60HZ	220/240V		Icu	65,000	100,000	—	—	—	—
						Ics	33,000	50,000	—	—	—	—
				380/415V		Icu	40,000	65,000	—	—	—	—
						Ics	20,000	33,000	—	—	—	—
				500V		Icu	—	—	—	—	—	—
						Ics	—	—	—	—	—	—
	DC	2-Pole 250V DC Interrupting Ratings					30,000	30,000	30,000	30,000	30,000	30,000
		3-Pole, 500V DC Interrupting Ratings①					25,000	50,000	50,000	25,000	50,000	50,000
Dimensions in inches		Circuit breakers require Connect-all mounting block. Dimensions shown are for circuit breaker only.				Height	16.00	16.00	16.00	16.0	16.00	16.00
						Width	9.00	9.00	9.00	9.00	9.00	9.00
						Depth	6.19	6.19	6.19	6.19	6.19	6.19
Overcurrent Devices		Thermal and Adjustable Magnetic Trip					√	√	√	√	√	√
		Adjustable Magnetic Trip Only Motor Circuit Protector					—	—	—	—	—	—
		Molded Case Switch					√	—	√	√	—	—
Accessories & Modifications		Undervoltage Trip					√	√	√	√	√	√
		Shunt Trip					√	√	√	√	√	√
		Auxiliary Switch					√	√	√	√	√	√
		Alarm Switch					√	√	√	√	√	√
		Mechanical Interlock					√	√	√	√	√	√
		Rear Connections Studs					√	√	√	—	—	—
		Electric Motor Operator					√	√	√	√	√	√
		Plug-in Mounting Assembly					√	√	√	—	—	—
		Fungus Proofing (ref. page 7-91)					√	√	√	√	√	√
		Mounting Block (required)					—	—	—	√	√	√
Individual Enclosures		Type 1 — Indoor Surface					√	√	√	√	√	√
		Type 1 — Indoor, Flush					—	—	—	—	—	—
		Type 3R — Outdoor-Rainproof					√	√	√	—	—	—
		Type 7 — Flammable Gas Atmosphere					√	√	√	—	—	—
		Type 9 — Combustion Dusttight					—	—	—	—	—	—
		Type 5, 12 — Lint, Fine Dust, Oils, Coolants					—	—	—	—	—	—
		Type 12K — Semi-Dusttight					√	√	√	—	—	—

For inches / millimeters conversion, see Application Data section.

① For DC UPS application.
② 2-pole design.
③ 3-pole design.
④ Requires Connect-all mounting assembly. Dimensions shown are for circuit breaker only.

Thermal-Magnetic Trip Breakers & Electronic Trip Breakers

							General Purpose Breakers		Solid State Trip Circuit Breakers					
							RD6,[1] RXD6[1]	HRD6,[1] HRXD6[1]	SJD6	SHJD6	SCJD6	SLD6	SHLD6	SCLD6
Page							7-73	7-73	7-53	7-53	7-53	7-57	7-57	7-57
Ratings		Poles					3	3	3	3	3	3	3	3
		Amperes, Continuous					1600-2000	1600-2000	200-400	200-400	200-400	300-600	300-600	300-600
		Volts 50/60 HZ				3-Pole	600	600	600	600	600	600	600	600
	AC	Interrupt Rating Symmetrical RMS Amperes	UL			240V	65,000	100,000	65,000	100,000	200,000	65,000	100,000	200,000
						480V	50,000	65,000	35,000	65,000	150,000	35,000	65,000	150,000
						600V	25,000	50,000	25,000	35,000	100,000	25,000	35,000	100,000
			IEC60947-2 50/60HZ	220/240V		Icu	—	—	—	—	—	—	—	—
						Ics	—	—	—	—	—	—	—	—
				380/415V		Icu	—	—	—	—	—	—	—	—
						Ics	—	—	—	—	—	—	—	—
				500V		Icu	—	—	—	—	—	—	—	—
						Ics	—	—	—	—	—	—	—	—
	DC	2-Pole 250V DC Interrupting Ratings					30,000	30,000	—	—	—	—	—	—
		3-Pole, 500V DC Interrupting Ratings[1]					25,000	50,000	—	—	—	—	—	—
Dimensions in inches		Height					16.00	16.00	11.00	11.00	17.86	11.0	11.00	17.86
		Width				3-Pole	9.00	9.00	7.50	7.50	7.50	7.50	7.50	7.50
		Depth					6.19	6.19	4.00	4.00	4.00	4.00	4.00	4.00
Overcurrent Devices		Solid State Trip					—	—	√	√	√	√	√	√
		Thermal and Adjustable Magnetic Trip					√	√	—	—	—	—	—	—
		Adjustable Magnetic Trip Only Motor Circuit Protector					—	—	—	—	—	—	—	—
		Molded Case Switch					√	—	—	—	—	—	—	—
Accessories & Modifications		Undervoltage Trip					√	√	√	√	√	√	√	√
		Shunt Trip					√	√	√	√	√	√	√	√
		Auxiliary Switch					√	√	√	√	√	√	√	√
		Alarm Switch					√	√	√	√	√	√	√	√
		Mechanical Interlock					√	√	√	√	√	√	√	√
		Rear Connections Studs					—	—	√	√	√	√	√	√
		Electric Motor Operator					√	√	√	√	√	√	√	√
		Plug-In Mounting Assembly					—	—	√	√	√	√	√	√
		Fungus Proofing (ref. page 7-91)					√	√	√	√	√	√	√	√
		Mounting Block (required)					√	√	—	—	—	—	—	—
Individual Enclosures		Type 1 — Indoor Surface					√	√	√	√	√	√	√	√
		Type 1 — Indoor, Flush					—	—	—	—	—	—	—	—
		Type 3R — Outdoor-Rainproof					—	—	√	√	—	√	√	—
		Type 7 — Flammable Gas Atmosphere					—	—	√	√	—	√	√	—
		Type 9 — Combustion Dusttight					—	—	√	√	—	√	√	—
		Type 5, 12 — Lint, Fine Dust, Oils, Coolants					—	—	√	√	√	√	√	√
		Type 12K — Semi-Dusttight					—	—	√	√	√	√	√	√

For inches / millimeters conversion, see Application Data section.

[1] Requires Connect-all mounting assembly. Dimensions shown are for circuit breaker only.

Electronic Trip Breakers

						Solid State Trip Circuit Breakers							
						SMD6	SHMD6	SCMD6	SND6	SHND6	SCND6	SPD6①	SHPD6①
Page						7-64	7-64	7-64	7-68	7-68	7-68	7-71	7-71
Ratings	**AC**	Poles				3	3	3	3	3	3	3	3
		Amperes, Continuous -				600-800	600-800	600-800	800-1200	800-1200	800-1200	1200-1600	1200-1600
		Volts 50/60HZ			3-Pole	600	600	600	600	600	600	600	600
		Interrupt Rating Symmetrical RMS Amperes	UL		240V	65,000	100,000	200,000	65,000	100,000	200,000	65,000	100,000
					480V	50,000	65,000	100,000	50,000	65,000	100,000	50,000	65,000
					600V	25,000	50,000	65,000	25,000	50,000	65,000	25,000	50,000
			IEC60947-2 50/60HZ	380/415V	Icu	—	—	—	—	—	—	—	—
					Ics	—	—	—	—	—	—	—	—
				690V	Icu	—	—	—	—	—	—	—	—
					Ics	—	—	—	—	—	—	—	—
Dimensions in inches		Height				10.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
		Width				9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
		Depth				6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.19
Overcurrent Devices		Solid State Trip				√	√	√	√	√	√	√	√
Accessories & Modifications		Undervoltage Trip				√	√	√	√	√	√	√	√
		Shunt Trip				√	√	√	√	√	√	√	√
		Auxiliary Switch				√	√	√	√	√	√	√	√
		Alarm Switch				√	√	√	√	√	√	√	√
		Mechanical Interlock				√	√	√	√	√	√	√	√
		Rear Connection Studs				√	√	√	√	√	√	—	—
		Electric Motor Operator				√	√	√	√	√	√	√	√
		Plug-In Mounting Assembly				√	√	√	√	√	√	—	—
		Fungus Proofing (ref. page 7-91)				√	√	√	√	√	√	√	√
Individual Enclosures		Type 1 — Indoor Surface				√	√	√	√	√	√	√	√
		Type 1 — Indoor, Flush				—	—	—	—	—	—	—	—
		Type 3R — Outdoor-Rainproof				√	√	√	√	√	√	—	—
		Type 7 — Flammable Gas Atmosphere				—	—	—	—	—	—	—	—
		Type 9 — Combustion Dusttight				—	—	—	—	—	—	—	—
		Type 5, 12 — Lint, Fine Dust, Oils, Coolants				√	√	√	√	√	√	—	—
		Type 12K — Semi-Dusttight				√	√	√	√	√	√	—	—

For inches / millimeters conversion, see Application Data section.

① Requires connect-all mounting block assembly. Dimensions shown are for circuit breaker.

② Breaker has rating plugs which can be changed within each frame rating.

Page				7-41	7-43		7-107			7-54			7-95		
Breaker Frame Family				**GG**	**EG**		**DG**			**FG**			**JG**		
	Continuous Amps			15–125A	15–125A		30–150A			40–250A			70–400A		
	Poles			1, 2, 3	1, 2, 3, 4		2, 3			2, 3			2, 3		
	Max. Volts AC			600Y/347V	600Y/347V		600V			600V			600V		
Breaker Type				**NGG**	**NEG**	**HEG**	**NDGA**	**HDGA**	**LDGA**	**NFGA**	**HFGA**	**LFGA**	**NJGA**	**HJGA**	**LJGA**
Ratings	Interrupting Class			N	N	H	N	H	L	N	H	L	N	H	L
	Interrupting Rating RMS Symmetrical Amperes AC 50/60Hz	UL	240Vac	65	85	100	65	100	200	65	100	200	65	100	200
			480Vac	25	35	65	35	65	100	35	65	100	35	65	100
			600Vac	14 (600Y/347)	22	25	18	20	25	18	20	25	25	25	25
		I_{CU}/I_{CS}	220/240Vac	65/33	85/43	100/50	65/65	100/75	200/150	65/65	100/75	200/150	65/65	100/75	200/150
			380/415Vac	25/12.5	40/30	70/35	40/40	70/70	100/75	40/40	70/70	100/75	45/45	70/70	100/75
			690Vac	—	—	—	12/6	12/6	12/6	12/6	12/6	12/6	12/6	15/8	15/8
	DC Interrupting Ratings (UL)②		250Vdc (2-Pole)	14	35	42	30	30	30	30	30	30	30	30	30
			500Vdc (3-Pole)①	—	—	—	18	18	18	18	18	30	25	35	35
			600Vdc (3-Pole)⑥	—	—	—	—	42	—	—	42	—	—	65	—
Dimensions in Inches	1-Pole			5.1H x 1W x 2.8D	5.5H x 1W x 3D		—						—		
	2-Pole			5.1H x 2W x 2.8D	5.5H x 2W x 3D		6.9H x 4.1W x 3.4D						11H x 5.5W x 4.2D		
	3-Pole			5.1H x 3W x 2.8D	5.5H x 3W x 3D		6.9H x 4.1W x 3.4D						11H x 5.5W x 4.2D		
	4-Pole			—	5.5H x 4W x 3D		—						—		
Trip Unit Information	Thermal-Magnetic			◆	◆		◆			◆			◆		
	Electronic						◆			◆			◆		
	Electronic with LCD						◆			◆			◆		
	Interchangeable Trip Unit						◆			◆			◆		
	Reverse Feed (w/Non-Interchangeable Trip)			◆	◆		◆			◆			◆		
	Communications Capability③						◆			◆			◆		
Specific Application Breakers	Molded Case Switch				◆		◆			◆			◆		
	Motor Circuit Protector				◆		◆			◆			◆		
	100% Rated						◆						◆		
	50°C Calibrated④				◆										
Accessories & Modifications	Auxiliary Switch			◆	◆		◆			◆			◆		
	Alarm Switch			◆	◆		◆			◆			◆		
	Shunt Trip			◆	◆		◆			◆			◆		
	Undervoltage Release				◆		◆			◆			◆		
	Mechanical Interlocks				◆		◆			◆			◆		
	Electric Motor or Stored Energy Operator				◆		◆			◆			◆		
	Rear Connecting Studs				◆		◆			◆			◆		
	Plug-In Mounting Assy. w/Trip Interlock				◆		◆			◆			◆		
	Draw-Out Assembly						◆			◆			◆		
	Handle Mechanism Options			◆	◆		◆			◆			◆		
Enclosures④	NEMA 1 – Indoor, Surface Mount			◆											
	NEMA 1 – Indoor, Flush Mount			◆											
	NEMA 3R – Outdoor, Rain Proof			◆											
	NEMA 4, 4X – Stainless Steel			◆⑤											
	NEMA 7, 9 – Hazardous Locations														
	NEMA 12 – Dust			◆											
	Terminal Shields			◆			◆			◆			◆		
	Distribution Lugs			◆	◆		◆			◆			◆		
	Ground Sensor (Neutral Transformer)						◆			◆			◆		

① 500Vdc nominal, 600Vdc max. for ungrounded DC UPS systems.
② DC Interrupting Ratings are not applicable to electronic circuit breakers.
③ Communications available via a COMPRO or COMMOD modules using Profibus or Modbus protocols.
④ Consult Siemens for availability.
⑤ "Non-metallic" NEMA 4X enclosure for NGG breakers.
⑥ Special version, see page 7-136.
GG and EG are not VL family breakers and do not share common VL accessories.

Page				7-119			7-123			7-127			7-131		
Breaker Frame Family				**LG**			**MG**			**NG**			**PG**		
	Continuous Amps			150–600A			200–800A			300–1200A			400–1600A		
	Poles			2, 3			2, 3			2, 3			3		
	Max. Volts AC			600V			600V			600V			600V		
Breaker Type				**NLGB**	**HLGB**	**LLGB**	**NMG**	**HMG**	**LMG**	**NNG**	**HNG**	**LNG**	**NPG**	**HPG**	**LPG**
Ratings	Interrupting Class			N	H	L	N	H	L	N	H	L	N	H	L
	Interrupting Rating RMS Symmetrical Amperes AC 50/60Hz	UL	240Vac	65	100	200	65	100	200	65	100	200	65	100	200
			480Vac	35	65	100	35	65	100	35	65	100	35	65	100
			600Vac	18④	18	18	25	35	65	25	35	65	25	35	65
		I_{cu}/I_{cs}	220/240Vac	65/65	100/75	200/150	65/35	100/50	200/150	65/65	100/75	200/100	65/35	100/50	200/100
			380/415Vac	45/45	70/70	100/75	50/50	70/70	100/75	50/25	70/35	100/50	50/25	70/35	100/50
			690Vac	12/6	15/8	15/8	20/10	30/15	35/17	20/10	30/15	35/17	20/10	30/15	35/15
	DC Interrupting Ratings (UL)③		250Vdc (2-Pole)	30	30	30	22	25	42	22	25	42	22	25	42
			500Vdc (3-Pole)②	25	35	35	35	50	65	35	50	65	35	50	65
			600Vdc (3-Pole)⑤	—	65	—	—	65	—	—	65	—	—	65	—
Dimensions in Inches	2-Pole			11H x 5.5W x 4.2D			16H x 7.5W x 4.7D			16H x 9W x 6.2D			—		
	3-Pole			11H x 5.5W x 4.2D			16H x 7.5W x 4.7D			16H x 9W x 6.2D					
Trip Unit Information	Thermal-Magnetic			◆			◆			◆			◆		
	Electronic			◆			◆			◆			◆		
	Electronic with LCD			◆			◆			◆			◆		
	Interchangeable Trip Unit						◆			◆			◆		
	Reverse Feed (w/Non-Interchangeable Trip)			◆			◆			◆			◆		
	Communications Capability①			◆			◆			◆			◆		
Specific Application Breakers	Molded Case Switch			◆			◆			◆			◆		
	Motor Circuit Protector			◆			◆			◆					
	100% Rated④			◆			◆			◆			◆		
Accessories & Modifications	Auxiliary Switch			◆			◆			◆			◆		
	Alarm Switch			◆			◆			◆			◆		
	Shunt Trip			◆			◆			◆			◆		
	Undervoltage Release			◆			◆			◆			◆		
	Mechanical Interlocks			◆			◆			◆			◆		
	Electric Motor or Stored Energy Operator			◆			◆			◆			◆		
	Rear Connecting Studs			◆			◆			◆			◆		
	Plug-In Mounting Assy. w/Trip Interlock			◆											
	Draw-Out Assembly			◆			◆								
	Handle Mechanism Options			◆			◆			◆			◆		
	Terminal Shields			◆			◆			◆			◆		
	Distribution Lugs														
	Ground Sensor (Neutral Transformer)			◆			◆			◆			◆		

① Communications available via COMPRO or COMMOD modules using Profibus or Modbus protocol.
② 500Vdc nominal, 600Vdc max. for ungrounded DC UPS systems.
③ DC Interrupting Ratings are not applicable to electronic circuit breakers.
④ LG frame maximum 500A.
⑤ Special version, see page 7-136.
⑥ Special 600Vac 25kA version available, see page 7-120.

• Revised •
06/13/14

Arc-Fault Circuit Interrupters (AFCI)

AFCI's detect arcing faults (an unintentional arcing condition in a circuit) that standard circuit breakers are unable to detect. The device is intended to mitigate the effects of arcing faults by functioning to de-energize the circuit when an arc-fault is detected.

Combination Type AFCI

Detects all three possible types of arc fault: line-to-ground, line-to-neutral, and series.

Breaker Type	Ampere Rating	10,000 A IR Catalog Number	22,000 A IR Catalog Number	65,000 A IR Catalog Number
QAF2/QAFH2/HQAF2 **1-Pole 120V AC**	15 20	QA115AFC① QA120AFC①	QA115AFCH■① QA120AFCH■①	QA115AFCHH QA120AFCHH
QAF2/QAF2H **2-Pole 120/240V AC**	15 20	Q215AFC① Q220AFC①	Q215AFCH■① Q220AFCH■①	— —

Branch-Feeder AFCI

Detects line-to-ground and line-to neutral arcs.

QAF2/QAFH2/HQAF2 **1-Pole 120V AC**	15 20	QA115AF① QA120AF①	QA115AFH■① QA120AFH■①	QA115AFHH QA120AFHH

NEW Dual Function AFCI/GFCI

The Dual Function Circuit Breaker combines Combination Type AFCI and GFCI, protecting against both Arc Faults and Ground Faults. The device includes the Self Test and Lockout feature, making it the fist in class in electrical safety for homeowners.

QFGA2/QFGAH2/ HQFGA2 **1-Pole 120V AC**	15 20	QA115DF QA120DF	Q115DFH Q120DFH	Q115DFHH Q120DFHH

Ground-Fault Circuit Interrupters (GFCI)

Provides Class A (5mA) ground fault protection. Intended for personnel protection. De-energizes the circuit for all ungrounded conductors of the circuit.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
QPF/ QPHF **1-Pole 120V AC Plug-in**	15 20 25 30	QF115① QF120① QF125■ QF130	QF115H① QF120H■① — QF130H
QPF/ QPHF **2-Pole 120/ 240V AC Plug-in**	15 20 30 40 50 60	QF215 QF220 QF230 QF240 QF250 QF260	QF215H QF220H QF230H QF240H QF250H QF260H

Ground Fault Equipment Protection (30mA)

Provides protection of equipment from damaging line-to-ground faults currents. De-energizes the circuit for all ungrounded conductors of the circuit.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
QE/ QEH **1-Pole 120V AC Plug-in**	15 20 30	QE115① QE120① QE130	QE115H① QE120H① QE130H
QE/ QEH **2-Pole 120/ 240V AC Plug-in**	15 20 30 40 50 60	QE215 QE220 QE230 QE240 QE250 QE260■	QE215H QE220H QE230H QE240H QE250H QE260H■


1-Pole Combination Type AFCI


2-Pole Combination Type AFCI


1-Pole Branch Feeder AFCI


1-Pole Dual Function AFCI/GFC


1-Pole GFCI


2-Pole GFCI


1-Pole Equipment Protection

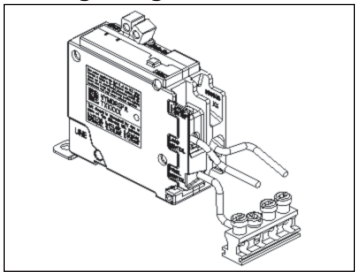

2-Pole Equipment Protection

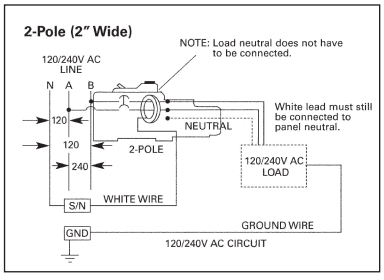
QAF2/QPF/QE Accessories

Description	Catalog Number
Padlocking Device 1-Pole	ECPLD1
Padlocking Device 2-Pole	ECPLD2
Handle Block	ECBX231M

■ Built to order. Allow 2–3 weeks for delivery.
① UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

Wiring Diagrams





Circuit Breakers

Type QP with INSTA-WIRE

Selection

Continuous Current Rating @ 40° C	Type QP① 10,000A IR Catalog Number	Type QPH 22,000A IR Catalog Number	Type HQP 65,000A IR Catalog Number
1-Pole Plug-In (120V AC)⑤			
10	Q110⑨	—	—
15	Q115③	Q115H③	Q115HH■③
20	Q120③	Q120H③	Q120HH■③
25	Q125	Q125H■	Q125HH■
30	Q130	Q130H	Q130HH■
35	Q135■	Q135H■	Q135HH■
40	Q140	Q140H	Q140HH■
45	Q145■	Q145H■	Q145HH■
50	Q150	Q150H	Q150HH■
60	Q160	Q160H■	Q160HH■
70	Q170	Q170H■	Q170HH■
2-Pole Plug-In (Common-Trip 120/240V AC)⑥			
10	Q210⑨	—	—
15	Q215	Q215H	Q215HH
20	Q220	Q220H	Q220HH
25	Q225	Q225H■	Q225HH■
30	Q230	Q230H	Q230HH
35	Q235	Q235H■	Q235HH■
40	Q240	Q240H	Q240HH■
45	Q245	Q245H■	Q245HH■
50	Q250	Q250H	Q250HH
60	Q260	Q260H	Q260HH
70	Q270	Q270H	Q270HH
80	Q280	Q280H■	Q280HH■
90	Q290	Q290H	Q290HH■
100	Q2100	Q2100H	Q2100HH
110	Q2110	Q2110H	Q2110HH■
125	Q2125	Q2125H	Q2125HH
2-Pole Plug-In (Common-Trip 240V AC)④⑥			
15	Q215R	—	—
20	Q220R	—	—
30	Q230R	—	—
40	Q240R	—	—
50	Q250R	—	—
60	Q260R	—	—
70	Q270R	—	—
100	Q2100R■	—	—
3-Pole Plug-In (Common-Trip 240V AC)⑦			
15	Q315	Q315H	Q315HH■
20	Q320	Q320H	Q320HH
25	Q325	Q325H■	Q325HH■
30	Q330	Q330H	Q330HH
35	Q335	Q335H■	Q335HH■
40	Q340	Q340H	Q340HH
45	Q345	Q345H■	Q345HH■
50	Q350	Q350H	Q350HH
60	Q360	Q360H	Q360HH
70	Q370	Q370H	Q370HH■
80	Q380	Q380H	Q380HH■
90	Q390	Q390H	Q390HH■
100	Q3100	Q3100H	Q3100HH







QP / QPH / HQP Internal Accessories

Control Voltage AC	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■②	Factory

Modifications

Description	Catalog Number
400 Hz Calibration	add suffix ...Y⑧
Marine 50°C Ambient Calibration	add suffix ...M
Fungus Proofing	add suffix ...F

For external accessories, please refer to page 7-93

■ 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 frequent switching applications (SWD). 120V AC Fluorescent Lighting.
④ UL Listed for use on 3-phase grounded "B" systems — 10,000 for this application.
⑤ Shipped 12 per sleeve.
⑥ Shipped 6 per sleeve.
⑦ Shipped 4 per sleeve.
⑧ UL Listed 5 KA IR.
⑨ Type QP1, UL listed for 16 AWG conductors and multiple wires.

Circuit Breakers

Duplex, Triplex and Quadplex Plug-In Breakers

Selection

Duplex Circuit Breakers

Breaker Type	Ampere Rating	Catalog Number	Catalog Number
QT **1-Pole** **10K AIC** **120V AC**	15–15	**Q1515**	**Q1515NC**①
	15–20	**Q1520**	**Q1520NC**①
	20–20	**Q2020**	**Q2020NC**①
	20–30	**Q2030**	—
	30–15■	**Q3015**	—
	30–20	**Q3020**	—
	30–30	**Q3030**	**Q3030NC**①
	SHIPPING: 12 per carton, (Wt. 4.8 lbs.)		





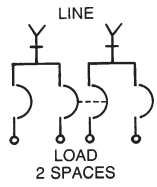
QT Duplex

These space saver duplex breakers combine two independent 1/2" breaker poles in a common unit. This unit plugs into one load center stab and requires one panel space. HACR rated.

Triplex Circuit Breakers

Breaker Type	Ampere Rating: Single Pole	Ampere Rating: Common-Trip 2-Pole	Catalog Number
QT **2-Pole** **10K AIC** **120/240V AC** **Inner Poles** **Common Trip**	15	15	**Q21515CT**
	15	20	**Q21520CT**
	15	25	**Q21525CT**■
	15	30	**Q21530CT**
	15	35	**Q21535CT**■
	15	40	**Q21540CT**
	15	45	**Q21545CT**■
	15	50	**Q21550CT**
	20	20	**Q22020CT**
	20	25	**Q22025CT**■
	20	30	**Q22030CT**
	20	35	**Q22035CT**■
	20	40	**Q22040CT**
	20	45	**Q22045CT**■
	20	50	**Q22050CT**
	30	30	**Q23030CT**
	SHIPPING: 6 per carton, (Wt. 4.9 lbs.)		





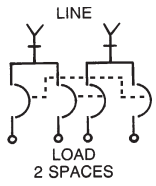
QT Triplex

These space saver triplex breakers provide a 2-pole common trip breaker for 120/240V AC circuits and two single poles for 120V AC circuits. Triplex require two panel spaces. HACR rated.

Quadplex Circuit Breakers

Breaker Type	Ampere Rating: Common-Trip 2-Pole Inside	Ampere Rating: Common-Trip 2-Pole Outside	Catalog Number
QT **2-Pole** **10K AIC** **120/240V AC** **Inner and** **Outter 2 Poles** **Common Trip**	15	15	**Q21515CT2**
	20	20	**Q22020CT2**
	20	30	**Q23020CT2**
	20	40	**Q24020CT2**
	30	30	**Q23030CT2**
	30	40	**Q24030CT2**
	40	40	**Q24040CT2**
	50	30	**Q23050CT2**
	SHIPPING: 6 per carton, (Wt. 4.8 lbs.)		





QT Quadplex

These space saver quadplex breakers provide two sets of common trip, two-pole breakers for 120/240V AC circuits, and require two panel spaces. HACR rated.

For external accessories, please refer to page 7-93

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

① Non-CTL. For replacement use only in panels manufactured before 1968

HID Lighting
For high-intensity discharge lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker.

Breaker Type	Wiring Diagram	Complete Breaker UL Unenclosed	
		Ampere Rating	Catalog Number
QP 1-Pole 120V AC	Figure 1	15	Q115HID①■
		20	Q120HID①
		30	Q130HID
QP 2-Pole 120/240V AC	Figure 2	15	Q215HID
		20	Q220HID■
		30	Q230HID■

Molded Case Switch
For applications that do not require overcurrent protection.

QP 1-Pole 120V AC	Figure 1	100	Q1100S
QP 2-Pole 120/240V AC	Figure 2	30	Q230S
		60	Q260S
		125	Q2125S

No-Noise
For applications that require a reduction in the 60-cycle hum of a standard breaker.

QP 2-Pole 120/240V AC	Figure 2	50	Q250NN■
		60	Q260NN
		70	Q270NN
		90	Q290NN■

Switching Neutrals
Used where all conductors are required to be disconnected. Neutral pole of the circuit breaker does not connect to load center bus. One side is wired to neutral and the other side to the device.

QG 2-Wire Common Trip 120V AC	Figure 3	15	QG215
		20	QG220
		30	QG230■
QG 3-Wire Common Trip 120/240V AC	Figure 4	15	QG315■
		20	QG320
		30	QG330■

Tungsten Lighting
For high wattage, tungsten-lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker.

QP 1-Pole 120V AC	Figure 1	15	Q115T①■
		20	Q120T①

Water Heater
When installed in a loadcenter, the water heater circuit breaker does not make electrical connection with the loadcenter bussing. Separate metered circuit is connected to line terminals of the breaker. Used in special rate water heating areas.

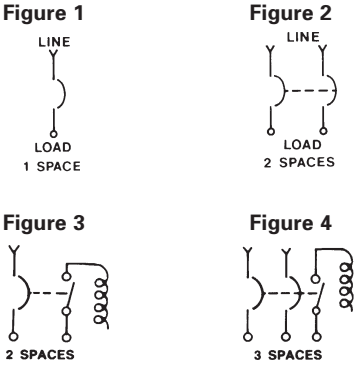
QW 2-Pole 120/40V AC Plug-In	Figure 5	15	QW215
		20	QW220
		30	QW230



Switching Neutral



Water Heater



Wiring Diagrams

■ Built to order. Allow 2–3 weeks for delivery.
Note: All circuit breakers on this page are 10K AIC

① UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

Features

- 3/4" format
- HACR Rated
- UL Classified for use in certain Square D load centers

Type QD Circuit Breakers

The Type QD circuit breaker line is available in 1-pole and 2-pole common trip versions listed on this page.

The circuit breakers are UL Classified and UL Listed.

All QD breakers are supplied with load side connectors suitable for 60/75°C wire and are calibrated for 40°C maximum ambient applications.

UL Classified

Siemens Type QD circuit breakers are UL Classified for use in specific Square D load centers in place of Square D Type QO® circuit breakers. A Panelboard Compatibility List packaged with each QD breaker shows which type QD circuit breakers are acceptable for use in Square D load centers.

The interrupting rating on these circuit breakers is 10,000A IR maximum and they are ***not*** series rated with Square D circuit breakers or equipment. This UL Classification allows a Siemens Type QD circuit breaker to be used in place of a Square D Type QO circuit breaker in those load centers that are specifically shown on the Panelboard Compatibility list. For additional information, contact your local Siemens sales engineer.





Continuous Current Rating @ 40°C	1-Pole	2-Pole
	120V	120/240V Common Trip
	Catalog Number	Catalog Number
15	**D115**①	**D215**
20	**D120**①	**D220**
30	**D130**	**D230**
40	**D140**	**D240**
50	**D150**	**D250**
60	**D160**	**D260**

Shipping Weights

Number of Poles	Number Per Carton	Shipping Weight (lbs.)
1	16	3.8
2	8	4.2

Panelboard Compatibility List

Listed Panelboards—Square D—Catalog Numbers

QO2L30F/S	QO12M100/RB	QO120-30M150/RB	QO130-40M200
QO2-4L70F/S	QO16-20M100/RB	QO124L150G	QO130200/RB
QO2-4L70TS	QO16M100/RB	QO124M150	QO130-40L200G/RB
QO2-4L70RB	QO20M100/RB	QO130L150G/RB	QO140M200/RB
QO6-12L100F/S	QO112L125G/RB	QO130M150/RB	QO16L200/RB
QO6-12L100DF/S	QO112-24L125/RB	QO16L150/RB	QO16M200/RB
QO6-12L100TF/S	QO112-24L125GWGC	QO16M150/RB	QO18-16M200FTRB
QO6-12L100DTF/S	QO116L125G	QO16-30L150/RB	QO20-40L200/RB
QO6-12L100RB	QO116-24L125G/RB	QO18-16M150FTRB	QO20-40M200TF/S
QO8-16L100F/S	QO12-24L125/RB	QO20-30M150/RB	QO20-40M200/RB
QO8-16L100DF/S	QO120-24L125G	QO20-30M150TF/S	QO24L200/RB
QO8-16L100TF/S	QO120-24L125GWGC	QO20-30L150	QO24M200/RB
QO-16L100DTF/S	QO120L125G	QO24L150/RB	QO30L200/RB
QO8-16L100RB	QO124L125G/RB	QO24M150/RB	QO30M200/RB
QO112M100/RB	QO124M125/RB	QO30L150/RB	QO30-40L200/RB
QO116M100/RB	QO16L125/RB	QO30M150/RB	QO30-40M200/RB
QO120M100/RB	QO16-12M125FTRB	QO8-16M200FT/RB	QO40M200/RB
QO124M100	QO16-24L125/RB	QO112L200G/RB	QO140M225
QO12L100DF/S	QO20L125/RB	QO120-40M200/RB	QO142L225G/RB
QO12L100RB	QO20-24L125/RB	QO120-40M200TC	
QO12-20M100/RB	QO24L125/RB	QO124M200	
QO12-20M100TF/S	QO120-30L150G	QO130L200G/RB	

For inches / millimeters conversion, see Application Data section.

① UL Listed for frequent switching applications (SWD). 120V AC Fluorescent Lighting. One or two load conductors.

Circuit Breakers

Main and Branch Circuit Breakers①

Selection

Breaker Type	Ampere Rating	Catalog Number	Catalog Number	UL Interrupting Ratings (kA)
QN 2-Pole 120/240V AC	150	**QN2150**	**QN2150R**②	10
	175	**QN2175■**	**QN2175R**②**■**	10
	200	**QN2200**	**QN2200R**②	10
QNH 2-Pole 120/240V AC	150	**QN2150H**	**QN2150RH**②	22
	175	**QN2175H■**	**QN2175RH**②**■**	22
	200	**QN2200H**	**QN2200RH**②	22
HQN 2-Pole 120/240V AC	150	**HQN2150**	**HQN2150R**②	65
	175	**HQN2175■**	—	65
	200	**HQN2200**	**HQN2200R**②	65

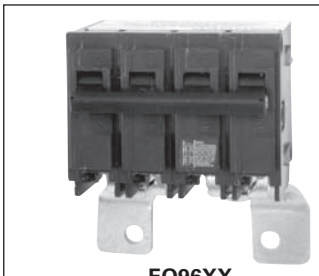
Requires 4 panel spaces, 2 adjacent and 2 opposite. **SHIPPING:** 1 per carton (Wt. 3 lbs.)



QNR⑤ **QN**⑤

Main Breaker Kits

For use in Ultimate Load Centers④			For use in EQIII Load Centers			
UL Type	Ampere Rating	Catalog Number	UL Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
EQ8681	100	**MBK100A**	EQ9675	100	**MBK100**	22
EQ8682	125	**MBK125A**	EQ9677	125	**MBK125**	22
EQ8693	150	**MBK150A**	EQ9683	150	**MBK150**	22
—	—	—	EQ9684	175	**MBK175■**	22
EQ8695	200	**MBK200A**	EQ9685	200	**MBK200**	22
EQ8696	225	**MBK225A**	EQ9686	225	**MBK225**	22

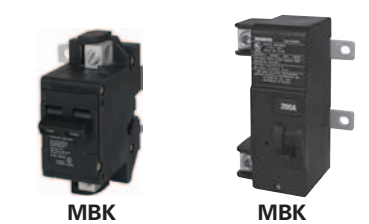


EQ96XX

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Ratings (kA)
QPJ③ 3-Pole 240V AC	125	**QPJ3125**	10
	150	**QPJ3150**	10
	200	**QPJ3200**	10

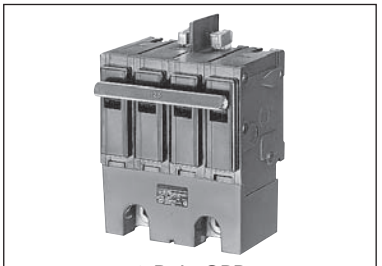
Requires 6 spaces due to cross over design. Fits only EQIII 125-400A 3-phase load centers

SHIPPING: 5 per carton (Wt. 17 lbs.)

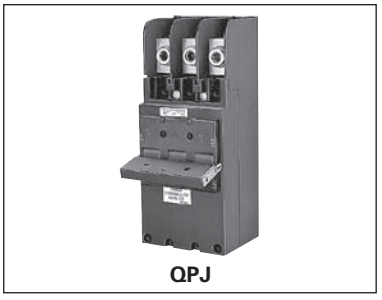


MBK (100,125)A **MBK** (150,200,225)A

Breaker Type	Ampere Rating	Catalog Number	UL Interrupting Breaker Ratings (kA) Volts AC 120/240
QPP 2-Pole 120/240V AC	125	**Q2125B**	10
	150	**Q2150B**	10
	175	**Q2175B■**	10
	200	**Q2200B**	10
	225	**Q2225B**	10
QPPH 2-Pole 120/240V AC	125	**Q2125BH**	22
	150	**Q2150BH**	22
	175	**Q2175BH■**	22
	200	**Q2200BH**	22
	225	**Q2225BH■**	22
HQPP 2-Pole 120/240V AC	125	**Q2125BHH■**	65
	150	**Q2150BHH**	65
	175	**Q2175BHH■**	65
	200	**Q2200BHH**	65
	225	**Q2225BHH■**	65
HQPPH 2-Pole 120/240V AC	100	**HQ2100BH■**	100
	125	**HQ2125BH■**	100
	150	**HQ2150BH■**	100
	175	**HQ2175BH■**	100
	200	**HQ2200BH■**	100
	225	**HQ2225BH■**	100



2-Pole **QPP**



QPJ

7 MOLDED CASE CIRCUIT BREAKERS

For inches / millimeters conversion, see Application Data section.
■ Built to order. Allow 2–3 weeks for delivery.

① All circuit breakers on this page are common trip.
② Reverse handle.
③ CSA Listed.
④ MBK100A for use in 100 and 125A load centers.
MBK125A for use in 125A load centers.
MBK150A for use in 150, 200 and 225A load centers.
MBK200A for use in 200 and 225A load centers.
MBK225A for use in 225A load centers.
MBK175A for use in 200 and 225A load centers.

⑤ QNR required for horizontal applications or vertical applications where the lugs are facing up. The QN breaker is required for vertical applications where the lugs are facing down as shown.

QS Breaker[1]

PowerMod's core offering of residential Meter Stacks, type WMM, offers the widest product offering & flexibility in the industry. Each meter stack houses the QuickSystem features to maximize productivity and minimize labor costs. To further simplify installation, our 225 Amp meter stacks feature the QS breaker. The QS breaker adds to the Siemens exclusive feature set in our Power Mod product line. Benefits and part numbers include:

- An exclusive side wired design saves wiring space and eliminates difficult "S bends"
- No need for costly filler plates — QS 225 Amp breaker takes the same space as standard 100 Amp QPs
- Single right hand bend wiring - saves time and wire
- Provides 100K AIC flexibility from 100 up to 225 Amps
- 10K to 100K AIC Series Rating

Front View

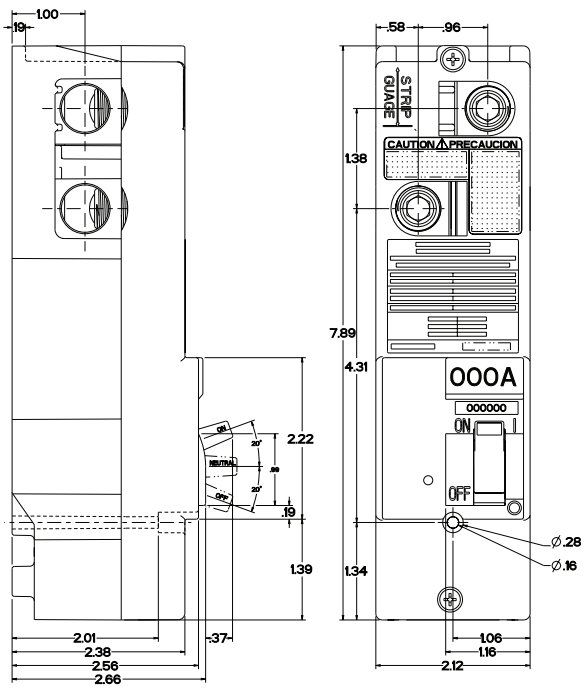




QS Breaker

Breaker Type	QS	QSH	QSHH	HQS	HQSH
Amperage	10K AIC	22K AIC	42K AIC	65K AIC	100K AIC
100	QS2100	QS2100H	QSH2100	QS2100HH	HQS2100H
125	QS2125	QS2125H	QSH2125	QS2125HH	HQS2125H
150	QS2150	QS2150H	QSH2150	QS2150HH	HQS2150H
175	QS2175	QS2175H	QSH2175	QS2175HH	HQS2175H
200	QS2200	QS2200H	QSH2200	QS2200HH	HQS2200H
225	QS2225	QS2225H	QSH2225	QS2225HH	HQS2225H

QS Breaker Dimension Drawing

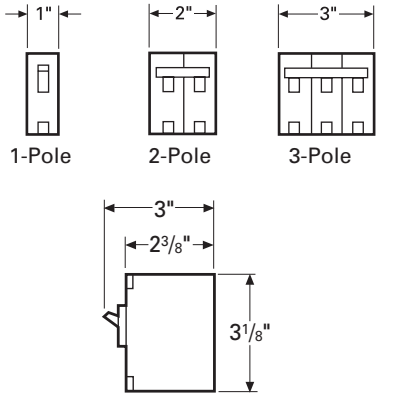


[1] For PowerMod information, please refer to Section 2, page 2-49

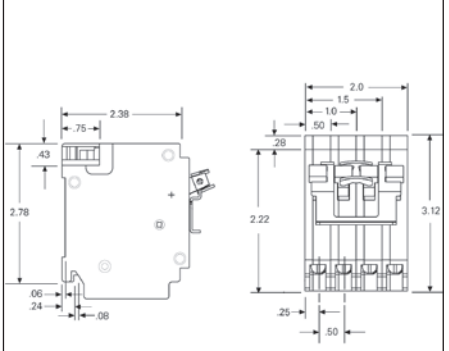
Circuit Breakers

Line Diagrams

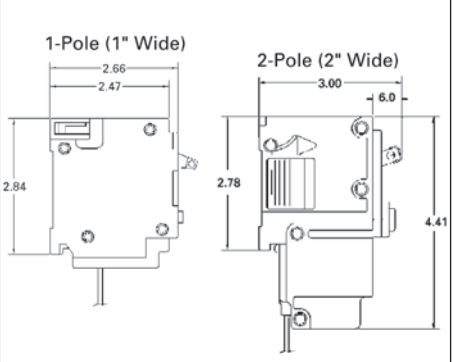
Dimension Drawings



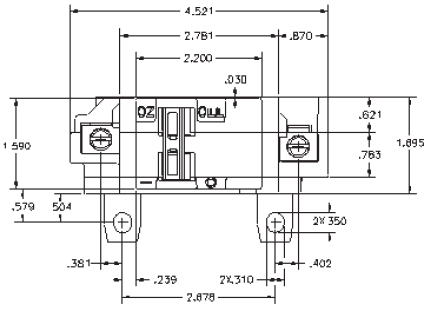
QP, QPH, HQP



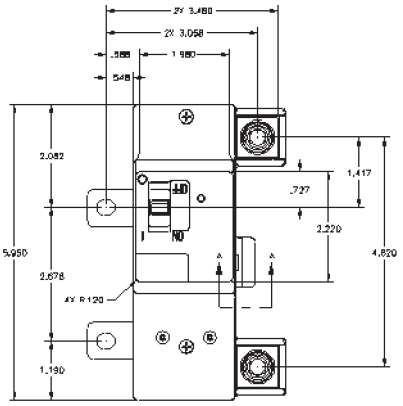
Type **QT**



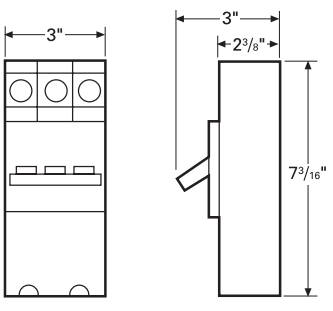
Type **QPF, QPHF, QE, QAF2, QAF2H**



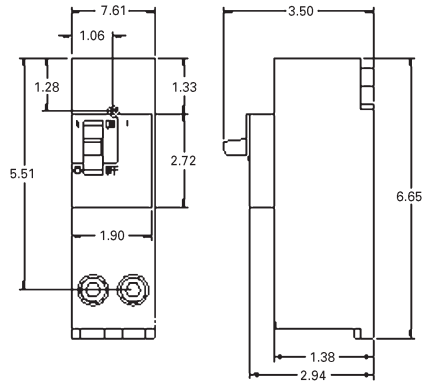
Type **EQ8681, EQ8682**



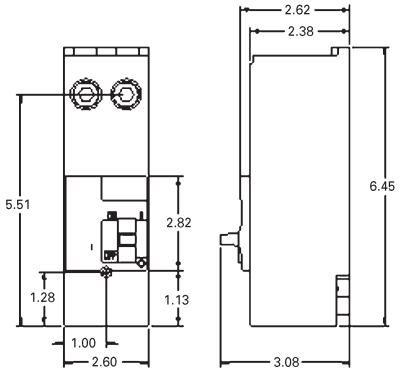
Type **EQ8693, EQ8695, EQ8696**



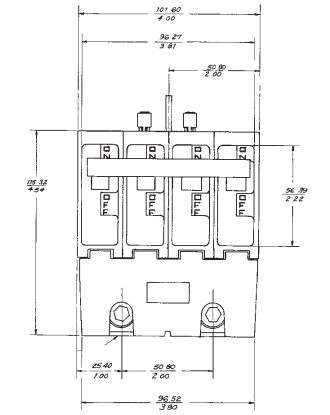
Type **QPJ**



Type **QN, QNH, HQN**



Type **QNR, QNRH, HQNR**



Type **QPP, QPPH, HQPP, HQPPH**

① All standard circuit breakers are calibrated to 40°C maximum ambient application.

Circuit Breakers

Lug Data

Reference

Circuit Breaker Type	Circuit Breaker Ampere Rating	Cables Per Connector	Connector Wire Range
	LOAD SIDE		
QP, QPH, HQP, Plug-in	10	2	#14-#16 AWG Cu
	15–35	1 1	#14–#6 AWG Cu #14–#6 AWG Al
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al
	55-125	1 1	#8-#2/0 AWG Cu #8-#2/0 AWG Al
QT	15–35	1 1	#14–#6 AWG Cu #14–#6 AWG Al
	40	1	#8 AWG CU-Al
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al
QPF, QPHF	15–30	1 1	#14–#10 AWG Cu #12–#8 AWG Al
	40–60	1 1	#8–#6 AWG Cu #8–#4 AWG Al
QAF2, QAFH2, QFGA2, QFGAH2	15–20	1 1	#14–#12 AWG Cu #12–#10 AWG Al
QD	15–20	2	#14–#8 AWG Cu Only
	15–20	1 1	#14–#12 AWG Cu #12–#10 AWG Al
	25–35	1 1	#10–#8 AWG Cu #10–#6 AWG Al
	40–60	1 1	#8–#6 AWG Cu #8–#4 AWG Al
QN, QNH, HQN	150–200	1	#1–300kcmil Cu-Al
QS, QSH, QSHH, HQS, HQSH	100–225	1	#3–300kcmil Cu-Al
EQ8681-Ultimate	100	1	#4–3/0 AWG Cu-Al
EQ8682-Ultimate	125	1	#4–3/0 AWG Cu-Al
EQ8693-Ultimate	150	1	#1–300kcmil Cu-Al
EQ8695-Ultimate	200	1	#1–300kcmil Cu-Al
EQ8696-Ultimate	225	1	#1–300kcmil Cu-Al
QPP, QPPH, HQPP, HQPPH	125	1 1	#1 AWG Cu #2/0 AWG Al
	150	1 1	#1/0 AWG Cu #3/0 AWG Al
	175	1 1	#2/0 AWG Cu #4/0 AWG Al
	200	1 1	#3/0 AWG Cu 250kcmil AWG Al
	225	1 1	#4/0 AWG Cu 300kcmil AWG Al
EQ9675-EQIII	100	1 1	#8-#2/0 AWG Cu #8-#2/0 AWG Al
EQ9677-EQIII	125	1 1	#8-#2/0 AWG Cu #8-#2/0 AWG Al
EQ9683-EQIII	150	1 1	#1/0 AWG Cu #3/0 AWG Al
EQ9684	175	1 1	#3/0 AWG Cu 250kcmil AWG AL
EQ9685-EQIII	200	1 1	#3/0 AWG Cu 250kcmil AWG Al
EQ9686-EQIII	225	1 1	#4/0 AWG Cu 300kcmil AWG Al
QPJ	125–200	1	#2–300kcmil Cu-Al

Surge Protection

Circuit Breaker and Surge Protective Device (SPD)

Features

- 2 inch wide plug-on design
  - — Includes (2) 1 Pole circuits breakers
  - — No loss of load center spaces
- Easy to install and perfect for retrofit
- LEDs provide protection status

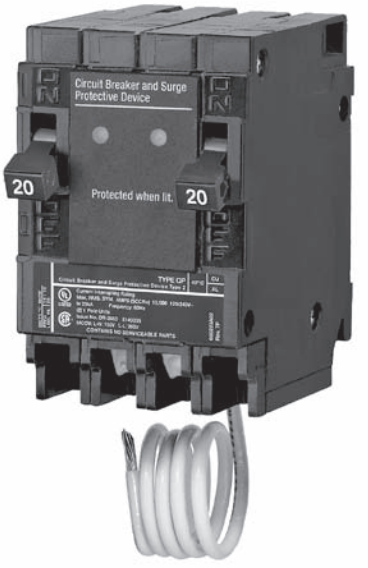
Benefits

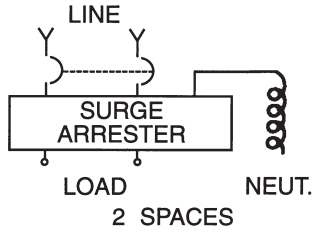
By installing a Siemens Circuit Breaker and Surge Protective Device (SPD) in the load center of the residence, surge protection is provided for all branch circuits①.

Two green LED indicator lights are provided to show that surge protection is provided for all circuits connected to the load center. These breakers should be used for circuit protection of frequently used household or facility circuits because the lights and devices connected to these circuits provide an effective indication that surge protection is being provided.

The circuit breaker and SPD utilize Siemens-built 150V AC, 40mm, metal oxide varistors (MOVs). The maximum impulse rating for the SPD module is 40kA. The standard interrupting rating for the circuit breakers is 10k AIC. All Type QP circuit breakers and SPD are plug-on style, with load terminals provided. The devices are rated for 120/240V AC and are calibrated for 40 degrees C maximum ambient applications.

Circuit Breaker and Surge Protective Device (SPD)





Breaker Type	Ampere Rating	Catalog Number	Surge Type
QP 1- Pole 120/240V AC 10K AIC	(2) 15	**QSA1515SPD**	SPD
	(2) 20	**QSA2020SPD**	SPD

Catalog Number	QSA1515SPD QSA2020SPD
Amperage	15 or 20 Amp
Number of Poles	(2) 1-Pole Circuit Breakers
Initial Clamping Level	240 Volts
Transient Energy Rating	360 Joules line-to-neutral 720 Joules line-to-line
Transient Suppression	500 volts peak, line-to-neutral
Voltage Rating	1000 volts peak, line-to-line
Peak Current Rating (impulse)	40,000 amperes
Discharge Voltage Characteristic	@ 1,500A, 600 volts @ 5,000A, 800 volts (both line-to-neutral)
Discharge Current Withstand Rating	10,000 amperes line-to-neutral
Circuit Breaker Interrupting Rating	10,000A, 120/240V AC
Listings/Certifications	UL, CSA Meets UL 1449 3rd Edition

① For warranty information please refer to the surge website www.usa.siemens.com/surge

Molded Case Circuit Breakers

Panelboard Mounting with INSTA-WIRE

1-Pole Bolt-On (120V AC)⑤

Continuous Current Rating @ 40° C	Type BL① 10,000A IR Catalog Number	Type BLH① 22,000A IR Catalog Number	Type HBL 65,000A IR Catalog Number
10⑨	B110	—	—
15	B115④	B115H④	B115HH④
20	B120④	B120H④	B120HH④
25	B125	B125H	B125HH■
30	B130	B130H	B130HH
35	B135	B135H■	B135HH■
40	B140	B140H	B140HH
45	B145■	B145H■	B145HH■
50	B150	B150H	B150HH■
60	B160	B160H■	B160HH■
70	B170	B170H■	B170HH■

2-Pole Bolt-On (Common-Trip 120/240V AC)⑥

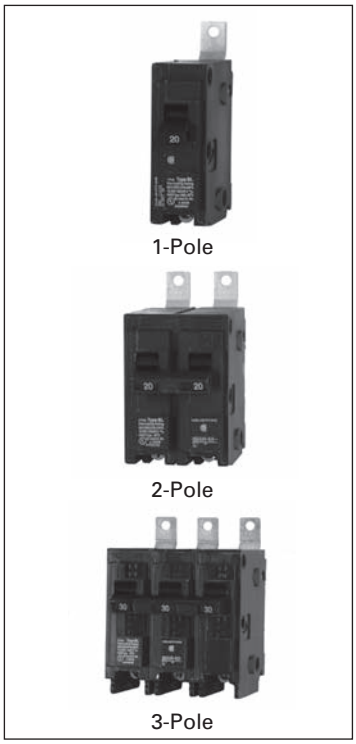
10	B210	—	—
15	B215	B215H	B215HH
20	B220	B220H	B220HH
25	B225	B225H■	B225HH■
30	B230	B230H	B230HH
35	B235	B235H■	B235HH■
40	B240	B240H	B240HH
45	B245	B245H■	B245HH■
50	B250	B250H	B250HH
60	B260	B260H	B260HH
70	B270	B270H■	B270HH■
80	B280	B280H■	B280HH■
90	B290	B290H■	B290HH■
100	B2100	B2100H	B2100HH
110	B2110■	B2110H■	B2110HH■
125	B2125	B2125H	B2125HH■

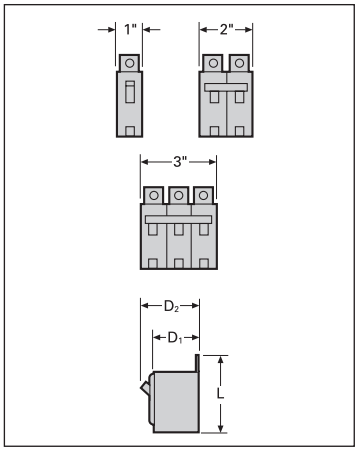
2-Pole Bolt-On (Common-Trip 240V AC)③⑥⑩

15	B215R	—	—
20	B220R	—	—
30	B230R	—	—
40	B240R■	—	—
50	B250R	—	—
60	B260R	—	—
70	B270R■	—	—
80	B280R■	—	—
90	B290R■	—	—
100	B2100R■	—	—

3-Pole Bolt-On (Common-Trip 240V AC)⑦

15	B315	B315H	B315HH
20	B320	B320H	B320HH
25	B325	B325H	B325HH■
30	B330	B330H	B330HH
35	B335	B335H■	B335HH■
40	B340	B340H	B340HH
45	B345	B345H■	B345HH■
50	B350	B350H	B350HH
60	B360	B360H	B360HH
70	B370	B370H	B370HH
80	B380	B380H■	B380HH
90	B390	B390H■	B390HH
100	B3100	B3100H	B3100HH





Breaker Type	Amperes	Dimensions L	D1	D2
BL, BLH	15–50	3 9/16	2 3/8	3
BL, BLH	55–125	3 3/4	2 3/8	3
HBL	15–125	3 3/4	2 3/8	3

BL/BLH/HBL 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■②	Factory

Modifications

Description	Catalog Number
400Hz Calibration	add suffix...Y⑧
Marine 50˚C Ambient Calibration	add suffix...M
Fungus Proofing	add suffix...F

For external accessories, please refer to page 7-93

■ 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. 120V AC Fluorescent Lighting.

②1A and 1B contacts.
③UL Listed for use on 3-phase grounded "B" systems — 10,000 for this application.
④UL Listed for frequent switching applications (SWD).
⑤Shipped 12 per sleeve.

⑥Shipped 6 per sleeve.
⑦Shipped 4 per sleeve.
⑧UL Listed 5KA IR.
⑨10 Amp breaker does not have INSTA-WIRE.
⑩For 3 Phase Applications.

Molded Case Circuit Breakers

Panelboard Mounting Circuit Breakers

Selection

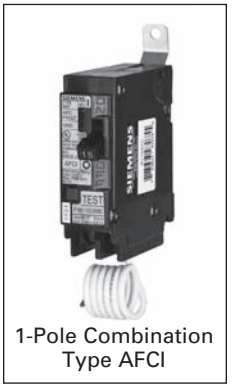
Arc-Fault Circuit Interrupters (AFCI)

AFCI's detect arcing faults (an unintentional arcing condition in a circuit) that standard circuit breakers are unable to detect. The device is intended to mitigate the effects of arcing faults by functioning to de-energize the circuit when an arc-fault is detected.

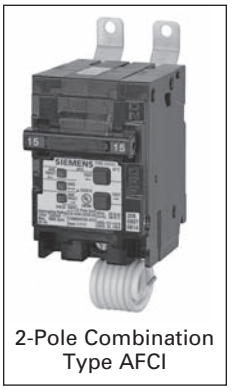
Combination Type AFCI

Detects all three possible types of arc fault: line-to-ground, line-to-neutral, and series.

Breaker Type	Ampere Rating	10,000 A IR Catalog Number	22,000 A IR Catalog Number	65,000 A IR Catalog Number
BAF2/BAFH2/HBAF2 1-Pole 120V AC	15	BA115AFC①	BA115AFCH■	BA115AFCHH
	20	BA120AFC①	BA120AFCH■	BA120AFCHH
BAF/BAFH 2-Pole 120/240V AC	15	B215AFC①	B215AFCH■	—
	20	B220AFC①	B220AFCH■	—



1-Pole Combination Type AFCI



2-Pole Combination Type AFCI

Branch-Feeder AFCI

Detects line-to-ground and line-to neutral arcs.

BAF2/BAFH2/HBAF2 1-Pole 120V AC	15	BA115AF①	BA115AFH■①	BA115AFHH
	20	BA120AF①	BA120AFH■①	BA120AFHH

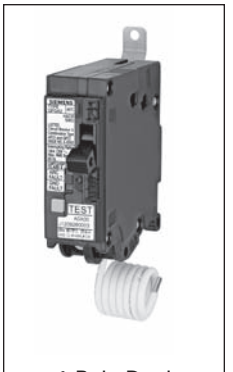


1-Pole Branch Feeder AFCI

NEW Dual Function AFCI/GFCI

The Dual Function Circuit Breaker combines Combination Type AFCI and GFCI, protecting against both Arc Faults and Ground Faults. The device includes the Self Test and Lockout feature, making it the fist in class in electrical safety for homeowners.

BFGA2/BFGAH2/HBFGA2 1-Pole 120V AC	15	B115DF	B115DFH	B115DFHH
	20	B120DF	B120DFH	B120DFHH



1-Pole Dual Function AFCI/GFC

Ground-Fault Circuit Interrupters (GFCI)

Provides Class A (5mA) ground fault protection. Intended for personnel protection. De-energizes the circuit for all ungrounded conductors of the circuit.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
BLF/BLHF 1-Pole 120V AC Bolt-On	15	BF115①	BF115H①
	20	BF120①	BF120H①■
	25	BF125■	BF125H■
	30	BF130	BF130H
BLF/BLHF 2-Pole 120/240V AC Bolt-On	15	BF215	BF215H
	20	BF220	BF220H
	30	BF230	BF230H
	40	BF240	BF240H
	50	BF250	BF250H
	60	BF260	BF260H

Ground Fault Equipment Protection (30mA)

Provides protection of equipment from damaging line-to-ground faults currents. De-energizes the circuit for all ungrounded conductors of the circuit.

Breaker Type	Amp Rating	10,000 A IR Catalog No.	22,000 A IR Catalog No.
BLE/BLEH 1-Pole, 120V AC Bolt-On	15	BE115①	BE115H①
	20	BE120①	BE120H①
	30	BE130	BE130H
BLE/BLEH 2-Pole 120/240V AC Bolt-On	15	BE215	BE215H
	20	BE220	BE220H
	30	BE230	BE230H
	40	BE240	BE240H
	50	BE250	BE250H
	60	BE260■	BE260H■



1-Pole Equipment Protection

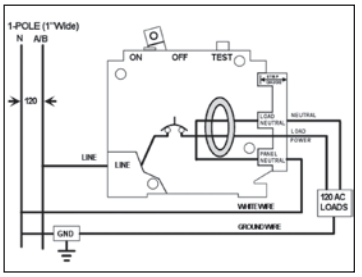


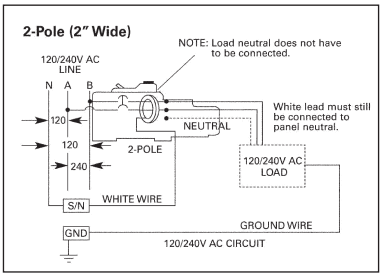
2-Pole Equipment Protection

QAF2/QPF/QE Accessories

Description	Catalog Number
Padlocking Device 1-Pole	ECPLD1
Padlocking Device 2-Pole	ECPLD2
Handle Block	ECBX231M

Wiring Diagrams





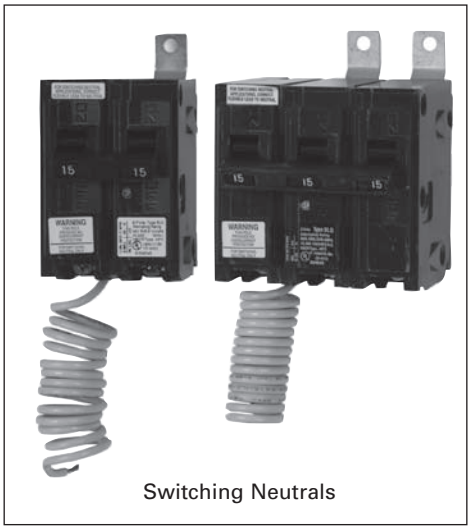
■ Built to order. Allow 2–3 weeks for delivery.

①UL Listed as SWD (Switching Duty) Rated, suitable for 120V AC Fluorescent Lighting.

Special Application Breakers

Switching Neutrals①

Breaker Type	Ampere Rating	Catalog Number
BLG 2-Wire Common Trip	15	**BG215■**
	20	**BG220■**
	30	**BG230■**
BLG 3-Wire Common Trip	15	**BG315■**
	20	**BG320■**
	30	**BG330■**



Switching Neutrals

HID Lighting①

For high-intensity discharge lamp loads having in-rush currents above the instantaneous trip setting of a standard breaker.

BL 1-Pole	15	**B115HID②■**
	20	**B120HID②**
	30	**B130HID■**
BL 2-Pole	15	**B215HID②■**
	20	**B220HID②**
	30	**B230HID■**

Tungsten Lighting

For high wattage, tungsten-lamp loads in-rush currents above the instantaneous trip setting of a standard breaker.

BL 1-Pole	15	**B115T②**
	20	**B120T②**

Molded Case Switch

For applications that do not require overcurrent protection.

BL 2-Pole	30	**B230S**
	60	**B260S**

■ Built to order. Allow 2–3 weeks for delivery.

① HACR rated.
② UL Listed for frequent switching applications (SWD). 120V AC fluorescent lighting.

BQD④

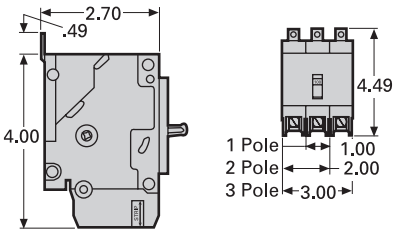
Continuous Current Rating @ 40°C	1-Pole 277V AC–125V DC Catalog Number	2-Pole③ 480Y/277V AC–125/250V DC Catalog Number	3-Pole③ 480Y/277V AC Catalog Number
15	BQD115①②	BQD215⑤	BQD315⑤
20	BQD120①②	BQD220⑤	BQD320⑤
25	BQD125②	BQD225⑤	BQD325⑤
30	BQD130②	BQD230⑤	BQD330⑤
35	BQD135②	BQD235⑤	BQD335⑤
40	BQD140②	BQD240⑤	BQD340⑤
45	BQD145②■	BQD245⑤	BQD345⑤
50	BQD150②	BQD250⑤	BQD350⑤
60	BQD160	BQD260	BQD360
70	BQD170■	BQD270	BQD370
80	BQD180■	BQD280	BQD380
90	BQD190■	BQD290	BQD390
100	BQD1100■	BQD2100	BQD3100

BQD6 CSA Certified

Continuous Current Rating @ 40°C	1-Pole 347V AC Catalog Number	2-Pole③ 600/347V AC Catalog Number	3-Pole③ 600/347V AC Catalog Number
15	BQD6115①	BQD6215	BQD6315
20	BQD6120①	BQD6220	BQD6320
25	BQD6125■	BQD6225■	BQD6325■
30	BQD6130	BQD6230	BQD6330
35	BQD6135■	BQD6235■	BQD6335■
40	BQD6140■	BQD6240■	BQD6340
45	BQD6145■	BQD6245■	BQD6345■
50	BQD6150■	BQD6250■	BQD6350
60	BQD6160■	BQD6260■	BQD6360
70	BQD6170■	BQD6270■	BQD6370



BQD, BQD6



BQD, BQD6

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.) (ea.)
1	1/12/48	.6
2	1/6/24	1.2
3	1/4/16	2.0

Lugs For 60/75°C Wire

BQD – Load End Only	
15–40	#14–#6 AWG Cu #12–#6 AWG Al
45–100	#8–#1 AWG Cu #6–#1/0 AWG Al

Interrupting Ratings

Breaker Type	Number of Poles	RMS Symmetrical Amperes (KA)							
		Volts AC						Volts DC	
		120	240	277	480/277	347	600/347	125	125/250
BQD (UL)	1	65	—	14	—	—	—	14	—
	2	—	65	—	14	—	—	—	14
	3	—	65	—	14	—	—	—	—
BQD6 (CSA)	1	65	—	—	—	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.

①SWD rated for switching fluorescent lighting.
②HID rated at 277V AC.
③Not suitable for 3-phase delta 480V applications.
④HACR rated.
⑤HID rated at 480Y/277V AC.

For external accessories, please refer to pages 7-95 to 7-100
For internal accessories, please refer to page 7-34

Molded Case Circuit Breakers

GB Frame

Selection

Type NGB Frame (Panelboard Mount)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	NGB1B015B①②	NGB2B015B②	NGB3B015B②
20	NGB1B020B①②	NGB2B020B②	NGB3B020B②
25	NGB1B025B②	NGB2B025B②	NGB3B025B②
30	NGB1B030B②	NGB2B030B②	NGB3B030B②
35	NGB1B035B②	NGB2B035B②	NGB3B035B②
40	NGB1B040B②	NGB2B040B②	NGB3B040B②
45	NGB1B045B②	NGB2B045B②	NGB3B045B②
50	NGB1B050B②	NGB2B050B②	NGB3B050B②
60	NGB1B060B	NGB2B060B	NGB3B060B
70	NGB1B070B	NGB2B070B	NGB3B070B
80	NGB1B080B	NGB2B080B	NGB3B080B
90	NGB1B090B	NGB2B090B	NGB3B090B
100	NGB1B100B	NGB2B100B	NGB3B100B
110	NGB1B110B	NGB2B110B	NGB3B110B
125	NGB1B125B	NGB2B125B	NGB3B125B

Load lugs are included as standard. HACR rated.



GB

Type HGB (Panelboard Mount)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	HGB1B015B①②	HGB2B015B②	HGB3B015B②
20	HGB1B020B①②	HGB2B020B②	HGB3B020B②
25	HGB1B025B②	HGB2B025B②	HGB3B025B②
30	HGB1B030B②	HGB2B030B②	HGB3B030B②
35	HGB1B035B②	HGB2B035B②	HGB3B035B②
40	HGB1B040B②	HGB2B040B②	HGB3B040B②
45	HGB1B045B②	HGB2B045B②	HGB3B045B②
50	HGB1B050B②	HGB2B050B②	HGB3B050B②
60	HGB1B060B	HGB2B060B	HGB3B060B
70	HGB1B070B	HGB2B070B	HGB3B070B
80	HGB1B080B	HGB2B080B	HGB3B080B
90	HGB1B090B	HGB2B090B	HGB3B090B
100	HGB1B100B	HGB2B100B	HGB3B100B
110	HGB1B110B	HGB2B110B	HGB3B110B
125	HGB1B125B	HGB2B125B	HGB3B125B

Type LGB (Panelboard Mount)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	LGB1B015B①②	LGB2B015B②	LGB3B015B②
20	LGB1B020B①②	LGB2B020B②	LGB3B020B②
25	LGB1B025B②	LGB2B025B②	LGB3B025B②
30	LGB1B030B②	LGB2B030B②	LGB3B030B②
35	LGB1B035B②	LGB2B035B②	LGB3B035B②
40	LGB1B040B②	LGB2B040B②	LGB3B040B②
45	LGB1B045B②	LGB2B045B②	LGB3B045B②
50	LGB1B050B②	LGB2B050B②	LGB3B050B②
60	LGB1B060B	LGB2B060B	LGB3B060B
70	LGB1B070B	LGB2B070B	LGB3B070B
80	LGB1B080B	LGB2B080B	LGB3B080B
90	LGB1B090B	LGB2B090B	LGB3B090B
100	LGB1B100B	LGB2B100B	LGB3B100B
110	LGB1B110B	LGB2B110B	LGB3B110B
125	LGB1B125B	LGB2B125B	LGB3B125B

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	0.9 (0.4)
2	1	1.9 (0.9)
3	1	2.9 (1.2)

Lugs For 60/75°C Wire

NGB		
Ampere Rating	Wire Size	Catalog Number
15–30A	#14–#6 AWG Cu #12–#6 AWG Al	Integral with breaker
35–125A	#8-1/0 AWG Cu #8-2/0 AWG Al	Integral with breaker

Interrupting Ratings (max. RMS symmetrical amperes kA)

		UL489							
		Volts AC						Volts DC	
	Poles	120	240	277	347	480Y/347	600Y/347	125	125/250
NGB	1	100	—	25	14	—	—	14	—
	2,3	—	100	—	—	25	14	—	14④
HGB	1	100	—	35	14	—	—	14	—
	2,3	—	100	—	—	35	14	—	14④
LGB	1	100	—	65	14	—	—	14	—
	2,3	—	100	—	—	65	14	—	14④

①SWD rated.
②HID rated.
③2-pole only.
④2-pole only or two outer poles of 3-pole breaker

For external accessories, please refer to pages 7-95 to 7-100
For internal accessories, please refer to page 7-34

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
AC	DC		Catalog Number
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.

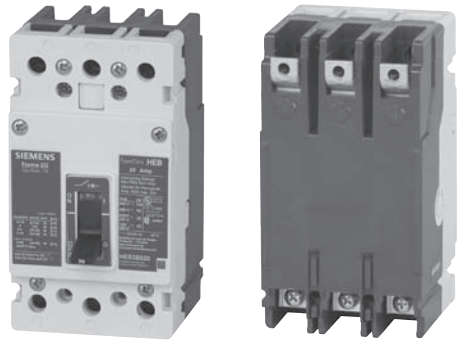
①Adds 1-pole space for accessory.

Molded Case Circuit Breakers

NEB & HEB Frame

Type NEB (Panelboard Mount)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	NEB1B015B①②	NEB2B015B②	NEB3B015B
20	NEB1B020B①②	NEB2B020B②	NEB3B020B
25	NEB1B025B②	NEB2B025B②	NEB3B025B
30	NEB1B030B②	NEB2B030B②	NEB3B030B
35	NEB1B035B②	NEB2B035B②	NEB3B035B
40	NEB1B040B②	NEB2B040B②	NEB3B040B
45	NEB1B045B②	NEB2B045B②	NEB3B045B
50	NEB1B050B②	NEB2B050B②	NEB3B050B
60	NEB1B060B	NEB2B060B	NEB3B060B
70	NEB1B070B	NEB2B070B	NEB3B070B
80	NEB1B080B	NEB2B080B	NEB3B080B
90	NEB1B090B	NEB2B090B	NEB3B090B
100	NEB1B100B	NEB2B100B	NEB3B100B
110	NEB1B110B	NEB2B110B	NEB3B110B
125	NEB1B125B	NEB2B125B	NEB3B125B



Front view Back view

HEB

Type HEB (Panelboard Mount)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	HEB1B015B①②	HEB2B015B②	HEB3B015B
20	HEB1B020B①②	HEB2B020B②	HEB3B020B
25	HEB1B025B②	HEB2B025B②	HEB3B025B
30	HEB1B030B②	HEB2B030B②	HEB3B030B
35	HEB1B035B②	HEB2B035B②	HEB3B035B
40	HEB1B040B②	HEB2B040B②	HEB3B040B
45	HEB1B045B②	HEB2B045B②	HEB3B045B
50	HEB1B050B②	HEB2B050B②	HEB3B050B
60	HEB1B060B	HEB2B060B	HEB3B060B
70	HEB1B070B	HEB2B070B	HEB3B070B
80	HEB1B080B	HEB2B080B	HEB3B080B
90	HEB1B090B	HEB2B090B	HEB3B090B
100	HEB1B100B	HEB2B100B	HEB3B100B
110	HEB1B110B	HEB2B110B	HEB3B110B
125	HEB1B125B	HEB2B125B	HEB3B125B

Load lugs are included as standard.
HACR rated.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	1.4 (0.5)
2	1	2.4 (0.9)
3	1	3.7 (1.4)

Lugs For 60/75°C Wire

NEB/HEB		
Ampere Rating	Wire Size	Catalog Number
15–100A	#14–1/0	**3TA1EG10** (kit of 3)
110–125A	#6–3/0	**3TA1EG30** (kit of 3)

Interrupting Ratings (max. RMS symmetrical amperes kA)

Breaker Type	Number of Poles	UL489/CSA						IEC 60947-2 (Ics = 50% Icu)			
		Volts AC					Volts DC	Volts AC		Volts DC	
		240	277	347	480	600Y/347	125/250	240	415	125	125/250
NEB	1	85	35	22	—	—	35	85	—	35	—
	2, 3	85	—	—	35	22	35	85	40	—	35
HEB	1	100	65	25	—	—	42	100	—	42	—
	2, 3	100	—	—	65	25	42	100	70	—	42

40°C, 50/60Hz.

① SWD Rated
② HID Rated

For external accessories, please refer to pages 7-95 to 7-100
For internal accessories, please refer to page 7-36

Molded Case Circuit Breakers

Internal Accessories for NEG & HEG 125A Frame, NEB & HEB 125A Frame

Shunt Trip

Control Voltage		NEG, HEG, NEB, HEB Catalog Number
V AC	V DC	
110-240	—	**STRER240A**
—	125	**STRED125D**
380-600	—	**STREV600**
24-60	24-60	**STREM60D**

Auxiliary Switch

Maximum Voltage		Number of Contacts	NEG, HEG, NEB, HEB Catalog Number
AC	DC		
240	125	1A–1B	**ASKE2**
240	125	2A–2B	**ASKE3**

Alarm Switch

Maximum Voltage		Number of Contacts	NEG, HEG, NEB, HEB Catalog Number
AC	DC		
240	125	1A–1B	**ASKE1**
240	125	2A–2B	**ASKE5**

Undervoltage Trip

Control Voltage		NEG, HEG, NEB, HEB Catalog Number
AC	DC	
24		**UVREB24A**
60		**UVREM60▲**
120		**UVREN120**
240		**UVRER240**
480		**UVREU480▲**
600		**UVREV600▲**
	24	**UVREB24D**
	48	**UVREC48D▲**
	125	**UVRED125D▲**
	250	**UVREE250D▲**

Alarm and Auxiliary Switch Combinations

For Breaker	Catalog Number
NEG, HEG	**ASKE6**

▲ Built to order. Allow 6–8 weeks for delivery.

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 BQ① 10,000A IR Catalog Number	Type BQH 22,000A IR Catalog Number	Type HBQ 65,000A IR Catalog Number
1-Pole (120V AC)⑤			
15	BQ1B015④	BQ1B015H④	HB1B015■④
20	BQ1B020④	BQ1B020H④	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)⑥			
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)③⑥			
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



1-Pole



2-Pole



3-Pole

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 7-93

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■②	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.

Molded Case Circuit Breakers

DIN Rail Mounted Circuit Breakers

Selection/Dimensions

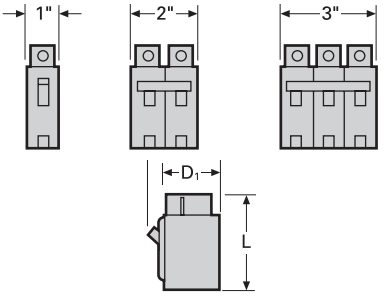
Breaker Type	Ampere Rating	Catalog Number	Load Side Connector	Interrupting Ratings (KA) (RMS Symmetrical Amperes) Volts AC 120	120/240
1-Pole DIN Rail (120V AC)					
BQXD 1-Pole 120V DIN Rail	10	**BQ1B010QLD**	TC1Q1	10	
	15	**BQ1B015QLD**	TC1Q1	10	
	20	**BQ1B020QLD**	TC1Q1	10	
	25	**BQ1B025QLD**	TC1Q1	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



BQ1B015QLD **BQ2B015QLD**



BQ1B015QXD **BQ2B015QXD**



Lugs-For Use with BQ, BQH, HBQ⑥

Circuit Breaker Amp. Rtg.	Cab. Per Lug	Lug Wire Range AWG	Catalog Number
Line Side			
10–40	1 1	#16–#6 Cu #12–#6 Al	**TC1Q1**①②
45–125	1 1	#8–#1 Cu #6–#1/0 Al	**TA1Q1**
Load Side			
10	2	#16 Cu	Connectors are Supplied with Circuit Breaker
15–20	1 1	#14–#10 Cu #12–#10 Al	
25–35	1 1	#14–#6 Cu #12–#10 Al	
40–50	1 1	#8–#6 Cu #8–#4 Al	
55–70	1 1	#8–#4 Cu #8–#2 Al	
80–100	1 1	#4–#1/0 Cu #2–#1/0 Al	
110–125	1 1	#2–#1/0 Cu #1/0–#2/0 Al	

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**③⑤
3R	**WB3100**

Breaker Type	Amperes	Dimensions (inches) L	D1	D2
BQ, BQH	15–50	3¾	2⅜	3
BQ, BQH	55–125	4	2⅜	3
HBQ	15–125	4	2⅜	3
BQXD	15–60	4½	2⅜	3

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.

②Connector has steel construction.

③Surface mounted indoor. If flush mounting is required, replace suffix "S" in catalog number with suffix "F".

④Neutral included in enclosure.

⑤Enclosure will not accept circuit breakers with shunt trips or auxiliary switches installed.

⑥Type BQXD uses TA1Q1 or TC1Q1 lugs on line side of circuit breaker.

Enclosures, see Section 6
For external accessories, please refer to pages 7-93, 7-95 to 7-100

Molded Case Circuit Breakers

QJ 225A Frame

Continuous Current Rating @ 40°C	2-Pole 240V AC Catalog Number	3-Pole 240V AC Catalog Number
Type QJ2②		
60	**QJ22B060■**	**QJ23B060**
70	**QJ22B070■**	**QJ23B070**
80	**QJ22B080■**	**QJ23B080■**
90	**QJ22B090■**	**QJ23B090■**
100	**QJ22B100**	**QJ23B100**
110	**QJ22B110■**	**QJ23B110**
125	**QJ22B125**	**QJ23B125**
150	**QJ22B150**	**QJ23B150**
175	**QJ22B175**	**QJ23B175**
200	**QJ22B200**	**QJ23B200**
225	**QJ22B225**	**QJ23B225**
Type QJH2②		
60	**QJH22B060■**	**QJH23B060■**
70	**QJH22B070■**	**QJH23B070■**
80	**QJH22B080■**	**QJH23B080■**
90	**QJH22B090■**	**QJH23B090■**
100	**QJH22B100■**	**QJH23B100**
110	**QJH22B110■**	**QJH23B110**
125	**QJH22B125**	**QJH23B125**
150	**QJH22B150**	**QJH23B150**
175	**QJH22B175■**	**QJH23B175**
200	**QJH22B200**	**QJH23B200**
225	**QJH22B225**	**QJH23B225**
Type QJ2H②		
60	**QJ22B060H■**	**QJ23B060H■**
70	**QJ22B070H■**	**QJ23B070H■**
80	**QJ22B080H■**	**QJ23B080H■**
90	**QJ22B090H■**	**QJ23B090H■**
100	**QJ22B100H■**	**QJ23B100H**
110	**QJ22B110H■**	**QJ23B110H■**
125	**QJ22B125H**	**QJ23B125H**
150	**QJ22B150H**	**QJ23B150H**
175	**QJ22B175H■**	**QJ23B175H**
200	**QJ22B200H**	**QJ23B200H**
225	**QJ22B225H**	**QJ23B225H**
Type HQJ2②		
100	—	**HQJ23B100▲**
110	—	**HQJ23B110▲**
125	—	**HQJ23B125▲**
150	—	**HQJ23B150▲**
175	—	**HQJ23B175▲**
200	—	**HQJ23B200▲**
225	—	**HQJ23B225▲**

Ordering Information

Load side TA1Q300 lugs are mounted and included when circuit breaker is ordered. For line and load lugs (TA1Q300) 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

QJ2, QJH2, QJ2H, HQJ2		
Number of Poles	**Number per Carton**	**Shipping Weight (lbs.)**
2	10	30
3	10	41

Lugs For 75°C Wire①

Catalog Number	Lug Body	Lug Wire Range
TA1Q300	Al	(1) #6—300 kcmil Cu (1) #4—300 kcmil Al
TC1Q250	Cu	(1) #6—250 kcmil Cu

Enclosures (Neutral Included)

Type	Catalog Number
1	**EB3225**(S)(F)
3R (2-pole)	**WB2225**
3R (3-pole)	**WB3225**

UL 489 Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (kA) Volts AC (50/60 Hz)	
	240	208Y/120
QJ2	10	—
QJH2	22	—
QJ2H	42	—
HQJ2	65	100



4.5″ 3-pole

QJ2

Internal Accessories (Factory installed only) (3-pole only)③
Add suffix to catalog number.

Control Voltage		Shunt Trip	Auxiliary Switches		Shunt Trip and 1A and 1B Auxiliary Switch
			1A and 1B	2A and 2B	
AC	DC	Suffix	Suffix	Suffix	Suffix
120/240		**00S01■**	**A01■**	**A02■**	**01S01■**
	24	**00S07■**	**A01■**	**A02■**	**01S07■**
	48	**00S09■**	**A01■**	**A02■**	**01S09■**

■ Built to order. Allow 2–3 weeks for delivery.

▲ Built to order. Allow 6–8 weeks for delivery.

① See **Note: A** page 7-81.
Note: QJ breakers are UL Listed for reverse feed applications.

② HACR rated.
③ Internal accessories are not available on 2-pole QJ breakers.

Enclosures Section 6
For external accessories, please refer to pages 7-95 to 7-100

Type CQD (Cable In - Cable Out) DIN Rail Mount③

Continuous Current Rating @ 40°C	1-Pole 277V AC 125V DC Catalog Number	2-Pole 480Y/277V AC 125/250V DC Catalog Number	3-Pole 480Y/277V AC Catalog Number
15	**CQD115①②**	**CQD215②**	**CQD315②**
20	**CQD120①②**	**CQD220②**	**CQD320②**
25	**CQD125②**	**CQD225②**	**CQD325②**
30	**CQD130②**	**CQD230②**	**CQD330②**
35	**CQD135②■**	**CQD235②■**	**CQD335②**
40	**CQD140②■**	**CQD240②**	**CQD340②**
45	**CQD145②■**	**CQD245②■**	**CQD345②■**
50	**CQD150②■**	**CQD250②**	**CQD350②**
60	**CQD160■**	**CQD260**	**CQD360**
70	**CQD170■**	**CQD270**	**CQD370**
80	**CQD180■**	**CQD280**	**CQD380**
90	**CQD190■**	**CQD290■**	**CQD390**
100	**CQD1100■**	**CQD2100**	**CQD3100**

Type CQD6 (Cable In - Cable Out) CSA Certified, not UL

Continuous Current Rating @ 40°C	1-Pole 347V AC 125V DC Catalog Number	2-Pole 600Y/347V AC 125/250V DC Catalog Number	3-Pole 600Y/347V AC Catalog Number
15	—	**CQD6215■**	**CQD6315■**
20	**CQD6120②■**	**CQD6220■**	**CQD6320■**
25	**CQD6125②■**	**CQD6225■**	**CQD6325■**
30	**CQD6130②■**	**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

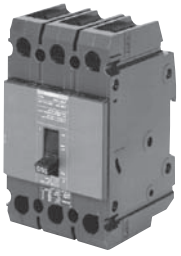
Breaker Type	Number of Poles	RMS Symmetrical Amperes (KA) Volts AC (50/60 Hz) 120	240	277	480/277	600/347	Volts DC 125	125/250
CQD (UL)	1	65	—	14	—	—	14	—
	2	—	65	—	14	—	—	14
	3	—	65	—	14	—	—	—
CQD6 (CSA)	1	65	—	14	—	10	14	—
	2	—	65	—	—	10	—	14
	3	—	65	—	—	10	—	—

Shipping Weights

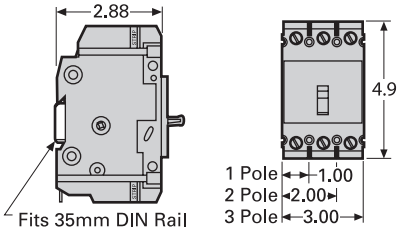
Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	0.5 (0)
2	1	1.0 (0)
3	1	1.5 (1)

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



CQD, CQD6

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

① SWD rated.

Note: CQD breakers are UL Listed for reverse feed applications.

② HID rated.

③ HACR rated.

Enclosures Section 6
Accessories pages 7-42 and 7-95 to 7-100

Molded Case Circuit Breakers

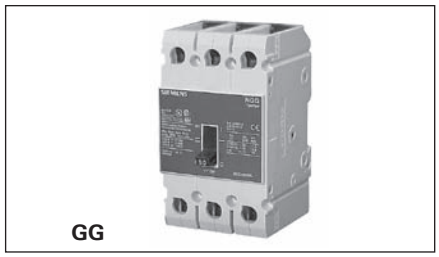
GG 125A Frame

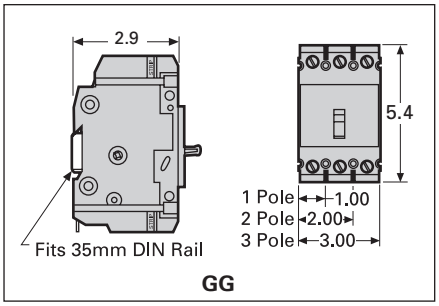
Selection/Dimensions

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	NGG1B015L①②	NGG2B015L②	NGG3B015L②
20	NGG1B020L①②	NGG2B020L②	NGG3B020L②
25	NGG1B025L②	NGG2B025L②	NGG3B025L②
30	NGG1B030L②	NGG2B030L②	NGG3B030L②
35	NGG1B035L②	NGG2B035L②	NGG3B035L②
40	NGG1B040L②	NGG2B040L②	NGG3B040L②
45	NGG1B045L②	NGG2B045L②	NGG3B045L②
50	NGG1B050L②	NGG2B050L②	NGG3B050L②
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	HGG1B015L①②	HGG2B015L②	HGG3B015L②
20	HGG1B020L①②	HGG2B020L②	HGG3B020L②
25	HGG1B025L②	HGG2B025L②	HGG3B025L②
30	HGG1B030L②	HGG2B030L②	HGG3B030L②
35	HGG1B035L②	HGG2B035L②	HGG3B035L②
40	HGG1B040L②	HGG2B040L②	HGG3B040L②
45	HGG1B045L②	HGG2B045L②	HGG3B045L②
50	HGG1B050L②	HGG2B050L②	HGG3B050L②
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	LGG1B015L①②	LGG2B015L②	LGG3B015L②
20	LGG1B020L①②	LGG2B020L②	LGG3B020L②
25	LGG1B025L②	LGG2B025L②	LGG3B025L②
30	LGG1B030L②	LGG2B030L②	LGG3B030L②
35	LGG1B035L②	LGG2B035L②	LGG3B035L②
40	LGG1B040L②	LGG2B040L②	LGG3B040L②
45	LGG1B045L②	LGG2B045L②	LGG3B045L②
50	LGG1B050L②	LGG2B050L②	LGG3B050L②
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 #12–#6 AWG Al	**TC1Q1** (qty. 1) **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 DC		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	—	14①	65		14
HGG	1	65	—	35	14	—	—	14	—	—		
	2,3	—	65	—	—	35	14	—	14①	—		14
LGG	1	65	—	65	14	—	—	14	—	—		
	2,3	—	65	—	—	65	14	—	14①	—		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

Enclosures Section 6
Accessories pages 7-42 and 7-95 to 7-100

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
AC	DC		Catalog Number
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.

①Adds 1-pole space for accessory.

Molded Case Circuit Breakers

EG 125A Frame

Type NEG (Cable In - Cable Out)

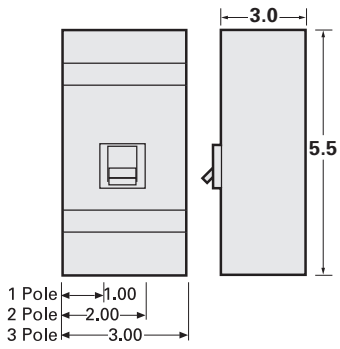
Continuous Ampere Rating @ 40°C	1-Pole	2-Pole	3-Pole	4-Pole
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
15	NEG1B015L①②	NEG2B015L②	NEG3B015L	NEG4B015L
20	NEG1B020L①②	NEG2B020L②	NEG3B020L	NEG4B020L
25	NEG1B025L②	NEG2B025L②	NEG3B025L	NEG4B025L
30	NEG1B030L②	NEG2B030L②	NEG3B030L	NEG4B030L
35	NEG1B035L②	NEG2B035L②	NEG3B035L	NEG4B035L
40	NEG1B040L②	NEG2B040L②	NEG3B040L	NEG4B040L
45	NEG1B045L②	NEG2B045L②	NEG3B045L	NEG4B045L
50	NEG1B050L②	NEG2B050L②	NEG3B050L	NEG4B050L
60	NEG1B060L	NEG2B060L	NEG3B060L	NEG4B060L
70	NEG1B070L	NEG2B070L	NEG3B070L	NEG4B070L
80	NEG1B080L	NEG2B080L	NEG3B080L	NEG4B080L
90	NEG1B090L	NEG2B090L	NEG3B090L	NEG4B090L
100	NEG1B100L	NEG2B100L	NEG3B100L	NEG4B100L
110	NEG1B110L	NEG2B110L	NEG3B110L	NEG4B110L
125	NEG1B125L	NEG2B125L	NEG3B125L	NEG4B125L



HEG

Type HEG (Cable In - Cable Out)

Continuous Ampere Rating @ 40°C	1-Pole	2-Pole	3-Pole	4-Pole
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
15	HEG1B015L①②	HEG2B015L②	HEG3B015L	HEG4B015L
20	HEG1B020L①②	HEG2B020L②	HEG3B020L	HEG4B020L
25	HEG1B025L②	HEG2B025L②	HEG3B025L	HEG4B025L
30	HEG1B030L②	HEG2B030L②	HEG3B030L	HEG4B030L
35	HEG1B035L②	HEG2B035L②	HEG3B035L	HEG4B035L
40	HEG1B040L②	HEG2B040L②	HEG3B040L	HEG4B040L
45	HEG1B045L②	HEG2B045L②	HEG3B045L	HEG4B045L
50	HEG1B050L②	HEG2B050L②	HEG3B050L	HEG4B050L
60	HEG1B060L	HEG2B060L	HEG3B060L	HEG4B060L
70	HEG1B070L	HEG2B070L	HEG3B070L	HEG4B070L
80	HEG1B080L	HEG2B080L	HEG3B080L	HEG4B080L
90	HEG1B090L	HEG2B090L	HEG3B090L	HEG4B090L
100	HEG1B100L	HEG2B100L	HEG3B100L	HEG4B100L
110	HEG1B110L	HEG2B110L	HEG3B110L	HEG4B110L
125	HEG1B125L	HEG2B125L	HEG3B125L	HEG4B125L



NEG, HEG

Line and load lugs are included as standard.
HACR rated.
Suitable for screw mounting.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	1.1 (0.5)
2	1	2.0 (0.9)
3	1	3.1 (1.4)
4	1	3.9 (1.8)

Lugs For 60/75°C Wire

NEG/HEG		
Ampere Rating	Wire Size	Catalog Number
15–125A	#14 – 3/0 AWG Cu (steel lugs)	3TW1EG30 (qty. 3)
15–125A④	#14 – 1/0 AWG Cu #14 – 1/0 AWG Al	3TA1EG10 (qty. 3)
15–125A④	#6 - 3/0 AWG Cu #6 - 3/0 AWG Al	3TA1EG30 (qty. 3)
15–125A	Nut Keeper plate w/ screw (for crimp terminals)	TNKE3 (3-Pole) TNKE4 (4-Pole)

Interrupting Ratings

Breaker Type	Number of Poles	UL 489 AIR RMS Symmetrical Amperes (KA) Volts AC(50/60Hz) 240	277	347	480	600/347	Volts DC 125	125/250	IEC 60947-2 Volts AC (50/60Hz) 220/240 Icu	Ics	380/415 Icu	Ics	Volts DC 125	125/250
NEG	1	85	35	22	—	—	35	—	85	43	—	—	35	—
	2, 3, 4	85	—	—	35	22③	—	35	85	43	40	20	—	35
HEG	1	100	65	25	—	—	42	—	100	50	—	—	42	—
	2, 3, 4	100	—	—	65	25③	—	42	100	50	70	35	—	42

For inches / millimeters conversion, see Application Data section.

① SWD rated.
② HID rated 277 VAC.
③ Applies to 3 & 4-pole breakers only.
④ Optional lugs for NEG and HEG breakers.

Accessories pages 7-44 and 7-95 to 7-100

Shunt Trip

Control Voltage		NEG, HEG, NEB, HEB Catalog Number
V AC	V DC	
110-240	—	**STRER240A**
—	125	**STRED125D**
380-600	—	**STREV600**
24-60	24-60	**STREM60D**

Auxiliary Switch

Maximum Voltage		Number of Contacts	NEG, HEG, NEB, HEB Catalog Number
AC	DC		
240	125	1A–1B	**ASKE2**
240	125	2A–2B	**ASKE3**

Alarm Switch

Maximum Voltage		Number of Contacts	NEG, HEG, NEB, HEB Catalog Number
AC	DC		
240	125	1A–1B	**ASKE1**
240	125	2A–2B	**ASKE5**

Undervoltage Trip

Control Voltage		NEG, HEG, NEB, HEB Catalog Number
AC	DC	
24		**UVREB24A**
60		**UVREM60▲**
120		**UVREN120**
240		**UVRER240**
480		**UVREU480▲**
600		**UVREV600▲**
	24	**UVREB24D**
	48	**UVREC48D▲**
	125	**UVRED125D▲**
	250	**UVREE250D▲**

Alarm and Auxiliary Switch Combinations

For Breaker	Catalog Number
NEG, HEG	**ASKE6**

▲ Built to order. Allow 6–8 weeks for delivery.

Molded Case Circuit Breakers

ED 125A Frame Sentron Series

Selection

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 addditional charge
- 50°C Calibration, 400HZ - see page 7-91. All ED frame circuit breakers may be reverse connected

Type ED2⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole 120V AC 125V DC Catalog Number	2-Pole 240V AC 125V DC 250V DC Catalog Number	3-Pole 240V AC Catalog Number
15	ED21B015④■	ED22B015	ED23B015
20	ED21B020④■	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

Type ED4⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole 120V AC 277V AC 125V DC Catalog Number	2-Pole 480V AC 250V DC Catalog Number	3-Pole 480V AC Catalog Number
15	ED41B015④	—	ED43B015
20	ED41B020④	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

Type ED6⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole① 347V AC Catalog Number	2-Pole 600V AC 250V DC Catalog Number	3-Pole 600V AC 500V DC 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

Note: ED frame circuit breakers qualified to UL 489 Supplement SB "Naval"— See page 7-91 for additional information

■ Built to order. Allow 2–3 weeks for delivery.

①CSA Certified only (Not UL)

②For CED types and all 110–125 ampere ED frames.

③See **Note: A,** page 7-88.

④SWD rated.

⑤HACR rated.

⑥Not for use with HHED6 breakers.

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

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

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

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Enclosures Section 6
Accessories pages 7-47 and 7-95 to 7-100

Molded Case Circuit Breakers

ED 125A Frame Sentron Series

Type HED4⑥ — Black Label

Continuous Current Rating @ 40°C	1-Pole 277V AC 125V DC	2-Pole 480V AC 250V DC	3-Pole 480V AC
	Catalog Number	Catalog Number	Catalog Number
15	HED41B015①	HED42B015	HED43B015
20	HED41B020①	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

FIGURE1 - ED, HED, HHED

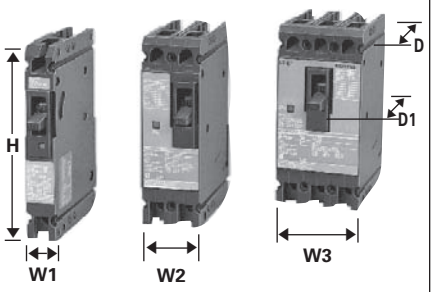
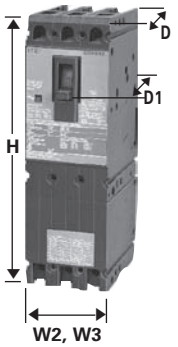


FIGURE 2 - CED (3-Pole shown)



Fuseless Current Limiting

Type HHED6⑥ — Black Label

Type CED6⑥ — Red Label

Continuous Current Rating @ 40°C	3-Pole 600V AC	2-Pole 600V AC, 250V DC	3-Pole 600V AC, 500V DC②
	Catalog Number⑦	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 ETI④	1	2	3	6.35	3.92	4.56
Figure 1 HHED6	—	2	3	6.53	3.92	4.56
Figure 2 CED6, CED6 ETI④	—	2	3	9.58	3.92	4.56

Interrupting Ratings

Breaker Type	UL 489 AIR (File #E10848) RMS Symmetrical Amperes (KA) Volts AC 120	240	277	347	480	600	Volts DC 125	250	500②	IEC 947-2 Volts AC (50/60Hz) 220/240 Icu	Ics	380/415 Icu	Ics	500 Icu	Ics
ED2 (1-P)	10	—	—	—	—	—	5	—	—	—	—	—	—	—	—
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)	—	—	—	30⑤	—	—	—	—	—	—	—	—	—	—	—
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)③		100			42			30 (2-P)		—	—	—	—	—	—
HHED6 (2, 3-P)③	—	100	—	—	65	18⑦	—	—	—	—	—	—	—	—	—
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 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

③HED4 and HHED6 type circuit breakers meet the UL criteria for "current limiting" at 240V AC.

④ED6-ETI, CED6-ETI, see page 7-74 for ordering information.

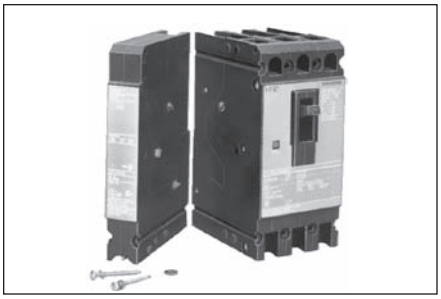
⑤Single Pole 15-30A 30KA @ 347V non-UL. 35-100A 18KA @ 347V non-UL.

⑥HACR rated.

⑦HHED63B015A is rated 18KAIC at 600/347V.

Accessories for:

ED 125A Frame



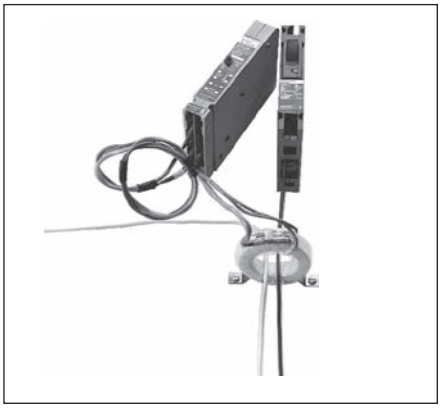
Combinations

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 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.

Molded Case Circuit Breakers

FD 250A Frame Sentron Series

Type FXD6-A①⑦

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker – Without Lugs)

Continuous Current Rating @ 40°C	2-Pole Catalog Number	3-Pole 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-A⑦

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 DC②			
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 DC③			
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	500③	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	—	—
HFXD6⑥, HFD6⑥	100	65	25	30 (2-P)	25 (3-P)	100	50	65	33	—	—
HHFD6⑥, HHFXD6⑥	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 Wire⑤

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
Neutral④	N250

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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.
⑤See **Note: A**, page 7-88.
⑥HFD6 and HHFD6 type circuit breakers meet the UL criteria for "current limiting" at 240 and 480V AC.
⑦HACR rated.

Molded Case Circuit Breakers

FD 250A Frame Sentron Series

Type HFD6, Type HFXD6②③④⑤⑥

Black 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)			
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 DC①			
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

Type HHFD, HHFXD6②③④⑥

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

Type CFD6-A③⑥

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

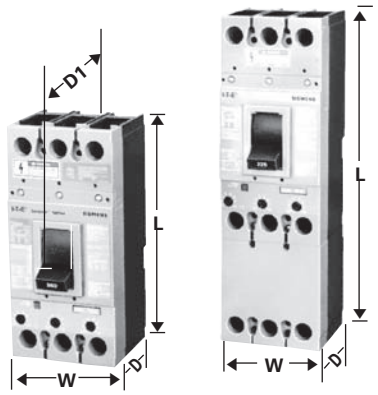


Figure 1 Figure 2

Dimensions (in inches)

Breaker Type	W	L	D	D1 (to handle)
Figure 1 FXD6-A, FD6-A, HFD6, HFXD6, HHFD6, FD6-ETI⑤	4.50	9.50	4	5.25
Figure 2 CFD6, CFD6-ETI⑤	4.50	14.25	4	5.25

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

■ Built to order. Allow 2–3 weeks for delivery.

① When wired as shown on page 7-4, 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 7-74 for ordering information.

⑥ HACR rated.

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.

①Auxiliary 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.

Molded Case Circuit Breakers

JD 400A Frame Sentron Series

Selection

Type JXD2-A⑤

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-A①⑤

600V AC, 2-Pole 250V DC, 3-Pole 500V DC② — Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
200	JXD62B200■	JXD63B200
225	JXD62B225■	JXD63B225
250	JXD62B250■	JXD63B250
300	JXD62B300	JXD63B300
350	JXD62B350■	JXD63B350
400	JXD62B400	JXD63B400

Type JD6-A⑤

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)			
200	JD62B200■	JD62F400	JD62T200■
225	JD62B225■		JD62T225■
250	JD62B250■		JD62T250■
300	JD62B300■		JD62T300■
350	JD62B350■		JD62T350■
400	JD62B400		JD62T400
3-Pole 600V AC, 500V DC②			
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)					
						220/240		380/415		500	
	240	480	600	250	500②	Icu	Ics	Icu	Ics	Icu	Ics
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	33	—	—
HHJD6, HHJXD6④	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 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③See **Note: A**, page 7-88.

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 7-91 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 without 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 7-91.

400Hz Applications see page 7-91.

Lugs For 75°C Wire③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2 2	#3/0-500 kcmil Cu #4/0-500 kcmil Al
TA1L6750	1 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

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Accessories pages 7-54 and 7-95 to 7-100

Molded Case Circuit Breakers

JD 400A Frame Sentron Series

Type HJD6-A, HJXD6-A②④⑥

Black 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)			
200	HJD62B200■	HJD62F400■	JD62T200■
225	HJD62B225■		JD62T225■
250	HJD62B250■		JD62T250■
300	HJD62B300■		JD62T300■
350	HJD62B350■		JD62T350■
400	HJD62B400■		JD62T400
3-Pole 600V AC, 500V DC①②⑤			
200	HJD63B200	HJD63F400	JD63T200
225	HJD63B225		JD63T225
250	HJD63B250		JD63T250
300	HJD63B300		JD63T300
350	HJD63B350		JD63T350
400	HJD63B400		JD63T400

Type HHJD6, HHJXD6②④⑥

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 Catalog Number	3-Pole 600V AC/500V DC 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

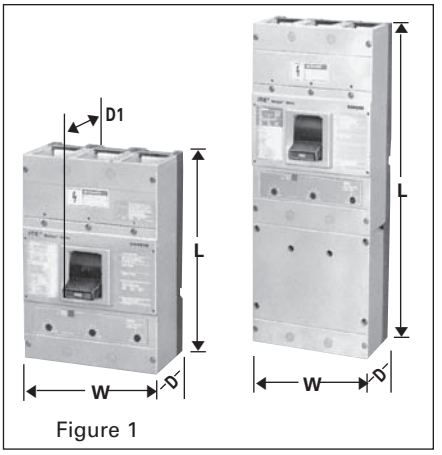


Figure 1

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-ETI③ SJD6, SHJD6	7.5	11	4	5.44
Figure 2 CJD6, CJD6-ETI,③ 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 7-4, 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 7-74 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.

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

SJD 400A Frame – 100% Rated②

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

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^2t 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 7-88.

②Refer to the NEC for proper application of 100% rated devices.

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 <u>not</u> 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

Lugs for 75° C Wire①

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**

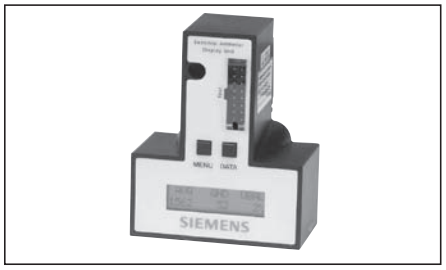
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Accessories for:

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	CatalogNumber
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.

Molded Case Circuit Breakers

LD 600A Frame Sentron Series

Type LXD6-A①④ — Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)

Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) 600V AC 250V DC Catalog Number	3-Pole 600V AC 500V DC Catalog Number
450	LXD62B450■	LXD63B450
500	LXD62B500■	LXD63B500
600	LXD62B600	LXD63B600

Type LD6-A④ — 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)			
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 DC②			
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)											
	UL 489 AIR (File E10848)					IEC 947-2					
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)					
	240	480	600	250	500③	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	—	—
HHLD6, 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 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.
③See **Note: A**, page 7-88.
④HACR rated.
Note: LD frame qualified to UL489 supplement SB "NAVAL". See page 7-91 for additional information.

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Enclosures Section 6
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Ordering Information

Complete Breaker Unassembled with Lugs
Prices of LD6, HLD6, and HHLD6 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 7-91.

400Hz Applications see page 7-91.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
LXD6, LD6, HLD6, HHLD6 Assembled Breaker (less terminals)		
2	1	17.5
3	1	19.5
LD6, HLD6, HHLD6 Frame Only		
2	1	14
3	1	15.5
LD6, HHLD6 Trip Unit Only		
2	1	3.5
3	1	4
CLD6 Complete Assembled Breaker (less terminals)		
3	1	31.5

Lugs For 75°C Wire③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0 500 kcmil Cu
	2	#4/0 500 kcmil Al
TC2J6500	2	#3/0-500 kcmil Cu
TA1L6750	1	500-750 kcmil Al
	1	500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
Compression Lug		
CCL600	1	500 kcmil Cu/Al

Type HLD6-A, HLXD6-A②③⑥

Black 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)			
250	**HLD62B250■**		**JD62T250■**
300	**HLD62B300■**		**JD62T300■**
350	**HLD62B350■**		**JD62T350■**
400	**HLD62B400■**	**HLD62F600■**	**JD62T400**
450	**HLD62B450■**		**LD62T450■**
500	**HLD62B500■**		**LD62T500■**
600	**HLD62B600■**		**LD62T600**
3-Pole 600V AC, 500V DC①⑤			
250	**HLD63B250**		**JD63T250**
300	**HLD63B300**		**JD63T300**
350	**HLD63B350**		**JD63T350**
400	**HLD63B400**	**HLD63F600**	**JD63T400**
450	**HLD63B450**		**LD63T450**
500	**HLD63B500**		**LD63T500**
600	**HLD63B600**		**LD63T600**

Type HHLD6, HHLXD6②③⑥

Black Label

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 (3-Pole Width)			
250	**HHLD62B250■**		**JD62T250■**
300	**HHLD62B300■**		**JD62T300■**
350	**HHLD62B350■**		**JD62T350■**
400	**HHLD62B400■**	**HHLD62F600■**	**JD62T400**
450	**HHLD62B450■**		**HHLD62T450■**
500	**HHLD62B500■**		**HHLD62T500■**
600	**HHLD62B600■**		**HHLD62T600■**
3-Pole 600V AC			
250	**HHLD63B250**		**JD63T250**
300	**HHLD63B300**		**JD63T300**
350	**HHLD63B350**		**JD63T350**
400	**HHLD63B400**	**HHLD63F600**	**JD63T400**
450	**HHLD63B450■**		**HHLD63T450■**
500	**HHLD63B500■**		**HHLD63T500■**
600	**HHLD63B600■**		**HHLD63T600■**

Type CLD6-A③⑥

Fuseless Current Limiting

Red 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
450	For 2-pole application use outside poles of 3-pole circuit breaker	**CLD63B450■**
500		**CLD63B500**
600		**CLD63B600**

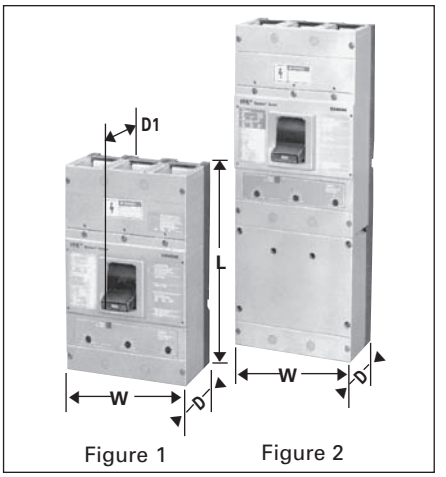


Figure 1 Figure 2

Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 LXD6-A, LD6-A HLD6-A HHLD6, HHLXD6, LXD6–ETI,④ SLD6, SHLD6	7.5	11	4	5.44
Figure 2 CLD6, CLD6-ETI,④ 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 7-4, 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 7-74 for ordering information.

⑤ CE Applies to non-interchangeable type HLXD only.

⑥ HACR rated.

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

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instan-taneous Setting	Short Time Pick Up	Short Time Delay	Short Time I^2t 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

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 <u>not</u> 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**

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 7-55; for enclosures, see page 7-56.

100% Rated – Not available in SLD6 Frame.

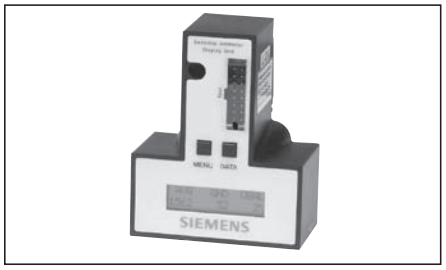
■ Built to order. Allow 2–3 weeks for delivery.

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	CatalogNumber
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.

Type LMXD6①④ — 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 LMD6④ — 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 DC②			
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 HLMD6 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 LMXD6 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 7-91.

400Hz Applications see page 7-91.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
LMD6, HLMD6, LMXD6, HLMXD6 Complete Breaker (less terminals)		
2	1	53
3	1	61.5
LMD6, HLMD6 Frame Only		
2	1	42.25
3	1	46
LMD6, HLMD6 Trip Unit Only		
2	1	4.5
3	1	6.5

Lugs③ 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 7-4, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

③ See **Note: A**, page 7-88.

④ HACR rated.

Modifications page 7-91
Enclosures Section 6
Accessories pages 7-61 and 7-95 to 7-100

Type HLMXD6①④ — 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

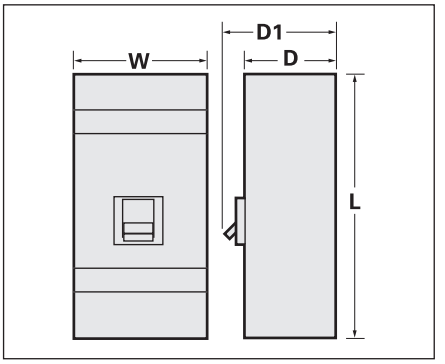
Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled Catalog Number	Frame Only Catalog Number	Trip Unit Only 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 240	480	600	Volts DC 250	500④
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-ETI②	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 7-74 for catalog information.

③ When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

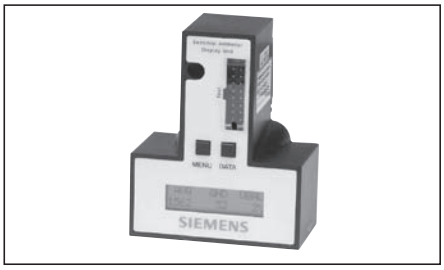
④ HACR rated.

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	CatalogNumber
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.

Molded Case Circuit Breakers

MD 800A Frame Sentron Series

Selection

Type MXD6①⑥ — Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole② Catalog Number	3-Pole Catalog Number
600	MXD62B600■	MXD63B600
700	MXD62B700■	MXD63B700
800	MXD62B800■	MXD63B800

Type MD6⑥ — 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 DC②			
500	MD62B500■	MD62F800■	MD62T500■
600	MD62B600■		MD62T600■
700	MD62B700■		MD62T700■
800	MD62B800■		MD62T800■
3-Pole 600V AC, 500V DC③			
500	MD63B500	MD63F800	MD63T500
600	MD63B600		MD63T600
700	MD63B700		MD63T700
800	MD63B800		MD63T800

Lugs④

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 3TA2N8750	1-2	2 3	500-750 kcmil Cu/Al
2TA3N8750 3TA3N8750	1-3	2 3	500-750 kcmil Cu/Al
2TA4N8500 3TA4N8500	1-4	2 3	250-500 kcmil Cu/Al
2TA4P8500 3TA4P8500	1-4	2 3	250-500 kcmil Cu/Al

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 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.
④ See **Note: A**, page 7-88.
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 7-91 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% Rated⑤ 3-Pole Only
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 7-91.

400Hz Applications see page 7-91.

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 3R 12	MND61 MND63 MND612■
Neutral	W63623

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Enclosures Section 6
Accessories pages 7-65 and 7-95 to 7-100

Molded Case Circuit Breakers

MD 800A Frame Sentron Series

Selection/Dimensions

Type HMXD6①⑤ — 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
600	For 2-pole application use outside poles of 3-pole circuit breaker	HMXD63B600■
700		HMXD63B700■
800		HMXD63B800

Type HMD6⑤ — Black 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 DC②			
500	HMD62B500■	HMD62F800■	MD62T500■
600	HMD62B600■		MD62T600■
700	HMD62B700■		MD62T700■
800	HMD62B800■		MD62T800■
3-Pole 600V AC, 500V DC④			
500	HMD63B500	HMD63F800	MD63T500
600	HMD63B600		MD63T600
700	HMD63B700		MD63T700
800	HMD63B800		MD63T800

Type CMD6①⑤

Fuseless Current Limiting — Red Label

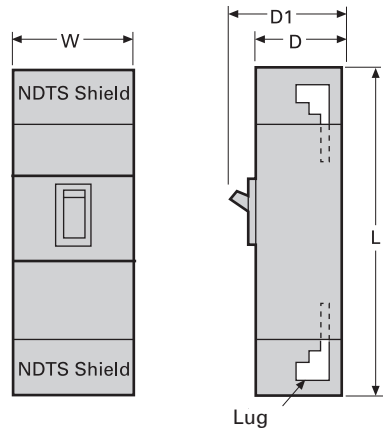
Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC Catalog Number	3-Pole 600V AC/500V DC Catalog Number
600	For 2-pole application use outside poles of 3-pole circuit breaker	CMD63B600■
700		CMD63B700■
800		CMD63B800

Interrupting Ratings

Breaker Type	UL 489 AIR—File E10848 RMS Symmetrical Amperes (KA) Volts AC 240	480	600	Volts DC 250	500④	IEC 947-2 AIR Volts AC (50/60HZ) 220/240 (Icu)	(Ics)	380/415 (Icu)	(Ics)	500 (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)	—	—	—	—	—	—





When wire lug shield NDTS is used.

Note: NDTS lug shields are required when oversized lugs are used. The kits include the NDTS shield.

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

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 7-74 for catalog information.
④When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.
⑤HACR rated.

Molded Case Circuit Breakers

SMD 800A Frame Digital Solid State Sentron Sensitrip III Series③

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

SMD 800A Frame – 100% Rated①

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

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 7-88.

③ SMD6, SHMD6 and SCMD6 circuit breakers are UL Listed for reverse connection applications.

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.

Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
All types	1	61.5

Lugs for 75°C Wire②

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/kit)		
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

Neutral Transformers

Ampere Rating	Catalog Number
600	**N06SMDA**
700	**N07SMDA**
800	**N08SMDA**

Enclosures

Type	Catalog Number
1	**MND61**
3R	**MND63**
12	**MND612**
Neutral	**W63623**

Enclosures Section 6
Accessories pages 7-65 and 7-95 to 7-100

Molded Case Circuit Breakers

Internal Accessories

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.

Molded Case Circuit Breakers

ND 1200A Frame Sentron Series

Selection

Type NXD6①⑧ — 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 ND6⑧ — 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 DC②			
800	ND62B800■	ND62F120	MD62T800■
900	ND62B900■		ND62T900■
1000	ND62B100■		ND62T100■
1200	ND62B120		ND62T120
3-Pole 600V AC, 500V DC③			
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	500③	220/240		380/415		500	
						(Icu)	(Ics)	(Icu)	(Ics)	(Icu)	(Ics)
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

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 7-91.

400Hz Applications see page 7-91.

Lugs⑥

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 (2 Kits required per breaker)		
2TA4P8500④ 3TA4P8500④	4	250-500 kcmil Cu/Al
2TA4N8500⑤ 3TA4N8500⑤	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

■ 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 7-4, 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 7-88.
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 7-91 for additional information.

Modifications page 7-91
Enclosures Section 6
Accessories pages 7-69 and 7-95 to 7-100

Type HNXD6①④

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 1000 1200	For 2-pole application use outside poles of 3-pole circuit breaker	HNXD63B900 HNXD63B100 HNXD63B120

Type HND6④

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 DC②			
800 900 1000 1200	For 2-pole application use outside poles of 3-pole circuit breaker		
3-Pole 600V AC, 500V DC③			
800	HND63B800	HND63F120	MD63T800
900	HND63B900		ND63T900
1000	HND63B100		ND63T100
1200	HND63B120		ND63T120

Type CND6①④

Fuseless Current Limiting

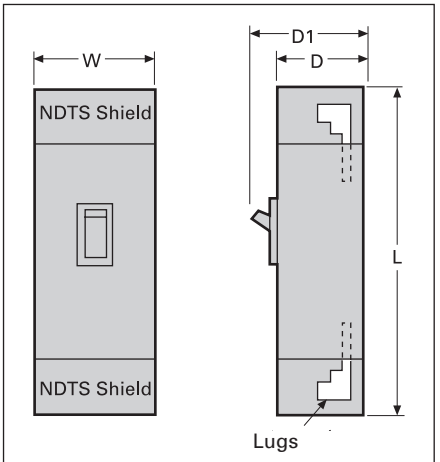
Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker)		
Continuous Current Rating @ 40°C	2-Pole	3-Pole
	Catalog Number	Catalog Number
900 1000 1200	For 2-pole application, use outside poles of 3-pole circuit breaker	CND63B900■ CND63B100 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





When lugs shield NDTS is used.

Note: NDTS lug shields are required when oversized lugs TA4P8500 or TA4N8500 are used. The kits include the NDTS shield.

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.

①HNXD6 and CND6 circuit breakers are UL Listed for reverse connection applications.

②2-pole units available in 3-pole width only.

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.

④HACR rated.

SND 1200A Frame – 100% Rated①

Current Limiting

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

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% Rated①

Current Limiting

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

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	Instan-taneous Setting	Short Time Pick Up	Short Time Delay	Short Time I^2t 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 7-66.

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 Breakers

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	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.

Type PXD6② Non-Interchangeable Trip⑤

3-Pole 600V AC, 250-500V DC① — Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only) Catalog Number	Mounting Assembly Catalog Number	Lugs (6 required) Catalog Number
1200	PXD63B120■	MB9301	TA5P600
1400	PXD63B140■	-or-	
1600	PXD63B160	MBR9302	

Type PD6 Interchangeable Trip⑤

3-Pole 600V AC, 250-500V DC① — Blue 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
1200	PD63B120■	PD63F160	PD63T120■	MB9301	TA5P600
1400	PD63B140		PD63T140	-or-	
1600	PD63B160		PD63T160	MBR9302	

Type HPXD6② Non-Interchangeable Trip⑤

3-Pole 600V AC, 250-500V DC① — 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 Trip⑤

3-Pole 600V AC, 250-500V DC① — 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
1200	HPD63B120■	HPD63F160	PD63T120■	MB9301	TA5P600
1400	HPD63B140		PD63T140	-or-	
1600	HPD63B160		PD63T160	MBR9302	

Type CPD6 Non-Interchangeable Trip⑤

Fuseless Current Limiting
3-Pole 600V AC, 250-500V DC① — 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 DC⑦	
	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.

①Use two outside poles of a 3-pole circuit breaker for 250V

②When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③PXD6, HPXD6 and CPD6 type circuit breakers are UL Listed for reverse feed applications.

④For additional information See **Note: A**, page 7-88.

⑤HACR rated.

Note: PD frame qualified to UL489 supplement B "NAVAL". See page 7-91 for additional information.

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 7-91.

400HZ Applications see page 7-91.

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

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

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instan-taneous Setting	Short Time Pick Up	Short Time Delay	Short Time I^2t 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		
	240V AC	480V AC	600V AC
SPD6	65	50	25
SHPD6	100	65	50

Lugs①

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**

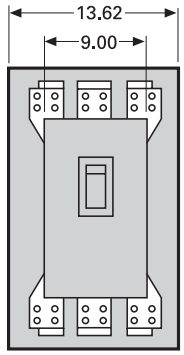
Enclosure

Type	Catalog Number
1	**PRD6N1**

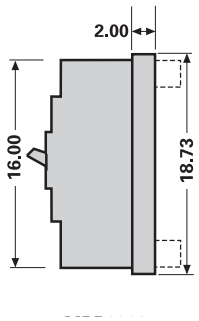
Mounting Block (Required)②

Catalog Number
MB9301
MBR9302

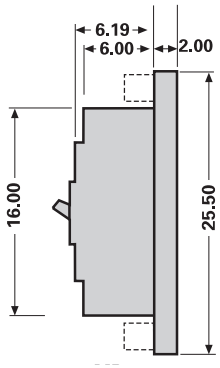
All PD, RD Frames:



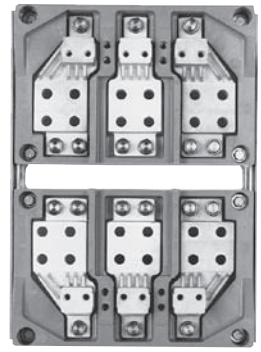
MB9301 (shown)
MBR9302



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 7-88.

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.

Molded Case Circuit Breakers

Internal Accessories

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	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.

Molded Case Circuit Breakers

RD 2000A Frame Sentron Series

Type RXD6④

3-Pole 600V AC, 250-500V DC① — 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	
1800	RXD63B180	-or-	TC5R600
2000	RXD63B200	MBR9302	

Type RD6④

3-Pole 600V AC, 250-500V DC① — 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■		RD63T160■	MB9301	
1800	RD63B180	RD63F200	RD63T180	-or-	TC5R600
2000	RD63B200		RD63T200	MBR9302	

Type HRXD6④ — Black Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only) Catalog Number
1600	HRXD63B160■
1800	HRXD63B180■
2000	HRXD63B200

Type HRD6④ — 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■		RD63T160■	MB9301	
1800	HRD63B180	HRD63F200	RD63T180	-or-	TC5R600
2000	HRD63B200		RD63T200	MBR9302	

Interrupting Ratings

Breaker Type	UL 489 A IR RMS Symmetrical KA Volts AC 240	480	600	Volts DC① 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	±20% Tolerance High
1200-2000	5000	5715	6430	7145	7860	8575	9790	10,000



Mounting Block⑥

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.

①Use two outside poles of a 3-pole circuit breaker for 250V DC applications.

②When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③RXD6 and HRXD6 type circuit breakers are UL Listed for reverse feed applications.

④HACR rated.

⑤For additional information See **Note: A**, page 7-88.
Note: RD frame qualified to UL489 supplement B "NAVAL". See page 7-91 for additional information.

⑥For required mounting base (MB9301 or MBR9302) see page 7-71.

Molded Case Circuit Breakers

Magnetic Trip Only — ETI Motor Circuit Protector

Selection

Breaker Type	Ampere Rating	Instantaneous Trip Range② Minimum③	Instantaneous Trip Range② Maximum③	Complete Circuit Breaker Without Lugs⑤ Catalog Number 2-Pole	Complete Circuit Breaker Without Lugs⑤ 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
FXD6④ 600V AC 250V DC	150	400	800	—	**FXD63L150■**
	150	800	1500	—	**FXD63A150**
	150	1100	2500	—	**FXD63H150**
	250	1100	2500	—	**FXD63A250**
	SHIPPING:				9 lbs. each
CFD6④ 600V AC 250V DC	150	400	800	—	**CFD63L150■**
	150	800	1500	—	**CFD63A150■**
	150	1100	2500	—	**CFD63H150■**
	250	1100	2500	—	**CFD63A250■**
	SHIPPING:			12 lbs. each	12 lbs. each
JXD6(A)① 600V AC 250V DC	400	1250	2500	—	**JXD63L400**
	400	2000	4000	**JXD62H400■**	**JXD63H400**
	SHIPPING:			16 lbs. each	20 lbs. each
CJD6① 600V AC 250V DC	400	1250	2500	—	**CJD63L400■**
	400	2000	4000	—	**CJD63H400■**
	SHIPPING:			29.5 lbs. each	31.5 lbs. each
LXD6(A)① 600V AC 250V DC	600	2000	4000	**LXD62L600■**	**LXD63L600■**
	600	3000	6000	—	**LXD63H600**
	SHIPPING:			16 lbs. each	20 lbs. each
CLD6① 600V AC 250V DC	600	2000	4000	—	**CLD63L600■**
	600	3000	6000	—	**CLD63H600■**
	SHIPPING:				31.5 lbs. each
LMXD6④ 600V AC 250V DC	800	2800	6000	—	**LMXD63L800■**
	800	3200	8000	—	**LMXD63A800**
	SHIPPING:				35 lbs. each
MXD6④ 600V AC 250V DC	800	3000	6000	—	**MXD63L800■**
	800	4000	8000	—	**MXD63A800■**
	800	5000	10000	—	**MXD63H800**
	SHIPPING:				33 lbs. each
CMD6④ 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.**

Lug Information pages 7-88 to 7-90
Enclosures Section 6
Accessories pages 7-95 to 7-100
Application data pages 7-75 to 7-76

■ 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 settings are -20%/+20%

④ For 2-pole application use outside poles of 3-pole circuit breaker.

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	LMXD63L800	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	LMXD63A800	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.

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 Data①			240V Circuit Breaker Data①			480V Circuit Breaker Data①			600V Circuit Breaker Data①		
	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	BQ②	**BQ3B015**	15	BQ②	**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	BQ②	**BQ3B040**	40	BQ②	**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		**FDX63B100**	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	FD6③ JD6③	**FD63B250** **JD63B250**	250 250	FXD6, FD6	**FD63B175**	175
125	LD6③ or LMD6	**LD63B600** **LMD63B600**	600	LD6③ or LMD6	**LD63B500** or **LMD63B500**	500	JD6③	**JD63B300**	300	FXD6, FD6 OR JD6③	**FXD63B200** **JD63B200**	200 200
150	LD6③ or LMD6	**LD63B600** or **LMD63B600**	600	LMD6	**LD63B600** or **LMD63B600**	600	JD6③	**JD63B300**	300	FXD6 or JD6③	**FXD63B225** **JD63B225**	225 225
200	LMD6	**LMD63B800**	800	LMD6	**LMD63B800**	800	JD6③	**JD63B350**	350	JD6③	**JD63B300**	300
250	—	**—**	—	—	**—**	—	JD6③	**JD63B400**	400	JD6③	**JD63B400**	400
300	—	**—**	—	—	**—**	—	LD6③ or LMD6	**LD63B600** or **LMD63B600**	600	JD6③	**JD63B400**	400
350	—	**—**	—	—	**—**	—	LMD6	**LMD63B700**	700	LD6③ or LMD6	**LD63B500** or **LMD63B500**	500
400	—	**—**	—	—	**—**	—	LMD6	**LMD63B800**	800	LD6③ 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.

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	3-Pole	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	—	—
	100	300	500	700	900	1000	—	—	1100	HEM3M100L	—	—
ED6	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	—	—
	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	—	—
CED6	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■	—	—
	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	—	—
FXD6-A	70	600	640	690	730	770	810	850	900	—	FXD62B070	FXD63B070
	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	400	460	520	580	640	700	760	820	FXD63L150	—	—
	150	800	900	1000	1100	1200	1300	1400	1500	FXD63A150	FXD62B150	FXD63B150
	150	1100	1300	1500	1700	1900	2100	2300	2500	FXD63H150	—	—
	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	FXD63A250	FXD62B250	FXD63B250
FD6-A	70	600	640	690	730	770	810	850	900	—	FD62B070	FD63B070
	80	600	640	690	730	770	810	850	900	—	FD62B080	FD63B080
	90	600	640	690	730	770	810	850	900	—	FD62B090	FD63B090
	100	700	770	840	920	990	1060	1140	1200	—	FD62B100	FD63B100
	110	700	770	840	920	990	1060	1140	1200	—	FD62B110	FD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	FD62B125	FD63B125
	150	800	900	1000	1100	1200	1300	1400	1500	—	FD62B150	FD63B150
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FD62B175	FD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FD62B200	FD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FD62B225	FD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FD62B250	FD63B250
HFD6	70	600	640	690	730	770	810	850	900	—	HFD62B070	HFD63B070
	80	600	640	690	730	770	810	850	900	—	HFD62B080	HFD63B080
	90	600	640	690	730	770	810	850	900	—	HFD62B090	HFD63B090
	100	700	770	840	920	990	1060	1140	1200	—	HFD62B100	HFD63B100
	110	700	770	840	920	990	1060	1140	1200	—	HFD62B110	HFD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	HFD62B125	HFD63B125
	150	800	900	1000	1100	1200	1300	1400	1500	—	HFD62B150	HFD63B150
	175	900	1060	1210	1370	1520	1780	1930	2000	—	HFD62B175	HFD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	HFD62B200	HFD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	HFD62B225	HFD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	HFD62B250	HFD63B250
HHFD6	70	600	640	690	730	770	810	850	900	—	—	HHFD63B070
	80	600	640	690	730	770	810	850	900	—	—	HHFD63B080
	90	600	640	690	730	770	810	850	900	—	—	HHFD63B090
	100	700	770	840	920	990	1060	1140	1200	—	—	HHFD63B100
	110	700	770	840	920	990	1060	1140	1200	—	—	HHFD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	—	HHFD63B125
	150	800	900	1000	1100	1200	1300	1400	1500	—	—	HHFD63B150
	175	900	1060	1210	1370	1520	1780	1930	2000	—	—	HHFD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	—	HHFD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	—	HHFD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	—	HHFD63B250
CFD6	70	600	640	690	730	770	810	850	900	—	CFD62B070	CFD63B070
	80	600	640	690	730	770	810	850	900	—	CFD62B080	CFD63B080
	90	600	640	690	730	770	810	850	900	—	CFD62B090	CFD63B090
	100	700	770	840	920	990	1060	1140	1200	—	CFD62B100	CFD63B100
	110	700	770	840	920	990	1060	1140	1200	—	CFD62B110	CFD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	CFD62B125	CFD63B125
	150	400	460	520	580	640	700	760	820	CFD63L150	—	—
	150	800	900	1000	1100	1200	1300	1400	1500	CFD63A150	CFD62B150	CFD63B150
	150	1100	1300	1500	1700	1900	2100	2300	2500	CFD63H150	—	—
	175	900	1060	1210	1370	1520	1780	1930	2000	—	CFD62B175	CFD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	CFD62B200	CFD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	CFD62B225	CFD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	CFD63A250	CFD62B250	CFD63B250

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.

Molded Case Circuit Breakers

Adjustable Instantaneous Magnetic Trip Settings

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	JXD62B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	JXD62B350	JXD23B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	JXD62B400	JXD23B400
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	1250	1430	1610	1790	1960	2140	2320	2500	JXD63L400	—	—
	400	2000	2290	2570	2860	3140	3430	3710	4000	JXD63H400	JD62B400	JD63B400
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	—	CJD63B400
	400	1250	1450	1610	1790	1960	2140	2320	2500	CJD63L400	—	—
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
	600	2000	2290	2570	2860	3140	3430	3710	4000	LXD63L600	—	—
	600	3000	3430	3800	4290	4710	5140	5570	6000	LXD63H600	LD62B600	LD63B600
HLD6(A)	250	1250	1430	1610	1790	1960	2140	2320	2500	—	HLD62B250	HLD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	HLD62B300	HLD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	HLD62B350	HLD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	HLD62B400	HLD63B400
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	HLD62B450	HLD63B450
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	HLD62B500	HLD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	HLD62B600	HLD63B600
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
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	HHLD62B600	HHLD63B600
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	—	—	CLD63B400
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	CLD63B450
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	CLD63B500
	600	2000	2290	2570	2860	3140	3430	3710	4000	CLD63L600	—	—
	600	3000	3430	3860	4290	4710	5140	5570	6000	CLD63H600	—	CLD63B600
LMXD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMXD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	LMXD62B600	LMXD63B600
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	LMXD62B700	LMXD63B700
	800	2800	3100	3400	3700	4000	4800	5500	6000	LMXD63L800	—	—
	800	3200	3500	3700	4200	4700	6400	7300	8000	LMXD63A800	LMXD62B800	LMXD63B800
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

Molded Case Circuit Breakers

Adjustable Instantaneous Magnetic Trip Settings

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	3000	3430	3860	4290	4710	5140	5570	6000	—	—	HLMXD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	HLMXD63B600
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	—	HLMXD63B700
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	—	HLMXD63B800
HLMD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	HLMD62B500	HLMD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	HLMD62B600	HLMD63B600
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	HLMD62B700	HLMD63B700
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	HLMD62B800	HLMD63B800
MD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	MD62B500	MD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	MD62B600	MD63B600
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	MD62B700	MD63B700
	800	3000	3430	3860	4280	4710	5140	5570	6000	MXD63L800	—	—
	800	4000	4570	5140	5710	6280	6850	7420	8000	MXD63A800	MD62B800	MD63B800
	800	5000	5715	6430	7145	7860	8575	9290	10000	MXD63H800	—	—
MXD6	500	3000	3430	3860	4280	4710	5140	5570	6000	—	MXD62B500	MXD63B500
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	MXD62B600	MXD63B600
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	MXD62B700	MXD63B700
	800	3000	3430	3860	4280	4710	5140	5570	6000	MXD63L800	—	—
	800	4000	4570	5140	5710	6280	6850	7420	8000	MXD63A800	MXD62B800	MXD63B800
	800	5000	5715	6430	7145	7860	8575	9290	10000	MXD63H800	—	—
HMD6	500	3000	3430	3860	4280	4710	5140	5570	6000	—	HMD62B500	HMD63B500
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	HMD62B500	HMD63B600
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	HMD62B700	HMD63B700
	800	4000	4570	5140	5710	6280	6850	7420	8000	—	HMD62B800	HMD63B800
HMXD6	500	3000	3430	3860	4280	4710	5140	5570	6000	—	—	HMXD63B500
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	—	HMXD63B600
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	—	HMXD63B700
	800	4000	4570	5140	5710	6280	6850	7420	8000	—	—	HMXD63B800
CMD6	400	3000	3430	3860	4280	4710	5140	5570	6000	—	—	
	500	3000	3430	3860	4280	4710	5140	5570	6000	—	—	
	600	3000	3430	3860	4280	4710	5140	5570	6000	—	—	CMD63B600
	700	4000	4570	5140	5710	6280	6850	7420	8000	—	—	CMD63B700
	800	3000	3430	3860	4280	4710	5140	5570	6000	CMD63L800	—	—
	800	4000	4570	5140	5710	6280	6850	7420	8000	CMD63A800	—	CMD63B800
	800	5000	5715	6430	7145	7860	8575	9290	10000	CMD63H800	—	—
ND6	800	4000	4570	5140	5710	6280	6850	7420	8000	—	ND62B800	ND63B800
	900	5000	5715	6430	7145	7860	8575	9290	10000	—	ND62B900	ND63B900
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	ND62B100	ND63B100
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	ND62B120	ND63B120
NXD6	900	5000	5715	6430	7145	7860	8575	9290	10000	—	NXD62B900	NXD63B900
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	NXD62B100	NXD63B100
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	NXD62B120	NXD63B120
HND6	800	4000	4570	5140	5710	6280	6850	7420	8000	—	HND62B800	HND63B800
	900	5000	5715	6430	7145	7860	8575	9290	10000	—	HND62B900	HND63B900
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	HND62B100	HND63B100
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	HND62B120	HND63B120
HNXD6	900	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HNXD63B900
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HNXD63B100
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HNXD63B120
CND6	800	4000	4570	5140	5710	6280	6850	7420	8000	—	—	CND63B800
	900	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CND63B900
	1000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CND63B100
	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CND63B120
PD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PD63B120
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PD63B140
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PD63B160
PXD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PXD63B120
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PXD63B140
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	PXD63B160
HPD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPD63B120
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPD63B140
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPD63B160
HPXD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPXD63B120
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPXD63B140
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HPXD63B160
CPD6	1200	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CPD63B120
	1400	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CPD63B140
	1600	5000	5715	6430	7145	7860	8575	9290	10000	—	—	CPD63B160
RD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RD63B180
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RD63B200
RXD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RXD63B180
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	RXD63B200
HRD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRD63B180
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRD63B200
HRXD6	1800	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRXD63B180
	2000	5000	5715	6430	7145	7860	8575	9290	10000	—	—	HRXD63B200

Molded Case Circuit Breakers

Molded Case Switch — Circuit Disconnect

Selection

Maximum Frame Amp Rating	2-Pole Catalog Number	3-Pole Catalog Number	Self-Protective Instantaneous Override ±20%③
100	**BQ2S060■**	**BQ3S060■**	1000
	BQ2S100■	**BQ3S100■**	1000
125	**ED22S100A■**	**ED23S100A**	1000
	ED42S100A■	**ED43S100A**	1000
	ED42S125A■	**ED43S125A**	1000
	ED62S100A■	**ED63S100A**	1000
	—	**ED63S125A**	1000
	CED62S100A■	**CED63S100A■**	1000
	CED62S125A■	**CED63S125A■**	1000
	—	**HES3S100L**	1250
	—	**HES3S125L**	1250
225	**QJ22S225A■**	**QJ23S225A**	2000
250	**FXD62S250A**	**FXD63S250A**	3200
	HFXD62S250A■ ①	**HFXD63S250A■**	3200
		CFD63S250A■	3200
400	**JXD22S400A■**	**JXD23S400A**	6000
	—	**JXD63S400A**	6000
	—	**HJXD63S400A■**	6000
	①	**CJD63S400A■**	6000
600	—	**LXD63S600A**	6000
	—	**HLXD63S600A■**	6000
	①	**CLD63S600A■**	6000
800	—	**LMXD63S800A■**	8000
	—	**MXD63S800A**	8000
	①	**CMD63S800A**	8000
1200	—	**NXD63S120A**	10000
	①	**CND63S120A■**	10000
1600	①	**PXD63S160A**⑤	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 7-88 to 7-90.

■ 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 7-88 to 7-90
Enclosures Section 6
Accessories pages 7-95 to 7-100

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.

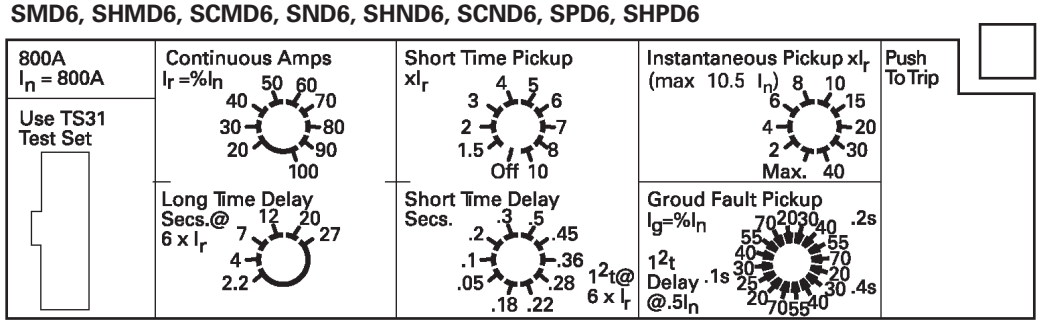
Functions available in Sentron Sensitrip circuit breakers

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^2t 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	√	√	√	√	√	√	√	√

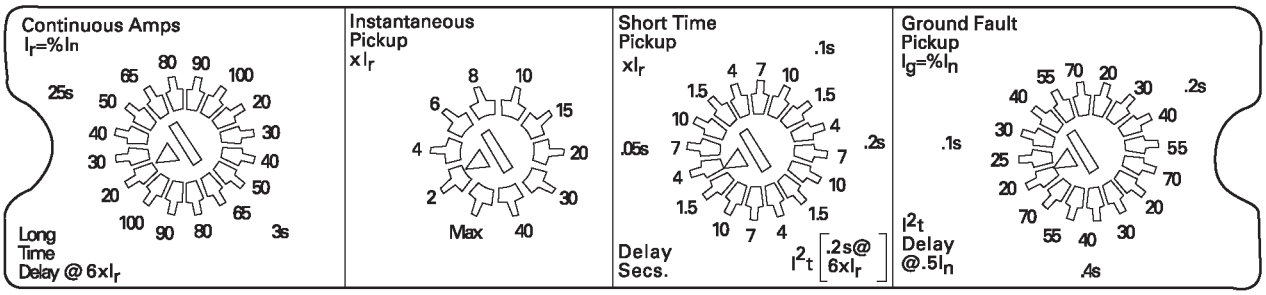
Letter "A" is used for MD and ND Solid State frame types only.

Typical Trip Unit Labeling and Adjustment Positions for the Sentron Sensitrip Circuit Breaker.

SMD6, SHMD6, SCMD6, SND6, SHND6, SCND6, SPD6, SHPD6



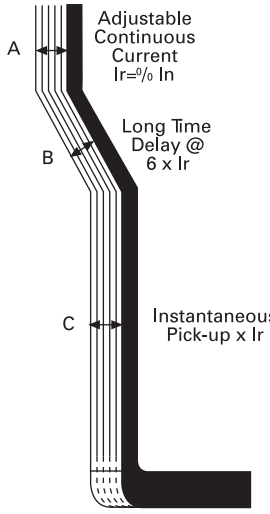
SJD6, SHJD6, SCJD6, SCD6, SHLD6, SCLD6



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 .



A. Adjustable "Continuous Amps" Rating Switch

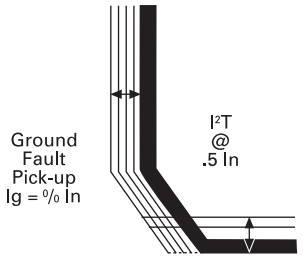
All Sensitrip III solid state molded case circuit breakers have an adjustable ampere rating switch. Adjustments made to this switch change the continuous current rating of the breaker from 20% to 100% of its maximum trip unit rating depending on the circuit breaker frame.

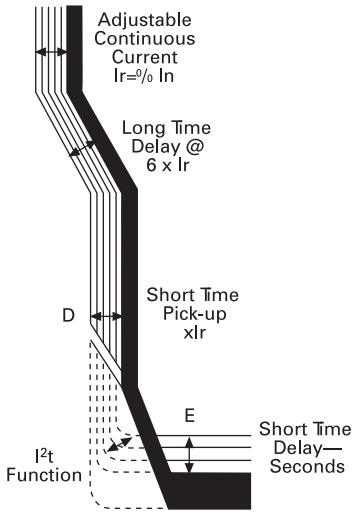
B. Adjustable "Long Time Delay" Switch

All Sensitrip III circuit breakers have an adjustable long time delay switch to allow for selection of long time delays of fixed time intervals at six times the setting of the adjustable "continuous amps" rating switch.

C. Adjustable "Instantaneous Pick-Up" Switch

Sensitrip III circuit breakers with an adjustable instantaneous trip switch allow selection of a tripping point from related to the adjusted circuit breaker Rating (I_r).





D. Adjustable "Short Time Pick-Up" Switch (Optional)

Sensitrip III circuit breakers with an adjustable short time pick-up switch allow for selection of short time pick-up in a range from 1.5 to 10 times the setting of the maximum current rating.

E. Adjustable "Short Time Delay" Switch (Optional)

Sensitrip III circuit breakers with an adjustable short time pick-up switch also contain a switch for adjustment in time delay. The adjustable short time delay switch allows for either of two modes of short time delays. One range of settings enables the breaker to be set for fixed time delays and the other range of settings enables the breaker to be set for short time delays based on I²t curves.

Adjustable "Ground Fault Pick-Up" Switch

Sensitrip III circuit breakers containing the optional equipment ground fault protection cover the ground fault pick-up range of 20% to 70% of the circuit breaker frame rating. The ground fault pick-up settings also allow for one of three time delays based on 12t curves.

For 3-phase, 4-wire systems, an external neutral transformer is required with an ampere rating equal to the trip unit ampere rating.

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	I²T 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 = 8 x 560 = 4480 amperes.

Ⓖ Short Time Delay = .5 seconds. (Definite Time)
Note: Ⓖ & Ⓗ are mutually exclusive.

Ⓗ I²t switch on .28 seconds @ 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.

WL Power Circuit Breakers

3-pole, up to 5000A

Breaker Description

The ever-increasing use of plant and energy management systems has intensified the demand for circuit breakers supporting multiple open protocols to monitor and control the flow of energy in the power system. The extensive and modular WL family of circuit breakers and accessories provides this for applications from 200A to 5000A.

Applications

WL breakers can be applied as main, tie, feeder or distribution breakers in low-voltage electrical power systems.

Versions

- Frame ratings: 800A to5000A
- 3 physical frame sizes
- Rated nominal operating voltage up to 600VAC
- Seven interrupting classes from 50kA to 200kA at 480V
- Circuit breaker or non-automatic switch
- WL Circuit Breakers are delivered as complete assembled breakers or individual frames, guide frames, and accessories

Installation Types

Fixed-mounted or Draw-out version.

Standards

- WL ANSI / UL 1066 Circuit Breakers will satisfy: C37.13, C37.16, C37.17, C37.50, NEMA SG3
- WL UL 489 Circuit Breakers will satisfy: UL 489
- WL Circuit Breakers are suitable for use in UL 1558 LV Switchgear and UL 891 LV Switchboards

Conditions of Application

WL Circuit Breakers are designed to meet standard Industrial and Commercial application requirements.

Uniform Dimensions

WL Circuit Breaker dimensions differ only in the device width, which varies by frame size. With the exception of the 200kA ANSI Frame Size II which has an additional 5" in depth to accommodate integral fuses and the UL489 Frame Size I which measures only 15" in height to allow six-high stacking in switchboards.

Minimal Space Requirements

The WL design is extremely compact without sacrificing performance and does not use energy-wasting heat sinks.

Trip Units

The electronic, micro processor-based trip unit is auxiliary voltage-independent for all protective functions and enables adaptation to the different protection requirements of distribution systems, motors, transformers and generators.

Non-Automatic Switch

A special version of the circuit breaker is used as a non-automatic switch. The non-automatic switch is constructed without a trip unit and has no protective function. A possible application is for use as a tie in systems with parallel feeds.

Main Bus Connectors

Breakers are equipped with standard vertical main bus connections. Horizontal bus connections are available as an option in Frame Size 1 and 2 up to 2000A.

Communication Capability

MODBUS or PROFIBUS communications transmit the acquired and metered data, such as current values, breaker status, trip log, etc. to a central monitoring computer. With a factory installed metering function option, the WL acquires data useful for power management and can contribute to a significant savings in energy costs. A new, internal circuit breaker bus enables the expansion of breaker functionality through the integration of many secondary functions which were previously separate, including:

- Control of analog displays
- Options for testing the communication setup
- Display of breaker status and reason for trip
- Input modules for reading other external signals and transmitting these signalsvia PROFIBUS or MODBUS communication
- A selection of output modules to provide contact closures based on events or measured-value setpoints. It is not only possible to monitor the breaker remotely, it is also possible to open and close the breaker as well as setting parameters remotely

Operating Mechanisms

Circuit breakers can be optionally delivered with different operating mechanisms, including:

- Manual operating mechanism with mechanical closing (standard)
- Manual operating mechanism with mechanical and electrically interlocked closing
- Motorized operating mechanism with mechanical and electrically interlocked closing. Operating mechanisms with electrically interlocked closing are suitable for synchronizing tasks

Auxiliary Contacts

Auxiliary switches can be added according to the type of installation. They are easily mounted via front, top mounted terminal blocks.

Modularity

Common guide frames for the draw-out version make them completely interchangeable between the UL 489 and ANSI / UL 1066 rated circuit breakers. Components, such as auxiliary releases, motorized operating mechanisms, trip units, current sensors, auxiliary signal switches, automatic reset devices or interlocks can be used to modify or retrofit any circuit breaker to meet changing requirements. The main contacts can be replaced to extend the life of the circuit breaker and feature integrated contact wear indicators.

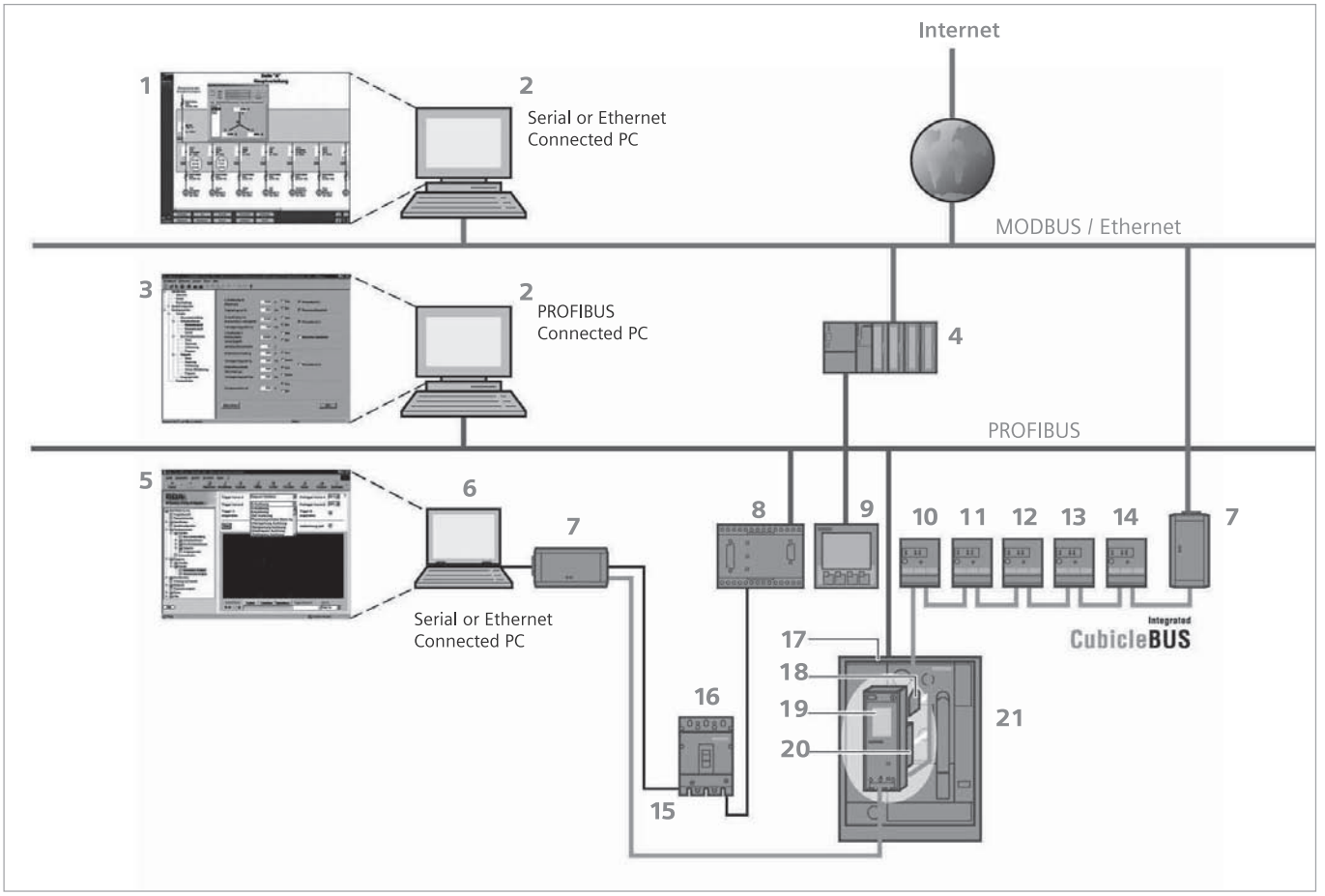
Electronic Trip Unit Modularity

Modularity is the outstanding feature of the new WL Circuit Breakers. The trip units themselves can be retrofitted with special LCDs, ground fault modules, rating plugs and communication modules.100% Rated Circuit Breaker WL circuit breakers are designed for continuous operation at 100% of their current rating without the need for external heat sinks.

Conditions of Application

WL Circuit Breakers are designed to meet standard Industrial and Commercial application requirements.





A spectrum of power distribution communication

1 WinPM.Net software
2 Server or desktop PC
3 Switch ES power software
4 PLC
5 BDA web server
6 Portable PC
7 Breaker data adapter (BDA)
8 COM10 PROFIBUS module or COM11 MODBUS module
9 Power metering device
10 Zone selective interlock
11 Digital input module
12 Analog output module
13 Digital output module
14 Relay output module
15 VL CubicleBus network
16 VL feeder breaker
17 Input power and communication terminals
18 Breaker status sensor (BSS)
19 Trip unit display
20 Metering function
21 WL power breaker









Trip Unit Functions

Basic Protective Functions		ETU745	ETU748	ETU776
Long-time overcurrent protection	L	●	●	●
Short-time delayed overcurrent protection	S	●	●	●
Instantaneous overcurrent protection	I	●	●	●
Neutral conductor protection	N	●	●	●
Ground fault protection	G	○	○	○
Additional Functions				
Selectable neutral protection		●	●	●
Defeatable short-time protection		●	—	●
Defeatable instantaneous protection		●	—	●
Selectable thermal memory		●	●	●
Zone selective interlocking		●	●	●
Selectable I2t or fixed short-time delay		●	●	●
Adjustable instantaneous pick-up		●	—	●
Selectable I2t or I4t long-time delay		●	●	●
Adjustable short-time delay and pick-up		●	●	●
Selectable and adjustable neutral protection		●	●	●
Dual protective setting capability		—	—	●
Dynamic arc-flash sentry		—	—	●
Extended instantaneous protection		●	●	●
Parameterization and Displays				
Parameterization by rotary switches (10 steps)		●	●	—
Parameterization by communication (absolute values)		—	●	●
Parameterization by menu/keypad (absolute values)		—	—	●
Remote parameterization of the basic functions		—	—	●
Remote parameterization of the additional functions		—	—	●
Alphanumeric LCD		○	○	—
Graphical LCD		—	—	●
Metering Function				
Metering function		○	○	○
Metering function Plus		○	○	○
Communication				
CubicleBUS		●	●	●
Communication via PROFIBUS-DP		○	○	○
Communication via the MODBUS		○	○	○
Communication via the Ethernet (BDA)		○	○	○

● Standard — Not available ○ Optional

Rating Plug

It is no longer necessary to replace the current transformer to change the rated current of the breaker. Instead, you simply replace the rating plug which is easily accessible on the front of the trip unit. The circuit breaker is set to the new rated current quickly and is already correctly labeled.

Long Time Overcurrent Protection with Switchable I2t/I4t Characteristics

The long time overcurrent protection in the ETU745, ETU755 and ETU776 trip units can be switched between an I2t and I4t characteristic to improve coordination between upstream circuit breakers and fuses.

Front Panel

The front panel is designed so that it can be accessed through a cutout in the door, which means that all controls and displays are accessible even when the cubicle door is closed. The front panels of all Frame Size II and Frame Size III circuit breakers are identical, and allow for two different through-door access designs: Trip unit and front panel controls or front panel controls only. The degree of protection of the front panel is IP 20.

Environmental Protection

The plastics used are halogen-free and recyclable.

Safety and Reliability

In order to help protect the electrical distribution system and circuit breaker against unauthorized breaker operations, a wide range of locking devices can be installed or retrofit, including:

- Lockable drawout version to protect against unauthorized removal (standard)
- High degree of protection through Plexiglas cover
- Mechanical reclosing lockout after long-time, short-time or instantaneous trip (optional)
- Devices with trip unit ETU745 or higher are equipped with temperature sensors on the BSS and COM15/COM16 (standard)
- Lock provision for locking the breaker in the OPEN position
- Lockable covers for the CLOSE button
- Lockable racking handle prevents moving the breaker
- Lockable charging handle prevents charging the springs

Standard Version Features

WL Circuit Breakers have the following standard equipment:

- Mechanical CLOSE and mechanical OPEN push buttons
- Manual operating mechanism with mechanical closing
- Contact position indicator
- Front panel ready-to-close indicator
- Spring charge indicator
- Rear vertical main contacts
- Main contact replacement flag
- Auxiliary plug system with bare wire pressure screw terminals. Delivery includes all auxiliary plugs necessary for both factory installed and future field installed accessories
- Mechanical trip indicator of the overcurrent release system
- Automatic reset after trip
- The front panel cannot be removed if the circuit breaker closed
- Laminated main contact fingers as part of the breaker contact strip on the drawout circuit breaker
- Breaker position display in the operator's panel
- Captive crank handle for racking out the breaker
- Guide frame with guide rails for easy handling of draw-out version
- Breaker cannot be moved in the CLOSED state
- Rated current coding between the guide frame and the breaker
- Suitable for reverse feed applications
- The breaker is always equipped with the required number of secondary disconnect blocks

Exclusive Features

Generator/Utility Protection Sets

24/7/365 power availability is critical for some systems. On-site generation capability is growing more and more common in many systems. All of the WL digital electronic trip units allow the system designer to precisely tailor trip settings for the most demanding requirements. However, the 776 trip unit allows one set of trip settings for a fully loaded utility feed and with a simple contact closure, the trip unit toggles to a second trip set tailored to provide optimal generator protection. The wide range of settings allows the WL to provide protection for a minimal generator capacity for only essential loads, through full backup for an entire facility. This dual utility/generator protection capability in a single circuit breaker allows the system designer unparalleled, cost effective, flexibility.

Dynamic Arc-Flash Sentry

A unique feature of the WL trip unit allows the system designer to achieve lower levels of arc flash energy and delayed tripping for selective trip coordination purposes. Dynamic Arc-Flash Sentry (DAS) employs the unique dual protective setting capability of the 776 trip unit, coupled with the ability to easily toggle to a lower arc flash parameter set. A normal operation parameter set can be optimized for selective trip coordination, while the second set is optimized for lower arc flash energy levels. The dynamic action comes from the ability to switch from the normal operation set to the arc flash limiting set based on the presence of personnel as they approach the flash protection boundary. A wide variety of switching methods may be used based on the needs of a particular facility. The capabilities range from fully automatic switching using appropriate occupancy sensors to manual switching via a key operation.

Extended Instantaneous Protection

Extended Instantaneous protection (EIP), another unique feature of the WL trip unit, allows the system designer to achieve full selective trip coordination up to the short-time rating of the frame while also allowing application of the breaker up to the interrupting rating of the frame. The typical power circuit breaker with an 'LS' trip unit, or when the instantaneous function is switched off on an 'LSI' trip unit, can only be applied up to it's short-time rating, commonly 85kA or less. For application on systems with levels of available fault current above the short-time rating, the typical 'LS' power circuit breaker cannot be applied or must employ an instantaneous override. This instantaneous override is set at as much as 20% below the short-time rating and can seriously compromise selective trip coordination with downstream breakers.

The WL, equipped with EIP, overcomes these limitations by providing full withstand capability, and full coordination, with a minus 0% short-time band tolerance up to 85kA on frame Size II and 100kA on Size III. Above fault currents of 20% higher than the full short-time rating, the WL breaker is self-protecting, and the EIP function will trip the breaker instantly to protect the frame and the system from these extremely high currents, as high as 150kA on frame Size III. One added benefit is that arc flash energy is greatly reduced in this high current region due to the instantaneous trip response that EIP provides.

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) MTCSB08 e.g.

Component Selection Guide①

Trip Units and Application		
Component Type	**ZSI (only) with Sensitrip MCCB'S**	**Access and/or ZSI with Sensitrip MCCB's**
EP	✓	✓
MTZ②	✓	
MTA②		✓
EPC Cable	✓	✓
MTC Cable③	✓	✓

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 switchboard 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

■ 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.

Lug information

Mechanical Lug

Selection

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

Selection

For Use With Type(s)	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Wire Range	Catalog Number
QJ2, QJH2, QJ2H, HQJ2, HQJ2H	60–225	1	#6 AWG–300 kcmil (Cu) #4 AWG–300 kcmil (Al)	**TA1Q300** (pkg. of 3)
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, HHLD6, SHLD6(A), CLD6, SCLD6	250–600	1–2	3/0–500 kcmil (Cu) 4/0–500 kcmil (Al)	**TA2J6500**
LMD6①, LMXD6①, HLMD6①, HLMXD6①, 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**②③ **3TA4P8500**②④
			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.

Lug information

Optional Mechanical Lugs

For Use With Type	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Material	Lug Wire Range	Qty Per Catalog No	Catalog Number
QJ2, QJH2, QJ2H, HQJ2, HQJ2H	60–225	1	Cu	#6 AWG–250 kcmil (Cu)	3	**TC1Q250**
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), HHLD6, 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, CMD6, SCMD6, SND6, N(X)D6, HN(X)D6, SHND6, CND6, SCND6	500–600	1–2	Cu	#1 AWG–500 kcmil (Cu)	1	**TC2K500**
	700–800	1–3	Cu	#1 AWG–350 kcmil (Cu)	1	**TC3K350**
		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**
QJ2, QJH2, QJ2-H	125–225	2, 3	1	350 kcmil Cu/Al	**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	6	500 kcmil	**CCM800K2**
		3	9		**CCM800K3**
N(X)D6, HN(X)D6, CND6, SND6, SHND6, SCND6	900–1200	2	8		**CCN1200K2**
		3	12		**CCN1200K3**

Distribution Lugs②

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.

①Used for 100% rated JD/LD frame circuit breakers.

② Special purpose wire connectors, not for general use.

Molded Case Circuit Breakers

Modifications

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, QJ2, 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 BQD, 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 Breakers ..... Add $10.00 net per pole
— Consult Sales Office for Availability

For all other Circuit Breaker Types ..... Add $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
BQD/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, HHLD6, 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, BL①	1	1, 2, 3	1	—	—	—	—	—			1,2	—	—	—	—	—
BQD, CQD, GB, GG	1	2, 3	1	1/1	—	—	—	—			1,2	1/1	1	—	—	—
QJ①	1	3	1	1/1	—	—	—	—			2	—	—	—	—	—
All ED	1	1, 2, 3	1	1/1,1/2	1/1	1/1/1	1	1/1, 1/2	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, LMD②	2	2, 3	1	1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 1/2	1, 2	—	—	—
SJD6, SHJD6, SCJD6, SLD6, SHLD6, SCLD6③	1	3	1	1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 1/2	1, 2	—	—	—
All MD, ND, PD, RD Including Electronic trip④	2	2, 3	1	1/1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 2/1	1, 2	—	—	—
STD⑤	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.



For ED Frames



For FD Frames



For JD and LD Frames

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 Breakers

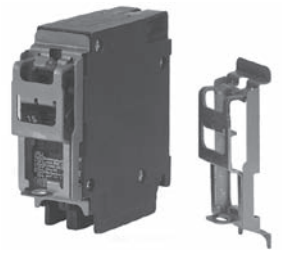
Circuit Breaker Accessories

Circuit Breaker Accessories ④⑤⑥⑦⑧⑨

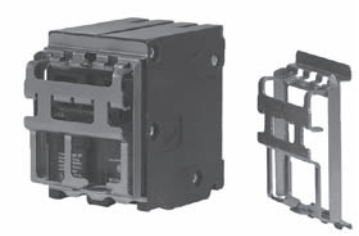
Catalog Number	For Use With Breaker Type	Number of Poles	Standard Package
Padlocking Device For locking breaker in "OFF" position. Note "ON" position does not affect breaker fuctionally			
ECPLD1	Type QP, BL, QAF2, QPF, QE, QT-Duplex, BQ, BQXD	1P	3 Pieces
ECPLD2	Type QP, BL, QAF2, QPF, QE, QT-Triplex & 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 swiching 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 Al Cu LGS	n/a	6 Pieces
TC1Q1	Type BQ, NGG 40A Al 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 page 1-23
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



ECPLD1



ECPLD2



ECQLD3



ECQLD4



ECQTH4

Handle Tie



ECQTH2



ECQTH3

Handle Blocking Device

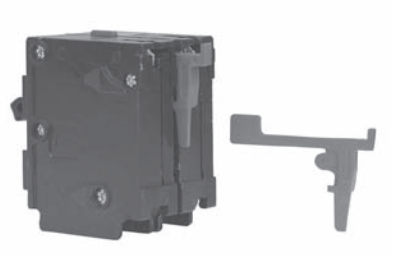


ECQL1



ECBX231M

Main Breaker Retainer



ECMBR1



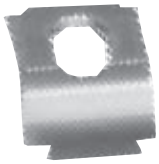
ECMBR2

Mechanical Interlock



ECQML12

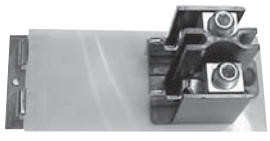
Mounting Accessories



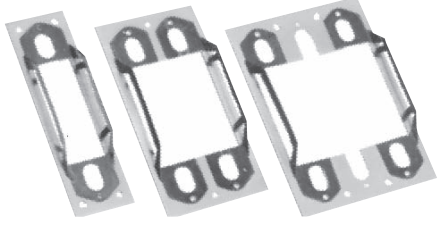
MB120

SMB6R





I0204ML1125



FP9508 FP9555 FP9556

Molded Case Circuit Breakers

External Accessories

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 QJ	**HL9419**	10	¼
All BQD, CQD, NGB, HGB, LGB	**BQDPLD**	1	⅛
NGG, HGG, LGG	**HPLG**	1	¼
EB, 1- thru 3-pole	**HPLEB**	1	⅛
EG, 3- and 4-pole only	**HPLE**	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 QJ	**QJHS1**①	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

Terminal Shields

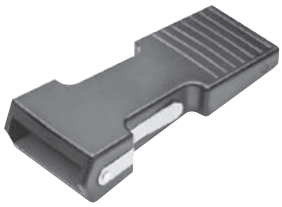
Breaker Type	Poles	Catalog Number	Standard Package
NGG, HGG, LGG	3	**TSSG3A**	1



FD Padlocking Device
FD6PLI



FD Handle Blocking Device
FD6HB1



Handle Extension
EX11

■ Built to order. Allow 2–3 weeks for delivery.
① Sold only in standard package quantities.

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 2 3	**CQDFMB1** **CQDFMB2■** **CQDFMB3■**	1 1 1	¼ ¼ ¼
NGG, HGG, LGG	1 2 3	**FMPG1** **FMPG2** **FMPG3**	**1** **1** **1**	¼ ¼ ¼

Back Mounting Plates

ED2, ED4, ED6, HED4, HED6	1	**E2BMB**	1	¼

Mounting Screw Kits

CQD, CQD6	**CQDSMK**①	1	1¼
NGG, HGG, LGG	**MSKG4**①	1	¼
All QJ	**MSQJ**①	1	1
All ED (CED6 requires 2 kits)	**MSE6**① **MSE6100**②	1 100⑥	¼ 1
All FD (CFD6 requires 2 kits)	**MSF6**① **MSF650**③	1 50⑥	¼ 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



Mounting Screw Kit
MSE6



Mechanical Interlock
MI5444

"MI" Mechanical Interlocks

For Use With Breaker Type(s)	Panel⑦ Mounted	Plug-in Mounted	Standard Package	Wt Lb Std Pkg
All EG (Sliding Bar)	**HSBE**	—	1	—
All QJ	**CSO**	— —	Complete with two breakers	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**⑤▲	—	—	—

■ Built to order. Allow 2–3 weeks for delivery.

▲ Built to order. Allow 6–8 weeks for delivery.

①Kit consists of 4 screws and washers.
②Consists of 1 screw and washers (order 100).
③Consists of 1 screw and washers (order 50).

④With mechanical interlock in place, no accessory can be installed into circuit breaker right pole.
⑤Addition of the mechanical interlock will prevent accessory installation in the left pole.
⑥Sold only in standard package quantities. Multiply List Price Each times package quantity for full price.

⑦Mechanical interlock is not designed for use within Siemens panelboards.

Molded Case Circuit Breakers

External Accessories

Rotary Door Mounted Operating Handles
Types 1, 3, 3R , 12, 4 4X

For Use With Breaker Frames	Complete Mechanism Catalog Number		Handle Only	Breaker Operator	Shaft Only	
	Standard Depth	Variable Depth	Catalog Number	Catalog Number	Length (inches)	Catalog Number
EG	RHVE64X	RHVE124X	—	—	—	—
ED①	CRHOESD	CRHOEVD	CRHOH③	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	RHOH③	RHONBO④	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	—	—

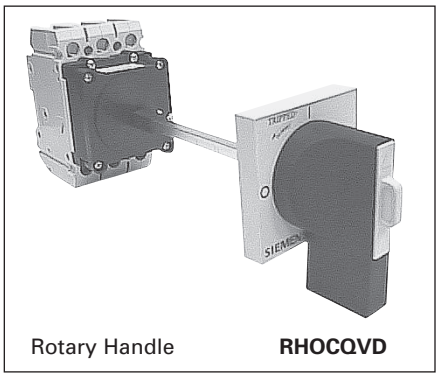
For CQD, NGG, HGG and LGG red emergency handle, order assembly **RHOCQVDE** (includes handle and operator).▲
For CQD, NGG, HGG and LGG in a NEMA 3R enclosure, order **CQDOP34** operator, **RHOH** handle and **RHOSVD** shaft.
For CQD, NGG, HGG and LGG in a NEMA 4 or 4X enclosure, order **CQDOP34** operator, **RHOH4** handle and **RHOSVD** shaft.

Through Door Mounted Operating Handles②
Types 1 & 12

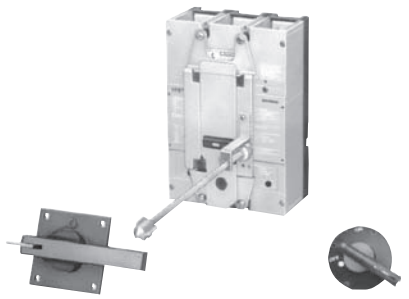
For Use With Breaker Frames	Standard Depth Catalog Number	Variable Depth Catalog Number
CQD, NGG, HGG, LGG	FMHOS	—
QJ	OH9498■	VH9499
EG (3 & 4-Pole only)	RHFESD	—
EG (red handle)	RHFESDEM	—
ED	E2RH1	E2RHV9
FD	F6RH1	F6RHV9

Door Latch Kits

Type	Catalog Number Right Hand	Catalog Number Left Hand
2 point latch	DKR2	DKL2■
3 point latch	DKR3	DKL3■



Rotary Handle **RHOCQVD**

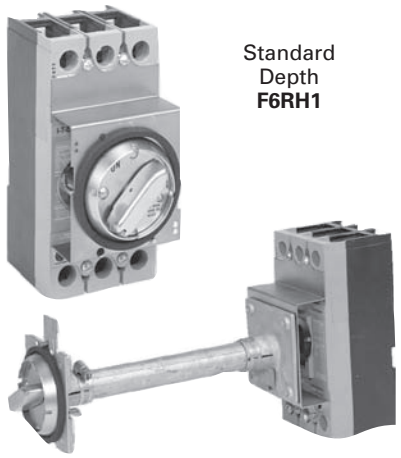


RHOH **CRHOH**



D11CEU2

Rotary Door Mounted Operating Handles



Standard Depth **F6RH1**

Variable Depth **F6RHV9**

■ 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**.

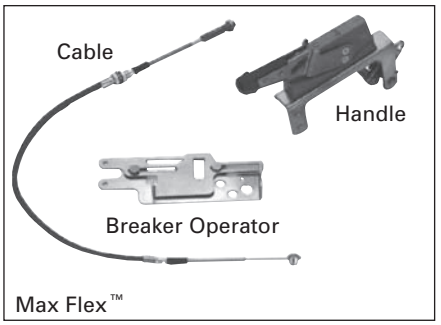
Molded Case Circuit Breakers

External Accessories

Max-Flex™, Flange Mounted Variable Depth Operators③

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	MFKE3④	—	—	—
	4 (x)	MFKE4X3	—		
ED	1, 3 (R), 12	FHOE036①	FHOH	FHOEBO①	FHOEC036
	4 (x)	—	FHOH4		
FD	1, 3 (R), 12	FHOF036	FHOH	FHOFBO	FHOFC036
	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	FHONC048②
	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 IECmarkets, where red handles have specific meaning. Order components separately, appending the letter "i" to the catalog number (e.g. FHOHI).



Max Flex™

Alternate Length Cable Only

Inches	ED Catalog Number	FD Catalog Number	JD/LD/LMD Catalog Number	MD/ND/PD/RD 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 Catalog Number	Right Hand Mount Catalog Number
ED⑤	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 IECmarkets, where red handles have specific meaning. Order components separately, appending the letter "i" to the catalog number (e.g. FHOHI).


FDFBFR

▲ Built to order. Allow 6–8 weeks for delivery.

①For 1- or 2-pole breaker order FHOED036 complete kit or FHOEDBO breaker operator only. Use MFHM3R handle.

②48 inch cable is standard length for M through R frame Max-Flex operators.

③Meets requirements of NFPA 79, section 5.3.3.1 for locking external operator disconnecting devices

④Consult sales office for additional cable lengths for EG Flex Shaft Operators. For 3-Pole only.

⑤3-Pole ED only.

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 48 125	**MOF6024DC▲** **MOF6048DC▲** **MOF6125DC▲**	120 240	**MOF6120** **MOF6240**
JD, LD	24 48 125	**MOJ6024DC▲** **MOJ6048DC▲** **MOJ6125DC▲**	120 240	**MOJ6120** **MOJ6240**
LMD	24 48 125	**MOLMD6024DC▲** **MOLMD6048DC▲** **MOLMD6125DC▲**	120 240	**MOLMD6120** **MOLMD6240**
MD, ND, PD, RD	— —	— —	120 240	**MOMN6120** **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.▲

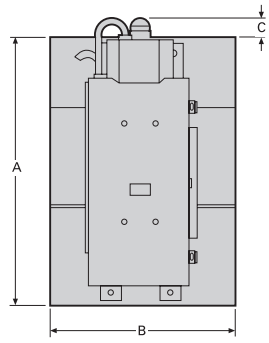


Telemand Motor Operator

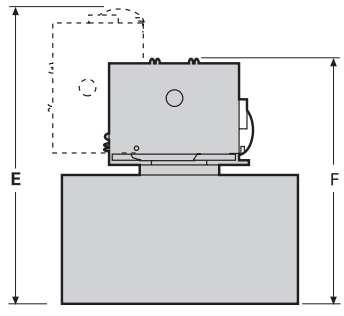
Dimensions

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

FD, JD, LD, LMD, MD, ND, PD, RD
Frames



Front View



Bottom View

Operating Currents

Catalog Number	On			Off			Reset (Amps)
	In-Rush (Amps)	Running (Amps)	Time (msec)	In-Rush (Amps)	Running (Amps)	Time (msec)	
MOE6120 **MOE6240**	10.25 5.2	2.3 1.1	550 500	10 5	2.3 1	400 330	2.3 1.1
MOF6120/L **MOF6240/L**	13.6 7.6	5.5 3.5	200 200	13.6 7.6	5.5 3.5	175 185	5.5 3.5
MOLMD6120/L	13.6	6	210	13.6	6	185	6
MOJ6120/L **MOJ6240/L**	13.6 7.6	6 3.5	210 217	13.6 7.6	6 3.5	185 185	6 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

For inches / millimeters conversion, see Application Data section.

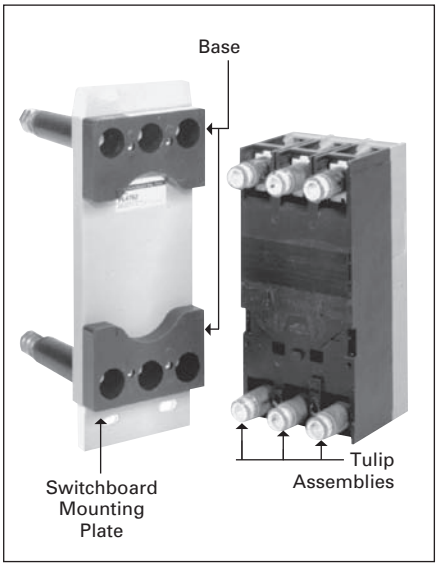
▲ Built to order. Allow 6–8 weeks for delivery.

Molded Case Circuit Breakers

External Accessories

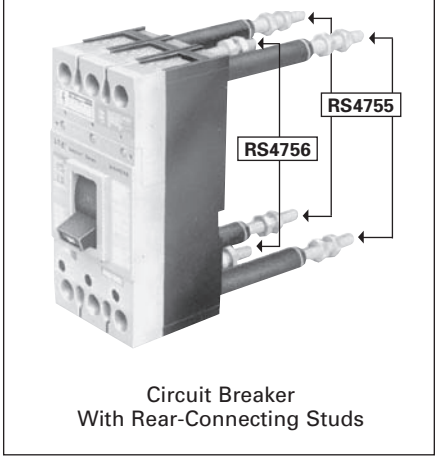
Plug-In Mounting Assemblies, Including Base and Tulip Assemblies

For Use With Breaker Frames	Poles	Line Side Catalog Number[2]	Load Side Catalog Number[2]	Steel Switchboard Mounting Plate[1] Catalog Number
EG	3	PCBERC3[6]	—	—
	4	PCBERC4[6]	—	
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 Catalog Number	3-Pole Catalog Number
ED	TCE2▲	TCE3▲
FD	TCF2▲	TCF3▲
JD	TCJ2▲	TCJ3▲
LD	TCL2▲	TCL3▲
MD	TCM2▲	TCM3▲
ND	TCN2▲	TCN3▲



Circuit Breaker With Rear-Connecting Studs

Rear-Connecting Studs

For Use With Breaker Frames	Ampere Rating	Description	Extension Behind Breaker (inches)	Line Side Catalog Number[4]	Load Side 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.

[1] Furnished at no extra charge when ordered with plug-in mounting assembly.

[2] Each piece catalog number consists of (1) mounting block assembly and required tulip assemblies (2) for 2-pole, (3) for 3-pole

[3] For vertical bus mounting — for horizontal, substitute PC5665 for PC5664 and PC5667 for PC5666.

[4] Price includes one current stud, insulating tube, stud nuts and terminal shields, when required.

[5] For proper electrical clearance, studs must alternate between short and long stud lengths on circuit breaker poles (e.g. SLSLSL or LSLSLS).

[6] Plug-in assembly for EG breakers include line and load side in one assembly.

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 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: 25° C (77° F)	50° C (122° F)	60° C (140° F)	Siemens Breaker Frames
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	
125	137	114	100	QJ
150	165	136	120	
175	192	159	140	
200	220	182	160	FD
225	247	205	180	
250	275	235	220	
300	330	276	252	JD
350	385	325	301	
400	440	372	340	
500	550	468	435	LD
600	660	564	525	
700	770	658	613	
800	880	754	704	MD
900	990	828	749	
1000	1100	900	825	
1200	1320	1090	1000	ND
1400	1540	1304	1148	
1600	1760	1500	1320	PD
1800	1980	1690	1485	
2000	2200	1880	1650	RD

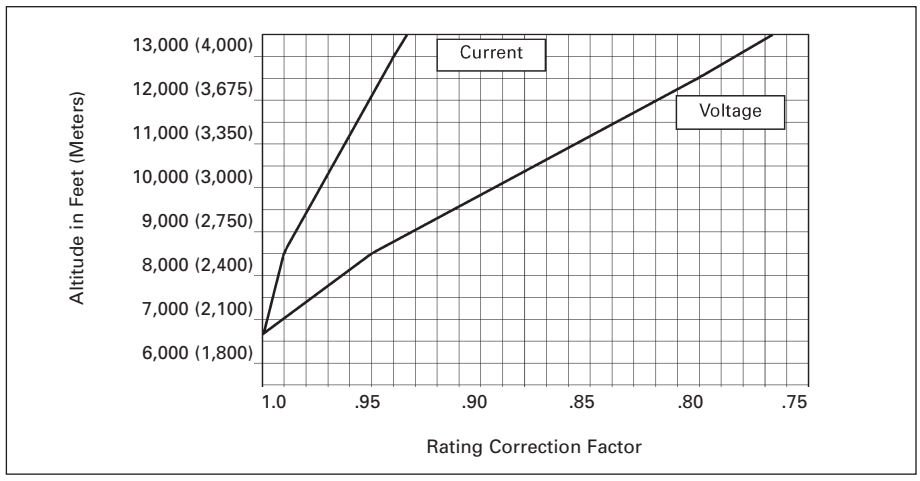


Figure 1 — Altitude Adjustment

Molded Case Circuit Breakers

Unusual Operating Conditions

Reference

400 Hz Systems①

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 factory. 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	400HZ			
	Open Air	Open Air③	Enclosed After Derating	No of Pieces	Wire Size
ED2, ED4, ED6, BQD, 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
	100	95	76	1	#3
	110	105	84	1	#2
	125	119	95	1	#1
QJ2, QJH2, QJ2H, HQJ2, HQJ2H, FD6, FXF6, HFD6, HFXD6, CFD6	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
	225	180	144	1	#4/0
	250	200	160	1	250 kcmil
JXD2, JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, CJD6	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
JD6, JXD6, HJD6, HJXD6 100% Rated	200	170	170	2	#3/0
	225	190	190	2	#4/0
	250	210	210	1	250 kcmil
	300	240	240	1	350 kcmil
	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	400/415HZ			
	Open Air	Open Air③	Enclosed After Derating	No of Pieces	Wire Size
LD6, LXD6, HLD6, HLXD6, HHLD6, 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
LD6, LXD6, HLD6, HLXD6, 100% Rated	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
	500	375	375	2	250 kcmil
	600	420	420	2	350 kcmil
MD6, MXD6, HMD6, HMXD6, CMD6	500	400	320	2	250 kcmil
	600	430	360	2	350 kcmil
	700	500	400	3	250 kcmil
	800	560	448	3	300 kcmil
MD6, MXD6, HMD6, HMXD6, CMD6 100% Rated	500	400	400	2	250 kcmil
	600	430	430	2	350 kcmil
	700	500	500	3	250 kcmil
	800	560	560	3	300 kcmil
ND6, NXD6 HND6, HNXD6, CND6	800	560	448	3	300 kcmil
	900	600	480	3	350 kcmil
	1000	650	520	3	400 kcmil
	1200	780	624	4	350 kcmil
ND6, NXD6 HND6, HNXD6, CND6 100% Rated	900	600	600	3	350 kcmil
	1000	650	650	3	400 kcmil
	1200	780	780	4	350 kcmil
PD6, PXD6, HPD6, HPXD6, CPD6,	1200	780	624	4	400 kcmil
	1400	850	680	4	500 kcmil
	1600	960	768	5	500 kcmil
PD6, PXD6, HPD6, HPXD6, CPD6 100% Rated	1200	780	780	4	400 kcmil
	1400	850	850	4	500 kcmil
	1600	960	960	5	500 kcmil
RD6, RXD6, HRD6, HRXD6 80% Rated	1600	960	768	5	500 kcmil
	1800	1080	864	5	500 kcmil
	2000	1200	960	6	500 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.

Frame Summary and Ratings Table

Frame Family		DG	FG	JG
				
Continuous Ampere Range		30 to 150A	40 to 250A	70 to 400A
Number of Poles		2, 3	2, 3	2, 3
Maximum Voltage Rating		600V	600V	600V
Type of Protection				
Thermal-Magnetic		◆	◆	◆
Electronic		◆	◆	◆
Electronic with LCD		◆	◆	◆
Motor Circuit Protector		◆	◆	◆
Molded Case Switch		◆	◆	◆
100% Rated Breaker		ETU only	—	◆
Interchangeable Trip Unit		◆	◆	◆
	W In.(mm)	4.1 (105)		5.5 (139)
	H	7.3 (175)		11 (279)
	D	3.4 (81)		4.2 (102)
	D1	4.2 (107)		5.4 (138)
Type N – Normal Interrupting Rating①, RMS Symmetrical Amperes (kA)				
UL	240Vac	65	65	65
	480Vac	35	35	35
	600Vac⑤	18	18	25
IEC (I_{cu}/I_{cs})	240Vac	65/65	65/65	65/65
	415Vac	40/40	40/40	45/45
	690Vac	12/6	12/6	12/6
DC Voltages – Interrupting Rating (kA)④				
	250Vdc - 2p	30	30	30
	500Vdc - 3p③	18	18	25
Type H – High Interrupting Rating①, RMS Symmetrical Amperes (kA)				
UL	240Vac	100	100	100
	480Vac	65	65	65
	600Vac⑤	18	18	25
IEC (I_{cu}/I_{cs})	240Vac	100/75	100/75	100/75
	415Vac	70/70	70/70	70/70
	690Vac	12/6	12/6	15/8
DC Voltages – Interrupting Rating (kA)④				
	250Vdc - 2p	30	30	30
	500Vdc - 3p③	18	25	35
	600Vdc - 3p②	42	42	65
Type L – Very High Interrupting Rating①, RMS Symmetrical Amperes (kA)				
UL	240Vac	200	200	200
	480Vac	100	100	100
	600Vac⑤	18	18	25
IEC (I_{cu}/I_{cs})	240Vac	200/150	200/150	200/150
	415Vac	100/75	100/75	100/75
	690Vac	12/6	12/6	15/8
DC Voltages – Interrupting Rating (kA)④				
	250Vdc - 2p	30	30	30
	500Vdc - 3p③	18	30	35

① UL does not recognize AIC ratings for Molded Case Switches or Motor Circuit Protectors.
② For 600 VDC breakers see page 7-136.
③ 500Vdc nominal, 600Vdc max. for ungrounded DC UPS systems.
④ DC Interruption Ratings do not apply to electronic trip circuit breakers.
⑤ DG & FG breakers are 600Y/347V.

Frame Summary and Ratings Table — Continued

Frame Family		LG	MG	NG	PG
					
Continuous Ampere Range		150 to 600A	200 to 800A	300 to 1200A	400 to 1600A
Number of Poles		2, 3	2, 3	2, 3	3
Maximum Voltage Rating		600V	600V	600V	600V
Type of Protection					
Thermal-Magnetic		◆	◆	◆	◆
Electronic		◆	◆	◆	◆
Electronic with LCD		◆	◆	◆	◆
Motor Circuit Protector		◆	◆	◆	—
Molded Case Switch		◆	◆	◆	◆
100% Rated		400/500 Amp	◆	◆	◆
Interchangeable Trip Unit		—	◆	◆	◆⑥
	W In.(mm)	5.5 (139)	7.5 (190)	9 (229)	
	H	11 (279)⑦	16 (406)	16 (406)	
	D	4.2 (102)	4.7 (114)	6.2 (157)	
	D1	5.4 (138)	5.9 (151)	8.1 (207)	
Type N – Normal Interrupting Rating①, RMS Symmetrical Amperes (kA)					
UL	240Vac	65	65	65	65
	480Vac	35	35	35	35
	600Vac	18	25	25	25
IEC (I_{cu}/I_{cs})	240Vac	65/65	65/65	65/65	65/65
	415Vac	45/45	50/50	50/25	50/25
	690Vac	12/6	20/10	20/10	20/10
DC Voltages – Interrupting Rating (kA)④					
	250Vdc - 2p	30	22	22	22
	500Vdc - 3p③	25	35	35	35
Type H – High Interrupting Rating①, RMS Symmetrical Amperes (kA)					
UL	240Vac	100	100	100	100
	480Vac	65	65	65	65
	600Vac	18②	35	35	35
IEC (I_{cu}/I_{cs})	240Vac	100/75	100/75	100/75	100/50
	415Vac	70/70	70/70	70/35	70/35
	690Vac	15/8	30/15	30/15	30/15
DC Voltages – Interrupting Rating (kA)④					
	250Vdc - 2p	30	25	25	25
	500Vdc - 3p③	35	50	50	50
	600Vdc - 3p⑤	65	65	65	65
Type L – Very High Interrupting Rating①, RMS Symmetrical Amperes (kA)					
UL	240Vac	200	200	200	200
	480Vac	100	100	100	100
	600Vac	18	50	65	65
IEC (I_{cu}/I_{cs})	240Vac	200/150	200/150	200/150	200/150
	415Vac	100/75	100/75	100/75	100/75
	690Vac	15/8	35/17	35/17	35/17
DC Voltages – Interrupting Rating (kA)④					
	250Vdc - 2p	30	42	42	42
	500Vdc - 3p③	35	65	65	65

① UL does not recognize AIC ratings for Molded Case Switches or Motor Circuit Protectors.
② 25kA available in a special version. Standard breakers rated 18kA. See page 7-120.
③ 500Vdc nominal, 600Vdc max. for ungrounded DC UPS systems.
④ DC Interruption Ratings do not apply to electronic trip circuit breakers.
⑤ For 600 VDC breakers see page 7-136.
⑥ Thermal-magnetic available non-interchangeable only.
⑦ 13.6" with extended shields.

VL Circuit Breakers

Trip Unit Overview

Selection

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 beaker 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 Alarm①	□	●	●	●	●	●	●	●
Last Trip Information	□	●①	●①	●①	●①	●	●	●
Zone Selective①	□	●	●	●	●	●	●	●
Communications①	□	●	●	●	●	●	●	●

◆ Adjustable setting
● This feature is included
□ Feature is not included.
① Requires a COMPRO20 or COMMOD21 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 x 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.

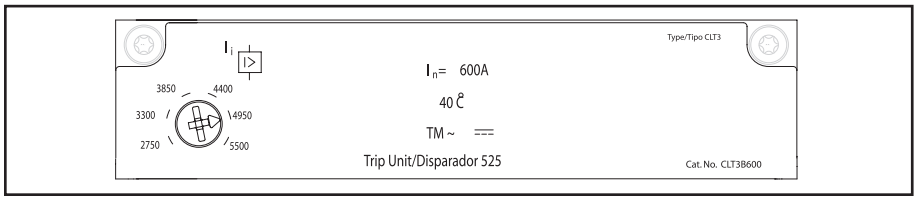
Ground Fault Pick-Up (I_g)

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.

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.



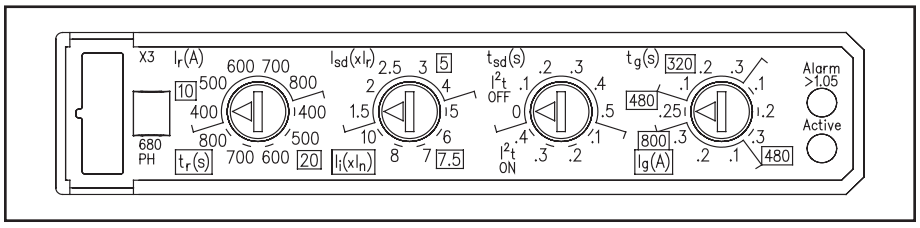
Electronic Trip Units

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.

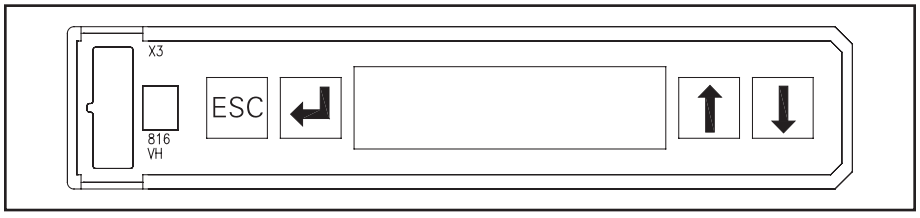
On the Model 555 Electronic Trip Unit a flashing LED confirms that the microprocessor is in operating and another indicates an overload condition. For ease-of-use and to insure proper coordination, the set points for the continuous current are shown on the face of these trip units in amps.

On the Model 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 Circuit Breakers

DG 150A Frame, VL Series

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 7-156.

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)						
							220/240		380/415		690		
		240	480	600Y /347	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

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

DG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I_n)	Instantaneous Overcurrent Setting (I_i)	
	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.

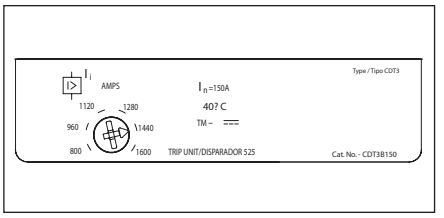
Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2(107)

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)

External Accessories pages 7-137 through 7-151



Model 525 Trip Unit

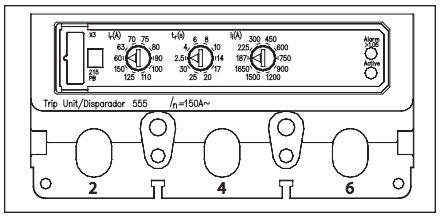
DG 150A Frame 2-Pole with Thermal-Magnetic Trip Unit

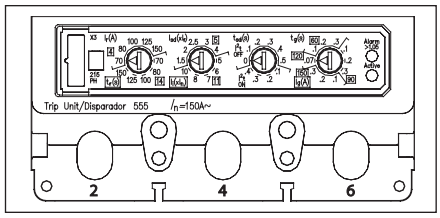
Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
50	NDK2B050L	HDK2B050L	LDK2B050L
60	NDK2B060L	HDK2B060L	LDK2B060L
70	NDK2B070L	HDK2B070L	LDK2B070L
80	NDK2B080L	HDK2B080L	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

• Revised •
03/08/13

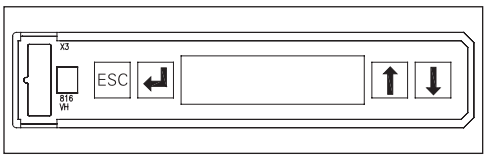




Model 555 Trip Units

DG 150A Frame 3-Pole Electronic Trip Unit①

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

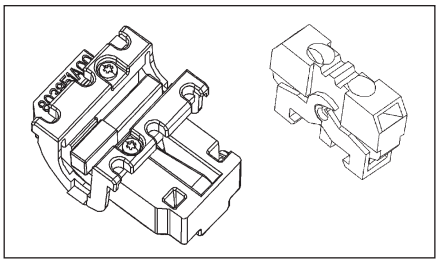
DG 150A Frame 3-Pole Electronic LCD Trip Unit①

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.

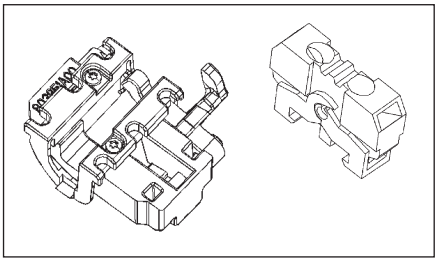
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	Catalog Number
1 Alarm Switch 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL1**
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	**ASKL2**
2 Aux. + 1 Alarm Switch 1A + 1B, 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL3**



Auxiliary/Alarm Switch Mounting Base Only

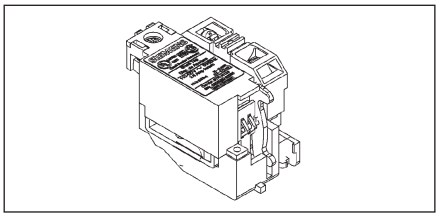
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	**AMBL1**
2 Aux. + 1 Alarm Switch	Left Pocket Only	**AMBL2**
2 Aux. + 1 Alarm Switch	Right Pocket Only	**AMBL3**



Auxiliary/Alarm Switch Only

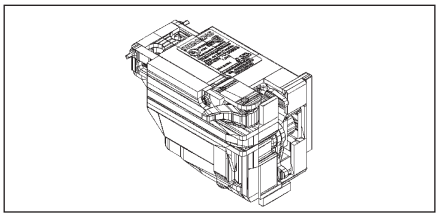
Common to DG - PG Frames

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		**UVRLL24**
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 7-152 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 7-137 through 7-151

VL Circuit Breakers

FG 250A Frame, VL Series

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 7-156.

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)						
						220/240		380/415		690	
	240	480	600①	250	500	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
Aluminum②	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)

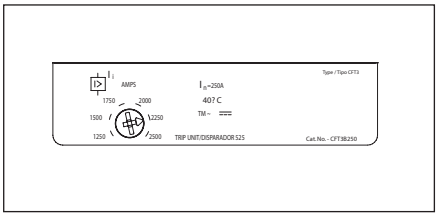
Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2 (107)

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)

7 MOLDED CASE CIRCUIT BREAKERS

External Accessories pages 7-137 through 7-151



Model 525 Trip Unit

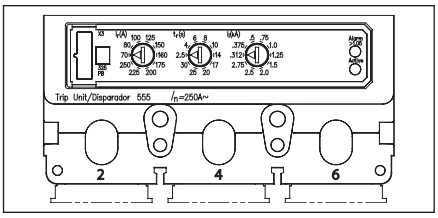
FG 250A Frame 2-Pole with Thermal-Magnetic Trip Unit

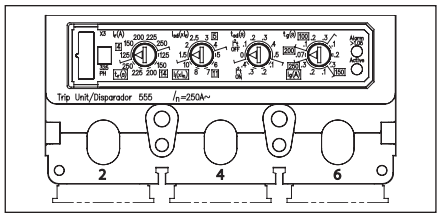
Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
100	NFK2B100L	HFK2B100L	LFK2B100L
110	NFK2B110L	HFK2B110L	LFK2B110L
125	NFK2B125L	HFK2B125L	LFK2B125L
150	NFK2B150L	HFK2B150L	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			
	NFG3F250	HFG3F250	LFG3F250	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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

• Revised •
03/08/13

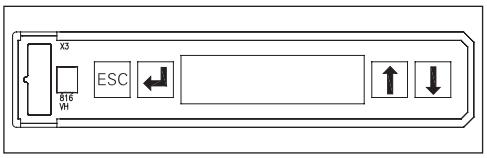




Model 555 Trip Units

FG 250A Frame 3-Pole Electronic Trip Unit①

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			
100	**NFK3R100L**	**HFK3R100L**	**LFK3R100L**
150	**NFK3R150L**	**HFK3R150L**	**LFK3R150L**
250	**NFK3R250L**	**HFK3R250L**	**LFK3R250L**
ELECTRONIC LSI TRIP			
100	**NFK3T100L**	**HFK3T100L**	**LFK3T100L**
150	**NFK3T150L**	**HFK3T150L**	**LFK3T150L**
250	**NFK3T250L**	**HFK3T250L**	**LFK3T250L**
ELECTRONIC LSIG TRIP			
100	**NFK3V100L**	**HFK3V100L**	**LFK3V100L**
150	**NFK3V150L**	**HFK3V150L**	**LFK3V150L**
250	**NFK3V250L**	**HFK3V250L**	**LFK3V250L**
ELECTRONIC LIG TRIP			
100	**NFK3W100L**	**HFK3W100L**	**LFK3W100L**
150	**NFK3W150L**	**HFK3W150L**	**LFK3W150L**
250	**NFK3W250L**	**HFK3W250L**	**LFK3W250L**



Model 586 Trip Unit

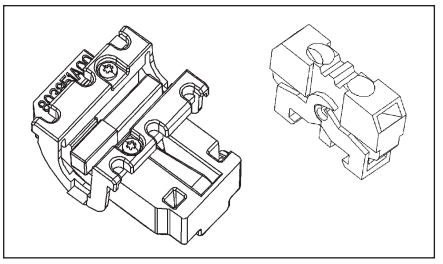
FG 250A Frame 3-Pole Electronic LCD Trip Unit①

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			
100	**NFK3A100L**	**HFK3A100L**	**LFK3A100L**
150	**NFK3A150L**	**HFK3A150L**	**LFK3A150L**
250	**NFK3A250L**	**HFK3A250L**	**LFK3A250L**
LCD ELECTRONIC LSIG TRIP			
100	**NFK3G100L**	**HFK3G100L**	**LFK3G100L**
150	**NFK3G150L**	**HFK3G150L**	**LFK3G150L**
250	**NFK3G250L**	**HFK3G250L**	**LFK3G250L**
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY			
100	**NFK3K100L**	**HFK3K100L**	**LFK3K100L**
150	**NFK3K150L**	**HFK3K150L**	**LFK3K150L**
250	**NFK3K250L**	**HFK3K250L**	**LFK3K250L**

① Due to the location of the magnetic tripping solenoid, the left accessory pocket is not available for accessories.

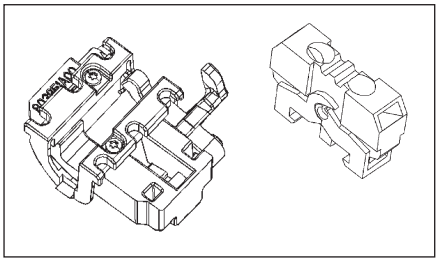
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	Catalog Number
1 Alarm Switch 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL1**
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	**ASKL2**
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL3**



Auxiliary/Alarm Switch Mounting Base Only

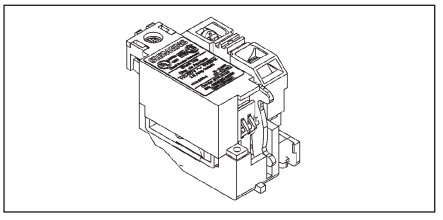
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	**AMBL1**
2 Aux. + 1 Alarm Switch	Left Pocket Only	**AMBL2**
2 Aux. + 1 Alarm Switch	Right Pocket Only	**AMBL3**



Auxiliary/Alarm Switch Only

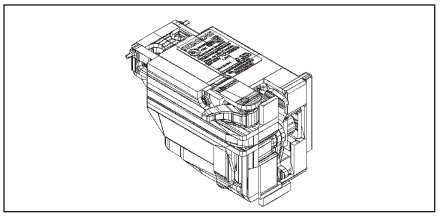
Common to DG - PG Frames

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		**UVRLL24**
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 7-152 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 7-137 through 7-151

VL Circuit Breakers

JG 400A Frame, VL Series

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 7-156.

Mounting hardware is included with each frame or complete breaker.

HACR rated.



Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)											
		UL 489 AIR (File E10848)					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	NJGA	65	35	25	30	25	65	65	45	45	12	6
H	HJGA	100	65	25	30	35	100	75	70	70	15	8
L	LJGA	200	100	25	30	35	200	150	100	75	15	8

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.

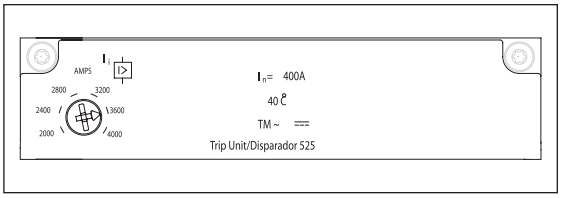
Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	5.5 (139)	11 (279)	4.2 (102)	5.4 (138)

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)

External Accessories pages 7-137 through 7-151



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			TRIP UNIT ONLY
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			TRIP UNIT ONLY
250	NJG3B250L	HJG3B250L	LJG3B250L	CJT3B250
300	NJG3B300L	HJG3B300L	LJG3B300L	CJT3B300
350	NJG3B350L	HJG3B350L	LJG3B350L	CJT3B350
400	NJG3B400L	HJG3B400L	LJG3B400L	CJT3B400

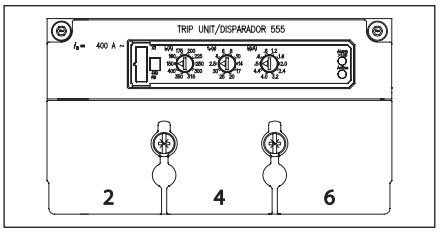
JJ 400A Frame 240V max., 2-pole with Thermal-Magnetic Non-Interchangeable Trip Unit①

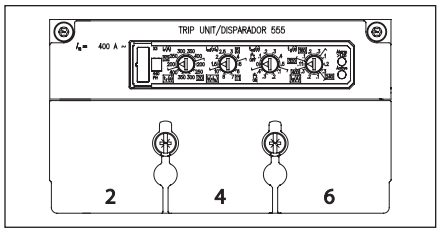
Continuous Ampere Rating	N-Interrupting Class
	Catalog Number
	COMPLETE BREAKER
250	NJJ2B250
300	NJJ2B300
350	NJJ2B350
400	NJJ2B400

JJ 400A Frame 240V max., 3-pole with Thermal-Magnetic Non-Interchangeable Trip Unit①

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.

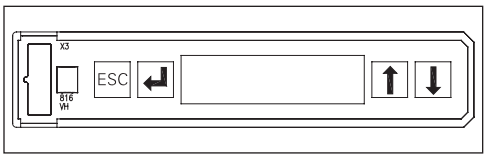




Model 555 Trip Units

JG 400A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class Catalog Number	H-Interrupting Class Catalog Number	L-Interrupting Class Catalog Number	Catalog Number
	FRAME ONLY			
	NJG3F400	HJG3F400	LJG3F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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



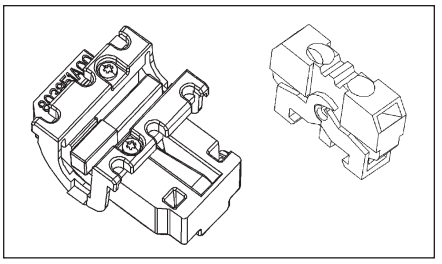
Model 586 Trip Unit

JG 400A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class Catalog Number	H-Interrupting Class Catalog Number	L-Interrupting Class Catalog Number	Catalog Number
	FRAME ONLY			
	NJG3F400	HJG3F400	LJG3F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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

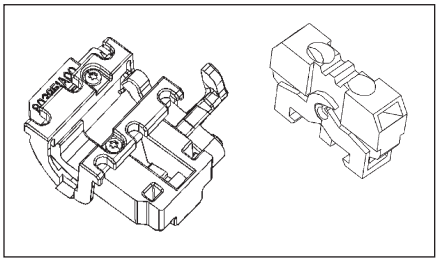
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	Catalog Number
1 Alarm Switch 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL1**
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	**ASKL2**
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL3**



Auxiliary/Alarm Switch Mounting Base Only

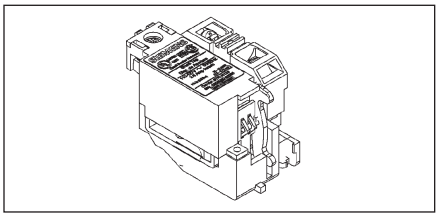
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	**AMBL1**
2 Aux. + 1 Alarm Switch	Left Pocket Only	**AMBL2**
2 Aux. + 1 Alarm Switch	Right Pocket Only	**AMBL3**



Auxiliary/Alarm Switch Only

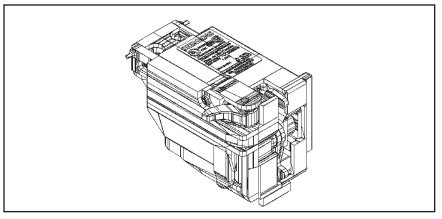
Common to DG - PG Frames

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		**UVRLL24**
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 7-152 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).

External Accessories pages 7-137 through 7-151

VL Circuit Breakers

LG 600A Frame, VL Series

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 7-156.

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	18①	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 7-120.

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number③
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**⑤
Copper	150-600	#2–600 kcmil Cu	2 (line side)	**3TC2LG600LN**⑤
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.

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.

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)		

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)

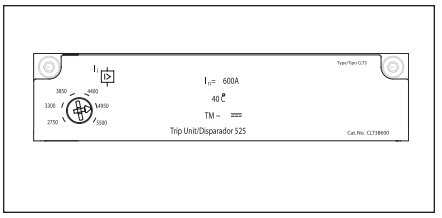
7 MOLDED CASE CIRCUIT BREAKERS

External Accessories pages 7-137 through 7-151

VL 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 Unit①

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 only②

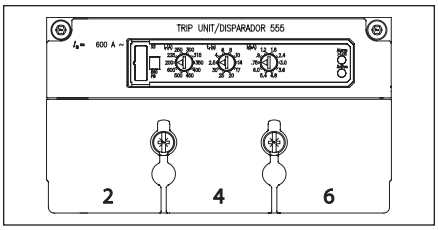
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	—	**HLV2B400L**	—
500	—	**HLV2B500L**	—
600	—	**HLV2B600L**	—

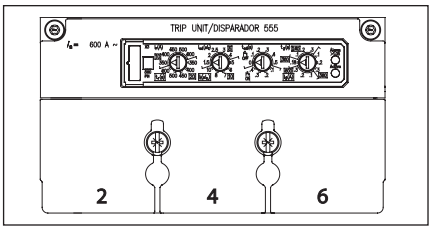
LG 600A Frame 3-Pole with Thermal-Magnetic Trip Unit , 600Vac 25kA only①②

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.

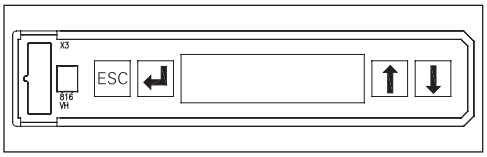




Model 555 Trip Unit

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



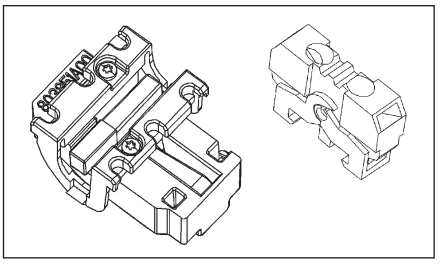
Model 586 Trip Unit

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

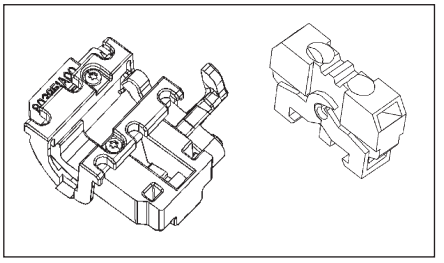
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	Catalog Number
1 Alarm Switch 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL1**
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	**ASKL2**
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B③ Bases AMBL2 & AMBL3	Left, Right②	**ASKL3**



Auxiliary/Alarm Switch Mounting Base Only

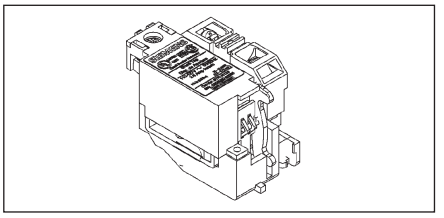
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	**AMBL1**
2 Aux. + 1 Alarm Switch	Left Pocket Only	**AMBL2**
2 Aux. + 1 Alarm Switch	Right Pocket Only	**AMBL3**



Auxiliary/Alarm Switch Only

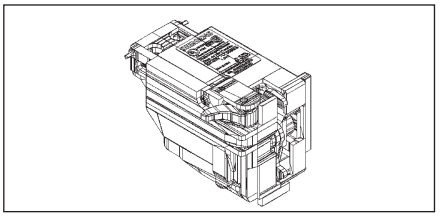
Common to DG - PG Frames

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		**UVRLL24**
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 7-152 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).

External Accessories pages 7-137 through 7-151

VL Circuit Breakers

MG 800A Frame, VL Series

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 7-156.

Mounting hardware is included with each frame or complete breaker.

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	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

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)

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

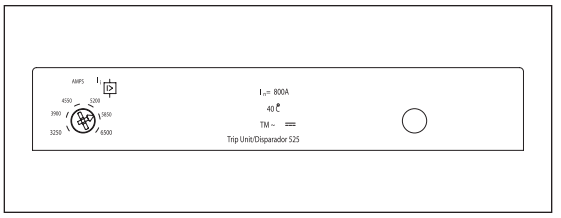
① Standard connector supplied with complete breakers.
② Kit consists of 3 terminal connectors.
③ Consists of one terminal.
④ Includes extended terminal cover.
⑤ Required for 100% rated MG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

MG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I_n)	Instantaneous Overcurrent Setting (I_i)	
	Min.	Max.
600	3000	6000
700	3250	6500
800	3250	6500

Note: Each breaker has 6 trip settings.

External Accessories pages 7-137 through 7-151



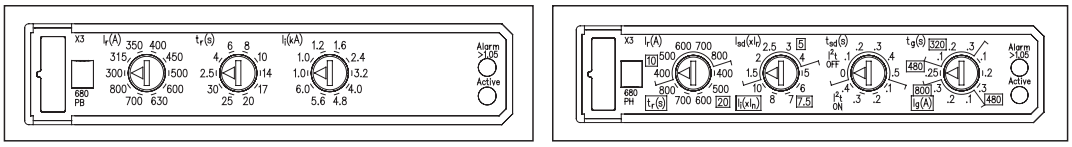
Model 525 Trip Unit

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			
	NMG2F800	HMG2F800	LMG2F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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

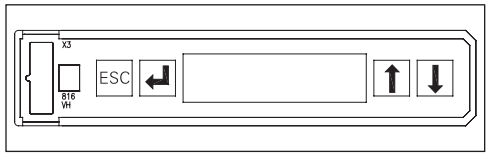
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			
	NMG3F800	HMG3F800	LMG3F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
600	NMG3B600L	HMG3B600L	LMG3B600L	CMT3B600
700	NMG3B700L	HMG3B700L	LMG3B700L	CMT3B700
800	NMG3B800L	HMG3B800L	LMG3B800L	CMT3B800



Model 555 Trip Units

MG 800A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class Catalog Number	H-Interrupting Class Catalog Number	L-Interrupting Class Catalog Number	Catalog Number
	FRAME ONLY			
	NMG3F800	HMG3F800	LMG3F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
ELECTRONIC LI TRIP				
600	NMG3R600L	HMG3R600L	LMG3R600L	CMT3R600
800	NMG3R800L	HMG3R800L	LMG3R800L	CMT3R800
ELECTRONIC LSI TRIP				
600	NMG3T600L	HMG3T600L	LMG3T600L	CMT3T600
800	NMG3T800L	HMG3T800L	LMG3T800L	CMT3T800
ELECTRONIC LSIG TRIP				
600	NMG3V600L	HMG3V600L	LMG3V600L	CMT3V600
800	NMG3V800L	HMG3V800L	LMG3V800L	CMT3V800
ELECTRONIC LIG TRIP				
600	NMG3W600L	HMG3W600L	LMG3W600L	CMT3W600
800	NMG3W800L	HMG3W800L	LMG3W800L	CMT3W800



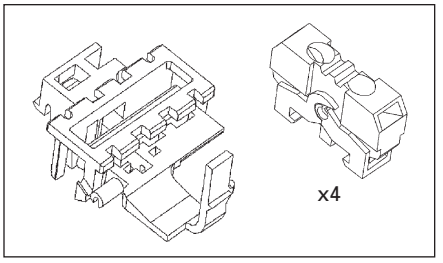
Model 586 Trip Unit

MG 800A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class Catalog Number	H-Interrupting Class Catalog Number	L-Interrupting Class Catalog Number	Catalog Number
	FRAME ONLY			
	NMG3F800	HMG3F800	LMG3F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
LCD ELECTRONIC LSI TRIP				
600	NMG3A600L	HMG3A600L	LMG3A600L	CMT3A600
800	NMG3A800L	HMG3A800L	LMG3A800L	CMT3A800
LCD ELECTRONIC LSIG TRIP				
600	NMG3G600L	HMG3G600L	LMG3G600L	CMT3G600
800	NMG3G800L	HMG3G800L	LMG3G800L	CMT3G800
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
600	NMG3K600L	HMG3K600L	LMG3K600L	CMT3K600
800	NMG3K800L	HMG3K800L	LMG3K800L	CMT3K800

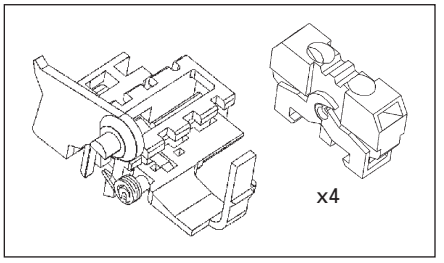
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	Catalog Number
2 Aux. + 2 Alarm Switches 2A + 2B Bases AMBP2	Left Pocket Only	**ASKP3**
4 Aux. Switches 2A + 2B Bases AMBP1	Left, Right	**ASKP4**



Auxiliary/Alarm Switch Mounting Base Only

Description	Mounting Pocket	Catalog Number
Up to 4 Auxiliary Switches	Left, Right	**AMBP1**
2 Aux. + 2 Alarm Switches	Left Pocket Only	**AMBP2**



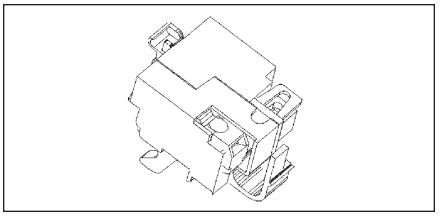
Auxiliary/Alarm Switch Only

Common to DG - PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	**ASWPA**
1 Normally Closed Contact (1B)	**ASWPB**

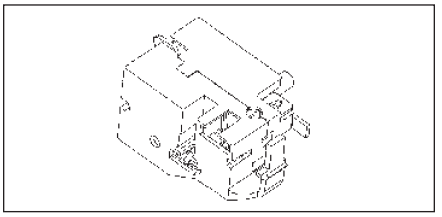
Shunt Trips

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 7-152 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).

External Accessories pages 7-137 through 7-151

VL Circuit Breakers

NG 1200A Frame, VL Series

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 7-156.

Mounting hardware is included with each frame or complete breaker.

A Toggle Handle Extension is included with each frame or complete breaker.

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	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

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_i)	
	Min.	Max.
800	4000	8000
900	5000	10000
1000	5000	10000
1200	7000	12000

Note: Each breaker has 6 trip settings.

Dimensions, inches (mm)

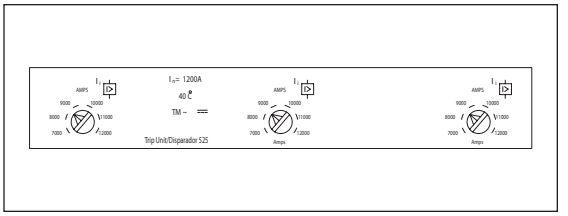
Number of Poles	W	L	D	To Handle D1
2, 3	9 (229)	16 (406)	6 (152)	8.1 (207)

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	46.3 (21.0)	8.8 (4.0)	55.1 (25.0)

7 MOLDED CASE CIRCUIT BREAKERS

External Accessories pages 7-137 through 7-151



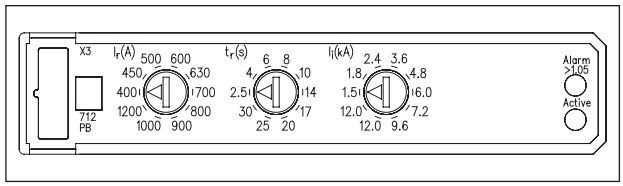
Model 525 Trip Unit

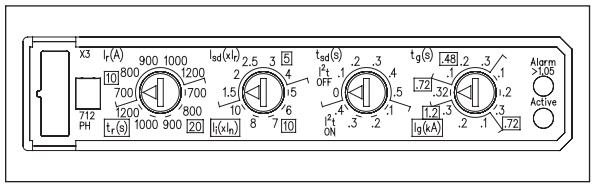
NG 1200A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			
	NNG2F120	HNG2F120	LNG2F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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			
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
800	NNG3B800L	HNG3B800L	LNG3B800L	CNT3B800
900	NNG3B900L	HNG3B900L	LNG3B900L	CNT3B900
1000	NNG3B100L	HNG3B100L	LNG3B100L	CNT3B100
1200	NNG3B120L	HNG3B120L	LNG3B120L	CNT3B120

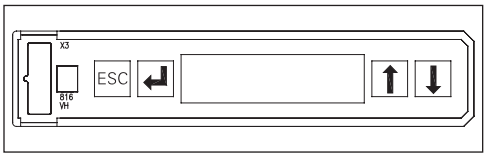




Model 555 Trip Units

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			
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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



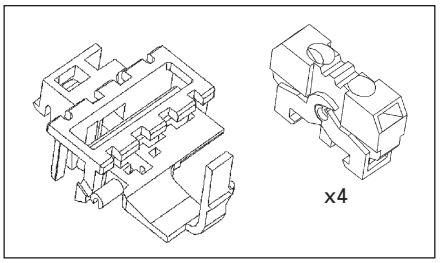
Model 586 Trip Unit

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			
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
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

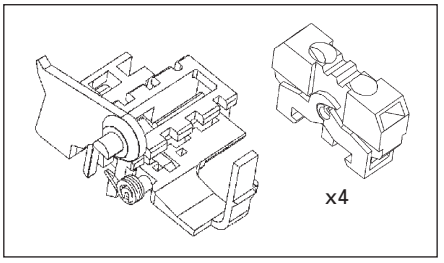
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	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 Pocket①	Catalog Number
Up to 4 Auxiliary Switches 2 Aux. + 2 Alarm Switches	Left, Right Left Pocket Only	**AMBP1** **AMBP2**



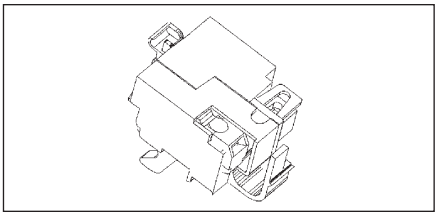
Auxiliary/Alarm Switch Only

Common to DG-PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	**ASWPA**
1 Normally Closed Contact (1B)	**ASWPB**

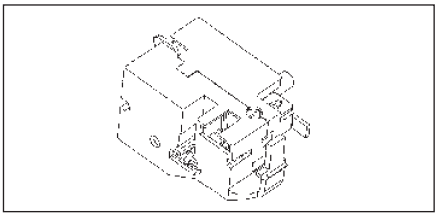
Shunt Trips

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 7-152 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).

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VL 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 seperate 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 7-156.

Mounting hardware is included with each frame or complete breaker.

A Toggle Handle Extension is included with each frame or complete breaker.



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

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.

Mounting Arrangement

Description	Catalog Number
Lug Mounting Assembly	**LMAP1600**
Breaker Mounting Base (Front Connect)	**MBPG1600**
Breaker Mounting Base (Rear Connect)	**MBPG1601**

Dimensions, inches (mm)

Number of Poles	W	L	D	To Handle D1
2, 3	9 (229)	16 (406)	6 (152)	8.1 (207)

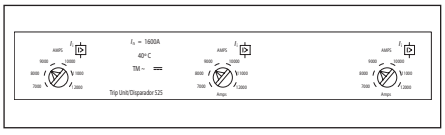
Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	60.2 (27.3)	8.8 (4.0)	69.0 (31.3)

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.

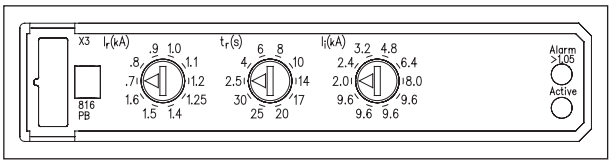


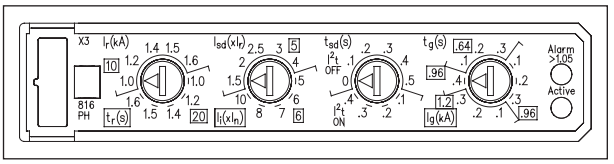
Model 525 Trip Unit

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 7-137 through 7-151

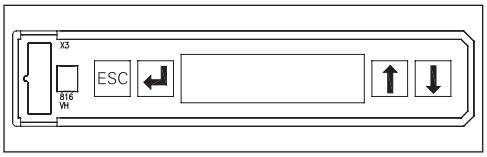




Model 555 Trip Unit

PG 1600A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class Catalog Number	H-Interrupting Class Catalog Number	L-Interrupting Class Catalog Number	Catalog Number
	FRAME ONLY			
	NPG3F160	HPG3F160	LPG3F160	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
ELECTRONIC LI TRIP				
1200	NPG3R120	HPG3R120	LPG3R120	CPT3R120
1600	NPG3R160	HPG3R160	LPG3R160	CPT3R160
ELECTRONIC LSI TRIP				
1200	NPG3T120	HPG3T120	LPG3T120	CPT3T120
1600	NPG3T160	HPG3T160	LPG3T160	CPT3T160
ELECTRONIC LSIG TRIP				
1200	NPG3V120	HPG3V120	LPG3V120	CPT3V120
1600	NPG3V160	HPG3V160	LPG3V160	CPT3V160
ELECTRONIC LIG TRIP				
1200	NPG3W120	HPG3W120	LPG3W120	CPT3W120
1600	NPG3W160	HPG3W160	LPG3W160	CPT3W160



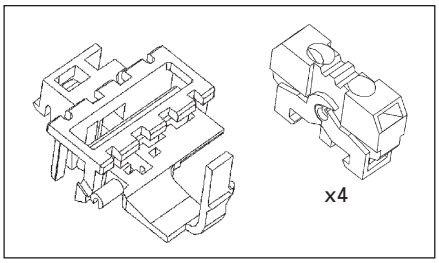
Model 586 Trip Unit

PG 1600A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class Catalog Number	H-Interrupting Class Catalog Number	L-Interrupting Class Catalog Number	Catalog Number
	FRAME ONLY			
	NPG3F160	HPG3F160	LPG3F160	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			TRIP UNIT ONLY
LCD ELECTRONIC LSI TRIP				
1200	NPG3A120	HPG3A120	LPG3A120	CPT3A120
1600	NPG3A160	HPG3A160	LPG3A160	CPT3A160
LCD ELECTRONIC LSIG TRIP				
1200	NPG3G120	HPG3G120	LPG3G120	CPT3G120
1600	NPG3G160	HPG3G160	LPG3G160	CPT3G160
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
1200	NPG3K120	HPG3K120	LPG3K120	CPT3K120
1600	NPG3K160	HPG3K160	LPG3K160	CPT3K160

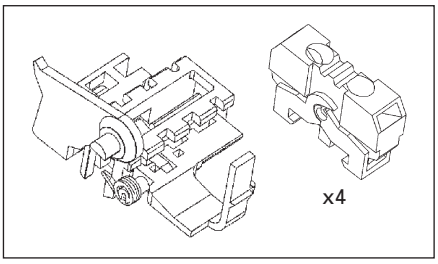
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket①	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 Pocket①	Catalog Number
Up to 4 Auxiliary Switches 2 Aux. + 2 Alarm Switches	Left, Right Left Pocket Only	**AMBP1** **AMBP2**



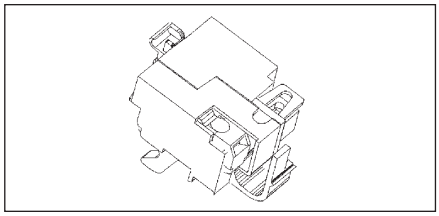
Auxiliary/Alarm Switch Only

Common to DG-PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	**ASWPA**
1 Normally Closed Contact (1B)	**ASWPB**

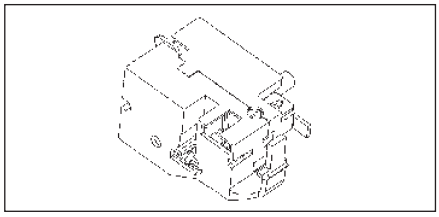
Shunt Trips

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 7-152 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).

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VL 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 Rating①			Self Protective Instantaneous Override
	Catalog Number	Catalog Number	240V	480V	600V	
150A / DG	**HDR2S150L**	**HDR3S150L**	100k	65k	20k	2,500A
250A / FG	**HFR2S250L**	**HFR3S250L**	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 Rating①			Self Protective Instantaneous Override
	Catalog Number	240V	480V	600V	
250A / FG	**LFR3S250L**	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 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 Number①
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	
115-150②	1500	
96-139	1250	HDP3H150L
115-150②	1500	
135-150②	1750	
135-150②	2000	
135-150②	2250	
135-150②	2500	
46-67	600	HFP3L250L
55-80	720	
65-93	840	
74-107	960	
83-120	1080	
92-133	1200	
77-111	1000	HFP3M250L
92-133	1200	
108-156	1400	
123-178	1600	
138-200	1800	
154-222	2000	
135-194	1750	HFP3H250L
162-210	2100	
188-220	2450	
215-241	2800	
242-250②	3150	
242-250②	3500	

Motor Full Load Amperes	Trip Setting (A)	Catalog Number①
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	
308-400②	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.

General

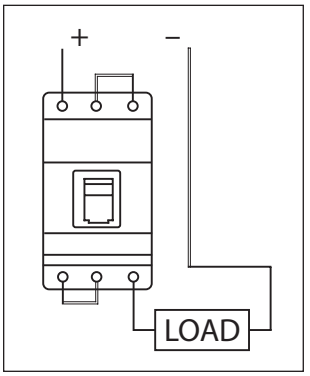
Siemens UL Listed non-interchangeable trip DC Thermal/magnetic Molded Case Circuit Breakers shown below are for use in grounded & ungrounded general DC circuits and ungrounded battery supply circuits of UPS systems. These breakers are rated at 600Vdc closed circuit and feature rated interruption levels 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.

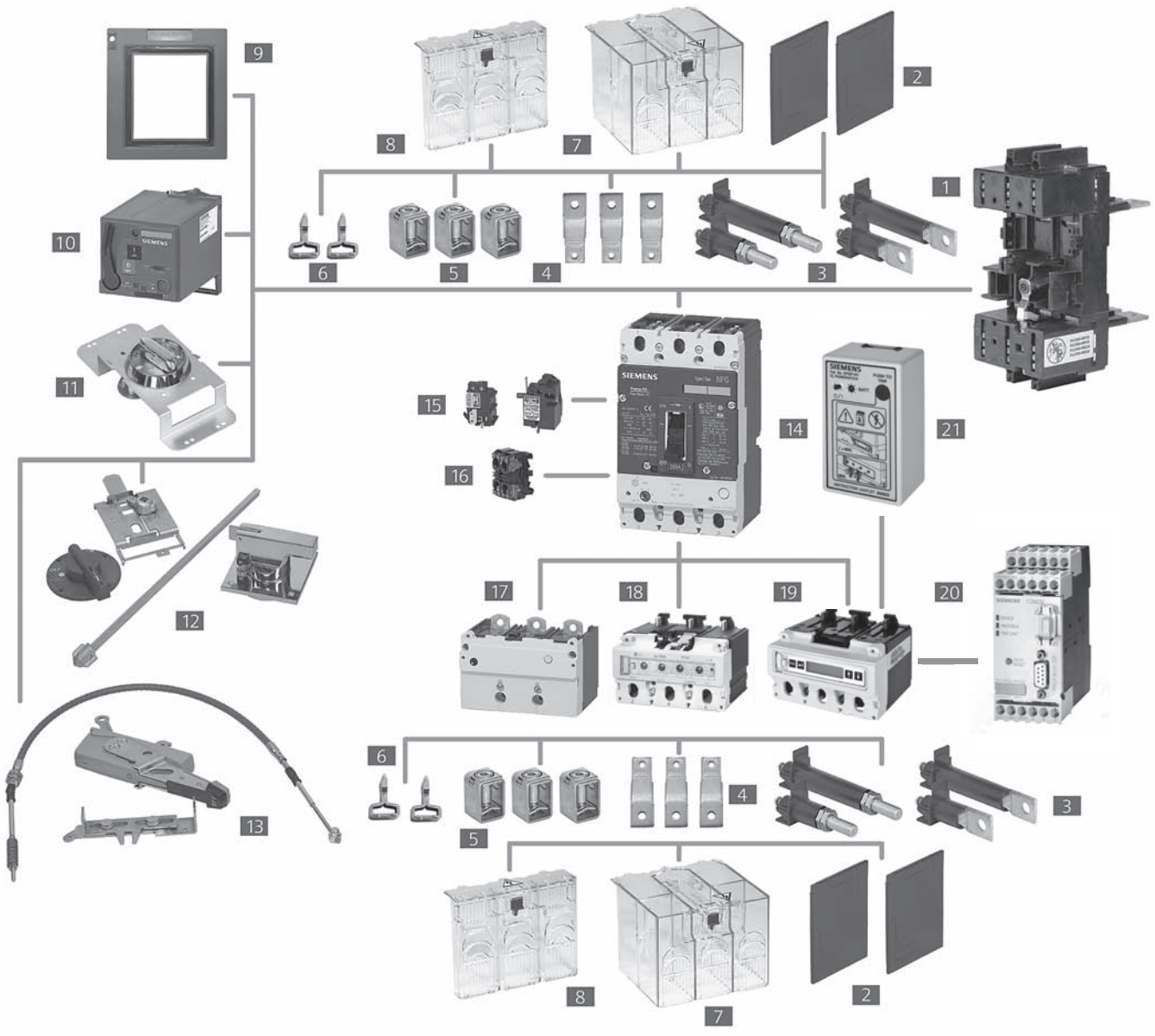
Frame	Type	Continuous Ampere Rating	Catalog Number (3-pole)①	Short-Circuit Current Rating 600VDC②
DG	HDGD	50	**HDC3B050**	42K
		60	**HDC3B060**	42K
		70	**HDC3B070**	42K
		80	**HDC3B080**	42K
		90	**HDC3B090**	42K
		100	**HDC3B100**	42K
		110	**HDC3B110**	42K
		125	**HDC3B125**	42K
		150	**HDC3B150**	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	HPGD	1200	**HPC3B120**	65K
		1400	**HPC3B140**	65K
		1600	**HPC3B160**	65K



① Terminal connectors must be ordered separately; see page 7-146.
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

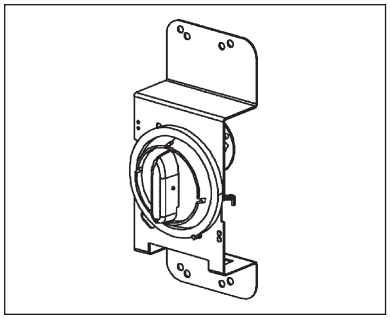
Modules and More: VL Circuit Breakers with Optional Accessories

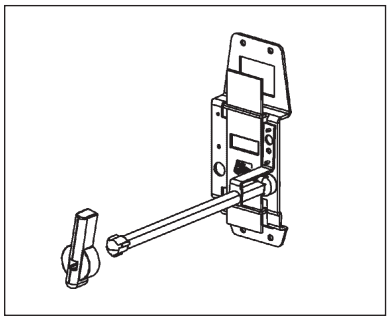


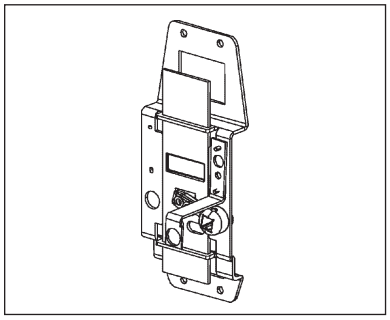
1 Base for Plug-In or Draw-Out
2 Interphase Barriers
3 Rear Terminals – Flat and Round
4 Bus Extensions
5 Terminal Connectors
6 Plug-In Terminal Blades
7 Extended Terminal Shield
8 Standard Terminal Shield
9 Cover Frame for Door Cutout
10 Stored Energy Operator
11 Rotary Handle Operator
12 Variable Depth Rotary Operator
13 Max Flex Operator
14 Circuit Breaker
15 Shunt Trip or Undervoltage Releases
16 Auxiliary/Alarm Switches
17 Thermal Magnetic Trip Unit (525)
18 Electronic Trip Unit (555)
19 Elec. Trip Unit with LCD (586)
20 Communication Module with ZSI
21 Electronic Trip Unit Tester and LCD Power Supply

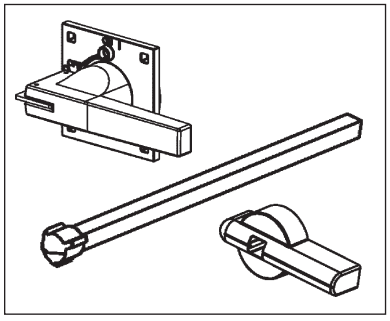
External Accessories

Operating Mechanisms









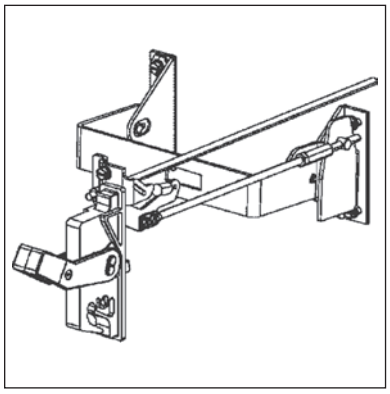
Description	For DG to FG Frame 150 to 250 A Catalog Number	For JG to LG Frame 400 A to 600 A Catalog Number
Through-Door Rotary Handle Operator Kit		
Fixed depth and the handle is mounted directly on the circuit breaker.		
Lockable knob (for up to 3 padlocks).		
NEMA 1, 12	**RHFF**	**RHFL**
Red Handle Version with red knob, yellow indicator plate		
NEMA 1, 12	**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 Kit①		
Includes 1 switch with 5′ wire		
For Door-Mounted Operator	— —	**RHSLA1**
For Through-Door Operator	**RHSFA1F**	**RHSLA1F**
Includes 2 switches with 5′ wire		
For Door-Mounted Operator	— —	**RHSLA2**
For Through-Door Operator	**RHSFA2F**	**RHSLA2F**
Door-Mounted Rotary Operator Mechanism		
Breaker mechanism only	**RHVFBM**	**RHVLBM**
Door-Mounted Rotary Handle Only		
Standard version NEMA 1, 12	**RHVM12H**	**RHVM12H**
NEMA 3R	**RHVM3RH**	**RHVM3RH**
NEMA 4X	**RHVM4XH**	**RHVM4XH**
Red Handle version	**RHVMEMH**	**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)	**RHVMS02**	**RHVMS02**
3 inches (76.2mm)	— —	— —
12 inches (304.8 mm)	**RHVMS12**	**RHVMS12**
16 inches (406.4 mm)	**RHVMS16**	**RHVMS16**
24 inches (609.6mm) w/ support bracket	**RHVMS24**	**RHVMS24**

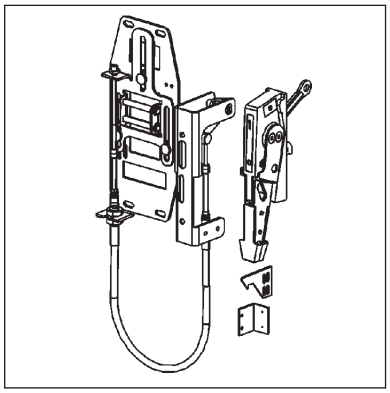
① During manual operation, Early Break auxiliary switch contacts open before the breaker opens.

Description	For MG Frame 800 A Catalog Number		For NG to PG Frame 1200 to 1600 A 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	**RHSMA1**		**RHSPA1**	
For Through-Door Operator	—	—	—	—
Includes 2 switches with 5′ wire				
For Door-Mounted Operator	**RHSMA2**		**RHSPA2**	
For Through-Door Operator	—	—	—	—
Door-Mounted Rotary Operator Mechanism				
Breaker mechanism only	**RHVMBM**		**RHVPBM**	
Door-Mounted Rotary Handle Only				
Standard version NEMA 1, 12	**RHVM12H**		**RHVP3RH**	
NEMA 3R	**RHVM3RH**		**RHVP3RH**	
NEMA 4X	**RHVM4XH**		**RHVP4XH**	
Red Handle version	**RHVMEMH**		**RHVPEMH**	
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)	**RHVMS02**		—	—
3 inches (76.2mm)	—	—	**RHVPS03**	
12 inches (304.8 mm)	**RHVMS12**		**RHVPS12**	
16 inches (406.4 mm)	**RHVMS16**		—	—
24 inches (609.6mm) w/ support bracket	**RHVMS24**		**RHVPS24**	

External Accessories

Operating Mechanisms





Description		For DG and FG Frame 150 to 250 A Catalog Number	For JG and LG Frame 400 to 600 A 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	**FHVF3R**	**FHVL3R**
	NEMA 4X	**FHVF4X**	**FHVL4X**
IEC Black Handle	NEMA 1, 3R, 12	**FHVF3RB**	**FHVL3RB**
	NEMA 4X	**FHVF4XB**	**FHVL4XB**
Max-Flex™, Variable Depth Flange Mounted Operator Kit			
Complete kit, includes plastic handle, breaker operator, and cable.	NEMA 1, 3R, 12	**MFKF3R**	**MFKL3R**
For DG and FG operators, the cable is 36″, all others are 48″			
May be right- or left-hand mounted			
Handle Only, for Max-Flex™ Variable Depth			
NEMA 1, 3R, 12	Plastic	**MFHM3R**	**MFHM3R**
NEMA 1, 3R, 12	Steel - epoxy coated	**MFHM3RS**	**MFHM3RS**
NEMA 4, 4X	Steel - chrome plated	**MFHM4X**	**MFHM4X**
Solid color (all gray) Plastic①			
NEMA 1, 3R, 12		**MFHM3RB**	**MFHM3RB**
Solid color (black handle) Steel epoxy coated①			
NEMA 1, 3R, 12		**MFHM3RSB**	**MFHM3RSB**
Breaker Operator Mechanism Only, for Max-Flex™		**MFMF**	**MFML**
Cable Only, for Max-Flex™ Variable Depth			
36″		**MFCF036**	**MFCM036**
48″		**MFCF048**	**MFCM048**
60″		**MFCF060**	**MFCM060**
72″		**MFCF072**	**MFCM072**
84″		**MFCF084**	**MFCM084**
96″		**MFCF096**	**MFCM096**
120″		**MFCF120**	**MFCM120**
144″		**MFCF144**	**MFCM144**
Handle Auxiliary Switch			
Form C (1NO - 1NC), early break②			
1 Aux. switch		**MFSFA1**	**MFSLA1**
2 Aux. switch		**MFSFA2**	**MFSLA2**

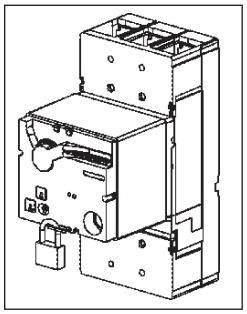
① Max-Flex™ handles are available with solid gray or black handles instead of the customary "Red for On" flange handle. The black handle is preferred for IEC markets, where red handles have a specific meaning.
② During manual operation, Early Break aux. contacts open before the breaker opens.

Description	For MG Frame 800 A Catalog Number	For NG Frame 1200 A Catalog Number	For PG Frame 1600 A 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	**MFKM3R**	**MFKP3RS**	**MFKP3RS**
For DG and FG operators, the cable is 36", all others are 48"			
May be right- or left-hand mounted			
Handle Only, for Max-Flex™ Variable Depth			
NEMA 1, 3R, 12 Plastic	**MFHM3R**	—	—
NEMA 1, 3R, 12 Steel - epoxy coated	**MFHM3RS**	**MFHP3RS**	**MFHP3RS**
NEMA 4, 4X Steel - chrome plated	**MFHM4X**	**MFHP4X**	**MFHP4X**
Solid color (all gray) Plastic①			
NEMA 1, 3R, 12	**MFHM3RB**	—	—
Solid color (black handle) Steel epoxy coated①			
NEMA 1, 3R, 12	**MFHM3RSB**	**MFHP3RSB**	**MFHP3RSB**
Breaker Operator Mechanism Only, for Max-Flex™	**MFMM**	**MFMP**	**MFMP**
Cable Only, for Max-Flex™ Variable Depth			
36"	**MFCM036**	—	—
48"	**MFCM048**	**MFCP048**	**MFCP048**
60"	**MFCM060**	**MFCP060**	**MFCP060**
72"	**MFCM072**	**MFCP072**	**MFCP072**
84"	**MFCM084**	**MFCP084**	**MFCP084**
96"	**MFCM096**	**MFCP096**	**MFCP096**
120"	**MFCM120**	**MFCP120**	**MFCP120**
144"	**MFCM144**	**MFCP144**	**MFCP144**
Handle Auxiliary Switch			
Form C (1NO - 1NC), early break②			
1 Aux. switch	**MFSPA1**	**MFSPA1**	**MFSPA1**
2 Aux. switch	**MFSPA2**	**MFSPA2**	**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.

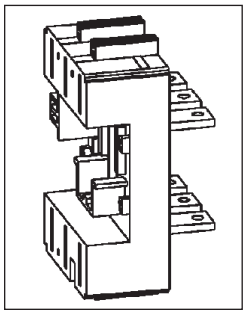
External Accessories

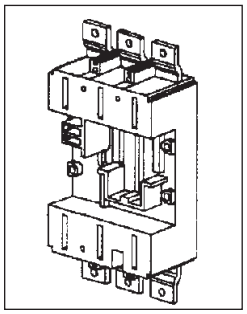
Operating Mechanisms

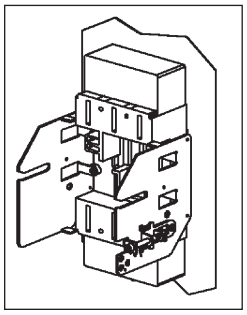


Description	For DG to FG Frame 150 to 250 A Catalog Number
Stored Energy and Motor Operators	
Lockable with up to 3 padlocks.	
AC Voltage / DC Voltage	Stored Energy Type
— / 24	**SEAFB**
42-48 / 42-48	**SEAFM**
60 / 60	**SEAFY**
110–127 / 110–127	**SEAFN**
220–250 / 220–250	**SEAFR**
Cylinder Locks for Field Installation	**CLKF**

Plug-In and Draw-Out Bases







Description	For DG Frame 150 A Catalog Number	For FG Frame 250 A 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	**PCBDRC3**	**PCBFRC3**
Front Connected		
3-pole	**PCBDFC3**	**PCBFFC3**
Draw-out Assembly		
Includes base, position indicator switch, socket, base trip interlock, crank handle, connectors, and necessary shields.		
Rear Connected		
3-pole	**DCADRC3**	**DCAFRC3**
Front Connected		
3-pole	**DCADFC3**	**DCAFFC3**
(Draw-out assembly includes side plates and all hardware)		
Hex Wrench for racking draw-out assembly and position indicator	**DCHP**	**DCHP**
Position Indicator Switch	**DCIP**	**DCIP**
Form "C" switch to indicate breaker engaged/de-engaged position.①		
Secondary Terminal Block Assy.	**PCTF83**	**PCTF83**
Accessory connections for plug-in or draw-out breakers. Pre-wired plug and block with 8 terminal points.②		
Plug-In Spare Breaker Kit	**PCXD3**	**PCXF3**
Set of 6 terminal blades, 2 terminal shield, & 1 trip interlock		
Draw-out Spare Breaker Kit	**DCXD3**	**DCXF3**
Set of 6 terminal blades, & 1 trip interlock		
Spare Breaker Trip Interlock	**PCXFT**	**PCXFT**

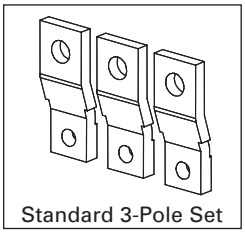
① Up to 2 position indicator switches may be mounted per plug-in or draw-out base.
② Up to 2 plugs per breaker (16 terminal points) may be mounted on DG, and FG breakers. Up to 3 plugs per breaker (24 terminal points) may be mounted on JG, LG, MG, NG, and PG breakers.

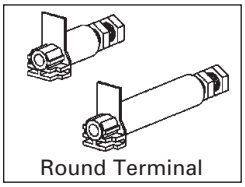
For JG to LG Frame 400 to 600 A	For MG Frame 800 A	For NG to PG Frame 1200 to 1600 A
Catalog Number	**Catalog Number**	**Catalog Number**
Stored Energy Type	Stored Energy Type	Motor Operator Type
SEALB	**SEAMB**	**MTRPB**
SEALM	**SEAMM**	**MTRPM**
SEALY	**SEAMY**	**MTRPY**
SEALN	**SEAMN**	**MTRPN**
SEALR	**SEAMR**	**MTRPR**
CLKP	**CLKP**	**CLKP**

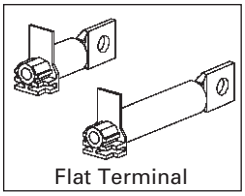
For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	**Catalog Number**	**Catalog Number**	**Catalog Number**	**Catalog Number**
PCBJRC3	**PCBLRC3**	**PCBMRC3**	**PCBNRC3**	—
PCBJFC3	**PCBLFC3**	—	—	—
DCAJRC3	**DCALRC3**	**DCAMRC3**	**DCANRC3**	—
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**	—

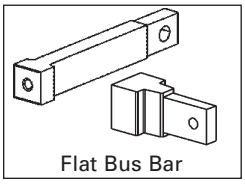
External Accessories

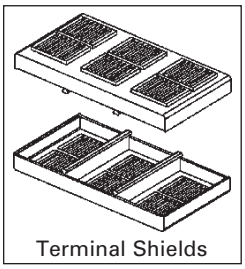
Connections

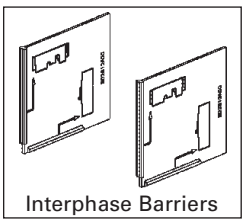

Standard 3-Pole Set


Round Terminal


Flat Terminal


Flat Bus Bar


Terminal Shields

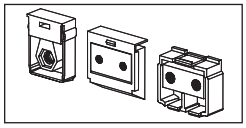
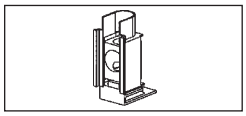
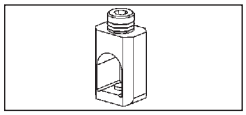
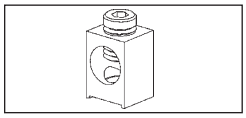
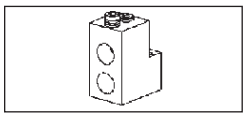
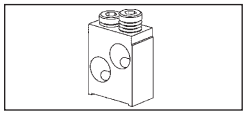
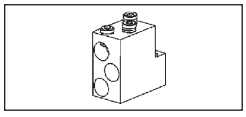
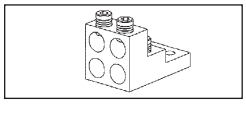
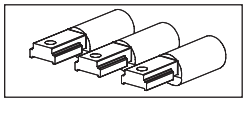
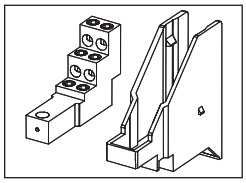

Interphase Barriers

Description	For DG Frame 150 A Catalog Number	For FG Frame 250 A Catalog Number
Front Bus Bar Connections		
Includes nut keeper plates and shield.		
Standard (straight)		
3-Pole Set	**FBCD3**	**FBCF3**
Bus Bar Connection Strap Kit	—	—
Includes 6 - Bus Bars, 6 Nut Keepers & Shields	—	—
100% rated applications		
Rear-Connecting Studs		
Short length round term. (1piece)	**RTLDSR**	**RTLFSR**
Long length round term. (1piece)	**RTLDLR**	**RTLFLR**
3-Pole round term. kit, 2 short + 1 long	**SRTDR3**	**SRTFR3**
Short length flat term. (1piece)	**RTLDSF**	**RTLFSF**
Long length flat term. (1piece)	**RTLDLF**	**RTLFLF**
3-Pole flat term. kit, 2 short + 1 long	**SRTDF3**	**SRTFF3**
Flat bus bar type (1 piece)	—	—
3-Pole set of flat bus bar	—	—
Terminal Shields		
Includes 2 terminal shields.		
3-Pole Standard Shield	**TSSF3**	**TSSF3**
3-Pole Extended Shield	**TSLF3**	**TSLF3**
Interphase Barriers		
Set of 2 barriers	**IPBF**	**IPBF**
Also fits plug-in and draw-out bases.		
Lug Mounting Assy.	—	—
Breaker Mounting Base		
Front connected	—	—
Rear connected	—	—

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 SRTLF3	— — — — — — RTLMSF SRTMF3	— — — — — — RTLNSF SRTNF3	— — — — — — — —
TSSL3 TSLL3	TSSL3① TSLL3①	TSSM3 TSLM3	TSSP3 TSLP3	TSSP3 TSLP3
IPBM	IPBM	IPBM	IPBP	IPBP
—	—	—	—	LMAP1600②
— —	— —	— —	— —	MBPG1600 MBPG1601

① Not for use with standard Al 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.

Description	For DG Frame 150 A Catalog Number	For FG Frame 250 A 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** *Steel Wrap Around Body (Cu Wire Only)* 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 Kit of 3	 #6-3/0; 1-hole **TA1DG30** — **3TA1DG30**	 #4-350 kcmil; 1-hole **TAW1FG350** — **3TAW1FG350**
 Cable Size; (cables per phase) Single Lug Kit of 2 Kit of 3	 — — — —	 — — — —
 Cable Size; (cables per phase) Single Lug Cable Size; (cables per phase) Single Lug	 — — — —	 — — — —
 *Copper Body (Cu Wire Only)* Cable Size; (cables per phase) Single Lug Kit of 2 Kit of 3	 #6-3/0; 1-hole **TC1DG30**① — **3TC1DG30**①	 #4-350 kcmil; 1-hole **TCW1FG350**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 representaions only.

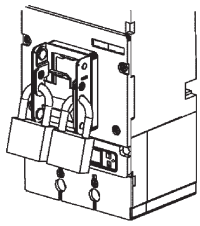
① Required for 100% rated breakers. Requires 90°C cable sized at 75°C ampacity.

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** *metric only*	**TNKL** **TNKL3**	**TNKM** **TNKM3**	**TNKP** **TNKP3**	**TNKP** **TNKP3**
1/0-600 kcmil; 1-hole **TW1JG600** **3TW1JG600**	— — —	— — —	— — —	— — —
3/0-250 kcmil; 2-hole **TA2JG250** — **3TA2JG250**	#2-600 kcmil; 2-hole — — — **3TA2LG600LD**① **3TA2LG600LN**②	1/0-500 kcmil, 3-hole **TA3MG500** **3TA3MG500**	1/0-500 kcmil; 4-hole — **2TA4NG500** **3TA4NG500** **3TA4NG500H**③	1/0-750 kcmil; 6-hole — — **3TA6PG750**⑤
AL: 250-750 kcmil CU: 3/0-600 kcmil; 1-hole **TA1JG750** — **3TA1JG750** — — — —	AL: 250-750 kcmil CU: 3/0-600 kcmil; 1-hole **TA1JG750** (400A max) — **3TA1JG750** (400A max) — — — —	500 -750 kcmil; 2-hole **TA2MG750** — **3TA2MG750** #2-600 kcmil; 3-hole — **3TA3MG600**④ (Kit of 3)	500 -750 kcmil; 3-hole — **2TA3NG750** **3TA3NG750** — —	600-750 kcmil; 4-hole **TA4P750**⑥ — 300-600 kcmil; 5; 6-hole **TA5P600**⑥ **TA6R600**⑥ —
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**③⑥
#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**	— —

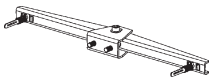
All lug kits include the nut keepers.
① Mounted on Load Side Only.
② Mounted on Line Side Only.
③ Required for 100% rated breakers. Requires 90°C cable sized at 75°C ampacity.
④ Requires extended modified shield.
⑤ Used only with LMAP1600 mounting base.
⑥ Used only with MBPG1600 or MBPG1601 mounting base.

External Accessories

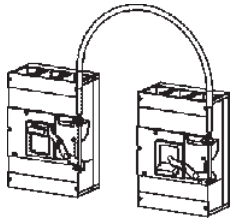
General



Handle Padlocking Device



Walking-Beam Interlock Mechanism



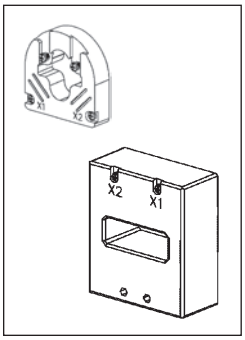
Cable Interlock System

Description	For DG Frame 150 A Catalog Number	For FG Frame 250 A 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 Note: Both breakers must be of the same frame size.	**WBMFFM**	**WBMFFM**
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. **Interlock Cable** Cable only, to connect 2 circuit breakers.	**CBTF**	**CBTF**
Cable length 18 in. .46m (recommended up to 250A)	**CBCF18**	**CBCF18**
Cable length 36 in. .91m (recommended from 400–800A)	**CBCM36**	**CBCM36**
Cable length 54 in. 1.37m (recommended from 1200–1600A)	**CBCP54**	**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)	**MSKF2**	**MSKF2**
Kit with 4 screws (SAE thread)	**MSKF4**	**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**

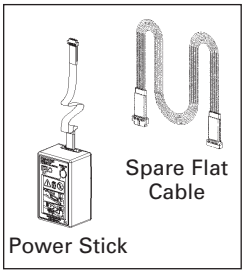
For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
HPLL	HPLL	HPLM	HPLP	HPLP
HBDL	HBDL	HBDM	HBDP	HBDP
WBMLFM	WBMLFM	WBMMFM	WBMPFM	WBMPFM
CBTL	CBTL	CBTM	CBTP	CBTP
—	—	—	—	—
CBCM36	CBCM36	CBCM36	—	—
CBCP54	CBCP54	CBCP54	CBCP54	CBCP54
—	—	—	—	—
MSKL4	MSKL4	MSKM4	MSKP4	MSKP4
TSCLTM	TSCLTM	TSCMTM	—	—

External Accessories

Ground Sensors & Electronic Accessories



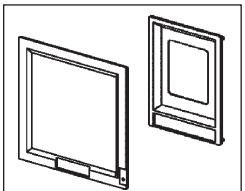
Description	For DG Frame 150 A Catalog Number	For FG Frame 250 A Catalog Number
Neutral Current Transformer (Ground Sensor, N-pole)		
Neutral = 35/60A	**NGSD060**	—
Neutral = 100A	**NGSF100**	**NGSF100**
Neutral = 150A	**NGSF150**	**NGSF150**
Neutral = 250A	—	**NGSJ250**
Neutral = 400A	—	—
Neutral = 600A	—	—
Neutral = 800A	—	—
Neutral = 1000/1200A	—	—
Neutral = 1600A	—	—



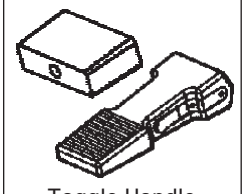
Communications & Electronics		
Power Stick - Hand held, battery operated power supply for LCD trip units. (Requires two 9V batteries.) Trip testing for both 555 & 586 trip units.	**EPSP18V**	**EPSP18V**
Spare flat cable for Power Stick.	**COMPCA**	**COMPCA**
COM20 Profibus Communications Module with ZSI for electronic trip units (order cable separately)	**COMPRO20**	**COMPRO20**
COM21 Modbus Communications Module with ZSI for electronic trip units (order cable separately)	**COMMOD21**	**COMMOD21**
Cable for COM20/21, 1.5 m (4.9 ft)	**COMKIT3**	**COMKIT3**
Cable for COM20/21, 3.0 m (9.8 ft)	**COMKIT6**	**COMKIT6**
Addressing Plug - assigns a field bus address without a PC by plugging into COM20/21	**3UF79100AA000**	**3UF79100AA000**



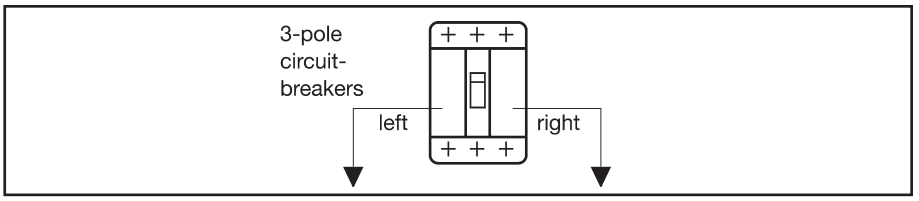
Door Cutouts & Extensions



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.)	—	—



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



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 Swich	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 Swiches	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.

Suffix for factory mounted Switch Combinations

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	RB	**STRLB24DC**
	48-60V DC	RC	**STRLC60DC**
	110-127V DC	RD	**STRLD125DC**
	220-250V DC	RE	**STRLE250DC**
	48-60V AC	RM	**STRLM60**
	110-127V AC	RN	**STRLN120**
	208-277V AC	RS	**STRLS277**
	380-600V AC	RV	**STRLV600**
MG, NG or PG	24V DC	RB	**STRPB24DC**
	48-60V DC	RC	**STRPC60DC**
	110-127V DC	RD	**STRPD125DC**
	220-250V DC	RE	**STRPE250DC**
	48-60V AC	RM	**STRPM60**
	110-127V AC	RN	**STRPN120**
	208-277V AC	RS	**STRPS277**
	380-600V AC	RV	**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	UA	**UVRLA12DC**
	24V DC	UB	**UVRLB24DC**
	48V DC	UC	**UVRLC48DC**
	60V DC	UG	**UVRLG60DC**
	110-127V DC	UD	**UVRLD125DC**
	220-250V DC	UE	**UVRLE250DC**
	24V AC	UL	**UVRLL24**
	110-127V AC	UN	**UVRLN120**
	220-240V AC	UR	**UVRLR240**
	208V AC	UP	**UVRLP208**
	277V AC	US	**UVRLS277**
	380-415V AC	UT	**UVRLT415**
	440-480V AC	UU	**UVRLU480**
MG, NG or PG	12V DC	UA	**UVRPA12DC**
	24V DC	UB	**UVRPB24DC**
	48V DC	UC	**UVRPC48DC**
	60V DC	UG	**UVRPG60DC**
	110-127V DC	UD	**UVRPD125DC**
	220-250V DC	UE	**UVRPE250DC**
	110-127V AC	UN	**UVRPN120**
	220-240V AC	UR	**UVRPR240**
	208V AC	UP	**UVRPP208**
	277V AC	US	**UVRPS277**
	380-415V AC	UT	**UVRPT415**
	440-480V AC	UU	**UVRPU480**

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		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 in series / 3 current paths 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.

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		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							

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: 25° C (77° F)	50°C (122° F)	60° C (140° F)	Siemens Breaker Frames
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	FG
200	220	182	160	
225	247	205	180	
250	275	235	220	JG
300	330	276	252	
350	385	325	301	
400	440	372	340	
500	550	468	435	LG
600	660	564	525	
700	770	658	613	MG
800	880	754	704	
900	990	828	749	NG
1000	1100	900	825	
1200	1320	1090	1000	
1400	1540	1304	1148	PG
1600	1760	1500	1320	

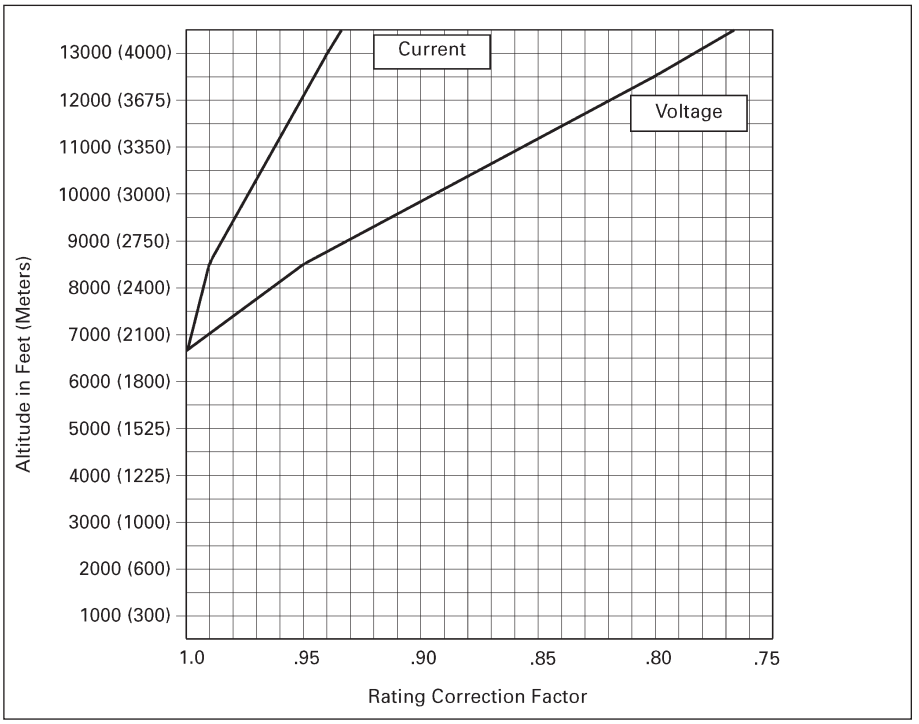


Figure 1 – Altitude adjustment

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			
	Open air	Open air③	Enclosed after derating	No of pieces	Wire size
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
	150	125	100	1	#1/0
FG	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
	250	200	160	1	250 kcmil
JG	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
	400	300	240	2	#2/0
JG 100% Rated	250	210	210	1	250 kcmil
	300	240	240	1	350 kcmil
	350	260	260	1	500 kcmil
	400	300	300	2	#3/0
LG	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			
	Open air	Open air③	Enclosed after derating	No of pieces	Wire size
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.

Molded Case Circuit Breakers

Series Connected Short Circuit Ratings

General

The term "Series Connected Short Circuit Rating" refers to the application of series circuit breakers in a combination that allows downstream breakers to have lower individual interrupting ratings than the available fault current.

This is permitted as long as the series combination has been tested and certified by UL.

The tables on these pages list specific main and branch breaker combinations that may be used for the short circuit interrupting ratings shown.

No substitutions are permitted. All combinations shown have been tested and are UL Listed. This information is provided as a reference tool only. **For verification of specific combination ratings consult the UL Recognized Components Directory**.

240V Series Ratings

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
22,000	QPH, BQH, BLH	70 (1P) 125 (2P) 100 (3P)	QP, BQ, BL	1	120/240	15–70
				2	240	15–125
				3	240	15–100
			QE, BLE, QPF, BLF, QAF, BAF	2	120/240	15–60
			QE, BLE, BE, QPF, BQF, BLF, QAF, BAF	1	120	15–30
			QT	1, 2	120/240	15–40
			QG, BG	1, 2	120/240	15–30
	QPPH	225 (2P)	QP, BQ, BL	1	120/240	15–70
				2	120/240	15–125
			QE, BLE, BE, QPF, BQF, BLF, QAF, BAF	1	120	15–30
			QE, BLE, BE, QPF, BLF, QAF, BAF	2	120/240	15–60
			QPP	2	120/240	125–200
			QT	1, 2	120/240	15–40
	QPMH	200 (2P)	QP	1	120/240	15–25
					120/240	35–70
				2	120/240	15–25
					120/240	35–125
			QE, QPF, QAF, BAF	1	120	15–30
				2	120/240	15–60
			QT	2	120/240	15–30
	QJH2	225 (2 & 3P)	QP, BQ, BL	1	120/240	15–70
				2	240	15–125
				3	240	60–100
			QPF, BQF, BLF, BG, BLG, QE, BE, BLE, QAF, BAF	1	120	15–30
			QPF, BLF, BG, BLG, QE, BE, BLE, QAF, BAF	2	120/240	15–60
			QT	1, 2	120/240	15, 20, 40
42,000	QJ2H	225 (2 & 3P)	QP, BQ, BL	1	120/240	15–70
				2	120/240	15–125
				3	240	60–100
			QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QJH2	2, 3	240	60–225
65,000	HQP, HBQ, HBL	70 (1P) 125 (2P) 100 (3P)	QP, BQ, BL, QPH, BQH, BLH	1	120/240	15–70
				2	240	15–125
				3	240	15–100
			QPF, BQF, BLF, BE, QPHF, BQHF, BLHF, QEH, BLEH, QE, BLE, QAFH, BAFH, QAF, BAF	1	120	15–30
			QEH, BLEH, QE, QPHF, BLHF, BLE, QPF, BLF, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			QT	1, 2	120/240	15–40
			QG, BG	1, 2	120/240	15–30
	HQPP	225 (2P)	QP, BQ, BL, QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
			QPF, BQF, BLF, QPHF, BQHF, BLHF, QEH, BLEH, QE, BLE, BE, QAFH, BAFH, QAF, BAF	1	120/240	15–30
			QEH, BLEH, QE, QPHF, BLHF, BLE, QPF, BLF, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			QT	1, 2	120	15–40
			QPPH, QPP	2	120/240	125–200
	ED4, ED6	100 (1P) 125 (2 & 3P)	QP, BQ, BL, QPH, BQH, BLH	1	120/240	15–70
				2	240	15–125
				3	240	15–100

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
65,000 (Continued)	ED4, ED6 (Cont.)		QPHF, BQHF, BLHF, QPF, BQF, BLF, QE, QEH, BLEH, BE, BLE, QAFH, BAFH, QAF, BAF	1	120	15–30
			QEH, BLEH, QE, QPHF, BLHF, BLE, QPF, BLF, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			ED2	1, 2, 3	120/240	15–100
			QT	1, 2	120/240	15–40
	FD6-A, FXD6-A	250 (2 & 3P)	QP, BQ, BL, QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QPF, QPHF, BLF, BLHF, QAF, QAFH, BAF, BAFH	1, 2	120/240	15–60
			QJ2H, QJ2, QJH2	2, 3	240	60–225
			QPPH	2	120/240	125–225
	JXD2-A, JD6-A, JXD6-A, LD6-A, LXD6-A	600 (2 & 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QJ2H, QJH2	2, 3	240	60–225
	HJD6-A, HJXD6-A, HLD6-A, HLXD6-A, HMD6, HMXD6, HND6, HNXD6, HPD6, HPXD6, HRD6, HRXD6	2000 (2 & 3P)	QPH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
	SJD6-A, SLD6-A, SMD6, SND6, SPD6	1600 (2 & 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
	MD6, MXD6, ND6, NXD6, PD6, PXD6, RD6, RXD6	2000 (2 & 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
	NDGA	50–150 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
	NFGA	70–250 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
	NJGA / NJJA	200–400 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QN, QNH	2	120/240	150–200
			QNR, QNRH	2	120/240	150–200
	NLGA	400–600 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QN, QNH	2	120/240	150–200
			QNR, QNRH	2	120/240	150–200
	NMG	600–800 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QN, QNH	2	120/240	150–200
			QNR, QNRH	2	120/240	150–200
	NNG	800–1200 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QN, QNH	2	120/240	150–200
			QNR, QNRH	2	120/240	150–200
	NPG	1200–1600 (2P, 3P)	QPH, BQH, BLH	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QN, QNH	2	120/240	150–200
			QNR, QNRH	2	120/240	150–200

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000	HED4, HED6	125 (2 & 3P)	QP, BQ, BL, QPH, BQH, BLH, HQP, HBQ, HBL	1	120/240	15–70
				2	240	15–125
				3	240	15–100
			QEH, BLEH, QE, BE, QPHF, BQHF, BLHF, QPF, BLF, BQF, BLE, QAFH, BAFH, QAF, BAF	1	120	15–30
			QEH, BLEH, QPHF, QE, BLHF, QPF, BLF, BLE, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			ED2	1, 2, 3	120/240	15–100
			ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			QT	1, 2	120/240	15–40
	HED4	100 (1P)	ED2, ED4	1	120	15–100
	HQPPH	225 (2P)	QP, BQ, BL, QPH, BQH, BLH, HQP, HBQ, HBL	1	120/240	15–70
				2	120/240	15–125
			HQPP, QPPH, QPP	2	120/240	125–225
			QEH, BLEH, QE, BE, QPHF, BQHF, BLHF, QPF, BQF, BLF, BLE, QAFH, BAFH, QAF, BAF	1	120	15–30
			QE, QEH, BLEH, QPHF, BLHF, QPF, BLF, BLE, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			QT	1, 2	120/240	15–40
	HQJ2H	225 (2 & 3P)	QP, BQ, BL	1	120/240	15–25
						35–70
				2	120/240	15–25
						35–125
				3	240	15–100
			QPH, BQH, BLH, HQP, HBQ, HBL	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QEH, BLEH, QE, BE, QPHF, BQHF, BLHF, QPF, BQF, BLF, BLE, QAFH, BAFH, QAF, BAF	1	120	15–30
			QEH, BLEH, QPHF, BLE, BLHF, QE, QPF, BLF, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			QT	1	120/240	15–50
	HFD6, HFXD6	250 (2 & 3P)	QP, BQ, BL, QPH, BQH, BLH, HQP, HBQ, HBL	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QE, BE, BLE, QPHF, BQHF, BLHF, QPF, BQF, BLF, QEH, BLEH, BAF, QAFH, BAFH, QAF	1	120	15–30
			QPF, BLF, BLE, BLEH, QPHF, BLHF, QEH, QE, QAFH, BAFH, QAF, BAF	2	120/240	15–60
			ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3	240	70–250
			QJ2, QJH2, QJ2H	2, 3	240	60–225
			HQPP, QPPH, QPP	2	120/240	125–225
			QT	1, 2	120/240	15–40
	HJD6-A, HJXD6-A, SHJD6-A	400 (2 & 3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
	HLD6-A	600 (2 & 3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000 (Continued)	HLD6-A (Cont.)	600 (2 & 3P) (Cont.)	JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3	240	200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
	HLXD6-A	600 (2 & 3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
	SHLD6-A	600 (3P)	ED4	1	120	15–100
			ED4, ED6	2,3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
	HMD6, HMXD6	800 (2 & 3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
			MD6, MXD6, SMD6	2,3		500–800
	SHMD6	800 (3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
			MD6, MXD6, SMD6	2, 3		500–800
	HND6, HNXD6, SHND6	1200 (2 & 3P)	ED4	1	240	15–100
			ED4, ED6	2, 3		15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
			MD6, MXD6, SMD6	2, 3		500–800
			ND6, NXD6, SND6	2, 3		500–1200
	HPD6, HPXD6, SHPD	1600 (3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
			MD6, MXD6, SMD6	2, 3		500–800
			ND6, NXD6, SND6	2, 3		500–1200
			PD6, PXD6, SPD6	2, 3		1200–1600
	HRD6, HRXD6	2000 (3P)	ED4	1	120	15–100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A	2, 3		70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		300–600
			MD6, MXD6, SMD6	2, 3		500–800
			ND6, NXD6, SND6	2, 3		500–1200
			PD6, PXD6, SPD6	2, 3		1200–1600
			RD6, RXD6	2, 3		1600–2000

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000	NGB	15–125 (1P, 2P, 3P)	QAF, BQAF, BAF	1	120	15–20
			QAFH, BQAFH			
			BAFH			
			QPF, BQF, BLF	1	120	15–30
			QPHF. BQHF			
			BLHF			
			QPF, BLF	2	120/240	15–60
	NGB	15–125 (2P, 3P)	QP,BQ,BL,QPH BQH,BLH,HQP HBQ,HBL	1	120	15–70
			QP,BQ,BL,QPH BQH,BLH,HQP HBQ,HBL	2	120/240	15–125
			QP,BQ,BL,QPH BQH,BLH,HQP HBQ,HBL	3	240	15–100
	HDGA	50–150 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3		50–150
	HFGA	70–250 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3	240	50–150
			NFGA			70–250
			FD6, FXD6			70–250
			FD6-A, FXD6-A			70–250
	HFD6, HFXD6	70–250 (2P, 3P)	NDGA	2–3	240	50–150
			NFGA			70–250
	HJGA	250–400 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3		50–150
			NFGA			70–250
			FD6, FXD6			70–250
			FD6-A, FXD6-A			70–250
			NJGA, NJJA			200–400
			JD6, JXD6			200–400
			JD6-A, JXD6-A			200–400
	HJD6, HJD6-A, HJXD6, HJXD6-A	200–400 (2P, 3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
	SHJD6, SHJD6-A	200–400 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
	HLGA	400–600 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3		50–150
			NFGA			70–250
			FD6, FXD6			70–250
			FD6-A, FXD6-A			70–250
			NJGA, NJJA			200–400
			JD6, JXD6			200–400
			JD6-A, JXD6-A			200–400
			NLGA			400–600
			LD6, LD6-A			200–600
			LXD6, LXD6-A			450–600
	HLD6, HLD6-A	200–600 (2P, 3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
	HLXD6, HLXD6-A	450–600 (2P, 3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000	SHLD6, SHLD6-A	300–600 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
	HMG	600–800 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3		50–150
			NFGA			70–250
			FD6, FXD6			70–250
			FD6-A, FXD6-A			70–250
			NJGA, NJJA			200–400
			JD6, JXD6			200–400
			JD6-A, JXD6-A			200–400
			NLGA			400–600
			LD6, LD6-A			200–600
			LXD6, LXD6-A			450–600
			NMG			600–800
			LMD6, LMXD6			600–800
			MD6, MXD6			400–800
	HMD6, HMXD6	500–800 (2–3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			500–800
	SHMD6	500–800 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			500–800
	HNG	800–1200 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3		50–150
			NFGA			70–250
			FD6, FXD6			70–250
			FD6-A, FXD6-A			70–250
			NJGA, NJJA			200–400
			JD6, JXD6			200–400
			JD6-A, JXD6-A			200–400
			NLGA			400–600
			LD6, LD6-A			200–600
			LXD6, LXD6-A			450–600
			NMG			600–800
			LMD6, LMXD6			600–800
			NNG			800–1200
			ND6, NXD6			600–1200
	HND6, HNXD6	800–1200 (2P, 3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			500–800
			NNG			800–1200
	SHND6	500–1200 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			500–800
			NNG			800–1200

240V Series Ratings

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000	HPG	1200–1600 (2P, 3P)	ED4, ED6	1	240	15–100
				2		15–125
				3		15–125
			NDGA	2–3		50–150
			NFGA			70–250
			FD6, FXD6			70–250
			FD6-A, FXD6-A			70–250
			NJGA, NJJA			200–400
			JD6, JXD6			200–400
			JD6-A, JXD6-A			200–400
			NLGA			400–600
			LD6, LD6-A			200–600
			LXD6, LXD6-A			450–600
			NMG			600–800
			LMD6, LMXD6			600–800
			MD6, MXD6			400–800
			NNG			800–1200
			ND6, NXD6			600–1200
			NPG			1200–1600
			PD6, PXD6			1200–1600
	HPD6, HPXD6	1200–1600 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600
	SHPD6	1200–1600 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600
	HRD6, HRXD6	1600–2000 (3P)	NDGA	2–3	240	50–150
			NFGA			70–250
			NJGA, NJJA			200–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600
200,000	CED6	125 (2 & 3P)	QP, BQ, BL, QPH, BQH, BLH, HQP, HBQ, HBL	1	120/240	15–70
				2	120/240	15–125
				3	240	15–100
			QPHF, BQHF, BLHF, QPF, BQF, BLF, QEH, QE, BE, BLEH, QAFH, BLE, BAFH, QAF, BAF	1	120	15–30
			QEH, BLEH, QAFH, QE, QPHF, BLHF, QPF, BLE, BLF, BAFH, QAF, BAF	2	120/240	15–60
			ED4, HED4	1	120	15–100
			ED4, ED6, HED4, HED6	2, 3	240	15–125
			QT	1, 2	120/240	15–40
	CFD6	250 (2 & 3P)	QP, BQ, BL, QPH, BQH, BLH, HQP, HBQ, HBL	1	120	15–70
				2	120/240	15–125
				3	240	15–100
			QPHF, BQHF, BLHF, QE, BE, BLE, QPF, BQF, BLF, QEH, BLEH, QAF, BAF	1	120	15–30
			QPHF, BLHF, QE, BLE, QPF, BLF, QEH, BLEH, QAF, BAF	2	120/240	15–60
			ED2	1, 2, 3	120/240	15–100
			HED4, ED4	1	120	15–100
			ED4, ED6, HED4, HED6	2, 3	240	15–125
			FD6-A, FXD6-A, HFD6, HFXD6	2, 3	240	70–250
			QJ2H, QJH2, QJ2	2, 3	240	60–225
			QPPH, QPP	2	120/240	125–225
			QT	1, 2	120/240	15–40

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
200,000	HHJD6, HHJXD6, HHLD6, HHLXD6	600 (2 & 3P)	FD6-A, FXD6-A, HFD6, HFXD6	2, 3	240	70–250
	CJD6-A	400 (2 & 3P)	QPH, BQH, BLH, HQP, HBQ, HBL	2	120/240	100–125
				3	240	100
			ED4, ED6	2, 3	240	15–125
			FD6-A, FXD6-A, HFD6, HFXD6	2, 3	240	70–250
			JXD2-A, JD6-A, JXD6-A, HJD6-A, HJXD6-A	2, 3	240	200–400
			QT	1, 2	120/240	15–30
	CLD6-A	600 (2 & 3P)	QPH, BQH, BLH, HQP, HBQ, HBL	2	120/240	100–125
				3	240	100
			ED4, ED6	2, 3	240	15–25
			FD6-A, FXD6-A, HFD6, HFXD6	2, 3	240	70–250
			JXD2-A, JD6-A, JXD6-A, HJD6-A, HJXD6-A	2, 3	240	200–400
			LD6-A, HLD6-A	2, 3	240	200–600
			LXD6-A, HJXD6-A	2, 3	240	450–600
			QT	1, 2	120/240	15–30
	CMD6	800 (2 & 3P)	ED4, ED6	1	240	15
			ED4, ED6, HED4, HED6	2, 3		15–125
			FD6-A, FXD6-A, HFD6, HFXD6	2, 3		70–250
			JXD2-A, JD6-A, JXD6-A, HJD6-A, HJXD6-A	2, 3		200–400
			LD6-A, HLD6-A	2, 3		200–600
			LXD6-A, HLXD6-A	2, 3		450–600
			MD6, MXD6, HMD6, HMXD6	2, 3		500–800
	SCMD6-A	800 (3P)	MD6, MXD6, HMD6, HMXD6	2, 3	240	500–800
	CND6-A	1200 (2 & 3P)	ED4, ED6	1	240	15
			ED4, ED6, HED4, HED6	2, 3		15–125
			FD6-A, FXD6-A, HFD6, HFXD6	2, 3		70–250
			JXD2-A, JD6-A, JXD6-A, HJD6-A, HJXD6-A	2, 3		200–400
			LD6-A, HLD6-A	2, 3		200–600
			LXD6-A, HLXD6-A	2, 3		450–600
			MD6, MXD6, HMD6, HMXD6	2, 3		500–800
			ND6, NXD6, SND6, HND6, HNXD6	2, 3		500–1200
	SCND6-A	1200 (3P)	MD6, HMD6, HMXD6, MXD6, SHMD6, SMD6	2, 3	240	500–800
			ND6, HND6, SHND6, NXD6, HNXD6, SND6	2, 3		500–1200
	CPD6	1600 (3P)	FD6-A, FXD6-A, HFD6, HFXD6	2, 3	240	70–250
			JXD2-A, JD6-A, JXD6-A, HJD6-A, HJXD6-A	2, 3		200–400
			LD6-A, HLD6-A	2, 3		200–600
			LXD6-A, HLXD6-A	2, 3		450–600
			MD6, MXD6, HMD6, HMXD6	2, 3		500–800
			ND6, NXD6, SND6, HND6, HNXD6	2, 3		500–1200
200,000	CED6	125 (2 & 3P)	NGB	1,2,3	240	15–125
	CFD6	70–250 (2P, 3P)	NGB	1,2,3	240	15–125
	LDGA	50–150 (2P, 3P)	NGB	1,2,3	240	15–125
			NDGA, HDGA	2-3		50–150

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
200,000	LFGA	70–250 (2P, 3P)	NGB	1,2,3	240	15–125
			NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
	CFD6	70–250 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
	LJGA	200–400 (2P, 3P)	NGB	1,2,3	240	15–125
			NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
	HHJD6, HHJXD6	200–400 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
	CJD6-A	200–400 (2P, 3P)	NGB	1,2,3	240	15–125
			NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
200,000	LLGA	400–600 (2P, 3P)	NGB	1,2,3	240	15–125
			NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, HJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
	HHLD6, HHLXD6	450–600 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
	CLD6-A	450–600 (2P, 3P)	NGB	1,2,3	240	15–125
			NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
	LMG	600–800 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
			MD6, MXD6			400–800
			HMD6, HMXD6			400–800
	CMD6	500–800 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
	SCMD6-A	500–800 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
	LNG	800–1200 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
			MD6, MXD6			400–800
			HMD6, HMXD6			400–800
			ND6, NXD6			600–1200
			HND6, HNXD6			600–1200

240V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
200,000	CND6	900–1200 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
	SCND6-A	900–1200 (2P, 3P)	NDGA, HNDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
200,000	LPG	1200–1600 (2P, 3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
			MD6, MXD6			400–800
			HMD6, HMXD6			400–800
			ND6, NXD6			600–1200
			HND6, HNXD6			600–1200
			PD6, PXD6			1000–1600
			HPD6, HPXD6			1000–1600
	CPD6	1200–1600 (3P)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800
	J, R	15–600 (1, 2, 3)	NGB	1, 2, 3	120	15–125
				2,3	240	
		50–600 (2, 3)	NDGA, HDGA	2–3		50–150
		70–600 (2, 3)	NFGA, HFGA			70–250
		200–600 (2, 3)	NJGA, NJJA			200–400
			HJGA			200–400
		400–600 (2, 3)	NLGA, HLGA			400–600
	T	15–1200 (1, 2, 3)	NGB	1, 2, 3	120	15–125
				2, 3	240	
		50–1200 (2, 3)	NDGA, HDGA	2–3		50–150
		70–1200 (2, 3)	NFGA, HFGA			70–250
		200–1200 (2, 3)	NJGA, NJJA			200–400
			HJGA			200–400
		400–1200 (2, 3)	NLGA, HLGA			400–600
		600–1200 (2, 3)	NMG, HMG			400–800
	L	601–6000 (2, 3)	NDGA, HDGA	2–3	240	50–150
			NFGA, HFGA			70–250
			NJGA, NJJA			200–400
			HJGA			200–400
			NLGA, HLGA			400–600
			NMG, HMG			400–800

480V Series Ratings

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
18,000	ED4	125 (2 & 3P)	BQD, CQD	1, 2, 3	277/480	15–100
25,000	ED6	125 (2 & 3P)	BQD, CQD	1, 2, 3	277/480	15–100
	NGB	125 (2 & 3P)	BQD, CQD	1	277	15–100
				2	277/480	15–100
				3	277/480	15–100
30,000	HED6	125 (2 & 3P)	BQD, CQD	1, 2, 3	277/480	15–100
			ED4	1	277	15–100
			ED4, ED6	2, 3	480	15–125
35,000	FD6-A, FXD6-A	250 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	JD6-A, JXD6-A	400 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
42,000	HED4	125 (2 & 3P)	BQD, CQD	1, 2, 3	277/480	15–100
			ED4	1	277	15–100
			ED4, ED6	2, 3	480	15–125
	HJD6-A, HJXD6-A	400 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
50,000	HFD6, HFXD6	250 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
50,000	HJD6-A, HJXD6-A, HLD6-A, HLXD6-A	600 (2 & 3P)	HED4	2, 3	480	15–50
	MD6, MXD6	800 (2 & 3P)	NDGA	2–3	480	50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
	MD6, MXD6, ND6, NXD6	1200 (2 & 3P)	FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		400–600
	ND6, NXD6	1200 (2 & 3P)	NDGA	2–3	480	50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
	SMD6	800 (3P)	NDGA	2–3	480	50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
	SND6	1200 (3P)	NDGA	2–3	480	50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
	SMD6, SND6, SPD6	1600 (3P)	JD6-A, JXD6-A	2, 3	480	200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		400–600
	PD6, PXD6	14–1600 (3P)	FD6-A, FXD6-A	2, 3	480	70–250
		1600 (3P)	JD6-A, JXD6-A, SJD6-A	2, 3	480	200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		400–600
			NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600

480V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
50,000 (Continued)	RD6, RXD6	18–2000 (3P)	FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A, SJD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			SLD6-A	3		400–600
		2000 (3P)	NDGA	2–3	480	50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600
65,000	HFD6, HFXD6	250 (2 & 3P)	BQD, CQD	1, 2, 3	277/480	15–100
			ED4, HED4	1	277	15–100
			ED4, ED6, HED4	2, 3	480	15–125
	HJD6-A, HJXD6-A	400 (2 & 3P)	HED4, ED4	1	277	15–100
			FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A	2, 3	480	200–400
	HLD6-A, HLXD6-A	600 (2 & 3P)	ED4, HED4	1	277	15–100
			FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
	HMD6, HMXD6	800 (2 & 3P)	FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
	HND6, HNXD6	1200 (2 & 3P)	FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
			MD6, MXD6, SMD6	2, 3		500–800
	HPD6, HPXD6	14–1600 (3P)	FD6-A, FXD6-A	2, 3	480	70–250
	HRD6, HRXD6	18–2000 (3P)	FD6-A, FXD6-A	2, 3	480	70–250
			JD6-A, JXD6-A	2, 3		200–400
			LD6-A	2, 3		200–600
			LXD6-A	2, 3		450–600
65,000	HJGA	400 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	HHJD6, HHJXD6	400 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	HLGA	600 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	HHLD6, HHLXD6	600 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	HDGA	150 (2 & 3P)	NDGA	2–3	480	50–150
	HFGA	250 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
	HFD6, HFXD6	250 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
	HJGA	400 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
	HJD6-A, HJXD6-A	400 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
	HLGA	600 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600

480V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
65,000 (Continued)	HLD6-A, HLXD6-A	600 (2 & 3P)	NDGA	2–3	480	50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
	HMG	800 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			LMD6, LMXD6			600–800
			MD6, MXD6			400–800
			SMD6	3		500–800
	HMD6, HMXD6	800 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
	HNG	1200 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			LMD6, LMXD6			600–800
			MD6, MXD6			400–600
			NNG			800–1200
			ND6, NXD6			800–1200
	HND6, HNXD6	1200 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
	HPG	1600 (2 & 3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			LMD6, LMXD6			600–800
			MD6, MXD6			400–600
			NNG			800–1200
			ND6, NXD6			800–1200
			NPG			1200–1600
	HPD6, HPXD6	1600 (3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600
	HRD6, HRXD6	2000 (3P)	NDGA	2–3		50–150
			NFGA			70–250
			NJGA			250–400
			NLGA			400–600
			NMG			600–800
			NNG			800–1200
			NPG			1200–1600
100,000	CFD6	250 (2 & 3P)	BQD, CQD①	1		15–100
				2, 3		15–30
	HHJXD6, HHJD6, HHLD6, HHLXD6	600 (2 & 3P)	ED4, ED6, HED4	1	277	15–100
			HFD6, HFXD6	2, 3	480	70–250
	CMD6	800 (3P)	FD6-A, FXD6-A, HFD6, HFXD6	2, 3	480	70–250
			JD6-A, HJD6-A, JXD6-A, HJXD6-A	2, 3		200–400
			LD6-A, HLD6-A	2, 3		200–600
			LXD6-A, HLXD6-A	2, 3		450–600
			MD6, MXD6, HMD6, HMXD6	2, 3		500–800

① BQD & CQD breakers (2, 3P) are series rated from 15–100A for Series 7A, S2, S3, and P1 panelboard applications only.

480V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000 (Continued)	SCMD-A, SCND6-A	1200 (3P)	HFD6, HFXD6	2, 3	480	70–250
	CND6	1200 (3P)	FD6-A, FXD6-A, HFD6, HFXD6	2, 3	480	70–250
			JD6-A, HJD6-A, JXD6-A, HJXD6-A	2, 3		200–400
			LD6-A, HLD6-A	2, 3		200–600
			LXD6-A, HLXD6-A	2, 3		450–600
			MD6, MXD6, HMD6, HMXD6	2, 3		500–800
			ND6, NXD6, HND6, HNXD6	2, 3		500–1200
	CPD6	1600 (3P)	FD6-A, FXD6-A, HFD6, HFXD6	2, 3	480	70–250
100,000	LDGA	150 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	LFGA	250 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	HHFD6, HHFXD6	250 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	CJD6-A	400 (2 & 3P)	NGB	1	277	15–125
				2	277/480	15–125
				3	277/480	15–125
	LFGA	250 (2 & 3P)	NDGA, HDGA	2–3	480	50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
	LJGA	400 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
	HHJD6, HHJXD6	400 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
	LLGA	600 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA , HJGA			200–400
	HHLD6, HHLXD6	600 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
	LMG	800 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, HJGA			200
			NLGA, HLGA			400–600
			MD6, MXD6			400–800
			HMD6, HMXD6			400–800
	CMD6	800 (3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200
			NLGA, HLGA			400–600
	LNG	1200 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600
			MD6, MXD6			400–800
			HMD6, HMXD6			400–800
			ND6, NXD6			600–1200
			HND6, HNXD6			600–1200
	CND6	1200 (3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600

480V Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker			
	Type	Maximum Amperes	Type	Number of Poles	Voltage	Amperes
100,000 (Continued)	LPG	1600 (2 & 3P)	NDGA, HDGA	2–3	480	50–150
			NFGA, HFGA			70–250
			HFD6, HFXD6			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600
			MD6, MXD6			400–800
			HMD6, HMXD6			400–800
			ND6, NXD6			600–1200
			HND6, HNXD6			600–1200
			PD6, PXD6			1200–1600
			HPD6, HPXD6			1200–1600
	CPD6	1600 (3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600
150,000	CJD6-A	400 (2 & 3P)	ED4	1	277	15–100
			HFD6, HFXD6	2, 3	480	70–250
			JD6-A, HJD6-A, JXD6-A, HJXD6-A	2, 3		200–400
	CLD6-A	600 (2 & 3P)	ED4	1	277	15–100
			HFD6, HFXD6	2, 3	480	70–250
			JD6-A, HJD6-A, JXD6-A, HJXD6-A	2, 3		200–400
			LD6-A, HLD6-A	2, 3		200–600
			LXD6-A, HLXD6-A	2, 3		450–600
200,000	CED6	125 (2 & 3P)	BQD, CQD①	1	277	15–100
				2, 3	277/480	20–30
			ED4, HED4	1	277	15–100
			ED4, ED6, HED4	2, 3	480	15–125
			NGB	1	277	15–125
			NGB	2	277/480	15–125
			NGB	3	277/480	15–125
	CFD6	250 (2 & 3P)	BQD, CQD	1	277	15–100
				2, 3	277/480	20–30
			ED4, ED6	2,3	480	15–50
			ED4, HED4	1	277	15–100
			HED4	2, 3	480	15–125
			FD6-A, FXD6-A, HFD6, HFXD6	2, 3	480	70–250
			NGB	1	277	15–125
			NGB	2	277/480	15–125
			NGB	3	277/480	15–125
100,000	J, R	600 (2 & 3P)	NDGA, HDGA	2–3	480	50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600
	T	1200 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600
	L	6000 (2 & 3P)	NDGA, HDGA	2–3		50–150
			NFGA, HFGA			70–250
			NJGA, HJGA			200–400
			NLGA, HLGA			400–600

① BQD & CQD breakers (2, 3P) are series rated from 15–100A for Series 7A, S2, S3, and P1 panelboard applications only.

240 Volt Fuse Series Ratings

UL Series Connected Rating	Main Breaker		Branch Breaker		
	Type	Maximum Amperes	Type	Number of Poles	Amperes
65,000	J, R	15–600 (1, 2, 3P)	QPH, BQH, BLH	1, 2, 3	15–125
	T	15–1200 (1, 2, 3P)	QPH, BQH, BLH	1, 2, 3	15–125
	L	601–6000 (1, 2, 3P)	QPH, BQH, BLH	1, 2, 3	15–125
100,000	T (300V)	15–200 (1, 2, 3P)	QP, BQ, BL	1, 2, 3	15–125
			HQP, HBQ, HBL, QPH, BQH, BLH	3	15–100
			QPF, BQF, BLF, QPHF, QE, BE, BLE, QEH, BLEH, BLHF, BQHF, QAFH, BAFH, QAF, BAF	1	15–30
			QEH, BLEH, QE, QPF, QPHF, BLHF, BLE, BLF, QAFH, BAFH, QAF, BAF	2	15–60
			QT	1, 2	15–50
		15–600 (1, 2, 3P)	QPH, BQH, BLH, HQP, HBQ, HBL	1, 2	15–125
	J, R	15–600 (2, 3P)	ED4, HED4	1	15–100
			ED4, ED6, HED4	2, 3	15–125
		70–600 (2, 3P)	FD6-A, FXD6-A	2, 3	70–250
		200–600 (2, 3P)	JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3	200–400
			LD6-A	2, 3	200–600
		300–600 (3P)	SLD6-A	3	300–600
		450–600 (2, 3P)	LXD6-A	2, 3	450–600
	T	15–1200 (2, 3P)	ED4, HED4	1	15–100
			ED4, ED6, HED4	2, 3	15–125
		70–1200 (2, 3P)	FXD6-A, FD6-A	2, 3	70–250
		450–1200 (2, 3P)	LXD6-A	2, 3	450–600
		200–1200 (2, 3P)	JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3	200–400
			LD6-A	2, 3	200–600
		300–1200 (3P)	SLD6-A	3	300–600
	L	601–6000 (2, 3P)	ED4, HED4	1	15–100
			ED4, ED6, HED4	2, 3	15–125
			FD6-A, FXD6-A	2, 3	70–250
			JD6-A, JXD6-A, JXD2-A, SJD6-A	2, 3	200–400
			LD6-A	2, 3	200–600
			LXD6-A	2, 3	450–600
			SLD6-A	3	300–600
			SMD6	3	500–800
			SND6	3	500–1200
			PD6, PXD6, SPD6	3	1200–1600
			RD6, RXD6	3	1600–2000
200,000	R	125–200 (2, 3P)	QJH2, QJ2H, QJ2	2, 3	125–200
	T, J	125–600 (2, 3P)	QJH2, QJ2H	2, 3	125–225
		125–400 (2, 3P)	QJ2	2, 3	125–225
	J, R	70–600 (2, 3P)	HFD6, HFXD6	2, 3	70–250

240 Volt Series Ratings (Continued)

UL Series Connected Rating	Main Breaker		Branch Breaker		
	Type	Maximum Amperes	Type	Number of Poles	Amperes
200,000	T	70–1200 (2, 3P)	HFD6, HFXD6	2, 3	70–250
	L	601–6000 (2, 3P)	HFD6, HFXD6	2, 3	70–250
			MD6, MXD6, HMD6, HMXD6	2, 3	500–800
			ND6, NXD6, HND6, HNXD6	2, 3	500–1200

480 Volt Fuse Series Ratings

UL Series Connected Rating	Main Breaker		Branch Breaker		
	Type	Maximum Amperes	Type	Number of Poles	Amperes
50,000	J	60–400 (1, 2, 3P)	ED4	1	60–100
		15–400 (2, 3P)	ED4	2, 3	15–100
100,000	J	15–400 (1, 2, 3P)	ED4	1	15–50
	T, J	70–600 (2, 3P)	FD6-A, FXD6-A	2, 3	70–250
	J, R	70–600 (2, 3P)	HFD6, HFXD6	2, 3	70–250
	T, J, R	200–600 (2, 3P)	JD6-A, JXD6-A HJD6-A, HJXD6-A	2, 3	200–400
			LD6-A, HLD6-A	2, 3	200–600
		450–600 (2, 3P)	LXD6-A, HLXD6-A	2, 3	450–600
	T	70–1200 (2, 3P)	HFD6, HFXD6	2, 3	70–250
	T, L	601–1200 (2, 3P)	JD6-A, JXD6-A HJD6-A, HJXD6-A	2, 3	200–400
			LD6-A, HLD6-A	2, 3	200–600
			LXD6-A, HLXD6-A	2, 3	450–600
	L	601–6000 (2, 3P)	HFD6, HFXD6	2, 3	70–250
			MD6, MXD6, HMD6, HMXD6	2, 3	500–800
			ND6, NXD6, HND6, HNXD6	2, 3	500–1200
200,000	R	15–100 (1, 2, 3P)	BQD, CQD	1	15–100
			BQD, CQD①	2, 3	20–30
	T, J	15–200 (1, 2, 3P)	BQD, CQD	1	15–100
			BQD, CQD①	2, 3	20–30

① BQD & CQD 2 pole breakers are series rated from 15–100A for Series 7A, S2, S3, P1, and P2 panelboard applications only.

Molded Case Circuit Breakers

IEC 947-2® AC Interrupting Ratings, 50/60 HZ KA

Reference

Ampere Rating	Breaker Frame	Breaker Type	220/240 Volts		380/415 Volts		500 Volts	
			Icu	Ics	Icu	Ics	Icu	Ics
15-125	ED	ED6	65	17	35	9	—	—
70-250	FD	FXD6	65	33	35	18	—	—
		FD6	65	33	35	18	—	—
		HFD6	100	50	65	33	—	—
		HFXD6	100	50	65	33	—	—
		HHFD6	200	100	100	50	—	—
		HHFXD6	200	100	100	50	—	—
250-400	JD	JXD6(A)	65	33	40	20	—	—
		JD6(A)	65	33	40	20	—	—
		HJD6(A)	100	50	65	33	—	—
		HJXD6(A)	100	50	65	33	—	—
		HHJD6	200	100	100	50	—	—
		HHJXD6	200	100	100	50	—	—
400-600	LD	LXD6(A)	65	33	40	20	—	—
		LD6(A)	65	33	40	20	—	—
		HLD6(A)	100	50	65	33	—	—
		HLXD6(A)	100	50	65	33	—	—
		HHLD6(A)	200	100	100	50	—	—
		HHLXD6	200	100	100	50	—	—
600-800	MD	MXD6	65	33	40	20	—	—
		MD6	65	33	40	20	—	—
		HMXD6	100	50	65	33	—	—
		HMD6	100	50	65	33	—	—
800-1200	ND	NXD6	65	33	40	20	—	—
		ND6	65	33	40	20	—	—
		HNXD6	100	50	65	33	—	—
		HND6	100	50	65	33	—	—

Typical Specifications

Reference

General Specifications

Molded case circuit breakers shall provide circuit overcurrent protection with inverse time and instantaneous tripping characteristics and shall be Siemens Sentron, Sensitrip or approved equal.

All circuit breakers shall be listed by Underwriters' Laboratories, Inc., conform to applicable requirements of NEMA Standard Publication No. AB1 and meet appropriate classifications of Federal Specifications W C 375B/Gen.

All circuit breakers shall have a quick-make, quick-break over center toggle type mechanism and the handle mechanism shall be trip free to prevent holding contacts closed against a short circuit or sustained overload. All circuit breaker handles shall assume a position between "ON" and "OFF when tripped automatically. Multi-pole circuit breakers shall be common-trip such that an overload or short circuit on any one pole will result in all poles opening simultaneously. Arc extinction is to be accomplished by magnetic arc chutes. All ratings are to be clearly visible. When reverse feed is indicated on the drawings, in accordance with UL, circuit breakers with sealed trip units shall be supplied.

Thermal Magnetic Specifications

Unless otherwise noted on the drawings, all Circuit breakers 2000 Ampere and below shall have thermal-magnetic trip units, with inverse time-current characteristics. Automatic operation of these circuit breakers shall be obtained by means of thermal-magnetic tripping devices located in each pole providing inverse time delay and instantaneous circuit protection. Circuit breakers shall be ambient compensating in that, as the ambient temperature increases over 40°C, the circuit breaker automatically derates itself so as to better protect its associated conductor. Thermal magnetic breakers from 250 to 2000A frames shall have thermal interchangeable trip units, with instantaneous magnetic trip settings that are adjustable and accessible from the front of all circuit breakers on frame sizes 250 Amperes and above. Where indicated, provide circuit breakers UL listed for application at 100% of their continuous ampere rating in their intended enclosure.

Motor Circuit Protectors

Where indicated on the drawings and in the combination motor starter/motor control center schedule, furnish instantaneous magnetic trip only circuit breakers for motor short circuit protection. The magnetic trips shall be adjustable and accessible from the front of all circuit breakers frames. The continuous current rating shall be between 1 and 800 Amperes as indicated on the drawing.

The interrupting rating of the circuit breakers shall be as indicated in the specifications, and shown on the drawing or single line diagram. The interrupting rating of the circuit breakers shall be at least equal to the available short circuit current at the line terminals of the circuit breaker and correspond to the UL listed integrated short circuit current rating specified.

Internal Accessories

Provide shunt trips, bell alarms, and auxiliary switches as shown on the contract drawings. Gold plated auxiliary switches shall be supplied for PLC connection. Internal accessories for all breakers shall be UL listed for field installation and modification.

Connection Accessories

Unless otherwise noted, Mechanical lugs shall be provided with all Molded Case Breakers. Where indicated on the drawings, compression lugs shall be provided on 1200 Ampere frame and below circuit breakers. All compression lugs shall be supplied by the Circuit Breaker Manufacturer. Where indicated on the drawings, UL listed plug-in or rear connectors shall be supplied.

Solid State Sensing Specifications

As indicated on the drawings, circuit breaker frames 400 Ampere through 3200-Ampere shall have microprocessor-based RMS sensing trip units, with the capability to measure through to the 21st harmonic. Automatic operation of all circuit breaker frames 400A and larger shall be obtained by means of solid state tripping elements providing inverse time delay and (instantaneous) and/or (short-time delay) circuit protection. Continuous current ratings shall be adjustable from 20% to 100% of the trip unit rating, without the need for a rating plug. Long-time delay and instantaneous trip shall be adjustable. The optional short-time trip function shall have adjustable pick-up settings, three fixed times, and I^2t ramp. Circuit breaker frames 400A and larger, and where indicated on the drawings, shall be 100% equipment rated.

Integral Ground Fault Option

Main and feeder circuit breakers, as indicated on the drawings, shall be provided with integral ground fault protection. Ground fault pick-up shall be adjustable from 20% to 70% of the circuit breakers maximum continuous current rating. Ground fault time delay shall be adjustable with three 1^2t ramps.

Metering Option

When indicated on the drawings, solid state trip breakers shall be furnished with a plug-in or panel mounted metering device. This device shall simultaneously display all three phase currents, as well as average current, ground current, and phase unbalance. In addition it shall display breaker status, a max log, and a trip log. The trip log will retain and display date, time and type of trip (overload, short circuit or ground fault) for the most recent 5 trip events.

Current Limiting Specifications

Where indicated on the drawings, Siemens current limiting circuit breakers are to be furnished. Current limiting circuit breakers shall limit the let-through I^2t to a value less than the I^2t of one-half cycle wave of the symmetrical prospective current without any fusible elements when operating within its current range.

Series Connected Combination Specifications

Where protective devices are applied in series combination, such that the prospective available fault current exceeds the interrupting rating (AIR) of the downstream protective devices, such combinations shall be UL recognized combinations. All electrical equipment using these UL recognized circuit breaker combinations shall be clearly marked in accordance with NEC Section 240-83(c).

Molded Case Circuit Breakers

Superseded Breakers

Sentron Series	Note	Superseded	Note	Superseded
CED62B015-CED62B125	①	CLE62B015-CLE62B100	③	CE2B015-CE2B100
CED62S100A	①	CLE62S100	③	CE2S100
CED63A001-CED63A125	①	CLE63A001-CLE63A125		
CED63B015-CED63B125	①	CLE63B015-CLE63B100	③	CE3B015-CEB100
CED63S100A	①	CLE63S100	③	CE3S100
HHED63B015-HHED63B125	①	HED63B015-HED63B125		
CFD62A150, CFD62L150, CFD62A250	①	CLF62A150, CLF62A250		
CFD62B070-CFD62B250	①	CLF62B070-CLF62B240	③	CJ2B125-CJ2B250
CFD62S250A	①	CLF62S250		
CFD63A150, CFD63L150, CFD63A250	①	CLF63A150, CLF63A250		
CFD63B070-CFD63B250	①	CLF63B070-CLF63B250	③	CJ3B125-CJ3B250
CFD63S250A	①	CLF63S250		
CJD62B200-CJD62B400	①	CLJ62B100-CLJ62B400	④	CJ2B300-CJ2B400
CJD62H400, CJD62L400	①	CLJ62L400, CLJ62H400		
CJD62S400A	①	CLJ62S400	④	CJ2S400
CJD63B200-CJD63B400	①	CLJ63B200-CLJ63B400	④	CJ3B300-CJ3B400
CJD63H400, CJD63L400	①	CLJ63L400, CLJ63H400		
CJD63S400A	①	CLJ63S400	④	CJ3S400
CPD63B120-CPD63B160	⑤	CP3B120-CP3B160		
ED21B015-ED21B100	①	E21B015-E21B100	②	EE1B015-EE1B100
ED22B015-ED22B100	①	E22B015-E22B100	②	EE2B015-EE2B100
ED22S100A	①	E22S100A	②	EE2S100
ED23B015-ED23B100	①	E23B015-E23B100	②	EE3B015-EE3B100
ED23S100A	①	E23S100A	②	EE3S100
ED41B015-ED41B100	①	E41B015-E41B100	②	EH1B015-EH1B100
ED42B015-ED42B125	①	E42B015-E42B100	②	EH2B015-ED2B125
ED42S100A	①	E42S100	②	EH2S100
ED43B015-ED43B125	①	E43B015-E43B100	②	EH3B015-EH3B100
ED43S100A	①	E43S100	②	EH3S100
ED61B015-ED61B100	①	E61B015-E61B100	②	EF1B015-EF1B020
ED62B015-ED62B125	①	E62B015-E62B100	②	EF2B015-EF2B100
ED62S100A	①	E62S100A	②	EF2S100
ED63A001-ED63A125	①	E63A001-E63A125	②	EF3A003, EF3J050, EF3L050-EF3A100, EF3H1
ED63B015-ED63B125	①	E63B015-E63B100	②	EF3B015-EF3B100
ED63S100A	①	E63S100A	②	EF3S100
HHED63B015-HHED63B125	①	HED63B015-HED63B125		
FD62B070-FD62B250⑥	①	F62B070, F62B250		
FD63B070-FD63B250⑥	①	F63B070-F63B250		
FXD62A150, FXD62L150, FXD62A250	①	FJ62A150, FJ62L150-FJ62A250		
FXD62B070-FXD62B250⑥	①	FJ62B070-FJ62B250	②	FJ2B070-FJ2B225
FXD62S250A	①	FJ62S250	②	FJ2S225
FXD63A150, FXD63L150, FXD63A250	①	FJ63A150, FJ63L150-FJ63A250	②	FJ3A225
FXD63B070-FXD63B250⑥	①	FJ63B070-FJ63B250	②	FJ3B070-FJ3B225
FXD63S250A	①	FJ63S250	②	FJ3S225
HED41B015-HED41B100	①	HE41B015-HE41B100		
HED42B015-HED42B125	①	HE42B015-HE42B100		
HED43B015-HED43B125	①	HE43B015-HE43B100		
HED61B015-HED61B100	①	HE61B015-HE61B100	②	HE2B015-HE2B100
HED63B015-HED63B125	①	HE63B015-HE63B100	②	HE3B015-HE3B100
HFD62B070-HFD62B250	①	HF62B070-HF62B250		
HFD63B070-HFD63B250	①	HF63B070-HF63B250		
HHED63B015-HHED63B125	①	HED63B015-HED63B125		
HJD63B200-HJD63B400	①	HJ63B200-HJ63B400	②	HJ3B125-HJ3B400
HLD63B250-HLD63B600	①	HL63B450-HL63B600	②	HL3B450-HL3B600
HMD63B500-HMD63B800	②	HN3B500-HN3B800		
HND63B100-HND63B120	②	HK3B100-HK3B120		
HPD63B120-HPD63B160	②	HP3B120-HP3B160		
HRD63B160-HRD63B200	②	HR3B160-HR3B200		

①Mechanically and electrically interchangeable.
②Electrically interchangeable only, refer to sales office for further details.
③Electrically interchangeable only if the system interrupting capacity is less than or equal to:
200 kA at 240V AC
200 kA at 480V AC
100 kA at 600V AC

④Electrically interchangeable only if the system interrupting capacity is less than or equal to:
200 kA at 240V AC
150 kA at 480V AC
100 kA at 600V AC

⑤Refer to local sales office for replacement information.

⑥Effective 1994 — The FD6 and FXD6 types have been replaced by FD6-A and FXD6-A type thermal / magnetic circuit breakers — mechanically and electrically interchangeable with the exception that FXD6-A and FD6-A have 22kA at 600V AC ratings versus 18kA at 600V AC for types FXD6 and FD6.

Sentron Series	Note	Superseded	Note	Superseded
JD62B200-JD62B400 **JD63B200-JD63B400**	① ①	JLB200-JL62B400 JL63B200-JL63B400	② ②	JL2B070-JL2B400 JL3B0L0-JL3B400
JXD22B200-JXD22B400 **JXD22S400A** **JXD23B200-JXD23B400** **JXD23S400A**	① ① ① ①	JD22B200-JD22B400 JD22S400 JD23B200-JD23B400 JD23S400	② ② ② ②	JD2B250-JD2B400 JD2S400 JD3B250-JD3B400 JD3S400
JXD62B200-JXD62B400 **JXD62H400, JXD62L400** **JXD62S400A** **JXD63B200-JXD63B400** **JXD63H400, JXD63L400** **JXD63S400A**	① ① ① ① ① ①	JJ62B200-JJ62B400 JL62L400, JL62H400 JJ62S400A JJ63B200-JJ63B400 JL63A400, JL63H400, JL63L400 JJ63S400A	② ② ② ②	JJ2B250-JJ2B400 JL2L400-JL2H400 JJ3B200-JJ3B400 JL3H400, JL3L400, JL3A225
LD62B250-LD62B500 **LD62B250-LD63B600**	① ①	LL63B250-LL62B600 LL63B250-LL63B600	② ②	LL2B450-LL2B600 LL3B450-LL3B600
LXD62B450-LXD62B600 **LXD62J600, LXD62L600** **LXD62S600A** **LXD63B450-LXD63B600** **LXD64H600, LXD63L600** **LXD63S600A**	① ② ① ① ① ①	LJ62B450-LJ62B600 LL2H600, LL2U600, LL2X600 LJ62S600 LJ63B450-LJ63B600 LL63H600, LL63L600 LJ63S600A	 ② ②	 LL3A450, LL3H600 LL3S600
MD62B500-MD62B800 **MD63B500-MD63B800**	② ②	KM2B500-KM2B800 KM3B500-KM3B800		
MXD62A800, MXD62H800, MXD62L800 **MXD62S800A** **MXD63A800, MXD63H800, MXD63L800** **MXD63S800A**	② ② ② ②	KM2A800, KM2H800, KM2L800 KM2S800 KM3A600, KM3H800, KM3L800 KM3S800		
ND63B100-ND63B900 **NXD63S120A**	② ②	KP3B100-KP3B900 KP3S120		
PD63B120-PD63B160 **PXD63S160A**	② ②	HP3B120-HP3B160 HP3S160		
RD63B160-RD63B200	②	HR3B160-HR3B200		
QJ22B060-QJ22B225 **QJ22B060H-QJ22B225H** **QJ22S225** **QJ23B060-QJ23B225** **QJ23B060H-QJ23B225H**	① ① ①	QJ2B125-QJ2B225 QJS225 QJ3B125-QJ3B225		
QJH22B060-QJH22B225 **QJH23B060-QJH23B225** **QJH23S225**	① ① ①	QJ2H125-QJ2B225 QJ3H125-QJ3H225 QJ3S225		
RD63B160-RD63B200 **RXD63S200A**	② ②	HR3B160-HR3B200 HR3S200		
SHJD69200-SHJD69400 **SHJD69200G-SHJD69400G** **SHJD69200NGT-SHJD69400NGT** **SHJD69200NT-SHJD69400NT**	① ① ① ①	SHJ63B200-SHJ63B400G SHJ63B200G-SHJ63B400G SHJ63N200G-SHJ63N400G SHJ63N200-SHJ63N400		
SHLD69300-SHLD69600 **SHLD69300G-SHLD69600G** **SHLD69300NGT-SHLD69600NG** **SHLD69300NT-SHLD69600NT**	① ① ① ①	SHL63B300-SHL63B600 SHL63B300G-SHL63B600G SHL63N300G-SHL63N600G SHL63N300-SHL63N600		
SHND69100A-SHND69120A **SHND69100AG-SHND69120AG**	① ①	SHND69100-SHND69800 SHND69100G-SHND69800G	② ②	SHKF3B100-SHKF3B800 SHKF3B100G-SHKF3B800G
SHPD69120-SHPD69160 **SHPD69120G-SHPD69160G**	② ②	SHPF3B120-SHPF3B160 SHPF3B120G-SHPF3B160G		

①Mechanically and electrically interchangeable.
②Electrically interchangeable only, refer to sales office for further details.
③Electrically interchangeable only if the system interrupting capacity is less than or equal to:
200 kA at 240V AC
200 kA at 480V AC
100 kA at 600V AC
④Electrically interchangeable only if the system interrupting capacity is less than or equal to:
200 kA at 240V AC
150 kA at 480V AC
100 kA at 600V AC
⑤Refer to local sales office for replacement information.

Molded Case Circuit Breakers

Superseded Breakers

General

Sentron Series	Note	Superseded	Note	Superseded
SHND69100NGT-SHND69800NGT **SHND69100NT-SHND69800NT**	① ②	SHKF3N100G-SHKF3N800G SHKF3N100-SHKF3N800	② ②	SHK3N100G-SHK3N600G SHK3N100-SHK3N600
SHPF3B120-SHPF3B160 **SHPF3B120G-SHPF3B160G** **SHPF3N120-SHPF3N160** **SHPF3N120G-SHPF3N160G**	② ② ② ②	SHP3B120-SHP3B800 SHP3B120G-SHP3B800G SHP3N120-SHP3N800 SHP3N120G-SHP3N800G		
SJD69200-SJ369400 **SJD69200G-SJD69400G** **SJD69200NGT-SJD69400NGT** **SJD69200NT-SJD69400NT**	① ① ① ①	SJL63B200-SJL63B400 SJL63B200G-SJL63B400G SJL63N200G-SJL63N400G SJL63N200-SJL63N400		
SLD69300-SLD69600 **SLD69300G-SLD69600G** **SLD69300NGT-SLD69600NGT** **SLD69300NT-SLD69600NT**	① ① ① ①	SLL63B300-SLL63B600 SLL63B300G-SLL63B600G SLL63N300G-SLL63N600G SLL63N300-SLL63N600		
SMD69600A-SMD69800A **SMD69600AG-SMD69800AG** **SMD69600ANGT-SMD69800ANGT** **SMD69600ANT-SMD69800ANT**	① ① ① ①	SMD69600-SMD69800 SMD69600G-SMD69800G SMD69600NGT-SMD69800NGT SMD69600NT-SMD69800NT	② ② ② ②	SKMF3B600-SKMF3B800 SKMF3B600G-SKMF3B800G SKMF3N600G-SKMF3N800G SKMF3N600-SKMF3N800
SND69800A-SND69120A **SND69800AG-SND69120AG** **SND69800ANGT-SND69120ANGT** **SND69800ANT-SND69120ANT**	① ① ① ①	SND69100-SND69800 SND69100G-SND69800G SND69100NGT-SND69800NGT SND69100NT-SND69800NT	② ② ② ②	SKPF3B100-SKPF3B600 SKPF3B100G-SKPF3B600G SKPF3N100G-SKPF3N600G SKPF3N100-SKPF3N600
SPD69120-SPD69160 **SPD69120G-SPD69160G** **SPD69120NGT-SPD69160NGT** **SPD69120NT-SPD69160NT**	② ② ② ②	SHPF3B120-SHPF3B160 SHPF3B120G-SHPF3B160G SHPF3N120-SHPF3N160G SHPF3N120G-SHPF3N160G		
— —	④	BQCC1B015-BQC1B030		
— — — — — —	④ ④ ④	CC1B015-CC1B030 CC2B015-CC2B030 CC3B015-CC3B030		
— —	④ ④	EF2A003, EF2H050, EF2L050, EF2A100, EF2H150, EF2L150		
— — — — — —	④ ④ ④	EH1B015-EH1B100 EH2B015-EH2B100 EH3B015-EH3B100		
— — — — — —	③ ③ ③	HE2A003, HE2H050, HE2L050-HE2A100 HE3A003, HE3H050, HE3L050-HE3A100 HE3B015-HE3B100		

①Mechanically and electrically interchangeable.
②Electrically interchangeable only, refer to sales office for further details.
③These units are for replacement purposes only. Consult sales office for availability.
④These units are no longer manufactured, and no replacement is available.

Notes

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Distribution Dry Type Transformers

600 Volts Class — Single and Three Phase

Selection

600 Volts Class
Single Phase 0.25–167 KVA
Three Phase 3–1000 KVA

Features

- Standard units are UL listed and are designed in accordance with ANSI, NEMA (ST20) and IEEE standards

Encapsulated

- UL listed designs (UL 506)
- Totally enclosed, non-ventilated, heavy gauge steel enclosure
- Core and coil completely embedded within a resin compound for quiet, low temperature operation
- Encapsulation seals out moisture and air
- UL listed indoor/outdoor enclosure features integral wall mounting brackets
- Rugged design resists weather, dust, and corrosion
- Efficient, compact, lightweight, easy to install
- Flexible wiring leads that terminate within the bottom wiring compartment
- Large wiring compartment on the bottom with convenient knockouts
- High quality non-aging electrical grade core steel
- Precision wound coils

Ventilated

- UL listed designs (UL 1561)
- Designed for indoor NEMA 2 installations. NEMA 3R enclosures suitable for outdoor locations available as an option
- Core and coils are designed with UL listed high-temperature materials rated for 220°C; standard units feature 150°C winding temperature rise①
- Optional low temperature rise of 115° C or 80° C winding temperature rise for increased efficiency and additional overload capability
- Rugged sheet steel enclosure per UL1561, UL506 standards with removable panels for access to the internal wiring area
- Neoprene noise dampening pads isolate the core and coil from the enclosure
- Optional drip shields/weathershield and wall brackets available
- High quality, non-aging electrical grade core steel
- Precision wound coils

①Temp rise and insulation system values shown are typical. Variation in these values may exist depending on size, design and series, but all will comply with the requirements of UL506 and UL1561.
②Average sound level applies to 150°C rise K-1 transformers. Average dB levels for low temperature and other K-Factor ratings available upon request.



Encapsulated Transformer



Ventilated Transformer

Single Phase Transformer Ampere Ratings

Single Phase Full Load Amperes (FLC)						
KVA	**120V**	**208V**	**240V**	**277V**	**480V**	**600V**
.25	2.0	1.2	1.0	0.9	0.5	0.4
.50	4.2	2.4	2.1	1.8	1.0	0.8
.75	6.3	3.6	3.1	2.7	1.6	1.3
1	8.3	4.8	4.2	3.6	2.1	1.7
1.5	12.5	7.2	6.2	5.4	3.1	2.5
2	16.7	9.6	8.3	7.2	4.2	3.3
3	25	14.4	12.5	10.8	6.2	5
5	41	24	20.8	18.0	10.4	8.3
7.5	62	36	31	27	15.6	12.5
10	83	48	41	36	20.8	16.7
15	125	72	62	54	31	25
25	206	120	104	90	52	41
37.5	312	180	156	135	76	62
50	416	240	208	180	104	83
75	625	340	312	270	156	125
100	833	480	416	361	208	166
167	1391	803	695	603	347	278

Three Phase Transformer Ampere Ratings

Three Phase Full Load Amperes (FLC)				
KVA	**208V**	**240V**	**480V**	**600V**
3	8.3	7.2	3.6	2.9
6	16.6	14.4	7.2	5.8
9	25	21.6	10.8	8.6
15	41.7	36.1	18.0	14.4
30	83.4	72.3	36.1	28.9
45	124	108	54.2	43.4
75	208	180	90	72
112.5	312	270	135	108
150	416	360	180	144
225	624	541	270	216
300	832	721	360	288
500	1387	1202	601	481
750	2084	1806	903	723
1000	2779	2408	1204	963

Insulation Class and Temperature Rise①

KVA		Insulation	
1-Phase	**3-Phase**	**Temperature Class**	**Temperature Rise**
0.25-1	N/A	130° C	95° C
1.5–25	3–15	180° C	135° C
15–167	15–1000	220° C	150° C

Sound Level in Decibels② — 600V Class

KVA	NEMA Average dB	KVA	NEMA Average dB
0–9	40	301–500	60
10–50	45	501–700	62
51–150	50	701–1000	64
151–300	55		

Transformers

Dry Type Distribution 600 Volt Class[1]

General

Siemens dry type distribution transformers are rated 600 volt class and are available in a wide variety of ratings to provide versatile electrical distribution for general purpose, lighting and power loads in commercial and industrial applications.

Ratings are available from 0.25 through 167 kVA single phase, and 3 through 1000 kVA 3-phase. A variety of primary and secondary voltage ratings are available to match the load requirements to the distribution system. All units meet applicable ANSI and NEMA standards. Standard designs are UL Listed.

Transformers shall be designed, manufactured, and tested in accordance with ANSI, NEMA and IEEE Standards and shall be UL Listed. The self-cooled kVA rating shall be suitable for 30°C average, 40°C maximum ambient temperature.

Encapsulated designs are provided for ratings from 0.25 kVA through 25 kVA, 1-phase, and from 3 kVA through 15 kVA 3-phase. These designs feature indoor/outdoor enclosures with integral wall mounting brackets, and either a 135°C rise, 180°C insulation system or a 95°C rise, 130°C insulation system.



Encapsulated Transformer

Ventilated designs are provided for ratings from 15 kVA through 167 kVA 1- phase, and from 15 kVA through 1000 kVA 3-phase. These feature indoor enclosures, 150°C rise, and 220°C insulation system.[1]

A wide variety of designs and optional accessories are available including weather shields for outdoor NEMA 3R protection.



Ventilated Transformer

Three phase designs 15KVA through 75KVA and single phase designs 15KVA through 50KVA will include primary and secondary terminal lugs. For larger KVA designs, refer to the lug table on page 8-18.

TP1- Energy Efficient Transformers

The TP1 designs include the use of higher grade electrical steel and other features designed to lower flux density and reduce losses especially at average 35% loading where the TP1 measurements apply. To meet TP1 the design engineer must consider both the "I square R" losses and the core or iron loses. Simple de-rating from a higher kVA will not satisfy the TP1 standards as the efficiency level is dependent on the combination of core (no-load) losses and I2R (winding) losses.

The core construction employs the use of high quality non-aging electrical grade silicon steel with high permeability, low hysteresis and low eddy current losses. These characteristics are required to achieve the TP1 efficiency levels. Core laminations must be tightly assembled enabling magnetic flux densities to be kept well below the saturation point.

The core and coil designs must be low loss type with minimum efficiencies per NEMA TP1 when operated at 35% of full load capacity. Efficiency shall be tested in accordance with NEMA TP2 (Standard test method for measuring the energy consumption of distribution transformers). The efficiency levels must meet the following minimums.

TP1- Energy Efficient transformers:

Single Phase		Three Phase	
kVA	**Efficiency**	**kVA**	**Efficiency**
15	97.7%	15	97.0%
25	98.0%	30	97.5%
37.5	98.2%	45	97.7%
50	98.3%	75	98.0%
75	98.5%	112.5	98.2%
100	98.6%	150	98.3%
167	98.7%	225	98.5%
250	98.8%	300	98.6%
333	98.9%	500	98.7%
		750	98.8%

[1] Temp rise and insulation system values shown are typical. Variation in these values may exist depending on size, design and series, but all will comply with the requirements of UL506 and UL1561.

Dry Type Distribution 600 Volt Class[1]

Specifications

Standard Construction Features

Transformers rated 15 kVA and larger shall be a ventilated dry type with a UL Listed 220°C insulation system. Units shall be designed to operate with a rated maximum temperature rise of 150°C (Provide optional 115°C or 80°C rise when specified). [1]

Construction shall consist of aluminum windings and arranged to brace coil layers and provide maximum ventilation. (Provide optional copper windings when specified). Cores shall be constructed of non-aging electrical grade steel with high magnetic permeability and low loss characteristics.

Core laminations shall be tightly assembled. The complete core and coil assembly shall be impregnated with non-hydroscopic thermo-setting varnish to provide a high dielectric, moisture-resistant, flame retardant seal that is inherently fungus-resistant.

Core and coil assemblies shall be constructed to provide short circuit with stand capability as defined by ANSI and NEMA standards. The complete assembly shall be installed on vibration dampening pads to reduce noise and securely bolted to the enclosure base. A flexible grounding conductor shall be installed between the core and coil assembly and the transformer enclosure.

Enclosures shall be ventilated, heavy gauge steel construction finished with light gray paint. Front and rear covers shall be removable to provide access to the terminal compartment. Terminals shall be fully sized to carry the transformer full load current and shall be arranged to accept required UL-Listed cable connectors. Units installed outdoors shall have a UL-Listed type 3R outdoor enclosure, or shall be UL Listed with optional weathershields installed.

Standard voltage ratings shall be supplied with NEMA standard taps for the high voltage windings.

Unless specified otherwise, average sound levels (150°C rise) shall meet the following ANSI/ NEMA standards:

0 to 9 kVA	40 dB
10 to 50 kVA	45 dB
51 to 150 kVA	50 dB
151 to 300 kVA	55 dB
301 to 500 kVA	60 dB
501 to 700 kVA	62 dB
701 to 1000 kVA	64 dB

[1]Temp rise and insulation system values shown are typical. Variation in these values may exist depending on size, design and series, but all will comply with the requirements of UL506 and UL1561.

Each transformer shall have a securely attached nameplate providing complete electrical ratings, wiring diagram, tap connections, and catalog number, as applicable.

K-Factor Rated for Non-Linear Loads

Siemens offers transformer designs which meet K-Factor ratings. K-Factor is a ratio between the additional losses due to harmonics and the eddy losses at 60Hz. It is used to specify transformers for non-linear loads. Note that K-Factor transformers do not eliminate harmonic distortion; they withstand the non-linear load condition without overheating.

K-Factor Features

- Designed to ANSI and NEMA Standards
- UL K-Factor Listed per UL 1561
- K-Factor Rating Designed to IEEE c57.110
- Aluminum Wound Coils
- Core, Conductors designed for Harmonics and Eddy Currents 150°C Rise, 220°C Insulation[1]
- Electrostatic Shield to Attenuate Line Transients
- 200% Neutral Bar (2X Phase current)
- NEMA 1 Enclosure

Transformers shall be designed, manufactured, and tested in accordance with ANSI, NEMA and IEEE Standards and shall be UL Listed. The self-cooled kVA rating shall be suitable for 30°C average, 40°C maximum ambient temperature.

Non-Linear rated transformers shall be suitable for nonsinusoidal loads and harmonic distortion as indicated in IEEE C57.110, and shall be designed with the following K-Factor rating (choose one):

K4 for 50% Non-Linear load

K13 for 100% Non-Linear load

K20 for 150% Non-Linear load

K30 for 200% Non-Linear load

Non-Linear rated transformers shall be UL Listed and shall bear the UL marking on the nameplate along with the specified K-Factor rating. Non-Linear rated transformers shall include the following design features:

a) Core designed to withstand voltage distortion and high frequency harmonic currents. Magnetic flux density designed to reduce eddy currents and prevent saturation or overheating of the core.

b) Primary and secondary coils designed to minimize stray losses, skin effect losses, and excessive heating from harmonic currents. Coils shall not exceed the specified winding temperature rise, the corresponding hot spot temperature rating, or the 220°C insulation rating while carrying the specified Non-Linear load.

c) Neutral bus sized for 200% of rated current to withstand circulating currents and triplen harmonics.

d) An Electrostatic Shield between the primary and secondary winding and grounded to a common point within the transformer enclosure. When properly grounded, the shield shall provide noise isolation and attenuate common mode and transverse mode noise transients under normal loading conditions.

e) The design and materials used shall enable the transformers to comply with NEMA TP1 efficiency standards.

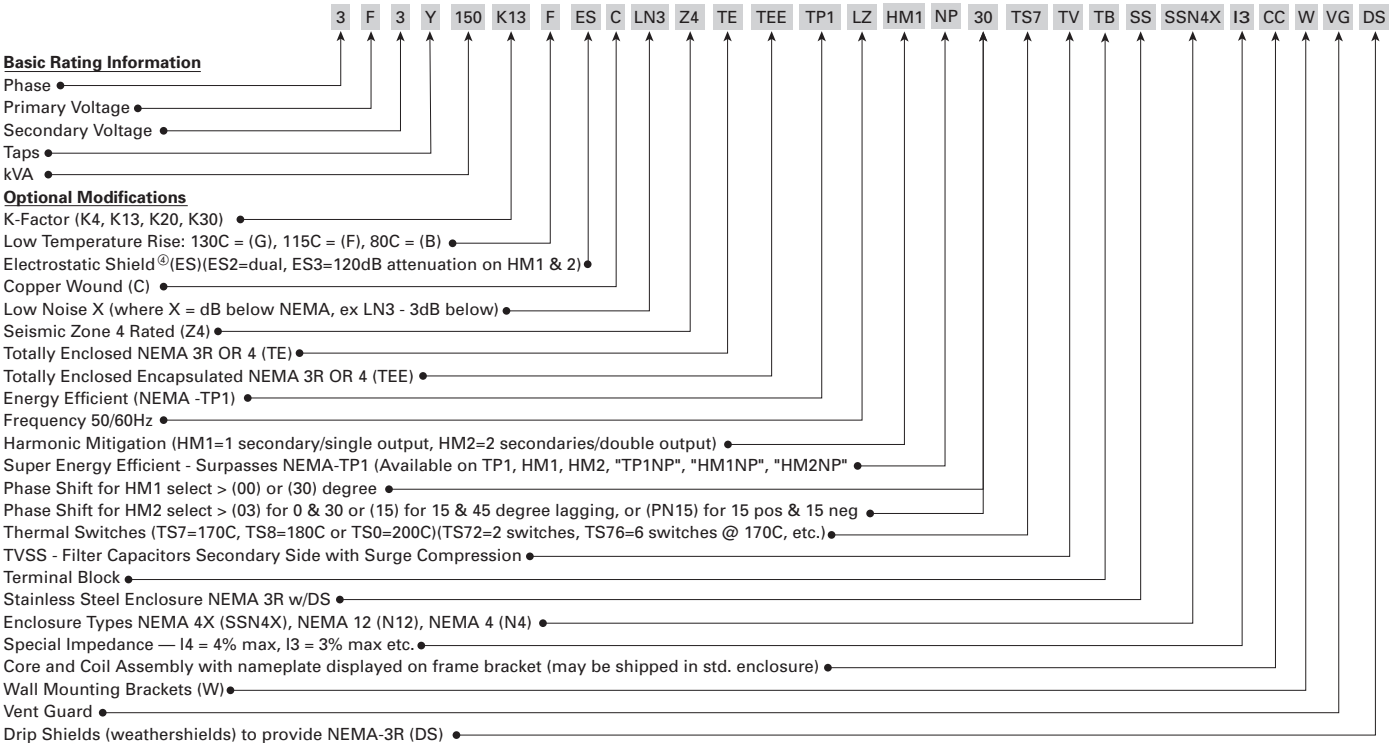
Options

- Special K-Factor ratings
- Special voltage ratings
- NEMA 3R Enclosure
- 80° or 115°C temperature rise
- Low noise designs
- Copper windings
- Drip shields
- Wall mounting brackets (15–45 kVA)
- NEMA Premium® Efficiencies

Distribution Dry Type Transformers

Catalog Number Coding System for Transformers

Selection



Note 1: If the catalog number will not completely describe the product, it will be identified as SPC-_ _ _KVA-XFMR.
Note 2: "JST" suffix on catalog numbers defines units available in the Siemens warehouse distribution system.
Note 3: Suffix K4TP1 or K13TP1 will indicate K-Factor rating and TP1 rating at K1 loading.
Note 4: Most transformers come standard with seismic rating. Contact factory for additional information.
Note 5: Primary and secondary terminal lugs are included on certain ventilated transformers. (15KVA - 75KVA 3PH & 15KVA - 50KVA 1PH)

Phase	
1-Phase	1
3-Phase	3

Primary	
240X120	A
208	B
240	C
480X240	D
277	E
480	F
600	G
190/200/208/220x380 400/416/440 Export Range	H
190/208/220/240x380 416/440/480 Export Range	X

Secondary	
120/240	1
240①	2
208Y/120	3
480 or 380	4
480Y/277	5
380Y/219	6
230Y/133	7
110/220	8
400Y/231	9

TAPS

Description②	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

KVA

KVA	Catalog Code	KVA	Catalog Code	KVA	Catalog Code	KVA	Catalog Code
0.25	205	5	005	30	030	150	150
0.50	505	6	006	37.5	037	167	167
0.75	705	7.5	007	45	045	225	225
1	001	9	009	50	050	300	300
1.5	105	10	010	75	075	500	500
2	002	15	015	100	100	750	750
3	003	25	025	112.5	112	1000	000

①Available in 3-phase 3 to 15 KVA only.
②Taps are determined by transformer design and are not selectable on standard catalog units.
③With continuous overloads these units will be operating as 150°C rise designs.
④"XES" Suffix coding for shielded isolation with filters & surge suppression.

OPTIONAL PRODUCT OFFERINGS

1. For non-standard or non-cataloged voltages or non-cataloged primary taps refer to sales office.
2. Non-standard application, 50/60 Hz, special impedance, voltage, etc. — consult sales office.
3. Wall mounting brackets and weathershields — available at no charge on all indicated units when requested at time of initial project order. Contact sales office for feasibility of wall brackets on units with special temperature rise, low noise, or copper windings.
4. Special temperature rise:
   — 115° C rise, can tolerate 15% continuous overload.③ (Suffix Code F)
   — 80° C rise, can tolerate 30% continuous overload.③ (Suffix Code B)
5. Copper windings — Available on most designs. (Suffix Code C)
6. Low Noise Suffix code LN3 (3dB below std.) available as indicated. For LN5, etc. contact sales office with required sound level.
7. Totally Enclosed Non-Ventilated (TE) — see page 8-8.
8. Auto transformers (A) — see page 8-11.
9. Non-standard paint color — contact sales office.
10. Electrostatic shield (full width copper foil) for added noise attenuation and reduction of high frequency disturbances. (Suffix Code ES)
11. Super Engery Efficient (NEMA Premium®) - Exceeds NEMA TP1 efficiencies by 30%—see page 8-14.
12. Harmonic mitigating transformers—see page 8-15.
13. Transformer and panel combinations—see page 8-13.

Distribution Dry Type Transformers

Single Phase

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②⑥	Drip Shield Required③	Enclosure Style④	Optional Modifications
208 Volts Primary, 120/240 Volts Secondary								
1	**1B1N001**	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
2	**1B1N002**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
3	**1B1N003**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	**1B1N005**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	**1B1N007**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	**1B1N010**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1B1N015**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1B1Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
25	**1B1Y025TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
37.5	**1B1Y037TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
50	**1B1Y050TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
75	**1B1Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5
100	**1B1Y100TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5
167	**1B1Y167TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5
240 × 480 Volts Primary, 120/240 Volts Secondary								
.25	**1D1N205**	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
.50	**1D1N505**	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
.75	**1D1N705**	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
1.0	**1D1N001**	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
1.5	**1D1N105**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
2.0	**1D1N002**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
3.0	**1D1N003**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5.0	**1D1N005**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	**1D1N007**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10.0	**1D1N010**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1D1N015**	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1D1Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
25	**1D1Y025TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
37.5	**1D1Y037TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
50	**1D1Y050TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
75	**1D1Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5
100	**1D1Y100TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5
167	**1D1Y167TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5
277 Volts Primary, 120/240 Volts Secondary								
3	**1E1U003**	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	**1E1U005**	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	**1E1U007**	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	**1E1U010**	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1E1U015**	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	**1E1U025**	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
480 Volts Primary, 120/240 Volts Secondary								
3	**1F1R003**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	**1F1R005**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	**1F1R007**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	**1F1R010**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1F1R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	**1F1R025**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields	DS⑤

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields/weathershields are UL listed for outdoor use. No charge when requested at time of initial project order.
④Encapsulated transformers are UL listed for indoor/outdoor use.
⑤No charge when requested at time of initial project order.
⑥Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.

Distribution Dry Type Transformers

Single Phase

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②⑥	Drip Shield Required③	Enclosure Style④	Optional Modifications
600 Volts Primary, 120/240 Volts Secondary								
3	**1G1R003**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	**1G1R005**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	**1G1R007**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	**1G1R010**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**1G1R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	**1G1R025**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	**1G1Y025TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
37.5	**1G1Y037TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
50	**1G1Y050TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
75	**1G1Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	2, 3, 5
100	**1G1Y100TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	2, 3, 5
167	**1G1Y167TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	2, 3, 5
Overseas Model 190/200/208/220 x 380/400/416/440 Volts Primary, 120/240 Volts Secondary—1Ø, 50/60 Hz								
1	**1H1N001**	N	95° C	130° C	Wall	No	Encapsulated	2, 3
2	**1H1N002**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
3	**1H1N003**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
5	**1H1N005**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
7.5	**1H1N007**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
10	**1H1N010**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
15	**1H1N015**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
25	**1H1N025**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
Overseas Model 190/208/220/240 x 380/416/440/480 Volts Primary, 120/240 Volts Secondary—1Ø, 50/60 Hz								
1	**1X1N001**	N	95° C	130° C	Wall	No	Encapsulated	2, 3
2	**1X1N002**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
3	**1X1N003**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
5	**1X1N005**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
7.5	**1X1N007**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
10	**1X1N010**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
15	**1X1N015**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
25	**1X1N025**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
Overseas Model 190/200/208/220 x 380/400/416/440 Volts Primary, 110/220 Volts Secondary—1Ø, 50/60 Hz								
1	**1H8N001**	N	95° C	130° C	Wall	No	Encapsulated	2, 3
2	**1H8N002**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
3	**1H8N003**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
5	**1H8N005**	N	135° C	180° C	Wall	No	Encapsulated	2, 3
7.5	**1H8N007**	N	135° C	180° C	Wall	No	Encapsulated	2, 3

Notice: CE mark is included on all overseas models.

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields	DS⑤

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields/weathershields are UL listed for outdoor use. No charge when requested at time of initial project order.
④Encapsulated transformers are UL listed for indoor/outdoor use.
⑤No charge when requested at time of initial project order.
⑥Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.

Distribution Dry Type Transformers

Three Phase

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②⑨	Drip Shield Required③	Enclosure Style④	Optional Modifications
480 Volts Δ Primary, 240 Volts Δ Secondary With 120 Volt Tap On B Phase⑤								
15	**3F1Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
30	**3F1Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
45	**3F1Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5
75	**3F1Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 7
112.5	**3F1Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 7
150	**3F1Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 7
225	**3F1Y225TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 7
300	**3F1Y300TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 7
500	**3F1Y500TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 7
750	**3F1Y750TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3
480 Volts Δ Primary, 240 Volts Δ Secondary								
3	**3F2R003**⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	**3F2R006**⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	**3F2R009**⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3F2R015**⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
480 Volts Δ Primary, 208Y/120 Volts Secondary								
3	**3F3R003**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	**3F3R006**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	**3F3R009**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3F3R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3F3Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3F3Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3F3Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3F3Y075TP1**	Y	150° C	220° C	Floor & Wall⑩	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3F3Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3F3Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3F3Y225TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3F3Y300TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3F3Y500TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
750	**3F3Y750TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6, 7
1000	**3F3S000TP1**	S, Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6, 7

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type	Drip Shield Required	Optional Modifications	Avg. Sound Level
Totally Enclosed Transformers, Indoor/Outdoor Use⑧ 480 Volts Δ Primary, 208Y/120 Volts Secondary								
15	**3F3Y015TE**	Y	150° C	220° C	Floor	No	1, 2, 3	45dB
30	**3F3Y030TE**	Y	150° C	220° C	Floor	No	1, 2, 3	45dB
45	**3F3Y045TE**	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
75	**3F3Y075TE**	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
112.5	**3F3Y112TE**	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
150	**3F3Y150TE**	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
225	**3F3Y225TE**	Y	150° C	220° C	Floor	No	1, 2, 3	57dB
300	**3F3Y300TE**	Y	150° C	220° C	Floor	No	1a, 2, 3	57dB
480 Volts Δ Primary, 240 Volts Δ Secondary with 120V Lighting Tap on B Phase⑤								
15	**3F1Y015TE**	Y	150° C	220° C	Floor	No	1, 2, 3	45dB
30	**3F1Y030TE**	Y	150° C	220° C	Floor	No	1, 2, 3	45dB
45	**3F1Y045TE**	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
75	**3F1Y075TE**	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
112.5	**3F1Y112TE**	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
150	**3F1Y150TE**	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
225	**3F1Y225TE**	Y	150° C	220° C	Floor	No	1, 2, 3	57dB
300	**3F1Y300TE**	Y	150° C	220° C	Floor	No	1a, 2, 3	57dB

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115°C Rise	F
1b. 80°C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields	DS⑥
6. Low noise—XdB below std.	LNX
7. Super Energy Efficient	NP⑪

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields are UL listed for outdoor use.
④Encapsulated transformers are UL listed for indoor/outdoor use (2.5% on each side of lighting tap).
⑤Reduced capacity 1-phase tap— When utilizing 1-phase tap at 5%, the 3-phase load is reduced to 85% max. (5% reduction on 3 coils). 10% of rated KVA absolute maximum (evenly balanced on each side of lighting tap). When utilizing 1-phase tap at 10%, the 3-phase load is reduced to 70% max. (10% reduction on 3 coils).
⑥No charge when requested at time of initial project order.
⑦240 volt secondary (3F2) is available in 3-phase 3 to 15KVA only.
⑧TE units will have inrush equal to 2 sizes larger than rated KVA.
⑨Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.
⑩Wall mounting for 150°C rise aluminum only.
⑪TP1NP features are described on page 8-14.

Distribution Dry Type Transformers

Three Phase

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②⑦	Drip Shield Required③	Enclosed Type④	Optional Modifications
480 Volts Δ Primary, 480Y/277 Volts Secondary								
15	**3F5R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3F5Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3F5Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3F5Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3F5Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3F5Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3F5Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3F5Y225TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3F5Y300TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3F5Y500TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
3-Phase 480 Δ — 208Y/120 K-4 (50% Non-Linear Load)⑤								
15	**3F3Y015K4TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
30	**3F3Y030K4TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
45	**3F3Y045K4TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
75	**3F3Y075K4TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
112.5	**3F3Y112K4TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
150	**3F3Y150K4TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
225	**3F3Y225K4TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
300	**3F3Y300K4TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
500	**3F3Y500K4TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
3-Phase 480 Δ — 208Y/120 K-13 (100% Non-Linear Load)⑤								
15	**3F3Y015K13TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
30	**3F3Y030K13TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
45	**3F3Y045K13TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
75	**3F3Y075K13TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
112.5	**3F3Y112K13TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
150	**3F3Y150K13TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
225	**3F3Y225K13TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
300	**3F3Y300K13TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
500	**3F3Y500K13TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
3-Phase 480 Δ — 208Y/120 K-20 (125% Non-Linear Load)⑤								
15	**3F3Y015K20TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
30	**3F3Y030K20TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
45	**3F3Y045K20TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
75	**3F3Y075K20TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
112.5	**3F3Y112K20TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
150	**3F3Y150K20TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
225	**3F3Y225K20TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
300	**3F3Y300K20TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
500	**3F3Y500K20TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
3-Phase 480 Δ — 208Y/120 K-30 (150% Non-Linear Load)⑤								
15	**3F3Y015K30TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
30	**3F3Y030K30TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
45	**3F3Y045K30TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5, 6, 7
75	**3F3Y075K30TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
112.5	**3F3Y112K30TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
150	**3F3Y150K30TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
225	**3F3Y225K30TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
300	**3F3Y300K30TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7
500	**3F3Y500K30TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5, 6, 7

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115°C Rise	F
1b. 80°C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields	DS⑥
6. Low noise—XdB below std.	LNX
7. Super Energy Efficient	NP⑧

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields are UL listed for outdoor use.
④Encapsulated transformers are UL listed for indoor/outdoor use. 15kva with R taps also available in ventilated enclosure.
⑤K-Factor transformers equipped with electrostatic shield and 200% neutral as standard features.
⑥No charge when requested at time of initial project order.
⑦Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.
⑧TP1NP features are described on page 8-14.

Distribution Dry Type Transformers

Three Phase

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②⑥	Drip Shield Required③	Enclosure Style④	Optional Modifications
208 Volts Δ Primary, 208Y/120 Volts Secondary								
3	**3B3R003**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	**3B3R006**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	**3B3R009**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3B3R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3B3Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3B3Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3B3Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3B3Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3B3Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3B3Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3B3S225TP1**	R, S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3B3S300TP1**	R, S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3B3S500TP1**	R, S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
208 Volt Δ Primary, 240 Δ Secondary with 120 Volt TAP on B Phase⑦								
15	**3B1Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3B1Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3B1Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3B1Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3B1Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3B1Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3B1Y225TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
208 Volts Δ Primary, 480Y/277 Volts Secondary								
9	**3B5R009**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3B5R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3B5R015TP1**	R	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3B5R030TP1**	R	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3B5R045TP1**	R	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3B5R075TP1**	R	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3B5R112TP1**	R	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3B5R150TP1**	R	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3B5S225TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3B5S300TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3B5S500TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
240 Volts Δ Primary, 208Y/120 Volts Secondary								
15	**3C3Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3C3Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3C3Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3C3Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3C3Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3C3Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3C3S225TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3C3S300TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3C3S500TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
240 Volts Δ Primary, 480Y/277 Volts Secondary								
15	**3C5Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3C5Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3C5Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3C5Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3C5Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3C5Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3C5S225TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3C5S300TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3C5S500TP1**	S	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields	DS⑤
6. Low noise—XdB below std.	LNX
7. Super Energy Efficient	NP⑧

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields are UL listed for outdoor use.
④Encapsulated transformers are UL listed for indoor/outdoor use. 15kva with R taps also available in ventilated enclosure.
⑤No charge when requested at time of initial project order.
⑥Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.
⑦Reduced capacity 1-phase tap— When utilizing 1-phase tap at 5%, the 3-phase load is reduced to 85% max. (5% reduction on 3 coils). 10% of rated KVA absolute maximum (evenly balanced on each side of lighting tap). When utilizing 1-phase tap at 10%, the 3-phase load is reduced to 70% max. (10% reduction on 3 coils).
⑧TP1NP features are described on page 8-14.

Distribution Dry Type Transformers

Three Phase

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②⑦	Drip Shield Required③	Enclosure Style④	Optional Modifications
600 Volts Δ Primary, 208Y/120 Volts Secondary								
3	**3G3R003**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	**3G3R006**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	**3G3R009**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3G3R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3G3Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3G3Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3G3Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3G3Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3G3Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3G3Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3G3Y225TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3G3Y300TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3G3Y500TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
600 Volts Δ Primary, 480Y/277 Volts Secondary								
3	**3G5R003**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	**3G5R006**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	**3G5R009**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3G5R015**	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	**3G5Y015TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
30	**3G5Y030TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
45	**3G5Y045TP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 2, 3, 4, 5, 6, 7
75	**3G5Y075TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
112.5	**3G5Y112TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
150	**3G5Y150TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
225	**3G5Y225TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
300	**3G5Y300TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7
500	**3G5Y500TP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 5, 6, 7

Dual Purpose Auto Transformers⑥

KVA		Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②	Drip Shield Required③	Enclosure Style④	Optional Modifications
600V Pri 480V Sec	480V Pri 380V Sec								
600 Volts Primary, 480 Volts Secondary 3Ø 60 Hz OR— 480 Volts Primary 380 Volts Secondary 3Ø 50/60 Hz Alternate Rating									
15	12	**3G4N015A**	N	80° C	130° C	Wall	No	Encapsulated	—
30	24	**3G4N030A**	N	115° C	180° C	Wall	No	Encapsulated	—
45	36	**3G4N045A**	N	150° C	220° C	Floor & Wall	Yes	Ventilated	4, 5
75	60	**3G4N075A**	N	150° C	220° C	Floor & Wall	Yes	Ventilated	4, 5
112.5	90	**3G4N112A**	N	150° C	220° C	Floor & Wall	Yes	Ventilated	4, 5
150	120	**3G4N150A**	N	150° C	220° C	Floor & Wall	Yes	Ventilated	4, 5
225	180	**3G4N225A**	N	150° C	220° C	Floor & Wall	Yes	Ventilated	4, 5
300	240	**3G4N300A**	N	150° C	220° C	Floor	Yes	Ventilated	5
500	400	**3G4N500A**	N	150° C	220° C	Floor	Yes	Ventilated	5

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields	DS⑤
6. Low noise - XdB below std.	LNX
7. Super Energy Efficient	NP⑧

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields are UL listed for outdoor use.
④Encapsulated transformers are UL listed for indoor/outdoor use.
⑤No charge when requested at time of initial project order.
⑥If used on unbalanced loads, these auto transformers will need to be used on a 4-wire system with the supply neutral connected to the transformer. If used on motor loads, then they may be used on a 3-wire system without a neutral or fourth wire. Review in NEC 450-4 and 450-5.
⑦Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.
⑧TP1NP features are described on page 8-14.

Isolation & Filtering Transformers

The Siemens "XES" models are specifically designed to protect sensitive equipment from surges, spikes and line noise. These designs are available with either 208 volt or 480 volt primary and 208Y/120 volt secondary up to 112.5 kVA. All units have spike/surge protection on the primary side and low pass filters on the secondary. The combination of these components and the electrostatic shielding provide excellent transverse mode noise attenuation of 60 db. Additionally the common mode noise attenuation of 120 db will increase protection from line noise, spikes and surges.

Shielded Isolation with Filter Capacitors and Surge Suppression ("XES" Models)

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type③	Drip Shield Required②	Enclosure Style	Optional Modifications
480 Volts Δ Primary, 208Y/120 Volts Secondary								
15	**3F3Y015XESTP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5
30	**3F3Y030XESTP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5
45	**3F3Y045XESTP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5
75	**3F3Y075XESTP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5
112.5⑤	**3F3Y112XESTP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1a, 3, 5
208 Volts Δ Primary, 208Y/120 Volts Secondary								
15	**3B3Y015XESTP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5
30	**3B3Y030XESTP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5
45	**3B3Y045XESTP1**	Y	150° C	220° C	Floor & Wall	Yes	Ventilated	1, 3, 4, 5
75	**3B3Y075XESTP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1, 3, 5
112.5⑤	**3B3Y112XESTP1**	Y	150° C	220° C	Floor	Yes	Ventilated	1a, 3, 5

Taps (See page 8-11)

Motor Drive Isolation

Three Phase 60HZ Motor Drive Isolation Transformers

Motor KVA	Catalog H.P.④	Standard Number	Taps①	Rise	Insulation	Mounting Type	Drip Shield Required②	Optional Modifications
7.5	3 & 5	DT ( ) 007	S	135° C	180° C	Floor & Wall	No	1, 2, 3
11	7.5	DT ( ) 011	S	135° C	180° C	Floor & Wall	No	1, 2, 3
14	10	DT ( ) 014	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
20	15	DT ( ) 020	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
27	20	DT ( ) 027	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
34	25	DT ( ) 034	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
40	30	DT ( ) 040	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
51	40	DT ( ) 051	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
63	50	DT ( ) 063	S	150° C	220° C	Floor & Wall	Yes	1, 2, 3, 4, 5, 6
75	60	DT ( ) 075	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
93	75	DT ( ) 093	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
118	100	DT ( ) 118	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
145	125	DT ( ) 145	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
175	150	DT ( ) 175	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
220	200	DT ( ) 220	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
275	250	DT ( ) 275	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
330	300	DT ( ) 330	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
440	400	DT ( ) 440	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
550	500	DT ( ) 550	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6
660	600	DT ( ) 660	S	150° C	220° C	Floor	Yes	1, 2, 3, 5, 6

DT ( ) Code	Primary Volts	Secondary Volts
18	208 Delta	208Y/120
20	208 Delta	230Y/133
21	208 Delta	460Y/266
22	230 Delta	230Y/133
24	230 Delta	460Y/266
30	380 Delta	460Y/266
42	460 Delta	230Y/133
44	460 Delta	460Y/266
45	460 Delta	380Y/220
52	575 Delta	230Y/133
54	575 Delta	460Y/266

Motor Drive Isolation Optional Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
5. Drip Shields/Weather Shields	DS
6. Thermal Switches	TS

(Contact Sales office for List Price)

①Actual taps may vary based on volts/turn ratio.
②For outdoor application. Ventilated transformers requiring drip shields are UL listed for outdoor use. No charge when requested at time of initial project order.
③Items marked floor and wall can be wall mounted with optional wall bracket identified with "W" suffix on catalog number.
④Refer selection and application guide for additional information on horsepower, Ampere, KVA ratings and applications. Standard taps varies with design volts/turn ratio.
⑤112.5 KVA XES transformer is only available with copper windings and 115C temp rise.

Distribution Dry Type Transformers

Sentron Power Centers

Selection

Economical Space Saving Package

Siemens Sentron Power Center is a pre-wired combination of a primary breaker disconnect, dry type shielded transformer, secondary breaker disconnect and a secondary power panel all in one convenient package.

You save time, space and money by not having to individually assemble, mount and wire these components. Simply add the branch and you're ready to go.

UL-3R Enclosures

All Sentron Power Center enclosures are UL-3R listed for indoor and outdoor use.

Transformer Assembly

Siemens totally encapsulated distribution transformers are designed for general purpose indoor/outdoor operation.

Sentron Power Centers can be installed in a wide variety of atmospheric and environmental conditions. A 180°C, UL recognized insulation system is used with a 115°C temperature rise.

Sentron Power Center units are electrostatically shielded to provide transient voltage protection at no extra cost. All units have 2-5% FCBN taps.

Panel Assembly

The power panel assembly will accommodate one-inch, 1, 2 or 3-pole, common trip, duplex secondary branch circuit breakers, Type Q and QT as well as ground fault circuit breakers. Per UL and NEC requirements, the Sentron Power Center assembly comes fully equipped with primary and secondary main circuit breakers. Branch circuit breakers can be obtained from our local distributor once you have established your branch circuit requirements. All Sentron Power Centers are UL listed for service entrance.



KVA	Catalog Number④⑧⑨	Maximum Secondary Circuits① 1" Wide 120V (1-Pole)	1/2" Wide 120V (1-Pole)	2" Wide 240V (2-pole)	Interior Number Reference	Approximate Dimensions (in inches) Height	Width	Depth	Approximate Net Weight (lbs.)
480 Volts Primary, 240/120 Volts Secondary — Single Phase② — Sentron Power Centers⑤									
5.0	**1LPC005**	8	16	4	I1224L1100CU	32.13	13.25	7.63	120
7.5	**1LPC007**	8	16	4	I1224L1100CU	32.13	15.88	11.00	160
10.0	**1LPC010**	8	16	4	I1224L1100CU	34.38	15.88	11.00	185
15.0	**1LPC015**	12	24	6	I1224L1125CU	34.38	17.13	12.38	240
25.0	**1LPC025**	20	40	10	I2440L1200CU	41.88	17.88	13.50	330

KVA	Catalog Number④⑧⑨	Maximum Secondary Circuits① 1" Wide 120V (1-Pole)	1/2" Wide 120V (1-Pole)	3" Wide 208V (3-pole)	Interior Number Reference	Approximate Dimensions (in inches) Height	Width	Depth	Approximate Net Weight (lbs.)
480 Volts Δ Primary, 208Y/120 Volts Secondary — Three Phase③ — Sentron Power Centers⑤									
9.0	**3LPC009**	12	24	4	PI1836L3200CUB	33.75	22.13	7.63	255
15.0	**3LPC015**	12	24	4	PI1836L3200CUB	35.13	22.13	12.38	385
22.5	**3LPC022**	18	36	6	PI2442L3200CUB	38.25	30.25	13.38	535
30.0	**3LPC030**	24	42	8	PI3054L3200CUB	43.75	33.00	13.75	680

Circuit Breaker Data for Sentron Power Centers

480 Volts to 240/120 Volts — Single Phase

KVA	480 Volts Primary Breaker①⑥⑦	240/120 Volts Secondary Main	Maximum Rating of Secondary Breakers
5.0	ED42B025L (25A)	Q225 (25A)	20 Amps
7.5	ED42B025L (25A)	Q240 (40A)	30 Amps
10.0	ED42B035L (35A)	Q250 (50A)	40 Amps
15.0	ED42B050L (50A)	Q270 (70A)	60 Amps
25.0	ED42B090L (90A)	Q2125 (125A)	100 Amps

480 Volts Δ to 208Y/120 Volts — Three Phase

KVA	480 Volts Primary Breaker①⑥⑦	208Y/120 Volts Secondary Main	Maximum Rating of Secondary Breakers
9.0	ED43B025L (25A)	Q330 (30A)	25 Amps
15.0	ED43B040L (40A)	Q350 (50A)	40 Amps
22.5	ED43B070L (70A)	Q370 (70A)	60 Amps
30.0	ED43B090L (90A)	Q3100 (100A)	80 Amps

① Primary breaker has lineside lug for customer connection.
② Single Phase – 18,000 Amps RMS Symmetrical Interrupting Capacity.
③ Three Phase – 18,000 Amps RMS Symmetrical Interrupting Capacity.
④ Sentron Power Centers are NEMA 3R for outdoor application and may be ordered with "SS" suffix for 304 stainless steel enclosure.
⑤ Secondary branch breakers are not included and must be ordered separately.
⑥ Primary and secondary main breakers are included and are factory installed.
⑦ ED frame breakers furnished are rated 18000 AIC and are sufficient for fault current of transformer. If higher AIC rating is required by spec, the ED can be changed in the field to HED 4 (42000 AIC) or HHED6 (65000 AIC).
⑧ 1LPC005 and 3LPC009 are copper wound.
⑨ Available with Stainless Steel NEMA 3R enclosures by adding catalog number suffix "SS".

Distribution Dry Type Transformers

Sentron Power Centers

Selection

Bolt-in Breaker Option

The same economical space saving package, NEMA 3R rated enclosure, and UL listed transformer of the original Sentron Power Center but now available with more robust BOLT-IN BREAKERS.

Panel Assembly

This version of the Sentron Power Center uses our UL Recognized P1 Lighting Panel interior with the following ratings & features:

- 200 kA Short Circuit rating
- 240 Volts maximum (when using type BL branch devices)
- 250 Amps maximum
- Copper bus
- 18 circuit panel for 15kVA and below
- 30 circuit panel for designs above 15kVA

The power panel assembly will accommodate one-inch, 1, 2, or 3-pole type BL, BLH, HBL branch Breakers, to include the BL family of AFCI, GFCI, Ground Fault, Switching Neutrals, HID Lighting, Tungsten Lighting, and Molded Case Switches.

The Sentron Power Center assembly comes fully equipped with transformer primary and secondary main circuit breakers. Branch circuit breakers can be obtained from our local distributor once you have established your branch circuit requirements. All Sentron Power Centers are UL listed for service entrance applications.



Voltage rating: 480 - 240/120, Single Phase, Sentron Power Center

kVA	Catalog Number③	Maximum Secondary Circuits①		Interior Part Number	Approximate Dimensions (inches)			Approximate Weight (lbs.)
		1" Wide	2" Wide		Height	Width	Depth	
5	**1LPC005J**	16	8	**12-B-3025-07**	38.00	15.88	11.00	165
7.5	**1LPC007J**	16	8	**12-B-3025-07**	38.00	15.88	11.00	165
10	**1LPC010J**	16	8	**12-B-3025-07**	34.38	17.13	12.38	240
15	**1LPC015J**	16	8	**12-B-3025-07**	34.38	17.13	12.38	240
25	**1LPC025J**	28	14	**12-B-3025-09**	41.88	17.88	13.50	330

Voltage rating: 480 Delta - 208Y/120, Three Phase, Sentron Power Center

kVA	Catalog Number③	Maximum Secondary Circuits②		Interior Part Number	Approximate Dimensions (inches)			Approximate Weight (pounds)
		1" Wide	2" Wide		Height	Width	Depth	
9	**3LPC009J**	15	7	**12-B-3025-08**	33.75	22.13	7.63	255
15	**3LPC015J**	15	7	**12-B-3025-08**	35.13	22.13	12.38	385
22.5	**3LPC022J**	27	13	**12-B-3025-10**	43.75	44.00	13.75	680
30	**3LPC030J**	27	13	**12-B-3025-10**	43.75	44.00	13.75	680

Circuit Breaker Data for Sentron Power Centers

For Single Phase Sentron Power Centers

kVA	Transformer Primary Breaker	Panel Secondary Main Breaker	Maximum rating of Branch Breakers (Amps)
5	ED42B025L (25A)	B230H (30A)	20
7.5	ED42B025L (25A)	B240H (40A)	30
10	ED42B035L (35A)	B250H (50A)	40
15	ED42B050L (50A)	B270 (70A)	60
25	ED42B090L (90A)	B2125 (125A)	100

For Three Phase Sentron Power Centers

kVA	Transformer Primary Breaker	Panel Secondary Main Breaker	Maximum rating of Branch Breakers (Amps)
9	ED43B025L (25A)	B330H (30A)	25
15	ED43B040L (40A)	B350H (50A)	40
22.5	ED43B070L (70A)	B370 (70A)	60
30	ED43B050L (90A)	B3100 (100A)	80

① Excluding Secondary Main Breaker that takes up 2 poles.
② Excluding Secondary Main Breaker that takes up 3 poles.
③ For stainless steel, add "SS" to the end of the part number.

NEMA Premium® Efficiency Transformer

The NEMA Premium Efficiency Transformer Program will help utilities, commercial buildings, and industrial plants incorporate super high-efficiency electrical transformers into their operations. NEMA originally set the standard for the efficiency of various types of distribution transformers with the publication of NEMA TP 1-2002 Guide for Determining Energy Efficiency for Distribution Transformers, which was later adopted by the U.S. Department of Energy (DOE) as the national energy-efficiency rule for low-voltage dry-type distribution transformers. The new Siemens NEMA Premium Efficiency Transformer designation requires 30 percent fewer losses than existing DOE regulations (10 CFR 431) for low-voltage dry-type distribution transformers.

The new transformers are available in all standard kVA ratings, optional K4 or K13 ratings, Aluminum or copper windings, and 80, 115, or 150 degree C temperature rise.

NEMA Premium Transformer Efficiencies

Single-Phase		Three-Phase	
kVA	Efficiency (%)	kVA	Efficiency (%)
15	98.39%	15	97.90%
25	98.60%	30	98.25%
37.5	98.74%	45	98.39%
50	98.81%	75	98.60%
75	98.95%	112.5	98.74%
100	99.02%	150	98.81%
167	99.09%	225	98.95%
250	99.16%	300	99.02%
333	99.23%	500	99.09%
		750	99.16%
		1000	99.23%

Estimated Annual Transformer Energy Savings

	15 kVA		30 kVA		45 kVA		75 kVA	
	NEMA TP1	NEMA Premium	NEMA TP1	NEMA Premium	NEMA TP1	NEMA Premium	NEMA TP1	NEMA Premium
No Load Losses (kW)	0.085	0.073	0.155	0.100	0.175	0.135	0.260	0.220
Load Losses (kW)	0.90	0.32	1.33	0.69	2.03	1.00	2.90	1.22
Energy Cost/Month ($) =	$24.21	$11.99	$37.98	$21.21	$53.21	$30.01	$76.94	$41.03
Energy Savings/Year ($) =	$147		$201		$278		$431	

Note 1: Based on 730 Average Hours/Month.
Note 2: Transformer data: Standard 3F3Y units. Example catalog number 3F3Y015TP1NP
Note 3: Cost of Electricty used is the 2009 National Average Commercial Rate (10.7 cents/KWhr).
Note 4: At 50% Average Load.

Sentron Harmonic Mitigating Transformers (HM1 & HM2)

Description

The Sentron Harmonic Mitigating Transformers (HMTs) are designed to meet the needs of modern power distribution systems that contain a large percentage of non-linear equipment that produces harmonics. Some examples of this type of equipment are computers, printers, fax machines, scanners, copiers, uninterruptible power supplies, ballast and variable frequency drives (VFD). This type of equipment generates harmonic voltages and currents because they contain AC to DC power conversion rectifiers. Harmonic voltages and currents can cause a variety of problems ranging from poor power factor, voltage distortion, capacitor resonance and motor failures to overloaded transformers and conductors.

The Sentron HMTs are specially designed to operate under high non-linear load conditions and have the additional benefit of improving the overall power system reliability.

Application

One of the most effective ways to eliminate power system harmonics is to use a technique known as "phase shifting." In this method power system harmonics are eliminated by pairing together harmonics that have 180° relative angular displacement, which causes them to cancel one another out. This can be accomplished by a variety of means:

Single Output Harmonic Mitigating Transformer (0° or -30° primary-secondary angular displacement)

- The primary of this transformer has a delta connection and its secondary has a special double winding connection. Although there is only one secondary three phase output, the 3rd, 9th and 15th harmonic currents are prevented from circulating in the primary windings by canceling their magnetic fluxes at low impedance with the double winding secondary, reducing voltage distortions to the loads.
- When two transformers with this type of connection, 0° and -30° displacement, are used in parallel, the 3rd, 9th and 15th harmonic currents are canceled as previously described, and additionally the 5th and 7th harmonic currents are cancelled in the electrical supply common to both transformers due to their relative 30° phase shift.
- If a single harmonic mitigating transformer (0°) is used in an existing or new system utilizing standard delta-wye transformers (-30°), the 5th and 7th harmonic currents originating from the HMT transformer (0°) will attempt to cancel the 5th and 7th harmonic currents originating from the standard delta-wye transformer (-30°). This reduces the overall 5th and 7th harmonics present in the system, with the actual reduction dependent on the magnitudes of the secondary loads.

Double-Output Harmonic Mitigating Transformer (0° and -30° or -15° and -45° primary-secondary angular displacement)

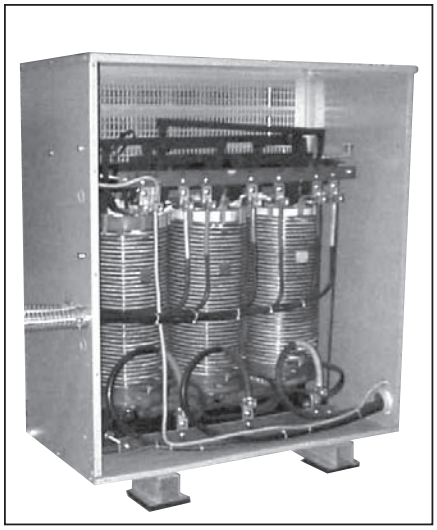
- The primary of this transformer has a delta connection and its secondary has double-output, special double winding connections with 30° phase shift between outputs. This arrangement cancels the 3rd, 5th, 7th, 9th, and 15th harmonics at very low impedance on the secondary side. This greatly improves voltage distortion for the loads and the primary power factor. The advantage of this arrangement is that the reductions of harmonic currents are achieved with one transformer creating a 12 pulse load.
- If two of these transformers are used, with the primaries of each phase shifted 15° with respect to one another, then cancellation of harmonics up to the 19th are achievable creating a 24 pulse load.

Benefits

Elimination of undesirable harmonics by using the Siemens Sentron HMTs is an effective solution to the power quality problems encountered by today's power system professionals. By treating the harmonics at their source, using advanced technology, installation problems can be avoided and overall system reliability improved. The Sentron HMT product line provides many far reaching benefits such as lower operating cost, improved operating efficiency, reduced down-time due to outages caused by nuisance tripping, and increased equipment life due to low voltage distortions.

Design and Construction Features

The Sentron Harmonic Mitigating Transformers comply with all applicable ANSI/IEEE standards including C57.12.91, C57.96, C57.110, CSA # C22.2 No. 47 (CUL), UL506, UL1561 as well as NEMA ST-20. The design life is 25 years at 130 degree C rise, 30 years at 115C rise and 40 years for 80C rise models. Approvals and listings include UL, CSA. with CE approval available when requested. The Sentron HMTs have capability up to the load capability up to K-20, which is achieved by harmonic cancellations in the secondary and low flux density design for protection against heat in place of design enlargement protection only. Copper coil windings with full width copper foil electrostatic shield are standard and additional shield options are available for higher noise attenuation requirements. All HMTs have 130C rise with optional 115C and 80C winding rise designs available. All designs include vacuum impregnated polyester resin encapsulation of windings and NEMA 3R enclosures. A neutral sized at 200% of the ampacity of the secondary phase conductors for extra protection against triplens and unbalanced single phase loads. The Sentron HMT designs have TP1 energy efficient rating equal to that of a non K-Factor rated transformer. Siemens HMT designs have TP1 efficiency levels at 35% load @ ref temp. 75 degree C and also retain TP1 efficiency levels at 65% load @ reference temperature 85C. A ten-year pro-rated warranty with standard liability limitations applies to all Sentron HMTs.



Transformers

Sentron Harmonic Mitigating Transformers (HM1 & HM2)

Selection

Catalog Number Coding:

Single output (1 secondary) = HM1,
Double output (2 secondaries) = HM2.
Phase Shift Options: HM1 followed by > (00) or (30) degree.
HM2 > (03) for 0 & 30 or (15) for 15 & 45 degree lagging.
HMT, 480 Volt Primary 208Y/120 Volt Secondary (3F3)–130C (standard), 115C and 80C Winding Rise displayed on this page.HMTs are also available with 480–480Y/277 (3F5), 208–208Y/120 (3B3), 208–480Y/277 (3B5).

Standard Features Include:

- K-20 Load profile rating.
- TP1 Efficiencies @ 35% through 65% load.
- (C) Copper windings.
- (ES) Electrostatic shield.
- 130 C Winding rise.

KVA	130C (std.) Rise HMT Catalog Number ①	115C Rise HMT Catalog Number ①	80C Rise HMT Catalog Number ①	Secondary Configuration		Enclosure Style	Optional HMT Modifications
				Outputs	Phase Shift		
15	**3F3Y015GHM100**	**3F3Y015FHM100**	**3F3Y015BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
15	**3F3Y015GHM130**	**3F3Y015FHM130**	**3F3Y015BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
15	**3F3Y015GHM203**	**3F3Y015FHM203**	**3F3Y015BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
15	**3F3Y015GHM215**	**3F3Y015FHM215**	**3F3Y015BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
30	**3F3Y030GHM100**	**3F3Y030FHM100**	**3F3Y030BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
30	**3F3Y030GHM130**	**3F3Y030FHM130**	**3F3Y030BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
30	**3F3Y030GHM203**	**3F3Y030FHM203**	**3F3Y030BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
30	**3F3Y030GHM215**	**3F3Y030FHM215**	**3F3Y030BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
45	**3F3Y045GHM100**	**3F3Y045FHM100**	**3F3Y045BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
45	**3F3Y045GHM130**	**3F3Y045FHM130**	**3F3Y045BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
45	**3F3Y045GHM203**	**3F3Y045FHM203**	**3F3Y045BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
45	**3F3Y045GHM215**	**3F3Y045FHM215**	**3F3Y045BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
75	**3F3Y075GHM100**	**3F3Y075FHM100**	**3F3Y075BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
75	**3F3Y075GHM130**	**3F3Y075FHM130**	**3F3Y075BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
75	**3F3Y075GHM203**	**3F3Y075FHM203**	**3F3Y075BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
75	**3F3Y075GHM215**	**3F3Y075FHM215**	**3F3Y075BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
112.5	**3F3Y112GHM100**	**3F3Y112FHM100**	**3F3Y112BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
112.5	**3F3Y112GHM130**	**3F3Y112FHM130**	**3F3Y112BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
112.5	**3F3Y112GHM203**	**3F3Y112FHM203**	**3F3Y112BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
112.5	**3F3Y112GHM215**	**3F3Y112FHM215**	**3F3Y112BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
150	**3F3Y150GHM100**	**3F3Y150FHM100**	**3F3Y150BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
150	**3F3Y150GHM130**	**3F3Y150FHM130**	**3F3Y150BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
150	**3F3Y150GHM203**	**3F3Y150FHM203**	**3F3Y150BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
150	**3F3Y150GHM215**	**3F3Y150FHM215**	**3F3Y150BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
225	**3F3Y225GHM100**	**3F3Y225FHM100**	**3F3Y225BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
225	**3F3Y225GHM130**	**3F3Y225FHM130**	**3F3Y225BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
225	**3F3Y225GHM203**	**3F3Y225FHM203**	**3F3Y225BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
225	**3F3Y225GHM215**	**3F3Y225FHM215**	**3F3Y225BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
300	**3F3Y300GHM100**	**3F3Y300FHM100**	**3F3Y300BHM100**	1	Zero Degree	Vented	A,B,C,D,E,F,G,H
300	**3F3Y300GHM130**	**3F3Y300FHM130**	**3F3Y300BHM130**	1	30 Deg Lagging	Vented	A,B,C,D,E,F,G,H
300	**3F3Y300GHM203**	**3F3Y300FHM203**	**3F3Y300BHM203**	2	0 & 30 Lagging	Vented	A,B,C,D,E,F,G,H
300	**3F3Y300GHM215**	**3F3Y300FHM215**	**3F3Y300BHM215**	2	15 & 45 Lagging	Vented	A,B,C,D,E,F,G,H
500	**3F3Y500GHM100**	**3F3Y500FHM100**	**3F3Y500BHM100**	1	Zero Degree	Vented	C,D,E,F,G,H
500	**3F3Y500GHM130**	**3F3Y500FHM130**	**3F3Y500BHM130**	1	30 Deg Lagging	Vented	C,D,E,F,G,H
500	**3F3Y500GHM203**	**3F3Y500FHM203**	**3F3Y500BHM203**	2	0 & 30 Lagging	Vented	C,D,E,F,G,H
500	**3F3Y500GHM215**	**3F3Y500FHM215**	**3F3Y500BHM215**	2	15 & 45 Lagging	Vented	C,D,E,F,G,H

Optional Modifications Table for HMTs			
	Sound Level	**Thermal Sensors 170° C= (TS7), 185° C= (TS8) or 200° C= (TS0)**	
A	LN3= (3dB below NEMA standard)	H	TS7 = 1 sensor center coil
B	LN5= (5dB below NEMA standard)	H	TS72 = 2 sensors center coil
	Attenuation—Single shield—60dB Common Mode Std.	H	TS76 = 6 sensors, (2) on each coil
C	ES2= Double shield—80dB Common Mode >	H	TS8 = 1 sensor center coil
D	ES3= Double shield & TVSS—120dB Common >	H	TS82 = 2 sensors center coil
	Filtering & Attenuation	H	TS86 = 6 sensors, (2) on each coil
E	TV= Secondary side TVSS (90kA Standard) with common mode noise attenuation	H	TS0 = 1 sensor center coil
F	TB= Terminal Block	H	TS02 = 2 sensors center coil
G	NP= Super Energy Efficient (HM1NP & HM2NP)	H	TS06 = 6 sensors, (2) on each coil

① Contact Sales Office for pricing.

Warehouse Stock Transformers

Type JST [Standard Units]

Selection

KVA	Catalog Number	Taps①	Temperature Rise	Insulation	Mounting Type②	Drip Shield Required③	Enclosure Style④
Single Phase							
240 × 480 Volts Primary, 120/240 Volts Secondary							
.05	1D1N555JST	N	95° C	130° C	Wall	None	Encapsulated
.075	1D1N775JST	N	95° C	130° C	Wall	None	Encapsulated
.10	1D1N110JST	N	95° C	130° C	Wall	None	Encapsulated
.15	1D1N115JST	N	95° C	130° C	Wall	None	Encapsulated
.25	1D1N205JST	N	95° C	130° C	Wall	None	Encapsulated
.50	1D1N505JST	N	95° C	130° C	Wall	None	Encapsulated
.75	1D1N705JST	N	95° C	130° C	Wall	None	Encapsulated
1.0	1D1N001JST	N	95° C	130° C	Wall	None	Encapsulated
1.5	1D1N105JST	N	135° C	180° C	Wall	None	Encapsulated
2.0	1D1N002JST	N	135° C	180° C	Wall	None	Encapsulated
3.0	1D1N003JST	N	135° C	180° C	Wall	None	Encapsulated
5.0	1D1N005JST	N	135° C	180° C	Wall	None	Encapsulated
7.5	1D1N007JST	N	135° C	180° C	Wall	None	Encapsulated
10	1D1N010JST	N	135° C	180° C	Wall	None	Encapsulated
15	1D1N015JST	N	135° C	180° C	Wall	None	Encapsulated
15	1D1Y015TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
25	1D1Y025TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
37.5	1D1Y037TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
50	1D1Y050TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
75	1D1Y075TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
100	1D1Y100TP1JST	Y	150° C	220° C	Floor	Contact Factory	Ventilated
167	1D1Y167TP1JST	Y	150° C	220° C	Floor	Contact Factory	Ventilated
Three Phase							
480 Volts Δ Primary, 208Y/120 Volts Secondary							
3	3F3R003JST	R	135° C	180° C	Wall	None	Encapsulated
6	3F3R006JST	R	135° C	180° C	Wall	None	Encapsulated
9	3F3R009JST	R	135° C	180° C	Wall	None	Encapsulated
15	3F3Y015TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
30	3F3Y030TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
45	3F3Y045TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
75	3F3Y075TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
112.5	3F3Y112TP1JST	Y	150° C	220° C	Floor	Contact Factory	Ventilated
150	3F3Y150TP1JST	Y	150° C	220° C	Floor	Contact Factory	Ventilated
Three Phase							
480 Volts Δ Primary, 240 Volts Δ Secondary With 120 Volt Tap On B Phase⑤							
15	3F1Y015TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
30	3F1Y030TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
45	3F1Y045TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
75	3F1Y075TP1JST	Y	150° C	220° C	Floor & Wall	Contact Factory	Ventilated
112.5	3F1Y112TP1JST	Y	150° C	220° C	Floor	Contact Factory	Ventilated
150	3F1Y150TP1JST	Y	150° C	220° C	Floor	Contact Factory	Ventilated

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

① Actual taps are shown for warehouse stock transformers.
② Wall designations for units having standard features.
③ For outdoor application. Ventilated transformers requiring drip shields are UL listed for outdoor use.
④ Encapsulated transformers are UL listed for indoor/outdoor use.
⑤ Reduced capacity 1-phase tap—5% of rated KVA (2.5% on each side of lighting tap).

□ = Warehouse Stock

Warehouse Stock Transformers

Type JST and Buck-Boost Transformers

Selection

Encapsulated, Indoor/Outdoor Enclosure

120 × 240 Volts — 12/24 Volts, 60 Hz, No Taps, Wall Mounted

Catalog Number	KVA
050BB1224J	.050
100BB1224J	.100
150BB1224J	.150
205BB1224J	.250
505BB1224J	.500
705BB1224J	.750
1BB1224J	1.00
105BB1224J	1.50
2BB1224J	2.00
3BB1224J	3.00
5BB1224J	5.00

120 × 240 Volts — 16/32 Volts, 60 Hz, No Taps, Wall Mounted

Catalog Number	KVA
050BB1632J	.050
100BB1632J	.100
150BB1632J	.150
205BB1632J	.250
505BB1632J	.500
705BB1632J	.750
1BB1632J	1.00
105BB1632J	1.50
2BB1632J	2.00
3BB1632J	3.00
5BB1632J	5.00

240 × 480 Volts — 24/48 Volts, 60 Hz, No Taps, Wall Mounted

Catalog Number	KVA
050BB2448J	.050
100BB2448J	.100
150BB2448J	.150
205BB2448J	.250
505BB2448J	.500
705BB2448J	.750
1BB2448J	1.00
105BB2448J	1.50
2BB2448J	2.00
3BB2448J	3.00
5BB2448J	5.00

Accessories

Dripshield/Weathershield Kits for Type JST Ventilated Transformers①②

Contact factory for price and availability of Dripshield/ Weathershield kits.

Wall Mounting Brackets for Type JST Ventilated Transformers

Contact factory for price and availability of Wall Mounting Brackets.

Terminal Lug Kits For Ventilated Transformers⑤

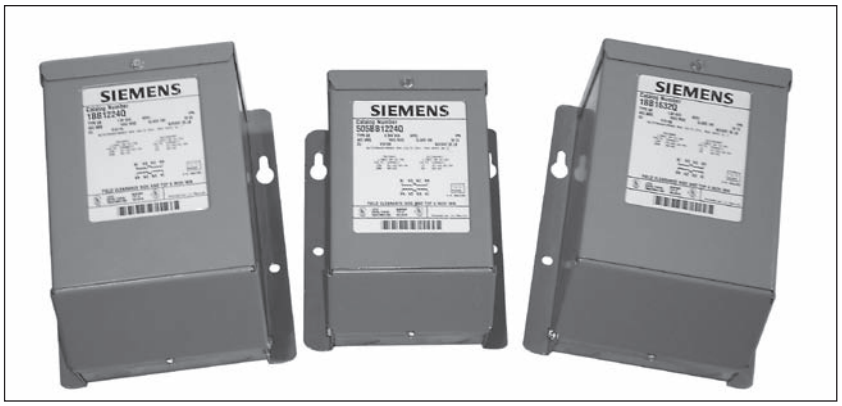
Catalog Number	Single Phase KVA Sizes	Three Phase KVA Sizes	Primary Terminal Lug③		Cable Range	Secondary Terminal Lug③		Cable Range	Primary Hardware Included		Secondary Hardware Included	
			Qty.④	Lug No.		Qty.④	Lug No.		Qty.	Bolt Size	Qty.	Bolt Size
TLK14Ω	75, 100	—	12	AB-350S	#6-350 kcmil				12	3/8 x 1 1/2		
TLK15Ω	167.5	—	8	AB-350S	#6-350 kcmil	12	AB-750S	1/0-750 kcmil	8	3/8 x 1 1/2	12	1/2 x 1 1/2
TLK34Ω	—	112.5	11	AB-350S	#6-350 kcmil				11	3/8 x 1 1/2		
TLK35Ω	—	150	3	AB-350S	#6-350 kcmil	8	AB-750S	1/0-750 kcmil	3	3/8 x 1 1/2	8	3/8 x 1 1/2
TLK36Ω	—	225	22	AB-350S	#6-350 kcmil				22	3/8 x 1 1/2		
TLK37Ω	—	300	6	AB-350S	#6-350 kcmil	16	AB-750S	1/0-750 kcmil	6	3/8 x 1 1/2	16	1/2 x 1 1/2
TLK38Ω	—	500	9	AB-350S	#6-350 kcmil	24	AB-750S	1/0-750 kcmil	9	3/8 x 1 1/2	24	1/2 x 1 1/2
TLK39Ω	—	750	12	AB-350S	#6-350 kcmil	28	AB-750S	1/0-750 kcmil	12	3/8 x 1 1/2	28	1/2 x 1 1/2

① These accessories fit only warehouse stock transformers with JST Catalog Suffix.
② UL Listed for indoor and outdoor use with dripshield installed.
③ May be used on "JST" suffix and "non JST" suffix transformers. Terminal lugs are screw type, lug connectors suitable for both copper and aluminum cable. All lugs are single barrel and suitable for cable ranges shown. 750kcmil lugs are capable of holding (2) 250kcmil cables in lieu of (1) 750kcmil cable. All lugs are rated 90˚C.
④ Lug kit contains quantity required for each transformer.
⑤ Primary and secondary terminal lugs are included on certain ventilated transformers. (15KVA - 75KVA 3PH & 15KVA - 50KVA 1PH)

Warehouse Stock Transformers

Warehouse Stock

Selection



Application

The Buck-Boost Transformer has four separate windings, two-windings in the primary and two-windings in the secondary. The unit is designed for use as an insulating transformer or as an autotransformer. As an autotransformer the unit can be connected to Buck (decrease) or Boost (increase) a supply voltage. When connected in either the Buck or Boost mode, the unit is no longer an insulating transformer but is an autotransformer. Units are designed for 60Hz applications (50Hz units available upon request).

Autotransformers are more economical and physically smaller than equivalent two-winding transformers and are designed to carry the same function as two-winding transformers, with the exception of isolating two circuits. Since autotransformers may transmit line disturbances directly, they may be prohibited in some areas by local building codes. Before applying them, care should be taken to assure that they are acceptable according to local code.

NOTE: Autotransformers are not used in closed delta connections as they introduce into the circuit a phase shift which makes them uneconomical.

As insulating transformers these units can accommodate a high voltage of 120, 240 or 480 volts. For units with two 12 volt secondaries, two 16 volt secondaries, or two 24 volt secondaries, the output can be wired for either secondary voltage, or for 3-wire secondary. The unit is rated (KVA) as any conventional transformer.

Operation

Electrical and electronic equipment is designed to operate on a standard supply voltage. When the supply voltage is constantly too high or too low, (usually greater than ± 5%), the equipment fails to operate at maximum efficiency. A Buck-Boost transformer is a simple and economical means of correcting this off-standard voltage up to ± 20%. A Buck-Boost transformer will NOT, however, stabilize a fluctuating voltage. Buck-Boost transformers are suitable for use in a three phase autotransformer bank in either direction to supply 3-wire loads. They are also suitable for use in a three phase autotransformer bank which provides a neutral return for unbalanced current. They are NOT suitable for use in a three phase autotransformer bank to supply a 4-wire unbalanced load when the source is a 3-wire circuit.

Construction

Buck-Boost Transformers are contained within a NEMA 3R, non-ventilated weatherproof enclosure. Wiring compartments are located at the bottom. Core and coil assemblies are encapsulated. Insulation system temperature is 130° C and the widing temperature rise is 95° C for units up through 1 kva. Insulation system temperature is 180° C and the winding temperature rise is 135° C for units 1.5 kva and above.

How To Select The Proper Transformer

To select the proper Transformer for Buck-Boost applications, determine:

1. Input line voltage — The voltage that you want to buck (decrease) or boost (increase). This can be found by measuring the supply line voltage with a voltmeter.
2. Load voltage — The voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.
3. Load KVA or Load Amps — You do not need to know both — one or the other is sufficient for selection purposes. This information usually can be found on the nameplate of the equipment that you want to operate.
4. Number of phases — Single or three phase line and load should match because a transformer is not capable of converting single to three phase. It is however a common application to make a single phase transformer connection from a three phase supply by use of one leg of the three phase supply circuit. Care must always be taken not to overload the leg of the three phase supply. This is particularly true in a Buck-Boost application because the supply must provide for the load KVA, not just the nameplate rating of the Buck-Boost transformer.
5. Frequency — The supply line frequency must be the same as the frequency of the equipment to be operated — either 50 or 60 cycles.

How To Use Selection Charts

1. Choose the selection table with the correct number of phases for single or three phase applications.
2. Line/Load voltage combinations are listed across the top of the selection table. Select a line/load voltage combination which comes closest to matching your applications.
3. Follow the selected column down until you find either the KVA or load amps of your application. If you do not find the exact value, go on the next highest rating.
4. Now follow across the table to the far left-hand side to find the catalog number and the KVA of the transformer you need.
5. Follow the column of your line/load voltage to the bottom to find the connection diagram for this application.
   NOTE: Connection diagrams show low voltage and high voltage connection terminals. Either can be input or output depending on Buck or Boost application.
6. In the case of three phase loads either wo or three single phase transformers are required as indicated in the "quantity required" line at the bottom of the table. The selection is dependent on whether a Wye connected bank of three transformers with a neutral is required or whether an open Delta connected bank of two ransformers for a Delta connected load will be suitable.
7. For line/load voltage not listed on the selection tables, use the pair listed on the table that is slightly above your application for reference. Then apply the first formula at the bottom of the table to determine "new" output voltage. The new KVA rating can be found using the second formula.

120 × 240 Volts Primary — 12/24 Volts Secondary, 60 Hz, No Taps, Wall Mounted

Single Phase — Table 1		Boosting								Bucking					
Catalog Number	Line Voltage (Available)	96	100	105	109	189	208	215	220	125	132	229	245	250	252
Insulating Transformer Rating	Load Voltage (Output)	115	120	115	120	208	229	237	242	114	120	208	222	227	240
050BB1224J .050 KVA	KVA	.24	.25	.50	.50	.43	.48	.49	.50	.52	.55	.48	.51	.52	1.05
	Load Amps	2.08	2.08	4.17	4.17	2.08	2.08	2.08	2.08	4.59	4.59	2.29	2.29	2.29	4.38
100BB1224J .100 KVA	KVA	.48	.50	.96	1.00	.87	.95	.99	1.01	1.04	1.10	.95	1.02	1.04	2.10
	Load Amps	4.17	4.17	8.33	8.33	4.17	4.17	4.17	4.17	9.16	9.16	4.58	4.58	4.58	8.75
150BB1224J .150 KVA	KVA	.72	.75	1.44	1.50	1.30	1.43	1.48	1.51	1.55	1.65	1.43	1.53	1.56	3.15
	Load Amps	6.25	6.25	12.50	12.50	6.25	6.25	6.25	6.25	13.75	13.75	6.88	6.88	6.88	13.13
205BB1224J .250 KVA	KVA	1.19	1.25	2.40	2.50	2.17	2.38	2.47	2.52	2.60	2.75	2.38	2.54	2.60	5.25
	Load Amps	10.42	10.42	20.83	20.83	10.42	10.42	10.42	10.42	22.92	22.92	11.46	11.46	11.46	21.88
505BB1224J .500 KVA	KVA	2.37	2.50	4.80	5.00	4.33	4.77	4.94	5.04	5.18	5.50	4.77	5.09	5.20	10.50
	Load Amps	20.83	20.83	41.67	41.67	20.83	20.83	20.83	20.83	45.83	45.83	22.92	22.92	22.92	43.75
705BB1224J .750 KVA	KVA	3.56	3.75	7.19	7.50	6.50	7.15	7.41	7.56	7.77	8.25	7.15	7.63	7.80	15.75
	Load Amps	31.25	31.25	62.50	62.50	31.25	31.25	31.25	31.25	68.75	68.75	34.38	34.38	34.38	65.63
1BB1224J 1.00 KVA	KVA	4.75	5.00	9.58	10.00	8.67	9.53	9.88	10.08	10.36	11.00	9.53	10.17	10.40	21.00
	Load Amps	41.67	41.67	83.33	83.33	41.67	41.67	41.67	41.67	91.66	91.66	45.83	45.83	45.83	87.50
105BB1224J 1.50 KVA	KVA	7.13	7.50	14.38	15.00	13.00	14.30	14.81	15.13	15.54	16.50	14.30	15.26	15.61	31.50
	Load Amps	62.50	62.50	125.00	125.00	62.50	62.50	62.50	62.50	137.50	137.50	68.75	68.75	68.75	131.25
2BB1224J 2.00 KVA	KVA	9.50	10.00	19.17	20.00	17.33	19.07	19.75	20.17	20.72	22.00	19.07	20.35	20.81	42.00
	Load Amps	83.33	83.33	166.66	166.66	83.33	83.33	83.33	83.33	183.33	183.33	91.66	91.66	91.66	175.00
3BB1224J 3.00 KVA	KVA	14.25	15.00	28.75	30.00	26.00	28.60	29.63	30.25	31.08	33.00	28.60	30.53	31.21	63.00
	Load Amps	125.00	125.00	250.00	250.00	125.00	125.00	125.00	125.00	275.00	275.00	137.50	137.50	137.50	262.50
5BB1224J 5.00 KVA	KVA	23.75	25.00	47.92	50.00	43.33	47.67	49.37	50.42	51.79	55.00	47.67	50.88	52.02	105.00
	Load Amps	208.33	208.33	416.66	416.66	208.33	208.33	208.33	208.33	458.33	458.33	229.17	229.17	229.17	437.50
Connection Diagram (pg. 8-23)		B	B	B	A	A	D	D	D	D	A	A	D	D	C

Three Phase — Table 2		Boosting									Bucking				
Catalog Number	Line Voltage (Available)	189Y/ 109	195Y/ 113	200Y/ 115	208Y/ 120	416Y/ 240	416Y/ 240	189	208	220	218	229	250	255	264
Insulating Transformer Rating	Load Voltage (Output)	208Y/ 120	234Y/ 135	240Y/ 139	229Y/ 132	458Y/ 264	437Y/ 252	208	229	242	208	208	227	232	240
050BB1224J .050 KVA	KVA	1.50	.84	.86	1.65	1.65	3.15	.75	.83	.87	1.58	.83	.90	.92	.95
	Load Amps	4.17	2.08	2.08	4.17	2.08	4.17	2.08	2.08	2.08	4.39	2.29	2.29	2.29	2.29
100BB1224J .100 KVA	KVA	3.00	1.69	1.73	3.30	3.30	6.29	1.50	1.65	1.75	3.15	1.65	1.80	1.84	1.90
	Load Amps	8.33	4.17	4.17	8.33	4.17	8.33	4.17	4.17	4.17	8.75	4.58	4.58	4.58	4.58
150BB1224J .150 KVA	KVA	4.50	2.54	2.60	4.96	4.96	9.44	2.26	2.48	2.62	4.73	2.48	2.71	2.76	2.86
	Load Amps	12.50	6.25	6.25	12.50	6.25	12.50	6.25	6.25	6.25	13.13	6.88	6.88	6.88	6.88
205BB1224J .250 KVA	KVA	7.50	4.22	4.33	8.30	8.25	15.75	3.75	4.13	4.37	7.88	4.13	4.50	4.61	4.76
	Load Amps	20.83	10.42	10.42	20.83	10.42	20.83	10.42	10.42	10.42	21.88	11.46	11.46	11.46	11.46
505BB1224J .500 KVA	KVA	15.01	8.44	8.66	16.60	16.50	31.50	7.50	8.26	8.73	15.76	8.26	9.01	9.21	9.53
	Load Amps	41.67	20.83	20.83	41.67	20.83	41.67	20.83	20.83	20.83	43.75	22.92	22.92	22.92	22.92
705BB1224J .750 KVA	KVA	22.52	12.67	12.99	24.90	24.75	47.25	11.26	12.39	13.10	23.64	12.39	13.52	13.82	14.29
	Load Amps	62.50	31.25	31.25	62.50	31.25	62.50	31.25	31.25	31.25	65.63	34.38	34.38	34.38	34.38
1BB1224J 1.00 KVA	KVA	30.02	16.89	17.32	33.20	33.00	63.00	15.01	16.51	17.47	31.52	16.51	18.02	18.42	19.05
	Load Amps	83.33	41.67	41.67	83.33	41.67	83.33	41.67	41.67	41.67	87.50	45.83	45.83	45.83	45.53
105BB1224J 1.50 KVA	KVA	45.03	25.33	25.98	49.80	49.50	94.50	22.52	24.77	26.20	47.28	24.77	27.03	27.63	28.53
	Load Amps	125.00	62.50	62.50	125.00	62.50	125.00	62.50	62.50	62.50	131.25	68.75	68.75	68.75	68.75
2BB1224J 2.00 KVA	KVA	60.06	33.77	34.64	66.40	66.00	126.00	30.02	33.03	34.93	63.05	33.03	36.04	36.84	38.11
	Load Amps	166.67	83.33	83.33	166.67	83.33	166.66	83.33	83.33	83.33	175.00	91.67	91.67	91.67	91.67
3BB1224J 3.00 KVA	KVA	90.07	50.66	51.96	99.59	99.00	189.00	45.03	49.54	52.39	94.57	49.54	54.06	55.25	57.16
	Load Amps	250.00	125.00	125.00	250.00	125.00	250.00	125.00	125.00	125.00	262.50	137.50	137.50	137.50	137.50
5BB1224J 5.00 KVA	KVA	150.11	84.44	86.60	165.99	165.00	318.00	75.05	82.56	87.32	157.62	82.56	90.10	92.09	95.26
	Load Amps	416.67	208.33	208.33	416.67	208.33	416.66	208.33	208.33	208.33	437.50	229.17	229.17	229.17	229.17
Quantity Required		3	3	3	3	3	3	2	2	2	2	2	2	2	2
Connection Diagram (pg. 8-23)		F	E	E	F	J	K	G	G	G	H	G	G	G	G

☐ = Warehouse Stock

- Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}}$ × Input Actual Voltage = Output New Voltage.
- Output KVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}}$ × Output KVA = New KVA Rating.
- Inputs and outputs may be reversed without affecting KVA capacity. See note on page 8-23

Warehouse Stock Transformers

Buck-Boost

Selection

120 × 240 Volts Primary — 16/32 Volts Secondary, 60 Hz, No Taps, Wall Mounted

Single Phase — Table 3			Boosting								Bucking					
Catalog Number	Line Voltage (Available)		95	100	105	208	215	215	220	225	135	240	240	245	250	255
Insulating Transformer Rating	Load Voltage (Output)		120	113	119	236	244	229	235	240	120	212	225	230	234	239
050BB1632J		KVA	.19	.36	.37	.37	.38	.72	.73	.73	.42	.37	.75	.77	.78	.80
.050 KVA	Load	Amps	1.56	3.12	3.12	1.56	1.56	3.12	3.12	3.12	3.54	1.77	3.33	3.33	3.33	3.33
100BB1632J		KVA	.38	.72	.74	.74	.76	1.44	1.46	1.50	.84	.74	1.50	1.54	1.56	1.60
.100 KVA	Load	Amps	3.13	6.25	6.25	3.13	3.13	6.25	6.25	6.25	7.09	3.54	6.66	6.66	6.66	6.66
150BB1632J		KVA	.56	1.06	1.12	1.12	1.14	2.16	2.20	2.26	1.26	1.10	2.26	2.30	2.34	2.40
.150 KVA	Load	Amps	4.69	9.38	9.38	4.69	4.69	9.38	9.38	9.38	10.64	5.30	10.02	10.02	10.02	10.02
205BB1632J		KVA	.94	1.78	1.86	1.88	1.91	3.59	3.67	3.75	2.11	1.84	3.75	3.83	3.90	3.98
.250 KVA	Load	Amps	7.81	15.63	15.63	7.81	7.81	15.63	15.63	15.63	17.71	8.85	16.67	16.67	16.67	16.67
505BB1632J		KVA	1.88	3.56	3.72	3.75	3.81	7.19	7.34	7.50	4.21	3.68	7.50	7.67	7.80	7.97
.500 KVA	Load	Amps	15.63	31.25	31.25	15.63	15.63	31.25	31.25	31.25	35.42	17.71	33.33	33.33	33.33	33.33
705BB1632J		KVA	2.81	5.34	5.58	5.63	5.72	10.78	11.02	11.25	6.32	5.53	11.25	11.50	11.70	11.95
.750 KVA	Load	Amps	23.44	46.88	46.88	23.44	23.44	46.88	46.88	46.88	53.13	26.56	50.00	50.00	50.00	50.00
1BB1632J		KVA	3.75	7.13	7.44	7.50	7.63	14.38	14.69	15.00	8.43	7.37	15.00	15.33	15.60	15.93
1.00 KVA	Load	Amps	31.25	62.50	62.50	31.25	31.25	62.50	62.50	62.50	70.83	35.42	66.67	66.67	66.67	66.67
105BB1632J		KVA	5.63	10.69	11.16	11.25	11.44	21.56	22.03	22.50	12.64	11.05	22.50	23.00	23.40	23.90
1.50 KVA	Load	Amps	43.90	93.80	93.80	46.90	46.90	93.80	93.80	93.80	106.30	53.10	100.00	100.00	100.00	100.00
2BB1632J		KVA	7.50	14.25	14.88	15.00	15.25	28.75	29.38	30.00	16.86	14.73	30.00	30.67	31.20	31.87
2.00 KVA	Load	Amps	62.50	125.00	125.00	62.50	62.50	125.00	125.00	125.00	141.70	70.80	133.30	133.30	133.30	133.30
3BB1632J		KVA	11.25	21.38	22.31	22.50	22.88	43.13	44.06	45.00	25.29	22.10	45.00	46.00	46.80	47.80
3.00 KVA	Load	Amps	93.80	187.50	187.50	93.80	93.80	187.50	187.50	187.50	212.50	106.30	200.00	200.00	200.00	200.00
5BB1632J		KVA	18.75	35.63	37.19	37.50	38.13	71.88	73.44	75.00	42.15	36.83	75.00	76.67	78.00	79.67
5.00 KVA	Load	Amps	156.30	312.50	312.50	156.30	156.30	312.50	312.50	312.50	354.20	177.10	333.30	333.30	333.30	333.30
Connection Diagram (pg. 8-23)			B	A	A	D	D	C	C	C	A	D	C	C	C	C

Three Phase — Table 4			Boosting					Bucking					
Catalog Number	Line Voltage (Available)		183Y/ 106	208Y/ 120	195	208	225	240	245	250	256	265	272
Insulating Transformer Rating	Load Voltage (Output)		208Y/ 120	236Y/ 136	208	236	240	208	230	234	240	234	240
050BB1632J		KVA	1.13	1.28	1.13	.62	1.30	.56	1.33	1.35	1.39	.72	.74
.050 KVA	Load	Amps	3.13	3.13	3.13	1.56	3.13	1.56	3.34	3.34	3.34	1.77	1.77
100BB1632J		KVA	2.25	2.55	2.25	1.30	2.60	1.13	2.66	2.70	2.77	1.44	1.48
.100 KVA	Load	Amps	6.25	6.25	6.25	3.13	6.25	3.13	6.67	6.67	6.67	3.55	3.55
150BB1632J		KVA	3.38	3.83	3.38	1.95	3.90	1.69	3.98	4.05	4.16	2.15	2.21
.150 KVA	Load	Amps	9.38	9.38	9.38	4.69	9.38	4.69	10.00	10.00	10.00	5.31	5.31
205BB1632J		KVA	5.63	6.39	5.63	3.17	6.50	2.81	6.64	6.76	6.93	3.59	3.68
.250 KVA	Load	Amps	15.63	15.63	15.63	7.81	15.63	7.81	16.67	16.67	16.67	8.85	8.85
505BB1632J		KVA	11.26	12.77	11.26	6.33	12.99	5.63	13.28	13.50	13.86	7.17	7.36
.500 KVA	Load	Amps	31.25	31.26	31.25	15.63	31.25	15.63	33.33	33.33	33.33	17.69	17.71
705BB1632J		KVA	16.89	19.16	16.89	9.50	19.49	8.44	19.92	20.26	20.78	10.76	11.04
.750 KVA	Load	Amps	46.88	46.88	46.88	23.44	46.88	23.44	50.00	50.00	50.00	26.54	26.56
1BB1632J		KVA	22.52	25.55	22.52	12.67	25.98	11.26	26.56	27.02	27.71	14.34	14.72
1.00 KVA	Load	Amps	62.50	62.50	62.50	31.25	62.50	31.25	66.67	66.67	66.67	35.39	35.42
105BB1632J		KVA	33.77	38.32	33.77	19.00	38.97	16.89	39.84	40.53	41.57	21.52	22.08
1.50 KVA	Load	Amps	93.75	93.75	93.75	46.88	93.75	46.88	100.00	100.00	100.00	53.08	53.13
2BB1632J		KVA	45.03	51.10	46.03	25.33	51.96	22.52	53.11	54.04	55.43	28.69	29.44
2.00 KVA	Load	Amps	125.00	125.00	125.00	62.50	125.00	62.50	133.33	133.33	133.33	70.78	70.83
3BB1632J		KVA	67.55	76.64	67.55	38.00	77.94	33.77	79.67	81.06	83.14	43.03	44.17
3.00 KVA	Load	Amps	187.50	187.50	187.50	93.75	187.50	93.75	200.00	200.00	200.00	106.17	106.25
5BB1632J		KVA	112.58	127.74	112.58	63.33	129.90	56.29	132.79	135.09	138.56	71.72	73.61
5.00 KVA	Load	Amps	312.50	312.50	312.50	156.25	312.50	156.25	333.33	333.33	333.33	176.95	177.08
Quantity Required			3	3	2	2	2	2	2	2	2	2	2
Connection Diagram (pg. 8-23)			F	F	H	G	H	L	H	H	H	G	G

□ = Warehouse Stock

- Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times$ Input Actual Voltage = Output New Voltage.
- Output KVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times$ Output KVA = New KVA Rating.
- Inputs and outputs may be reversed without affecting KVA capacity. See note on page 8-23.

Warehouse Stock Transformers

Buck-Boost

240 × 480 Volts Primary — 24/48 Volts Secondary, 60 Hz, No Taps, Wall Mounted

Single Phase — Table 5		Boosting										Bucking			
Catalog Number	Line Voltage (Available)	230	380	416	425	430	435	440	450	450	460	277	480	480	504
Insulating Transformer Rating	Load Voltage (Output)	276	418	458	468	473	457	462	495	472	483	231	436	457	480
050BB2448J .050 KVA	KVA	.29	.44	.48	.49	.49	.95	.96	.52	.98	1.01	.29	.50	1.00	1.05
	Load Amps	1.04	1.04	1.04	1.04	1.04	2.08	2.08	1.04	2.08	2.08	1.25	1.15	2.19	2.19
100BB2448J .100 KVA	KVA	.58	.87	.95	.97	.99	1.90	1.93	1.03	1.97	2.01	.58	1.00	2.00	2.10
	Load Amps	2.08	2.08	2.08	2.08	2.08	4.17	4.17	2.08	4.17	4.17	2.50	2.29	4.38	4.38
150BB2448J .150 KVA	KVA	.86	1.31	1.43	1.46	1.48	2.86	2.89	1.55	2.95	3.02	.86	1.50	3.00	3.15
	Load Amps	3.13	3.13	3.13	3.13	3.13	6.25	6.25	3.13	6.25	6.25	3.75	3.44	6.56	6.56
205BB2448J .250 KVA	KVA	1.44	2.18	2.38	2.43	2.46	4.76	4.81	2.58	4.92	5.03	1.44	2.50	5.00	5.25
	Load Amps	5.21	5.21	5.21	5.21	5.21	5.21	10.42	5.21	10.42	10.42	6.25	5.73	10.94	10.94
505BB2448J .500 KVA	KVA	2.88	4.35	4.77	4.87	4.93	9.52	9.62	5.16	9.83	10.06	2.88	5.00	10.00	10.50
	Load Amps	10.42	10.42	10.42	10.42	10.42	20.83	20.83	10.42	20.83	20.83	12.50	11.46	21.88	21.88
705BB2448J .750 KVA	KVA	4.31	6.53	7.15	7.30	7.39	14.28	14.44	7.73	14.75	15.09	4.31	7.49	15.00	15.75
	Load Amps	15.63	15.63	15.62	15.63	15.63	31.25	31.25	15.63	31.25	31.25	18.75	17.19	32.81	32.81
1BB2448J 1.00 KVA	KVA	5.75	8.71	9.53	9.74	9.85	19.04	19.25	10.31	19.67	20.13	5.75	9.99	20.00	21.00
	Load Amps	20.83	20.83	20.83	20.83	20.83	41.67	41.67	20.83	41.67	41.67	25.00	22.92	43.75	43.75
105BB2448J 1.50 KVA	KVA	8.63	13.06	14.30	14.61	14.78	28.56	28.88	15.47	29.50	30.19	8.63	14.99	30.00	31.50
	Load Amps	31.25	31.25	31.25	31.25	31.25	62.50	62.50	31.25	62.50	62.50	37.50	34.38	65.63	65.63
2BB2448J 2.00 KVA	KVA	11.50	17.42	19.07	19.48	19.71	38.08	38.50	20.63	39.33	40.25	11.50	19.98	40.00	42.00
	Load Amps	41.67	41.67	41.67	41.67	41.67	83.33	83.33	41.67	83.33	83.33	50.00	45.83	87.50	87.50
3BB2448J 3.00 KVA	KVA	17.25	26.13	28.60	29.22	29.56	57.13	57.75	30.94	59.00	60.38	17.25	29.98	60.00	63.00
	Load Amps	62.50	62.50	62.50	62.50	62.50	125.00	125.00	62.50	125.00	125.00	75.00	68.80	131.25	131.25
5BB2448J 5.00 KVA	KVA	28.75	43.54	47.67	48.70	49.30	95.20	96.20	51.56	98.30	100.60	28.80	50.00	100.00	105.00
	Load Amps	104.17	104.17	104.17	104.17	104.20	208.30	208.30	104.17	208.30	208.30	125.00	114.60	218.75	218.75
Connection Diagram (pg. 8-23)		B	D	D	D	D	C	C	D	C	C	B	D	C	C

Three Phase — Table 6		Boosting								Bucking							
Catalog Number	Line Voltage (Available)	399Y/230	380	430	440	460	460	480	480	440	440	460	460	480	480	500	500
Insulating Transformer Rating	Load Voltage (Output)	480Y/277	418	473	462	506	483	528	504	400	419	438	418	457	436	455	476
050BB2448J .050 KVA	KVA	.86	.75	.85	1.66	.91	1.74	.95	1.82	.79	1.58	1.66	.83	1.73	.86	.90	1.80
	Load Amps	1.04	1.04	1.04	2.08	1.04	2.08	1.04	2.08	1.14	2.18	2.18	1.14	2.18	1.14	1.14	2.19
100BB2448J .100 KVA	KVA	1.73	1.51	1.70	3.33	1.82	3.48	1.90	3.63	1.59	3.17	3.31	1.66	3.46	1.73	1.80	3.61
	Load Amps	2.08	2.08	2.08	4.16	2.08	4.16	2.08	4.16	2.29	4.37	4.37	2.29	4.37	2.29	2.29	4.38
150BB2448J .150 KVA	KVA	2.60	2.26	2.56	4.99	2.73	5.22	2.85	5.45	2.38	4.75	4.97	2.48	5.19	2.59	2.70	5.41
	Load Amps	3.12	3.13	3.12	6.24	3.12	6.25	3.12	6.24	3.43	6.55	6.55	3.43	6.55	3.43	3.43	6.56
205BB2448J .250 KVA	KVA	4.33	3.77	4.26	8.32	4.56	8.70	4.76	9.08	3.96	7.92	8.28	4.14	8.64	4.32	4.51	9.02
	Load Amps	5.20	5.21	5.20	10.40	5.20	10.40	5.20	10.40	5.72	10.92	10.92	5.72	10.92	5.72	5.72	10.94
505BB2448J .500 KVA	KVA	8.60	7.54	8.52	16.64	9.11	17.40	9.51	18.16	7.93	15.85	16.57	8.28	17.29	8.64	9.02	18.04
	Load Amps	10.40	10.42	10.40	20.80	10.40	20.80	10.40	20.80	11.44	21.84	21.84	11.44	21.84	11.44	11.44	21.88
705BB2448J .750 KVA	KVA	12.90	11.31	12.77	24.97	13.67	26.10	14.27	27.24	11.89	23.77	24.85	12.42	25.93	12.96	13.52	27.06
	Load Amps	15.60	15.63	15.60	31.20	15.60	31.20	15.60	31.20	17.16	32.76	32.76	17.16	32.76	17.16	17.16	32.81
1BB2448J 1.00 KVA	KVA	17.30	15.08	17.03	33.29	18.23	34.80	19.02	36.31	15.85	31.70	33.14	16.57	34.57	17.28	18.03	36.08
	Load Amps	20.80	20.83	20.80	41.60	20.80	41.60	20.80	41.60	22.88	43.68	43.68	22.88	43.68	22.88	22.88	43.75
105BB2448J 1.50 KVA	KVA	25.90	22.62	25.55	49.93	27.34	52.50	28.53	54.47	23.78	47.55	49.71	24.85	51.86	25.92	27.05	54.13
	Load Amps	31.20	31.25	31.20	62.40	31.20	62.40	31.20	62.40	34.32	65.52	65.52	34.32	65.62	34.32	34.32	65.63
2BB2448J 2.00 KVA	KVA	34.60	30.17	34.07	66.58	36.46	69.60	38.04	72.63	31.70	63.40	66.27	33.13	69.15	34.56	36.06	72.17
	Load Amps	41.60	41.67	41.60	83.20	41.60	83.20	41.60	83.20	45.76	87.36	87.36	45.76	87.36	45.76	45.76	87.50
3BB2448J 3.00 KVA	KVA	52.00	45.25	51.18	100.03	54.69	104.57	57.07	109.12	47.63	95.25	99.57	49.77	103.89	51.92	54.18	108.25
	Load Amps	62.50	62.50	62.50	125.00	62.50	125.00	62.50	125.00	68.75	131.25	131.25	68.75	131.25	68.75	68.75	131.25
5BB2448J 5.00 KVA	KVA	86.10	75.42	85.17	166.44	91.15	174.01	95.11	181.57	79.26	158.50	165.69	82.83	172.87	86.39	90.16	180.42
	Load Amps	104.00	104.17	104.00	208.00	104.00	208.00	104.00	208.00	114.40	218.40	218.40	114.40	218.40	114.40	114.40	218.75
Quantity Required		3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Connection Diagram (pg. 8-23)		E	G	G	H	G	H	G	H	G	H	H	G	H	G	G	H

☐ = Warehouse Stock

- Output voltage for lower input can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}}$ × Input Actual Voltage = Output New Voltage.
- Output KVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}}$ × Output KVA = New KVA Rating.
- Inputs and outputs may be reversed without affecting KVA capacity. See note on page 8-23.

Buck-Boost Transformers

Single Phase, Three Phase

Typical Connection Diagrams

Single Phase

Diagram A

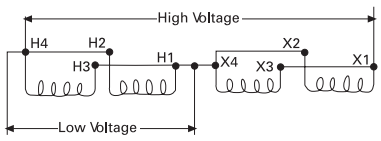


Diagram B

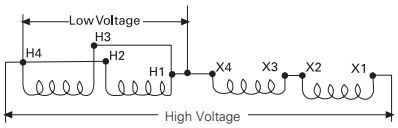


Diagram C

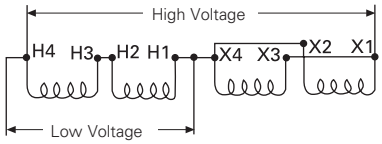
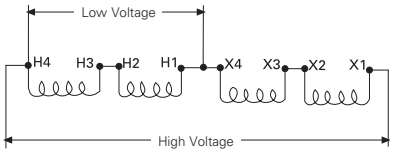
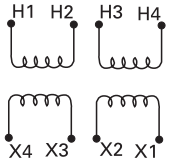


Diagram D



(Standard Step-down Application)*



Three Phase

Note: Contact sales office for diagrams applicable to "J" suffix.

Diagram E①

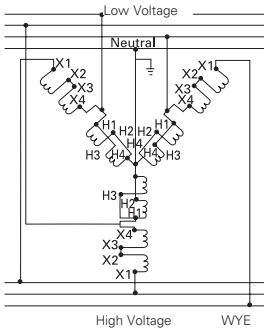


Diagram F①

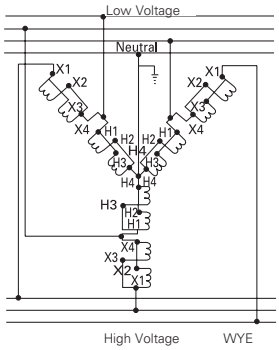


Diagram G②

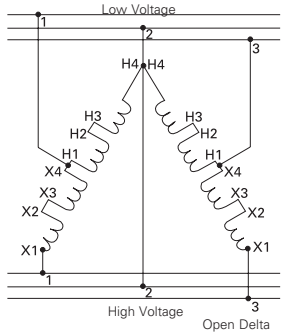


Diagram J①

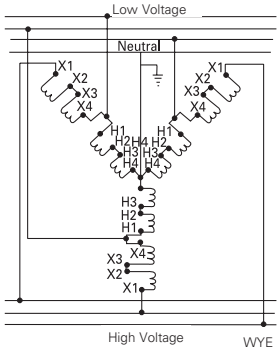


Diagram H②

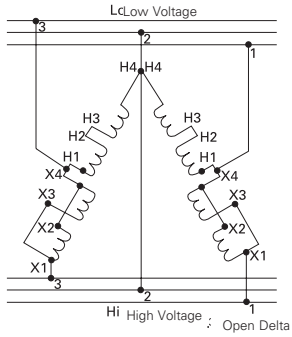


Diagram K①

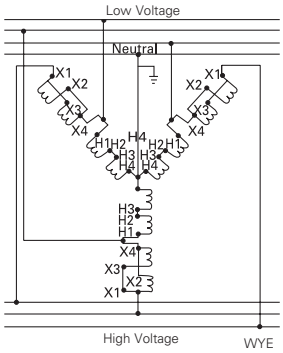
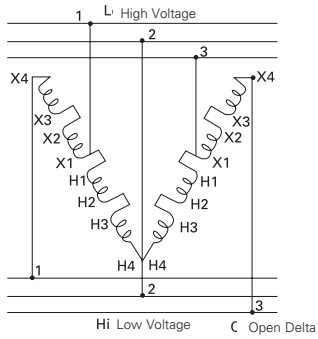


Diagram L②



*Low Voltage Applications:
By using the "Standard Step-down Application" diagram at left, buck boost transformers will convert 120V or 240V to 12, 24, 16 or 32 volts and 240V or 480V to 24 or 48 volts without affecting the nameplate KVA rating of the transformer. Buck boost transformers used in this type of application will become isolation or insulating type transformers.

① These diagrams can only be used when the source is a 4-wire supply.
② The neutral XO should not be used when the source is a three wire supply.

Note:
- Inputs and Outputs may be reversed; KVA capacity remains constant. Exception: Cannot use 3-wire input with 4-wire output to form a neutral and does not apply to standard step-down applications.
- Refer to NEC 450-4 for overcurrent protection of an autotransformer.
- All applications are suitable for 60Hz only, contact factory for 50Hz information.

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Intelligent Metering and Control Devices 9-3

Power Meters

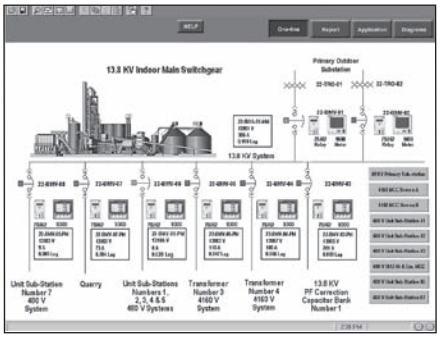
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Energy Management Software

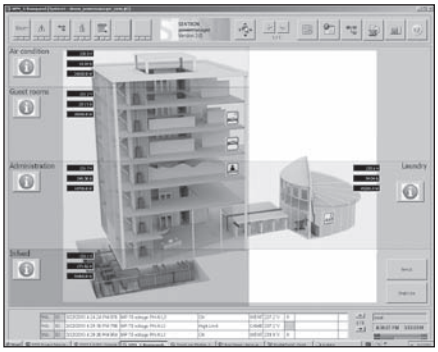
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Application Engineering

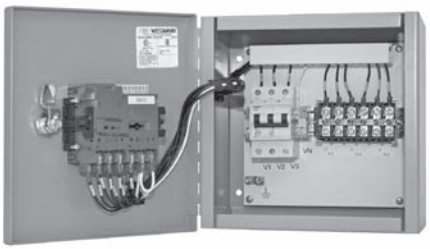
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WinPM.net Software



Powermanager Software



Assembled Meter Enclosure



Power Meters

Siemens recognizes that high performance facilities make for high performance business. Energy is the lifeline of your business, and better efficiency and sustainability can have a large positive impact on your bottom line.

Energy Management and Control Systems from Siemens are complete enterprise solutions that help you manage the energy costs and availability of your business. With our advanced meters and controls, you can be sure to use only the energy you need, when you need it.

Siemens Power Distribution Solutions contribute toward achieving LEED® certification and provides the needed energy metering data for federal/local government energy reductions programs.

Features and Benefits of Siemens Power Distribution Solutions:

- Power Quality Reliability & Analysis
- Utilities Cost Allocation & Billing
- Utilities Usage Aggregation
- Load Preservation
- Equipment Monitoring
- Facility Monitoring & Automation
- Sequence of Event Recording
- Preventative Maintenance
- Electrical Asset Management

Additional Products/Services Available:

- Branch Circuit Monitoring
- Sub-Billing and Cost Allocation
- Application Engineering
- Services Agreements
- Network/Communication Components
- Integration with Existing
- SCADA/BAS Systems
- Incorporation of Third Party Devices

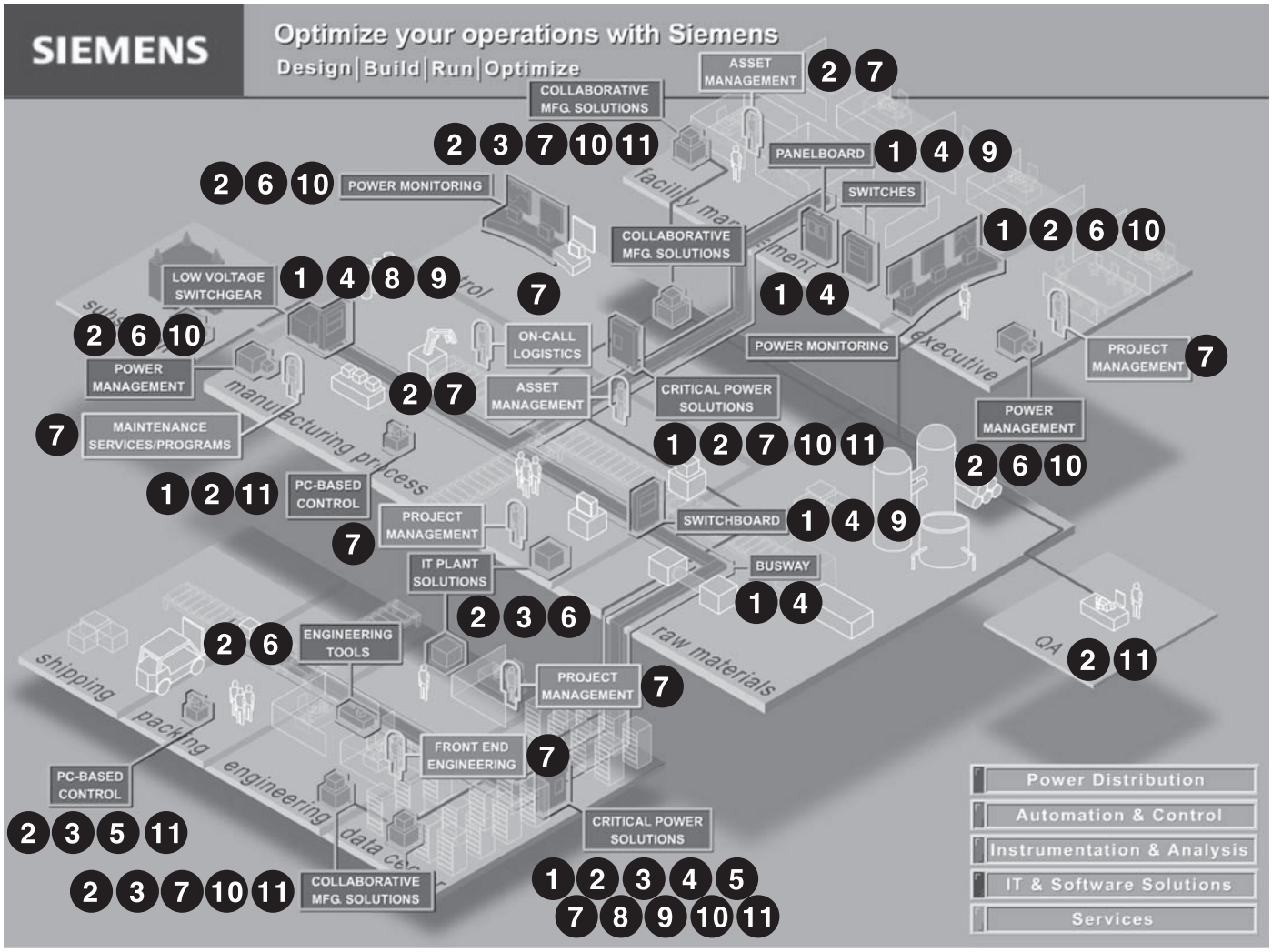
For Technical Assistance Contact:
1-800-333-7421

Online Support:
www.siemens.com/automation/support-request

For The Latest Information Go To:
www.usa.siemens.com/pds

Totally Integrated Power

System Overview



1. Power Meters
Siemens power monitors combine the best of new technologies and proven practices. Monitor critical loads, power quality, and demand via the web directly from the meters.

2. Power Monitoring Software
WinPM.Net and Powermanager web-enabled software facilitates easy, enterprise-wide connection to power monitoring equipment, circuit breakers, and other devices from Siemens and third parties. Access information via the web with unlimited no-cost clients using built-in WebReach™ via your web browser.

3. Communications Networks
Utilize existing Ethernet or RS-485 communications networks to extract the information you need and get it where it needs to go.

4. Components
Current Transformers (CTs), Voltage/Potential Transformers (PTs), Power Supplies, Ethernet Switches, Protocol Converters. Siemens can provide everything required for your system.

5. Intelligent I/O
Our S7 I/O enables plug-n-play communications with Modbus devices and expands digital and analog input and output functionality of Siemens Systems.

6. Billing and Load Allocation Software
Powermanager is the simplified solution for cost allocation, billing & load/demand analysis using your web browser.

7. Engineering Services
PDS Application Engineers can help from design through commissioning of even the most demanding power quality and monitoring systems.

8. Motor Control Centers
Monitor mains and feeders for critical or power-intensive loads. Communicate with WL and VL breakers, SIMOCODE, I/O and devices from other manufacturers. Use Siemens power meters to web-enable new as well as existing MCCs.

9. Low & Medium Voltage Switchgear
Web-enable switchgear by having Siemens power monitoring as well as breaker status and upload the information to a corporate Intranet or to the Internet. Use MeterMail™ directly from meters for alarm conditions or simple reporting.

10. Facility Management Systems
Tie into building automation systems to provide the required power and energy information. Many communications options are available ranging from legacy protocols to XML directly from the power monitors.

11. Distributed Control Systems, Automation, and SCADA/Human Machine Interface
Siemens power monitors and/or software can talk to all major vendors' systems.

Power Distribution Solutions

Intelligent Metering and Control Devices



	PAC3100	PAC3200	PAC4200	9340	9360	9510 ADR	9510	9610/9610H
Power, energy and demand								
Voltage/current: per phase, average	■	■	■	■	■		■	■
Voltage/current: unbalance	■	■	■	■	■		■	■
Power: real (kW), reactive (kVAR), apparent (kVA), power factor, frequency (Hz)	■	■	■	■	■		■	■
Energy (kWh): bi-directional, import, export	■	■	■	■	■		■	■
Energy (kWh): total, net	■		■	■	■		■	■
Demand: block, sliding window	■	■	■	■	■		■	■
Demand: thermal predicted				■	■		■	■
Power quality analysis								
Sag/swell monitoring					■		■	■
Symmetrical components: zero, negative, positive								■
Transient detection, microseconds								17 µs @ 60 Hz, (20 µs @ 50 Hz)
Harmonics (individual, even, odd, total) up to		THD only	31st	31st	63rd		63rd	127th/256th
Sampling rate, maximum samples/cycle	64	64	170	128	128		256	512/1024
Flicker, harmonics to EN50160, IEC 6100-4-7 / 4-15				■	■			■
Configurable for IEEE 519-1992, IEEE 1159, SEMI/ITIC								■
"Number of nines" uptime data (3 nines=99.9%)		■	■				■	■
Data and waveform logs								
Triggered by setpoint, schedule, or external signal					■	■	■	■
Sequence-of-event logs, variable log depth			■	■	■		■	■
Minimum/maximum logs			■	■	■		■	■
Historical logs / maximum # of channels			1	1	3	800	800	800
Waveform recording					■		■	■
Time-stamps, resolution in seconds			0.1		0.1	0.001	0.001	0.001
Event Log			■	■	■	■	■	■
GPS time synchronization				■	■	■	■	■
Communication ports & I/O ( ) = Optional								
RS-232/485 ports						1	1	1
RS-485-only ports	1	(1)	(1)	1	1	2	2	2
Ethernet ports		1	1	(1)	(1)	(1)	(1)	(1)
Infrared optical ports						1	1	1
PROFIBUS DP, PROFINET ports		(1)	(1)					
IEC61850 & Comtrade						(1)	(1)	(1)
Modbus RTU Slave on serial, modem or infrared ports (If equipped with modem or infrared port)	1	(1)	(1)	■	■		■	■
Modbus RTU Master on serial ports						■	■	■
Modbus/TCP on Ethernet ports		■	■	■	■	■	■	■
DNP 3.0 on serial, modem, infrared ports						■	■	■
Ethernet Gateway: 31 other meters accessible via RS-485			■	■	■	■	■	■
Multiple masters over Ethernet			3	(42)	(42)	(2)	(2)	(2)
Email alarming				■	■	■	■	■
On-board web server				■	■	■	■	■
XML				■	■	■	■	■
Analog inputs				(2)	(2)	(4)	(4)	(4)
Analog outputs				(2)	(2)	(4)	(4)	(4)
Digital status/counter inputs (standard/optional add-ons)	2	1	2	1 / (6)	1 / (6)	8/8	8/8	8/8
Digital relay outputs (control/pulse)	2	1	2	1 / (2)	1 / (2)	7	7	7
Setpoints, alarming and control								
Setpoints, minimum response time		■	■	■	■	½ cycle	½ cycle	½ cycle
Math, logic, trig, log, linearization formulas		and/or, > <	and/or, > <	■	■	■	■	■
Single- and multi-condition alarms		■	■	■	■	■	■	■
Call-out on alarm		■	■	■	■	■	■	■
Revenue metering								
ANSI C12.16 accuracy compliant	1S			■	■		■	■
ANSI C12.20		0.5S	0.2S	0.5S	0.5S		0.2S	0.2S
EN50160					■		■	■
IEC 60687 0.2S compliant		■	■				■	■
IEC 60687 accuracy class 0.5S compliant	■	■	■				■	■
ANSI class 10 (5A nominal, 10A max)				■	■			
ANSI class 2, IEC 1/10 (1A nominal, 10A max)							■	■
ANSI class 20, IEC 5/20 (5A nominal, 20A max)							■	■
MV-90 on serial; Ethernet ports						■	■	■
Time-of-use							■	■
Transformer/line loss compensation							■	■

Some features are optional. Refer to datasheets for allowable port configurations. Products meet or exceed the accuracy requirements of the standards listed; due to form factors, not all ANSI/IEC compliance tests may apply. Some products certified by third-party laboratory.

Power Distribution Solutions

PAC3100 Power Meter

Basic Monitoring of Electrical Power Systems

The **PAC3100** is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications, where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 25 parameters or as part of an industrial control, building automation or global power monitoring system. Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub-billing or cost allocation installations.

The PAC3100 has many features not usually found in this price class of meters. A large graphical display supports multiple languages and easy to use menus that can be used to set up the meter. The meter also has built in Modbus RTU communications via a RS485 interface. The meter comes standard with two digital inputs and outputs. One output is suitable for pulse output for export/import real and reactive energy. The other output is controllable from an outside source by way of a Modbus register.

Precision

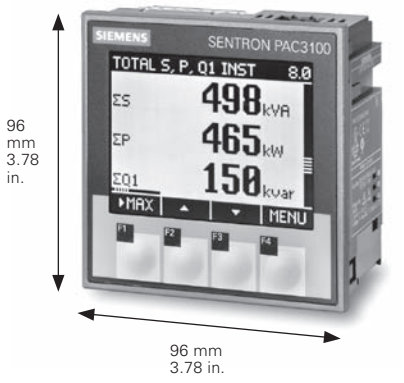
- ANSI C12.16 Class1s
- Energy Measurement
  - Voltage +/- 1%
  - Current +/- 1%
  - Power Factor +/- 1%
  - Sampling Rate 64/per cycle
- Revenue Accurate
  - Sub Billing
  - Cost Allocation
- Cost Effective

Energy Management

- Energy Consumption
- Demand Control
- Automation Integration
- Solution for LEED® credit
- Monitors Critical Equipment
- Sub Metering

Reliability

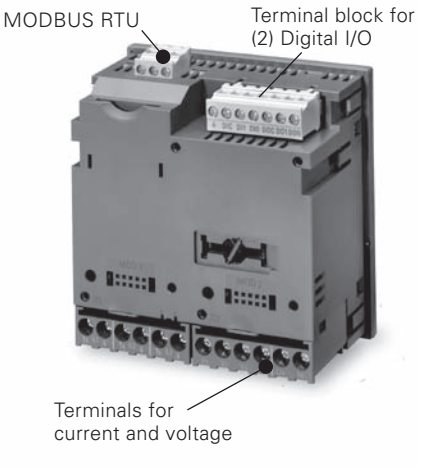
- Economical Measurement
  - Commercial
  - Industrial
  - Residential
- Degree of Protection
  - Front – IP65
  - Rear – IP20
- 480V Connected Voltage
- Simple Retrofit Installation
- Integration with Existing Systems



Full Graphic LCD Display to indicate:
- Display title or designation of the displayed measurements
- Phase
- Measured value
- Unit
- Labeling of function keys



Example of operating menu
With an easy-to-read adjustable back lit LCD display, the PAC3100 can be commissioned in only two steps. After selecting the language and setting two parameters (voltage and current inputs), the meter is ready for use.①



Order information

Product	Catalog Number ②
PAC3100 compression terminals AC/DC	**7KM3133-0BA00-3AA0**
Adapter Plate for 4700/4720 meter cutout	**93-47ADAPTER**
PAC32/4200 Meter DIN Rail adapter – Meter display will not be seen	**7KM9900-0YA00-0AA0**

① Languages included as standard in the meter are English, German, French, Spanish, Italian, Portuguese, Turkish, Russian and Chinese.

② Omit dashes from part numbers when ordering except on 93-47ADAPTER.

Power Distribution Solutions

PAC3200 Power Meter

Reliable and Precise Monitoring of Electrical Power Systems

The **PAC3200** is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 50 parameters or as part of an industrial control, building automation or global power monitoring system. Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub billing or cost allocation installations with multiple tariffs.

The PAC3200 provides open communications using Modbus RTU/TCP, PROFIBUS-DP, and PROFINET protocols for easy integration into any local or remote monitoring system. Simple configuration of the meter can be done from the front display.

Precision

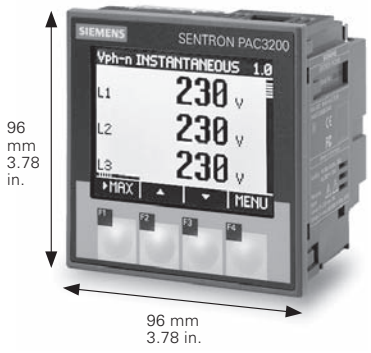
- ANSI C12.20 Class 0.5s
- Energy Measurement
  - Voltage +/- .3%
  - Current +/- .3%
  - Power Factor +/- .5%
  - Sampling Rate 64/per cycle
  - Total Harmonic Distortion (THD)
- Revenue Accurate
  - Sub Billing
  - Cost Allocation
- Cost Effective

Energy Management

- Energy Consumption
- Automation Integration
- Solution for LEED® credit
- Monitors Critical Equipment
- Modbus TCP/RTU
- Industrial Systems
  - PROFIBUS
  - PROFINET

Reliability

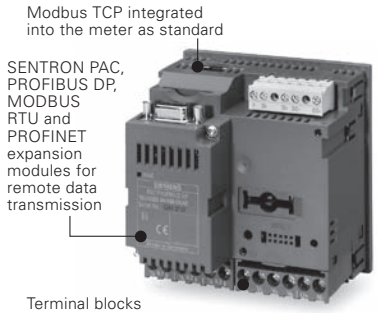
- Economical Measurement
  - Commercial
  - Industrial
  - Residential
- Degree of Protection
  - Front – IP65
  - Rear – IP20
- 600V Connected Voltage
- Simple Retrofit Installation
- Integration with Existing Systems



Full Graphic LCD Display to indicate:
- Display title or designation of the displayed measurements
- Phase
- Measured value
- Unit
- Labeling of function keys



Example of operating menu:
The texts can be displayed in several languages, which can be selected directly on the device.① The large graphic LCD display facilitates reading even from a distance. For optimum visability even in poor light conditions the PAC3200 comes with a gradually adjustable background illumination.



Order information

Product	Catalog Number②
PAC3200 compression terminals not suitable for use with ring tongue terminals, AC/DC	**7KM2112-0BA00-3AA0**
PAC3200 compression terminals not suitable for use with ring tongue terminals, DC only	**7KM2111-1BA00-3AA0**
PAC PROFIBUS DP expansion module	**7KM9300-0AB00-0AA0**
PAC MODBUS RTU expansion module	**7KM9200-0AB00-0AA0**
PAC PROFINET expansion module	**7KM9300-0AE01-0AA0**
Connector block suitable for use with ring tongue terminals	**Consult Siemens Sales**
Adapter Plate for 4700/4720 meter cutout	**93-47ADAPTER**
SITOP Power Supply AC 99-264VAC, 24 VDC, 0.5A	**6EP1331-2BA10**
PAC3200/4200 Meter DIN Rail adapter – Meter display will not be seen	**7KM9900-0YA00-0AA0**

① Languages included as standard in the meter are English, German, French, Spanish, Italian, Portuguese, Turkish, Russian and Chinese.
② Omit dashes from part numbers when ordering except on 93-47ADAPTER.

Power Distribution Solutions

PAC4200 Power Meter

Reliable and Precise Monitoring of Electrical Power Systems

The **PAC4200** is a feature packed power monitoring device that is suitable for use in industrial, government and commercial applications where basic to advanced metering, logging, and I/O is required. The meter may be used as a stand alone device monitoring over 200 parameters or as part of an industrial control, building automation or global enterprise wide monitoring system.

Advanced power quality monitoring and logging applications range from single low voltage breaker / building metering to sub-station main feeder monitoring, sub-billing or cost allocation installations with multiple tariffs. Whether your goal is to reduce operation cost, reduce your carbon footprint or to maintain your power assets, the PAC4200 meter should be an important part of your power monitoring system.

The PAC4200 provides open communication using the standard built-in Ethernet Modbus TCP and has the capability of communicating through Optional Modbus RTU, PROFIBUS-DP, and PROFINET protocol modules simultaneously. This allows for easy integration into any local or remote monitoring system. The gateway functionality of this device reduces installation cost by replacing other gateway devices and simplifying wiring.

Precision

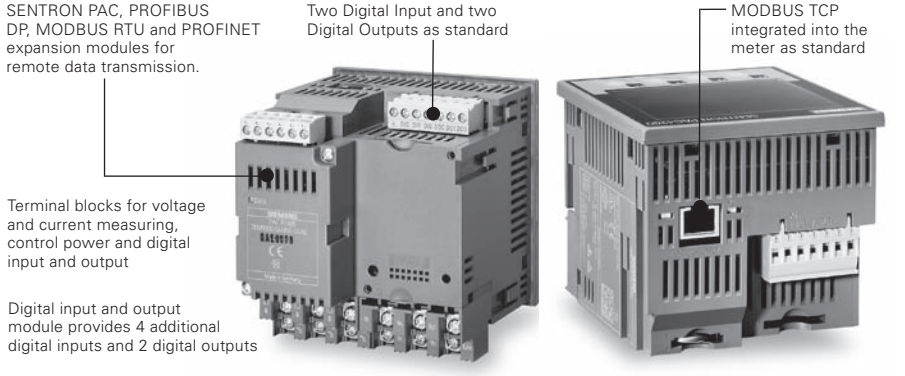
- ANSI C12.20 Class .2s
- Energy Measurement
  - Voltage +/- .2%
  - Current +/- .2%
  - Power Factor +/- .5%
  - Sampling Rate 170/per cycle
  - Individual Harmonics up to 31st
- Power Quality
- Revenue Accurate
  - Sub Billing
  - Cost Allocation
- Cost Effective

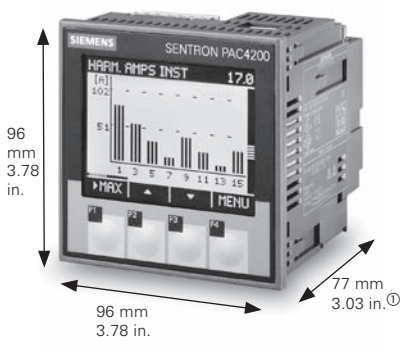
Energy Management

- Serves two masters via the TCP connection
- Energy Consumption
- Min/Max and Event Logs
  - Storage Capacity 40 days at 15 min intervals
  - Event Logging 4000 events
- Demand Control
- Automation Integration
- Modbus Gateway
- Modbus TCP/RTU
- Industrial Systems
  - PROFIBUS
  - PROFINET

Reliability

- Monitors Critical Equipment
- Economical Measurement
  - Commercial
  - Industrial
- Degree of Protection
  - Front – IP65
  - Rear – IP20
- 600V Connected Voltage
- Customizable Displays
- Simple Retrofit Installation
- Integration with Existing Systems
- Solution for LEED® credit





Order information

Product	Catalog Number②
PAC4200 compression terminals not suitable for use with ring tongue terminals, AC/DC	**7KM4212-0BA00-3AA0**
PAC4200 Compression Terminals DC only	**7KM4211-1BA00-3AA0**
PAC PROFIBUS DP expansion module	**7KM9300-0AB00-0AA0**
PAC MODBUS RTU expansion module	**7KM9200-0AB00-0AA0**
PAC PROFINET expansion module	**7KM9300-0AE01-0AA0**
PAC I/O module 4DI + 2DO	**7KM9300-0AM00-0AA0**
Connector block suitable for use with ring tongue terminals	**Consult Siemens Sales**
Adapter Plate for 4700/4720 meter cutout	**93-47ADAPTER**
PAC32/4200 Meter DIN Rail adapter – Meter display will not be seen	**7KM9900-0YA00-0AA0**
SITOP Power Supply AC 99-264VAC, 24 VDC, 0.5A	**6EP1331-2BA10**

① 99mm, 3.90 in., with expansion module
② Omit dashes from part numbers when ordering except on 93-47ADAPTER.

Power Distribution Solutions

9340 / 9360 Power Meter Web-Enabled

Reliable and Precise Monitoring of Electrical Power Systems

The Siemens **ACCESS 9340/9360** series power meters combine accurate, 3-phase energy and power measurement with data logging, power quality analysis, alarm, and I/O capabilities not typically available in a compact meter. The meters are ideally suited to local and remote monitoring of low or high voltage electrical installations in industrial facilities, commercial buildings, utility networks or critical power environments. Facility and operations personnel will benefit in energy related costs while avoiding power quality conditions that can reduce equipment life and productivity.

ACCESS 9340/9360 series meters are easy to install and use, offering integrated or remote high-visibility displays. A choice of two models and a range of expansion modules help match features to the application and support field-upgrading of meters as required. Serial and Ethernet communication options enable the meters to be used within a Siemens power management system or with third-party automation systems.



Precision

- ANSI C12.20 Class 0.5s
  - Energy Measurement
  - Voltage +/- .1%
  - Current +/- .1%
  - Power Factor +/- .5%
  - Sampling Rate 128/per cycle
  - 9340 Individual Harmonics up to 31st
  - 9360 Individual Harmonics up to 63rd
  - 9360 Sags / Swells Detection
  - Programmable Math / Logic Function
- Revenue Accurate
  - Sub Billing
  - Cost Allocation

Energy Management

- Energy Consumption
- 9360 Waveform Capture
- Customizable Webpages
- Min/Max and Event Logs
  - 9340 Storage Capacity 80kb
  - 9360 Storage Capacity 800kb
- Demand Control
- Automation Integration
- Solution for LEED® credit
- Monitors Critical Equipment
- Modbus Gateway
- Modbus TCP/RTU
- Industrial Systems

Reliability

- Economical Measurement
  - Commercial
  - Industrial
- Degree of Protection
  - Front – IP52
  - Rear – IP30
- 600V Connected Voltage
- Customizable Displays
- Email Alarms through Ethernet
- Field Addable Modules
- Simple Retrofit Installation
- Integration with Existing Systems

Order information

Meter with integrated display	Catalog Number
ACCES S 9340 meter with display, THD, alarming, 80 kb logging	**9340DC**
ACCESS 9360 meter with display, THD, alarming, 800 kb logging, configurable waveform sag, swell detection	**9360DC**
Meter with remote display	**Catalog Number**
ACCESS 9340 meter with remote display, basic instrumentation, THD, alarming, 80 kb logging	**9340RC**
ACCESS 9360 meter with display, THD, alarming, 800 kb logging, configurable waveform sag, swell detection	**9360RC**
Meter without display	**Catalog Number**
ACCESS 9340 meter without display, THD, alarming, 80 kb logging	**9340TC**
ACCESS 9360 meter without display, THD, alarming, 800 kb logging, configurable waveform sag, swell detection	**9360TC**
Remote display, adapter and accessories	**Catalog Number**
ACCESS 9340 display adapter kit	**9340-DISPKIT**
ACCESS 9360 display adapter kit	**9360-DISPKIT**
ACCESS 9340 and 9360 display adapter	**9340-60-DISPADA**
ACCESS 9340/60 gasket analog meter round	**9340-60-GASKET**
ACCESS 9340/60 I/O module, 2 relay output, 6 digital input	**9340-60-I/O26**
ACCESS 9340/60 I/O module, 2 relay output, 2 digital input, 2 analog input, 2 analog output	**9340-60-I/O2222**
ACCESS 9340/60 ethernet communication card	**9340-60-ETHER**
ACCESS 9340/60 RJ11 extender kit	**9340-60-RJ11EXT**

Power Distribution Solutions

9510 / 9610 Power Quality Meter

Power Quality Meter with Web Server Technology



These high power quality meters are packed with features such as the ability to determine the location of a disturbance quickly and accurately and determine the direction of the disturbance relative to the meter. Analysis results are captured in the event log, along with a time-stamp and confidence level indicating level of certainty. The 9510/9610 base meter includes 8 digital inputs capable of providing 1 millisecond time stamping and 7 digital outputs. The 9510/9610 meters support numerous protocols including IEC61850 and Comtrade.

Fast sampling rates and extensive memory make this the perfect choice for critical power systems making analysis of issues possible for correction and prevention. As a data accumulator, the 9510 and 9610 meters can also save money and time by simplifying wiring and networking. Information from the meter and downstream devices can be displayed on the large LCD display, on customizable web pages in reports and screens.

Applications for the 9510 and 9610 meters range from critical power applications such as data centers to industrial, commercial and government power and power quality monitoring systems. The 9510 and 9610 meters are offered in a number of forms from single meter enclosures integrated into Siemens switchgear, switchboard and panelboards. Place these high end power quality meters throughout the power distribution system where critical information is desired. Know what is happening in your facility and get maximum efficiency.

Precision

- ANSI C12.20 Class .2s
- Energy Measurement
  - Voltage +/- .01%
  - Current +/- .01%
  - Power Factor +/- .5%
  - 9510 Sampling Rate 256/per cycle
  - 9610 Sampling Rate 512/per cycle
  - 9610 XH Sampling Rate 1024/per cycle
  - 9510 Individual Harmonics up to 127th
  - 9610 Individual Harmonics up to 256th
  - Sags / Swells Detection
  - Programmable Math / Logic Function
- Revenue Accurate
  - Sub Billing
  - Cost Allocation

Energy Management

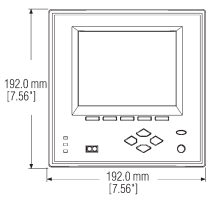
- Energy Consumption
- Waveform Capture
- Transient Capture 17 µs @ 60 Hz
- Disturbance Direction Detection (DDD)
- Customizable Webpages
- Min/Max and Event Logs
  - Storage Capacity up to 3.3 years at
  - 15 min intervals
  - Event Logging up to 20,000
  - Waveform Captures up to 390
- Demand Control
- Automation Integration
- Monitors Critical Equipment
- Modbus Master / Gateway
- Supports Multiple Protocols
- Supports Multiple Master via Ethernet

Reliability

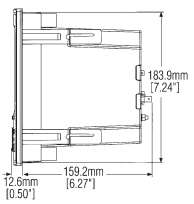
- Economical Measurement
  - Commercial
  - Industrial
- 600V Connected Voltage
- Transformer Line Loss Compensation
- Email Alarms
- Customizable Displays
  - Event / Alarm Log
  - Trending
  - Phasor Diagrams
- Password Protected
- Hardware Lockable
- Supports Copper or Fiber Ethernet
- Integration with Existing Systems

9

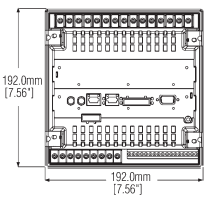
Meter with integral display dimensions



Front view

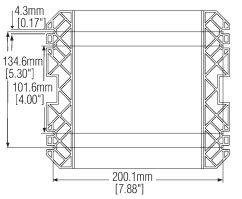


Side view

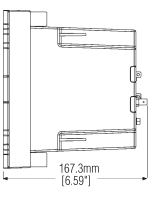


Front view,
TRAN model

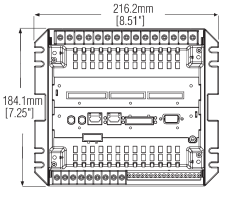
Meter transducer unit (w/o display) dimensions



Back View



Side view,
TRAN model



Rear view,
TRAN model

Order Information for 95/9610 Power Meters

Catalog Number

9	X	1	0	D	C	1	1	5	6	C	Z	Z	A

Description

Meter base unit and display options

• Meter with integrated display and 5MB logging memory	D
• Meter with integrated display and 10MB logging memory	E
• Meter without display (Tran version) and 5MB logging memory	T
• Meter without display (Tran version) and 10MB logging memory	U

Sampling rate

• Standard sampling (256 for 9510) (512 for 9610) per cycle maximum	C
• 1024 Samples per cycle (9610 only)	H

Power Supply

• 85-240 Vac / 110-300 Vdc	1
• 20-60 Vdc	2

Input Voltage

• 120 to 347 L-N / 208 to 600 L-L V AC	1

Input Current

• 1A Nominal (10 Amp full scale)	1
• 5A Nominal (20 Amp full scale)	5

Frequency

• 50 Hz	5
• 60 Hz	6

Communication Cards

RS232/RS485 (Selectable)	RS485	Infrared (Note 1)	Modem (Notes 1 & 2)	10/100 Base-T	10/100 Base-FX	
•	•	•				A
•	•	•	•			C
•	•	•		•		G
•	•	•	•	•		H
•	•	•		•	•	J
•	•	•	•	•	•	K

Auxiliary I/O Cards

• None (base meter includes 8 digital in and 7 digital out)	Z
• 8 Binary Inputs; 4 Analog Inputs 0 to 20 mA and 4 Analog Outputs 0 to 20 mA	F
• 8 Binary Inputs; 4 Analog Inputs 0 to 1 mA and 4 Analog Outputs -1 to 1 mA	G

Tropicalization Option

• None	Z
• Yes	T

Specials

• None	A
• Password protected and hardware lockable (lock enabled/disabled via jumper on comm card)	B
• EN50160 Compliance Monitoring (available on 9610 only)	C
• EN50160 Compliance Monitoring with password protected and hardware lockable (lock enabled/disabled via jumper on comm) (available on 9610 only)	D

Note 1 – The infrared and modem connections cannot be operated simultaneously. The connection type is configurable.
Note 2 – The listed modems are not suitable for European applications. Contact Siemens for special versions.

9510 RTU Data Concentrator

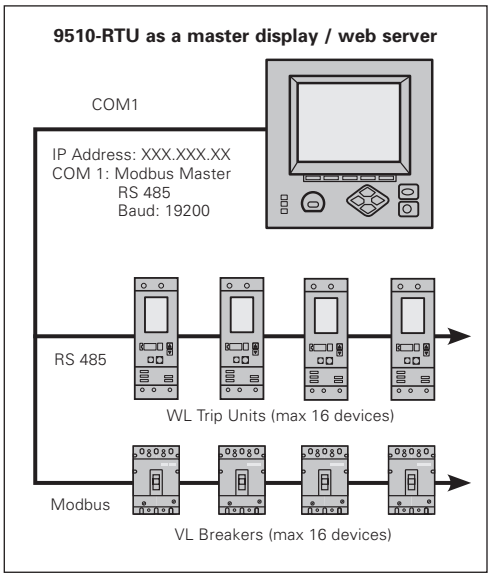
Siemens Advanced Data Recorder and Central Display



The **9510-RTU** unit can serve many uses through out a facility. This low-cost central display - data recorder can provide HTML web pages and customizable displays to allow easy access to the data and provide E-mail alarming for critical information. This multi-functional unit supports communications to any Modbus RTU device and digital / analog I/O, allowing the 9510-RTU to provide solutions for many different applications.

Features

- Monitor breaker status changes with 1ms resolution
- Collect, log, and scale pulse inputs from water, air, gas, electricity, or steam meters
- Act as an Ethernet gateway for serial devices
- Display Modbus slave information and make available as a web page
- Log and e-mail down stream Modbus device date
- Display trip unit data from WL, VL, Static Trip III① and SB-EC devices①
- Trigger and email alarms based on setpoint conditions
- Display feeder energy information for LEED certification
- Engineering service required to setup the 9510-RTU features



Catalog Number

9	5	1	0	E	C	1	R	T	U	G	Z	Z	A

Description

Meter base unit and display options	
Option #1 – Meter with integrated display and 5MB logging memory	D
Option #2 – Meter with integrated display and 10MB logging memory	E
Option #3 – Meter without display, with a 5MB logging memory (TRAN version)	T
Option #4 – Meter without display with a 10MB logging memory (TRAN version)	U
Communications	
ION / Modbus RTU - Factory configured for ION	C
Power Supply	
85-240 Vac / Vdc	1
20-60 Vdc	2
No Display Option	
Remote transducer option	R T U

Communication Cards

RS232/RS485 (Selectable)	RS485	Infrared (Note 1)	Modem (Notes 1 & 2)	10/100 Base-T	10/100 Base-FX	
•	•	•				A
•	•	•	•			C
•	•	•		•		G
•	•	•	•	•		H
•	•	•		•	•	J
•	•	•	•	•	•	K

Auxiliary I/O Cards	
None (base meter includes 8 digital in and 7 digital out)	Z
8 binary inputs; 4 Analog Inputs 0 to 20 mA and 4 Analog Outputs 0 to 20 mA	F
8 binary inputs; 4 Analog Inputs 0 to 1 mA and 4 Analog Outputs -1 to 1 mA	G
Tropicalization Option	
None	Z
Yes	T
Specials	
Standard (password protected, no locking or sealing)	A

Note 1 – The infrared and modem connections cannot be operated simultaneously. The connection type is configurable.
Note 2 – The listed modems are not suitable for European applications. Contact Siemens for special versions.

Enclosed Meters

Convenience and Reliability with Siemens Meter Enclosures

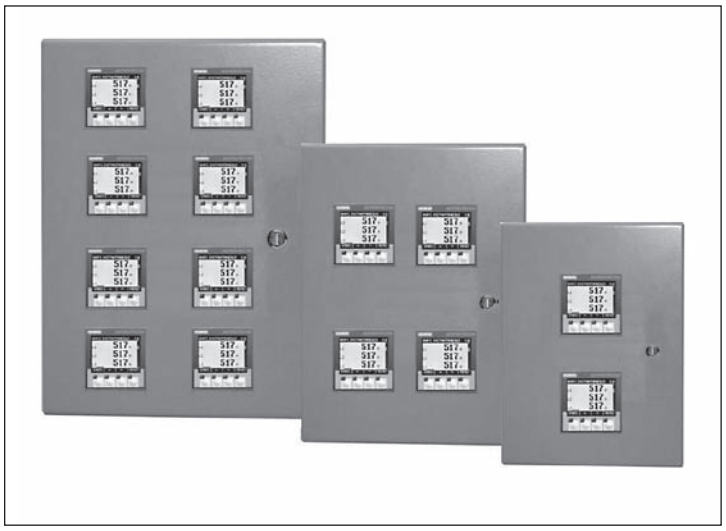
The Siemens meter enclosure offering is available to order with the SENTRON PAC series meters, the ACCESS series meters, and a combination of both power meter product offerings. The enclosed meter offering provides the required energy and basic metering information needed for a typical sub-billing / cost allocation application, as well as providing a simple retrofit solution for any project.

With Safety being paramount, Siemens has designed the meter enclosure product offering with many safety and convenience features in mind. These include a single circuit breaker for both the control voltage & voltage taps to protect internal wiring and the power meters from damage and allowing a "single source" disconnect from outside power, separate CT shorting blocks for each meter, a grounding lug, and the Modbus serial communications will be terminated to one location for ease of network installation.

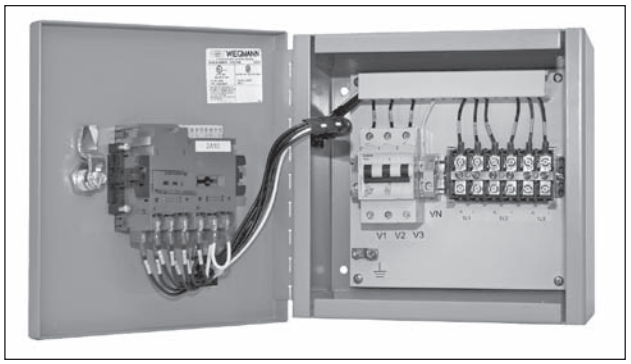
The Siemens meter enclosure solutions are delivered with all the required components pre-installed prior to shipment. All components will be mounted to a back plate in the enclosure and for applications above 240 volts, a CPT will be provided for control.

For low cost and simple tenant monitoring, sub-billing or industrial cost allocation, turn to Siemens metering units. Installed in rugged NEMA 1 or NEMA 12 enclosures, these metering units are ideal for:

- Property Management Firms
- Government Applications
- Universities
- Corporate Campus Facilities
- Malls
- Food Courts
- Building Retrofits



① PAC3100 standard is Modbus RTU.
② PAC3200 and PAC4200 Standard is Modbus TCP.
③ Modules not available on PAC3100.



Features:

- Rugged design and small footprint for easy installation
- Bright, easy-to-read LCD display
- Multiple configurations
- Packaged by voltage and current ratings to accommodate any installation
- Utilizes 5A secondary current input for improved accuracy and increased compatibility

Benefits:

- Replace multiple utility meters with one enclosure, saves wall space
- Consolidate utility bills for sub-billing and energy management, bill tenants on actual usage
- Improve energy efficiency
- Aggregate energy purchases for reduced rates
- Improve productivity when coupled with Siemens software solutions or third party billing software

Catalog Logic:

E N C L X X X X X X X X X

Meter
31 PAC3100 Series Meter①
32 PAC3200 Series Meter②
42 PAC4200 Series Meter②

Voltage
240 240V
480 480V

Type
01 NEMA 1 Enclosure
12 NEMA 12 Enclosure

Module
TC Standard
RT Modbus RTU③
PD PROFIBUS③
PN PROFINET③

Options
X Standard

Meter Enclosure Without Meter	
Catalog Number	**Description**
ENX24001-121208	12W x 12H x 8D NEMA 1 Enclosure 240V
ENX24012-121208	12W x 12H x 8D NEMA 12 Enclosure 240V
ENX48001-121208	12W x 12H x 8D NEMA 1 Enclosure 480V
ENX48012-121208	12W x 12H x 8D NEMA 12 Enclosure 480V

Power Distribution Solutions

Branch Circuit Monitoring / Embedded Metering

Space Savings, Convenience, and Reliability with Siemens Branch Circuit Monitoring



In a world where tenant square footage is a premium in commercial building designs, the area for electrical metering is being drastically reduced, and critical power is being relied upon in data centers applications, Siemens Branch Circuit Monitoring provides the solution.

The Siemens Branch Circuit Monitoring Solution utilizes the metering and monitoring technology integrated into the space saving panelboards from Siemens. When compared to the typical external wall mounted metering installations, considerable savings in space, installation costs, and data collection are realized with the Siemens Branch Circuit Monitoring Solution.

In addition, contractor labor costs for installation of sub-metering systems continues to increase. Still, building owners and property management companies must face the challenges of how to cost effectively provide tenant sub-metering in the constrained spaces.

To meet the sub-metering challenges of designers, contractors and property management companies, Siemens offers a proven cost-effective solution for Branch Circuit Monitoring/Embedded Metering .This solution combines a fully integrated metering system factory installed into the Siemens "P" series panel boards and switchboards, which along with the required local or remote sub-billing software, provides a "Total" sub-metering system.

Siemens Branch Circuit Monitoring / Embedded Metering Solution

- Saves you money – A tenant billing system improves cash flow, allows immediate pass-on of electric rate increases and helps building owners control costs. Tenants are confident they are paying their fair share for energy use and are saving money through energy conservation.
- Fast, low-cost installation – The embedded Siemens solution provides a faster and lower cost installation compared to other external systems.
- Lower space requirements – The embedded panelboard construction design requires no additional wall space to provide tenant metering. Conventional metering requires an external metering enclosure and possibly a current transformer transition cabinet.
- Reliable and accurate – Many Siemens systems are already in operation in large commercial and residential buildings around the country. Their accuracy exceeds utility industry and government standards like EPact 2005 for revenue grade meters.
- LEED certification – Provides the energy monitoring and logging required to achieve additional LEED points.
- Automated billing – With automated billing services the responsibility to acquire the data, store the data and bill the tenants is removed from the property management company, thus saving manpower and time.
- Responsive service – With remote monitoring, continuous 24/7 monitoring can be done by the property management company or tenants. The service can also relay consumption changes to the owners for immediate investigation.

Designer and contractor benefits include:

- Much smaller footprint versus the traditional socket meter combo units
- Factory pre-wired – less installation time
- Drastically less installation wiring
- No CT installation required in the field
- All equipment fits into the standard Siemens panel design
- Additional utilities like water, air and gas can be easily integrated into the system for a comprehensive monitoring system
- Hardwire and wireless communication options
- All components factory calibrated to meet revenue metering requirements
- Additional meters can be added in the field
- UL and CSA-us listed

Branch Circuit Monitoring applications include:

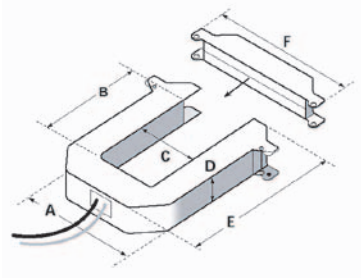
- Mixed Tenant & Retail
- Industrial Manufacturing
- Higher Ed
- Strip Malls
- Critical Power
- Goverment
- LEEDS buildings
- Airports

Please Contact Your Siemens Sales Engineer for additional information regarding Branch Circuit Monitoring / Embedded Metering

Comprehensive metering grade CT offering spilt-core, flexible and solid core designs

Split core – Rectangular Window





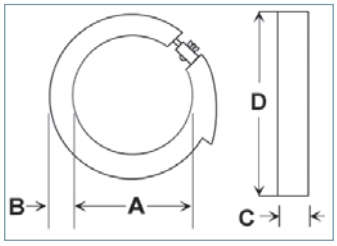
Siemens Instrument Grade Current Transformers (CT) have a split-core construction and provide a safe 5A secondary output. These split-core current transformers allow for easy installation, retrofit, and service. CT's come with 4' leads (18 gauge). Use on low voltage applications of 600V or less.
Accuracy 0.5%.

200A – 300A	400A – 800A	1000A – 1200A
A = 3.75″ (95mm)	A = 4.90″ (124mm)	A = 4.90″ (124mm)
B = 1.51″ (38mm)	B = 2.89″ (73mm)	B = 5.50″ (140mm)
C = 1.25″ (32mm)	C = 2.45″ (62mm)	C = 2.45″ (62mm)
D = 1.13″ (29mm)	D = 1.13″ (29mm)	D = 1.13″ (29mm)
E = 4.20″ (107mm)	E = 5.57″ (141mm)	E = 8.13″ (207mm)
F = 4.75″ (121mm)	F = 5.91″ (150mm)	F = 5.92″ (150mm)

Amps	Window (C x B)	Catalog Number
100A	1.25″x1.15″	**PDS-CTSC-011**
200A	1.25″x1.51″	**PDS-CTSC-021**
300A	1.25″x1.51″	**PDS-CTSC-031**
400A	2.45″x2.89″	**PDC-CTSC-042**
600A	2.45″x2.89″	**PDS-CTSC-062**
800A	2.45″x2.89″	**PDS-CTSC-083**
1000A	2.45″x5.50″	**PDS-CTSC-013**
1200A	2.45″x5.50″	**PDS-CTSC-123**
1600A	2.45″x5.50″	**PDS-CTSC-163**
2000A	2.45″x5.50″	**PDS-CTSC-200**
3000A	2.75″x6.625″	**PDS-CTSC-03R**

Split-core – Round Window





Split-core round rubber insulated flexible CT's with 12' heavy duty leads (18 AWG) and 5A secondary output for use on low voltage applications of 600V.
Accuracy is 4% for 200/400A, 3% for 400A, and 2% for 600A and above.

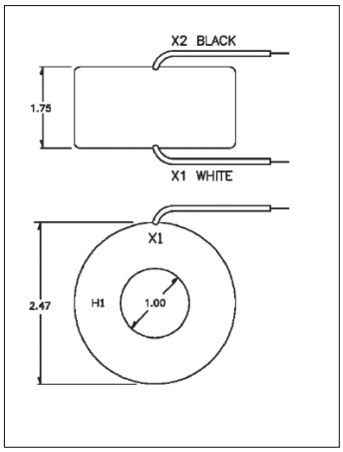
200A – 1200A	3000A – 4000A
A = 4.00″	A = 6.00″
B = 1.25″	B = 1.25″
C = 1.50″	C = 1.50″
D = 6.50″	D = 8.50″

Amps	Window (A)	Catalog Number
200A	4.00″	**PDS-CTHC-024**
300A	4.00″	**PDS-CTHC-034**
400A	4.00″	**PDC-CTHC-044**
600A	4.00″	**PDS-CTHC-064**
800A	4.00″	**PDS-CTHC-084**
1200A	4.00″	**PDS-CTSC-123**
2000A	6.00″	**PDS-CTHC-206**
3000A	6.00″	**PDS-CTHC-306**
4000A	6.00″	**PDS-CTHC-406**

Comprehensive metering grade CT offering spilt-core, flexible and solid core designs

Solid-core – Round with Round Window

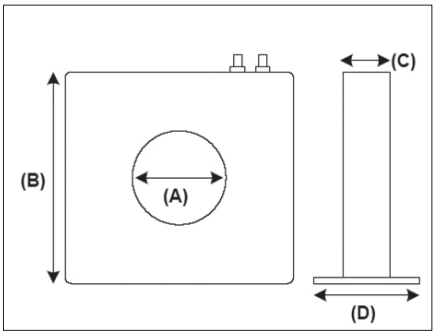
The small size solid core Current Transformer (CT) are designed for tight locations and new installations providing a safe 5 amp secondary for use on voltage applications of 600V or less.
Accuracy is 0.3%.



Solid core – Round metering grade, 600V		
Catalog Number	**Primary**	**Size**
SMU-CT-011	100A	1.75″ x 2.47″, 1″ Window
SMU-CT-021	200A	1.75″ x 2.47″, 1″ Window
SMU-CT-025	250A	1.75″ x 2.47″, 1″ Window
SMU-CT-031	300A	1.75″ x 2.47″, 1″ Window
SMU-CT-041	400A	1.1″ x 3.56″, 1.56″ Window
SMU-CT-061	600A	1.1″ x 3.56″, 1.56″ Window
SMU-CT-081	800A	1.1″ x 3.56″, 1.56″ Window
SMU-CT-123	1000A	1.1″ x 3.56″, 1.56″ Window
SMU-CT-02R	2000A	1.15″ x 5.73″, 3.25″ Window

Solid-core – Square with Round Window

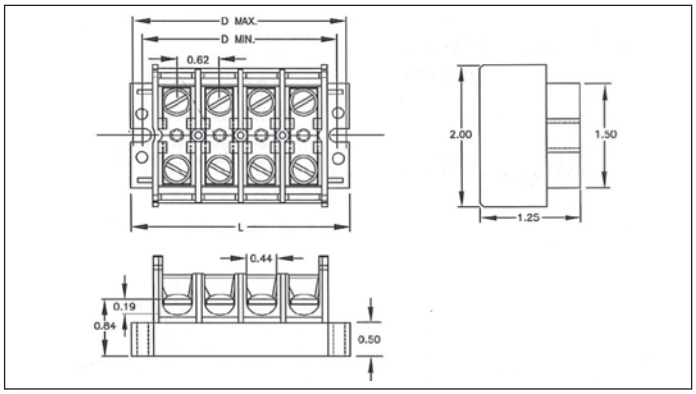
Siemens Instrument Grade Current Transformers (CT) are designed as solid-core construction and provide a safe 5A secondary output. Solid-core CT's come with terminals for attaching leads. Use on low voltage applications of 600V or less.
Accuracy is 0.3%.



Amps	Dimension (A x B x C x D)	Catalog Number
200:5	1.25″ x 4.88″ x 2.19″ x 4.68″	**PDS-CTRC-021**
300:5	1.25″ x 4.88″ x 2.19″ x 4.68″	**PDS-CTSC-031**
400:5	1.25″ x 4.88″ x 2.19″ x 4.68″	**PDS-CTRC-041**
500:5	1.25″ x 5.10″ x 3.00″ x 5.50″	**PDC-CTRC-051**
600:5	1.25″ x 5.10″ x 3.00″ x 5.50″	**PDS-CTRC-061**
800:5	1.25″ x 5.10″ x 3.00″ x 5.50″	**PDS-CTRC-081**
1000:5	1.25″ x 5.10″ x 3.00″ x 5.50″	**PDS-CTRC-101**
100:5	2.25″ x 6.31″ x 3.00″ x 5.82″	**PDS-CTRC-012**
200:5	2.25″ x 6.31″ x 3.00″ x 5.82″	**PDS-CTRC-022**
300:5	2.25″ x 6.31″ x 3.00″ x 5.82″	**PDS-CTRC-032**
400:5	2.25″ x 6.31″ x 3.00″ x 5.82″	**PDS-CTRC-042**
800:5	4.00″ x 6.44″ x 3.25″ x 3.25″	**PDS-CTRC-084**
1000:5	4.00″ x 6.44″ x 3.25″ x 3.25″	**PDS-CTRC-104**
1200:5	4.00″ x 6.44″ x 3.25″ x 3.25″	**PDS-CTRC-124**
1600:5	4.00″ x 6.44″ x 3.25″ x 3.25″	**PDS-CTRC-164**
2000:5	4.00″ x 6.44″ x 3.25″ x 3.25″	**PDS-CTRC-204**
3200:5	6.50″ x 9.88″ x 7.00″ x 7.00″	**PDS-CTRC-326**
4000:5	6.50″ x 9.88″ x 7.00″ x 7.00″	**PDS-CTRC-426**

Shorting Block

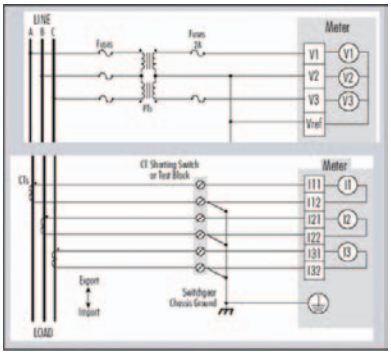
All low voltage current transformers should be installed with a shorting block to allow for easy removal of the metering unit and to provide a safe method for disconnecting the CT signal. One shorting block is required per meter. Various size shorting blocks are available; 4, 6, and 8 pole configurations are available with four slotted shorting screws and cover. Wire size is 18-10 AWG.



Catalog Number		Mounting		
	Ckts.	L	D min.	D max.
IKU4SC	4	3.25	2.88	3.00
IKU6SC	6	4.50	4.12	4.25
IKU8SC	8	5.75	5.38	5.50
IKU12SC	12	8.25	7.88	8.00

Typical electrical meter CT and shorting block installation

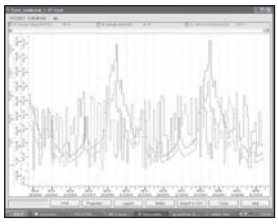
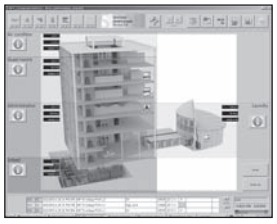
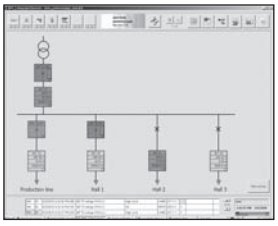
This example shows a common three phase, three wire installation where three CT's and one shorting block are used.



Power Distribution Solutions

Powermanager

A power management system that can be customized to your needs.
View and control your facilities' infrastructure condition from anywhere.

SENTRON Powermanager software, combined with Siemens power meters and low voltage protective devices, provides a complete energy management solution for your business. It allows you to measure, process, analyze, store and share energy usage and status information across your entire enterprise. It offers control capabilities, comprehensive energy usage and reliability, and detailed reporting that will help you reduce energy related costs.

Cost allocation and Sub-billing Reports

Cost allocation and sub-billing functionality in the Powermanager software allows the user to track energy related costs by building, floor, tenant, feeder or location. Match virtually any fixed rate billing structure and use comprehensive multi-year scheduling and time-of-use features to manage the energy costs.

Load Studies and Asset Management

Trend power usage data to take full advantage of your electrical distribution system capacity and avoid over-design. Create usage profiles that will allow you to distribute loads and avoid demand peak which helps to identify energy leaks such as equipment running during down time.

Equipment Monitoring and Control

Powermanager allows you to meter all your utilities including gas, steam, air and water and set up general condition alarming and pre-event alarms for impending or imminent conditions. Interface with other energy management and SCADA systems through multiple communication channels and protocols like OPC.

Reports

Standard reports provide models of daily electricity usage so you can distribute loads and avoid demand peaks. This enables you to allocate energy consumption and/or costs to individual areas and identify expensive processes that need attention. The historic trending report compiles data from load circuits over a users predefined period. This enables the user to fully utilize the power distribution system and run at near rated tolerances.

Benefits

- Visibility and control of power flows
- Exact knowledge of the consumption profile
- Increase of energy efficiency
- Optimization of power supply contracts
- Compliance with contractual terms or regulations
- Allocation of costs to individual cost centers
- Optimization of plant maintenance
- Identification of critical systems conditions

The Powermanager software:

- Is available in a stand-alone or LAN/WAN based configuration that can also exchange information with other supervisory systems like building automation software
- Can utilize any Ethernet or serial based connections
- Is expandable from the basic monitoring application to a fully customized enterprise management system
- Is fully scalable with regard to the connected devices and to the software's function to meet current and future needs
- Ensures the seamless integration of power monitoring devices from the Siemens SENTRON PAC series meters and SENTRON WL/VL circuit breakers as well as other Modbus communicating devices
- Is designed to collect, archive, monitor, display and evaluate any kind of energy related device data
- Provides web based reporting and detailed graphics construction utilities as standard

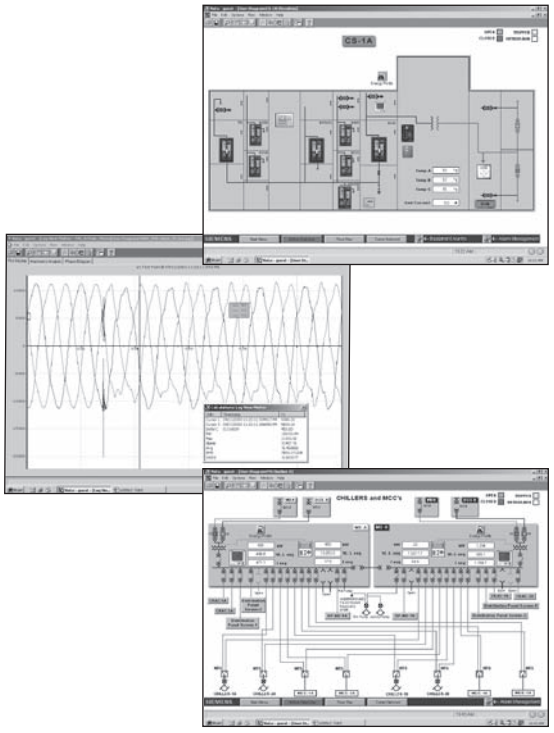
Ordering information

Powermanager Software and Device License	Catalog Number
Trial License 10 devices, feature packages "Expert" and "Web," 30 days	**3ZS27110CC200YA7**
Lean License 10 devices	**3ZS27110CC200YA0**
Lean Plus License 10 devices, feature packages "Expert" and "Web"	**3ZS27118CC200YA0**
Standard Plus License 50 devices, feature packages "Expert" and "Web"	**3ZS27128CC200YA0**
Advanced Plus License 100 devices, feature packages "Expert" and "Web"	**3ZS27138CC200YA0**
Maximum Plus License 200 devices, feature packages "Expert" and "Web"	**3ZS27148CC200YA0**
Powermanager Add Ons and Upgrades	**Catalog Number**
Lean Plus to Standard Plus Upgrade License	**3ZS27120CC200YD0**
Standard Plus to Advanced Plus	**3ZS27130CC200YD0**
Advanced Plus to Maximum Plus	**3ZS27140CC200YD0**
Windows Client <= 5 Expansion up to 5 total clients	**3ZS27103CC200YH0**
Windows Client <=10 Expansion from 5 to 10 clients, requires <=5	**3ZS27104CC200YH0**

Contact Siemens for upgrade information

Power Distribution Solutions

WinPM.net



WinPM.net is a complete energy information management solution for your business allowing you to process, analyze, store and share energy usage and power quality data across your entire enterprise. It offers control capabilities, comprehensive power quality and reliability analysis and can help you reduce energy-related costs. WinPM.net allows you to manage intelligent metering and protective devices, analyze data, and decide on new courses of action to help you save money and keep your business up and running.

Its cutting-edge flexibility and compatibility means you can add one piece at a time, at your own pace, while still maintaining your original investments. Interface to your existing systems through industry-standard protocols and choose newer components as they become available.

The WinPM.net software:

- Provides detailed analysis of the power quality and overlays waveforms to correlate phase-to-phase relationships between voltages and currents and cascading failures
- Pinpoints the sources of transients, harmonics, or sags, whether external or internal to your facility, allowing you to decide on the right corrective actions. By monitoring circuits 24 hours a day, you can develop strategies to avoid interruptions
- Provides a comprehensive graphics utility as standard to build and edit any graphical screen whether it is a standard screen or a customized one. These custom screens can display real-time and historical data, alarms, status indications, meter, relay and third party equipment information
- Supports Modbus RTU, Modbus TCP, ION, XML, OPC, FTP, and PQDIF compliant systems, so you can unify your diverse operations into one system. Interface to other energy management software, or include transducers, PLCs, and RTUs in a WinPM.net network. OPC can extract values from other software databases then combine these values with up-to-date readings from WinPM.net to perform real time calculations
- Offers easy, cost effective and fast system expansion. The system grows as your needs grow. Add one piece at a time, at your own pace, within your own budget

Cost allocation and sub-billing

Track energy-related costs by building, feeder, or tool. Match virtually any billing structure and use comprehensive multi-year scheduling and time-of-use activity profiles.

Load studies and asset management

Trend power usage data to take full advantage of your electrical distribution system capacity and avoid over-design. Create usage profiles so you can distribute loads and avoid demand peak.

Demand and power factor control

Eliminate penalties through automated power factor correction, load shedding, or peak shaving.

Equipment monitoring and control

Meter all your utilities including gas, steam, air and water. Set up alarms for pending problems, pre-alarm on impending or imminent conditions. Interface with other energy management and SCADA systems through multiple communication channels and protocols.

Preventative maintenance

Base your maintenance schedule on actual operating history.

Ordering information

Software	Catalog Number
WinPM.Net V6.0 DVD New (includes 5 Access meter device licenses, 1 Engineering Client, 2 web clients)	**3ZS67100CC600BA0**
WinPM.Net V6.0 DVD Replacement	**3ZS67100CC600BC0**
Device License	
ACCESS 9xxx Meter Device License Limit 6...50	**3ZS68120CC600BA2**
ACCESS 9xxx Meter Device License Limit 51...100	**3ZS68130CC600BA2**
ACCESS 9xxx Meter Device License Limit 101...1000	**3ZS68140CC600BA2**
ACCESS Comp. or Modbus/SeaBus Device License Limit 1...50	**3ZS68220CC600BA2**
ACCESS Comp. or Modbus/SeaBus Device License Limit 51...100	**3ZS68230CC600BA2**
ACCESS Comp. or Modbus/SeaBus Device License Limit 101...1000	**3ZS68240CC600BA2**
Options	
WinPM.Net Engineering Client License Limit 2...50	**3ZS67220CC600BA2**
WinPM.Net Engineering Client License Limit 51...100	**3ZS67230CC600BA2**
WinPM.Net Web Client License	**3ZS67420CC600BA2**
WinPM.Net OPC Server License	**3ZS67520CC600BA2**
WinPM.Net SQL 2008 CPU License	**3ZS67308CC600BA0**
Allows remote configuration of base WinPM.Net software. Note: WinPM.Net software will support limited Engineering client & Web client access. Additional Engineering client and Web client can be added with additional cost. Excel is required for Reporter. Outlook is required for e-mailing reports.	

Contact Siemens for upgrade information

Power Distribution Solutions

Application Engineering



Application Engineering capabilities

Provides:

- Power Quality Reliability & Analysis
- Utilities Cost Allocation & Billing
- Utilities Usage Aggregation
- Load Preservation
- Equipment Monitoring
- Facility Monitoring & Automation
- Sequence of Event Recording
- Preventative Maintenance
- Electrical Asset Management

The Siemens Power Distribution Solutions Application Engineering team provides the required experience and knowledge to implement any system regardless of the size or complexity. Siemens Application Engineers are highly skilled professionals who understand how to combine the best PMC software and hardware to create solutions that exceed our customer's expectations.

Key Market Expertise:

- Commercial Construction:
  - New / Retrofit
  - Tenant / Sub Billing
- Critical Power:
  - Data Centers
  - Hospitals
  - JCAHO
- Government:
  - Local, State & Federal Government EPACT projects
  - Universities
  - Airports
- Industrial Applications:
  - Petro - Chem., Cement, Food & Beverage, Waste water, Automotive

PDS Custom Solutions:

- LAN – WAN based solutions using our WinPM.Net web-based software
- Custom power metering logic
- Custom billing, energy usage or load profile reports
- Integration of other utilities like gas, water, steam, air and more
- Custom interactive one-line, elevation or floor plan graphics
- Third party hardware and software Integration
- Extensive alarm configuration and implementation
- Custom data logging and data retrieval.
- Siemens or others plant factory witness testing
- On-site and remote hands-on system training
- Overall PMC project management

Application Engineers Capabilities:

- Communication network topology approval drawings
- Project management plan for the PMC system
- Interface to Siemens APOGEE building management system
- Power monitoring workstations and server configuration
- Final as-built operation and maintenance manuals
- Integrate with Siemens medium voltage, low voltage Switchgear & motor control centers
- Integration with Siemens Industrial Automation components & Software WinCC / PCS 7
- System communication troubleshooting
- Site Acceptance Test procedure (SAT), Method of Procedures (MOP), Factory Acceptance Test Procedure (FAT)
- On-site startup & commissioning

Reliable Power Quality

Whether you are designing a fault tolerant mission critical infrastructure or you want to intelligently balance workloads to optimize energy usage and control costs, you need a reliable and industry proven monitoring solution. You will gain a visible look into the actual power consumption to understand the average and peak power utilization, monitor and manage UPS's and power distribution units, or even a complete IT support infrastructure, including generators, environmental systems and detection devices, as well as other components from multiple vendors. A Siemens designed solution using WinPM.Net or Powermanager, coupled with high quality Siemens meters will result in a powerful tool, helping to analyze, identify and correct power issues before they become critical. Instant notification by email or alarm when power quality issues such as sag/swell or voltage disturbance occur.

Flexible

Easily integrate with any vendor's equipment using standard communication protocols to combine critical alerts and realtime data. Monitor and manage critical power devices from a single uninterruptible power system (UPS), an enterprise-wide network of many UPS's and power distribution devices, or a complete IT support infrastructure, including generators, environmental systems and detection devices, and other components from multiple vendors.

Informative

Siemens Power Distribution and Solutions provide an energy monitoring solution that can provide you with the reports and the data you need for your operation. Complete power analysis from the incoming utility power to individual branch circuits.



Advantages to You...

- Technical experts
- Single source supplier
- Available 24/7, 365 days a year
- Reduced total cost of ownership (TCO)
- Avoid unscheduled downtime with preventive maintenance

SIEPRO Service Products

Modular SIEPRO service products enable you to customize a technical service agreement to meet your organization's maintenance needs over the entire life cycle of your installation. Including SIEPRO products in your TSA will provide the following benefits:

- Substantial savings versus "on demand" purchases
- Optimized scaling of your maintenance organization
- Assurance that your installation is operating at maximum performance and availability

Telephone and Internet

Priority support
When you need help right now, choose the support coverage that fits your business:
24 hours x 7 days a week
8 hours x 5 days a week

Extended support

With extended support, you can request blocks of support hours for specific projects and tasks. We can customize this support service to meet your individual needs.

Remote service

Remote service provides support and diagnostics via data line to save you time and money. Technical support specialists directly access your system for real-time troubleshooting to provide maximum uptime.

Technical account liaison

A technical account liaison provides consulting and guidance on all aspects of support through familiarity with the application, your business goals and processes, and your maintenance and engineering staff.

In addition to a site visit to assess your installation and support requirements, the technical account liaison will conduct monthly reviews with your staff to ensure you are receiving maximum payback on your investment.

Field services

Block of hours
Purchase field service hours in 40 hour increments for preventative, predictive or emergency services.

Embedded engineer

Full-time, on-site support from a certified Siemens professional.

Emergency support

Purchase emergency service hours in 40 hour increments to ensure the fastest possible response time.

Maintenance programs

Packaged maintenance programs available for:
- System performance checks
- Run diagnostics
- Analyze power quality
- Visual inspections of key system components
- Database trim and backup

Training

Operation and maintenance
Siemens training offers a broad range of educational services, providing quality and excellence to the automation industry. Targeted product and system training provides the student with practical, hands-on experience.

Customized on-site training

On-site training is excellent for large groups or when individual, one-on-one instruction is needed. When the trainer visits your facility, product training will be conducted on your specific installation. Classroom lectures, and trouble-shooting techniques specific to your installation are covered in detail during the training session.

Software update service

The software update service enables you to take advantage of enhancements to the most current software versions. A site evaluation is conducted to determine necessary upgrade requirements prior to the Software Update Service.

Contents

Siemens TPS3 family of hardwired Surge Protective Devices

(formally known as Surge/Lightning Arrestors and/or Transient Voltage Surge Suppressors –TVSS)

Family SPDs	10-2
SOLID Protection	10-3
TPS3 Integral SPDs	10-4
TPS3 03 (Surge Arrestor Replacement)	10-5
TPS3 09	10-5
TPS3 11	10-6
TPS3 12 and TPS3 L12 (10 mode)	10-7
TPS3 15 and TPS3 L15 (10 mode)	10-8

Integrally Mounted SPDs



Features

- Per Phase Surge Current Capacity ranging from 100 kA to 1000 kA
- Industry best VPRs
- I_n = 20 kA (most models)
- Across the board UL 96A compliance (most models)
- Ground Integrity Monitoring (GIM) diagnostics

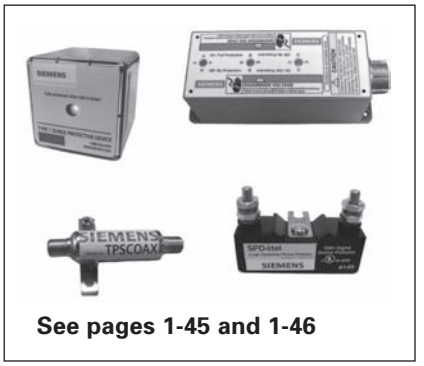
External or Wall Mounted SPDs



Features

- Per Phase Surge Current Capacity ranging from 50 kA to 1000 kA
- Industry best VPRs
- I_n = 20 kA (most models)
- Across the board UL 96A compliance (most models)
- Ground Integrity Monitoring (GIM) diagnostics (excluding TPS3 03 & TPS3 09)

Residential SPDs



See pages 1-45 and 1-46

Features

- Per Phase Surge Current Capacity of 40 kA or 50 kA
- Complete Service Protection for
  - Power
  - Telephone
  - Coax
- Ground Integrity Monitoring (GIM) diagnostics

SPD - Surge Protective Devices

Siemens Surge Protection Innovations

Introduction

In today's electronic world, home and business electrical systems just aren't complete unless they incorporate surge protection. **Stopping Surges Before They Get Into** these systems is best accomplished through the installation of appropriately sized hard-wired surge protective devices (SPDs) beginning at the incoming service followed by installations at other key surge entry points.

When Siemens first developed the Transient Protection System (TPS) family of surge protectors, we knew early on that hard-wired surge protectors needed fully coordinated safety controls. This led to the adoption of a number of SPD industry safety control firsts including the patented Ceramgard and TranSafe circuitry, coordinated fusing and thermal cutouts, dielectric isolation, mechanical re-enforcing taping, etc… resulting in a design that ensures the highest possible electrical system surge protection and reliability.

Our next generation UL 1449 3rd Edition TPS3 SPDs carry on this same legacy. Every TPS3 is infused with Siemens engineering safety and performance "know-how." Siemens SPDs have the highest degree of safety while delivering the industry's best performance ratings – some of the lowest Voltage Protection Ratings (VPRs), 'Type 1' and 20 kA I-nominal ratings (for most models) with surge current ratings from 50 to 1000 kA.

Electrical disturbances will always occur, but they don't have to cause surge protectors to fail in an unsafe manner. Safer surge protection means uncompromised electrical system **protection, safety, and reliability.**

The following pages provide additional technical and ordering information concerning our TPS3 family of Surge Protective Devices (SPDs).

Surge Protector Per Phase Surge Current Capacities

Wall Mounted Standard Mode						10 Mode SPDs		
Per Phase Surge Current	TPS3 03 	TPS3 09 	TPS3 11 	TPS3 12 	TPS3 15 	Per Phase Surge Current	TPS3L 12 	TPS3L 15 
50 kA						150 kA		
100 kA						300 kA		
150 kA						450 kA		
200 kA						600 kA		
250 kA						900 kA		
300 kA								
400 kA								
500 kA								
600 kA								
800 kA								
1000 kA								

SPD - Surge Protective Devices

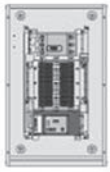
Recommending Surge Protection

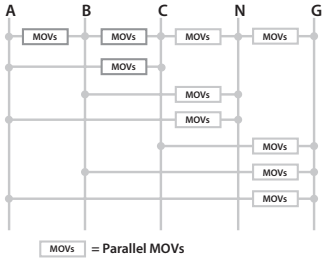
SOLID Protection

Either at home or in the work place, nearly every electrical load is electronic infused. With today's power quality being the same as it was 50 years ago, equipment is more susceptible to surge damage and/or disruption generated by normal electrical distribution interactions. Places where lightning activity is minimal are now experiencing more electronic failures due to surges generated by the day to day operations of equipment like washers and dryers, copiers, chillers, etc. Designers, a few years ago, never gave thought to the need of incorporating surge protection within their designs. They are now reconsidering this practice. Government studies suggest that the most efficient way to protect electrical systems from surges is through the installation and application of hardwired SPDs at key points within the distribution system.

To ensure complete electrical system surge protection, Siemens recommends implementing a "SOLID" electrical system surge protection installation. "SOLID" systems incorporate hardwired SPDs at the incoming electrical service to stop surges originating from the utility service. This is followed by hardwiring additional SPDs at other distribution system surge entry points.

The illustration to the right shows "SOLID" locations that are typically present a school's electrical system. Each letter from the word "SOLID" stands for the location on the distribution system where surge protection is to be installed. For each location, we list the most common integral or wall mounted specified Siemens TPS3.

S	O	L	I	D
				
TPS30620 or TPS31220	TPS30515 or TPS31215	TPS30110 or TPS31110	TPS31110 or TPS30910	TPS30350 or Call TPS Group
Service Entrance	**Outside loads like Parking Lot Lighting powered from distribution panels**	**Lower voltage distribution panels powering computers and other electronics**	**Individual critical equipment like servers**	**Data, telephone, and coaxial cables**

Surge Arrestor Replacement		Discrete or True 10 Mode Style SPDs	
 **TPS3 03 Type 1 SPD with I_n = 20 kA**	Low voltage surge and lightning arrestors became obsolete when UL 1449 3rd edition went into effect in 2009. They were replaced with Type 1 SPDs having an I-nominal (I_n) rating equal to 20 kA. Most all Siemens TPS3s are rated as Type 1, I_n=20 kA SPDs. However, the style and form factor of traditional surge arrestors is best replaced using our TPS3 03.		For mission critical or high profile applications, a growing number of end users prefer the assurance discrete or true 10-mode SPDs provide. When surges traverse the electrical system via phase to phase conductors, standard SPDs indirectly protect via the line to neutral or line to ground modes of protection. Siemens integral or wall mounted "Discrete" or "True" 10-mode SPDs address L-L surges by incorporating directly connected line to line surge protection elements. This style of SPD provides the "Just in Case" assurance mission critical or high profile projects require.

SPD - Surge Protective Devices

TPS3 Integral or Internally Mounted SPDs

Selection

Siemens Integral TPS3 series surge protectors are UL 1449 3rd Edition factory-installed SPDs mounted within our standard distribution equipment. Internally mounted SPDs maximize protection by keeping electrical connections as short as possible, which minimizes impedance losses. The results are some of the industry's best "installed" Voltage Protection Ratings. In addition to this performance benefit, our integral SPDs share the following features:

- UL 1449 3rd Edition and UL 1283
- UL Type 1 or Type 4 tested as Type 1 or 2 SPDs
- 20 kA I_n (most models)
- Ground Integrity Monitoring diagnostics
- 200 kA SCCR (most models)
- UL 96A Lightning Protection Master Label Compliant

TPS3 01 and TPS3 L1 ("True" or "Discrete" 10-Mode)

Siemens TPS3 01 and L1 surge protective devices are designed for integration within our P1, P2, and P3 power distribution panelboards, as well as motor control centers and busway systems.

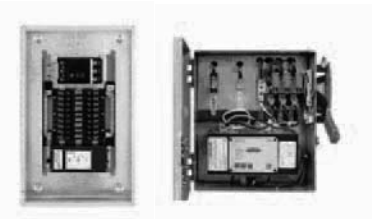
Surge Current Capacity:
100 kA to 300 kA

See the following sections for ordering details:

Panelboards	11
Busway	15
Motor Control Centers	16



TPS3 01 Module



TPS3 01 Sample Installations

TPS3 05 and TPS3 L5 ("True" or "Discrete" 10-Mode)

Siemens TPS3 05 and L5 surge protective devices are designed for integration within our P4 and P5 panelboards as well as distribution switchboards.

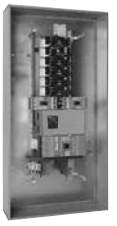
Surge Current Capacity:
100 kA to 300 kA

See the following sections for ordering details:

Panelboards	11
Switchboards	13



TPS3 05 Module



TPS3 05 Sample Installations

TPS3 06 and TPS3 L6 ("True" or "Discrete" 10-Mode)

Siemens TPS3 06 and L6 surge protective devices are designed for integration within our SB1, SB2, SB3, Type RCS Switchboards, Low Voltage Switchgear, Motor Control Centers, and Busway Systems.

Surge Current Capacity:
100 kA to 500 kA

See the following sections for ordering details:

Switchboards	13
Switchgear	14
Busway	15
Motor Control Centers	16



TPS3 06 Module



TPS3 06 Sample Installations

Note: Wall mounted TPS3 12, TPS3 L12, TPS3 15, and TPS3 L15 can be configured for integral applications where Type 1 applications are required and for surge current capacity up to 1000 kA.

TPS3 03

TPS3 03 is a UL 1449 3rd Edition 50 kA Type 1 compact surge protective device that can be used as a replacement secondary surge or lighting arrestors. Having a Type 1 designation allows for flexible electrical system connection location (line or load side) as well as UL 96A compliance (@ 20 kA I_n).

TPS3 03 Key Features
- UL 1449 3rd Edition Listed
- Type 1 Rated SPD
- 50 kA Per Phase Surge Current
- 20 kA I_n (Most models)
- 200 kA SCCR (Most models
- UL 96A Lightning Protection Master Labeling compliant (@ 20 kA))
- Every MOV is monitored
- Mounting – chase nipple, bracket, or DIN RAIL
- Standard compact NEMA 4X polycarbonate enclosure
- Modes of Protection: L-N or L-G and L-L
- Standard Monitoring: LED Indicator
- Dimensions: 3.25" x 3.25" x 3.3" (82.6 mm x 82.6 mm x 83.8 mm)
- Weight: 2 lb. (0.9 kg)
- 2 Year Product Warranty

Available Options:
- Dry contacts & Audible Alarm (option "D")



TPS3 03



TPS3 01 DIN RAIL Mounting

Ordering Information

Catalog # TPS3 ☐ 03 ☐☐ ☐

Voltage Code	Surge Current (kA)	Options
A = 120/240 V, 1Ø, 3W	05 = 50 kA per phase	D = Dry contact & audible alarm
B = 120/240 V, 3Ø, 4W C = 120/208 V, 3Ø, 4W D = 240 V, 3Ø, 3W E = 277/480 V, 3Ø, 4W F = 480 V, 3Ø, 3W G = 600 V, 3Ø, 3W K = 380/220 V, 3Ø, 4W L = 600/347 V, 3Ø, 4W		

Example - TPS3C0305D = Type 1 SPD for a 208/120 V application with a surge current capacity of 50 kA per phase, in a standard NEMA 4X enclosure with dry contacts and audible alarm option.

When an option is not selected, include a zero (0) in the field.

Available Accessories: Ordered Separately
RMSIE - Remote monitor

TPS3 09

TPS3 09 is a UL 1449 3rd Edition 100 kA Type 1 compact multi-mode surge protective device that can be installed on either the line or load side of the electrical service. When installed at the electrical service entrance, it can be used for UL 96A compliance (@ 20 kA I_n).

TPS3 09 Key Features
- UL 1449 3rd Edition Listed
- Type 1 Rated SPD
- 100 kA Per Phase Surge Current
- 20 kA I_n (Most models)
- 200 kA SCCR (Most models)
- UL 96A Lightning Protection Master Labeling compliant (@ 20 kA)
- Every MOV is monitored, including N-G
- Mounting: chase nipple or wall mounted
- Standard compact NEMA 4X polycarbonate enclosure
- Modes of Protection: L-N, L-G, N-G, and L-L
- Standard Monitoring: LED Indicators
- Dimensions: 8" x 3" x 3" (203 mm x 76 mm x 76 mm)
- Weight: 3 lb. (1.4 kg)
- 10 Year Product Warranty

Available Options:
- Dry contacts & Audible Alarm (option "D")
- Extended indicator light (option "E")
- Internal mounting in P1, P2 Panels (option "I"), requires TPS9IKITP1 or TPS9IKITP2 mounting bracket accessory.



TPS3 09

Ordering Information

Catalog # TPS3 ☐ 09 ☐☐ ☐☐☐

Voltage Code	Surge Current (kA)	Options
A = 120/240 V, 1Ø, 3W B = 120/240 V, 3Ø, 4W C = 120/208 V, 3Ø, 4W D = 240 V, 3Ø, 3W E = 277/480 V, 3Ø, 4W F = 480 V, 3Ø, 3W G = 600 V, 3Ø, 3W K = 380/220 V, 3Ø, 4W L = 600/347 V, 3Ø, 4W S = 400/230 V, 3Ø, 4W	10 = 100 kA per phase	E = Extended indicator light I = Internal mounting in P1, P2 panels D = Dry Contact & audible alarm

Example: TPS3C0910D00 = SPD for a 208/120 V panelboard with a surge current capacity of 100 kA per phase with standard NEMA 4X enclosure, dry contacts and audible alarm option.

Available for field retrofit in P1 panels.

When an option is not selected, include a zero (0) in the field.

Available Accessories: Ordered Separately
- RMSIE = Remote monitor
- FMKITC = Flush mount plate
- TPS9IKITP1 = Mounting bracket for installation in P1 panels
- TPS9IKITP2 = Mounting bracket for installation in P2 panels

TPS3 11

TPS3 11 is a UL 1449 3rd Edition Listed multi-mode Type 1 surge protective device with a per phase surge current capacity that can be increased to 200 kA. In addition, this unit provides UL 1283 listed EMI/RFI or Sine Wave tracking filtering that will condition low energy L-N coupled noise. When installed at the electrical service entrance, it can be used for UL 96A compliance (@ 20 kA I_n).

Standard monitoring includes protection status indication LEDs. Complete protection is intact when the status indicators are illuminated. When protection is lost, the status indicator will extinguish and the red service light will illuminate. An audible alarm and dry contacts are available monitoring options.

A new diagnostic feature integrated within the TPS3 11 is Ground Integrity Monitoring or (GIM) diagnostic indication circuit. Ground Integrity Monitoring or (GIM) diagnostics monitors the health of the electrical system's neutral to ground bond. If voltage is seen across neutral and ground, the phase indicators will remain illuminated, while the red service light begins to flash alerting the end user that the electrical system grounding needs to be checked and serviced. This feature can be remotely monitored when the optional dry contacts are included. Siemens TPS3s are one of the first in the industry to offer this power quality safety and performance indication.

TPS3 11 Key Features

- UL 1449 3rd Edition and UL 1283 Listed
- Type 1 Rated SPD
- 100, 150, 200 kA Per Phase Surge Current
- 20 kA I_n (Most models)
- 200 kA SCCR (Most models)
- UL 96A Lightning Protection Master Labeling compliant (@ 20 kA)
- Every MOV is monitored, including N-G
- Mounting – chase nipple or wall mounted
- Standard NEMA 4X polycarbonate enclosure (UL 746C (f1), UL 94-5VA)
- Modes of Protection: L-N, L-G, N-G, and L-L
- Standard Monitoring: LED Indicators and Ground Integrity Monitoring diagnostics
- Wire size: #8 AWG to #10 AWG
- Dimensions: 6" x 6" x 4" (152 mm x 152 mm x 102 mm)
- Weight: 5 lb. (2.27 kg)
- 10 Year Product Warranty

Available Options:

- Dry contacts & Audible Alarm (option "D")



TPS3 11

Ordering Information

Catalog # TPS3 □ 11 □□ □

Voltage Code	Surge Current (kA)	Options
A = 120/240 V, 1Ø, 3W	10 = 100 kA per phase	D = Dry Contacts & audible alarm
B = 120/240 V, 3Ø, 4W	15 = 150 kA per phase	
C = 120/208 V, 3Ø, 4W	20 = 500 kA per phase	
D = 240 V, 3Ø, 3W		
E = 277/480 V, 3Ø, 4W		
F = 480 V, 3Ø, 3W		
G = 600 V, 3Ø, 3W①		
K = 380/220 V, 3Ø, 4W		
L = 600/347 V, 3Ø, 4W		
S = 400/230 V, 3Ø, 4W		

Example: TPS3C1110D = Type 1 SPD for a 208/120 V application with a surge current capacity of 100 kA per phase, in a standard NEMA 4X enclosure with dry contacts and audible alarm option.

When an option is not selected, include a zero (0) in the field.

Available Accessories: Ordered Separately
- RMSIE = Remote monitor
- KITFMXF = Flush mount plate

① Available in 100 kA per phase only

TPS3 12 and TPS3 L12 (True or Discrete 10-Mode)

TPS3 12 and TPS3 L12 are UL 1449 3rd Edition Listed replaceable module, multimode Type 1 surge protective device with a per phase surge current capacity that can be increased to 500 kA (TPS3 L12 up to 450 kA). For mission critical or high profile applications, the TPS3 L12 is our "True" or "Discrete" 10-mode style SPD providing the "Just in Case" assurance of directly connected L-L MOVs.

Both TPS3 12 and TPS3 L12 are UL 1283 Listed incorporating EMI/RFI or Sine Wave tracking filtering designed to condition low energy L-N coupled noise. When installed at the electrical service entrance, it can be used for UL 96A compliance (@ 20 kA In).

Standard monitoring includes protection status indication LEDs, audible alarm, and dry contacts. Complete protection is intact when the status indicators are illuminated. When protection is lost, the status indicator will extinguish, the red service light will illuminate, and the dry contacts will change state. An optional surge counter is available.

A new diagnostic feature integrated within the TPS3 12 and TPS3 L12 is Ground Integrity Monitoring or (GIM) diagnostic indication circuit. Ground Integrity Monitoring or (GIM) diagnostics monitors the health of the electrical system's neutral to ground bond. If voltage is seen across neutral and ground, the phase indicators will remain illuminated, while the red service light begins to flash alerting the end user that the electrical system grounding needs to be checked and serviced. This feature can be remotely monitored via the dry contact outputs. Siemens TPS3s are one of the first in the industry to offer this power quality safety and performance indication.

TPS3 12 and TPS3 L12 Key Features

- UL 1449 3rd Edition and UL 1283 Listed
- Type 1 Rated SPD
- TPS3 12: 100 – 500 kA Per Phase Surge Current
- TPS3 L12: 150, 300, 450 kA Phase Surge Current
- 20 kA I_n (Most models)
- 200 kA SCCR (Most models)
- UL 96A Lightning Protection Master Labeling compliant (@ 20 kA)
- Every MOV is monitored, including N-G
- Mounting – chase nipple or wall mounted
- Standard NEMA 1/12/3R/04 ANSI 61 steel enclosure
- TPS3 12 Modes of Protection – L-N, L-G, N-G, and L-L
- TPS3 L12 Modes of Protection – L-N, L-G, N-G, and L-L (directly connected L-L elements)
- Standard Monitoring:
  - LED Indicators
  - Ground Integrity Monitoring diagnostics
  - Dry Contacts
  - Audible alarm with silence switch and test button
- Wire size: #8 AWG to 1/0
- Dimensions: 12" x 12" x 7" (305 mm x 305 mm x 178 mm)*
- Weight: 20 lb. (9.07 kg) *
- 10 Year Product Warranty

*Other NEMA ratings may increase enclosure size and weight

Available Options:

- Internal rotary disconnect
- Thru-door disconnect
- Surge counter



TPS3 12

Ordering Information

Catalog # TPS3 □ 12 □□ □ □□

Voltage Code
A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
D = 240 V, 3Ø, 3W①
E = 277/480 V, 3Ø, 4W
F = 480 V, 3Ø, 3W①
G = 600 V, 3Ø, 3W②
K = 380/220 V, 3Ø, 4W
L = 600/347 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Surge Current (kA)
10 = 100 kA per phase
15 = 150 kA per phase
20 = 200 kA per phase
25 = 250 kA per phase
30 = 300 kA per phase
40 = 400 kA per phase
50 = 500 kA per phase

Enclosure
0 = Standard NEMA 1/12/3R/4 Steel
V = NEMA 4X non-metallic
S = NEMA 4X stainless steel
F = NEMA 1 flush mount
P = NEMA 1 screwcover pullbox with extended display on 6ft cable for line side mounting in SWBD/SWGR

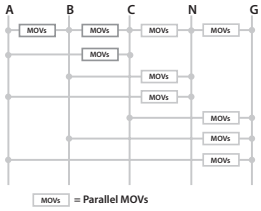
Options
D = Internal rotary disconnect
T = Thru-door disconnect
X = Surge Counter

Example: TPS3C12100XD = Type 1 SPD for a 208/120 V application with a surge current capacity of 100 kA per phase, in a standard NEMA 1/12/3R/4 enclosure with a surge counter and internal rotary disconnect option.

When an option is not selected, include a zero (0) in the field.

Available Accessories: Ordered Separately
- RMSIE = Remote monitor

① Not available in 500 kA
② Available in 100 kA, 150 kA, 200 kA & 250 kA only



"True" or "Discrete" 10-Mode SPD



TPS3 L12

Ordering Information

Catalog # TPS3 □ L12 □□ □ □□

Voltage Code
A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
E = 277/480 V, 3Ø, 4W
K = 380/220 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Surge Current (kA)
15 = 150 kA per phase
30 = 300 kA per phase
45 = 450 kA per phase

Enclosure
0 = Standard NEMA 1/12/3R/4 Steel
V = NEMA 4X non-metallic
S = NEMA 4X stainless steel
F = NEMA 1 flush mount
P = NEMA 1 screwcover pullbox with extended display on 6ft cable for line side mounting in SWBD/SWGR

Options
D = Internal rotary disconnect
T = Thru-door disconnect
X = Surge Counter

Example: TPS3C12100XD = Type 1 SPD for a 208/120 V application with a surge current capacity of 100 kA per phase, in a standard NEMA 1/12/3R/4 enclosure with a surge counter and internal rotary disconnect option.

When an option is not selected, include a zero (0) in the field.

Available Accessory: Ordered Separately
- RMSIE = Remote monitor

TPS3 15 and TPS3 L15 (True or Discrete 10-Mode)

TPS3 15 and TPS3 L15 are UL 1449 3rd Edition Listed replaceable dual module, multimode Type 1 surge protective device with a per phase surge current capacity that can be increased to 1000 kA (TPS3 L15 up to 900 kA). For mission critical or high profile applications, the TPS3 L15 is our "True" or "Discrete" 10-mode style SPD providing the "Just in Case" assurance of directly connected L-L MOVs.

Both TPS3 15 and TPS3 L15 are UL 1283 Listed incorporating EMI/RFI or Sine Wave tracking filtering designed to condition low energy L-N coupled noise. When installed at the electrical service entrance, it can be used for UL 96A compliance (@ 20 kA I_n).

Standard monitoring includes protection status indication LEDs, audible alarm, and dry contacts. Complete protection is intact when the status indicators are illuminated. When protection is lost, the status indicator will extinguish, the red service light will illuminate, and the dry contacts will change state. An optional surge counter is available.

A new diagnostic feature integrated within the TPS3 15 and TPS3 L15 is Ground Integrity Monitoring or (GIM) diagnostic indication circuit. Ground Integrity Monitoring or (GIM) diagnostics monitors the health of the electrical system's neutral to ground bond. If voltage is seen across neutral and ground, the phase indicators will remain illuminated, while the red service light begins to flash alerting the end user that the electrical system grounding needs to be checked and serviced. This feature can be remotely monitored via the dry contact outputs. Siemens TPS3s are one of the first in the industry to offer this power quality safety and performance indication.

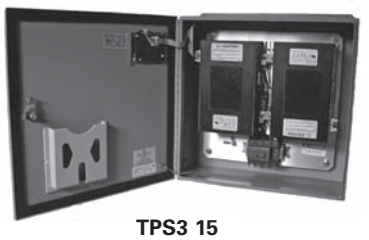
TPS3 15 and TPS3 L15 Key Features

- UL 1449 3rd Edition and UL 1283 Listed
- Type 1 Rated SPD
- TPS3 15: 400 – 1000 kA Per Phase Surge Current
- TPS3 L15: 600 and 900 kA Phase Surge Current
- 20 kA I_n (Most models)
- 200 kA SCCR (Most models)
- UL 96A Lightning Protection Master Labeling compliant (@ 20 kA)
- Every MOV is monitored, including N-G
- Mounting – chase nipple or wall mounted
- Standard NEMA 1/12/3R/04 ANSI 61 steel enclosure
- TPS3 15 Modes of Protection – L-N, L-G, N-G, and L-L
- TPS3 L15 Modes of Protection – L-N, L-G, N-G, and L-L (directly connected L-L elements)
- Internal rotary disconnect switch included
- Standard Monitoring:
  - LED Indicators
  - Ground Integrity Monitoring diagnostics
  - Dry Contacts
  - Audible alarm with silence switch and test button
- Wire size: #8 AWG to 1/0
- Dimensions: 20" x 20" x 7" (508 mm x 508 mm x 178 mm)
- Weight: 64 lb. (29 kg) *
- 10 Year Product Warranty

*Other NEMA ratings may increase enclosure size and weight.

Available Options:

- Thru-door disconnect
- Surge counter



TPS3 15

Ordering Information

Catalog # TPS3 □ 15 □□ □ □□

Voltage Code

A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
D = 240 V, 3Ø, 3W②
E = 277/480 V, 3Ø, 4W
F = 480 V, 3Ø, 3W②
G = 600 V, 3Ø, 3W③
K = 380/220 V, 3Ø, 4W
L = 600/347 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Surge Current (kA)

40 = 400 kA per phase①
50 = 500 kA per phase①
60 = 600 kA per phase
80 = 800 kA per phase
1K = 1000 kA per phase

Enclosure

0 = Standard NEMA 1/12/3R/4 Steel
V = NEMA 4X non-metallic
S = NEMA 4X stainless steel
F = NEMA 1 flush mount
P = NEMA 1 screwcover pullbox with extended display on 5ft cable for line side mounting in SWBD/SWGR

Options

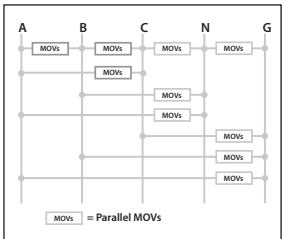
T = Thru-door disconnect
X = Surge Counter

Example: TPS3C1560SX0 = Type 1 SPD for a 208/120V application with a surge current capacity of 600 kA per phase, in a NEMA 4X stainless steel enclosure with a surge counter option and standard disconnect switch.

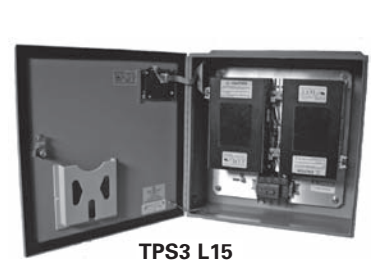
When an option is not selected, include a zero (0) in the field.

Available Accessories: Ordered Separately
- RMSIE = Remote monitor

① Available in G voltage code only
② Available in 600 kA & 800 kA only
③ Available in 400 kA & 500 kA only



"True" or "Discrete" 10-Mode SPD



TPS3 L15

Ordering Information

Catalog # TPS3 □ L15 □□ □ □□

Voltage Code

A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
E = 277/480 V, 3Ø, 4W
K = 380/220 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Surge Current (kA)

60 = 600 kA per phase
90 = 900 kA per phase

Enclosure

0 = Standard NEMA 1/12/3R/4 Steel
V = NEMA 4X non-metallic
S = NEMA 4X stainless steel
F = NEMA 1 flush mount
P = NEMA 1 screwcover pullbox with extended display on 5ft cable for line side mounting in SWBD/SWGR

Options

T = Thru-door disconnect
X = Surge Counter

Example: TPS3CL15600X0 = 10 Mode, Type 1 SPD for a 208/120V application with a surge current capacity of 600 kA per phase, in a standard NEMA 1/12/3R/4 enclosure with a surge counter option.

When an option is not selected, include a zero (0) in the field.

Available Accessory: Ordered Separately
- RMSIE = Remote monitor

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Panelboards

Introduction

General

This generation of panelboards from Siemens offers the high level of engineering and innovation you've come to expect from the leader in power distribution technology. The "P Series" line of panelboards offers a stepped approach to power distribution.

Additional strength has been added to an already rugged and durable panelboard family. Engineered specifically to provide maximum flexibility, the new designs simplify wiring and reduce material requirements making them easier to install and less costly than competitive products. At the heart of the product line is the extensive research and technology found among Siemens circuit protection devices – both fusible switches and molded case circuit breakers.

The line is anchored by the innovative P1. Featuring the industry's most flexible designs, the P1 virtually eliminates common errors, such as feed direction, and main lug versus main breaker. Increasing distribution is simplified by the ability to add feed-thru lugs. Because of its unique design, the P1 meets the majority of lighting panel needs with only six standard sizes.

Subsequent steps in the P Series offer increased capacity and more design options:

- The highly flexible P2 provides options to fit the most demanding specifications.
- Sized more like a lighting panel, the P3 packs the power of a distribution panel in a space-saving, highly flexible design.
- The P4 is a mid-sized distribution panel that allows both fusible and circuit breaker branch and main devices.
- The powerful P5 anchors the high end of the series. With larger fusible and circuit breaker branch and main devices, the venerable P5 delivers maximum power and flexibility to larger distribution systems.

Siemens also offers a number of specialty panels, like column panels. Don't see a panel to meet your requirements? Ask your Siemens representative about our custom capabilities.

Features Overview

P Series lighting panel features include Fas-Latch trim, which is popular among installers; the jacking screw system, that permits adjustments even after wiring has been installed; our exclusive split neutral, and more. Many panelboards have the capability of mixing and matching breakers of different sizes and ratings – or changing from main lug to main breaker, or adding subfeed breakers without changing the box size. Other models accept a wide range of fuse types, including Siemens exclusive Vacu-Break® technology.

Key Panelboard Features

	P1	P2	P3	P4	P5
Lighting And Appliance Applications (Pre 2008 NEC)	•	•	•	•	•
Power Panelboard Applications	—	•	•	•	•
Convertible From Top Feed To Bottom Feed Or Vice Versa	•	—	—	—	—
Change From Main Lug To Main Breaker Or	•	—	—	—	—
Add Subfeed Without Changing Enclosure Size					
Space-Saving, Horizontally Mounted Main Breaker	Up To 250 Amps	Up To 250 Amps	Up To 250 Amps	•	•
Short-Circuit Rating Label Giving Performance Level	•	•	•	•	•
Standard Aluminum Ground Assembly	•	•	•	•	•
Blank End-Walls Standard①	•	•	•	•	•
Bolted Current-Carrying Parts	•	•	•	•	•
Split Neutral	•	•	•	•	•
Connection Accessible From Front	•	•	•	•	•
Screw-Type Mechanical Lugs	•	•	•	•	•
Time-Reducing Wing Nuts To Secure Interior Without Tools	•	•	•	•	•
Main and Branch Devices Connected With	•	•	•	•	•
Case-Hardened Hardware					
Flush Lock, Concealed Door Hinges/Trim Screws	•	•	•	—	—
Symmetrical Interior Mounting Studs	•	•	•	•	•
To Eliminate Upside-Down Mounting of Box					
Interior Height Adjustment For Flush Applications	•	•	•	•	•
Mix and Match Fusible Switch Circuit Breaker Capability	—	—	—	•	•
Shallow Depth	5.75"	5.75"	7.75"	10.00"	12.75"
Accepts A Wide Range Of Fuse Types	—	—	—	•	•
Accepts Vacu-Break Fusible Switch	—	—	—	•	•
Accepts A Wide Range Of Circuit Breakers	—	•	•	•	•
Accepts ACCESSTM Communications Tie-In②	—	•	•	•	•
Optional Compression Lugs	•	•	•	•	•

• Standard

① KO's available on P1 and P2 – 5.75" Deep x 20" Wide boxes and P3 7.75" deep X 24" wide boxes.

② Panelboards equipped with Siemens Sensitrip® circuit breakers or Power Meters can be integrated into Siemens ACCESS™ electrical monitoring system.

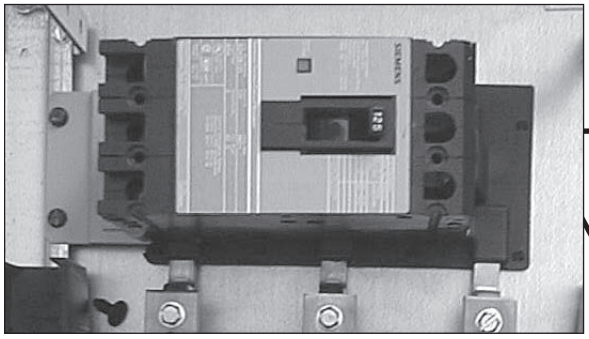
Panelboards

Features / Benefits

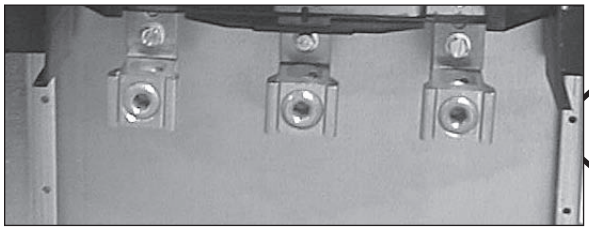
Reference

The standard Siemens P1 panelboard has some unique features that make it easier to design for an engineer, easier to reconfigure in the field for a contractor, and easier to upgrade and maintain for the Owner. The P1 is the smallest panel in the Siemens lineup, with bus sizes up to 400A. What makes it different is it's split neutral design and it's open ended bus. In the Siemens panel, instead of the common single neutral bus on one end, we have a neutral bus on both sides that is cross-bussed. This makes branch wiring simpler and cleaner – the lead lengths for line and neutral can now be made the same, creating more room and a neater installation. It also allows access to both ends of the bus as a standard feature – this provides the flexibility to make changes in the field, even if it wasn't part of the original configuration.

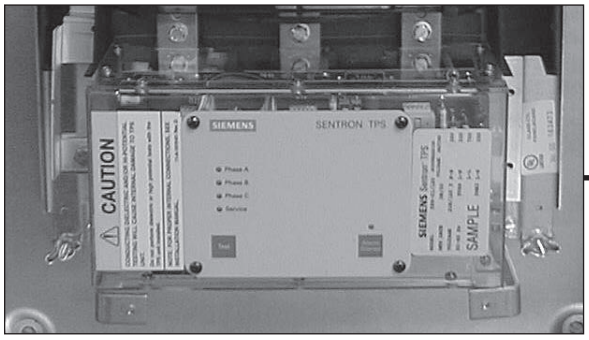
MAIN BREAKER or SUB-FEED BREAKER

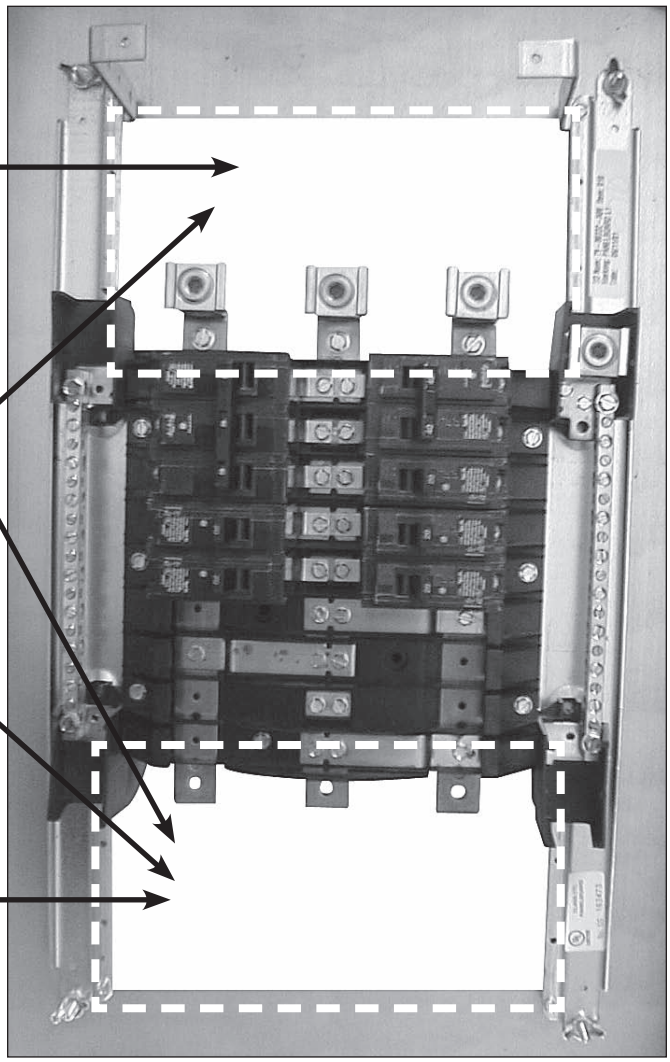


MAIN LUGS or FEED-THROUGH LUGS



INTEGRAL BUS MOUNTED SPD



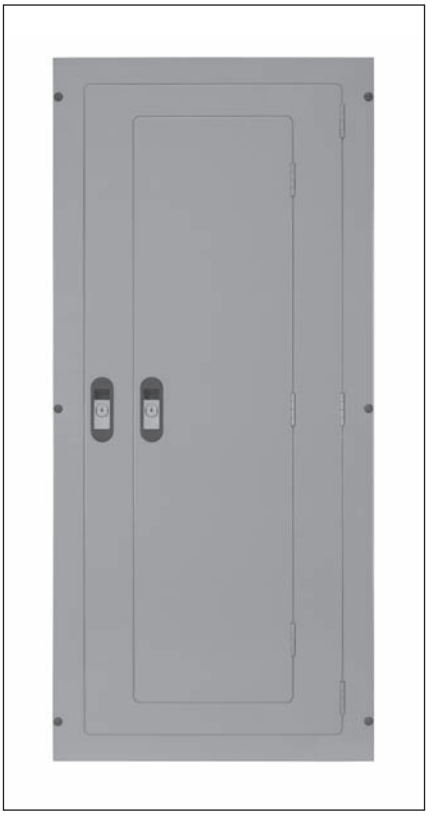


The following can be done to a standard P1 panelboard **in the field** with no modifications:

- Change from top fed to bottom fed
- Add feed-through lugs
- Add an Integral bus-mounted SPD
- Add a sub feed breaker up to 250 amps
- Change from Main Lugs to Main Breaker
- Change from Main Breaker to Main Lugs
- Panel may have up to two ground assemblies. Options are standard aluminum, copper, insulated or isolated aluminum or copper. Mounting provisions in opposing corners of the box are standard. Any of these options may be added after installation.



Standard Trim (FAS-Latch)



Door in Door Front

Also available:

- Piano Hinge Trim
- Screw to Box Trim



Hinged Front

Panelboards

Special Enclosures

Options



NEMA 3R Enclosures



NEMA 4X Enclosures

Panel Family Portrait



"P" Series Panelboard Family for Lighting and Appliance and Distribution Panel Applications

Class CTL Panelboards (when applicable)

Class CTL panelboards incorporate physical features which, in conjunction with the physical size, configuration, or other means provided in Class CTL circuit breakers, are designed to prevent the installation of more over current protective poles than the number for which the device is designed and rated, per UL 67 and National Electrical Code (NEC) NFPA70.

Service Entrance Equipment

When a panelboard is used as service entrance equipment, it must be located near the point of entrance of building supply conductors. In a main lugs only panel, the number of breakers or switches directly connected to the main bus must be limited to six. In a panel having a main breaker or main switch, the number of circuits are not limited except as may be provided under other panelboard requirements, i.e., lighting and appliance branch circuit panelboards. Also, panels must include a connector for bonding and grounding neutral conductor.

Panelboard Code Data (where applicable)

2008 NEC no longer distinguishes between lighting and appliance panelboards and power panelboards; therefore, eliminating the 42 circuit branch circuit limitation. Adoption of this code vary by a state or local jurisdiction. Consult the local code authorities to determine if this has been adopted in that area.

Integrated Equipment Short Circuit Rating

The term "Integrated Equipment Short Circuit Rating" refers to the application of series connected circuit breakers in a combination that allows some breakers to have lower individual interrupting ratings than the available fault current. This is permitted as long as the series combination has been tested and certified by UL.

Standards
NEC: 2008 (where accepted)
NEMA: PB1
UL: 67 and 50. Listed by Underwriter's Laboratories, Inc., under "Panelboards" File #E2269, and #E4016. Meets Federal Specification W-P-115c.

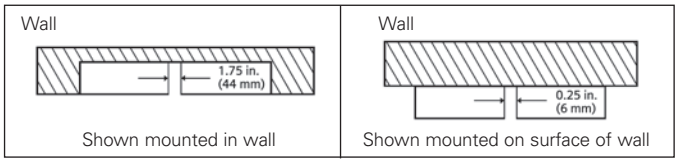
Wire Connectors

Standard wire connectors in Siemens panels are suitable for copper or aluminum cables rated 60/75 degree. Copper main lugs are a price-added option for most panel types and some Circuit Breakers (check with Siemens sales for availability). It should be noted that most copper lugs will only accept copper cables. Some applications, 100% rated devices in particular, require that the cable and connectors be rated 90 degree but are sized to the 75 degree tables.

Standard ground connectors are also suitable for copper or aluminum wire. Ground connector assemblies (EGK, IGK) have (7) 1/0 max. and (15) #6 max. connections. The 1/0 holes are capable of connecting up (3) #10 max. wires. Copper ground assemblies (ECGK, ICGK) are rated for copper wire only and have the same wiring capacity as the Al/Cu connectors.

Standard neutrals, like standard main lugs, are also rated for copper or aluminum wire. The neutral cross bar material follows the selection bus. Copper neutral lugs are rated for copper cable only and available as a price added option.

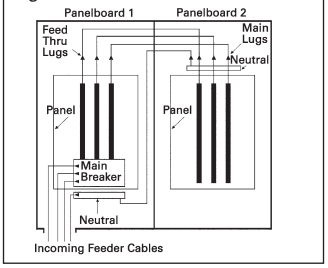
Lug Data
Space Required for Mounting of Double Panels



Use two or more panelboards with feed-thru or subfeed lugs when:
1. Lighting and appliance panelboards are required with more than 42 circuits in areas where the zone code has not been accepted.
2. More circuit mounting space is required than is provided in the largest box size

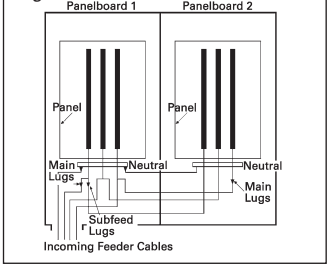
Feed-Thru Lugs

Fig. G-1



Subfeed Lugs or Double Lug

Fig. G-2



Feed-thru lugs are mounted at the opposite end of the main bus from the main lugs or main breaker and are used to connect two or more panelboards to the incoming feeder. The feeder cables are brought into Panelboard 1 and connected to the main lugs or main breaker. Cables interconnecting the two panelboards are connected to the feed-thru lugs in Panelboard1 and are carried over the main lugs in Panelboard 2. This arrangement could be reversed with the main lugs located at the top and the feed-thru lugs at the bottom of the panel. Subfeed lugs are mounted directly beside the main incoming lugs and are used to connect two or more panelboards to the incoming feeder. The feeder cables are brought into Panelboard 1 and connected to the main lugs. Another set of cables that are the same size are connected to the subfeed lugs of Panelboard 1 and are carried over the main lugs of Panelboard 2.

Panelboards

General Specifications

General

Bussing Sequence

Interiors are designed to accommodate top or bottom feed. Regardless of which is specified, the uppermost pole is always on "A" phase; the second pole down is always on "B" phase, and the third pole down is always on "C" phase (assuming 3Ø panel).

As standard, branch breakers shall be mounted at the top of the panel with "spaces" at the bottom, regardless of the direction panel is fed.

All breakers have bolted connections except plug-in type. The panel design provides bracing up to 200,000A IR UL short circuit rating. Case-hardened, high performance, thread rolling screws are used on branch bus.



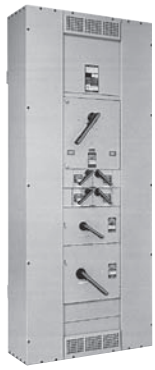
Circuit Breaker Lighting Panel Type P1



Circuit Breaker Lighting or Distribution Panel Types P2/P3



Circuit Breaker Distribution Panel Type P4/P5



Fusible Switch Distribution Panel Type P4/P5

Panelboard Ratings

Description	P1	P2	P3	P4	P5
Max. Voltage	480Y/277V AC Max. 250V DC Max	600V AC Max. 500V DC Max.	600V AC Max. 500V DC Max.	600V AC Max. 500V DC Max.	600V AC Max. 500V DC Max.
System	1-Phase, 2-wire 1-Phase, 3-wire 3-Phase, 3-wire 3-Phase, 4-wire	1-Phase, 2-wire 1-Phase, 3-wire 3-Phase, 3-wire 3-Phase, 4-wire	1-Phase, 2-wire 1-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire	1-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire	1-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire
Mains					
Main Lugs Main Breaker Main Switch	125A-400A 100A-400A —	125A-600A 100A-600A —	250A-800A 225A-600A —	400A-1200A 400A-800A —	800A-1200A 800A-1200A 200A-1200A
Circuits	18, 30, 42	18, 30, 42, 54, 66 78, 90 ①	—	—	—
Branch Ratings	15-125A ②	15-400A	15-400A	15-800A MCCB 30-200A Fusible	15-1200A MCCB 30-1200 Fusible
Branch Disconnect Devices	BL, BLH, HBL, BQD, BQD6, BLE, BLEH, BLF, BLHF, BAF, BAFH, BGL, NGB ⑦	BL, BLH, HBL, BQD, BQD6, QJ2, HQJ2, QJ2H, HQJ2H⑤, ED2, ED4, HED4, ED6, HHED6, BLE, BLEH, BLF, BLHF, BAF, BAFH, BGL, NGB	BL, BLH, HBL, BQD, BQD6, QJ2, HQJ2, QJ2H, HQJ2H⑥, ED2, ED4, HED4, ED6, BLHF, BAF, BAFH, BGL, NGB, NEB, HEB	All 15-1200A MCCBs, VL MG at 800A and 30-200A VB switches	All 15-1200A MCCBs, 30-600A VB switches and 400-1200A HCP switches
Subfeed Circuit Breakers ②③	ED2, ED4, ED6, HED4, HED6, QJ2, QJH2, QJ2-H, FD6, HFD6, FXD6, HFXD6	JD6, HJD6, JXD6, HJXD6, FD6, HFD6, FXD6, HFXD6	JD6, HJD6, JXD6, FD6, HFD6, FXD6, HFXD6	—	—
Enclosure Heights Inches – (mm)	32, 38, 44 @250 A (813, 965, 1118) 56, 62, 68 @400 A (1422, 1575, 1727)	26, 32, 38, 44, 50, 56, 62, 68, 74 (660-1880)	56, 62, 68, 74, 80 (1422-2032)	60, 75, 90 (1524, 1905, 2286)	60, 75, 90 (1524, 1905, 2286)
Standard Trims	Fas-Latch – 1 Piece Surface or Flush	Fas-Latch – 1 Piece Surface or Flush	Fas-Latch – 1 Piece Surface or Flush	Four Piece④ Surface or Flush	Four Piece④ Surface or Flush

① Functional pricing is based on circuits shown. However, the panel can be figured with less circuits.
② P1 can have 1 subfeed breaker. P2 and P3 can have up to (2) FD subfeed breakers.
③ JD and FD breakers are mounted vertical. Limitations apply.
④ Trim ring provided for flush applications.
⑤ A maximum of (4) QJ breakers may be mounted in a P2 Panel and are single mounted.
⑥ A maximum of (6) QJ breakers may be mounted in a P3 panel and are twin mounted.
⑦ P1 panels with NGB breakers are limited to NGB branch devices only. BL and BQD frames may not be mixed in this panel type.

Panelboards

General Specifications

Typical Panelboard Modifications

Description	Lighting and Distribution Panelboards			Distribution Panelboards	
	P1	P2	P3	P4	P5
Box					
Type 3R/12	•	•	•	•	•
Type 4, 4X	•	•	•	•	•
Drip Proof Hood	•	•	•	•	•
Gasketed Trim	•	•	•	•	•
Wider Box	•	•	•	•	•
Deeper Box	—	•	•	•	•
Front					
Hinged Front	•	•	•	•	•
Door-in-Door Front	•	•	•	•	•
Common Front	•	•	•	—	—
Special Locks	•	•	•	•	•
Nameplate	•	•	•	•	•
Interior					
Aluminum Equipment Ground Bar	Standard	Standard	Standard	Standard	Standard
Copper Equipment Ground Bar	•	•	•	•	•
Insulated Equipment Ground	•	•	•	•	•
Subfeed Lugs	—	•	•	•	•
Feed-Thru Lugs	•	•	•	•	•
Split Bus	—	•	•	•	•
Compression Lugs	•	•	•	•	•
Copper Lugs	•	•	•	•	•
200% Neutral	•	•	•	Check Plant For Availability	Check Plant For Availability
Temperature Rated - Aluminum①	Standard	Standard	Standard	Standard	Standard
Temp. Rise Over Ambient - Copper	•	•	•	•	•
750 Ampere / in. - Aluminum①	—	•	•	•	•
1000 Ampere / in. - Copper	—	•	•	•	•
Copper Plating - Silver or Tin	Tin	Tin Std./ Silver Optional	Tin Std./ Silver Optional	Silver Std./ Tin Optional	Silver Std./ Tin Optional
Remote Control Switches	External Mounted	•	•	•	•
Time Clocks	External Mounted	•	•	•	•
Circuit Breaker Shunt Trips	•	•	•	•	•
R, J and T Fuse Clips	—	—	—	•	•

① All aluminum bus is tin-plated. • Available as an option.

UL Fuse Classes①

Class	Amperes	Volts	Interrupting Ratings (kA)	I^2t, I_i	Circuits
H	1-600	250 and 600V or less AC	10	—	Less than 10,000A Available
K5②	1-600	250 and 600V or less AC	100	I•t – RK5 up to 100A, I_i – RK5 up to 100A	Feeder circuits
J	1-600	600V or less	200	I•t – Low, I_i – Low	Feeder circuits (motor load small %)
RK1	1/10-600	600V or less and 250V or less	200	I•t – Slightly > J, I_i – Slightly > J	Feeder circuits (motor load small %)
RK5	1/10-600	600V or less and 250V or less	200	I•t – > RK-1, I_i – > RK-1	Motor starting currents a factor
T	1-800, 1-1200	300 and 600V or less AC	To 200	I•t – Low, I_i – Low	Non-Motor loads
L	601-1200	600V or less	200	I•t – Low, I_i – Low	Mains, feeder circuits

① Per UL 67.
② Fuses do not prohibit the use of Class H type fuse in switch.

Panelboards

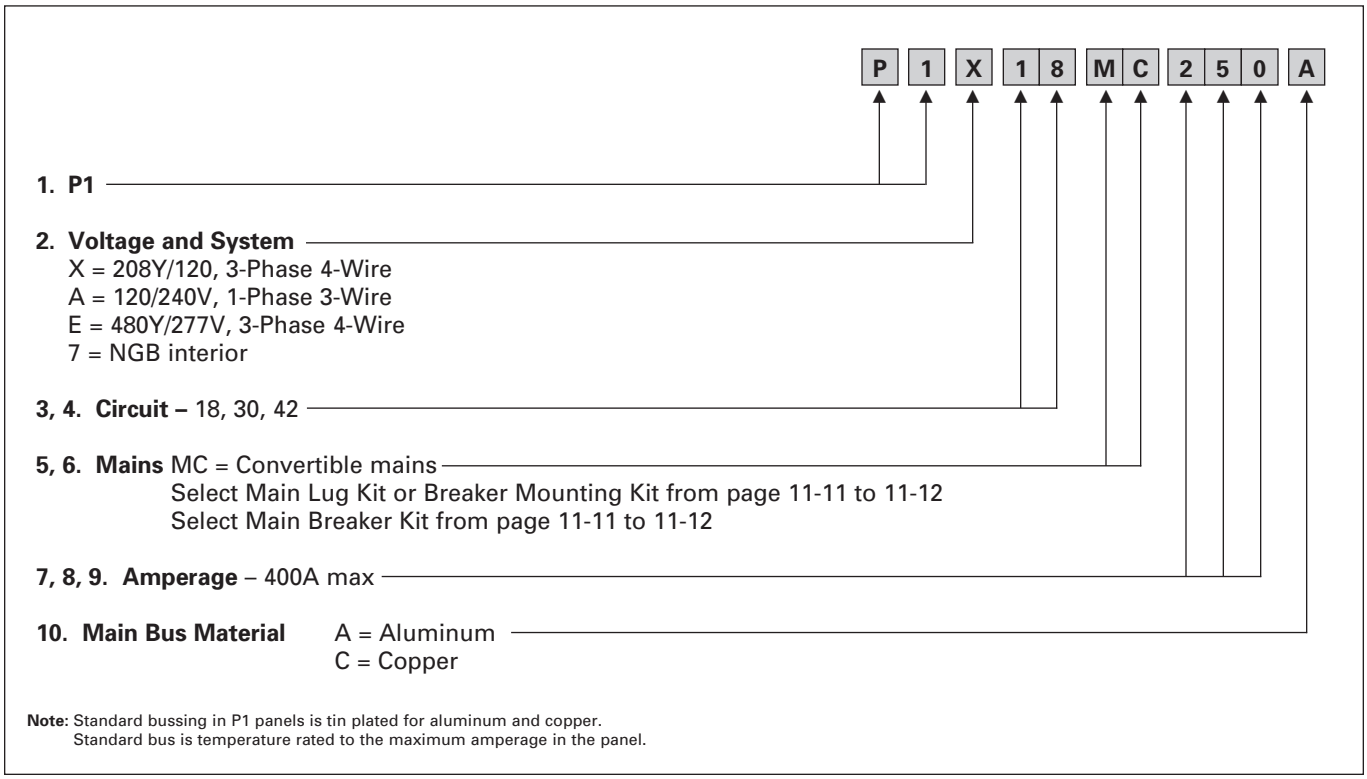
Unassembled

Reference

Catalog Numbering System

Type P1 unassembled panelboards are completely convertible from main lug to main breaker and vice-versa. Additionally feed-thru lugs, or a subfeed circuit breaker up to 400 amperes can be added without increasing the box height. Follow these easy steps to select and price the proper P1 panel from stock:

1. Compute total number of poles to determine interior catalog number.
2. List catalog number and price of interior, box and front.
3. Select main lug kit or main breaker kit from appropriate tables. **Note:** Main/Subfeed Breaker mounting kits may be ordered with or without breakers included, see page 11-11 and 11-12 for selection.
4. List required branch circuit breakers and filler plates to cover any unused positions.
5. Select any modifications or accessories.



Note: Standard bussing in P1 panels is tin plated for aluminum and copper. Standard bus is temperature rated to the maximum amperage in the panel.

Branch Breakers

Panel Type	Voltage (Max.)	Breaker Type	Speedfax Page
P1	240	BI, BLH, HBL, BQD, NGB	See section 7
	480/277	BQD, NGB	
	600/347	BQD	

① Consult sales office for availability of CSA.

Panelboards

Distributor Stock

Selection

Pricing An Unassembled Panel

400A Max. — 20" Wide x 5.75" Deep

1. Choose the appropriate Interior from the table below.
2. Choose and price the Main Device: Main Lugs from pages 11-11, Main Breaker Kit from page 11-13 and Main Breakers from Section 7.
3. Choose and price Branch Breakers. BL, BQD and NGB breakers from Section 7.
4. Choose and price Feed-Thru Lugs or Subfeed Breaker Feed-Thru Lugs from page 11-11, Subfeed Breaker Kit from page 11-11, and Subfeed Breaker from Section 7.



Type P1 Unassembled Panelboards

Interiors Only–Less Branch Breakers			Boxes			Fronts	
Amperes Rating Mains	Max. No of Poles	Interiors	Height (inches)	Type 1	Type 3R/12①	Surface	Flush
Convertible Mains — 1-Phase, 3-Wire							**120/240V**
250	18	P1A18MC250A	32	B32	WP32	S32B	F32B
	30	P1A30MC250A	38	B38	WP38	S38B	F38B
	42	P1A42MC250A	44	B44	WP44	S44B	F44B
400	18	P1A18MC400A	56	B56	WP56	S56B	F56B
	30	P1A30MC400A	62	B62	WP62	S62B	F62B
	42	P1A42MC400A	68	B68	WP68	S68B	F68B
250	18	P1A18MC250C	32	B32	WP32	S32B	F32B
	30	P1A30MC250C	38	B38	WP38	S38B	F38B
	42	P1A42MC250C	44	B44	WP44	S44B	F44B
400	18	P1A18MC400C	56	B56	WP56	S56B	F56B
	30	P1A30MC400C	62	B62	WP62	S62B	F62B
	42	P1A42MC400C	68	B68	WP68	S68B	F68B
Convertible Mains — 3-Phase, 4-Wire							**208Y/120V**
250	18	P1X18MC250A	32	B32	WP32	S32B	F32B
	30	P1X30MC250A	38	B38	WP38	S38B	F38B
	42	P1X42MC250A	44	B44	WP44	S44B	F44B
400	18	P1X18MC400A	56	B56	WP56	S56B	F56B
	30	P1X30MC400A	62	B62	WP62	S62B	F62B
	42	P1X42MC400A	68	B68	WP68	S68B	F68B
250	18	P1X18MC250C	32	B32	WP32	S32B	F32B
	30	P1X30MC250C	38	B38	WP38	S38B	F38B
	42	P1X42MC250C	44	B44	WP44	S44B	F44B
400	18	P1X18MC400C	56	B56	WP56	S56B	F56B
	30	P1X30MC400C	62	B62	WP62	S62B	F62B
	42	P1X42MC400C	68	B68	WP68	S68B	F68B
Convertible Mains — 3-Phase, 4-Wire							**480Y/277V**
250	18	P1E18MC250A	32	B32	WP32	S32B	F32B
	30	P1E30MC250A	38	B38	WP38	S38B	F38B
	42	P1E42MC250A	44	B44	WP44	S44B	F44B
400	18	P1E18MC400A	46	B56	WP56	S56B	F56B
	30	P1E30MC400A	62	B62	WP62	S62B	F62B
	42	P1E42MC400A	68	B68	WP68	S68B	F68B
250	18	P1E18MC250C	32	B32	WP32	S32B	F32B
	30	P1E30MC250C	38	B38	WP38	S38B	F38B
	42	P1E42MC250C	44	B44	WP44	S44B	F44B
400	18	P1E18MC400C	56	B56	WP56	S56B	F56B
	30	P1E30MC400C	62	B62	WP62	S62B	F62B
	42	P1E42MC400C	68	B68	WP68	S68B	F68B
Interiors for NGB Breakers — 3-Phase, 4-Wire							**480Y/277V**
250	18	P1718MC250A	32	B32	WP32	S32B	F32B
	30	P1730MC250A	38	B38	WP38	S38B	F38B
	42	P1742MC250A	44	B44	WP44	S44B	F44B
400	18	P1718MC400A	46	B56	WP56	S56B	F56B
	30	P1730MC400A	62	B62	WP62	S62B	F62B
	42	P1742MC400A	68	B68	WP68	S68B	F68B
250	18	P1718MC250C	32	B32	WP32	S32B	F32B
	30	P1730MC250C	38	B38	WP38	S38B	F38B
	42	P1742MC250C	44	B44	WP44	S44B	F44B
400	18	P1718MC400C	56	B56	WP56	S56B	F56B
	30	P1730MC400C	62	B62	WP62	S62B	F62B
	42	P1742MC400C	68	B68	WP68	S68B	F68B

① Front included in NEMA 3R Box.

Type P1 Panelboards

Lug Kits — Main or Feed Thru

Ampere Rating	Material	Wire Range	Service	Catalog Number
250	Al	(1) #6 AWG–350 kcmil Cu or Al	1-Phase	**MLKA1**
		(1) #6 AWG–350 kcmil Cu or Al	3-Phase	**MLKA3**
	Cu	(1) #6 AWG–350 kcmil Cu or Al	1-Phase	**MLKC1**
		(1) #6 AWG–350 kcmil Cu or Al	3-Phase	**MLKC3**
400	Al	(2) 3/0 250 or (1) 600 kcmil	1-Phase 3-Phase	**4MLKA1** **4MLKA3**
	Cu	(2) 3/0 250 or (1) 600 kcmil	1-Phase 3-Phase	**4MLKC1** **4MLKC3**

Copper Neutral Lug Kits — 250A

Number of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	**CNLK18**
30	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	**CNLK30**
42	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	**CNLK42**

200% Neutral Lug Kits/250A

18	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	**2NLK18**
30	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	**2NLK30**
42	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	**2NLK42**

200% Neutral Lug Kits/400A

18 30 42	2 Branch Neutral Strips, 1 Main 600MCM Neutral Lug, Hardware	**42NLK18** **42NLK30** **42NLK42**

Miscellaneous Parts and Accessories

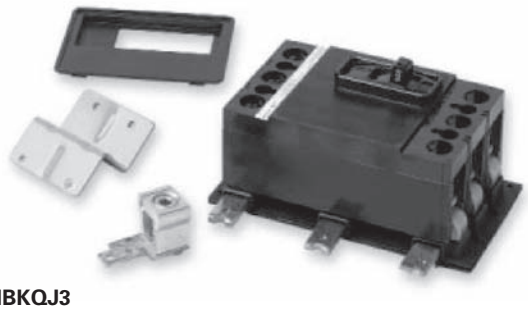
Catalog Number	Description
EGK	Al Ground Bus 44 Connections
BK1	Bonding kit for 250A max. and all P1 panels
BK2	Bonding kit for S1/S2 400 & 600
BK3	Bonding kit
IMK1	Interior Adjusting Kit
11-1824-01	Directory Card Holder
12-1110-01	Directory Card
11-1056-01	NEMA Instruction Book
NBK03	Number Strips 1–42
NBK04	Number Strips 43–84
NBK05	Number Strips 85–126
NBK06	Number Strips 127–168
ECGK	Cu Ground Bus 44 Connections
IGK	Insulated Al Ground Bus
ICGK	Insulated Cu Ground Bus
EWK1	End Wall Kit with Knockouts (20" W x 5.75" DP)
EWK2	End Wall Kit with Knockouts (24" W x 7.75" DP)
QF3	Filler Plate
EBF1	NEB/HEB Filler Plate

Type P1 Panelboards

Breaker Mounting Kits 250A Max. — Main or Subfeed w/o Breaker

Ampere Rating	Breaker Types	Service	Catalog Number
100A	BQD	3-Phase	**MBKBC3**
100A	BL, BLH, HBL	1-Phase 3-Phase	**MBKBL1** **MBKBL3**
125A	NGB	1-Phase 3-Phase	**MBKNB1** **MBKNB3**
125A	ED4, ED6, HED4, HED6	1-Phase 3-Phase	**MBKED1** **MBKED3**
225A	QJ2, QJH2, QJ2-H	1-Phase 3-Phase	**MBKQJ1** **MBKQJ3**
250A	FXD6, FD6, HFD6, HFDX6	1-Phase 3-Phase	**MBKFD1** **MBKFD3**
400A①	JXD2, JD6, JXD6, HJD6, HJXD6	1-Phase 3-Phase	**MBKJD1** **MBKJD3**

① 400 amp kit is for main—only not allowed for subfeed breaker.



MBKQJ3



MBKFD3

S1/S2 Panels—All the P1 panel kits for 250 amp and below panels will work for 250 amp maximum S1/S2 panels.

400/600 Amp S1/S2 and All SE Panels

Lug Kits — Main or Feed Thru

Ampere Rating	Material	Wire Range	Service	Catalog Number
125A/250A	Al/Cu	(2) 1/0–250 kcmil	1-Phase	**MLKA1**
125A/250A	Al/Cu	(2) 1/0–250 kcmil	3-Phase	**MLKA3**
400A/600A	Al/Cu	(2) #4–250 kcmil or (1) 3/0–500 kcmil	1-Phase	**SMLKA1**
400A/600A	Al/Cu	(2) #4–250 kcmil or (1) 3/0–500 kcmil	3-Phase	**SMLKA3**

Breaker Mounting Kits

Ampere Rating	Breaker Types	Service	Catalog Number
125A	ED2, ED4, ED6, HED4, HED6, HHED6	1-Phase	**SMBKED1**
225A	ED2, ED4, ED6, HED4, HED6, HHED6	3-Phase	**SMBKED3**
225A	QJ2, HQJ2, HQJ2H①	1-Phase	**SMBKQJ1**
225A	QJ2, HQJ2, HQJ2H①	3-Phase	**SMBKQJ3**
250A	FXD6, FD6, HFXD6, HFD6	1-Phase	**SMBKFD1**
250A	FXD6, FD6, HFXD6, HFD6	3-Phase	**SMBKFD3**
400A	JD6, JXD6, HJD6, HJXD6	1-Phase	**SMBKJD1**
400A	JD6, JXD6, HJD6, HJXD6	3-Phase	**SMBKJD3**
600A	LD6, LXD6, HLD6, HLXD6	1-Phase	**SMBKLD1**
600A	LD6, LXD6, HLD6, HLXD6	3-Phase	**SMBKLD3**

Neutral Kits

Ampere Rating	Description	Catalog Number
250A max.	30/42 circuit 200% neutral kit	**2NLK2**
400/600A max.	42 circuit 200% neutral kit	**2NLK1**

Other applications:
For P4/S4 and 10" deep SPP panels see page 11-53 for branch breaker mounting kits.
For P5/S5 and 12.75" deep SPP panels see page 11-67 for branch breaker mounting kits.
For P4/F1 and 10" deep FPP panels see page 11-53 for branch fusible switch mounting kits.
For P5/F2 and 12.75" deep FPP panels see page 11-67 for branch fusible switch mounting kits.
For Series 5, Series 6, CDP6 and VB 6 panels as well as FC20, FCI, FCII, SB1, SB2 and SB3 distribution switchboards, see page 12-32 for branch device mounting kits.

① QJ mounting kit is for subfeed breakers only, not main breaker. The kit contains mountings for (2) breakers.

Main Breaker Mounting Kits w/Breakers for P1 panels

Catalog Number	Description	Ratings	
		240V	480V
MBKED3100	Kit w/3-pole ED4 100A breaker	65KA	18KA
MBKED3125	Kit w/3-pole ED4 125A breaker	65KA	18KA
MBKQJ1125	Kit w/2-pole QJ2 125A breaker	10KA	—
MBKQJ1150	Kit w/2-pole QJ2 150A breaker	10KA	—
MBKQJ1175	Kit w/2-pole QJ2 175A breaker	10KA	—
MBKQJ1200	Kit w/2-pole QJ2 200A breaker	10KA	—
MBKQJ1225	Kit w/2-pole QJ2 225A breaker	10KA	—
MBKQJ3125	Kit w/3-pole QJ2 125A breaker	10KA	—
MBKQJ3150	Kit w/3-pole QJ2 150A breaker	10KA	—
MBKQJ3175	Kit w/3-pole QJ2 175A breaker	10KA	—
MBKQJ3200	Kit w/3-pole QJ2 200A breaker	10KA	—
MBKQJ3225	Kit w/3-pole QJ2 225A breaker	10KA	—
MBKQJ1125H	Kit w/2-pole QJ2H 125A breaker	42KA	—
MBKQJ1150H	Kit w/2-pole QJ2H 150A breaker	42KA	—
MBKQJ1175H	Kit w/2-pole QJ2H 175A breaker	42KA	—
MBKQJ1200H	Kit w/2-pole QJ2H 200A breaker	42KA	—
MBKQJ1225H	Kit w/2-pole QJ2H 225A breaker	42KA	—
MBKQJ3125H	Kit w/3-pole QJ2H 125A breaker	42KA	—
MBKQJ3150H	Kit w/3-pole QJ2H 150A breaker	42KA	—
MBKQJ3175H	Kit w/3-pole QJ2H 175A breaker	42KA	—
MBKQJ3200H	Kit w/3-pole QJ2H 200A breaker	42KA	—
MBKQJ3225H	Kit w/3-pole QJ2H 225A breaker	42KA	—
MBKFD3150	Kit w/3-pole FXD6 150A breaker	65KA	35KA
MBKFD3175	Kit w/3-pole FXD6 175A breaker	65KA	35KA
MBKFD3200	Kit w/3-pole FXD6 200A breaker	65KA	35KA
MBKFD3225	Kit w/3-pole FXD6 225A breaker	65KA	35KA
MBKFD3250	Kit w/3-pole FXD6 250A breaker	65KA	35KA
MBKJD1300	Kit w/2-pole JXD6 300A breaker	65KA	—
MBKJD3300	Kit w/3-pole JXD6 300A breaker	65KA	35KA
MBKJD1400①	Kit w/2-pole JXD6 400A breaker	65KA	35KA
MBKJD3400①	Kit w/3-pole JXD6 400A breaker	65KA	35KA

Branch Breakers Selection for P1

Selection Guide

1. Select breaker type.
2. Select required amperage.
3. Select number of poles.
4. Select branch breaker catalog numbers.
5. Select ground bar and filler plates. (See replacement parts & accessories on Page 11-11.)

AFCI – Combination Type Arc Fault Circuit Interrupter

Breaker Type	Ampere Rating	Catalog Number	Interrupting Ratings (kA) RMS Symmetrical Amperes		
			Volts AC		
			120	120/240	240
BAF2 1-pole	15	**BA115AFC**	10	—	—
	20	**BA120AFC**	10	—	—
BAFH2 1-pole	15	**BA115AFCH**	22	—	—
	20	**BA120AFCH**	22	—	—
HBAF2 1-pole	15	**BA115AFCHH**	65	—	—
	20	**BA120AFCHH**	65	—	—

AFCI – Branch Feeder Type Arc Fault Circuit Interrupter

Breaker Type	Ampere Rating	Catalog Number	Interrupting Ratings (kA) RMS Symmetrical Amperes		
			Volts AC		
			120	120/240	240
BAF2 1-pole	15	**BA115AF**	10	—	—
	20	**BA120AF**	10	—	—
BAFH2 1-pole	15	**BA115AFH**	22	—	—
	20	**BA120AFH**	22	—	—
HBAF2 1-pole	15	**BA115AFHH**	65	—	—
	20	**BA120AFHH**	65	—	—

Switching Neutrals

Breaker Type	Ampere Rating	Catalog Number	Interrupting Ratings (kA) RMS Symmetrical Amperes		
			Volts AC		
			120	120/240	240
BG 2-Wire Common Trip	15	**BG215■**	10	—	—
	20	**BG220■**	10	—	—
	30	**BG230■**	10	—	—
BG 3-Wire Common Trip	15	**BG315■**	—	10	—
	20	**BG320■**	—	10	—
	30	**BG330■**	—	10	—

■ Built to order.

① 400 Amp Kit used as Main and for top feed application only. For bottom feed, order breaker, bracket and lugs separately.

Branch Breakers Selection for P1

Selection Guide

1. Select breaker type.
2. Select required amperage.
3. Select number of poles.
4. Select branch breaker catalog numbers.
5. Select ground bar and filler plates. (See replacement parts & accessories on Page 11-11.)

BL Branch Breakers – 10,000A IR②

Amp Rating	1-Pole 120/240V	2-Pole 120/240V	2-Pole 240V	3-Pole 240V
15	B115	B215	B215R	B315
20	B120	B220	B220R	B320
25	B125	B225	B225R	B325
30	B130	B230	B230R	B330
35	B135	B235	B235R	B335
40	B140	B240	B240R	B340
45	B145	B245	B245R	B345
50	B150	B250	B250R	B350
55	B155	—	—	—
60	B160	B260	B260R	B360
70	B170	B270	B270R	B370
80	—	B280	B280R	B380
90	—	B290	B290R	B390
100	—	B2100	B2100R	B3100
110	—	B2110	—	—
125	—	B2125	—	—

HBL Branch Breakers – 65,000A IR②

Amp Rating	1-Pole 120/240V	2-Pole 120/240V	3-Pole 240V
15	B115HH	B215HH	B315HH
20	B120HH	B220HH	B320HH
30	B130HH	B230HH	B330HH
40	B140HH	B240HH	B340HH
50	B150HH	B250HH	B350HH
60	—	B260HH	B360HH
70	—	B270HH	B370HH
80	—	B280HH	B380HH
90	—	B290HH	B390HH
100	—	B2100HH	B3100HH

GFCI Personnel Protection (5MA)

Breaker Type	Ampere Rating	Catalog Number	Interrupting Ratings (kA) RMS Symmetrical Amperes Volts AC 120	120/240	240
BLF 1-Pole	15	**BF115**	10	—	—
	20	**BF120**	10	—	—
	25	**BF125■**	10	—	—
	30	**BF130**	10	—	—
BLF 2-Pole	15	**BF215**	—	10	—
	20	**BF220**	—	10	—
	30	**BF230**	—	10	—
	40	**BF240■**	—	10	—
	50	**BF250■**	—	10	—
	60	**BF260■**	—	10	—
BLHF 1-Pole	15	**BF115H**	22	—	—
	20	**BF120H**	22	—	—
	30	**BF130H■**	22	—	—
BLHF 2-Pole	15	**BF215H■**	—	22	—
	20	**BF220H■**	—	22	—
	30	**BF230H■**	—	22	—
	40	**BF240H■**	—	22	—
	50	**BF250H■**	—	22	—
	60	**BF260H■**	—	22	—

BLH Branch Breakers – 22,000A IR②

Amp Rating	1-Pole 120/240V	2-Pole 120/240V	3-Pole 240V
15	B115H	B215H	B315H
20	B120H	B220H	B320H
25	B125H	B225H	B325H
30	B130H	B230H	B330H
40	B140H	B240H	B340H
50	B150H	B250H	B350H
55	B155H	—	—
60	B160H	B260H	B360H
70	B170H	B270H	B370H
80	—	B280H	B380H
90	—	B290H	B390H
100	—	B2100H	B3100H

BQD Branch Breakers – 14,000A IR Max. @ 480/277 Vac / 65,000A IR max. @ 240 Vac③

Amp Rating	1-Pole 277V	2-Pole 480Y/277V	3-Pole 480Y/277V
15	BQD115	BQD215	BQD315
20	BQD120	BQD220	BQD320
25	BQD125	BQD225	BQD325
30	BQD130	BQD230	BQD330
35	BQD135	BQD235	BQD335
40	BQD140	BQD240	BQD340
45	BQD145	BQD245	BQD345
50	BQD150	BQD250	BQD350
60	BQD160	BQD260	BQD360
70	BQD170	BQD270	BQD370
80	BQD180	BQD280	BQD380
90	BQD190	BQD290	BQD390
100	BQD1100	BQD2100	BQD3100

NGB Branch Breakers – 25,000 A IR Max. @ 480/277V AC / 100,000 A IR @ 240V AC

Amp Rating	1-pole 277V	2-pole 480Y/277V	3-pole 480Y/277V
15	NGB1B015B	NGB2B015B	NGB3B015B
20	NGB1B020B	NGB2B020B	NGB3B020B
25	NGB1B025B	NGB2B025B	NGB3B025B
30	NGB1B030B	NGB2B030B	NGB3B030B
35	NGB1B035B	NGB2B035B	NGB3B035B
40	NGB1B040B	NGB2B040B	NGB3B040B
45	NGB1B045B	NGB2B045B	NGB3B045B
50	NGB1B050B	NGB2B050B	NGB3B050B
60	NGB1B060B	NGB2B060B	NGB3B060B
70	NGB1B070B	NGB2B070B	NGB3B070B
80	NGB1B080B	NGB2B080B	NGB3B080B
90	NGB1B090B	NGB2B090B	NGB3B090B
100	NGB1B100B	NGB2B100B	NGB3B100B
110	NGB1B110B	NGB2B110B	NGB3B110B
125	NGB1B125B	NGB2B125B	NGB3B125B

■ Built to order. Allow 2–3 weeks for delivery.
① HACR rated.
② To add shunt trip to BL breakers, see page 7-29 Accessories.
③ To add shunt trip to BQD breakers, see page 7-36 Accessories.

Catalog Numbering System

P 1 C 4 2 F X 2 5 0 A T S

Type of Panel
P1, P2, P3, P4, P5

Voltage and System*

C = 208Y/120 3Ø 4 W Wye AC - All
E = 480Y/277 3Ø 4 W Wye AC - All
D = 240 3Ø 3 W Delta AC - All
F = 480 3Ø 3 W Delta AC - All
G = 600 3Ø 3 W Delta AC - P2, P3, P4, P5
I = 347 3Ø 3 W Delta AC P2, P3, P4, P5
B = 240/120 3Ø 4 W Delta BØ High Leg AC - All
Q = 240/120 3Ø 4 W Delta CØ High Leg AC - All
A = 120/240 1Ø 3 W Grounded Neutral AC (2) - All
H = 120 1Ø 2 W Grounded Neutral AC (2) - All
J = 240 1Ø 2 W No Neutral AC (3) - All
Y = 125 1Ø 2 W Grounded Neutral AC (2) - P2, P3, P4, P5
Z = 500 2W DC - P2, P3, P4, P5
K = 220/127 3Ø 4 W Wye AC - All
M = 380/220 3Ø 4 W Wye AC - All
R = 415/240 3Ø 4 W Wye AC - All
S = 440/250 3Ø 4 W Wye AC - All
L = 600/347 3Ø 4 W Wye AC - All
T = 230 3Ø 3 W Delta AC - All
W = 380 3Ø 3 W Delta AC - P2, P3, P4, P5
1 = 24V DC 1-Pole Branches Only (3) - All
2 = 24V DC 2-Pole Branches Only (3) - All
3 = 48V DC 1-Pole Branches Only (3) - All
4 = 48V DC 2-Pole Branches Only (3) - Al
5 = 125V DC 1-Pole Branches Only (3) - All
N = 125V DC 2-Pole Branches Only - All
O = 125/250V DC 2-Pole Branches Only - All
P = 125/250V DC 2 & 3-Pole Branches - All
U = 120V AC 3Ø3W - All
V = 240V 3Ø3W Grounded B Phase - All

*For any voltage system not listed, check with sales for availability.

Circuits **or** **Enclosure Height**
P1 – 18, 30, 42 — P3 – 56, 62, 68, 74, 80
P2 – 18, 30, 42, 54, 66, 78, 90.① — P4, P5 – 60, 75, 90

Main Lug (ML), Main Breaker
(See Main Breaker Table coding below), Main Switch (MS)

Amperage
100–400A = P1 250–800A = P3
100–600A = P2 400–1200A = P4, P5

Bus Material	Bus Plating	Letter
Temp rated Al.	Tin-Plated	A
750A/sq. in. Al.	Tin-Plated	B
Temp rated Cu.	Tin-Plated	C
Temp rated Cu.	Silver-Plated	E
Temp rated Cu.	Tin-Plated	F
1000A/sq. in. Cu.	Tin-Plated	G
1000A/sq. in. Cu.	Silver-Plated	H

Bus Code	P1①	P2	P3	P4	P5
A	•	•	•	•	•
B	n/a	•	•	•	•
C	•	•	•	n/a	n/a
F	n/a	•	•	•	•
E	n/a	optional	optional	•	•
G	n/a	•	•	optional	optional
H	n/a	optional	optional	•	•

• Indicates default for this bus type.

Feed Location
T = Top
B = Bottom

Mounting
S = Surface
F = Flush. Flush trims extend 1 1/2" beyond the base box dimensions on P1, P2 and P3 and 2" on P4 and P5 panels.

Main Breaker Coding

(Breaker Type) Code
(BAF) BA, (BAFH) BF, (BQD) BQ,(BQD6) B6, (BL) BL, (BLEH) BE, (BLH) BH, (BLR) BR, (HBL) HB, (BGL-SWI) B1, (BLE-GFCI) BG, (BLF-GFCI) BC, (CED6) CE,(ED2) ED, (ED4) E4, (ED6) E6, (HED4) H4, (HHED6) HA, (BLHF-GFCI) B4, (BL-HID) B2, (NGB) NB, (HQP) HQ, (QP) QP, (QPH) PQ, (CEG) C4, (QJ2) QJ, (QJ2H) Q2, (QJH2) QH, HQJ2H (Q3), (CFD6) CF, (FD6) FD, (FXD6) FX, (HFD6) HF, (HFXD6) H2, (HHFD6) H1, (HHFXD6) H3, (CJD6) CJ, (HHJD6) H4, (HHJXD6) H9, (HJD6) H6, (HJXD6) H5, (HJXD6H) H7, (JD6) J6, (JXD2) JD, (JXD2H) J2, (JXD6) JX, (JXD6H) JH, (NJX) J1, (HJX) J7, (LJX) J3, (NJY) J4, (SJD6H) SH, (SJD6) SJ, (SHJD6) SX, (SHJD6H) SY, (SCJD6) SC, (HJY) J5, (LJY) J8, (CLD6) CL (HHLD6) HH, (HHLXD6) XH, (HLD6) HL, (HLXD6) HO, (HLXD6H) HP, (LD6) L6, (LXD6) LX, (LXD6H) LH, (NLX) L7, (HLX) L2, (LLX) L3, (SLD6) SL, (SHLD6) S2, (SCLD6) S1, (HLMD6) HJ, (HLMXD6) HK, (LMD6) L1, (LMXD6) LM, (CMD) CM, (CMD6H) CH, (HMD6) HM, (HMXD6) HR, (HMXD6H) HS, (MD6) MD, (MXD6) MX, (MXD6H) MH, (NMX) M1, (HMX) M2, (LMX) M3, SCMD6 (SO), SCMD6H (SQ), SMD6 (SM), SMD6H (AX), SHMD6 (S5), SHMD6H (S6)(CND6) CN, (CND6H) C6, (HND6) HN, (HNXD6) HT, (HNXD6H) HX, (ND6) ND, (NXD6) NX, (NXD6H) NT, (NNX) N1, (HNX) N2, (LNX) N3, (NNY) N4, (HNY) N5, (LNY) N6, (SCND6) SR, (SCND6H) ST, (SND6) SN, (SHND6) AD, (SND6H) AY

① Panel must not be a lighting and appliance panel. See NEC article 408.34 for areas on NEC 2008 or earlier.

② Standard bussing in P1, P2 and P3 panels is tin-plated for aluminum and copper. Standard bus is temperature rated to the maximum amperage in the panel.

Panelboards

Circuit Breaker / Lighting and Distribution

Pricing

Types P1

1) To specify a particular panelboard; list panel catalog number, branches, modifications, and price on an Estimate Sheet. Price includes interior with provisions, box, ground bar, and trim. See Example No. 1.
2) When more than 42 circuits are specified for P1 a two section panel will be required. Feed-thru lugs must be priced in one section from the modifications on pages 11-20.

Example No. 2 is a two section panel, each having 42 circuits. Section One will contain 1-225/3 QJ2 main breaker (top feed), 250A feed-thru lugs and 21" of unit space. Section Two will contain 250A main lugs only (bottom feed) and 21" of unit space. Sections will be 44" in height.

3) Standard main breakers are indicated by the 6th and 7th positions in the catalog number. If any other main breaker type is required, replace with the appropriate code from page 11-18. See Example No. 3.
4) All panel modifications must be listed and priced separately.
5) If the boxes are to be sized the same then each panel must have the same amount of unit space.

Panel LPA		
1 — P1C30QJ225ATS		**2540.**
10–20/1	**25. ea.**	**250.**
4–30/3	**140. ea.**	**560.**
		3350.

Example No. 1

Panel LPB	
1 — P1C42QJ225ATS	**2760.**
1 — P1C42ML250ATS	**1330.**
1 — Feed-Thru Lugs	**190.**
	4280.

Example No. 2

Panel LPC		
1 — P1C42HF250CTS		**3160.**
HFD6 Main		**1900.**
42–20/1 BLH	**35. ea.**	**1470.**
Cu Bus		**255.**
Type 3R		**860.**
		7645.

Example No. 3

Type P2

Type P2 panelboards are priced the same as Type P1 described above except for two section panels.

1) When more than 42 circuits are specified for P2, a two section panel will be assumed. Main breaker codes in the 5th and 6th positions will dictate the use of feed-thru lugs. An "ML" in the fifth and sixth positions will dictate the use of subfeed lugs for 125A and 250A and feed-thru lugs for 400A and 600A.

Boxes will be sized the same for two section panels.

Base price includes all provisions. Subfeed or feed-thru lugs as required must be priced from page 11-29.

Example No. 4 is a two section panel, each having 42 circuits. Section One will contain 1-400/3 JXD6 main breaker (top feed), 225A feed-thru lugs, and 21" of unit space. Section Two will contain 400A main lugs only (bottom feed) and 21" of unit space. Sections will be 53" in height.

Types P3, P4 and P5

1) To specify a particular panelboard, first determine voltage, system, amperage and type of main, amperage and type of branch devices, and modifications if any. (Step 1)
2) List branch devices and modifications requiring space additions. List unit space requirements of each.

   Note: Some units are twin mounted meaning two breakers occupy the same unit space.

   Select appropriate enclosure height from selection chart on pages 11-37, 11-47, or 11-61, based on unit space requirements. (Step 2)
3) Select panelboard catalog number from appropriate table based upon voltage, system, amperage and unit space requirements. (Step 3)

Step #1

Amperage	400
Voltage	208Y/120
System	3-phase 4-wire
Main	Main Breaker
Branches	5-125/3, 2-225/3, 1-250/3
Modification	None
Feed	Top
Mounting	Surface

Step #2 Unit Space Calculation

5-125/3 QJ2	5" = 15"
5-225/3 QJ2	5" = 5"
1-250/3 FXD6	5" = 5"
	25"

Enclosure is B275 from Selection Chart on page 11-44.
(32" wide, 75" high, 10" deep).

Step #3

1—**P4C75JX400ATS**		**$ 4210.**
5-125/3 QJ2	**940.**	**4700.**
2-225/3 QJ2	**940.**	**1880.**
1-250/3 FXD6	**2700.**	**2700.**
		13490.

For inches / millimeters conversion, see Application Data section.

Type P1

480Y/277 Vac Maximum
600Y/ 347 Vac (CSA only) Maximum
400 Ampere Mains
400 Ampere Maximum Branch
UL Short Circuit Rating — 200,000 A. @ 240 Vac / 100,000 A. @ 480/277 Vac. IR Maximum

Branch Breaker Symmetrical Interrupting Capacity

Based on Underwriters' Test Procedure

Feed thru and subfeed lugs may result in lower interrupting ratings if not protected by a main device. Consult sales office.

Meets 2008 NEC wire bending requirement, section 408.55.

Meet Federal Specification W-P-115C.

Panelboards

Listed by Underwriters' Laboratories, Inc., under "Panelboards" File #E2269 for interiors and #E4016 for boxes and fronts.

Service

1-phase 2-wire - 120 Vac, 240 Vac, 24 Vdc, 48 Vdc, 125 Vdc

1-phase 3-wire - 120/240 Vac, 125/250 Vdc

3-phase 3-wire - 480Y/277 (when derived from 3-phase 4-wire system), 240 Vac, 120 Vac, 125/250 Vdc

3-phase 4-wire - 208Y/120 Vac, 240/120 Vac, 480Y/277 Vac, 600Y/347 Vac, 380/220 Vac.

Panelboard Fronts and Doors

Standard panelboards are furnished with trim featuring concealed fasteners and hinges with a flush door lock. All are factory-assembled for ease of installation. Fronts are fabricated from code gauge steel and finished ANSI-61. See page 11-79 for optional fronts.

Main Breakers

BL, BLH, HBL, BQD, ED4, ED6, HED4, HHED6, QJ2, QJH2, QJ2-H, FXD6, FD6, HFD6, HFXD6, JXD6, JD6, HJXD6, HJD6. (All main breakers except 400 amp frame are mounted horizontal.)

Main Breaker Panel Connectors

Ampere Rating	Connectors Suitable for Cu or Al
100	(1)—#14 1/0 AWG
125	(1)—#4 1/0 AWG
225	(1)—#4 AWG–300 kcmil
250	(1)—#4/0 AWG–350 kcmil Al (1)—#6/0 AWG–350 kcmil Cu
400①	(2)—#3/0 AWG–250 kcmil Al or (1)—#3/0 AWG–500 kcmil Al

Connector ranges indicated do not apply to all main breaker types. Refer to molded case circuit breaker standard pressure wire connector chart (Section 7) for the connector range of a specific frame.

Main Lug Connectors

125	(1)—#6 AWG–350 kcmil
250	(1)—#6 AWG–350 kcmil
400	(2)—#3/0 AWG–250 kcmil or (1)—#3/0 AWG–600 kcmil

Boxes

20" wide, 5.75" deep

- End walls are blank as standard. End walls with knockouts will be supplied at no charge on 5.75" deep panels if requested at time of order.

Main Breaker Gutter Dimensions (inches)

Main Breaker	Side Gutter		Neutral Location
	20" w/box	24" w/box	20" w/box
BL, BLH, HBL, BQD	8.500	10.500	11.500
NGB	8.000	10.000	11.500
ED4, ED6, HED4	6.125	8.125	11.500
QJ2, QJH2, QJ2-H	6.500	8.500	11.500
FD6, FXD6, HFD6, HFDX6	5.250	7.250	11.500
JD6②, JXD6②	15.000	15.000	26.750

Main Lug End Gutter Dimensions (inches)

Amp Rating	End Gutter	Neutral Location
125	10.500	11.500
250	10.500	11.500
400③	25.500	26.750

Side Gutter Wiring Space (inches)

Reference Letter	Panel Width 20"	Panel Width 24" (Optional)
A	6.375	7.375
B	5.500	7.500
C	6.125	8.125
D④	6.500	8.500
E	5.250	7.250
F	5.000	7.000

Branch Breaker Side Gutters

← A →	BL, BLH, HBL	BL, BLH, HBL	← A →
	BLF, BLHF	BLF, BLHF	
← B →	BQD	BQD	← B →
← C →	ED, ED4, ED6, HED4, HHED6		
← D →	QJ2, QJH2, QJ2-H		
← E →	FXD6, FD6, HFD6, HFDX6④		
← F →	xGB	xGB	← F →

Weight — Approximate

Total panelboard weight when filled with a normal quantity of breakers and accessories is:

- About 3 lbs. per inch of box height

Gauge Steel Boxes

Width	Height	Gauge Steel
20"	All	#16

Fronts — Surface, Flush

20"	All	#14

Series Connected Short Circuit Ratings

The term "Series Connected Short Circuit Rating" refers to the application of series connected circuit breakers in a combination that allows some breakers to have lower individual interrupting ratings than the available fault current. This is permitted as long as the series combination has been tested and certified by UL.

The table below lists specific main and branch breaker series combinations that are marked on all P1 panels. All combinations shown have been tested for use in P1 panelboards and are UL listed. Other combinations are available. See Circuit Breaker Section, of this book.

These series ratings must be specified on order at time of entry.

① P1 400 amp main breaker panels have wire bending space available for 600 kcmil.
② 400A main breaker is vertical mounted.
③ Feed-thru lug and neutral wire bending space is 15.000" and 16.250" respectively on 400A panel.
④ P1 panel limited to (1) subfeed 250 amperes max.

For inches / millimeters conversion, see Application Data section.

Type P1

Shown with Standard Mains, Top Fed and Surface Trim

Catalog number is for aluminum main bus. For optional copper main bus change "A" in position 11 to "C".

Panels are top feed, surface mounted. For bottom feed, change "T" in position 12 to "B". For flush mounting, change "S" in position 13 to "F".

Replace fifth and sixth position in panelboard catalog number, with alternate main breaker code. Use price adders from main breaker selection table. Horizontally mounted.

Main Lugs Only

Maximum Panel Ampere Rating	Maximum 1-Pole Circuits	Box Height (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	120/240V 1-Phase, 3-Wire Catalog Number	480Y/277V 3-Phase, 4-Wire Catalog Number
125	18	32	**P1C18ML125ATS**	**P1A18ML125ATS**	**P1E18ML125ATS**
	30	38	**P1C30ML125ATS**	**P1A30ML125ATS**	**P1E30ML125ATS**
	42	44	**P1C42ML125ATS**	**P1A42ML125ATS**	**P1E42ML125ATS**
250	18	32	**P1C18ML250ATS**	**P1A18ML250ATS**	**P1E18ML250ATS**
	30	38	**P1C30ML250ATS**	**P1A30ML250ATS**	**P1E30ML250ATS**
	42	44	**P1C42ML250ATS**	**P1A42ML250ATS**	**P1E42ML250ATS**
400	18	56	**P1C18ML400ATS**	**P1A18ML400ATS**	**P1E18ML400ATS**
	30	62	**P1C30ML400ATS**	**P1A30ML400ATS**	**P1E30ML400ATS**
	42	68	**P1C42ML400ATS**	**P1A42ML400ATS**	**P1E42ML400ATS**

Main Circuit Breaker

100	18	32	**P1C18BL100ATS**	**P1A18BL100ATS**	**P1E18BD100ATS**
	30	38	**P1C30BL100ATS**	**P1A30BL100ATS**	**P1E30BD100ATS**
	42	44	**P1C42BL100ATS**	**P1A42BL100ATS**	**P1E42BD100ATS**
125	18	32	**P1C18NB125ATS**	**P1A18NB125ATS**	**P1E18NB125ATS**
	30	38	**P1C30NB125ATS**	**P1A30NB125ATS**	**P1E30NB125ATS**
	42	44	**P1C42NB125ATS**	**P1A42NB125ATS**	**P1E42NB125ATS**
225	18	32	**P1C18QJ225ATS**	**P1A18QJ225ATS**	**P1E18FX225ATS**
	30	38	**P1C30QJ225ATS**	**P1A30QJ225ATS**	**P1E30FX225ATS**
	42	44	**P1C42QJ225ATS**	**P1A42QJ225ATS**	**P1E42FX225ATS**
250	18	32	**P1C18FX250ATS**	**P1A18FX250ATS**	**P1E18FX250ATS**
	30	38	**P1C30FX250ATS**	**P1A30FX250ATS**	**P1E30FX250ATS**
	42	44	**P1C42FX250ATS**	**P1A42FX250ATS**	**P1E42FX250ATS**
400	18	56	**P1C18JX400ATS**	**P1A18JX400ATS**	**P1E18JX400ATS**
	30	62	**P1C30JX400ATS**	**P1A30JX400ATS**	**P1E30JX400ATS**
	42	68	**P1C42JX400ATS**	**P1A42JX400ATS**	**P1E42JX400ATS**

Main Breaker Selection

Ampere Rating	Breaker Type	Maximum Interrupting Rating 240 Vac	480/277 Vac	Catalog Number	Available Trip Values
100	BL	10	—	**BL**	15, 20, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	BLH	22	—	**BH**	15, 20, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	HBL	65	—	**HB**	15, 20, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	BQD	65	14	**BQ**	15, 20, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
125	NGB	100	25	**NB**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 125
	ED4	65	18	**E4**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 125
	HED4	100	42	**H4**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 125
	HHED6	100	65	**HA**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 125
225	QJ2	10	—	**QJ**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJH2	22	—	**QH**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJ2-H	42	—	**Q2**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HQJ2H	100	—	**HQ**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	FD6		35	**FD**	
	FXD6	65	35	**FX**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFD6	100	65	**HF**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFXD6		65	**H2**	
250	FD6			**FD**	
	FXD6	65	35	**FX**	250
	HFD6	100	65	**HF**	250
	HFXD6			**H2**	
400	JD6			**J6**	
	JXD6	65	35	**JX**	200, 225, 250, 300, 350, 400
	HJD6	100	65	**H6**	200, 225, 250, 300, 350, 400
	HJXD6			**H5**	

For inches / millimeters conversion, see Application Data section.

Branch Circuit Breakers

Breaker Type	Number of Poles	Max. Interrupting Rating (kA)					Available Trip Values
		120V	120/240V	240V	277V	480/277V	
BL	1	10	—	—	—	—	15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70
	2	—	10	—	—	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	3	—	—	10	—	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
BLR	2	—	—	10	—	—	15, 20, 30, 40, 50, 60, 70, 90, 100
BL, HID	1	10	—	—	—	—	15, 20, 30
	2	—	10	—	—	—	15, 20, 30
BLH	1	—	22	—	—	—	15, 20, 30, 40, 50, 55, 60, 70
	2	—	22	—	—	—	15, 20, 30, 40, 50, 60, 70, 90, 100
	3	—	—	22	—	—	15, 20, 30, 40, 50, 60, 70, 80, 90, 100
HBL	1	—	65	—	—	—	15, 20, 30, 40, 50
	2	—	65	—	—	—	15, 20, 30, 40, 50, 60, 70
	3	—	—	65	—	—	15, 20, 30, 40, 50, 60, 70, 80, 90, 100
BLF	1	10	—	—	—	—	15, 20, 30
	2	—	10	—	—	—	15, 20, 30, 40, 50, 60
BLHF	1	22	—	—	—	—	15, 20, 30
	2	—	22	—	—	—	15, 20, 30, 40, 50, 60
BGL①	2	10	—	—	—	—	15, 20, 30
	3	—	10	—	—	—	15, 20, 30
BLE	1	10	—	—	—	—	15, 20, 30
	2	—	10	—	—	—	15, 20, 30, 40, 50, 60
BLEH	1	22	—	—	—	—	20, 30
	2	—	22	—	—	—	15, 20, 30, 40, 50, 60
BAF	1	10	—	—	—	—	15, 20
BAFH	1	22	—	—	—	—	15, 20
BQD	1	—	65	—	14	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	2	—	65	—	—	14	
	3	—	—	65	—	14	
NGB②	1	100	—	—	25	—	15, 20, 25, 30, 35, 40, 50, 60 70, 80, 90, 100, 125
	2	—	100	100	—	25	
	3	—	100	100	—	25	

Subfeed Breakers

Breaker Type	Number of Poles	Max. Interrupting Rating (kA)		Available Trip Values
		240V	480Y/277V	
QJ2	2, 3	10	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
QJH2	2, 3	22	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
QJ2H	2, 3	42	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
HQJ2H	2, 3	100	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
ED4	2, 3	65	18	15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 125
HED4	2, 3	100	42	15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 125
FXD6	2, 3	65	35	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
FD6	2, 3	65	35	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
HFD6	2, 3	100	65	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
HFXD6	2, 3	100	65	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250

① 2-pole breaker is one phase and neutral. 3-pole is two phases and neutral.

② P1 panel with NGB branch devices will not accept BL or BQD frames in the same panel as branch devices.

Note: BL, HBL, BQD breakers are mounted in common mountings in 3" or 6-pole increments.

• Revised •
07/25/13

Panelboards

Type 1 P1 Panelboard Modifications and Additions

Selection

Enclosures

Description
6" end gutter 2" side gutter Barrier in gutter (add to extra gutter price – min 4" required) 24" wide
Hinged trims Piano hinged trims Door-in-door trims Screw to the box trims
Trim mounted devices . . . . . See page 11-80 • Pilot lights • Toggle switches • Push buttons (Devices mounted to be wired to the trim should also have hinged trim specified)
Painted boxes . . . . . See page 11-80 Custom colors . . . . . See painted boxes Increase gauge trims and boxes . . . . . See page 11-80 Stainless steel trims and boxes, Type 1 . . . . . See page 11-80

Meters
(Contact sales for pricing and application engineering for space requirements)

Panel Skirts See page 11-81

Special Locks

TEY
TEU1
Cat 60
LL803
LL806
Yale 47 (NYC)
National C413A
Best Lock 7-pin tumbler
Southco 1/4 Fastener
Corbin 1001 FAB7

Panel Modifications

Catalog No. Addition	Main Bus	Amp Ratings
C	Copper (tin pltd.)	125A
C	Copper (tin pltd.)	250A
C	Copper (tin pltd.)	400A

* "C" represents "A" in the 11th digit of the catalog number.

Branch and Main Breaker and Accessories
See breaker section for pricing on the following options
- Handle blocks
- Handle locks
- Aux. Contacts①
- UVR①

Bus mounted SPD see section 10

Service Entrance Label

Type P1 Panelboards are factory labeled suitable for use as service entrance equipment when NEC requirements are met. A panelboard cannot have more than six main disconnects, unless it is a lighting and appliance branch panelboard. Lighting and appliance branch panelboards are limited to two main disconnects.

① Accessories on 1" pole breakers (BL, BQD, ED) will take unit space.

Panel Modifications (cont.)

Grounding of Panelboards

Ground Bars except for brazed to box are shipped with the panel interior factory mounted.
- Non-Insulated Equipment Ground Bar
- Copper Non-Insulated Ground Bar
- Al Insulated Equipment Ground Bar
- Cu Insulated Equipment Ground Bar
- Ground Bar Brazed to Box (not recommended for painted boxes)

Shunt Trip on Main or Branch

BL, BLH, HBL, BQD as branch only. BL, BLH, HBL, NGB, ED4, ED6, HED4, HED6, HHED6 uses 1" unit space for shunt trip as a branch device. All others may be used on mains or subfeeds. See breaker section for list price adders.

Time Clocks

Time clocks may be mounted in a 23" enclosure to be cable connected to the panel. Sangamo, Tork or Paragon time clock can be supplied.

Description
Time Clock (1 or 2-pole, single or double throw contacts; 3-pole, single throw) 277V maximum with plain dial
Astronomical dial
An omitting device
Reserve power or carryover
Space and mounting provisions only

Remote Switches Modifications

(See page 11-79)

Remote Control Switches

480V AC max. mounted in a 23" enclosure to be cable connected to the panel.

Application for Remote Switch

Switch Type	Modification
920	Mounts in 23" relay cabinet as a main only
LEN	30A mounts in 23" relay cabinet as a main only

Feed-Thru Lugs

Cannot be used in conduction with SPD or subfeed breakers

Ampere Rating	Type	Connector Range
250	Al/Cu Lay-in Mechanical Cu Lay-in Mechanical Al/Cu Compression	(1)—#6 AWG-350 kcmil (1)—#6 AWG-350 kcmil (1)—#6 AWG-350 kcmil
400	Al/Cu AWG Mechanical Cu Al/Cu Compression	(2)—#3/0 AWG-250 kcmil or (1)—#3/0 AWG-600 kcmil (2)—#3/0 AWG-250 kcmil or (1)—#3/0 AWG-600 kcmil (1) 400—600 kcmil

Note: Specify copper or aluminum cable.

Type P1, P2, and P3 Panelboards

Miscellaneous Parts and Accessories

Catalog Number	Description
EGK	Al Ground Bus 44 Connections
BK1	Bonding kit for 250A max. and all P1 panels
IMK1	Interior Adjusting Kit
11-1824-01	Directory Card Holder
12-1110-01	Directory Card
11-1056-01	NEMA Instruction Book
NBK03	Number Strips 1–42. Stick-on type; Use w/ P1 series Panels
NBK04	Number Strips 43–84. Stick-on type; Use w/ P1 series Panels
NBK05	Number Strips 85–126. Stick-on type; Use w/ P1 series Panels
NBK06	Number Strips 127–168. Stick-on type; Use w/ P1 series Panels
ECGK	Cu Ground Bus 44 Connections
IGK	Insulated Al Ground Bus
ICGK	Insulated Cu Ground Bus
EWK1	End Wall Kit with Knockouts (20" W x 5.75" DP)
EWK2	End Wall Kit with Knockouts (24" W x 7.75" DP)
QF3	Filler Plate
EBF1	NEB/HEB Filler Plate

Compression Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Box Height Addition
MLO	125	N/A	(1) #4 AWG - 350 kcmil	None
	250			
	400	N/A	(1) 250-600 kcmil or (2) #3/0 AWG - 250 kcmil (custom option)	None
Main Breaker	125	ED4, ED6, HED4	(1) #12-1/0 AWG	Box must go to 24" wide
		HHED6		
	225	QJ2, QJH2, QJ2H	(1) #6 AWG - 350 kcmil Cu or Al	Box must go to 24" wide for all breakers
	250	FXD6, HFD6	(1) #6 AWG - 350 kcmil Cu or Al	Box must go to 24" wide for all breakers

NOTE: Standard compression lugs used for P1 panels are range taking lugs and may require a particular crimping tool (tool is Anderson VC6) to accommodate the range. Consult factory for information. 200% neutral not available with compression lugs. NGB breakers cannot accommodate compressions lugs.

Enclosure Modifications

Description
20" Panel Width NEMA 3R enclosures NEMA 3R/12 enclosures Gasket between trim and box (Type 1)
24" Panel Width NEMA 3R enclosures NEMA 3R/12 enclosures Gasket between trim and box (Type 1)

NEMA-4—Water Tight, Dust Tight, Steel Enclosure (consult plant for actual enclosure size and for anything larger than 44")

Box Height (inches)	Enclosure Size		
	H	W	D
32	32	24	8
38	38	30	8
48	48	36	8

Additional Enclosure Modifications
(check with factory for availablity)

Description
Strip Heaters
Humidstat Control
Thermostat Control

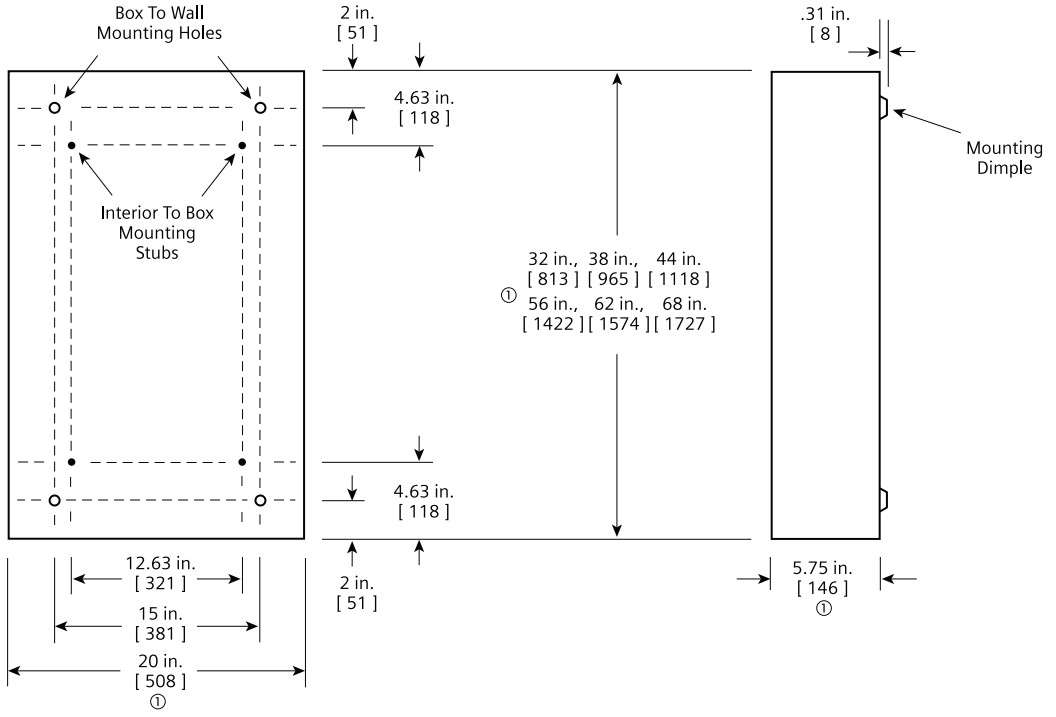
NEMA-4X—Water Tight, Dust Tight and Corrosion Resistant
(consult plant for actual enclosure size)

Catalog Number	Enclosure – Stainless Steel Size (inches)		
	H	W	D
B4X26	26	20	5.75
B4X32	32	20	5.75
B4X38	38	20	5.75
B4X44	44	20	5.75
B4X56	56	20	5.75
B4X62	62	20	5.75
B4X68	68	20	5.75
B4X74	74	20	5.75

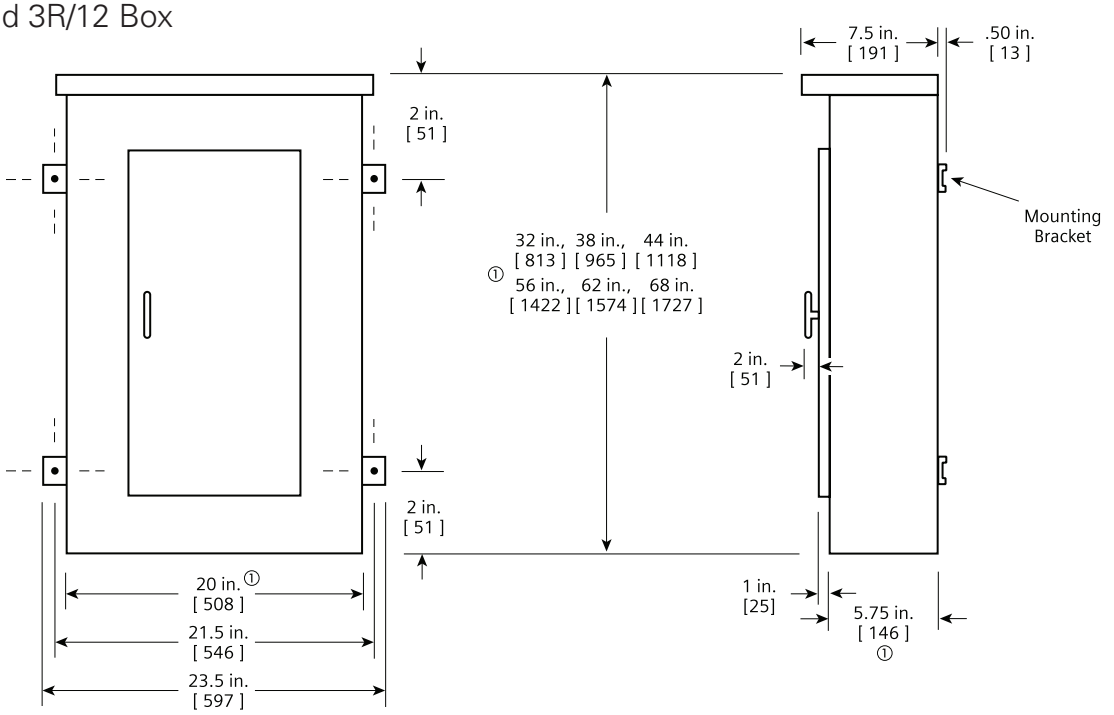
Enclosure – Fiberglass Size (inches)		
H	D	W
36	30	8
48	36	12

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



①Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

Dimensions shown in inches and millimeters [ ].

Features

Flexibility is the hallmark of the P2 panel. This panel offers a wide array of factory-assembled options to meet almost all lighting panel applications. With this design, the ability to mix breaker frames in unit space up to 250 amps will also meet many distribution panel requirements in a much smaller package. Bussing options for the P2 vary from the typical temperature rated to 750 A/Si aluminum to 1000A/Si copper. Standard bussing in the P2 panel is tin-plated. Silver-plated copper is also offered as an option. Integrated time clocks, bus mounted contactors, as mains or sub mains, split bus, and subfeed lugs (up to 400 amp) are just a few of the options of this unique panel.

Like a lighting panel, P2 is set up around 18, 30, 42, 54, 66, 78, and 90 circuit configurations. It will also allow the user to configure the panel to the smallest possible size. The P2 panel starts with 9" of unit space (18 circuits of 1" pole breakers). Breakers mounted in unit space can be mixed and matched to meet customer requirements. All 1" pole breakers (BL, BQD, ED frames) are mounted in 3" or 6" pole increments. Breaker frames, above 125 amps, are mounted in 6" single breaker mountings.

As an example of a minimum panel, (6) 20 amp 1-pole BL breakers (3" of unit space) and a 3-pole 225 amp QJ breaker (6" of unit space) equaling 9" of unit space can be configured in a P2 panel without any extra provisions or space required. FD 250 amp and JD 400 amp breakers are mounted as subfeed breakers outside of unit space.

Another unique feature of the P2 panel is that blank unit space can be added to allow for future expansions or modifications. Any expansions or modifications must be in 3" increments. BL, BQD, and ED frame breakers have 3" or 6" pole kits, and can be mixed in unit space by these increments. Breakers of the same frame can cross from one mounting to another if contiguous. QJ frame breakers are mounted in 6" increments for two- and three pole, single mounted units. Changes in the unit space length for BL, BQD, or ED frame breakers require an addition deadfront, center strip kit. Check with sales or the factory for additional unit space kits.

Main Lug / Main Breaker

Enclosure – Standard Type 1 enclosure is 20" wide x 5.75" deep X. Box Height is determined by main device and unit space. See charts for box height.

Voltage – 600V AC max.
250V DC max.

Amperage – 600 amp max.

Short circuit rating – 200 KAIC max. symmetrical or equal to the lowest rated device installed unless a series rating is indicated. Panels with subfeed or feed-thru lugs without a main device, circuit breaker or fusible unit, are limited to a three-cycle rating. The three-cycle rating for the P2 panel is limited to 22 KAIC. Note that the main device may be mounted remote from the panel.

Bussing – The P2 panel has more options to meet market requirements. The standard bussing is temperature rated aluminum. The rating is per the requirements of UL 67 – the standard for panelboards. All aluminum bussing is tin-plated. Optional bussing for the P2 panel is: 750 A/Si aluminum, temperature rated copper, and 1000 A/Si copper. The copper bus option for this panel is tin-plated.

Weight – Approximate
Total panelboard weight when filled with a normal quantity of breakers and accessories is about 3 lbs. (1 kg) per inch (54g per mm) of box height.

Gauge Steel of Boxes Fronts, Surface and Flush

Dimensions in inches (mm)		Gauge Steel	
Width	Height	Box	Front
20 (508)	26–74 (660–1880)	#16	#14

Standard Circuit P2 Panels

Base Box Size Requirements for P2 Panels with Standard Line Lugs, and fewer than 55 poles of 1" module (BL,BQD, ED, NGB) branch breakers and provisions. Unit Spaces range from 9" to 45" (in 6" increments). Boxes range from 26" to 74" high (in 6" increments). Inclusion of optional modifications may require size increases that must be added to these base values to calculate the final box size for the panel (see pages 11-29, 11-32). Vertical Main breaker options with the "Vert." designation are added-price options (see page 11-26). Values in brackets [ ], at the bottom of each column, indicate the maximum allowable 1" module branch poles for each main type.

"B" Dimension Box Height	P2 Panels with Standard Line Lugs. Unit Space (starting with 9" and adding 6" increments) "A" Dimension														
	Main Lugs			Main Breakers											
	125A	250A	400A 600A	125A Horiz. BL, BQD, NGB, ED	125A Vert. ED①	125A Horiz. CED	225A Horiz. QJ	225A Vert. QJ①	250A Horiz. FD	250A Vert. FD①	250A CFD	400A JD	400A CJD	600A LD	600A CLD
26	9	—	—	9	—	—	—	—	—	—	—	—	—	—	—
32	15	9	—	15	9	9	9	—	—	—	—	—	—	—	—
38	21	15	9	21	15	15	15	9	9	—	—	—	—	—	—
44	27	21	15	27	21	21	21	15	15	9	—	—	—	—	—
50	27	27	21	27	27	27	27	21	21	15	9	9	—	—	—
56	39	27	27	39	33	33	33	27	27	21	15	15	—	9	—
62	45	39	33	45	39	39	39	33	33	27	21	21	9	15	9
68	45	45	39	45	45	45	45	39	39	33	27	27	15	21	15
74	45	45	45	45	45	45	45	45	45	39	33	33	21	27	21
	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[42p]	[54p]	[42p]

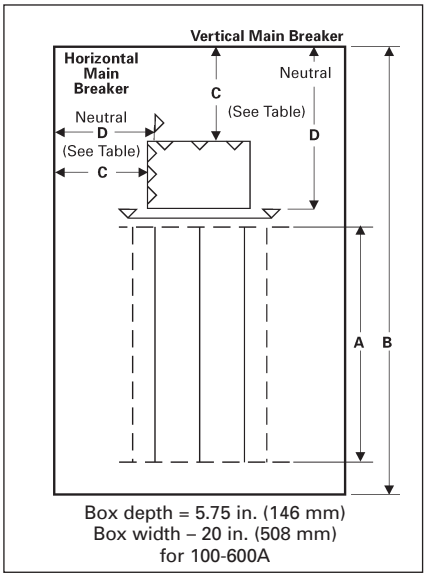
Extended Circuit P2 Panels

Base box size requirements for Extended Circuit P2 Panels with Standard Line Lugs, and 55 or more poles of 1" module (BL,BQD, ED, NGB) branch breakers and provisions. Unit Spaces range from 33" to 45" (in 6" increments). Boxes range from 56" to 74" high (in 6" increments). Inclusion of optional modifications may require size increases that must be added to these base values to calculate the final box size for the panel (see pages 11-29, 11-32). Vertical Main breaker options with the "Vert." designation are added-price options (see page 11-26). Values in brackets [ ], at the bottom of each column, indicate the maximum allowable 1" module branch poles for each main type.

"B" Dimension Box Height	P2 Panels with Standard Line Lugs. Unit Space (starting with 9" and adding 6" increments) "A" Dimension														
	Main Lugs			Main Breakers											
	125A	250A	400A 600A	125A Horiz. BL, BQD, NGB, ED	125A Vert. ED①	125A Horiz. CED	225A Horiz. QJ	225A Vert. QJ①	250A Horiz. FD	250A Vert. FD①	250A CFD	400A JD	400A CJD	600A LD	600A CLD
56	33	—	—	33	—	—	33	—	—	—	—	—	—	—	—
62	39	33	33	39	33	33	39	33	—	—	—	—	—	—	—
68	45	39	39	45	39	39	45	39	33	—	—	—	—	—	—
74	45	45	45	45	45	45	45	45	39	33	—	33	—	—	—
	[90p]	[90p]	[90p]	[90p]	[90p]	[90p]	[90p]	[90p]	[78p]	[66p]	[54p]	[66p]	[42p]	[54p]	[42p]

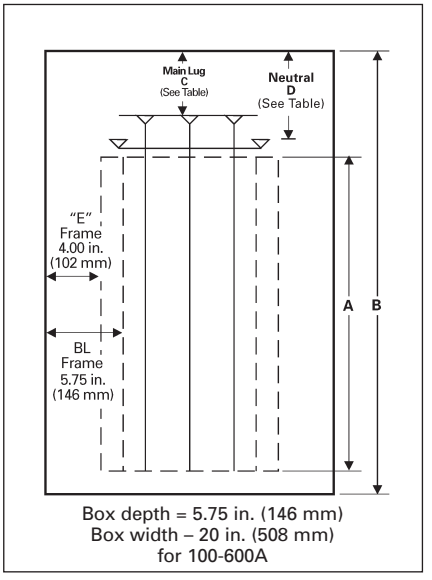
①Note: The vertical main breaker application for ED, QJ, and FD adds 6" of box height.

Main breaker wire bending space diagram



Box depth = 5.75 in. (146 mm)
Box width – 20 in. (508 mm)
for 100-600A

Main lug wire bending space diagram



Box depth = 5.75 in. (146 mm)
Box width – 20 in. (508 mm)
for 100-600A

Standard Circuit P2 Panels

Main Breaker Wire Bending

Standard Circuits (up to 54 1" module branch poles)			
Panel Amps	**Breaker Frames**	**C①**	**D①**
100	BL	5.75	8.00
	BQD	5.13	8.00
125	NGB	4.63	8.00
	ED (horiz.)	4.00	8.00
	ED (vert.)	6.56	11.13
225	QJ (horiz.)	5.00	7.00
	QJ (vert.)	10.06	16.69
250	FD (horiz.)	5.00	7.00
	FD (vert.)	13.25	22.72
400	JD	15.38	25.00
600	LD	15.38	23.00

Main Lug Connectors

Standard Circuits (up to 54 1" module branch poles)			
Panel Amps	**Standard Connectors**	**C①**	**D①**
125	(1) #14-2/0	6.62	8.19
250	(1) #6 AWG - 350 MCM	11.75	10.72
400	(1) #4 AWG - 600 MCM or (2) #6 - 250 MCM	14.00	13.09
600	(2) #4 AWG - 500 MCM	14.00	11.00

Extended Circuit P2 Panels

Main Breaker Wire Bending

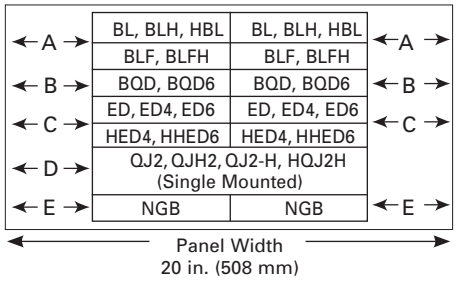
Extended Circuits (more than 54 1" module branch poles)			
Panel Amps	**Breaker Frames**	**C①**	**D①**
100	BL	5.75	6.56
	BQD	5.13	6.56
125	NGB	4.63	6.56
	ED (horiz.)	4.00	6.56
	ED (vert.)	12.56	14.88
225	QJ (horiz.)	5.00	6.44
	QJ (vert.)	10.06	15.53
250	FD (horiz.)	5.00	5.63
	FD (vert.)	19.25	25.71
400	JD	15.38	23.75
600	LD (54p max)	N/A	N/A

Main Lug Connectors

Extended Circuits (more than 54 1" module branch poles)			
Panel Amps	**Standard Connectors**	**C①**	**D①**
125	(1) #14-2/0	12.62	8.91
250	(1) #6 AWG - 350 MCM	17.75	13.69
400	(1) #4 AWG - 600 MCM or (2) #6 - 250 MCM	14.00	14.19
600	(2) #4 AWG - 500 MCM	14.00	14.23

Branch Breaker Side Gutters Inches (mm)

Reference Letter	Panel Width 20" (508)
A	5.750 (146)
B	5.125 (130)
C	4.000 (102)
D②	5.000 (127)
E	4.625 (117)



① Refer to diagrams at the bottom of page 11-24.
② Single branch mounting construction.

Panelboards

Type P2 Panelboards

Selection

Main Breaker Selection①

Ampere Rating	Breaker Type	Maximum Interrupting Rating (kA) 240V	480V	600V	Ref. Catalog Number	Available Trip Values
100	BL	10	—	—	**BL**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	HBL	65	—	—	**HB**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	BQD	65	14	—	**BQ**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	BLH	22	—	—	**BH**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	ED4	65	18	—	**E4**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	NGB	100	25	—	**NB**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 100
	ED6	100	25	14	**E6**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	HED4	100	42	—	**H4**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	HHED6	100	65	18	**HA**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	CED6②	200	200	100	**CE**	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
125	NGB	100	25	—	**NB**	110, 125
	ED4	65	18	—	**E4**	125
	ED6	65	25	18	**E6**	125
	HED4	100	42	—	**H4**	125
	HHED6	100	65	18	**HA**	125
	CED6②	200	200	100	**CE**	125
225	QJ2	10	—	—	**QJ**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJH2	22	—	—	**QH**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJ2H	42	—	—	**Q2**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HQJ2H	100	—	—	**Q3**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	FD6	65	35	18	**FD**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	FXD6	65	35	18	**FX**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFD6	100	65	25	**HF**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFXD6	100	65	25	**H2**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	CFD6②	200	200	100	**CF**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
250	FD6	65	35	18	**FD**	250
	FXD6	65	35	18	**FX**	250
	HFD6	100	65	35	**HF**	250
	HFXD6	65	35	25	**H2**	250
	CFD6②	200	150	100	**CF**	50
400	JXD6②	65	35	25	**JX**	200, 225, 250, 300, 350, 400
	JD6②	65	35	35	**J6**	200, 225, 250, 300, 350, 400
	HJXD6②	100	65	35	**H6**	200, 225, 250, 300, 350, 400
	HJD6②	100	65	35	**H5**	200, 225, 250, 300, 350, 400
	SJD6②	65	35	25	**SJ**	200, 300, 400
	SHJD6②	100	65	35	**S2**	200, 300, 400
	CJD6②	200	200	100	**CJ**	200, 300, 400
	SCJD6②	200	200	100	**SC**	200, 300, 400
600	LXD6②	65	35	25	**LX**	450, 500, 600
	LD6②	65	35	25	**L6**	250, 300, 350, 400, 450, 500, 600
	HLXD6②	100	65	35	**HL**	250, 300, 350, 400, 450, 500, 600
	HLD6②	100	65	35	**HO**	250, 300, 350, 400, 450, 500, 600
	SLD6②	65	35	25	**SL**	300, 400, 500, 600
	SHLD6②	100	65	35	**S6**	300, 400, 500, 600
	CLD6②	200	150	100	**CL**	300, 400, 500, 600
	SCLD6	200	150	100	**C6**	300, 400, 500, 600

When an ED4, ED6, HED4, QJ2, QJH2, QJ2H, FD6, HFD6, or FXD6 frame main breaker, vertically mounted, is required, price as a main breaker panel and add from the table for the main breaker mounting.

Vertically Mounted Main Breaker
(available in 2-pole or 3-pole)

Ampere Rating	Breaker Type(s)	Unit Space (in.)
100	ED4, ED6, HED4	6
225	QJ2, QJH2, QJ2-H FXD6, FD6, HFD6	6

Subfeed Breakers (available in 2-pole or 3-pole)

Breaker Type	Mounting Position When Used as Subfeed Breaker	Ampere Ratings For Load	Maximum Interrupting Rating (kA) Symmetrical 240V AC	480V AC	600V AC
	Vertical				
FD6③, FXD6	Twin	70–250	65	35	22
HFD6③, HFXD6	Twin	70–250	100	65	25
JD6④, JXD6	Single	200–400	65	35	25
HJD6④, HJXD6	Single	200–400	100	65	35

① Interchangeable trip main breakers are mounted at top of panel only.
② Vertically mounted.
③ Twin mounted subfeed breakers are mounted at the bottom of panelboard only and adds 24" to the panel height.
④ Subfeed breaker is mounted at bottom of panelboard only. 400 amp subfeed breaker adds 24" to the panel height. (Only for use with MLO)

Branch Circuit Breakers

Max. Amp Rating	Bolt-On Breaker Type	Amps	Availability			Maximum Interrupting Rating (kA)						
			1-Pole	2-Pole	3-Pole	120V AC	120/240V AC	240V AC	277V AC	480V AC	600V AC	250V DC
100	BL	15–60	√	√	√	10	—	—	—	—	—	—
		70	√	√	√	—	10	—	—	—	—	—
		80–100	—	√	√	—	—	10	—	—	—	—
	BLH	15–60	√	√	√	—	22	—	—	—	—	—
		70	√	√	√	—	22	—	—	—	—	—
		80–100	—	√	√	—	—	22	—	—	—	—
	HBL	15–55	√	√	√	—	65	—	—	—	—	—
		60–100	—	√	√	—	65	—	—	—	—	—
	BL, HID	15–30	√	√	—	10	10	—	—	—	—	—
	BLR (240V)	15–60	—	√	—	—	—	10	—	—	—	—
		70–100	—	√	—	—	—	10	—	—	—	—
	BLE (GFCI)	15–30	√	√	—	10	—	—	—	—	—	—
		40–60	—	√	—	—	10	—	—	—	—	—
	BLEH	20–30	√	—	—	22	—	—	—	—	—	—
		15–60	√	√	—	—	22	—	—	—	—	—
	BLF (GFCI)	15–30	√	√	—	10	—	—	—	—	—	—
		40–60	√	√	—	—	10	—	—	—	—	—
	BLHF (GFCI)	15–30	√	√	—	22	—	—	—	—	—	—
		40–60	√	√	—	—	22	—	—	—	—	—
	BGL②	15–30	—	√	√	10	10	—	—	—	—	—
	BAF	15–20	√	√	—	10	—	—	—	—	—	—
	BAFH	15–20	√	√	—	22	—	—	—	—	—	—
	BQD	15–60	√	√	√	—	65	—	14	—	—	14
		70–100	√	√	√	—	65	—	—	14	—	14
	NGB	15–60	√	√	√	100	100	100	25	25	—	14
		70–100	√	√	√	100	100	100	25	25	—	14
		110–125	—	√	√	100	100	100	25	25	—	14
125	ED4	15–60	√	√	√	65	—	—	22	—	—	—
		70–100	√	√	√	—	—	65	—	18	—	30
		110–125	—	√	√	—	—	65	—	18	—	—
	ED6	15–60	—	√	√	—	—	65	—	25	18	30
		70–100	—	√	√	—	—	65	—	25	18	—
		110–125	—	√	√	—	—	65	—	25	18	—
	HED4①	15–60	√	√	√	—	—	65	—	42	18	30
		70–100	√	√	√	—	—	65	—	42	18	—
		110–125	—	√	√	—	—	65	—	42	18	—
	HHED6	15–60	—	√	√	—	—	100	65	—	—	—
		70–100	—	√	√	—	—	100	42	65	—	30
		110–125	—	√	√	—	—	100	—	65	—	—
225	QJ2	60–225	—	√	√	—	—	10	—	—	—	—
	QJH2	60–225	—	√	√	—	—	22	—	—	—	—
	QJ2H	60–225	—	√	√	—	—	42	—	—	—	—
	HQJ2H	60–225	—	—	√	—	—	100	—	—	—	—

Branch Device Limitations

In areas where 2008 NEC has not been adopted, some limitations may apply for panels used in systems requiring neutral connections. By application rule (480.14 in all versions of the NEC prior to 2008), lighting and appliance panels are limited to 42 installed circuits. Each over current device pole counts as a circuit.

Branch Neutral Connections

Wire Range	Max. Number of Connections	Max. Amp③
#14-#6	26	65
#14-1/0	28	125
#6-350 kcmil	3	250
(1) #4-600 kcmil or (2) #6-250 kcmil	1	400

① 1-Pole HED 4 15–30A Rated 65kA 35 through 100A Rated 25kA.
② Two pole breaker is one phase and neutral.
Three pole is two phase and neutral.
③ Based on 75 degree copper.

NOTE: QJ Breakers are single mounted in unit space and take 6" of unit space. Limited to (4) per panel max. BL, HBL, BLH and BQD breakers are mounted in common mountings in 3" or (6) pole increments. ED4, ED6, HED4 and HHED6 breakers are mounted in common mountings in 3" or (6) pole increments.

Panelboards

Type P2 Panelboards

Selection

Main Lugs Only

Maximum Panel Amp Rating	Maximum 1-pole Circuits	Box Height Inches	Catalog Number 3Ø4W 208Y/120V	Catalog Number 1Ø3W 120/240V	Catalog Number 3Ø4W 480Y/277V
125	18	26	P2C18ML125ATS	P2A18ML125ATS	P2E18ML125ATS
	30	32	P2C30ML125ATS	P2A30ML125ATS	P2E30ML125ATS
	42	38	P2C42ML125ATS	P2A42ML125ATS	P2E42ML125ATS
	54	56	P2C54ML125ATS	P2A54ML125ATS	P2E54ML125ATS
	66	62	P2C66ML125ATS	P2A66ML125ATS	P2E66ML125ATS
	78	68	P2C78ML125ATS	P2A78ML125ATS	P2E78ML125ATS
	90	74	P2C90ML125ATS	P2A90ML125ATS	P2E90ML125ATS
250	18	32	P2C18ML250ATS	P2A18ML250ATS	P2E18ML250ATS
	30	38	P2C30ML250ATS	P2A30ML250ATS	P2E30ML250ATS
	42	44	P2C42ML250ATS	P2A42ML250ATS	P2E42ML250ATS
	54	56	P2C54ML250ATS	P2A54ML250ATS	P2E54ML250ATS
	66	62	P2C66ML250ATS	P2A66ML250ATS	P2E66ML250ATS
	78	68	P2C78ML250ATS	P2A78ML250ATS	P2E78ML250ATS
	90	74	P2C90ML250ATS	P2A90ML250ATS	P2E90ML250ATS
400	18	38	P2C18ML400ATS	P2A18ML400ATS	P2E18ML400ATS
	30	44	P2C30ML400ATS	P2A30ML400ATS	P2E30ML400ATS
	42	50	P2C42ML400ATS	P2A42ML400ATS	P2E42ML400ATS
	54	56	P2C54ML400ATS	P2A54ML400ATS	P2E54ML400ATS
	66	62	P2C66ML400ATS	P2A66ML400ATS	P2E66ML400ATS
	78	68	P2C78ML400ATS	P2A78ML400ATS	P2E78ML400ATS
	90	74	P2C90ML400ATS	P2A90ML400ATS	P2E90ML400ATS
600	18	38	P2C18ML600ATS	P2A18ML600ATS	P2E18ML600ATS
	30	44	P2C30ML600ATS	P2A30ML600ATS	P2E30ML600ATS
	42	50	P2C42ML600ATS	P2A42ML600ATS	P2E42ML600ATS
	54	56	P2C54ML600ATS	P2A54ML600ATS	P2E54ML600ATS
	66	62	P2C66ML600ATS	P2A66ML600ATS	P2E66ML600ATS
	78	68	P2C78ML600ATS	P2A78ML600ATS	P2E78ML600ATS
	90	74	P2C90ML600ATS	P2A90ML600ATS	P2E90ML600ATS

Main Circuit Breaker

Maximum Panel Amp Rating	Maximum 1-pole Circuits	Box Height Inches	Catalog Number 3Ø4W 208Y/120V	Catalog Number 1Ø3W 120/240V	Catalog Number 3Ø4W 480Y/277V
100	18	26	P2C18BL100ATS	P2A18BL100ATS	P2E18BL100ATS
	30	32	P2C30BL100ATS	P2A30BL100ATS	P2E30BL100ATS
	42	38	P2C42BL100ATS	P2A42BL100ATS	P2E42BL100ATS
125	18	26	P2C18NB125ATS	P2A18NB125ATS	P2E18NB125ATS
	30	32	P2C30NB125ATS	P2A30NB125ATS	P2E30NB125ATS
	42	38	P2C42NB125ATS	P2A42NB125ATS	P2E42NB125ATS
	54	56	P2C54NB125ATS	P2A54NB125ATS	P2E54NB125ATS
	66	62	P2C66NB125ATS	P2A66NB125ATS	P2E66NB125ATS
	78	68	P2C78NB125ATS	P2A78NB125ATS	P2E78NB125ATS
	90	74	P2C90NB125ATS	P2A90NB125ATS	P2E90NB125ATS
225	18	32	P2C18QJ225ATS	P2A18QJ225ATS	P2E18FX225ATS
	30	38	P2C30QJ225ATS	P2A30QJ225ATS	P2E30FX225ATS
	42	44	P2C42QJ225ATS	P2A42QJ225ATS	P2E42FX225ATS
	54	56	P2C54QJ225ATS	P2A54QJ225ATS	P2E54FX225ATS
	66	62	P2C66QJ225ATS	P2A66QJ225ATS	P2E66FX225ATS
	78	68	P2C78QJ225ATS	P2A78QJ225ATS	P2E78FX225ATS
	90	74	P2C90QJ225ATS	P2A90QJ225ATS	P2E90FX225ATS
250	18	38	P2C18FX250ATS	P2A18FX250ATS	P2E18FX250ATS
	30	44	P2C30FX250ATS	P2A30FX250ATS	P2E30FX250ATS
	42	50	P2C42FX250ATS	P2A42FX250ATS	P2E42FX250ATS
	54	62	P2C54FX250ATS	P2A54FX250ATS	P2E54FX250ATS
	66	68	P2C66FX250ATS	P2A66FX250ATS	P2E66FX250ATS
	78	74	P2C78FX250ATS	P2A78FX250ATS	P2E78FX250ATS
400	18	50	P2C18JX400ATS	P2A18JX400ATS	P2E18JX400ATS
	30	56	P2C30JX400ATS	P2A30JX400ATS	P2E30JX400ATS
	42	62	P2C42JX400ATS	P2A42JX400ATS	P2E42JX400ATS
	54	68	P2C54JX400ATS	P2A54JX400ATS	P2E54JX400ATS
	66	74	P2C66JX400ATS	P2A66JX400ATS	P2E66JX400ATS
600	18	56	P2C18LX600ATS	P2A18LX600ATS	P2E18LX600ATS
	30	62	P2C30LX600ATS	P2A30LX600ATS	P2E30LX600ATS
	42	68	P2C42LX600ATS	P2A42LX600ATS	P2E42LX600ATS
	54	74	P2C54LX600ATS	P2A54LX600ATS	P2E54LX600ATS

Enclosures

Extra Gutter to Sides or Ends of the Can (Type 1 Only)

Description
6" end gutter 2" side gutter Barrier in gutter (add to extra gutter price – min 4" required) 24" wide
Hinged trims Piano hinged trims Door-in-door trims Screw to the box trims
Trim mounted devices . . . . . See page 11-80 • Pilot lights • Toggle switches • Push buttons
Painted boxes . . . . . See page 11-80 Custom colors . . . . . See painted boxes Increase gauge trims and boxes . . . . . See page 11-80 Stainless steel trims and boxes, Type 1 . . . . . See page 11-80

Meters
(Contact sales for pricing and application engineering for space requirements)

Panel Skirts See page 11-81

Special Locks

TEY
TEU1
Cat 60
LL803
LL806
Yale 47 (NYC)
National C413A
Best Lock 7-pin tumbler
Southco 1/4 Fastener
Corbin 1001 FAB7

Panel Bus Modifications

Main Bus	Catalog Number Addition Amperes Ratings			
	125A	250A	400A	600A
750 A/Sl AL.	B	B	B	B
Copper (tin pltd.)	F	F	F	F
Copper (silver pltd.)	E	E	E	E
1000 A/Sl Copper (tin pltd.)	G	G	G	G
1000 A/Sl Copper (silver pltd.)	H	H	H	H

① Accessories on 1" pole breakers (BL, BQD, ED) will take unit space.

Subfeed, Feed-Thru and Split Bus (for 2-pole or 3-pole)

Ampere Rating	Connector Cu/Al Wire Range	Unit Space (inches)

Subfeed (Double) Lugs for Main Lug Panelboards Only

100/125	(2)—#12 AWG-2/0 kcmil	6
225/250	(2)—#6 AWG-350 kcmil (custom)	6
400	(4)—250 kcmil (custom) (2)—600 kcmil	6

Feed-Thru Lugs — Cannot Be Used in Conjunction with TVSS or Subfeed Breakers (200% Neutral not available)

100/125	(1)—#12 AWG-2/0 kcmil	6
225/250	(1)—#6 AWG-350 kcmil	6
400	(2)—250 kcmil (1)—600 kcmil	9
600	(2)—250-500 kcmil	12

Split Bus (1 per interior)
Requires feed thru lugs also to feed sub panel section and for space requirements.

100/125	(1)—#12 AWG-2/0 kcmil	6
225/250	(1)—#6 AWG-350 kcmil	6
400	(2)—250 kcmil (1)—600 kcmil	6
600	(2)—250-500 kcmil	6

Contactor Mains or Submain*
See Page 11-79

- Asco 920 through 225 amps – adds 12" unit space as main, 15" unit space as submain
- External with manufacture supplied enclosure
- Siemens LEN through 30 amps - adds 6" as main; 18" for up to 100A submain and 21" for 200A. 7.75" depth cans for up to 100A and 10" depth cans for 200A.

*Call plant for correct can size.

Branch and Main Breaker Accessories

See breaker section of this catalog.
- Handle blocks
- Handle locks
- Aux. Contacts①
- UVR①

Increase Capacity Neutral up to 200%
(N/A on Feed Thru Lugs & Subfeed Lugs)

Main Bus Amps
125
250
400
600

See page 11-32 for unit space adders and compatibility with other options.
(Devices mounted and wired to the trim should also have hinged trim specified)

Copper MLO Only

Main Bus Amps
125
250
400
600

Bus mounted SPD See Section 10

Service Entrance Label

Type P2 Panelboards are factory labeled suitable for use as service entrance equipment when NEC requirements are met. A panelboard cannot have more than six main disconnects, unless it is a lighting and appliance branch panelboard. Lighting and appliance branch panelboards are limited to two main disconnects.

Grounding of Panelboards

Ground Bars except for brazed to box are shipped with the panel interior factory mounted.
- Non-Insulated Equipment Ground Bar
- Copper Non-Insulated Ground Bar
- Al Insulated Equipment Ground Bar
- Cu Insulated Equipment Ground Bar
- Ground Bar Brazed to Box (Not recommended for painted or NEMA 3R enclosures)

Shunt Trip on Main or Branch

BL, BLH, HBL, NGB, ED4, HED4, HED6, HHED6 uses 1" unit space for shunt trip. All others may be used on mains or subfeeds. See breaker section for list price adders.

Time Clocks

Time clocks may be mounted in a 23" enclosure to be cable connected to the panel. Sangamo, Tork or Paragon time clock can be supplied and mounted in panelboard cabinet. Adds 12" to panel height. Mounts in Sub-area.

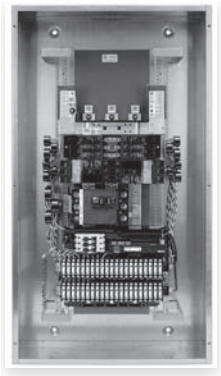
Description
Time Clock (1 or 2-pole, single or double throw contacts; 3-pole, single throw) 277V maximum with plain dial
Astronomical dial
An omitting device
Reserve power or carryover
Space and mounting provisions only

SEM3 System configured in Panelboards

The Siemens SEM3 system can be configured for factory installation in branch circuit monitoring applications using the Siemens COMPAS configuration tool. This option can lower the installation time of the system for the installer while providing a factory warrantied solution.

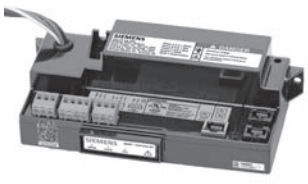
The SEM3 system can be factory installed in unit space in type P2, P4, & P5 Siemens panel boards and SB1, SB2, & SB3 type Siemens switchboards. Please note P1 and P3 configurations are not available at this time and the amount of unit space needed varies depending upon the application. Please note that lead time adders will apply and may vary depending upon the configuration of the system.

SEM3 for use in Siemens Panelboards



Type P2: Enclosure

- Available in a NEMA 1, 3R, or 12 rated enclosure.
- Minimum width & depth: 24" width x 5.75" depth
- Height: Up to 74" depending on branch breaker selection
  - – Addition of monitoring on some mains (primary and subfeed) may require additional box length. In these cases the box will be increased to the next size available as a standard design.
  - – In cases where enclosure size is increased all multi-section panels will be increased to match the largest section.



Controller

SEM3 controller is mounted in unit space opposite of the feed location specified in COMPAS (i.e., bottom mount for top feed) and will require 3" of unit space. Each controller will be powered by direct tap connection to the panel section bus. Each controller can monitor up to 45 circuits. Applications that require monitoring more than 45 circuits will require additional controllers.



Current Transformers (CTs)

Five sizes of CTs are available for use in the P2 panel: 50, 125, 250, 400 & 600 amp. All CTs are pre-mounted to a support bracket that attaches to the base rail of the interior of the panel board. Each bracket supports a maximum of 3 CTs and is designed for the breaker selected (brackets are not interchangeable between breaker frames). Each CT will be attached to a data module that is placed in the meter racks.



Meter Racks

Each meter rack requires 3" of unit space. All meter racks will be installed next to the SEM3 controller in unit space. The COMPAS configuration tool will select the appropriate meter rack configuration according to the user's application and will use the 21 space meter rack as a default option where possible. Only one meter rack (regardless of number of positions) can be installed in 3" of unit space.

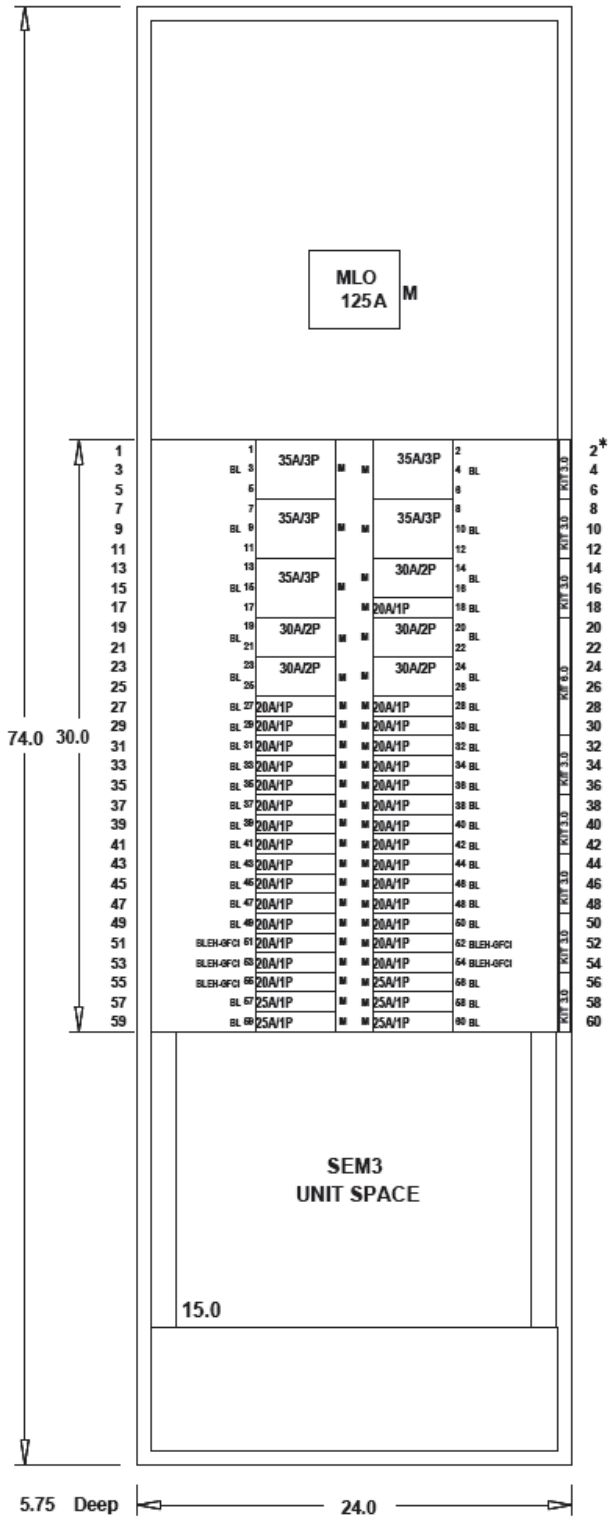
NOTE: Monitoring of 45 circuits will require 9" of unit space: two 21 position racks and one 3 position rack

P2 Devices
Enclosure sizes

Example P2 Panel with SEM3 Type 1 Enclosure (24" Wide x 5.75" Deep)

Enclosure heights are in 6" increments from 26" thru 74".
Enclosure heights: 26", 32", 38", 44", 50", 56", 62", 68", 74"

The COMPAS configuration tool can provide actual dimensions based on the configuration.
Example below is largest standard P2 enclosure for factory assembled panel
with all small (1") branch breakers installed.



24" std. width

Main Breaker / Main Lug space varies based on selected options

Unit space varies
based on selected options

Note: All circuits do not have to be monitored by SEM3 - user can select any circuits in this space to be monitored.

Based on smallest branch breakers and a 3-phase main being monitored.
There is a maximum of 63 circuits that can be monitored with the configuration shown.
Some selections of main breakers and other subfeed options could limit this further.

In this situation there is 30" of unit space available - so 60 branch circuits could be monitored.
If monitoring the main three additional circuits could be monitored with a total of 63 circuits.

This requires two controllers and three 21 position racks using 15" of unit space.
- see below -

SEM3 space varies by number of circuits monitored - this uses unit space.

== > 6" of space for up to 21 circuits monitored
one controller and one 21-pos rack

== > 9" of space for up to 42 circuits monitored
one controller and two 21-pos racks

== > 12" of space for up to 45 circuits monitored
one controller and two 21-pos racks plus one 3-pos rack

== > 15" of space for up to 63 circuits monitored
two controllers and three 21-pos racks

Note: If subfeed space is needed - it will take away from available unit space.

Panelboards

Type P2 Panelboard Standard Modifications and Additions

Selection

Box Size Additions for Optional Features

Options	Main Lugs				Main Breakers											
	125A	250A	400A	600A	125A Horiz. BL, BQD, ED, NGB	125A Horiz. CED	125A Vert. ED	225A Horiz. QJ	225A Vert. QJ	225A Horiz. FD	250A Vert. FD	250A Vert. CFD	400A JD	400A CJD	600A LD	600A CLD
***Min. Box Size**	**26"**	**32"**	**38"**	**38"**	**26"**	**32"**	**32"**	**32"**	**38"**	**38"**	**44"**	**50"**	**50"**	**62"**	**56"**	**62"**
200% Neutral (lug type)	0	0	6 (all)	6 (all)	0	0	0	N/A	0	N/A	0	0	0	0	0	0
Std. Lugs (100% Neut. PNL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CU Lugs (100% Neut. PNL)	6	6	6	0	N/A	N/A	0	N/A	0	N/A	0	0	0	0	0	0
Comp Lugs (100% Neut. PNL)	6	6	6	6	N/A	N/A	0	N/A	0	N/A	0	0	0	0	0	0
Feed-thru Standard Lugs	6	6	12	12	6	6	6	N/A	6	N/A	6	6	12	12	12	12
Feed-thru Cu Lugs	6	6	12	N/A	N/A	N/A	6	N/A	6	N/A	6	6	12	12	N/A	N/A
Feed-thru Comp Lugs	6	12	12	N/A	N/A	N/A	6	N/A	6	N/A	12	12	12	12	N/A	N/A
Subfeed Standard Lugs	0	6	6	N/A	—	—	—	—	—	—	—	—	N/A	—	—	—
Split Bus	6	6	6	6	6	6	6	N/A	6	N/A	6	6	6	6	6	6
(1) FD Subfeed (Horizontal Mtg.)	N/A	12	12	12	N/A	N/A	N/A	N/A	N/A	12	12	12	12	12	12	12
(2) FD Subfeed (Vertical Mtg.)	N/A	24	24	24	N/A	N/A	N/A	N/A	N/A	24	24	24	24	N/A	N/A	N/A
SPD	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Split bus is paired with feed-thru lugs by default. Feed-thru lugs are to feed the section after the split.

NOTE: N/A = OPTION NOT AVAILABLE

*Min. Box Size, corresponding to 9" of Unit Space.

Compression Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Box Height Addition
MLO	125	N/A	(1)#6 - 350 kcmil Al/Cu	6
	250	N/A	(1)#6 - 350 kcmil Al/Cu	6
	400	N/A	(1) 400 - 600 kcmil Cu or (2)#6 - 350 kcmil Al/Cu	6
	600	N/A	(2)#6 - 350 kcmil Cu or Cu/Al or 400 - 600 kcmil Al/Cu	6
Main Breaker	100	ED4, ED6, HED4 HHED6, CED6①	(1)#14-2/0 AWG Cu or Al	Box must go to 24" wide on CED6 breaker only Add 6" to box height for NØ
	225	QJ2, QJH2, QJ2H	(1)#6 AWG - 350 kcmil Cu or Al	Box must go to 24" wide
	250	FXD6, HFD6, CFD6	(1)#6 AWG - 350 kcmil Cu or Al	Box must go to 24" wide for all breakers Requires an additional 6.0" box height
	400	JD6, JXD6, HJD6, CJD6, SJD6, SHJD6, SCJD6	(2)#1/0 AWG - 500 kcmil Cu or Al	9
	600	LD6, LXD6, HLD6, CJD6, SLD6, SHLD6, SCLD6	(2)#2/0 AWG - 500 kcmil Cu or Al	6

Alternate Lugs

Style	Amp Rating	Breaker Type	Standard AL Connectors	Box Height Addition
MLO	400	N/A	(1) 250 - 750 kcmil or (2)#3/0 AWG - 250 kcmil Cu or Al	6
Main Breaker	400	JD6, JXD6, HJD6, CJD6, SJD6, SHJD6, SCJD6	(1)#4/0 AWG - 750 kcmil Cu or Al	6

① Not availabe for feed thru lug.

Enclosure Modifications

Description
20" Panel Width
NEMA 3R enclosures
NEMA 3R/12 enclosures
Gasket between trim and box (Type 1)
24" Panel Width
NEMA 3R enclosures
NEMA 3R/12 enclosures
Gasket between trim and box (Type 1)

NEMA-4 for Type P2
Water Tight, Dust Tight, Steel Enclosure
(consult plant for actual enclosure size and for anything larger than 44")

Box Height (inches)	Enclosure Size		
	H	W	D
32	32	20	5.75
38	38	20	5.75
44	44	20	5.75

NEMA-4X for Type P2
Water Tight, Dust Tight and Corrosion Resistant
(consult plant for actual enclosure size)

Catalog Number	Enclosure – Stainless Steel Size (inches)		
	H	W	D
B4X26	26	20	5.75
B4X32	32	20	5.75
B4X38	38	20	5.75
B4X44	44	20	5.75
B4X56	56	20	5.75
B4X62	62	20	5.75
B4X68	68	20	5.75
B4X74	74	20	5.75

Enclosure – Fiberglass Size (inches)		
H	D	W
36	30	8
48	36	12

Panelboards

Type P2 Panelboard Kits and Accessories

Selection

Standard Enclosures

Box Height Inches	Catalog Number				
	Type 1 Standard Trim				
	Box	Surface	Flush	Type 3R	Type 3R/12
26	**B26**	**S26B**	**F26B**	**NR26**	**WP26**
32	**B32**	**S32B**	**F32B**	**NR32**	**WP32**
38	**B38**	**S38B**	**F38B**	**NR38**	**WP38**
44	**B44**	**S44B**	**F44B**	**NR44**	**WP44**
50	**B50**	**S50B**	**F50B**	**NR50**	**WP50**
56	**B56**	**S56B**	**F56B**	**NR56**	**WP56**
62	**B62**	**S62B**	**F62B**	**NR62**	**WP62**
68	**B68**	**S68B**	**F68B**	**NR68**	**WP68**
74	**B74**	**S74B**	**F74B**	**NR74**	**WP74**

Options For Type 1 Trims

Items must be ordered as manual line item on Spartanburg
Hinged trim – Replace “B” suffix with “H”
Door-in-door – Replace “B” suffix with “D”
Screw to Box - Replace "B" suffix with "C"
Metal card holder - Add "M" suffix on all trims

Option For 24" Wide Enclosures with Equal Gutter on Both Sides (Excludes NEMA 3R)

24" wide with equal gutter on both sides - Add “24” as prefix

Breaker Kits and Accessories

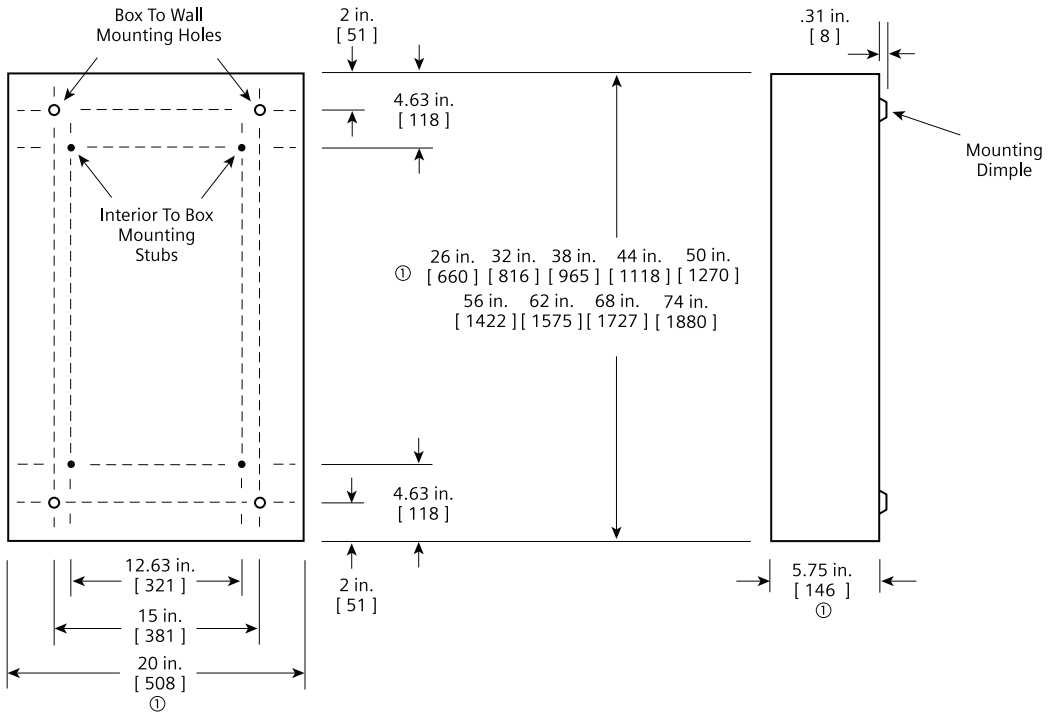
Kit Number	Description	Contents
BBKB32	BL/BQD 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKED32	ED 6-pole 3" branch breaker kit	Kit contains breaker support, inter-phase barriers, (3) A/C connectors, (1) B connector, hardware
BBKNB32	NGB 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKQ1	QJ branch breaker kit for 2 and 3-pole single mount	Kit to contain all connectors and cover plates necessary to mount both 2 and 3-pole breakers
DFK1	BL, BQD, ED deadfront kit for 1" pole breakers	Center strips 3", 6", 9", 15", 21" plus mounting hardware
DFFP3	Deadfront filler 3"	3" empty space filler and hardware
DFFP6	Deadfront filler 6"	6" empty space filler and hardware
BNK2	Branch neutral (P2)	Three tier lug with mounting hardware to increase neutral capacity
P2BK1	P2 250A max. Bonding Kit	Bonding strap and hardware
P2BK2	P2 400A max. Bonding Kit	Bonding strap and hardware
P2BK3	P2 600A max. Bonding Kit	Bonding strap and hardware

Type P1, P2, and P3 Panelboards

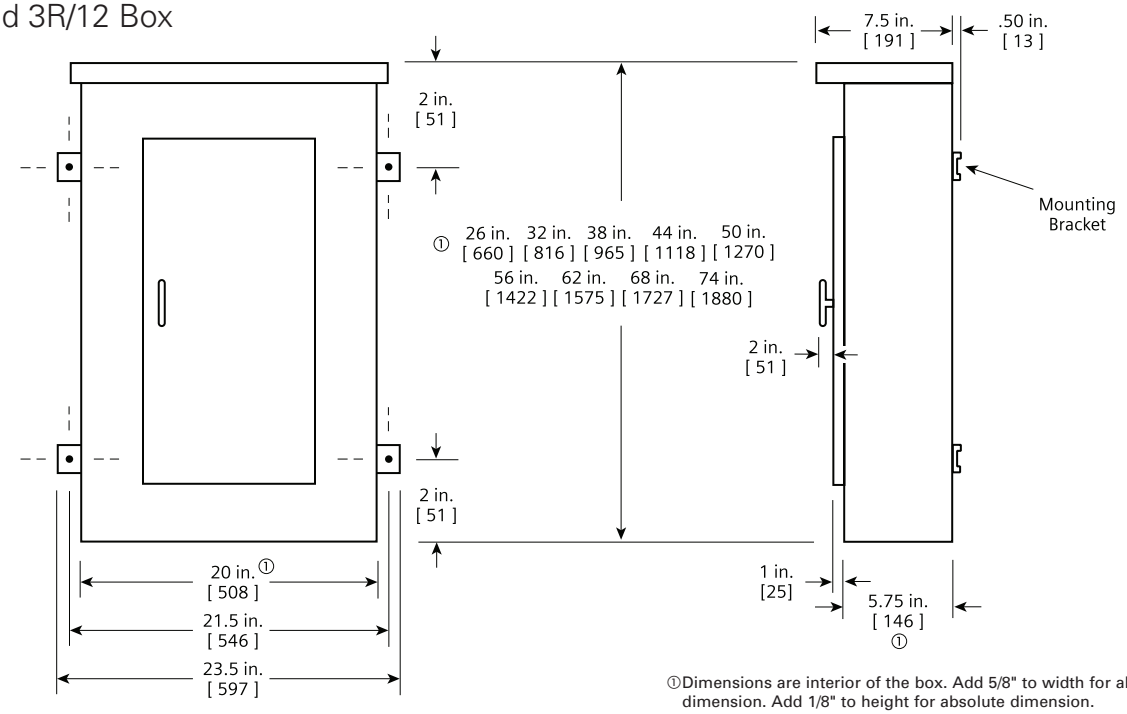
Miscellaneous Parts and Accessories

Catalog Number	Description	Catalog Number	Description
EGK	Al Ground Bus 44 Connections	**NBK6**	Number Strips 86-168
P2BK1	P2 250A Bonding Kit	**NBK7**	Number Strips 169-210
P2BK2	P2 400A Bonding Kit	**NBK8**	Number Strips 211-252
P2BK3	P2 600A Bonding Kit	**ECGK**	Cu Ground Bus 44 Connections
IMK1	Interior Adjusting Kit	**IGK**	Insulated Al Ground Bus
11-1824-01	Directory Card Holder	**ICGK**	Insulated Cu Ground Bus
12-1110-01	Directory Card	**EWK1**	End Wall Kit with Knockouts (20" W x 5.75" DP)
11-1056-01	NEMA Instruction Book	**EWK2**	End Wall Kit with Knockouts (24" W x 7.75" DP)
NBK3	Number Strips 1-42	**QF3**	Filler Plate
NBK4	Number Strips 43-84	**EBF1**	NEB/HEB Filler Plate
NBK5	Number Strips 85-126		

Type 1 Box
Box is symmetrical



Type 3R and 3R/12 Box



①Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.
Dimensions shown in inches and millimeters [ ].

Features

Another innovation from Siemens is the P3 panel. It is a smaller, footprint distribution panel to fit a large number of applications that require more (or larger) branch devices than the lighting panel class offer. This panel offers a wide array of factory-assembled options, and has the ability to mix breaker frames in unit space up to 250 amps. Bussing options for the P3 vary from the standard temperature aluminum to temperature rated copper, 750 A/Si aluminum, and 1000A/Si copper designs. All bussing in the P3 panel is tin-plated as a standard. Silver-plated copper is offered as an option on a copper bus. Integrated time clocks, bus mounted contactors, as mains or sub mains, split bus and subfeed lugs (up to 400 amp) are just a few of the options of this unique panel.

The P3 panel configurations, defined by the unit space, allow for a given amperage, main device, and box height. The P3 panel starts with a 56" high box. Breaker unit space can be mixed and matched to meet customer requirements. All 1" pole breakers (BL, BQD, ED frames) are mounted in 3" or 6" pole increments. Breakers frames, above 125 amps, are mounted in 6" single or twin breaker mountings. As an example panel, FD 250 amp and JD 400 amp breakers are mounted as subfeed breakers outside of unit space.

Like other distribution panels, the P3 panel can have blank space added into the panel to allow for future expansions or modifications. Any expansions or modifications must be in 3" increments. BL, BQD and ED frame breakers have 3" or 6-pole kits and can be mixed in unit space by these increments. Breakers of the same frame can cross from one mounting to another if contiguous. QJ frame breakers are mounted in 6" increments for two and three pole single and twin mounted units. Changes in the unit space length for BL, BQD, or ED frame breakers require an additional deadfront center strip kit. Check with sales or the factory for additional unit space kits.

Main Lug/Main Breaker

Enclosure – Standard Type 1 enclosure is 24" wide x 7.75" deep. X Box Height is determined by main device and unit space. See charts for box height.

Voltage – 600V AC max.
250V DC max.

Amperage – 800 amp max.

Short Circuit Rating – 200 Kaic max. symmetrical or equal to the lowest rated device installed unless a series rating is indicated. Panels with subfeed or feed-thru lugs without a main device, circuit breaker or fusible unit, are limited to a three-cycle rating. The three-cycle rating for the P3 panel is limited to 22 Kaic. Note that the main device may be mounted remote from the panel.

Bussing – The P3 panel has more options to meet market requirements. The standard bussing is temperature rated aluminum. The rating is per the requirements of UL 67 – the standard for panelboards. All aluminum bussing is tin-plated. Optional bussing for the P3 panel is: 750 A/si aluminum, temperature rated copper, and 1000 A/si copper. The copper bus option for this panel is tin-plated.

Weight – Approximate
Total panelboard weight when filled with a normal quantity of breakers and accessories is about 5 lbs. (1 kg) per inch (54g per mm) of box height.

Gauge Steel of Boxes Fronts, Surface & Flush

Dimensions in inches (mm)		Gauge Steel	
Width	Height	Box	Front
24" (610)	56 - 80" (1422, 2032)	#16	#14

Panel Unit Space To Box Height Requirements

"B" Dimension Box Height	P3 Panels With Standard Line Lugs. Unit Space (starting with 9" and adding 6" increments) "A" Dimension										
	Main Lugs				Main Breakers						
	250A	400A	600A	800A	250A Horiz. FD	250A Vert. FD	250A CFD	400A JD	400A CJD	600A LD	600A CLD
56	27	21	21	21	21	15	9	9	—	9	—
62	33	27	27	27	27	21	15	15	9	15	9
68	39	33	33	33	33	27	21	21	15	21	15
74	45	39	39	39	39	33	27	27	21	27	21
80	45	45	45	45	45	39	33	33	27	33	27

Main Breaker Wire Bending

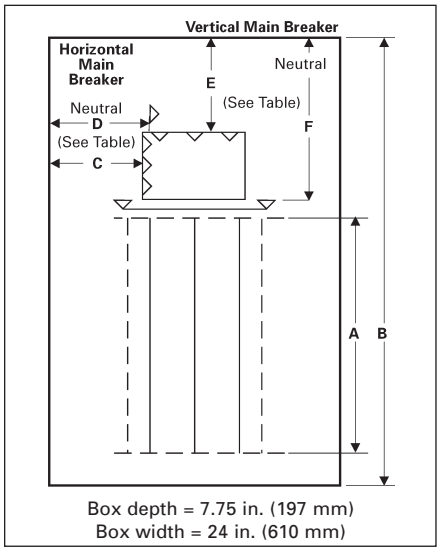
Breaker Frame	C	E	F
FD Horiz.	7.25	—	20.13
FD Vert.	—	12.25	25.38
CFD	—	13.63	31.38
JD	—	15.63	29.38
CJD	—	14.75	35.38
LD	—	14.75	29.38
CLD	—	14.00	35.38

Main Lug Wire Bending

Panel Amps	Standard Connectors	C	D
250	(1) #6 AWG - 350 kcmil	10.75 ①	13.50
400	(2) #3/0 AWG - 250 kcmil or (1) 600 kcmil	16.00	17.88
600	(2) #3/0 AWG - 500 kcmil	16.00	17.88
800	(2) 600 kcmil	16.00	17.88

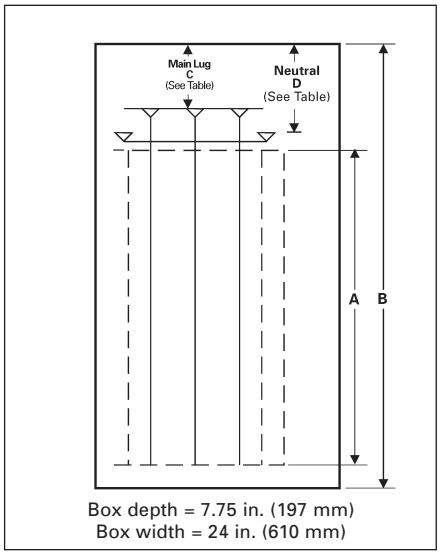
① This lug is removable.

Main Breaker Wire Bending Diagram



Main Breaker Wire Bending

Main Lug Wire Bending Diagram



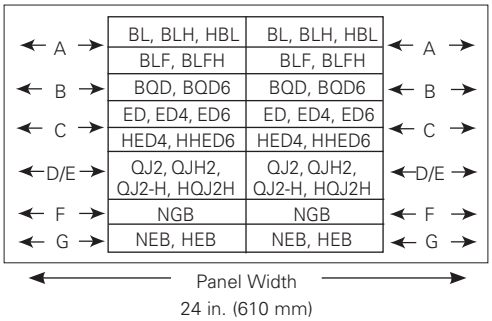
Main Lug Wire Bending

Branch Breaker Side Gutters Inches (mm)

Reference Letter	Panel Width 24" (609)
A	7.750 (197)
B	7.125 (181)
C	6.000 (152)
D①	7.000 (178)
E	5.000 (127)
F	6.625 (168)
G	5.750 (144)

① Single branch mounting construction.

Branch Breaker Wire Bending Diagram



Branch Breaker Side Gutters

Alternate Main Breakers

Ampere Rating	Breaker Type	Maximum Interrupting Rating (kA)			Ref. Catalog Number	Available Configurations②			Available Trip Values
		240V	480V	600V		240V AC	480V AC	600V AC	
250	FD6	65	35	18	**FD**	**STD**	**STD**	**STD**	70, 80, 90, 100, 110, 125, 150, 200, 225, 250
	FXD6	65	35	18	**FX**	**STD**	**STD**	**STD**	70, 80, 90, 100, 110, 125, 150, 200, 225, 250
	HFD6	100	65	25	**HF**	**ADD**	**ADD**	**ADD**	70, 80, 90, 100, 110, 125, 150, 200, 225, 250
	HFXD6	100	65	25	**H2**	**ADD**	**ADD**	**ADD**	70, 80, 90, 100, 110, 125, 150, 200, 225, 250
	CFD6①	200	150	100	**CF**	**ADD**	**ADD**	**ADD**	70, 80, 90, 100, 110, 125, 150, 200, 225, 250
400	JXD6①	65	35	25	**JX**	**STD**	**STD**	**STD**	200, 225, 250, 300, 350, 400
	JD6①	65	35	25	**J6**	**STD**	**STD**	**STD**	200, 225, 250, 300, 350, 400
	HJXD6①	100	65	35	**H6**	**ADD**	**ADD**	**ADD**	200, 225, 250, 300, 350, 400
	HJD6①	100	65	35	**H5**	**ADD**	**ADD**	**ADD**	200, 225, 250, 300, 350, 400
	SJD6①	65	35	25	**SJ**	**ADD**	**ADD**	**ADD**	200, 300, 400
	SHJD6①	100	65	35	**S2**	**ADD**	**ADD**	**ADD**	200, 300, 400
	CJD6①	200	200	100	**CJ**	**ADD**	**ADD**	**ADD**	200, 300, 400
	SCJD6①	200	200	100	**SC**	**ADD**	**ADD**	**ADD**	200, 300, 400
600	LXD6①	65	35	25	**LX**	**STD**	**STD**	**STD**	450, 500, 600
	LD6①	65	35	25	**L6**	**STD**	**STD**	**STD**	250, 300, 350, 400, 450, 500, 600
	HLXD6①	100	65	35	**HL**	**ADD**	**ADD**	**ADD**	250, 300, 350, 400, 450, 500, 600
	HLD6①	100	65	35	**HO**	**ADD**	**ADD**	**ADD**	250, 300, 350, 400, 450, 500, 600
	SLD6①	65	35	25	**SL**	**ADD**	**ADD**	**ADD**	300, 400, 500, 600
	SHLD6①	100	65	35	**S6**	**ADD**	**ADD**	**ADD**	300, 400, 500, 600
	CLD6①	200	150	100	**CL**	**ADD**	**ADD**	**ADD**	300, 400, 500, 600
	SCLD6	200	150	100	**C6**	**ADD**	**ADD**	**ADD**	300, 400, 500, 600

① Vertically mounted
② STD = Standard configuration. ADD = Additional cost.

Branch Circuit Breakers

Max. Amp Rating	Bolt-On Breaker Type	Amps	Provisions for Maximum Interrupting Rating (kA)						
			120V AC	120/240V AC	240V AC	277V AC	480V AC	600V AC	250V DC
100	BL	15–60	10	—	—	—	—	—	—
		70	—	10	—	—	—	—	—
		80–100	—	—	10	—	—	—	—
	BLH	15–60	—	22	—	—	—	—	—
		70	—	22	—	—	—	—	—
		80–100	—	—	22	—	—	—	—
	HBL	15–55	—	65	—	—	—	—	—
		60–100	—	—	65	—	—	—	—
	BL, (HID)	15–30	10	—	—	—	—	—	—
	BLR (240V)	15–60	—	—	10	—	—	—	—
		70–100	—	—	10	—	—	—	—
	BLE (GFCI)	15–30	10	—	—	—	—	—	—
		40–60	—	10	—	—	—	—	—
	BLEH (GFCI)	15–30	22	—	—	—	—	—	—
		15–60	—	22	—	—	—	—	—
	BLF (GFCI)	15–30	10	—	—	—	—	—	—
		40–60	—	10	—	—	—	—	—
	BLHF (GFCI)	15–30	22	—	—	—	—	—	—
		40–60	—	22	—	—	—	—	—
	BGL①	15–30	10	—	—	—	—	—	—
	BAF	15–20	10	—	—	—	—	—	—
	BAFH	15–20	22	—	—	—	—	—	—
	BQD	15–60	—	65	—	—	14	—	14
		70–100	—	—	65	—	14	—	14
125	NGB	15–60	100	100	100	25	25	—	14
		70–100	100	100	100	25	25	—	14
		110–125	100	100	100	25	25	—	14
	NEB	15–60	85	85	85	35	35	22	35
		70–100	85	85	85	35	35	22	35
		110–125	85	85	85	35	35	22	35
	HEB	15–60	100	100	100	65	65	25	42
		70–100	100	100	100	65	65	25	42
		110–125	100	100	100	65	65	25	42
	ED4	15–60	65	—	—	22	—	—	—
		70–100	—	—	65	—	18	—	30
		110–125	—	—	65	—	18	—	—
	ED6	15–60	—	—	65	—	25	18	30
		70–100	—	—	65	—	25	18	—
		110–125	100	—	—	—	—	—	—
	HED4	15–60	100	—	—	—	—	—	—
		70–100	—	—	—	65	—	—	—
		110–125	—	—	—	65	—	—	—
	HHED6	15–60	—	—	100	42	42	—	30
		70–100	—	—	100	42	42	—	30
		110–125	—	—	100	—	42	—	—
225	QJ2	60–225	—	—	10	—	—	—	—
	QJH2	60–225	—	—	22	—	—	—	—
	QJ2H	60–225	—	—	42	—	—	—	—
	HQJ2H	60–225	—	—	100	—	—	—	—

Subfeed Breakers (available in 2-pole or 3-pole)

Breaker Type	Mounting Position When Used as Subfeed Breaker	Ampere Ratings For Load	Maximum Interrupting Rating (kA) Symmetrical		
	Vertical		240V AC	480V AC	600V AC
FD6②, FXD6	Twin	70–250	65	35	18
HFD6②, HFXD6	Twin	70–250	100	65	25
JD6③, JXD6	Single	200–400	65	35	25
HJD6③, HJXD6	Single	200–400	100	65	35

Neutral Connectors

Wire Range	Max. Number of Connections	Max. Amps⑤
#14-#1/0	44	125
#4 - 350 kcmil	6	250
(1)#4 - 600 kcmil or (2)#6 - 250 kcmil	1	400

Branch Device Limitations

In areas where 2008 NEC has not been adopted, some limitation may apply for panels used in systems requiring neutral connections. By application rule (480.14 in all versions of the NEC prior to 2008), lighting and appliance panels are limited to 42 installed circuits. Each overcurrent device pole counts as a circuit.

NOTE: QJ Breakers are twin mounted in unit space and take 6" of unit space. Limited to (6) per panel max. BL, HBL, BLH and BQD breakers are mounted in common mountings in 3" or (6) pole increments. ED2, ED4, ED6, HED4 and HHED6 breakers are mounted in common mountings in 3" or (6) pole increments.

① BGL 2-pole is (1) phase and neutral 3-pole is (2) phases and neutral.

② Twin mounted subfeed breakers are mounted at bottom of panelboard only and adds 24" to the panel height.

③ Subfeed breaker is mounted at bottom of panelboard only. 400 amp subfeed breaker adds 30" to the panel height.

Panelboards

Type P3 Panelboards

Typical Catalog Numbers

Main Lugs Only – shown with aluminum bus, top fed, and surface trims

Maximum Panel Amp Rating	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V or 250V DC Max. 1-Phase, 3-Wire Catalog Number
250	27	P3C56ML250ATS	P3B56ML250ATS	P3A56ML250ATS
	33	P3C62ML250ATS	P3B62ML250ATS	P3A62ML250ATS
	39	P3C68ML250ATS	P3B68ML250ATS	P3A68ML250ATS
	45	P3C74ML250ATS	P3B74ML250ATS	P3A74ML250ATS
	51	P3C80ML250ATS	P3B80ML250ATS	P3A80ML250ATS
400	21	P3C56ML400ATS	P3B56ML400ATS	P3A56ML400ATS
	27	P3C62ML400ATS	P3B62ML400ATS	P3A62ML400ATS
	33	P3C68ML400ATS	P3B68ML400ATS	P3A68ML400ATS
	39	P3C74ML400ATS	P3B74ML400ATS	P3A74ML400ATS
	45	P3C80ML400ATS	P3B80ML400ATS	P3A80ML400ATS
600	21	P3C56ML600ATS	P3B56ML600ATS	P3A56ML600ATS
	27	P3C62ML600ATS	P3B62ML600ATS	P3A62ML600ATS
	33	P3C68ML600ATS	P3B68ML600ATS	P3A68ML600ATS
	39	P3C74ML600ATS	P3B74ML600ATS	P3A74ML600ATS
	45	P3C80ML600ATS	P3B80ML600ATS	P3A80ML600ATS
800	21	P3C56ML800ATS	P3B56ML800ATS	P3A56ML800ATS
	27	P3C62ML800ATS	P3B62ML800ATS	P3A62ML800ATS
	33	P3C68ML800ATS	P3B68ML800ATS	P3A68ML800ATS
	39	P3C74ML800ATS	P3B74ML800ATS	P3A74ML800ATS
	45	P3C80ML800ATS	P3B80ML800ATS	P3A80ML800ATS

Maximum Panel Amp Rating	Unit Space (inches)	240V 3-Phase, 3-Wire Catalog Number	408Y/277V 3-Phase, 4-Wire Catalog Number	480V① 3-Phase, 3-Wire Catalog Number
250	27	P3D56ML250ATS	P3E56ML250ATS	P3F56ML250ATS
	33	P3D62ML250ATS	P3E62ML250ATS	P3F62ML250ATS
	39	P3D68ML250ATS	P3E68ML250ATS	P3F68ML250ATS
	45	P3D74ML250ATS	P3E74ML250ATS	P3F74ML250ATS
	51	P3D80ML250ATS	P3E80ML250ATS	P3F80ML250ATS
400	21	P3D56ML400ATS	P3E56ML400ATS	P3F56ML400ATS
	27	P3D62ML400ATS	P3E62ML400ATS	P3F62ML400ATS
	33	P3D68ML400ATS	P3E68ML400ATS	P3F68ML400ATS
	39	P3D74ML400ATS	P3E74ML400ATS	P3F74ML400ATS
	45	P3D80ML400ATS	P3E80ML400ATS	P3F80ML400ATS
600	21	P3D56ML600ATS	P3E56ML600ATS	P3F56ML600ATS
	27	P3D62ML600ATS	P3E62ML600ATS	P3F62ML600ATS
	33	P3D68ML600ATS	P3E68ML600ATS	P3F68ML600ATS
	39	P3D74ML600ATS	P3E74ML600ATS	P3F74ML600ATS
	45	P3D80ML600ATS	P3E80ML600ATS	P3F80ML600ATS
800	21	P3D56ML800ATS	P3E56ML800ATS	P3F56ML800ATS
	27	P3D62ML800ATS	P3E62ML800ATS	P3F62ML800ATS
	33	P3D68ML800ATS	P3E68ML800ATS	P3F68ML800ATS
	39	P3D74ML800ATS	P3E74ML800ATS	P3F74ML800ATS
	45	P3D80ML800ATS	P3E80ML800ATS	P3F80ML800ATS

① For 600V, change "F" in position 3 to "G." Price only branch breakers with 600V ratings.

Typical Catalog Numbers

Main Circuit Breaker – shown with aluminum bus, top fed, and surface trims

Maximum Panel Amp Rating	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V or 250V DC Max 1-Phase, 3-Wire Catalog Number
250	21	P3C56FD250ATS	P3B56FD250ATS	P3A56FD250ATS
	27	P3C62FD250ATS	P3B62FD250ATS	P3A62FD250ATS
	33	P3C68FD250ATS	P3B68FD250ATS	P3A68FD250ATS
	39	P3C74FD250ATS	P3B74FD250ATS	P3A74FD250ATS
	45	P3C80FD250ATS	P3B80FD250ATS	P3A80FD250ATS
400	9	P3C56JD400ATS	P3B56JD400ATS	P3A56JD400ATS
	15	P3C62JD400ATS	P3B62JD400ATS	P3A62JD400ATS
	21	P3C68JD400ATS	P3B68JD400ATS	P3A68JD400ATS
	27	P3C74JD400ATS	P3B74JD400ATS	P3A74JD400ATS
	33	P3C80JD400ATS	P3B80JD400ATS	P3A80JD400ATS
600	9	P3C56LD600ATS	P3B56LD600ATS	P3A56LD600ATS
	15	P3C62LD600ATS	P3B62LD600ATS	P3A62LD600ATS
	21	P3C68LD600ATS	P3B68LD600ATS	P3A68LD600ATS
	27	P3C74LD600ATS	P3B74LD600ATS	P3A74LD600ATS
	33	P3C80LD600ATS	P3B80LD600ATS	P3A80LD600ATS

Maximum Panel Amp Rating	Unit Space (inches)	240V 3-Phase, 3-Wire Catalog Number	408Y/277V 3-Phase, 4-Wire Catalog Number	480V① 3-Phase, 3-Wire Catalog Number
250	21	P3D56FD250ATS	P3E56FD250ATS	P3F56FD250ATS
	27	P3D62FD250ATS	P3E62FD250ATS	P3F62FD250ATS
	33	P3D68FD250ATS	P3E68FD250ATS	P3F68FD250ATS
	39	P3D74FD250ATS	P3E74FD250ATS	P3F74FD250ATS
	45	P3D80FD250ATS	P3E80FD250ATS	P3F80FD250ATS
400	9	P3D56JD400ATS	P3E56JD400ATS	P3F56JD400ATS
	15	P3D62JD400ATS	P3E62JD400ATS	P3F62JD400ATS
	21	P3D68JD400ATS	P3E68JD400ATS	P3F68JD400ATS
	27	P3D74JD400ATS	P3E74JD400ATS	P3F74JD400ATS
	33	P3D80JD400ATS	P3E80JD400ATS	P3F80JD400ATS
600	9	P3D56LD600ATS	P3E56LD600ATS	P3F56LD600ATS
	15	P3D62LD600ATS	P3E62LD600ATS	P3F62LD600ATS
	21	P3D68LD600ATS	P3E68LD600ATS	P3F68LD600ATS
	27	P3D74LD600ATS	P3E74LD600ATS	P3F74LD600ATS
	33	P3D80LD600ATS	P3E80LD600ATS	P3F80LD600ATS

① For 600V, change "F" in position 3 to "G." Price only branch breakers with 600V ratings.

Enclosures

Extra Gutter to Sides or Ends of the Can (Type 1 Only)

Description
6" end gutter 2" side gutter Barrier in gutter (add to extra gutter price – min 4" required)
Hinged trims Piano hinged trims Door-in-door trims Screw to the box trims
Trim mounted devices . . . . . See page 11-80 • Pilot lights • Toggle switches • Push buttons
Painted boxes . . . . . See page 11-80 Custom colors . . . . . See painted boxes Increase gauge trims and boxes . . . . . See page 11-80 Stainless steel trims, Type 1 . . . . . See page 11-80

Meters
(Contact sales for pricing and application engineering for space requirements)

Panel Skirts See page 11-81

Special Locks

TEY
TEU1
Cat 60
LL803
LL806
Yale 47 (NYC)
National C413A
Best Lock 7-pin tumbler
Southco 1/4" Fastener
Corbin 1001 FAB7

Panel Bus Modifications

Main Bus	Catalog Number Addition Amperes Ratings			
	125A	250A	400A	600A
750 A/Sl AL.	B	B	B	B
Copper (tin pltd.)	F	F	F	F
Copper (silver pltd.)	E	E	E	E
1000 A/Sl Copper (tin pltd.)	G	G	G	G
1000 A/Sl Copper (silver pltd.)	H	H	H	H

Subfeed, Feed-Thru and Split Bus (for 2-pole or 3-pole)

Ampere Rating	Connector Cu/Al Wire Range

Subfeed (Double) Lugs for Main Lug Panelboards Only

225/250	(2)—#6 AWG-350 kcmil
400	(2)—250 kcmil (1)—600 kcmil

Feed-Thru Lugs — Cannot Be Used in Conjunction with TVSS or Subfeed Breakers
See page 11-43 for unit space adders and compatibility with other options.

225/250	(1)—#6 AWG-350 kcmil
400	(2)—250 kcmil (1)—600 kcmil
600	(2)—250-500 kcmil
800	(2)—600 kcmil

Split Bus (1 per interior)

225/250	(1)—#6 AWG-350 kcmil
400	(2)—250 kcmil (1)—600 kcmil
600	(2)—250-500 kcmil
800	(2)—600 kcmil

Branch and Main Breaker Accessories

See page 11-78 and Breaker Section
• Handle blocks
• Handle locks
• Aux. Contacts①
• UVR①

Increase capacity neutral up to 200%

Main Bus Amps
125
250
400
600

See page 11-43 for unit space adders and compatibility with other options.

Copper MLO Only

Main Bus Amps
125
250
400
600

(Devices mounted and wired to the trim should also have hinged trim specified)

Bus mounted SPD
See Section 10 for TPS1

Service Entrance Label

Type P3 Panelboards are factory labeled suitable for use as service entrance equipment when NEC requirements are met. A panelboard cannot have more than six main disconnects, unless it is a lighting and appliance branch panelboard. Lighting and appliance branch panelboards are limited to two main disconnects.

Grounding of Panelboards

Ground Bars except for brazed to box are shipped with the panel interior factory mounted.
• Non-Insulated Equipment Ground Bar
• Copper Non-Insulated Ground Bar
• Al Insulated Equipment Ground Bar
• Cu Insulated Equipment Ground Bar
• Ground Bar Brazed to Box (recommended for painted boxes)

Shunt Trip on Main or Branch

BL, BLH, HBL, BQD, ED4, HED4, ED6, HED6, HHED6, QJ2, QJ2H, QJH2, HQJ2H as branch only. BL, BLH, HBL, NGB, ED2, ED4, HED4, ED6, HED6, HHED6 uses 1" unit space for shunt trip. All others may be used on mains or subfeeds.

Time Clocks

Time clocks may be mounted in a 23" enclosure to be cable connected to the panel. Sangamo, Tork or Paragon time clock can be supplied and mounted in panelboard cabinet. Adds 12" to panel height. Mounts in Sub-area.

Description
Time Clock (1 or 2-pole, single or double throw contacts; 3-pole, single throw) 277V maximum with plain dial
Astronomical dial
An omitting device
Reserve power or carryover
Space and mounting provisions only

① Accessories on 1" pole breakers (BL, BQD, ED) will take unit space.

Option Combinations

Amps	Incoming	Subfeed Lugs	Feed-thru Lugs	FD① Subfeed	JD① Subfeed	FD② Subfeeds	200% Neutral	Min. Box Size (in.)	Unit Space (in.)
250	Main Lug Only	—	•	—	—	—	•	56	27
			—	•	—	—	•	56	15
			—	—	—	•	•	56	9
	Main Lugs w/Subfeed Lugs	•	•	—	—	—	•	56	21
			—	•	—	—	•	56	21
			—	—	—	•	•	62	9
	Main Breaker (Horiz. FD)	—	•	—	—	—	•	56	21
			—	•	—	—	•	56	9
	Main Breaker (Vert. FD)	None Std.	•	—	—	—	•	56	15
	Main Breaker (CFD)	None Std.	•	—	—	—	•	56	9
			—	•	—	—	•	68	9
400②③	Main Lug Only	•	—	—	—	—	•	56	21
		—	•	—	—	—	•	56	15
		—	—	•	—	—	•	56	9
		—	—	—	•	—	•	56	9
		—	—	—	—	•	•	62	9
	Main Breaker (JD)	None Std.	—	—	—	—	•	56	9
			•	—	—	—	•	62	9
			—	•	—	—	•	68	9
			—	—	•	—	•	68	9
			—	—	—	•	•	74	9
	Main Breaker (CJD)	None Std	—	—	—	—	•	62	9
			•	—	—	—	•	74	9
			—	•	—	—	•	74	9
			—	—	•	—	•	74	9
			—	—	—	•	•	80	9
600②③	Main Lug Only	—	—	—	—	—	•	56	21
			•	—	—	—	•	56	15
			—	•	—	—	•	56	9
			—	—	•	—	—	56	9
			—	—	—	•	•	62	9
	Main Breaker LD	—	—	—	—	—	•	56	9
			•	—	—	—	•	62	9
			—	•	—	—	•	68	9
			—	—	•	—	—	68	9
			—	—	—	•	•	74	9
	Main Breaker CLD	—	—	—	—	—	•	62	9
			•	—	—	—	•	68	9
			—	•	—	—	•	74	9
			—	—	•	—	—	74	9
			—	—	—	•	•	80	9
800②③	Main Lug Only	—	—	—	—	—	•	56	21
			•	—	—	—	•	56	9
			—	•	—	—	•	56	9
			—	—	•	—	—	56	9
			—	—	—	•	•	62	9

① Subfed lugs are currently not offered as standard with main circuit breakers.
② Subfed lugs on panels above 400A are not standard.
③ 200% neutral cannot be provided along with a 400A subfeed breaker because the breaker blocks the 4th lug site.

Compression Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Box Height Addition
MLO	250	N/A	(1)#6 AWG - 350 kcmil	—
	400	N/A	(1) 250 - 500 kcmil or (2)# 1/0 AWG - 250 kcmil	— —
	600	N/A	(2)#3/0 AWG - 500 kcmil	—
	800	N/A	(2) 400-750 kcmil Cu only	—
Main Breaker	250	FXD6, HFD6, CFD6	(1)#6 AWG - 350 kcmil Cu or Al	CFD6 requires an additional 6.0" box height
	400	JD6, JXD6, HJD6, CJD6, SJD6, SHJD6, SCJD6	(2)#1/0 AWG - 500 kcmil Cu or Al	—
	600	LD6, LXD6, HLD6, CJD6, SLD6, SHLD6, SCLD6	(2)#2/0 AWG - 500 kcmil Cu or Al	—

Alternate Lugs

Style	Amp Rating	Breaker Type	Standard AL Connectors	Box Height Addition
MLO	400	N/A	(1) 250 - 750 kcmil or (2)#3/0 AWG - 250 kcmil Cu or Al	6
	800	N/A	(3) 500 kcmil	6
Main Breaker	400	JD6, JXD6, HJD6, CJD6, SJD6, SHJD6, SCJD6	(1)#4/0 AWG - 750 kcmil Cu or Al	6

Enclosure Modifications

24" Panel Width Description
NEMA 3R enclosures
NEMA 3R/12 enclosures
Gasket between trim and box (Type 1)

NEMA-4X For Type P3
Water Tight, Dust Tight and Corrosion Resistant
(consult plant for actual enclosure size and for NEMA 4 enclosures)

Box Height Inches	Enclosure – Stainless Steel		
	H	W	D
56	56	24	7.75
62	62	24	7.75
68	68	24	7.75
74	74	24	7.75
80	80	24	7.75

Standard Enclosures

Box Height (in.)	Catalog Number				
	Type 1 Standard Trim				
	Box	Surface	Flush	Type 3R	Type 3R/12
56	**24WD56**	**P3S56**	**P3F56**	**24NRD56**	**24WPD56**
62	**24WD62**	**P3S62**	**P3F62**	**24NRD62**	**24WPD62**
68	**24WD68**	**P3S68**	**P3F68**	**24NRD68**	**24WPD68**
74	**24WD74**	**P3S74**	**P3F74**	**24NRD74**	**24WPD74**
80	**24WD80**	**P3S80**	**P3F80**	**24NRD80**	**24WPD80**

Options For Type 1 Trims

Items must be ordered as manual line item on factory
Hinged trim – Add "H" suffix
Door-in-door – Add "D" suffix
Metal card holder – Add "M" suffix

Breaker Kits and Accessories

Kit Number	Description	Contents
BBKB32	BL/BQD 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKNB32	NGB 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKEB32	NEB/HEB 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKED32	ED 6-pole 3" branch breaker kit	Kit contains breaker support, inter-phase barriers, (3) A/C connectors, (1) B connector, hardware
BBKQ2	Branch breaker kit for 2 and 3-pole QJ twin mount	Kit contains all connectors and cover plates necessary to mount both 2 and 3-pole breakers
DFFP3	Deadfront filler 3"	3" empty space filler and hardware
DFFP6	Deadfront filler 6"	6" empty space filler and hardware
P3BK1	P3 bonding kit	Bonding strap and hardware
EBF1	HEB/NEB Filler Plate	Filler Plate

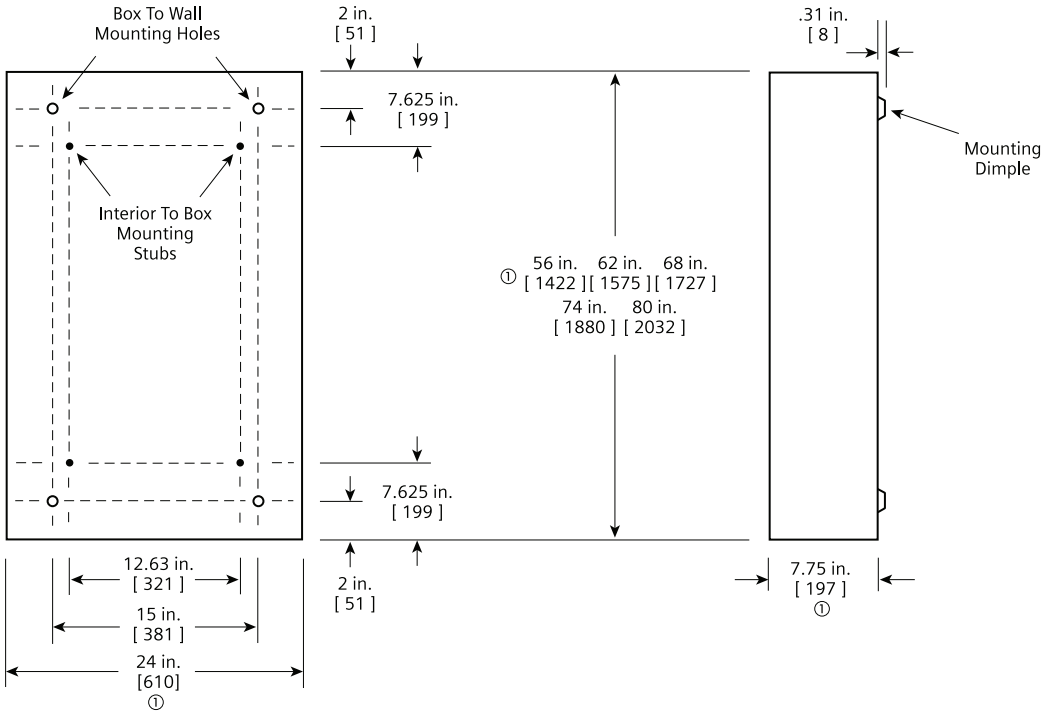
Type P1, P2, and P3 Panelboards

Miscellaneous Parts and Accessories

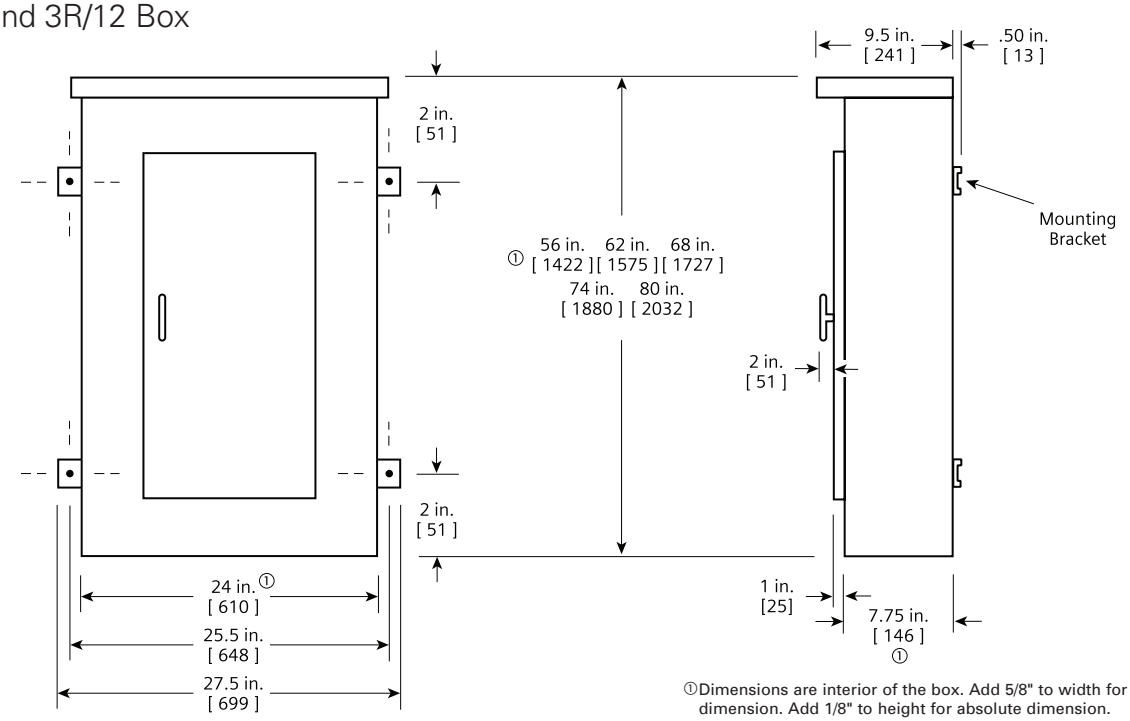
Catalog Number	Description
EGK	Al Ground Bus 44 Connections
BK1	Bonding kit for 250A max. and all P1 panels
IMK1	Interior Adjusting Kit
11-1824-01	Directory Card Holder
12-1110-01	Directory Card
11-1056-01	NEMA Instruction Book
NBK3	Number Strips 1-42. Snap-in type; Use w/P2 & P3 series Panels
NBK4	Number Strips 43-84. Snap-in type; Use w/P2 & P3 series Panels
NBK5	Number Strips 85-126. Snap-in type; Use w/P2 & P3 series Panels
NBK6	Number Strips 127-168. Snap-in type; Use w/P2 & P3 series Panels
NBK7	Number Strips 169-210. Snap-in type; Use w/P2 & P3 series Panels
NBK8	Number Strips 211-252. Snap-in type; Use w/P2 & P3 series Panels
ECGK	Cu Ground Bus 44 Connections
IGK	Insulated Al Ground Bus
ICGK	Insulated Cu Ground Bus
EWK2	End Wall Kit with Knockouts (24" W x 7.75" DP)
QF3	Filler Plate

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



①Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

Dimensions shown in inches and millimeters [ ].

Panelboards

Type P4 Panelboards

General

Features

The P4 panel is a medium sized footprint distribution panel to fit a large number of applications that require more or larger branch devices and higher amp ratings than the lighting panel class offers. Even with the increased capacity, this panel is a space saver with its 32" width and 10" depth. The P4 panel offers a wide array of factory-assembled options and has the ability to mix breaker frames in unit space up to 800 amps and fusible switches up to 200 amps. Bussing options for the P4 vary from the standard temperature rated aluminum to temperature rated copper and 750A/Si aluminum and 1000A/Si copper designs. All aluminum bussing in the P4 panel is tin-plated as a standard. Silver-plated is offered as the default for copper bus and tin as an option. Integrated time clocks, bus mounted contactors as mains or submains, split bus and subfeed lugs (up to 600 amp) are just a few of the options of this flexible panel.

The 3 panel configurations defined by the unit space allowed for a given amperage, main device and box height. The P4 panel starts with a 60" high box. All of the branch devices are unit space mounted. Breakers and switches can be mixed and matched to meet customer requirements.

Main Lug / Main Breaker

Enclosure – Standard Type 1 enclosure is 32" wide x 10" deep. X Box Height is determined by main device and unit space. See charts for box height.
Voltage – 600V AC max.
250V DC max.

Amperage – 400-800 amp main breaker or 400-1200 amp main lug only.

Short Circuit Rating – 200 KAIC max. symmetrical or equal to the lowest rated device installed unless a series rating is indicated. Panels with subfeed or feed-thru lugs without a main device, circuit breaker or fusible unit, are limited to a three-cycle rating. The three-cycle rating for the P4 panel is limited to 42 KAIC. Note that the main device may be mounted remote from the panel.

Bussing – The P4 panel has more options to meet market requirements. The standard bussing is temperature rated aluminum. The rating is per the requirements of UL 67 – the standard for panelboards. All aluminum bussing is tin-plated. Optional bussing for the P4 panel is: 750 A/Si aluminum, temperature rated copper, and 1000 A/Si copper. The copper bus option for this panel is silver-plated.

Weight – Approximate

Total panelboard weight when filled with a normal quantity of breakers and accessories is about 8 lbs. (1 kg) per inch (54g per mm) of box height.

Main Lugs①

Ampere Rating	Connectors Suitable for Copper or Aluminum
400	(1) - #3/0 AWG-500 kcmil
	(2) - #3/0 AWG-250 kcmil
600	(2) - #3/0 AWG-500 kcmil
800	(3) - #3/0 AWG-500 kcmil
1000	(4) - #3/0 AWG-500 kcmil
1200	(4) - #3/0 AWG-500 kcmil

① Alternate lugs for 750 kcmil cable are available, but result in significant loss of branch unit mounting space. Consult Siemens.

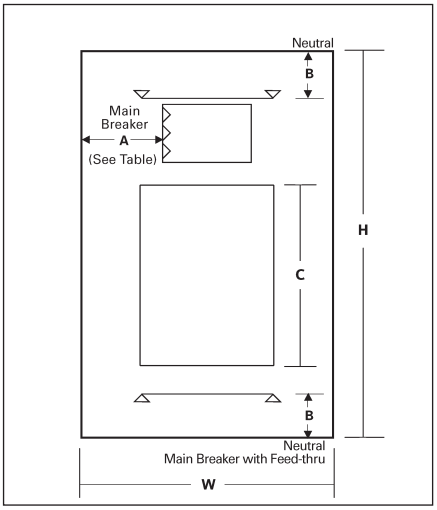
Gauge Steel of Boxes Fronts, Surface and Flush

Dimensions in inches (mm)		Gauge Steel	
Width	Height	Box	Fronts
32" (813)	60 - 75 - 90 (1524, 1905, 2286)	#16①	#14 (1 piece trim) #14 Ga (4 piece trim)

① Box has 16 gauge side panels and 12 gauge back support.

Enclosure Selection①

Enclosure Dimension in Inches (mm)			Available Circuit Space in Inches (mm) Dimension "C"	
H	W	D	Main Lug	Main Breaker
Type 1 and Type 3R/12			400-800A	400-800A
60 (1524)	32 (813)	10 (254)	30 (762)	21.25 (540)
75 (1905)	32 (813)	10 (254)	45 (1143)	36.25 (921)
90 (2286)	32 (813)	10 (254)	60 (1524)	51.25 (1302)



Main Breaker Unit Space Dimensions

Ampere Rating	Breaker Type	Breaker Family	Dimensions in Inches (mm)	
			A	B
400	JXD6, JD6, HJXD6, HJD6, HHJXD6, HHJD6	Sentron	10.425 (265)	13.125 (333)
400	NJ, HJ, LJ ②	VL	12.500 (318)	
400	SJD6, SHJD6	Sentron	10.425 (265)	
400	CJD6, SCJD6	Sentron	8.250 (210)	
600	LXD6, LD6, HLXD6, HLD6, HHLXD6, HHLD6	Sentron	10.425 (265)	
600	NL, HL, LL ②	VL	11.250 (286)	
600	SLD6, SHLD6	Sentron	10.425 (265)	
600	CLD6, SCLD6	Sentron	8.250 (210)	
800	NM, HM, LM	VL	10.500 (267)	

① Standard trim is four piece without door. Surface or flush one piece trim is available for 32 in. (813 mm) wide circuit breaker panel.
② Solid state (electronic) trip units only.

Panelboards

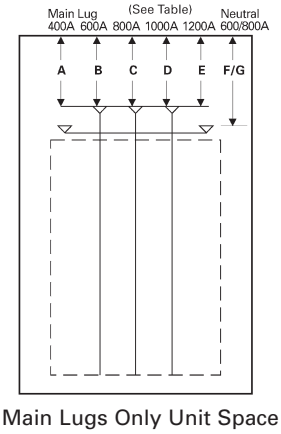
Type P4 Panelboards

Dimensions

Ampere Rating	Trip Type	Breaker Family	Frame Type	Maximum Interruption Rating (KAIC) 240V	480V	600V	Unit Space Requirements in Inches (mm)	Trip Amperage
400	Thermal Magnetic	Sentron	JXD6, JD6	65,000	35,000	25,000	8.75 (222)	200, 225, 250, 300, 350, 400
			HJXD6, HJD6	100,000	65,000	35,000	8.75 (222)	200, 225, 250, 300, 350, 400
			HHJXD6, HHJD6	200,000	100,000	50,000	8.75 (222)	200, 225, 250, 300, 350, 400
			CJD6	200,000	150,000	100,000	8.75 (222)	200, 225, 250, 300, 350, 400
	Electronic (Solid state)	VL	NJ	65,000	35,000	25,000	6.25 (159)	250, 400
			HJ	100,000	65,000	25,000	6.25 (159)	250, 400
			LJ	200,000	100,000	25,000	6.25 (159)	250, 400
		Sentron	SJD6	65,000	35,000	25,000	8.75 (222)	200, 300, 400
			SHJD6	100,000	65,000	35,000	8.75 (222)	200, 300, 400
			SCJD6	200,000	150,000	100,000	8.75 (222)	200, 300, 400
600	Thermal Magnetic	Sentron	LXD6	65,000	35,000	25,000	8.75 (222)	450, 500, 600
			LD6	65,000	35,000	25,000	8.75 (222)	250, 300, 350, 400, 450, 500, 600
			HLXD6, HLD6	100,000	65,000	35,000	8.75 (222)	250, 300, 350, 400, 450, 500, 600
			HHLXD6, HHLD6	200,000	100,000	50,000	8.75 (222)	250, 300, 350, 400, 450, 500, 600
			CLD6	200,000	150,000	100,000	8.75 (222)	250, 300, 350, 400, 450, 500, 600
	Electronic (Solid state)	VL	NL	65,000	35,000	25,000	6.25 (159)	400, 600
			HL	100,000	65,000	25,000	6.25 (159)	400, 600
			LL	200,000	100,000	25,000	6.25 (159)	400, 600
		Sentron	SLD6	65,000	35,000	25,000	8.75 (222)	300, 400, 500, 600
			SHLD6	100,000	65,000	35,000	8.75 (222)	300, 400, 500, 600
			SCLD6	200,000	150,000	100,000	8.75 (222)	300, 400, 500, 600
800	Thermal Magnetic	VL	NM	65,000	35,000	25,000	8.75 (222)	600, 700, 800
			HM	100,000	65,000	35,000	8.75 (222)	600, 700, 800
			LM	200,000	100,000	50,000	8.75 (222)	600, 700, 800
	Electronic (Solid state)	VL	NM	65,000	35,000	25,000	8.75 (222)	600, 800
			HM	100,000	65,000	35,000	8.75 (222)	600, 800
			LM	200,000	100,000	50,000	8.75 (222)	600, 800

Main Lugs Only Wire Bending Space

Lugs	Dimensions in inches (mm) Main Lug 400A A	600A B	800A C	1000A D	1200A E	Neutral 400-600A F	800-1200A G
Standard	16.500 (419)	16.750 (419)	15.969 (406)	15.969 (406)	15.969 (406)	13.125 (333)	13.125 (333)
Oversize	16.500 (419)	21.750 (552)	25.969 (660)	25.969 (660)	25.969 (660)	18.125 (460)	23.125 (587)
Crimp	19.187 (487)	18.250 (464)	18.687 (475)	18.250 (464)	18.250 (464)	15.937 (405)	15.937 (405)
Standard w/Subfeed	16.750 (425)	15.969 (406)	—	—	—	13.125 (333)	13.125 (333)
Standard w/Feed-thru	16.500 (419)	16.750 (419)	—	—	—	13.125 (333)	13.125 (333)



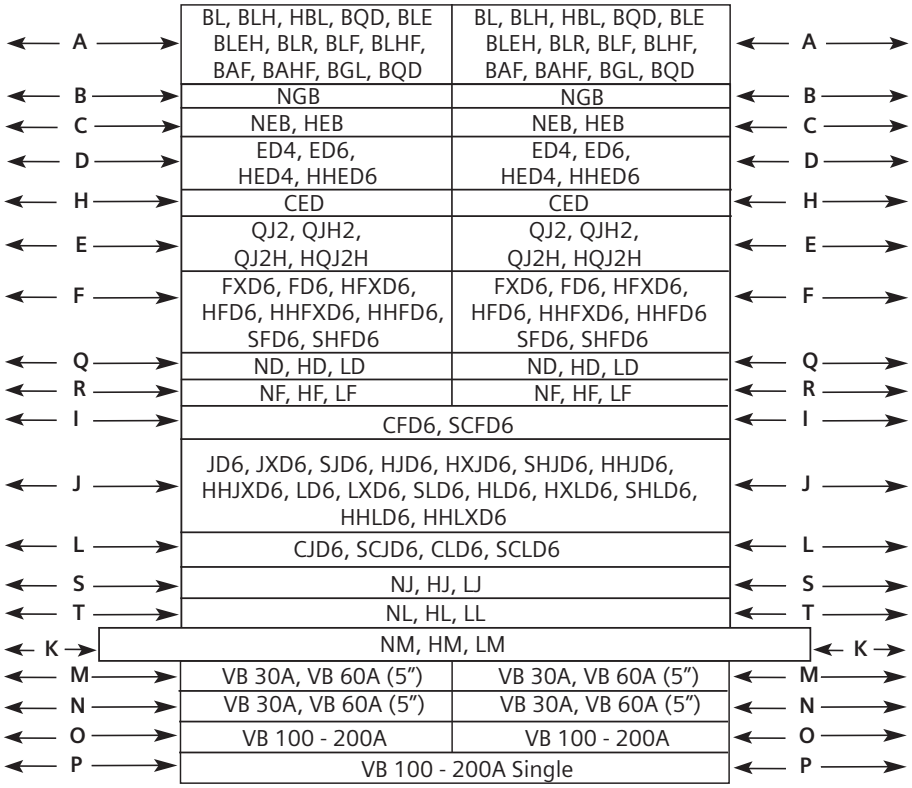
Main Lugs Only Unit Space

Branch Switch Unit Space

Ampere Rating	Number of Poles	Mounting Height in inches (mm) Twin Mounted	Single Mounted	AC Voltage	Cables Per Connector	Connectors Suitable for Copper or Aluminum
30-30	2, 3	2.50 (64)	—	240	1	#14 - #8 AWG (Cu Only)
30-30	2, 3	5.00 (127)	—	240	1	#14 - #4 AWG
30-60	2, 3	5.00 (127)	—	240	1	#14 - #4 AWG
60-60	2, 3	5.00 (127)	—	240	1	#14 - #4 AWG
60-100	2, 3	7.50 (191)	—	240	1	#10 - #1/0 AWG
100-100	2, 3	7.50 (191)	—	240	1	#10 - #1/0 AWG
200-200	3	10.00 (254)	—	240	1	#6 AWG - 350 kcmil
200	2	—	7.50 (191)	240	1	#6 AWG - 350 kcmil
200	3	—	10.00 (254)	240	2	#6 AWG - 350 kcmil
30-30	2, 3	7.5 (191)	—	600	1	#14 - #8 AWG
30-60	2, 3	7.5 (191)	—	600	1	#14 - #4 AWG
60-60	2, 3	7.5 (191)	—	600	1	#14 - #4 AWG
60-100	2, 3	7.5 (191)	—	600	1	#10-#1/0 AWG
100-100	2, 3	7.5 (191)	—	600	1	#10-#1/0 AWG
200-200	3	10.00 (254)	—	600	1	#6 AWG - 250 kcmil
100	2, 3	—	7.50 (191)	600	1	#10-#1/0 AWG
200	2, 3	—	10.00 (254)	600	1	#6 AWG - 250 kcmil

Branch Breaker Side Gutter Inches (mm)

Reference Letter	Panel Width 32 Inches Dimensions in inches (mm)
A	11.0 (279)
B	10.98 (279)
C	8.62 (219)
D	7.0 (178)
E	5.75 (146)
F	5.25 (133)
H	4.62 (177)
I	8.76 (223)
J	10.42 (265)
K	10.0 (254)
L	8.25 (210)
M	10.0 (254)
N	7.0 (178)
O	5.0 (127)
P	7.50 (191)
Q	7.9 (200)
R	7.9 (200)
S	2.5 (318)
T	11.25 (286)



Type P4

Shown with Standard Mains, Top Fed and Surface Trim

Catalog number is for aluminum main bus. For optional copper main bus change "A" in position 11 to "C".

Panels are top feed, surface mounted. For bottom feed, change "T" in position 12 to "B". For flush mounting, change "S" in position 13 to "F".

Replace fifth and sixth position in panelboard catalog number, with alternate main breaker code. Use price adders from main breaker section table. Horizontally mounted.

Main Lugs Only — shown with aluminum bus, top fed, and surface trims.

Maximum Panel Amps	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V or 250 V DC Max 1-Phase, 3-Wire Catalog Number
400	30	P4C60ML400ATS	P4B60ML400ATS	P4A60ML400ATS
	45	P4C75ML400ATS	P4B75ML400ATS	P4A75ML400ATS
	60	P4C90ML400ATS	P4B90ML400ATS	P4A90ML400ATS
600	30	P4C60ML600ATS	P4B60ML600ATS	P4A60ML600ATS
	45	P4C75ML600ATS	P4B75ML600ATS	P4A75ML600ATS
	60	P4C90ML600ATS	P4B90ML600ATS	P4A90ML600ATS
800	30	P4C60ML800ATS	P4B60ML800ATS	P4A60ML800ATS
	45	P4C75ML800ATS	P4B75ML800ATS	P4A75ML800ATS
	60	P4C90ML800ATS	P4B90ML800ATS	P4A90ML800ATS
1000	30	P4C60ML101ATS	P4B60ML101ATS	P4A60ML101ATS
	45	P4C75ML101ATS	P4B75ML101ATS	P4A75ML101ATS
	60	P4C90ML101ATS	P4B90ML101ATS	P4A90ML101ATS
1200	30	P4C60ML120ATS	P4B60ML120ATS	P4A60ML120ATS
	45	P4C75ML120ATS	P4B75ML120ATS	P4A75ML120ATS
	60	P4C90ML120ATS	P4B90ML120ATS	P4A90ML120ATS
Maximum Panel Amps	Unit Space (inches)	240V 3-Phase, 3-Wire Catalog Number	480Y/277V 3-Phase, 4-Wire Catalog Number	480V① 3-Phase, 3-Wire Catalog Number
400	30	P4D60ML400ATS	P4E60ML400ATS	P4F60ML400ATS
	45	P4D75ML400ATS	P4E75ML400ATS	P4F75ML400ATS
	60	P4D90ML400ATS	P4E90ML400ATS	P4F90ML400ATS
600	30	P4D60ML600ATS	P4E60ML600ATS	P4F60ML600ATS
	45	P4D75ML600ATS	P4E75ML600ATS	P4F75ML600ATS
	60	P4D90ML600ATS	P4E90ML600ATS	P4F90ML600ATS
800	30	P4D60ML800ATS	P4E60ML800ATS	P4F60ML800ATS
	45	P4D75ML800ATS	P4E75ML800ATS	P4F75ML800ATS
	60	P4D90ML800ATS	P4E90ML800ATS	P4F90ML800ATS
1000	30	P4D60ML101ATS	P4E60ML101ATS	P4F60ML101ATS
	45	P4D75ML101ATS	P4E75ML101ATS	P4F75ML101ATS
	60	P4D90ML101ATS	P4E90ML101ATS	P4F90ML101ATS
1200	30	P4D60ML120ATS	P4E60ML120ATS	P4F60ML120ATS
	45	P4D75ML120ATS	P4E75ML120ATS	P4F75ML120ATS
	60	P4D90ML120ATS	P4E90ML120ATS	P4F90ML120ATS

Main Circuit Breaker — shown with standard mains, aluminum bus, top fed, and surface trims.

Maximum Panel Amps	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V or 250 Vdc Max 1-Phase, 3-Wire Catalog Number
400	21.25	P4C60JX400ATS	P4B60JX400ATS	P4A60JX400ATS
	36.25	P4C75JX400ATS	P4B75JX400ATS	P4A75JX400ATS
	51.25	P4C90JX400ATS	P4B90JX400ATS	P4A90JX400ATS
600	21.25	P4C60LX600ATS	P4B60LX600ATS	P4A60LX600ATS
	36.25	P4C75LX600ATS	P4B75LX600ATS	P4A75LX600ATS
	51.25	P4C90LX600ATS	P4B90LX600ATS	P4A90LX600ATS
800	21.25	P4C60M1800ATS	P4B60M1800ATS	P4A60M1800ATS
	36.25	P4C75M1800ATS	P4B75M1800ATS	P4A75M1800ATS
	51.25	P4C90M1800ATS	P4B90M1800ATS	P4A90M1800ATS
Maximum Panel Amps	Unit Space (inches)	240V 3-Phase, 3-Wire Catalog Number	480Y/277V 3-Phase, 4-Wire Catalog Number	480V① 3-Phase, 3-Wire Catalog Number
400	21.25	P4D60JX400ATS	P4E60JX400ATS	P4F60JX400ATS
	36.25	P4D75JX400ATS	P4E75JX400ATS	P4F75JX400ATS
	51.25	P4D90JX400ATS	P4E90JX400ATS	P4F90JX400ATS
600	21.25	P4D60LX600ATS	P4E60LX600ATS	P4F60LX600ATS
	36.25	P4D75LX600ATS	P4E75LX600ATS	P4F75LX600ATS
	51.25	P4D90LX600ATS	P4E90LX600ATS	P4F90LX600ATS
800	21.25	P4D60M1800ATS	P4E60M1800ATS	P4F60M1800ATS
	36.25	P4D75M1800ATS	P4E75M1800ATS	P4F75M1800ATS
	51.25	P4D90M1800ATS	P4E90M1800ATS	P4F90M1800ATS

① For 600V application, change "F" in position 3 to "G". See alternate main breaker table on page 11-51 for 600V rated mains. Change position 5 and 6 and add price from table. Price only 600V rated branch breakers.

Type P4

Alternate Main Breaker Selection

Breaker Frame Rating	Trip Type	Breaker Family	Frame Type	Alternate Main Breaker Code	Trip Amperage	Unit Space Requirements in Inches	Maximum Interruption Rating (KAIC) Volts AC		
							240	480	600
400	Thermal Magnetic	Sentron	JXD6	JX	200, 225, 250, 300, 350, 400	8.75	65,000	35,000	25,000
			JD6	J6	200, 225, 250, 300, 350, 400	8.75	65,000	35,000	25,000
			HJXD6	H5	200, 225, 250, 300, 350, 400	8.75	100,000	65,000	35,000
			HJD6	H6	200, 225, 250, 300, 350, 400	8.75	100,000	65,000	35,000
			HHJXD6	H9	200, 225, 250, 300, 350, 400	8.75	200,000	100,000	50,000
			HHJD6	6H	200, 225, 250, 300, 350, 400	8.75	200,000	100,000	50,000
			CJD6	CJ	200, 225, 250, 300, 350, 400	8.75	200,000	150,000	100,000
	Electronic (Solid state)	VL	NJ	J1	250, 400	6.25	65,000	35,000	25,000
			HJ	J7	250, 400	6.25	100,000	65,000	25,000
			LJ	J3	250, 400	6.25	200,000	100,000	25,000
		Sentron	SJD6	SJ	200, 300, 400	8.75	65,000	35,000	25,000
			SHJD6	SX	200, 300, 400	8.75	100,000	65,000	35,000
			SCJD6	SC	200, 300, 400	8.75	200,000	150,000	100,000
600	Thermal Magnetic	Sentron	LXD6	LX	450, 500, 600	8.75	65,000	35,000	25,000
			LD6	L6	250, 300, 350, 400, 450, 500, 600	8.75	65,000	35,000	25,000
			HLXD6	HO	250, 300, 350, 400, 450, 500, 600	8.75	100,000	65,000	35,000
			HLD6	HL	250, 300, 350, 400, 450, 500, 600	8.75	100,000	65,000	35,000
			HHLXD6	XH	250, 300, 350, 400, 450, 500, 600	8.75	200,000	100,000	50,000
			HHLD6	HH	250, 300, 350, 400, 450, 500, 600	8.75	200,000	100,000	50,000
			CLD6	CL	250, 300, 350, 400, 450, 500, 600	8.75	200,000	150,000	100,000
	Electronic (Solid state)	VL	NL	L7	400, 600	6.25	65,000	35,000	25,000
			HL	L2	400, 600	6.25	100,000	65,000	25,000
			LL	SL	400, 600	6.25	200,000	100,000	25,000
		Sentron	SLD6	L6	300, 400, 500, 600	8.75	65,000	35,000	25,000
			SHLD6	S2	300, 400, 500, 600	8.75	100,000	65,000	35,000
			SCLD6	SI	300, 400, 500, 600	8.75	200,000	150,000	100,000
800	Thermal Magnetic	VL	NM	M1	600, 700, 800	8.75	65,000	35,000	25,000
			HM	M2	600, 700, 800	8.75	100,000	65,000	35,000
			LM	M3	600, 700, 800	8.75	200,000	100,000	50,000
		Sentron	LMXD6	LM	500, 600, 700, 800	8.75	65,000	50,000	25,000
			LMD6	L1	500, 600, 700, 800	8.75	65,000	50,000	25,000
			HLMXD6	HK	500, 600, 700, 800	8.75	100,000	65,000	50,000
			HLMD6	HJ	500, 600, 700, 800	8.75	100,000	65,000	50,000
	Electronic (Solid state)	VL	NM	M1	600, 800	8.75	65,000	35,000	25,000
			HM	M2	600, 800	8.75	100,000	65,000	35,000
			LM	M3	600, 800	8.75	200,000	100,000	50,000

For inches / millimeters conversion, see Application Data section.

Branch Breaker Selection①

Breaker Frame Rating	Trip Type	Breaker Family	Frame Type	Poles	Trip Amperage	Unit Space Requirements in Inches		Maximum Interruption Rating (KAIC) Volts AC					
						Single	Twin	120	240	480Y/ 277	480	600Y/ 347	600
100	Thermal Magnetic	General Application	BL	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	10,000	10,000	—	—	—	—
			BLR	2	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	3.75②③	10,000	10,000	—	—	—	—
			BLH	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	22,000	22,000	—	—	—	—
			HBL	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	65,000	65,000	—	—	—	—
			BQD	1, 2, 3	15-50, 60, 70, 80, 90, 100	—	3.75②③	65,000	65,000	14,000	—	—	—
			BQD6	1, 2, 3	15-50, 60, 70	—	3.75②③	65,000	65,000	—	—	10,000	—
	Special Application		BL-HID	1, 2	15, 20, 30	—	3.75②③	10,000	10,000	—	—	—	—
			BL-BG	2, 3	15, 20, 30	—	3.75②③	10,000	10,000	—	—	—	—
	Ground Fault Circuit Interrupter		BLE-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
			BLEH-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
			BLF-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
			BLHF-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
	Arc Fault Circuit Interrupter		BAF-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
			BAFH-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
			BAFC-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
			BAFCH-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
125	Thermal Magnetic	General Application	NGB	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	25,000	—	14,000	—
			NEB	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	85,000	—	35,000	22,000	—
			HEB	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	—	65,000	25,000	—
			ED4	1, 2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	65,000	—	18,000	—	—
			HED4④⑤	1, 2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	—	42,000	—	—
			HHED6	2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	—	65,000	—	18,000
			CED6	2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	200,000	—	200,000	—	100,000
150	Electronic (Solid state)	VL	ND	3	60, 100, 150	—	5.00	—	65,000	—	35,000	—	18,000
			HD	3	60, 100, 150	—	5.00	—	100,000	—	65,000	—	20,000
			LD	3	60, 100, 150	—	5.00	—	200,000	—	100,000	—	25,000
225	Thermal Magnetic	General Application	QJ2	2, 3	60-110, 125, 150, 175, 200, 225	—	5.00	—	10,000	—	—	—	—
			QJH2	2, 3	60-110, 125, 150, 175, 200, 225	—	5.00	—	22,000	—	—	—	—
			QJ2H	2, 3	60-110, 125, 150, 175, 200, 225	—	5.00	—	42,000	—	—	—	—
			HQJ2H	3	100, 110, 125, 150, 175, 200, 225	—	5.00	—	100,000	—	—	—	—
250	Thermal Magnetic	Sentron	FXD6, FD6	2, 3	70-110, 125, 150, 175, 200, 225, 250	5.00	5.00	—	65,000	—	35,000	—	22,000
			HFXD6, HFD6	2, 3	70-110, 125, 150, 175, 200, 225, 250	5.00	5.00	—	100,000	—	65,000	—	25,000
			HHFXD6, HHFD6	2, 3	70-110, 125, 150, 175, 200, 225, 250	5.00	5.00	—	200,000	—	100,000	—	25,000
			CFD6	3	70-110, 125, 150, 175, 200, 225, 250	—	5.00	—	200,000	—	200,000	—	100,000
	Electronic (Solid state)	VL	NF	3	100, 150, 250	5.00	5.00	—	65,000	—	35,000	—	18,000
			HF	3	100, 150, 250	5.00	5.00	—	100,000	—	65,000	—	20,000
			LF	3	100, 150, 250	5.00	5.00	—	200,000	—	100,000	—	25,000
400	Thermal Magnetic	Sentron	JXD6, JD6	2, 3	200, 225, 250, 300, 350, 400	8.75	—	—	65,000	—	35,000	—	25,000
			HJXD6, HJD6	2, 3	200, 225, 250, 300, 350, 400	8.75	—	—	100,000	—	65,000	—	35,000
			HHJXD6, HHJD6	2, 3	200, 225, 250, 300, 350, 400	8.75	—	—	200,000	—	100,000	—	50,000
			CJD6	3	200, 225, 250, 300, 350, 400	8.75	—	—	200,000	—	150,000	—	100,000
	Electronic (Solid state)	VL	NJ	3	250, 400	6.25	—	—	65,000	—	35,000	—	25,000
			HJ	3	250, 400	6.25	—	—	100,000	—	65,000	—	25,000
			LJ	3	250, 400	6.25	—	—	200,000	—	100,000	—	25,000
		Sentron	SJD6	3	200, 300, 400	8.75	—	—	65,000	—	35,000	—	25,000
			SHJD6	3	200, 300, 400	8.75	—	—	100,000	—	65,000	—	35,000
			SCJD6	3	200, 300, 400	8.75	—	—	200,000	—	150,000	—	100,000
600	Thermal Magnetic	Sentron	LXD6	2, 3	450, 500, 600	8.75	—	—	65,000	—	35,000	—	25,000
			LD6	2, 3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	65,000	—	35,000	—	25,000
			HLXD6, HLD6	2, 3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	100,000	—	65,000	—	35,000
			HHLXD6, HHLD6	2, 3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	200,000	—	100,000	—	50,000
			CLD6	3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	200,000	—	150,000	—	100,000
	Electronic (Solid state)	VL	NL	3	400, 600	6.25	—	—	65,000	—	35,000	—	25,000
			HL	3	400, 600	6.25	—	—	100,000	—	65,000	—	25,000
			LL	3	400, 600	6.25	—	—	200,000	—	100,000	—	25,000
		Sentron	SLD6	3	300, 400, 500, 600	8.75	—	—	65,000	—	35,000	—	25,000
			SHLD6	3	300, 400, 500, 600	8.75	—	—	100,000	—	65,000	—	35,000
			SCLD6	3	300, 400, 500, 600	8.75	—	—	200,000	—	150,000	—	100,000
800	Thermal Magnetic	VL	NM	2, 3	600, 700, 800	8.75	—	—	65,000	—	35,000	—	25,000
			HM	2, 3	600, 700, 800	8.75	—	—	100,000	—	65,000	—	35,000
			LM	2, 3	600, 700, 800	8.75	—	—	200,000	—	100,000	—	50,000
	Electronic (Solid state)	VL	NM	3	600, 800	8.75	—	—	65,000	—	35,000	—	25,000
			HM	3	600, 800	8.75	—	—	100,000	—	65,000	—	35,000
			LM	3	600, 800	8.75	—	—	200,000	—	100,000	—	50,000

① Space price covers cost of housing frame plate with blank cover plate. Provision price includes all necessary mounting hardware, less circuit breaker, and includes housing frame cover plate with breaker handle opening.

② 1 to 6 poles may be mounted in 3.75" of unit space.

③ Accessories such as shunt trips on three pole breakers require 6.25" of unit space.

④ HED4 1-pole 15–30A = 65,000 IR
35–100A = 25,000 IR

⑤ HED 4 3-Pole=42,000 IR

Branch Switch Selection

Ampere Rating	Mounting Height (inches)
240V — Twin Mounted	**NEC Fuse Clips②**
30-30	2½③
30-30	5
30-60	5
60-60	5
60-100	7½
100-100	7½
200-200	10
240V — Single Mounted	**NEC Fuse Clips②**
30	7½
60	7½
100	7½
200	10
200	7½

Ampere Rating	Mounting Height (inches)
600V — Twin Mounted	**NEC Fuse Clips②**
30-30	7½
30-60	7½
60-60	7½
60-100	7½
100-100	7½
200-200	10
600V — Single Mounted	**NEC Fuse Clips②**
100	7½
200	10

Type S4/P4/SPP (10" deep) and F1/P4/FPP (10" deep)

Connecting Strap Kits — w/o Circuit Breaker

For use with Type P4, Type S4 or Sentron SPP Shallow depth panelboards					
Max Amp Rating	**Breaker Family**	**Breaker Type**	**Catalog Number①**	**Unit Height (inches)**	**Mounting**
100	General	BL, BQD	**SBL**	3.75	Twin
125	General	NGB	**SNB**	3.75	Twin
	General	EB	**SEB**	3.75	Twin
	General	ED	**SE6**	3.75	Twin
	General	CED	**SCE**	3.75	Twin
150	VL	DG	**SDG**	5.00	Twin
225	General	QJ	**SQJ**	5.00	Twin
250	VL	FG	**SFG**	5.00	Twin
	Sentron	FD	**SF6**	5.00	Twin
	Sentron	CFD	**SCF**	5.00	Single
400	VL	JG	**SJG**	6.25	Single
	Sentron	JD	**SJ1**	8.75	Single
	Sentron	CJD	**SCJ**	8.75	Single
	Sentron	SJD	**SSJ1**	8.75	Single
	Sentron	SCJD	**SSCJ**	8.75	Single
600	VL	LG	**SLG**	6.25	Single
	Sentron	LD	**SL6**	8.75	Single
	Sentron	CLD	**SCL**	8.75	Single
	Sentron	SLD	**SSL6**	8.75	Single
	Sentron	SCLD	**SSCL**	8.75	Single
800	VL	MG	**MG1**	8.75	Single
	Sentron	LMD	**SLM1**	8.75	Single

Blank Plates — Circuit Breaker and Vacu-Break

For use with Type P4, Type S4 or Sentron SPP Shallow depth panelboards	
Height (inches)	**Catalog Number**
1.25	**6FPB01**
2.5	**6FPB02**
3.75	**6FPB03**
5.0	**6FPB05**
10.0	**6FPB10**

Filler Plates

For use with Type P4, Type S4 or Sentron SPP Shallow depth panelboards	
Breaker Type	**Filler Plate Catalog Number**
BL, BLH, HBL ED2, ED4, ED6 HED4, HHED6	**QF3**
NEB, HEB	**EBF1**

Connecting Strap Kits④ Fusible

For use with Sentron Shallow Depth or Type SPP/FPP/F1/P4 power panels		
		10" Deep Box
Ampere Rating	**Unit Height (inches)**	**Catalog Number**
30–30	2.5	**F602**
30–60	5, 7.5	**F657**
30–60	5, 7.5	**F657**
60–60	5, 7.5	**F657**
60–100	5, 7.5	**F657**
100–100	5, 7.5	**F657**
100	7.5	**F657**
200	7.5	**F657**
200	10	**F671**
200–200	10	**F672**

For inches / millimeters conversion, see Application Data section.

① Includes housing frame plate without breaker handle opening. Provisions include all necessary mounting hardware less breakers.

② For Class J, R or T fuse clip prices, refer to page 11-54. For Class J fuse clips price 600V, 7½" high units.

③ NEC fuse clips only.

④ Normal stock item.

P4 Panelboards

Devices Mounted on Gutter Cover Includes Device, Mounting – Wired or Unwired

Description
One piece front with door
Hinged Gutter Covers 4 pc front
Toggle Switch — SPST or 3-way
15A, 277V maximum
Pilot Light — General Purpose
Neon or Incandescent
Pushbutton

Increased Capacity Neutral

Ampere Rating		Unit Space (inches)
Phase	Neutral	
400	600	0
400	800	0
600	1200	0
800	1200	0

Subfeed or Feed-Thru Lugs (One Set Per Panel) Subfeed Double Lugs (Main Lug Panels)

Amp Rating	Unit Spaces (Additional inches)
	MLO
400	0
600	0
800	N/A
1200	N/A

Feed-Thru Lugs

Ampere Rating	Unit Space (inches)
400	10
600	10
800	17.5
1200	17.5

Grounding of Panelboards Ground Bars (except for brazed-to-box) are shipped with the panel interior factory mounted.

- Non-Insulated Equipment Ground Bar – Standard
- Copper Non-Insulated Ground Bar
- Al Insulated Equipment Ground Bar
- Cu Insulated Equipment Ground Bar
- Ground Bar Brazed to Box

Fuse Clip Provisions (Add to 250 Volts or 600 Volts Unit Prices Per Switch)

Amp Rating	Class J	Class R	Class T
30		•	•
60		•	•
100		•	•
200		•	•

Spanner Wrenches (for Vacu-Break Switches)

Ground Fault on Main Breaker

Description
Conventional Ground Fault ① Includes: ground fault relay, ground sensor, CPT & shunt trip
Test and Monitor Panel ②
Ground Fault add to Sensitrip III breaker price

Time Clocks ③

Sangamo, Tork or Paragon time clock can be supplied, mounted in panelboard cabinet. For required increase in enclosure dimension, consult local sales office.

Description
Time clock (1- or 2-Pole, Single or Double Throw Contacts; 3-Pole Single Throw)
277V Maximum with Plain Dial
Optional: Astronomical Dial An Omitting Device Reserve Power or Carryover
Space and Mounting Provisions Only

Circuit Breaker Accessories Handle Blocking Device Blocks handle in either the "ON" or "OFF" position.

Padlocking Device – Padlocks in "OFF" position.

Main Bus

Standard main bus and ground bus are tin-plated aluminum. For copper main bus, neutral bus and ground bus, add from the table for each panel.

Lugs – For Main Lug Only Panels

Standard main lugs and neutral lugs are tin-plated aluminum, UL listed for use with aluminum/copper cables. Copper only lugs are an option.

Ampere Rating
400 - 1200

Shunt Trip on Main and Branches④

Description
BL, BQD, NGB (branch only)
QJ2, QJH2, QJ2H, HQJ2H, NEB, HEB, ED4, ED6, HED4, HHED6, CED6
All others to 800A

100% Rated Main Circuit Breakers

Ampere Rating	Breaker Type
400A	JXD6H, HJXD6H
	SCJD6H, SHJD6H
	NJY, HJY, LJY
600A	LXD6H, HLXD6H
	NMY⑤, HMY⑤, LMY⑤
800A	MXD6H, HMXD6H, CMD6H
	SMD6H, SHMD6H, SCMD6H

① Available in 90" high enclosure only. Unit space is 42 1/2" with Test and Monitor Panel; 45" without Test and Monitor Panel.

② Not available on Sensitrip III.

③ For required unit space, consult local sales office.

④ Shunt Trip on 100A frame breakers increases mounting height to 6.25" for twin mounting.

⑤ The 600A, 100% rated breaker requires the use of an 800A frame breaker.

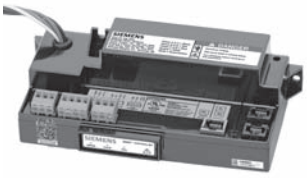
SEM3 System configured in Panelboards

The Siemens SEM3 system can be configured for factory installation in branch circuit monitoring applications using the Siemens COMPAS configuration tool. This option can lower the installation time of the system for the installer while providing a factory warrantied solution.

The SEM3 system can be factory installed in unit space in type P2, P4, & P5 Siemens panel boards. Please note P1 and P3 configurations are not available at this time and the amount of unit space needed varies depending upon the application. Please note that lead time adders will apply and may vary depending upon the configuration of the system.

SEM3 for use in Siemens Panelboards

Available in a NEMA 1, 3R, or 12 rated enclosure



Controller

SEM3 controller is mounted in unit space opposite of the feed location specified in COMPAS (i.e., bottom mount for top feed) and will require 3" of unit space. Each controller will be powered by direct tap connection to the panel section bus. Each controller can monitor up to 45 circuits. Applications that require monitoring more than 45 circuits will require additional controllers.



Current Transformers (CTs)

Five sizes of CTs are available for use in the P2 panel: 50, 125, 250, 400 & 600 amp. All CTs are pre-mounted to a support bracket that attaches to the base rail of the interior of the panel board. Each bracket supports a maximum of 3 CTs and is designed for the breaker selected (brackets are not interchangeable between breaker frames). Each CT will be attached to a data module that is placed in the meter racks.



Meter Racks

Each meter rack requires 3" of unit space. All meter racks will be installed next to the SEM3 controller in unit space. The COMPAS configuration tool will select the appropriate meter rack configuration according to the user's application and will use the 21 space meter rack as a default option where possible. Only one meter rack (regardless of number of positions) can be installed in 3" of unit space.

NOTE: Monitoring of 45 circuits will require 9" of unit space: two 21 position racks and one 3 position rack

Other Considerations

Configuration: Data modules from CTs monitoring a circuit breaker must be mounted adjacent to one another in the meter rack. Any field changes to the factory configuration must take this into account.

Start-up & Commissioning: Siemens can provide these services. Contact your local SIEMENS PDS Power Solutions Business Developer for more details.

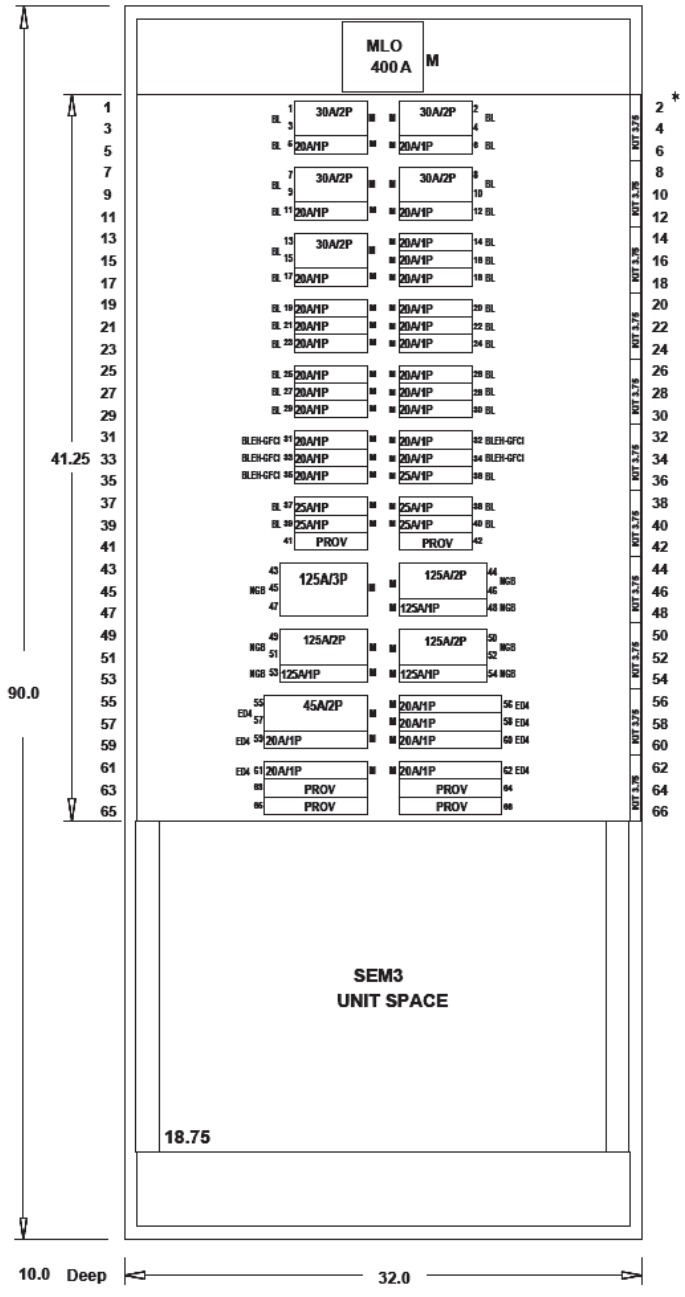
Billing Services for sub billing applications: Billing services are available. Contact your local SIEMENS PDS Power Solutions Business Developer for more details.

P4 Devices
Enclosure sizes

Example P4 Panel with SEM3 Type 1 Enclosure
P4 = (32" Wide x 10" Deep)

Enclosure heights are in 15" increments from 60" thru 90".
Enclosure heights: 60", 75", 90" (there are optional depths also)

The COMPAS configuration tool can provide actual dimensions based on the configuration. Example below is largest standard P4 enclosure for factory assembled panel - unit space is in 3.75" increments - up to 6 circuits can occupy each 3.75" of unit space.



32" std. width for P4

Main Breaker / Main Lug space varies based on selected options

Unit space varies based on selected options

Note: All circuits do not have to be monitored by SEM3 - user can select any circuits in this space to be monitored.

Based on smallest branch breakers and a 3-phase main being monitored. There is a maximum of 63 circuits that can be monitored with the configuration shown. Some selections of main breakers and other subfeed options could limit this further.

In this situation there is 37.5" of unit space available - so 60 branch circuits could be monitored.
If monitoring the main three additional circuits could be monitored with a total of 63 circuits.

This requires two controllers and three 21 position racks using 18.75" of unit space.
- see below -

SEM3 space varies by number of circuits monitored - this uses unit space.

== > 7.5" of space for up to 21 circuits monitored
one controller and one 21-pos rack

== > 11.25" of space for up to 42 circuits monitored
one controller and two 21-pos racks

== > 15" of space for up to 45 circuits monitored
one controller and two 21-pos racks plus one 3-pos rack

== > 18.75" of space for up to 63 circuits monitored
two controllers and three 21-pos racks

Note: If subfeed space is needed - it will take away from available unit space.

Lug Modifications

Compression Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Available Unit Space Reduction
MLO	400	N/A	All compression lugs	Deduct 5.0″ of Unit Space
	600	N/A	All compression lugs	
	800	N/A	All compression lugs	
	1000	N/A	All compression lugs	
	1200		All compression lugs	
Main Breaker	400	JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, CJD6, SJD6, SHJD6, SCJD6	(2)#2/0 AWG - 500 Kcmil Cu or Al	Deduct 0″ of Unit Space
Main Breaker	600	LD6, LXD6, HLD6, HLXD6, HHLD6, HHLXD6, CLD6, SLD6, SHLD6, SCLD6	(2) #2/0 AWG - 500 Kcmil Cu or Al	Deduct 0″ of Unit Space

Alternate Lugs

Amp Rating	Breaker Type	Compression Connectors	Available Unit Space Reduction
400	N/A	(1)#3/0 AWG - 750 Kcmil or (2)#3/0 AWG 250 Kcmil Cu or Al	Deduct 0″ of Unit Space
600	N/A	(2)#3/0 AWG - 750 Kcmil	Deduct 5″ of Unit Space
800	N/A	(3)#3/0 AWG - 750 Kcmil Cu or Al	Deduct 10″ of Unit Space
1200	N/A	(4)#3/0 AWG - 600 Kcmil Cu or Al (4)#3/0 AWG - 750 Kcmil Cu or Al	Deduct 10″ of Unit Space

P4 Enclosures

Description	Catalog number
P4 Type 1 32″ W x 10″ D x 60″ H	**PB60**
P4 Type 1 32″ W x 10″ D x 75″ H	**PB75**
P4 Type 1 32″ W x 10″ D x 90″ H	**PB90**
P4 Type 3R/12 60″ H	**WP260**
P4 Type 3R/12 75″ H	**WP275**
P4 Type 3R/12 90″ H	**WP290**

P4 Trims

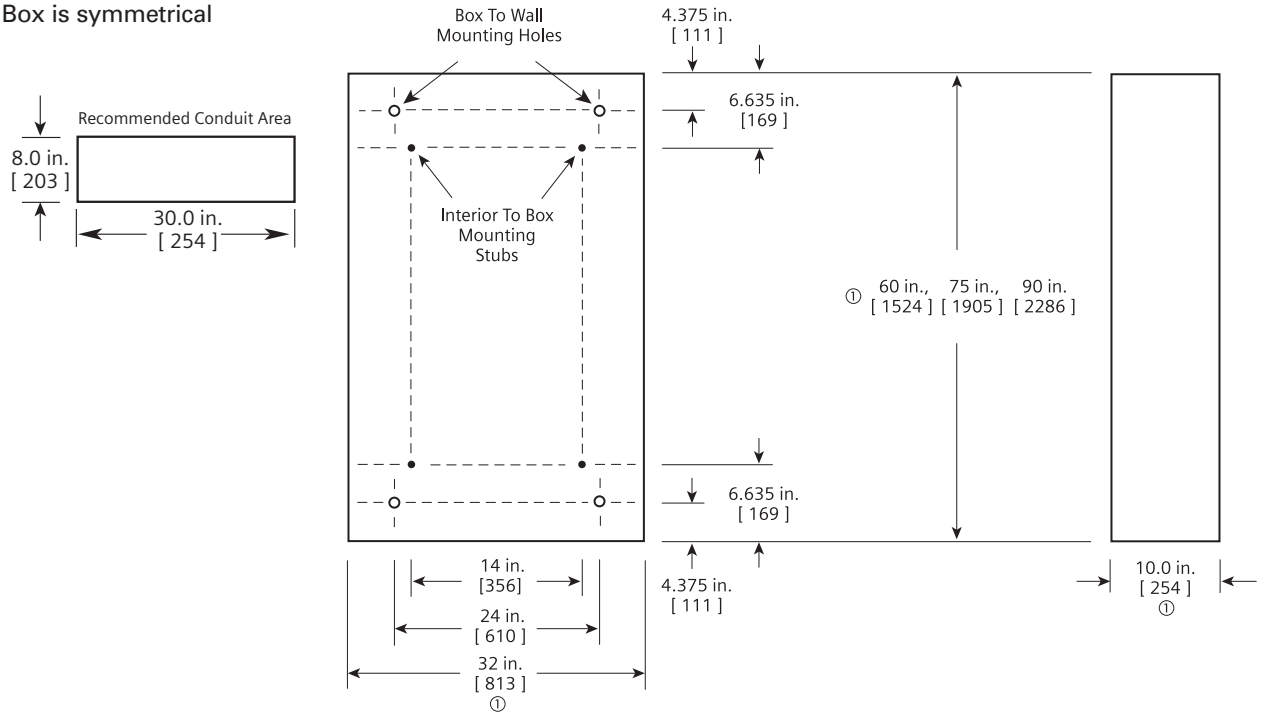
Description	Catalog number
P4 Std (4 piece trim) vented 60″	**P460V**
P4 Std (4 piece trim) vented 75″	**P475V**
P4 Std (4 piece trim) vented 90″	**P490V**
P4 VBS Std (4 Piece trim) vented 60″	**P460VV**
P4 VBS Std (4 Piece trim) vented 75″	**P475VV**
P4 VBS Std (4 Piece trim) vented 90″	**P490VV**
P4 Std (4 piece trim) unvented 60″	**P460NV**
P4 Std (4 piece trim) unvented 75″	**P475NV**
P4 Std (4 piece trim) unvented 90″	**P490NV**
P4 VBS Std (4 Piece trim) unvented 60″	**P460NVV**
P4 VBS Std (4 Piece trim) unvented 75″	**P475NVV**
P4 VBS Std (4 Piece trim) unvented 90″	**P490NVV**
P4 Std (4 piece trim) vented 60″ with hinged gutter covers	**P460VHG**
P4 Std (4 piece trim) vented 75″ with hinged gutter covers	**P475VHG**
P4 Std (4 piece trim) vented 90″ with hinged gutter covers	**P490VHG**
P4 VBS Std (4 piece trim) vented 60″ w/Hinged gutter covers	**P460VVHG**
P4 VBS Std (4 piece trim) vented 60″ w/Hinged gutter covers	**P475VVHG**
P4 VBS Std (4 piece trim) vented 60″ w/Hinged gutter covers	**P490VVHG**
P4 Std (4 piece trim) unvented 60″ with hinged gutter covers	**P460NVHG**
P4 Std (4 piece trim) unvented 75″ with hinged gutter covers	**P475NVHG**
P4 Std (4 piece trim) unvented 90″ with hinged gutter covers	**P490NVHG**
P4 VBS Std (4 piece trim) unvented 60″ w/Hinged gutter covers	**P460NVVHG**
P4 VBS Std (4 piece trim) unvented 60″ w/Hinged gutter covers	**P475NVVHG**
P4 VBS Std (4 piece trim) unvented 60″ w/Hinged gutter covers	**P490NVVHG**
P4 Std (1 PC Door) vented 60″	**P460VD**
P4 Std (1 PC Door) vented 75″	**P475VD**
P4 Std (1 PC Door) vented 90″	**P490VD**
P4 Std (1 PC Door) unvented 60″	**P460NVD**
P4 Std (1 PC Door) unvented 75″	**P475NVD**
P4 Std (1 PC Door) unvented 90″	**P490NVD**
P4 Std (1 PC Door-in-door) vented 60″	**P460VDD**
P4 Std (1 PC Door-in-door) vented 75″	**P475VDD**
P4 Std (1 PC Door-in-door) vented 90″	**P490VDD**
P4 Std (1 PC Door-in-door) unvented 60″	**P460NVDD**
P4 Std (1 PC Door-in-door) unvented 75″	**P475NVDD**
P4 Std (1 PC Door-in-door) unvented 90″	**P490NVDD**

P4 Flush mounting kits

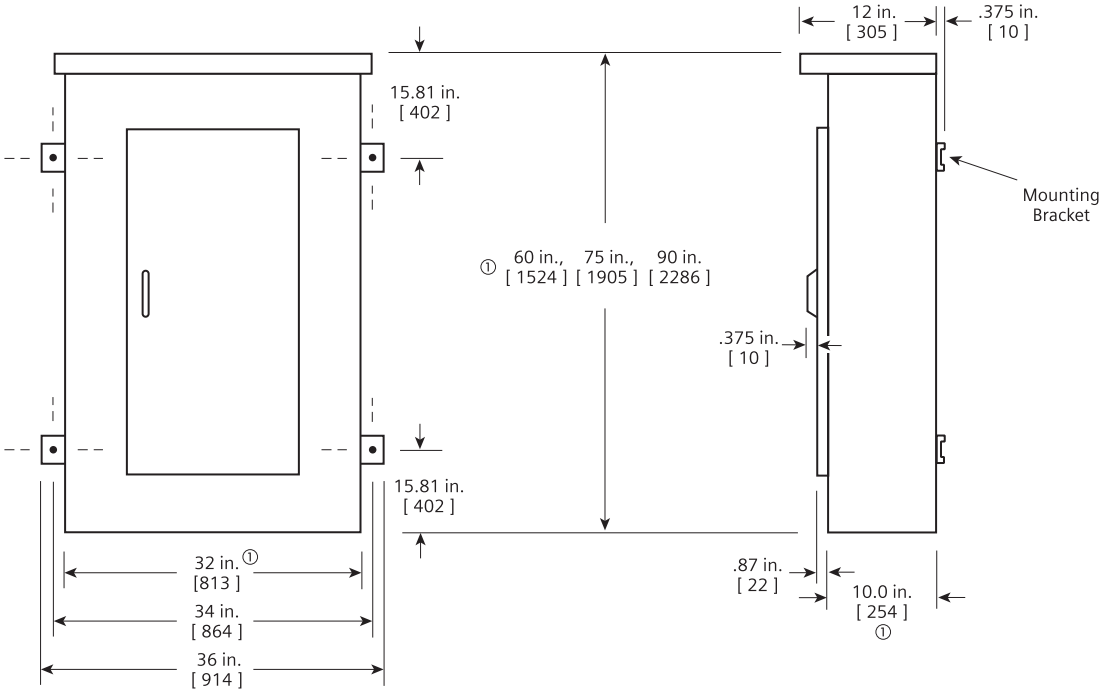
Description	Catalog number
Flush kit for P4 60″ High	F60
Flush kit for P4 75″ High	F75
Flush kit for P4 90″ High	F90

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



①Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.
Dimensions shown in inches and millimeters [ ].

Features

The P5 panel is the largest footprint distribution panel in the Siemens panel family. Even though it is our largest panel type, the P5 panel is still a space saver with it's 38" width and 12.75" depth. With even higher main ratings to fit the application that require more or larger branch devices. This panel offers a wide array of factory assembled options and has the ability to mix breaker frames in unit space up to 1200 amps and fusible switches up to 1200 amps. Bussing options for the P5 vary from the standard temperature rated aluminum to temperature rated copper and 750 A/SI aluminum and 1000A/Si copper designs. All aluminum bussing in the P5 panel is tin-plated as a standard. Silver-plated is offered as the default for copper bus and tin as an option. Integrated time clocks, bus mounted contactors as mains or submains, split bus and subfeed lugs (up to 600 amps) are just a few of the options of this flexible panel.

The P5 panel configurations defined by the unit space allowed for a given amperage, main device and box height. The P5 panel starts with a 60" high box. All of the branch devices are unit space mounted. Breakers and switches can be mixed and matched to meet customer requirements.

Main Lug / Main Breaker / Main Switch

Enclosure – Standard Type 1 enclosure is 38" wide x 12.75" deep. X Box Height is determined by main device and unit space. See charts for box height.

Voltage – 600V AC max.
250V DC max.

Amperage – 400-1200 amp main breaker, 400-1200 amp main lug only or 200-1200 amp main switch.

Short Circuit Rating – 200 Kaic max. symmetrical or equal to the lowest rated device installed unless a series rating is indicated. Panels with subfeed or feed-thru lugs without a main device, circuit breaker or fusible unit, are limited to a three-cycle rating. The three-cycle rating for the P5 panel is limited to 42 Kaic. Note that the main device may be mounted remote from the panel.

Bussing – The P5 panel has more options to meet market requirements. The standard bussing is temperature rated aluminum. The rating is per the requirements of UL 67 – the standard for panelboards. All aluminum bussing is tin-plated. Optional bussing for the P5 panel is: 750 A/si aluminum, temperature rated copper, and 1000 A/si copper. The copper bus option for this panel is tin-plated.

Weight – Approximate

Total panelboard weight when filled with a normal quantity of breakers and accessories is about 10 lbs. (1 kg) per inch (54g per mm) of box height.

Main Lugs ①

Ampere Rating	Connectors Suitable for Copper or Aluminum
400	(1) 250-500Kcmil
600	(2) #3/0-500Kcmil
800	(3) #3/0 AWG-500 Kcmil
1000	(4) #3/0 AWG-500 Kcmil
1200	(4) #3/0 AWB-500 Kcmil

① Alternate lugs for 750 kcmil cable are available, but result in significant loss of branch unit mounting space. Consult Siemens.

Gauge Steel of Boxes Fronts, Surface and Flush

Dimensions in inches (mm)		Gauge Steel	
Width	Height	Box	Fronts
38" (965)	60 - 75 - 90 (1524, 1905, 2286)	#16①	#14 (1 piece trim) #14 (4 piece trim)

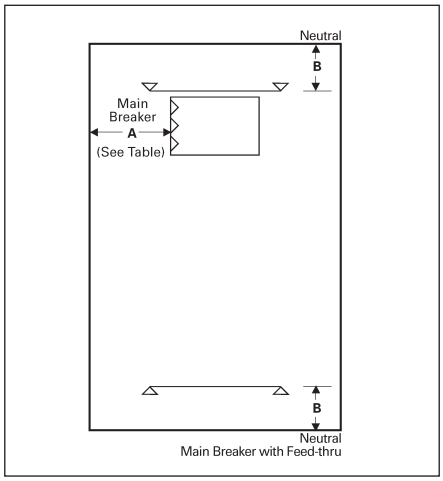
① 16 gauge side panels, 12 gauge back support.

Enclosure Selection ①

Enclosure Dimension in Inches (mm)				Available Unit Space in Inches (mm)					
H	W	D		Main Lug Only	Main Breaker		Main VB Switch		Main HCP Switch
Type 1 or 3R/12		Type 1	Type 3R/12	400 - 1200A	400-800A	1200A	200A	400A-600A	400-1200A
60 (1524)	38 (965)	12.75 (324)	14.25 (362)	30 (762)	21.25 (540)	20 (508)	20 (508)	-	13.75 (349)
75 (1905)	38 (965)	12.75 (324)	14.25 (362)	45 (1143)	36.25 (921)	35 (889)	40 (1016)	25 (889)	28.75 (730)
90 (2286)	38 (965)	12.75 (324)	14.25 (362)	60 (1524)	51.25 (1302)	50 (1270)	55 (1397)	40 (1270)	43.75 (1111)

Main Breaker Unit Space Dimensions

Ampere Rating	Breaker Family	Breaker Type	Dimensions in inches (mm)	
			A	B
400	Sentron	JXD6, JD6, HJXD6, HJD6, HHJXD6, HHJD6	13.425 (265)	13.125 (333)
	VL②	NJ, HJ, LJ	15.500 (318)	
	Sentron	SJD6, SHJD6	13.425 (265)	
		CJD6, SCJD6	11.250 (210)	
600	Sentron	LXD6, LD6, HLXD6, LD6, HHLXD6, HHLD6	13.425 (265)	
	VL②	NL, HL, LL	14.250 (286)	
	Sentron	SLD6, SHLD6	13.425 (265)	
		CLD6, SCLD6	11.250 (210)	
800	VL	NM, HM, LM	13.425 (265)	
	Sentron	MXD6, MD6, HMXD6, HMD6, CMD6, SMD6, SHMD6, SCMD6	13.00 (330) 10.42 (265	
1200	VL	NN, HN, LN	13.425 (265)	
	Sentron	NXD6, ND6, HNXD6, HND6, CND6, SND6, SHMD6, SCND6	13.00 (330) 13.00 (330)	



Main Breaker Wire Bending Space Dimensions & Main Switch

Main Switch

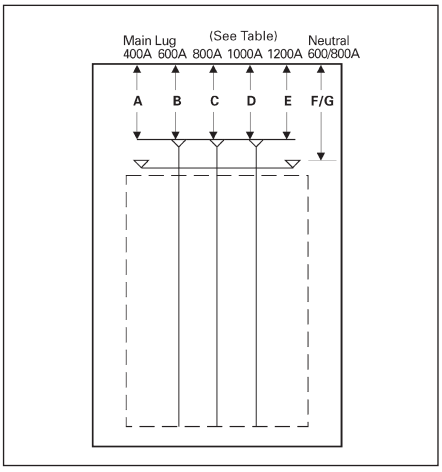
Maximum Ampere Rating	A	B
400A/600A VB	9.30 (236)	13.125 (333)
800A/1200A HCP	10.30 (262)	
200A VB	13.425 (265)	

Main Switch Connectors

Ampere Rating	Connectors suitable for Copper or Aluminum
400	(1) #3/0 AWG-500 kcmil (2) #3/0 AWG-250 kcmil
600	(2) #3/0 AWG-500 kcmil
800	(3) #3/0 AWG-500 kcmil
1200	(4) #3/0 AWG-500 kcmil

Main Lugs Only Wire Bending Space

Lugs	Dimensions in inches (mm)					
	Main Lug					Neutral
	400A A	600A B	800A C	1000A D	1200A E	800A G
Standard	16.500 (419)	16.750 (425)	15.969 (406)	15.969 (406)	15.969 (406)	13.125 (333)
Oversize	16.500 (419)	21.750 (552)	25.969 (660)	25.969 (660)	25.969 (660)	23.125 (587)
Crimp	19.187 (487)	18.250 (464)	18.687 (475)	18.250 (464)	18.250 (464)	15.937 (405)
Standard with Subfeed	16.750 (425)	15.969 (406)	—	—	—	13.125 (333)
Standard with Feed-thru	16.500 (419)	16.750 (425)	—	—	—	13.125 (333)



Main Lugs Only Wire Bending Space

① Standard trim is for space without door. Surface flush one piece trim is available for 32" (813mm) wide circuit breaker panel.

② Available with solid state (electronic) trip units only.

Type P5

Shown with Standard Mains, Top Fed and Surface Trim

Catalog number is for aluminum main bus. For optional copper main bus change "A" in position 11 to "C".

Panels are top feed, surface mounted. For bottom feed, change "T" in position 12 to "B". For flush mounting, change "S" in position 13 to "F".

Replace fifth and sixth position in panelboard catalog number, with alternate main breaker code. Use price adders from main breaker section table. Horizontally mounted.

Main Lugs Only — shown with aluminum bus, top fed, and surface trims.

Maximum Panel Ampere Rating	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V or 250 Vdc Max 1-Phase, 3-Wire Catalog Number
800②	30	P5C60ML800ATS	P5B60ML800ATS	P5A60ML800ATS
	45	P5C75ML800ATS	P5B75ML800ATS	P5A75ML800ATS
	60	P5C90ML800ATS	P5B90ML800ATS	P5A90ML800ATS
1000	30	P5C60ML101ATS	P5B60ML101ATS	P5A60ML101ATS
	45	P5C75ML101ATS	P5B75ML101ATS	P5A75ML101ATS
	60	P5C90ML101ATS	P5B90ML101ATS	P5A90ML101ATS
1200	30	P5C60ML120ATS	P5B60ML120ATS	P5A60ML120ATS
	45	P5C75ML120ATS	P5B75ML120ATS	P5A75ML120ATS
	60	P5C90ML120ATS	P5B90ML120ATS	P5A90ML120ATS
Maximum Panel Ampere Rating	**Unit Space (inches)**	**240 3-Phase, 3-Wire Catalog Number**	**480Y/277V 3-Phase, 4-Wire Catalog Number**	**480V① 1-Phase, 3-Wire Catalog Number**
800②	30	P5D60ML800ATS	P5E60ML800ATS	P5F60ML800ATS
	45	P5D75ML800ATS	P5E75ML800ATS	P5F75ML800ATS
	60	P5D90ML800ATS	P5E90ML800ATS	P5F90ML800ATS
1000	30	P5D60ML101ATS	P5E60ML101ATS	P5F60ML101ATS
	45	P5D75ML101ATS	P5E75ML101ATS	P5F75ML101ATS
	60	P5D90ML101ATS	P5E90ML101ATS	P5F90ML101ATS
1200	30	P5D60ML120ATS	P5E60ML120ATS	P5F60ML120ATS
	45	P5D75ML120ATS	P5E75ML120ATS	P5F75ML120ATS
	60	P5D90ML120ATS	P5E90ML120ATS	P5F90ML120ATS

Main Circuit Breaker — shown with aluminum bus, top fed, and surface trims.

Maximum Panel Ampere Rating	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V or 250 Vdc Max 1-Phase, 3-Wire Catalog Number
800②	21.25	P5C60M1800ATS	P5B60M1800ATS	P5A60M1800ATS
	36.25	P5C75M1800ATS	P5B75M1800ATS	P5A75M1800ATS
	51.25	P5C90M1800ATS	P5B90M1800ATS	P5A90M1800ATS
1200	20	P5C60N1120ATS	P5B60N1120ATS	P5A60N1120ATS
	35	P5C75N1120ATS	P5B75N1120ATS	P5A75N1120ATS
	50	P5C90N1120ATS	P5B90N1120ATS	P5A90N1120ATS
Maximum Panel Ampere Rating	**Unit Space (inches)**	**240 3-Phase, 4-Wire Catalog Number**	**480Y/277V 3-Phase, 4-Wire Catalog Number**	**480V① 1-Phase, 3-Wire Catalog Number**
800②	21.25	P5D60M1800ATS	P5E60M1800ATS	P5F60M1800ATS
	36.25	P5D75M1800ATS	P5E75M1800ATS	P5F75M1800ATS
	51.25	P5D90M1800ATS	P5E90M1800ATS	P5F90M1800ATS
1200	20	P5D60N1120ATS	P5E60N1120ATS	P5F60N1120ATS
	35	P5D75N1120ATS	P5E75N1120ATS	P5F75N1120ATS
	50	P5D90N1120ATS	P5E90N1120ATS	P5F90N1120ATS

For inches / millimeters conversion, see Application Data section.

① For 600V, change "F" in position 3 to "G". Price only branch breakers with 600V ratings.
② Alternate main breaker requires additional 1.25" unit space.

Main Fusible Switch (fuses not included)

Maximum Panel Ampere Rating	Unit Space (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	240/120V 3-Phase, 4-Wire Catalog Number	120/240V 1-Phase, 3-Wire Catalog Number	240V 3-Phase, 3-Wire Catalog Number	480Y/277V 3-Phase, 4-Wire Catalog Number	480V① 3-Phase, 3-Wire Catalog Number
400	25	**P5C75MS400ATS**	**P5B75MS400ATS**	**P5A75MS400ATS**	**P5D75MS400ATS**	**P5E75MS400ATS**	**P5F75MS400ATS**
	40	**P5C90MS400ATS**	**P5B90MS400ATS**	**P5A90MS400ATS**	**P5D90MS400ATS**	**P5E90MS400ATS**	**P5F90MS400ATS**
600	25	**P5C75MS600ATS**	**P5B75MS600ATS**	**P5A75MS600ATS**	**P5D75MS600ATS**	**P5E75MS600ATS**	**P5F75MS600ATS**
	40	**P5C90MS600ATS**	**P5B90MS600ATS**	**P5A90MS600ATS**	**P5D90MS600ATS**	**P5E90MS600ATS**	**P5F90MS600ATS**
800④	28.75	**P5C75MS800ATS**	**P5B75MS800ATS**	**P5A75MS800ATS**	**P5D75MS800ATS**	**P5E75MS800ATS**	**P5F75MS800ATS**
	43.75	**P5C90MS800ATS**	**P5B90MS800ATS**	**P5A90MS800ATS**	**P5D90MS800ATS**	**P5E90MS800ATS**	**P5F90MS800ATS**
1200④	28.75	**P5C75MS120ATS**	**P5B75MS120ATS**	**P5A75MS120ATS**	**P5D75MS120ATS**	**P5E75MS120ATS**	**P5F75MS120ATS**
	43.75	**P5C90MS120ATS**	**P5B90MS120ATS**	**P5A90MS120ATS**	**P5D90MS120ATS**	**P5E90MS120ATS**	**P5F90MS120ATS**

Alternate Main Breaker Selection②

Breaker Frame Rating	Trip Type	Breaker Family	Frame Type	Alternate Main Breaker Code③	Trip Amperage	Unit Space Requirements in Inches	Maximum Interruption Rating (KAIC) Volts AC 240	480	600
400	Thermal Magnetic	Sentron	JXD6	JX	200, 225, 250, 300, 350, 400	8.75	65,000	35,000	25,000
			JD6	J6	200, 225, 250, 300, 350, 400	8.75	65,000	35,000	25,000
			HJXD6	H5	200, 225, 250, 300, 350, 400	8.75	100,000	65,000	35,000
			HJD6	H6	200, 225, 250, 300, 350, 400	8.75	100,000	65,000	35,000
			HHJXD6	H9	200, 225, 250, 300, 350, 400	8.75	200,000	100,000	50,000
			HHJD6	6H	200, 225, 250, 300, 350, 400	8.75	200,000	100,000	50,000
			CJD6	CJ	200, 225, 250, 300, 350, 400	8.75	200,000	150,000	100,000
	Electronic (Solid state)	VL	NJ	J1	250, 400	6.25	65,000	35,000	25,000
			HJ	J7	250, 400	6.25	100,000	65,000	25,000
			LJ	J3	250, 400	6.25	200,000	100,000	25,000
		Sentron	SJD6	SJ	200, 300, 400	8.75	65,000	35,000	25,000
			SHJD6	SX	200, 300, 400	8.75	100,000	65,000	35,000
			SCJD6	SC	200, 300, 400	8.75	200,000	150,000	100,000
600	Thermal Magnetic	Sentron	LXD6	LX	450, 500, 600	8.75	65,000	35,000	25,000
			LD6	L6	250, 300, 350, 400, 450, 500, 600	8.75	65,000	35,000	25,000
			HLXD6	HO	250, 300, 350, 400, 450, 500, 600	8.75	100,000	65,000	35,000
			HLD6	HL	250, 300, 350, 400, 450, 500, 600	8.75	100,000	65,000	35,000
			HHLXD6	XH	250, 300, 350, 400, 450, 500, 600	8.75	200,000	100,000	50,000
			HHLD6	HH	250, 300, 350, 400, 450, 500, 600	8.75	200,000	100,000	50,000
			CLD6	CL	250, 300, 350, 400, 450, 500, 600	8.75	200,000	150,000	100,000
	Electronic (Solid state)	VL	NL	L7	400, 600	6.25	65,000	35,000	25,000
			HL	L2	400, 600	6.25	100,000	65,000	25,000
			LL	SL	400, 600	6.25	200,000	100,000	25,000
		Sentron	SLD6	L6	300, 400, 500, 600	8.75	65,000	35,000	25,000
			SHLD6	S2	300, 400, 500, 600	8.75	100,000	65,000	35,000
			SCLD6	SI	300, 400, 500, 600	8.75	200,000	150,000	100,000
800	Thermal Magnetic	VL	NM	M1	600, 700, 800	8.75	65,000	35,000	25,000
			HM	M2	600, 700, 800	8.75	100,000	65,000	35,000
			LM	M3	600, 700, 800	8.75	200,000	100,000	50,000
		Sentron	LMXD6	LM	500, 600, 700, 800	8.75	65,000	50,000	25,000
			LMD6	L1	500, 600, 700, 800	8.75	65,000	50,000	25,000
			HLMXD6	HK	500, 600, 700, 800	8.75	100,000	65,000	50,000
			HLMD6	HJ	500, 600, 700, 800	8.75	100,000	65,000	50,000
			MXD6	MX	500, 600, 700, 800	10.00	65,000	50,000	25,000
			MD6	MD	500, 600, 700, 800	10.00	65,000	50,000	25,000
			HMXD6	HR	500, 600, 700, 800	10.00	100,000	65,000	50,000
			HMD6	HM	500, 600, 700, 800	10.00	100,000	65,000	50,000
			CMD6	CM	500, 600, 700, 800	10.00	200,000	100,000	65,000
	Electronic (Solid state)	VL	NM	M1	600, 800	8.75	65,000	35,000	25,000
			HM	M2	600, 800	8.75	100,000	65,000	35,000
			LM	M3	600, 800	8.75	200,000	100,000	50,000
		Sentron	SMD6	SM	600, 700, 800	10.00	65,000	50,000	25,000
			SHMD6	S5	600, 700, 800	10.00	100,000	65,000	50,000
			SCMD6	SO	600, 700, 800	10.00	200,000	100,000	65,000
1200	Thermal Magnetic	VL	NN	N1	800, 900, 1000, 1200	10.00	65,000	35,000	25,000
			HN	N2	800, 900, 1000, 1200	10.00	100,000	65,000	35,000
			LN	N3	800, 900, 1000, 1200	10.00	200,000	100,000	65,000
		Sentron	NXD6	NX	900, 1000, 1200	10.00	65,000	50,000	25,000
			ND6	ND	900, 1000, 1200	10.00	65,000	50,000	25,000
			HNXD6	HT	900, 1000, 1200	10.00	100,000	65,000	50,000
			HND6	HN	900, 1000, 1200	10.00	100,000	65,000	50,000
			CND6	Cn	900, 1000, 1200	10.00	200,000	100,000	65,000
	Electronic (Solid state)	VL	NN	N1	800, 1000, 1200	10.00	65,000	35,000	25,000
			HN	N2	800, 1000, 1200	10.00	100,000	65,000	35,000
			LN	N3	800, 1000, 1200	10.00	200,000	100,000	65,000
		Sentron	SND6	SN	800, 1000, 1200	10.00	65,000	50,000	25,000
			SHND6	AD	800, 1000, 1200	10.00	100,000	65,000	50,000
			SCND6	SR	800, 1000, 1200	10.00	200,000	100,000	65,000

For inches / millimeters conversion, see Application Data section.

① For 600V, change "F" in position 3 to "G". Price only branch breakers with 600V ratings.
② For ground fault, see page 11-68.
③ Replace "MS" in catalog number with code letter.
④ 800 and 1200 ampere switches have "L" class fuse provisions (Type HCP).

Type P5

Branch Circuit Breakers①

Breaker Frame Rating	Trip Type	Breaker Family	Frame Type	Poles	Trip Amperage	Unit Space Requirements in Inches		Maximum Interruption Rating (KAIC) Volts AC					
						Single	Twin	120	240	480Y/ 277	480	600Y/ 347	600
100	Thermal Magnetic	General Application	BL	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	10,000	10,000	—	—	—	—
			BLR	2	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	3.75②③	10,000	10,000	—	—	—	—
			BLH	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	22,000	22,000	—	—	—	—
			HBL	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	65,000	65,000	—	—	—	—
			BQD	1, 2, 3	15-50, 60, 70, 80, 90, 100	—	3.75②③	65,000	65,000	14,000	—	—	—
			BQD6	1, 2, 3	15-50, 60, 70	—	3.75②③	65,000	65,000	—	—	10,000	—
	Special Application		BL-HID	1, 2	15, 20, 30	—	3.75②③	10,000	10,000	—	—	—	—
			BL-BG	2, 3	15, 20, 30	—	3.75②③	10,000	10,000	—	—	—	—
	Ground Fault Circuit Interrupter		BLE-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
			BLEH-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
			BLF-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
			BLHF-GFCI	1, 2	15, 20, 30, 40, 50, 60	—	3.75②	10,000	10,000	—	—	—	—
	Arc Fault Circuit Interrupter		BAF-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
			BAFH-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
			BAFC-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
			BAFCH-AFCI	1, 2	15, 20	—	3.75②	10,000	10,000	—	—	—	—
125	Thermal Magnetic	General Application	NGB	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	25,000	—	14,000	—
			NEB	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	85,000	—	35,000	—	22,000
			HEB	1, 2, 3	15-60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	—	65,000	—	25,000
			ED4	1, 2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	65,000	—	18,000	—	—
			HED4④⑤	1, 2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	—	42,000	—	—
			HHED6	2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	100,000	—	65,000	—	18,000
			CED6	2, 3	15-50, 60, 70, 80, 90, 100, 110, 125	—	3.75②③	—	200,000	—	200,000	—	100,000
150	Electronic (Solid state)	VL	ND	3	60, 100, 150	—	5.00	—	65,000	—	35,000	—	18,000
			HD	3	60, 100, 150	—	5.00	—	100,000	—	65,000	—	20,000
			LD	3	60, 100, 150	—	5.00	—	200,000	—	100,000	—	25,000
225	Thermal Magnetic	General Application	QJ2	2, 3	60-110, 125, 150, 175, 200, 225	—	5.00	—	10,000	—	—	—	—
			QJH2	2, 3	60-110, 125, 150, 175, 200, 225	—	5.00	—	22,000	—	—	—	—
			QJ2H	2, 3	60-110, 125, 150, 175, 200, 225	—	5.00	—	42,000	—	—	—	—
			HQJ2H	3	100, 110, 125, 150, 175, 200, 225	—	5.00	—	100,000	—	—	—	—
250	Thermal Magnetic	Sentron	FXD6, FD6	2, 3	70-110, 125, 150, 175, 200, 225, 250	5.00	5.00	—	65,000	—	35,000	—	22,000
			HFXD6, HFD6	2, 3	70-110, 125, 150, 175, 200, 225, 250	5.00	5.00	—	100,000	—	65,000	—	25,000
			HHFXD6, HHFD6	2, 3	70-110, 125, 150, 175, 200, 225, 250	5.00	5.00	—	200,000	—	100,000	—	25,000
			CFD6	3	70-110, 125, 150, 175, 200, 225, 250	—	5.00	—	200,000	—	200,000	—	100,000
	Electronic (Solid state)	VL	NF	3	100, 150, 250	—	5.00	—	65,000	—	35,000	—	18,000
			HF	3	100, 150, 250	—	5.00	—	100,000	—	65,000	—	20,000
			LF	3	100, 150, 250	—	5.00	—	200,000	—	100,000	—	25,000
400	Thermal Magnetic	Sentron	JXD6, JD6	2, 3	200, 225, 250, 300, 350, 400	8.75	8.75	—	65,000	—	35,000	—	25,000
			HJXD6, HJD6	2, 3	200, 225, 250, 300, 350, 400	8.75	8.75	—	100,000	—	65,000	—	35,000
			HHJXD6, HHJD6	2, 3	200, 225, 250, 300, 350, 400	8.75	8.75	—	200,000	—	100,000	—	50,000
			CJD6	3	200, 225, 250, 300, 350, 400	8.75	—	—	200,000	—	150,000	—	100,000
	Electronic (Solid state)	VL	NJ	3	250, 400	6.25	6.25	—	65,000	—	35,000	—	25,000
			HJ	3	250, 400	6.25	6.25	—	100,000	—	65,000	—	25,000
			LJ	3	250, 400	6.25	6.25	—	200,000	—	100,000	—	25,000
		Sentron	SJD6	3	200, 300, 400	8.75	—	—	65,000	—	35,000	—	25,000
			SHJD6	3	200, 300, 400	8.75	—	—	100,000	—	65,000	—	35,000
			SCJD6	3	200, 300, 400	8.75	—	—	200,000	—	150,000	—	100,000

For inches / millimeters conversion, see Application Data section.

① Includes housing frame plate with blank cover plate. Provision price includes all necessary mounting hardware, less circuit breaker, and includes housing frame cover plate with breaker handle opening.

② 1 to 6 poles may be mounted in 3.75" of unit space.

③ Accessories such as shunt trips on three pole breakers require 6.25" of unit space.

④ HED4 1-pole 15–30A = 65,000 IR
35–100A = 25,000 IR

⑤ HED4 3-Pole = 42,000 IR-

Type P5

Branch Circuit Breakers[1] (cont.)

Breaker Frame Rating	Trip Type	Breaker Family	Frame Type	Poles	Trip Amperage	Unit Space Requirements in Inches		Maximum Interruption Rating (KAIC) Volts AC					
						Single	Twin	120	240	480Y/ 277	480	600Y/ 347	600
600	Thermal Magnetic	Sentron	LXD6	2, 3	450, 500, 600	8.75	—	—	65,000	—	35,000	—	25,000
			LD6	2, 3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	65,000	—	35,000	—	25,000
			HLXD6, HLD6	2, 3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	100,000	—	65,000	—	35,000
			HHLXD6, HHLD6	2, 3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	200,000	—	100,000	—	50,000
			CLD6	3	250, 300, 350, 400, 450, 500, 600	8.75	—	—	200,000	—	150,000	—	100,000
	Electronic (Solid state)	VL	NL	3	400, 600	6.25	—	—	65,000	—	35,000	—	25,000
			HL	3	400, 600	6.25	—	—	100,000	—	65,000	—	25,000
			LL	3	400, 600	6.25	—	—	200,000	—	100,000	—	25,000
		Sentron	SLD6	3	300, 400, 500, 600	8.75	—	—	65,000	—	35,000	—	25,000
			SHLD6	3	300, 400, 500, 600	8.75	—	—	100,000	—	65,000	—	35,000
			SCLD6	3	300, 400, 500, 600	8.75	—	—	200,000	—	150,000	—	100,000
800	Thermal Magnetic	VL	NM	2, 3	600, 700, 800	8.75	—	—	65,000	—	35,000	—	25,000
			HM	2, 3	600, 700, 800	8.75	—	—	100,000	—	65,000	—	35,000
			LM	2, 3	600, 700, 800	8.75	—	—	200,000	—	100,000	—	50,000
		Sentron	MXD6	2, 3	600, 700, 800	10.00	—	—	65,000	—	50,000	—	25,000
			MD6	2, 3	500, 600, 700, 800	10.00	—	—	65,000	—	50,000	—	25,000
			HMXD6	2, 3	600, 700, 800	10.00	—	—	100,000	—	65,000	—	50,000
			HMD6	2, 3	500, 600, 700, 800	10.00	—	—	100,000	—	65,000	—	50,000
			CMD6	3	600, 700, 800	10.00	—	—	200,000	—	100,000	—	65,000
	Electronic (Solid state)	VL	NM	3	600, 800	8.75	—	—	65,000	—	35,000	—	25,000
			HM	3	600, 800	8.75	—	—	100,000	—	65,000	—	35,000
			LM	3	600, 800	8.75	—	—	200,000	—	100,000	—	50,000
		Sentron	SMD6	3	600, 700, 800	10.00	—	—	65,000	—	50,000	—	25,000
			SHMD6	3	600, 700, 800	10.00	—	—	100,000	—	65,000	—	50,000
			SCMD6	3	600, 700, 800	10.00	—	—	200,000	—	100,000	—	65,000
1200	Thermal Magnetic	VL	NN	2, 3	800, 900, 1000, 1200	10.00	—	—	65,000	—	35,000	—	25,000
			HN	2, 3	800, 900, 1000, 1200	10.00	—	—	100,000	—	65,000	—	35,000
			LN	2, 3	800, 900, 1000, 1200	10.00	—	—	200,000	—	100,000	—	65,000
		Sentron	NXD6	2, 3	900, 1000, 1200	10.00	—	—	65,000	—	50,000	—	25,000
			ND6	2, 3	800, 900, 1000, 1200	10.00	—	—	65,000	—	50,000	—	25,000
			HNXD6	2, 3	900, 1000, 1200	10.00	—	—	100,000	—	65,000	—	50,000
			HND6	2, 3	800, 900, 1000, 1200	10.00	—	—	100,000	—	65,000	—	50,000
			CND6	2, 3	900, 1000, 1200	10.00	—	—	200,000	—	100,000	—	65,000
	Electronic (Solid state)	VL	NN	3	800, 1000, 1200	10.00	—	—	65,000	—	35,000	—	25,000
			HN	3	800, 1000, 1200	10.00	—	—	100,000	—	65,000	—	35,000
			LN	3	800, 1000, 1200	10.00	—	—	200,000	—	100,000	—	65,000
		Sentron	SND6	3	800, 1000, 1200	10.00	—	—	65,000	—	50,000	—	25,000
			SHND6	3	800, 1000, 1200	10.00	—	—	100,000	—	65,000	—	50,000
			SCND6	3	800, 1000, 1200	10.00	—	—	200,000	—	100,000	—	65,000

For inches / millimeters conversion, see Application Data section.

[1] Includes housing frame plate with blank cover plate. Provision price includes all necessary mounting hardware, less circuit breaker, and includes housing frame cover plate with breaker handle opening.

Panelboards

Power and Distribution

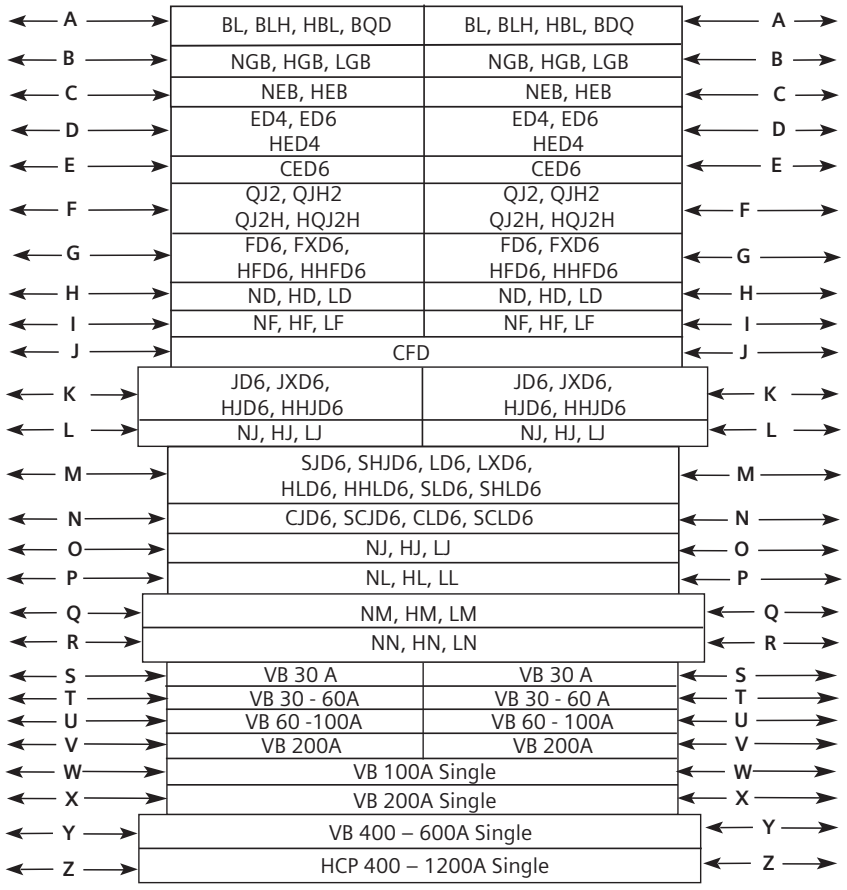
Selection/Dimensions

Ampere Rating	Mounting Height (inches)
240V — Twin Mounted	**NEC Fuse Clips②**
30-30	2½④
30-30	5
30-60	5
60-60	5
60-100	7½
100-100	7½
200-200	10
240V — Single Mounted	**NEC Fuse Clips②**
30	7½
60	7½
100	7½
200	10
200	7½
400	15
600	15
800 (HCP)	16¼
1200 (HCP)	16¼

Ampere Rating	Mounting Height (inches)
600V — Twin Mounted	**NEC Fuse Clips②**
30-30	7½
30-60	7½
60-60	7½
60-100	7½
100-100	7½
200-200	10
600V — Single Mounted	**NEC Fuse Clips②**
100	7½
200	10
400	15
400 (HCP)	15
600	15
600	15
800③ (HCP)	16¼
1200③ (HCP)	16¼

Branch Breaker Side Gutter Inches (mm)

Reference Letter	Panel Width 38 Inches Dimensions in inches (mm)
A	14.00 (356)
B	13.98 (355)
C	11.62 (295)
D	10.00 (254)
E	7.61 (193)
F	8.75 (222)
G	8.25 (210)
H	10.90 (276)
I	10.90 (276)
J	11.76 (299)
K	7.92 (201)
L	8.00 (203)
M	13.42 (341)
N	12.00 (305)
O	15.50 (393)
P	14.25 (362)
Q	13.42 (341)
R	13.42 (341)
S	10.00 (254)
T	8.00 (203)
U	10.50 (267)
V	10.50 (267)
W	9.30 (236)
X	10.30 (262)
Y	9.30 (236)
Z	10.30 (262)



For inches / millimeters conversion, see Application Data section.

① Includes housing frame plate without breaker handle opening.
Provisions include all necessary mounting hardware less breakers.

② For Class J, R or T fuse clip prices, refer to page 11-68.
③ 800 and 1200 ampere switches have class "L" fuse provisions. (Type HCP).
④ NEC fuse clips only.

Types P5 and SPP/FPP, F2 (12 3/4" deep)

Connecting Strap Kits①②③ Circuit Breaker

For use with P5, Sentron Deep or Type S5 Power Panels					
Max Amp Rating	**Breaker Family**	**Breaker Type**	**Catalog Number**	**Unit Height (inches)**	**Mounting**
100	General	BL, BQD	**SBLBD**	3.75	Twin
125	General	NGB	**SNBD**	3.75	Twin
	General	EB	**SEBD**	3.75	Twin
	General	ED	**SE6D**	3.75	Twin
	General	CED	**SCED**	3.75	Twin
150	VL	DG	**SDGD**	5.00	Twin
225	General	QJ	**SQJD**	5.00	Twin
250	Sentron	FD	**SF6D**	5.00	Twin
	VL	FG	**SFGD**	5.00	Twin
	Sentron	CFD	**SCFD**	5.00	Single
400	Sentron	JD	**SJ1D**	8.75	Single
	Sentron	JD	**SJ2D**	8.75	Twin
	Sentron	SJD	**SSJ1D**	8.75	Single
	VL	JG	**SJG1D**	6.25	Single
	VL	JG	**SJG2D**	6.25	Twin
	Sentron	CJD	**SCJD**	8.75	Single
	Sentron	SJD	**SSCJD**	8.75	Single
600	Sentron	LD	**SL6D**	8.75	Single
	Sentron	SLD	**SSL6D**	8.75	Single
	VL	LG	**SLGD**	6.25	Single
	Sentron	CLD	**SCLD**	8.75	Single
	Sentron	SCLD	**SSCLD**	8.75	Single
800	VL	MG	**MG1D**	8.75	Single
	Sentron	LMD	**SLM1D**	8.75	Single
	Sentron	MD	**SMND**	10.00	Single
	Sentron	SMD	**SSMND**	10.00	Single
1200	VL	NG	**NG1D**	10.00	Single
	Sentron	ND	**SMND**	10.00	Single
	Sentron	SND	**SSMND**	10.00	Single

Connecting Strap Kits③ Fusible

For use with P5, Sentron FPP Deep or Type F2 power panels		
Ampere Rating	**Unit Height (inches)**	**12. 75" Deep Box CatalogNumber**
30–30	2.5	**F602D**
30–30	5, 7.5	**F657D**
30–60	5, 7.5	**F657D**
60–60	5, 7.5	**F657D**
60–100	5, 7.5	**F657D**
100–100	5, 7.5	**F657D**
100	7.5	**F657D**
200	7.5	**F657D**
200	10	**F671D**
200–200	10	**F672D**
400–600	15	**F6150D**
800–1200④	16.25	**F6162D**

Blank Plates Circuit Breaker and Vacu-Break①

For use with P5, Sentron SPP and Type S5 power panels	
Height (inches)	**Catalog Number**
1.25	**6FPB01**
2.5	**6FPB02**
3.75	**6FPB03**
5.0	**6FPB05**
10.0	**6FPB10**

Filler Plates

For use with P5, Sentron SPP and Type S5 power panels	
Breaker Type	**Filler Plate Catalog Number**
BL, BLH, HBL, BQD, ED2, ED4, ED6, HED4, HED6, HHED6	**QF3**
NEB, HEB	**EBF1**

For inches / millimeters conversion, see Application Data section.

① Normal stock item.

② Includes cover plate and mounting hardware, less circuit breaker.

③ Also fits Types FCI, FCII, SB1 and SB2 switchboards.

④ 800–1200 amp units are HCP switch.

Note: When a front filler plate is not completely filled with breakers, the openings in the unused space must be closed with filler plates selected from this table.

Type P5 Panelboards

Devices Mounted on Gutter Cover Includes Device, Mounting – Wired or Unwired

Description
One piece front with door
(Depth increases to 14.25")
Hinged Gutter Covers 4 pc front
Toggle Switch — SPST or 3-way
15A, 277V maximum
Pilot Light — General Purpose
Neon or Incandescent
Pushbutton

Feed-Thru Lugs

Ampere Rating	Unit Space (inches)
400	10
600	10
800	17.5
1200	17.5

Grounding of Panelboards

Ground Bars except for brazed to box are shipped with the panel interior factory mounted.

- Non-Insulated Equipment Ground Bar – Standard
- Copper Non-Insulated Ground Bar
- Al Insulated Equipment Ground Bar
- Cu Insulated Equipment Ground Bar
- Ground Bar Brazed to Box

Fuse Clip Provisions (Add to 250 Volts or 600 Volts Unit Prices Per Switch)

Amp Rating	Class J	Class R	Class T
30	•	•	N/A
60	•	•	N/A
100	•	•	•
200①	•	•	•
400	•	•	•
600	•	•	•

• Indicates available

Ground Fault on Main Breaker

Description	Amp Rating
Conventional Ground Fault② Includes:	
Ground Fault Relay, Ground Sensor, CPT and Shunt Trip	800-1200
Test and Monitor Panel ③	
Ground Fault add to Sensitrip III breaker price (takes 5" of unit space)	800-1200

Time Clocks④

Sangamo, Tork or Paragon time clock can be supplied, mounted in panelboard cabinet. For required increase in enclosure dimension, consult local sales office.

Description
Time clock (1- or 2-Pole, Single or Double Throw Contacts; 3-Pole Single Throw)
277V Maximum with Plain Dial
Optional: Astronomical Dial An Omitting Device Reserve Power or Carryover
Space and Mounting Provisions Only

Circuit Breaker Accessories
Handle Blocking Device Blocks handle in either the "ON" or "OFF" position.

Padlocking Device – Padlocks in "OFF" position.

Main Bus

Standard main bus and ground bus are tin-plated aluminum. For copper main bus, neutral bus and ground bus, add from the table for each panel.

Lugs – For Main Lug Only Panels

Standard main lugs and neutral lugs are tin-plated aluminum, UL listed for use with aluminum/copper cables. Copper only lugs are an option.

Ampere Rating
400 - 1200

Shunt Trip on Main and Branches⑤

Description
BL, BQD, NGB, NEB, HEB (branch only)
QJ2, QJH2, QJ2H, HQJ2H, ED2, ED4, HED4, HHED6, CED (branch only)
All others to 1200A

100% Rated Main Circuit Breakers

Ampere Rating	Breaker Type
400	JXD6H, HJXD6H
	NJY, HJY, LJY
600	LXD6H, HLXD6H
600⑥	NMY, HMY, LMY
800⑦	NNY, HNY, LNY
1200	NNY, HNY, LNY

① For use on main lug, main breaker or main switch panels without subfeed breakers.
② Available in 90" high enclosure only. Unit space is 42½" with Test and Monitor Panel; 45" without Test Monitor Panel.
③ Not available on Sensitrip III.
④ For required unit space, consult local sales office.
⑤ Shunt Trip on 100A frame breakers increases mounting height to 6.25" for twin mounting.
⑥ The 600A, 100% rated braaker application requires the use of an 800A frame breaker.
⑦ The 800A, 100% rated breaker application requires the use of a 1200A frame breaker.

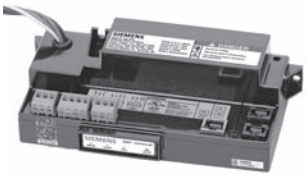
SEM3 System configured in Panelboards

The Siemens SEM3 system can be configured for factory installation in branch circuit monitoring applications using the Siemens COMPAS configuration tool. This option can lower the installation time of the system for the installer while providing a factory warrantied solution.

The SEM3 system can be factory installed in unit space in type P2, P4, & P5 Siemens panel boards. Please note P1 and P3 configurations are not available at this time and the amount of unit space needed varies depending upon the application. Please note that lead time adders will apply and may vary depending upon the configuration of the system.

SEM3 for use in Siemens Panelboards

Available in a NEMA 1, 3R, or 12 rated enclosure



Controller

SEM3 controller is mounted in unit space opposite of the feed location specified in COMPAS (i.e., bottom mount for top feed) and will require 3" of unit space. Each controller will be powered by direct tap connection to the panel section bus. Each controller can monitor up to 45 circuits. Applications that require monitoring more than 45 circuits will require additional controllers.



Current Transformers (CTs)

Five sizes of CTs are available for use in the P2 panel: 50, 125, 250, 400 & 600 amp. All CTs are pre-mounted to a support bracket that attaches to the base rail of the interior of the panel board. Each bracket supports a maximum of 3 CTs and is designed for the breaker selected (brackets are not interchangeable between breaker frames). Each CT will be attached to a data module that is placed in the meter racks.



Meter Racks

Each meter rack requires 3" of unit space. All meter racks will be installed next to the SEM3 controller in unit space. The COMPAS configuration tool will select the appropriate meter rack configuration according to the user's application and will use the 21 space meter rack as a default option where possible. Only one meter rack (regardless of number of positions) can be installed in 3" of unit space.

NOTE: Monitoring of 45 circuits will require 9" of unit space: two 21 position racks and one 3 position rack

Other Considerations

Configuration: Data modules from CTs monitoring a circuit breaker must be mounted adjacent to one another in the meter rack. Any field changes to the factory configuration must take this into account.

Start-up & Commissioning: Siemens can provide these services. Contact your local SIEMENS PDS Power Solutions Business Developer for more details.

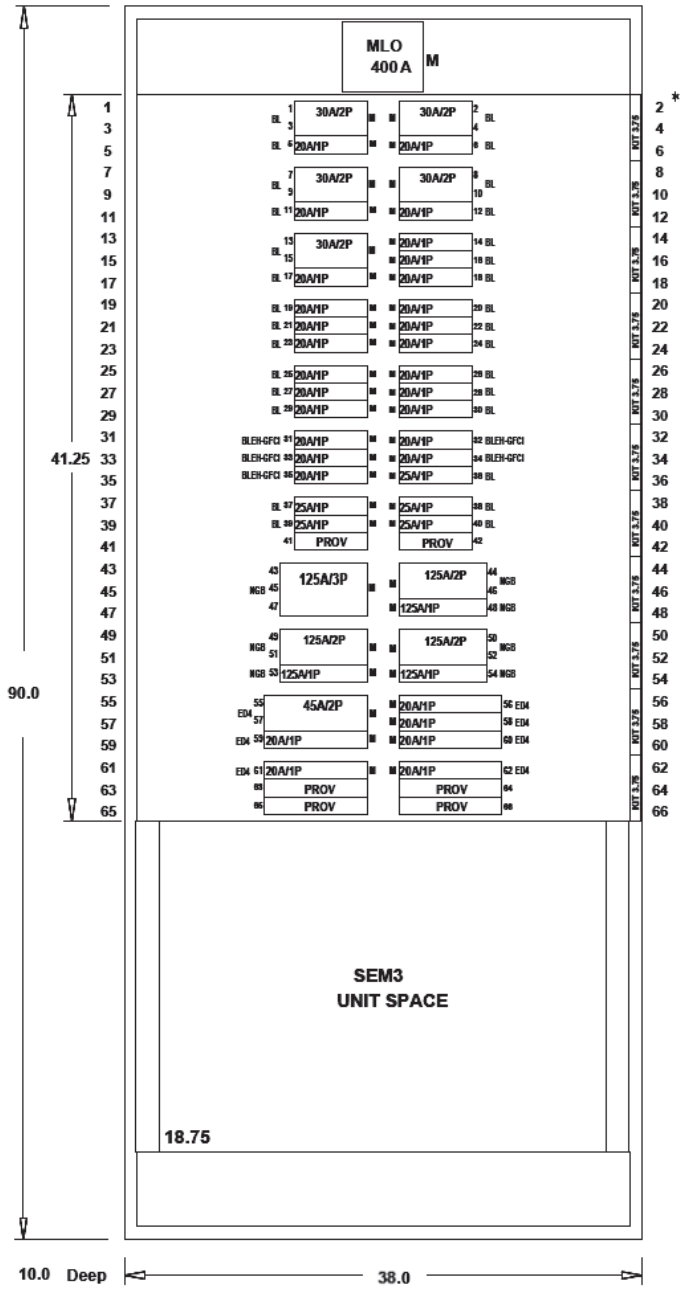
Billing Services for sub billing applications: Billing services are available. Contact your local SIEMENS PDS Power Solutions Business Developer for more details.

P5 Devices
Enclosure sizes

Example P5 Panel with SEM3 Type 1 Enclosure
P5 = (38" or 46" Wide x 10" Deep)

Enclosure heights are in 15" increments from 60" thru 90".
Enclosure heights: 60", 75", 90" (there are optional depths also)

The COMPAS configuration tool can provide actual dimensions based on the configuration. Example below is largest standard P4 enclosure for factory assembled panel - unit space is in 3.75" increments - up to 6 circuits can occupy each 3.75" of unit space.



38" std. width for P5

Main Breaker / Main Lug space varies based on selected options

Unit space varies based on selected options

Note: All circuits do not have to be monitored by SEM3 - user can select any circuits in this space to be monitored.

Based on smallest branch breakers and a 3-phase main being monitored. There is a maximum of 63 circuits that can be monitored with the configuration shown. Some selections of main breakers and other subfeed options could limit this further.

In this situation there is 37.5" of unit space available - so 60 branch circuits could be monitored.
If monitoring the main three additional circuits could be monitored with a total of 63 circuits.

This requires two controllers and three 21 position racks using 18.75" of unit space.
- see below -

SEM3 space varies by number of circuits monitored - this uses unit space.

== > 7.5" of space for up to 21 circuits monitored
one controller and one 21-pos rack

== > 11.25" of space for up to 42 circuits monitored
one controller and two 21-pos racks

== > 15" of space for up to 45 circuits monitored
one controller and two 21-pos racks plus one 3-pos rack

== > 18.75" of space for up to 63 circuits monitored
two controllers and three 21-pos racks

Note: If subfeed space is needed - it will take away from available unit space.

Panelboards

Modifications and Additions

Selection

Type P5 Panelboards

Vacu-Break Fusible Switches

For Branch Circuit Use with AC Combination Full Voltage Starters ①

Amp Rating	Horsepower Ratings				Mounting Height in Inches (mm)				Min. Section Width Inches (mm)
	240V AC		480V AC		240V AC		480V AC		
	With NEC Fuse	With Dual-Element Fuse	With NEC Fuse	With Dual-Element Fuse	Twin	Single	Twin	Single	
30-30	3	7.5	—	—	2.50 ② (64)	—	—	—	32 (813)
30-30	3	7.5	5	10	5.00 (127)	—	7.50 (191)	—	32 (813)
30-60	3-7.5	7.5-15	5-15	25	5.00 (127)	—	7.50 (191)	—	32 (813)
60-60	7.5	15	15	25	5.00 (127)	—	7.50 (191)	—	32 (813)
60-100	7.5-15	15-30	15-25	25-50	7.50 (191)	—	7.50 (191)	—	32 (813)
100-100	15	30	25	50	7.50 (191)	—	7.50 (191)	—	32 (813)
100	—	—	25	50	—	—	—	7.50 (191)	32 (813)
200	25	50	50	100	—	10.00 (254)	—	10.00 (254)	32 (813)
200-200	—	50	—	100	10.00 (254)	—	10.00 (254)	—	32 (813)
400	50	100	100	—	—	15.00 (381)	—	15.00 (381)	38 (965)
600	75	100	—	—	—	15.00 (381)	—	15.00 (381)	38 (965)

Connector Modifications

Compression Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Available Unit Space Reduction
MLO	800	N/A	All compression lugs	Deduct 5.0″ Unit Space
	1000	N/A	All compression lugs	Deduct 5.0″ Unit Space
	1200	N/A	All compression lugs	Deduct 5.0″ Unit Space
Main Breaker	800	MD6, HMD6, CMD6, SMD6, SHMD6, SCMD6	(3)#2/0 AWG - 500 Kcmil CU or Al	0
	1200	ND6, HND6, CND6, SND6, SHND6. SCND6	(4)#250 - 500 Kcmil Cu or Al	0

Alternate Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Available Unit Space Reduction
MLO	800	N/A	(3)#3/0 AWG - 750 Kcmil Cu or Al	Deduct 10″ Unit Space
	1000	N/A	(4)#3/0 - 600 Kcmil Cu or Al (4)#3/0 AWG - 750 Kcmil Cu or Al	Deduct 10″ Unit Space
	1200	N/A	(4)#3/0 AWG - 600 Kcmil Cu or Al (4)#3/0 AWG - 750 Kcmil CU or Al	Deduct 10″ Unit Space

① 100,000 kA at 480V with Class J or Class RK5 fuses.

② The 2.50 inch (64mm) high unit is suitable for NEC Class H and K5 fuses only. Class R rejection type fuse holders are not available.

Type P5 Panelboards

Enclosures

Description	Catalog number
P5 Type 1 36" W x 12.75" D x 60" H	**PB860**
P5 Type 1 36" W x 12.75" D x 75" H	**PB875**
P5 Type 1 36" W x 12.75" D x 90" H	**PB890**
P5 Type 1 36" W x 14.75" D x 60" H	**PBD860**①
P5 Type 1 36" W x 14.75" D x 75" H	**PBD875**①
P5 Type 1 36" W x 14.75" D x 90" H	**PBD890**①
P5 Type 3R/12 60" H	**WP860**
P5 Type 3R/12 75" H	**WP875**
P5 Type 3R/12 90" H	**WP890**

Trims

Description	Catalog number
P5 Std (4 piece trim) vented 60"	**P560V**
P5 Std (4 piece trim) vented 75"	**P575V**
P5 Std (4 piece trim) vented 90"	**P590V**
P5 Std (4 piece trim) unvented 60"	**P560NV**②
P5 Std (4 piece trim) unvented 75"	**P575NV**②
P5 Std (4 piece trim) unvented 90"	**P575NV**②
P5 Std (4 piece trim) vented 60" with hinged gutter covers	**P560VHG**
P5 Std (4 piece trim) vented 75" with hinged gutter covers	**P575VHG**
P5 Std (4 piece trim) vented 90" with hinged gutter covers	**P590VHG**
P5 Std (4 piece trim) unvented 60" with hinged gutter covers	**P560NVHG**
P5 Std (4 piece trim) unvented 75" with hinged gutter covers	**P575NVHG**
P5 Std (4 piece trim) unvented 90" with hinged gutter covers	**P590NVHG**
P5 Std (1 PC Door) vented 60"	**P560VD**③
P5 Std (1 PC Door) vented 75"	**P575VD**③
P5 Std (1 PC Door) vented 90"	**P590VD**③
P5 Std (1 PC Door) unvented 60"	**P560NVD**③
P5 Std (1 PC Door) unvented 75"	**P575NVD**③
P5 Std (1 PC Door) unvented 90"	**P590NVD**③
P5 Std (1 PC Door-in-door) vented 60"	**P560VDD**③
P5 Std (1 PC Door-in-door) vented 75"	**P575VDD**③
P5 Std (1 PC Door-in-door) vented 90"	**P590VDD**③
P5 Std (1 PC Door-in-door) unvented 60"	**P560NVDD**③
P5 Std (1 PC Door-in-door) unvented 75"	**P575NVDD**③
P5 Std (1 PC Door-in-door) unvented 90"	**P590NVDD**③

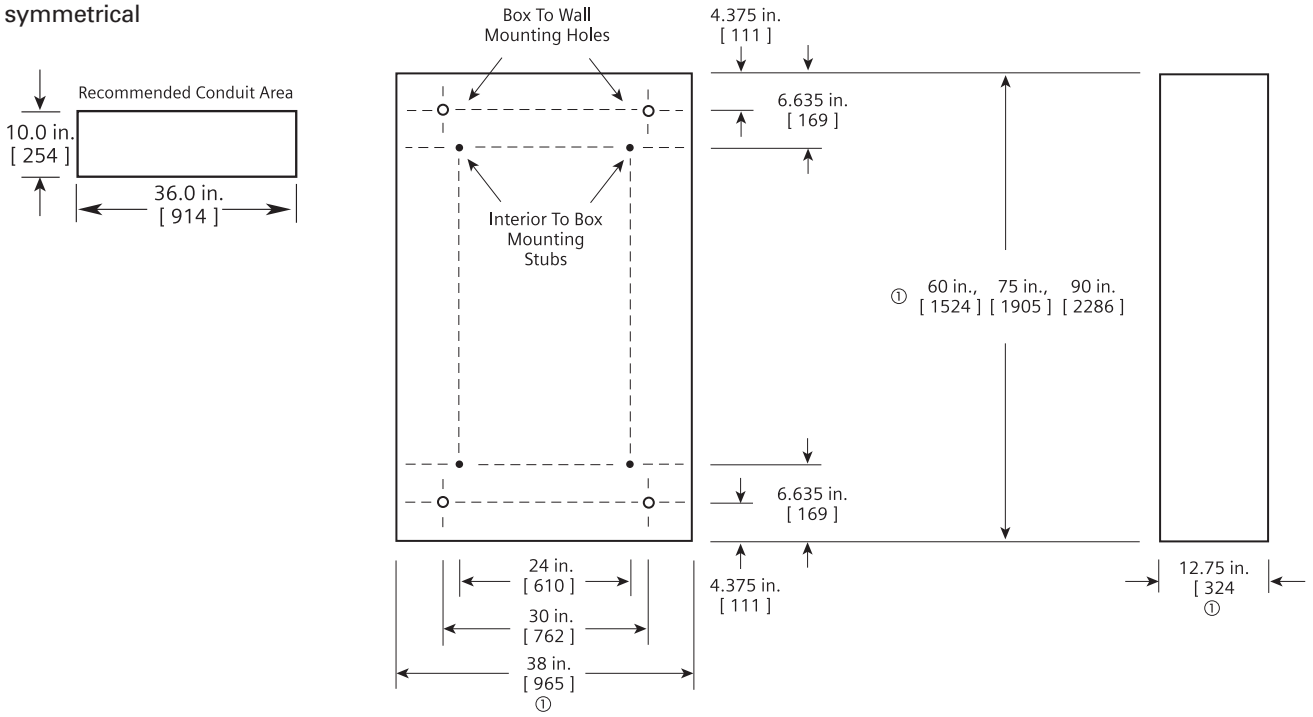
Flush mounting kits

Description	Catalog number
Flush kit to P5 60" High	**F860**
Flush kit to P5 75" High	**F875**
Flush kit to P5 90" High	**F890**

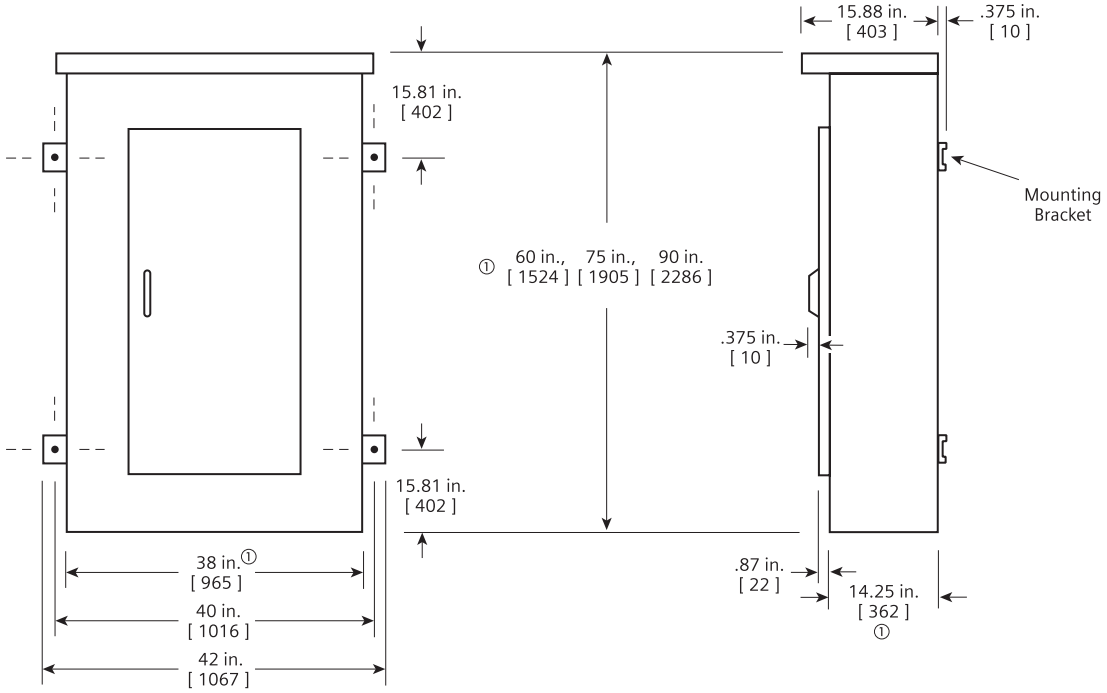
① Required with door over breaker handles.
② Unvented trims require amps per square inch bussing.
③ Requires 14.5" deep box.

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



①Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.

Dimensions shown in inches and millimeters [ ].

Type C1

240 Volts AC Maximum
250 Ampere Mains
250 Ampere Maximum Branch
UL Short Circuit Rating — 200,000 IR Maximum

Branch Breaker Symmetrical Interrupting Rating

Based on Underwriters' Test Procedure

Type C2

480Y/277 Volts AC Maximum
250 Ampere Mains
250 Ampere Maximum Branch
UL Short Circuit Rating — 100,000 IR Maximum

Meets 2002 NEC wire bending requirement, section 312–6.

Panelboards

Listed by Underwriter's Laboratories, Inc., under "Panelboards" File #E2269.

Meets Federal Specification W–C375B/Gen.

Service

240 Volts Maximum. 1-Phase, 3-Wire, or 3-Phase, 4-Wire.

Panelboards Fronts and Doors

Standard panelboards are furnished with trim with a flush door lock. All are factory assembled for ease of installation. Fronts are fabricated from code gauge steel and finished ANSI-61.

Main Breakers C1

BL, BLH and HBL frame breakers are mounted horizontally. All other frames are mounted vertically.

Main Breakers C2

BQD frame breakers are mounted horizontally. All other frames are mounted vertically.

Boxes

C1 — 7⅝" wide, 5¾" deep.
C2 — 8½" wide, 5¾" deep.

Branch Breaker Side Gutters

Type	Circuit Breaker	Side Gutter (inches)
C1	BL, BLH, HBL	3.505
C2	BQD	3.5

Weight–Approximate

Total panelboard weight when filled with a normal quantity of breakers and accessories is:
*About 3 lbs. per inch of box height.

Gauge Steel Boxes

Type	Width	Height	Gauge Steel
C1	7⅝"	48", 73", 85"	#14
C2	8½"	48", 73", 85"	#14

Fronts

C1	7⅝"	48", 73", 85"*	#14
C2	8½"	48", 73", 85"*	#14

***Note:** Feed thru lugs and subfeed breaker not available for this height.

Main Breaker Connectors

Ampere Rating	Connectors suitable for Cu or Al
100	(1) #14–1/0 AWG
125	(1) #4–1/0 AWG
225	(1) #6 AWG–300 kcmil
250	(1) #4 AWG–350 kcmil Al (1) #6 AWG–350 kcmil Cu

Main Lug Connectors

125	(1) #6 AWG–350 kcmil
250	(1) #6 AWG–350 kcmil

For inches / millimeters conversion, see Application Data section.

① Connector ranges indicated do not apply to all main breaker types. Refer to molded case circuit breaker standard pressure wire connectors in the breaker section of this catalog for the wire ranges for a specific breaker frame.

Panelboards

Circuit Breaker / Column Type

Selection

Main Lugs Only C1

240 Volts Maximum

Maximum Panel Ampere Rating	Maximum 1-Pole Circuits	Box Height (inches)	208Y/120V 3-Phase, 4-Wire Catalog Number	120/240V 1-Phase, 3-Wire Catalog Number
125	18	48	C1C18ML125CTS	C1A18ML125CTS
	30	73	C1C30ML125CTS	C1A30ML125CTS
	42	85	C1C42ML125CTS	C1A42ML125CTS
250	18	48	C1C18ML250CTS	C1A18ML250CTS
	30	73	C1C30ML250CTS	C1A30ML250CTS
	42	85	C1C42ML250CTS	C1A42ML250CTS

Main Circuit Breaker①② C1

240 Volts Maximum

100	18	48	C1C18BL100CTS	C1A18BL100CTS
	30	73	C1C30BL100CTS	C1A30BL100CTS
	42	85	C1C42BL100CTS	C1A42BL100CTS
125	18	48	C1C18E4125CTS	C1A18E4125CTS
	30	73	C1C30E4125CTS	C1A30E4125CTS
	42	85	C1C42E4125CTS	C1A42E4125CTS
225	18	48	C1C18QJ225CTS	C1A18QJ225CTS
	30	73	C1C30QJ225CTS	C1A30QJ225CTS
	42	85	C1C42QJ225CTS	C1A42QJ225CTS
250	18	48	C1C18FX250CTS	C1A18FX250CTS
	30	73	C1C30FX250CTS	C1A30FX250CTS
	42	85	C1C42FX250CTS	C1A42FX250CTS

Main Lugs Only C2

480Y/277 Volts Maximum

Maximum Panel Ampere Rating	Maximum 1-Pole Circuits	Box Height (inches)	480Y/277V 3-Phase, 4-Wire Catalog Number
125	18	48	C2E18ML125CTS
	30	73	C2E30ML125CTS
	42	85	C2E42ML125CTS
250	18	48	C2E18ML250CTS
	30	73	C2E30ML250CTS
	42	85	C2E42ML250CTS

Main Circuit Breaker①② C2

480Y/277 Volts Maximum

100	18	48	C2E18BD100CTS
	30	73	C2E30BD100CTS
	42	85	C2E42BD100CTS
125	18	48	C2E18E4125CTS
	30	73	C2E30E4125CTS
	42	85	C2E42E4125CTS
225	18	48	C2E18FX225CTS
	30	73	C2E30FX225CTS
	42	85	C2E42FX225CTS
250	18	48	C2E18FX250CTS
	30	73	C2E30FX250CTS
	42	85	C2E42FX250CTS

Alternate Main Breaker Selection①② C1

Ampere Rating	Breaker Type	Maximum Interrupting Rating (KA)	Catalog Number	Available Trip Values
100	BL	10	**BL**	50, 60, 70, 80, 90, 100
	BLH	22	**LH**	50, 60, 70, 80, 90, 100
	HBL	65	**HL**	50, 60, 70, 80, 90, 100
125	ED4	65	**E4**	50, 60, 70, 80, 90, 100, 110, 125
	HED4	100	**H4**	50, 60, 70, 80, 90, 100, 110, 125
225	QJ2	10	**QJ**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJH2	22	**QH**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJ2-H	42	**Q2**	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
225	FXD6	65	**FX**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFD6②	100	**HF**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
250	FXD6	65	**FX**	250
	HFD6②	100	**HF**	250

For inches / millimeters conversion, see Application Data section.

① BL, BLH, HBL and BQD are horizontally mounted. All others vertically mounted.

② Interchangeable trip breakers such as FD6 and HFD6 cannot be back fed. Must be top feed only.

• Revised •
09/19/14

Panelboards

Circuit Breaker / Column Type

Selection

Branch Breaker Selection C1

Breaker Type	Available Ampere Rating	Availability 1-Pole	2-Pole	3-Pole	Maximum Interrupting Rating (kA) 120V	120/240V	240V
BL (120V)	15, 20, 30, 40, 50, 60	√	√	√	—	10	—
	70	√	√	√	—	10	—
	70, 80, 90, 100	—	√	√	—	10	—
BL (HID)	15, 20, 30	√	√	—	—	—	—
BLF (GFCI)	15, 20, 30	√	√	—	10	—	—
	40, 50, 60	—	√	—	10	—	—
BLE (EQGFI)	15, 20, 30	√	√	—	10	—	—
BGL (SWN)	15, 20, 30	—	√	√	10	—	—
BLR (240V)	15, 20, 30, 40, 50, 60	—	√	—	—	—	10
	70, 80, 90, 100	—	√	—	—	—	10
BLH (120V)	15, 20, 30, 40, 50, 60	√	√	√	—	22	—
	70	√	√	√	—	22	—
	70, 80, 90, 100	—	√	√	—	22	—
BLHF (GFCI)	15, 20, 30	√	√	—	—	22	—
	40, 50, 60	—	√	—	—	22	—
HBL	15, 20, 30, 40, 50	√	√	√	—	65	65
	60, 70, 80, 90, 100	—	√	√	—	65	65

Subfeed Breakers — Limit One Per Panel② C1 (Not available for 42 circuit panels)

ED4	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	√	√	—	—	65
	110, 125	—	√	√	—	—	65
HED4	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	√	√	—	—	65
	110, 125	—	√	√	—	—	100
QJ2	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225	—	√	√	—	—	10
QJH2	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225	—	√	√	—	—	22
QJ2-H	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225	—	√	√	—	—	42
FXD6	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250	—	√	√	—	—	65
HFD6③	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250	—	√	√	—	—	100

Alternate Main Breaker Selection①②③ C2

Ampere Rating	Breaker Type	IR	Catalog Number	Available Trip Values
100	BQD	14	**BD**	50, 60, 70, 80, 90, 100
	ED4	18	**E4**	50, 60, 70, 80, 90, 100
	ED6	25	**E6**	50, 60, 70, 80, 90, 100
	HED4	42	**H4**	50, 60, 70, 80, 90, 100
	HHED6	65	**H6**	50, 60, 70, 80, 90, 100
125	ED4	18	**E4**	110, 125
	ED6	25	**E6**	110, 125
	HED4	42	**H4**	110, 125
	HHED6	65	**H6**	110, 125
225	FXD6	35	**FX**	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFD6	65	**HF**	170, 80, 90, 100, 110, 125, 150, 175, 200, 225
250	FXD6	35	**FX**	250
	HFD6	65	**HF**	250

Branch Circuit Breakers C2

Breaker Type	Available Ampere Rating	Availability 1-Pole	2-Pole	3-Pole	Maximum Interrupting Rating (kA) 277V	480/277V	480V
BQD	15, 20, 30, 40, 50, 60	√	√	√	14	14	—
	70, 80, 90, 100	√	√	√	14	14	—

Subfeed Breakers — Limit One Per Panel①② C2 (Not available for 42 circuit panels)

ED4	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	√	√	—	18	18
	110, 125	—	√	√	—	18	18
ED6	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	√	√	—	—	25
	110, 125	—	√	√	—	—	25
HED4	15, 20, 30, 40, 50, 60, 70, 80, 90, 100	—	√	√	—	—	42
	110, 125	—	√	√	—	—	42
FXD6	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250	—	√	√	—	—	35
HFD6	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250	—	√	√	—	—	65

① No increase in box height. Space is already built into C1 panel.
② BL, BLH, HBL and BQD are horizontally mounted. All others vertically mounted.
③ Interchangeable trip breakers such as FD6 and HFD6 cannot be back fed. Must be top feed only.

Type C1/C2

When required, special constructions or additions to standard panelboards may be specified for factory-assembled column panelboards.

Box Modifications

Description
Gasketed
Metal Card Holder
Welded Metal Card Holder
Nameplate
Al Ground Bar
Cu Ground Bar
Insulated Al Ground Bar
Insulated Cu Ground Bar

Interior Modifications

Description
Feed-Thru Lugs
Cu Neutral Lugs
Cu main Lugs 125A
Cu main Lugs 250A

Box Sizing Chart

Certain modifications such as subfeed breakers and feed-thru lugs require additional unit space. Use this chart to determine proper enclosure size.

Panel Configuration	Box Height (inches)
All MLO 18 Circuit	48
All MLO 30 Circuit	73
All MLO 42 Circuit	85
All MLO 18 Circuit with feed-thru lugs	73
All MLO 30 Circuit with feed-thru lugs	85
All MLO 18 Circuit with subfeed breaker	73
All MLO 30 Circuit with subfeed breaker	85
All Main Breaker 18 Circuit	48
All Main Breaker 30 Circuit	73
All Main Breaker 42 Circuit	85
All Main Breaker 18 Circuit with feed-thru lugs	73
All Main Breaker 30 Circuit with feed-thru lugs	85
All Main Breaker 18 Circuit with subfeed breaker	73
All Main Breaker 30 Circuit with subfeed breaker	85

Column Extension

Available in various standard lengths, extensions are 5¼ inches deep and 7 inches wide.

Height (inches)	Catalog Number①
14	**LXX-14**
20	**LXX-20**
26	**LXX-26**
32	**LXX-32**
38	**LXX-38**
41	**LXX-41**
44	**LXX-44**
53	**LXX-53**
56	**LXX-56**
62	**LXX-62**
65	**LXX-65**
68	**LXX-68**
74	**LXX-74**
80	**LXX-80**
86	**LXX-86**

Pull Boxes

Two styles of pull boxes are available, top and front mounted. When the panel and its extensions are mounted in a structural WF beam a front mounted pull box is required. When the panels are surface mounted, a top mounted pull box may be used. Provisions are made so that the neutral bar may be mounted in the pull box when required.
(Front mounted pull box dimensions are 14" H. X 20" W.)

Description	Catalog Number①
Top Mount	**LXXP-T**
Front Mount②	**LXX50-F**

For inches / millimeters conversion, see Application Data section.

① Must be ordered as a manual line.
② Includes 50" extension.

Telephone and Equipment Cabinets: Conform to requirements of Underwriters' Laboratories, Inc., for all cabinets and boxes bearing their label. Surface and Flush enclosures: box and front constructed of code-gauge steel, box galvanized and front only finished with light gray, ANSI-61. Cabinets provided without backboards.

Boxes: Standard construction has blank end walls, without knockouts.

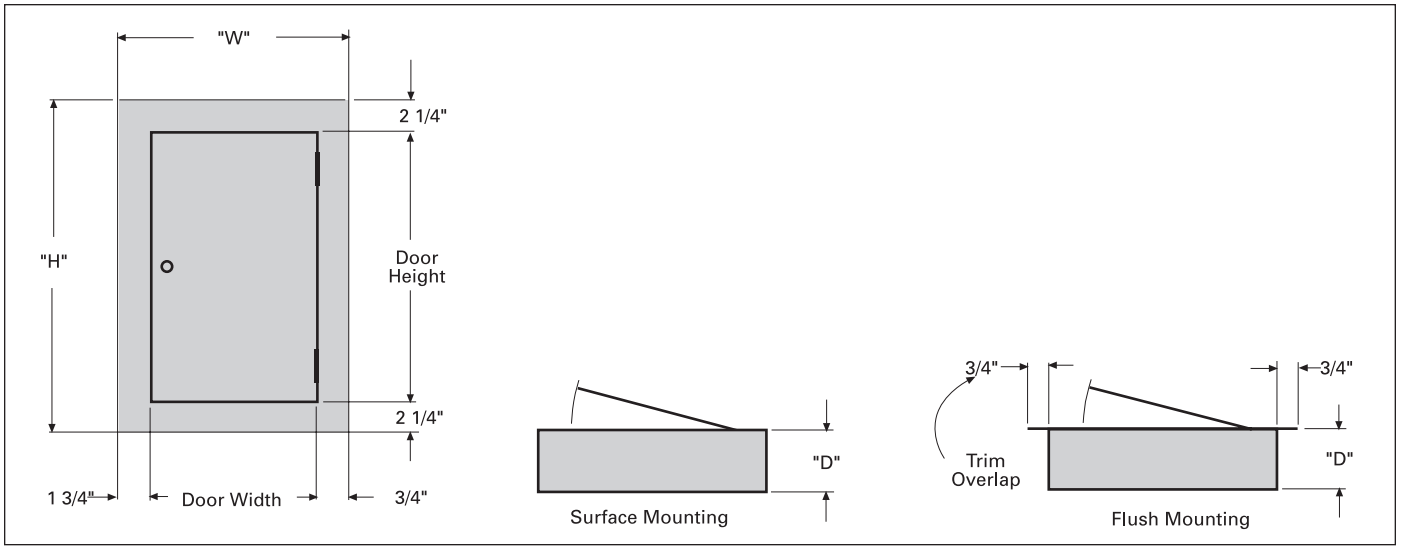
Fronts: Siemens Fas Latch fronts feature concealed hinges and fastening screws. Match P1 and P2 Panels in appearance. Two locks supplied on doors more than 51 inches high.

Cabinets

Dimensions (inches)			Surface Mount Catalog Number	Flush Mount Catalog Number
Height	Width	Depth		
With FAS Latch Front				
29	20	5.75	**TCS29B**	**TCF29B**
41	20	5.75	**TCS41B**	**TCF41B**
47	20	5.75	**TCS47B**	**TCF47B**
59	20	5.75	**TCS59B**	**TCF59B**



Dimensions



For inches / millimeters conversion, see Application Data section.

① Add S for Surface, F for Flush.

Customer Relay Cabinets

Dimensions			
H	W	D	Catalog Number
23	20	5.75	RC(1)23B①
23	24	5.75	RCW(1)23B②

Additional Enclosures Modifications

Description
Strip Heaters
Humidstat control
Thermostat control

Ampere Rating	ASCO #920 Mechanically held		ASCO #911 — Mechanically held remote control switch suitable for all classes of loads (Total system loads). Voltage rated to 480V AC, UL listed.	Siemens LEN Electrically Held	
	2-Pole	3-Pole	3-Pole	2-Pole	3-Pole
20	—	—	—	—	—
30	√	√	—	—	√
60	√	√	—	—	√
75	√	√	—	—	—
100	√	√	√	—	√
150	√	√	√	—	—
200	√	√	—	—	√
225	√	√	—	—	—
260	—	—	√	—	—
300	—	—	√	—	—
400	—	—	√	—	—
600	—	—	√③	—	—
800	—	—	√	—	—
1000	—	—	√	—	—
1200	—	—	√	—	—

√ = available configurations

Application (See individual panel sections for application information)

Remote Control Switch Modification

Description
Auxiliary Contacts (Mounted Not Wired) Ea.
2-Wire Control (add 6" to panel height.)

Control Power Transformer

Size	VA
0,1	50
2	75
3	150
4	250

① Replace (1) with "S" for surface applications and "F" for flush applications.

② Includes Fas latch trim and steel mounting pan. If 2 or more cabinets are to be stackedn order (no extra charge for connecting hardware).

③ Available in P4 or P5 only.

Standard Enclosures Made From Special Materials — Type P1, P2, P3

Stainless Steel Options

14GA 304 SS	Front
Grade (Brush Front)	Front

Aluminum, Stainless Steel, and Chrome Plated Additions to Enclosure Size (Type 1 Only)

	Lighting Panel	Distribution Panels
Width	Order in 2" increments (30" max)	Order in 2" increments
Depth	Order in 2" increments (10" max)	Order in 2" increments

Consult factory for dimension limitations.

Miscellaneous

Description.
Conduit Hubs — Up to 1 1/2 in. Each 2 in. to 2 1/2 in. Each 3 in. Each

Increased Gauge Steel — 10 gauge Maximum

Box and Front
Box or Front Only

Painted Finish

Set-up Charge Net .
Box Only
Alternate Color Trim

Front And Door Modifications

Two Panels with Common Trim②

Devices Mounted On Interior-Includes Device, Mounting (Wired or Unwired)①

Toggle Switch-SPST or 3-way; 15A, 277 V Maximum
Pilot Light-General Purpose, Neon or Incandescent
Pushbutton

Note: For retro fit interiors and fronts into existing can, retro fit must match or exceed minimum height, width, and depth requirements of standard Type 1 enclosures.

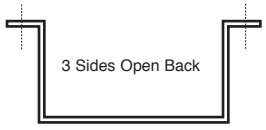
①Panels having doors over 48 in. high, 2 locks are standard.
② Lighting panels only. Field must supply dimensional information and panel orientation.

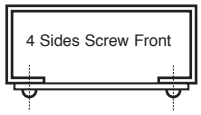
Conduit Enclosing Shield (Panel Skirts)

Sheet metal to cover conduits above or below a standard panelboard box.

Skirt Length	Width	Depth
8, 9, 11, 12	20.00	5.75
14, 17, 18, 23, 25	20.00	5.75
26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36	20.00	5.75
37, 38, 39, 40, 41, 42, 43, 44	20.00	5.75
8, 9, 11, 12	24.00	7.75
14, 17, 18, 23, 25	24.00	7.75
26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36	24.00	7.75
37, 38, 39, 40, 41, 42, 43, 44	24.00	7.75

Panel Skirts Standard Length





8, 9, 10,11, 12, 14, 17, 18, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44

Molded Case Switches①

(Non-Automatic Circuit Interrupters)

When Molded case switches are substituted for thermal breakers deduct from the installed thermal breaker price:

Ampere Rating	Breaker Frame	Availability	
		3-Pole	2-Pole
100	ED2 ED4 ED6	√ √ √	√ √ √
225	QJ2	√	√
250	FXD6	√	√
400	JXD2 JXD6	√ √	√ √
600	LXD6	√	√
800	MD6	√	√
1200	ND6	√	—

① Available only as a main switch for non-service equipment applications. Not available for branch devices.



QuikShip™

All SQSCP configurations of the standard NEMA 1 enclosure can be specified for shipment within 10 business days of order when specified.

Mains	MLO (Main Lug Only)
	Fused disconnect switch
	Non-fused disconnect switch
Assembly SCCRs	200kA, 100kA or 50kA AC, 100kA or 20kA@125Vdc①
Voltage ratings	Applicable on any 600Vac or less, or 125Vdc② or less systems
Bus amperages	400A, 225A, 200A, 100A, 60A or 30A
Branch circuits	Circuits: 18, 30 or 42*
	Amps: Up to 100A
	Type: 1-, 2- and 3-Pole
Panels	Feed: top & bottom
	Mounting: surface or flush
	Door/Trim: regular or door-in-door
	NEMA Ratings: 1 & 3R. Other ratings available, consult factory.
Through-lugs & loadside disconnect	Feed-Through: single and double
	Sub-Feed
	Feed/Sub-Through
	Fused loadside disconnect, (up to 1/2 of main amp rating)
Neutrals	200A, 400A and 800A unbonded and bonded
Grounds	Non-isolated or isolated
Enclosure sizes	Standard size panelboard (20″ W x 5¾″ D x 33″- 69″ H)*
Spare fuses	Spare fuse compartment holds up to six fuses
Options	Surge protection device (TVSS) for high and low energy transients.

① Depending on configuration.
② 125Vdc rating applicable to only 40 amp or less CCPBs on MLO panels only.

Catalog Symbol: SQSCP4

Description

Panelboards for commercial/industrial branch or service entrance applications on systems up through 600Vac.

The SQSCP is especially designed to address the NEC® Selective Coordination Requirements for Emergency, Legally Required Standby, Healthcare Essential Electrical and Critical Operation Power Systems (COPS) per NEC® 700.27, 701.18, 517.26 and 708.54. Not for applications requiring AFCI protected circuits. The SQSCP is configured to order for the application. To confirm availability of options and constructions, contact your Siemens distributor.

Ratings

Volts: 600Vac (or less), 125 Vdc
Amps: 30, 60, 100, 200, 225, 400A
SCCR: 20kA or 100kA @ 125Vdc–See panelboard short circuit ratings table for AC ratings.

Agency information

- UL 67–Standard for panelboards
- UL 50/UL 50E–Enclosures for electrical equipment
- CSA 22.2, No. 29-M1989–Panelboards and encl. panelboards
- UL listed, class CTL panelboard (meets 2002 NEC® 408.1 limit of 42 overcurrent devices per panel)
- UBC and CBC Seismic Qualified and IBC Approved

Main options

- Main lug only (MLO)
- Fused main disconnect
- Non-fused main disconnect

Branch disconnect options

- 1-, 2-, and 3-pole 15, 20, 30, 40, 50, 60, 70, 90, and 100A rejecting branch disconnects (see table for details).

  Branch ampacity on 125Vdc panels limited to SCCPB 40A or less.

Branch circuit positions

- 18, 30 and 42

Neutral options

- Unbonded and bonded 200A, 400A and 800A

Ground options

- Isolated and non-isolated

Enclosures

- NEMA 1 and NEMA 3R. Other ratings available. Consult factory.

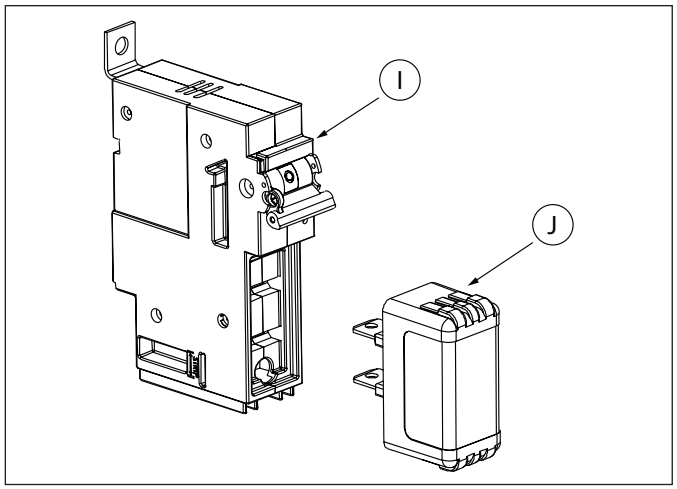
Spare fuse compartment

- Six space spare fuse compartment standard on all models

Panelboard Short-circuit Current Ratings

	AC main options				DC
SCCR	Main lug only (MLO)①	70-200A main disc. no fuses① or w/ Class J fuses	225-400A main disc. no fuses① or w/ Class J fuses	SCCP_CF main disc. (60A) ②	Main lug only (MLO)①
High	200kA	200kA	100kA	200kA	100kA
Std.	50kA	50kA	50kA	50kA	20kA

① Class J, T or RK1 fuses upstream, max amps = panel amps.
② CUBEFuse® disconnect



I – CCPB Branch Disconnects

Poles	Ampacity	Part No.
1-pole	15A, 20A, 30A, 40A, 50A, 60A, 70A, 90A, 100A	SCCPB-1-(amp)CF
2-pole		SCCPB-2-(amp)CF
3-pole		SCCPB-3-(amp)CF

J – CUBEFuse® Fuses

For CCPB① Part No.	Non-indicating Part No. STCF(amps)RN	Indicating② Part No. STCF(amps)
SCCPB-(# of poles)-15CF	STCF1RN, STCF3RN, STCF6RN, STCF10RN, STCF15RN	STCF6 STCF10 STCF15
SCCPB-(# of poles)-20CF	STCF17-1/2 RN STCF20RN	STCF17-1/2 STCF20
SCCPB-(# of poles)-30CF	STCF25RN STCF30RN	STCF25 STCF30
SCCPB-(# of poles)-40CF	STCF35RN STCF40RN	STCF35 STCF40
SCCPB-(# of poles)-50CF	STCF45RN STCF50RN	STCF45 STCF50
SCCPB-(# of poles)-60CF	STCF60RN	STCF60
SCCPB-(# of poles)-70CF	STCF70RN	STCF70
SCCPB-(# of poles)-90CF	STCF80RN STCF90RN	STCF80 STCF90
SCCPB-(# of poles)-100CF	STCF100RN	STCF100

① CCPB disconnect can accept CUBEFuses® with amp ratings less than or equal to the amp rating of the SCCPB disconnect.
② 1A indicating CUBEFuse® not available. Correct fit with SCCPB disconnect requires indicating CUBEFuse® with date code R38 or later.

Fuse and disconnect performance data

For details and specifications, access the following data sheets online at *www.usa.siemens.com/panelboards*

CUBEFuse® Specifications Catalog Symbols

STCF_ (6-100A Indicating version)
STCF_RN (1-100A Non-indicating version)

Description

The CUBEfuse® is a finger-safe, dual-element, time delay UL Class CF power fuse with Class J fuse electrical performance charcteristics. 10 Seconds minimum operating time at 500% rated current.

Ratings

Volts: 600Vac/300Vdc
Amps: 1-100 (non-indicating version)
6-100 (indicating version)
IR: 300kA RMS Sym. (UL)
200kA RMS. Sym (CSA)
100kA DC (UL & CSA)

Agency Information

- UL Listed Special Purpose Fuse: Guide JFHR, File E56412
- CSA Certified Fuse: Class 1422- 02, File 53787
- CE compliance for the European Union low voltage directive

Other Ratings/Specifications

Watts Loss at rated current: STCF30: 3.99W
STCF60: 6.23W
STCF100: 9.51W

Operating and Storage Temperature Range

14 to 149°F(-10 to 65°C)

Material Specifications

- Case: Glass filled PES (Polyethersulfone)
- Terminals: Copper alloy
- Terminal plating: Electroless tin
- Indicator lens: PES (Polyethersulfone) (indicating version only)
- Indicator: Energetic chemical

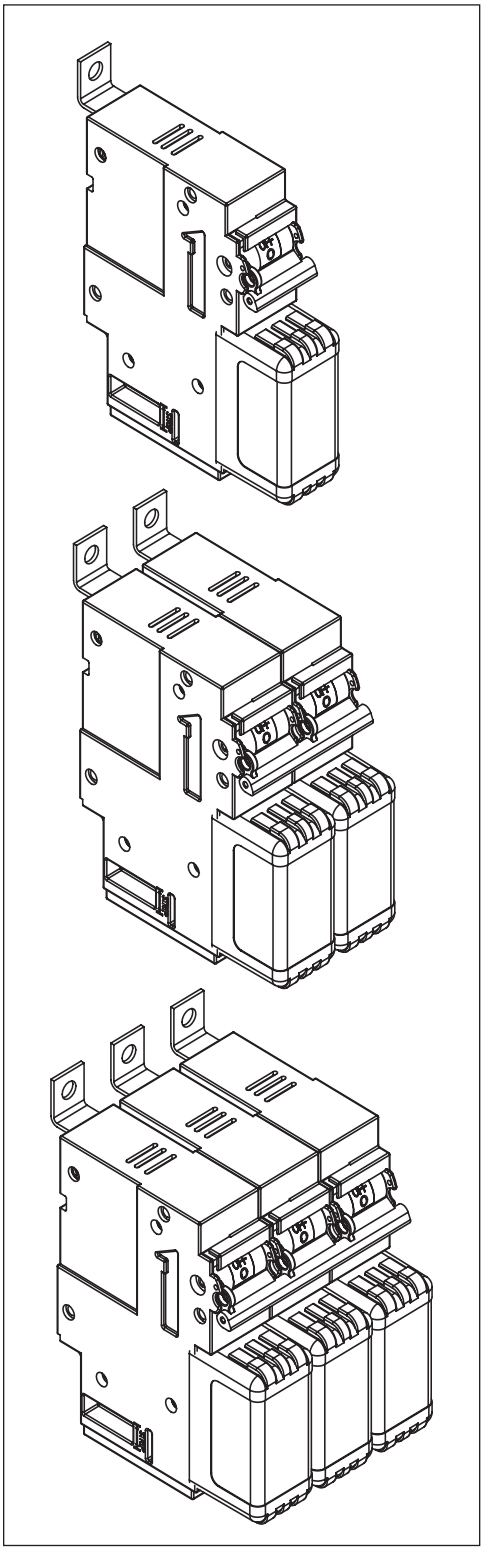
CUBEFuse®, Low-Peak®, Quik-Spec™, QuikShip™, and easyID™ are valuable trademarks of Cooper Industries in the United States and other countries.

SCCPB Horsepower Ratings

SCCPB Disconnect	Amp Rating	HP Rating @ Vac			
		120	240	480	600
SCCPB-(poles)-15CF	15	0.5	3	5	7.5
SCCPB-(poles)-20CF	20	0.75	3	7.5	10
SCCPB-(poles)-30CF	30	1.5	5	15	10
SCCPB-(poles)-40CF	40	2	7.5	20	10
SCCPB-(poles)-50CF	50	3	7.5	20	10
SCCPB-(poles)-60CF	60	3	7.5	20	10
SCCPB-(poles)-70CF	70	3	15	30	40
SCCPB-(poles)-90CF	80	5	20	40	50
SCCPB-(poles)-100CF	100	5	20	50	50

Branch Disconnects

SCCPB① Part No.	Poles	Fuse Amp Range	Max. SCCBP Amp.	Non-indicating Fuses (Standard)	Indicating Fuses (Opt'l)②
SCCPB-1-15CF	1	1-15	15	STCF1RN, STCF3RN, STCF6RN, STCF10RN, STCF15RN	STCF6 STCF10 STCF15
SCCPB-2-15CF	2				
SCCPB-3-15CF	3				
SCCPB-1-20CF	1	17.5-20	20	STCF17-1/2 RN STCF20RN	STCF17-1/2 STCF20
SCCPB-2-20CF	2				
SCCPB-3-20CF	3				
SCCPB-1-30CF	1	25-30	30	STCF25RN STCF30RN	STCF25 STCF30
SCCPB-2-30CF	2				
SCCPB-3-30CF	3				
SCCPB-1-40CF	1	35-40	40	STCF35RN STCF40RN	STCF35 STCF40
SCCPB-2-40CF	2				
SCCPB-3-40CF	3				
SCCPB-1-50CF	1	45-50	50	STCF45RN STCF50RN	STCF45 STCF50
SCCPB-2-50CF	2				
SCCPB-3-50CF	3				
SCCPB-1-60CF	1	60	60	STCF60RN	STCF60
SCCPB-2-60CF	2				
SCCPB-3-60CF	3				
SCCPB-1-70CF	1	70	70	STCF70RN	STCF70
SCCPB-2-70CF	2				
SCCPB-3-70CF	3				
SCCPB-1-90CF	1	80-90	90	STCF80RN STCF90RN	STCF80 STCF90
SCCPB-2-90CF	2				
SCCPB-3-90CF	3				
SCCPB-1-100CF	1	100	100	STCF100RN	STCF100
SCCPB-2-100CF	2				
SCCPB-3-100CF	3				



① SCCPB disconnect can accept CUBEFuses® with amp ratings less than or equal to the amp rating of the SCCPB disconnect.
② Correct fit with SCCPB disconnect requires indicating CUBEFuses® with date code R30 or later.

Panelboards

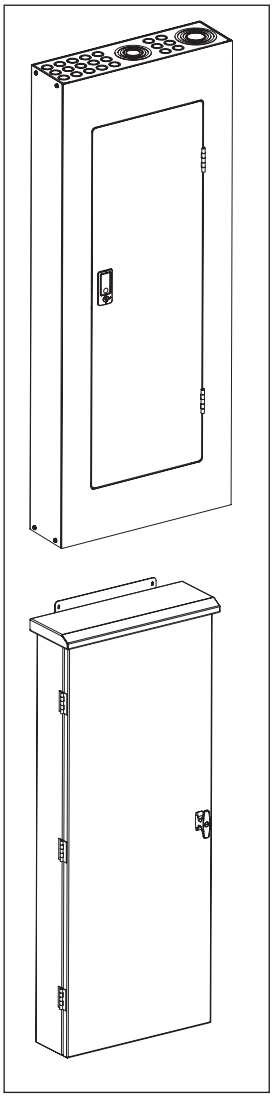
Enclosure/System Types, AC & DC Voltages

NEMA 1

- Flush or surface mount.
- Galvanized steel with removable end walls –blank or with knockouts to order.
- Box sizes: 20" W x 5.75" D x 33", 50", 59" or 69" H (510 W x 145 D x 838, 1270, 1500 or 1753mm H). Box can be rotated 180° to accommodate conduit feed.
- Enclosure and chassis mounting instructions are found in supplied literature.
- Chassis mounts directly onto studs in the enclosure.
- Trim finished with gray powder coat paint over phosphatized steel (ANSI 61).
- Door and door-in-door configurations with locks.
- Door locks use key #2A1910-2.
- Circuit directory card is located on the inside of the door.
- Trim screws are concealed.

NEMA 3R

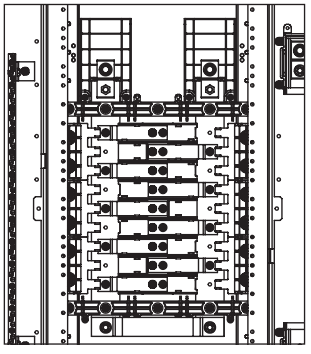
- Surface mount only.
- Finished with gray powder coat paint over phosphatized steel (ANSI 61).
- Bottom feed only, no knockouts
- Box sizes: 20" W x 7.7" D x 34.5", 51.5", 60.5" or 70.5 H (510 W x 195 D x 876, 1310, 1535 or 1791mm H).
- Enclosure and chassis mounting instructions are found in supplied literature
- Chassis mounts directly onto studs in the enclosure.
- Gasketed door has vault handle with lock.
- Door locks use key #2A1910-1.
- Circuit directory card is located on the inside of the door.



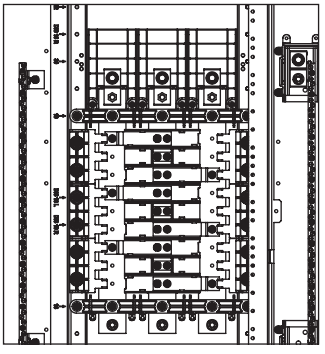
Busing

Tin-plated copper with sufficient cross section to meet UL 67 temperature rise requirements.

Distributed 1- & 3-phase busing
All SCCPB branch disconnects can be mounted in any branch circuit position.



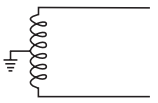
Single-phase



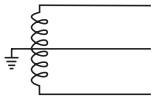
Three-phase

AC Voltages

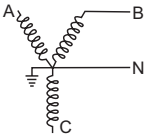
1 phase, 2 wire
- 120V 1 phase, 2 wire
- 240V 1 phase, 2 wire



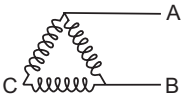
1 phase, 3 wire
- 120/240V 1 phase, 3 wire



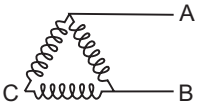
1 phase, 2 wire, Wye
- 277V 1 phase, 2 wire



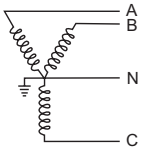
1 phase, 2 wire, Delta
- 480V 1 phase, 2 wire



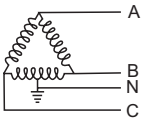
1 phase, 3 wire, Delta
- 240/480V 1 phase, 3 wire



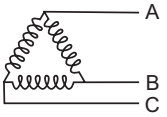
3 phase, 4 wire, Wye
- 208Y/120V 3 phase, 4 wire
- 480Y/277V 3 phase, 4 wire
- 600Y/347V 3 phase, 4 wire



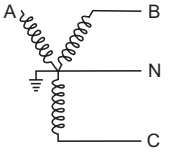
3 phase, 4 wire, Delta
- 240/120V 3 phase, 4 wire
- 480/240V 3 phase, 4 wire



3 phase, 3 wire, Delta
- 240V, 3 phase, 3 wire
- 480V, 3 phase, 3 wire
- 600V, 3 phase, 3 wire
- 240V, 3 phase, 3 wire, grounded B
- 480V, 3 phase, 3 wire, grounded B
- 600V, 3 phase, 3 wire, grounded B



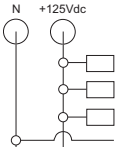
1 phase, 3 wire, Wye
- 208Y/120V 1 phase, 3 wire
- 480Y/277V 1 phase, 3 wire



DC voltage

1 phase, 2 wire
- 125Vdc, 2 wire

(Up to 125Vdc, MLO option only, SCCPB 40A or less.)



Panelboards

Dimensions and Panelboard Configurations

NEMA 1 and 3R Enclosure Dimensions

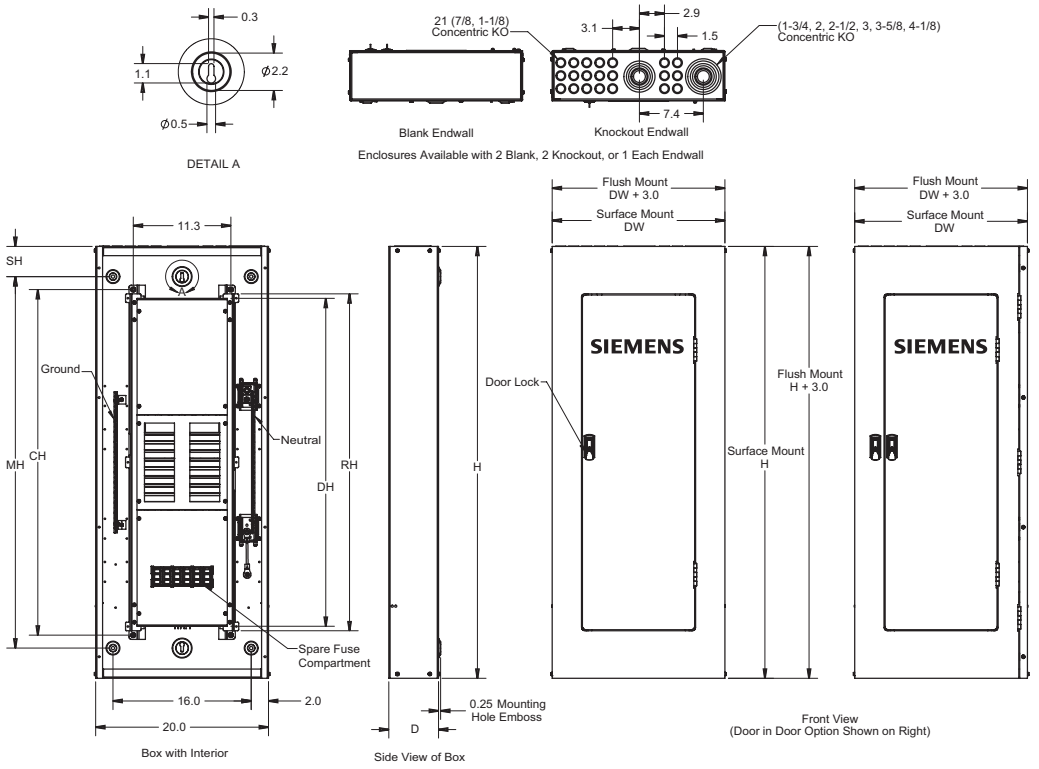
Encl. Type	Encl. Height	Dimensions (inches) H	HC	MH	CH	DH	RH	SH	DW	D
NEMA 1	33	33.0	N/A	29.0	26.0	28.9	25.0	2.0	20.0	5.7
	50	50.0	N/A	43.0	40.0	37.9	39.0	3.5	20.0	5.7
	59	59.0	N/A	52.0	49.0	46.9	48.0	3.5	20.0	5.7
	69	69.0	N/A	62.0	59.0	56.9	58.0	3.5	20.0	5.7
NEMA 3R	33	33.0	34.5	35.5	26.0	28.9	25.0	2.0	20.0	6.3
	50	50.0	51.5	52.5	40.0	37.9	39.0	2.0	20.0	6.3
	59	59.0	60.5	61.5	49.0	46.9	48.0	2.0	20.0	6.3
	69	69.0	70.5	71.5	59.0	56.9	58.0	2.0	20.0	6.3

Available panelboard configurations

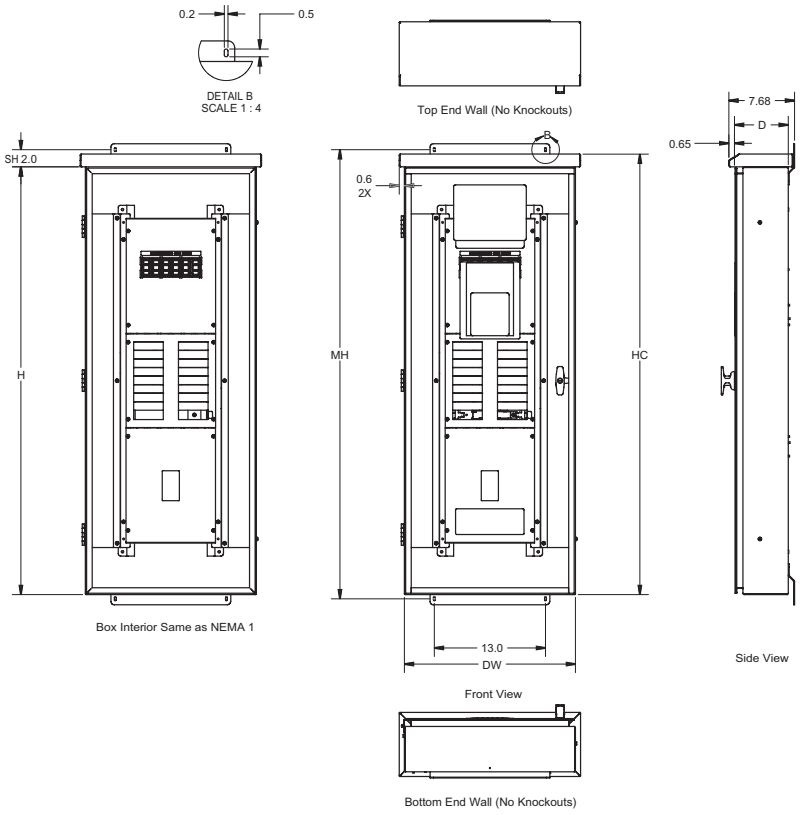
Based on enclosure height, panel amp rating and number of branch circuit positions

Encl. height (inches)	Panel amp rating	Branch positions	Available configurations
33″	30–200	18	· Main lug only, with or without feed-through lugs · Non-fused disconnect, no loadside options
		30	· Main lug only, no loadside options
50″	30–60	18	· 30 through 60A fused main disconnect with or without feed-through lugs or TVSS device
		30	· 30 through 60A fused main disconnect with or without feed-through lugs or TVSS device
		42	· 30 through 60A fused main disconnect with or without feed-through lugs or TVSS device
	70–200	18	· 70 through 200A fused main disconnect with or without feed-through lugs or TVSS device
		30	· 70 through 200A fused disconnect with or without feed-through lugs
	30–200	18	· Main lug only with TVSS device · Non-fused disconnect, with feed-through lugs or TVSS device
		30	· Main lugs only, with feed-through lugs or TVSS device · Non-fused disconnect, with or without feed through lugs
		42	· Main lug only, with or without feed-through lugs or TVSS device · Non-fused disconnect, with or without feed-through lugs
	225–400A	18	· Main lug only, with ot without feed through lugs or TVSS device · Non-fused disconnect, with or without feed-through lugs
		30	· Main lug only, with or without feed-through lugs
59″	70–200	30	· 70 through 200A fused main disconnect, with TVSS device
		42	· 70 through 200A fused main disconnect with or without feed-through lugs or TVSS device
	30–200	42	· Non-fused disconnect with TVSS device
	225–400A	18	· Main lug only with loadside disconnect · Non-fused disconnect, with TVSS device · 225 through 400A fused disconnect with or without feed-through lugs or TVSS device
		30	· Main lug only, with TVSS device · 225 through 400A fused disconnect, with no loadside options
		42	· Main lug only, with or without feed-through lugs or TVSS device · Non-fused disconnect, with no loadside options
69″	225–400A	18	· Non-fused disconnect, with loadside disconnect
		30	· Main lug only with loadside disconnect · 225 through 400A fused disconnect with feed-through lugs or TVSS device
		42	· Non-fused disconnect, with or without feed through lugs or TVSS device · 225 through 400A fused main disconnect, with or without feed-through lugs or TVSS device

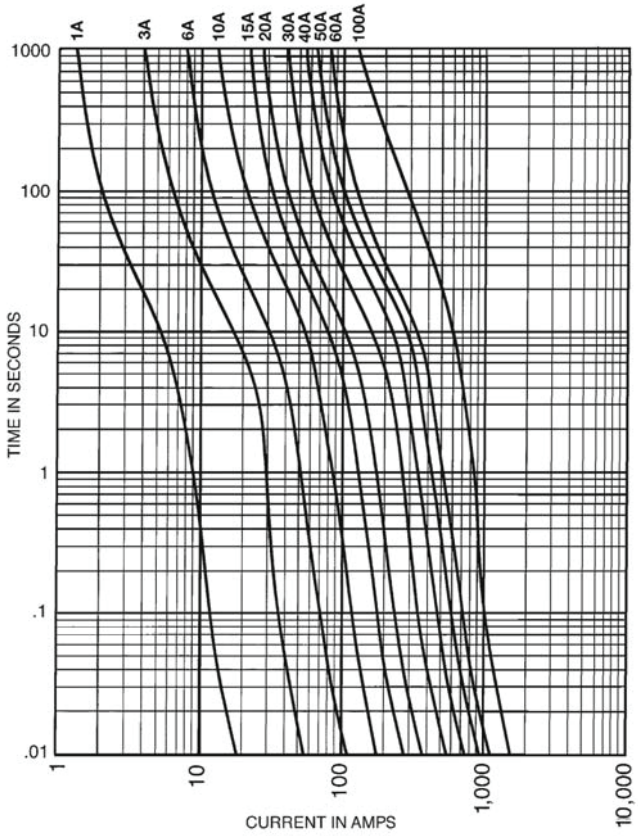
NEMA 1 Enclosures and Interior



NEMA 3R Enclosures Interior same as NEMA 1

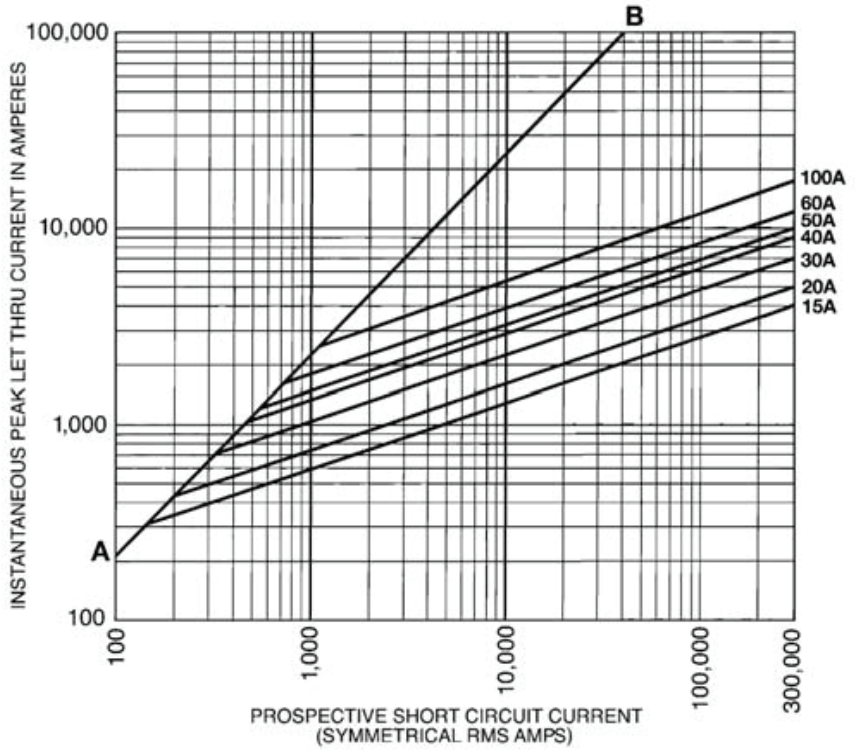


Fuse Curves



Time-Current Characteristic Curves–Average Melt

Current Limitation Curves



Notes

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LCP3000EZ

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Benefits of Lighting Control Systems

The benefits of lighting control systems include enhanced comfort, productivity, security, environmental aesthetics and of course, energy savings. In terms of energy savings, many lighting control systems can easily pay for themselves in less than two years.

Siemens has developed two lighting control systems which are simple in both design and installation. They efficiently cover a complex range of lighting schemes with a minimal investment of time and money.

The Siemens i-3 and LCP3000EZ Lighting Control Systems have been designed to make lighting control genuinely accessible for any building, whether the need is a single ON-OFF panel, or a complicated fully networked system of control panels sequencing on-off schemes across a building. In short, lighting control is something you can do quickly and affordably.

The i-3 system is integrated into the panelboard; it is circuit breaker based. The LCP3000EZ system is relay based. For production details and pricing, please contact your nearest local Siemens sales office or contact the Siemens Call Center at 1-800-964-4114 for technical information.

Code Requirements

ANSI/ASHRAE/IESNA require positive lighting control beyond the historical light switch and circuit breaker disconnect panel. The code states: Interior lighting in non-residential buildings larger than 5000 square feet and not in operation 24 hours a day shall be controlled with an automatic control device to shut off building lighting in all spaces. This automatic control device shall function on a scheduled basis or an occupancy sensor or a signal from an other control or alarm system.

The LCP3000EZ and i-3 are California Title 24 Certified.

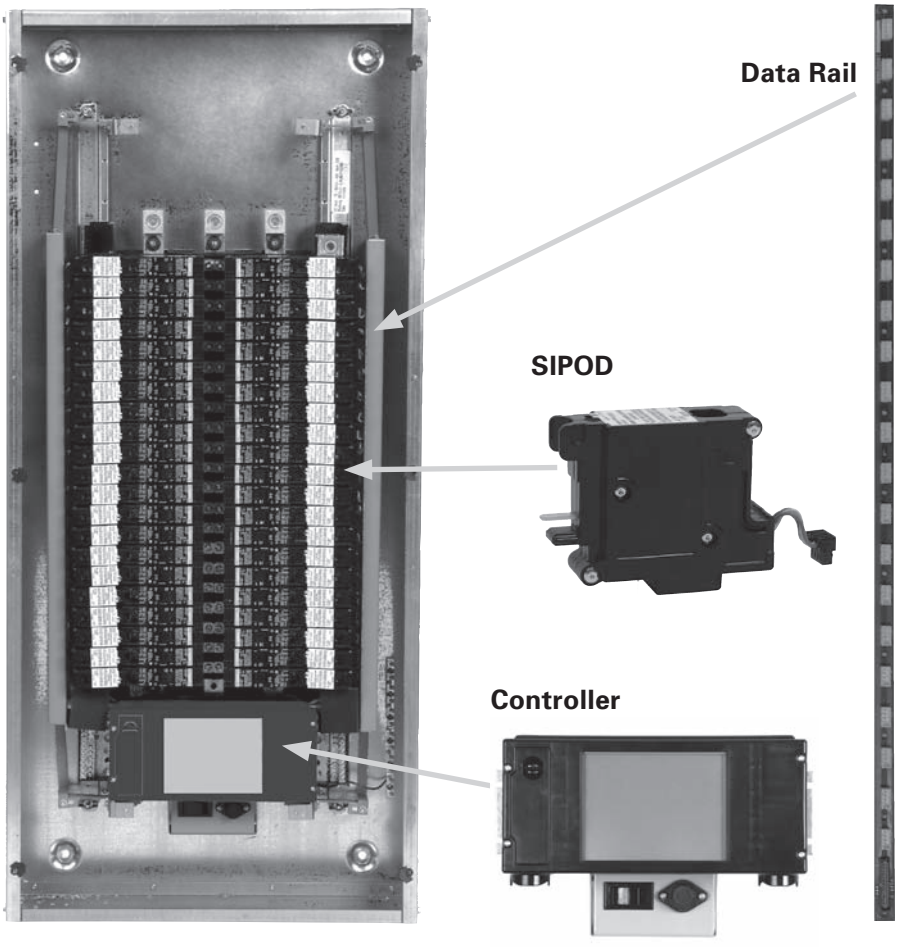
P1 Series Lighting Panel

i-3 Control Technology

Introduction

Features

- i-NTEGRATION
  - Reduced electrical room size
  - Reduced total installation cost
  - Small foot print - up to 2 panels of 42 circuits in one section of IPS
- i-NSTALLATION
  - For use in new and existing Siemens installations
  - Reduced wiring complexity over traditional systems
  - Fits standard P1 lighting panelboard enclosures
  - Reduced labor costs
- i-NTERFACE
  - Dry-contact, Modbus, BACnet, EIB,and Analog
  - USB interface
  - Commissioning wizards
  - Touch panel
- P1 Panelboard - Panel Size
  - 18 Circuits
  - 30 Circuits
  - 42 Circuits
- Service Information
  - 3 ph/4-w, 480Y/277V AC, 208Y/120V AC
  - 1 ph/3-w, 120/240V AC
  - Up to 250A
- System is UL 916 listed
- Panel is UL 67 listed
- Panel enclosure is UL 50 listed



Note: This device/system may only be set up and used in conjunction with the instruction manuals. Installation, maintenance and operation of this device/system may only be performed by qualified personnel. Qualified persons are defined as persons who have the skills and knowledge related to the construction and operation of the electrical equipment and installations and have received safety training to recognize and avoid the hazards involved.

P1 Series Lighting Panel

i-3 Control Technology

Features

P1 Lighting Control Panel with i-3 Control Technology

Main Breaker: 250A Max.
Main Lugs Only: 250A Max.
480Y/277V Maximum 3Ø 4W

Specifications

General:

i-3 Lighting Control Panels comply with the following standards:

- UL 50 Enclosures
- UL 67 Panelboards
- UL 916 Energy Management
- UL 489 Breakers
- CA Title 24 certified

Operating Conditions:

- Operating: 23°F to 104°F (-5°C to 40°C)
- Storage: -13°F to 158°F (-25°C to 70°C)

Controllers: I/O and System:

- I/O Mapping
- Configurable Zones
- Up to 480 scheduled events (System Controller Only)
- LCD color touchscreen (System Controller Only)
- USB Interface (System Controller Only)

Protocols:

- Modbus RTU
- Modbus TCP/IP
- EIB
- BACnet MSTP

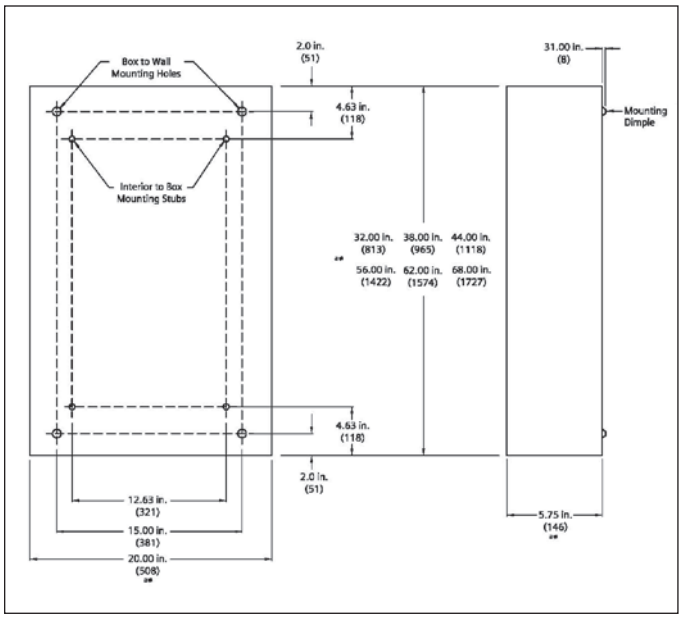
I/O:

- 20 2-wire or 10 3-wire digital inputs
- Up to 2 analog inputs and 2 analog outputs

SIPODS:

- 20 and 30 amp 1 Pole and 2 pole for added flexibility SIPODs that can be coupled with 15, 20, 25 and 30 Amp BQD circuit breakers
- UL 489 circuit breaker accessory
- 20 Amp SIPOD is rated for 500,000 operations at full load. 30 Amp SIPOD is rated for 200,000 operations at full load.
- Same short circuit ratings as BQD breaker

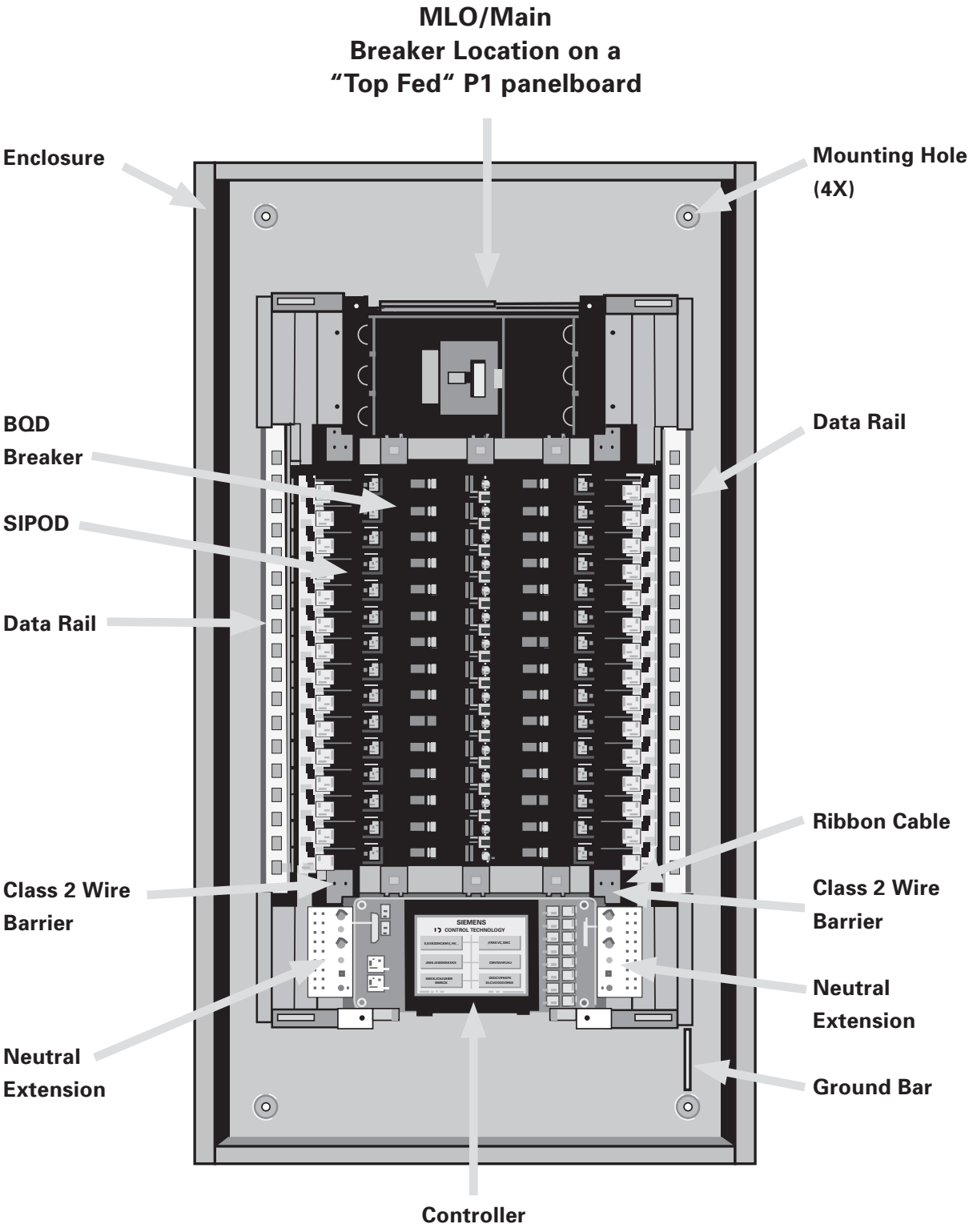
P1 Panelboard dimensions



Main Lug Gutter		
Amp Rating	**End Gutter (Inches)**	**Neutral Location (Inches)**
125	10.50	11.50
250	10.50	11.50

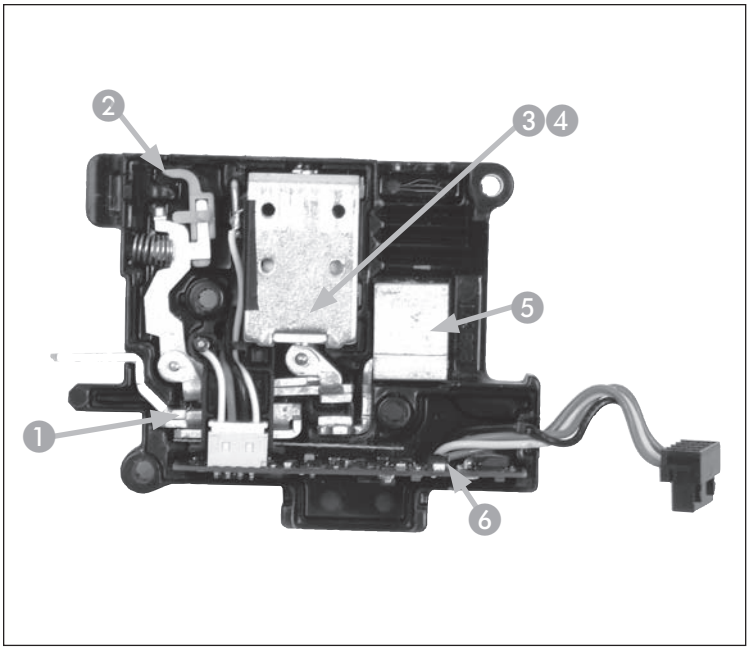
Branch Breaker Side Gutter	
Branch Breakers	**Wiring Space (Inches)**
BQD + SIPOD Combo	3.25
BQD	5.50
BL	6.375

BQD Circuit Breaker Interrupting Ratings					
System Voltage (AC)		**120V**	**240V**	**277V**	**480Y/277V**
1-p	15A, 20A, 25A, 30A	65kA	-	14kA	-
2-p	15A, 20A, 25A, 30A	-	65kA	-	14kA


MLO/Main
Breaker Location on a
"Top Fed" P1 panelboard
Enclosure
Mounting Hole
(4X)
BQD
Breaker
SIPOD
Data Rail
Data Rail
Ribbon Cable
Class 2 Wire
Barrier
Class 2 Wire
Barrier
Neutral
Extension
Neutral
Extension
Ground Bar
Controller
SIEMENS
CONTROL TECHNOLOGY

SIPOD

SIPOD is a UL 489 circuit breaker accessory for the Siemens BQD circuit breaker and assumes the short circuit rating of the circuit breaker. See BQD circuit breaker interrupting ratings.



1. Blow-closed mechanism
2. Manual override (for contact closing)
3. Maglatch mechanism
4. Extended life 200,000 - 500,000 operations fully loaded
5. Same lug size as BQD circuit breaker
6. Integrated electronics

System voltage		BQD Interrupting ratings (Amps RMS)			
		120V AC	240V AC	277V AC	480Y/ 277V AC
1-pole	15-20A	65,000	-	14,000	-
2-pole	15-20A	-	65,000	-	14,000
1-pole	30A	65,000	-	14,000	-
2-pole	30A	-	65,000	-	14,000

I/O controller

- Dry-contact inputs
- Modbus RTU and TCP/IP (Optional)
- BACnet MSTP
- EIB
- I/O mapping and output groups

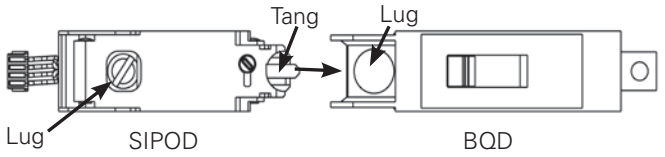
System controller

- Dry-contact inputs
- Modbus RTU and TCP/IP
- I/O mapping and output groups
- USB interface
- Color touch screen panel
- Event scheduling and zoning
- Basic setup (wizard driven)
- Tools, overrides
- Advanced setup
- Three levels of password protection

What is a SIPOD (Siemens POD)?

A SIPOD is a remotely operated, electro-mechanical contactor that is attached to a Siemens BQD molded case circuit breaker. The SIPOD is a key component of the i-3 Control Technology lighting controls system. The SIPOD provides a set of contacts in series with the circuit breaker that allow loads to be switched ON and OFF from a remote location or according to a time schedule. The SIPOD contacts are not intended to interrupt short circuit events.

The SIPOD connects to the load side of the breaker using a conductor tab (tang) inserted into the breaker load lug. The load wiring is connected to the load lug of the SIPOD which is the same size as the circuit breaker lug. The SIPOD assumes the short circuit current rating of the attached BQD breaker due to the design of the blow closed mechanism.



What is the blow closed mechanism?

The blow closed mechanism is designed to keep the SIPOD contacts closed during short circuit and overload conditions, allowing the circuit breaker to interrupt the high current levels.

When relays are used, short circuit levels must be restricted (often to 10kA or lower).

The SIPOD avoids these concerns. The blow closed mechanism is designed to keep the SIPOD contacts closed during overload and short circuit events.

The SIPOD switching mechanism is created through implementation of a maglatch mechanism.

The SIPOD matches the short circuit ratings of the BQD breaker

The maglatch mechanism requires approximately 1.7A @ 24VDC for 2-25 milliseconds to break continuity in less than 4.5 milliseconds. The lower voltage results in a much longer mechanical life. The maglatch mechanism allows the SIPOD to operate quietly (only the sound of the contacts striking can be heard) with lower power, and operate rapidly without unnecessary complexity.

To learn more about the SIPOD and i-3 control technology in general, visit the product webpage:

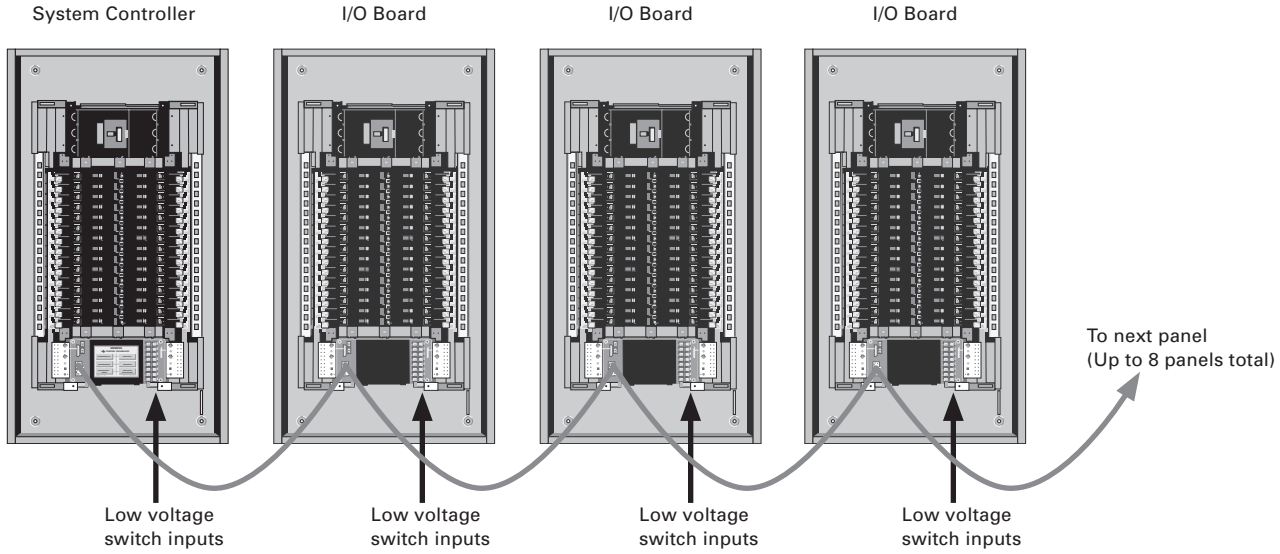
www.usa.siemens.com/i-3

or contact your local Siemens sales office.



Catalog Numbers
BQD20CPOD1 or BQD30CPOD1

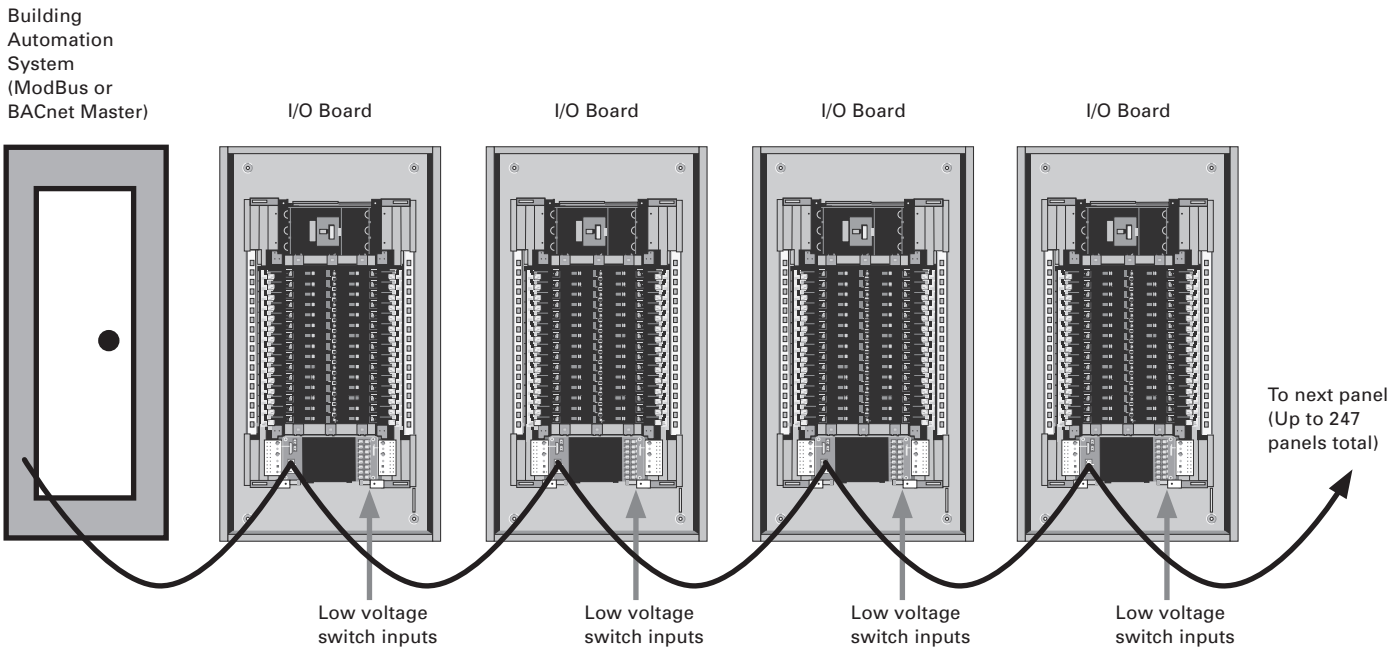
System Connections Layout



Twisted pair, 18 AWG solid copper wire
(Maximum total wire length 3,300 ft.)



Twisted pair, 18 AWG solid copper wire
with EIB connector (Recommended: Belden 6320)

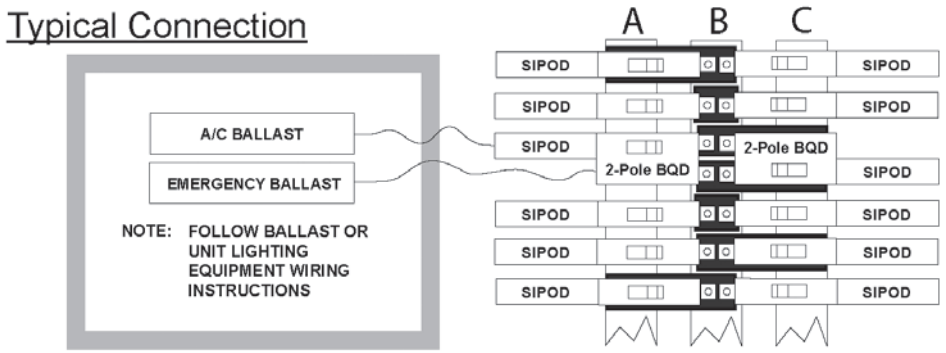


Modbus or BACnet communications bus
(22-18 AWG shielded copper wire)

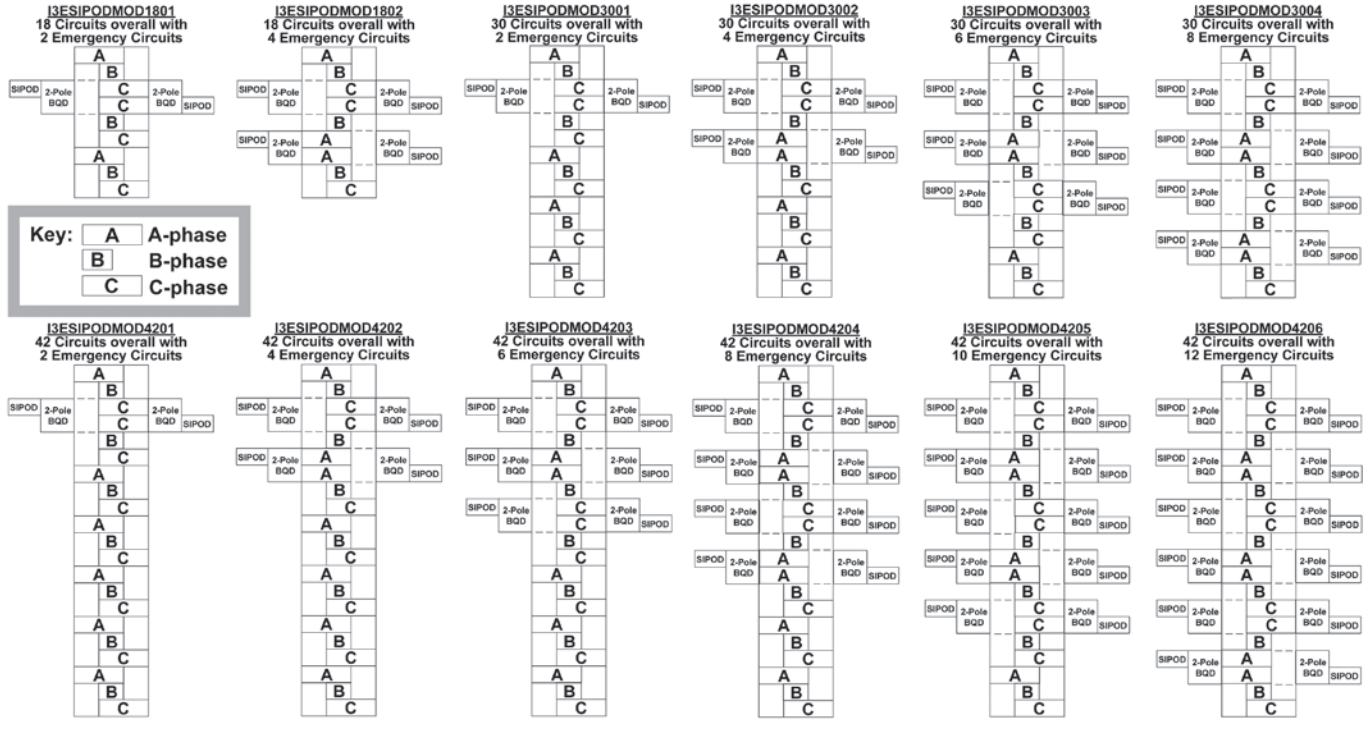


Modbus or BACnet communications connector

Emergency Lighting Circuits Control Application



STANDARD CONFIGURATIONS



The emergency lights control is accomplished with a two-pole circuit breaker, one pole is controlled with an i-3 SIPOD. Both poles of the circuit breaker are connected to the same phase; this is meant to meet NEC requirements to turn the emergency lights ON in case of a power failure. The controlled pole feeds the standard ballast of the light fixture, which operates under normal conditions. The non-controlled pole is connected to the emergency ballast of the light fixture in order to keep the emergency ballast battery charged at all times. In case of a power outage, the sensor circuit in the emergency ballast switches the lights to be powered by the emergency ballast battery.

i-3 Replacement Parts

P1 Panel

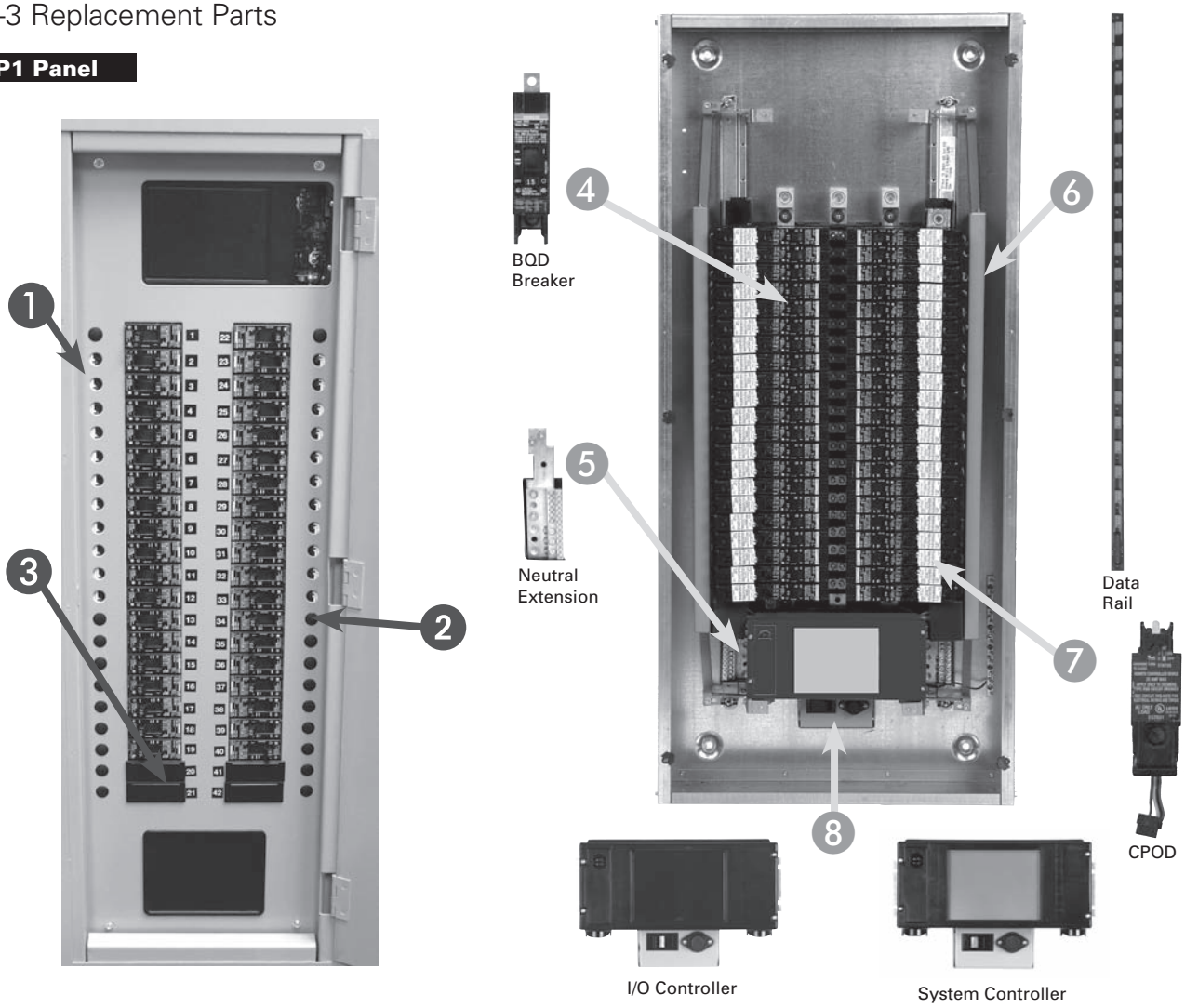


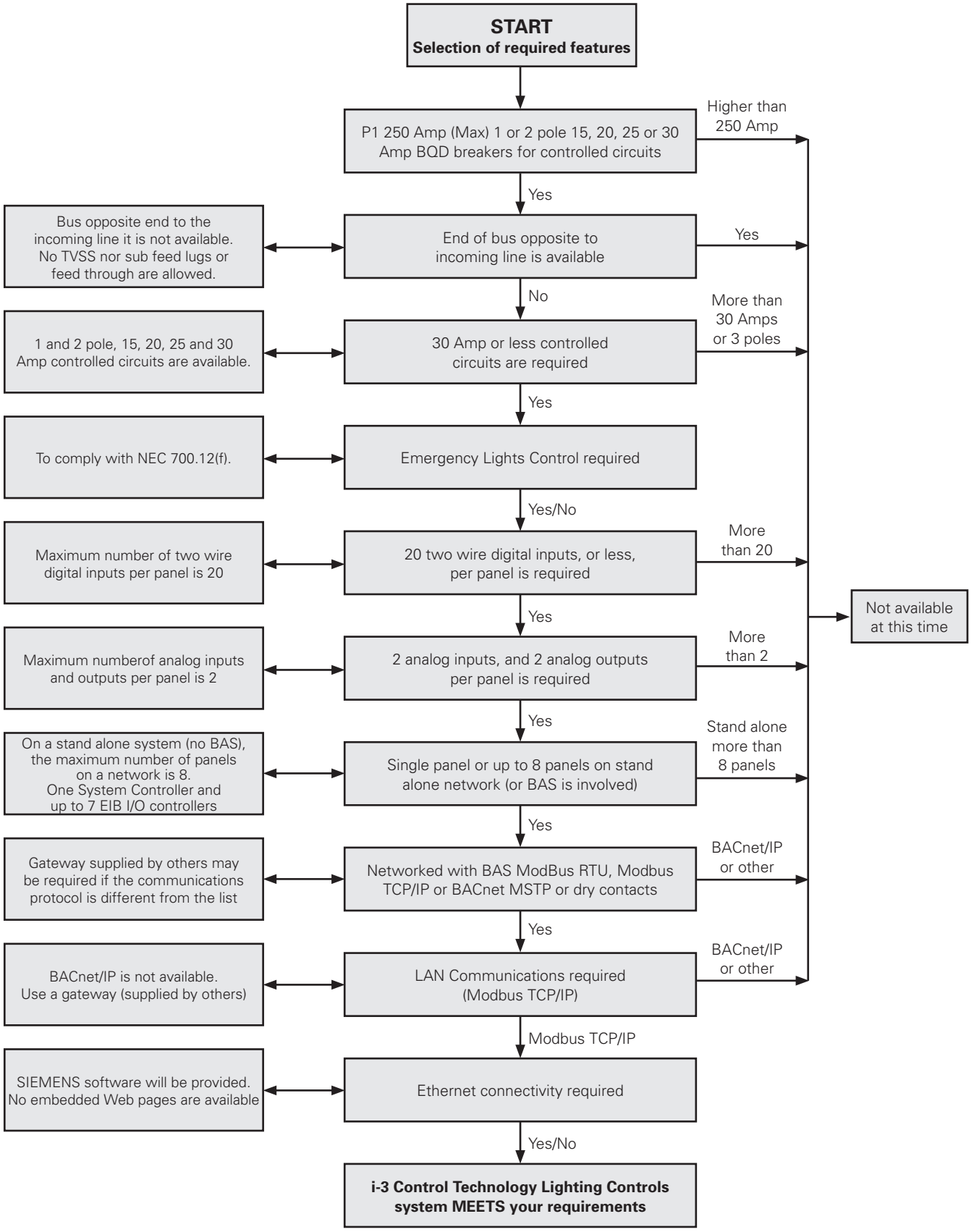
Diagram identifier	Part description	Catalog number
1②	18 circuit i-3 P1-250 deadfront	**11-D-3155-01**
	30 circuit i-3 P1-250 deadfront	**11-D-3155-02**
	42 circuit i-3 P1-250 deadfront	**11-D-3155-03**
2①	1/2" diameter hole plug for deadfront	**11-1836-01**
3①	Breaker filler plate	**QF3**
4②	BQD 15 Amp 1 Pole	**BDQ115**
	BQD 20 Amp 1 Pole	**BQD120**
	BQD 15 Amp 2 Pole	**BQD215**
	BQD 20 Amp 2 Pole	**BQD220**
	BQD 30 Amp 1 Pole	**BQD130**
	BQD 30 Amp 2 Pole	**BQD230**
5③	Neutral Extension (Right)	**11-A-3555-01**
	Neutral Extension (Left)	**11-A-3555-02**

Diagram identifier	Part description	Catalog number
6③	18 circuit data rail assembly	**US2:I3DATARL18**
	30 circuit data rail assembly	**US2:I3DATARL30**
	42 circuit data rail assembly	**US2:I3DATARL42**
7②	SIPOD 20 Amp 1 Pole	**BQD20CPOD1**
	SIPOD 20 Amp 2 Pole	**BQD20CPOD2**
	SIPOD 30 Amp 1 Pole	**BQD30CPOD1**
	SIPOD 30 Amp 2 Pole	**BQD30CPOD2**
8③	System Controller - Touch Screen	**US2:I3SYSCONT42EIB**
	I/O (EIB) Networked w/System Controller	**US2:I3IOCONT42EIB**
	I/O Controller - Modbus	**US2:I3IOCONT42MOD**
	I/O Controller - BACnet	**US2:I3IOCONT42BAC**
10①	RS485/RS232 Converter cable	**5WG1715-8XY01**
	RS485/USB Converter cable	**5WG1715-8XY02**

① Can be replaced by user.
② Must be replaced by a Siemens trained technician or licensed electrician.
③ Must be replaced by a Siemens trained technician.

P1 Series Lighting Panel

i-3 Features Selection Requirements for an Installation



LCP3000EZ Panels

General



System Features

The Siemens LCP3000EZ is fully assembled and delivered with all specified relays, digital inputs, power supply and RS232 interface installed in the enclosure. Wall mount the enclosure. Connect the 120V AC power supply. connect the loads to the relays. Connect the inputs. Then with a PDA with serial port support (RS232) (running Palm OS 3.5 or higher), configure which inputs control which output/s (relay/s) and the system is ready to go. The configuration software also can be run on a PC using Palm Emulator software. The configuration software and the Palm Emulator are provided with every order at no charge.

If your system has more than one panel, simply interconnect the panels with an 18 AWG solid copper twisted pair.

The Siemens LCP3000EZ lighting control system comes with an abundance of standard operating features and the intelligence to meet virtually any lighting control application. Each panel is equipped with an RS232 interface for easy configuration of inputs and outputs. Any panel in the network can be configured from any other panel in the same network. Other options include Ethernet interface, PC software, two different time clocks (4 and 16 control points, which provide the ability to set 324 or 500 schedules respectively), motion sensors, dual sensors for light and temperature and more. These options enable you to have a lighting control system that can meet even the most demanding applications.

Each individual device holds its own operating program in non-volatile memory. There is no central or master controller. This feature prevents entire system shut down, which could happen on systems with a central logic board.

Networking

Up to 10 panels can be networked together without the need for any additional cards or devices. With optional Web access devices and ComBridge Studio Software, the user can network up to 500 panels. The LCP3000EZ interfaces with any Building Automation System using OPC.

Web Access Software

The optional Web access software allows the user access any device in the LCP3000EZ system. This allows control of any relay from a PC. Password protection allows partial control to individual users. For example, the employee can turn ON or OFF the office lights from any PC.



Enclosure

The LCP3000EZ is enclosed in a NEMA 1, UL listed enclosure with hinged door and hinged dead fronts. There are two dead fronts, one for the low voltage (24V) section and one for the line voltage load relays. There is a barrier between the two sections.

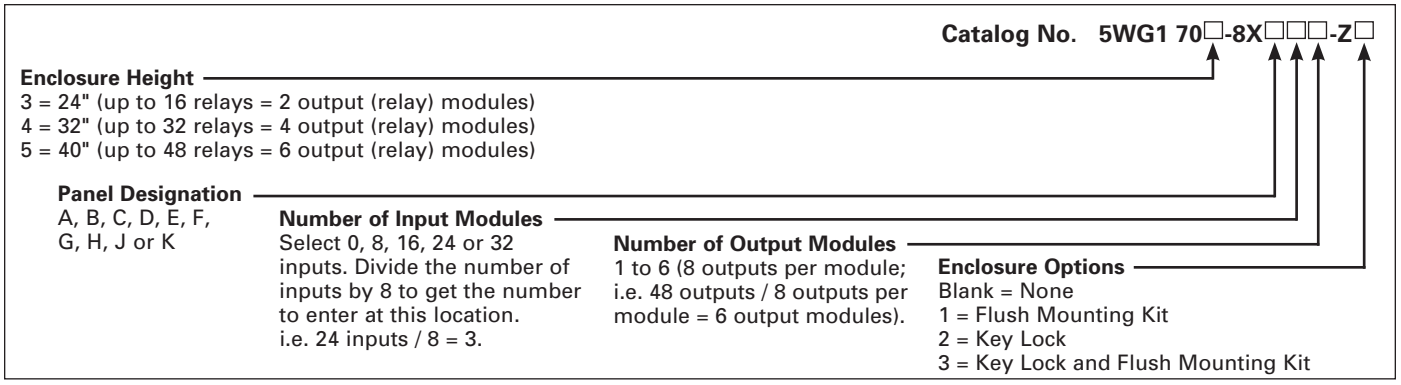
Technical Literature

You are able to review and download a copy of the LCP3000EZ Lighting Control Selection and Application Guide at usa.siemens.com/LCP3000EZ. A printed version of the Selection and Application Guide, No. LCSA-03000-0604, or the Technical Data Sheet, No. LCSS-01002-0304, can be requested through the Siemens Call Center at 1-800-427-2256.

System Specifications

- NEMA 1, surface mount, optional key lock and flush mount kit
- Enclosures are always 20" wide and 5¾" deep; height depends on number of outputs:
  - 24" high for up to 16 outputs
  - 32" high for up to 32 outputs
  - 40" high for up to 48 output relays
- Load relays:
  - Mechanically held
  - Visual position indicator
  - Have manual override
  - Built in timer which can be set in 30 minute intervals up to 6 hours
  - Eight relays per module
  - Can be programmed as groups to control two or three pole loads
  - Are rated 20 Amp, 277 Volt (480V "Y" with ground three phase loads)
- All panel size accept a maximum of 32 digital (switch) inputs:
  - Rated 24V AC/DC
  - Can be configured to accept maintained, or momentary inputs
  - Four inputs per module
- 4 control channels time clock allows 324 schedules
- 16 control channels time clock allows 500 schedules. Four channels have astronomical clock feature
  - Both time clocks have 10 years battery back up
  - Automatic day light savings time adjustment
  - Time of day (TOD) schedules
  - Warn Off - 5 minutes
- RS-232 interface in every panel
- Network up to 10 panels twisted pair wire, without additional cards
- Network up to 500 panels with optional Web access devices and ComBridge Studio Software
- Ambient Conditions:
  - Ambient operating temperature: 23˚F - 113˚F (-5... +45˚C)
  - Ambient temperature (non-op): -13˚F - 158˚F (-25... +70˚C)
  - Relative Humidity (non-condensing): 5% to 93%

LCP3000EZ Catalog Numbering System



To format the LCP3000EZ catalog number proceed as follows:

1. **Enclosure Height:** Determine the number of relays and provisions for future relay additions your installation requires. Round the number up to the nearest multiple of 8 (relays come in blocks of 8 relays).
   - 8 to 16 outputs (relays) enclosure height is 24". Enter 3 in the Enclosure Height field
   - 24 to 32 outputs (relays) enclosure height is 32". Enter 4 in the Enclosure Height field
   - 40 to 48 outputs (relays) enclosure height is 40". Enter 5 in the Enclosure Height field

2. **Panel designation:** First panel is A, second panel is B, third panel is C, etc. Last panel is K. There is no Panel I.

3. **Number of input Modules:** Determine the number of inputs your system requires and round the number up to the nearest multiple of 8 (input modules are packaged as 2 blocks of 4; therefore, they are supplied in groups of 8). Divide the number of inputs by 8 to determine the number of input modules:
   - 8 inputs: enter 1 in the Number of Input Modules field
   - 16 inputs: enter 2 in the Number of Input Modules field
   - 24 inputs: enter 3 in the Number of Input Modules field
   - 32 inputs: enter 4 in the Number of Input Modules field

4. **Number of output (relay) modules:** Determine the number of relays, and provisions for future relay additions your installation requires; then round the number up to the nearest 8 (relays come in blocks of 8 relays). Divide the number of relays by 8 to determine the number of output (relay) modules:
   - 8 relays: enter 1 for Number of Output (relay) Modules field
   - 16 relays: enter 2 in the Number of Output (relay) Modules field
   - 24 relays: enter 3 in the Number of Output (relay) Modules field
   - 32 relays: enter 4 in the Number of Output (relay) Modules field
   - 40 relays: enter 5 in the Number of Output (relay) Modules field
   - 48 relays: enter 6 in the Number of Output (relay) Modules field

5. **Enclosure options:** Determine if key lock, flush mounting kit of both are required.
   - No option required: leave the Enclosure Options field blank
   - Flush mount kit: enter 1 in the Enclosure Options field
   - Key lock: enter 2 in the Enclosure Options field
   - Key lock and flush mount kit: enter 3 in the Enclosure Options field

Example:
A system needs two panels:
The first panel requires 20 inputs and 30 outputs (relays).
The second panel requires 31 inputs and 44 outputs (relays).
Key lock is required in both panels.

First Panel:
1. Enclosure height: Number of outputs (relays) = 30, round up to the nearest multiple of 8 which is 32. 32/8 = 4. Enter **4** in the Enclosure Height field.
2. Panel designation: This is the first panel. Enter **A** in the Panel Designation field.
3. Number of input modules: Number of inputs = 20, round up to the nearest multiple of 8 which is 24. 24/8 = 3. Enter **3** in the Number of Input Modules field
4. Number of output (relay) modules: Number of relays = 30 round up to the nearest multiple of 8 which is 32. 32/8 = 4. Enter **4** in the Number of Output (relay) Modules field.

Second Panel:
5. Enclosure height: Number of outputs (relays) = 44, round up to the nearest multiple of 8 which is 48. 48/8 = 6. Enter **5** in the Enclosure Height field.
6. Panel designation: This is the second panel. Enter **B** in the Panel Designation field.
7. Number of input modules: Number of inputs = 31, round up to the nearest multiple of 8 which is 32. 32/8 = 4. Enter **4** in the Number of Input Modules field.
8. Number of output (relay) modules: Number of relays = 42 round up to the nearest multiple of 8 which is 48. 48/8 = 6. Enter **6** in the Number of Output (relay) Modules field.

Applicable to all panels:
9. Enclosure options: Key lock required. Enter **2** in the Enclosure Options field.

Finalized catalog numbers:
First panel is: 5WG1 70**4**-8X**A34**-Z**2**
Second panel is: 5WG1 70**5**-8X**B46**-Z**2**

External options

After you have finished with the LCP3000EZ catalog number, select any external options for the project. i.e.:
- Motion sensors (two SIEMENS motion sensors are supported per panel). Third party motion sensors with dry contacts can be used; This type is used in conjunction with the Input Modules
- Outdoor light sensor (one is supported by each network of 10 panels
- Override or key switch (you may select this option, although the binary inputs can also be used for this purpose
- Web Access software (ComBridge Studio)
- OPC interface
- E-mail services
- Data Base services

Options (not included in panel catalog number)

5WG1 372-5EY01-Z-A201	4 control channels time clock
5WG1 373-5EY01-Z-A202	16 control channels time clock
5WG1 255-2AB11	Motion sensor
5WG1 114-2AB02-Z-A221	Wall mounted bus coupler for motion sensor(s). Panel A*
5WG1 114-2AB02-Z-A231	Wall mounted bus coupler for motion sensor(s). Panel A*
5WG1 114-2AB02-Z-B222	Wall mounted bus coupler for motion sensor(s). Panel B*
5WG1 114-2AB02-Z-B232	Wall mounted bus coupler for motion sensor(s). Panel B*
5WG1 114-2AB02-Z-C223	Wall mounted bus coupler for motion sensor(s). Panel C*
5WG1 114-2AB02-Z-C233	Wall mounted bus coupler for motion sensor(s). Panel C*
5WG1 114-2AB02-Z-D224	Wall mounted bus coupler for motion sensor(s). Panel D*
5WG1 114-2AB02-Z-D234	Wall mounted bus coupler for motion sensor(s). Panel D*
5WG1 114-2AB02-Z-E225	Wall mounted bus coupler for motion sensor(s). Panel E*
5WG1 114-2AB02-Z-E235	Wall mounted bus coupler for motion sensor(s). Panel E*
5WG1 114-2AB02-Z-F226	Wall mounted bus coupler for motion sensor(s). Panel F*
5WG1 114-2AB02-Z-F236	Wall mounted bus coupler for motion sensor(s). Panel F*
5WG1 114-2AB02-Z-G227	Wall mounted bus coupler for motion sensor(s). Panel G*
5WG1 114-2AB02-Z-G237	Wall mounted bus coupler for motion sensor(s). Panel G*
5WG1 114-2AB02-Z-H228	Wall mounted bus coupler for motion sensor(s). Panel H*
5WG1 114-2AB02-Z-H238	Wall mounted bus coupler for motion sensor(s). Panel H*
5WG1 114-2AB02-Z-J229	Wall mounted bus coupler for motion sensor(s). Panel J*
5WG1 114-2AB02-Z-J239	Wall mounted bus coupler for motion sensor(s). Panel J*
5WG1 114-2AB02-Z-K230	Wall mounted bus coupler for motion sensor(s). Panel K*
5WG1 114-2AB02-Z-K240	Wall mounted bus coupler for motion sensor(s). Panel K*
5WG1 588-2CB11-Z-A211	Touch Panel, Panel A
5WG1 588-2CB11-Z-B212	Touch Panel, Panel B
5WG1 588-2CB11-Z-C213	Touch Panel, Panel C
5WG1 588-2CB11-Z-D214	Touch Panel, Panel D
5WG1 588-2CB11-Z-E215	Touch Panel, Panel E
5WG1 588-2CB11-Z-F216	Touch Panel, Panel F
5WG1 588-2CB11-Z-G217	Touch Panel, Panel G
5WG1 588-2CB11-Z-H218	Touch Panel, Panel H
5WG1 588-2CB11-Z-J219	Touch Panel, Panel J
5WG1 588-2CB11-Z-K220	Touch Panel, Panel K
5WG1 254-3EY01-Z-A203	Outdoor ambient light level sensor
5WG1 220-2CB02-Z-A204	Key switch



5WG1 376-5EY01-Z-A201
4 Control channels



5WG1 254-3EY01-Z-A203
Outdoor ambient light sensor



5WG1 148-1AB21-Z-A251
IP Interface

Software options for remote control and monitoring

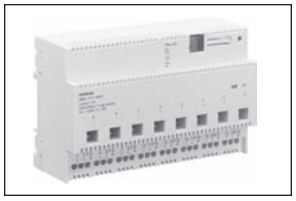
63101-32-01	Software for LAN connection (for monitoring and control)
63101-32-10	5 license extension for LAN software
63101-32-06	OPC services for connection with BAS, LAN software required
63101-32-01	LAN software e-mail services
63101-32-04	LAN software database services
63101-32-08	LAN software Visual Editor

***** Each panel supports 2 SIEMENS motion sensors. Catalog number corresponds to bus coupling 1 and bus coupling 2 for each panel. The actual motion sensing device plugs into the bus coupling unit.

Notes about components catalog number:
- First 12 characters are the "out of the box" component catalog number (i.e. 5WG1 588 2CB11).
- Z is a position holder in the catalog number sequence.
- Last four characters are for a component's specific location in the system (for example K220; where K indicates that the device belongs to panel K and 220 is the device's unique address).

Description of devices

All devices described here are interconnected via 18 AWG solid copper twisted pair or via a communication bus on the DIN rails incorporated into the panels.



Output (relay) Device (5WG1 512-1CB01): Block of 8 277 V, 20 amp, relays with timers, visual indication and manual override capability.



Input Device (5WG1 261-1CB01): Block of 4 digital inputs. It can take inputs from a set of dry contacts (maintained or momentary). Inputs requires 24 volt supplied by the power supply.



Power Supply (5WG1 123-1CB01): Input 120 V, 50/60 HZ. One per panel. It supplies voltage for communications and for the inputs.



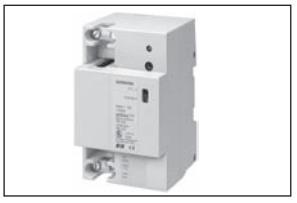
Choke (5WG1 120-1AB01): It is mounted next to the power supply. The choke prevents the power-supply 5WG1 123-1CB01 from short-circuiting the data on the bus line. It picks up the power from the two outer printed conductors and feeds it via inductors to the two inner printed conductors.



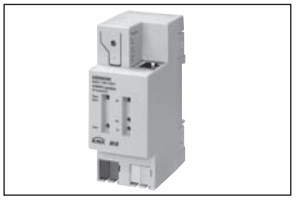
Four Control Channels Time Clock (5WG1 372-5EY01): It has four control channels; each channel can be seen by the system as an input. This device can be programmed with up to 322 different schedules, automatic day light saving time and 10 years battery back up.



Sixteen Control Channels Time Clock (5WG1 373-5EY01): It has 16 control channel. Each channel can be seen by the system as an input. This device can be programmed with up to 500 different schedules, automatic day light saving time and 10 years battery back up. The first four control channels can be programmed as astronomical time clock. This feature allows to control the outside lights based on date and geographical location, rather than with an outdoor light level sensor.



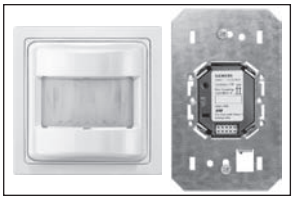
RS232 Interface (5WG1 148-1AB04): It allows the user to configure the panel on site via a DB9 serial cable. Configuration is done with the software supplied free of charge with every order.



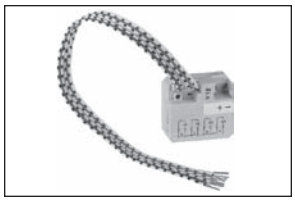
IP Interface (5WG1 148-1AB21): It allows connection to the user's LAN for control and monitoring of the system. Optional ComBridge Studio software is required for LAN connectivity. It can be configured for fixed IP address and also for DHCP.



Outdoor Ambient Light Sensor (5WG1 P254-3EY01): Used to control outdoor lights such as parking lot, signs, drive through window. Three light level thresholds (100 Fc, 50 Fc and 20 Fc) are pre-programmed into the device. This is also a temperature sensor. Outside temperature can be read when the optional ComBridge Studio LAN software is used.



Motion Sensor (5WG1 255-2AB11): Detects motion to command light to turn ON. Each motion sensor require bus coupling unit 5WG1 114-2CB02.



Key Switch (5WG1 220-2CB02): It is a block of 4 digital inputs It can take inputs from a set of dry contacts (maintained or momentary). It requires no voltage from the power supply. One UP220 device is supported by each set of 10 panels. This device is intended to be used for after hours override purposes (i.e. cleaning crews).



Touch panel (5WG1 588-2CB11): It allows remote control of the lights. It also provides relay status, indication of outside light level and temperature. Each panel in the system can have a dedicated touch panel.

LAN software (ComBridge Studio): It allows connectivity to the user's LAN for control and monitoring of the lighting control system. It has options for the following applications:

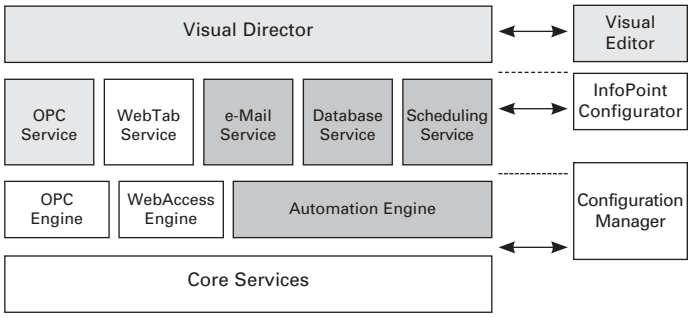
- Additional licenses to allow more than one person to control the lights (access is password protected with levels of access authority)
- OPC interface: For communications with building automation systems (BAS)
- E-mail services: can be programmed to send e-mail when a pre-selected event occurs
- Database Services: Stores pre-selected events on a database for further viewing and analysis
- Visual editor: Allows a graphical interface with the lighting control system

Replacement parts

To order replacement parts simply refer to the number on a device label (for devices installed in the enclosure, this number label is also on the inner door. This number starts with the panel letter designation followed by a number (i.e. A-101). From this number, SIEMENS knows exactly what you need.

Web Visualization with ComBridge Studio

Overview



Visual Director is a complete Web visualization tool with user interface, its own navigation structure with EIB display and control elements that can be freely positioned.

The OPC service links EIB elements with OPC client systems.

Automation Services execute automation functions directly from the ComBridge Studio Server PC: schedule jobs, e-mails and database entries for the purpose of data analysis and reporting.

Core and Webtab Services link the EIB system to the network and enable fast tabular visualization.

Applications

Get and configure only the functions that you really need to establish a simple, easy to operate interface. The graphical interface is ideal for use by non-technical personnel. It is also used to create links to other building automation functions and systems.

Tools

IP Router, users and functional expansions can be added at any time. This offers considerable cost benefits. These functions can be divided into four groups:

- Webtab Services
- Automation Services
- OPC Services
- Visualization

Webtab Services



This package provides all the functions to control and monitor an LCP3000EZ Lighting Control System.

It contains Webtabs, which support linking to the visualization of the lighting control data points in the shortest time possible.

The following tools are part of the Core and Webtab Services:

- ComBridge Configuration Manager: User interface for management of the IP router, TCP engines and software licenses
- ComBridge InfoPoint Configurator: Easy-to-use tool for the creation of Webtabs, OPC data point lists, email services, time jobs and database entries.

Automation Services



- Web-based user control:
  Control of the installation, ComBridge Studio Automation Services deliver application services at the supervisory level.

Schedules:
Daily programs can be stored and managed centrally using the Scheduling Service. Simply checkmark the week days on which you need to activate. Switching and control commands can be executed according to the schedule.

Emails:
Critical conditions or events can be monitored so that in event of their occurrence, emails are delivered. The contents of emails can be custom designed, and even sent with an attachment, e.g. with photos or circuit diagrams. This capability enables an easy to visualize system that can expedite Trouble Diagnosis & Repair.

Data recording:
Using the Database Services, you can write selected events to a database for daily, weekly or monthly scheduled evaluation and reporting.

OPC Services



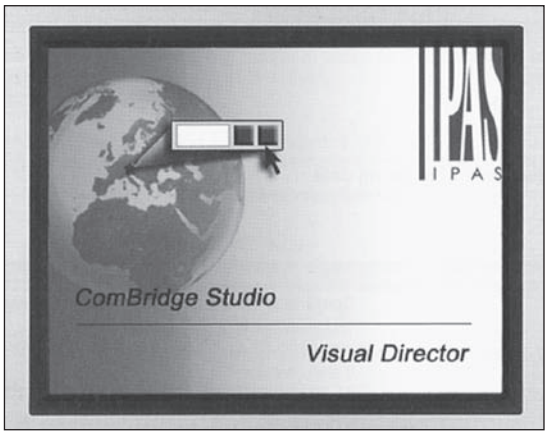
ComBridge Studio offers full OPC server functionality enabling SIEMENS lighting controls integration with other building automation systems (BAS).

Double Advantage:
ComBridge Studio OPC Services can also be used at the same time as other ComBridge Studio applications.

For example, the facility can be controlled by OPC at the same time as the workplace is controlled using Webtab or a Visual Director application. It is also possible to ensure access to the system installations for service personnel, or setup an email message services.

Quantity Control:
Not all data is of interest to the OPC client system. Exchanging all data with the system can lead to huge volumes of information that clogs up the system. In the InfoPoint Configurator you can restrict lists to the required information only.

Visual Director



ComBridge Studio Visual Director is supplementary to Webtab and offers a wide range of design options such as definable navigation, layout of the graphical display and control elements.

Web Standards:
Visual Director is HTML-based. Web assets, such as, navigation, graphics, dynamic HTML, layouts, scripts and dynamic contents in visualization projects can be used repeatedly. Furthermore, HTML know-how is now prevalent in the market and easily available.

User Login:
Visual Director provides complete system definition, application and use. Each user can be assigned their own start page and navigation allowing for individual system or operational "views" depending upon operator or monitor access level, engineering, maintenance or security function. The user level lets you control the data points each user can access.

Visual Editor:
Visual Director contains a menu-assisted, pixel-graphic HTML editor with a multitude of functions for creating your Web user interface.

5WG1 261-1CB01 Binary Input Device

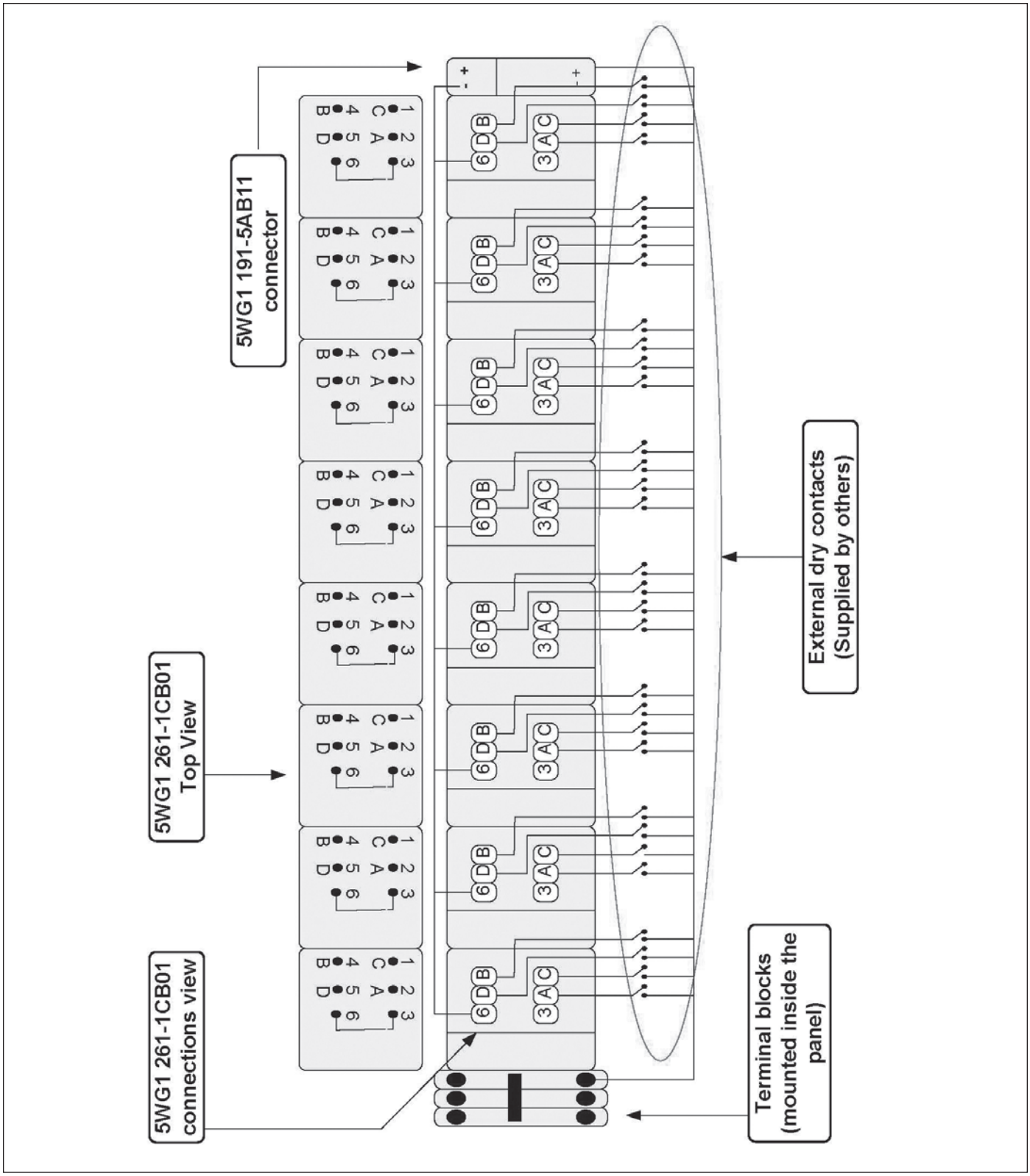


Figure 2

5WG1 512-1CB01 Load Relays Device

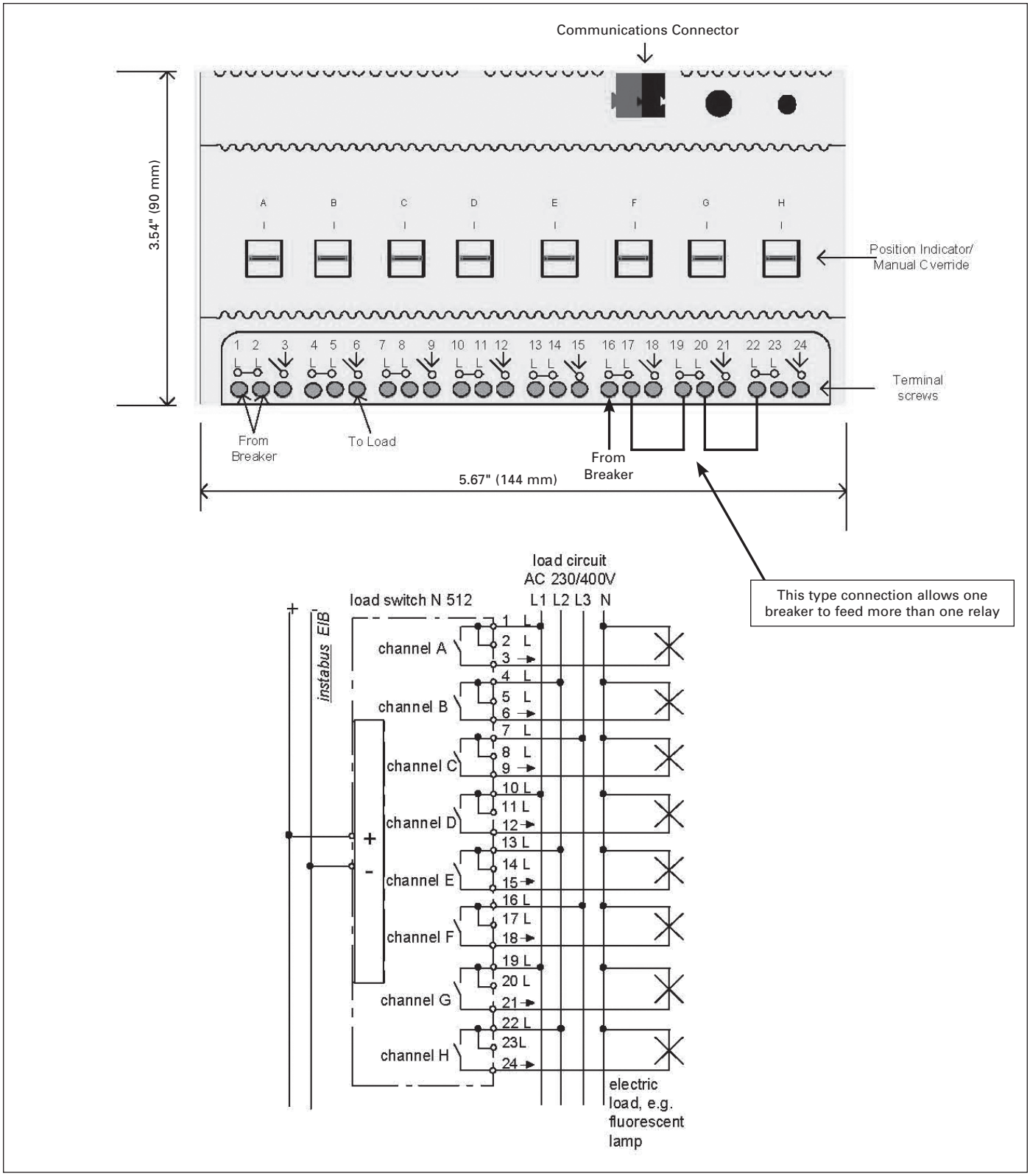


Figure 3

Notes

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Distribution Switchboards

Type SB1, SB2 and SB3

Product Description

Siemens modular front connected switchboard design provides a broad range of features and capabilities for a wide range of applications.

Every aspect of design of Siemens switchboards has been aimed at improving layout convenience, reducing installation costs and minimizing the impact and cost of changes to the system.

Siemens switchboards provide a rugged design and the flexibility necessary in electrical systems for all types of applications, some examples are:

- Commercial buildings
- Industrial plants
- Retail chain stores
- Health care facilities
- Hi-rise complexes



Front Connected Distribution Switchboard (Type SB2)

Features & Benefits

Features

- Up to 6000 ampere main bus rating
- Up to 600 volts AC
- Bus bracing up to 200KAIC
- Tin plated aluminum bus, silver plated copper bus or tin plated copper bus
- Bussing can be temperature or density rated
- Type 1 and Type 3R enclosures
- Main and branch circuit breakers and fusible switches
- Thermal magnetic and solid state circuit breakers
- Surge protective devices
- Customer metering
- Utility metering provisions
- Ground fault protection on mains and distribution devices
- Busway and transformer connections
- ACCESS power monitoring on mains and branches

Service Sections

Typical switchboards require one or more service main disconnects that feed one or more distribution sections. Service sections can be fed from overhead or underground, occasionally underground applications require that a pull section to be added to the switchboard lineup.

Distribution Sections

All switchboard distribution sections can accommodate any combination of panel mounted or individually mounted circuit breakers or fusible switches. This modularity allows future system modifications to be made without adding switchboard sections.

Front Accessibility

All Siemens switchboards are rear aligned and front accessible, enabling switchboards to be placed against a wall, while minimizing floor space requirements. Switchboards are standard rear aligned to minimize floor space requirements but can be front and rear aligned as an option.

Rear Accessibility

Rear access is available as an option for when bus maintenance and cable entry and exit require access to the rear of the switchboard.

Features & Benefits (continued)

Protective Devices

Thermal magnetic molded case circuit breakers can be supplied from 15 to 2000 amperes. Solid state (electronic) molded case circuit breakers are available from 30 to 1600 amperes. The solid state trip units provide finite trip setting adjustment, Modbus and Profibus communication along with many other features.

WL insulated case UL489 circuit breakers can be provided from 200 to 5000 amperes with solid state trip units.

For fusible applications, bolted pressure switches, high contact pressure switches and Vacu-Break fusible switches can be supplied.

Power Monitoring

Power monitoring can be accomplished in both service and distribution sections with a wide array of ACCESS power monitoring products. Digital and analog meters can be applied as well as branch circuit monitoring devices for tenant sub-billing or cost allocation applications. See section 9 of the Speedfax for further information on power monitoring devices.

Surge Protective Devices

Siemens surge protective devices can be applied in switchboards to improve the electrical system's protection, safety and reliability. These devices can be applied in customer metering compartments in main service sections or can be panel mounted in auxiliary compartments in distribution sections. See section 10 of the Speedfax for further information on surge protection devices.

Arc Flash Mitigation

Many arc flash mitigating features can be incorporated into switchboards. The WL breaker can be provided with Dynamic Arc Flash Sentry to allow for safer device settings when personnel are working near the switchboard. Also, breaker shutters, remote racking devices and infrared scanning windows can be supplied to further protect personnel from potential arc flash hazards.

Busway and Transformer Connections

Busway and transformer incoming and outgoing connections can be provided in switchboards. For busway connections to the switchboard, bussing is provided up to where the busway enters the switchboard. Also, a cutout for the busway is provided to allow for quick connection of the switchboard to the busway. For transformer connections, flex connectors are supplied for close coupling the switchboard to the secondary side of the unit substation.

Standards and Certifications

- UL891
- NEMA PB-2
- Seismically qualified
- Other equipment is UL listed as applicable

Additional Information

For complete application and pricing information contact your local Siemens sales office.

For further information on the product, visit our website at www.usa.siemens.com/switchboards

For detailed configuration information consult the selection and application guide on the website.



Front Connected Distribution Switchboard (Type SB2)

Individual Product lines

SB1 Switchboards

Siemens SB1 switchboards have been specifically designed for the shortest lead times and for applications where floor space is at a premium. The rear of all sections align so the switchboard can be installed against a wall. SB1 switchboards can contain main and branch protective devices and through bus ratings up to 2000 amperes and 600 Volts AC.

SB2 Switchboards

Siemens SB2 switchboards have been designed to be able to incorporate additional features. SB2 switchboards can have extra depth behind the bussing in each distribution section, can be front and rear aligned and can handle up to 4000 amperes and 600 Volts AC. These switchboards may also include insulated case circuit breakers, solid state molded case circuit breakers and density rated bussing.

SB3 Switchboards

Siemens SB3 switchboards are designed for custom options. SB3 switchboards can incorporate custom busway & transformer connections, rear access, all types of utility metering provisions and many other options. No matter your need, Siemens SB3 switchboards can provide a solution.

SB1 Switchboards

Available Features	Device Usage	Device Type	Ampere Rating	Mounting
• Individual or panel mounted mains • Individual or panel mounted branches • Thermal magnetic MCCBs • 2000A maximum main bus • Front accessible • Standard utility metering • Customer metering: digital & analog meters • 65KAIC interruption rating • 65C Copper and Aluminum bussing • Type 1 and 3R enclosures • Integrated lighting panelboards	Main	Molded Case Circuit Breakers (MCCB) Molded Case Circuit Breakers (MCCB) Vacu-Break Switches (VBS) Vacu-Break Switches (VBS) High Contact Pressure Switches (HCP) Bolted Pressure Switches (BPS)	400 - 1200 400 - 2000 400 - 600 800 - 1200 800 - 1200 800 - 2000	Panel Individual Panel Individual Individual Individual
	Branch	Molded Case Circuit Breakers (MCCB) Molded Case Circuit Breakers (MCCB) Vacu-Break Switches (VBS) Vacu-Break Switches (VBS) High Contact Pressure Switches (HCP) Bolted Pressure Switches (BPS)	400 - 1200 400 - 2000 400 - 600 800 - 1200 800 - 1200 800 - 2000	Panel Individual Panel Individual Individual Individual

SB2 Switchboards

Available Features	Device Usage	Device Type	Ampere Rating	Mounting
• All SB1 options • 4000A maximum main bus • Electronic trip unit (solid state) MCCBs • Density rated copper and aluminum bussing • 100KAIC interruption rating • Front and rear aligned	Main	All SB1 main devices Bolted Pressure Switches (BPS) WL Insulated Case Circuit Breakers (WL)	 Up to 4000 Up to 4000	 Individual Individual
	Branch	All SB1 branch devices Bolted Pressure Switches (BPS) WL Insulated Case Circuit Breakers (WL)	 Up to 4000 Up to 4000	 Individual Individual

SB3 Switchboards

Available Features	Device Usage	Device Type	Ampere Rating	Mounting
• All SB1 & SB2 options • 6000A maximum main bus • 200KAIC interruption rating • Rear accessible • Custom busway connections • Custom transformer connections • Custom utility metering • Additional special options and configurations	Main	All SB1 & SB2 main devices Bolted Pressure Switches (BPS) WL Insulated Case Circuit Breakers (WL)	 Up to 6000 Up to 5000	 Individual Individual
	Branch	All SB1 & SB2 branch devices Bolted Pressure Switches (BPS) WL Insulated Case Circuit Breakers (WL)	 Up to 6000 Up to 5000	 Individual Individual

Integrated Power Systems Switchboards

Type IPS

Product Description

Siemens integrated power systems (IPS) switchboards integrate multiple pieces of electrical distribution equipment into a single assembly. The design results in reduced installation time, a reduced footprint and reduced labor risk for installation.

The modular design of the IPS switchboard allows it to be combined with standard service entrance or distribution switchboards if needed. Also, the IPS switchboard can be added to an existing switchboard lineup.

IPS switchboards have a wide range of applications and are commonly used in retail stores, offices, health care facilities and retrofits.

Features & Benefits

Features

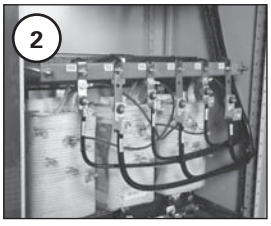
- All standard SB1, SB2 & SB3 switchboard features
- Lighting panelboards
- Distribution transformers
- Half high distribution switchboard chassis
- i-3 lighting control
- Individually mounted breakers (cable in & cable out)
- Auxiliary sections for surge devices, ACCESS power monitoring, contactors, relays, time clocks, motor starters, customer equipment, etc.

Integrated Power Systems Switchboard
Commonly Mounted Equipment



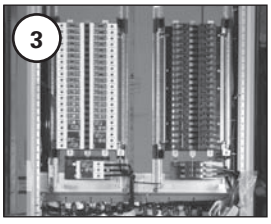
Distribution sections

- Up to 3000A (full height)
- Up to 1200A (half height)



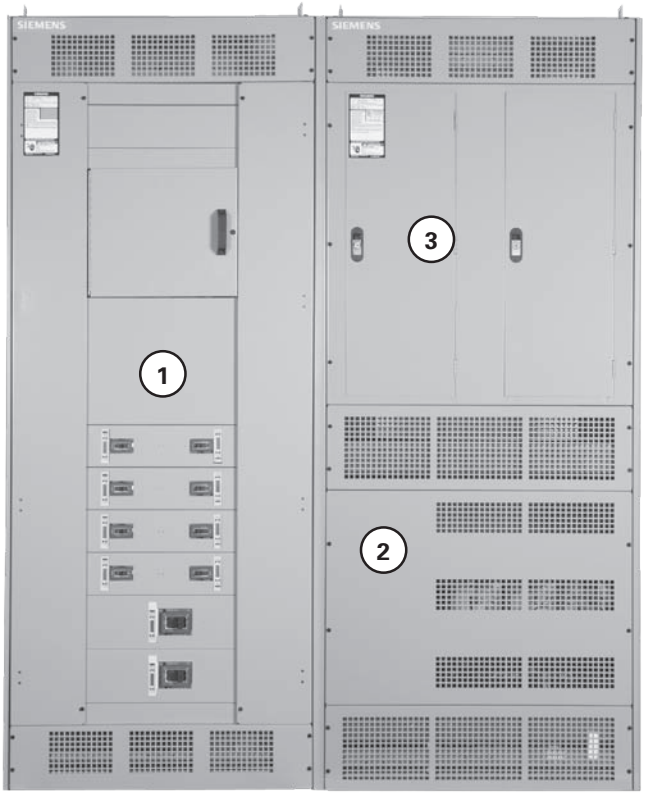
Transformers

- Up to 300KVA (full height)
- Up to 150KVA (half height)



Panelboards

- Up to 800A (full height)
- Up to 600A (half height)



Features & Benefits (continued)

Reduced Installation Time

IPS switchboards arrive at a jobsite with the components factory installed and wired. The result is significantly reduced installation time. The realized savings on installation result in lower labor costs which drops directly to the bottom line.

Reduced Space Requirements

By integrating components that are typically individually mounted, the IPS switchboard can reduce the space requirements for typical electrical equipment installation by up to 40%. This smaller footprint frees up valuable square footage that can be utilized by the building owner for other profitable uses.

Reduced Installation Risk

IPS switchboards are assembled at Siemens manufacturing plants with meticulous attention to details reinforced with strict testing procedures. This focus on quality ensures that problems encountered with traditional installations such as misinterpretation of drawings or field installation errors are eliminated. Utilizing IPS switchboards eliminates risks, enabling projects to come in on time and on budget.

Standards and Certifications

- UL891
- NEMA PB-2
- Seismically qualified
- Mounted panelboards built to UL67 and NEMA PB-1
- Other equipment is UL listed as applicable

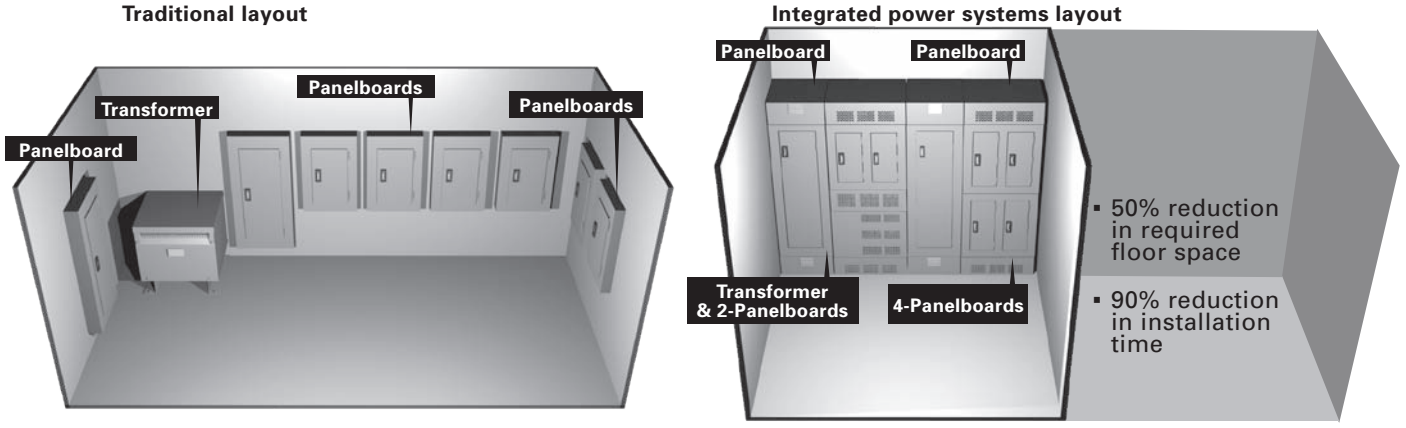
Additional Information

For complete application and pricing information contact your local Siemens sales office.

For further information on the product, visit our website at www.usa.siemens.com/switchboards

For detailed configuration information consult the selection and application guide on the website.

Integrated Power Systems Switchboard
Optimized electrical room layout



Commercial Multi-Metering Switchboards

Type SMM & MMS

Product Description

Siemens commercial multi-metering switchboards provide utility metering for multiple tenants. The sockets and protective devices are cable connected at the factory making the sockets ready for the installation of the meters.

With the modular design of Siemens switchboards all multi-metering sections can be combined with standard main service or distribution sections.

Multi metering switchboards can be used in many applications, some of the most common are:

- Shopping centers
- Office buildings
- Retail chain stores



SMM Commercial Multi-Metering Switchboard

Features & Benefits

Features

- Up to 4000 ampere main bus rating
- Up to 600 volts AC
- Bus bracing up to 200KAIC
- Type 1 and Type 3R enclosures
- Standard hot sequence metering with optional cold sequence metering
- 100, 200 or 320 ampere meter sockets
- Sockets include lever type manual bypass
- Ring-less type meter cover design
- Type 1 and Type 3R ratings
- All other SB1, SB2 & SB3 switchboard features

Individual Product Lines

Type SMM

Type SMM switchboards are specifically designed for the west coast and meet all EUSERC requirements.

Type MMS

Type MMS switchboards are designed for non-EUSERC territories and are designed to meet the specific requirements of any local utility.

Standards and Certifications

- UL891
- NEMA PB-2
- Seismically qualified
- Other equipment is UL listed as applicable

Additional Information

For complete application and pricing information contact your local Siemens sales office.

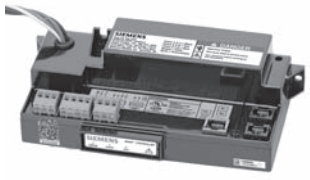
For further information on the product, visit our website at www.usa.siemens.com/switchboards

For detailed configuration information consult the selection and application guide on the website.

SEM3 System configured in Distribution Panels and Switchboards

The information below pertains to panelboard types P4, P5 and switchboard types SB1, SB2, and SB3. Please note SEM3 is not available for P3 panelboards. SEM3 is available in NEMA type 1, 3R, and 12 enclosures. SEM3 specifics to P4, P5, SB1, SB2, and SB3 are:

SEM3 for use in Siemens Switchboards



Controller

SEM3 controller is mounted in unit space. For P4 and P5 panels it will be mounted opposite of the feed location specified in COMPAS (i.e., bottom mount for top feed). The controller will require 3.75" of unit space in P4/5 and SB1/2/3. Each controller will be powered by direct tap connection to the section bus and can monitor up to 45 circuits. Applications that require monitoring more than 45 circuits will require additional controllers. For multi-section applications each controller will only be connected to meter racks in the same section as the controller.



Current Transformers (CTs)

Six sizes of CTs are available for use in P4/5 & SB1/2/3 applications: 50, 125, 250, 400, 600, and 1200 amp. All CTs are pre-mounted to a support bracket that attaches to the interior. Each bracket supports a maximum of 3 CTs and is designed for the breaker selected (brackets are not interchangeable between breaker frames). Each CT will be attached to a data module that is placed in the meter racks.



Meter Racks

Each meter rack requires 3.75" of unit space. All meter racks will be installed next to the SEM3 controller in unit space. The COMPAS configuration tool will select the appropriate meter rack configuration according to the user's application and will use the 21 space meter rack as a default option where possible. Only one meter rack (regardless of number of positions) can be installed in 3.75" of unit space. For multi-section applications each rack will only be connected to data modules from CTs in that section. Racks will not be setup to monitor CTs from adjacent sections.

NOTE: Monitoring of 45 circuits will require 9" of unit space: two 21 position racks and one 3 position rack

Other Considerations

Configuration: Data modules from CTs monitoring a circuit breaker must be mounted adjacent to one another in the meter rack. Any field changes to the factory configuration must take this into account.

Start-up & Commissioning: Siemens can provide these services. Contact your local SIEMENS PDS Power Solutions Business Developer for more details.

Billing Services for sub billing applications: Billing services are available. Contact your local SIEMENS PDS Power Solutions Business Developer for more details.

Generator Ready Switchboards

Type Generator Ready

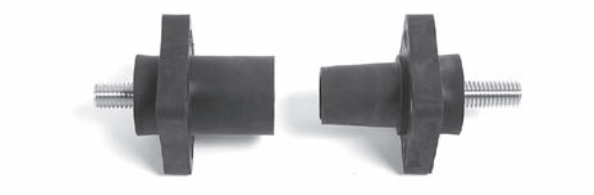
Product Description

Siemens Generator Ready quick connect switchboards meet the market need for quick connection of a generator for temporary back-up power.

The most common application of these switchboards are retail stores with perishable items, nursing homes & hospitals. However, these types of switchboards should be applied in any application that is sensitive to power outages.



Generator Ready Switchboard in NEMA 3R Enclosure



4/0 Crouse-Hinds quick connect Cam-Lok

Features & Benefits

Features

- All standard SB1, SB2 & SB3 switchboard features
- Crouse-Hinds quick-connect Cam-Loks for a quick primary connection method
- Standard mechanical lugs suitable for use with Type W welding cable for a secondary connection method
- NEMA 1 and NEMA 3R enclosures
- Trap door on NEMA 3R enclosure to maintain rating with cables connected
- Labeled phases and ground connections
- Bus connection between generator breaker and plug-in quick connects
- Mechanical interlocking with normal breaker
- Removable screw cover for covering quick-connects when not in use
- Stand alone or hard bussed in standard switchboard lineup

Generator Breaker Compartment

The generator breaker can be connected to the normal main switchboard by cable or bus. The generator breaker should be key-interlocked with the main breaker in the normal switchboard lineup. The switchboard can rated Suitable for Service Entrance (SUSE).

Quick-Connect Compartment

The Crouse-Hinds quick-connect Cam-Loks are provided in a compartment with a removable screw cover covering the quick-connects for when they are not in use. In addition to the quick-connects, standard mechanical lugs are provided as a secondary method of connection. The mechanical lugs are rated for Type W welding cable which is common in these generator connection applications.

Outgoing Connection

The outgoing load connection of the generator breaker can be accomplished through either cable connection or can be hard bussed to an existing or new switchboard lineup.

Standards and Certifications

- UL891
- NEMA PB-2
- NEC702
- Florida Building Code section 420.4.2.9.7
- Seismically qualified
- Other equipment is UL listed as applicable

Generator Ready Switchboards

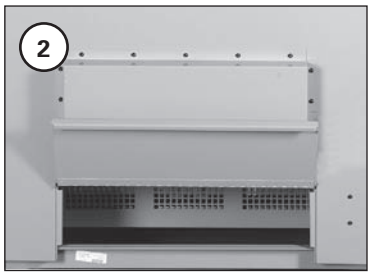
Type Generator Ready

Product Features

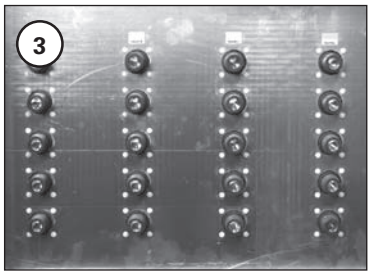




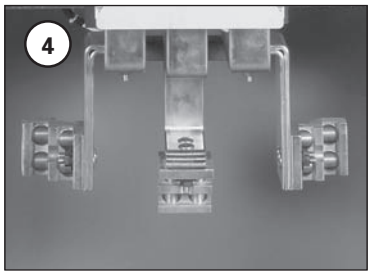
2000A main WL generator breaker key interlocked with normal main breaker



Hinged NEMA 3R door to maintain NEMA 3R rating with cables connected



2000A of Crouse-Hinds Cam-Loks for a three phase four wire system with ground connections



Standard mechanical lugs suitable for use with Type W welding cable as a secondary method of connection

Common Application



Rear Connected Switchboards

Type RCS

General

Siemens RCS switchboards differ from the front connected (Type SB1, SB2, SB3) design primarily in the distribution sections. In the distribution section the branch feeders are individually mounted. Because of this method of mounting, access to the outgoing cable terminals must be from the rear of the unit. Bus bar extensions from the feeder devices are run to the rear of the RCS section stopping before the conduit area for easy access and cable connection.

An optional cable management system can be requested to secure the outgoing cables. The front and rear of all sections align and are designed for mounting away from the wall. RCS switchboard will accommodate requirements up to 6000 ampere and 600 volts. The main bus can be specified for 400 to 6000 ampere rating. Main, tie and branch devices are available in amperage ratings up to 6000 amps. RCS switchboards can be indoor (NEMA 1) or outdoor (NEMA 3R) construction.

RCS switch boards utilize Type WL insulated case and/or low voltage power circuit breakers with drawout mountings. Features and benefits include high breaker density, 100kA standard short circuit bus bracing and three levels of horizontal bus. Options include insulated/isolated bus, Dynamic Arc Flash Sentry, ModBus Communication and intelligent power monitoring.





Switchboard Type RCS	Mounting	WL Insulated Case Circuit Breaker Drawout Mount	WL LV Power Circuit Breaker Drawout Mount
Main Devices	Individual	400-5000A	400-5000A
Branch Devices	Individual	400-5000A	400-5000A

For additional information on this product visit our website at www.sea.siemens.com.
For application pricing information contact your local distributor or the closest Siemens sales office.

Stock Service Entrance Switchboards

Product Description and Application

Product Description

Siemens stock service entrance switchboards are designed as stock units to meet the fast delivery needs of the market.

All of Siemens stock switchboards are suitable for service entrance. These switchboards combine utility metering provisions and a main service disconnect that can either be a Vacu-Break fusible switch or a molded case circuit breaker.

Stock switchboards have many applications, some of the most common include:

- Retail stores
- Office buildings
- Small factories
- Commercial stores and shopping centers

Individual Product Lines

Super Blue Pennant

- Specifically designed to meet EUSERC requirements
- Provision for EUSERC utility metering
- Main fusible switch or circuit breaker
- Optional distribution panel

BCT Service Cubicle

- Provision for utility metering (non-EUSERC)
- Main molded case circuit breaker

SCT Service Cubicle

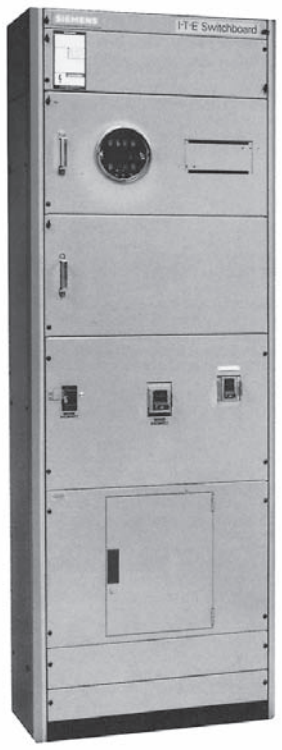
- Provision for utility metering (non-EUSERC)
- Main Vacu-Break fusible switches

Additional Information

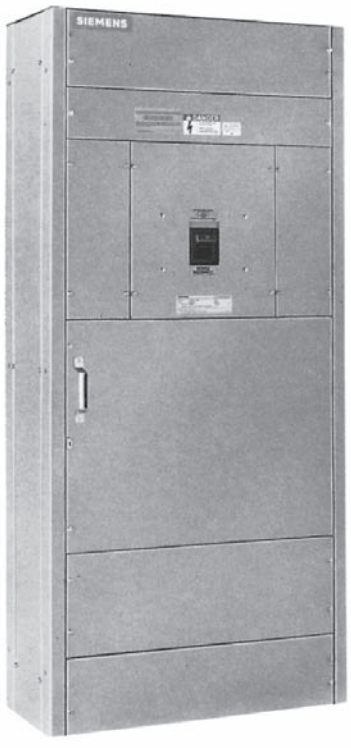
For complete application and pricing information contact your local Siemens sales office.

For further information on the product, visit our website at www.usa.siemens.com/switchboards

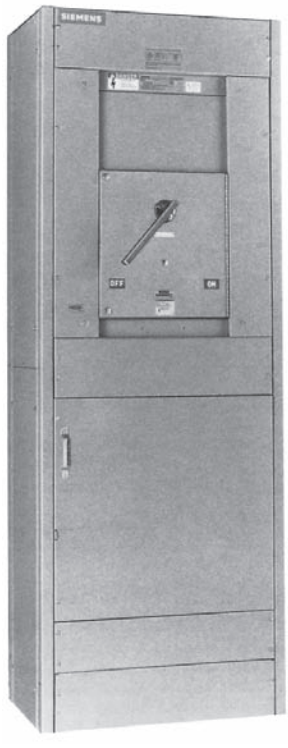
For detailed configuration information consult the selection and application guide on the website.



Super Blue Pennant



BCT Service Cubicle



SCT Service Cubicle

Stock Service Entrance Switchboards

Super Blue Pennant Switchboards

Product Description

Siemens Super Blue Pennant stock service entrance switchboards are designed as stock units to meet the fast delivery needs of the market.

Super Blue Pennant switchboards are suitable for service entrance and are specifically designed to meet EUSERC requirements. They combine utility metering provisions with either a main Sentron molded case circuit breaker or Vacu-Break fusible switch. An optional plug-in or bolt on distribution panel can also added in the field in the same section.

Super Blue Pennant switchboards have many applications, some of the most common include:

- Retail stores
- Office buildings
- Small factories
- Commercial stores and shopping centers



Super Blue Pennant

Features & Benefits

Features

- Up to 800 amperes
- Up to 480 volts AC
- Bus bracing up to 200KAIC
- Type 1 or Type 3R enclosures

Utility Provision

Incoming main lugs are mechanical screw-type, mounted on studs and accept a wide range of cable sizes. A barriered hot sequence utility metering compartment is supplied which meets all EUSERC requirements. The meter and test block provisions are also built to meet EUSERC requirements.

Main Disconnect

The main service disconnect can be either a Sentron molded case circuit breaker in 400, 600 or 800 amperes or a Vacu-Break fusible switch in 400 or 600 amperes.

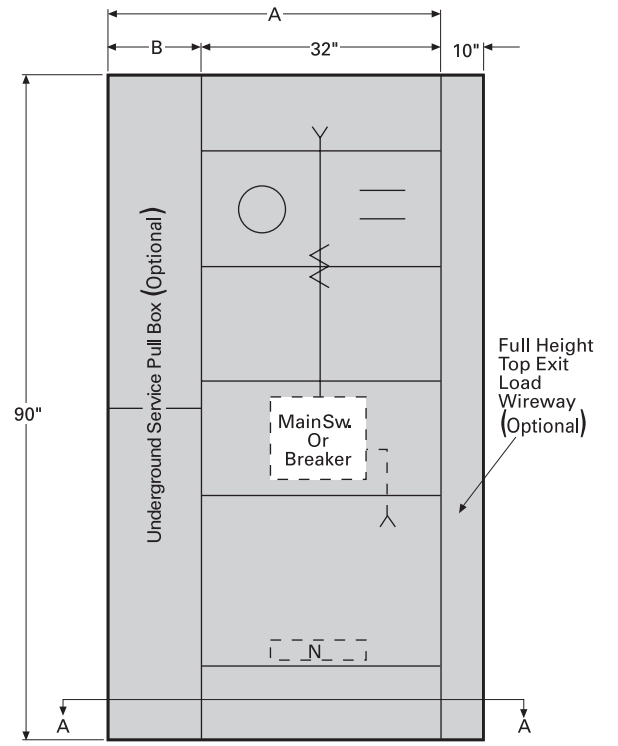
Distribution Panel

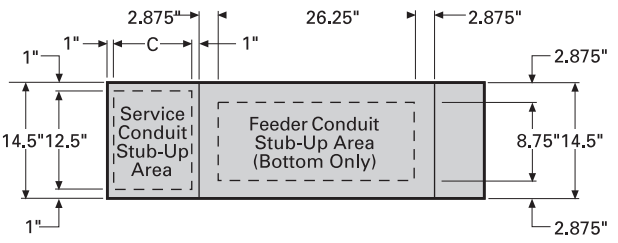
Super Blue Pennant switchboards can accommodate an optional distribution panel assembly per unit with ratings of 400, 600 or 800 amperes. The distribution panel can take up to 40 single pole branch breakers which can be either bolt on or plug-in.

Standards & Certifications

- UL891
- NEMA PB-2
- Seismically qualified
- Other equipment is UL listed as applicable

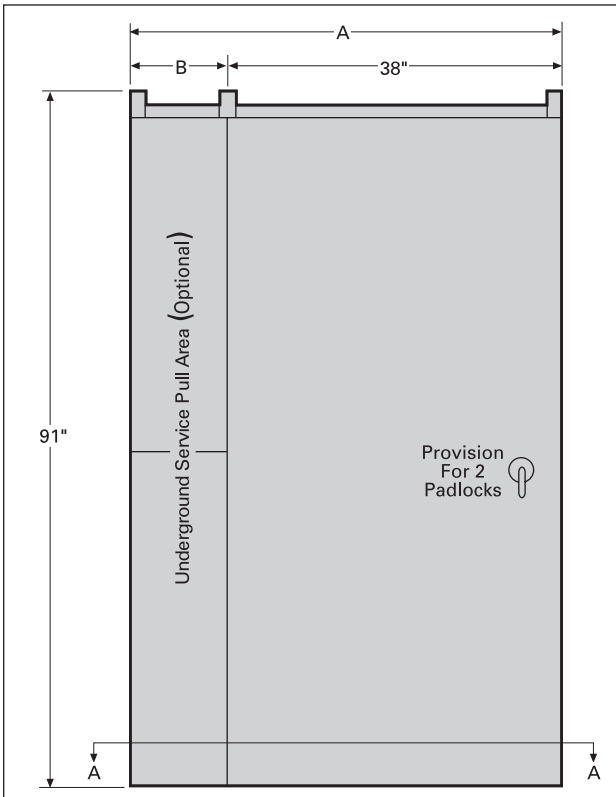
Type 1 — Indoor

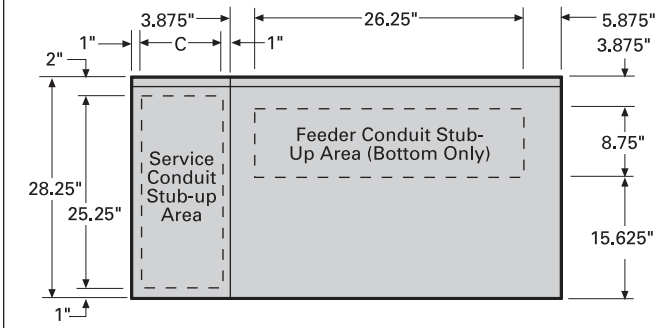




Description	Dimensions (inches) A	B	C
Without Lug Landing	46	14	12
With Lug Landing	58	26	24

Type 3R — Outdoor Weatherproof





Description	Dimensions (inches) A	B	C
Without Lug Landing	53	15	13
With Lug Landing	65	27	25

For inches / millimeters conversion, see conversion table in Application Data section.

Stock Service Entrance Switchboards

Super Blue Pennant Switchboards

Selection

Main Circuit Breaker

Main Device Ampere Rating	Service Voltage	Catalog Number		Meter Socket Clips	Distribution Kits Available	Approximate Weight (lbs.)	
		Indoor	Outdoor			Indoor	Outdoor
400 Ampere Line Lugs (2)—⅜-500 kcmil (Copper or Aluminum) Breaker Rated 65,000A IR Symmetrical at 240 Volts 35,000A IR Symmetrical at 480 Volts Type JD6	120/240; 1-Phase, 3-Wire	**PB224**	**WPB224**	5②	**PQ2630 PQ2612**	320	1050
	240/120; 3-Phase, 4-Wire Delta 240; 3-Phase, 3-Wire 208Y/120; 3-Phase, 4-Wire	**PB424**	**WPB424**	15	**PQ4630 PQ4612**	335	1060
	480Y/277; 3-Phase, 4-Wire 480; 3-Phase, 3-Wire	**PB444**	**WPB444**	15	**PE4630 PF4606**	335	1060
600 Ampere Line Lugs (2)—¾-500 kcmil (Copper or Aluminum) Breaker Rated 65,000A IR Symmetrical at 240 Volts 35,000A IR Symmetrical at 480 Volts Type LD6	120/240; 1-Phase, 3-Wire	**PB226**	**WPB226**	5②	**PQ2630 PQ2612**	320	1050
	240/120; 3-Phase, 4-Wire Delta 240; 3-Phase, 3-Wire 208Y/120; 3-Phase, 4-Wire	**PB426**	**WPB426**	15	**PQ4630 PQ4612**	335	1060
	480Y/277; 3-Phase, 4-Wire 480; 3-Phase 3-Wire	**PB446**	**WPB446**	15	**PE4630 PF4606**	335	1060
800 Ampere Line Lugs (3)—⅜-500 kcmil (Copper or Aluminum) Breaker Rated 65,000A IR Symmetrical at 240 Volts 50,000A IR Symmetrical at 480 Volts Type MD6	120/240; 1-Phase, 3-Wire	**PB228**	**WPB228**	5②	**PQ2840 PQ2816**	460	1090
	240/120; 3-Phase, 4-Wire Delta 240; 3-Phase, 3-Wire 208Y/120; 3-Phase, 4-Wire	**PB428**	**WPB428**	15	**PQ4840 PQ4818**	475	1090
	480Y/277; 3-Phase, 4-Wire 480; 3-Phase, 3-Wire	**PB448**	**WPB448**	15	**PE4840 PF4809**	475	1090



For inches / millimeters conversion, see conversion table in Application Data section.

①Load side lugs, distribution panel and subfeed kits are not included.
②For 6-jaw requirements, order 6th clip kit from accessories.

☐ = Warehouse Stock

Main Fusible Switch①

Main Device Ampere Rating	Service Voltage	Catalog Number		Meter Socket Clips	Distribution Kits Available	Approximate Weight (lbs.)	
		Indoor	Outdoor			Indoor	Outdoor
400 Ampere Line Lugs (2)—⅜-500 kcmil (Copper or Aluminum) 200,000 AIC maximum at 600 Volts	120/240; 1-Phase, 3-Wire	**PF224**	**WPF224**	5③	**PQ2630 PQ2612**	365	1094
	240/120; 3-Phase, 4-Wire Delta 240; 3-Phase, 3-Wire 208Y/120; 3-Phase, 4-Wire	**PF424**	**WPF424**	15	**PQ4630 PQ4612**	375	1110
	480Y/277; 3-Phase, 4-Wire 480; 3-Phase, 3-Wire	**PF444**	**WPF444**	15	**PE4630 PF4606**	375	1110
600 Ampere Line Lugs (2)—⅜-500 kcmil (Copper or Aluminum) 200,000 AIC maximum at 600 Volts	120/240; 1-Phase, 3-Wire	**PF226**	**WPF226**	5③	**PQ2630 PQ2612**	370	1100
	240/120; 3-Phase, 4-Wire Delta 240; 3-Phase, 3-Wire 208Y/120; 3-Phase, 4-Wire	**PF426**	**WPF426**	15	**PQ4630 PQ4612**	390	1110
	480Y/277; 3-Phase, 4-Wire 480; 3-Phase 3-Wire	**PF446**	**WPF446**	15	**PE4630 PF4606**	390	1120



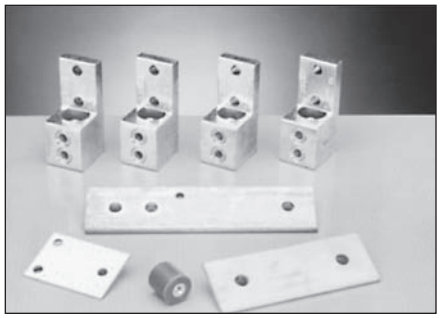
For inches / millimeters conversion, see conversion table in Application Data section.

①Fuses not included.
②Load side lugs, distribution panel and subfeed kits are not included.
③For 6-jaw requirements, order 6th clip kit from accessories.

□ = Warehouse Stock

Main Device (Circuit Breaker or Fusible Switch) Load Side Lugs①— Discount Schedule SWBD

Ampere Rating	Description	Catalog Number	Wire Range
400	For Fusible	**LKF4**	(1)—3/0-750 kcmil (Cu or Al)
600	Switch	**LKF6**	(2)—3/0-500 kcmil (Cu or Al)
400	For Circuit	**LKB4**	(1)—600-750 kcmil (Cu or Al)
600	Breaker	**LKB6**	(2)—3/0-350 kcmil (Cu or Al)
800		**LKB8**	(2)—600-750 kcmil (Cu or Al)



Distribution Panel Kits — Discount Schedule SWBD

Ampere Rating	Voltage	Number and Type of Breaker Poles				Catalog Number	Weight
		QP or HQ⑦	ED4⑦	QJ2 or QJH2⑦	FXD6②⑥⑦		
400 and 600	120/240V; 1-Phase, 3-Wire	30	—	—	—	**PQ2630**	39
		12	—	12	—	**PQ2612**	
	240/120V; 3-Phase, 4-Wire Delta④⑤ 240V; 3-Phase, 3-Wire⑤ 208Y/120V; 3-Phase, 4-Wire	30	—	—	—	**PQ4630**	42
		12	—	12	—	**PQ4612**	
	480Y/277V; 3-Phase, 4-Wire 480V; 3-Phase, 3-Wire	—	30	—	—	**PE4630**	42
		—	12	—	6	**PF4606**	65
800	120/240V; 1-Phase, 3-Wire	40	—	—	—	**PQ2840**	65
		12	—	16	—	**PQ2816**	
	240/120V; 3-Phase, 4-Wire Delta④⑤ 240V; 3-Phase, 3-Wire 208Y/120V; 3-Phase, 4-Wire	40	—	—	—	**PQ4840**	70
		12	—	18	—	**PQ4818**	
	480V; 3-Phase, 3-Wire	—	40	—	—	**PE4840**	65
		—	12	—	9	**PF4809**	70

Circuit Breaker Subfeed Kits: (Breakers Not Included) — Discount Schedule SWBD

Description	Catalog Number
For FXD6-225A 2 or 3-pole	**PSFFJ6**
For JXD6, JD6, HJD6 400A 2 or 3-pole	**PSFJL6**

For inches / millimeters conversion, see conversion table in Application Data section.

①Includes phase and neutral load lugs and neutral link assembly.
②2-pole FXD6 requires 3-pole space.
③Includes branch neutral and disconnect link assembly.
④1-pole breakers must not be connectedto "B" phase.
⑤2-pole breakers must be rated 240V.
⑥FXD6 circuit breakers are limited to 225A maximum.
⑦Price from Molded Case Circuit Breaker section.

□ = Warehouse Stock

Description	Catalog Number
Underground Pull Section or Full Height Section For Load Wiring — Discount Schedule SWBD	
14.5" Deep 90" High 14" Wide (12" opening) — indoor 15" Wide (12" opening) — outdoor	 **PUG14** **WPUG14**
26" Wide (24" opening) — indoor 27" Wide (24" opening) — outdoor	**PUG26** **WPUG26**
10" Wide (load wiring)	**PLW10**
Lug Landing Kits — Discount Schedule SWBD (Requires Catalog Number PUG26 or WPUG26)	
400A 1-Phase, 3-Wire or 3-Phase, 4-Wire	**PLL44**①
600A 1-Phase, 3-Wire or 3-Phase, 4-Wire	**PLL46**①
800A 1-Phase, 3-Wire or 3-Phase, 4-Wire	**PLL48**①
"R" Fuse Clip Adapter Kit (Set of 3) — Discount Schedule VBSS	
400A 250/600V	**SSRK35**
600A 250/600V	**SSRK36**
"J" Fuse Clip Adapter Kit (Set of 3) — Discount Schedule VBSS	
400A 250V	**W49814**
400A 600V	**W49816**
600A 240V	**W49813**
600A 600V	**W49815**
"T" Fuse Clip Adapter Kit (One Pole Kit) — Discount Schedule VBSS	
400A 240V	**TFAK52**
400A 600V	**TFAK55**
600A 240V	**TFAK62**
600A 600V	**TFAK65**
Optional Meter Sockets and Doors — Discount Schedule SWBD	
Meter Compartment Door (32" Wide x 15" High for "S" base socket with test block cutout (order necessary meter base from items below)	**PSP32**
Meter Compartment Door (32" Wide x 30" High) for 2 "S" base meters with mounting provisions for test block and printing demand meter (order meter base from table below) Left Hand Hinge or Right Hand Hinge	**PSDP32**
Blank Meter Compartment Door (32" Wide x 15" High)	**PBP32**
5 Clip Meter Socket with ring	**PMS5**
6 Clip Meter Socket with ring	**PMS6**
8 Clip Meter Socket with ring	**PMS8**
13 Clip Meter Socket with ring	**PMS13**
15 Clip Meter Socket with ring	**PMS15**
Filler Plates — Discount Schedule MCCB	
QP, BL, BQD, NGB, ED	**QF3**
EB	**EBF1**
Handle Blocking and Padlock Devices — Discount Schedule MCCB	
Blocking (QP-HQP 1, 2 and 3-pole)	**ECQL1**
Blocking (QJ2, QJ2-H, QJH2)	**QJHS1**
Blocking (ED2, ED4, ED6)	**E2HBL**
Padlock (QP-HQP)	**ECQLD3**
Padlock (QJ2, QJ2-H, QJH2)	**HL9419**
Padlock (ED2, ED4, ED6)	**ED2HPL**
Equipment Ground Bus — Discount Schedule SWBD	
	PEGB42

For inches / millimeters conversion, see conversion table in Application Data section.

①A PUG26 or WPUG26 Underground pull section is required when using these lug landing kits.

☐ = Warehouse Stock

Stock Service Entrance Switchboards

BCT Service Cubicle

Selection

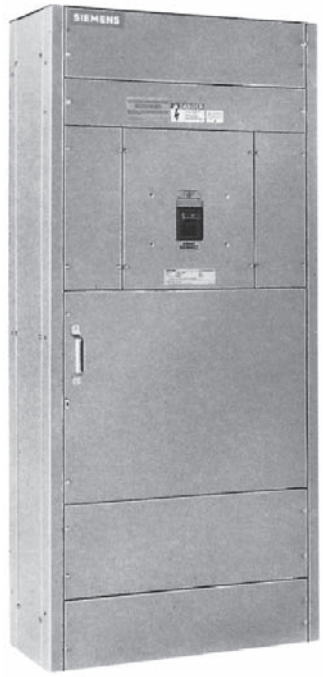
Product Description

Siemens BCT stock service entrance switchboards are designed as stock units to meet the fast delivery needs of the market.

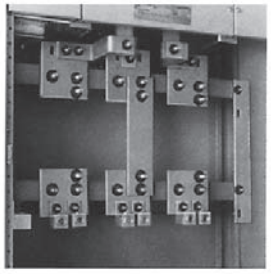
Siemens BCT switchboards incorporate a utility current transformer compartment and a Sentron molded case circuit breaker in a single section.

BCT switchboards have many applications, some of the most common include:

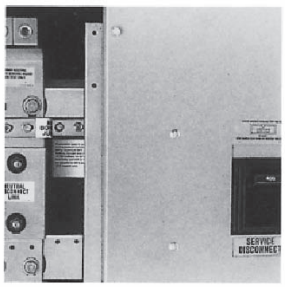
- Retail stores
- Office buildings
- Small factories
- Commercial stores and shopping centers



BCT Service Cubicle



Utility metering provsion



Neutral disconnect link

Features & Benefits

Features

- Up to 1200 amperes
- Up to 600 volts AC
- Bus bracing up to 100KAIC
- Type 1 enclosures only

Utility Provision

The provision can be adjusted for use with 12" or 14.5" primary bar type current transformers. All switchboards are supplied as top feed cold sequence metering only. Switchboards can be field modified for other configurations per the available configurations table below.

Main Disconnect

The main service disconnect is a Sentron molded case circuit breaker available from 400 to 1200 amperes.

Enclosure

The enclosure is tamperproof with a hinged door over the utility provision compartment with a latch for the utility to be able to seal off the compartment. Enclosures are only available as type 1 indoor.

Standards & Certifications

- UL891
- NEMA PB-2
- Other equipment is UL listed as applicable

Connectors (Per Phase & Neutral)

Ampere Rating	Connectors Suitable For Cu or Al
400	(1) 4/0-500 kcmil (2) 250 kcmil
600	(2) 4/0-500 kcmil
800	(2) 250-500 kcmil
1000	(4) 250-500 kcmil
1200	(4) 250-500 kcmil

BCT Catalog Numbers & Application Data

Catalog Number	Symmetrical Amperes Interrupting Capacity			Ampere Rating	System Voltage		Dimensions (inches)			Available Configurations		
	240V	480V	600V				Height	Width	Depth	Top Feed Cold Seq.	Top Feed Hot Seq.	Bottom Feed Cold / Hot Seq.
BCT436JXD6	65,000	35,000	25,000	400	120/240V 208Y/120V 240V 480Y/277V 480V 600V	1-Phase, 3-Wire 3-Phase, 4-Wire 3-Phase, 3-Wire 3-Phase, 4-Wire 3-Phase, 3-Wire 3-Phase, 3-Wire	70	32	13.75	●	●	●
BCT436HJD6	100,000	65,000	35,000							●	●	
BCT636LXD6	65,000	35,000	25,000	600						●	●	●
BCT636HLD6	100,000	65,000	35,000							●	●	
BCT836MXD6	65,000	50,000	25,000	800			90			●	●	●
BCT836HMD6	100,000	65,000	50,000							●		
BCT1036NXD6	65,000	—	—	1000	208Y/120V 240V	3-Phase, 4-Wire 3-Phase, 4-Wire				●	●	●
BCT1036HND6	100,000	—	—							●		
BCT1236NXD6	65,000	—	—	1200						●	●	●
BCT1236HND6	100,000	—	—							●		
PTE	Potential Transformer Enclosure			—	—	—	20	20	10			

Stock Service Entrance Switchboards

SCT Service Cubicle

Selection

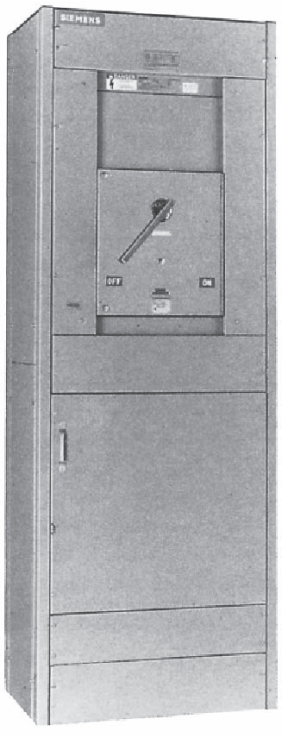
Product Description

Siemens SCT stock service entrance switchboards are designed as stock units to meet the fast delivery needs of the market.

Siemens SCT switchboards incorporate a utility current transformer compartment and a Vacu-Break fusible switch.

SCT switchboards have many applications, some of the most common include:

- Retail stores
- Office buildings
- Small factories
- Commercial stores and shopping centers



SCT Service Cubicle

Features & Benefits

Features

- Up to 1200 amperes
- Up to 600 volts AC
- Bus bracing up to 200KAIC
- Type 1 enclosures only

Utility Provision

The provision can be adjusted for use with 12" or 14.5" primary bar type current transformers. All switchboards are supplied as top feed cold sequence metering only..

Main Disconnect

The main service disconnect is a Vacu-Break fusible switch available from 400 to 1200 amperes.

Enclosure

The enclosure is tamperproof with a hinged door over the utility provision compartment with a latch for the utility to be able to seal off the compartment. Enclosures are only available as type 1 indoor.

Standards & Certifications

- UL891
- NEMA PB-2
- Other equipment is UL listed as applicable



Vacu-Break Main Switch

Connectors (Per Phase & Neutral)

Ampere Rating	Connectors Suitable For Cu or Al
400	(1) 4/0-500 kcmil (2) 250 kcmil
600	(2) 4/0-500 kcmil
800	(2) 250-500 kcmil
1000	(4) 250-500 kcmil
1200	(4) 250-500 kcmil

Fuse Clips

Ampere Rating	Fuse Clip	Symmetrical Amperes Interrupting Capacity
400 - 600	R	200,000
800 - 1200	L	100,000

SCT Catalog Numbers & Application Data

Catalog Number		Ampere Rating	System Voltage		Dimensions (inches)		
Cold Sequence	Hot Sequence				Height	Width	Depth
SCT432	**LSCT432**	400	120/240V	1-Phase, 3-Wire	90	32	20
SCT632	**LSCT632**	600	208Y/120V 240V	3-Phase, 4-Wire 3-Phase, 3-Wire			
SCT436	**LSCT436**	400	480Y/277V	3-Phase, 4-Wire			
SCT636	**LSCT636**	600	480 or 600V	3-Phase, 3-Wire			
SCT836	**LSCT836**	800	All	—			
SCT1236	**LSCT1236**	1200	208Y/120V 240V	3-Phase, 4-Wire 3-Phase, 3-Wire			

Connection Strap Kits - Circuit Breaker①

For use with SB1, SB2, SB3, FC20, FCI, FCII, CDP-6 & VB-6 switchboards or series 5 or 6 CDP circuit breaker panelboards. Includes straps, cover plates and necessary hardware for switchboards manufactured since 1974. For replacement strap kits for RCIII switchboards, contact your local sales office.

Max Amp Rating	Breaker Family	Breaker Type	Catalog Number②	Unit Height (inches)	Mounting
100	General	BL, BQD	**SBLBD**	3.75	Twin
125	General	EB	**SEBD**	3.75	Twin
	General	NGB	**SNBD**	3.75	Twin
	General	ED	**6E62**	3.75	Twin
	General	CED	**6CLE2**	3.75	Twin
150	VL	DG	**SDGD**	5	Twin
225	General	QJ	**6QJ2**	5	Twin
250	VL	FG	**SFGD**	5	Twin
	Sentron	FD	**6F62**	5	Twin
	Sentron	CFD	**6CLF1**	5	Single
400	VL	JG	**SJG2D**⑤	6.25	Twin
	VL	JG	**SJG1D**	6.25	Single
	Sentron	JD	**6JJ61**	8.75	Single
	Sentron	JD	**6JJ62**	8.75	Twin
	Sentron	CJD	**6CLJ1**	8.75	Single
	Sentron	SJD	**6SJL1**	8.75	Single
	Sentron	SCJD	**6SCJ1**	8.75	Single
600	VL	LG	**SLGD**	6.25	Single
	Sentron	LD	**6LL61**	8.75	Single
	Sentron	CLD	**6CLL1**	8.75	Single
	Sentron	SLD	**6SLL1**	8.75	Single
	Sentron	SCLD	**6SCL1**	8.75	Single
800	VL	MG	**MG1D**	8.75	Single
	Sentron	LMD	**SLM1D**	8.75	Single
	Sentron	MD	**SMND**	10	Single
	Sentron	SMD	**SSMND**	10	Single
1200	VL	NG	**NG1D**	10	Single
	Sentron	ND	**SMND**	10	Single
	Sentron	SND	**SSMND**	10	Single

Filler Plates①

For use with SB1, SB2, SB3, FC20, FCI, FCII, CDP-6 & VB-6 switchboards or series 5 or 6 CDP circuit breaker panelboards. Includes straps, cover plates and necessary hardware for switchboards manufactured since 1974. For replacement strap kits for RCIII switchboards, contact your local sales office.

Breaker Frame	Filler Plate Catalog Number	Notes
BL, BQD, ED	**QF3**	Per Pole
EB	**EBF1**	Per Pole

Note: When a front filler plate is not completely filled with breakers, the openings in the unused space must be closed with 1-pole filler plates from table.

Connection Strap Kits - Vacu-Break & HCP①

For use with SB1, SB2, SB3, FC20, FCI, FCII, VB-5 & VB-6 switchboards. Includes straps, cover plates and necessary hardware for switchboards manufactured since 1974. For replacement strap kits for RCIII switchboards, contact your local sales office.

Switch Type	Ampere Rating	Unit Height (inches)	Catalog Number
Vacu-Break	30-30	5, 7.5	**VB657**
	30-60	5, 7.5	
	60-60	5, 7.5	
	60-100	7.5	
	100-100	7.5	
	100	7.5	
	200	7.5, 10	**VB671**
	200-200	10	**VB610**
	400-600	15	**VB6150**
HCP	800-1200	16.25	**F6162D**

Blank Plates - Circuit Breaker & Fusible Switch①

For use with SB1, SB2, SB3, FC20, FCI, FCII switchboards or series 5 or 6 VB and CDP panelboards.

Unit Height (Inches)	Catalog Number
1.25	**6FPB01**
2.5	**6FPB02**
3.75	**6FPB03**
5	**6FPB05**
10	**6FPB10**

Replacement Meter Socket Kits①③④

For use with SMM and SMD metering switchboards

Type	Catalog Number
1-Phase	**MSK2001**
3-Phase	**MSK2003**

Connecting Kits①③

For use with SMM and SMD metering switchboards

Disconnect Device	Catalog Number
NGG	**SMMNGMK**
EG	**SMMHEMK**
BQ	**SMMBQMK**
QJ	**SMMQJMK**
ED	**SMMEDMK**
FD	**SMMFDMK**
CED	**SMMCEMK**
T-Fuse Pullout	**SMMTFMK**

For inches / millimeters conversion, see conversion table

① Consult sales office for availability
② Connecting strap kit includes front filler plate after 1/91.
③ Siemens meter socks used in SMM switchboards
④ Siemens Type WMS263 Meter Sockets are rated 200A in application Data Section
⑤ Twin mounted VL JG breakers places the trip unit under the gutters preventing the trip unit from being visible by the customer.

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All statements, technical information and recommendations contained herein are based on information and tests we believe to be reliable. The accuracy or completeness hereof is not guaranteed. Since conditions of use are outside our control, the user should determine the suitability of the product for its intended use and assumes all risk and liability whatsoever in connection herewith.



Figure 1: Type GM-SG switchgear



Figure 2: Type GM-SG-AR switchgear



Programmable and Self-Monitoring Power Distribution Switchgear Solution

Siemens, a world leader in innovative technologies, has taken another step forward by creating one of the most advanced medium-voltage, metal-clad switchgear solutions in the industry.

Smart-Gear® PDS is a programmable and self-monitoring power distribution solution that combines Siemens type GM-38, type GM-SG non-arc-resistant or type GM-SG-AR arc-resistant, medium-voltage switchgear and Siemens type SIPROTEC protective relay technologies to offer one of the most advanced standardized switchgear solutions in the industry.

Smart-Gear PDS is equipped with standard self-monitoring features, designed specifically to enhance the performance and reliability of the switchgear. With Smart-Gear PDS, the user is notified in advance of potential problems such as those in trip circuit and space heater circuits. Also, based on the usage of the equipment, the user will be notified when periodic recommended preventive maintenance is needed.

Features and benefits include:

- Reduced control wiring for increased reliability — digital and fiber-optic circuits instead of hard-wired circuits
- Self-monitoring — feature-rich increased operational reliability
- Programmable — easy to implement complex schemes with flexibility for future changes
- IEC 61850 communication protocol, providing integrated control, monitoring and protection
- Usage-based preventative maintenance notification
- Faster commissioning and start-up.

Types SG-64 and SG-80

Smart-Gear PDS is available in two types: SG-64 and SG-80. The specific functionality of the self-monitoring features are dependent on the Smart-Gear PDS type selected.

Application-Based Specifying

Application modules are the building blocks used for configuring a Smart-Gear PDS switchgear lineup.

The five classes of modules for pre-configured applications designed to perform specific functions include:

- System application modules
- Auxiliary application modules
- Circuit breaker application modules
- Remote control application modules
- Special application modules.

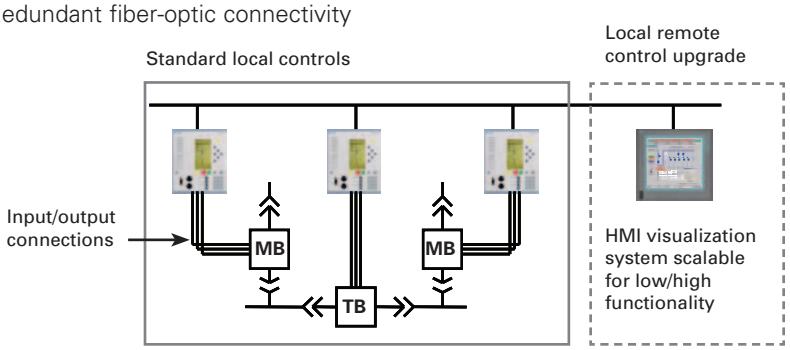
With Smart-Gear PDS, specifying medium-voltage, metal-clad switchgear is easy. All of the information can be found in "The complete application guide to specifying a Smart-Gear® power distribution solution (PDS)" (E50001-F710-A123-*-****) available electronically at the Siemens website or from your local Siemens sales representative.

Table 1: Types SG-64 and SG-80 features③④⑤

Features available via protective relay devices	Type SG-64①	Type SG-80②
Circuit breaker operating cycles monitoring	Standard	Standard
Circuit breaker trip-circuit monitoring	Standard	Standard
Circuit breaker close-circuit monitoring	Standard	Not available⑥
Vacuum interrupter wear monitoring	Standard	Standard
Integrated controls	Standard	Standard
Circuit breaker racking position indication	Standard	Not available⑥
Integrated power monitoring	Standard	Standard
Programmable circuit breaker control interlocking	Optional	Optional
Programmable main-tie-main transfer scheme	Optional	Optional
Fan cooling monitoring for 4,000 A circuit breaker	Standard	Not available⑥
Voltage transformer monitoring	Standard	Standard
Current transformer monitoring	Standard	Standard
Bus protection (device 50B)	Standard	Standard
Space heater operation monitoring	Standard	Standard
Large protective relay display screen	Standard	Not available⑥
IEC 61850 communication protocol (only)	Standard	Standard
Arc-flash detection	Optional	Optional

Figure 3: Extended Smart-Gear PDS network with local human machine interface (HMI)

- GOOSE messaging/peer-to-peer
- IEC 61850
- Redundant fiber-optic connectivity



① Type SG-64 Smart-Gear PDS is equipped with type 7SJ6415 protective relays on feeder, main and tie circuit breakers.
② Type SG-80 Smart-Gear PDS is equipped with type 7SJ8041 protective relays on feeder circuit breakers and type 7SJ6415 protective relays on main and tie circuit breakers.
③ MOC and TOC are not required for remote control and monitoring using communications.
④ Circuit breaker operation provided through protective relays. Control switches are not provided.
⑤ All functions are available via intelligent electronic device in a Siemens protective relay.
⑥ Standard for type 7SJ6415 protective relays furnished on main circuit breakers.

5 – 15 kV Types GM-SG and GM-SG-AR and 38 kV Type GM38 Metal-Clad Switchgear *General*

Overview

Siemens 5, 7.2, 15 and 38 kV class medium-voltage, one- or two-high vacuum circuit breaker switchgear is of the Metal-Clad type as covered by ANSI/IEEE standard C37.20.2. All parts are completely enclosed within grounded metal barriers. Circuit breakers are the horizontal drawout type. Secondary control devices and primary circuits are isolated from each other by shutters or barriers. Primary circuits of different potential are also separated by barriers. All primary bus work and joints are completely encased with insulation material to suit the voltage class of the equipment.

Single Source Responsibility

Single source responsibility is assured since the complete equipment is designed by Siemens and is manufactured and tested in a single facility. The vacuum circuit breakers are checked in the switchgear cells as part of production testing, and to assure interchangeability.

Features

Siemens Type 3AH3 Operating Mechanism

The types GMSG and 38-3AH3 circuit breakers use the proven Siemens type 3AH3 stored-energy operating mechanism. This operator is an evolution of the type 3A family of operators first introduced in 1976. Over 60,000 type 3AH3 operating mechanisms have been produced since 1998.

Faster Interruption

Standard interrupting time is five-cycles with an option available for three-cycle interrupting time.

Floor Rollout

No lift truck or dolly is needed to insert or remove circuit breakers in the lower cell of the switchgear located at floor level. For indoor switchgear located on a raised housekeeping pad or for outdoor, non-walk-in switchgear, a lift truck is required to handle circuit breakers or drawout fuse trucks.

Closed Door Racking

The circuit breaker can be racked in or out with the cell door open or closed. The mechanism includes an indicator to show the racking mechanism position with the door closed. For racking, a manual drive crank or an optional electric motor drive may be used.

Automatic Shutters

Automatically operated grounded steel shutters are included to allow or block access to the stationary primary disconnects. The shutters are opened by the circuit breaker as it moves toward the connected position. The shutters close as the circuit breaker is racked away from the connected position. The shutters remain closed until they are forced open by insertion of the circuit breaker. This design enhances protection for personnel compared to shutters that are linked to the racking mechanism.

5 through 15 kV Available in One- or Two-High Design

38 kV Available in One-High Design Only

Tested to ANSI/IEEE Standards

Siemens switchgear is tested to meet the requirements of ANSI/IEEE standards. A complete design test program including short-circuit interruption, load-current switching, continuous current, mechanical endurance, close and latch current, short time and momentary withstand, impulse withstand, and the other tests required by the standards has been successfully completed. These tests encompass the complete equipment design, including both the switchgear structure and the circuit breaker removable element. Certified test data can be furnished to customers upon request.

UL or C-UL Listing

When specified, if the component configuration allows, the switchgear can be provided with the UL or C-UL (for use in Canada) Listed label, indicating conformance to the requirements of ANSI/IEEE C37.54 and ANSI/IEEE C37.55.

Quality Systems

Facilities involved with application, engineering, design and production are certified to ISO 9001 requirements.

Siemens Relays, see Relaying section on page 14-28



Type GM-SG 5 - 15 kV Metal-Clad Switchgear



Type GM38 38 kV Metal-Clad Switchgear

5 – 15 kV Types GM-SG and GM-SG-AR and 38 kV Type GM38 Metal-Clad Switchgear *General*

Siemens types GM-SG and GM-SG-AR 5, 7.2 and 15 kV and type GM38 38 kV metal-clad power switchgear assemblies with horizontal drawout vacuum circuit breakers take advantage of the latest developments in vacuum interrupter technology. Up to two circuit breakers can be stacked in a single vertical section, allowing significant space savings in the types GM-SG and GM-SG-AR switchgear. In the type GM38 switchgear, circuit breaker are available only in the lower compartment.

The equipment meets or exceeds the latest standards of ANSI, IEEE and NEMA.

Types GM-SG, GM-SG-AR and GM38 switchgear are designed for use in industrial plants, commercial buildings, electric utility systems, cogeneration installations and other electrical systems. It is commonly used for protection and switching of transformers, motors, generators, capacitors, buses, distribution feeder lines and, in general, for protection of any medium-voltage power circuit.

Siemens' experience gained in over 80 years of supplying metal-clad switchgear in the U.S. has been captured in the switchgear designs. The objective has been to incorporate features designed to provide safety, while simplifying operation and maintenance, and minimizing installation cost.

The switchgear structure and the drawout vacuum circuit breaker are an integrated design, with dielectric, thermal and interruption integrity built directly into the basic design, not added as an afterthought.

Siemens Vacuum Interrupters

The vacuum interrupters used in the types GMSG and 38-3AH3 circuit breakers are manufactured by Siemens and have been proven in thousands of installations since 1976. The chrome-copper contact design used in these vacuum interrupters assures low chopping levels, eliminating the need for surge protection on most circuits.

Front Mounted Operating Mechanism

The simple type 3AH3 operating mechanism makes maintenance and inspection easy. The mechanism is located on the front of the circuit breaker, rather than underneath.

Maintenance Intervals

If applied under ANSI "usual service" conditions, maintenance of the circuit breaker mechanism is only needed at 10-year intervals for type GMSG circuit breakers and at five-year intervals for type 38-3AH3 circuit breakers.

Maintenance of the switchgear cubicle is recommended at five-year intervals, and primarily consists of cleaning insulation.

"Universal" Spare Circuit Breaker

The physical configuration and interlock logic allow the use of a single circuit breaker to serve as a "universal" spare breaker at an installation site for up to 50 kA for type GM-SG or type GM-SG-AR, or for up to 40 kA in type GM38 switchgear. The universal spare breaker (63 kA) type GMSG vacuum circuit breaker is designed such that a circuit breaker can be installed in any type GM-SG circuit breaker cell rated 63 kA. Circuit breakers rated 63 kA cannot be used in equipment rated 50 kA and lower. The interlock logic checks the principal rating characteristics (continuous current, maximum voltage, and interrupting current), and allows a circuit breaker to be inserted in any circuit breaker cell, provided that the circuit breaker equals or exceeds the ratings required by the cell.

Full ANSI and IEEE Design Background

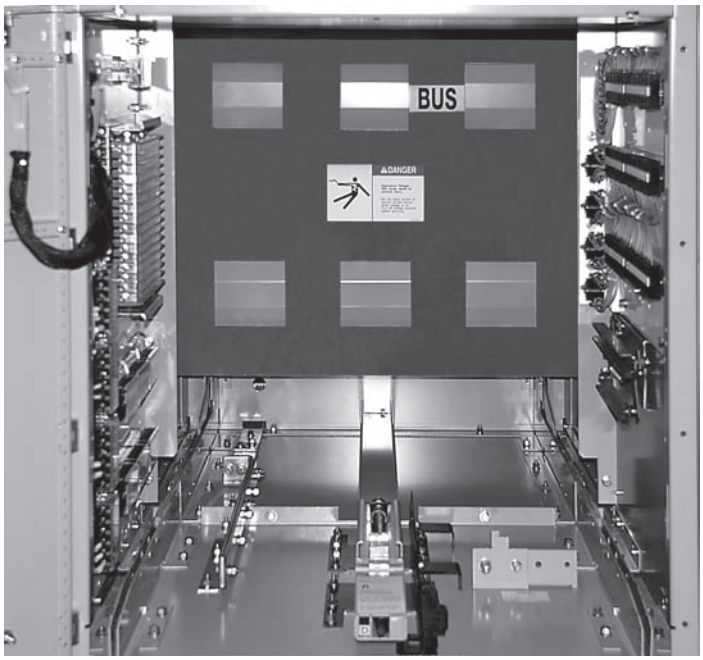
Full design integrity is assured. ANSI C37.09 and C37.20.2 require design tests on circuit breakers and structures together. The 3AH3 operator design is controlled in our global center of competence for circuit breakers in Berlin, and final assembly of both the drawout circuit breaker and the switchgear structures occurs in a single facility. Siemens controls the entire process, from design concept to production. Records are maintained to document compliance with ANSI/IEEE standards.

4,000 A Rating (5 – 15 kV)

Designs are available to 3000A self-cooled, and 4,000 A fan cooled.

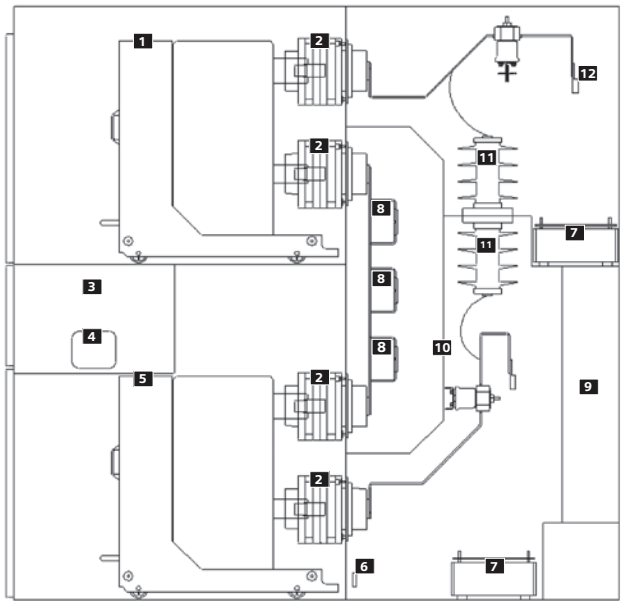
3,000 A Rating (38 kV)

Designs are available to 2,000 A self-cooled and 3,000 A fan cooled.



Type GM-SG Circuit Breaker Cell Interior

Type GM-SG Circuit Breaker Cell (1,200 A or 2,000 A with VT Auxiliary (3,000 A Similar Except Upper Cell Reserved for Fan-Cooling Equipment)



1 Upper type GMSG circuit breaker
2 Standard accuracy current transformers (CTs)-two per bushing
3 Isolated protective relay and instrument compartment
4 Inter-unit wiring
5 Lower type GMSG circuit breaker
6 Ground bar
7 Ground sensor CT
8 Main bus bars
9 Power cable duct
10 Removable barrier
11 Surge arresters
12 Outgoing cable lugs (downfeed shown)

Structural Flexibility for Types GM-SG and GM-SG-AR

Siemens metal-clad switchgear provides enhanced flexibility in locating circuit breaker, auxiliary, and metering cells within the structure layout. Circuit breakers rated 1,200 A and 2,000 A may be located in upper or lower cell positions.

Bus sectionalizing (tie) circuit breaker cells may be located on the upper or lower levels and are located next to an auxiliary cell on the same level for the transition bus work.

The types GM-SG and GMSG-AR offer significant flexibility for stacking breakers. See page 14-12 for more information. The 3,000 A circuit breaker can be used for 4,000 A continuous current applications, with the addition of fan cooling equipment in the auxiliary cell above or below the circuit breaker. This application of fan cooling is well suited if loads above 3,000 A are infrequent, as for example, in the case of a fan-cooled rating on a power transformer.

The type GM-SG-AR arc-resistant design offers significant flexibility compared to the design of other suppliers. The side-mounted, arc duct design for the type GM-SG-AR allows the same flexibility as the type GM-SG non-arc resistant design for mounting voltage transformers, a drawout control power transformer and fuse roll-out trays.

Siemens type GM38 metal-clad switchgear provides enhanced flexibility in locating circuit breaker, auxiliary and metering cells within the structure layout. Circuit breakers are located in the lower cell positions. The upper cell position can be used for voltage transformers with the associated drawout primary fuses.

Each vertical section contains the main bus bar compartment, plus a rear compartment for incoming and outgoing connections. The front portion of the vertical section contains a lower cell for circuit breaker, auxiliary devices, VTs, CPT (if primary fuses are located in upper cell) or drawout primary fuses for a CPT located in the rear of the section.

Instruments, protective relays and power meters along with their secondary wiring and other components are located in the upper cell. The switchgear is normally designed so that additional vertical sections may be added in the future.

Enclosure Design

The switchgear designs includes full ANSI/IEEE C37.20.2 Metal-Clad construction. This means complete enclosure of all live parts and separation of major portions of the circuit to retard the spread of faults to other compartments.

The type GM-SG-AR design includes full ANSI/IEEE C37.20.7-2007, accessibility type 2B. The ground bus extends the entire length of the complete switchgear lineup, and to all circuit breaker cells.

Exhaust System for Type GM-SG-AR

The top-mounted pressure relief channel (PRC) factory-installed for reduced installation time. An outlet of the switchgear room is supplied with each lineup of equipment.

Circuit Breaker Interchangeability

The switchgear cubicle and the removable circuit breaker element are both built to master fixtures so circuit breakers of the same ratings are interchangeable with each other even if the circuit breaker is required for use with a cell with "provisions only" supplied years earlier. A circuit breaker of higher rating can be used in a cell of equal or lower rating. The GMSG circuit breaker is not interchangeable with the older designs. 63 kA rated type GMSG circuit breakers can only be used in 63 kA rated cells and lower rated circuit breakers cannot be used in 63 kA rated cells. The type 38-3AH3 circuit breaker is interchangeable with the type 38-3AF circuit breaker, provided the ratings are equal. The type 38-3AF circuit breaker is not interchangeable with the 40 kA type 38-3AH3.

5, 7.2 and 15 kV Drawout Metal-Clad Indoor Switchgear up to 63 kA

- One-high or two-high construction
- Up to 100 full-fault interruptions
- Universal spare circuit breaker for 50 kA and lower ratings
- Universal spare circuit breaker for 63 kA ratings
- Interlocks permit insertion of high rating vacuum circuit breaker into lower rated cell but not vice versa
- Front accessible circuit breaker operating mechanism for ease of maintenance
- Closed door racking
- Floor rollout circuit breaker in lower cell without a dolly
- Visible secondary disconnect
- Circuit breaker ships inside of cell, thus reducing installation cost and transit damage
- Pair with Siemens protective relays to match any typical application
- Horizontal drawout type GMSG vacuum circuit breaker with type 3AH3 operating mechanism
- Uses the latest developments in vacuum interrupter technology
- Highly reliable vacuum interrupters - MTTF over 42,000 years
- Common type 3AH3 operator platform for all ratings
- Over 60,000 type 3AH3 operators produced since 1998
- Generator circuit breakers (to IEEE C37.013 optionally available)
- 10,000 operations to overhaul
- Three-cycle interrupting time (optional)
- Meets or exceeds the latest ANSI, IEEE and NEMA standards
- UL or C-UL Listing available



Type GMSG circuit breaker ratings constant kA basis - ANSI/IEEE C37.06-2009

Historic "MVA" class	Maximum design voltage kV	Rated interrupting rating kA	Maximum interrupting and short-time kA	Voltage range factor	Continuous current②	Insulation levels dielectric		Close & latch (kA)	
						60 Hz	BIL	rms 1.55 KI	Peak 2.6 KI
—	4.76	40	40	1.0	1,200, 2,000, 3,000	19	60	62	104
—	4.76	50	50	1.0	1,200, 2,000, 3,000	19	60	78	130
—	8.25	63	63	1.0	1,200, 2,000, 3,000	19	60	98	164
—	15.0	40	40	1.0	1,200, 2,000, 3,000	36	95	62	104
—	15.0	25	25	1.0	1,200, 2,000	36	95	39	65
—	15.0	40	40	1.0	1,200, 2,000, 3,000	36	95	62	104
—	15.0	50	50	1.0	1,200, 2,000, 3,000	36	95	78	130
—	15.0	63	63	1.0	1,200, 2,000, 3,000	36	95	98	164

② 4,000 A fan-cooled available using a 3,000 A circuit breaker together with a modified switchgear structure incorporating fan cooling equipment.

Type GM-SG switchgear available as:

- Indoor (GM-SG)
- Outdoor non-walk-in (OGM-SG)
- Outdoor walk-in Shelter-Clad (SGM-SG)
  - Single-aisle
  - Factory insulated and assembled aisle (optional).

5, 7.2 and 15 kV Drawout Metal-Clad Arc-Resistant Indoor Switchgear up to 50 kA

- Arc-resistant to IEEE C37.20.7, up to 50 kA, 0.5 sec, accessibility type 2B
- Application flexible exhaust system
- Top-mounted pressure relief channel factory-installed for reduced installation time
- One-high or two-high construction
- Up to 100 full-fault interruptions
- Universal spare circuit breaker
- Interlocks permit insertion of high rating vacuum circuit breaker into lower rated cell but not vice versa
- Front accessible circuit breaker operating mechanism for ease of maintenance
- Closed-door racking
- Floor rollout circuit breaker in lower cell without a dolly
- Visible secondary disconnect
- Circuit breaker ships inside of cell, thus reducing installation cost and transit damage
- Instrumentation/controls located in a separate compartment isolated from all primary circuit elements
- Pair with Siemens protective relays to match any typical application
- Horizontal drawout type GMSG vacuum circuit breaker with type 3AH3 operating mechanism
- Uses the latest developments in vacuum interrupter technology
- Highly reliable vacuum interrupters - MTTF over 42,000 years
- Common type 3AH3 operator platform for all ratings
- Over 60,000 type 3AH3 operators produced since 1998
- 10,000 operations to overhaul
- Three-cycle interrupting time (optional)
- Meets or exceeds the latest ANSI, IEEE and NEMA standards
- UL or C-UL Listing available



Type GMSG circuit breaker ratings constant kA basis - ANSI/IEEE C37.06-2009

Historic "MVA" class	Maximum design voltage kV	Rated interrupting rating kA	Maximum interrupting and short-time kA	Voltage range factor	Continuous current②	Insulation levels dielectric		Close & latch (kA)	
						60 Hz	BIL	rms 1.55 KI	Peak 2.6 KI
----	4.76	40	40	1.0	1,200, 2,000, 3,000	19	60	62	104
----	4.76	50	50	1.0	1,200, 2,000, 3,000	19	60	78	130
----	8.25	40	40	1.0	1,200, 2,000, 3,000	36	95	62	104
----	15.0	25	25	1.0	1,200, 2,000	36	95	39	65
----	15.0	40	40	1.0	1,200, 2,000, 3,000	36	95	62	104
----	15.0	50	50	1.0	1200, 2,000, 3,000	36	95	78	130

② 4,000 A fan-cooled available using a 3,000 A circuit breaker together with a modified switchgear structure incorporating fan cooling equipment.

Type GM-SG-AR switchgear available as:

- Indoor (Type GM-SG-AR)
- Outdoor walk-in Shelter-Clad (Type SGM-SG-AR)
  - Single-aisle
  - Factory insulated and assembled aisle (optional).

Type GMSG Vacuum Circuit Breakers 5, 7.2 and 15 kV

Siemens type GMSG circuit breakers are available in 25 kA through 63 kA "constant kA" interrupting classes, or 250 MVA through 1,000 MVA on the older "constant MVA" rating basis. Continuous current ratings include 1,200 A, 2,000 A, and 3,000 A self-cooled. 4,000 A is available using a 3,000 A circuit breaker together with forced-air (fan) cooling and larger conductors in the switchgear cubicle.

Maintenance Features

Type GMSG circuit breakers incorporate many features designed to reduce and simplify maintenance, including:

- Low maintenance vacuum interrupter
- Ten-year maintenance interval (assuming ANSI "usual service" conditions)
- Floor rollout
- Front-mounted operator
- Common operator family
- Simple outer-phase barriers
- "Universal" spare circuit breaker concept
- Non-sliding current transfer
- Rugged secondary disconnects.

Ten-Year Maintenance Interval on type GMSG Circuit Breaker

When applied under mild conditions (ANSI "usual service" conditions), maintenance is typically needed at ten-year intervals on the circuit breaker. The maintenance interval for the switchgear cubicles is five years.

Low-Maintenance Requirements

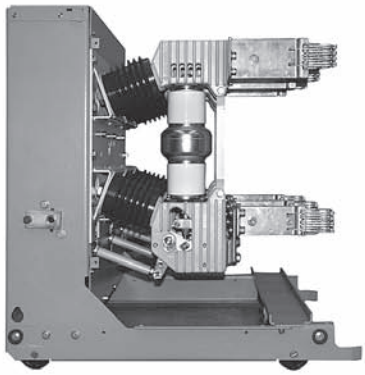
The vacuum interrupter is a sealed unit, so the only maintenance necessary is to clean off any contaminants and to check the vacuum integrity. The vacuum interrupters can be disconnected from the stored-energy mechanism quickly, without tools, and vacuum integrity inspected by hand; alternatively, a simple high-potential test can be used.

Floor Rollout

When located in the lower cell, the circuit breakers are arranged to rollout directly on the floor in front of the switchgear if the switchgear is not located on a "housekeeping" pad. No adapter, hoist, or lift truck is necessary.



Front



Side (barriers removed)



Rear

Type GMSG Circuit Breaker

Type GMSG and GM-SG-AR Circuit Breaker Ratings (New "Constant kA" Ratings Basis)

These ratings are in accordance with the following standards:

- ANSI/IEEE C37.04-1999 Standard Rating Structure for AC High-Voltage Circuit Breakers
- ANSI C37.06-2009 AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - Preferred Ratings and Related Required Capabilities for Voltages Above 1,000 Volts
- ANSI/IEEE C37.09-1999 Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis
- ANSI/IEEE C37.010-1999 Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis

Rated Values		Units	Circuit Breaker Type①							
			5-GMSG-40 xxxx-104	5-GMSG-50 xxxx-130	5-GMSG-63⑧ xxxx-164	7-GMSG-40 xxxx-104	15-GMSG-25 xxxx-65	15-GMSG-40 xxxx-104	15-GMSG-50 xxxx-130	15-GMSG-63⑧ xxxx-164
Maximum Design Voltage (V)②		kV rms	4.76	4.76	4.76	8.25	15.0	15.0	15.0	15.0
Voltage Range Factor (k)③		—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Withstand Voltage Levels	Power Frequency	kV rms	19	19	19	36	36	36	36	36
	Lightning Impulse (BIL)	kV crest	60	60	60	95	95	95	95	95
Continuous④		A rms	1,200 2,000 3,000 4,000FC	1,200 2,000 3,000 4,000FC	1,200 2,000 3,000 4,000FC	1,200 2,000 3,000 4,000FC	1,200 2,000	1,200 2,000 3,000 4,000FC	1,200 2,000 3,000 4,000FC	1,200 2,000 3,000 4,000FC
Short-Circuit (I)⑤⑥		kA rms sym	40	50	63	40	25	40	50	63
Interrupting Time⑦		ms cycles	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5
Permissible Tripping Delay (y)		Sec	2	2	2	2	2	2	2	2
Maximum Symmetrical Interrupting (I)		kA rms sym	40	50	63	40	25	40	50	63
% dc Component		%	47	47	47	47	47	47	47	47
Short-Time Current (I) (Three Seconds)		kA rms	40	50	63	40	25	40	50	63
Closing and Latching (Momentary) Asymmetrical (1.55 x I)		kA rms	62	78	98	62	39	62	78	98
Closing and Latching (Momentary) Peak (2.6 x I)		kA peak	104	130	164	104	65	104	130	164

① "xxxx" in type designation refers to the continuous current rating 1,200 A, 2,000 A, or 3,000 A, as appropriate. The 4,000 A fan-cooled rating is achieved using a 3,000 A circuit breaker, in combination with fan cooling as indicated in Footnote 4.
② Maximum design voltage for which the circuit breaker is designed, and the upper limit for operation.
③ K is listed for informational purposes only. For circuit breakers rated on a "constant kA basis", the voltage range factor is 1.0.
④ 4,000FC indicates that fan cooling is included in the switchgear structure for this rating. 4,000 A rating is not available in outdoor equipment.
⑤ All values apply to polyphase and line-to-line faults.
⑥ Standard duty cycle is O - 0.3s - CO - 3 min. - CO.
⑦ Standard rated interrupting time is five cycles (83 ms)/Optional rated interrupting time of three cycles (50 ms) 63 kA is available (except with 24 Vdc tripping).
⑧ 63 kA rating not available in type GM-SG-AR arc-resistant switchgear
⑨ Table shows modern "constant kA" ratings. Historic "constant MVA" ratings also available. Consult factory.

Cubicle Dimensions Per Vertical Section①③

Type	Dimensions in Inches (mm)				Weight in lbs. (kg)
	Height	Width	Depth	Drawout Aisle	
Indoor GM-SG	95.2 (2,416)	36.0 (914)	98.6 (2,504)③⑦	72.0 (1,829) recommended②	3,300 (1,497)
Shelter-Clad Single-Aisle SGM-SG	118.9 (3,021)	36.0 (914)①	173.5 (4,407)	72.0 (1,829) included②	5,000 (2,268)
Aisle-Less Non-Walk-In OGM-SG	118.7 (3,015)	36.0 (914)①	102.1 (2,594)⑩	72.0 (1,829) recommended②	3,950 (1,792)
Indoor GM-SG-AR	116.4 (2,957)⑤	40.0 (1,016)⑥⑨	98.5 (2,502)⑦⑨	72.0 (1,829) recommended②	7,300 (3,312)
Shelter-Clad Single Aisle SGM-SG-AR	135.6 (3,444)	40.0 (1,016)⑥	179.8 (4,566)⑩	72.0 (1,829) recommended②	9,200 (4,173)

① Add 6" (152 mm) to each end of lineup for aisle extension 12" (304 mm) total.
② 72" (1,829 mm) aisle space recommended allows room for interchange of circuit breakers. Minimum aisle space required for handling circuit breaker with lift truck is 65" (1,651mm). Minimum aisle space required if all circuit breakers are at floor level is 55" (1,397 mm).
③ If indoor switchgear is installed on a raised housekeeping pad, the pad must not extend further than 3" (75 mm) from the front of the switchgear to avoid interference with the use of the portable lift truck.
④ Dimensions are approximate size of floor footprint. For outdoor equipment, enclosure overhangs floor frame.
⑤ No obstructions permitted within 10 inches (254 mm) of top of switchgear structure.
⑥ Add nine inches (229 mm) to width of lineup for end trims.
⑦ For GM-SG add 4.5 inches (114 mm) to the depth for front and rear doors. For GM-SG-AR add 7.5 inches (190 mm) to the depth for front and rear doors.
⑧ An exhaust system to direct arc fault products outside of the switchgear room is supplied with each lineup of equipment.
⑨ The switchgear must have at least 6 inches (152 mm) horizontal clearance: From left and right sides to nearest wall or equipment, and From rearmost extension of vents on rear to nearest wall or equipment.
⑩ See section 14-14 and 14-15 for roof and enclosure overhang information

Type GMSG Vacuum Circuit Breaker Weight in lbs. (kg)②③

Continuous Current (A)	Circuit Breaker Type							
	5-GMSG-40 5-GMSG-250	5-GMSG-50 5-GMSG-350	5-GMSG-63⑨	7-GMSG-40 7-GMSG-500	15-GMSG-25 15-GMSG-500	15-GMSG-40 15-GMSG-750	15-GMSG-50 15-GMSG-1000	15-GMSG-63⑨
1,200	440 (200)	455 (206)	809 (368)	455 (206)	430 (195)	445 (202)	460 (209)	819 (372)
2,000	650 (295)	665 (302)	819 (372)	665 (302)	640 (290)	670 (304)	675 (306)	829 (377)
3,000	665 (302)	670 (304)	824 (375)	675 (306)	—	675 (306)	680 (308)	834 (379)

① Weight does not include circuit breakers, add separately from table 7.
② Weight estimates are for circuit breaker only. Add 75 lbs (34 kg) if shipped separately packaged.
③ Weight and dimensions are approximate.
④ Add 6" (152 mm) to each end of lineup for aisle extension 12" (304 mm) total.
⑤ 72" (1,829 mm) aisle space recommended allows room for interchange of circuit breakers. Minimum aisle space required for handling circuit breaker with lift truck is 65" (1,651 mm). Minimum aisle space required if all circuit breakers are at floor level is 55" (1,397 mm).
⑥ Add for roof overhang.

	Non-Walk-In	Shelter-Clad
Rear (cable side)	3.7" (92 mm)	3.7" (92 mm)
Front (drawout side)	5.37" (136 mm)	1.5" (38 mm)

⑦ If indoor switchgear is installed on a raised "housekeeping" pad, the pad must not extend further than 3" (75 mm) from the front of the switchgear to avoid interference with the use of the portable lift truck.
⑧ Approximate circuit breaker dimensions in inches (mm) (W X D X H):
Net 32" (813 mm) X 39" (991 mm) X 36" (914 mm)
If packed for shipment separate from switchgear: 42" (1,067 mm) X 47" (1,194 mm) X 43" (1,092 mm)
⑨ 63 kA rating not available in type GM-SG-AR arc-resistant switchgear.



1,200 A Circuit Breaker **A**	1,200 A Circuit Breaker **A**	Auxiliary **C**	1,200 A Circuit Breaker **A**	2,000 A Circuit Breaker **A**	
Low-Voltage Panel	Low-Voltage Panel	Auxiliary **D**	Low-Voltage Panel	Low-Voltage Panel	
1,200 A Circuit Breaker **B**	Auxiliary **E**	Low-Voltage Panel	2,000 A Circuit A243 Breaker	1,200 A Circuit Breaker	
	Auxiliary **F**	1,200 A Circuit Breaker **B**			

2,000 A Circuit Breaker	Auxiliary **C**	2,000 A Circuit Breaker **A**	Vented⑤ **A**	3,000 A② Circuit Breaker	Auxiliary **C**
Low-Voltage Panel	Auxiliary **D**	Low-Voltage Panel	Low-Voltage Panel	Low-Voltage Panel	Auxiliary **D**
2,000 A Circuit Breaker **B**	Low-Voltage Panel	Auxiliary **E**	3,000 A⑤ Circuit Breaker **B**	Vented⑤ **E**	Low-Voltage Panel
	2,000 A Circuit Breaker **B**	Auxiliary **F**		Auxiliary **F**	Auxiliary **E**
					Auxiliary **F**

Type GM-SG Stacking Versatility

① Main bus sizes 1,200 A, 2,000 A, 3,000 A or 4,000 A (self-cooled).
② No rollout auxiliaries allowed in upper cell (C or D) if lower cell (B) has 3,000 A circuit breaker. If 3,000 A circuit breaker is located in upper cell (A), one rollout auxiliary may be located in lower cell (F).
③ Auxiliary cells (C, D, E, or F) may each contain one rollout (except as indicated in Footnotes 2 and 5).
④ Fuse rollout for stationary control power transformer (CPT) must be located in lower rollout cell F, if CPT is located in rear or is remote. If CPT is located in lower auxiliary cell (E and F), fuse rollout is located in upper auxiliary cell.
⑤ For fan-cooled 4,000 A rating, circuit breaker (3,000 A self-cooled, 4,000 A fan-cooled) may be located in lower cell (B) with fan cooling in cell A.
⑥ Stacking arrangements are available as shown. Total circuit breaker loading in a vertical unit may not exceed main bus rating. Consult Siemens for specific application assistance regarding total load limits in each unit, or refer to ANSI/IEEE C37.20.2.

Standard Accessories Include:

Small accessories are located in an accessory cabinet, normally mounted on the end of an indoor assembly. The accessory cabinet can be removed and installed on a wall, if desired.

- Manual racking crank
- Spring charging crank
- Drawout extension rails (facilitate handling of circuit breakers in upper cell)
- Lifting sling (for circuit breakers above floor level)
- Split plug jumper (standard unless test cabinet is furnished)
- Contact lubricant
- Touch up paint.

Optional Accessories Include:

- Circuit breaker lift device
- Adapter to enable lift truck use for VT, CPT or CPT Fuse rollout tray
- Test cabinet (in place of split plug jumper)
- Test plugs (if required by devices)
- Electric racking motor assembly (to enable racking while operator is at a distance from the switchgear)
- Manual or electrical ground and test device (manual device not applicable for type GM-SG-AR).

Test provisions, either a split plug jumper or a test cabinet, are available for testing the circuit breaker outside its cubicle.

The split plug jumper is used to bridge the secondary disconnects with a flexible cable, so the circuit breaker may be electrically closed and tripped with the control switch on the instrument panel while the circuit breaker is outside of its compartment. The test cabinet, including a control switch is used for closing and tripping the circuit breaker at a location remote from the switchgear.

Manually Operated Ground and Test Device (up to 50 kA)

This is a drawout element that can be inserted into a circuit breaker cell rated for a short-circuit current of 50 kA or lower. It opens the shutters, connects to the cell primary disconnecting contacts and so provides a means to make the primary disconnect stabs available for testing. It is suitable for high-potential testing of outgoing circuits of the switchgear main bus or for phase sequence checking. It also provides a means to connect temporary grounds to de-energized circuits for maintenance purposes.

The manual ground and test incorporates three-position, single-pole switches (upper stabs to ground, neutral, and lower stabs to ground), eliminating the need for user-furnished ground cables. The switches hookstick, in the closed position, operable and are rated for the full momentary and short-time ratings of the associated switchgear. User-furnished grounding cables and commercially available ground clamps seldom have ratings equal to those of the switchgear.

Electrical Ground and Test Device (Up to 63 kA)

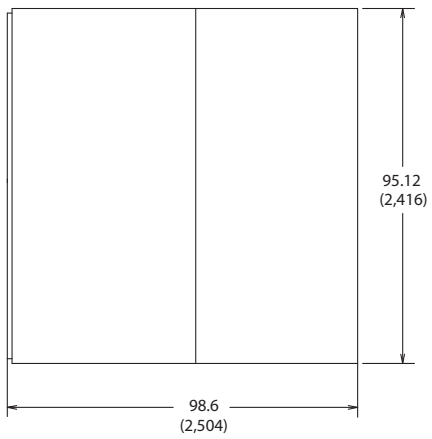
An electrical ground and test device includes a power operated switch (derived from a type GMSG circuit breaker) arranged to allow grounding one set of disconnect stabs. Two devices, one each for the upper and lower stabs, are required if grounding is desired to either side of the unit. The device also provides a means of access to the primary circuits for high-potential tests or for phase-sequence checking. These devices are able to close and latch against short-circuit currents corresponding to the ratings of the equipment. Due to the unique requirements frequently involved in such devices, all applications of electrically operated ground and test devices should be referred to Siemens for review.

Note: Due to the special nature of ground and test devices, each user must develop definitive operating procedures for incorporating safe operating practices. Only qualified personnel should be allowed to use ground and test devices.

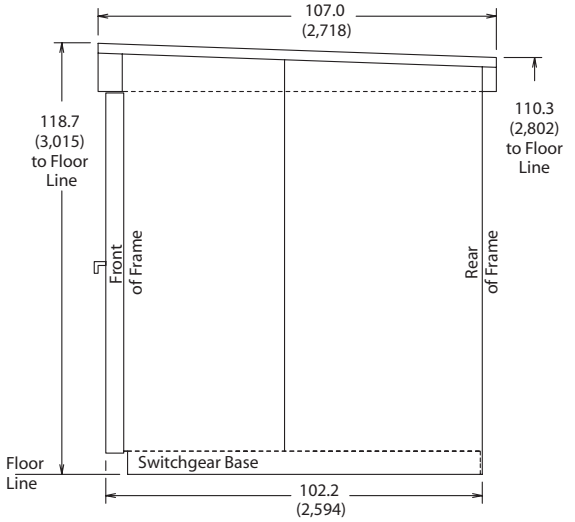


Accessory Cabinet

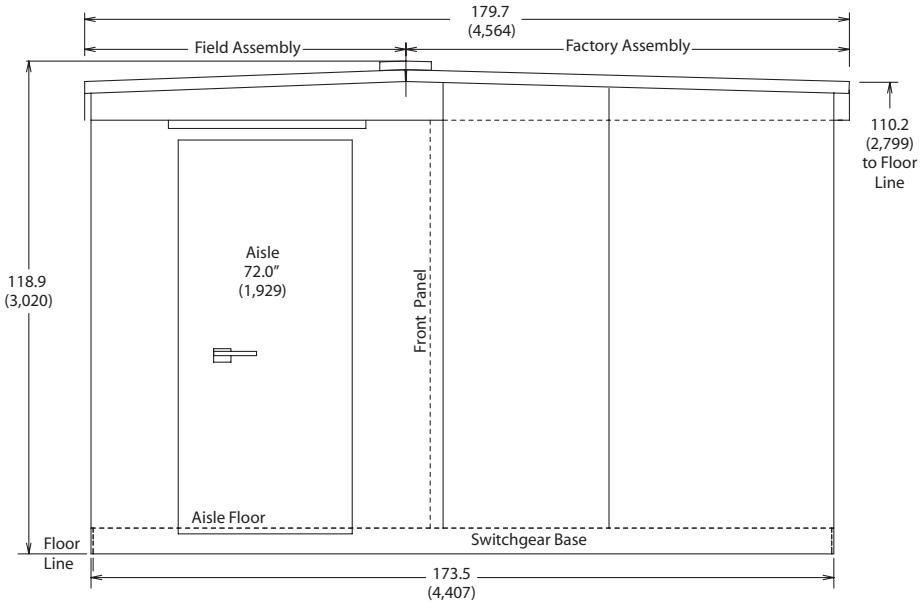
Switchgear End Views



Type GM-SG Indoor Switchgear

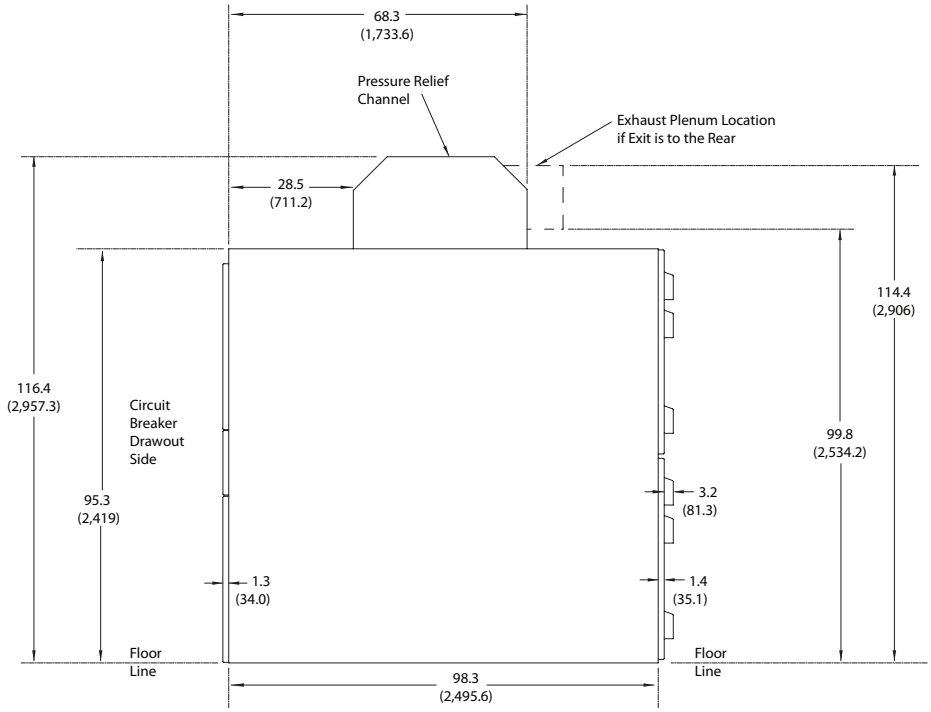


Type OGM-SG Non-Walk-In Outdoor Switchgear

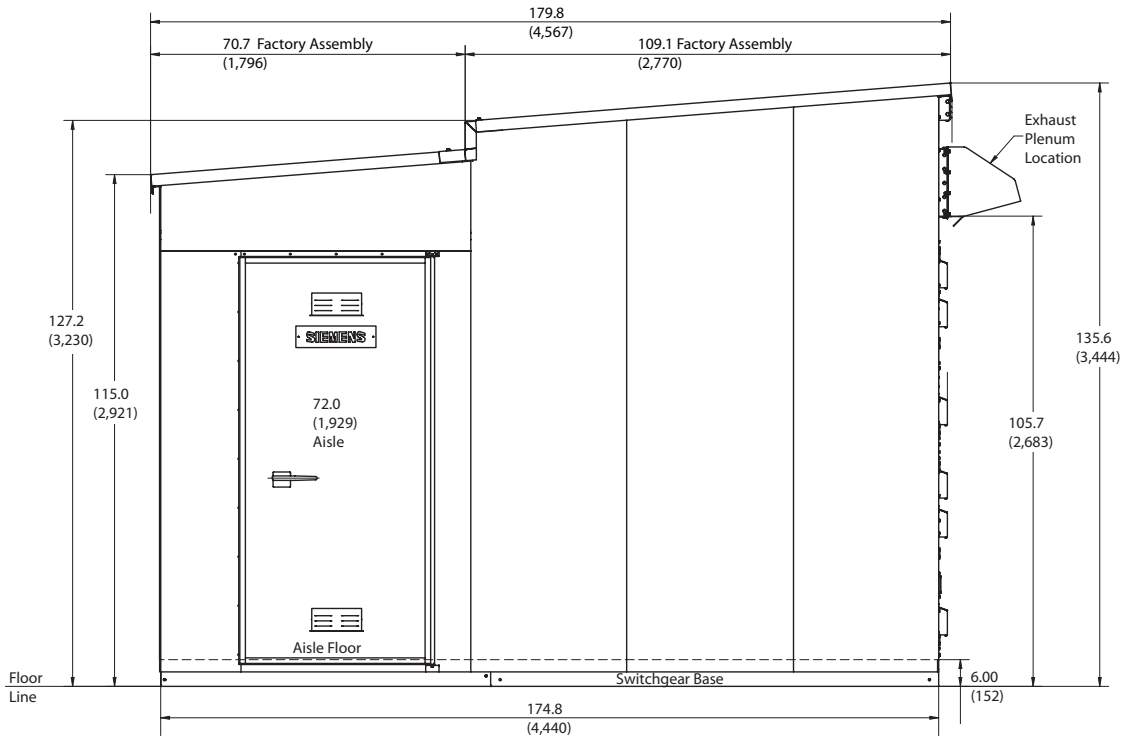


Type SGM-SG Shelter-Clad Single-Aisle Outdoor Switchgear

Switchgear End Views



Type SGM-SG-AR Indoor



Type GM-SG-AR Outdoor



Drawout Indoor Switchgear

- Horizontal drawout type 38-3AH3 vacuum circuit breaker
- Uses the latest developments in vacuum interrupter technology
- Highly reliable vacuum interrupters – MTTF over 42,500 years
- Up to 50 full-fault interruptions
- Meets or exceeds the latest ANSI, IEEE and NEMA standards
- UL Listing available for 40 kA rating
- Universal spare circuit breaker
- Interlock permits insertion of higher rating vacuum circuit breaker into lower rated cell but not vice-versa
- Front accessible circuit breaker operating mechanism for ease of maintenance
- Closed door racking
- Floor rollout circuit breaker in lower cell without a dolly
- Visible secondary disconnect
- One-high construction
- Pair with Siemens protective relays to match any typical application

Type 38-3AH3 Circuit Breaker Ratings

Measured Parameter					Circuit Breaker Type		
					38-3AH3-1500①	38-3AH3-31①	38-3AH3-40①
General	Nominal Voltage Class			kV	38.0	38.0	38.0
	Nominal Three-Phase MVA Class⑨			MVA	1,500	—	—
Rated Values	Rated Voltage	Maximum Design Voltage (V)		kV rms	38.0	38.0	38.0
		Voltage Range Factor		K	1.65	1.0	1.0
	Insulation Levels	Withstand Voltage Levels	Power Frequency	kV rms	80	80	80
			Lightning Impulse (BIL)	kV peak	150	150	150
	Rated Current	Continuous④		Amperes	1,200 2,000 3,000FC	1,200 2,000 3,000FC	1,200 2,000 3,000FC
		Short-Circuit (At Rated Maximum Design Voltage) (I)		kA rms sym	21	31.5	40
		Interrupting Time		Cycles/ms	5/83	5/83	5/83
		Permissible Tripping Delay (Y)		Sec.	2	2	2
Related Required Capabilities	Current	Maximum Design Voltage (V) divided by K = (V/K)		kA rms	23	38	38
		Maximum symmetrical (sym) interrupting (K x I)		kA rms sym	35	31.5	40
		Short-Time Current (K x I) (three seconds)		kA rms sym	35	31.5	40
	Closing and Latching (Momentary)	Asymmetrical		kA rms	56	50	62
		Peak		kA peak	95	85	104

① Type 38-3AH3-1500 ratings are in accord with ANSI C37.06-1987. Types 38-3AH3-31 and 38-3AH3-40 ratings conform to ANSI/IEEE C37.06-2009 ratings.
② Maximum voltage for which the circuit breaker is designed and the upper limit for operation.
③ K is the ratio of rated maximum voltage to the lower limit of the range of operating voltage in which the required symmetrical and asymmetrical interrupting capabilities vary in inverse proportion to the operating voltage.
④ 3,000 A ratings are achieved using forced air cooling in the switchgear cubicle.
⑤ To obtain the required symmetrical interrupting capability of a circuit breaker at an operating voltage between 1/K times rated maximum voltage and rated maximum voltage, the following formula shall be used.

$$\text{Required Symmetrical Interrupting Capacity} = \text{Rated Short Circuit Current} \times \frac{\text{Rated Maximum Voltage}}{\text{Operating Voltage}}$$

For operating voltages below 1/K times rated maximum voltage, the required symmetrical interrupting capability of the circuit breaker shall be equal to K times rated short circuit current.
⑥ With the limitations stated in 5.10 of ANSI/IEEE Standard C37.04-1979, all values apply for polyphase and line-to-line faults. For single phase-to-ground faults, the specific conditions stated in 5.10.2.3 of ANSI Standard C37.04-1979 apply.
⑦ Current values in this row are not to be exceeded even for voltages below 1/K times rated maximum voltage. For voltages between rated maximum voltage and 1/K times rated maximum voltage, follow 5 above.
⑧ Current values in this row are independent of operating voltage up to and including rated maximum voltage.
⑨ Included for reference only—not listed in ANSI/IEEE C37.06.

Enclosure Dimensions

Cubicle Dimensions—Per Vertical Section

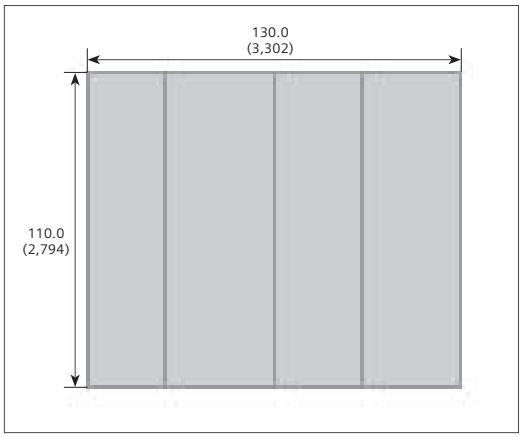
Type		Weight in lbs. (kg)	Dimensions in inches (mm)		
			Width	Depth	Drawout Aisle
Indoor	GM38	5,000 (2,273)	48.0 (1,219)	110.0 (2,794)	96.0 (2,438) Recommended
Shelter-Clad Single-Aisle	SGM38	6,400 (2,909)	48.0 (1,219)	132.5 (3,366)	96.0 (2,438) Included
Shelter-Clad Common-Aisle	SGM38	11,700 (5,318)	48.0 (1,219)	132.5 (3,366)	96.0 (2,438) Included
Shelter-Clad Common-Aisle	OGM38	5,800 (2,636)	48.0 (1,219)	130.5 (3,315)	96.0 (2,438) Recommended

Add 6" (152 mm) to each end of lineup for aisle extension, 12" (305 mm) total.

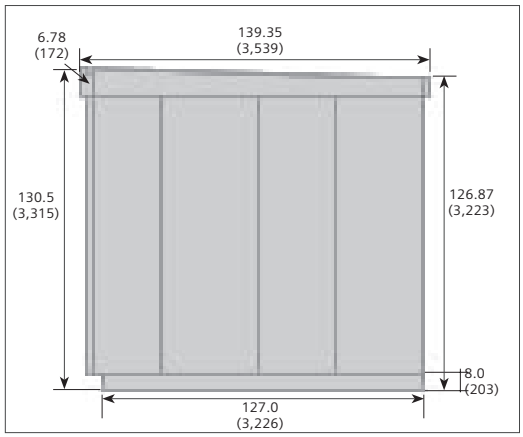
Add for roof overhang	Non-Walk-in	Shelter-Clad
Rear (Cable Side)	3.875" (98 mm)	3.875" (98 mm)
Front	6.875" (175 mm)	1.5" (38 mm)

Type 38-3AH3 Circuit Breaker Weights in lbs. (kg)

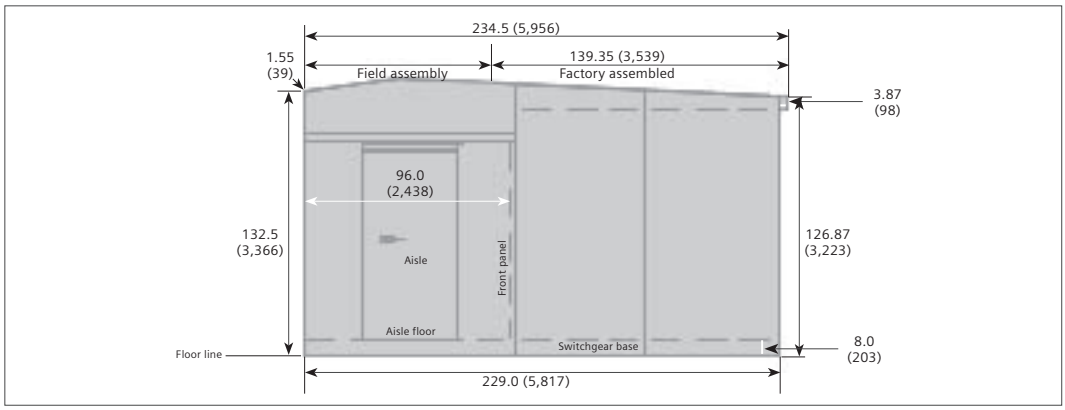
Cont. Current Amps	Circuit BreakerType		
	38-3AH3-1500	38-3AH3-31	38-3AH3-40
1,200	800 (364)	800 (364)	850 (387)
2,000	900 (409)	900 (409)	950 (432)
3,000	1,000 (455)	1,000 (455)	1,050 (478)



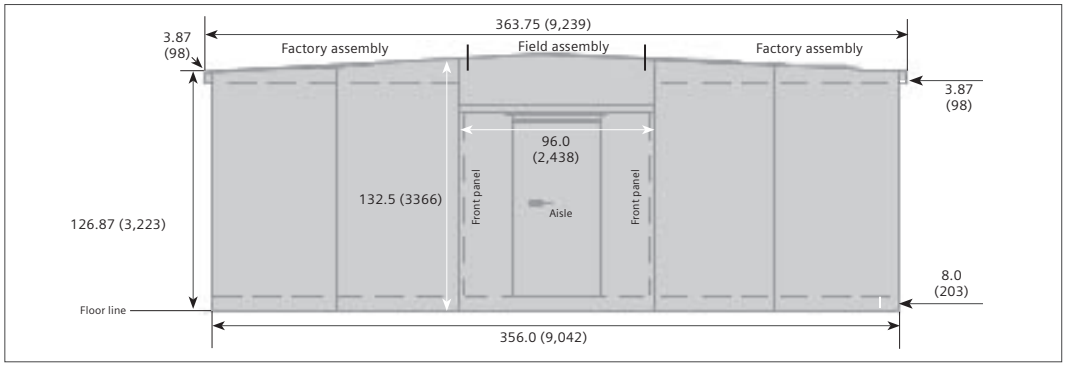
Type GM38 indoor switchgear



Type OGM38 non-walk-in outdoor switchgear

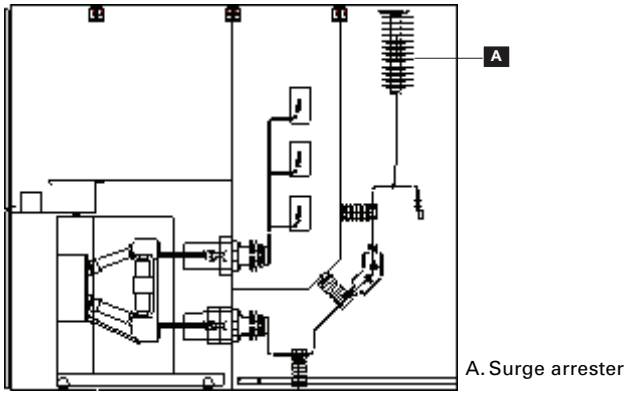


Type SGM38 Shelter-Clad single-aisle outdoor switchgear

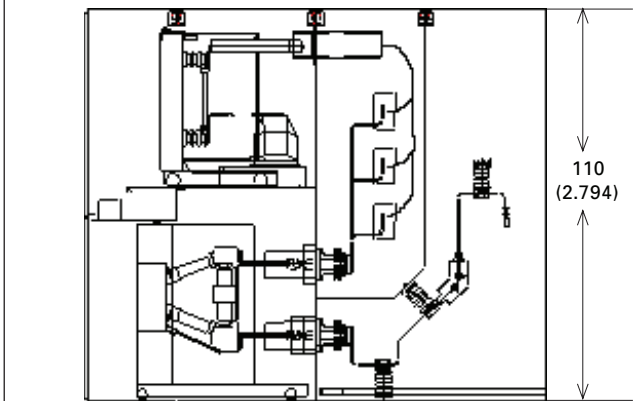


Type SGM38 Shelter-Clad common-aisle outdoor switchgear

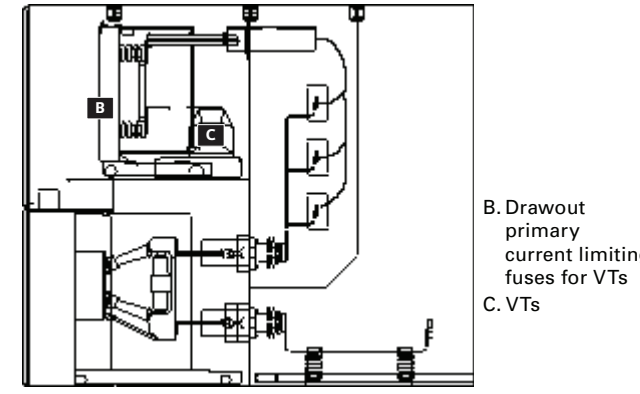
Side Views — 1,200 A, 2,000 A, 3,000 A Circuit Breakers/Auxiliary



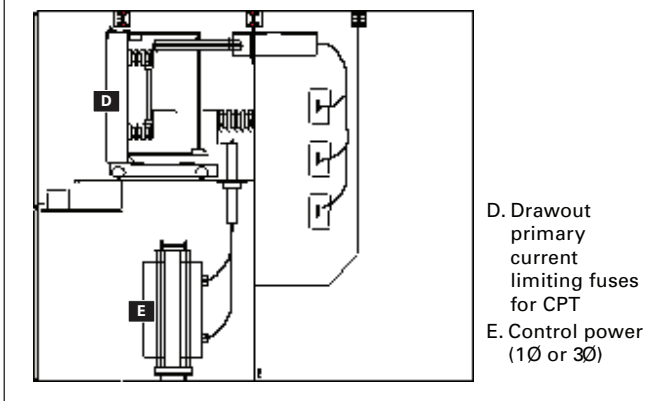
Auxiliary/1,200A, 2,000 A or 3,000 A circuit breaker (no drawout auxiliaries in upper cell for 3,000 A fan-cooled circuit breaker)



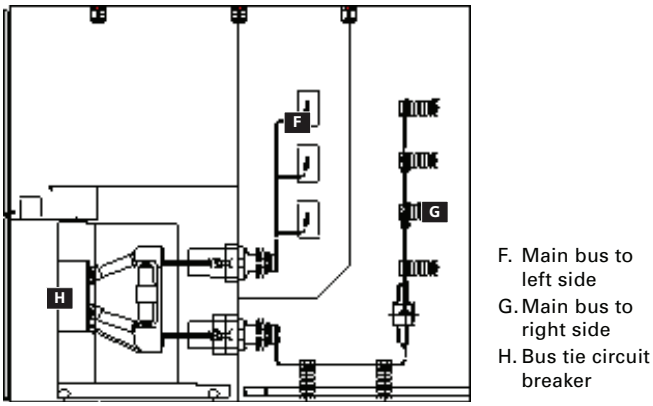
Circuit breaker 1,200 A or 2,000 A with VT auxiliary (downfeed cables)



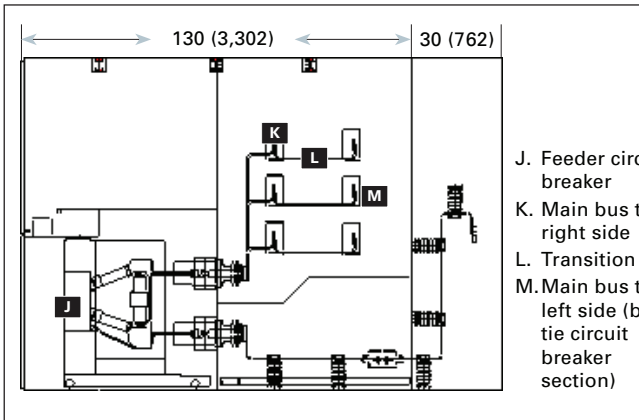
VT auxiliary/1,200 A or 2,000 A circuit breaker (upfeed cables)



CPT fuse truck/stationary CPT (1Ø or 3Ø)



Auxiliary/Bus tie circuit breaker



Auxiliary/feeder circuit breaker (adjacent to right side of bus tie circuit breaker section)

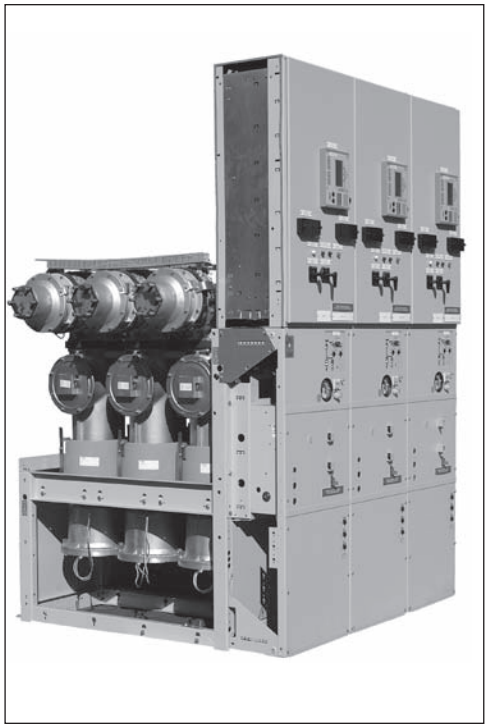
MV GIS

Types 8DA10 and 8DB10 medium-voltage, gas-insulated switchgear are gas-insulated, vacuum circuit breaker designs with a voltage range of 4.16 kV to 38 kV. Lightning impulse withstand voltage ratings up to 200 kV BIL and interrupting ratings up to 40 kA are available.

The types 8DA10 and 8DB10 medium-voltage, gas-insulated switchgear designs feature fixed-mounted, vacuum circuit breakers, connectable to the main bus through three-position (closed-open-ready to ground) switches. The position of the switches is externally observable from the front of the unit using a convenient camera system. Medium-voltage, gas-insulated switchgear is suitable for systems where small size, arc resistance, environmental immunity or reduced maintenance needs are important. Depending upon the voltage rating, medium-voltage, gas-insulated switchgear is approximately 1/5th the size of conventional air-insulated switchgear.

Features include:

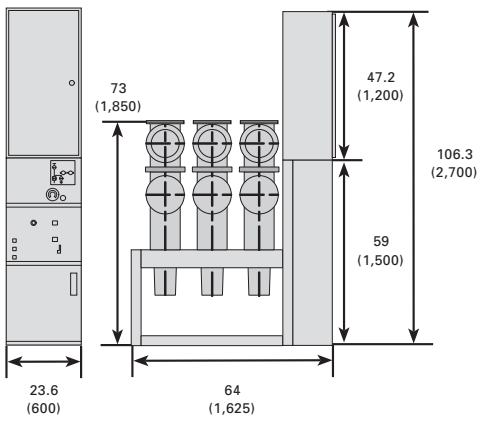
- Tested for arc-resistance to IEEE C37.20.7-2007, type 2A
- Significantly reduced PPE needs
- Compact – up to 80% smaller than air-insulated switchgear
- 20-year internal maintenance cycle
- Meets IEEE and IEC standards
- UL or C-UL Listing available
- Single-phase design eliminates phase-to-phase faults
- Meets NEC visible disconnect requirement
- Well suited for contaminated environments
- Pair with Siemens protective relays to match any application.



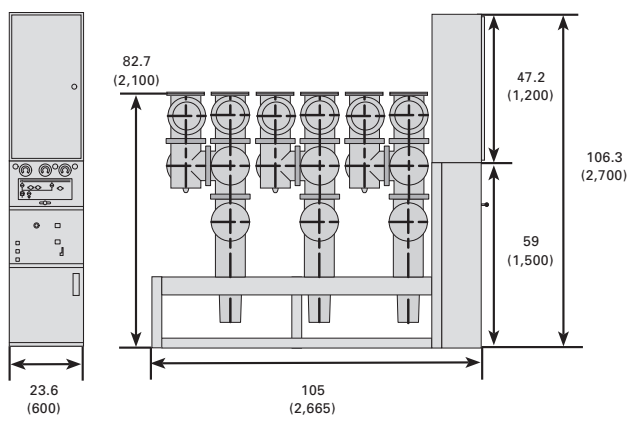
Rated Values					
Maximum Design Voltage	kV	15	27	38	42*
Frequency	Hz	60	60	60	60
Power-Frequency Withstand Voltage (1 min.)	kV rms	36	60	80	80
Lightning Impulse Withstand Voltage	kV peak	95	125	170; 200*	185; 200*
Short-Circuit Interrupting Current	kA	40	40	40	40
Short-Time Withstand Current, 3 s	kA	40	40	40	40
Short-Circuit Making Current (close and latch)	kA peak	104	104	104	104
Peak Withstand Current	kA peak	104	104	104	104
Continuous Current of Main Bus	A	4,000	4,000	4,000	4,000
Continuous Current of Circuit Breakers	A	2,500	2,500	2,500	2,500

* On request. Consult factory

Type 8DA dimensions in inches (mm)



Type 8DB dimensions in inches (mm)



Type SIMOSEC
Medium-voltage, metal-enclosed, load-interrupter indoor switchgear up to 27.6 kV.

- For application on systems up to 63 kA 15 kV and 20 kA 27.6 kV
- Load current switching rating 600 A, main bus continuous current rating 1,200 A
- Extremely compact footprint
- Meets ANSI/IEEE C37.20.3
- UL or C-UL Listing available
- Seismic rated up to IBC 2003
- Ideal for utility, construction and industrial applications
- Animated mimic diagram (mimic bus)
- High switching capacity – 100 operations at 600 A – five times higher than ANSI requirements
- High endurance – 1,000 mechanical operations
- Gas-insulated three-position switch disconnector, hermetically sealed for life inside a stainless steel vessel
- No maintenance or adjustment required on the switch module over life of the switch
- Switch disconnector combines the function of a load-interrupter switch (with closed-open indication) and a grounding switch (with open-ground indication), thus inherent design offers additional safety for the operators
- Integrated mechanical interlocking
- High-voltage current limiting fuses and cable terminations accessible only if the feeder grounding switch is in the grounded position
- Fuses and outgoing cables are front accessible, which means SIMOSEC can be placed against the wall and maximize the use of available space
- Convenient viewing window for verification of primary contact position (visible break)
- Capacitive voltage indicators to show if the cable side of the switch is energized
- Configurations: individual feeder switches, transformer primary switches and switch line-ups
- Main bus at top or bottom to suit application
- Over 20 years experience and more than 350,000 switch-disconnector units installed



Type SIMOSEC Specifications

Rated voltage	Rated frequency	Rated short-duration power-frequency withstand voltage	Rated lightning-impulse withstand voltage (BIL)	Rated short-time withstand current, two seconds	Fused short-circuit current rating (FS panel only)	Maximum fused continuous current (not equal to fuse E rating)			Main bus continuous current rating	Switch disconnector	
						Single fuse FS-1	Double fuse FS-2	Triple fuse FS-3		Continuous	Interrupting
kV	Hz	kV	kV	kA	kA	A	A	A	A	A	A
5.0	50/60	19	60	25	63	325	575	600	1,200	600	600
8.25 and 15.0	50/60	36	95	25	63	165	305	430	1,200	600	600
27.6	50/60	60	125	20	20	65	117	156	1,200	600	600

Dimensions in inches (mm)	Cable switch	Fused switch	Metering	Cable connection
	CS	FS	MT	CC
Width	14.8 (375)① 19.7 (500)② —⑤	14.8 (375)① 19.7 (500)② 29.5 (750)③	—⑤ 19.7 (500)④ 29.5 (750)④	14.8 (375)① 19.7 (500)② —⑤
Depth	48.4 (1,230)	48.4 (1,230)	48.4 (1,230)	48.4 (1,230)
Height	88.6 - 100.4 (2,250 - 2,850) depending upon arrangement	88.6 - 100.4 (2,250 - 2,850) depending upon arrangement	88.6 - 100.4 (2,250 - 2,850) depending upon arrangement	88.6 - 100.4 (2,250 - 2,850) depending upon arrangement

① Single cable (CS) or single fuse (FS)
② Two cables (CS) or double-barrel fuse (FS)
③ Three cables or triple-barrel fuse
④ Width depends on equipment arrangement
⑤ Section not available at this dimension.

General

The design and manufacture of the Series 81000™ medium-voltage controller unit is Siemens experience gained in over 50 years as a leading manufacturer of motors worldwide. The benefits of this experience result in control scheme flexibility and increased safety, while simplifying operations, maintenance, and minimizing installation costs. Typical applications include:

- Squirrel-Cage Induction Motors (non-reversing, reversing or multi-speed)
- Reduced-Voltage Starters (autotransformer, reactor or solid-state type)
- Synchronous motors (brush or brushless type)
- Transformer Feeders
- Capacitor Bank Feeders
- Power Bus Feeders (Tie).

The utilization voltage range for the controllers is 2.3 kV through 13.8 kV.

The Siemens Series 81000 medium-voltage controller allows the user to combine vacuum contactors, latched contactors and load-break switches in one lineup. The user can also connect directly to Siemens type GM-SG medium-voltage switchgear with a transition section. This provides extreme flexibility in systems design.

Load-Break Switches (LBS)

Drawout Controllers:

- Full-Voltage Non-Reversing (FVNR)
- Reduced-Voltage Primary Reactor (RVPR)
- Reduced-Voltage Autotransformer (RVAT)
- Reduced-Voltage Solid State (SSRV)
- Brushless Synchronous (BL-SYNCH)
- Brushtype Synchronous (BT-SYNCH)
- Two-Speed Two-Winding (2S2W)
- Two-Speed One-Winding (2S1W)
- Reversing.

E2 (Fused) Contactors — To meet interrupting capability required for NEMA Class E2 controllers, types 97H3, 96H6 and 3TL71 contactors are provided with primary current-limiting fuses in all each phases. The resulting interrupting ratings are shown in bottom table.



Drawout

Controllers and Load-Break Switches (LBS)

	Controller type	2.3 kV	4.16 kV	6.9 kV	13.8 kV
Maximum motor size	Drawout	to 3,000 HP	to 5,500 HP	to 7,000 HP	to 5,500 HP
	SSRV	to 3,000 HP	to 5,500 HP	to 4,000 HP	to 6,500 HP
Load-break switch (LBS)	600 A	Fused	Fused	----	----
		Unfused	Unfused	Unfused	----
	1,200 A	Fused	Fused	----	----
		Unfused	Unfused	Unfused	----

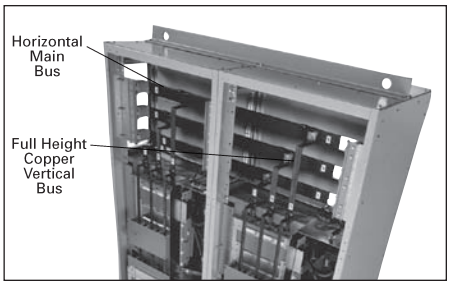
Ratings

System voltage	Vacuum contactor	Enclosed continuous ampere rating	Interrupting capacity		Motor horsepower rating (three-phase)				Transformer loads	
			Unfused class E1	Fused class E2	Synchronous motors		Induction motors	Maximum motor fuse rating	Maximum three-phase	Maximum fuse rating
kV	Type	A	kA	kA	0.8 PF	1.0 PF	HP		kVA	
2.3	97H3	360	5	50	1,500	1,750	1,500	24R	1,500	450E
2.3	96H6	720	7.2	50	3,000	3,500	3,000	57X	2,000	600E
4.0	97H3	360	5	50	2,500	3,000	2,500	24R	2,500	450E
4.0	96H6	720	7.2	50	5,500	6,000	5,500	57X	3,500	600E
4.6	97H3	360	5	50	2,500	3,000	2,500	24R	2,500	450E
4.6	96H6	720	7.2	50	5,500	6,000	5,500	57X	4,000	600E
6.9①	97H3	360	4.2	50	4,000	5,000	4,000	24R	1,500	200E
6.9①	96H6	720	7.2	50	7,000	7,500	7,000	57X	②	②
13.8	3TL71	300	3.0	50	5,500	6,000	5,500	300E	5,500	300E

① Nominal motor voltage 6.6 kV. (Temporary overvoltage of 7.6 kV)

② Consult factory.

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.



Main and Vertical Bus Construction (shown with optional insulation)

Power Bus

Power bus is isolated behind grounded steel barriers. Automatic shutters are provided on drawout controllers to cover the line-side bus stabs whenever a starter door is opened or the drawout carriage is in the disconnect position. Horizontal bus ratings range from 1,000 A through 3,000 A and are detailed in the table below. Vertical tap buses in each section are rated 360 A, 540 A or 720 A, depending on the application. The standard bus material is silver-plated copper bus. Tin-plating is available as an option. Insulated bus with boots are available as options.

Drawout

The Siemens Series 81000 drawout medium-voltage motor controller is a modular design consisting of up to three vacuum contactors per vertical section each with three current limiting fuses, all housed in a free-standing sheet steel enclosure.

The completely drawout contactor carriage (360 A) includes all major power components (vacuum contactor, power fuses, CPT, CPT fuses) on a wheeled, drawout carriage. The drawout contactor carriage includes a quick disconnect plug for secondary connections. Drawout fuse carriages are used when loads require 720 A vacuum contactors. Contactors are available in up to three-high mounting for 5 kV and 360 A.

The drawout controllers are available in a wide range of starter types, including Solid-State Reduced-Voltage.

Solid-State, Reduced-Voltage Controller (SSRV)

Benefits include:

- Reduce torque shock damage
- Increase motor and drive train reliability
- Limit starting kVA
- Maintain future system flexibility
- Soft start and soft stop pumps to control water hammer
- Reduced hydraulic/mechanical problems.

Standard Features

- Drawout main fused contactor (360 A)
- Drawout main fuses with fixed-mounted main contactor (720 A)
- Bypass contactor
- Heavy duty soft start module
- 125% continuous duty rating (on soft start module only)
- Digital microprocessor control with non-volatile memory
- Fiber optic isolation
- Advanced electronic motor protection
- Metering
- Alphanumeric LCD display
- Keypad programming
- Modbus RTU communications



Solid-State Reduced-Voltage

Standard Adjustment Capabilities

- Soft start and stop
- Voltage and current ramp

Starting Methods (settable)

- Current limit and dual ramp
- Learned acceleration curve or user defined (custom) acceleration curve
- Kick start and jog

Optional Features

- Zero sequence ground fault protection
- Profibus communications

Dependability

- The Series 81000 has been in production for over 20 years

C-UL Listed

Bus ratings

Bus type	Continuous amperes (A)	Conductor size in inches (mm)	Conductor material	Current density (A/in^2)
Main Horizontal	1,000	0.25 (6) x 3.0 (76)	Copper	1,333
	1,200	0.375 (10) x 3.0 (76)	Copper	1,067
	2,000	Two 0.375 (10) x 3.0 (76)	Copper	889
	3,000①	Three 0.50 (13) x 3.0 (76)	Copper	667
Vertical	300 (15 kV)	0.25 (6) x 2.0 (51)	Copper	600
	360	0.25 (6) x 1.0 (25)	Copper	1,440
	540	0.25 (6) x 1.5 (38)	Copper	1,440
	720	0.50 (13) x 2.0 (51)	Copper	720
Ground	600	0.25 (6) x 2.0 (51)	Copper	1,200

① 3,000 A bus must be located on top of unit in 13″ (330 mm) top hat (15″ (381 mm) for 15 kV).

Dimensions and Weights

Controller		Qty. of cont.⑦	Dimensions in inches (mm)					Weight in lbs (kg)	
			NEMA 1, 1A or 12			NEMA 3R walk-in	NEMA 3R non-walk-in		
Type	Rating		Height	Width	Depth	Width	Width	NEMA 1 or 12	N3R
Induction, full-voltage, non-reversing, (FVNR) drawout	5 kV 360 A	1	30 (762)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,400 (635)	1,600 (726)
	5 kV 720 A	1	36 (915)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,600 (726)	1,800 (817)
	7 kV 360 A	1	90 (2,286)①	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,500 (681)	1,700 (772)
	7 kV 720 A	1	90 (2,286)①	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,600 (726)	1,800 (817)
	15 kV 360 A	1	90 (2,286)	126 (3,201)	48 (1,220)	----	----	5,000 (2,268)	5,700 (2,586)
Reduced-voltage, primary reactor, non-reversing, (RVPR) drawout	5kV 360 A	2	90 (2,286)	60 (1,524)/ 72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	4,000 (1,815)/ 6,800 (3,085)	4,400 (1,996)/ 7,200 (3,266)
	5 kV 720 A	2	90 (2,286)	96 (2,439)/ 108 (2,744)	36 (915)	114 (2,896)	120 (3,048)	7,400 (3,357)/ 8,800 (3,992)	7,800 (3,538)/ 9,200 (4,173)
	7 kV 360 A	2	90 (2,286)	72 (1,829)/ 96 (2,439)	36 (915)	78 (1,982)/ 114 (2,896)	120 (3,048)	4,600 (2,087)/ 6,800 (3,085)	5,000 (2,268)/ 7,800 (3,538)
	7 kV 720 A	2	90 (2,286)	②	36 (915)	②	②	②	②
Reduced-voltage, auto-ltransformer, non-reversing, (RVAT) drawout	5kV 360 A	3	90 (2,286)	60 (1,524)/ 72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	4,200 (1,905)/ 7,000 (3,175)	4,600 (2,087)/ 7,400 (3,357)
	5 kV 720 A	3	90 (2,286)	96 (2,439)/ 108 (2,744)	36 (915)	114 (2,896)	120 (3,048)	7,600 (3,447)/ 9,000 (4,082)	8,200 (3,720)/ 9,600 (4,355)
	7 kV 360 A	3	90 (2,286)	72 (1,829)/ 96 (2,439)	36 (915)	78 (1,982)/ 114 (2,896)	120 (3,048)	4,800 (2,177)/ 6,800 (3,084)	5,400 (2,449)/ 8,200 (3,720)
	7 kV 720 A	3	90 (2,286)	②	36 (915)	②	②	②	②
Induction, full-voltage, non-reversing, (FVNR) drawout	5 kV 360 A	3	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,800 (817)	2,000 (907)
	5 kV 720 A	3	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,200 (1,452)	3,600 (1,633)
	7 kV 360 A	3	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	2,000 (907)	2,200 (998)
	7 kV 720 A	3	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	42 (1,067)	3,200 (1,452)	3,600 (1,633)
Synchronous, reduced-voltage, auto-trans-former, non-reversing (RVATS)	5 kV 360 A	3	90 (2,286)	84 (2,134)/ 108 (2,744)	36 (915)	114 (2,896)	120 (3,048)	5,100 (2,313)/ 7,900 (3,583)	5,700 (2,585)/ 8,500 (3,856)
	5 kV 720 A	3	90 (2,286)	132 (3,353)/ 144 (3,658)	36 (915)	150 (3,810)	156 (3,962)	8,500 (3,856)/ 9,900 (4,491)	9,300 (4,218)/ 10,700 (4,853)
	7 kV 360 A	3	90 (2,286)	132 (3,353)	36 (915)	150 (3,810)	156 (3,962)	5,700 (2,585)/ 7,900 (3,583)	6,500 (2,948)/ 9,300 (4,218)
	7 kV 720 A	3	90 (2,286)	②	36 (915)	②	②	②	②

Table continued on next page

① Also available in 45" (1,143 mm) high construction for two-high arrangement and requires top-mounted bus. Consult factory.
② Consult factory.
③ Weight of drawout carriage is approximately 200 lbs (91 kg).
④ Height is 107" (2,718 mm).
⑤ Height is 103" (2,616 mm).
⑥ Restricted to 7 kV cable rating only.
⑦ Number of vacuum contactors.
⑧ Load-break switch.

Dimensions and weights (cont.)

Controller		Qty. of cont.⑦	Dimensions in inches (mm)					Weight in lbs (kg)	
			NEMA 1, 1A or 12			NEMA 3R walk-in④	NEMA 3R non-walk-in⑤		
Type	Rating		Height	Width	Depth	Width	Width	NEMA 1 or 12	N3R
Induction, full-voltage, two-speed, one-winding, (2S1W) drawout	5 kV 360 A	3	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	2,000 (907)	2,200 (998)
	5 kV 720 A	3	90 (2,286)	②	36 (915)	②	②	②	②
	7 kV 360 A	3	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,300 (1,497)	3,700 (1,678)
	7 kV 720 A	3	90 (2,286)	②	36 (915)	②	②	②	②
Induction, full-voltage, two-speed, two-winding, (2S2W) drawout	5 kV 360 A	2	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,800 (817)	2,000 (907)
	5 kV 720 A	2	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,200 (1,452)	3,600 (1,633)
	7 kV 360 A	2	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,000 (1,361)	3,400 (1,542)
	7 kV 720 A	2	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,200 (1,452)	3,600 (1,633)
Latched contactor, drawout	5 kV 360 A	1	30 (762)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,400 (635)	1,600 (726)
	5 kV 720 A	1	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,600 (726)	1,800 (817)
	7 kV 360 A	1	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,500 (681)	1,700 (772)
	7 kV 720 A	1	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,700 (771)	1,900 (862)
Solid-state, reduced-voltage, non-reversing (SSRV) drawout	5 kV 360 A	2	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,600 (726)	1,800 (817)
	5 kV 720 A	2	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,200 (1,452)	3,600 (1,633)
	7 kV 360 A	2	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	3,200 (1,452)	3,600 (1,633)
	7 kV 720 A	2	90 (2,286)	②	36 (915)	②	②	②	②
	15 kV 300 A	2	90 (2,286)	96 (2,438)	66 (1,677)	----	----	5,000 (2,268)	----
LBS⑧ 600 A or 1,200 A unfused	5 kV/7 kV	----	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,400 (635)	1,600 (726)
LBS⑧ 600 A fused or 1,200 A/ 900E fused	5 kV/7 kV	----	90 (2,286)	36 (915)	36 (915)	42 (1,067)	42 (1,067)	1,400 (635)	1,600 (726)
LBS⑧ 1,200 A/ 1,100E fused	5 kV/7 kV	----	90 (2,286)	72 (1,829)	36 (915)	78 (1,982)	78 (1,982)	2,200 (998)	2,600 (1,179)
Incoming line/main lugs only	5 kV/7 kV	----	90 (2,286)	18 (457)/ 24 (610)/ 36 (915)	36 (915)	42 (1,067)	42 (1,067)	600 (272)	1,400 (635)

① Also available in 45" (1,143 mm) high construction for two-high arrangement and requires top-mounted bus. Consult factory.
② Consult factory.
③ Weight of drawout carriage is approximately 200 lbs (91 kg).
④ Height is 107" (2,718 mm).
⑤ Height is 103" (2,616 mm).
⑥ Restricted to 7 kV cable rating only.
⑦ Number of vacuum contactors.
⑧ Load-break switch.

Motor Protection Options

Motors often play a decisive role in the functioning of a production process. Motor damage and breakdowns not infrequently lead also to consequential damage and production shutdowns, the cost of which significantly exceeds the cost of repairing the motor. Optimum design of the motor protection ensures that damage following thermal overload is prevented, meaning that there is no reduction to the normal service life. Secondary faults are minimized in the event of short circuits, ground faults and winding faults. The spectrum extends from small low-voltage motors with an output of a few kW to high voltage motors with outputs measured in MW. Protection system design must be based on the rating of the motor, the importance of the drive for the technological process, the operating conditions and the requirements of the motor manufacturer.

Common motor protection functions and SIPROTEC motor protective relay selection tables are provided below.



Protection functions for various types of motor faults

Fault	Protection	ANSI Number
Stator thermal overload	Stator thermal overload protection	49
Rotor thermal overload during start too long or blocked too frequent	2 Protection principles for the rotor overload protection Motor starting time supervision Restart inhibit	 48 66, 49R
Ground-fault	Ground-fault protection (I_0>;U_0>;<(U_0,I_0))	50G, 64G, 67G
Short-Circuit	Overcurrent time protection Current differential protection	50, 51 87
Loss of phase	Negative sequence protection (I_2/I_N)	46
Bearing overload	Temperature sensors (RTD's)	38
Overheating of plant on unloaded drives (pumps, compressors)	Undercurrent protection, Active power protection (P<)	37 32U
Undervoltage (starting torque not reached M ~ U^2 or start too long	Undervoltage protection	27
Asynchronous operation (of a synchronous motor)	Underexcitation protection	40

Motor Protection Selection Table

Asynchronous Motor		Synchronous Motor
100 kW – 500 kW **7SJ60** Basic device	**7SJ61** + more I/O's + control functions + flexible serial interfaces + better local HMI (4 line display; digital keyboard	< 2 MW **7UM61** (Option: Generator Basic)
500 kW – 2 MW **7SJ62** Basic device + control functions	**7UM61** + more I/O's (7UM612) + control functions + high accuracy + high sensitivity + operating range in a wide frequency band (11Hz - 68Hz)	< 10 MW **7UM62** (Option: Generator Basic)
or with control functions via bay mimic diagram in graphic display		
7SK80 + more I/O's + compact design + high accuracy + high sensitivity	7SJ64 + Synchro check function + high sensitivity + extensive control function + 1 serial interface more	
> 2 MW		> 10 MW
	7UM62 + differential protection + control functions + high accuracy + high sensitivity + operating range in a wide frequency band (11Hz - 68Hz)	**7UM61** + (Option: Generator Basic) **7UM62** (Option: Generator Basic) or with control functions via bay mimic diagram in graphic display **7SJ64** + (Option: Generator Basic)

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.



Description

The SIPROTEC CBII CONTROLLER combines modern microprocessor relay protection and control technology with IEC61850 to provide control and monitoring of medium voltage circuit breakers in substation applications from a distance of up to 1000 feet.

The SIPROTEC CB CONTROLLER is a new cost effective solution that will address Arc Flash mitigation as required by NFPA 70E by removing the operator from the front of a circuit breaker. Nobody needs to be in front of medium voltage switchgear today. Regular operations that include opening, closing and obtaining metering information is now done from a distance away of the actual breaker.

The SIPROTEC CBII CONTROLLER is expertly programmed and bench tested ready for installation. Everything is addressed from drawings, settings through testing. Just install and energize.

.

The SIPROTEC CBII CONTROLLER is the ideal solution to refurbish your old relays or installed in your new switchgear Control for a distance of up to 1000 feet.

Product Features

- Metering & Monitoring
- Protection of:
  - Feeders
  - Motors
  - Transformers
  - Busses
- Transfer Schemes
- Arc Flash Setting groups
- Remote Arc Flash setting activation
- Load Shedding schemes
- One Software Package
- Redundant Communication
- PLC Functionality
- Secure self healing Ethernet Fiber ring communication.
- Programmed and Tested
- Optional remote Control and visualisation

Packaged Power Solutions (PPS)

Power Equipment Centers



Siemens offers two types of PECs: Crimped plate (shown) and Interlocking panel

Power Equipment Centers

Siemens Packaged Power Solutions (PPS) designs and manufactures power equipment centers (PECs), prefabricated modular skid-mounted enclosures for low- and medium-voltage switchgear, motor control center equipment, SCADA and other auxiliary equipment.

As a fully integrated power distribution system, our PECs are completely engineered, coordinated, manufactured, assembled and production tested at the Siemens facility.

With over 20 years of experience in delivering PECs to utility and industrial customers, PPS is equipped with the knowledge and capability to deliver almost any complex system requirement.

Packaging your project with Siemens PPS offers the following benefits:

- Single point of contact
- Design flexibility
- Strategic sourcing capabilities
  In-house engineering team available for customer and production support
- ISO 9001-2000 compliant processes and procedures quality system (certification testing scheduled for April 2011)
- Established name and customer base.

Siemens PPS is centrally located in Houston, convenient to road, rail or water.

Siemens PPS products are built to applicable industry standards ANSI, IEEE, NEMA and NPFA.

Structural Professional Engineer calculations are provided with each project.

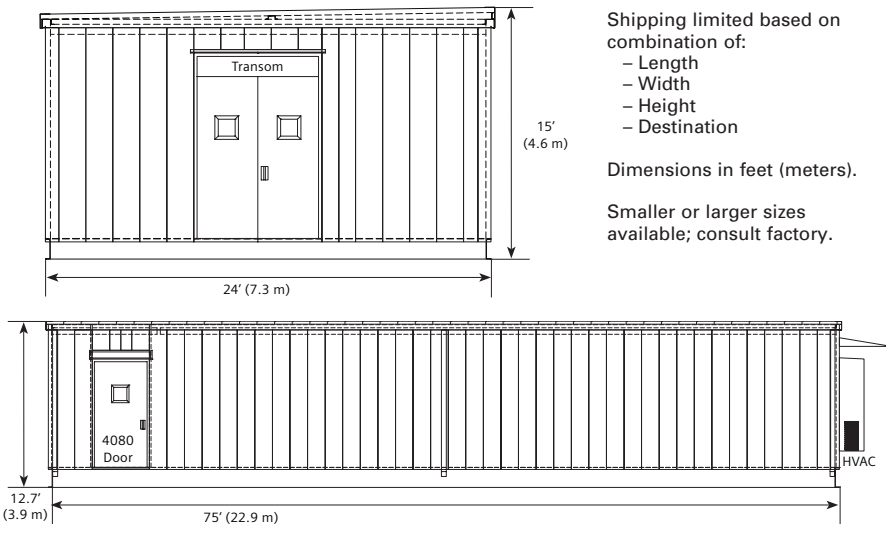
Siemens PPS solutions can include:

- Power equipment centers
- Packaged equipment
  - Metal-clad and/or metal-enclosed switchgear
  - Medium-voltage motor controllers
  - Low-voltage switchgear and motor control centers
  - Variable frequency drives (VFD)
  - PLC I/O, marshalling and relay panels
- Motor control rooms
- Instrumentation enclosures
- Analyzer shelters
- Non-segregated phase bus duct.

Siemens PPS can also offer a full-range of support services that include:

- Field services and commissioning
- Post-installation maintenance and repair
- Switchgear maintenance and repair
- Field service hotline.

PEC dimensions



Shipping limited based on combination of:
- Length
- Width
- Height
- Destination

Dimensions in feet (meters).

Smaller or larger sizes available; consult factory.

SICAM PAS & PQ Analyzer

SICAM PAS (Power Automation System) is a complete substation automation control and protection system for HV and MV switchgear (i.e., >600 volts) used in electric utility and industrial facility substations. SICAM PAS offers many time and cost saving benefits for entities along the switchgear value chain including, electric utilities, industrial plant owners, switchgear manufacturers, designers, integrators, panel builders, installers and OEMs.

Key Features

- Integrated substation automation system for SCADA monitoring, control and system protection.
- Fully compliant with the IEC 61850 industry design standard.
- Automated Power Quality and protection relay fault record retrieval and data reporting (supports NERC PRC-002).
- Substation Human Machine Interface (HMI) for visualization, alarm handling and control using graphical displays.
- NERC CIP cyber security compliance tools.
- Redundant server option for greater reliability.

Benefits

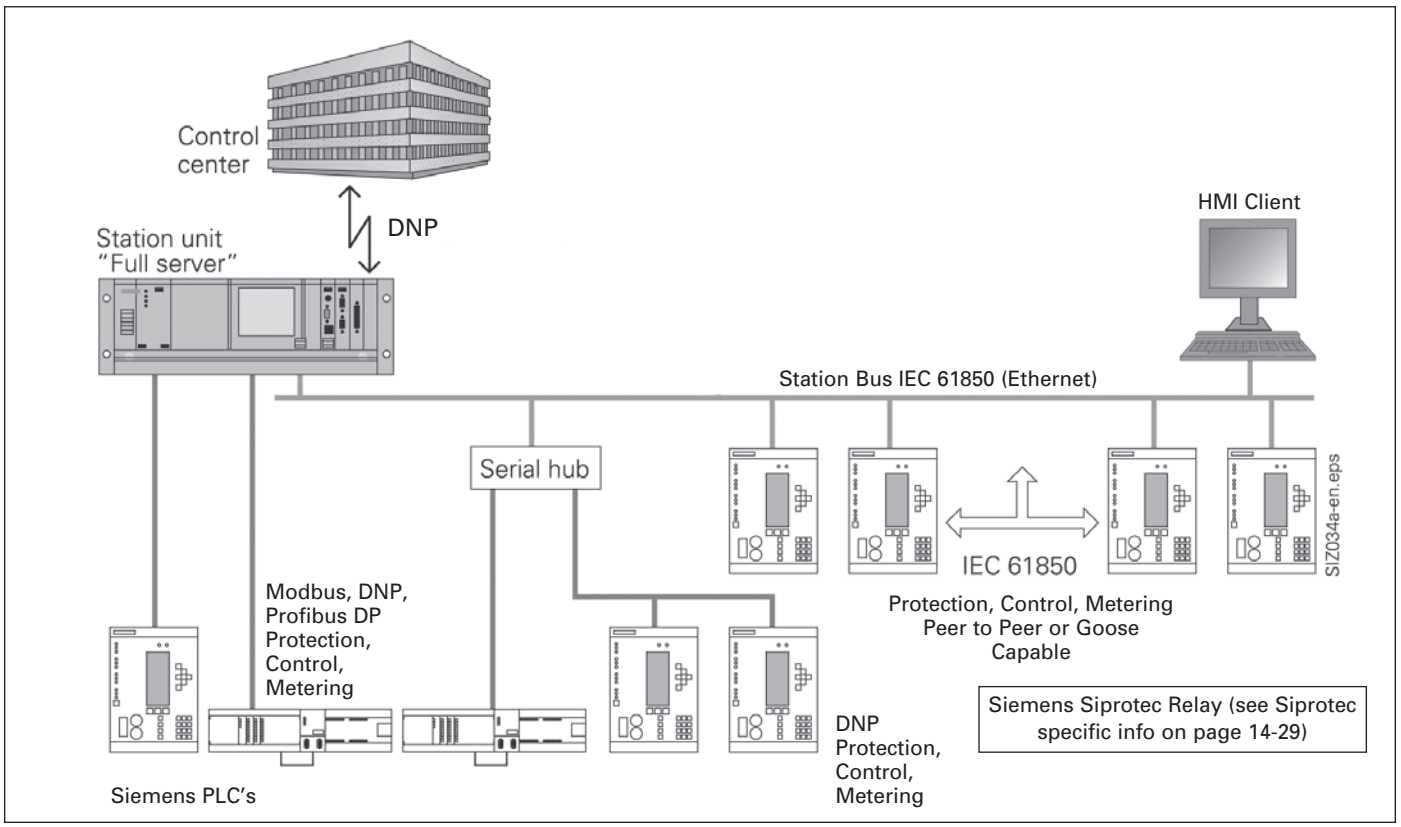
- SICAM PAS saves designers, panel builders and OEMs time and money to deploy standardized and reusable protection and control systems.
- SICAM PAS is interoperable with third-party devices using IEC 61850, DNP, OPC and Modus communication protocols.
- The IEC 61850 design standard results in a significant reduction of panel wiring which saves in material costs and installation and test time.
- IEC 61850 also provides the means to bench test and debug the system and protection design before the switchgear is deployed in the substation, which significantly reduces the project schedule and on-site integration risk.
- Plant owners can see savings through automated power quality reporting.

SICAM PAS Substation Server

SICAM PAS works on industrial-standard hardware with the Microsoft Windows operating systems. The advantages of this platform are low hardware and software costs, ease of operation, scalability, flexibility and constantly available support. With the powerful real-time data distribution system, applications can be allocated among several computers, thus boosting performance, connectivity and availability. A database system stores and organizes the data basis (e.g. configuration data, administrative status data, etc.). The device master function for communication with Intelligent Electronic Devices (IEDs) supports a large number of well established protocols. The SICAM PAS data normalization function allows conversions such as measured-value filtering, threshold value calculation and linear characteristics.

SICAM PAS CC HMI

SICAM PAS CC is used for process visualization. Specifically designed for energy applications, it assists the operating personnel in optimizing the operations management. It provides quick visualization and response to substation conditions. SICAM PAS CC is based on SIMATIC WinCC, one of the leading process visualization systems that is used in industrial automation world.



Siemens Siprotec Relay (see Siprotec specific info on page 14-29)

SIPROTEC Protective Relays

Overview

High-performance protective relaying comes into its own when it's a question of minimizing power system operationg costs.

Uncomplicated operation, convenient commissioning tools and flexible communication are all important elements when service and maintenance costs have to be reduced. The Siemens SIPROTEC family with its protection relays and bay control units is an integrated system for medium-voltage to extra-high-voltage applications.

Numerical protection systems are nothing new; after all, Siemens has more than 25 years experience in this field. Although system hardware is still often referred to as protection equipment or units – as was once the case with analog technology – it can now do so much more. These relays not only handle fault detection and location tasks but also control, metering and monitoring functions. And it is these additional functions – impossible before the advent of numerical technology – which offer major cost-cutting potential.

IEC 61850

SIPROTEC — the standard for numerical protective relaying — has established itself right across the market. Besides the common system platform and the unique DIGSI 4 service interface that may be used for all protective devices, it also supports the new IEC 61850 communication standard. A potential that offers more efficiency, easily and conveniently. With SIPROTEC relays and bay control units from Siemens we offer all the advantages of an expert and innovative partner in the field of protective relaying and substation automation. We bring you attractively priced intelligent solutions by paying particular attention to lowering your life cycle and system management costs. These solutions are the first ones available on the market with the international IEC 61850 standard. To enable you to profit from these advantages as quickly as possible, Siemens collaborated in the preparation of this international standard and made every effort to ensure no time was lost in bringing it out. The result is certainly worth a look, because SIPROTEC and other Power Automation products and Siemens systems are available on the basis of the IEC 61850 standard and can even be retrofitted in systems supplied since 1998.

System advantages

- **One bay, one unit**

The SIPROTEC 4 relay family offers fully integrated protection, control, monitoring, and automation functions incorporated in a single device. For many applications, this product contains all the functions you need to meet all your protection and control requirements with just one unit per bay, saving on investment and installation costs and enhancing availability.

- **DIGSI 4 – one tool for all tasks and products**

DIGSI 4 is a computer program designed for all SIPROTEC relays. DIGSI 4 offers users a universal tool for all support tasks from setting and commissioning of devices to simple analysis and documentation of system faults. Our powerful analysis tool speeds up trouble-shooting and supplies important service information.

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

ANSI Selection List for Protective Relays

		Distance		Pilot wire differential	Line differential		Overcurrent									Motor protection	Differential						Generator and motor protection		Breaker management		Breaker failure	Voltage, frequency
ANSI No.*	**Protection functions**	**7SA522**	**7SA6**	**7SD600**	**7SD5**	**7SD610**	**7SJ45**	**7SJ46**	**7SJ600**	**7SJ602**	**7SJ80**	**7SJ61**	**7SJ62**	**7SJ63**	**7SJ64**	**7SK80**	**7VH60**	**7UT612**	**7UT613**	**7UT63**	**7SS60**	**7SS52**	**7UM61**	**7UM62**	**7VK61**	**7VE6**	**7SV600**	**7RW600**
14	Locked rotor protection	—	—	—	—	—	—	—	—	—	—	●	●	●	●	■	—	—	—	—	—	—	■	■	—	—	—	—
21	Distance protection, phase	■	■	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	—	—	—	—
21N	Distance protection, earth (ground)	■	■	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21FL	Fault locator	■	■	—	●	—	—	—	—	—	●	—	●	●	●	—	—	—	—	—	—	—	—	—	—	—	—	—
24	Overfluxing (V/*f* protection)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	—	—	■	■	—	—	—	■
25	Synchronizing, synchronism check	●	●	—	●	—	—	—	—	—	●	—	●	—	●	—	—	—	—	—	—	—	—	—	■	■	—	—
27	Undervoltage	●	●	—	●	●	—	—	—	—	●	—	●	●	●	●	—	—	—	●	—	—	■	■	●	●	—	■
27/34	Stator earth-fault 3rd harmonic	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	—	—	—	—
32	Directional power	—	—	—	—	—	—	—	—	—	●	—	●	—	●	●	—	—	—	●	—	—	—	■	—	—	—	—
32F	Forward power	—	—	—	—	—	—	—	—	—	●	—	●	—	●	●	—	—	●	—	—	—	●	■	—	—	—	—
32R	Reverse power	—	—	—	—	—	—	—	—	—	●	—	●	—	●	●	—	—	●	—	—	—	■	■	—	—	—	—
37	Undercurrent or underpower	—	—	—	—	—	—	—	—	●	■	■	■	■	■	■	—	—	—	—	—	—	—	■	—	—	—	—
40	Loss of field	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	■	—	—	—	—
46	Load unbalance, negative phase-sequence overcurrent	—	—	—	—	—	—	—	■	■	■	■	■	■	■	■	—	●	—	●	—	—	●	●	—	—	—	—
47	Phase-sequence voltage	■	■	—	■	—	—	—	—	—	●	—	■	■	■	●	—	—	—	—	—	—	■	■	—	—	—	—
48	Incomplete sequence, locked rotor	—	—	—	—	—	—	—	■	●	—	●	●	●	●	■	—	—	—	—	—	—	●	●	—	—	—	—
49	Thermal overload	—	●	—	■	■	—	—	■	■	■	■	■	■	■	■	—	■	■	■	—	—	■	■	—	—	—	—
49R	Rotor thermal protection	—	—	—	—	—	—	—	■	■	—	■	■	■	■	■	—	—	—	—	—	—	—	■	—	—	—	—
49S	Stator thermal protection	—	—	—	—	—	—	—	■	■	—	■	■	■	■	■	—	—	—	—	—	—	■	■	—	—	—	—
50	Instantaneous overcurrent	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	—	■	■	■	—	●	■	■	■	—	—	—
50N	Instantaneous earth-fault overcurrent	■	■	—	■	■	—	—	■	■	■	■	■	■	■	■	—	■	■	■	—	●	■	■	—	—	—	—
50BF	Breaker failure	●	●	—	■	●	—	—	—	■	■	■	■	■	■	■	—	●	●	●	—	■	■	■	■	—	■	—
51GN	Zero speed and underspeed device	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	—	—	—	—
51	Overcurrent-time relay, phase	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	—	■	■	■	—	●	■	■	—	—	—	—
51N	Overcurrent-time relay, earth	■	■	—	■	■	■	■	■	■	■	■	■	■	■	■	—	■	■	■	—	●	■	■	—	—	—	—
51M	Load jam protection	—	—	—	—	—	—	—	—	—	—	●	●	●	●	■	—	—	—	—	—	—	—	—	—	—	—	—
51V	Overcurrent-time relay, voltage controlled	—	—	—	—	—	—	—	—	—	—	—	■	—	■	—	—	—	—	—	—	—	■	■	—	—	—	—
59	Overvoltage	●	●	—	●	●	—	—	—	—	●	—	●	●	●	●	—	—	—	●	—	—	■	■	●	●	—	■
59N	Residual voltage earth-fault protection	●	●	—	●	—	—	—	—	■	●	—	■	■	■	●	—	—	—	—	—	—	■	■	—	—	—	—
59GN	Stator earth-fault protection	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	—	—	—	—
64	100 % Stator earth-fault protection (20 Hz)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—
64R	Rotor earth fault	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	—	—	—	—

■ Standard function
● Optional
* ANSI/IEEE C37.2: IEEE Standard Electrical Power System Device Function Numbers

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

ANSI Selection List for Protective Relays

		Distance		Pilot wire differential	Line differential		Overcurrent									Motor protection	Differential						Generator and motor protection		Breaker management	Synchronizing	Breaker failure	Voltage, frequency
ANSI No.*	**Protection functions**	**7SA522**	**7SA6**	**7SD600**	**7SD5**	**7SD610**	**7SJ45**	**7SJ46**	**7SJ600**	**7SJ602**	**7SJ80**	**7SJ61**	**7SJ62**	**7SJ63**	**7SJ64**	**7SK80**	**7VH60**	**7UT612**	**7UT613**	**7UT63**	**7SS60**	**7SS52**	**7UM61**	**7UM62**	**7VK61**	**7VE6**	**7SV600**	**7RW600**
67	Directional overcurrent	—	—	—	—	●	—	—	—	—	●	—	●	●	●	—	—	—	—	—	—	—	■	■	—	—	—	—
67N	Directional earth-fault overcurrent	●	●	—	●	●	—	—	—	■①	●	—	●	●	●	●	—	—	—	—	—	—	■	■	—	—	—	—
67G	Stator earth-fault directional overcurrent	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	—	—	—	—
68	Power swing detection	●	●	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—
74TC	Trip circuit supervision	■	■	—	■	■	—	—	■	■	■	■	■	■	■	■	—	●	●	●	—	—	■	■	■	—	—	—
78	Out-of-step protection	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	—	—	—	—
79	Auto-reclosure	●	●	—	●	●	—	—	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—	—	■	—	—	—
81	Frequency protection	■	■	—	●	●	—	—	—	—	●	—	●	●	●	●	—	—	—	●	—	—	■	■	—	●	—	■
81R	Rate-of-frequency-change protection	—	—	—	—	—	—	—	—	—	●	—	●	—	—	●	—	—	—	—	—	—	●	●	—	●	—	●
	Vector jump supervision	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	—	●	—	—
85	Carrier interface/remote trip	■	■	●	■	■	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	—	—	—	—	—	—
86	Lockout function	■	■	■	■	■	—	—	—	—	■	■	■	■	■	■	—	■	■	■	■	—	■	■	■	●	—	—
87G	Differential protection generator	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	—	—	—	■	—	—	—	—
87T	Differential protection transformer	—	—	■	●	●	—	—	—	—	—	—	—	—	—	—	■	■	■	■	—	—	—	■	—	—	—	—
87BB	Differential protection busbar	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	■	—	—	—	—	—	—
87M	Differential protection motor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	■	■	—	—	—	■	—	—	—	—
87L	Differential protection line	—	—	■	■	■	—	—	—	—	—	—	—	—	—	—	—	■	■	■	—	—	—	—	—	—	—	—
87N	Restricted earth-fault protection	—	—	—	●	●	—	—	—	—	■	■	■	■	■	—	■	●	●	●	—	—	—	●	—	—	—	—

■ Standard function
● Optional
✻ ANSI/IEEE C37.2: IEEE Standard Electrical Power System Device Function Numbers

① Only sensitive directional earth-fault overcurrent (67Ns).

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Siemens Protective Relays - Quick Competitor Comparison by Application

Motor Protection

Model	Siemens Equivalent	Typical Catalog Number
GE 239	**7SK80**	**7SK8051-5EC96-3HD0+L0G**
GE 269	**7SK80**	**7SK8051-5EC96-3HD0+L0G**
GE 269+	**7SK80**	**7SK8051-5EC96-3HD0+L0G**
GE 369	**7SK80**	**SIMPRO-100-R-V**
GE 469	**7SK80** and **7SJ601**	**SIMPRO-100-R-V/7SJ6015-4EA01-0AA0**

Feeder Protection

Model	Siemens Equivalent	Typical Catalog Number
ABB CO (4 single phase)	**7SJ45** (1 three phase) 7SJ46 (1 three phase) 7SJ601 (1 three phase)	**7SJ4505-1EA00-1AA1 (1 three phase)** 7SJ4605-1EA00-1AA0 (1 three phase) 7SJ6015-4EA01-0AA0 (1 three phase)
ABB Microshield	7SJ600 7SJ602 **7SJ80** 7SJ61 7SJ62	7SJ6005-4EA00-0DA1 7SJ6025-4EB00-1FA0 **7SJ8041-5EC96-3FC1+L0G** 7SJ6115-5EC90-1FA0+L0D 7SJ6215-5EC90-1FE0+L0D
ABB DPU-1500	**7SJ62** 7SJ63 7SJ64	**7SJ6215-5EC90-1FE0+L0D** 7SJ6315-5EC90-1FE0+L0D 7SJ6405-5EC92-1FE4+L0D
ABB DPU-2000R	7SJ62 7SJ63 **7SJ64**	7SJ6215-5EC90-1FE0+L0D 7SJ6315-5EC90-1FE0+L0D **7SJ6405-5EC92-1FE4+L0D**
Basler BE3-51 (4 single phase)	**7SJ45** (1 three phase) 7SJ46 (1 three phase)	**7SJ4505-1EA00-1AA1** (1 three phase) 7SJ4605-1EA00-1AA0 (1 three phase)
Basler BE1-51 (4 single phase)	**7SJ45** (1 three phase) 7SJ46 (1 three phase) 7SJ601 (1 three phase)	**7SJ4505-1EA00-1AA1** (1 three phase) 7SJ4605-1EA00-1AA0 (1 three phase) 7SJ6015-4EA01-0AA0 (1 three phase)
Basler BE1-851	7SJ600 7SJ602 **7SJ80** 7SJ61	7SJ6005-4EA00-0DA1 7SJ6025-4EB00-1FA0 **7SJ8041-5EC96-3FC1+L0G** 7SJ6115-5EC90-1FA0+L0D
Basler BE1-951	**7SJ62** 7SJ63 7SJ64	**7SJ6215-5EC90-1FE0+L0D** 7SJ6315-5EC90-1FE0+L0D 7SJ6405-5EC92-1FE4+L0D
GE MDP	7SJ45 7SJ46 7SJ601 **7SJ80**	7SJ4505-1EA00-1AA1 7SJ4605-1EA00-1AA0 7SJ6015-4EA01-0AA0 **7SJ8041-5EC96-3FC1+L0G**
GE 735	7SJ600 7SJ602 **7SJ80** 7SJ61	7SJ6005-4EA00-0DA1 7SJ6025-4EB00-1FA0 **7SJ8041-5EC96-3FC1+L0G** 7SJ6115-5EC90-1FA0+L0D
GE 750	**7SJ62** 7SJ63 7SJ64	**7SJ6215-5EC90-1FE0+L0D** 7SJ6315-5EC90-1FE0+L0D 7SJ6405-5EC92-1FE4+L0D
GE F60	**7SJ62** 7SJ63 7SJ64	**7SJ6215-5EC90-1FE0+L0D** 7SJ6315-5EC90-1FE0+L0D 7SJ6405-5EC92-1FE4+L0D
SEL 351A	**7SJ62** 7SJ63 7SJ64	**7SJ6215-5EC90-1FE0+L0D** 7SJ6315-5EC90-1FE0+L0D 7SJ6405-5EC92-1FE4+L0D
SEL 351	**7SJ62** 7SJ63 7SJ64	**7SJ6215-5EC90-1FE0+L0D** 7SJ6315-5EC90-1FE0+L0D 7SJ6405-5EC92-1FE4+L0D
SEL 351S	7SJ62 7SJ63 **7SJ64**	7SJ6215-5EC90-1FE0+L0D 7SJ6315-5EC90-1FE0+L0D **7SJ6405-5EC92-1FE4+L0D**
SEL 501	7SJ600 7SJ602 **7SJ80** 7SJ61	7SJ6005-4EA00-0DA1 7SJ6025-4EB00-1FA0 **7SJ8041-5EC96-3FC1+L0G** 7SJ6115-5EC90-1FA0+L0D
SEL 551	7SJ600 **7SJ602** **7SJ80** 7SJ61	7SJ6005-4EA00-0DA1 **7SJ6025-4EB00-1FA0** **7SJ8041-5EC96-3FC1+L0G** 7SJ6115-5EC90-1FA0+L0D

*Siemens catalog numbers in Bold are the preferred equivalent model.
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For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

General Protection

Model	Siemens Equivalent	Typical Catalog Number
ABB GPU2000	**7UM62**	**7UM6215-5EC90-0BA0+L0D**
Basler BE1- GPS100	7UM61 **7UM62**	7UM6115-5EC90-0CA0+L0D **7UM6215-5EC90-0BA0+L0D**
Beckwith M-3420	7UM61 **7UM62**	7UM6115-5EC90-0CA0+L0D **7UM6215-5EC90-0BA0+L0D**
Beckwith M-3425	**7UM62**	**7UM6215-5EC90-0CA0+L0D**
GE 489	7UM61 **7UM62**	7UM6115-5EC90-0CA0+L0D **7UM6215-5EC90-0BA0+L0D**
SEL 300G	7UM61 **7UM62**	7UM6115-5EC90-0CA0+L0D **7UM6215-5EC90-0BA0+L0D**

Bus Protection

Model	Siemens Equivalent	Typical Catalog Number
ABB HU	**7VH60**	**7VH6002-0EA20-0AA0**
ABB CA	**7VH60**	**7VH6002-0EA20-0AA0**
ABB TPU2000R	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
Basler BE1-87	7UT513 **7UT612** (3) 7VH60	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0** 7VH6002-0EA20-0AA0
GE PVD	**7VH60**	**7VH6002-0EA20-0AA0**
GE B30	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
SEL 387	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**

Transformer Protection

Model	Siemens Equivalent	Typical Catalog Number
ABB HU (3)	7UT512 (1) 7UT513 (1) **7UT612 (1)**	7UT5125-4GB11-0AA0 7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
ABB CA (3)	7UT512 (1) 7UT513 (1) **7UT612 (1)**	7UT5125-4GB11-0AA0 7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
ABB TPU2000R	7UT512 7UT513 **7UT612**	7UT5125-4GB11-0AA0 7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
Basler BE1-CDS	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
GE 745	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
GE T60	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
SEL 387	7UT513 **7UT612**	7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**
SEL 587	7UT512 7UT513 **7UT612**	7UT5125-4GB11-0AA0 7UT5135-4GB11-1AA0 **7UT6125-5EC00-1AA0**

Voltage/Frequency Protection

Model	Siemens Equivalent	Typical Catalog Number
Basler BE1-27	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
Basler BE1-59	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
Basler BE1-27/59	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
Basler BE1-81O/U	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE IAV	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE IFV	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE MIV	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE NGV	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE DFF	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE MFF	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**
GE SFF	**7RW600 and 7RW80**	**7RW60000-4EA00-0DA0 and 7RW8020-5EC96-1DA0+L0G**

*Siemens catalog numbers in Bold are the preferred equivalent model.

Ratings from 5–38 kV, 250–1500 MVA, 1200-3000 Amperes

Replacement circuit breakers provide a cost-effective way to upgrade your system capabilities while saving you from costly maintenance and lost productivity and preserving your investment in existing cubicles and cables.

Whether your equipment was originally manufactured by Allis-Chalmers, Westinghouse, GE, Federal Pacific, ITE, or another manufacturer, we will assist you to evaluate the Siemens replacement options which best meet your needs.

Why Replacement Breakers?

- Increased Reliability and Performance
- Reduced Operating and Maintenance Expenditures
- Reduced Downtime, Minimal Changeover Time During Upgrade
- Preserved Investment in Existing Cubicles
- Improved Employee and Environmental Safety

Why Siemens?

Siemens Offers the Best Vacuum Circuit Breaker in the Industry.

- Superior Performance, Longer Service Life

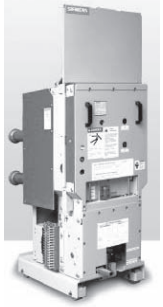
– 10,000 full load operation, 10-year maintenance cycle on replacement circuit breakers with 3AH operator

- Standard Operator on All Siemens Replacement, Medium Voltage Distribution, and Outdoor Vacuum Circuit Breakers
- Extensive Replacement Breaker Experience – 750+ projects since 1983

– Over 400,0000 3AF/H series circuit breakers in service worldwide

– Nuclear Class 1E Rated (350+ breakers)

- Full Range of Service Capabilities by Skilled Factory-Trained Engineers and Technicians



5-MSV (replacement for Allis-Chalmers MA)

Siemens Medium Voltage Replacement Circuit Breakers

The following circuit breakers are available as pre-engineered designs. Other manufacturers, models, and ratings can be engineered by Siemens.

Transformer Protection

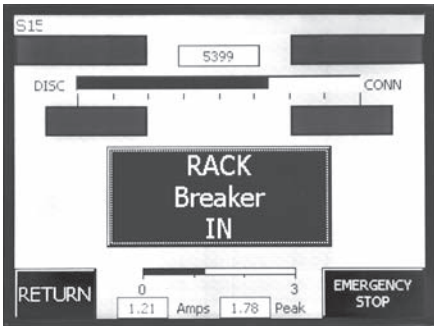
Manufacturer	Model	kV	Ratings MVA	AMP
Allis-Chalmers	AM	5	150	1200, 2000
(All Air-Magnetic)			250	1200, 2000
	MB	7	250	1200, 2000
			500	1200, 2000
	MC/MCV	15	150	1200
			250	1200, 2000
			500	1200, 2000
	MA	5	250	1200, 2000
			350	1200, 2000
	FA	5	350	3000
	FB	7	500	1200, 2000, 3000
	FC/FCV	15	500	1200, 2000
			750	1200, 2000
			1000	1200, 2000, 3000
Siemens	3AF (2-High)	5	250	1200, 2000
			350	1200, 2000, 3000
		7.5	500	1200, 2000, 3000
		15	500	1200, 2000
			750	1200, 2000
			1000	1200, 2000, 3000
GE	Magneblast (AMH)	4.16	250	600, 1200, 2000
(All Air-Magnetic)	Magneblast (AM)	2.4	100	600, 1200, 2000
			150	600, 1200, 2000
		4.16	100	600, 1200, 2000
			150	600, 1200, 2000
			250	600, 1200, 2000
			350	1200, 2000, 3000
		7.2	500	1200, 2000, 3000
		13.8	250	1200, 2000
			500	1200, 2000
			750	1200, 2000
			1000	1200, 2000, 3000
Westinghouse	DH	5	150	1200, 2000
			250	1200, 2000
			350	3000
		7.5	500	1200, 2000
		15	500	1200, 2000
			750	1200, 2000
			1000	1200, 2000, 3000
	DHP	5	350	1200, 2000
		7.5	500	1200, 2000
		15	500	1200, 2000
			750, 750C	1200, 2000
			1000	1200, 2000
ITE	HV	5	100	600, 1200
			150	600, 1200
			250	600, 1200
	HK	7.5	500	1200, 2000
		15	500	1200, 2000
			750	1200, 2000
			1000	1200, 2000
Federal Pacific	DST2	5	250	1200, 2000
		7.5	500	1200, 2000
		15	500	1200, 2000
			750	1200, 2000
	MOP	27	1000	1200
McGraw Edison	PSD	15	501	1200
			502	2000
			751	1200



In addition to eliminating the need for arc flash suits during racking, SARRACS also streamlines the procedure. First, the unit is positioned and secured. Then, the operator connects the breaker's racking mechanism to SARRACS' Racking Adaptor.



With the Operator's Station in hand, the operator moves to a location safely beyond the flash zone. The object, switchgear and breaker are selected on the touch screen. Next, the starting position is input and the racking operation initiated.



As the breaker is being racked, the operator receives precise real-time location and movement readings. Should a problem occur, fault-indicating screens are displayed, and the racking process is terminated immediately.

SARRACS™ (Safety Remote Breaker Racking System) provides increased protection for your most important assets – your personnel and your equipment

Traditionally, breaker racking on an energized system required that operators work within the arc flash boundary, at risk from intense heat, percussion forces and airborne debris should a fault explosion occur. This led OSHA to establish the current standard that requires personnel to wear full-body flash suits while performing racking procedures within the flash boundary.

Now, with SARRACS, the operator can be positioned safely outside the arc flash boundary while racking any manufacturer's breaker in or out of a live bus – eliminating the need for flash suits. In addition, the advanced technologies Siemens incorporated into SARRACS make racking more efficient, while limiting the potential for damage to electrical equipment during the procedure.

Maximize safety

Via the touch screen on the portable Operator's Station, racking procedures can be controlled from a distance of up to 75 feet.

Streamlining the process improves racking efficiency, reduces downtime

SARRACS shortens breaker racking times by as much as 50% over traditional techniques. In addition, it allows expenses for related safety equipment, including flash suits, to be kept to a minimum.

Siemens components deliver Siemens reliability

SARRACS uses a three-phase gear motor to provide the power needed for racking and a digital encoder for precise position control and sensing. An AC variable-frequency drive operates all speed adjustments, over current limits and ramp functions.

Unmatched control capabilities

The advanced Siemens SIMATIC S7-200 PLC provides the control required to limit damage to the breaker or cell that can be caused by equipment misalignment and jamming. This allows for:

- Precise position tracking and movement monitoring to .001"
- Accurate detection of breaker positions requiring high or low torque

Total flexibility – one unit can take on any breaker

- Simply adjust the elevation of the motor carriage to align the gear motor assembly to the racking mechanism on any manufacturer's breaker
- Profile Torque Protection technology uses the PLC to generate a distinct torque vs. position record for each individual breaker in a lineup. These torque profiles are stored in PLC memory using the Operator's Station and can be easily updated anytime a breaker is being racked.

Easily transport and store this robust yet compact unit

With ball bearing wheels, casters and a transport handle, this lightweight unit (200 lbs.) is easily maneuvered in confined spaces.

Get your operators up to speed in the shortest possible time

Either at your facility or at one of our training centers, Siemens can provide professional training to ensure safe and efficient SARRACS operation.

Field Services

Start-up Commissioning Services

General

We realize that, even though our Totally Integrated Automation® and Totally Integrated Power® products are designed for quick and easy installation, your schedule may not allow you to allocate the resources and personnel necessary to get this equipment up and running when it is required.

In today's business environment, staff members are frequently overloaded, or they may be dedicated to other projects. Now, when you purchase new equipment from Siemens, you can add startup services at special rates. This will give you the additional help required to meet even the most pressing deadlines... at affordable rates. You can be confident that we will arrive at your door with the installation experience necessary to get your new general purpose drives, motor control center or switchgear properly started up and working when you need it.

Factory-trained engineers will:

- Startup your newly-purchased Siemens equipment
- Test for operational functionality
- Provide a written report detailing tests and services
- Advise your team on upkeep and maintenance.

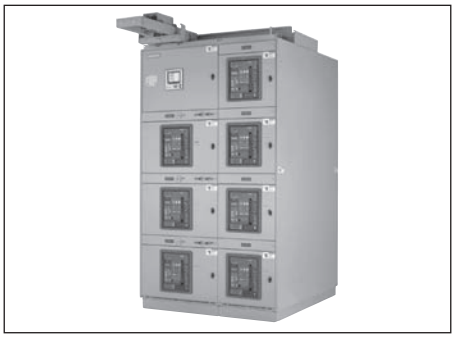
In many cases, you will receive a one-year parts warranty extension on your new equipment such as:

- Motor control centers
- General purpose variable speed drives
- Low voltage switchgear.



Medium Voltage Switchgear Startup Service

- Inspect anchorage, alignment and grounding
- Check tightness of bolted bus joints
- Measure and record critical distances such as contact gap
- Perform mechanical operation tests on the operating mechanism
- Perform a contact resistance test on the breaker vacuum contacts
- Perform insulation resistance tests
- Perform vacuum interrupter integrity (over-potential) tests
- Perform insulation resistance test on all control wiring at 1000 volts DC
- Verify trip, close, trip-free and anti-pump functions
- More



Low Voltage Switchgear Startup Service

- Perform mechanical operational test
- Check cell fit and element alignment
- Check tightness of connections
- Lubricate as required
- Perform a contact resistance test
- Perform an insulation resistance test at 1000 volts DC from pole-to-pole and from each pole-to-ground with breaker closed and across open contacts of each phase
- Perform secondary current injection testing
- More



Switchboards and Power Switching Centers

- Inspect for physical damage and nameplate compliance with single line diagram
- Perform mechanical operational test. (circuit breakers, switches, etc.)
- Check cell fit and element alignment
- Check tightness of connections and lubricate
- Perform a contact resistance test on RL/WL/SB breakers and power switches
- Perform an insulation resistance test at 1000 volts DC from pole-to-pole and from each pole-to-ground with breaker or switch closed and across open contacts of each phase
- Perform Secondary Current Injection Testing (RL/WL/SB breakers)
- More

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Field Services

Start-up Commissioning Services

General



Motor Control Center Startup Service

- Ensure that all protective devices have been properly set and locked
- Review power fuse selection and installation procedures
- Conduct a general physical inspection of MCC power and control connections. Check tightness of connections
- Ensure incoming line power connections comply with UL/NEC requirements where applicable
- Ensure that any special motor starting and running applications have been considered when selecting motor starter controls, and that main metering is functioning properly
- Perform startup on drives, solid state/ soft-start starters and other equipment
- More

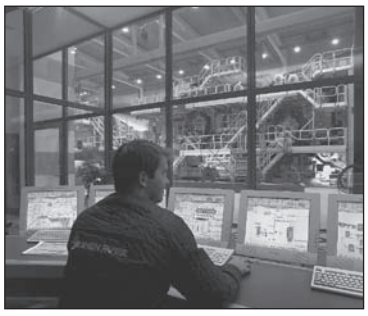


General Purpose Variable Speed Drives Startup Service

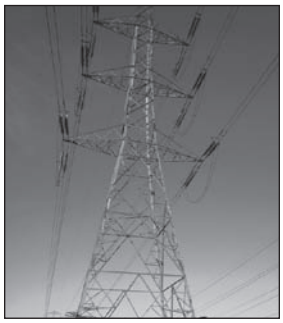
- Inspect electrical and mechanical parts after installation and wiring (per drawings)
- Make final adjustments such as speed range, acceleration/deceleration and tuning to motor
- Check starting, stopping, interlocking and sequencing (per drawings)
- Check and adjust for purchased options such as bypass, braking, serial communications, encoder interface, and line filters
- Verify power quality (MM440 units only)
- More

Engineer-by-the-Day for new equipment purchases





*Minimum purchase required. Extended warranty not vailable with Engineer-by-the-Day service.



Now, you can take advantage of the expertise of a Siemens factory-trained engineer to startup your Siemens power distribution and control equipment purchases.

Engineer-by-the-Day is available in complete one-day increments for setup of the following products*:

- ACCESS power monitoring
- Busway
- Dry type transformers
- Insulated case circuit breakers
- Molded case circuit breakers
- Panelboards
- Sensitrip circuit breakers
- Switchboards
- Switches
- More

Siemens Industry is committed to ensuring that your equipment is up and running...when you need it. Siemens Industrial Services provides expert factoryauthorized equipment startup at a special rate when you purchase the service before your product is delivered.

Get your equipment up and running on time. Contact your local distributor or Siemens Industry sales office to learn more.

Power System Studies



Short Circuit Study

Power system specialists from Siemens will determine the maximum duty that your system's protective devices, transformers, and interconnections will be subjected to in the event of three phase and/or line-to-ground fault conditions. In addition, we will provide basic information required to establish protective relay settings.

Coordination Study

Under fault conditions, systems should isolate the faulted area to minimize disturbance to the remaining system, and simultaneously limit damage to equipment. We will review the characteristics of your protective devices, then provide the settings necessary to ensure that your system functions optimally should a fault occur.

Harmonic Analysis

As AC drives have become increasingly prevalent in industry, we have seen the introduction of destructive harmonics to many systems. The power quality experts from Siemens will determine the extent and severity of harmonics in your system, then recommend the appropriate means of limiting potential damage.

Transient Stability Study

This study is particularly valuable for facilities that generate their own power, and those with very large motors. Our power system specialists will study the transient response of rotating equipment following system disturbances, and analyze system behavior in relation to the power company tie.

Protective Device Evaluation

With the objective of achieving optimum protection, we will perform the necessary calculations required to select the interrupting rating of power fuses, circuit breakers, and other protective devices.

Power Quality Assessment

With the proliferation of sensitive electronic equipment in recent years, power quality has become a major concern for industry. We perform structured, step-by-step studies with timely diagnosis and expert solutions to the complex challenges of utility and end-user power quality issues.

Arc Flash Study

NFPA 70E recommends that an Arc Flash Hazard Analysis be performed prior to work on electrical equipment. Siemens will determine the incident energy levels, Arc Flash Boundary (AFB), and required level of Personal Protective Equipment (PPE).

Load Flow Study

This steady-state analysis of your system's capability to supply the connected load will produce a listing of real and reactive power flow in each line or branch, and the bus voltages, under both normal and abnormal system conditions.

Voltage Unbalance Study

Voltage flicker and poor voltage regulation are a common concern on systems with large arc furnaces. The experts from Siemens use this study to develop comprehensive solutions that limit the effects of voltage irregularities and protect sensitive equipment.

Grounding Study

With the goal of ensuring proper protection and reducing the possibility of excessive transient overvoltages during line-to-ground faults, our engineers will determine and recommend the most appropriate form of system grounding protection (including solidstate, low resistance, and high resistance).

With power system expertise and experience that comes from real-world successes, the specialized team of professional engineers and certified technicians from Siemens will help you:

- Minimize downtime
- Improve the safety of your operations for employees and sub-contractors
- Optimize your system's performance
- Extend your equipment's life cycle
- Reallocate your valuable internal maintenance resources to your core business
- Maximize the protection of sensitive electronics
- Ensure your facility complies with applicable safety regulations

In addition, the power system specialists from Siemens also provide the following:

Power System Studies on "Equipment Release for Manufacture"

- To ensure adequate interrupting rating, and to ensure that coordination capabilities are recognized

Streamlined Power System Construction Studies (PSCS)

- For devices being installed on construction projects

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.



Arc Flash Hazards

In the fraction of a second that it takes copper to expand to vapor, an arc flash can generate skin-searing heat — four times hotter than the surface of the sun.

Recent revisions to NFPA70E require that an Arc Flash Hazard Analysis be performed prior to working on or near electrical equipment containing exposed energized conductors. The analysis determines the arc flash boundaries (AFB), incident energy levels and the required level of personal protective equipment (PPE). The recommendations in the analysis can be used to determine hazards in your workplace. Implementing the recommendations will help protect your workers and help you satisfy OSHA requirements.

The Siemens solution to minimize risks from arc flash hazards

Working within NFPA and IEEE guidelines, our experienced power systems engineers will perform systematic and accurate Arc Flash Hazard Studies as follows:

1. Short Circuit Calculations
   Siemens will either use your data, or make calculations for you, to identify bolted and arcing fault levels at key points in a power distribution system.
2. Protective Device Coordination
   Using the customer's electrical systems coordination study, Siemens determines the duration of the arcing faults.
3. Arc Flash Hazard Calculations
   The incident energy level, the flash hazard boundary, and the PPE required are then calculated for each location.
4. Documentation
   The information above is compiled for you into a comprehensive report, which contains information necessary to comply with regulatory requirements.
5. Unsafe Work Locations
   The report will identify work locations having incident energy levels in excess of available PPE ratings.
6. Arc Flash Hazard Mitigation
   Recommendations will be made to minimize Arc Flash Hazards by changes in system protection or operational procedures.
7. Arc Flash Hazard Labels
   In addition to the report, our customers will receive a field label containing the flash hazard boundary distance, incident energy level, PPE category and shock hazard for each location.

Implementing recommendations from a Siemens Arc Flash Hazard Study can bring you the following benefits:

- Improve employee safety
- Improve your electrical system
- Provide safety information to subcontractors
- Assist in compliance with regulations
- Provide you with documentation that may bring about reductions in workers compensation and insurance rates

Turn to Siemens for Arc Flash Hazard Studies, comprehensive safety training and other related services that will enhance the safety of your personnel and the reliability of your operation.

SARRACS — Complete arc flash protection for switchgear racking.

After completion of your Arc Flash Hazard Study and Equipment Labeling efforts, why not consider another aspect to your personnel safety initiatives? Why not consider Siemens' SARRACS remote circuit breaker racking system? Racking medium voltage circuit breakers (>1000V) into and out of a live bus is one instance where the PPE required may not be adequate to protect personnel from arc flash. Siemens SARRACS effectively removes the operator from the arc flash boundary by allowing for remote installation or removal. In addition, SARRACS provides torque monitoring to detect improper breaker connection.

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Secondary Unit Substations

Overview

General

Siemens offers a wide variety of unit substation designs to meet customer requirements. A unit substation consists of one or more transformers mechanically and electrically connected to and coordinated in design with one or more switchgear or switchboard assemblies. A secondary unit substation is defined as a unit substation whose outgoing section is rated below 1000 volts.

A typical secondary unit substation consists of three sections:

- Primary: an incoming section that accepts incoming high voltage (2400 to 13,800 volts) line
- Transformer: section that transforms incoming voltage down to utilization voltage (600 volts or less)
- Secondary: an outgoing section that distributes power to outgoing feeders and provides protection for these feeders (600 volts and less)

Standard secondary unit substations consist of:

- Medium Voltage Primary
- Transformer
- Low Voltage Secondary

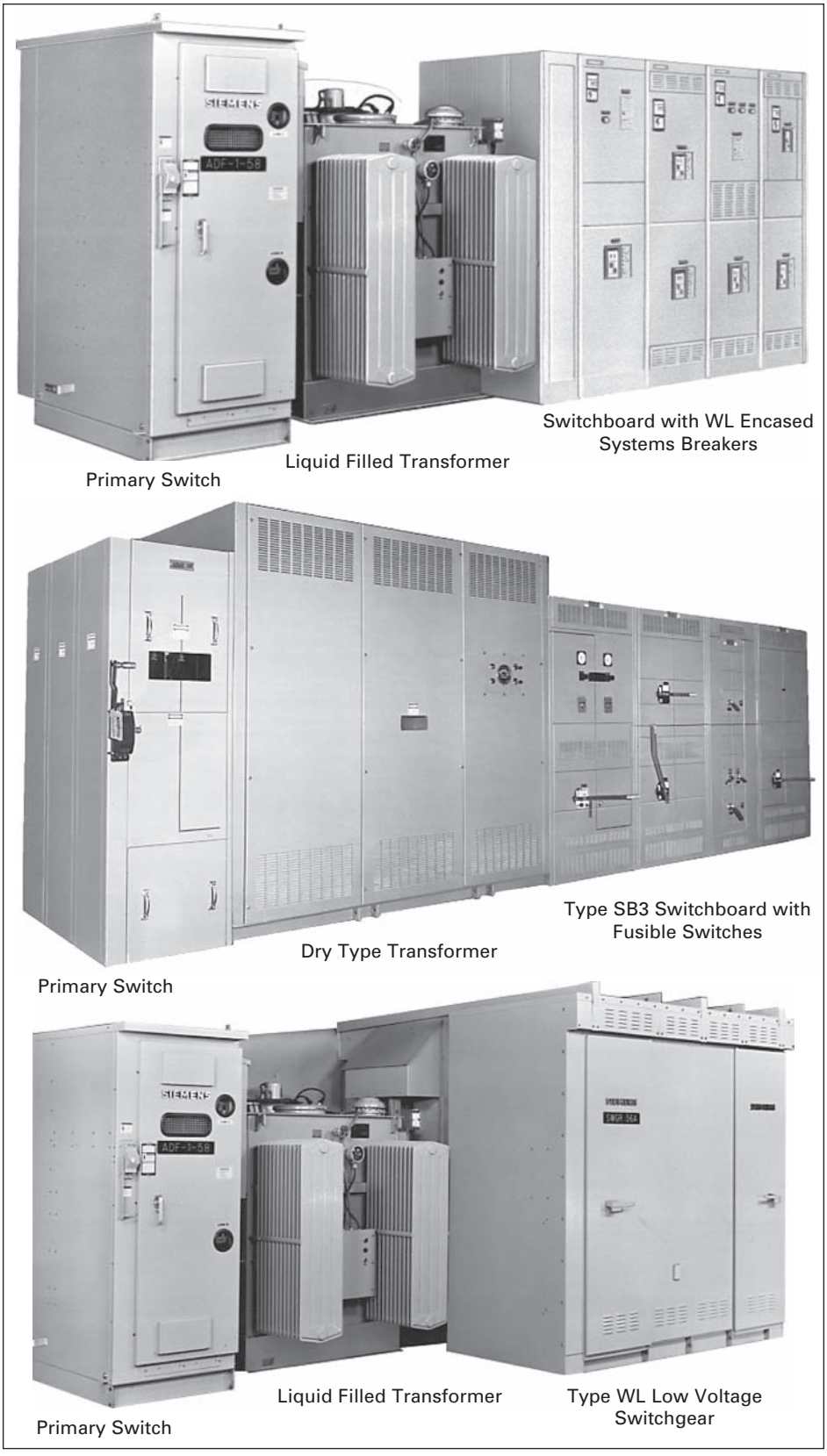
Siemens also offers low voltage unit substations with:

- Low Voltage Primary
- Transformer
- Low Voltage Secondary

The primary reason for using a secondary unit substation is to bring power as close as possible to the center of the loads. Another reason is that it provides a system design concept incorporating a wide variety of components that permits tailoring equipment to the needs of the application. A secondary unit substation provides

- Reduced power losses
- Better voltage regulation
- Improved service continuity
- Increased functional flexibility
- Lower installation cost
- Efficient space utilization

Every component and assembly of secondary unit substations are designed and engineered as an integral part of a complete system.



For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Siemens Unit Substation Solutions

5–27.6 kV Type SIMOSEC Metal-Enclosed Load Interrupter Primary Switch

SIMOSEC Specifications

- Extremely compact footprint
- Meets ANSI/IEEE C37.20.3
- UL or C-UL listing available
- Seismic compliant up to IBC 2003
- High switching capacity - 100 operations at 600A - five times higher than ANSI requirements
- Gas-insulated, three-position switch\ disconnector, hermetically sealed for life inside a stainless steel vessel
- Switch-disconnector combines the functions of a load-interrupter switch(with CLOSED-OPEN indication) and an optional grounding switch (with OPEN-GROUND indication)
- Front accessible fuses and outgoing cables, which means type SIMOSEC switches can be placed against the wall and maximize the use of available space
- Convenient viewing window for visible verification of primary contact position (visible break)
- Standard capacitive voltage indicators to show whether the cable side is energized or not
- Integrated mechanical interlocking
- Animated mimic diagram (mimic bus)
- Main bus at top or bottom to suit application
- Configurations: individual feeder switches, transformer primary switches and switch line-ups
- Ideal for utility, construction and industrial applications
- Over 20 years of field experience with more than 350,000 switch-disconnector units installed
- Switch-disconnector contacts maintenance free and sealed for life.
- Main bus continuous current rating" (row title) (blank 2nd column from left) and "1,200 A" in each of three columns on right



Dimensions

		 Cable switch CS	 Fused switch FS	 Duplex switch
Width	Single cable or fuse Three cables or double-barrel fuse Two cables + SA or 3-barrel fuse	14.8" (375 mm) 19.7" (500 mm) 29.6" (750 mm)	14.8" (375 mm) 19.7" (500 mm) 29.6" (750 mm)	 19.7" (500 mm) + 19.7" (500 mm) 29.6" (750 mm) + 19.7" (500 mm)
Depth		48.4" (1,230 mm)		
Height		88.6 - 100.4" (2,250 - 2,850 mm) depending on arrangement		

Technical Data

Rated voltage		5 kV	8.25 kV and 15 kV	27.6 kV
Rated frequency		50/60 Hz	50/60 Hz	50/60 Hz
Rated short-duration power-frequency withstand voltage		19 kV	36 kV	60 kV
Rated lightning-impulse withstand voltage (BIL)		60 kV	95 kV	125 kV
Rated short-time withstand current, two seconds		Up to 25 kA	Up to 25 kA	Up to 20 kA
Fused short-circuit current rating (FS panels only) Single fuse FS-1 Double fuse FS-2 Triple fuse FS-3		 63 kA (to 450E) 63 kA (to two 350E) 63 kA (to three 200E)	 63 kA (to 200E) 63 kA (to two 200E) 63 kA (to three 200E)	 20 kA 20 kA 20 kA
Maximum fused continuous current (not equal to fuse E rating)	Single fuse FS-1	325 A	165 A	65 A
	Double fuse FS-2	575 A	305 A	117 A
	Triple fuse FS-3	600 A	430 A	156 A
Switch disconnector	Continuous	600 A	600 A	600 A
	Interrupting	600 A	600 A	600 A
Main bus continuous current rating		1,200 A	1,200 A	1,200 A

High-voltage (HV) Fuse Selection Table

			Allowable continuous current (A)		
Maximum voltage (kV)	Fuse type	E -rating (open air)	FS-1①	FS-2②	FS-3③
5.5	55GDMSJ10ES	10E	10		
5.5	55GDMSJ15E	15E	15		
5.5	55GDMSJ20ES	20E	20		
5.5	55GDMSJ25ES	25E	25		
5.5	55GDMSJ30ES	30E	30		
5.5	55GDMSJ40ES	40E	40		
5.5	55GDMSJ50ES	50E	50		
5.5	55GDMSJ65ES	65E	65		
5.5	55GDMSJ80ES	80E	80		
5.5	55GDMSJ100ES	100E	100		
5.5	55GDMSJ125ES	125E	120		
5.5	55GFMSJ150ES	150E	150		
5.5	55GFMSJ175ES	175E	164		
5.5	55GFMSJ200ES	200E	183	327	
5.5	55GFMSJ250ES	250E	220	390	
5.5	55GFMSJ300ES	300E	241	429	598
5.5	55GFMSJ350ES	350E	269	478	600
5.5	55GFMSJ400ES	400E	302	536	600
5.5	55GFMSJ450ES	450E	325	575	600
17.5	175GDMSJ10ES	10E	10		
17.5	175GDMSJ15ES	15E	15		
17.5	175GDMSJ20ES	20E	20		
17.5	175GDMSJ25ES	25E	25		
17.5	175GDMSJ30ES	30E	30		
17.5	175GFMSJ40ES	40E	40		
17.5	175GFMSJ50ES	50E	50		
17.5	175GFMSJ65ES	65E	59		
17.5	175GXMSJ80ES	80E	73		
17.5	175GXMSJ100ES	100E	85		
17.5	175GXQSJ125ES	125E	112	207	
17.5	175GXQSJ150ES	150E	123	238	336
15.5	155GXQSJ175ES	175E	167	310	420
15.5	155GXQSJ200ES	200E	165	305	430

Example:

- 5,000 kVA, 12.47 kV transformer
- Full-load current 231.5 A
- Multiplier 1.33
- Current for fuse-size selection = 1.33 x 231.5 A - 308 A
- Multiplier of 1.33 for transformer with fan-cooled rating 125% of self-cooled rating (adjust multiplier for differing fan-cooled transformer capability)
- Fuse rating = 2 x 175E/phase (FS-2).

① FS-1: One fuse barrel per phase
② FS-2: Two fuse barrels per phase
③ FS-3: Three fuse barrels per phase

Siemens Unit Substation Solutions

Overview

Siemens offers a wide variety of unit substation designs to meet virtually any customer requirement. A unit substation consists of one or more transformers mechanically and electrically connected to, and coordinated with, one or more switchgear or switchboard assemblies. A secondary unit substation is defined as a unit substation whose outgoing section is rated below 1,000 volts.

A typical secondary unit substation consists of three sections:

- **Primary**: depending on the specific application, this section accepts medium voltage (2,400 to 27,600 volts) incoming power
- **Transformer**: reduces incoming voltage to utilization voltage (600 volts or less)
- **Secondary**: distributes power to, and provides protection for, outgoing feeders (600 volts and less).

The key benefit of a secondary unit substation is that it economically brings power as close as possible to the loads, minimizing power loss and maximizing voltage regulation. It also enhances flexibility, using a system design concept that integrates a wide variety of components to tailor the equipment to the specific needs of each application.

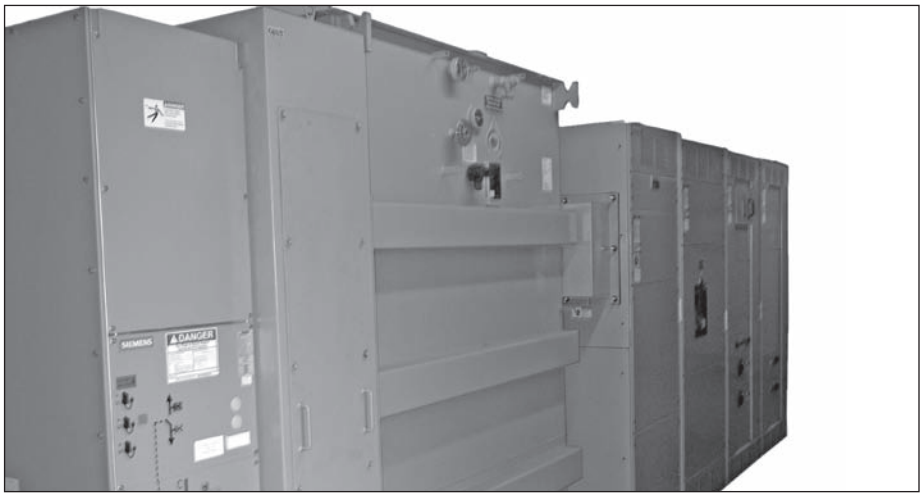
Every component or assembly utilized in secondary unit substations is engineered to be an integral part of a complete system.

A secondary unit substation helps you:

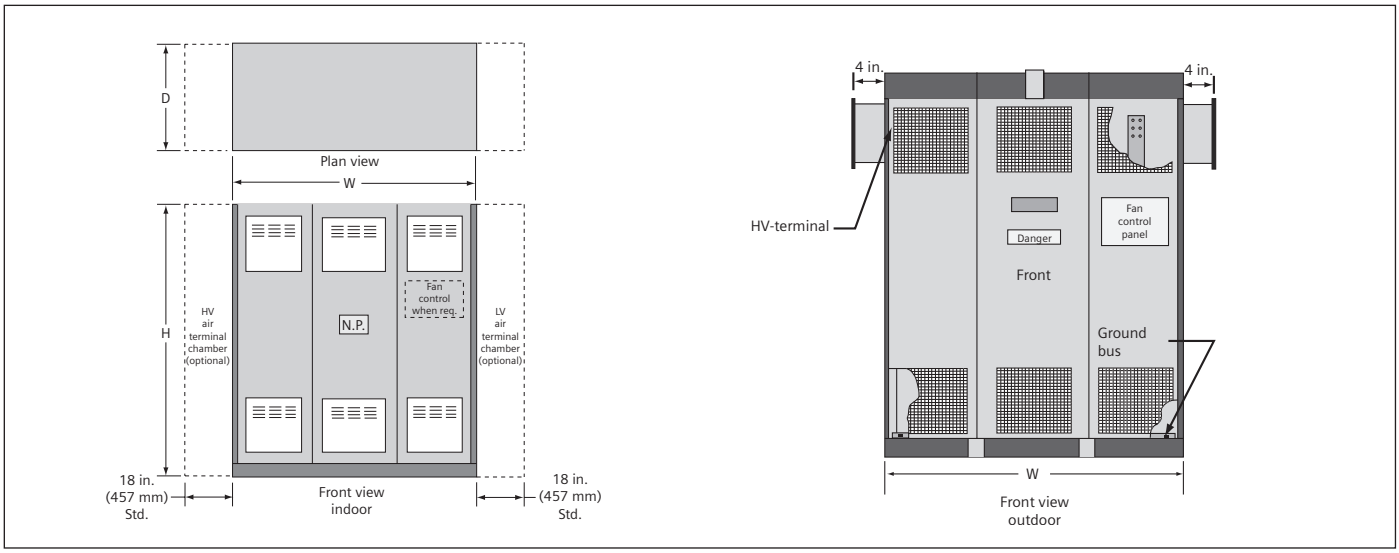
- Reduce power losses
- Enhance voltage regulation
- Improve service continuity
- Increase functional flexibility
- Lower installation costs
- Minimize space utilization.



SIMOSEC Primary Switch **Dry-Type Transformer** **Type SB3 Switchboard**



SIMOSEC Primary Switch **Liquid Filled Type Transformer** **Type SB3 Switchboard**



Type = VPI/VPE
Primary Volts = 2400-13800
Sec_Volts = 208-600
Temperature Rise = 150C for Aluminum Windings, 80/115C for Copper Windings
Standard kV BIL (HV/LV) = 60/30 for Aluminum Windings, 95/30 for Copper Windings

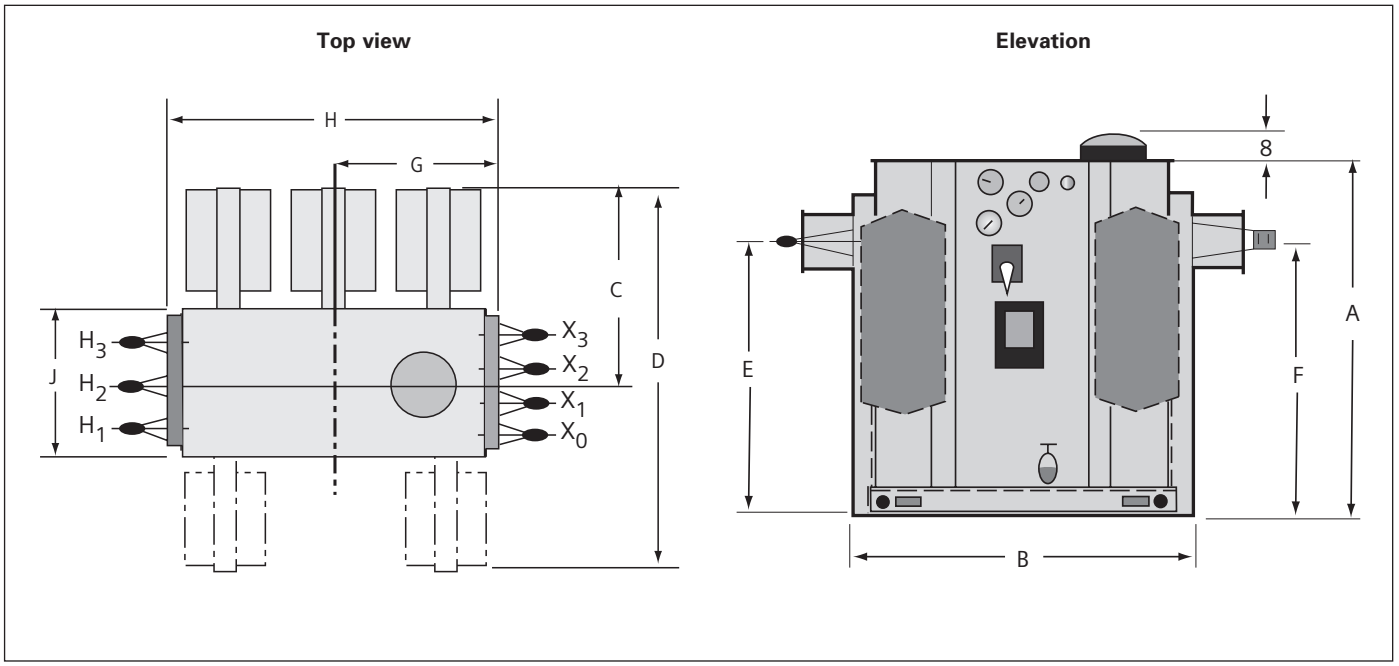
Table 1 Low Voltage Switchgear or Switchboard Coordination

Winding Material	KVA	Height (Inches)	Width (Inches)	Depth (Inches)	Weight (Pounds)
Aluminum	300	90	90	54	4600
Aluminum	500	90	90	54	4800
Aluminum	750	90	90	54	5800
Aluminum	1000	90	102	60	7000
Aluminum	1500	96	102	60	9200
Aluminum	2000	102	102	60	11000
Aluminum	2500	108	112	60	12200
Aluminum	3000	108	118	60	14100
Aluminum	3750	112	126	66	15800
Aluminum	5000	118	132	66	17000
Copper	300	90	90	54	6000
Copper	500	90	96	60	6400
Copper	750	90	102	60	8000
Copper	1000	96	102	60	9700
Copper	1500	102	108	60	13200
Copper	2000	108	112	60	17400
Copper	2500	118	126	60	19000
Copper	3000	118	132	60	22000
Copper	3750	126	132	66	27000
Copper	5000	132	138	66	30000

Type = Cast Coil
Primary Volts = 2400-13800
Sec_Volts = 208-600
Temperature Rise = 80/115C for Both Aluminum & Copper Windings
Standard kV BIL (HV/LV) = 60/30 for Aluminum Windings, 95/30 for Copper Windings

Table 2 Low Voltage Switchgear or Switchboard Coordination

Winding Material	KVA	Height (Inches)	Width (Inches)	Depth (Inches)	Weight (Pounds)
Aluminum	300	90	90	54	5500
Aluminum	500	90	90	54	6300
Aluminum	750	90	96	60	7800
Aluminum	1000	96	102	60	9500
Aluminum	1500	102	108	60	11500
Aluminum	2000	108	112	60	13800
Aluminum	2500	112	126	60	16200
Aluminum	3000	118	132	60	19200
Aluminum	3750	126	138	66	25000
Aluminum	5000	132	144	66	28000
Copper	300	90	90	60	6200
Copper	500	90	96	60	7000
Copper	750	90	102	60	9100
Copper	1000	96	112	60	10600
Copper	1500	102	118	60	14300
Copper	2000	108	118	66	18200
Copper	2500	118	126	66	19500
Copper	3000	126	132	66	23500
Copper	3750	126	144	66	28000
Copper	5000	132	160	66	35000



Unit Type Substation Transformer

Primary Volts = 25kV and below, Secondary Voltage = 5kV and below

Table 3 Liquid-Filled 55/65 °C Rise

	Drawing Dimensions (in.)									Aluminum Windings		Copper Windings	
kVA	A	B	C	D	E	F	G	H	J	Gallons Of Fluid	Approx. Total Weight (lbs.) (With Fluid)	Gallons Of Fluid	Approx. Total Weight (lbs.) (With Fluid)
500	66	51	26	52	45	45	30	60	35	300	5600	310	5900
750	75	59	26	52	55	55	34	68	35	360	7000	370	7400
1000	75	67	26	52	55	55	38	76	35	420	8400	430	8800
1500	75	59	59	80	55	55	34	68	35	400	9500	420	10000
2000	85	67	67	90	55	55	38	76	39	520	12000	500	12800
2500	85	75	68	92	55	55	42	84	41	570	14600	590	14900
3750	85	75	70	120	65	65	42	84	45	790	20500	830	21500
5000	99	87	72	144	65	65	48	96	49	1050	26000	1090	28000
7500	99	95	74	148	75	75	52	104	53	1320	35000	1360	37000
10,000	99	103	76	152	75	75	56	112	57	1740	43000	1780	45000
12,000	99	103	82	164	75	75	56	112	61	1850	49000	1880	50000

Weights, gallons of fluid and dimensions are for reference only, and not for construction.
Please contact Siemens Industry Inc. for exact dimensions

Siemens Unit Substation Solutions

Type WL Low Voltage Switchgear Substation Secondaries

Siemens type WL low-voltage, metal-enclosed switchgear is designed, constructed and tested to provide superior power distribution, power monitoring and control. At the heart of the type WL low voltage switchgear is the world class Siemens type WL breaker. Siemens type WL low-voltage switchgear can be utilized in the following applications:

- Industrial
- Institutional
- Critical power
- Utility and co-generation
- Commercial.



Product Scope

- Equipment ratings:
  - 635 Vac maximum
  - Three-phase, three-wire
  - Three-phase, four-wire
  - 50/60 Hz
  - 6,000 A maximum horizontal bus
  - 5,000 A maximum vertical bus.
- Enclosure options:
  - NEMA 1 indoor
  - NEMA 3R outdoor walk-in
  - NEMA 3R outdoor non walk-in.

Exclusive features

Generator/utility protection sets 24/7/365 power availability is critical for some systems. On-site generation capabilities are becoming more and more common. Type WL digital electronic trip units allow the system designer to precisely tailor trip settings for the most demanding requirements.

The Siemens type WL 776 trip unit allows one set of trip settings for a fully loaded utility feed and, with a simple contact closure, the trip unit toggles to a second trip set tailored to provide optimal generator protection. The wide range of settings allows the type WL to provide protection for a minimal generator capacity for only essential loads, through full backup for an entire facility. This dual utility/generator protection capability in a single circuit breaker allows the system designer unparalleled, cost effective flexibility.

For more information, visit our web site at: www.usa.siemens.com/switchgear.

Extended instantaneous protection (EIP)

This patent pending type WL trip unit feature allows the system designer to achieve full selective trip coordination up to the short-time rating of the frame, while also allowing application of the circuit breaker up to the interrupting rating of the frame. EIP allows the type WL breaker to be applied up to the full withstand rating of the circuit breaker, for complete coordination, with a minus 0% short-time band tolerance up to 85 kA on Frame Size II and 100 kA on Frame Size III.

Above fault currents of 20-percent higher than the full short-time rating, the type WL circuit breaker is self-protecting, and the EIP function will trip the circuit breaker instantly to protect the frame and the system from these extremely high currents (as high as 150 kA on Frame Size III). An added benefit is that arc flash energy is greatly reduced in this high- current region due to EIP's instantaneous trip response.

Industry standards

Type WL switchgear with power circuit breakers are designed, tested and constructed in accordance with:

- UL 1558—Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
- ANSI C37.20.1—Metal-Enclosed Low- Voltage Power Circuit Breaker Switchgear.

Type WL drawout circuit breakers are designed for continuous operation at 100-percent of their current rating without the need for external heat sinks, and are in accordance with:

- UL 1066—Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
- ANSI C37.13—Low-Voltage AC Power Circuit Breakers Used in Enclosures.

Switchgear Secondary

Note: See Pages 14-52 to 14-61 for complete details concerning WL Low Voltage Switchgear unit substation secondaries.

Siemens Unit Substation Solutions

Switchboard Substation Secondaries



Product Overview

Siemens modular front connected switchboard design provides a broad range of features and capabilities for a wide range of applications.

Every aspect of design of Siemens switchboards has been aimed at improving layout convenience, reducing installation costs and minimizing the impact and cost of changes to the system.

Siemens switchboards provide a rugged design and the flexibility necessary in electrical systems for all types of applications, some examples are:

- Industrial plants
- High-rise complexes
- Hospitals
- Commercial buildings

Standards and Certifications

Siemens switchboards are designed, tested and constructed in accordance with:

- UL891 – Switchboards
- NEMA PB-2
- Seismially qualified
- Other equipment is UL listed as applicable

Features & Benefits

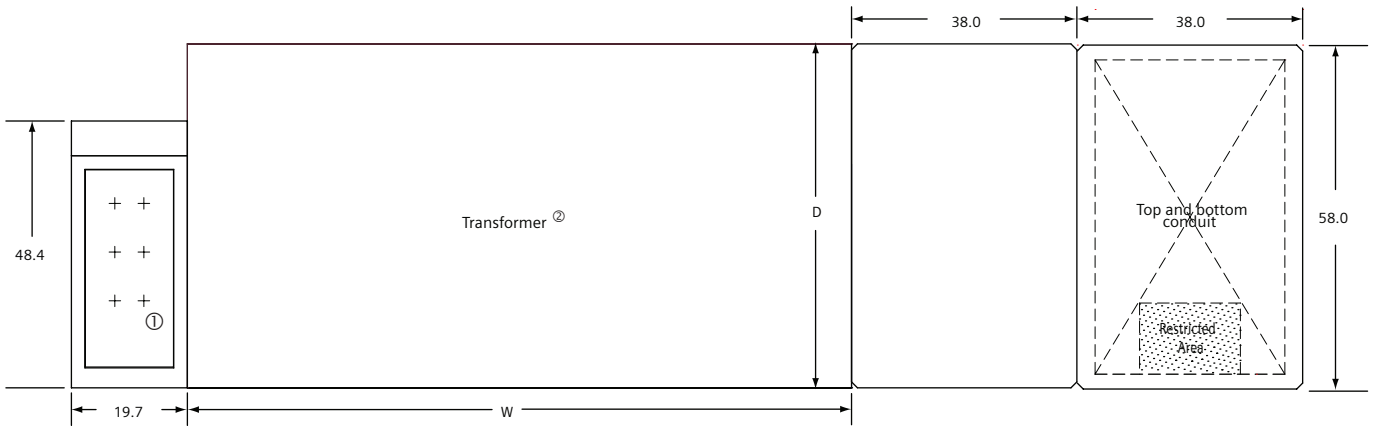
Siemens switchboards ratings and features include:

- Up to 6000 ampere main bus rating
- Up to 600 volts AC
- Bus bracing up to 200KAIC
- Copper or aluminum bussing
- Temperature or density rated bussing
- Type 1 and Type 3R enclosures
- Main and branch circuit breakers and fusible switches
- Thermal magnetic and solid state circuit breakers
- Surge protective devices
- Utility metering provisions
- ACCESS power monitoring on mains and branches
- Ground fault protection on mains and branches
- Busway and transformer connections
- Protective relaying
- Two and three device autothrowover scheme

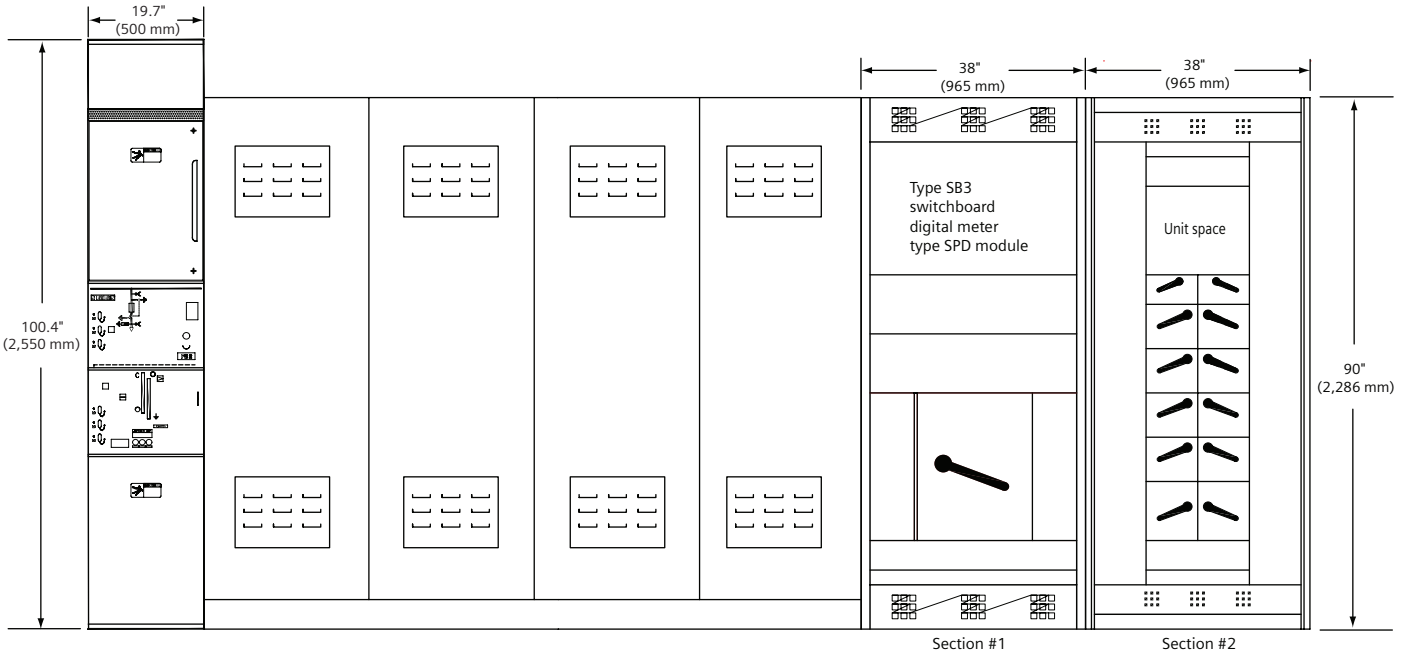
Further Switchboard Information

See Section 13 for complete details concerning SB3 front-connected switchboard unit substation secondaries.

Plan view



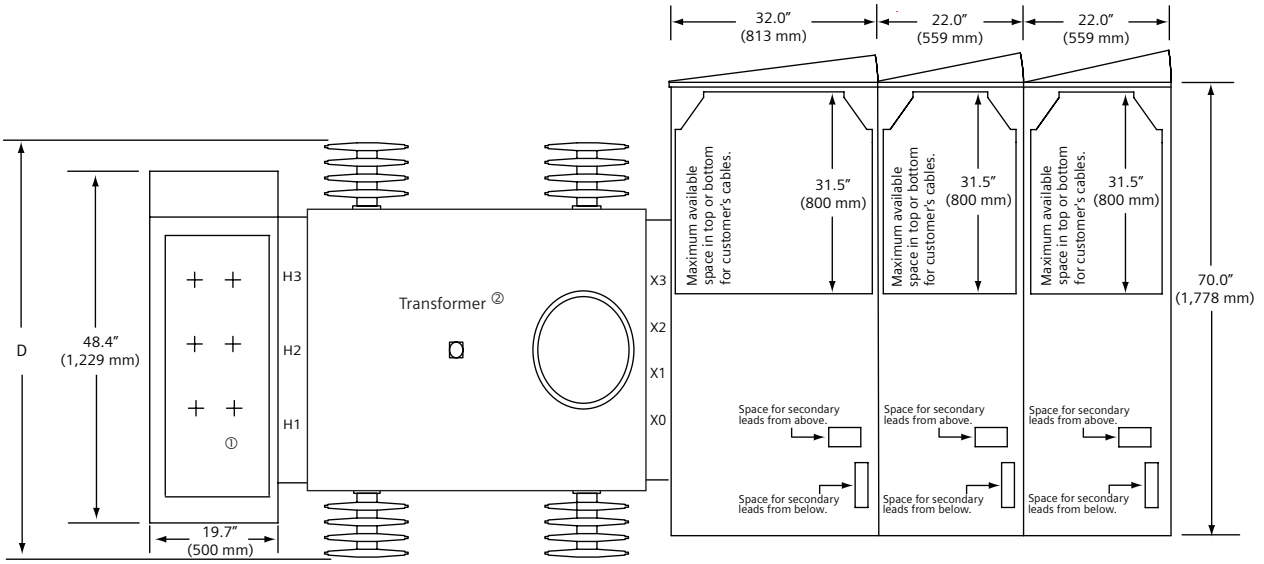
Front view



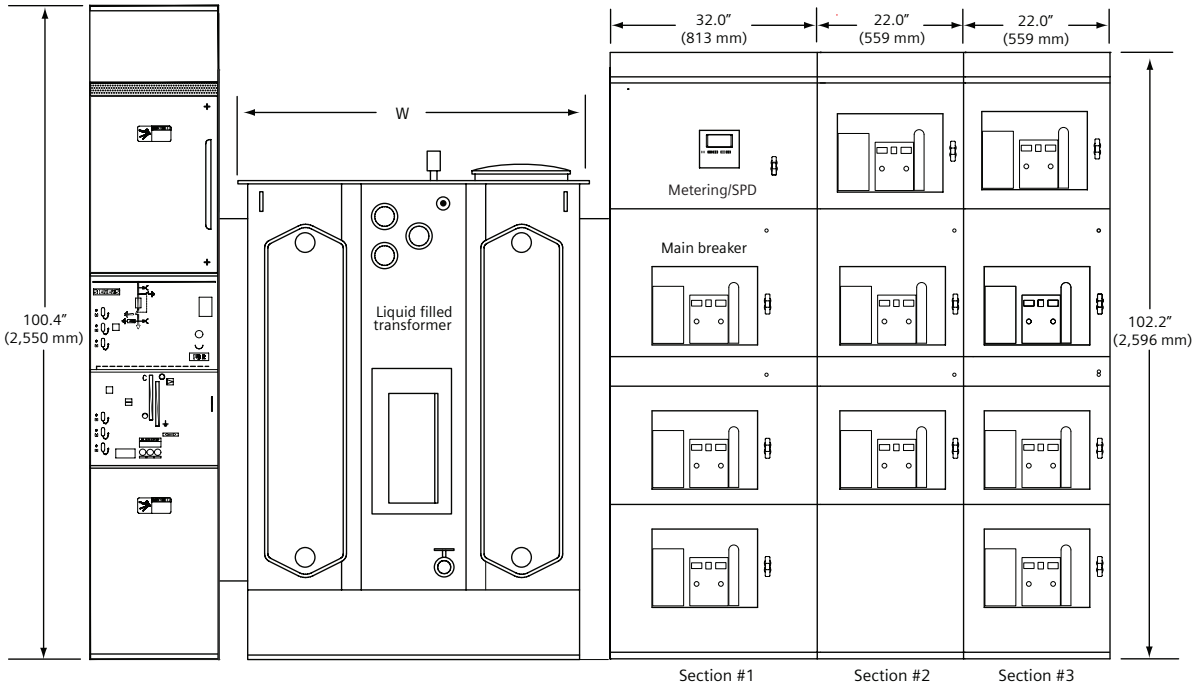
Primary Switch requires front access for top cable entry terminations.
Transformer requires access from the front and 12" (305 mm) on the back side for ventilation space.

Primary lug location
See page 5 for transformer dimensions.

Plan view



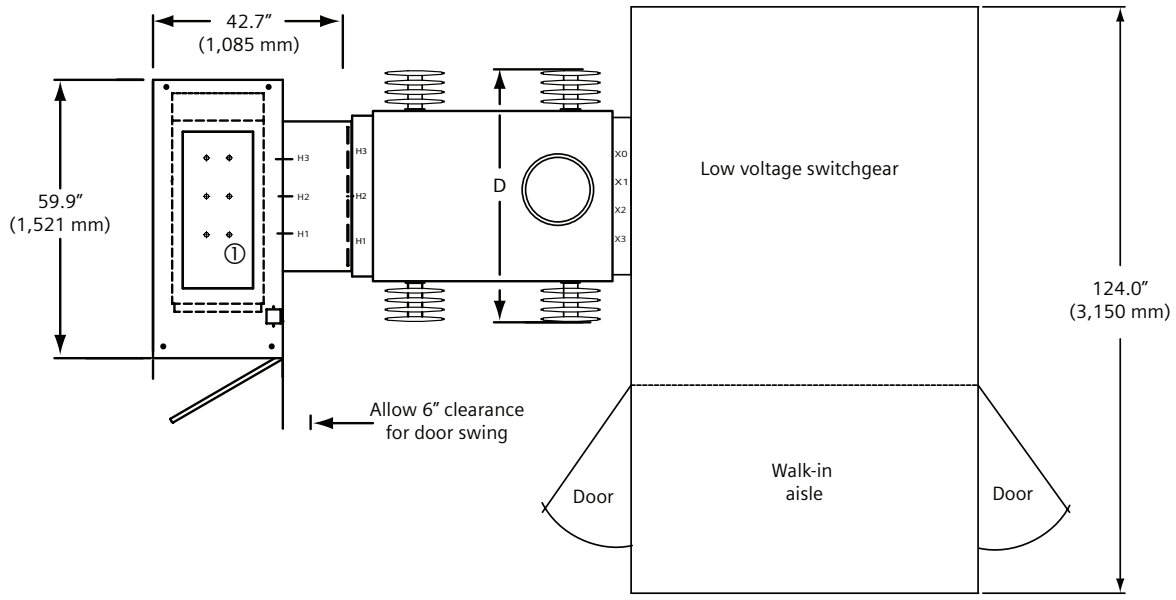
Front view



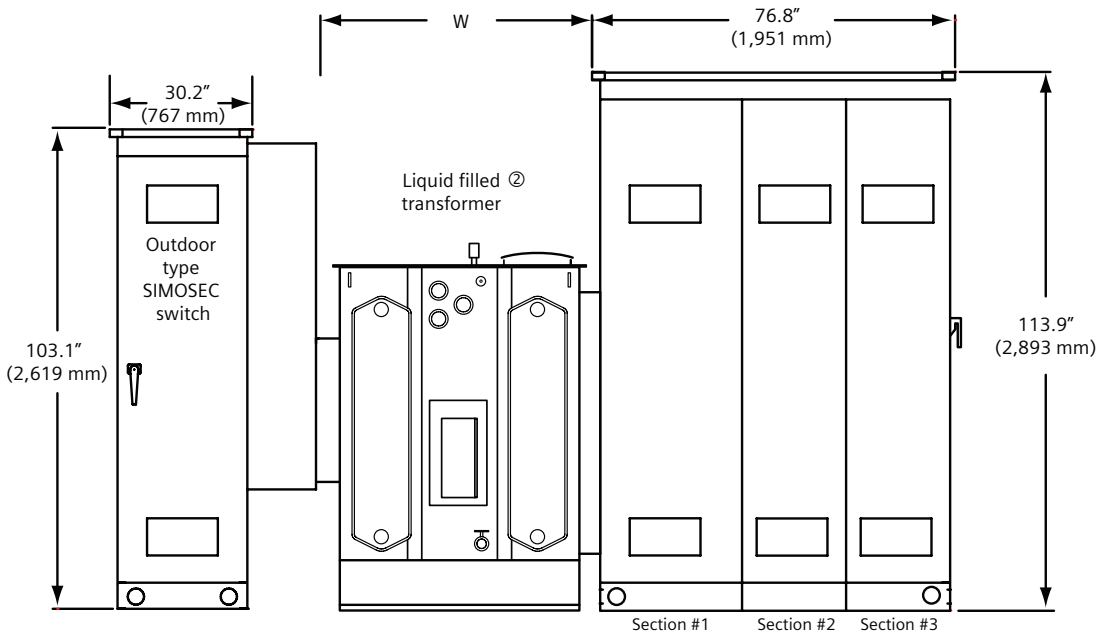
Primary Switch requires front access for top cable entry terminations.
Transformer requires access from the front and 12″ (305 mm) on the back side for ventilation space.

Primary lug locations.
See page 6 for transformer dimensions.

Plan view



Front view



Primary lug locations.
See page 6 for transformer dimensions.

Low Voltage Switchgear

Type WL Low Voltage Metal-Enclosed Switchgear

General

Siemens Type WL low voltage metal-enclosed switchgear is designed, constructed and tested to provide superior power distribution, power monitoring and control. At the heart of the Type WL low voltage switchgear is the World Class Siemens WL breaker.

Siemens Type WL low voltage switchgear can be utilized in the following applications:

- Industrial
- Institutional
- Critical Power
- Utility and co-generation
- Commercial



Type WL Low Voltage Metal-Enclosed Switchgear

Product Scope

- Equipment ratings
  635VAC Maximum
  3-Phase 3-Wire,
  3-Phase 4-Wire
  50/60 Hz
  6000 amp maximum horizontal bus
  5000 amp maximum vertical distribution bus
- Enclosure options
  NEMA 1 Indoor
  NEMA 3R Outdoor Walk-in
  NEMA 3R Outdoor Non Walk-in

Exclusive Features

Generator/Utility Protection Sets

24/7/365 power availability is critical for some systems. On-site generation capability is growing more and more common in many systems. All of the WL digital electronic trip units allow the system designer to precisely tailor trip settings for the most demanding requirements. However, the 776 trip unit allows one set of trip settings for a fully loaded utility feed and with a simple contact closure, the trip unit toggles to a second trip set tailored to provide optimal generator protection. The wide range of settings allows the WL to provide protection for a minimal generator capacity for only essential loads, through full backup for an entire facility. This dual utility/generator protection capability in a single circuit breaker allows the system designer unparalleled, costeffective flexibility.

Extended Instantaneous Protection

(EIP – Patent Pending Feature)

Another unique feature of the WL Trip Unit, allows the system designer to achieve full selective trip coordination up to the short-time rating of the frame, while also allowing application of the breaker up to the interrupting rating of the frame. EIP allows the WL breaker to be applied up to the full withstand rating of the breaker, for complete coordination, with a minus 0% short- time band tolerance up to 85kA on Frame Size II and 100kA on Frame Size III. Above fault currents of 20% higher than the full short-time rating, the WL breaker is self protecting, and the EIP function will trip the breaker instantly to protect the frame and the system from these extremely high currents, as high as 150 kA on Frame Size III. One added benefit is that arc flash energy is greatly reduced in this high current region due to the instantaneous trip response that EIP provides.

Industry Standards

Type WL switchgear with power circuit breakers are designed, tested and constructed in accordance with:

- UL 1558—Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear
- ANSI C37.20.1—Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear
- IEEE C37.20.7 - IEEE Guide for Testing Metal-Enclosed Switchgear Rated Up to 38KV for Internal Arcing Faults (Optional)

WL drawout circuit breakers are designed for continuous operation at 100% of their current rating without the need for external heat sinks, and are in accordance with:

- UL 1066—Low Voltage AC and DC Power Circuit Breakers Used in Enclosures
- ANSI C37.13—Low Voltage AC Power Circuit Breakers Used in Enclosures

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

WL Low Voltage Metal-Enclosed Switchgear Features & Benefits

- Control and communication termination area located in front of equipment and segregated from power cable termination area that is located in rear of equipment
- Front accessible vertical and horizontal wiring channels
- No heat sinks on breaker or bus
- No front-breaker door ventilation
- 100kA bus bracing standard - 150kA and 200kA optional
- Insulated/isolated bus through 6000 amps
- Three levels of horizontal bus through 5000 amps
- Modular design for maximum configuration flexibility
- Breaker racking handle integral to the breaker
- All breaker settings and displays clearly visible with breaker door closed
- Field installable "drop in place" accessories and trip units
- Same accessories work for entire breaker line
- ModBus, ProfiBus and Ethernet communication
- Field installable ground fault protection and zone selective interlock
- Rogowski coil current sensors provide high metering accuracy and prevent saturation at high current levels
- Dynamic Arc Flash Sentry (DAS) and EIP (Extended Instantaneous Protection) are patent pending features from Siemens that greatly reduce Arc Flash Energy
- Optional arc resistant metal-enclosed low voltage switchgear designed and tested to provide an additional degree of protection for personnel performing normal operating duties in proximity to the energized equipment.

Breaker Ratings

Frame Size II																		
Frame Rating		**800**					**1600**					**2000**				**3200**		
Rating Designation		**N**	**S**	**H**	**L**	**F**	**N**	**S**	**H**	**L**	**F**	**S**	**H**	**L**	**F**	**S**	**H**	**L**
Interrupting Current I_{cs}	254VAC	50	65	85	100	200	50	65	85	100	200	65	85	100	200	65	85	100
(kAIR RMS) 50/60 Hz	508VAC	50	65	85	100	200	50	65	85	100	200	65	85	100	200	65	85	100
	635VAC	50	65	65	85	200	50	65	65	85	200	65	65	85	200	65	65	85
Short-time Withstand Current I_{cw} (kA RMS) 50/60 Hz	0.5s	50	65	65	85	20	50	65	65	85	20	65	65	85	20	65	65	85
Extended Instantaneous Protection (kA RMS - 0% to 20+%)	285-508VAC	50	65	85	100	200	50	65	85	100	200	65	85	100	200	65	85	100
	635VAC	50	65	65	85	200	50	65	65	85	200	65	65	85	200	65	65	85
Close & Latch Ratings (kA RMS) 50/60 Hz		50	65	65	85	75	50	65	65	85	75	65	65	85	75	65	65	85
Rating Plug Range		200A to 800A					200A to 1600A					200A to 2000A				200A to 3200A		
Endurance Rating (switching operations with maintenance)[1]	Mech.	15,000					15,000					15,000				15,000		
	Elec.	15,000					15,000					15,000				15,000		

Frame Size III											
Frame Rating		**3200**		**4000**				**5000**			
Rating Designation		**M**	**F**	**H**	**L**	**M**	**F**	**H**	**L**	**M**	**F**
Interrupting Current I_{cs}	254VAC	150	200	85	100	150	200	85	100	150	200
(kAIR RMS) 50/60 Hz	508VAC	150	200	85	100	150	200	85	100	150	200
	635VAC	85	200	85	85	85	200	85	85	85	200
Short-time Withstand Current I_{cw} (kA RMS) 50/60 Hz	0.5s	100	40	85	100[2]	100	40	85	100[2]	100	40
Extended Instantaneous Protection (kA RMS - 0% to 20+%)	254VAC 508VAC	150	200	85	100	150	200	85	100	150	200
	635VAC	85	200	85	85	85	200	85	85	85	200
Close & Latch Ratings (kA RMS) 50/60 Hz		100	40	85	100[2]	100[2]	40	85	100[2]	100	40
Rating Plug Range		800A to 3200A		800A to 4000A				800A to 5000A			
Endurance Rating (switching operations with maintenance)[1]	Mech.	10,000		10,000				10,000			
	Elec.	10,000		10,000				10,000			

[1] Maintenance means: Replacing main contacts and arc chutes (see operating instructions). Main contacts in breakers with Rating Designation M can only be replaced by Siemens personnel.

[2] Do not apply breaker at 635V AC on a system with available fault current > 85kA RMS.

Main and Ground Bus
The standard main bus is silver-plated copper. Tin-plated copper bus is optionally available. Vertical and horizontal bus bar utilize a channel shape design to maximize short circuit withstand capability and minimize heat rise. All bus joints include Grade 5 bolts and conical spring washers. Provisions for future extension of the main bus include plated joints and high tensile strength steel hardware.

The main three phase horizontal bus is arranged vertically one phase above the other with edge-to-edge alignment to provide high, short circuit strength. Insulated main bus with isolated vertical bus is optional.

Vertical bus ratings available are 1600, 2000, 3200, 4000 and 5000 amperes continuous current. Horizontal bus ratings available are 1600, 2000, 3200, 4000, 5000 and 6000 amperes. A neutral bus is furnished when specified, and can be rated 1600, 2000, 3200, 4000, 5000 or 6000 amperes continuous current.

A standard copper ground bus extends through all sections. Cable lugs are mounted to the ground bus in each section.

Standard short-circuit withstand (4 cycle) and short-time withstand (60 cycle) bus bracing is 100,000 amperes. Higher short-circuit withstand bus bracings (150kA and 200kA) are available.

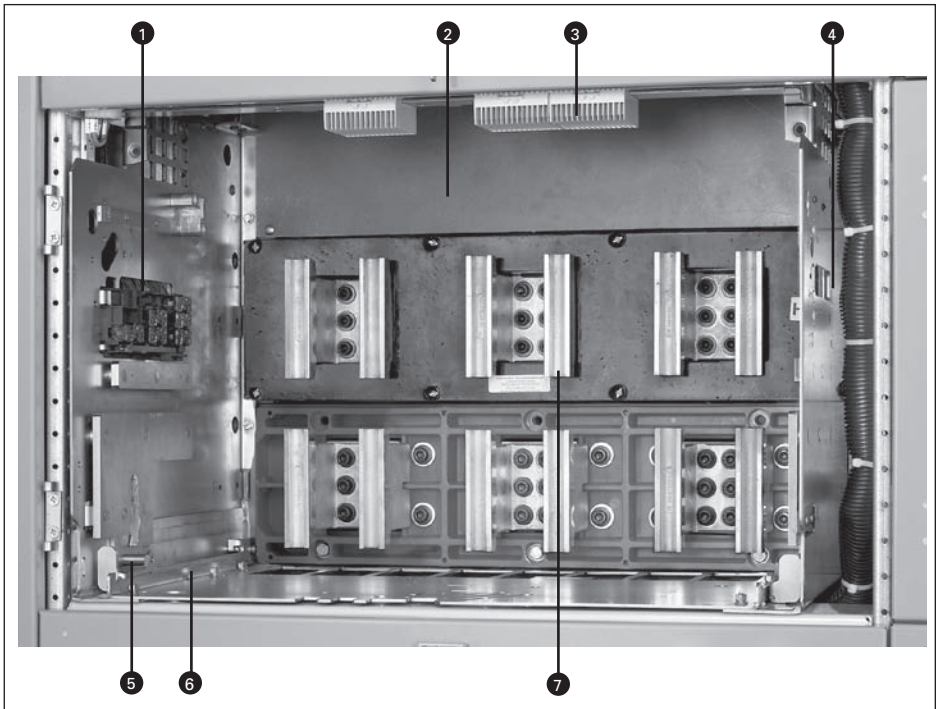
Load side runbacks for feeder circuits are copper construction, are insulated with sleeve tubing in the main bus area, and are supported by high-strength bus bracing.

Control and Communication Wiring
Standard control and communication wiring is #14 AWG extra-flexible, stranded copper type SIS. Terminations are made with compression-type, insulated terminals. Control and communication wiring is installed and accessed from the front of the switchgear structure. Each breaker compartment has a dedicated horizontal and vertical wireway.

For devices not having screw-type terminals, pressure terminals are used.

Insulation
The insulation used is a UL recognized thermoset material that has excellent heat resistance, flame retardance, dimensional stability and low moisture absorption.

Circuit Breaker Compartments
Typical circuit breaker compartments include primary disconnects, drawout rails, secondary disconnects, vertical wireway, horizontal wireway and, if applicable, TOC switch operator, MOC switch operator and associated interlocks. Drawout rails allow the breaker to be withdrawn from the compartment without additional extensions or adapters. Up to six (2 sets of three) current transformers for metering or relaying can be mounted in each compartment.



1. TOC Switch Operator
2. Breaker Compartment Rear Barrier
3. Secondary Disconnect
4. Vertical Wireway
5. Interference Interlock
6. Drawout Rails
7. Primary Disconnect

Circuit Breaker Cell Interior

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Options

Siemens High Resistance Grounding System

(1) The HRG section can be 22" or 32" wide. The HRG instrument compartment is 45" high and either 19" or 24" deep depending on whether the circuit breakers are fused. The HRG instrument compartment will house all of the high resistance grounding system components either on the door or in the device bucket except for the grounding resistors.

(2) The grounding resistor assembly will mount in the rear cable compartment of the switchgear on the runback support posts. It will typically mount behind the HRG instrument compartment where it cannot interfere with feeder breaker runbacks.

(3) In a typical Siemens HRG application with a close coupled main breaker section, a general purpose instrument compartment takes up the A compartment, the main breaker goes in the B compartment and the HRG instrument compartment takes up the C & D compartments. An alternate HRG main breaker section can have the HRG instrument compartment in the A & B compartments, main breaker in the C compartment and a general instrument compartment in the D compartment.

Switchgear Mounted Hoist

The integrally mounted hoist, standard on walk-in outdoor and optional on indoor switchgear enclosures, travels along rails on top of the switchgear to assist in breaker handling.

TOC and MOC Switches

The Truck Operated Cell (TOC) Switch provides interlocking control or remote indication of the breaker racking position. The cubicle mounted auxiliary switch or Mechanism Operated Cell (MOC) switch provides interlocking control or remote indication based on the main contact position (open or closed).

Shutters

These provide protection against accidental contact with primary disconnects in a compartment when the breaker is removed. Shutters automatically close when the breaker is withdrawn and are padlockable and field installable.

Key Interlock

This provides a mechanical means for operating circuit breakers and other devices only when predescribed conditions are met.

Test Set

A portable breaker test set is available as an option and supports testing the full range of functions and protective settings supplied with the breaker trip unit.

Metering and Auxiliary Compartments

Compartments are available to house devices such as voltage transformers, metering, control power transformers, and supervisory devices.

Instrument and Control Transformers

Voltage transformers and control power transformers are mounted in auxiliary compartments. These transformers are protected by primary pull-out type current-limiting fuses and secondary fuses. Current transformers are normally mounted on the compartment primary disconnect studs where they are readily accessible.

Miscellaneous

- Each switchgear lineup includes a breaker lifting device that is adjustable for use with Size II and Size III breakers
- An optional portable breaker hoist is available if the integrated breaker hoist and track is not specified
- A test cabinet is also available as an option. The test cabinet is wall mounted necessary equipment for testing electrically-operated breakers that have been removed from the breaker compartment. The test cabinet doesn't include or replace a breaker trip unit tester
- 4" high formed steel channel sills are available for indoor switchgear enclosures

Outdoor Switchgear

Type WL switchgear is available in two outdoor (NEMA 3R) enclosures. Walk-in and non walk-in versions are available to meet your particular application.

For protection from snow, rain and other foreign matter, both outdoor enclosures rest on a six-inch high, formed steel base which provides rigid support and a tight bottom seal. A heavy duty protective undercoating is applied to the underside of all outdoor enclosures to protect against moisture and corrosion. Shielded ventilation housings permit proper air circulation while excluding dirt and foreign matter.

In the walk-in outdoor enclosure a lighted, unobstructed service aisle is provided at the front of the switchgear allowing inspection and maintenance without exposure to the elements. An access door equipped with an emergency bar release is located at each end of the aisle.

The following features are standard with walk-in outdoor enclosures.

(1) Space heaters in breaker compartment and bus compartment.

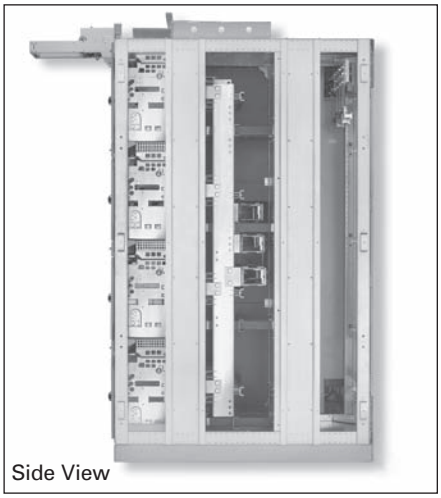
(2) Screens and filters for exterior door ventilation louvers.

(3) Incandescent lighting receptacle with three-way switch at each aisle access door.

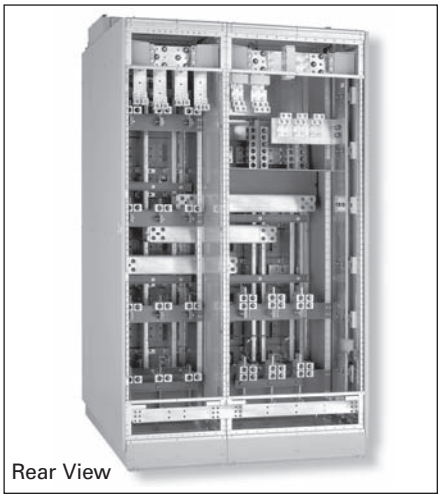
(4) Duplex receptacle with ground fault protection at each aisle access door.

(5) Load center for power distribution to lights, receptacles, switches and heaters.

For non walk-in outdoor enclosures, space heaters and screens/filters for ventilation louvering are standard with lighting, receptacles, switches and load centers offered as options.

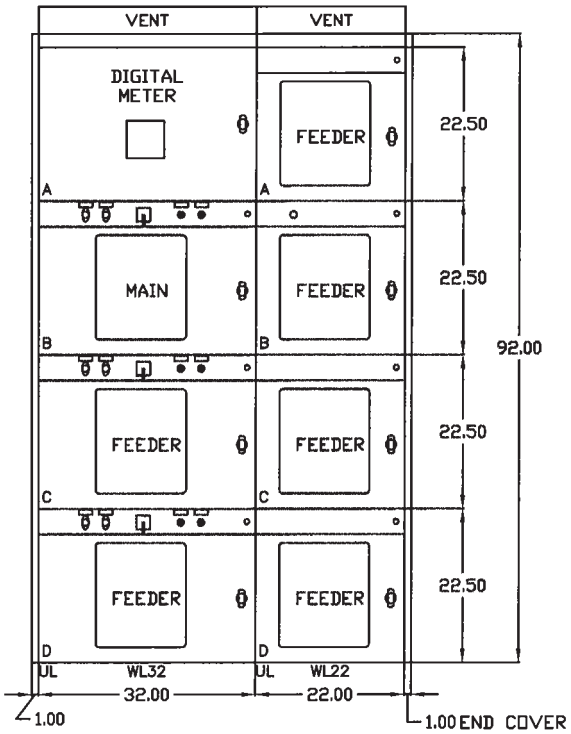


Side View

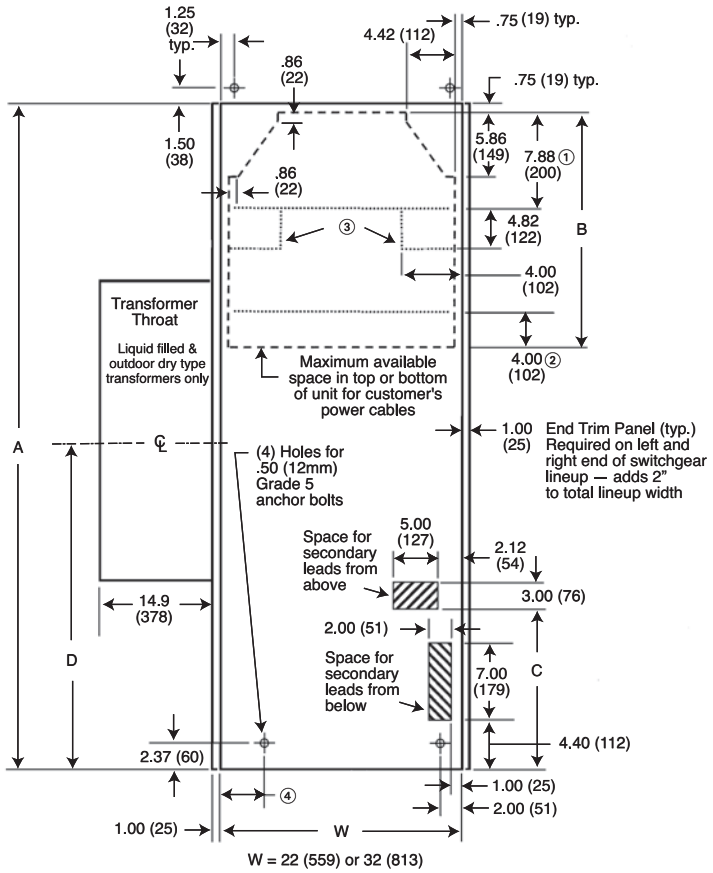


Rear View

Indoor Front Elevation View



Indoor Floor Plan and Cable Space Details



A Equipment Depth	Direction of Cables	B	C	D
60" Non-Fused with (N, S, H or L-Rating Breakers) OR 65" Fused with (F-Rating Breakers)	Below	21.50 (546) ①②	13.88 (353)	32.59 (828)
	Above	21.25 (540) ①	18.88 (480)	37.59 (955)
70" Non-fused with (N, S, H or L-Rating Breakers) OR 75" Fused with (F-Rating Breakers)	Below	31.50 (800) ①②	13.88 (353)	32.59 (828)
	Above	31.25 (794) ①	18.88 (480)	37.59 (955)
80" Non-fused with (N, S, H or L-Rating Breakers)	Below	41.50 (1054) ①②	13.88 (353)	32.59 (828)
	Above	41.25 (1048) ①		
80" Fused with (F-Rating Breakers)	Below	36.50 (927) ①②	18.88 (480)	37.59 (955)
	Above	36.25 (921) ①		

Note: Dimensions shown in inches and (mm).
① Reduce by 7.88" if upper neutral is present with cables above or if a lower neutral is present with cables below.
② Reduce by 4.00" if an 800-3200A breaker is located in the bottom compartment.
Reductions per notes 1 & 2 are additive. Example: cables below + lower neutral + 2000A breaker in bottom compartment = B-11.88.
③ Reduce cable space by 4.00" x 4.82" if Neutral Riser is present. (Consult Factory).
④ 4.10 (104) if W=22; 4.60 (117) if W=32.

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

General Notes:

- Any 22" wide section can be 32" wide if more conduit working room is needed
- For bus duct connections – if incoming is top, Compartment A must be blank/instrument, if incoming is bottom, Com-partment D must be blank/instrument
- Bused transition section is 22" wide
- For close coupled transformer connections, Compartment A must be blank/instrument
- Utility metering is always in a separate section. Section width is dependent on utility

Note 1 – If a 4000 amp feeder breaker is installed in Compartment C, Compartment D must be a Blank or Instrument Compartment.

Note 2 – If a 4000 amp breaker is installed in Compartment B, Compartment A must be a Blank or Instrument Compartment.

Note 3 – Contact Sales for application guidelines related to this design.

Note 4 – If a 3200 amp breaker is installed in Compartment B, the middle level through bus is not available.

Note 5 – If a 3200 amp breaker is installed in Compartment D, the lower level through bus is not available.

Note 6 – If incoming is bottom, feeder breakers can mount in compartments A and/or B.

Note 7 – If a 3200 amp breaker is installed in Compartment B, Feeder Breaker in Compartment A is limited to 1600 amp.

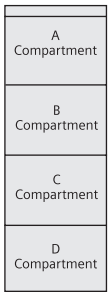
Note 8 – If a 3200 amp breaker is in Compartment BC, the maximum breaker in Compartment A is 1600 amp and if a 4000 amp breaker is in Compartment BC, the maximum breaker in Compartment A is 800 amp.

Switchgear Depth Dimensional Information

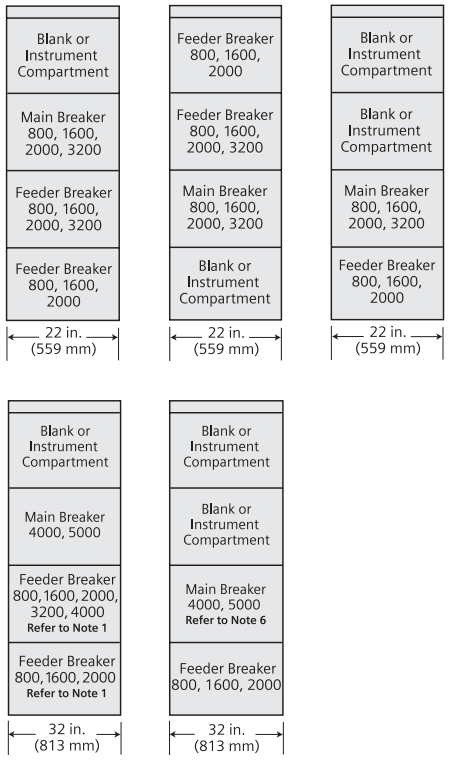
(Dimensions below are for internal frames – not total structure depth)

- Non-fused indoor – 60" standard, 70" and 80" optional
- Fused indoor – 65" standard, 75" and 80" optional
- Non-fused non-walk-in outdoor – 60" standard and 75" optional
- Fused non-walk-in outdoor – 65" standard and 75" optional
- Non-fused walk-in outdoor – 60" standard and 75" optional
- Fused walk-in outdoor – 65" standard and 75" optional
- Walk-in outdoor aisle is 42" deep
- Sections with cable connected main, tie and/or feeder breakers that are 3200 amp or greater must be minimum depth of 70" for unfused breakers and 75" for fused breakers.

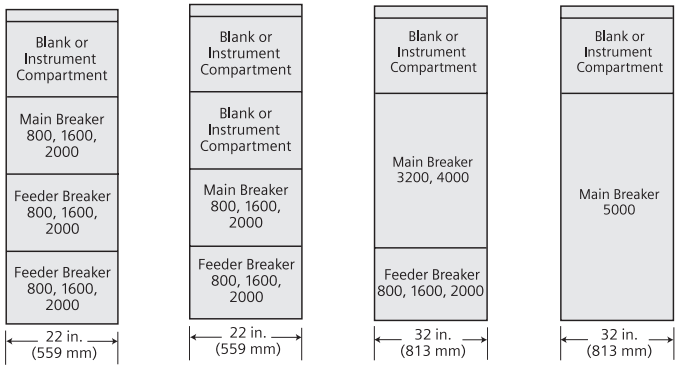
Section Compartment Arrangement



Main Sections – Non-Fused Breakers

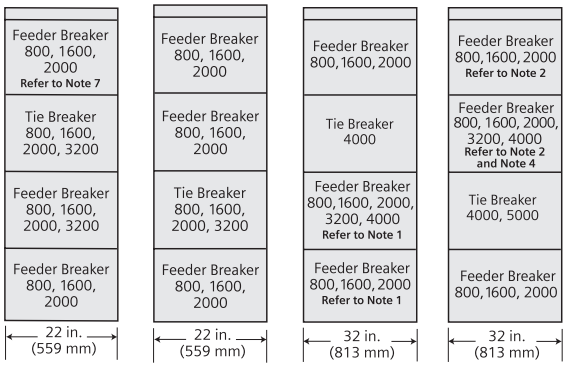


Main Sections – Fused Breakers

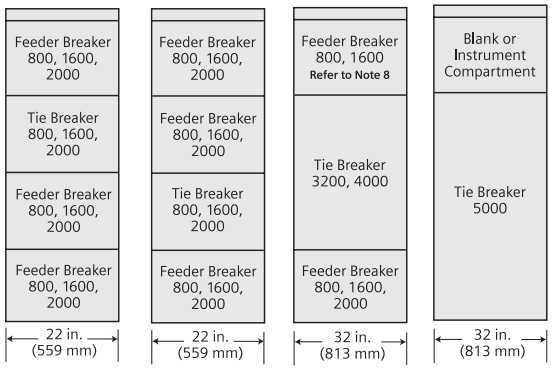


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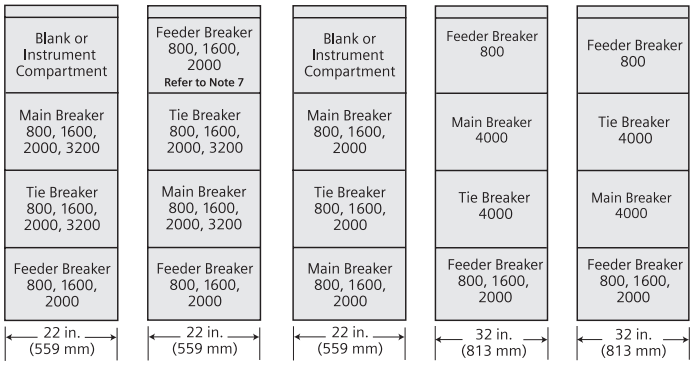
Tie Sections – Non-Fused Breakers



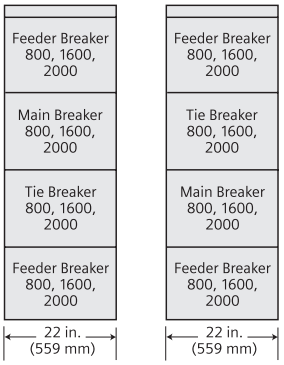
Tie Sections – Fused Breakers



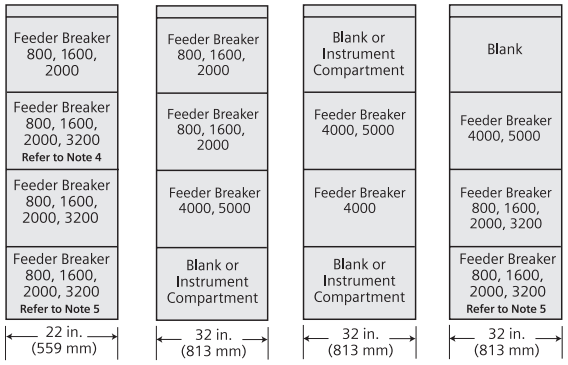
Main and Tie Sections – Non-Fused Breakers



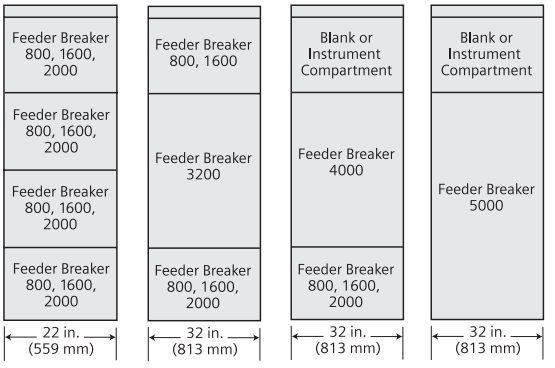
Main and Tie Sections – Fused Breakers



Feeder Sections – Non-Fused Breakers



Feeder Sections – Fused Breakers

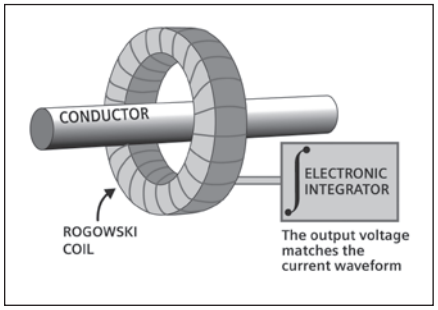


For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Rogowski Coil CT Technology

A Rogowski coil is an 'air-core' toroidal coil placed round the conductor. The alternating magnetic field produced by the current induces a voltage in the coil which is proportional to the rate of change of current.

The direct output from the coil is given by Vout=M dI/dt Where M is the mutual inductance of the coil and dI/dt is the rate of change of current. To complete the transducer the voltage is integrated electronically so that the output from the integrator is a voltage that accurately reproduces the current waveform.



Coil and Integrator:

The combination of a coil and an integrator provides an exceptionally versatile current-measuring system which can be designed to accommodate a vast range of frequencies, current levels and conductor sizes. The output is independent of frequency, has an accurate phase response and can measure complex current waveforms and transients.

Linearity:

One of the most important properties of a Rogowski coil measuring system is that it is inherently linear. The coil contains no saturable components and the output increases linearly in proportion to current right up to the operating limit determined by voltage breakdown. The integrator is also inherently linear up to the point where the electronics saturates. Linearity makes Rogowski coils easy to calibrate because a transducer can be calibrated at any convenient current level and the calibration will be accurate for all currents including very large ones. Also, because of their linearity, the transducers have a very wide dynamic range and an excellent transient response.

Coil Winding

With a Rogowski coil it is important to ensure that the winding is as uniform as possible. A non-uniform winding makes the coil susceptible to magnetic pickup from adjacent conductors or other sources of magnetic fields. We have developed special machines for making accurate windings. Coils come in a range of styles including rigid and flexible coils but we have developed several other variations to meet specific needs.

Output Indication

The output from the integrator can be used with any form of electronic indicating device that has an input impedance greater than about 10kohm such as a voltmeter, oscilloscope, transient recorder or protection system.

Split Coils

Some designs of coil can be fitted on the conductor without the need to disconnect the conductor. Most flexible coils can be fitted this way and it is also possible to build split rigid coils. Split iron-cored devices such as current transformers are subject to appreciable amplitude and phase errors if the halves are misaligned by even a small amount. Rogowski coils do not have this problem. Misalignment of the joining faces of a split Rogowski coil has only a small effect on the amplitude and no effect on the phase.

Electronic Trip Unit

Selection Criteria for WL Circuit Breakers

The basic criteria for selecting circuit breakers is:

Maximum Available Short Circuit at the installation point. This value determines the short circuit current interrupting rating or short circuit current withstand rating of the circuit breaker.

Rated Current I_n which is to flow through the respective circuit breaker continuously. This value may not be greater than the maximum rated current of the circuit breaker. The rated current for the WL is determined by the rating plug, up to the maximum frame rating.

Ambient Temperature of the circuit breaker. This is usually the temperature inside the cubicle.

Design of the circuit breaker.

Protective Functions of the circuit breaker. These are determined by the selection of the appropriate trip unit.

Dynamic Arc-Flash Sentry (Patent Pending) A unique feature of the WL trip unit allows the system designer to achieve lower levels of arc flash energy and delayed tripping for selective trip coordination purposes.

Rating Plug

The Rating Plug is a replaceable module that enables users to reduce the rated device current for optimum adaptation to the system; e.g., during startup of a plant section. The Rating Plug should be selected so that it corresponds to the rated current of the system.

Switch-selectable I^2t or I^4t Characteristic Curve Improved Overload Protection.

The best possible protection is assured when all protective devices in the system are optimally coordinated. To achieve optimum selectivity and coordination, the long-time characteristic can be switched between I^2t and I^4t, to improve coordination with fuses or inverse relays.

Switchable Parameter Sets

To allow the protection to adapt to changes in system needs such as switching between utility and generator feeds, WL Circuit Breakers support ETUs with two independent parameter sets. Switching between the parameter sets occurs in less than 100 ms and can be done remotely or via a contact input to an optional CubicleBUS module.

Trip Unit Functions









		ETU745	ETU748	ETU776
Basic Protective Functions				
Long-time overcurrent protection	L	●	●	●
Short-time delayed overcurrent protection	S	●	●	●
Instantaneous overcurrent protection	I	●	–	●
Neutral protection	N	●	●	●
Ground fault protection	G	❍	❍	❍
Additional Functions				
Selectable neutral protection		●	●	●
Defeatable short-time delay		●	●	●
Defeatable instantaneous protection		●	–	●
Selectable thermal memory		●	●	●
Zone selective interlocking		❍	❍	❍
Selectable I^2t or fixed short-time delay		●	●	●
Adjustable instantaneous pick-up		●	–	●
Selectable I^2t or I^4t long-time delay		●	●	●
Adjustable short-time delay and pick-up		●	●	●
Selectable and adjustable neutral protection		●	●	●
Dual protective setting capability (DAS)*		–	–	●
Extended instantaneous protection		●	●	●
Parameterization and Displays				
Parameterization by rotary switches (10 steps)		●	●	–
Parameterization by communication (absolute values)		–	●	●
Parameterization by menu/keypad (absolute values)		–	–-	●
Remote parameterization of the basic functions		–	–	●
Remote parameterization of the additional functions		–	–	●
Alphanumeric LCD		❍	❍-	–
Graphical LCD		–	–-	●
Metering Function				
Metering function *Plus*		❍	❍	❍
Communication				
CubicleBUS		●	●	●
Communication via PROFIBUS-DP		❍	❍	❍
Communication via the MODBUS		❍	❍	❍
Communication via the Ethernet (BDA)		❍	❍	❍

● standard – not available ❍ optional

① Fixed short-time delay only

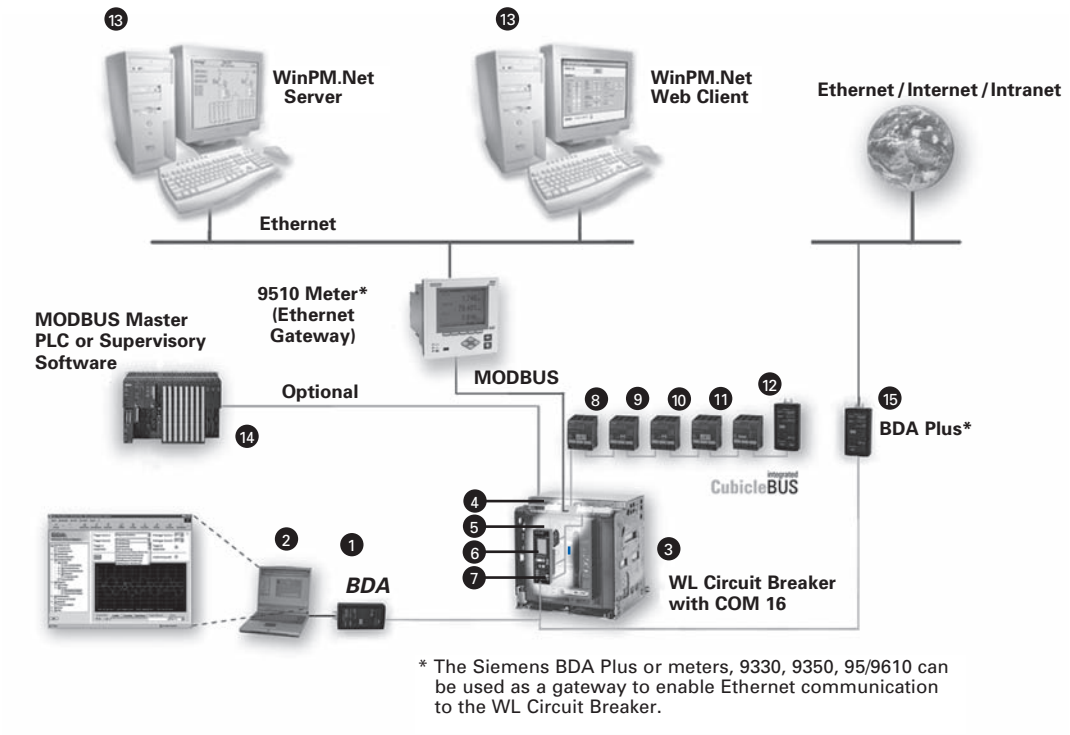
* DAS- Dynamic Arc Flash Sentry, Siemens patent pending protective feature

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

WL Communication Overview

Connection Diagram

1. Breaker Data Adapter (BDA)
2. Browser-capable input and output device (e.g. notebook)
3. WL Circuit Breaker
4. COM 16 MODBUS module or COM 15 PROFIBUS module
5. Breaker Status Sensor (BSS)
6. Electronic Trip Unit
7. Metering function PLUS
8. Zone Selective Interlocking (ZSI) module
9. Digital output module with relay or optocoupler outputs
10. Digital output module with relay or optocoupler outputs, remotely configurable
11. Analog output module
12. Digital input module
13. WinPM.Net on PC
14. PLC (e.g. SIMATIC S7)
15. BDA Plus



Features

- Industry standard MODBUS or PROFIBUS communication available on all WL breakers from 200A to 5000A
- The high modularity of the WL Circuit Breakers and accessories allows simple retrofitting of all communication components
- The ability to connect additional input and output modules to the breaker-internal CubicleBUS of the WL opens up a range of opportunities to reduce econdary device count and wiring and to increase functionality implemented in switchgear
- Innovative software products for local configuration, operation, monitoring and diagnostics of WL Circuit Breakers using MODBUS, PROFIBUS or via Ethernet/Intranet/Internet
- Complete integration of WL Circuit Breakers in all Totally Integrated Power and Totally Integrated Automation Solutions

Metering Function/Metering Function PLUS

The integrated metering function can be installed on all ETU745, ETU748, and ETU776 trip units and provides a viable alternative to external multi-function measuring instruments in many applications.

Metering Function can measure the following:

- Currents
- Voltages
- Power
- Energy
- Power Factor
- Frequency

All metered quantities are delivered as real time values with min/max recording. The metering module also contains additional alarm setpoint and protective relay functions (e.g. trip on overfrequency or undervoltage, and alarm on reverse power or over ampere demand).

The Metering Function PLUS has two additional wave form buffers and supports harmonic analysis. With the two independent wave form buffers, the current and voltage waveforms can be recorded, and allows detailed diagnostic triggering on events.

If the Metering Function /Metering Function PLUS is ordered together with the circuit breaker, it is already installed and ready for operation. As a retrofit part, the metering function is simply attached to the ETU and connected to the CubicleBUS.

For more information, please visit http://automation.usa.siemens.com/consultant/ or contact your local sales office.

Low Voltage Switchgear

TPS3 Family of Hardwired Surge Protective Devices

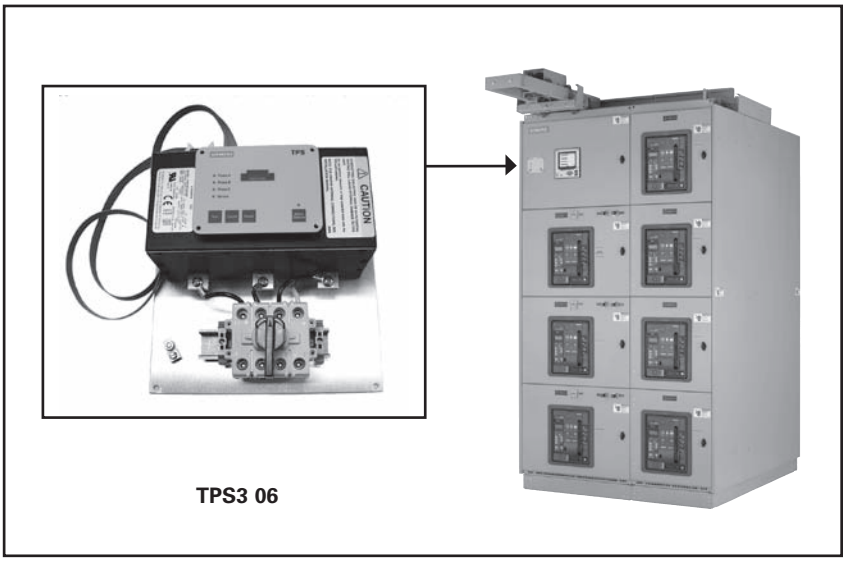
Product Overview

TPS3 Integral or Internally Mounted SPDs for Switchgear

Siemens Integral TPS3 06 and L6 are UL 1449 3rd Edition SPDs that can be factory installed in Siemens WL low voltage metal-enclosed switchgear, utilizing optimal electrical system connections to minimize impedance losses. This results in the some of the industry's best "installed" Voltage Protection Ratings. These SPDs share the following features:

TPS3 Features

- UL 1449 3rd Edition and UL 1283
- UL Type 1 (consult factory) or Type 4 tested as Type 1 or 2 SPDs
- 20 kA In (most models)
- 200 kA SCCR (most models)
- UL96A Lightning Protection Master Label Compliant
- 100 – 500 kA surge current capacity per phase
- EMI/RFI filtering or Sine Wave tracking
- Monitoring – LEDs, Audible Alarm, Dry Contacts, and Ground Integrity Monitoring Diagnostics



TPS3 06

Ordering Information

Catalog # TPS3 ☐ 06 ☐☐ ☐ 0

Voltage Code
A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
D = 240 V, 3Ø, 3W
E = 277/480 V, 3Ø, 4W
F = 480 V, 3Ø, 3W
G = 600 V, 3Ø, 3W
K = 380/220 V, 3Ø, 4W
L = 600/347 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Surge Current (kA)
10 = 100 kA per phase
15 = 150 kA per phase
20 = 200 kA per phase
25 = 250 kA per phase
30 = 300 kA per phase
40 = 400 kA per phase
50 = 500 kA per phase

X= Surge counter

- Example: TPS3C0640X0 = SPD for a 208/120 V low voltage switchgear with a surge current capacity of 400 kA per phase and a surge counter option
- When an option is not selected, include a zero (0) in the field

True 10 Mode SPD

Catalog # TPS3 ☐ L6 ☐☐ ☐ 0

Voltage Code
A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
E = 277/480 V, 3Ø, 4W
K = 380/220 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Surge Current (kA)
15 = 150 kA per phase
30 = 300 kA per phase
45 = 450 kA per phase

X= Surge counter

- Example: TPS3CL645XO = 10 mode SPD for a 208/120 V low voltage switchgear with a surge current capacity of 450 kA per phase and a surge counter option

Please consult the factory for applications requiring SPDs with larger per phase surge current capacities and/or 10-mode style configurations.

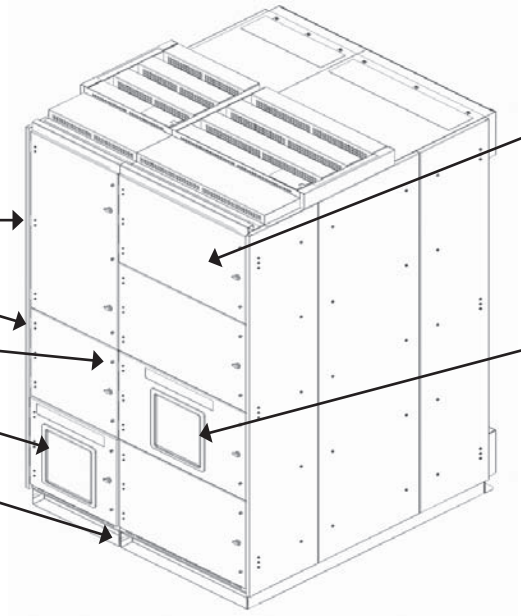
Arc Resistant Switchgear

- Insulated and isolated bus
- Separation barriers and top venting
- Breaker shutters

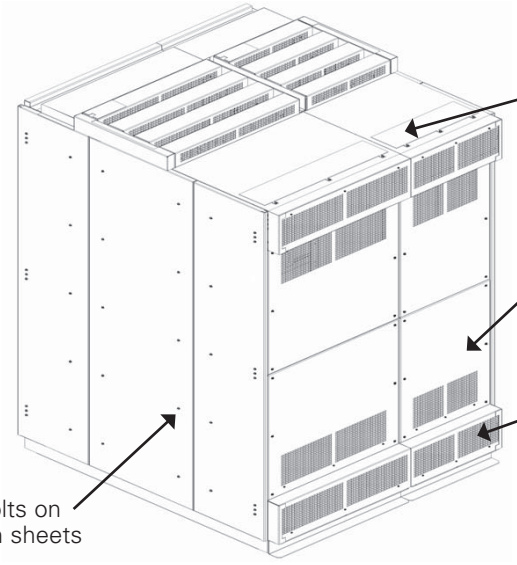
Arc resistant metal-enclosed low voltage switchgear is an optional product offering that contains and channels internal arcing fault energy. This new switchgear construction provides an additional degree of protection to the personnel performing normal operating duties in close proximity to the equipment while the equipment is operating under normal conditions. In each of the descriptions below, additional design features are indicated, all of which aid in directing faults upward away from personnel or reduce the chances of a fault by insulating and isolating live parts.



Front view



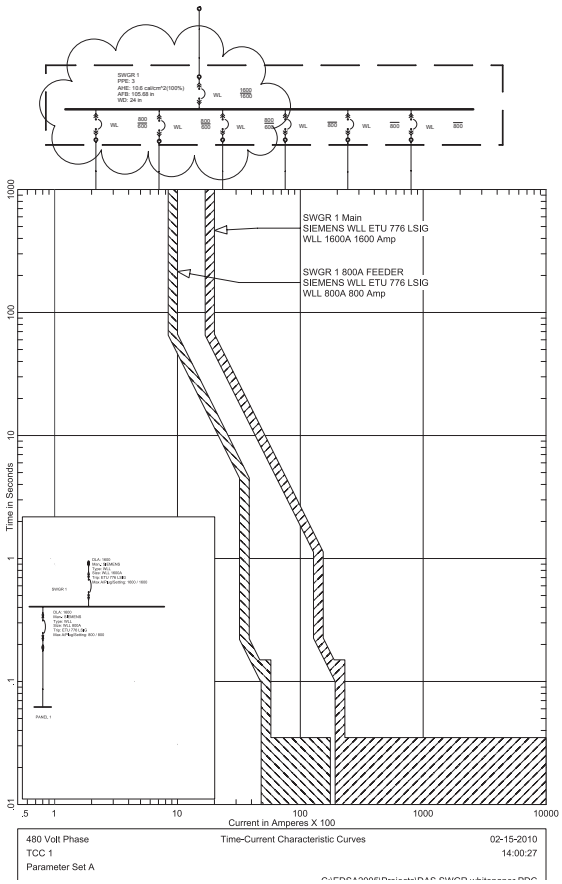
Rear view



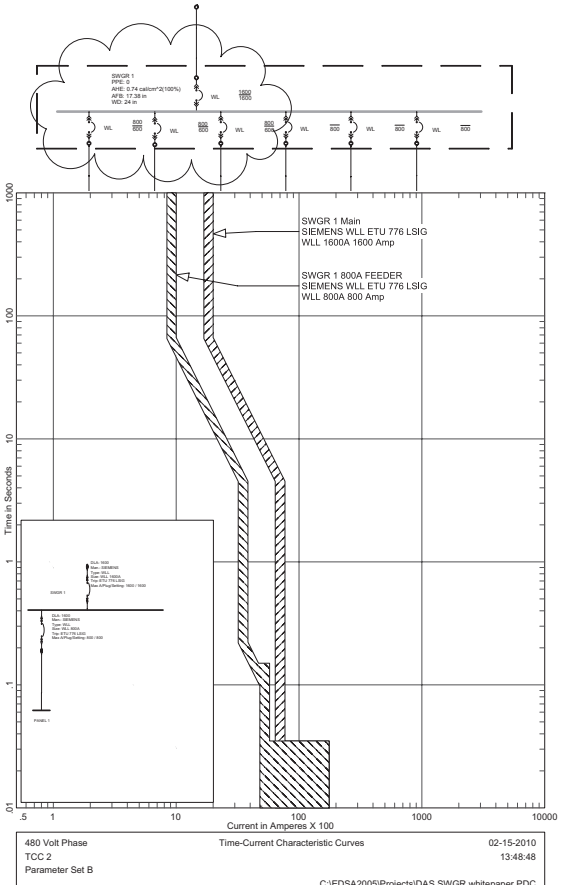
Dynamic Arc Sentry

One of the trip units available for the Siemens WL Family of breakers is the ETU 776. It offers dual parameter sets that enable the trip unit to automatically lower the instantaneous setting and thereby lower the available energy in a fault condition. Commonly referred to as "maintenance mode", making a breaker trip faster while engaged in any form of maintenance or just by being in proximity to energized equipment is an effective way to minimize arc flash dangers. If one is concerned about the effects of temporarily inhibiting selectivity, then rest assured that with the ETU 776 single step changes are possible giving engineers the ability to clear faults faster with minimum effect on coordination. In the example below the effects of the DAS system may be seen.

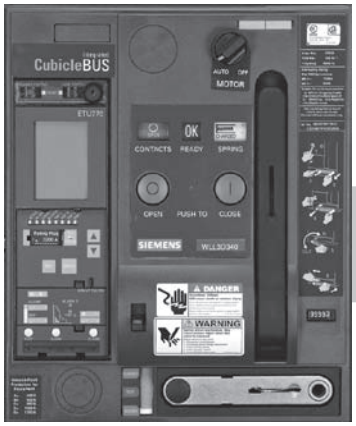
Example 1



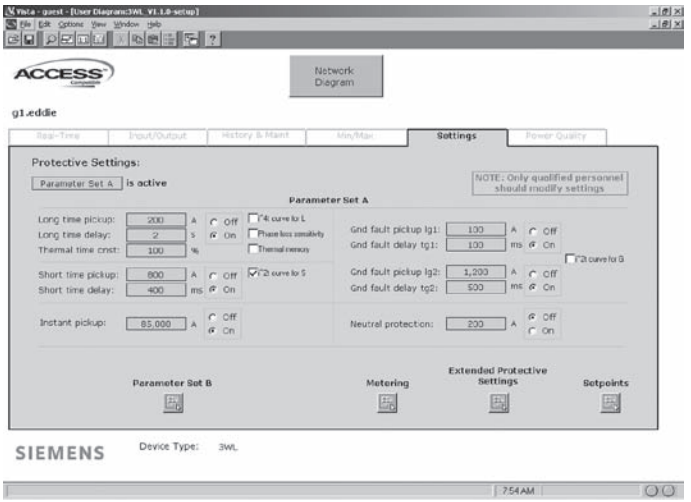
Parameter set "A"



Parameter set "B"



WL Breaker with ETU 776

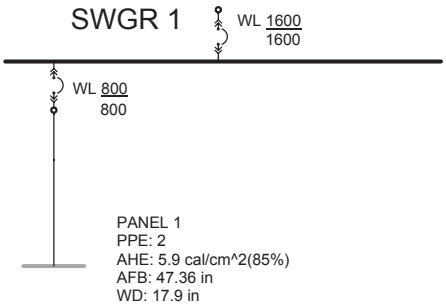


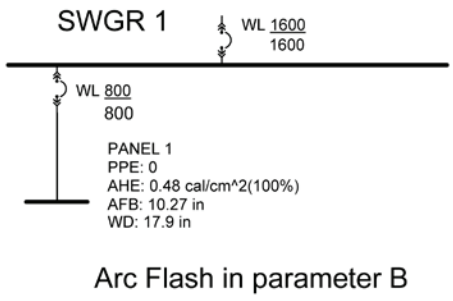
Dual Parameter sets enable "maintenance mode" - can be set remotely via software or automatically via digital input.

Under normal conditions, the switchgear's calculated arc flash energy will require PPE level 3 protection for anyone within the arc flash boundary. Incorporating the features built into the DAS system, and using the ETU776 trip unit, the system changes to parameter set B. In the second figure the instantaneous has been changed to a lower setting and the calculation shows a reduction of arc flash energy. The resultant PPE level has been reduced to 0.

Below is another example of the benefit of the DAS, or even manual switching, of breaker parameter set. The reduced settings set available in the ETU 776 can also be used to reduce the arc flash energy at downstream equipment. In the first figure on the left with normal settings the arc energy at panel 1 requires PPE level 2. After switching to the parameter B settings, the PPE level at Panel 1 is reduced to 0.

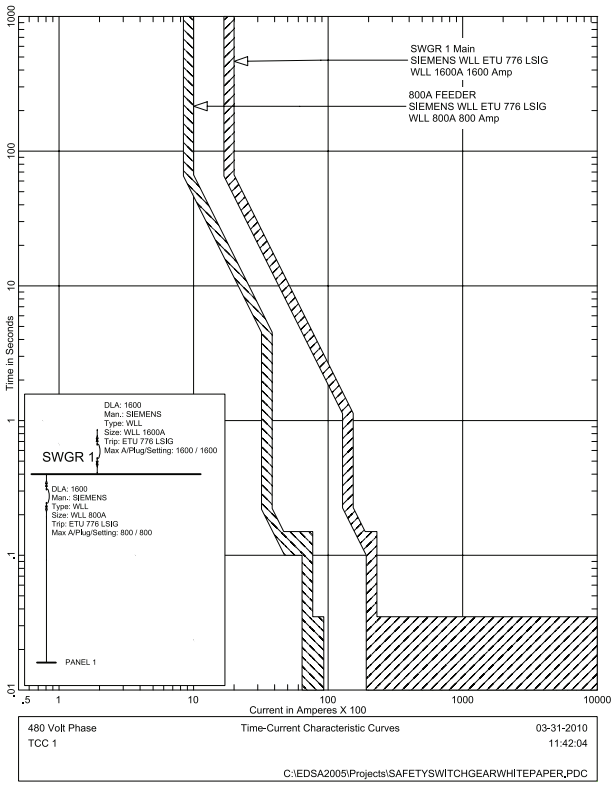
Example 2



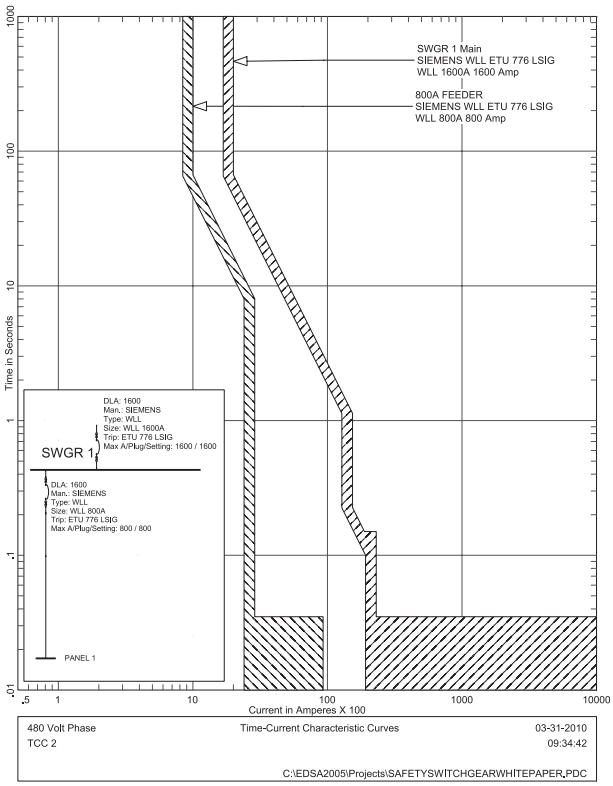


Arc Flash in parameter B

Arc Flash in parameter A



Arc Flash in parameter B



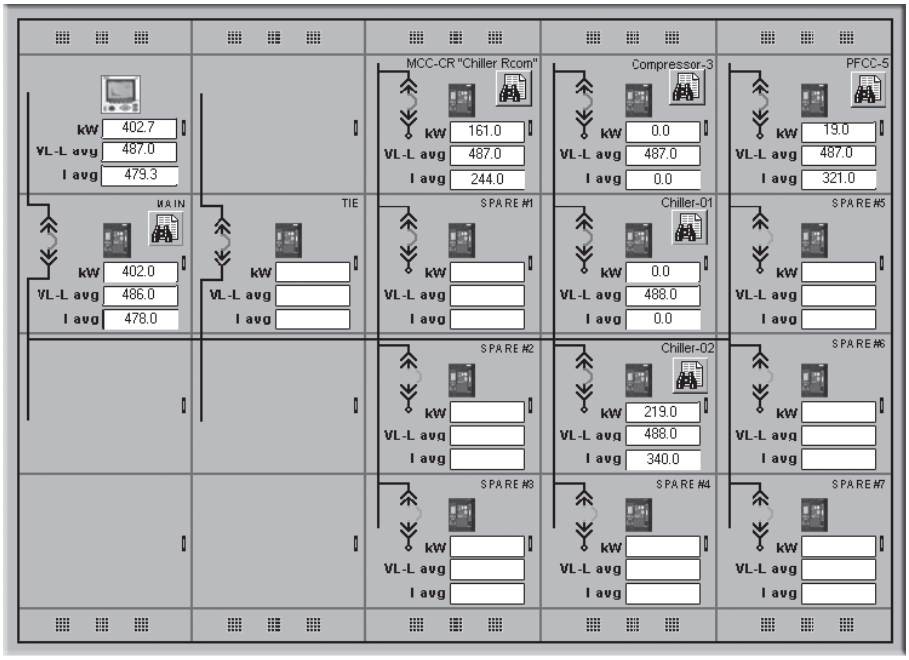
Remote operation and monitoring

- Remote Monitoring for temperature, metering and maintenance data.
- Remote Control via communications with or without interposing relays.
- Remote Racking feature.
- Remote Operation for opening and closing via local hand held pendant station.

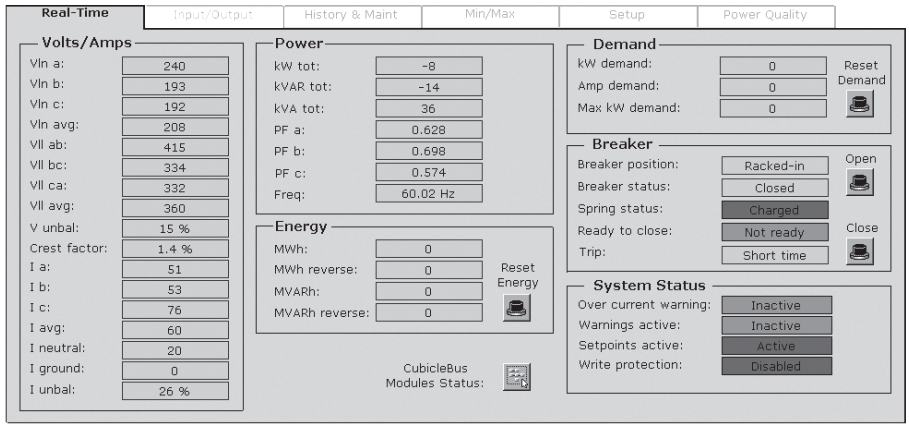
Remote Monitoring is an effective way to maintain separation between personnel and energized electrical equipment. With the latest equipment from Siemens, this is now easier and more cost effective than ever. Maintenance personnel and engineers can now view real-time electrical parameters, operating conditions (like temperature in the breaker and number of operations), and open and close breakers remotely. The WinPM.Net software with its Web Enabled interface allows multiple users to access only the information they are interested in from the convenience of their desks. Accountants can access cost allocation and utility billing information to enforce accountability for electrical resources and verify utility bills. Trip settings and other parameters for the LV power breakers can be modified and monitored remotely as well.

In addition, WL breakers with appropriate electrical controls and communication components, can be opened and closed through communications directly or with the use of interposing relays.

Unit sub #5 elevation



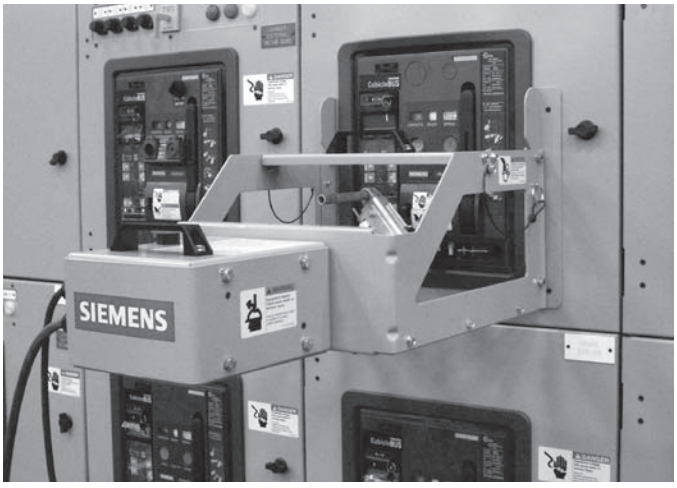
Real-time data from WL breakers with remote open/close capability



Remote Racking Device

Although it is always preferable to work on equipment that has been de-energized, in some cases it may not be practical. Siemens now offers the Remote Breaker Racking Device. This product uses an integral torque overload sensing mechanism and allows users to safely rack our WL breakers into the Connect, Test and Disconnect position from up to 30 feet away.

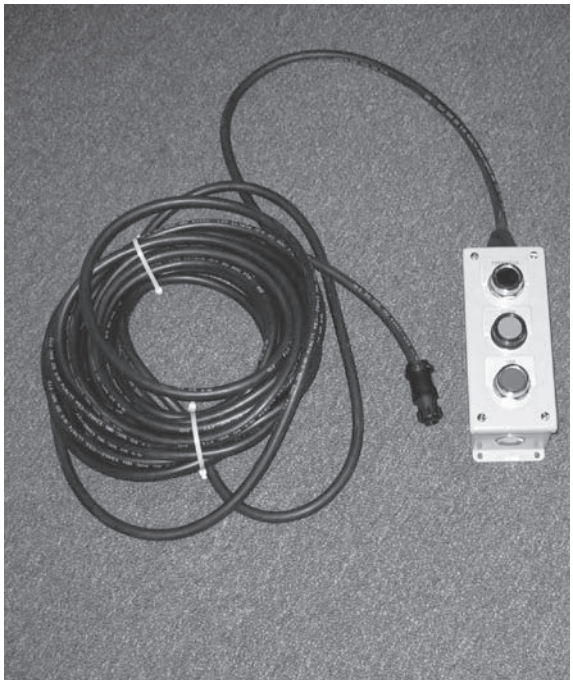
This allows the operator to be outside the arc flash boundary thereby providing additional personnel protection and reducing the PPE requirements. This system can be retrofitted to existing Siemens WL switchgear lineups.



Remote Racking Device

Remote Operator Pendant

This hand held pendant allows a user to remotely operate (open/close) a WL breaker without being in front of the switchgear. Standard cable lengths are 30 feet with other lengths available. This pendant, along with the Remote Racking device, can be used to improve personnel safety by putting operators outside the arc flash boundary. Maintenance personnel can remotely open breakers and close breakers, without being in front of the equipment. The Remote Operator Pendant can be used in combination with the Remote Racking Device for added personnel safety.



Remote Operator Pendant



Control port on WL Switchgear

Other protection options

- Infrared Viewing ports
- Zone Selective Interlocking
- High Resistance Grounding

Infrared Viewing Ports

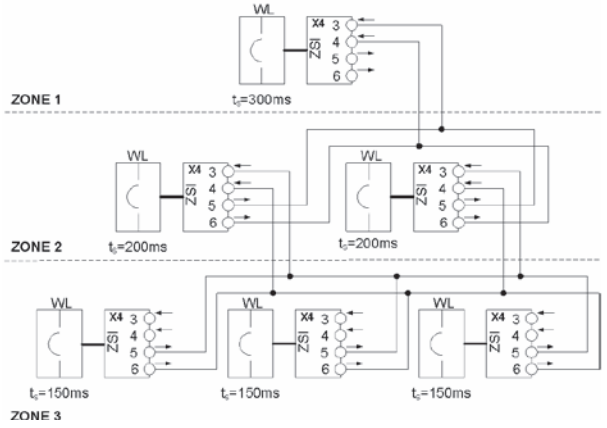
Infrared viewing ports allow maintenance personnel to monitor temperatures of the cable and bus connection points in the rear of the gear while it is energized and under load. Excessive temperatures can be an indication of a problem with a connection.



Infrared viewing ports

Zone Selective Interlocking

Zone Selective Interlocking eliminates any intentional time delay in the event a fault occurs between two breakers in adjacent zones. In the schematic to the right, representative time delay values are shown for the breakers in each zone. If a fault occurs on the load side of the downstream breaker, the ZSI system enables the upstream breaker's delay and allows the downstream device more time to independently clear the fault. If the fault occurs on the line side of the downstream breaker (between two zones), the delay in the upstream breaker will not occur. This allows the fastest tripping time for faults and will reduce the amount of arc energy which may be released. The ZSI function is available for short time delays and ground fault delays.

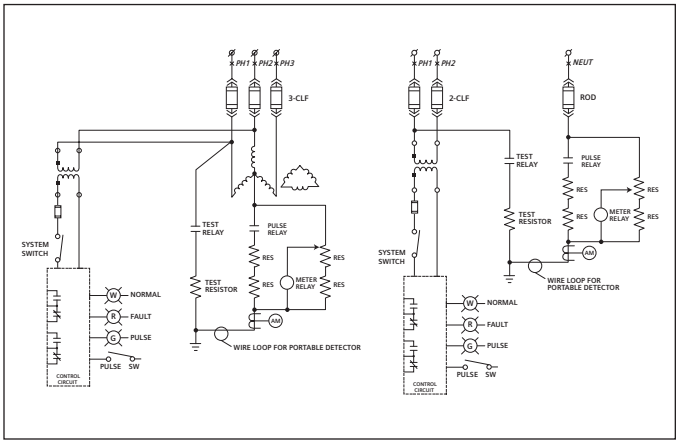


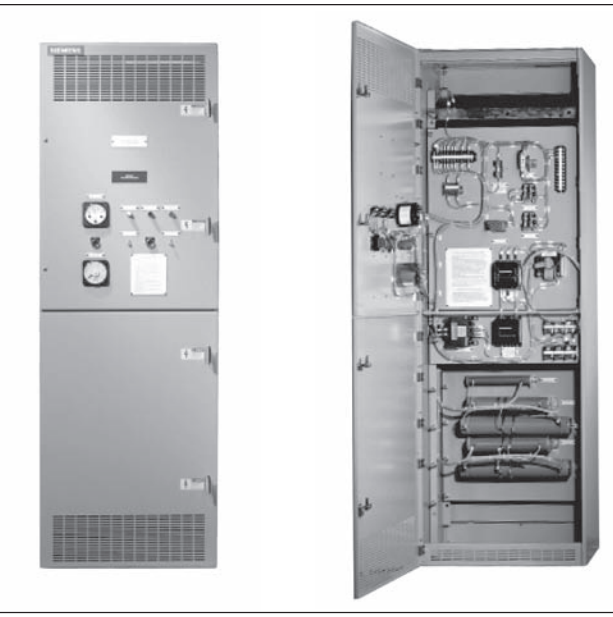
Zone Selective Interlocking

High Resistance Grounding

Research has shown that a high percentage of arc faults start as a phase to ground fault. High resistance grounding systems minimize the available phase to ground arcing current.

A high resistance grounding system reduces the magnitude of phase to ground faults. This will reduce the mechanical stress on equipment for the most common of faults and will reduce the magnitude of energy released.





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A. Footage Pricing

1. Sentron and XL-U base pricing is listed on a per foot charge. When calculating the footage charge, fractions are figured to the next larger number of whole feet (i.e., a linear run totaling 66'3" would be priced at 67 feet.
2. BD and XJ-L HD base pricing is listed on a per section charge.

B. Accessories

Some busway accessories are listed as complete device prices while others are listed under accessory charges.

1. Complete device price includes all material and accessory charges for a standard device. (Busway footage included if applicable).
2. Accessory Charge includes fabrication and any miscellaneous fittings for the standard device. (No busway footage included).

C. End Cable Tap Boxes are designed to be installed at the beginning or end of a busway run. The busway rating determines the tap box list price. Mechanical lugs are standard. For compression lugs add 30% to tap box list price.

D. Elbows with an angle other than 90 degrees, the accessory charge is to be doubled.

E. Flange Ends (Switchboard Connections / Stubs) accessory prices are for connection to Siemens equipment. For connection to other manufacturer's equipment, multiply the flange end list price by 2.5. Standard list price includes eight inches of bus extension into equipment from mounting flange, if more than 8 inches required consult factory for pricing. Sentron Switchboards can be assembled with the Busway Flanged End pre-installed, eliminating the labor to connect the Busway to the switchboard at the job site.

F. Service Heads are specially constructed tap boxes suitable for outdoor use and are equipped to accept service cables through a removable insulated bottom plate. The busway should be priced through the end of the run.

G. Phase Transpositions can be built into a busway section to provide better voltage balance on long runs. To price, use the "Expansion Section" accessory charge for the appropriate ampere rating.

H. Hangers
Sentron and XL-U busway are UL listed for standard hanger spacing of ten feet (on center). Purchasing busway hangers for horizontal installations is optional. Unistrut/ Kindorf is commonly used by contractors as an approved alternative.

Two hangers are furnished free of charge with every straight section of BD and XJ-L HD. Self compensating "Spring" hangers required for vertical installations are designed to be field installed by the installer and are shipped separately. These are also used as intermediate supports where floor-to-floor height is greater than 16 feet.

I. Ceiling, Floor And Wall Flanges are used when busway passes through a floor or wall and are intended to cover that portion of the opening around the outside of the busway. **They are not to be used to support the busway.**

J. Reducers price is determined by the rating of the larger busway. Fused reducers do not include fuses.

K. Special Paint — Busway Sections, Accessories And Bus Plugs
Standard finish is ASA #61 light gray. For other than standard color, add 20% and consult factory for availability. XJL HD Busway is offered in ASA#61 Gray and Graphite Gray.

L. For Silver Finishing of Copper Bus Bars, add 10%.

M. Roof Flanges are specially constructed collars and plates built onto a section of 3R busway which passes through a flat or angled roof. Roof pitch must be given for angled roof.

N. Circuit Breaker Type Bus Plugs for Sentron Busways are priced as "complete devices" with circuit breakers factory installed. Circuit Breaker plugs for XJ-L HD, BD, XL-U and XL-X busways are priced "enclosure only."

O. Fusible Type Bus Plugs do not include fuses. Adapter kits for Class R, T & J fuses are available for field installation.

P. Cubicle list prices include labor and material for a single frame device with enclosure including line side internal bussing for connection to busway and protective device. Fuses and load side bussing are not included in the base price.

Q. Sentron Busway has been tested in accordance with UL1479 and offers a certified two hour fire rating for gypsum wall board construction, and a three hour fire rating for concrete slab or block penetrations. These ratings were achieved using standard busway installed with SpecSeal® sealant from Specified Technologies Inc. This material is available through Electrical Distribution.

R. Expansion Section

Qty (1) Expansion Section should be used for every 200ft of continuous Busway run length and for each building expansion joint. The Busway run must be positioned accordingly to accommodate the Expansion Section(s).

I-T-E (then known as Bulldog Electric) was the first manufacturer to make a Busway System. Since its introduction in 1932, Busway Systems have improved and expanded into several designs to meet the ever changing needs of the electrical industry. The Busway Selection Chart below will help you in selecting the proper product to fit your requirements.

Busway Selector Chart

100-6500 Ampere **600 Volts or Less**

Feature			Product: Plug-in and Feeder Busway			
			Sentron Plug-in/Feeder	XL-U Plug-in/Feeder	XJ-L HD Plug-in	BD Plug-in
Ampere Rating		100			√	
		150				
		200				
		225	√	√	√	√
		400	√	√	√	√
		600	√	√		√
		800	√	√		√
		1000	√	√		√
		1200	√	√		√
		1350	√	√		√
		1600	√	√		√
		2000	√	√		
		2500	√	√		
		3000	√	√		
		3200	√			
		4000	√	√		
		5000	√	√		
		6000, 6500		√		
Conductor		Copper	√	√	√	√
		Aluminum	√	√		√
Use		Indoor	√	√	√	√
		Outdoor	√	√		
AC Service 50-60 Hz 400Hz②		2W				
		1Ø3W			√	
		3Ø3W	√	√	√	√
		3Ø4W FN	√	√	√	√
		3Ø4W 200% N	√		√	
Voltage		600 volts or less	√	√	√	√
Construction		Ventilated		√		
		Non-Ventilated	√	√	√	√
Meets Electrical Standard	**UL**	857	√	√	√	√
	NEMA	BU1	√	√	√	√
	CSA/CUL	C22.2 NO 27	√	√	√	√
	ANCE	NMX-J-148ANCE	√	√	√	√
	IEC	60439-1, 60439-2	①	①	①	①
		60529	①	①	①	①

① Meets most applicable provisions of this foreign standard.

② Consult factory for information.

S	X	4	0	2	C	1	0

Sentron
SX = US Lengths

Configuration
3 = 3Ø, 3W
4 = 3Ø, 4W 100% Neutral
5 = 3Ø, 4W 200% Neutral

Ampere Rating

02 =	225A	**32** =	3200A
04 =	400A	**40** =	4000A
06 =	600A	**50** =	5000A①
08 =	800A		
10 =	1000A		
12 =	1200A		
13 =	1350A		
16 =	1600A		
20 =	2000A		
25 =	2500A		
30 =	3000A		

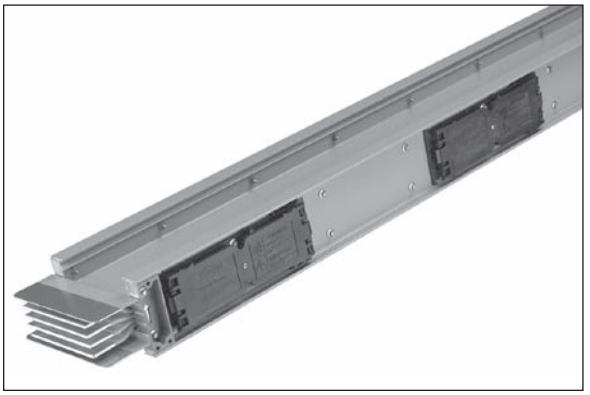
Bus Bar Material
C = Copper
M = 1000 Amps/In² Copper
A = Aluminum
L = 750 Amps/In² Aluminum

Ground
1 = Integral (Housing)
2 = Internal Bus Bar②
3 = Isolated Ground②

IP Rating
0 = IP40⑥
4 = IP55⑥
6 = IP66③⑦⑧
9 = NEMA 3R④⑦⑧

① Copper only
② Copper or aluminum ground bar
③ IEC Markets
④ NEMA Markets
⑤ For odd degree angle (other than 90°) specify the degree angle of the turn.
⑥ Indoor only (Plug-in and Feeder)
⑦ Outdoor use (Feeder only)
⑧ Elbow Stack (IP40 and IP55 only)

• Catalog Numbers for Hangers can be found on page 15-38.
• Specials must be ordered by description (drawing must be included). Contact factory for pricing.



Suffix part of Catalog Numbers

P	L	0	6

Feeder	**L**ength in Inches, ex.: 2'3" = 027 Feeder lengths available from 2'0" (024 Inches) up to 10'0" (120 inches)		
Plug-in	**L**	**L**ength	**04** = 4'0" **06** = 6'0" **08** = 8'0" **10** = 10'0"
Riser	**I**	**L**ength	**04** = 4'0" **06** = 6'0" **08** = 8'0" **10** = 10'0"
Elbows	**S** = Stack⑧ **L** = 90° **O** = Odd degree angle⑤	**E**dge	**U**p **D**own
		Flat	**R**ight **L**eft
Tees	**E**	**E**dge	**U**p **D**own
		Flat	**R**ight **L**eft
Offsets	**F**	**E**dge	**U**p **D**own
		Flat	**R**ight **L**eft
Combinations	**O**	Edge **U**p Edge **D**own Edge **U**p Edge **D**own	Flat **L**eft Flat **L**eft Flat **R**ight Flat **R**ight
		Flat **L**eft Flat **L**eft Flat **R**ight Flat **R**ight	Edge **U**p Edge **D**own Edge **U**p Edge **D**own
E**X**pansion Fittings	P	**F**	**T**
Center Cable Tap Boxes	**T**	**B**	**S**tandard E**X**panded
End Cable Tap Boxes	T	**V**ertical **H**orizontal	**S**tandard E**X**panded
End Closers	**C**	**L**	**S**
Flan**G**e	**R**oof **W**all	**F**	**L**
Joint Stacks	**S**tandard **I**solation	**S**	**T**
Ser**V**ice Heads	**1** = 1-Phase **3** = 3-Phase **T** = Throat	**T**ranformer	**H**
		Utility	**F**lorida Pwr/Light **H**ouston Pwr/Light **C**ommonwealth ED **P**acific Gas/Electric **D**etroit Edison **O**ther
Reducers	**F**used **N**on-fused	**R** **R**	**F** **N**
Flanged End	**E** = Int'l Standard **R** = U.S. Standard **O** = Other	**N** **N**	**D** **D**
Transposition	**R**	**PG** = Phase & Ground **PO** = Phase only **GO** = Ground only	

Copper (225 - 5000Ampere)

Base Catalog Number Guide									
Ampere	3-Pole	3-Pole Internal Ground	3-Pole Isolated Ground	4- Pole	4-Pole 200% Neutral	4-Pole Internal Ground	4-Pole 200% Neutral Internal Ground	4-Pole Isolated Ground	4-Pole 200% Neutral Isolated Ground
225	SX302C1	SX302C2	SX302C3	SX402C1	SX502C1	SX402C2	SX502C2	SX402C3	SX502C3
400	SX304C1	SX304C2	SX304C3	SX404C1	SX504C1	SX404C2	SX504C2	SX404C3	SX504C3
600	SX306C1	SX306C2	SX306C3	SX406C1	SX506C1	SX406C2	SX506C2	SX406C3	SX506C3
800	SX308C1	SX308C2	SX308C3	SX408C1	SX508C1	SX408C2	SX508C2	SX408C3	SX508C3
1000	SX310C1	SX310C2	SX310C3	SX410C1	SX510C1	SX410C2	SX510C2	SX410C3	SX510C3
1200	SX312C1	SX312C2	SX312C3	SX412C1	SX512C1	SX412C2	SX512C2	SX412C3	SX512C3
1350	SX313C1	SX313C2	SX313C3	SX413C1	SX513C1	SX413C2	SX513C2	SX413C3	SX513C3
1600	SX316C1	SX316C2	SX316C3	SX416C1	SX516C1	SX416C2	SX516C2	SX416C3	SX516C3
2000	SX320C1	SX320C2	SX320C3	SX420C1	SX520C1	SX420C2	SX520C2	SX420C3	SX520C3
2500	SX325C1	SX325C2	SX325C3	SX425C1	SX525C1	SX425C2	SX525C2	SX425C3	SX525C3
3000	SX330C1	SX330C2	SX330C3	SX430C1	SX530C1	SX430C2	SX530C2	SX430C3	SX530C3
3200	SX332C1	SX332C2	SX332C3	SX432C1	SX532C1	SX432C2	SX532C2	SX432C3	SX532C3
4000	SX340C1	SX340C2	SX340C3	SX440C1	SX540C1	SX440C2	SX540C2	SX440C3	SX540C3

Aluminum (225 - 4000Ampere)

Base Catalog Number Guide									
Ampere	3-Pole	3-Pole Internal Ground	3-Pole Isolated Ground	4- Pole	4-Pole 200% Neutral	4-Pole Internal Ground	4-Pole 200% Neutral Internal Ground	4-Pole Isolated Ground	4-Pole 200% Neutral Isolated Ground
225	SX302A1	SX302A2	SX302A3	SX402A1	SX502A1	SX402A2	SX502A2	SX402A3	SX502A3
400	SX304A1	SX304A2	SX304A3	SX404A1	SX504A1	SX404A2	SX504A2	SX404A3	SX504A3
600	SX306A1	SX306A2	SX306A3	SX406A1	SX506A1	SX406A2	SX506A2	SX406A3	SX506A3
800	SX308A1	SX308A2	SX308A3	SX408A1	SX508A1	SX408A2	SX508A2	SX408A3	SX508A3
1000	SX310A1	SX310A2	SX310A3	SX410A1	SX510A1	SX410A2	SX510A2	SX410A3	SX510A3
1200	SX312A1	SX312A2	SX312A3	SX412A1	SX512A1	SX412A2	SX512A2	SX412A3	SX512A3
1350	SX313A1	SX313A2	SX313A3	SX413A1	SX513A1	SX413A2	SX513A2	SX413A3	SX513A3
1600	SX316A1	SX316A2	SX316A3	SX416A1	SX516A1	SX416A2	SX516A2	SX416A3	SX516A3
2000	SX320A1	SX320A2	SX320A3	SX420A1	SX520A1	SX420A2	SX520A2	SX420A3	SX520A3
2500	SX325A1	SX325A2	SX325A3	SX425A1	SX525A1	SX425A2	SX525A2	SX425A3	SX525A3
3000	SX330A1	SX330A2	SX330A3	SX430A1	SX530A1	SX430A2	SX530A2	SX430A3	SX530A3
3200	SX332A1	SX332A2	SX332A3	SX432A1	SX532A1	SX432A2	SX532A2	SX432A3	SX532A3
4000	SX340A1	SX340A2	SX340A3	SX440A1	SX540A1	SX440A2	SX540A2	SX440A3	SX540A3

Suffix Numbers

	Base Catalog Number Suffix		
Busway Type	IP40	IP55	Nema 3R
Feeder	0F	4F	9F
Plug-in	0P	4P	—
Riser	0R	4R	—

The following table identifies the feeder footage that is included in busway fittings.

Ampere Rating	Elbow Stack	Elbow	Tee	Cross	Tap Box End	Tap Box Center	Flanged End Swbd. Conn.	XFMR Throat	Expansion Section	Reducer Fusible	Reducer Unfused
225–1350 Al 225–1600 Cu	1'	2'	3'	4'	1'	4'	1'	4'	4'	4'	4'
1600–3200 Al 2000–4000 Cu	2'	3'	5'	6'	1'	4'	1'	4'	4'	4'	4'
4000 Al 5000 Cu	3'	4'	6'	8'	1'	4'	1'	4'	4'	4'	4'

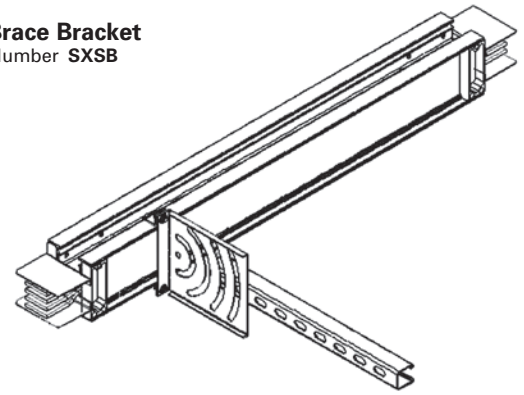
"M" Rating / Standard Rating Conversion Table

1000/A Square Inch "M" Rating	Standard 55°C Rating
	Sentron
225	600
400	800
600	1200
800	1350
1000	1600
1200	2000
1350	2000
1600	—
2000	2500
2500	4000
3000	4000
3200	4000
4000	5000

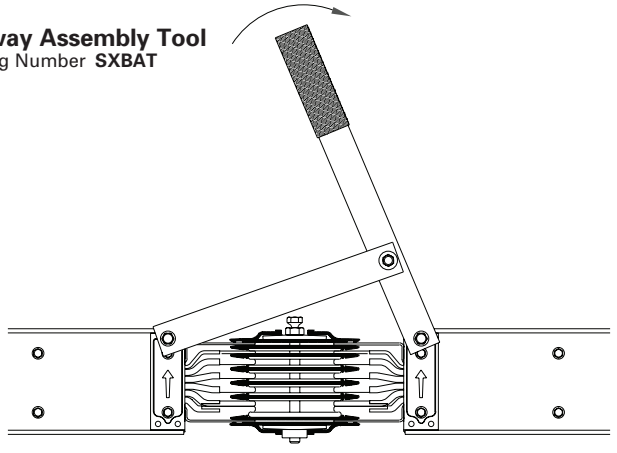
"L" Rating / Standard Rating Conversion Table

750/A Square Inch "L" Rating	Standard 55°C Rating
	Sentron
225	600
400	800
600	1000
800	1200
1000	1350
1200	1600
1350	2000
1600	2000
2000	2500
2500	3000
3000	4000
3200	4000

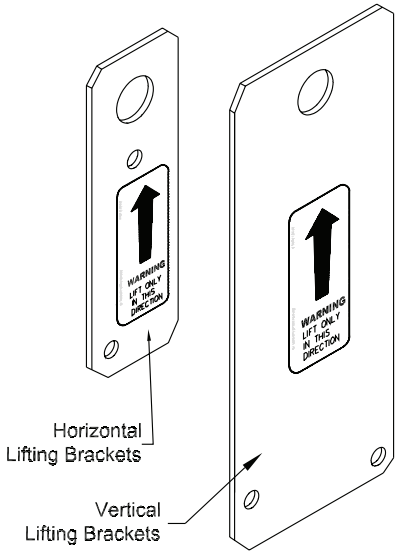
Sway Brace Bracket
Catalog Number **SXSB**



Busway Assembly Tool
Catalog Number **SXBAT**



Lifting Kit
Catalog Number **SXLK**



Fusible Cubicles①③

3-Pole, 600V/4-Pole, 480/277V

Ampere Ratings:
200
400
600
800
1200

Bolted Pressure Switches③

3-Pole 480V, 4-Pole 480V,
3-Pole 600V or 4-Pole 600V

Ampere Ratings:
800
1200
1600
2000
2500
3000
4000

Solid State Molded Case Circuit Breaker Cubicles③

3-Pole, 600V or 4-Pole 480/277V

Breaker Frame	Ampere Rating
SJD6 SJD6G SJD6NT SJD6NGT	200–400
SLD6 SLD6G SLD6NT SLD6NGT	300–600
SMD6A SMD6AG SMD6ANT SMD6ANGT	600–800
SND6A SND6AG SND6ANT SND6ANGT	800–1200
SPD6 SPD6G SPD6NT SPD6NGT	1400–1600

Molded Case Circuit Breaker Cubicles

3-Pole, 600V or 4-Pole 480/277V

Breaker Frame	Ampere Rating
JD6	200–400
LD6	300–600
MD6	600–800
ND6	800–1200
PD6	1400–1600
RD6	1800–2000

Current-Limiting

3-Phase, 600V AC or 120/280V AC,
277/480V AC

Breaker Type	Ampere Rating
CJD6	150–225 250–400
CLD6	450–600
CMD6	400–800 800 1000
CPD6	1200 1400 1600
CRD6	1800 2000

Power Circuit Breaker②③

3-Pole or 3-Phase, 4-Wire

Breaker Frame Size	Maximum Ampere Rating	AC Interrupting Capacity Symmetrical (RMS) Amperes		
		240 Volt	480 Volt	600 Volt
Type RL				
RL-800	800	30,000	30,000	30,000
RL-1600	1600	50,000	50,000	50,000
RL-2000	2000	65,000	65,000	65,000
RL-3200	3200	65,000	65,000	65,000
RL-4000	4000	85,000	85,000	85,000
Type RL (Fused)				
RLF-800	800	200,000	200,000	200,000
RLF-3200	3200	200,000	200,000	200,000
RLF-4000	4000	200,000	200,000	200,000

① Fuses not included.
② For electrically operated, specify control voltage.
③ IP40 and IP55

Sentron® Bus Plugs

Catalog Numbering System

Sentron Bus Plugs—Circuit Breaker (Installed)

S	L	E	C	S①	3	2	0	1	5	0	G②	E	D	2

Plug Type
SL = Sentron II

Circuit Breaker Frame
E =15–125A
F =70–250A
J =200–400A
L =250–600A
M =500–800A

Enclosure Type
C = Circuit Breaker Enclosure
L = Current Limiting Enclosure

Cradle Designation
S = 3Ø3W, 3Ø4W>400A 200%N>200A only

Configuration
3 = 3Ø, 3W
4 = 3Ø, 4W
5 = 3Ø, 4W 200% neutral③④

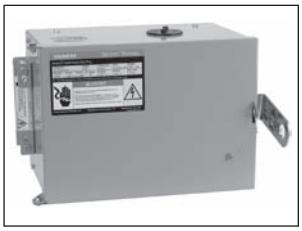
Breaker Voltage
2 = 240V⑤
4 = 480V⑥
6 = 600V

Ampere Trip Rating

IP Rating
0 = IP40
4 = IP55

Ground Designation
G = Internal Ground
IG = Isolated Ground

Circuit Breaker Frame Identification



Sentron SLVB Bus Plugs—Fusible

S	L	V	B	R	3	2	1	0	G

Plug Type
SL = Sentron II

Heavy Duty Fusible Switch
VB

Orientation
R = Riser
H = Horizontal

Configuration (Poles/Wires)
3 = 3Ø3W
4 = 3Ø4W
5 = 3Ø4W 200% Neutral③

Voltage
2 = 240V
6 = 600V

Max Ampere Rating
1 = 30A
2 = 60A
3 = 100A
4 = 200A
5 = 400A
6 = 600A

IP Rating
0 = IP40
4 = IP55

Ground Designation
G = Internal Ground
IG = Isolated Ground



① The S digit is only used on 3- and 4-wire (100%N) plugs that are greater than 400A and 200%N plugs greater than 200A. Lower amperage plugs do not require this digit. (Ex. SLID3610, SLEC32060ED2)
② The G and IG digits are used to specify internal and isolated ground respectively. Integral (housing) ground plugs do not require this digit. (Ex. SLID3610, SLEC360150ED6)
③ Available through 400A only.
④ Available with E, F and J Frame breakers only.
⑤ Available with ED2 breakers only.
⑥ Available with ED4 and HHED6 breakers only.

3-Pole, 250 Volt①

Ampere Rating	Catalog Number
30A	SLVB*3210 SLVB*3210G SLVB*3210IG
60A	SLVB*3220 SLVB*3220G SLVB*3220IG
100A	SLVB*3230 SLVB*3230G SLVB*3230IG
200A	SLVB*3240 SLVB*3240G SLVB*3240IG
400A②	SLVB*3250 SLVB*3250G SLVB*3250IG
600A②	SLVB*3260 SLVB*3260G SLVB*3260IG

4-Pole, 250 Volt,①

Ampere Rating	Catalog Number	Catalog Number 200% Neutral①
30A	SLVB*4210 SLVB*4210G SLVB*4210IG	SLVB*5210 SLVB*5210G SLVB*5210IG
60A	SLVB*4220 SLVB*4220G SLVB*4220IG	SLVB*5220 SLVB*5220G SLVB*5220IG
100A	SLVB*4230 SLVB*4230G SLVB*4230IG	SLVB*5230 SLVB*5230G SLVB*5230IG
200A	SLVB*4240 SLVB*4240G SLVB*4240IG	SLVB*5240 SLVB*5240G SLVB*5240IG
400A②	SLVB*4250 SLVB*4250G SLVB*4250IG	SLVB*5250 SLVB*5250G SLVB*5250IG
600A②	SLVB*4260 SLVB*4260G SLVB*4260IG	

3-Pole, 600 Volt①

Ampere Rating	Catalog Number	
30A	SLVB*3610 SLVB*3610G SLVB*3610IG	
60A	SLVB*3620 SLVB*3620G SLVB*3620IG	
100A	SLVB*3630 SLVB*3630G SLVB*3630IG	
200A	SLVB*3640 SLVB*3640G SLVB*3640IG	
400A②	SLVB*3650 SLVB*3650G SLVB*3650IG	
600A②	SLVB*3660 SLVB*3660G SLVB*3660IG	

4-Pole, 600 Volt,①

Ampere Rating	Catalog Number	Catalog Number 200% Neutral①
30A	SLVB*4610 SLVB*4610G SLVB*4610IG	SLVB*5610 SLVB*5610G SLVB*5610IG
60A	SLVB*4620 SLVB*4620G SLVB*4620IG	SLVB*5620 SLVB*5620G SLVB*5620IG
100A	SLVB*4630 SLVB*4630G SLVB*4630IG	SLVB*5630 SLVB*5630G SLVB*5630IG
200A	SLVB*4640 SLVB*4640G SLVB*4640IG	SLVB*5640 SLVB*5640G SLVB*5640IG
400A②	SLVB*4650 SLVB*4650G SLVB*4650IG	SLVB*5650 SLVB*5650G SLVB*5650IG
600A②	SLVB*4660 SLVB*4660G SLVB*4660IG	

Note: Replace * in catalog number with "H" for horizontal applications and "R" for riser applications.

Ground Detector And Potentializer Plug

Description	Catalog Number
For 2 or 3-pole 240 and 480 volt service. (IP40 construction only)	SLPGR3140G

Note: Available in IP40 construction only.

Description	Catalog Number
Spring Kit	SXSK

Note: Used on 400A and larger bus plugs that require auxiliary support and that are mounted on vertical/riser busway. Kit contains two springs (part number 32-9909-04). One kit required per bus plug.

Fuse Adapter Kits

Switch Rating	Std Fuse Class	Class R Catalog Number	Class T Catalog Number	Class J Catalog Number
250V				
30A	H, K	SLR2030		
60A	H, K	SLR2060		
100A	H, K	SLR2100	SLT2100	
200A	H, K	SLR2200	SLT2200	
400A②	H, K, J	SLR2400	SLT2400	
600A②	H, K, J	SLR2600	SLT2600	SLJ2600
600V				
30A	H, K, J	SLR6030		
60A	H, K, J	SLR6060		
100A	H, K, J	SLR6100	SLT6100	
200A	H, K, J	SLR6200	SLT6200	
400A②	H, K, J	SLR6400	SLT6400	
600A②	H, K, J	SLR6600	SLT6600	SLJ6600

① All plugs shown are rated IP40; if IP55 rating is desired, substitute a "4" for "0" in position 8.
② 400A and larger bus plugs require auxiliary support. See also SXSK Spring Kit.

Sentron® Bus Plugs

Bus Plugs with Standard Circuit Breakers ①②③④

Selection

E Frame 3-Pole, 240 Volt, ED2 Breaker

Ampere Rating	Catalog Number
15-60A	SLEC32***0ED2 SLEC32***0GED2 SLEC32***0IGED2
70-100A	SLEC32***0ED2 SLEC32***0GED2 SLEC32***0IGED2

E Frame 4-Pole, 240 Volt, ED2 Breaker

Ampere Rating	Catalog Number
15-60A	SLEC42***0ED2 SLEC42***0GED2 SLEC42***0IGED2
70-100A	SLEC42***0ED2 SLEC42***0GED2 SLEC42***0IGED2

E Frame 200% Neutral

Ampere Rating	Catalog Number
15-60A	SLEC52***0ED2 SLEC52***0GED2 SLEC52***0IGED2
70-100A	SLEC52***0ED2 SLEC52***0GED2 SLEC52***0IGED2

E Frame 3-Pole, 480 Volt, ED4 Breaker

Ampere Rating	Catalog Number
15-60A	SLEC34***0ED4 SLEC34***0GED4 SLEC34***0IGED4
70-100A	SLEC34***0ED4 SLEC34***0GED4 SLEC34***0IGED4
110-125A	SLEC34***0ED4 SLEC34***0GED4 SLEC34***0IGED4

E Frame 4-Pole, 480 Volt, ED4 Breaker

Ampere Rating	Catalog Number
15-60A	SLEC44***0ED4 SLEC44***0GED4 SLEC44***0IGED4
70-100A	SLEC44***0ED4 SLEC44***0GED4 SLEC44***0IGED4
110-125A	SLEC44***0ED4 SLEC44***0GED4 SLEC44***0IGED4

E Frame 200% Neutral

Ampere Rating	Catalog Number
15-60A	SLEC54***0ED4 SLEC54***0GED4 SLEC54***0IGED4
70-100A	SLEC54***0ED4 SLEC54***0GED4 SLEC54***0IGED4
110-125A	SLEC54***0ED4 SLEC54***0GED4 SLEC54***0IGED4

E Frame 3-Pole, 600 Volt, ED6 Breaker

Ampere Rating	Catalog Number
15-60A	SLEC36***0ED6 SLEC36***0GED6 SLEC36***0IGED6
70-100A	SLEC36***0ED6 SLEC36***0GED6 SLEC36***0IGED6
110-125A	SLEC36***0ED6 SLEC36***0GED6 SLEC36***0IGED6

E Frame 4-Pole, 600 Volt, ED6 Breaker

Ampere Rating	Catalog Number
15-60A	SLEC46***0ED6 SLEC46***0GED6 SLEC46***0IGED6
70-100A	SLEC46***0ED6 SLEC46***0GED6 SLEC46***0IGED6
110-125A	SLEC46***0ED6 SLEC46***0GED6 SLEC46***0IGED6

E Frame 200% Neutral

Ampere Rating	Catalog Number
15-60A	SLEC56***0ED6 SLEC56***0GED6 SLEC56***0IGED6
70-100A	SLEC56***0ED6 SLEC56***0GED6 SLEC56***0IGED6
110-125A	SLEC56***0ED6 SLEC56***0GED6 SLEC56***0IGED6

F Frame 3-Pole, 600 Volt, FXD6 Breaker

Ampere Rating	Catalog Number
70-225A	SLFC36***0FXD6 SLFC36***0GFXD6 SLFC36***0IGFXD6
250A	SLFC362500FXD6 SLFC362500GFXD6 SLFC362500IGFXD6

F Frame 4-Pole, 600 Volt, FXD6 Breaker

Ampere Rating	Catalog Number
70-225A	SLFC46***0FXD6 SLFC46***0GFXD6 SLFC46***0IGFXD6
250A	SLFC462500FXD6 SLFC462500GFXD6 SLFC462500IGFXD6

F Frame 200% Neutral

Ampere Rating	Catalog Number
70-200A	SLFC56***0FXD6 SLFC56***0GFXD6 SLFC56***0IGFXD6
225-250A	SLFC56***0FXD6 SLFC56***0GFXD6 SLFC56***0IGFXD6

J Frame 3-Pole, 600 Volt, JXD6 Breaker

Ampere Rating	Catalog Number
200-400A④	SLJC36***0JXD6 SLJC36***0GJXD6 SLJC36***0IGJXD6

J Frame 4-Pole, 600 Volt, JXD6 Breaker

Ampere Rating	Catalog Number
200-400A④	SLJC46***0JXD6 SLJC46***0GJXD6 SLJC46***0IGJXD6

J Frame 200% Neutral

Ampere Rating	Catalog Number
200A④	SLJC562000JXD6 SLJC562000GJXD6 SLJC562000IGJXD6
225-400A④	SLJCS56***0JXD6 SLJCS56***0GJXD6 SLJCS56***0IGJXD6

L Frame 3-Pole, 600 Volt, LXD6 Breaker

Ampere Rating	Catalog Number
450-600A④	SLLCS36***0LXD6 SLLCS36***0GLXD6 SLLCS36***0IGLXD6

L Frame 4-Pole, 600 Volt, LXD6 Breaker

Ampere Rating	Catalog Number
450-600A④	SLLCS46***0LXD6 SLLCS46***0GLXD6 SLLCS46***0IGLXD6

M Frame 3-Pole, 600 Volt, MXD6 Breaker

Ampere Rating	Catalog Number
500-800A④	SLMCS36***0MXD6 SLMCS36***0GMXD6 SLMCS36***0IGMXD6

M Frame 4-Pole, 600 Volt, MXD6 Breaker

Ampere Rating	Catalog Number
500-800A④	SLMCS46***0MXD6 SLMCS46***0GMXD6 SLMCS46***0IGMXD6

Description	Catalog Number
Spring Kit	SXSK

NOTE: Used on 400A and larger bus plugs that require auxiliary support and that are mounted on vertical/riser busway. Kit contains two springs (part number 32-9909-04). One kit required per bus plug.

① Replace "***" with breaker trip rating.
Example: SLEC36**060**ED6, for 60A trip.

② All plugs shown have an IP40 rating, if IP54/55 is desired substitute "4" for "0" in position 10 (or 11 for cradle plugs):
E Frame: Ex. SLEC360604ED6
F Frame: Ex. SLFC360704FXD6
J Frame: Ex. SLJC36100**JXD6**
L Frame: Ex. SLLCS365004LXD6
M Frame: Ex. SLMCS368004MXD6

③ For the following breaker charges, change the catalog number suffix:

15-60A:	HHED6	Ex. SLEC36***0**HHED6**
70-100A:	HHED6	Ex. SLEC36***0**HHED6**
110-125A:	HHED6	Ex. SLEC36***0**HHED6**
F Frame:	FD6	Ex. SLFC36***0**FD6**
F Frame:	HFD6	Ex. SLFC36***0**HFD6**
J Frame:	JD6	Ex. SLJC36***0**JD6**
J Frame:	HJD6	Ex. SLJC36***0**HJD6**
L Frame:	LD6	Ex. SLLCS36***0**LD6**
L Frame:	HLD6	Ex. SLLCS36***0**HLD6**
M Frame:	MD6	Ex. SLMCS36***0**MD6**
M Frame:	HMD6	Ex. SLMCS36***0**HMD6**

④ 400A and larger bus plugs that require auxiliary support. See also SXSK Spring Kit.

Sentron® Bus Plugs

Bus Plugs with Current Limiting Circuit Breakers ①②

E Frame 3-Pole, 600 Volt, CED6 Breaker

Ampere Rating	Catalog Number
15-60A	**SLEL36***0CED6 **SLEL36***0GCED6 **SLEL36***0IGCED6
70-100A	**SLEL36***0CED6 **SLEL36***0GCED6 **SLEL36***0IGCED6
110-125A	**SLEL36***0CED6 **SLEL36***0GCED6 **SLEL36***0IGCED6

E Frame 4-Pole, 600 Volt, CED6 Breaker

Ampere Rating	Catalog Number
15-60A	**SLEL46***0CED6 **SLEL46***0GCED6 **SLEL46***0IGCED6
70-100A	**SLEL46***0CED6 **SLEL46***0GCED6 **SLEL46***0IGCED6
110-125A	**SLEL46***0CED6 **SLEL46***0GCED6 **SLEL46***0IGCED6

E Frame 200% Neutral

Ampere Rating	Catalog Number
15-60A	**SLEL56***0CED6 **SLEL56***0GCED6 **SLEL56***0IGCED6
70-100A	**SLEL56***0CED6 **SLEL56***0GCED6 **SLEL56***0IGCED6
110-125A	**SLEL56***0CED6 **SLEL56***0GCED6 **SLEL56***0IGCED6

F Frame 3-Pole, 600 Volt, CFD6 Breaker

Ampere Rating	Catalog Number
100-225A	**SLFL36***0CFD6 **SLFL36***0GCFD6 **SLFL36***0IGCFD6
250A	**SLFL362500CFD6 SLFL362500CGFD6 SLFL362500ICGFD6**

F Frame 4-Pole, 600 Volt, CFD6 Breaker

Ampere Rating	Catalog Number
100-225A	**SLFL46***0CFD6 **SLFL46***0GCFD6 **SLFL46***0IGCFD6
250A	**SLFL462500CFD6 SLFL462500GCFD6 SLFL462500IGCFD6**

F Frame 200% Neutral

Ampere Rating	Catalog Number
70-200A	**SLFL56***0CFD6 **SLFL56***0GCFD6 **SLFL56***0IGCFD6
225-250A	**SLFL56***0CFD6 **SLFL56***0GCFD6 **SLFL56***0IGCFD6

J Frame 3-Pole, 600 Volt, CJD6 Breaker

Ampere Rating	Catalog Number
200-400A③	**SLJL36***0CJD6 **SLJL36***0CGJD6 **SLJL36***0ICGJD6**

J Frame 4-Pole, 600 Volt, CJD6 Breaker

Ampere Rating	Catalog Number
200-400A③	**SLJL46***0CJD6 — **SLJL46***0GCJD6 — **SLJL46***0IGCJD6 —

J Frame 200% Neutral

Ampere Rating	Catalog Number
200A③	**SLJL562000CJD6 SLJL562000GCJD6 SLJL562000IGCJD6**
225-400A③	**SLJLS56***0CJD6 **SLJLS56***0GCJD6 **SLJLS56***0IGCJD6**

L Frame 3-Pole, 600 Volt, CLD6 Breaker

Ampere Rating	Catalog Number
450-600A③	**SLLLS36***0CLD6 **SLLLS36***0GCLD6 **SLLLS36***0IGCLD6**

L Frame 4-Pole, 600 Volt, CLD6 Breaker

Ampere Rating	Catalog Number
450-600A③	**SLLLS46***0CLD6 **SLLLS46***0GCLD6 **SLLLS46***0IGCLD6**

① Replace "***" with breaker trip rating.
Example: SLEC36**060**ED6, for 60A trip.

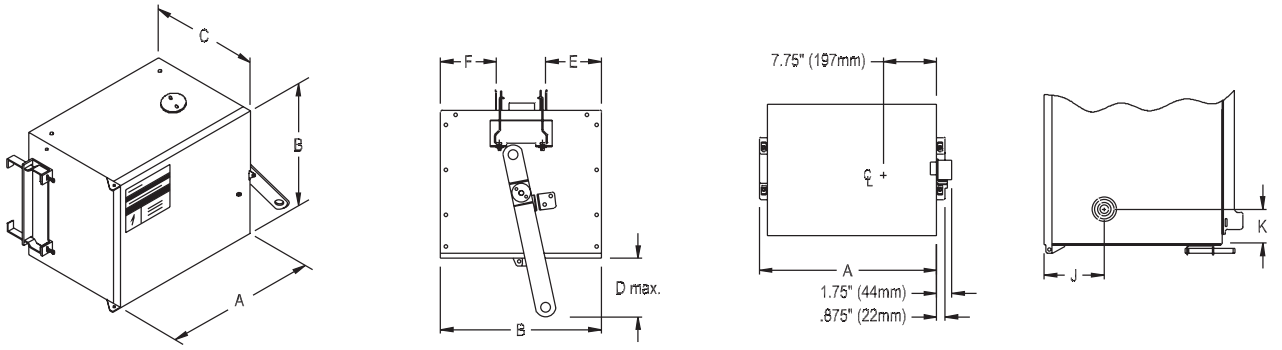
② All plugs shown have an IP40 rating, if IP54/55 is desired, substitute "4" for "0" in position 10 (or 11 for cradle plugs):
E Frame: Ex. SLEC360604ED6
F Frame: Ex. SLFC360704FXD6
J Frame: Ex. SLJC361004JXD6
L Frame: Ex. SLLCS365004LXD6
M Frame: Ex. SLMCS368004MXD6

③ 400A and larger bus plugs that require auxiliary support. See also SXSK Spring Kit.

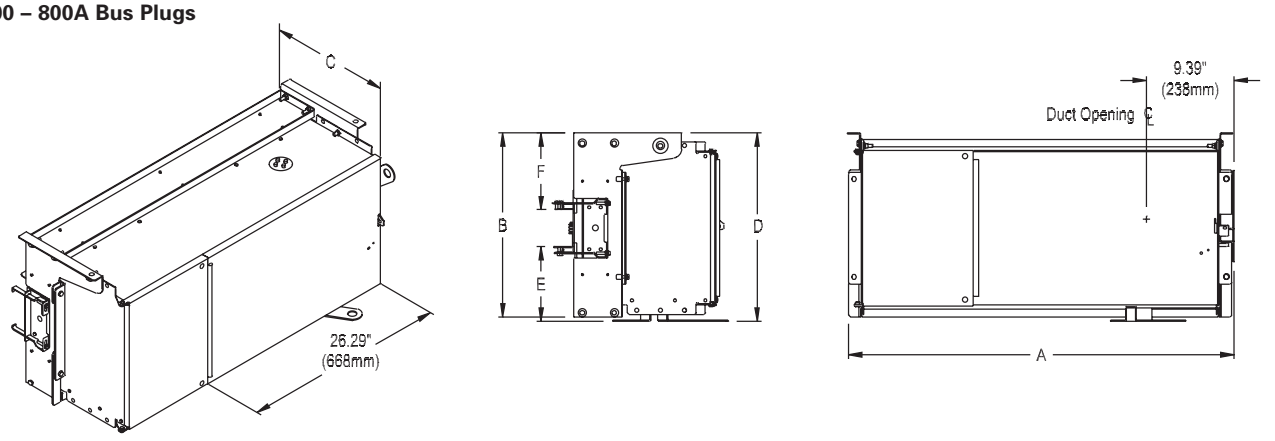
Circuit Breaker Bus Plugs, Dimensions and Weights (Enclosure only)

Ampere Rating	Dimensions Inches (mm)								Weight lbs (kg)
	"A"	"B"	"C"	"D" max.	"E"	"F"	"J"	"K"	
125	15.13 (384)	10.18 (259)	9.75 (248)	1.60 (41)	2.50 (64)	2.50 (64)	3.50 (89)	2.25 (57)	35 (15.87)
250	20.25 (514)	10.18 (259)	9.75 (248)	1.60 (41)	2.50 (64)	2.50 (64)	3.25 (83)	3.25 (83)	50 (22.68)
400	21.75 (552)	16.75 (425)	11.75 (298)	1.60 (41)	5.75 (146)	5.75 (146)	4.00 (102)	3.25 (83)	83 (37.64)
600	41.50 (1054)	19.75 (502)	15.75 (400)	2.31 (59)	7.00 (178)	7.75 (197)	—	—	130 (58.97)
800	41.50 (1054)	19.75 (502)	15.75 (400)	2.31 (59)	7.00 (178)	7.75 (197)	—	—	177 (80.29)

125 – 400A Bus Plugs



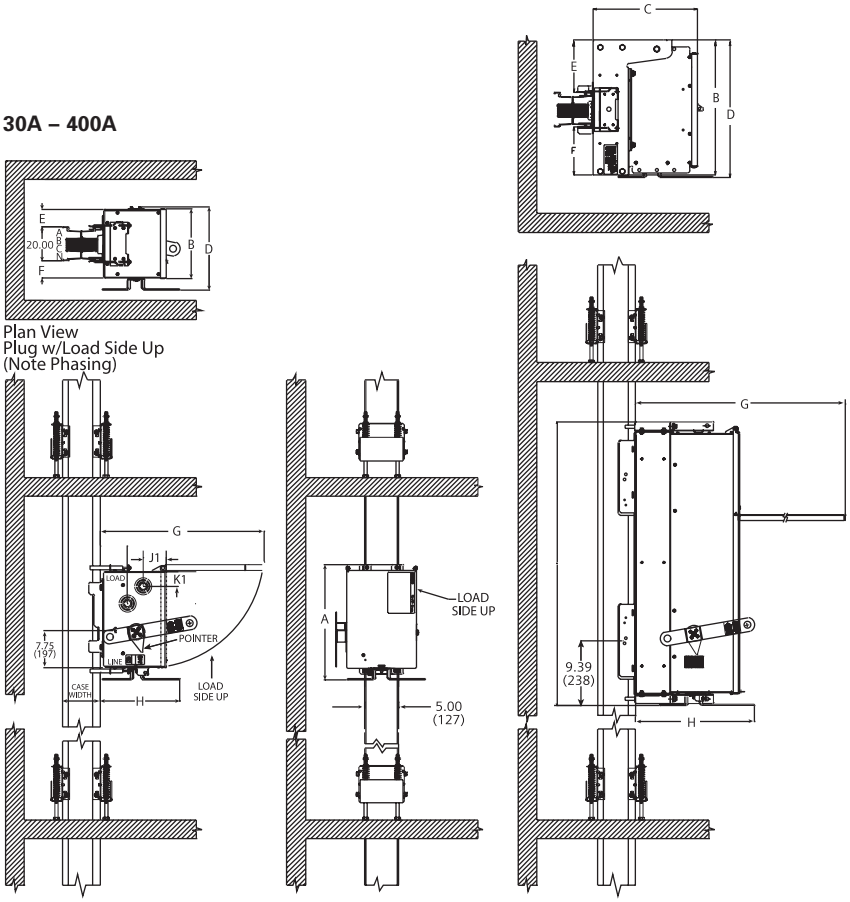
600 – 800A Bus Plugs



Circuit Breaker Bus Plugs, Load Lugs and Knockouts

Frame Size	Ground Lug Cu/Al	Neutral Lug Cu/Al	Phase Lug Cu/Al	Knockout Sizes In. (mm)
E Frame	#14-2	#14-2	#14-1/0	7/8 (22), 1 1/8 (29), 1 3/8 (35), 1 3/4 (44), 2 (51), 2 1/2 (64)
F Frame	#14-2	#6-350 kcmil	#6-350 kcmil	2 (51), 2 1/2 (64), 3 (76), 3 5/8 (92), 4 1/8 (105)
J Frame	#14-2	(2) #4-500 kcmil	(2) 3/0-500 kcmil	7/8 (22), 1 1/8 (29), Pilot

600A and 800A Cradle Mounted



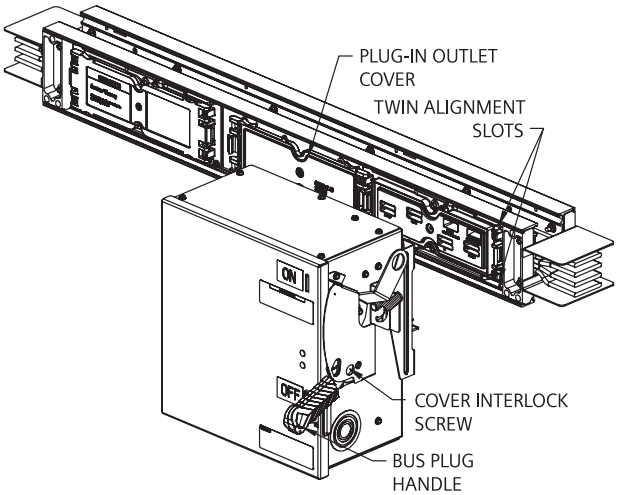
Dim. Legend	Circuit Breaker Plugs No Cradle						Circuit Breaker Plugs w/Cradle			
	E Frame Current		F Frame① Current		J Frame① Current		L Frame Current		M Frame Current	
	Standard	Limiting	Standard	Limiting	Standard	Limiting	Standard	Limiting	Standard	Limiting
A	17.00 (432)	22.00 (559)	22.00 (559)	27.00 (686)	23.50 (597)	30.50 (775)	41.50 (1054)	41.50 (1054)	41.50 (1054)	41.50 (1054)
B	10.25 (260)	10.25 (260)	10.25 (260)	10.25 (260)	16.75 (425)	16.75 (425)	19.75 (502)	19.75 (502)	19.75 (502)	19.75 (502)
C	9.75 (248)	9.75 (248)	9.75 (248)	9.75 (248)	11.75 (298)	11.75 (298)	15.75 (400)	15.75 (400)	15.75 (400)	15.75 (400)
D	12.25 (311)	12.25 (311)	12.25 (311)	12.25 (311)	18.75 (476)	18.75 (476)	20.25 (514)	20.25 (514)	20.25 (514)	20.25 (514)
E	2.50 (64)	2.50 (64)	2.50 (64)	2.50 (64)	5.75 (146)	5.75 (146)	7.75 (197)①	7.75 (197)	7.75 (197)	7.75 (197)
F	2.50 (64)	2.50 (64)	2.50 (64)	2.50 (64)	5.75 (146)	5.75 (146)	7.00 (178)	7.00 (178)	7.00 (178)	7.00 (178)
G	24.00 (610)	29.00 (737)	29.00 (737)	29.00 (737)	32.50 (826)	39.50 (1003)	41.50 (1054)	41.50 (1054)	41.50 (1054)	41.50 (1054)
H	11.25 (286)	11.25 (286)	11.25 (286)	11.25 (286)	13.50 (343)	13.50 (343)	18.00 (457)	18.00 (457)	18.00 (457)	18.00 (457)
J1	3.50 (89)	3.50 (89)	3.25 (83)	3.25 (83)	4.00 (102)	4.00 (102)	—	—	—	—
K1	2.25 (57)	2.25(57)	3.25 (83)	3.25 (83)	3.25 (83)	3.25 (83)	—	—	—	—

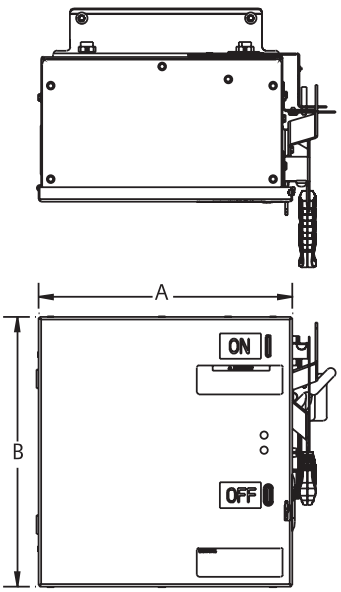
Legend:
A = Length of enclosure including handle
B = Height of enclosure
C = Depth of enclosure
D = Height of enclosure including optional handle location
E = Extension of plug above top of busway
F = Extension of plug below bottom of busway
G = Cover (depth) clearance for enclosure
H = Depth of enclosure from handle to edge of busway
J = Knockout/ pilot hole location (horizontal)
K = Knockout/ pilot hole location (vertical)

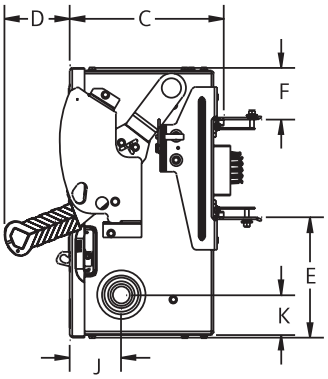
① 200%N Applications
- for F-Frame Rated <200A use L-Frame Dims.
- for J-Frame Rated <400A use L-Frame Dims.
- for 400A Fusible switch use 600A Switch Dims.

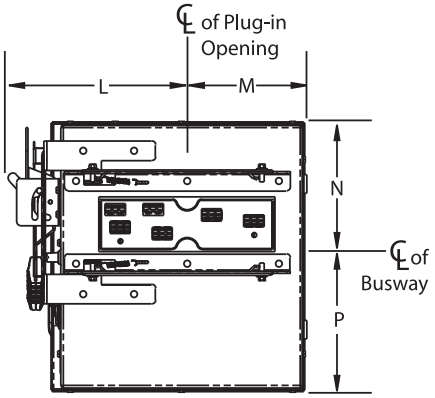
Horizontal Fusible Bus Plug Dimensions and Weighs (Enclosure Only)

Ampere Rating	Dimensions Inches (mm)												Weight lbs (kg)
	"A"	"B"	"C"	"D max."	"E"	"F"	"J"	"K"	"L"	"M"	"N"	"P"	
30	13.13 (333)	13.86 (352)	7.96 (202)	2.60 (66)	6.18 (156)	2.66 (67)	2.65 (67)	2.06 (52)	9.81 (249)	6.22 (157)	5.30 (134)	8.63 (219)	23.5 (10.66)
60	13.13 (333)	14.86 (377)	7.96 (202)	2.60 (66)	7.18 (182)	2.66 (67)	2.65 (67)	2.06 (52)	9.81 (249)	6.22 (157)	5.30 (134)	9.63 (244)	25.5 (11.56)
100	13.13 (333)	15.86 (402)	7.96 (202)	2.60 (66)	8.18 (207)	2.66 (67)	2.65 (67)	2.06 (52)	9.81 (249)	6.22 (157)	5.30 (134)	10.53 (267)	28.0 (12.70)
200	14.88 (377)	22.86 (580)	10.58 (268)	2.60 (66)	15.88 (403)	2.66 (67)	3.40 (86)	3.06 (78)	9.81 (249)	7.95 (201)	5.30 (134)	17.62 (447)	49.0 (22.22)
400	18.63 (473)	25.36 (644)	15.67 (398)	5.50 (140)	12.67 (322)	7.67 (195)	12.15 (309)	3.06 (78)	11.80 (299)	9.43 (239)	11.90 (302)	15.15 (384)	100.0 (254)
600	18.63 (473)	25.36 (644)	15.67 (398)	5.50 (140)	12.67 (322)	7.67 (195)	12.15 (309)	3.06 (78)	11.80 (299)	9.43 (239)	11.90 (302)	15.15 (384)	100.0 (254)



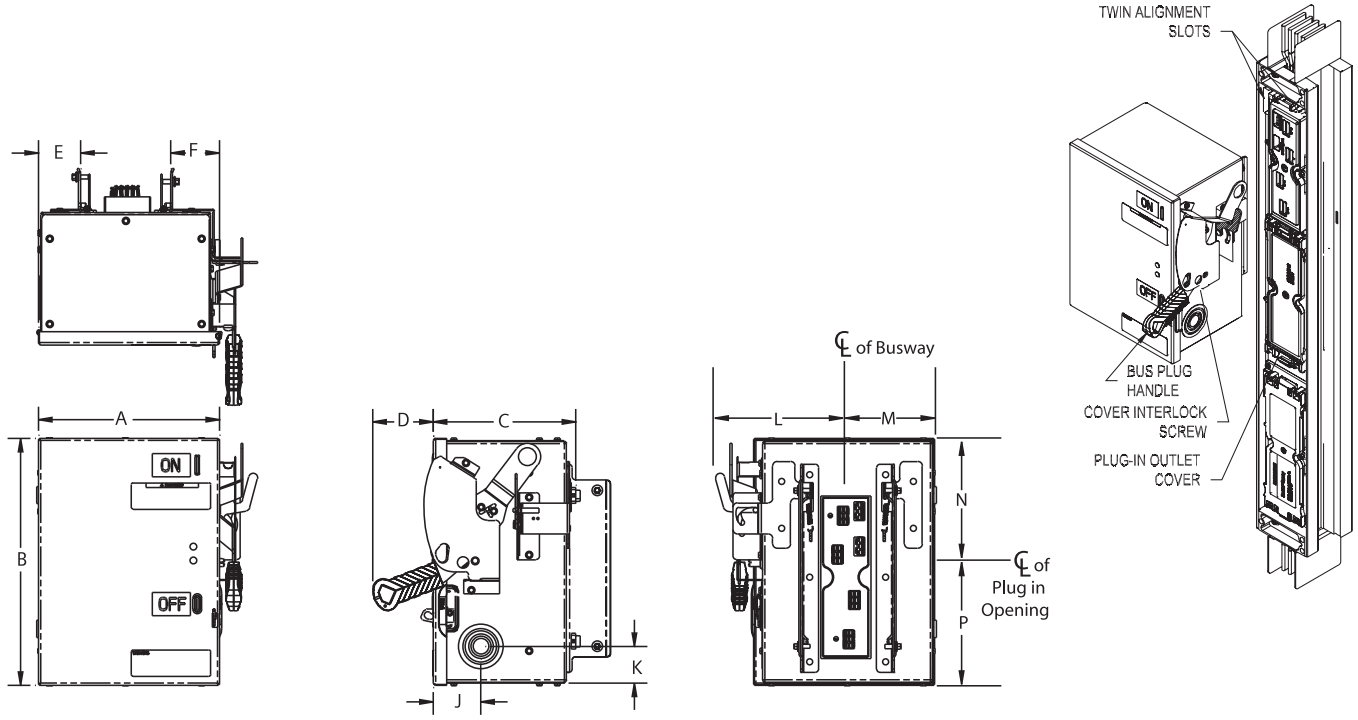






Riser Fusible Bus Plug Dimensions and Weighs (Enclosure Only)

Ampere Rating	Dimensions Inches (mm)												Weight lbs (kg)
	"A"	"B"	"C"	"D max."	"E"	"F"	"J"	"K"	"L"	"M"	"N"	"P"	
30	10.13 (257)	13.86 (352)	7.96 (202)	5.25 (133)	2.74 (69)	2.36 (59)	2.65 (67)	2.06 (52)	8.06 (204)	5.08 (129)	7.83 (198)	6.09 (154)	23.5 (10.66)
60	10.13 (257)	14.86 (377)	7.96 (202)	5.25 (133)	2.74 (69)	2.36 (59)	2.65 (67)	2.06 (52)	8.06 (204)	2.08 (52)	7.83 (198)	7.09 (180)	25.5 (11.56)
100	11.13 (282)	15.86 (402)	7.96 (202)	5.25 (133)	7.74 (196)	3.36 (85)	2.65 (67)	2.06 (52)	8.06 (204)	6.08 (154)	7.83 (198)	8.09 (205)	28.0 (12.70)
200	14.88 (377)	22.86 (580)	10.58 (268)	5.90 (149)	5.11 (129)	4.74 (120)	3.40 (86)	3.06 (78)	10.42 (264)	7.35 (186)	9.08 (230)	13.84 (351)	49.0 (22.22)
400	18.63 (473)	25.36 (644)	15.67 (398)	5.50 (140)	6.60 (167)	7.10 (180)	12.15 (309)	3.06 (78)	11.97 (304)	9.25 (234)	13.56 (344)	13.49 (342)	100.0 (2540)
600	18.63 (473)	25.36 (644)	15.67 (398)	5.50 (140)	6.60 (167)	7.10 (180)	12.15 (309)	3.06 (78)	11.97 (304)	9.25 (234)	13.56 (344)	13.49 (342)	100.0 (2540)

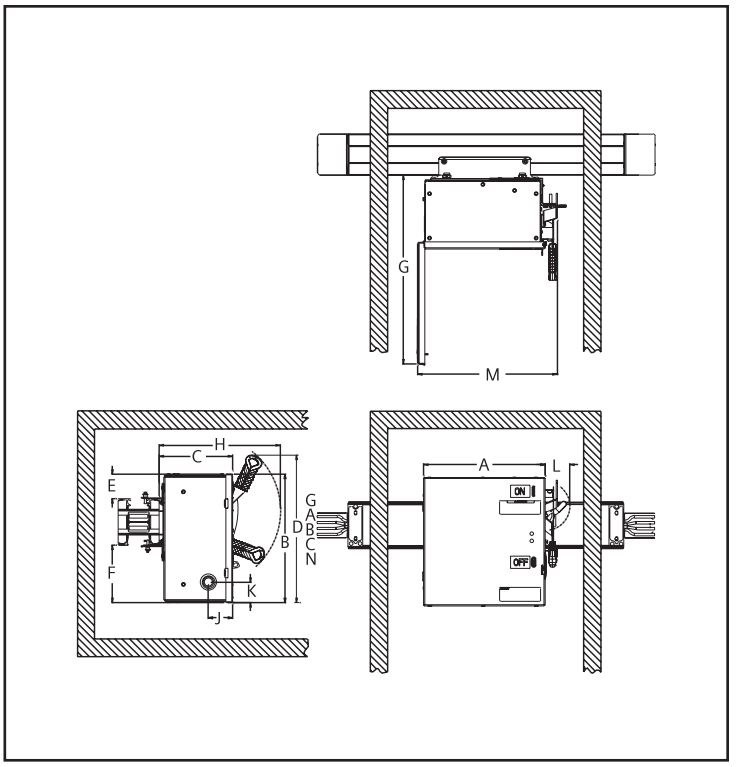


Fusible Switch Plug, Load Lugs, and Knockouts

Ampere Rating	Ground Lug Cu/Al	Neutral Lug Cu/Al	Phase Lug Cu/Al	Knockout Sizes Inches (mm)
30	#14-1/0	#14-2	#14-2	7/8 (22, 1 1/8 (29), 1 3/8 (35), 1 3/4 (44, 2 (51), 2 1/2 (64)
60	#14-1/0	#14-1/0	#14-2	7/8 (22, 1 1/8 (29), 1 3/8 (35), 1 3/4 (44, 2 (51), 2 1/2 (64)
100	#14-1/0	#14-1/0	#14-1/0	7/8 (22, 1 1/8 (29), 1 3/8 (35), 1 3/4 (44, 2 (51), 2 1/2 (64)
200	#14-1/0	#6-300MCM	#6-300MCM	1 3/8 (35), 1 3/4 (44), 2 (51), 2 1/2 (64), 3 (76)
400	#6-350MCM	(2) 1/0-250MCM or (1) 1/0-750MCM	(2) 1/0-250MCM or (1) 1/0-750MCM	7/8 (22), 1 1/8 (29)
600	#6-350MCM	(4) 1/0-250MCM or (2) 1/0-750MCM	(4) 1/0-250MCM or (2) 1/0-750MCM	7/8 (22), 1 1/8 (29)

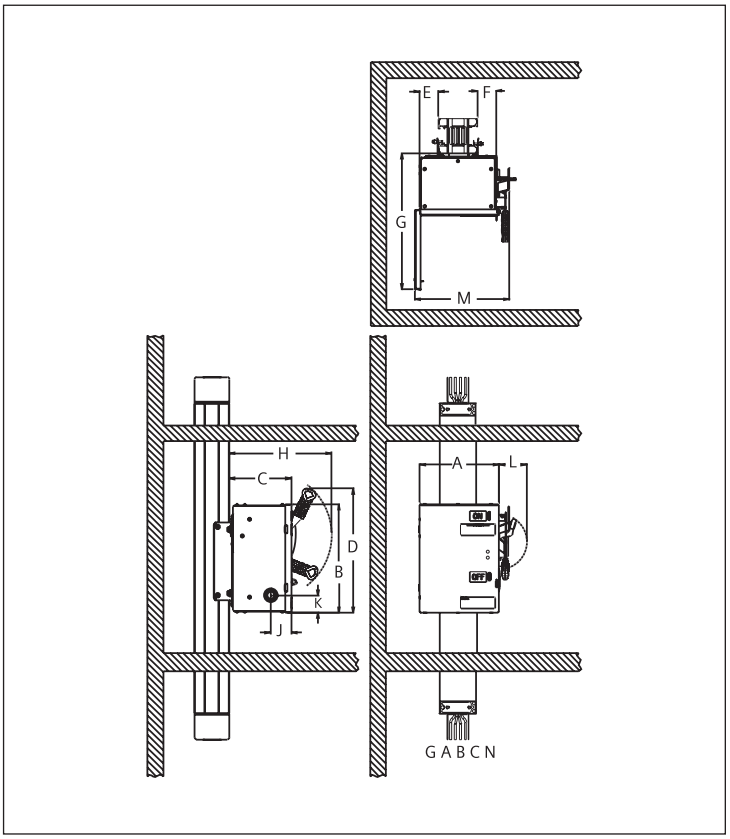
Wall Clearance and Bus Plug Dimensions Horizontal (Inches/mm)

Dim.	No Cradle					
	30	60	100	200	400	600
A	13.13 (333)	13.13 (333)	13.13 (333)	14.88 (377)	18.63 (473)	18.63 (473)
B	13.86 (352)	14.86 (377)	15.86 (402)	22.86 (580)	27.00 (686)	27.00 (686)
C	7.96 (202)	7.96 (202)	7.96 (202)	10.58 (268)	15.67 (398)	15.67 (398)
D	15.89 (403)	16.68 (423)	17.68 (449)	24.66 (626)	20.00 (508)	20.00 (508)
E	6.19 (157)	7.19 (182)	8.19 (208)	15.19 (385)	12.67 (322)	12.67 (322)
F	2.67 (67)	2.67 (67)	2.67 (67)	2.67 (67)	7.67 (195)	7.67 (195)
G	20.39 (517)	20.39 (517)	20.39 (517)	24.76 (628)	33.75 (857)	33.75 (857)
H	13.09 (332)	13.09 (332)	13.09 (332)	16.55 (420)	21.17 (538)	21.17 (538)
J	2.65 (67)	2.65 (67)	2.65 (67)	3.40 (86)	12.15 (309)	12.15 (309)
K	2.06 (52)	2.06 (52)	2.06 (52)	3.06 (78)	3.06 (78)	3.06 (78)
L	2.65 (67)	2.65 (67)	2.65 (67)	2.65 (67)	2.65 (67)	2.65 (67)
M	15.07 (382)	15.07 (382)	15.07 (382)	16.82 (427)	21.00 (533)	21.00 (533)



Wall Clearance and Bus Plug Dimensions Riser (Inches/mm)

Dim.	No Cradle					
	30	60	100	200	400	600
A	10.13 (237)	10.13 (257)	11.13 (282)	14.68 (372)	18.63 (473)	18.63 (473)
B	13.86 (352)	14.86 (377)	15.86 (402)	22.86 (580)	27.00 (686)	27.00 (686)
C	7.96 (202)	7.96 (202)	7.96 (202)	10.58 (268)	15.67 (398)	15.67 (398)
D	15.89 (403)	16.68 (423)	17.68 (449)	24.66 (626)	20.00 (508)	20.00 (508)
E	2.74 (69)	2.74 (69)	7.74 (196)	5.11 (129)	6.60 (167)	6.60 (167)
F	2.36 (59)	2.36 (59)	3.36 (85)	4.74 (120)	7.10 (180)	7.10 (180)
G	17.39 (441)	17.39 (441)	18.39 (467)	24.76 (628)	33.75 (857)	33.75 (857)
H	13.09 (332)	13.09 (332)	13.09 (332)	16.55 (420)	21.17 (538)	21.17 (538)
J	2.65 (67)	2.65 (67)	2.65 (67)	3.40 (86)	12.15 (309)	12.15 (309)
K	2.06 (52)	2.06 (52)	2.06 (52)	3.06 (78)	3.06 (78)	3.06 (78)
L	3.55 (90)	3.55 (90)	3.55 (90)	3.55 (90)	2.65 (67)	2.65 (67)
M	12.07 (306)	12.07 (306)	13.07 (331)	16.82 (427)	21.00 (533)	21.00 (533)

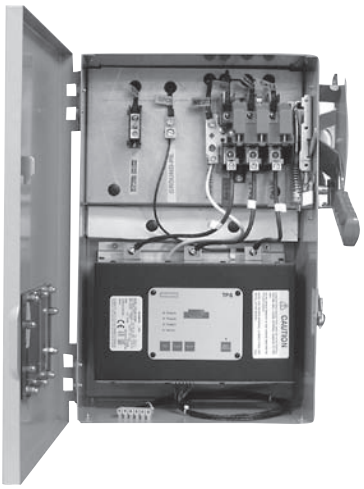


The Siemens advantage...

Siemens history of innovation and safety continues with our line of UL 1449 3rd Edition SPD's. The TPS Series utilizes thermally protected MOV's specifically designed for safe operation in high fault current or sustained overvoltage conditions that can cause other SPD's to fail in an unsafe manner and damage other equipment in the distribution system. Every MOV, including N-G, is monitored. Indicator lights for each phase provide indication of loss of protection and phase loss protection. The direct bus, integral design reduces circuit impedance resulting in the lowest possible let-through voltages providing maximum protection to facility equipment and systems.

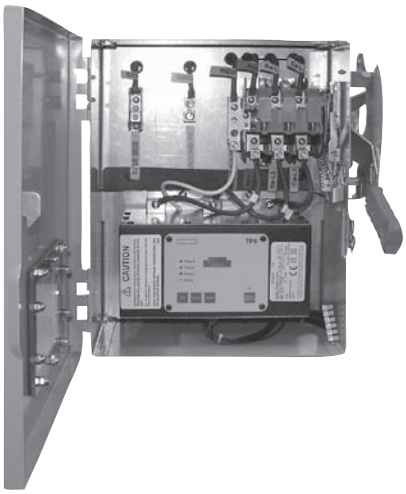
All TPS Series SPD's:

- UL 1449 3rd Edition Listed, CUL, CE Mark
- Designed, tested, manufactured to ANSI/IEEE C62.42.1 – 2002, C62.41.2 – 2002, C62.45 – 2002
- Provide indication of loss of protection on each phase and phase loss
- Include all UL-required over current protection and safety coordination inside
- Prevent internally generated surges from propagating throughout a facility and externally generated surges from reaching sensitive loads



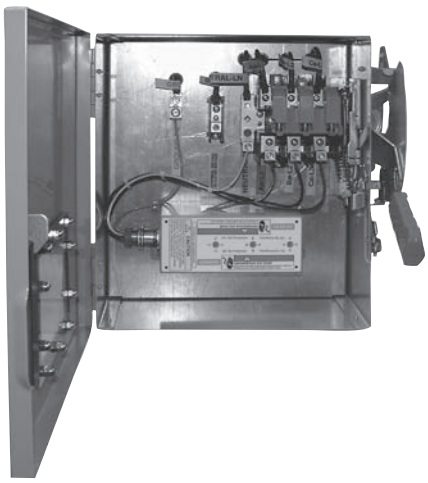
High Exposure Applications - TPS6

- 400kA – 500kA per phase
- 200kA SCCR
- 20kA nominal discharge current
- Indicator lights, audible alarm and dry contacts standard
- Individually fused, thermally protected MOV's
- EMI/RFI filtering
- Surge counter optional



Medium Exposure Applications - TPS1

- 100kA – 300kA per phase
- 200kA SCCR
- 20kA nominal discharge current
- Indicator lights, audible alarm and dry contacts standard
- Individually fused, thermally protected MOV's
- EMI/RFI filtering
- Surge counter optional

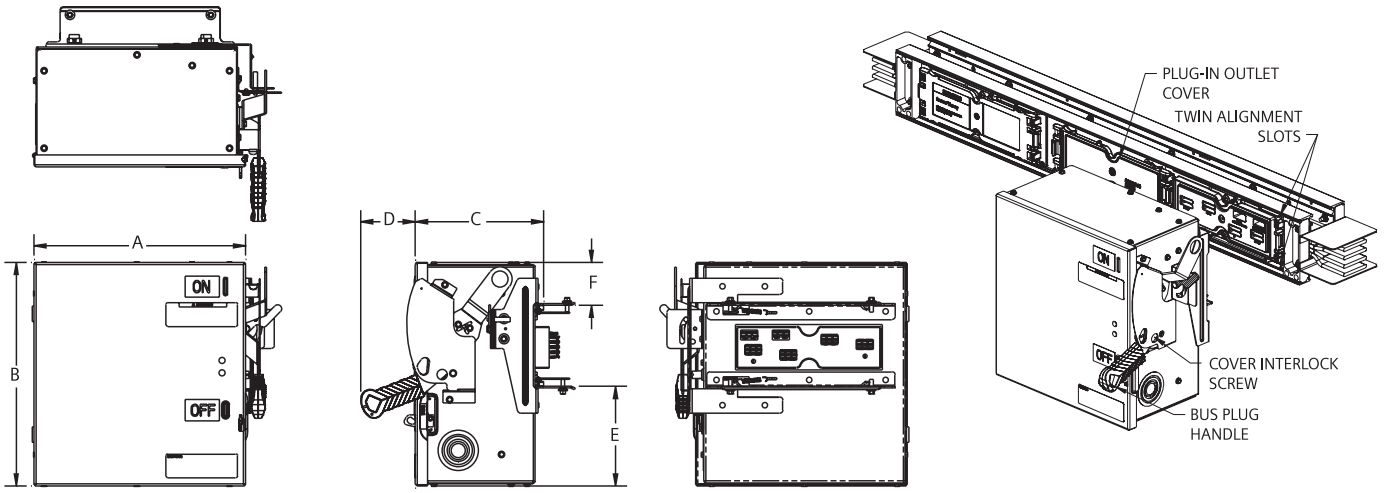


Low Exposure Applications - TPS9

- 100kA per phase
- 200kA SCCR
- 20kA nominal discharge current
- Indicator lights standard
- Individually fused, thermally protected MOV's
- Dry contacts and audible alarm optional

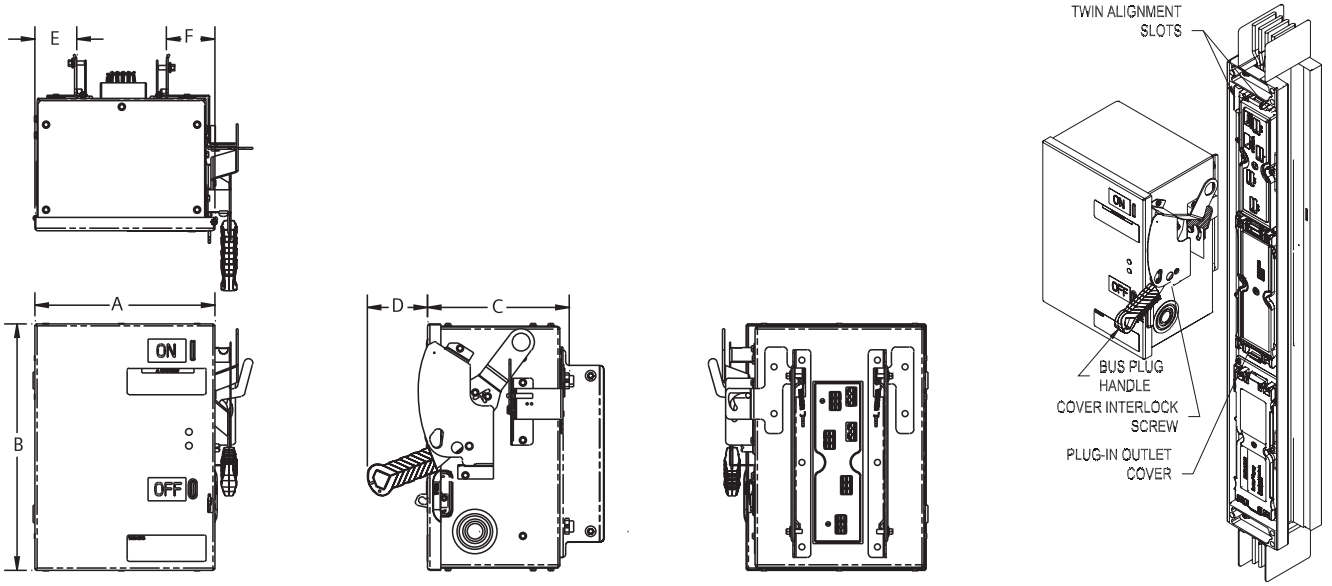
Horizontal SPD bus plugs dimensions and weights

Plug type	Dimensions inches (mm)						
	"A"	"B"	"C"	"D" max.	"E"	"F"	Weight lbs. (kgs)
TPS 9	13.25 (336)	13.86 (352)	7.96 (202)	2.60 (66)	6.18 (156)	2.66 (67)	30 (13.63)
TPS 1	13.25 (336)	15.86 (402)	7.96 (202)	2.60 (66)	8.18 (207)	2.66 (67)	35 (15.90)
TPS 6	13.25 (336)	19.86 (504)	7.96 (202)	2.60 (66)	12.18 (372)	2.66 (67)	38 (17.27)



Riser SPD bus plugs dimensions and weights

Plug type	Dimensions inches (mm)						
	"A"	"B"	"C"	"D" max.	"E"	"F"	Weight lbs. (kgs)
TPS 9	10.25 (260)	13.86 (352)	7.96 (202)	5.25 (133)	2.74 (69)	2.36 (59)	25 (11.36)
TPS 1	11.25 (286)	19.36 (492)	7.96 (202)	5.25 (133)	7.74 (196)	3.36 (85)	35 (15.90)
TPS 6	15.00 (381)	22.86 (580)	10.58 (268)	5.25 (133)	5.11 (129)	4.74 (120)	45 (20.45)



SENTRON SPD Bus Plug Numbering System

STP H 4 4 G E 06 24

Plug Type

STP = Sentron SPD VBII

Orientation

H = Horizontal
R = Riser

Configuration (Poles/Wires)

3 = 3∅ 3W
4 = 3∅ 4W

IP Rating

4 = IP55

Ground Designation

G = Internal Ground (Isolated ground available as custom)

Voltage Code

A = 120/240V 1∅ 3W
B = 240/120V 3∅ 4W
D = 240V 3∅ 3W
E = 480Y/277V 3∅ 4W
F = 480V 3∅ 3W
G = 600V 3∅ 3W ①
L = 600Y/347V 3∅ 4W

TPS Model Number

01 = TPS 1④
1L = TPS1L (10 Mode) ② ④
06 = TPS 6 ④
6L = TPS6L (10 Mode) ② ④
09 = TPS 9 ③

Surge Current (kA)

10 = 100kA per Phase	TPS1, TPS9
15 = 150kA per Phase	TPS1L
20 = 200kA per Phase	TPS1
25 = 250KA per phase	TPS1
30 = 300kA per Phase	TPS1, TPS1L
40 = 400kA per Phase	TPS6
45 = 450kA per Phase	TPS6L
50 = 500kA per Phase	TPS6

Options

TPS1 and TPS6:
R = Remote Monitor
X = Surge Counter
TPS 9:
D = Dry Contact & Audible Alarm

Notes:
① Available in 100kA & 150kA for TPS1 and 100kA, 150kA, 200kA & 250kA for TPS6.
② The 10 mode devices provide additional circuit protection for Line to Neutral and Neutral to Ground. The 10 modes of protection are: L1-G, L2-G, L3-G, L1-L2, L2-L3, L1-L3, L1-N, L2-N, L3-N, N-G.
③ Standard features: indicator lights.
④ Standard features: indicator lights, dry contacts, audible alarm with silence switch, test button.

Sentron Busway Overview

Sentron Busway for Global Power Distribution Applications

Building on a solid foundation of advanced products for the construction industry, the Siemens Sentron name is recognized worldwide as synonymous with quality and consistent performance. Sentron Busway delivers impressive features and benefits that make it ideal for many types of industrial and construction implementations.

Engineered to ensure the safe and efficient distribution of power in industrial, commercial and institutional environments world-wide, Sentron ampacities range from 225A to 5000A UL and IEC. Thanks to an innovative design, you benefit from labor-saving installation and a flexible, compact bus system that is an ideal fit for most applications. In fact, Sentron Busway is one of the industry's least labor-intensive systems.

Sentron Busway installs with minimal hardware and often costs less than cable and conduit installations. The lightweight aluminum housing acts as an integral ground, joint stacks connect with splice plates featuring a single-bolt design, and bus plugs and cable tap boxes offer the industry's largest wire bending space. An optional 200% neutral within the bus bar housing accommodates harmonics common in today's power systems.

Sentron Busway conductors are insulated with a state-of-the-art epoxy insulation system, which is applied using an electrostatic spray process for optimal insulation integrity.

Exemplifying the spirit of continuing innovation, Sentron Busway is now available with economical and convenient elbow stacks for changing left, right, up or down directions at 90 degrees.

And, of course, Sentron Busway is certified to design standards worldwide, including UL, NEMA, IEC, CSA, VDE and BS.

Siemens Busway Business uses industry leading technology in all its manufacturing processes. From bus bar fabrication to Electrostatic Spray Epoxy insulation, all the processes used in the manufacturing of Siemens Sentron Busway are electronically controlled to provide for consistent, high quality results, making Sentron Busway products best in its class.

Housing

Sentron Busway incorporates an all aluminum housing. This lightweight totally enclosed, non-ventilated housing resists rust and other elements, distributes heat away from the conductors, and provides an excellent ground path. The totally enclosed design also eliminates the need for derating of the system regardless of installation orientation. The housing is covered with an electrostatically applied light gray ANSI 61 polyester urethane powder paint that is scratch resistant and has a 1,000-hour salt spray resistance rating.

Conductors

Sentron Busway conductors have a compact construction and can be configured as 3-phase 3-wire, 3-phase 4-wire or 3-phase 4-wire with 200% neutral. The conductors may be ordered in copper (98% conductivity), 1000A/in^2 M-Rated Copper, Aluminum (58% conductivity) and 750A/in^2 L-Rated Aluminum. The optional 200% neutral helps to handle harmonic conditions that may exist. This system is especially useful with discharge lighting (fluorescent) and computer installations. This will help to minimize overheating and prolong the life cycle of your power distribution equipment.

Ground

Sentron Busway offers ground options to meet your specifications: standard integral aluminum housing ground and optional internal grounding bars. An optional isolated ground is also available which is especially useful in applications where a clean ground is needed.

Plating

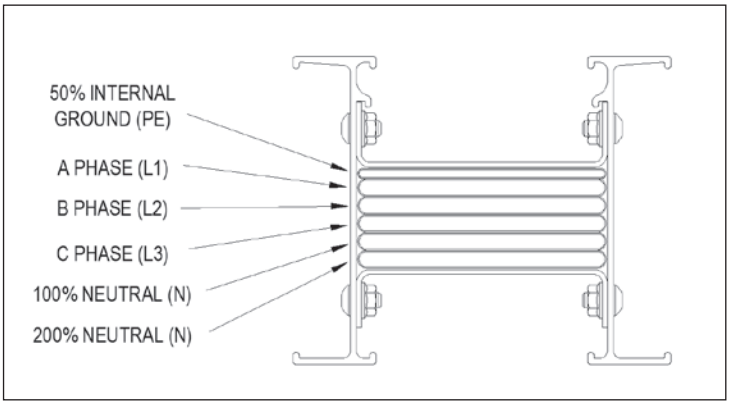
All bus bars are electroplated with tin. This unique tin plating provides excellent conductivity and resists outside elements from attaching to the bars. Optional silver plating is also available.

Insulation

Sentron Busway is insulated with an Epoxy Powder Coating system designed by Siemens Engineers, Epoxy System Engineers and Epoxy Powder Specialists, specifically for Siemens Busway products.

The Siemens exclusive Electrostatic Spray insulation process produces uniform application of Epoxy powder over the entire conductor bar. This is further enhanced by the inline filter process and magnetic separator that helps to eliminate contaminants common to fluidized bed systems. The electrostatic application also provides a better coating consistency than that of the older fluidized bed process. The combination of electrostatic spray and lower oven temperatures produces a consistent coverage with fewer impurities and pinholes in the insulation. The lower oven temperatures reduce the risk of bar annealing, which affects the overall quality of the system.

Sentron Busway insulation is Class B, 130°C Rated. Every bus bar and completed assembly is dielectric tested to ensure the insulation is free of defects.



Sentron Busway Overview

Joint Stack

Each Sentron Busway piece is shipped with a joint stack and joint covers installed at one end of the busway and a shipping end protector at the other end. The joint stacks feature a single bolt design and a special, torque indicating, double headed break-off bolt. This eliminates the need for torque wrenches and assures proper torque at installation of 50 ft.-lbs.(68 N-m).

When the proper torque value is achieved, the top bolt head will shear off. Each joint stack allows for +/- .625 inches (15.8mm) adjustability at each joint. Over adjustment is prevented by the joint covers, which will only allow a .625 inch (15.8mm) adjustment when the knockouts on the joint cover are removed.

It is possible to remove any joint connection assembly to allow electrical isolation or removal of a busway length without disturbing adjacent busway lengths. Isolation joint stacks are available and used to electrically isolate a busway section(s) within a busway run. For easy visual identification, isolation joint stack assemblies are painted white.

Plug-in Opening

Sentron Busway offers plug-in style busway which feature plug-in openings rated for finger safety to IP2X in accordance with IEC 529 and BS EN 60439-1, -2 and BS EN 60529.

Each plug-in opening has a reversible hinged dead front designed to protect the contact surfaces from dirt, dust or moisture. Gasketing is used where applications require a splash proof (IP55) rating.

IP Ratings

Sentron Busway is available in a variety of IP ratings. Use the chart below to determine the IP rating that best fits your application needs.

Testing

Each piece of Sentron Busway is factory tested before shipping. Tests performed include dielectric tests, which are used to insure integrity of insulation. In addition, Sentron Busway is tested in accordance with both UL and IEC standards. All Sentron Busway is manufactured and inspected in an ISO 9001:2000 registered facility.

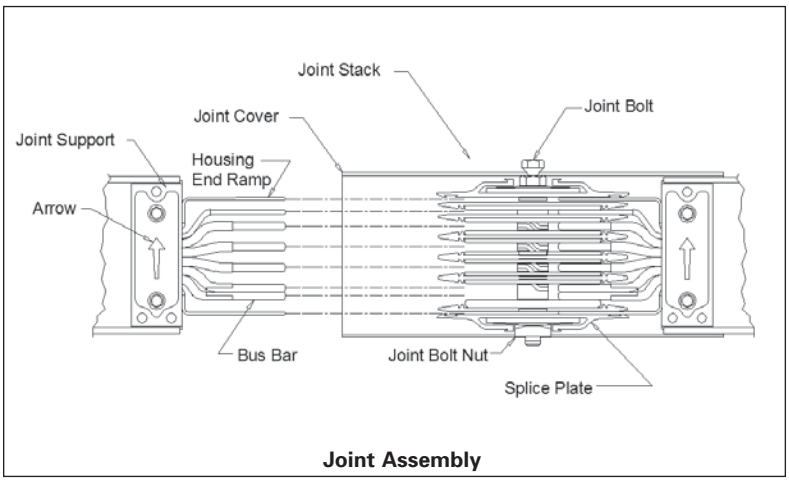
Standards

All Sentron Busway products meet the following standards:

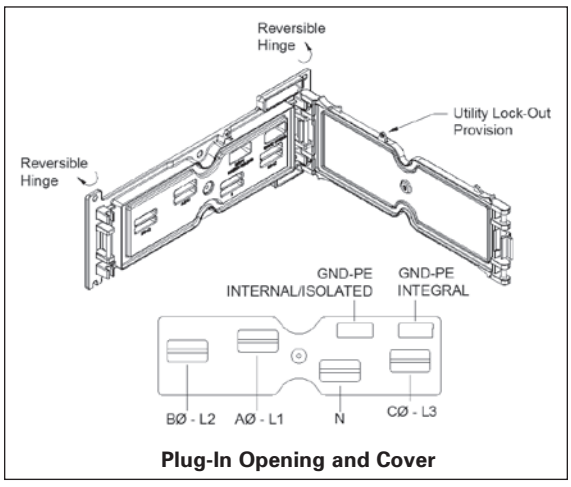
UL 857
NEMA BU1
CSA C22.2
IEC 439-1(1993), IEC 439-2 (1993), IEC 529 (1989)
BS EN 60529
BS EN 60439-1, 60439-2
UL 1479
DIN 4102 Parts 9&12
BS 6387 Parts 11.1 and 11.2

Labor Savings

Using Sentron Busway instead of cable and conduit can create savings of up to 20 - 30% on total installed costs. Sentron busway is lightweight, compact and takes half the time to install as cable and conduit. Siemens Busway Systems Cable Conversion Program will show you side by side comparisons of busway vs. cable/conduit. These comparisons include material costs, labor costs, bill of materials, and technical information between busway and cable/conduit. Contact your local Siemens sales office to find out more information, or visit our web site at www.sea.siemens.com.



Joint Assembly



Plug-In Opening and Cover

Levels of Protection Description

Code	Description	Sentron Busway		Sentron Bus Plugs
		Feeder	Plug-In	
IP 2X	Plug-In outlet protects against access to live parts by .472 in. (12 mm) test probe, even with cover opened. **Finger Safe**	•	•	•
IP 40	Enclosure protects against entry of .039 in. (1.0 mm) test probe. **Indoor** (Typical UL Designation)	•	•	•
IP 55	Enclosure protects against entry of dust and water jets. **Splash Proof**	•	•	•
IP 66	Enclosure is dust tight and protects against powerful water jets. **Outdoor** (International Only)	•		
NEMA 3R	Enclosure protects against rain, sleet and damage from ice formation. **Outdoor** - NAFTA	•		

Sentron Bus Plug Overview

Overview

SENTRON Bus Plugs are engineered with the installer and end user in mind. The installer will benefit from the numerous features, such as factory installed circuit breakers, compact footprint, generous wirebend space, and dual interlocks. The end user will appreciate the visible position indicator, as well as the spring loaded pad lockable latch which prevents access to unauthorized personel.

SENTRON Bus Plugs are designed with an interlock device to prevent the door from being opened when the disconnect is on. This also prevents the disconnect from being turned on while the door is open. The interlock ensures that the protective device is "OFF" prior to installation or removal of the bus plug. Once the bus plug is properly installed, a spring - loaded, padlock latch provides additional security by preventing unauthorized access to the unit.

Alignment and interlock stabs are features of the Sentron Bus Plugs engineered to prevent improper installation of the unit. Guide stabs prevent installing the bus plug 180 degrees out of rotation. In addition, the stabs provide vertical support for vertical applications. The bus plug ground stabs are designed to ensure positive contact with both the integral and optional internal busway grounds before the bus plug fingers contact the phase and neutral bars. Sentron Bus Plugs also feature bolt-on mounting to the busway housing for secure attachment.

Sentron Bus Plugs can be configured for horizontal or vertical applications. The following Bus Plugs can be mounted (side by side) five (5) per busway side channel (Total 10 per 10' Section).

- 30-600 SLVBH Fusible (Horizontal)①
- 30-200 SLVBR Fusible (Riser)①
- 30-400 Circuit Breaker①

Sentron SLVB Fusible Bus Plugs feature a direct drive mechanism. The operating handle mounts directly to the switch mechanism for fewer moving parts.

Enclosure Ratings:

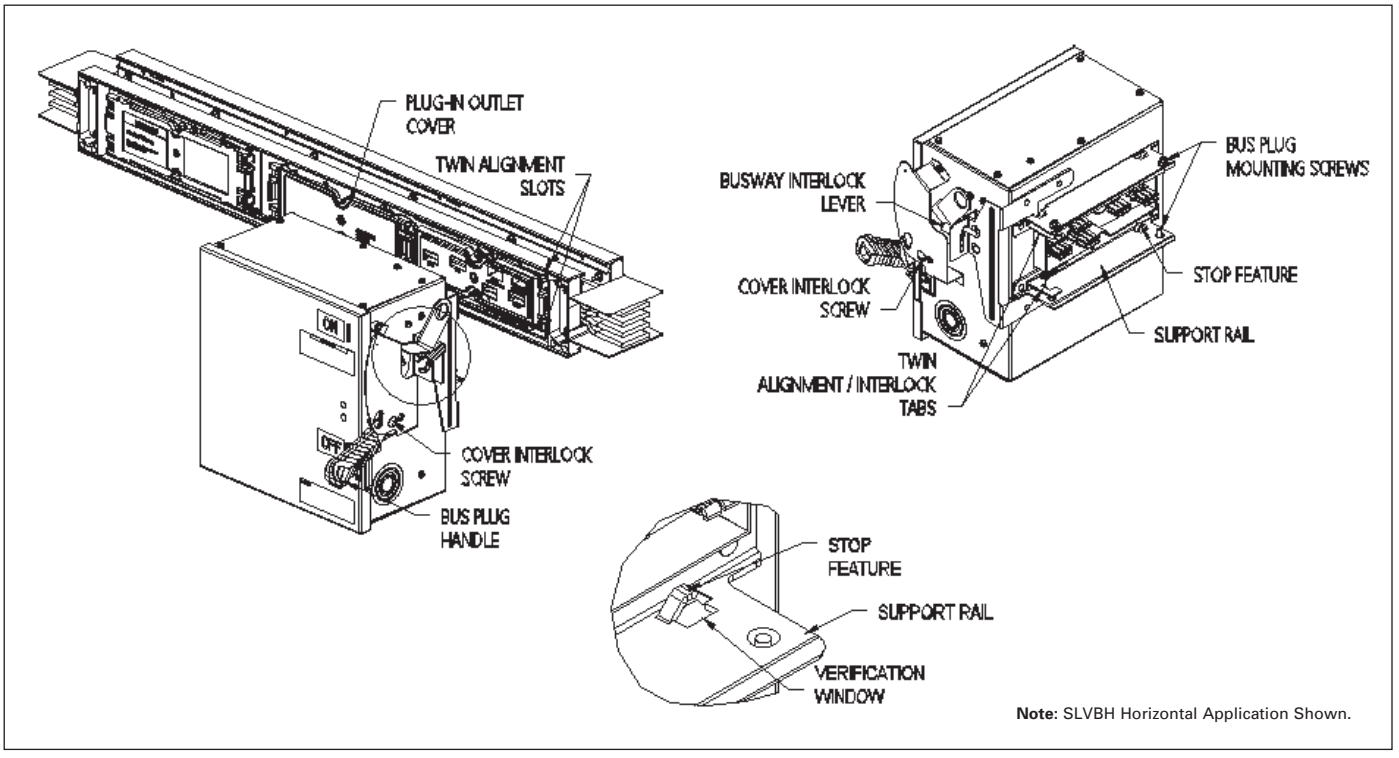
- IP40
- IP55

Conductors:

- 3-phase, 3-wire
- 3-phase, 4-wire
- 3-phase, 4-wire 200% neutral (400A and below)

Grounding:

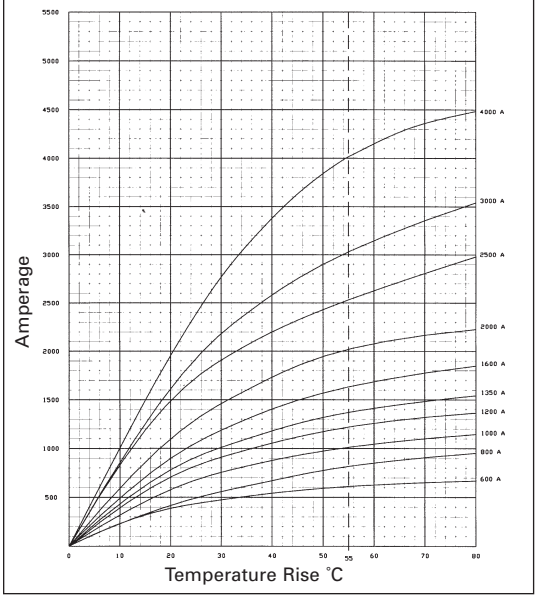
- Integral (Housing)
- Internal
- Isolated



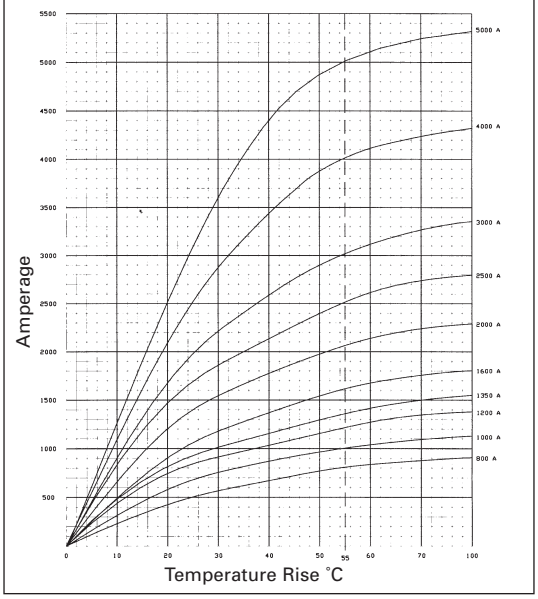
Note: SLVBH Horizontal Application Shown.

① Contact Siemens for 200% Neutral Applications.

Temperature Rise Curves
Aluminum Bus Bar **Sentron Busway**



Temperature Rise Curves
Copper Bus Bar **Sentron Busway**



R, X, Z and Ohms, Voltage Drop

Ampere Rating		Bus Bar Width x 0.25 in. (6.4mm) Thick	Ohms x 10^3 per 100 feet Line to Neutral R	X	Z	Voltage Drop - Concentrated Loads, Line-to-Line per 100 feet at 100% Rated Load, 35°C Ambient①③⑦ Power Factor 0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
AL	**L-Rated③**												
225	—	1.75 (44.5)	3.94	1.13	4.10	0.88	1.02	1.15	1.27	1.39	1.49	1.57	1.54
400	—	1.75 (44.5)	4.08	1.23	4.26	1.66	1.91	2.15	2.38	2.58	2.77	2.91	2.83
600	—	1.75 (44.5)	4.26	1.32	4.46	2.64	3.03	3.40	3.75	4.08	4.37	4.58	4.43
800	400	2.38 (60.5)	3.42	1.06	3.58	2.82	3.24	3.64	4.02	4.36	4.67	4.90	4.74
1000	600	3.25 (82.6)	2.45	0.74	2.56	2.50	2.88	3.24	3.57	3.89	4.17	4.38	4.24
1200	800	4.38 (111.3)	1.86	0.59	1.95	2.32	2.66	2.99	3.29	3.58	3.82	4.01	3.87
1350	1000	5.38 (138.7)	1.39	0.24	1.41	1.50	1.81	2.10	2.39	2.67	2.93	3.17	3.25
1600	1200	6.50 (165.1)	1.21	0.48	1.29	2.19	2.48	2.75	3.00	3.23	3.43	3.56	3.35
2000	1350,1600	8.75 (222.3)	0.91	0.35	0.98	2.11	2.38	2.64	2.87	3.08	3.26	3.37	3.16
2500	2000	(2) 5.63 (143.0)	0.68	0.29	0.74	2.09	2.34	2.57	2.78	2.97	3.12	3.21	2.95
3000	2500	(2) 6.75 (171.5)	0.54	0.28	0.61	2.24	2.47	2.67	2.85	3.01	3.12	3.16	2.80
3200	2000	(2) 7.50 (190.5)	0.48	0.33	0.58	2.53	2.73	2.91	3.06	3.17	3.23	3.20	2.68
4000	3000,3200	(2) 9.00 (228.6)	0.62	0.21	0.51	2.34	2.61	2.85	3.08	3.27	3.43	3.51	3.20
CU	**M-Rated③**												
225	—	1.75 (44.5)	2.34	1.13	2.60	0.69	0.77	0.84	0.90	0.95	0.99	1.01	0.91
400	—	1.75 (44.5)	2.44	1.13	2.69	1.26	1.40	1.52	1.64	1.74	1.82	1.86	1.69
600	—	1.75 (44.5)	2.58	1.16	2.83	1.96	2.18	2.39	2.58	2.74	2.87	2.94	2.68
800	400	1.75 (44.5)	2.71	1.17	2.95	2.67	2.98	3.28	3.55	3.78	3.97	4.08	3.76
1000	—	2.25 (67.2)	2.12	0.98	2.30	2.58	2.88	3.17	3.44	3.67	3.86	3.98	3.67
1200	600	2.88 (73.2)	1.66	0.77	1.83	2.56	2.85	3.11	3.35	3.56	3.72	3.80	3.45
1350	800	3.50 (88.9)	1.30	0.64	1.45	2.34	2.59	2.82	3.03	3.20	3.33	3.39	3.04
1600	1000	4.50 (114.3)	1.06	0.56	1.20	2.37	2.60	2.66	3.01	3.17	3.29	3.32	2.94
2000	1200,1350	6.00 (152.4)	0.77	0.44	0.89	2.27	2.48	2.50	2.83	2.96	3.05	3.07	2.66
—	1600	—	—	—	—	—	—	—	—	—	—	—	—
2500	2000	8.50 (215.9)	0.55	0.35	0.65	2.15	2.34	2.50	2.64	2.75	2.82	2.81	2.39
3000	—	(2) 4.75 (120.7)	0.49	0.27	0.56	2.07	2.28	2.46	2.62	2.76	2.86	2.89	2.54
3200	—	(2) 5.50 (139.7)	0.44	0.30	0.53	2.33	2.51	2.67	2.80	2.90	2.96	2.93	2.44
4000	2500,3000,3200	(2) 6.50 (165.1)	0.36	0.15	0.39	1.76	1.97	2.17	2.35	2.51	2.63	2.71	2.49
5000	4000	(2) 8.50 (215.9)	0.30	0.21	0.37	2.49	2.69	2.86	3.00	3.11	3.17	3.15	2.63

Notes:

① For plug-in distributed loads, divide voltage drop values by 2.

② To determine voltage drop line-to-neutral, multiply line-to-line values by 0.577.

③ Actual voltage drop for different lengths and at loadings less than full rated current can be calculated using the formula:
Vd (actual) = Vd (table) x actual load x actual length (ft)
rated load 100 feet

④ For 50 Hz, multiply reactance (X) by 0.85 and resistance values do not change. For 400 Hz, multiply reactance by 3.75 and multiply resistance by 1.4. Calculate new voltage drop:
Vd = amps load x $\sqrt{3}$(Rcos θ + X sin θ) per 100 ft,
where cos θ = Power Factor.

⑤ For metric conversion R, X, Z values "in Ohms per meters Line to Neutral"
R x .0328
X x .0328
Z x .0328

⑥ For metric conversion "Line to Line per meter at 25° C ambient in mV/A/m" (Vd 32.8) / A. Divide Vd by 2 for distributed loads.

⑦ Voltage Drop will decrease in lower ambient temperature. Contact Siemens for Voltage Drop in other ambient conditions.

Ground Capacity

Ampere Rating		Bus Bar Width Inches (mm)	Bars per Pole	Min. CSA for Ground Bus per UL 857 Table 14 In2 (mm2)	Sectional Area 50% Internal Ground Bar In2 (mm2)	Integral (Hsg.) Ground In2 (mm2)	Effective Current Carrying Capacity of Housing		Grd. Circuit Characteristics under Fault Conditions Ohms x 103 per 100 ft					
							% of UL Req	% of Phase Bar	Internal Ground R	X	Z	Housing Ground R	X	Z
A	**L-Rated**													
225	—	1.75 (44.5)	1	0.08 (53.5)	0.22 (141.1)	2.30 (1485.1)	1333	253	10.267	9.037	4.872	14.200	12.963	5.797
400	—	1.75 (44.5)	1	0.17 (107.1)	0.22 (141.1)	2.30 (1485.1)	667	253	10.267	9.037	4.872	14.200	12.963	5.797
600	—	1.75 (44.5)	1	0.17 (107.1)	0.22 (141.1)	2.30 (1485.1)	667	253	10.267	9.037	4.872	14.200	12.963	5.797
800	400	2.38 (60.5)	1	0.17 (107.1)	0.30 (191.9)	2.40 (1550.1)	688	192	8.063	7.333	3.351	11.150	10.000	4.932
1000	600	3.25 (82.6)	1	0.20 (126.5)	0.41 (262.1)	2.54 (1639.9)	607	147	7.208	6.628	2.833	9.202	8.442	3.662
1200	800	4.38 (111.1)	1	0.23 (146.5)	0.55 (352.8)	2.72 (1756.6)	552	115	6.358	5.852	2.487	7.625	6.926	3.189
1350	1000	5.38 (136.5)	1	0.29 (189.7)	0.67 (433.5)	2.88 (1859.8)	446	9	5.561	5.115	2.182	6.478	5.883	2.713
1600	1200	6.50 (165.1)	1	0.29 (189.7)	0.81 (524.2)	3.06 (1975.4)	467	84	4.837	4.489	1.801	5.687	5.206	2.289
2000	1350,1600	8.75 (222.3)	1	0.35 (227.7)	1.09 (705.6)	3.42 (2207.7)	425	69	3.735	3.467	1.390	4.565	4.267	1.623
2500	2000	5.63 (142.9)	2	0.52 (332.3)	1.41 (907.3)	3.85 (2480.7)	320	59	3.169	2.955	1.145	4.129	3.837	1.526
3000	2500	6.75 (171.5)	2	0.59 (380.0)	1.69 (1088.7)	4.20 (2711.9)	301	53	2.848	2.683	0.954	3.835	3.635	1.221
3200	2000	7.50 (190.5)	2	0.81 (522.6)	1.88 (1209.7)	4.44 (2866.8)	229	51	2.648	2.493	0.894	3.614	3.428	1.144
4000	3000,3200	9.00 (228.6)	2	0.81 (522.6)	2.25 (1451.6)	4.92 (3176.5)	250	50	2.446	2.339	0.715	3.500	3.378	0.916
CU	**M-Rated**													
225	—	1.75 (44.5)	1	0.05 (33.5)	0.22 (141.1)	2.30 (1485.1)	2128	261	7.380	6.330	3.803	11.338	10.083	5.183
400	—	1.75 (44.5)	1	0.11 (67.7)	0.22 (141.1)	2.30 (1485.1)	1054	261	7.380	6.330	3.803	11.338	10.083	5.183
600	—	1.75 (44.5)	1	0.11 (67.7)	0.22 (141.1)	2.30 (1485.1)	1054	261	7.380	6.330	3.803	11.338	10.083	5.183
800	400	1.75 (44.5)	1	0.11 (67.7)	0.22 (141.1)	2.30 (1485.1)	1054	261	7.380	6.330	3.803	11.338	10.083	5.183
1000	—	2.25 (57.2)	1	0.13 (85.2)	0.28 (181.5)	2.38 (1536.7)	860	207	6.715	5.993	3.029	10.194	9.191	4.409
1200	600	2.88 (73.0)	1	0.18 (114.2)	0.36 (231.9)	2.48 (1601.8)	661	166	6.186	5.676	2.460	8.996	8.212	3.674
1350	800	3.50 (88.9)	1	0.24 (152.3)	0.44 (282.3)	2.58 (1665.8)	510	140	5.704	5.267	2.188	8.000	7.492	2.807
1600	1000	4.50 (114.3)	1	0.24 (152.3)	0.56 (362.9)	2.74 (1769.0)	534	113	4.719	4.323	1.893	7.411	6.880	2.756
2000	1200,1350	6.00 (152.4)	1	0.29 (189.7)	0.75 (483.9)	2.98 (1923.8)	457	90	3.507	3.181	1.476	6.422	6.032	2.205
—	1600	6.50 (165.1)	1	0.29 (189.7)	0.81 (524.2)	3.06 (1975.4)	467	84	4.837	4.489	1.801	5.687	5.206	2.289
2500	2000	8.50 (215.9)	1	0.35 (227.7)	1.06 (685.5)	3.38 (2181.9)	421	70	2.294	2.020	1.087	3.072	5.419	1.764
3000	—	4.75 (120.7)	2	0.41 (265.8)	1.19 (766.1)	3.56 (2290.0)	376	66	2.117	1.874	0.984	4.859	4.631	1.470
3200	—	5.50 (139.7)	2	0.59 (380.0)	1.38 (887.1)	3.80 (2453.9)	277	60	1.938	1.691	0.947	4.353	4.129	1.378
4000	2500,3000,3200	6.50 (165.1)	2	0.59 (380.0)	1.63 (1048.4)	4.12 (2660.3)	296	54	1.688	1.500	0.773	3.334	3.060	1.323
5000	4000	8.50 (215.9)	2	0.71 (456.1)	2.13 (1371.0)	4.76 (3073.2)	278	50	1.360	1.218	0.606	1.989	1.783	0.882

Note: Bus bar thickness = .25 in. (6.4mm), Ground bar thickness = .125 in.(3.18mm)

UL Short Circuit Ratings					UL Series Connected with Fuse		
		RMS Symmetrical (kA)			Maximum Fuse Size for 200kA RMS Symmetrical Rating		
Ampere	Rating	6 cycle	1 sec.	3 sec.	Class R	Class J & T	Class L
AL	**L-Rated**						
225	—	85	28	16	600	600 J & T	—
400	—	85	28	16	600	600 J & T	—
600	—	85	28	16	600	600 J & T	—
800	400	100	47	27	—	800 T	1200
1000	600	100	50	29	—	—	3000
1200	800	125	60	35	—	—	3000
1350	1000	150	75	43	—	—	3000
1600	1200	150	90	52	—	—	3000
2000	1350,1600	150	110	64	—	—	5000
2500	2000	200	130	75	—	—	5000
3000	2500	200	160	92	—	—	—
3200	2000	200	160	92	—	—	—
4000	3000,3200	200	200	115	—	—	—
CU	**M-Rated**						
225	—	85	40	23	600	600 J & T	—
400	—	85	40	23	600	600 J & T	—
600	—	85	40	23	600	600 J & T	—
800	400	85	40	23	—	800 T	1600
1000	—	100	50	29	—	—	3000
1200	600	100	65	38	—	—	3000
1350	800	100	80	46	—	—	3000
1600	1000	125	95	55	—	—	4000
2000	1200,1350	150	115	66	—	—	5000
—	1600	150	90	52	—	—	3000
2500	2000	150	130	75	—	—	5000
3000	—	200	175	101	—	—	—
3200	—	200	175	101	—	—	—
4000	2500,3000,3200	200	200	115	—	—	—
5000	4000	200	200	115	—	—	—

Sentron Busway has UL approved Series Ratings. By using the appropriate line side fuse, short circuit ratings can be enhanced to 200kA for lower amperage busway.

Straight Sections

Sentron Busway can be ordered with Aluminum or Copper bus bars. Aluminum bars are available in 225-4000 ampere sections. Copper bars are available in 225-5000 ampere sections. Sentron Busway includes an integral housing ground, and is available with an internal ground bar or an isolated ground bar in all ampere ratings. Sentron Busway housing is a four-piece aluminum design.

Plug-In Sections

Sentron plug-in sections are designed with plug-in openings centered on 24 in. (610mm) intervals, and are located on both sides of the busway for optimum utilization. Plug-in sections are available in standard lengths of 4 ft. (1.22m), 6 ft. (1.83m), 8 ft. (2.44m) and 10 ft. (3.05m). Sentron plug-in sections meet IP40 (indoor) and IP55 (splash proof) requirements. One joint stack assembly is provided with each plug-in section.

Riser Sections

Sentron Riser sections are designed with plug-in openings centered on 24 in. (610mm) intervals on one side of the busway only. This eliminates unusable plug-in outlets in vertical applications. Riser busway is available in standard lengths of 4 ft. (1.22m), 6 ft. (1.83m), 8 ft. (2.44m) and 10 ft. (3.05m). Sentron Riser Busway is available in IP40 (indoor) and IP55 (splash proof). One joint stack assembly is provided with each riser section.

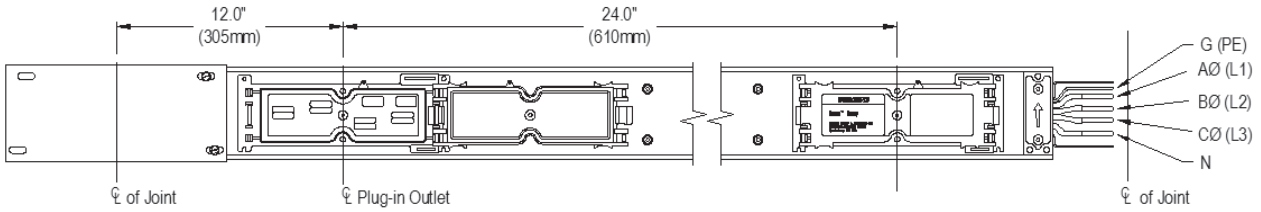
Plug-In Outlet Features

The plug-in outlet molded guard design prevents incidental finger contact with live conductors. Sentron plug-in outlets are IP 2X rated (with the outlet cover open) which means a .472 in. (12mm) or larger probe is unable to enter a plug-in outlet. The outlet is IP40 Rated with the cover closed and IP55 Rated when configured with gaskets.

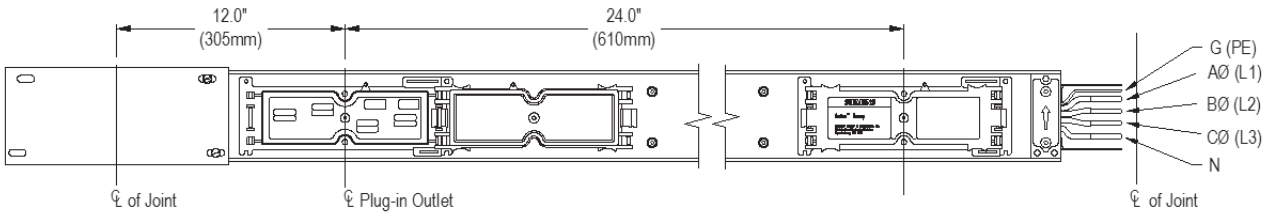
Feeder Sections

Feeder busway carries the current of the busway system from the supply source. Feeder busway does not have plug-in outlets. Sentron Feeder busway is available in custom lengths from 2 ft. (.61m) to 10 ft. (3.05m). Feeder sections are rated as IP40 (Indoor), IP55 (Splash Proof), NEMA 3R (Outdoor), and IP66 (Severe Outdoor). One joint stack assembly is provided with each feeder section.

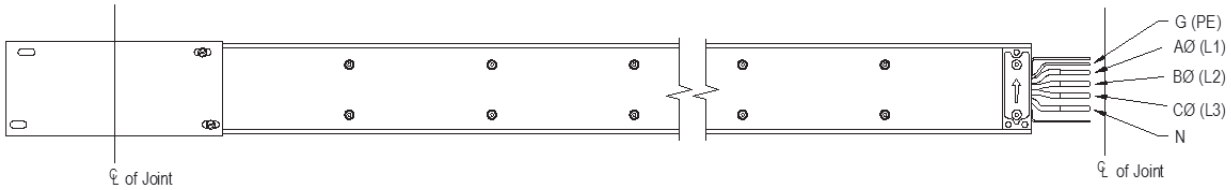
Standard Plug-In Section (Standard plug-in outlets on both sides on 24 in. centers)
Suffix PL04 (4 ft.), PL06 (6 ft.), PL08 (8 ft.), PL10 (10 ft.)



Standard Riser Section (Standard Plug-In outlets on one side on 24 in. centers)
Suffix RI04 (4 ft.), RI06 (6 ft.), RI08 (8 ft.), RI10 (10 ft.)

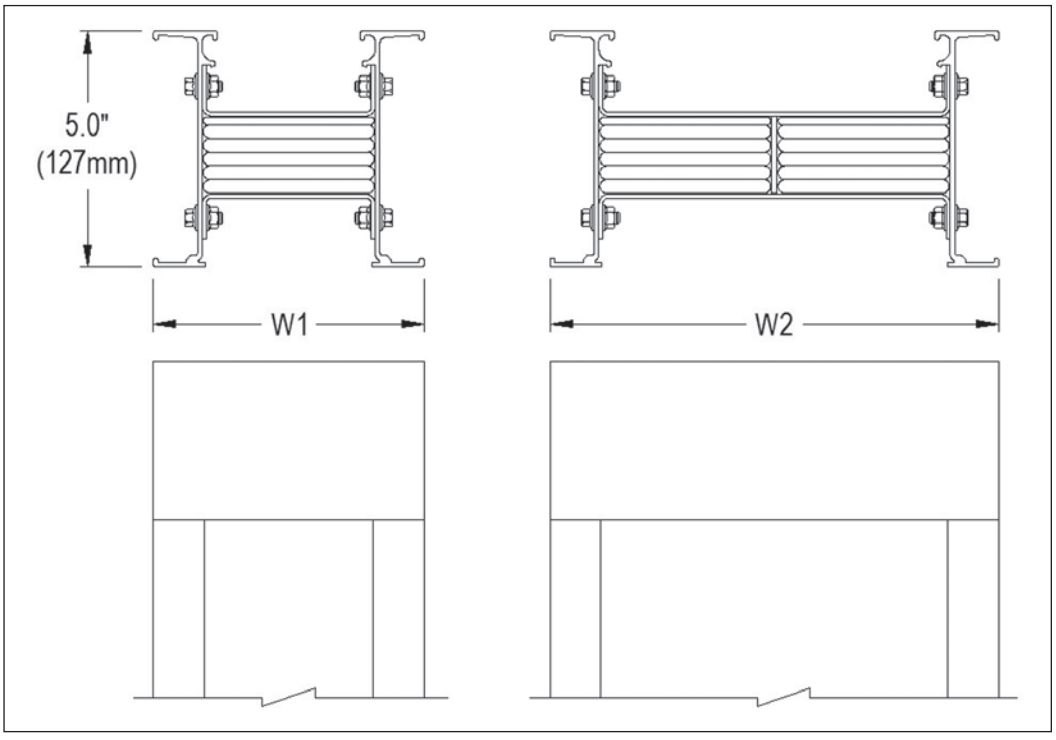


Standard Feeder Section
Suffix F024 - 120 (last 3 digits = length in Inches, 024=24 in., 120=120 in.)



Sentron Busway, Widths and Weights

Ampere	Rating	Dimension Inches (mm)	Approximate Weight - lbs per ft. (kg per meter)					
			3Ø, 3-Wire	3Ø, 3-Wire with Internal Ground	3Ø, 4-Wire	3Ø, 4-Wire with Internal Ground	3Ø, 4-Wire 200% Neutral	3Ø, 4-Wire 200% Neutral with Internal Ground
AL	**L-Rated**							
225	—	"W1" 3.9 (99)	5 (8)	5 (8)	6 (9)	6 (9)	7 (10)	7 (10)
400	—	"W1" 3.9 (99)	5 (8)	5 (8)	6 (9)	6 (9)	7 (10)	7 (10)
600	—	"W1" 3.9 (99)	5 (8)	5 (8)	6 (9)	6 (9)	7 (10)	7 (10)
800	400	"W1" 4.6 (117)	6 (9)	6 (9)	7 (10)	7 (10)	7 (11)	8 (11)
1000	600	"W1" 5.4 (137)	7 (10)	7 (11)	8 (12)	8 (12)	9 (13)	9 (14)
1200	800	"W1" 6.6 (168)	8 (12)	9 (13)	9 (14)	10 (15)	11 (16)	11 (17)
1350	1000	"W1" 7.6 (193)	9 (13)	10 (15)	11 (16)	11 (17)	12 (18)	13 (19)
1600	1200	"W1" 8.7 (221)	10 (15)	11 (17)	12 (18)	13 (19)	14 (21)	15 (22)
2000	1250,1600	"W1" 10.9 (277)	13 (19)	14 (21)	15 (23)	16 (24)	18 (26)	19 (28)
2500	2000	"W2" 13.7 (348)	15 (22)	17 (25)	8 (27)	20 (30)	22 (33)	23 (34)
3000	2500	"W2" 15.8 (402)	17 (25)	19 (28)	21 (31)	23 (34)	25 (37)	27 (40)
3200	2000	"W2" 17.3 (439)	18 (27)	20 (30)	23 (34)	25 (37)	27 (40)	29 (43)
4000	3000,3200	"W2" 20.3 (516)	22 (33)	25 (37)	27 (40)	30 (44)	32 (48)	35 (52)
CU	**M-Rated**							
225	—	"W1" 3.9 (99)	9 (13)	10 (14)	10 (16)	11 (17)	12 (18)	13 (19)
400	—	"W1" 3.9 (99)	9 (13)	10 (14)	10 (16)	11 (17)	12 (18)	13 (19)
600	—	"W1" 3.9 (99)	9 (13)	10 (14)	10 (16)	11 (17)	12 (18)	13 (19)
800	400	"W1" 3.9 (99)	9 (13)	10 (14)	10 (16)	11 (17)	12 (18)	13 (19)
1000	—	"W1" 4.4 (112)	10 (15)	11 (17)	12 (19)	14 (20)	15 (22)	16 (23)
1200	600	"W1" 5.1 (130)	12 (18)	14 (20)	15 (23)	16 (24)	18 (26)	19 (29)
1350	800	"W1" 5.7 (145)	14 (21)	16 (24)	17 (26)	19 (29)	21 (31)	23 (34)
1600	1000	"W1" 6.7 (170)	17 (26)	19 (29)	22 (32)	24 (35)	26 (38)	28 (42)
2000	1200,1350	"W1" 8.2 (208)	22 (32)	25 (37)	28 (41)	30 (45)	33 (50)	36 (54)
—	1600	"W1" 10.9 (277)	13 (19)	14 (21)	5 (23)	16 (24)	18 (26)	19 (28)
2500	2000	"W1" 10.7 (272)	30 (44)	34 (50)	38 (56)	42 (62)	46 (68)	50 (74)
3000	—	"W2" 11.8 (300)	33 (49)	37 (55)	42 (63)	47 (70)	51 (76)	56 (83)
3200	—	"W2" 13.3 (335)	37 (55)	2 (63)	48 (72)	53 (79)	58 (86)	64 (95)
4000	2500,3000,3200	"W2" 15.3 (389)	43 (64)	50 (75)	56 (83)	62 (92)	68 (101)	75 (112)
5000	4000	"W2" 19.3 (491)	56 (83)	4 (95)	72 (107)	80 (119)	89 (132)	97 (145)



Elbows

Sentron Busway elbows provide a simple, convenient method of changing the direction (left, right, up or down) of a busway run. Two elbow styles are offered: elbow stack and elbow section.

Flatwise Elbow Stacks, Dimensions (standard/min.)		
Ampere Rating		Dimensions Inches (mm) "A"
AL	**L-Rated**	
225	—	1.00 (25)
400	—	1.00 (25)
600	—	1.00 (25)
800	400	1.12 (28
1000	600	2.00 (51)
1200	800	2.50 (64)
1350	1000	3.00 (76)
1600	1200	3.50 (89)
2000	1350,1600	4.62 (117)
2500	2000	5.75 (146)
3000	2500	7.00 (178)
3200	2000	7.75 (197)
4000	3000,3200	9.35 (237)
CU	**M-Rated**	
225	—	1.00 (25)
400	—	1.00 (25)
600	—	1.00 (25)
800	400	1.00 (25)
1000	—	1.12 (28)
1200	600	.25 (33)
1350	800	2.00 (50)
1600	1000	2.50 (64)
2000	1200,1350	3.25 (83)
—	1600	4.62 (117)
2500	2000	4.50 (114)
3000	—	5.00 (127)
3200	—	5.75 (146)
4000	2500,3000,3200	6.75 (171)
5000	4000	8.87 (225)

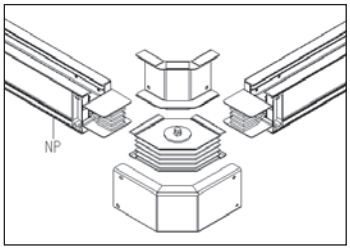
Note: Flatwise elbow stacks can be ordered as either right-hand (ESFR) or left-hand (ESFL) to follow the same nomen-clature as an elbow section. The construction is identical and interchangeable.

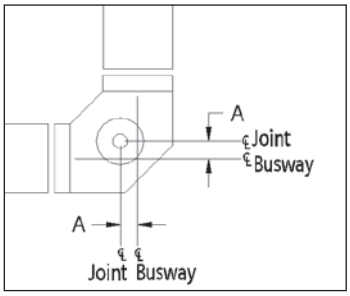
Flatwise Elbow Stacks

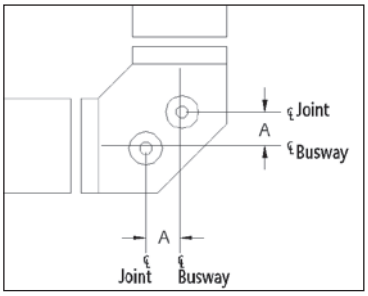
Flatwise elbow stacks are used for left and right directional changes. When the busway system is mounted flatwise in the horizontal plane (bus bars run parallel to the floor).

Flat

Suffix ESFR/ESFL





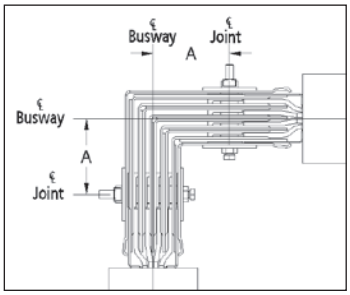


Edgewise Elbow Stacks, Dimensions (standard/min.)		
Ampere Rating		Dimensions Inches (mm) "A"
AL	**L-Rated**	
225	—	4.25 (108)
400	—	4.25 (108)
600	—	4.25 (108)
800	400	4.25 (108)
1000	600	4.25 (108)
1200	800	4.25 (108)
1350	1000	4.25 (108)
1600	1200	4.25 (108)
2000	1350,1600	4.25 (108)
2500	2000	4.25 (108)
3000	2500	4.25 (108)
3200	2000	4.25 (108)
CU	**M-Rated**	
225	—	4.25 (108)
400	—	4.25 (108)
600	—	4.25 (108)
800	400	4.25 (108)
1000	—	4.25 (108)
1200	600	4.25 (108)
1350	800	4.25 (108)
1600	1000	4.25 (108)
2000	1200,1350	4.25 (108)
—	1600	4.25 (108)
2500	2000	4.25 (108)
3000	—	4.25 (108)
3200	—	4.25 (108)
4000	2500,3000,3200	4.25 (108)
5000	4000	4.25 (108)

Note: Edge up and edge down elbow stacks are not interchangeable.

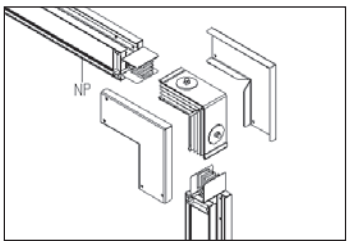
Edgewise Elbow Stacks

Edgewise elbow stacks create up and down directional changes. The "A" phase is on the inside of the bend for edge up elbow stacks. The "A" phase is on the outside of the bend for edge down elbow stacks.



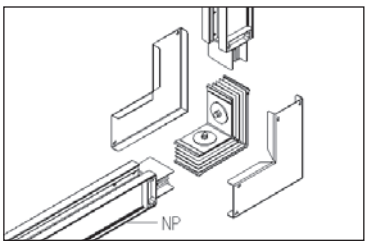
Edge Down

Suffix ESED



Edge Up

Suffix ESEU



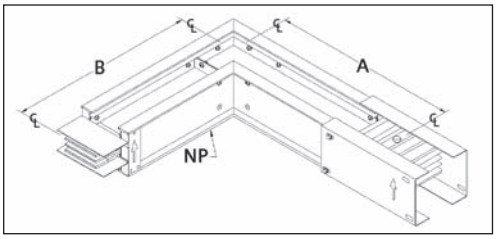
Flatwise Elbow Sections, Dimensions (standard/min.)			
Ampere Rating		Dimensions Inches (mm) "A"	"B"
AL	**L-Rated**		
225	—	12 (305)	12 (305)
400	—	12 (305)	12 (305)
600	—	12 (305)	12 (305)
800	400	12 (305)	12 (305)
1000	600	12(305)	12 (305)
1200	800	12 (305)	12 (305)
1350	1000	12 (305)	12 (305)
1600	1200	18 (457)	18 (457)
2000	1350,1600	18 (457)	18 (457)
2500	2000	18 (457)	18 (457)
3000	2500	18 (457)	18 (457)
3200	2000	18 (457)	18 (457)
4000	3000,3200	24 (610)	24 (610)
CU	**M-Rated**		
225	—	12 (305)	12 (305)
400	—	12 (305)	12 (305)
600	—	12 (305)	12 (305)
800	400	12 (305)	12 (305)
1000	—	12 (305)	12 (305)
1200	600	12 (305)	12 (305)
1350	800	12 (305)	12 (305)
1600	1000	12 (305)	12 (305)
2000	1200,1350	12 (305)	12 (305)
—	1600	18 (457)	18 (457)
2500	2000	18 (457)	18 (457)
3000	—	18 (457)	18 (457)
3200	—	18 (457)	18 (457)
4000	2500,3000,3200	18 (457)	18 (457)
5000	4000	24 (610)	24 (610)

Flatwise Elbow Sections

Flatwise elbow sections are used for left and right directional changes when the busway system is mounted in the horizontal plane (bus bars run parallel to the floor). The joint stack assembly may be moved to the opposite leg to change the orientation from left to right/right to left.

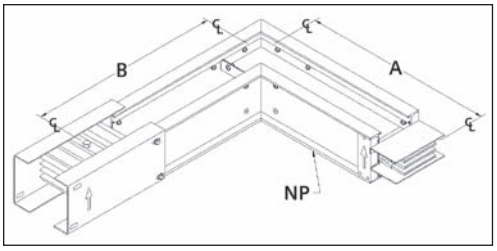
Flat Left

Suffix ELEF



Flat Right

Suffix ELFR



Edgewise Elbow Sections, Dimensions (standard/min.)			
Ampere Rating		Dimensions Inches (mm) "A"	"B"
AL	**L-Rated**		
225	—	10 (254)	10 (254)
400	—	10 (254)	10 (254)
600	—	10 (254)	10 (254)
800	400	10 (254)	10 (254)
1000	600	10 (254)	10 (254)
1200	800	10 (254)	10 (254)
1350	1000	10 (254)	10 (254)
1600	1200	10 (254)	10 (254)
2000	1350,1600	10 (254)	10 (254)
2500	2000	10 (254)	10 (254)
3000	2500	10 (254)	10 (254)
3200	2000	10 (254)	10 (254)
4000	3000,3200	10 (254)	10 (254)
CU	**M-Rated**		
225	—	10 (254)	10 (254)
400	—	10 (254)	10 (254)
600	—	10 (254)	10 (254)
800	400	10 (254)	10 (254)
1000	—	10 (254)	10 (254)
1200	600	10 (254)	10 (254)
1350	800	10 (254)	10 (254)
1600	1000	10 (254)	10 (254)
2000	1200,1350	10 (254)	10 (254)
—	1600	10 (254)	10 (254)
2500	2000	10 (254)	10 (254)
3000	—	10 (254)	10 (254)
3200	—	10 (254)	10 (254)
4000	2500,3000,3200	10 (254)	10 (254)
5000	4000	10 (254)	10 (254)

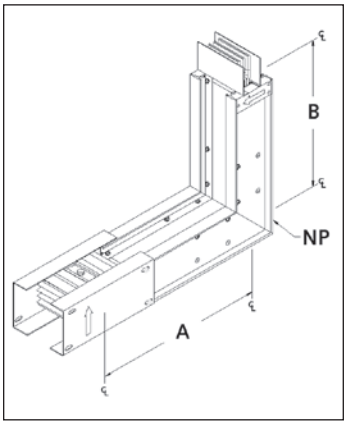
Note : Odd angle elbow flatwise and edgewise elbow sections are available for angles 95° - 175° in 5° increments.

Edgewise Elbow Sections

Edgewise elbow sections create up and down directional changes. The "A"phase bus bar lies on the inside of the bend for edge up elbows. The "A" phase bus bar lies on the outside of the bend for edge down elbows. The joint stack assembly on edgewise elbows can not be moved in order to change orientation from up to down/down to up. Sentron Busway elbow sections are shipped with a joint stack assembly on one end for direct connection to the busway system.

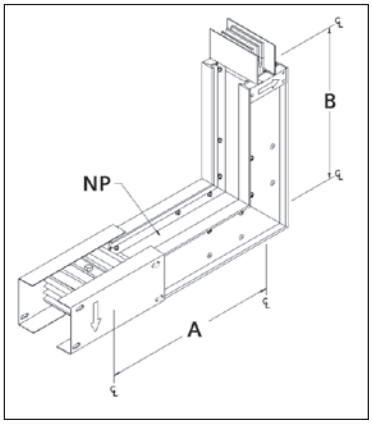
Edge Up

Suffix ELEU



Edge Down

Suffix ELED



Offsets

Offsets can be utilized to solve difficult contour problems and save space. In applications where space does not allow for two connected elbows, a single offset can bypass an obstruction. All offsets are supplied with one joint stack assembly.

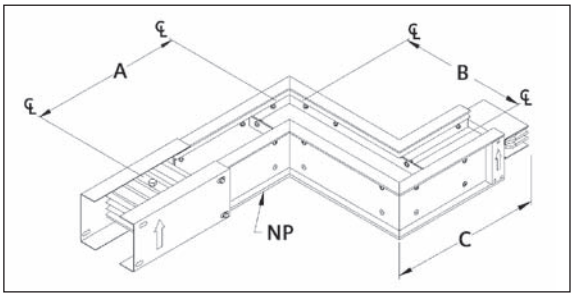
Flatwise Offsets, Dimensions (standard/min.)				
Ampere Rating		Dimensions Inches (mm) *"A"	"B"	"C"
AL	L-Rated			
225	—	12 (305)	5 (127)	12 (305)
400	—	12 (305)	5 (127)	12 (305)
600	—	12 (305)	5 (127)	12 (305)
800	400	12 (305)	5 (127)	12 (305)
1000	600	12 (305)	5 (127)	12 (305)
1200	800	12 (305)	5 (127)	12 (305)
1350	1000	12 (305)	5 (127)	12 (305)
1600	1200	18 (457)	5 (127)	18 (457)
2000	1350,1600	18 (457)	5 (127)	18 (457)
2500	2000	18 (457)	5 (127)	18 (457)
3000	2500	18 (457)	5 (127)	18 (457)
3200	2000	18 (457)	5 (127)	18 (457)
4000	3000,3200	24 (610)	8 (203)	24 (610)
CU	M-Rated			
225	—	12 (305)	5 (127)	12 (305)
400	—	12 (305)	5 (127)	12 (305)
600	—	12 (305)	5 (127)	12 (305)
800	400	12 (305)	5 (127)	12 (305)
1000	—	12 (305)	5 (127)	12 (305)
1200	600	12 (305)	5 (127)	12 (305)
1350	800	12 (305)	5 (127)	12 (305)
1600	1000	12 (305)	5 (127)	12 (305)
2000	1200,1350	12 (305)	5 (127)	12 (305)
—	1600			
2500	2000	18 (457)	5 (127)	18 (457)
3000	—	18 (457)	5 (127)	18 (457)
3200	—	18 (457)	5 (127)	18 (457)
4000	2500,3000,3200	18 (457)	5 (127)	18 (457)
5000	4000	24 (610)	8 (203)	24 (610)

Edgewise Offsets, Dimensions (standard/min.)				
Ampere Rating		Dimensions Inches (mm) *"A"	"B"	"C"
AL	L-Rated			
225	—	10 (254)	6 (152)	10 (254)
400	—	10 (254)	6 (152)	10 (254)
600	—	10 (254)	6 (152)	10 (254)
800	400	10 (254)	6 (152)	10 (254)
1000	600	10 (254)	6 (152)	10 (254)
1200	800	10 (254)	6 (152)	10 (254)
1350	1000	10 (254)	6 (152)	10 (254)
1600	1200	10 (254)	6 (152)	10 (254)
2000	1350,1600	10 (254)	6 (152)	10 (254)
2500	2000	10 (254)	6 (152)	10 (254)
3000	2500	10 (254)	6 (152)	10 (254)
3200	2000	10 (254)	6 (152)	10 (254)
4000	3000,3200	10 (254)	6 (152)	10 (254)
CU	M-Rated			
225	—	10 (254)	6 (152)	10 (254)
400	—	10 (254)	6 (152)	10 (254)
600	—	10 (254)	6 (152)	10 (254)
800	400	10 (254)	6 (152)	10 (254)
1000	—	10 (254)	6 (152)	10 (254)
1200	600	10 (254)	6 (152)	10 (254)
1350	800	10 (254)	6 (152)	10 (254)
1600	1000	10 (254)	6 (152)	10 (254)
2000	1200,1350	10 (254)	6 (152)	10 (254)
—	1600	10 (254)	6 (152)	10 (254)
2500	2000	10 (254)	6 (152)	10 (254)
3000	—	10 (254)	6 (152)	10 (254)
3200	—	10 (254)	6 (152)	10 (254)
4000	2500,3000,3200	10 (254)	6 (152)	10 (254)
5000	4000	10 (254)	6 (152)	10 (254)

***Note:** Leg Dimensions A and C have been reversed from prior publications.

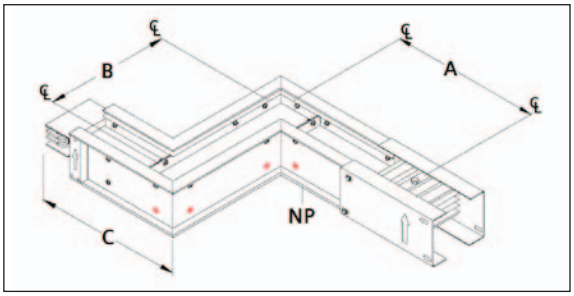
Flat Right

Suffix OFFR



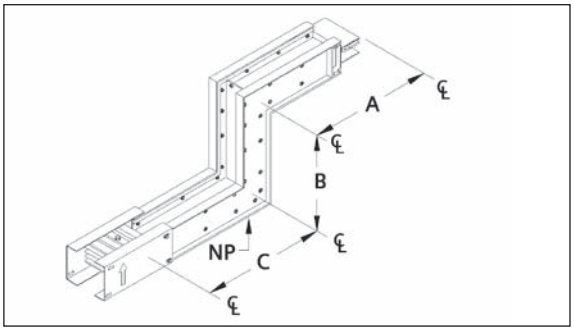
Flat Left

Suffix OFFL



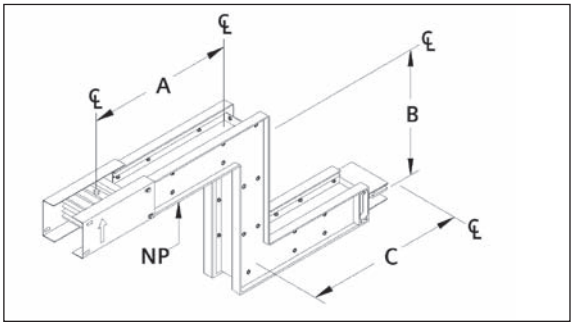
Edge Up

Suffix OFEU



Edge Down

Suffix OFED



Combinations

Combinations are used to create edge to flat and flat to edge changes in the busway run. One joint stack assembly is shipped with combination.

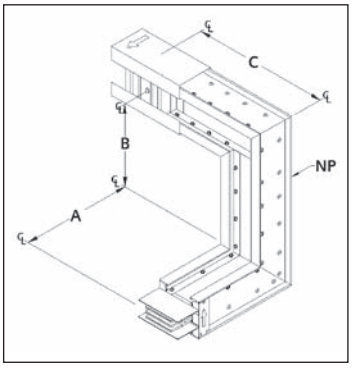
See drawings for minimum dimensions. Consult Busway Order Service for information on custom lengths.

Combinations, Dimensions (standard/min.)				
Ampere Rating		Dimensions Inches (mm) *"A"	"B"	"C"
AL	**L-Rated**			
225	—	10 (254)	8 (203)	12 (305)
400	—	10 (254)	8 (203)	12 (305)
600	—	10 (254)	8 (203)	12 (305)
800	400	10 (254)	8 (203)	12 (305)
1000	600	10 (254)	8 (203)	12 (305)
1200	800	10 (254)	8 (203)	12 (305)
1350	1000	10 (254)	8 (203)	12 (305)
1600	1200	10 (254)	12 (305)	18 (457)
2000	1350,1600	10 (254)	12 (305)	18 (457)
2500	2000	10 (254)	12 (305)	18 (457)
3000	2500	10 (254)	12 (305)	18 (457)
3200	2000	10 (254)	12 (305)	18 (457)
4000	3000,3200	10 (254)	16 (406)	24 (610)
CU	**M-Rated**			
225	—	10 (254)	8 (203)	12 (305)
400	—	10 (254)	8 (203)	12 (305)
600	—	10 (254)	8 (203)	12 (305)
800	400	10 (254)	8 (203)	12 (305)
1000	—	10 (254)	8 (203)	12 (305)
1200	600	10 (254)	8 (203)	12 (305)
1350	800	10 (254)	8 (203)	12 (305)
1600	1000	10 (254)	8 (203)	12 (305)
2000	1200,1350	10 (254)	8 (203)	12 (305)
—	1600	10 (254)	12 (305)	18 (457)
2500	2000	10 (254)	12 (305)	18 (457)
3000	—	10 (254)	12 (305)	18 (457)
3200	—	10 (254)	12 (305)	18 (457)
4000	2500,3000,3200	10 (254)	12 (305)	18 (457)
5000	4000	10 (254)	16 (406)	24 (610)

***Note:** Leg Dimensions A and C have been reversed from prior publications.

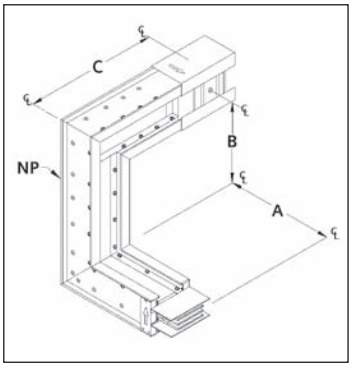
Flat Right - Edge Up

Suffix CORU



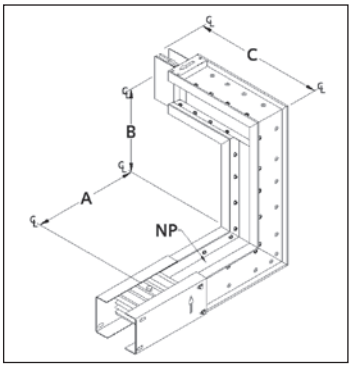
Flat Left - Edge Up

Suffix COLU



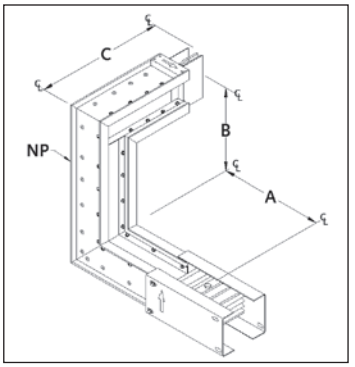
Edge Up - Flat Left

Suffix COUL



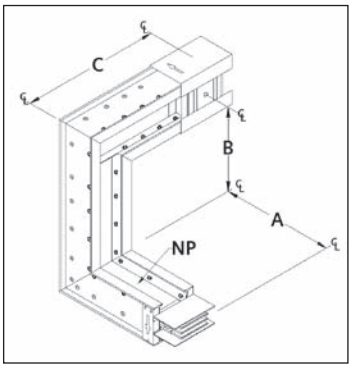
Edge Up - Flat Right

Suffix COUR



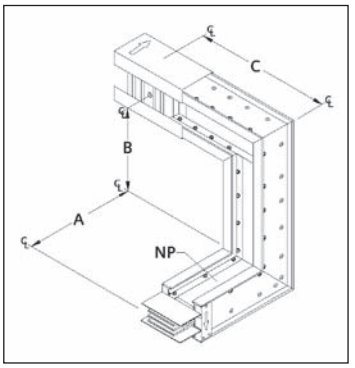
Flat Right - Edge Down

Suffix CORD



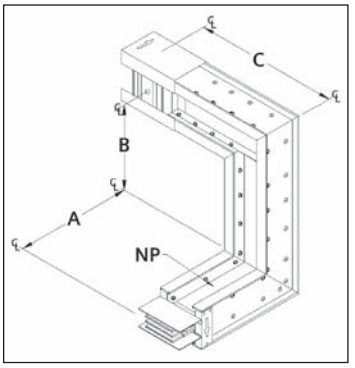
Flat Left - Edge Down

Suffix COLD



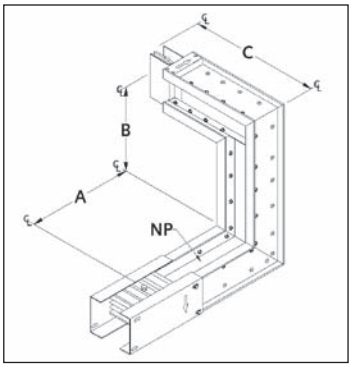
Edge Down - Flat Left

Suffix CODL



Edge Down - Flat Right

Suffix CODR



Tees

Tees are used to simplify directional and plane orientation changes in a busway system. Tees can make 90° bends left or right, and up and down along the busway run. All tees are supplied with two joint stack assemblies.

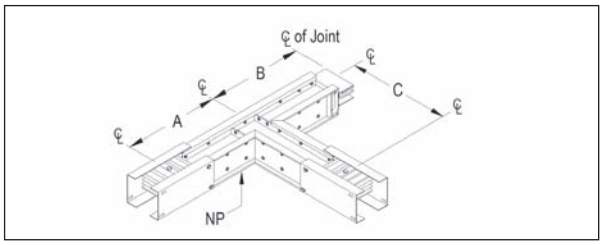
Flatwise Tees, Dimensions (standard/min.)		
Ampere Rating		Dimensions Inches (mm) "A", "B", "C"
AL	**L-Rated**	
225	—	12 (305)
400	—	12 (305)
600	—	12 (305)
800	400	12 (305)
1000	600	12 (305)
1200	800	12 (305)
1350	1000	12 (305)
1600	1200	18 (457)
2000	1350,1600	18 (457)
2500	2000	18 (457)
3000	2500	18 (457)
3200	2000	18 (457)
4000	3000,3200	24 (610)
CU	**M-Rated**	
225	—	12 (305)
400	—	12 (305)
600	—	12 (305)
800	400	12 (305)
1000	—	12 (305)
1200	600	12 (305)
1350	800	12 (305)
1600	1000	12 (305)
2000	1200,1350	12 (305)
—	1600	18 (457)
2500	2000	18 (457)
3000	—	18 (457)
3200	—	18 (457)
4000	2500,3000,3200	18 (457)
5000	4000	24 (610)

Flatwise Tees

Flatwise tees are used to create left and right branches.

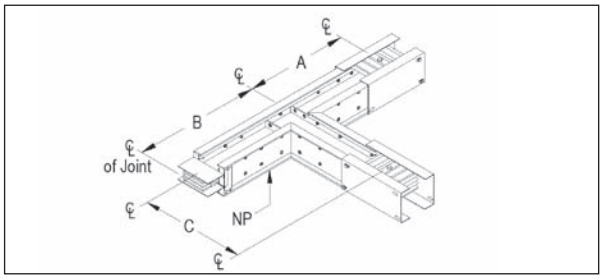
Flat Right

Suffix TEFR



Flat Left

Suffix TEFL



Edgewise Tees, Dimensions (standard/min.)		
Ampere Rating		Dimensions Inches (mm) "D"
AL	**L-Rated**	
225	—	13 (330)
400	—	13 (330)
600	—	13 (330)
800	400	13 (330)
1000	600	13 (330)
1200	800	18 (457)
1350	1000	18 (457)
1600	1200	18 (457)
2000	1350,1600	18 (457)
2500	2000	27 (686)
3000	2500	27 (686)
3200	2000	27 (686)
4000	3000,3200	29 (737)
CU	**M-Rated**	
225	—	13 (330)
400	—	13 (330)
600	—	13 (330)
800	400	13 (330)
1000	—	13 (330)
1200	600	13 (330)
1350	800	13 (330)
1600	1000	18 (457)
2000	1200,1350	18 (457)
—	1600	18 (457)
2500	2000	18 (457)
3000	—	27 (686)
3200	—	27 (686)
4000	2500,3000,3200	27 (686)
5000	4000	29 (737)

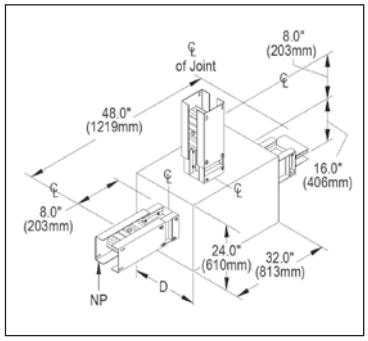
① 12.0" (305mm) For Isolated Ground.

Edgewise Tees

Edgewise tees are used to create branches that stem up or down from the busway run.

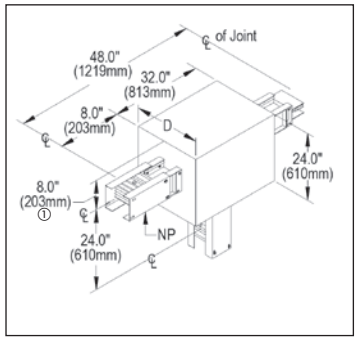
Edge Up

Suffix TEEU



Edge Down

Suffix TEED



End Tap Boxes

Selection

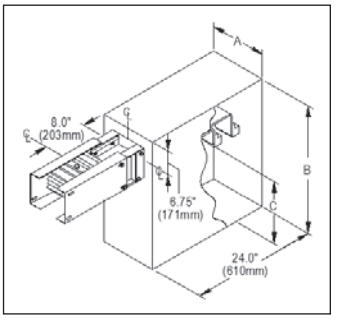
End tap boxes are non-fusible devices used to connect cable and conduit to the end of a busway run or where busway runs connect without the need for over-current protection. End tap boxes may be installed at the end or beginning of a run. Vertical end tap boxes and horizontal end tap boxes can be installed in both horizontal and vertical applications. Extended end tap boxes are available if the application requires additional wire bending space. One joint stack assembly is shipped with each end tap box.

Standard and Extended Horizontal End Tap Boxes, Dimensions

Ampere Rating		Dimensions Inches (mm) "A"	"B" Std.	"B" Ext.	Wire Bend Space "C" Std.	"C" Ext.	Cable Lugs Per Phase & Neutral Qty.	Size	Ground Lugs①
AL	**L-Rated**								
225	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	1	①	1
400	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	1	②	1
600	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	2	②	1
800	400	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	3	②	1
1000	600	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	4	②	1
1200	800	18 (457)	32 (813)	37 (940)	20 (508)	24 (610)	4	②	1
1350	1000	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	4	②	1
1600	1200	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	6	②	2
2000	1350,1600	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	6	②	2
2500	2000	27 (686)	33 (838)	37 (940)	20 (508)	24 (610)	8	②	2
3000	2500	27 (686)	33 (838)	37 (940)	20 (508)	24 (610)	9	②	2
3200	2000	27 (686)	33 (838)	37 (940)	20 (508)	24 (610)	9	②	2
4000	3000,3200	29 (737)	33 (838)	37 (940)	20 (508)	24 (610)	12	②	3
CU	**M-Rated**								
225	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	1	①	1
400	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	1	②	1
600	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	2	②	1
800	400	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	3	②	1
1000	—	13 (330)	30 (762)	34 (863)	17 (432)	21 (533)	4	②	1
1200	600	13 (330)	33 (838)	37 (940)	20 (508)	24 (610)	4	②	1
1350	800	13 (330)	33 (838)	37 (940)	20 (508)	24 (610)	4	②	1
1600	1000	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	5	②	1
2000	1200,1350	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	6	②	2
—	1600	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	5	②	1
2500	2000	18 (457)	33 (838)	37 (940)	20 (508)	24 (610)	8	②	2
3000	—	27 (686)	33 (838)	37 (940)	20 (508)	24 (610)	9	②	2
3200	—	27 (686)	33 (838)	37 (940)	20 (508)	24 (610)	9	②	2
4000	2500,3000,3200	27 (686)	33 (838)	37 (940)	20 (508)	24 (610)	12	②	3
5000	4000	29 (737)	33 (838)	37 (940)	20 (508)	24 (610)	15	②	4

Horizontal End Tap Box

Suffix ETHS (Standard)
Suffix ETHX (Extended)

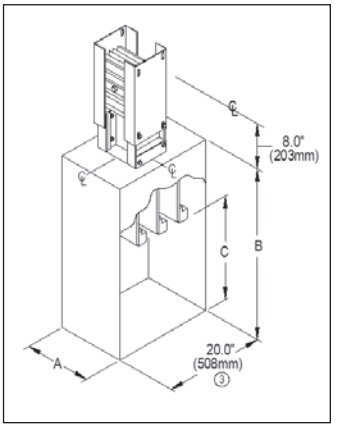


Standard and Extended Vertical End Tap Boxes, Dimensions

Ampere Rating		Dimensions Inches (mm) "A"	"B" Std.	"B" Ext.	Wire Bend Space "C" Std.	"C" Ext.	Cable Lugs Per Phase & Neutral Qty.	Size	Ground Lugs①
AL	**L-Rated**								
225	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	1	①	1
400	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	1	②	1
600	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	2	②	1
800	400	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	3	②	1
1000	600	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	4	②	1
1200	800	18 (457)	32 (813)	32 (813)	20 (508)	24 (610)	4	②	1
1350	1000	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	4	②	1
1600	1200	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	6	②	2
2000	1350,1600	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	6	②	2
2500	2000	27 (686)	28 (711)	32 (813)	20 (508)	24 (610)	8	②	2
3000	2500	27 (686)	28 (711)	32 (813)	20 (508)	24 (610)	9	②	2
3200	2000	29 (737)	28 (711)	32 (813)	20 (508)	24 (610)	9	②	2
4000	3000,3200	29 (737)	28 (711)	32 (813)	20 (508)	24 (610)	12	②	3
CU	**M-Rated**								
225	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	1	①	1
400	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	1	②	1
600	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	2	②	1
800	400	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	3	②	1
1000	—	13 (330)	25 (635)	29 (737)	17 (432)	21 (533)	4	②	1
1200	600	13 (330)	28 (711)	32 (813)	20 (508)	24 (610)	4	②	1
1350	800	13 (330)	28 (711)	32 (813)	20 (508)	24 (610)	4	②	1
1600	1000	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	5	②	1
2000	1200,1350	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	6	②	2
—	1600	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	5	②	1
2500	2000	18 (457)	28 (711)	32 (813)	20 (508)	24 (610)	8	②	2
3000	—	27 (686)	28 (711)	32 (813)	20 (508)	24 (610)	9	②	2
3200	—	27 (686)	28 (711)	32 (813)	20 (508)	24 (610)	9	②	2
4000	2500,3000,3200	27 (686)	28 (711)	32 (813)	20 (508)	24 (610)	12	②	3
5000	4000	29 (737)	28 (711)	32 (813)	20 (508)	24 (610)	15	②	4

Vertical End Tap Box

Suffix ETVS (Standard)
Suffix ETVX (Extended)



① #6 AWG -350 kcmil, Cu/Al. ② #4 AWG -600 kcmil, Cu/Al. ③ 24.0" (610mm) for isolated ground.

Center Tap Boxes

Selection

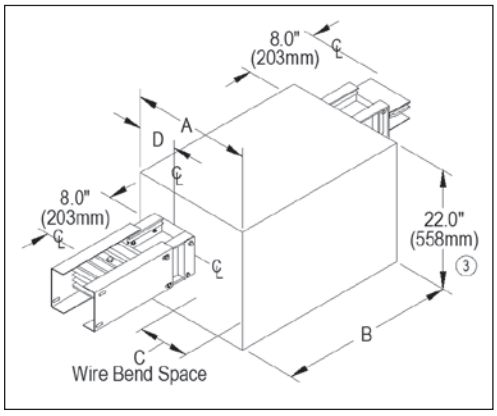
Center tap boxes are non-fusible devices utilized to feed to or take off power from the busway run. When loads served by the busway run do not require over-current protection, center tap boxes may be used. If the application requires additional wiring bending space, extended center tap boxes are available. One joint stack assembly is provided with each center tap box.

Standard and Extended Center End Tap Boxes, Dimensions

Ampere Rating		Dimensions Inches (mm) "A"Std.	"B"	"D"	Wire Bend Space "A" Ext..	"C" Std.	"C" Ext.	Cable Lugs Per Phase & Neutral Qty.	Size	Ground Lugs①
AL	**L-Rated**									
225	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	1	①	1
225	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	1	②	1
400	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	1	②	1
600	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	2	②	1
800	400	25 (635)	16 (406)	4.2 (107)	29 (737)	17 (432)	21 (533)	3	②	1
1000	600	25 (635)	16 (406)	4.6 (117)	29 (737)	17 (432)	21 (533)	4	②	1
1200	800	29 (737)	16 (406)	5.2 (132)	33 (838)	20 (508)	24 (610)	4	②	1
1350	1000	29 (737)	16 (406)	5.7 (145)	33 (838)	20 (508)	24 (610)	4	②	1
1600	1200	33 (838)	20 (508)	6.3 (160)	37 (940)	20 (508)	24 (610)	5	②	1
2000	1350,1600	33 (838)	20 (508)	7.4 (188)	37 (940)	20 (508)	24 (610)	6	②	2
2500	2000	37 (940)	24 (610)	8.7 (221)	41 (1041)	20 (508)	24 (610)	8	②	2
3000	2500	37 (940)	24 (610)	9.7 (246)	41 (1041)	20 (508)	24 (610)	9	②	2
3200	2000	37 (940)	24 (610)	9.7 (246)	41 (1041)	20 (508)	24 (610)	9	②	2
4000	3000,3200	45 (1143)	28 (711)	11.9 (302)	49 (1245)	20 (508)	24 (610)	12	②	3
CU	**M-Rated**									
225	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	1	②	1
400	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	1	②	1
600	—	25 (635)	16 (406)	3.9 (99)	29 (737)	17 (432)	21 (533)	2	②	1
800	400	25 (635)	16 (406)	4.2 (107)	29 (737)	17 (432)	21 (533)	3	②	1
1000	—	25 (635)	16 (406)	4.2 (107)	29 (737)	18 (457)	22 (559)	4	②	1
1200	600	29 (737)	16 (406)	4.5 (114)	33 (838)	22 (559)	26 (660)	4	②	1
1350	800	29 (737)	16 (406)	4.8 (122)	33 (838)	21 (533)	25 (635)	4	②	1
1600	1000	29 (737)	20 (508)	5.3 (135)	33 (838)	21 (533)	25 (635)	5	②	1
2000	1200,1350	29 (737)	20 (508)	6.1 (155)	33 (838)	20 (508)	24 (610)	6	②	2
—	1600	33 (838)	20 (508)	6.3 (160)	37 (940)	20 (508)	24 (610)	5	②	1
2500	2000	33 (838)	24 (610)	7.3 (185)	37 (940)	23 (584)	17 (432)	8	②	2
3000	—	33 (838)	24 (610)	7.9 (201)	37 (940)	20 (508)	24 (610)	9	②	2
3200	—	33 (838)	24 (610)	7.9 (201)	37 (940)	20 (508)	24 (610)	9	②	2
4000	2500,3000, 3200	37 (940)	28 (711)	9.4 (239)	41 (1041)	20 (508)	24 (610)	12	②	3
5000	4000	40(1016)	34 (863)	11.7(297)	44 (1118)	19 (483)	23 (584)	15	②	4

Center Tap Box

Suffix CTBS (Standard)
Suffix CTBX (Extended)



① #6 AWG -350 kcmil, Cu/Al.
② #4 AWG -600 kcmil, Cu/Al.
③ 24.0" (610mm) for isolated ground.

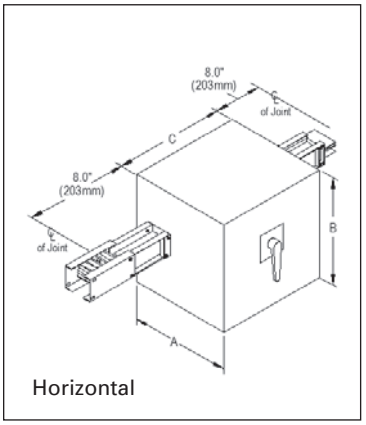
In-Line Disconnect Cubicle, Dimensions ②	
Description of Unit	**Type of Disconnect**
Fusible Switch	400-600A FK Visible Blade 800-1200A Vacu-Break
Molded Case Circuit Breaker	JD6, LD6, MD6, ND6 PD6, RD6
Digital Sentron Series MCCB's	SJD6, SLD6, SMD6, SND6 SPD6 1600A Frame
Power Circuit Breaker	200-5000A WL①
Bolted Pressure Switch ACCESS-compatible	800A 1200-2500A 3000A 4000A

① Consult your local Siemens sales office for details on WL breakers.
② Consult factory for dimensions.

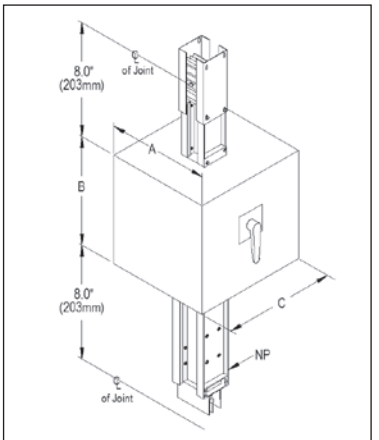
In-Line Disconnect Cubicles

Cubicles provide a means of mounting switches or circuit breakers where power feeds to or pulls from the busway system. When bolted connections are preferred, cubicles may be used in place of plug-in units. Cubicles can also be used at ampere ratings that exceed standard plug-in unit ratings. Modifications to cubicles can be made in order to accommodate key inter-locks, ground fault detector systems and power monitoring systems.

In-Line Disconnect Cubicle



Horizontal



Vertical

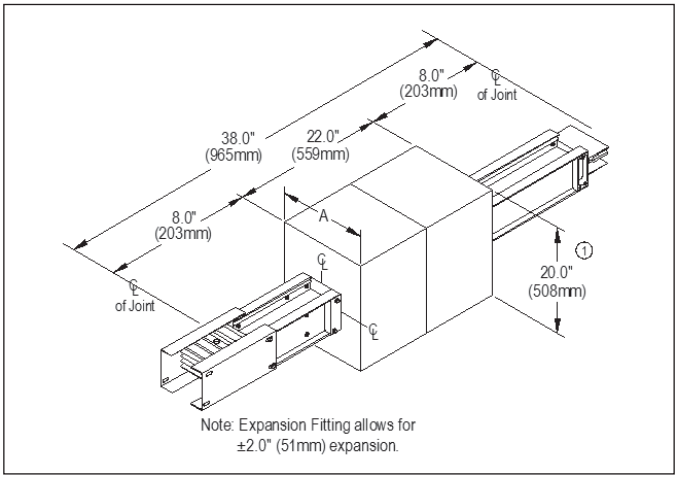
Expansion Fittings, Dimensions (standard/min.)		
Ampere Rating		**Dimensions Inches (mm) "A"**
AL	**L-Rated**	
225	—	13 (330)
400	—	13 (330)
600	—	13 (330)
800	400	13 (330)
1000	600	13 (330)
1200	800	18 (457)
1350	1000	18 (457)
1600	1200	18 (457)
2000	1350,1600	18 (457)
2500	2000	23 (584)
3000	2500	23 (584)
3200	2000	23 (584)
4000	3000,3200	25 (635)
CU	**M-Rated**	
225	—	13 (330)
400	—	13 (330)
600	—	13 (330)
800	400	13 (330)
1000	—	13 (330)
1200	600	13 (330)
1350	800	13 (330)
1600	1000	18 (457)
2000	1200,1350	18 (457)
—	1600	18 (457)
2500	2000	18 (457)
3000	—	23 (584)
3200	—	23 (584)
4000	2500,3000,3200	23 (584)
5000	4000	25 (635)

Expansion Fittings

Expansion fittings accommodate for expansion and contraction of a busway run and building movement. Expansion fittings typically are installed in the center of long busway runs, and at the beginning of riser runs to minimize stress on the lower most device or where a busway run crosses an expansion joint of a building.

Qty (1) Expansion Section should be used for every 200ft of continuous Busway run length and for each building expansion joint. The Busway run must be positioned accordingly to accommodate the Expansion Section(s).

Expansion Fitting
Suffix XPFT



① 24.0" (610mm) for isolated ground.

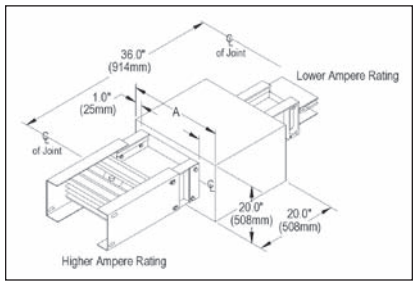
Fused Reducers, Dimensions (standard/min.)		
Ampere Rating		Dimensions Inches (mm) "A"
AL	**L-Rated**	
225	—	11.4 (289)
400	—	11.4 (289)
600	—	11.4 (289)
800	400	11.4 (289)
1000	600	11.4 (289)
1200	800	12.5 (318)
1350	1000	13.5 (343)
1600	1200	14.6 (372)
2000	1350,1600	16.9 (429)
2500	2000	19.6 (498)
3000	2500	21.3 (541)
3200	2000	22.9 (582)
4000	3000,3200	31.5 (800)
CU	**M-Rated**	
225	—	10.4 (264)
400	—	10.4 (264)
600	—	10.4 (264)
800	400	10.4 (264)
1000	—	10.4 (264)
1200	600	11.0 (280)
1350	800	11.6 (296)
1600	1000	12.6 (321)
2000	1200,1350	14.1 (359)
—	1600	14.6 (372)
2500	2000	16.6 (423)
3000	—	17.9 (455)
3200	—	18.9 (480)
4000	2500,3000,3200	20.9 (531)
5000	4000	31.5 (800)

Fused Reducers

The National Electric Code requires over current protection when busway systems are reduced in ampacity. A fused reducer is used to reduce the allowable ampere rating in those sections of the busway that do not require a higher rating (i.e. at branch circuit junctures).

Fused Reducer

Suffix RFRF



Non-Fused Reducers

Non-fused reducers are used in conjunction with the following exception to the Fused Reducer in the National Electric Code: "For industrial establishments only,omission of over current protection shall be permitted at points where busways are reduced in ampacity, provided that the length of the busway having the smaller ampacity does not exceed 50 ft. and has an ampacity of at least equal to one-third the rating or setting of the over current device next back on the line, and provided that such busway is free from contact with combustible material." Special joint stack connections are provided for non-fused reducer connections. Consult factory for specific design guidelines.

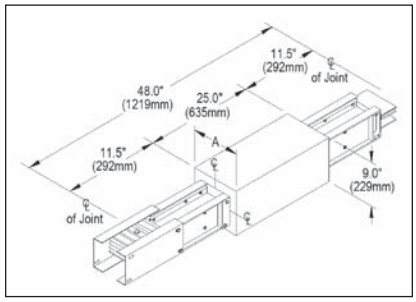
Phase Rotation Fittings, Dimensions (standard/min.)		
Ampere Rating		Dimensions Inches (mm) "A"
AL	**L-Rated**	
225	—	7.9 (200)
400	—	7.9 (200)
600	—	7.9 (200)
800	400	8.5 (216)
1000	600	9.4 (239)
1200	800	10.5 (267)
1350	1000	11.5 (293)
1600	1200	12.6 (321)
2000	1350,1600	14.9 (376)
2500	2000	17.6 (447)
3000	2500	19.8 (503)
3200	2000	21.3 (541)
4000	3000,3200	24.3 (617)
CU	**M-Rated**	
225	—	7.9 (200)
400	—	7.9 (200)
600	—	7.9 (200)
800	400	7.9 (200)
1000	—	8.4 (213)
1200	600	9.0 (229)
1350	800	9.6 (245)
1600	1000	10.6 (270)
2000	1200,1350	12.1 (372)
—	1600	12.6 (321)
2500	2000	14.6 (200)
3000	—	15.8 (402)
3200	—	17.3 (439)
4000	2500,3000,3200	19.3 (490)
5000	4000	23.3 (592)

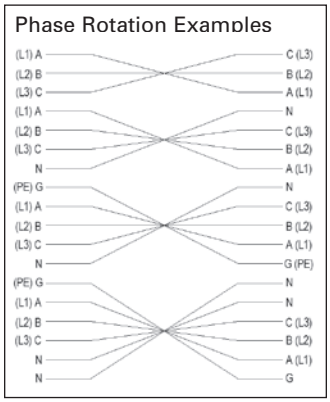
Phase-Rotation Fittings

Phase-rotation fittings can be used when the application requires a phase rotation in the power supply. Phase rotation fittings can be ordered for "phase and ground", "phase only" and "ground only" rotations.

Phase Rotation Fitting

Suffix TRPG, Phase and Ground
TRPO, Phase Only
TRGO, Ground Only





Sentron® Busway Systems – Reference Information

Service Heads

Selection

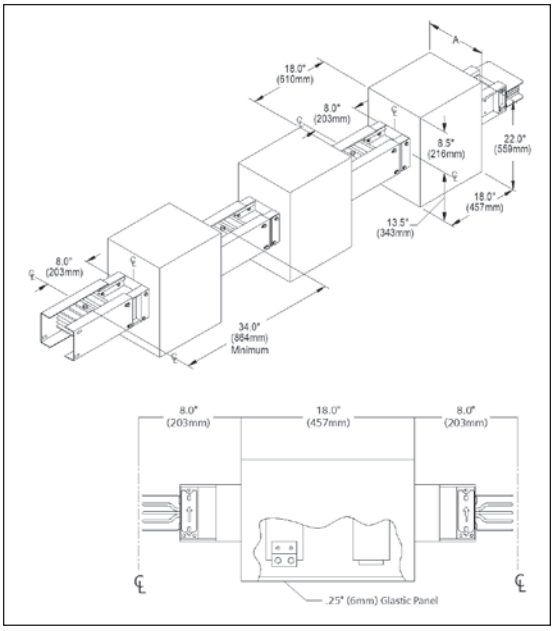
Service Heads are used to connect busway to a service entrance. In the Sentron Busway line, 3 single-phase service heads and 3-phase service head connections are available. The standard service entrance connection is the 3-phase service head which consists of one service head for all three phases. 3 single-phase service heads consist of three heads – one for each phase and may be used to meet the requirements of certain applications. To ensure ease of installation of incoming cables, both types of Sentron service heads are constructed so that the lugs face the Glastic bottom of the box. The Glastic bottom provides insulation and protection to the incoming cables.

Single-Phase Service Heads, Dimensions (standard/min.)

Ampere Rating		Dimensions Inches (mm) Single-Phase "A"	Cable Lugs per Phase and Neutral Qty.	Size	Ground Lugs①
AL	**L-Rated**				
225		13 (330)	1	①	1
400	225	13 (330)	1	②	1
600	—	13 (330)	2	②	1
800	400	13 (330)	3	②	1
1000	600	13 (330)	4	②	1
1200	800	18 (457)	4	②	1
1350	1000	18 (457)	4	②	1
1600	1200	18 (457)	5	②	1
2000	1350,1600	20 (508)	6	②	2
2500	2000	27 (686)	8	②	2
3000	2500	29 (737)	9	②	2
3200	2000	29 (737)	9	②	2
4000	3000,3200	29 (737)	12	②	3
CU	**M-Rated**				
225		13 (330)	1	①	1
400		13 (330)	1	②	1
600		13 (330)	2	②	1
800	400	13 (330)	3	②	1
1000	—	13 (330)	4	②	1
1200	600	13 (330)	4	②	1
1350	800	13 (330)	4	②	1
1600	1000	18 (457)	5	②	1
2000	1200,1350	20 (508)	6	②	2
—	1600	18 (457)	5	②	1
2500	2000	20 (508)	8	②	2
3000	—	27 (686)	9	②	2
3200	—	27 (686)	9	②	2
4000	2500,3000,3200	27 (686)	12	②	3
5000	4000	29 (737)	15	②	4

Three Single-Phase Service Heads

Suffix V1TX



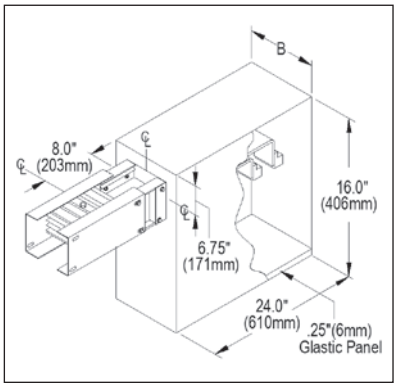
Three-Phase Service Heads, Dimensions (standard/min.)

Ampere Rating		Dimensions Inches (mm) Three-Phase "B"	Cable Lugs per Phase and Neutral Qty.	Size	Ground Lugs①
AL	**L-Rated**				
225		13 (330)	1	①	1
400	225	13 (330)	1	②	1
600	—	13 (330)	2	②	1
800	400	13 (330)	3	②	1
1000	600	13 (330)	4	②	1
1200	800	18 (457)	4	②	1
1350	1000	18 (457)	4	②	1
1600	1200	18 (457)	5	②	1
2000	1350,1600	18 (457)	6	②	2
2500	2000	27 (686)	8	②	2
3000	2500	27 (686)	9	②	2
3200	2000	27 (686)	9	②	2
4000	3000,3200	29 (737)	12	②	3
CU	**M-Rated**				
225		13 (330)	1	①	1
400		13 (330)	1	②	1
600		13 (330)	2	②	1
800	400	13 (330)	3	②	1
1000	—	13 (330)	4	②	1
1200	600	13 (330)	4	②	1
1350	800	13 (330)	4	②	1
1600	1000	18 (457)	5	②	1
2000	1200,1350	18 (457)	6	②	2
—	1600	18 (457)	5	②	1
2500	2000	18 (457)	8	②	2
3000	—	27 (686)	9	②	2
3200	—	27 (686)	9	②	2
4000	2500,3000,3200	27 (686)	12	②	3
5000	4000	29 (737)	15	②	4

①#6 AWG - 350 kcmil, Cu / Al. ②#4 AWG - 600 kcmil, Cu / Al.

Three-Phase Service Head

Suffix V3TX

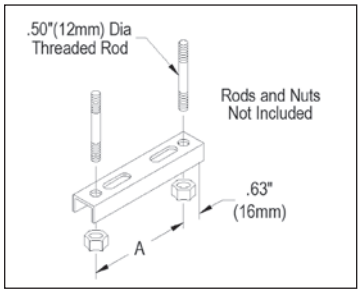


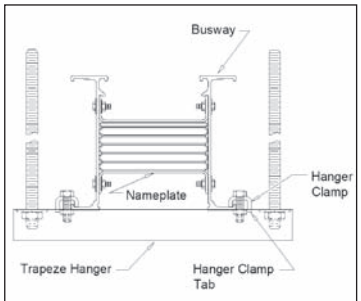
Trapeze Hanger, Dimensions and Catalog Numbers			
Ampere Rating		"A" Dimensions Inches (mm)	Flat Mounted Catalog Number①
AL	**L-Rated**		
225	—	10.0 (254)	**SXTH1**
400	—	10.0 (254)	**SXTH1**
600	—	10.0 (254)	**SXTH1**
800	400	10.0 (254)	**SXTH1**
1000	600	10.0 (254)	**SXTH1**
1200	800	10.0 (254)	**SXTH1**
1350	1000	13.5 (343)	**SXTH2**
1600	1200	13.5 (343)	**SXTH2**
2000	1350,1600	13.5 (343)	**SXTH2**
2500	2000	13.5 (343)	**SXTH3**
3000	2500	13.5 (343)	**SXTH3**
3200	2000	13.5 (343)	**SXTH3**
4000	3000,3200	23.0 (584)	**SXTH4**
CU	**M-Rated**		
225	—	10.0 (254)	**SXTH1**
400	—	10.0 (254)	**SXTH1**
600	—	10.0 (254)	**SXTH1**
800	400	10.0 (254)	**SXTH1**
1000	—	10.0 (254)	**SXTH1**
1200	600	10.0 (254)	**SXTH1**
1350	800	10.0 (254)	**SXTH1**
1600	1000	10.0 (254)	**SXTH1**
2000	1200,1350	13.5 (343)	**SXTH2**
—	1600	13.5 (343)	**SXTH2**
2500	2000	13.5 (343)	**SXTH2**
3000	—	18.5 (470)	**SXTH3**
3200	—	18.5 (470)	**SXTH3**
4000	2500,3000,3200	18.5 (470)	**SXTH3**
5000	4000	23.0 (584)	**SXTH4**

① Use SXTH1 for Edge Mounted.

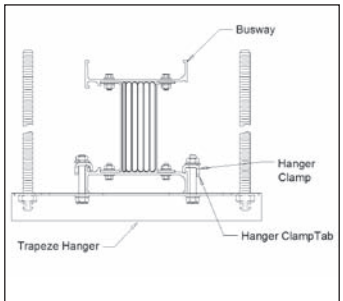
Trapeze Hanger

A complete offering of hangers is available to support Sentron Busway in both vertical and horizontal applications. Standard trapeze hangers support Sentron Busway in horizontal applications on 10 ft. (3.05m) centers. Additional hangers may be used if structural requirements mandate their use. The contractor must supply drop rods to complete assembly for trapeze hangers.





Flat Mounted

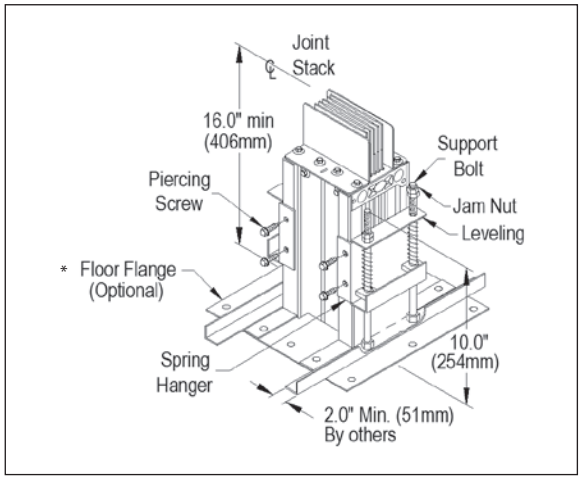


Edge Mounted

Spring Hanger, Catalog Numbers						
		Catalog Assembly floor to ceiling height				
Ampere Rating		10ft.	12 ft.	14 ft.	16 ft.	18 ft.
AL	**L-Rated**					
225	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
400	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
600	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
800	400	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1000	600	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1200	800	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1350	1000	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1600	1200	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
2000	1350,1600	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
2500	2000	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH6**	**SXSH6**
3000	2500	**SXSH4**	**SXSH6**	**SXSH6**	**SXSH6**	**SXSH6**
3200	2000	**SXSH4**	**SXSH6**	**SXSH6**	**SXSH6**	**SXSH6**
4000	3000,3200	**SXSH4**	**SXSH6**	**SXSH6**	**SXSH6**	**SXSH8**
CU	**M-Rated**					
225	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
400	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
600	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
800	400	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1000	—	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1200	600	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
1350	800	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH6**	**SXSH6**
1600	1000	**SXSH4**	**SXSH4**	**SXSH6**	**SXSH6**	**SXSH6**
2000	1200,1350	**SXSH6**	**SXSH6**	**SXSH6**	**SXSH6**	**SXSH8**
—	1600	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**	**SXSH4**
2500	2000	**SXSH2**	**SXSH6**	**SXSH8**	**SXSH8**	**SXSH8**
3000	—	**SXSH6**	**SXSH8**	**SXSH8**	**SXSH10**	**SXSH10**
3200	—	**SXSH6**	**SXSH8**	**SXSH8**	**SXSH10**	**SXSH12**
4000	2500,3000,3200	**SXSH6**	**SXSH8**	**SXSH10**	**SXSH12**	**SXSH12**
5000	4000	**SXSH6**	**SXSH10**	**SXSH12**	**SXSH14**	**SXSH14**

Spring Hanger

Spring hangers and floor support hangers must be used to provide secure mounting of the busway run in vertical applications. Spring hangers support the weight of the busway on each floor and also compensate for minimal building movement and thermal expansion. Maximum distance between spring hangers may not exceed 16 ft. (4.88m). When ordering 18 ft. (5.49m) floor to ceiling height assemblies, intermediate support hangers are necessary.

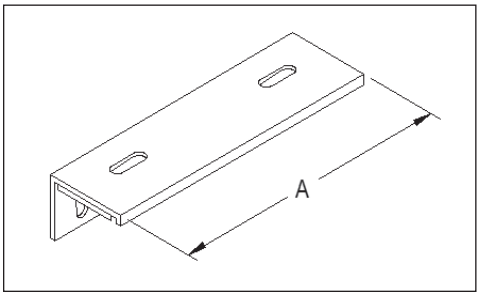


***Note:** Flanges do not offer support to the busway. Flanges provide a means of covering the hole created in the existing structure.

Structural Steel Hanger, Dimensions and Catalog Numbers			
Ampere Rating		"A" Dimensions Inches (mm)	Catalog Number
AL	**L-Rated**		
225	—	10.0 (254)	**SXSS1**
400	—	10.0 (254)	**SXSS1**
600	—	10.0 (254)	**SXSS1**
800	400	10.0 (254)	**SXSS1**
1000	600	10.0 (254)	**SXSS1**
1200	800	10.0 (254)	**SXSS1**
1350	1000	13.5 (343)	**SXSS2**
1600	1200	13.5 (343)	**SXSS2**
2000	1350,1600	13.5 (343)	**SXSS2**
2500	2000	18.5 (470)	**SXSS3**
3000	2500	18.5 (470)	**SXSS3**
3200	2000	18.5 (470)	**SXSS3**
4000	3000,3200	23.0 (584)	**SXSS4**
CU	**M-Rated**		
225	—	10.0 (254)	**SXSS1**
400	—	10.0 (254)	**SXSS1**
600	—	10.0 (254)	**SXSS1**
800	400	10.0 (254)	**SXSS1**
1000	—	10.0 (254)	**SXSS1**
1200	600	10.0 (254)	**SXSS1**
1350	800	10.0 (254)	**SXSS1**
1600	1000	10.0 (254)	**SXSS1**
2000	1200,1350	13.5 (343)	**SXSS2**
—	1600	13.5 (343)	**SXSS2**
2500	2000	13.5 (343)	**SXSS2**
3000	—	13.5 (343)	**SXSS2**
3200	—	13.5 (343)	**SXSS2**
4000	2500,3000,3200	13.5 (343)	**SXSS2**
5000	4000	23.0 (584)	**SXSS4**

Structural Steel Hanger

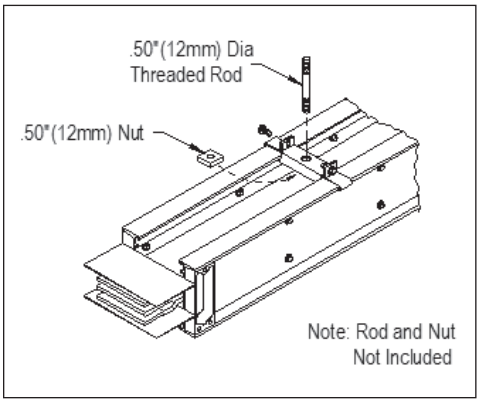
A complete offering of hangers is available to support Sentron Busway in both vertical and horizontal applications. Structural Steel hangers support Sentron Busway in horizontal applications on 10 ft. (3.05m) centers. Additional hangers may be used if structural requirements mandate their use.



Single Drop Rod Hanger, Catalog Numbers		
Ampere Rating		Catalog Number
AL	**L-Rated**	
225	—	**SXDRA1**
400	—	**SXDRA1**
600	—	**SXDRA1**
800	400	**SXDRA2**
1000	600	**SXDRA3**
1200	800	**SXDRA4**
1350	1000	**SXDRA5**
1600	1200	**SXDRA6**
2000	1350,1600	**SXDRA7**
2500	2000	**—**
3000	2500	**—**
3200	2000	**—**
4000	3000,3200	**—**
CU	**M-Rated**	
225	—	**SXDRC1**
400	—	**SXDRC1**
600	—	**SXDRC1**
800	400	**SXDRC1**
1000	—	**SXDRC2**
1200	600	**SXDRC3**
1350	800	**SXDRC4**
1600	1000	**SXDRC5**
2000	1200,1350	**SXDRC6**
—	1600	**SXDRC6**
2500	2000	**SXDRC7**
3000	—	**—**
3200	—	**—**
4000	2500,3000,3200	**—**
5000	4000	**—**

Single Drop Rod Hanger

A complete offering of hangers is available to support Sentron Busway in both vertical and horizontal applications. Single drop rod hangers support Sentron Busway in horizontal applications on 10 ft. (3.05m) centers. Additional hangers may be used if structural requirements mandate their use. The contractor must supply drop rods to complete assembly for single drop rod hangers.



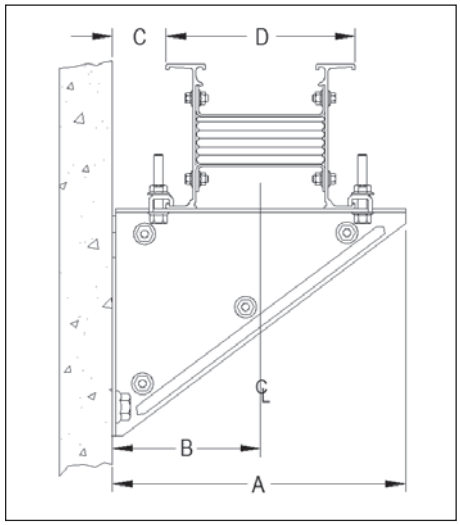
Note: Drop rod hangers can only be used when phase arrows are pointing up.

Wall Mounted Hanger, Dimensions and Catalog Numbers					
Ampere Rating		Dimensions Inches (mm) "A"	"B"	"C"	Catalog Number
AL	**L-Rated**				
225	—	12.3 (311)	6.1 (156)	4.2 (107)	**SXWH1**
400	—	12.3 (311)	6.1 (156)	4.2 (107)	**SXWH1**
600	—	12.3 (311)	6.1 (156)	4.2 (107)	**SXWH1**
800	400	12.3 (311)	6.1 (156)	3.8 (97)	**SXWH1**
1000	600	12.3 (311)	6.1 (156)	3.8 (97)	**SXWH1**
1200	800	12.3 (311)	6.1 (156)	2.8 (72)	**SXWH1**
1350	1000	16.3 (413)	8.1 (206)	4.4 (111)	**SXWH2**
1600	1200	16.3 (413)	8.1 (206)	3.9 (98)	**SXWH2**
2000	1350,1600	16.3 (413)	8.1 (206)	2.8 (70)	**SXWH2**
2500	2000	20.8 (527)	10.4 (264)	3.6 (92)	**SXWH3**
3000	2500	20.8 (527)	10.4 (264)	2.5 (64)	**SXWH3**
3200	2000	20.8 (527)	10.4 (264)	1.8 (46)	**SXWH3**
4000	3000,3200	25.3 (641)	12.6 (321)	2.5 (64)	**SXWH4**
CU	**M-Rated**				
225	—	12.3 (311)	6.1 (156)	4.2 (107)	**SXWH1**
400	—	12.3 (311)	6.1 (156)	4.2 (107)	**SXWH1**
600	—	12.3 (311)	6.1 (156)	4.2 (107)	**SXWH1**
800	400	12.3 (311)	6.1 (156)	3.8 (97)	**SXWH1**
1000	—	12.3 (311)	6.1 (156)	3.8 (97)	**SXWH1**
1200	600	12.3 (311)	6.1 (156)	2.8 (72)	**SXWH1**
1350	800	12.3 (311)	6.1 (156)	2.8 (72)	**SXWH1**
1600	1000	12.3 (311)	6.1 (156)	2.8 (72)	**SXWH1**
2000	1200,1350	16.3 (413)	8.1 (206)	4.4 (111)	**SXWH2**
—	1600	16.3 (413)	8.1 (206)	3.9 (98)	**SXWH2**
2500	2000	16.3 (413)	8.1 (206)	2.8 (70)	**SXWH2**
3000	—	20.8 (527)	10.4 (264)	3.6 (92)	**SXWH3**
3200	—	20.8 (527)	10.4 (264)	2.5 (64)	**SXWH3**
4000	2500,3000,3200	20.8 (527)	10.4 (264)	1.8 (46)	**SXWH3**
5000	4000	25.3 (641)	12.6 (321)	2.5 (64)	**SXWH4**

Wall Mounted Hanger

Wall Mounted Hangers are used for horizontal applications close to a wall. The busway can be mounted either edgewise or flatwise to the wall.

Wall Mounted Hanger ensures the minimum clearance between the wall and the busway run.

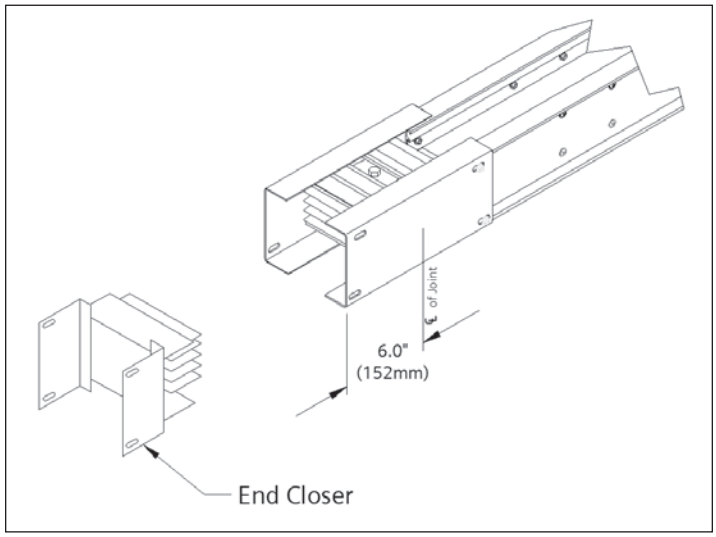


End Closers

End closers safely terminate a busway run and protect the bus bar ends. End closers may be removed easily in order to extend a busway run. End closers are shipped with Glastic insulation pieces, however, joint stacks and inspection covers are not included.

End Closers

(Joint stack and covers not included)
Suffix ECLS



Roof, wall and floor flanges are available for Sentron Busway. When the busway run passes thorough a roof, wall or ceiling, a flange should be used. Flanges do not offer support to the busway. Flanges provide a means of covering the hole created in the existing structure. Additional sealant may be required to meet fire codes and all other local requirements. No caulking or gasketing is provided with Sentron flanges.

Roof Flanges, Dimensions

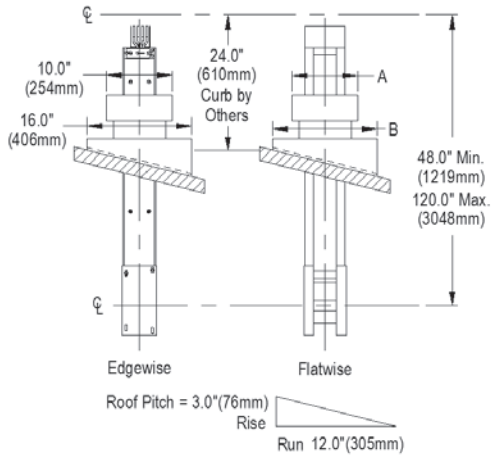
Ampere Rating		Dimensions Inches (mm) "A"	"B"
AL	**L-Rated**		
225	—	12 (305)	18 (457)
400	—	12 (305)	18 (457)
600	—	12 (305)	18 (457)
800	400	12 (305)	18 (457)
1000	600	12 (305)	18 (457)
1200	800	12 (305)	18 (457)
1350	1000	16 (406)	22 (559)
1600	1200	16 (406)	22 (559)
2000	1350,1600	16 (406)	22 (559)
2500	2000	20.5 (521)	22 (559)
3000	2500	20.5 (521)	26.5 (673)
3200	2000	20.5 (521)	26.5 (673)
4000	3000,3200	25 (635)	31 (787)
CU	**M-Rated**		
225	—	12 (305)	18 (457)
400	—	12 (305)	18 (457)
600	—	12 (305)	18 (457)
800	400	12 (305)	18 (457)
1000	—	12 (305)	18 (457))
1200	600	12 (305)	18 (457)
1350	800	12 (305)	18 (457)
1600	1000	12 (305)	18 (457)
2000	1200,1350	16 (406)	22 (559)
—	1600	16 (406)	22 (559)
2500	2000	16 (406)	22 (559)
3000	—	20.5 (521)	26.5 (673)
3200	—	20.5 (521)	26.5 (673)
4000	2500,3000,3200	20.5 (521)	26.5 (673)
5000	4000	25 (635)	31 (787)

Roof Flanges

Roof flanges are available for Sentron Busway. When the busway run passes thorough a roof, a flange should be used. Flanges do not offer support to the busway. Flanges provide a means of covering the hole created in the existing structure. Additional sealant may be required to meet fire codes and all other local requirements. No caulking or gasketing is provided with Sentron flanges. Roof flanges provide a watertight seal for use with NEMA 3R and IP66 rated busway. Roof pitch must be indicated on drawings when ordering roof flanges.

Roof Flanges

Suffix GRFL



Wall, Ceiling and Floor Flanges, Dimensions

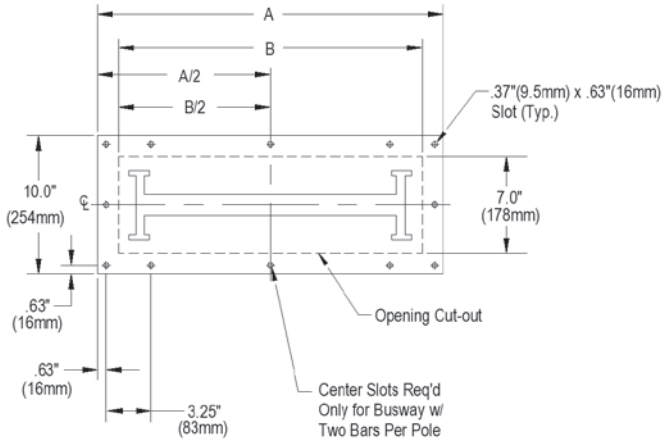
Ampere Rating		Dimensions Inches (mm) "A"	"B"
AL	**L-Rated**		
225	—	11 (279)	7 (178)
400	—	11 (279)	7 (178)
600	—	11 (279)	7 (178)
800	400	11 (279)	7 (178)
1000	600	12 (305)	8 (203)
1200	800	13 (330)	9 (229)
1350	1000	14 (356)	10 (254)
1600	1200	15 (381)	11 (279)
2000	1350,1600	17 (432)	13 (330)
2500	2000	20 (508)	16 (406)
3000	2500	22 (559)	18 (457)
3200	2000	24 (610)	20 (508)
4000	3000,3200	26 (660)	22 (559)
CU	**M-Rated**		
225	—	10 (254)	6 (152)
400	—	10 (254)	6 (152)
600	—	10 (254)	6 (152)
800	400	10 (254)	6 (152)
1000	—	11 (279)	7 (178)
1200	600	12 (305)	8 (203)
1350	800	12 (305)	8 (203)
1600	1000	13 (330)	9 (229)
2000	1200,1350	15 (381)	11 (279)
—	1600	15 (381)	11 (279)
2500	2000	17 (432)	13 (330)
3000	—	18 (457)	14 (356)
3200	—	19 (483)	15 (381)
4000	2500,3000,3200	21 (533)	17 (432)
5000	4000	26 (660)	22 (559)

Wall, Ceiling and Floor Flanges

Wall/Floor flanges are available for Sentron Busway. When the busway run passes thorough a wall or ceiling, a flange should be used. Flanges do not offer support to the busway. Flanges provide a means of covering the hole created in the existing structure. Additional sealant may be required to meet fire codes and all other local requirements. No caulking or gasketing is provided with Sentron flanges.

Wall, Ceiling and Floor Flanges

Suffix GWFL



Flanged Ends

Selection

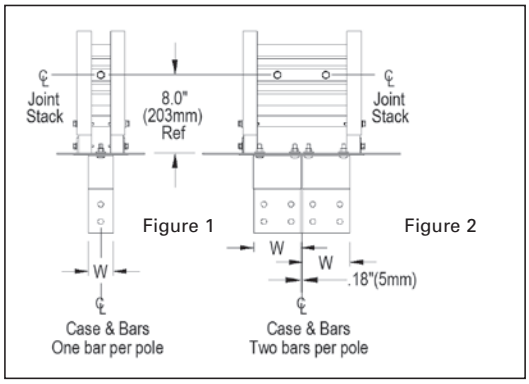
Flanged ends provide a direct connection to low voltage switchgear, switchboards, motor control centers, large power panels, and other electrical distribution equipment.

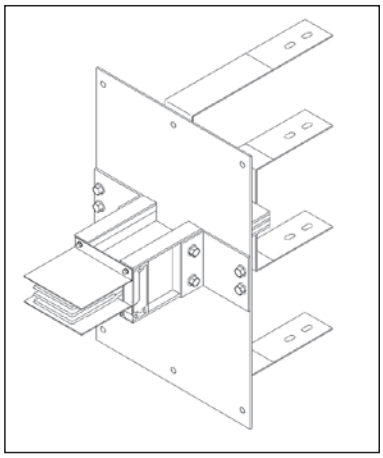
Flanged ends are shipped with one joint stack assembly. The switchgear manufacture supplies lugs and mounting hardware. See illustration for flanged end drilling patterns.

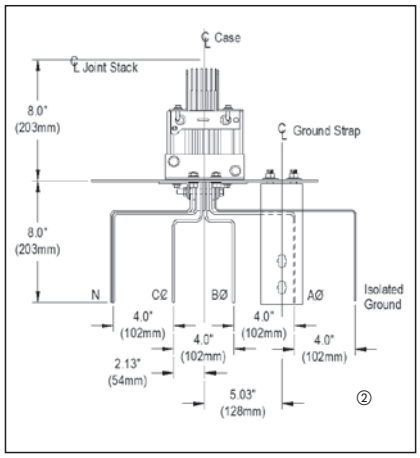
Flanged End, Dimensions			
		Dimensions Inches (mm)	
Ampere Rating		"W"	Fig. No.
AL	**L-Rated**		
225	—	1.75 (44.4)	1
400	—	1.75 (44.4)	1
600	—	1.75 (44.4)	1
800	400	2.38 (60.5)	1
1000	600	3.25 (82.6)	1
1200	800	4.38 (111.3)	1
1350	1000	5.38 (136.7)	1
1600	1200	6.50 (165.1)	1
2000	1350,1600	8.75 (222.3)	1
2500	2000	5.63 (143.0)	2
3000	2500	6.75 (171.5)	2
3200	2000	6.75 (171.5)	2
4000	3000,3200	9.00 (228.6)	2
CU	**M-Rated**		
225	—	1.75 (44.4)	1
400	—	1.75 (44.4)	1
600	—	1.75 (44.4)	1
800	400	1.75 (44.4)	1
1000	—	2.25 (57.2)	1
1200	600	2.88 (73.2)	1
1350	800	3.50 (88.9)	1
1600	1000	4.50 (114.3)	1
2000	1200,1350	6.00 (152.4)	1
—	1600	6.50 (165.1)	1
2500	2000	8.50 (215.9)	1
3000	—	4.75 (120.7)	2
3200	—	5.50 (139.7)	2
4000	2500,3000,3200	6.50 (165.1)	2
5000	4000	8.50 (215.9)	2

Flanged End

Suffix FRND

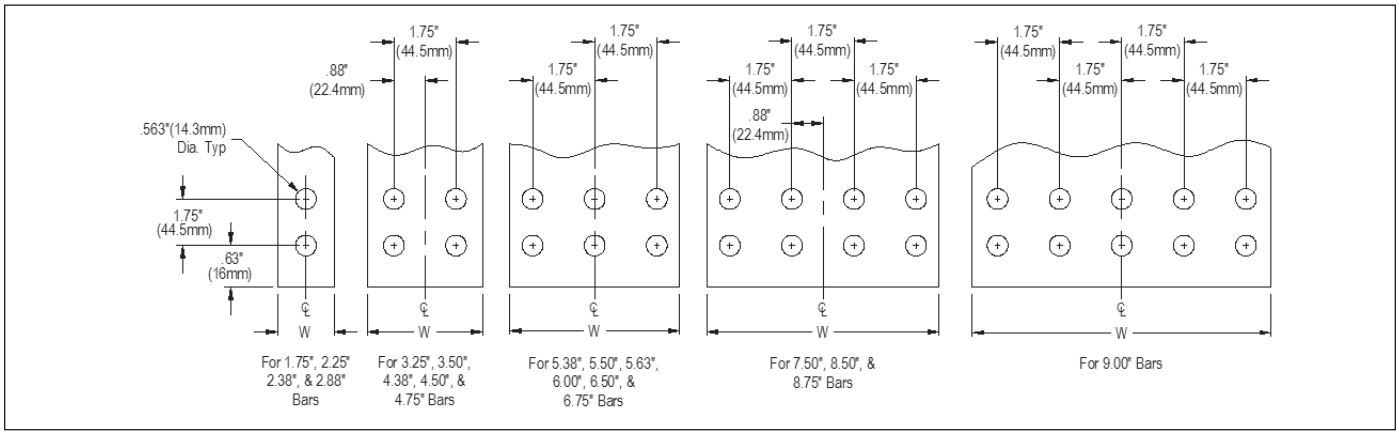






Flanged End Bus Bar Drilling Pattern (NEMA)①

(Same pattern for 2 bus bars per pole, see figure 2 above.)



① Other drilling patterns are available and must be specified at order entry.
② See Figures 4, 5 and 6 on page 15-42.

Flanged End, Dimensions (standard/min.)

Ampere Rating		Dimensions Inches (mm) Ref. Bar Width	Fig. No.	"A"	"B"	"C"	"D"	"E"	"F"	"G"	Fig. No.
AL	**L-Rated**										
225	—	2.38 (60.5)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.94 (49)	3.88 (99)	—	6.00 (152)	4, 5
400	—	2.38 (60.5)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.94 (49)	3.88 (99)	—	6.00 (152)	4, 5
600	—	2.38 (60.5)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.94 (49)	3.88 (99)	—	6.00 (152)	4, 5
800	400	2.38 (60.5)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.94 (49)	3.88 (99)	—	6.00 (152)	4, 5
1000	600	3.25 (82.6)	2	10.0 (254)	8.00 (203)	4.38 (111)	1.94 (49)	2.06 (52)	—	6.00 (152)	4, 6
1200	800	4.38 (111.3)	2	15.50 (395)	13.50 (343)	7.13 (181)	1.60 (41)	3.19 (81)	—	8.50 (216)	4, 6
1350	1000	5.38 (136.7)	2	15.50 (395)	13.50 (343)	7.13 (181)	2.10 (53)	4.19 (106)	—	8.50 (216)	4, 6
1600	1200	6.50 (165.1)	2	15.50 (395)	13.50 (343)	7.13 (181)	2.66 (67)	5.31 (135)	—	8.50 (216)	4, 6
2000	1350,1600	8.75 (222.3)	2	15.50 (395)	13.50 (343)	7.13 (181)	3.78 (96)	7.56 (192)	—	8.50 (216)	4, 6
2500	2000	5.63 (143.0)	3	20.0 (508)	18.00 (457)	4.50 (114)	0.68 (17)	1.37 (36)	4.44 (113)	13.25 (337)	4, 6
3000	2500	6.75 (171.5)	3	20.0 (508)	18.00 (457)	4.50 (114)	0.68 (17)	1.37 (36)	5.56 (141)	13.25 (337)	4, 6
3200	2000	7.50 (190.5)	3	24.0 (610)	22.0 (569)	5.50 (140)	0.68 (17)	1.37 (36)	6.32 (161)	13.25 (337)	4, 6
4000	3000,3200	9.00 (228.6)	3	24.0 (610)	22.0 (569)	5.50 (140)	0.68 (17)	1.37 (36)	7.81 (198)	14.25 (362)	4, 6
CU	**M-Rated**										
225	—	1.75 (44.4)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.63 (41)	3.25 (83)	—	6.00 (152)	4, 5
400	—	1.75 (44.4)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.63 (41)	3.25 (83)	—	6.00 (152)	4, 5
600	—	1.75 (44.4)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.63 (41)	3.25 (83)	—	6.00 (152)	4, 5
800	400	1.75 (44.4)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.63 (41)	3.25 (83)	—	6.00 (152)	4, 5
1000	—	2.25 (57.2)	1	10.0 (254)	8.00 (203)	4.38 (111)	1.88 (48)	3.75 (95)	—	6.00 (152)	4, 5
1200	600	2.88 (73.2)	2	10.0 (254)	8.00 (203)	4.38 (111)	0.85 (21)	1.69 (43)	—	6.00 (152)	4, 6
1350	800	3.50 (88.9)	2	10.0 (254)	8.00 (203)	4.38 (111)	1.16 (29)	2.31 (59)	—	6.00 (152)	4, 6
1600	1000	4.50 (114.3)	2	15.50 (395)	13.50 (343)	7.13 (181)	1.66 (42)	3.31 (84)	—	8.50 (216)	4, 6
2000	1200,1350	6.00 (152.4)	2	15.50 (395)	13.50 (343)	7.13 (181)	2.41 (42)	4.81 (122)	—	8.50 (216)	4, 6
—	1600	6.50 (165.1)	2	15.50 (395)	13.50 (343)	7.13 (181)	2.66 (67)	5.31 (135)	—	8.50 (216)	4, 6
2500	2000	8.50 (215.9)	1	15.50 (395)	13.50 (343)	7.13 (181)	3.66 (93)	7.31 (186)	—	8.50 (216)	4, 6
3000	—	4.75 (120.7)	3	20.0 (508)	18.00 (457)	4.50 (114)	0.68 (17)	1.37 (36)	3.56 (90)	13.25 (337)	4, 6
3200	—	5.50 (139.7)	3	20.0 (508)	18.00 (457)	4.50 (114)	0.68 (17)	1.37 (36)	4.32 (110)	13.25 (337)	4, 6
4000	2500,3000,3200	6.50 (165.1)	3	20.0 (508)	18.00 (457)	4.50 (114)	0.68 (17)	1.37 (36)	5.31 (135)	13.25 (337)	4, 6
5000	4000	8.50 (215.9)	3	24.0 (610)	22.00 (569)	5.50 (140)	0.68 (17)	1.37 (36)	7.31 (186)	14.25 (362)	4, 6

Figure 1

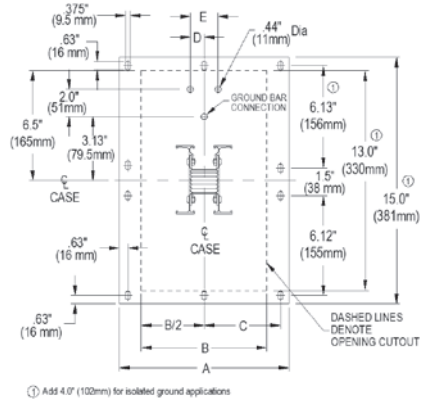


Figure 2

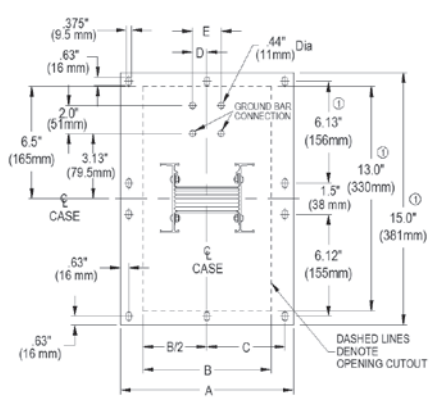
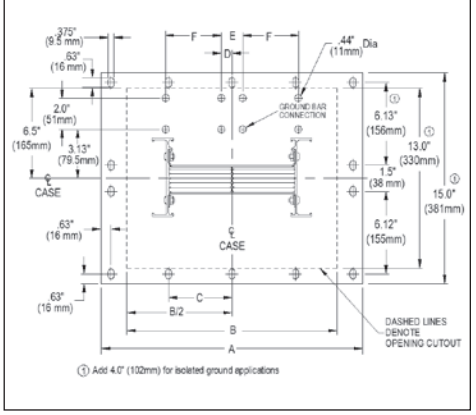


Figure 3



Integral and Internal Ground Strap Drilling Detail

Figure 4

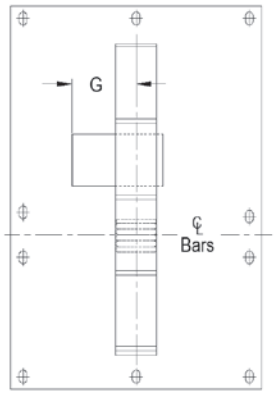


Figure 5

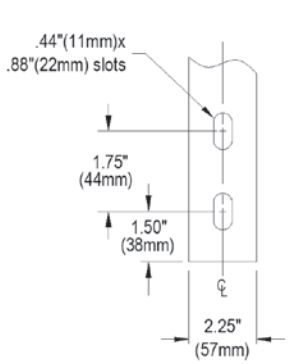
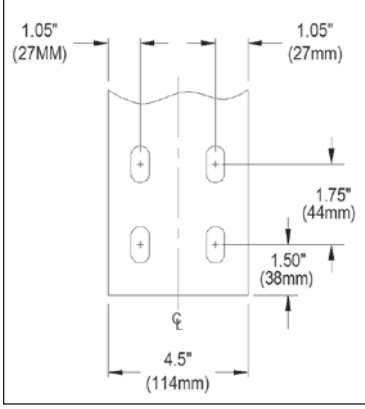


Figure 6



Meter center modules provide a quick and convenient method of connecting to metering devices for both commercial and industrial applications.

Meter center modules connect at the side of a busway run to special joint stacks; these special joints can be added to existing busway to accommodate meter center module connections. When using multiple metering stacks, main disconnects are available if the system reaches the 6 circuit rule (see metering bulletin for further information).

Dimensional Data Required

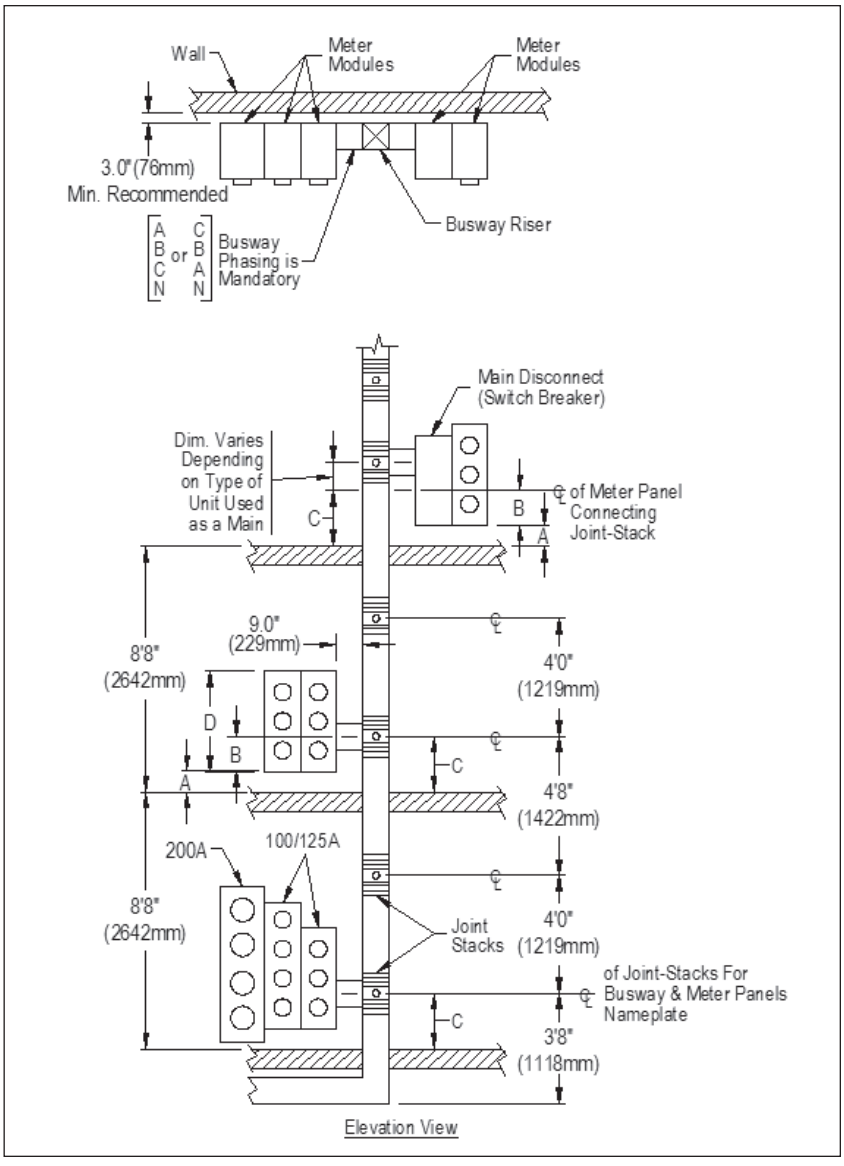
Dimensions Inches (mm)

"A" Distance between floor and bottom of meter center as required by the customer.

"B" Dimension from bottom of meter center to centerline of meter center joint connection stack:
100-125A Panel, B = 16.5 (419)
200A Panel, B = 22.0 (559)

"C" Equals "A" plus "B", Minimum 16.0 (406)

"D" Individual meter center height. Consult Modular Metering application information.



Meter Center Cubicles

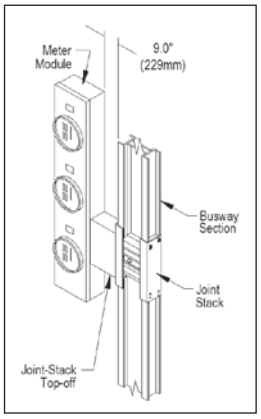
Meter center cubicles provide a quick and convenient method of connecting to metering devices for both commercial and industrial applications and have the main disconnect circuit breaker factory installed.

Having the main disconnect built into the device reduces the required space on the right and left side of the busway. Meter center modules connect at the side of the cubicle frame box using an SBJ4 stack. Meter center cubicles are available for 600 – 1200 Amp (L, M and N Frames). They are available with flexible meter center connections, left side, right side or both. (When ordering a meter center cubicle a SBJ4 stack must be ordered separately.)

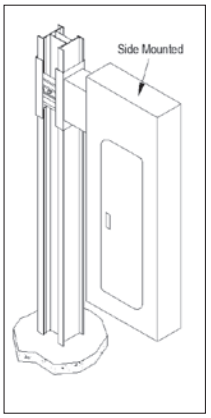
Molded Case Circuit Breaker Cubicles with Meter Tap Stack Provisions Dimensions, Inches (mm)

Ampere Rating		Busway Width W	L Frame Breaker (250-600A)			M Frame Breaker (250-600A)			N Frame Breaker (800-1200A)		
			A	B	C	A	B	C	A	B	C
AL	**L-Rated**										
225	—	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
400	—	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
600	—	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
800	400	4.6 (117)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1000	600	5.4 (137)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1200	800	6.6 (168)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1350	1000	7.6 (193)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1600	1200	8.7 (221)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	20 (490)	37 (940)	26 (660)	20 (490)
2000	1350,1600	10.9 (277)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	20 (490)	37 (940)	26 (660)	20 (490)
2500	2000	13.7 (348)	32 (813)	24 (610)	23.5 (597)	37 (940)	26 (660)	23.5 (597)	37 (940)	26 (660)	23.5 (597)
3000	2500	15.8 (401)	32 (813)	24 (610)	23.5 (597)	37 (940)	26 (660)	23.5 (597)	37 (940)	26 (660)	23.5 (597)
3200	2000	17.3 (439)	32 (813)	24 (610)	23.5 (597)	37 (940)	26 (660)	28 (711)	37 (940)	26 (660)	28 (711)
4000	3000,3200	20.3 (516)	32 (813)	24 (610)	28 (711)	37 (940)	26 (660)	28 (711)	37 (940)	26 (660)	28 (711)
4000	3000,3200	20.3 (516)	32 (813)	24 (610)	28 (711)	37 (940)	26 (660)	28 (711)	37 (940)	26 (660)	28 (711)
CU	**M-Rated**										
225	—	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
400	—	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
600	—	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
800	400	3.9 (99)	32 (813)	24 (620)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1000	—	4.4 (112)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1200	600	5.1 (130)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1350	800	5.7 (145)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
1600	1000	6.7 (170)	32 (813)	24 (610)	16 (406)	37 (940)	26 (660)	16 (406)	37 (940)	26 (660)	16 (406)
2000	1200,1350	8.2 (208)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	20 (490)	37 (940)	26 (660)	20 (490)
—	1600	8.7 (221)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	20 (490)	37 (940)	26 (660)	20 (490)
2500	2000	10.7 (272)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	20 (490)	37 (940)	26 (660)	20 (490)
3000	—	11.8 (300)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	20 (490)	37 (940)	26 (660)	20 (490)
3200	—	13.3 (335)	32 (813)	24 (610)	20 (490)	37 (940)	26 (660)	23.5 (597)	37 (940)	26 (660)	23.5 (597)
4000	2500,3000,3200	15.3 (389)	32 (813)	24 (610)	23.5 (597)	37 (940)	26 (660)	23.5 (597)	37 (940)	26 (660)	23.5 (597)
5000	4000	19.3 (491)	32 (813)	24 (610)	28 (711)	37 (940)	26 (660)	28 (711)	37 (940)	26 (660)	28 (711)

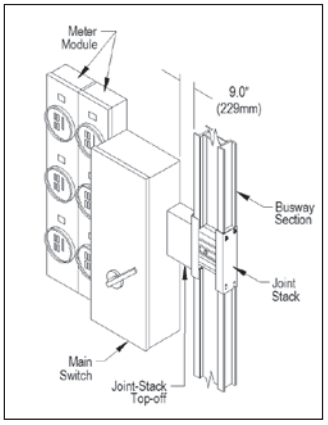
Meter Center Module



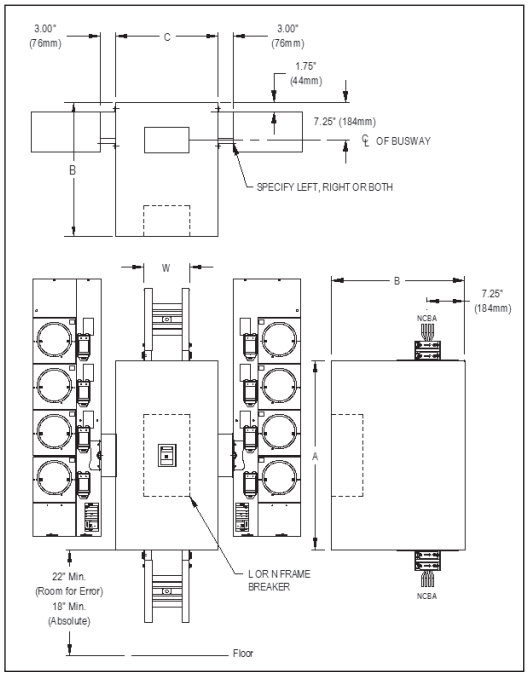
Side Mount Panelboard



Main Disconnect Meter Module



Meter Center Cubicle



Installation

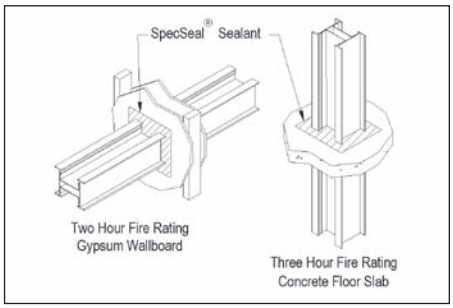
In preparation for installation of your busway systems, it is important to familiarize yourself with the following installation publications:

- General Instructions For Handling, Installation, Operation and Maintenance of Busway Rated 600 volts or less (NEMA Standards Publication BU1)
- Storage, Installation and Maintainance Instructions for Sentron Busway

These publications should be read through thoroughly and used as reference during installation to ensure proper installation procedures. All equipment should be inspected upon delivery. If the busway is not installed immediately, it should be stored in a clean, dry location. Factory supplied record drawings as well as installation tools should be accessible in preparation for installation.

UL 1479 Fire Rated Installations

Sentron Busway has been tested in accordance with UL 1479 and offers a certified two hour fire rating for gypsum wallboard construction and a three hour fire rating for concrete slab or block penetrations. These ratings were achieved using standard busway installed with SpecSeal® sealant from Specified Technologies Inc. The SpecSeal® fire stop system provides superior performance at the industry's lowest installed cost. Sentron is the first busway system to achieve a fire rating for gypsum wallboard construction.



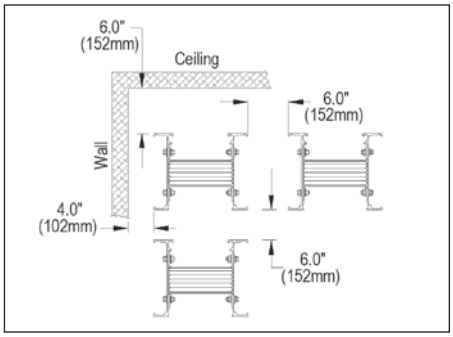
Measuring

Critical to the success of any busway installation is the layout and the accurate measuring of the busway. First and foremost:

Select a route for your busway that will require the fewest fittings and the maxumum number of 10' (3.05m) sections. It is important that the busway system be designed to meet the requirements of the National Electric Code for Busway. There are a number of techniques that may be used to ensure an accurate measurement before purchasing and installing the busway. The following tools will be required during layout and masuring:

- 100' (30.48m) tape measure
- Meauring Stick
- Chalkline
- Plumb Bob
- Marker

(A laser distance measuring device may be used to speed the measuring process).



Minimal Clearances

Minimum clearances for installing feeder busway are shown. Additional clearance may be required for plug-in devices larger than 100A fusible and 250A circuit breaker.

SIEMENS

Busway Order Entry Checklist

Complete one checklist for each busway run.

Date Submitted: _____

Purchase Order #: _____
Project Name: _____
Sales Suport: _____
Sales Engineer: _____

Release ☐ Hold For Release ☐ YES

Run Designation _____
Busway Catalog # _____
Service, _____ _____ Amps
Bus material ☐ CU ☐ AL ☐ "M" Rated ☐ "L" Rated
Neutral ☐ None ☐ 100 % ☐ 200 %
Ground ☐ Case ☐ Internal ☐ Isolated
IP rating ☐ IP 40 Indoor
☐ IP 55 Splash Proof
☐ NEMA 3R Outdoor

Drawing requirements
Approval drawings ☐ # copies ☐
Recorder drawings ☐ # copies ☐
Ship Complete ____ Partial Shipments ____ YES
Ship not before: _____
Shipping Instructions

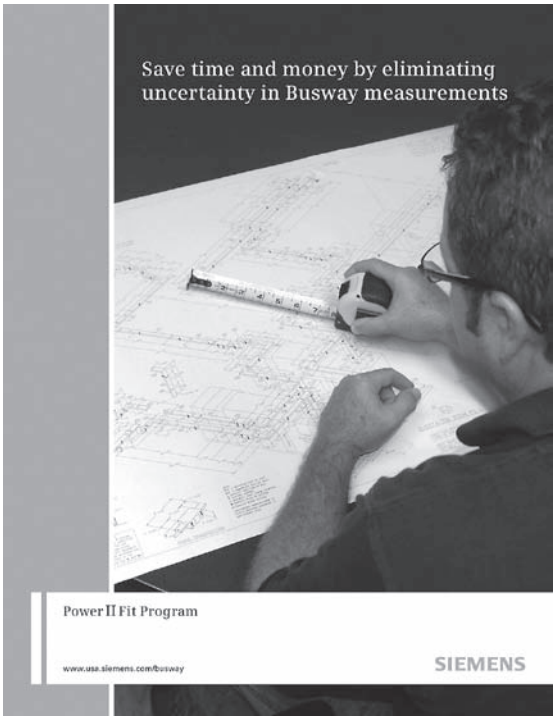
TIP, You can make additioanl copies of this sheet by right clicking on the tab and creating a duplicate.
Use one sheet for each Busway run.

*NOTE: For OUTDOOR BUSWAY, contact the factory before quoting outdoor busway runs over 50 ft.

Busway mounting position in reference to floor

A) **Engineering Information**
☐ Field sketches or factory approval drawings attached?
☐ Dimensions from walls, column lines, ect.
☐ Wall, floor and roof thickness and pitch.
Floor Elevation's
☐ Floor to floor
☐ Floor to ceiling
☐ Wall locations
☐ Equipment pads Height _____
☐ Existing Busway to be extended cat # _____
☐ Phasing
☐ Nameplate Information
☐ Match to competitor, Contact the plant.
☐ Special SWBD connection, provide details
☐ Phase Transpositions: Provide phasing on drawings
☐ Riser Bus
☐ Load side of bus plug (top or bottom)
☐ Required distance from floor to top of panels/plugs
☐ Meter bank (center line of tap stack)
☐ Barriers and/or floor supports
☐ Transformer Connections
☐ Standard XFMR Service head
☐ Single phase
☐ Three single phase
☐ Special drawing required
☐ Dimensions between phases
☐ LV spade detail, including drilling and thickness
☐ Dimensions of LV spade from tank wall
☐ Throat opening and bolt pattern, if any
☐ Utility Vault Connection Utility type _____
☐ Required drawing attached?
☐ End Cable Tap Box
☐ Horizontal ☐ Vertical
☐ Standard Lugs
☐ Special lugs, specify below,
☐ Intermediate Hangers ☐ Qty. *Note: Intermediate Hangers are for floor to ceiling height greater than 16ft. Consult factory if greater than 32 ft.
☐ Expansion Sections ☐ Qty.
*Note: Expansion Section is required for every 200ft of continuous Busway run length and for each building expansion joint. The Busway run must be positioned accordingly to accommodate the Expansion Section(s).

B) **Specifications** (check or fill appropriate blanks)
☐ Standard busway meet specifications
☐ Exceptions to specifications, note comments below
Short-circuit bracing 100KAIC Amps symmetrical
Voltage drop requirement _____
Temperature-rise requirement _____
Current density requirement _____
Special paint, provide paint chip. _____
Special Comments



What is the PowerII Fit Program?

Siemens PowerII Fit (PIIF) Program compensates for dimensional deviations that may result in busway layouts. With the PIIF Program, specific dimensions on straight sections and/or elbows may be left out of factory released drawings. After the busway run has been installed (minus PIIF pieces), final measurements are taken and sent to the factory. The PIIF Program guarantees shipment of straight sections and/or 90 degree angle elbows within 5 business days for IP40 (indoor) and 8 business days for NEMA 3R (outdoor), upon receipt of the PIIF Order Form. The PIIF Program may be used with SENTRON.

Why use the PowerII Fit Program?

The PIIF Program can save you both time and money by eliminating uncertainty in busway measurements. When you take advantage of the PIIF Program, your busway runs fit exactly the first time, eliminating incorrect pieces and costly reordering time.

When should the PowerII Fit Program be used?

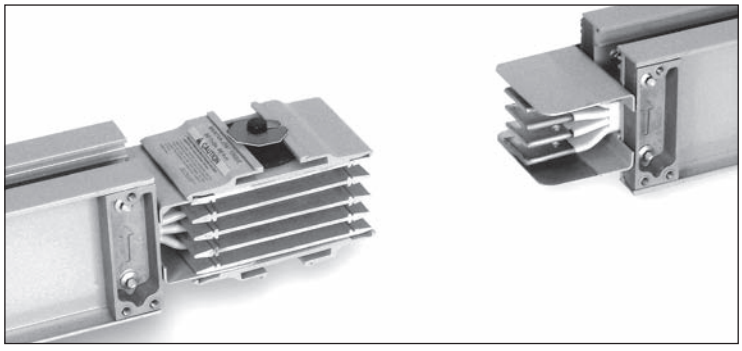
The PIIF Program will benefit you when you are uncertain of exact dimensions on long busway runs and when difficult contour situations require special attention.

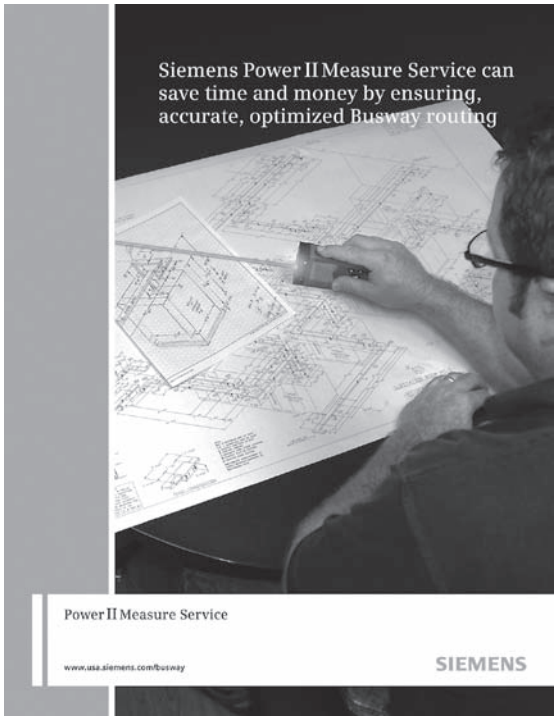
Program Details

- Product Line: SENTRON.
- Pricing: Included with original order entry.
- Quantity: A maximum of 5 pieces per order.
  (Straight feeder sections and/or 90 degree elbows.)
- Shipment: 5 business days for IP40 (indoor) and 8 business days for NEMA 3R (outdoor), after receipt of PIIF Order Form. All orders ship via standard carrier originating from Spartanburg, SC. Optional air freight shipments available when customer assumes shipping cost.

Ordering Details

- Identify Siemens Busway PIIF Pieces at time of original order. Busway Customer Service approves PIIF Pieces.
- Fax PIIF Order Form to Busway Customer Service when exact measurements are known.
- Busway Customer Service acknowledges PIIF Order and PIIF pieces ship within 5 business days for IP40 (indoor) and 8 business days for NEMA 3R (outdoor).





What is the Power II Measure service?

Siemens Power II Measure (P II M) service provides professional busway routing and measurement by a factory representative. The Siemens representative will meet with the designated site contact to review project details and discuss routing options. Using a laser measuring device, all pertinent site measurements will be recorded and then transferred to a CAD approval drawing(s). The P II M service guarantees correct alignment and routing of the busway. If there are any errors in the busway routing that resulted from Siemens, replacement busway items will be provided at no charge.

Why use the Power II Measure service?

The P II M service can save you both time and money by:
- Ensuring the most cost effective busway routing
- Ensuring accurate measurements
- Reducing order engineering lead-time

When should the Power II Measure service be used?

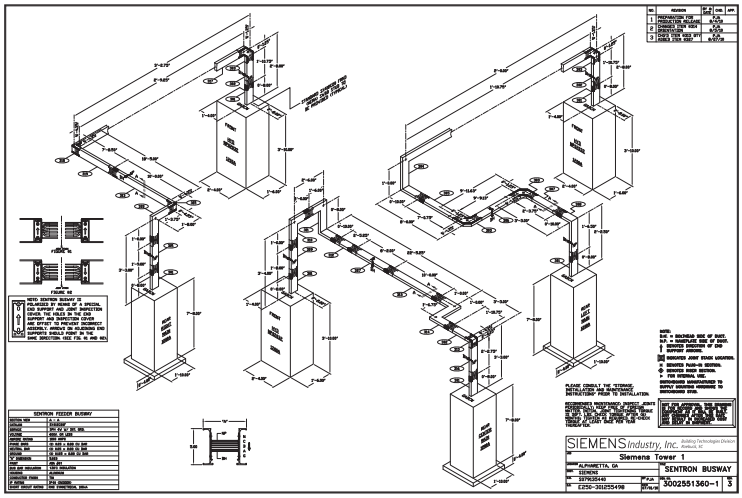
The P II M service can be beneficial for all projects (new or existing, large or small). The P II M service is especially beneficial for large and/or complex projects.

Program details

- Product Line: Sentron, XJL, XLU, BD
- Pricing: Fixed daily rate includes travel expenses, site review, measurement service and approval drawings
- Deliverable: An electronic CAD approval package will be submitted within 3 weeks of the site visit. The drawing package will include isometric busway routing with gear orientation, and any special application notes/details.

Ordering details

- The P II M service should be ordered at the same time as the busway
- The P II M service may be ordered for project cost estimation
- Allow 2 weeks notice to schedule the P II M service



Siemens Sentron Busway Quick Reference

Critical Dimensions:

Busway that passes through a wall, ceiling or floor:
- centerline of a joint to the wall, ceiling or floor = 7 in. min.
- centerline of a joint (*above a floor support*) to a floor = 16 in. min.
- joints cannot be positioned inside a wall, ceiling or floor (*joints must be accessible for maintenance*)

Feeder Busway clearances:
- from the top of the busway to a ceiling/floor/wall or other busway = 6 in. min.
- from the side of the busway to a ceiling/floor/wall or other busway = 4 in. min

Plug-in Busway clearances:
- plug-In busway clearances depend on the configuration of bus plugs (*see bus pug clearance charts in the Sentron Selection and Application Guide*)
- otherwise, clearances for feeder busway apply
- note orientation of the operating handle and provide clearance for access & operation

Feeder Busway length:
- minimum length = 14.38 in.
- maximum length = 10 ft.

Plug-In & Riser length:
- available only in 4, 6, 8 and 10 ft. lengths

Flat Elbow section:
- maximum leg length = 4 ft.
- minimum leg length: Varies according to amperage and bus bar material

Edge Elbow section:
- maximum length = 4 ft.
- minimum leg length = 10 in.

Combination and Offset Elbows:
- maximum leg lengths = 4 ft.
- minimum leg lengths: varies according to amperage and bus bar material (*See Sentron Selection and Application Guide*)

Elbow - Stub Combinations:
- maximum leg length = 4 ft.
- minimum leg length = 2.50 in. + (case size x .5)

Critical Details:
- busway DRAWINGs must include all releva¬nt dimensions
- CENTERLINE dimensions are expected (*please note any dimensions that are not center line dimensions*)
- WALLs and FLOORs must be located (*wall & floor thickness must be included*)
- locate the **FRONT of all switchboards** and provide the phasing of any existing boards (*advise if any PADs are located under boards*)
- when using RISER plug-in busway please note the desired direction of the load side of bus plugs (*G,A,B,C,N from left to right will position the load side to the bottom and "UP is On" handle operation*)
- TRANSFORMER THROAT connections require complete details.
- Horizontal plug-in busway must be oriented with the A phase on top (*bolt head on top*).
- In-Line Disconnect CUBICLEs are engineered to order. The **FRONT** of the cubicle and **Breaker** information must be specified.
- Panels - panel type and size / if a certain panel or breaker height is required (those dimensions)
- Curb height

Intermediate Hangers
- Add qty (1) Intermediate Hanger for floor to ceiling height greater than 16ft. Consult factory if greater than 32 ft.

Expansion Sections:
- Qty (1) Expansion Section should be used for every 200ft of continuous Busway run length and for each building expansion joint. The Busway run must be positioned accordingly to accommodate the Expansion Section(s).

Outdoor Busway:
- route busway to minimize outdoor busway run length
- call factory before quoting outdoor busway runs over 50 ft.
- avoid installing busway near exhaust pipes that may generate steam or caustic vapors

XJ-L™ HD Busway System

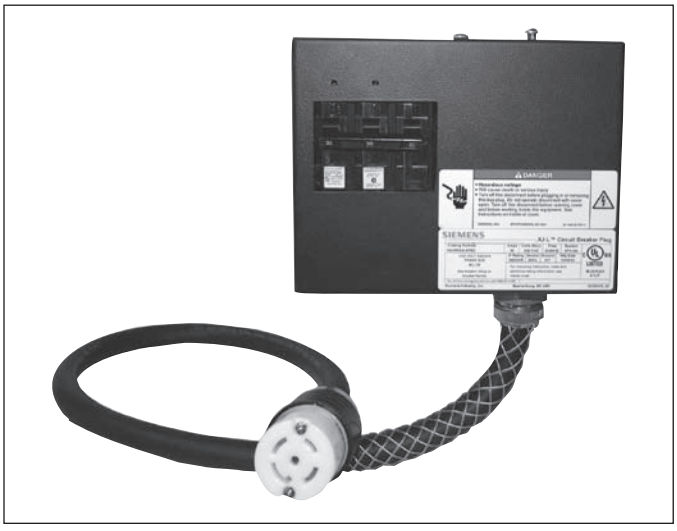
XJ-L HD Busway Introduction

Competitive Advantages

XJ-L HD Busway is available up to 400A. First introduced in 1960, XJ-L Busway continues to be the leading power distribution solution for demanding applications that require reliable, high quality power. XJ-L HD Busway is the optimal choice for both contractors and users concerned with designing superior electrical systems that require a high plug density and optimal space utilization.

Competitive advantages:

- Compact size – small cross section for applications where busway routing is constrained
- Joint Connection – dual spring clamp assemblies ensure reliable, maintenance-free joints
- Safety – plug-in outlets are IP2X finger safe (optional XOC outlet covers increase system to IP40)
- Reliability – fundamental design has a 60 year history of reliability
- Service – simple snap together installation, maintenance free joints, factory stock of critical components and large distribution inventory of bus plugs ensure quick and easy serviceability
- Fittings – elbow, tee, crosses, flanged end, and tap boxes are offered in standard and custom configurations
- Compatibility – the full range of XJ-L HD bus plugs are interchangeable between 100A, 225A and 400A busway





Key features:

- Up to twelve 100A bus plugs can be installed per 10' of plug-in busway. Plug-in busway can be configured with six plug-in openings per side (standard) or twelve on one side (high density).
- Bus plugs are readily installed on energized busway and are fully interchangeable between 100, 225 and 400A configurations.
- Bus plugs are available with fusible or circuit breaker disconnects, configured with a wide variety of optional receptacles, branch circuit breakers, drop cords, power monitoring, indicator lights, etc.
- Bus bars are solid copper (98% conductivity) and tin plated for superior electrical performance and corrosion resistance (optional silver plating is also available). The solid bus bar design provides superior short circuit strength (up to 35 kA) compared to channel style conductors and cable.
- Totally enclosed steel housing is robust, guarding against incidental contact and contamination of live parts. Enclosed box design will not twist or distort during bus plug installation.
- Installation is fast and easy. Joint connections simply snap together without special tools, housing couplers, or bus connectors.
- Suitable for horizontal and vertical mounting and under-the floor applications.

XJ-L™ HD Busway System

XJ-L HD Busway Overview

XJ-L HD Busway

XJ-L HD Busway is well known for its outstanding performance, providing convenient, cost-effective power distribution for high-tech environments, data centers, laboratories, and other applications requiring consistent, quality power distribution. Key XJ-L HD design features include optional isolated ground or 200% neutral across entire product range. For maximum availability, XJ-L HD Busway is maintained as a stock product to meet your quickship requirements.

As a result, XJ-L HD Busway is an intelligent choice for contractors and users concerned with designing superior electrical distribution systems The compact design is ideal for limited working areas in computer manufacturing, laboratory or test facilities, schools, hospitals, and machine shops.

With XJ-L HD Busway, you get an exclusive, optional isolated ground design that ensures clean power. Unlike bonded ground designs that may convey surges from one electrical devce to another, the XJ-L HD optional isolated ground system is well suited for high-tech computer intensive environments. The ground bar is the same size as the phase bars, with the same ampere rating. Installation is easy, joining one XJ-L HD Busway section to another is as simple as matching ends and snapping them together. Bus bars are held securely in place by spring pressure clips located in the joint insulator. The joint is secured when the external housing plate is attached with captive screws. Thanks to built-in flexibility and a low initial cost, you also benefit from future savings when you need new equipment.

Time to add on busway for new or expanded facilities? The XJ-L Busway you installed years ago matches the XJ-L HD Busway you specify today and years from now the new busway sections, components or system-compatible bus plugs will still fit.

Dependability

With over one million feet in service, XJ-L HD Busway has a proven track record. The busway joints are easy to install and maintenance free. Solid copper bus bars and totally enclosed steel housings are designed for decades of dependable service.

Flexibility

Siemens XJ-L HD Busway is available in a wide variety of straight lengths, elbows, tees, crosses, and tap boxes that can be installed and then readily expanded or reconfigured to meet changing requirements. Custom fittings and straight lengths can be engineered to tailor the busway system to application-specific customer requirements. Bus Plugs can be installed, then relocated as required without de-energizing the busway. All XJ-L HD Bus Plugs are fully interchangeable with all XJ-L HD Busway configurations.

Cost

Siemens XJ-L HD Busway offers a lower cost solution, compared to cable and conduit, sandwich style busway or even light duty track busway. Snap together installation requires no special tools and is fast, easy and maintenance free. Solid, highly conductive bus bars minimize electrical losses and ensure long-term energy savings.

Equipment protection

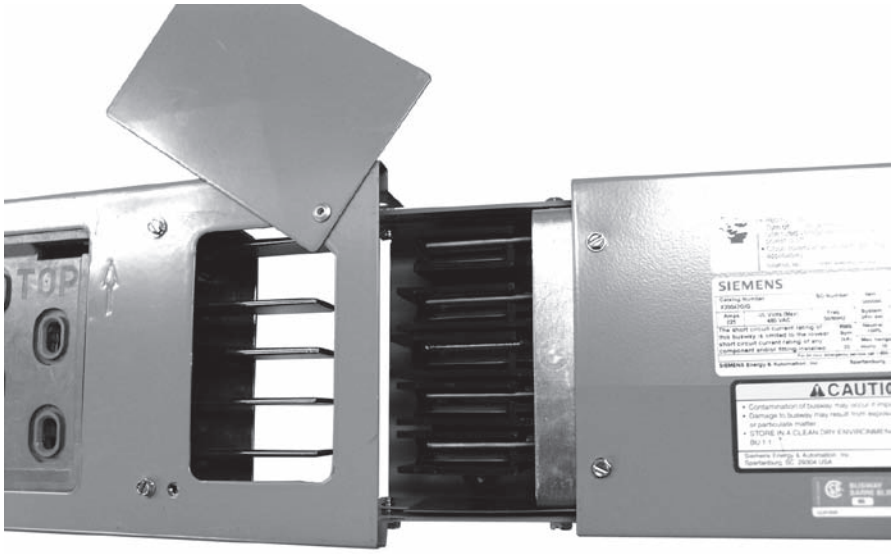
Critical equipment is protected via fuse or circuit breaker plugs. Due to their proximity, the plugs provide a localized method of protection and disconnection.

Space

Space in critical power/data center facilities is at a premium. XJ-L HD Busway requires less space than conventional power distribution methods such as cable and conduit.

Availability

XJ-L HD Busway and plugs are stocked to meet your quick-ship requirements. Once you factor in all the advantages, XJ-L HD is clearly the best choice for reliable, flexible, and economical power distribution for data centers, light industrial, and high tech applications.



XJ-L™ HD Busway System

XJ-L HD Busway Specifications

XJ-L HD Busway is available in 100A, 225A and 400A ratings making it the right choice for light industrial and commercial applications where low initial startup and maintenance costs are prerequisites. XJ-L HD Busway is the most logical choice for high tech, data intensive environments, especially when isolated ground is required.

Housing

XJ-L HD Busway features a totally enclosed, non-ventilated, steel housing. The housing is covered with an electrostatically applied polyester urethane powder paint. Choice of colors: ASA#61 Gray or Graphite Gray. The paint is scratch resistant and has a 500 hour salt spray rating.

Conductors

The conductors are fabricated from 98% conductivity copper. The bars are "spaced-in-air" and held securely in the housing by the plug-in outlets and joints.

Neutral

100% neutral is available for standard 4 wire applications. A second neutral bar can be added for 200% neutral capacity.

Note: the 200% neutral bar can be utilized as Isolated Ground.

The internal ground bus is 100% rated for 100A, 60% rated for 225A, and 50% for 400A busway. Isolated ground is rated at 100% for both amperages.

Plating

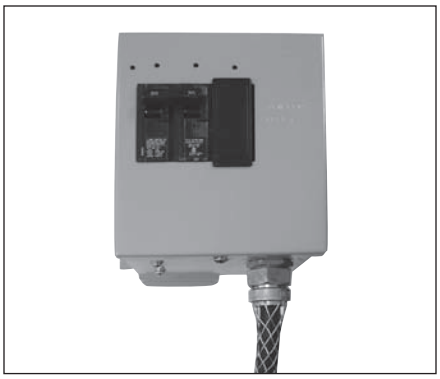
The entire length of the bus bar is tin plated to ensure good electrical contact at all joint and plug tap-off points. The plating also serves to protect the bars from corrosion. Optional silver plating is available.

Plug-in base

XJ-L HD Busway features multiple plug-in locatons. The plastic, non-tracking outlets are located on 20 inch centers and support the bus bars providing bracing during short circuit conditions. The plug-in outlets are IP2X (finger safe). Optional plug-in base covers (XOC) are available separately or they can be factory installed.

Joint connection

Busway sections are connected via a maintenance-free, spring pressure joint. The busway ends are easily aligned and bus bar ends are held securely in place by spring pressure clips located in the joint insulator. The housings are connected via external housing plates and captive screws.



Bus plugs

There are twleve plug-in outlets on each 10 foot (3.048 m) section, six openings on 5 foot (1.524 m) sections and two outlets on 2 foot (.616 m) sections. Bus plugs are available with amperages ranging from 15A to 200A. Bus plugs feature circuit breakers or fusible switch disconnects.

Testing

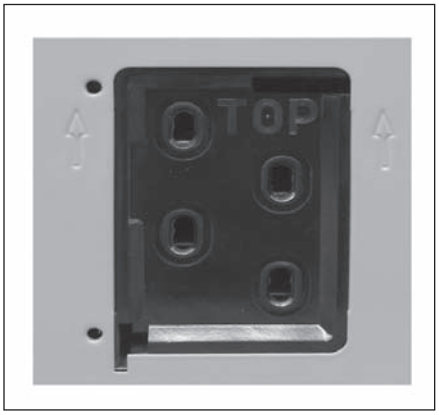
Each piece of XJ-L HD Busway is factory tested prior to shipment. A dielectric test is performed to ensure product integrity. XJ-L HD Busway is manufactured and inspected in accordance to an ISO 9001 registered Quality Management System.

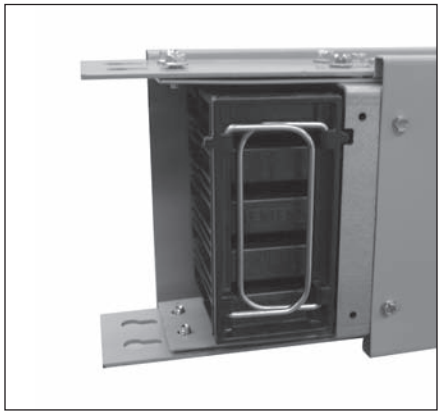
Standards

XJ-L HD Busway products meet the following standards:
UL 857
NEMA BU1
CSA C22.2

Ratings

Amperage:	100A, 225A and 400A
Voltage:	600 VAC max
Short circuit:	100A – 10kAIC 225A – 22kAIC 400A – 35kAIC





R,X,Z and voltage drop

Ampere rating	Bus bar width x .125 in. (3.2 mm) thick	Ohm x 10-3 per 100 ft. Line to neutral			Voltage drop – concentrated loads, line-to-line per 100 ft. at 100% rated load, 35°C ambient power factor							
		R	X	Z	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
100	0.50 (13.0)	1.67	8.71	1.88	2.30	2.54	2.75	2.94	3.10	3.21	3.25	2.89
225	1.00 (25.4)	8.20	4.08	9.16	2.48	2.74	2.98	3.19	3.37	3.51	3.57	3.20
400	2.13 (54.1)	4.27	3.01	5.23	2.88	3.10	3.29	3.44	3.56	3.62	3.57	2.96

XJ-L™ HD Busway System

Straight Sections

Plug-in section

												Plug-in Busway Only	
Prefix	Type	Fitting Type				Amp	Configuration	Color	Plug-In Location	Plug-In Spacing
BW	**J**	**P**	**1**	**2**	**0**	**1**	**6**	**G**	**L**	**2**

XJ-L HD

Plug-in

Length:
024 = 24 inches
060 = 60 inches
120 = 120 inches

1 = 100
2 = 225
4 = 400

1 = 3Ø
2 = 3Ø + Internal Grd
3 = 3Ø + Isolated Grd
4 = 3Ø + Internal Grd + Isolated Grd
5 = 3Ø + Neutral
6 = 3Ø + Neutral + Internal Grd
7 = 3Ø + Neutral + Isolated Grd
8 = 3Ø + Neutral + Internal Grd + Isolated Grd
9 = 3Ø + 200% Neutral
0 = 3Ø + 200% Neutral + Internal Ground

A = Graphite
G = ANSI 61
X = Other

L = Left Side Only
R = Right Side Only
S = Dual Side

1 = 20″ Dual Side①
2 = 9.75″ Single Side②
X = Other③

Notes:
① Use for Plug-in Length = "S"
② Use for Plug-in Length = "L" or "R"
③ Other custom spacing must be pre-approved

Plug-in sections

Available in 10 foot (3.048 m), 5 foot (1.524 m) or 2 foot (.616 m) standard plug-in lengths, XJ-L HD Busway offers layout flexibility to meet custom requirements. Plug-in busway can be configured with six plug-in openings per side or twelve on one side.

Feeder Section

Prefix	Type	Fitting Type				Amp	Configuration	Color
BW	**J**	**F**	**1**	**2**	**0**	**1**	**6**	**G**

XJ-L HD

Feeder

Length in inches, Ex. 2′ 3″ = **024** Feeder lengths available from 16″ (**016**) up to 10′ 0″ (**120**)

1 = 100
2 = 225
4 = 400

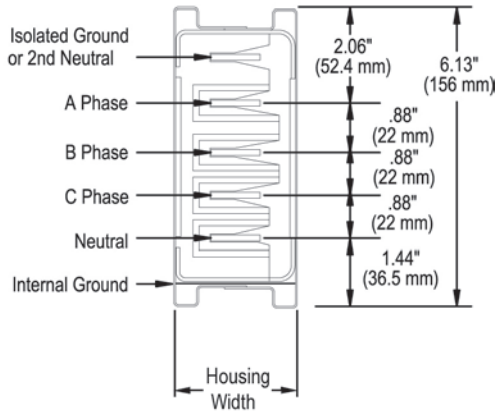
1 = 3Ø
2 = 3Ø + Internal Grd
3 = 3Ø + Isolated Grd
4 = 3Ø + Internal Grd + Isolated Grd
5 = 3Ø + Neutral
6 = 3Ø + Neutral + Internal Grd
7 = 3Ø + Neutral + Isolated Grd
8 = 3Ø + Neutral + Internal Grd + Isolated Grd
9 = 3Ø + 200% Neutral
0 = 3Ø + 200% Neutral + Internal Ground

A = Graphite
G = ANSI 61
X = Other

Feeder Sections

Feeder busway carries the current of the busway system from the supply source. Feeder busway does not have plug-in outlets. Feeder busway is available in custom lengths from 16.00 in (406mm) to 120.00 in (3048mm). Feeder sections are available as Indoor.

XJ-L HD Busway also features an exclusive rotating cover plate to facilitate inspection of the joints. The light weight design of the busway and plugs makes the installation of XJ-L HD Busway quick and trouble-free.

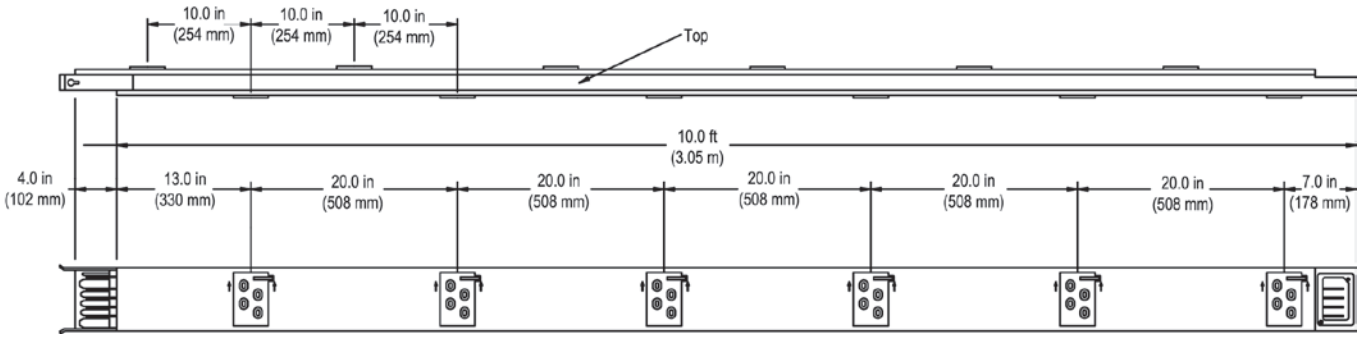




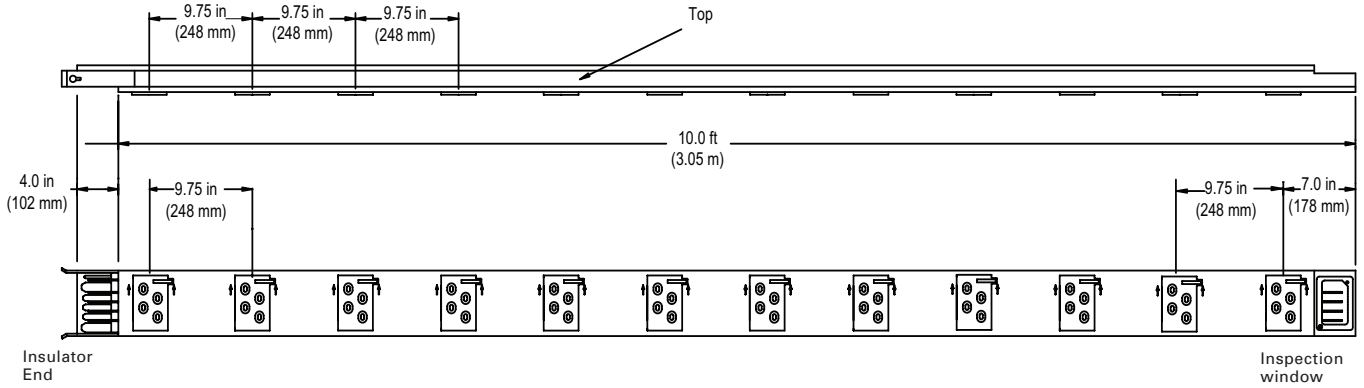
XJ-L™ HD Busway System

Straight Sections

Plug-in Section (Dual Side)



Plug-in Section (Single Side–Right hand configuration shown)



Plug-in Section

Ampere Rating	Bus Bar Material	Bar Thickness	Bar Width	Housing Width	Housing Height	Max Voltage	Short Circuit Rating	Length Ft (M)	3 Pole			4 Pole		
									Catalog Number	Model Number①	Wgt. (lb)	Catalog Number	Model Number①	Wgt. (lb)
100	Copper	.125 (3.2)	.5 (13)	2.0 (51)	6.13 (156)	600V	10kA	10.0 (3.05)	**XC1003**	**BWJP12011GS1**	42	**XC1004**	**BWJP12015GS1**	45
100	Copper	.125 (3.2)	.5 (13)	2.0 (51)	6.13 (156)	600V	10kA	5.0 (1.52)	**XC10035**	**BWJP06011GS1**	21	**XC10045**	**BWJP06015GS1**	23
100	Copper	.125 (3.2)	.5 (13)	2.0 (51)	6.13 (156)	600V	10kA	2.0 (.61)	**XC10032**	**BWJP02411GS1**	8	**XC10042**	**BWJP02415GS1**	9
225	Copper	.125 (3.2)	1.0 (25)	2.5 (64)	6.13 (156)	600V	22kA	10.0 (3.05)	**X2003**	**BWJP12021GS1**	56	**X2004**	**BWJP12025GS1**	62
225	Copper	.125 (3.2)	1.0 (25)	2.5 (64)	6.13 (156)	600V	22kA	5.0 (1.52)	**X20035**	**BWJP06021GS1**	28	**X20045**	**BWJP06025GS1**	30
225	Copper	.125 (3.2)	1.0 (25)	2.5 (64)	6.13 (156)	600V	22kA	2.0 (.61)	**X20032**	**BWJP02421GS1**	10	**X20042**	**BWJP02425GS1**	12
400	Copper	.125 (3.2)	2.12 (54)	3.6 (92)	6.13 (156)	600V	35kA	10.0 (3.05)	**X4003**	**BWJP12041GS1**	69	**X4004**	**BWJP12045GS1**	79
400	Copper	.125 (3.2)	2.12 (54)	3.6 (92)	6.13 (156)	600V	35kA	5.0 (1.52)	**X40035**	**BWJP06041GS1**	35	**X40045**	**BWJP06045GS1**	40
400	Copper	.125 (3.2)	2.12 (54)	3.6 (92)	6.13 (156)	600V	35kA	2.0 (.61)	**X40032**	**BWJP02441GS1**	15	**X40042**	**BWJP02445GS1**	17

① Model Numbers Effective Aug 2011

Feeder Section

Ampere Rating	Bus Bar Material	Bar Thickness	Bar Width	Housing Width	Housing Height	Max Voltage	Short Circuit Rating	Length In. (mm)	3 Pole			4 Pole		
									10' Catalog Number	10' Model Number①	Wgt. (lb/ ft)	10' Catalog Number	10' Model Number①	Wgt. (lb/ ft)
100	Copper	.125 (3.2)	.5 (13)	2.0 (51)	6.13 (156)	600V	10kA	16.0-120.0 (406 - 3048)	XC1003-Spec	**BWJF12011GS1**	4.2	XC1004-Spec	**BWJP12015GS1**	4.5
225	Copper	.125 (3.2)	1.0 (26)	2.5 (64)	6.13 (156)	600V	22kA		X2003-Spec	**BWJF12021GS1**	5.6	X2004-Spec	**BWJP12025GS1**	6.2
400	Copper	.125 (3.2)	2.12 (54)	3.6 (92)	6.13 (156)	600V	35kA		X4003 -Spec	**BWJF12041GS1**	6.9	X4004-Spec	**BWJP12045GS1**	7.9

① Model Numbers Effective Aug 2011

XJ-L™ HD Busway System

Elbows

Fittings

Prefix	Type	Fitting Type				Amp	Configuration	Color
BW	J	E	L	E	L	1	7	A

XJ-L HD → J
Elbow → E
L

E = Edge **L** = Left
F = Flat **R** = Right

1 = 100
2 = 225
4 = 400

1 = 3Ø
2 = 3Ø + Internal Grd
3 = 3Ø + Isolated Grd
4 = 3Ø + Internal Grd + Isolated Grd
5 = 3Ø + Neutral
6 = 3Ø + Neutral + Internal Grd
7 = 3Ø + Neutral + Isolated Grd
8 = 3Ø + Neutral + Internal Grd + Isolated Grd
9 = 3Ø + 200% Neutral
0 = 3Ø + 200% Neutral + Internal Ground

A = Graphite
G = ANSI 61
X = Other

Flat elbows

Right hand or left hand XJ-L HD Busway system 90 degree flat elbows are available. When specifying be sure to use the proper catalog number suffix to identify the required fitting.

Flat Elbow

Ampere Rating	Poles	Catalog Number	Model Number①	Catalog Number	Model Number①
100	3	**XC1003L1**	**BWJELFR11G**	**XC1003L3**	**BWJELFL11G**
100	4	**XC1004L1**	**BWJELFR15G**	**XC1004L3**	**BWJELFL15G**
225	3	**X2003L1**	**BWJELFR21G**	**X2003L3**	**BWJELFL21G**
225	4	**X2004L1**	**BWJELFR25G**	**X2004L3**	**BWJELFL25G**
400	3	**X4003L1**	**BWJELFR41G**	**X4003L3**	**BWJELFL41G**
400	4	**X4004L1**	**BWJELFR45G**	**X4004L3**	**BWJELFL45G**

① Model Numbers Effective Aug 2011

Edge elbows

Right hand or left hand XJ-L HD Busway system 90 degree edge elbows are available. When specifying, be sure to use the proper catalog number suffix to identify the required fitting.

Edge Elbow

Ampere Rating	Poles	Catalog Number	Model Number①	Catalog Number	Model Number①
100	3	**XC1003L2**	**BWJELER11G**	**XC1003L4**	**BWJELEL11G**
100	4	**XC1004L2**	**BWJELER15G**	**XC1004L4**	**BWJELEL15G**
225	3	**X2003L2**	**BWJELER21G**	**X2003L4**	**BWJELEL21G**
225	4	**X2004L2**	**BWJELER25G**	**X2004L4**	**BWJELEL25G**
400	3	**X4003L2**	**BWJELER41G**	**X4003L4**	**BWJELEL41G**
400	4	**X4004L2**	**BWJELER45G**	**X4004L4**	**BWJELEL45G**

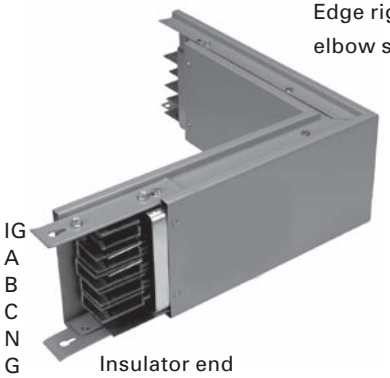
① Model Numbers Effective Aug 2011

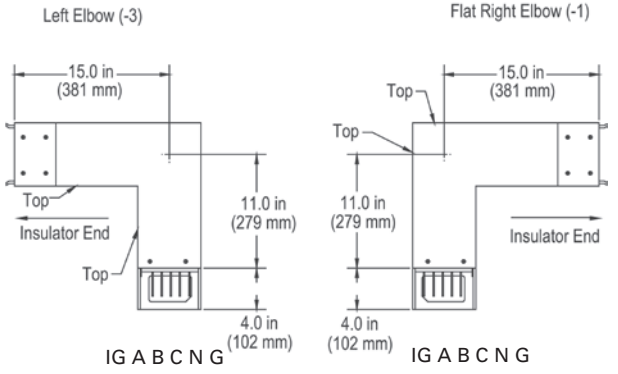
Flat right elbow shown

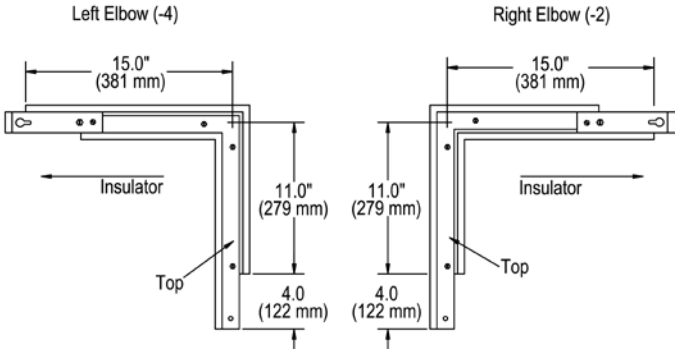
Insulator end



Edge right elbow shown







XJ-L™ HD Busway System

Tees and Crosses

Fittings

Prefix	Type	Fitting Type				Amp	Configuration	Color
BW	**J**	**C**	**R**	**E**	**2**	**1**	**7**	**A**
XJ-L HD		**C**	**R**	**E** = Edge	**2**	**1** = 100 **2** = 225 **4** = 400	**1** = 3Ø **2** = 3Ø + Internal Grd **3** = 3Ø + Isolated Grd **4** = 3Ø + Internal Grd + Isolated Grd **5** = 3Ø + Neutral **6** = 3Ø + Neutral + Internal Grd **7** = 3Ø + Neutral + Isolated Grd **8** = 3Ø + Neutral + Internal Grd + Isolated Grd **9** = 3Ø + 200% Neutral **0** = 3Ø + 200% Neutral + Internal Ground	**A** = Graphite **G** = ANSI 61 **X** = Other
Cross								

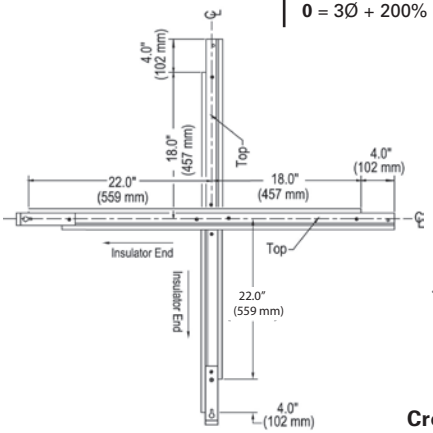
Cross

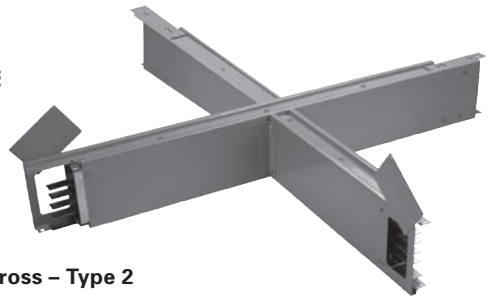
Crosses are fittings used to interconnect two busway runs which are located at right angle to each other.

Cross

Ampere Rating	Poles	Catalog Number	Model Number①
100	3	**X1003CR2**	**BWJCRE211G**
100	4	**XC1003CR2**	**BWJCRE215G**
225	3	**X2003CR2**	**BWJCRE221G**
225	4	**X2004CR2**	**BWJCRE225G**
400	3	**X4003CR2**	**BWJCRE241G**
400	4	**X4004CR2**	**BWJCRE245G**

① Model Numbers Effective Aug 2011





Cross – Type 2

Fittings

Prefix	Type	Fitting Type				Amp	Configuration	Color
BW	**J**	**T**	**E**	**E**	**2**	**1**	**7**	**A**
XJ-L HD		**T**	**E**	**E** = Edge	**2,4**	**1** = 100 **2** = 225 **4** = 400	**1** = 3Ø **2** = 3Ø + Internal Grd **3** = 3Ø + Isolated Grd **4** = 3Ø + Internal Grd + Isolated Grd **5** = 3Ø + Neutral **6** = 3Ø + Neutral + Internal Grd **7** = 3Ø + Neutral + Isolated Grd **8** = 3Ø + Neutral + Internal Grd + Isolated Grd **9** = 3Ø + 200% Neutral **0** = 3Ø + 200% Neutral + Internal Ground	**A** = Graphite **G** = ANSI 61 **X** = Other
Tee								

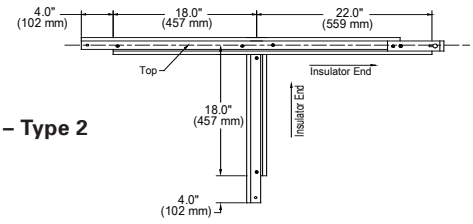
Tee

Tees permit a second run of busway to extend at right angles to a straight busway run.

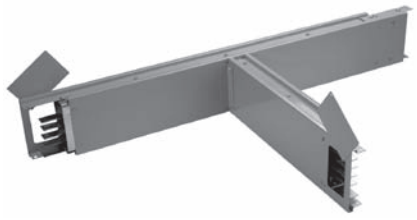
Tees

Ampere Rating	Poles	Catalog Number	Model Number①	Catalog Number	Model Number①
100	3	**XC1003T2**	**BWJTEE211G**	**XC1003T4**	**BWJTEE411G**
100	4	**XC1004T2**	**BWJTEE215G**	**XC1004T4**	**BWJTEE415G**
225	3	**X2003T2**	**BWJTEE221G**	**X2003T4**	**BWJTEE421G**
225	4	**X2004T2**	**BWJTEE225G**	**X2004T4**	**BWJTEE425G**
400	3	**X4003T2**	**BWJTEE241G**	**X4003T4**	**BWJTEE441G**
400	4	**X4004T2**	**BWJTEE245G**	**X4004T4**	**BWJTEE445G**

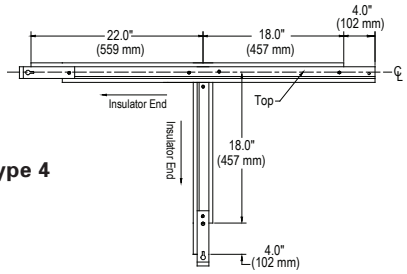
① Model Numbers Effective Aug 2011



Tee – Type 2



Right Hand Shown



Tee – Type 4

XJ-L™ HD Busway System

Tap Boxes

Center Tap Boxes

									Tap Box Only②			
Prefix	Type	Fitting Type				Amp	Config.	Color	Tap Box Steel	Lug opt.	Meter	Meter Surface
BW	**J**	**C**	**T**	**L**	**N**	**2**	**4**	**A**	**S**	**A**	**1**	**N**
XJ-L HD		**C**	**T**	**L** = Left (rear) **R** = Right (front)	**N**	**1** = 100 **2** = 225 **4** = 400		**A** = Graphite **G** = ANSI 61 **X** = Other	**S** = Standard **X** = Custom / Other		**N** = None **1** = PAC3200 **2** = PAC3100 **X** = Other	**N** = None / NA **L** = Left **R** = Right (Inspection Cover Side) **X** = Other
Center Tap Box												

1 = 3Ø
2 = 3Ø + Internal Grd
3 = 3Ø + Isolated Grd
4 = 3Ø + Internal Grd + Isolated Grd
5 = 3Ø + Neutral
6 = 3Ø + Neutral + Internal Grd
7 = 3Ø + Neutral + Isolated Grd
8 = 3Ø + Neutral + Internal Grd + Isolated Grd
9 = 3Ø + 200% Neutral
0 = 3Ø + 200% Neutral + Internal Ground

A = Std Mech Lug
B = 1.75 Dual Hole (No Lug)
X = Custom / Other①
D = Extended Box with 500MCM Mechanical

Notes:
① Use X for Tap Box Steel
② Not required for Flanged End. Leave fields blank

Center Cable Tap Box

Center tap boxes are non-fusible devices utilized to feed to or take off power from the busway run. When loads served by the busway run do not require over-current protection, center tap boxes may be used. If the application requires additional wiring bending space, extended center tap boxes are available. Center tap boxes are an actual part of the busway run and require a space of 32 in. (810 mm) for installation.



Right Hand Shown

Figure 1
Right

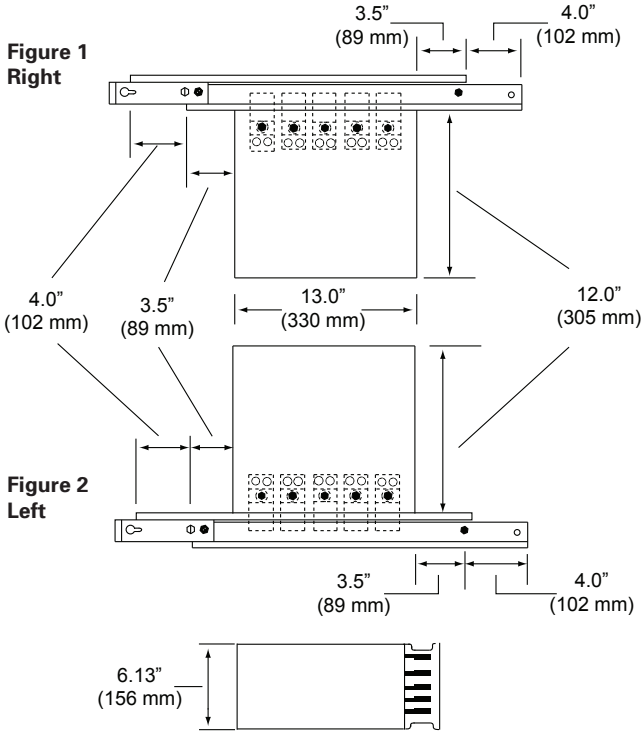


Figure 2
Left

Center Tap Box

Ampere Rating	Poles	Catalog Number Front Connected Fig 1	Model Number① Right Connected Fig 1	Catalog Number Rear Connected Fig 2	Model Number① Left Connected Fig 2	Teminals Provided Qty/Pole and Size Cu/Al wire
225	3	**X2003M**	**BWJCTRN21GSANN**	**X2003M**	**BWJCTLN21GSANN**	(1) 350MCM - #6
225	4	**X2004M**	**BWJCTRN25GSANN**	**X2004M**	**BWJCTLN25GSANN**	(1) 350MCM - #6
400	3	**X4003M1**	**BWJCTRN41GSANN**	**X4003M2**	**BWJCTLN41GSANN**	(2) 350MCM - #6
400	4	**X4004M1**	**BWJCTRN45GSANN**	**X4004M2**	**BWJCTLN45GSANN**	(2) 350MCM - #6

① Model Numbers Effective Aug 2011

XJ-L™ HD Busway Systems

Tap Boxes

End Tap Boxes

									Tap Box Only②			
Prefix	Type	Fitting Type				Amp	Config.	Color	Tap Box Steel	Lug opt.	Meter	Meter Surface
BW	**J**	**E**	**T**	**B**	**R**	**2**	**4**	**A**	**S**	**A**	**1**	**R**
	XJ-L HD				**L** = Left	**1** = 100		**A** = Graphite	**S** = Standard		**N** = None	**N** = None / NA
		E	**T**	**B**	**R** = Right	**2** = 225		**G** = ANSI 61	**X** = Custom / Other		**1** = PAC3200	**L** = Left
	End Tap Box					**4** = 400		**X** = Other			**2** = PAC3100	**R** = Right (Inspection Cover Side)
											X = Other	**X** = Other

1 = 3Ø
2 = 3Ø + Internal Grd
3 = 3Ø + Isolated Grd
4 = 3Ø + Internal Grd + Isolated Grd
5 = 3Ø + Neutral
6 = 3Ø + Neutral + Internal Grd
7 = 3Ø + Neutral + Isolated Grd
8 = 3Ø + Neutral + Internal Grd + Isolated Grd
9 = 3Ø + 200% Neutral
0 = 3Ø + 200% Neutral + Internal Ground

A = Std Mech Lug
B = 1.75 Dual Hole (No Lug)
X = Custom / Other①
D = Extended Box with 500MCM Mechanical

Notes:
① Use X for Tap Box Steel
② Not required for Flanged End. Leave fields blank

End Tap Box

End tap boxes are devices used to connect cable and conduit to the end of a busway run or where busway runs connect without the need for over-current protection. End tap boxes may be installed at the end or beginning of a run.

Tap boxes can be configured with surge protection and current monitoring devices.



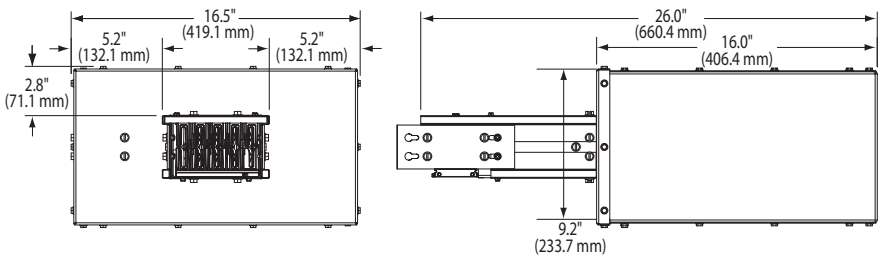


Right Hand Shown

End Tap Box

Ampere Rating	Poles	Catalog Number	Model Number①	Teminals Provided Qty/Pole and Size Cu/Al wire
100	3	**X1003ETVB**	**BWJETBR11GS**	(1) 1/0 - #14
100	4	**X1004ETVB**	**BWJETBR15GS**	(1) 1/0 - #14
225	3	**X2003ETVB**	**BWJETBR21GS**	(1) 350MCM - #6
225	4	**X2004ETVB**	**BWJETBR25GS**	(1) 350MCM - #6
400	3	**X4003ETVB**	**BWJETBR41GS**	(2) 350MCM - #6
400	4	**X4004ETVB**	**BWJETBR45GS**	(2) 350MCM - #6

① Model Numbers Effective Aug 2011



XJ-L™ HD Busway System

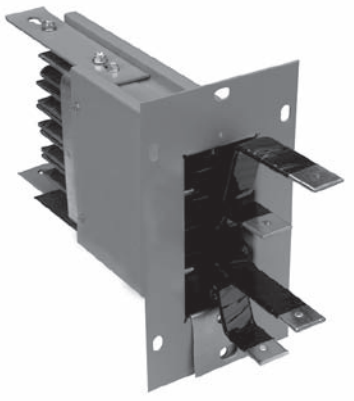
Flanged Ends

Flanged End

Prefix	Type	Fitting Type				Amp	Config.	Color
BW	**J**	**F**	**R**	**N**	**N**	**2**	**4**	**A**
	XJ-L HD → **J**		**E** = Std.			**1** = 100	**1** = 3Ø	**A** = Graphite
			R = Nema			**2** = 225	**2** = 3Ø + Internal Grd	**G** = ANSI 61
	Flanged End →	**F**		**N**	**N**	**4** = 400	**3** = 3Ø + Isolated Grd	**X** = Other
			X = Other				**4** = 3Ø + Internal Grd + Isolated Grd	
							5 = 3Ø + Neutral	
							6 = 3Ø + Neutral + Internal Grd	
							7 = 3Ø + Neutral + Isolated Grd	
							8 = 3Ø + Neutral + Internal Grd + Isolated Grd	
							9 = 3Ø + 200% Neutral	
							0 = 3Ø + 200% Neutral + Internal Ground	

Flanged end

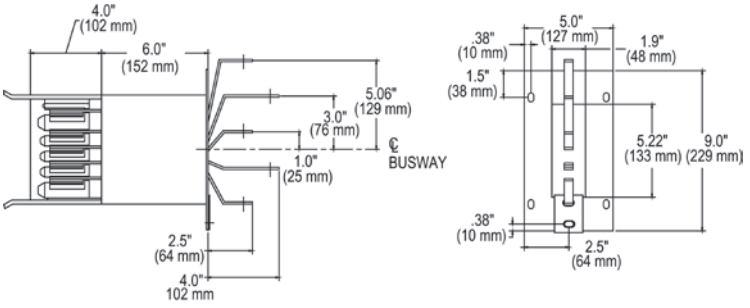
Flanged ends are used to connect busway to switchboards. Flanged ends come complete with bus bar extensions to facilitate the making of electrical connections.



Flanged end

Ampere Rating	Poles	Catalog Number	Model Number①
100	3	**XC1003FE**	**BWJFENN11GS**
100	4	**XC1004FE**	**BWJFENN15GS**
225	3	**X2003FE**	**BWJFENN21GS**
225	4	**X2004FE**	**BWJFENN25GS**
400	3	**X4003FE**	**BWJFENN41GS**
400	4	**X4004FE**	**BWJFENN45GS**

① Model Numbers Effective Aug 2011



Busway hanger

XH2 and XH3 hangers are used to support XJ-L HD Busway and can be used with customer supplied rods up to 3/8 inch in diameter. Hangers are adaptable for wall mounting or ceiling suspension arrangements, either edge or flat. Custom mounting solutions available upon request.

Busway Hanger

Ampere Rating	Catalog Number	Model Number①	Dimn A in. (mm)
100	**XH2**	**BWJH0011G**	2.25 (57)
225	**XH2**	**BWJH0012G**	2.75 (69)
400	**XH3**	**BWJH0014G**	4 (101)

Tip: Bus plug access may be restricted by hangers or drop rods. This should be considered in the system layout.

Hangers

Prefix	Type	Fitting Type				Amp	Color
BW	**J**	**H**	**0**	**0**	**1**	**1**	**G**

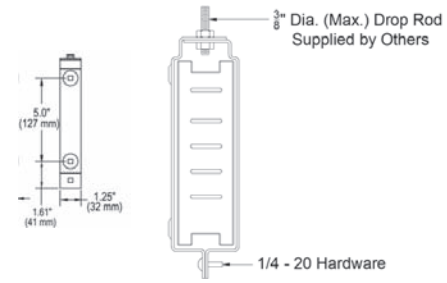
XJ-L HD → **J**; Hanger → **H**

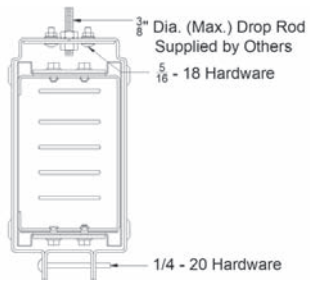
001 = Singe Drop Rod (XH style)
002 = Side Mount for strut channel①
003 = Saddle Mount for strut channel①
004 = Pole Mount①
005 = Dual Drop Rod Saddle①
006 = Dual/Single Drop Rod Frame
XXX = Other①

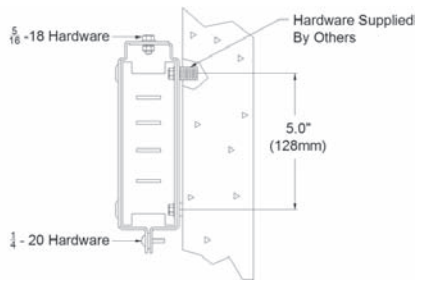
1 = 100, **2** = 225, **4** = 400

A = Graphite, **G** = ANSI 61, **X** = Other

Notes:
① MTO-E Custom Product









End closer

An end closer is used to terminate busway runs. To extend the run, simply remove the end closer and add new sections as needed.



End Closer

Prefix	Type	Fitting Type				Amp	Color
BW	**J**	**X**	**E**	**N**	**N**	**1**	**G**

XJ-L HD → **J**; End Closer → **X**

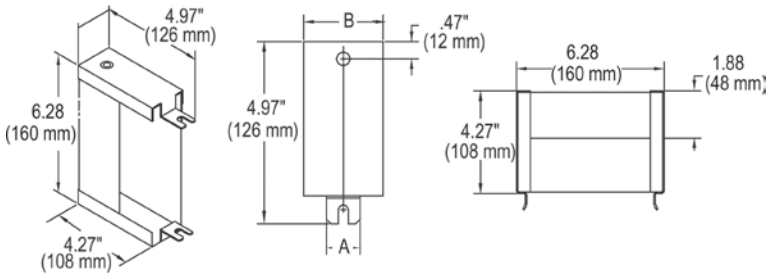
1 = 100, **2** = 225, **4** = 400

A = Graphite, **G** = ANSI 61, **X** = Other

End Closer

Ampere Rating	Catalog Number	Model Number①	Dimn. A in (mm)	Dimn. B in (mm)
100	**XE100**	**BWJXENN1G**	2.06 (52)	0.94 (24)
225	**XE200**	**BWJXENN2G**	2.31 (59)	1.44 (37)
400	**XE400**	**BWJXENN4G**	3.44 (87)	2.5 (64)

Tip: Utilization of the busway plug-in opening adjacent to the End Closer may be limited to XQ45 bus plugs. This applies only if the End Closer is located to the Right-hand of the bus plug.



XOC outlet covers

Optional outlet covers are available for closing off the plug-in outlets when desired.

Outlet Cover

Ampere Rating	Catalog Number	Model Number①
100	**XOC**	**BWJXOCN1G**
225	**XOC**	**BWJXOCN2G**
400	**XOC**	**BWJXOCN4G**



Outlet Cover

Prefix	Type	Fitting Type				Amp	Color
BW	**J**	**X**	**O**	**C**	**N**	**1**	**G**

XJ-L HD → **J**; Plug-in Cover → **X**

1 = 100, **2** = 225, **4** = 400

A = Graphite, **G** = ANSI 61, **X** = Other

① Model Numbers Effective Aug 2011

XJ-L™ HD Busway Systems

Bus Plugs / XJ-L HD Power Modules (XPMs)

Bus plugs for XJ-L Busway are available from 15A to 200A, with molded case circuit breakers or Vacu-Break fusible switches. All XJ-L bus plugs are fully interchangeable with all XJ-L Busway configurations.

Lightweight and portable, plugs can be installed or relocated as required **without de-energizing the busway**. Pre-engineered plug-in opening locations ensure no interference for **greater density** and maximum flexibility. This is especially important in high tech areas requiring frequent movement of equipment.

XJ-L HD Power Modules are available with 3, 6, or 12 branch circuit protection in both single and 3-phase configurations, ranging from 15 –200 amps for maximum power density and flexibility.

A wide variety of NEMA and IEC receptacles or cord connections are available for the XPM. Integral current monitoring and surge protection are available upon request.



Selection Guide

Enclosure Type	Plug-in Spacing	Breaker Type	Application
A = 3 Circuit - XQ Series	20.00 & 9.75	BQ, BQH, HBQ QP, QPH, HPQ	XQ style — No receptacle
B = 3 Circuit - XQR Series	20.00 & 9.75⑬		XQR style — with duplex receptacle provision. May be used for custom receptacles or when additional wiring space is required
C = 3 Circuit HD XPM	20.00 & 9.75		Use for applications that require factory installed breakers and receptacles
E = 6 Circuit HD XPM	20.00 & 9.75	BL, BLH, HBL, BQD	
F = 12 Circuit XPM⑬⑭	9.75 only⑬⑭		
G = XLEC	20.00 & 9.75⑬	ED2,ED4,ED6	Cover operable handle. Uses heavy duty E-Frame Breakers
H = XEC	20.00 & 9.75⑬		Uses heavy duty E-Frame breakers
J = Plug-in Tap Box	20.00⑮	na	Plug-in tap off device - lugs only
K = XLVB Fusible	20.00 & 9.75⑬	na	Cover operable Vacu-Break Switch

Tip: Type C & E XPMs will install on all plug-in busway. Type F will not install on dual side plug-in busway.



Siemens XJ-L™ HD Bus Plugs and Power Modules

Use For Breaker Group = A, B, X⑪

Prefix	Type	Enclosure	System Config.	Color	Breaker Group	Ampere Rating or Breaker/Receptacle Arrangement⑦⑧⑨⑩	Custom Features
BP	**J**	**H**	**6**	**A**	**A**	**E D 4 6 0**	**N N**
Bus Plug XJ-L HD		**A** = 3 Circuit – XQ Series No Receptacle **B** = 3 Circuit – XQR Series Receptacle Provision **C** = 3 Circuit HD XPM **E** = 6 Circuit HD XPM **F** = 12 Circuit XPM⑬ **G** = XLEC②⑧⑬⑭ **H** = XEC③⑨⑬ **J** = Plug-in Tap Box④⑥⑩⑮ **K** = XLVB Fusible⑤⑥⑨⑬	**1** = 3Ø **2** = 3Ø + Internal Grd **3** = 3Ø + Isolated Grd **4** = 3Ø + Internal Grd + Isolated Grd **5** = 3Ø + Neutral **6** = 3Ø + Neutral + Internal Grd **7** = 3Ø + Neutral + Isolated Grd **8** = 3Ø + Neutral + Internal Grd + Isolated Grd **9** = 3Ø + 200% Neutral **0** = 3Ø + 200% Neutral + Internal Ground	**A** = Graphite **G** = ANSI 61 **X** = Other	**A** = Non-Mixed Factory Installed Breakers① **B** = Mixed Factory Installed Breakers **E** = Enclosure Only (no Breaker)①⑪ **X** = Other / Fusible⑥	See Notes below for information	**NN** = None / NA **XX** = Other⑫

Notes:
① Use "A" or "E" for XLEC and XEC
② Available in System Configs: 1,2,5,6
③ Available in System Configs: 1,2,3,4,5,6,7,8,9
④ Available in System Configs: 1,2,5,6
⑤ Available in System Configs: 1,2,5,6
⑥ For non-breaker style plug use "X" for Breaker Grouping field. (Fusible & Plug-in Tap Box)
⑦ For Enclosure = C,E,F see Breaker / Receptacle Arrangement Schedule for Details
⑧ For XEC and XLEC Ampere Rating field use ED2xx, ED4xx,ED6xx where xx = 15 to 00 trip rating (100A max).
⑨ For XLVB Ampere Rating field use 02xxx for 240V & 06xxx for 600V where xxx = 030, 060, 100 ampere
⑩ For Plug-in Tap Box Ampere Rating field use PBxxx where xxx = 100, 200 ampere
⑪ Ampere Rating and Customer Features fields not required for Breaker Group = "E". Leave fields blank.
⑫ Custom metering available upon request.
⑬ Requires two plug-in openings for 9.75 spacing.
⑭ Installs on 9.75 single side plug-in spacing only.
⑮ 200A Tap Box installs on 20.0 dual side plug-in spacing only. Requires two plug-in openings.

Bus Plugs

XQ and XQR Series

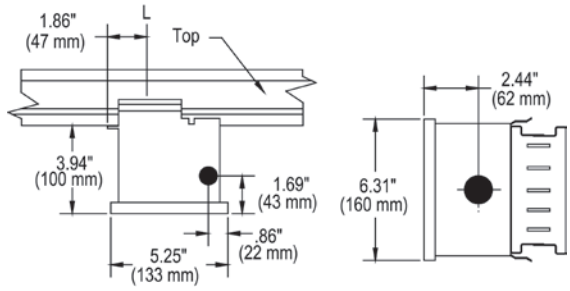
XQ and XQR bus plugs accept QP (plug-in) or BQ (bolt-on) circuit breakers. The plugs feature knockouts to facilitate quick installation. The XQR has added wiring space to allow receptacle installation.

XQ Series Bus plug (60A max)

Breaker Type	Volts	No. of Spaces	Catalog Number	Model Number①	Catalog Number	Model Number①
QP and BQ	120/240	3	**XQ35**	**BPJA1GE**	**XQ45**	**BPJA5GE**

Enclosure Only



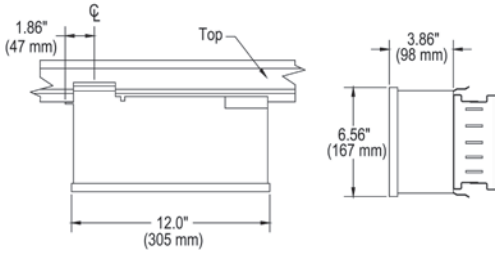


XQR Series Bus plug (60A max)

Breaker Type	Volts	No. of Spaces	Catalog Number	Model Number①	Catalog Number	Model Number①
QP and BQ	120/240	3	**XQ35R**	**BPJB1GE**	**XQ45R**	**BPJB5GE**

Enclosure Only





Accessories for XQ and XQR Series

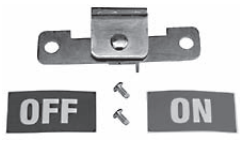
XEQH	Floor Operating Handle (not for 1 pole or 2 pole breakers)
W62890	Bonded Ground Kit
W68101	Isolated Ground Kit



W68101



W62890



XEQH

① Model Numbers Effective Aug 2011

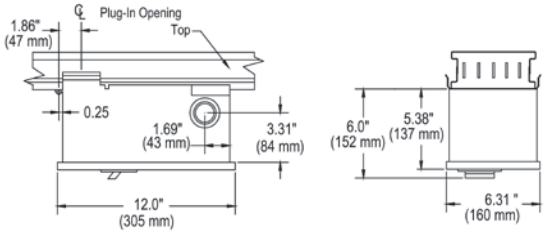
XEC Series

(Cover operable, 100A max)
XEC bus plugs accept ED2 and ED4 circuit breakers. The plugs feature a spacious chassis which allows room for wire bending and knockout provisions. Isolated ground plugs are available from the factory.

XEC Series bus plug

Breaker Type	Volts	Ampere Rating	Catalog Number	Model Number①	Catalog Number	Model Number①
ED2	240	100	XEC3100-Spec	**BPJH1GAED200NN**	XEC4100-Spec	**BPJH5GAED200NN**
ED4	480	30	XEC3100-Spec	**BPJH1GAED430NN**	XEC4100-Spec	**BPJH5GAED430NN**
ED6	600	60	XEC3100-Spec	**BPJH1GAED660NN**	XEC4100-Spec	**BPJH5GAED660NN**
Enclosure Only	600 Max	15-100	XEC3100	**BPJH1GE**	XEC4100	**BPJH5GE**







W62890
bonded ground kit

XLEC Series

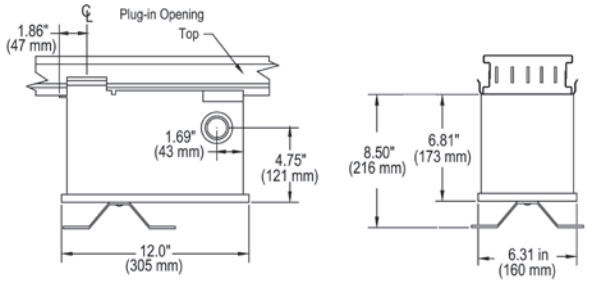
(Floor operable, 100A max)
XLEC bus plugs accept ED2, ED4 and ED6 circuit breakers. The plugs feature a spacious chassis which allows room for wire bending and knockout provisions. These plugs may be operated from the floor with a pull chain or hookstick.

XLEC Series bus plug

Breaker Type	Volts	Ampere Rating	Catalog Number	Model Number①	Catalog Number	Model Number①
ED2	240	100	**XLEC3100-Spec**	**BPJG1GAED200NN**	XLEC4100-Spec	**BPJG5GAED200NN**
ED4	480	30	**XLEC3100-Spec**	**BPJG1GAED430NN**	XLEC4100-Spec	**BPJG5GAED430NN**
ED6	600	60	**XLEC3100-Spec**	**BPJG1GAED660NN**	XLEC4100-Spec	**BPJG5GAED660NN**
Enclosure Only	600 Max	15-100	**XLEC3100**	**BPJG1GE**	XLEC4100	**BPJG5GE**

Additional add-on features, such as shunt trips, alarm switches, and auxillary contacts are also available for XEC and XLEC bus plugs.





① Model Numbers Effective Aug 2011

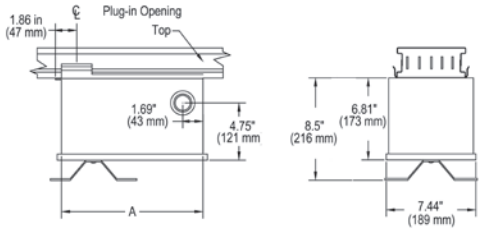
XLVB Series



(Floor operable, 100A max)
XLVB fusible bus plugs utilize the Vacu-Break switching principle, which minimizes arcing and reduces maintenance costs. The Vacu-Break bus plugs are quick-make and quick-break, cover interlocked, horsepower rated, and may be operated from the floor with a pull chain or hookstick.

XLVB Series bus plug

Volts	Ampere Rating	Catalog Number	Model Number①	Catalog Number	Model Number①
240	30	**XLVB321**	**BPJK1GX02030NN**	**XLVB421N**	**BPJK5GX02030NN**
240	60	**XLVB322**	**BPJK1GX02060NN**	**XLVB422N**	**BPJK5GX02060NN**
240	100	**XLVB323**	**BPJK1GX02100NN**	**XLVB423N**	**BPJK5GX02100NN**
600	30	**XLVB351**	**BPJK1GX06030NN**	**XLVB451N**	**BPJK5GX06030NN**
600	60	**XLVB352**	**BPJK1GX06060NN**	**XLVB452N**	**BPJK5GX06060NN**
600	100	**XLVB353**	**BPJK1GX06100NN**	**XLVB453N**	**BPJK5GX06100NN**

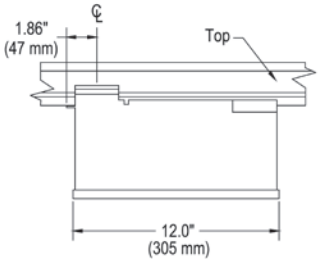


W47185
ON/OFF labels



100A Plug-in tap box

Plug-in cable tap boxes are non-fusible devices used for end or center feed. The 100A tap boxes can be attached at any plug-in opening.





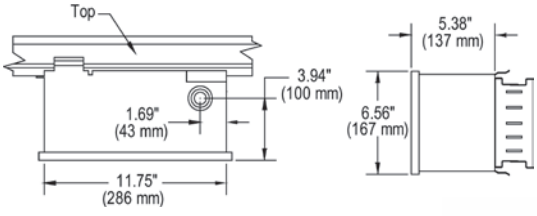
100A Plug-in Tap Box

Ampere Rating	Poles	Catalog Number	Model Number①
100	3	**X103PB**	**BWJJ1GXPB100NN**
100	4	**X104PB**	**BWJJ5GXPB100NN**

Note: Add suffix letter "G" to catalog number for ground bus.

200A Plug-in tap box

Plug-in cable tap boxes are non-fusible devices used for end or center feed. The 200A tap box requires two adjacent openings.





200A Plug-in Tap Box

Ampere Rating	Poles	Catalog Number	Model Number①
200	3	**X2003PB**	BWJJ1GXPB200NN
200	4	**X2004PB**	BWJJ5GXPB200NN

Note: Add suffix letter "G" to catalog number for ground bus.

① Model Numbers Effective Aug 2011

Ampere Rating	Plug In① 10′–0″ Straight Length Catalog Number	Case Dimensions (inches)	Shipping Weight Lb./Ft.	90° Elbow Prefix ④⑤ Catalog Number	Switch-Board Connection⑥ Prefix	Building Expansion Fitting Catalog Number	Cable Tap Box		End Closure Catalog Number	Hangers⑨ Catalog Number
							End⑦ Catalog Number	Center⑧ Catalog Number		
3-Phase, 3-Wire										**600V or Less**
225	**BDP302**	4⅛ x 8⅝	9	**LDP302**	**FEP302**	**EJP302**	**ETB302**	**CTB302**	**ECP6**	**BDH10**
400	**BDP304**	4⅛ x 8⅝	12½	**LDP304**	**FEP304**	**EJP304**	**ETB304**	**CTB304**	**ECP6**	
600	**BDP306**	4⅛ x 8⅝	13½	**LDP306**	**FEP306**	**EJP306**	**ETB306**	**CTB306**	**ECP6**	
800	**BDP308**	6⅛ x 8⅝	18½	**LDP308**	**FEP308**	**EJP308**	**ETB308**	**CTB308**	**ECP10**	
1000	**BDP310**	6⅛ x 8⅝	22	**LDP310**	**FEP310**	**EJP310**	**ETB310**	**CTB310**	**ECP10**	
1350	**BDP313**	12⅛ x 8⅝	28	**LDP313**	**FEP313**	**EJP313**	**ETB313**	**CTB313**	**ECA10**	**BDH12**
1600	**BDP316**	12⅛ x 8⅝	29	**LDP316**	**FEP316**	**EJP316**	**ETB316**	**CTB316**	**ECA10**	
3-Phase, 4-Wire — Full Capacity Neutral										**480V or Less**
225	**BDP4024**	4⅛ x 8⅝	12	**LDP4024**	**FEP4024**	**EJP4024**	**ETB4024**	**CTB4024**	**ECP6**	**BDH10**
400	**BDP4044**	4⅛ x 8⅝	14½	**LDP4044**	**FEP4044**	**EJP4044**	**ETB4044**	**CTB4044**	**ECP6**	
600	**BDP4064**	4⅛ x 8⅝	15½	**LDP4064**	**FEP4064**	**EJP4064**	**ETB4064**	**CTB4064**	**ECP6**	
800	**BDP4084**	8⅛ x 8⅝	28	**LDP4084**	**FEP4084**	**EJP4084**	**ETB4084**	**CTB4084**	**ECA8**	**BDH12**
1000	**BDP4104**	8⅛ x 8⅝	32	**LDP4104**	**FEP4104**	**EJP4104**	**ETB4101**	**CTB4101**	**ECA8**	
Rod-Hanger Adapter (optional)			**UJ100**							

Aluminum to Copper Cross Reference

Aluminum

3-Phase, 3-Wire

Ampere Rating	Plug In① 10′–0″ Straight Length Catalog Number	Case Dimensions (inches)
225	**ABD302**	4⅛ x 8⅝
400	**ABD304**	4⅛ x 8⅝
600	**ABD306**	6⅛ x 8⅝
800	**ABD308**	6⅛ x 8⅝
1000	**ABD310**	12⅛ x 8⅝
1200	**ABD312**	12⅛ x 8⅝

3-Phase, 4-Wire — Full Capacity Neutral

Ampere Rating	Plug In① 10′–0″ Straight Length Catalog Number	Case Dimensions (inches)
225	**ABD4024**	4⅛ x 8⅝
400	**ABD4044**	4⅛ x 8⅝
600	**ABD4064**	6⅛ x 8⅝
800	**ABD4084**	8⅛ x 8⅝
1000	**ABD4104**	12⅛ x 8⅝
1200	**ABD4124**	12⅛ x 8⅝

Copper

3-Phase, 3-Wire

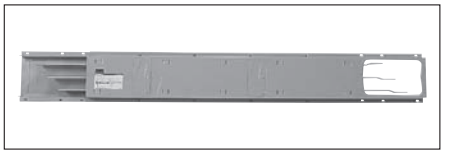
Ampere Rating	Plug In① 10′–0″ Straight Length Catalog Number	Case Dimensions (inches)
225	**BDP302**	4⅛ x 8⅝
400	**BDP304**	4⅛ x 8⅝
600	**BDP306**	4⅛ x 8⅝
800	**BDP308**	6⅛ x 8⅝
1000	**BDP310**	6⅛ x 8⅝
1350	**BDP313**	12⅛ x 8⅝
1600	**BDP316**	12⅛ x 8⅝

3-Phase, 4-Wire — Full Capacity Neutral

Ampere Rating	Plug In① 10′–0″ Straight Length Catalog Number	Case Dimensions (inches)
225	**BDP4024**	4⅛ x 8⅝
400	**BDP4044**	4⅛ x 8⅝
600	**BDP4064**	4⅛ x 8⅝
800	**BDP4084**	8⅛ x 8⅝
1000	**BDP4104**	8⅛ x 8⅝

"M" Rating / Standard Rating Conversion Table

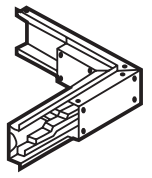
1000/A Square Inch "M" Rating	Standard 55°C Rating BDP
225	—
400	600
600	800
800	800
1000	1000
1200	—
1350	1350
1600	1600
2000	—
2500	—
3000	—
4000	—



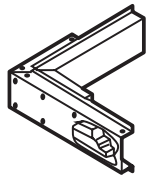
For inches / millimeters conversion, see Application Data Section.

①Consult local sales office for five foot length.
②For higher short circuit ratings add an "H" after the "D" or "P" (ABDH302 or BDPH302). Consult sales office for ratings.
③"GK" suffix is an internal ground bus. For any other ground configuration, consult local sales office. Please use following footage for fittings:
Elbow - 3'
SWB - 1'
End Cable Tap Box - 1'
Center Cable Tap Box - 10'
Building Expansion - 10'

④



Right Edgewise Elbow (-2)



Left Edgewise Elbow (-4)

⑤

Suffix	Description
-1	Right Flatwise
-2	Right Edgewise
-3	Left Flatwise
-4	Left Edgewise

Appropriate suffix must be added to Elbow Catalog Number to order.

⑥Switchboard stub includes flange to cover cutout in top of indoor switchboard and 6" of bus inside switchboard. Connecting hardware supplied by switchboard manufacturer.
⑦Includes busway stub. Total length added to run is 2′ for 225A and 400A aluminum or 225A–600A copper; 3′ for all others. Box is designed to connect to offset bus-bar ends. When it is to be connected to straight bus-bar ends, adapter will be furnished upon request.
⑧Must be factory-assembled to busway. Complete device includes 10′ busway.
⑨Two hangers included free of charge with each busway section, elbow, tee and cross.

XL-U® Aluminum (225–5000 Ampere)

225–5000 Amperes / 600 Volts or Less

Non-Ventilated 225–600 Amperes

Busway Catalog Number				Wall Flange Catalog Number	Floor Support Catalog Number	End Closure Catalog Number	Hangers② Catalog Number
Ampere Rating	Basic Catalog Number	Case Dimensions (inches)	Shipping Weight Lb./Ft.				
3-Pole							
225	**UH302AB**	4½ x 10	8	**UF145**	**UFS145**	**UE145**	**UH145**
400	**UH304AB**	4½ x 10	9	**UF145**	**UFS145**	**UE145**	**UH145**
600	**UH306AB**	5½ x 10	10	**UF145**	**UFS145**	**UE155**	**UH155**
4-Pole Full Neutral							
225	**UH502AB**	4½ x 10	8	**UF145**	**UFS145**	**UE145**	**UH145**
400	**UH504AB**	4½ x 10	9	**UF145**	**UFS145**	**UE145**	**UH145**
600	**UH506AB**	5½ x 10	10	**UF145**	**UFS145**	**UE155**	**UH155**

Ventilated 800–5000 Amperes With Ground Bus

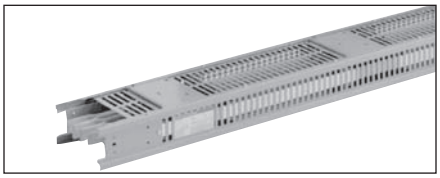
Busway Sections Complete					Wall Flange Catalog Number	Floor Support Catalog Number	End Closure Catalog Number	Hangers② Catalog Number
Ampere Rating①								
Edge-wise ⎸⎸⎸	Flat-wise ═══	Basic Catalog Number	Case Dimensions (inches)	Shipping Weight Lb./Ft.				
3-Pole								
800	800	**UH308AV**	4½ x 10	10	**UF145**	**UFS145**	**UE145**	**UH145**
1000	800	**UH310AV**	4½ x 10	11	**UF145**	**UFS145**	**UE145**	**UH145**
1200	1000	**UH312AV**	5½ x 10	12	**UF155**	**UFS145**	**UE155**	**UH155**
1350	1200	**UH313AV**	5½ x 10	13	**UF155**	**UFS145**	**UE155**	**UH155**
1600	1350	**UH316AV**	7½ x 10	16	**UF175**	**UFS179**	**UE175**	**UH175**
2000	1600	**UH320AV**	7½ x 10	19	**UF175**	**UFS179**	**UE175**	**UH175**
2500	2000	**UH325AV**	9½ x 10	23	**UF195**	**UFS179**	**UE175**	**UH195**
3000	3000	**UH330AV**	7½ x 20⅝	32	**UF275**	**UFS279**	**UE275**	**UH275**
4000	3500	**UH340AV**	9½ x 20⅝	41	**UF295**	**UFS279**	**UE295**	**UH295**
5000	4000	**UH350AV**	9½ x 20⅝	45	**UF295**	**UFS279**	**UE295**	**UH295**
4-Pole Full Neutral								
800	800	**UH508AV**	4½ x 10	11	**UF145**	**UFS145**	**UE145**	**UH145**
1000	800	**UH510AV**	4½ x 10	12	**UF145**	**UFS145**	**UE145**	**UH145**
1200	1000	**UH512AV**	5½ x 10	14	**UF155**	**UFS145**	**UE155**	**UH155**
1350	1200	**UH513AV**	5½ x 10	15	**UF155**	**UFS145**	**UE155**	**UH155**
1600	1350	**UH516AV**	7½ x 10	18	**UF175**	**UFS179**	**UE175**	**UH175**
2000	1600	**UH520AV**	7½ x 10	21	**UF175**	**UFS179**	**UE175**	**UH175**
2500	2000	**UH525AV**	9½ x 10	26	**UF195**	**UFS179**	**UE195**	**UH195**
3000	3000	**UH530AV**	7½ x 20⅝	35	**UF275**	**UFS279**	**UE275**	**UH275**
4000	3500	**UH540AV**	9½ x 20⅝	47	**UF295**	**UFS279**	**UE295**	**UH295**
5000	4000	**UH550AV**	9½ x 20⅝	52	**UF295**	**UFS279**	**UE295**	**UH295**

XLU Suffix Table

Description	Suffix
Feeder	F
Plug-in	P
Elbow	L
Tee	T
Cross	X
Switchboard Connection	S
Expansion Section	J
Center Tap Box	M
End Tap Box	B
XFMR Throat	—
XFMR Tap 1-3 Phase	—
XFMR Tap 3-1 Phase	—
Roof Flange	—
Fused Reducer	—
Non Fused Reducer	—

① Ventilated XL-U busway has two ratings; see above for edgewise or flatwise mounting.
② For rod-hanger adapter UJ100 see page 15-64.

GENERAL NOTES:
1) For inches / millimeters conversion, see Application Data Section.
2) To form complete catalog number, use basic catalog number and substitute suffix of required item. Example: Basic busway Catalog Number U316AV— accessory switchboard stub with ground bus U316AVSG.
3) Totally Enclosed offering is available up to 3000A Al. Replace "V" with "E" in catalog number.
4) The following feeder busway footages apply:
XL-U Elbow 2′ XLU-EXP Section 4′
XL-U Tee 3′ XL-U SWBD Stub 1′
XL-U Cross 4′ XL-U Reducer 4′
5) For higher short circuit rating add an "HH" after the "U" (UHH302ABP)
6) Floor and ceiling flanges are ordered by description.
7) Internal ground bar provided as standard.
8) For elbows other than 90°, accessory charge is doubled.
9) Switchboard stub includes flange to cover cutout in top of indoor switchboard and 8" of bus inside switchboard. Connecting hardware supplied by switchboard manufacturer.
10) Transformer throat connection includes gasketed box sized to match throat plus flexible straps and bolts. No Busway footage is included. For connection to transformers not manufactured by Siemens, consult factory



225–6500 Amperes / 600 Volts or Less

Non-Ventilated 225–600 Amperes

Busway Catalog Number				Wall Flange Catalog Number	Floor Support Catalog Number	End Closure Catalog Number	Hangers② Catalog Number
Ampere Rating	Basic Catalog Number	Case Dimensions (inches)	Shipping Weight Lb./Ft.				
3-Pole							
225	**UH302CB**	4½ x 10	8	**UF145**	**UFS145**	**UE145**	**UH145**
400	**UH304CB**		12	**UF145**	**UFS145**	**UE145**	**UH145**
600	**UH306CB**		13	**UF145**	**UFS145**	**UE145**	**UH145**
4-Pole Full Neutral							
225	**UH502CB**	4½ x 10	9	**UF145**	**UFS145**	**UE145**	**UH145**
400	**UH504CB**		13	**UF145**	**UFS145**	**UE145**	**UH145**
600	**UH506CB**		15	**UF145**	**UFS145**	**UE145**	**UH145**

Ventilated 800–5000 Amperes With Ground Bus

Busway Sections Complete					Wall Flange Catalog Number	Floor Support Catalog Number	End Closure Catalog Number	Hangers② Catalog Number
Ampere Rating①								
Edge-wise ▯▯▯	Flat-wise ▭ ▭ ▭	Basic Catalog Number	Case Dimensions (inches)	Shipping Weight Lb./Ft.				
3-Pole								
800	800	**UH308CV**	4½ x 10	12	**UF145**	**UFS145**	**UE145**	**UH145**
1000	1000	**UH310CV**	4½ x 10	15	**UF145**	**UFS145**	**UE145**	**UH145**
1200	1000	**UH312CV**	4½ x 10	16	**UF145**	**UFS145**	**UE145**	**UH145**
1350	1200	**UH313CV**	4½ x 10	19	**UF145**	**UFS145**	**UE145**	**UH145**
1600	1350	**UH316CV**	5½ x 10	23	**UF155**	**UFS145**	**UE155**	**UH155**
2000	1600	**UH320CV**	5½ x 10	26	**UF155**	**UFS145**	**UE155**	**UH155**
2500	2000	**UH325CV**	7½ x 10	34	**UF175**	**UFS179**	**UE175**	**UH175**
3000	2500	**UH330CV**	9½ x 10	41	**UF195**	**UFS179**	**UE195**	**UH195**
4000	4000	**UH340CV**	7½ x 20⅝	57	**UF275**	**UFS279**	**UE275**	**UH275**
5000	4500	**UH350CV**	7½ x 20⅝	70	**UF275**	**UFS275**	**UE275**	**UH275**
6000	5000	**UH360CV**	9½ x 20⅝	85	**UF295**	**UFS279**	**UE295**	**UH295**
6500	5500	**UH365CV**	9½ x 20⅝	98	**UF295**	**UFS279**	**UE295**	**UH295**
4-Pole Full Neutral								
800	800	**UH508CV**	4½ x 10	14	**UF145**	**UFS145**	**UE145**	**UH145**
1000	1000	**UH510CV**	4½ x 10	18	**UF145**	**UFS145**	**UE145**	**UH145**
1200	1000	**UH512CV**	4½ x 10	19	**UF145**	**UFS145**	**UE145**	**UH145**
1350	1200	**UH513CV**	4½ x 10	23	**UF145**	**UFS145**	**UE145**	**UH145**
1600	1350	**UH516CV**	5½ x 10	28	**UF155**	**UFS145**	**UE155**	**UH155**
2000	1600	**UH520CV**	5½ x 10	30	**UF155**	**UFS145**	**UE155**	**UH155**
2500	2000	**UH525CV**	7½ x 10	42	**UF175**	**UFS179**	**UE175**	**UH175**
3000	2500	**UH530CV**	7½ x 10	61	**UF195**	**UFS179**	**UE195**	**UH195**
4000	4000	**UH540CV**	7½ x 20⅝	70	**UF275**	**UFS279**	**UE275**	**UH275**
5000	4500	**UH550CV**	7½ x 20⅝	86	**UF275**	**UFS279**	**UE275**	**UH275**
6000	5000	**UH560CV**	9½ x 20⅝	105	**UF295**	**UFS279**	**UE295**	**UH295**
6500	5500	**UH565CV**	9½ x 20⅝	122	**UF295**	**UFS279**	**UE295**	**UH295**

XLU Suffix Table

Description	Suffix
Feeder	F
Plug-in	P
Elbow	L
Tee	T
Cross	X
Switchboard Connection	S
Expansion Section	J
Center Tap Box	M
End Tap Box	B
XFMR Throat	—
XFMR Tap 1-3 Phase	—
XFMR Tap 3-1 Phase	—
Roof Flange	—
Fused Reducer	—
Non Fused Reducer	—

"M" Rating / Standard Rating Conversion Table

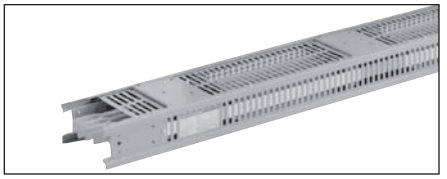
1000/A Square Inch "M" Rating	Standard 55°C Rating XL-U
225	—
400	—
600	800
800	1200
1000	1350
1200	1600
1350	2000
1600	2500
2000	2500
2500	3000
3000	4000
4000	5000

① Ventilated XL-U busway has two ratings; see above for edgewise or flatwise mounting.

② For rod-hanger adapter UJ100 see page 15-64.

GENERAL NOTES:

1) For inches / millimeters conversion, see Application Data Section.
2) To form complete catalog number, use basic catalog number and substitute suffix of required item. Example: Basic busway Catalog Number U316CV— accessory switchboard stub with ground bus U316CVSG.
3) Totally Enclosed offering is available up to 4000A Cu. Replace "V" with "E" in catalog number.
4) The following feeder busway footages apply:
   XL-U Elbow 2′ XLU-EXP Section 4′
   XL-U Tee 3′ XL-U SWBD Stub 1′
   XL-U Cross 4′ XL-U Reducer 4′
5) For higher short circuit rating add an "HH" after the "U" (UHH302CBP)
6) Floor and ceiling flanges are ordered by description.
7) Internal ground bar provided as standard.



8) For elbows other than 90°, accessory charge is doubled.
9) Switchboard stub includes flange to cover cutout in top of indoor switchboard and 8" of bus inside switchboard. Connecting hardware supplied by switchboard manufacturer.
10) Transformer throat connection includes gasketed box sized to match throat plus flexible straps and bolts. No Busway footage is included. For connection to transformers not manufactured by Siemens, consult factory

Busway Power Distribution

XL-X®, XL-U®, BD® Plug-In Units

Selection

Circuit Breaker Plugs

As of June 2014, Siemens no long supplies a complete solution for Legacy bus plug offerings—these part numbers are highlighted in gray

Floor Operable

Breaker Type	AC Volts	Ampere Rating	3-Phase, 3-Wire Enclosure Only② Catalog Number② XL-X	3-Phase, 3-Wire Enclosure Only② Catalog Number② XL-U	3-Phase, 3-Wire Enclosure Only② Catalog Number BD Plug-In①②⑤	3-Phase, 4-Wire Enclosure Only② Catalog Number② XL-X	3-Phase, 4-Wire Enclosure Only② Catalog Number② XL-U	3-Phase, 4-Wire Enclosure Only② Catalog Number BD Plug-In①②⑤⑥
ED2	240	15–60 70–100	REC3100G	UEC3100G	BEC3100	REC4100G	UEC4100G	BEC4100
ED4	480	15–60 70–100						
ED6	600	15–60 70–100						
FD6, FXD		70–250	RFC3250G	UFC3250G	BFC3250	RFC4250G	UFC4250G	BFC4250
JXD6		200–400						
JXD2	240	200–400	~~RJC3400G~~	~~UJC3400G~~	~~BJC3400~~	~~RJC4400G~~	~~UJC4400G~~	~~BJC4400_⑧~~
JD6	600	200–400						
LXD6		450–600③	~~RLC3600G~~	~~ULC3600G~~	~~BLC3600~~	~~RLC4600G~~	~~ULC4600G~~	~~BLC4600_⑧~~
LD6		250–600③						
MD6		400–600③ 700–800③	~~RMC3800G~~	~~UMC3800G~~	~~BMC3800~~	~~RMC4800G~~	~~UMC4800G~~	~~BMC4800_⑧~~

I-T-E Fusible Vacu-Break® Switch Plugs Floor-Operable with Line Terminal Protection

Volts	Ampere Rating	3-Phase, 3-Wire Horsepower Ratings Standard (NEC)	Horsepower Ratings Maximum (Time Delay)	Catalog Number XL-X	Catalog Number XL-U	Catalog Number BD⑥ Plug-In①⑤	3-Phase, 4-Wire Horsepower Ratings, AC Standard (NEC)	Horsepower Ratings, AC Maximum (Time Delay)	Catalog Number XL-X	Catalog Number XL-U	Catalog Number BD⑥ Plug-In①⑤
250 AC or 250 DC	30	3	7½	RV321G	UV321G	BOS14321	3	7½	RV421G	UV421G	BOS16421
	60	7½	15	RV322G	UV322G	BOS14322	7½	15	RV422G	UV422G	BOS16422
	100	15	30	RV323G	UV323G	BOS14323	15	30	RV423G	UV423G	BOS16423
	200	25	60	RV324G	UV324G	BOS14324	25	60	RV424G	UV424G	BOS16424
	400	50	125	~~RV325G~~	~~UV325G~~	~~BOS14325~~	50	125	~~RV425G~~	~~UV425G~~	~~BOS16425_⑧~~
	600③	75	200	~~RV326G~~	~~UV326G~~	~~BOS14326~~	75	200	~~RV426G~~	~~UV426G~~	~~BOS16426_⑧~~
600 AC	30	7½	20	RV361G	UV361G	BOS14351	5	15	RV461G	UV461G	BOS16451
	60	15	50	RV362G	UV362G	BOS14352	15	30	RV462G	UV462G	BOS16452
	100	30	75	RV363G	UV363G	BOS14353	25	60	RV463G	UV463G	BOS16453
	200	60	150	RV364G	UV364G	BOS14354	50	125	RV464G	UV464G	BOS16454
	400	125	350	RV365G	UV365G	BOS14355	100	150	RV465G	UV465G	BOS16455_⑧
	400④	125	350	~~RV365SG~~	~~UV365SG~~	—	100	150	~~RV465SG~~	~~UV465SG~~	—
	600③	200	500	~~RV366G~~	~~UV366G~~	~~BOS14356~~	150	400	~~RV466G~~	~~UV466G~~	~~BOS16456_⑧~~

Fuse Adapter Kits — RV and UV

Amperage	Class "J" Catalog Number	Class "T" Catalog Number	Class "R" Catalog Number
240V AC/250V DC			
30	⑦	⑦	W56626
60	⑦	⑦	W56628
100	⑦	TFAK32	W55365
200	⑦	TFAK42	W55366
400	⑦	TFAK52	W55367
600	W49813	TFAK62	W55368
600V			
30	⑦	⑦	W56627
60	⑦	⑦	W56629
100	⑦	TFAK35	W55365
200	⑦	TFAK45	W55366
400	⑦	TFAK55	W55367
600	W49813	TFAK65	W55368

Field Addable Ground Kits for BD Bus Plugs

Fusible

Ampere Rating	Catalog Number
30–60	W63231
100	W63232
200	W63233
400	W63234
600	W63234

Circuit Breaker

BEC	W63553
BFC	W63554
BJC	W63238
BLC	W63238
BMC	W73534

Note: These are for use on busway with internal ground bus manufactured after March, 1986. For ground kits prior to this date, consult local sales office.

Fuse Adapter Kits — BOS

Amperage	Class "J" Catalog Number	Class "T" Catalog Number	Class "R" Catalog Number
240V AC/250V DC			
30	⑦	⑦	W56626
60	⑦	⑦	W56628
100	W49827	TFAK32	W55365
200	W49819	TFAK42	W55366
400	W49814	TFAK52	W55367
600	W49813	TFAK62	W55368
600V			
30	W49832	⑦	W56627
60	W49830	⑦	W56629
100	W49828	TFAK35	W55365
200	W49818	TFAK45	W55366
400	W49816	TFAK55	W55367
600	W49815	TFAK65	W55368

① Grounding Finger — See table.
② Enclosures available from stock. When ordering circuit breaker bus plugs complete with breaker, factory-installed, allow time for assembly and **SPECIFY** enclosure frame size, phase and ampere rating. Example: One UEC3100—ED4—3P—70A–factory assembled
③ Bus plugs 400A and smaller require one plug-in opening. 600–800A require two plug-in openings.
④ To order 400A fusible plug with increased wire space, add "S" to the catalog number. Example: UV365SG, UV465SG.
⑤ Channel Spacers — Must be used with bus plugs mounted on 600, 800, or 1000 ampere ABD busway or on 800 or 1000 ampere BDP busway. Catalog Number **W37940**
⑥ When BD busway capacity exceeds 400A for aluminum or 600A for copper, capacity must be specified to obtain proper number and arrangement of neutral fingers.
⑦ Not required.
⑧ Replace "_" with "1" or "2" .
See Table: BD Bus Plug Catalog Number Ref. shown on Page 15-61.

Busway Power Distribution

XL-X®, XL-U® and BD® Plug-In Units and Cubicles

Selection

Shipping Weights — Pounds

For Circuit Breaker Bus Plugs Only

Breaker Type	Ampere Rating	3-Phase, 3-Wire				3-Phase, 4-Wire			
		Enclosure Only		Complete Assembly		Enclosure Only		Complete Assembly	
		XL-U XL-X	BD, LO-X	XL-U XL-X	BD, LO-X	XL-U XL-X	BD, LO-X	XL-U XL-X	BD, LO-X
ED2, ED4, ED6	15–100	12	14	13	9	13	15	14	10
FD6	70–250	1	27	51	37	45	28	55	38

Fusible and Molded Case Circuit Breaker Cubicles

See page 15-7 for typical configurations.

Accessories

Description	Catalog Number
Channel Spacers–Must be used with Bus Plugs or Plug-in Branch-Run Adapters mounted on 600-, 800- or 1000-ampere ABD Busway or on 800- or 1000-ampere BDP Busway. 4 per package	W37940
"ON-OFF" Bus Plug Stickers – Pressure sensitive, per pair.	W47185

Shipping Weights — Pounds

For Fusible Switch Bus Plugs Only

Switch Ampere Rating	3-Phase, 3-Wire		3-Phase, 4-Wire	
	XL-X XL-U	BD, LO-X	XL-X XL-U	BD, LO-X
	Prefix RV UV	Prefix BOS	Prefix RV UV	Prefix BOS
30,60	17	15	19	12
100	17	18	19	18
200	36	34	38	36
400	165	111	160	112

Special Bus Plugs

Description	Catalog Number		
	XL-U	XL-X	BD, LO-X
Ground Detector and Potentializer– For 2 or 3-pole 240 and 480 Volt service.	UPGR314G	RPGR314G	PGR6314

BD Bus Plug Catalog Number Reference

Catalog Number	ABD4 Busway						BDP4 Busway						
	225 ABD402	400 ABD404	600 ABD406	800 ABD408	1000 ABD410	1200 ABD412	225 BDP402	400 BDP404	600 BDP406	800 BDP408	1000 BDP410	1350 BDP413	1600 BDP416
~~BJC44001~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BJC44002~~	—	√	—	√	—	—	—	√	√	√	√	—	—
~~BJC4400G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BJC4400G2~~	—	√	—	√	—	—	—	√	√	√	√	—	—
~~BLC46001~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BLC46002~~	—	—	—	√	—	—	—	—	√	√	√	—	—
~~BLC4600G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BLC4600G2~~	—	—	—	√	—	—	—	—	√	√	√	—	—
~~BMC48001~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BMC48002~~	—	—	—	√	—	—	—	—	—	√	√	—	—
~~BMC4800G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BMC4800G2~~	—	—	—	√	—	—	—	—	—	√	√	—	—
~~BOS164251~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS164252~~	—	√	—	√	—	—	—	√	√	√	√	—	—
~~BOS16425G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS16425G2~~	—	√	—	√	—	—	—	√	√	√	√	—	—
~~BOS164261~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS164262~~	—	—	—	√	—	—	—	—	√	√	√	—	—
~~BOS16426G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS16426G2~~	—	—	—	√	—	—	—	—	√	√	√	—	—
BOS164551	—	—	√	—	√	√	—	—	—	—	—	√	√
BOS164552	—	√	—	√	—	—	—	√	√	√	√	—	—
~~BOS16455G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS16455G2~~	—	√	—	√	—	—	—	√	√	√	√	—	—
~~BOS164561~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS164562~~	—	—	—	√	—	—	—	—	√	√	√	—	—
~~BOS16456G1~~	—	—	√	—	√	√	—	—	—	—	—	√	√
~~BOS16456G2~~	—	—	—	√	—	—	—	—	√	√	√	—	—

As of June 2014, Siemens no long supplies a complete solution for Legacy bus plug offerings—these part numbers are highlighted in gray

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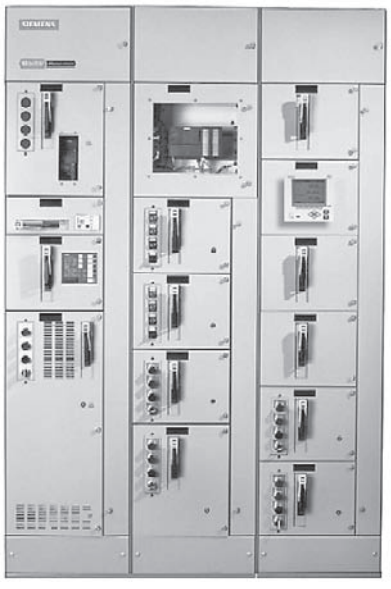
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Motor Control Center @ Siemens

Motor control centers (MCC) have come a long way since they were introduced in 1937 as a way to save floor space by placing several starters in a single cabinet. Modern processes and facilities now dictate that motor control centers should display a high level of intelligence as well. They must deliver vital operating information; plus provide automation features, optimal control, and critically fast communications to meet even the most demanding applications. Ideally, the best-of the-best must also save installation time and money. Siemens MCCs are designed as self-contained modular units. They come with rear-mounted, self-aligning copper stabs that firmly grasp onto the bus. Brackets also guide the placement of units, further assuring positive engagement with the bus.

tiastar MCC

Siemens tiastar MCC is based on the Furnas System/89™ MCC introduced in 1980 and represent the state-of-the-art motor control technology, with a modular, open architecture design. High performance and quality expectations have been researched at the planning stage and throughout the construction stage. The Siemens tiastar MCC has many features and options to meet your specific needs. Requirements such as the standard isolated vertical bus to fully insulated vertical bus and standard 22mm to 30mm pilot devices. Heavy gauge steel is used for framing and side panel; sections are separated by 14 gauge steel barriers that are formed to provide rigidity and durability. The modular units implement all the motor protection and control functions, determine operational, diagnostic and statistical data, and organize communications data between the automation system and the motor feeder.



tiastar Motor Control Center

tiastar SMART MCC

Siemens tiastar Smart MCC with PROFIBUS-DP Communications combines heavy-duty construction and user friendly features. These intelligent units deliver detailed diagnostics by communicating with starter units, variable frequency drives, reduced voltage soft-start units, circuit breakers, or power meters via PLC/DCS. This means overload relays, linked to the PLCs, can now deliver detailed motor management data at speeds previously unheard of. PROFIBUS-DP, the backbone of the system, greatly simplifies I/O wiring.

Domestic Design Standards

The following are the principal domestic standards which apply to motor control center design, testing, construction and application. The tiastar motor control center complies fully with the latest version of all these standards.

NEMA

- AB-1 Molded Case Circuit Breakers
- ICS 1 General Standards for Industrial Control
- ICS 2 Standard for Industrial Control Devices, Controllers and Assemblies
- ICS 18 Standard for motor control centers

UL

- 845 Motor Control Centers
- 508 Industrial Control Equipment
- 891 Switchboard Design
- 94 Test for Flammability of Plastic Materials for Parts, Devices, and Appliances
- 489 Molded Case Circuit Breakers and Circuit Breaker Enclosures
- 991 Tests for Safety-related Controls Employing Solid-state Devices

NFPA – National Fire Protection Association

- 70 National Electrical Code

Low Voltage Seismic Compliance

Today, strict seismic requirements are not limited to areas prone to earthquakes. Engineers in all locations must be aware of, and comply with, earthquake protection regulations. In addition to construction materials and techniques, these regulations cover non-structural building systems, including electrical components. In critical applications, such as healthcare facilities, these components must be designed to go beyond surviving an earthquake, to remain in operation after the event is over.

At Siemens, we are committed to making it easier for you to comply with all building requirements, including seismic ratings.

Please contact your Siemens representative for complete details on seismic rating compliance for specific products and configurations.

The purpose of this compliance assessment is to document the seismic compliance of tiastar motor control center to the following building codes:

Building code	Edition
Uniform Building Code (UBC)	1997
BOCA National Building Code (BOCA)	1999
Standard Building Code (SBC)	1999
California Building Code (CBC)	2010
International Building Code (IBC)	2009

Earthquake loading compliance tests (shake tests) were performed at Clarke Dynamic Test Laboratories in accordance with ICC-ES-AC 156 and ASCE 7-10.

Notes:

1. tiastar motor control centers are certified to the stringent seismic requirements of California OSHPD (Office of Statewide Health Planning and Development). Approval # OSP-0074-10. For details, refer to: http://www.oshpd.ca.gov/FDD/Pre-Approval/.
2. The codes and standards referenced in this document are published by independent organizations, institutes, or agencies. All copyrights and trademarks related to such codes and publications and the use thereof belong to the entities owning rights to the same.
3. These test results indicate third-party analysis of the Siemens product for compliance to the referenced codes and editions. Nothing in this publication should be taken as endorsements, official approvals, or official test results provided by the publishers of the referenced codes or any code enforcement authorities.

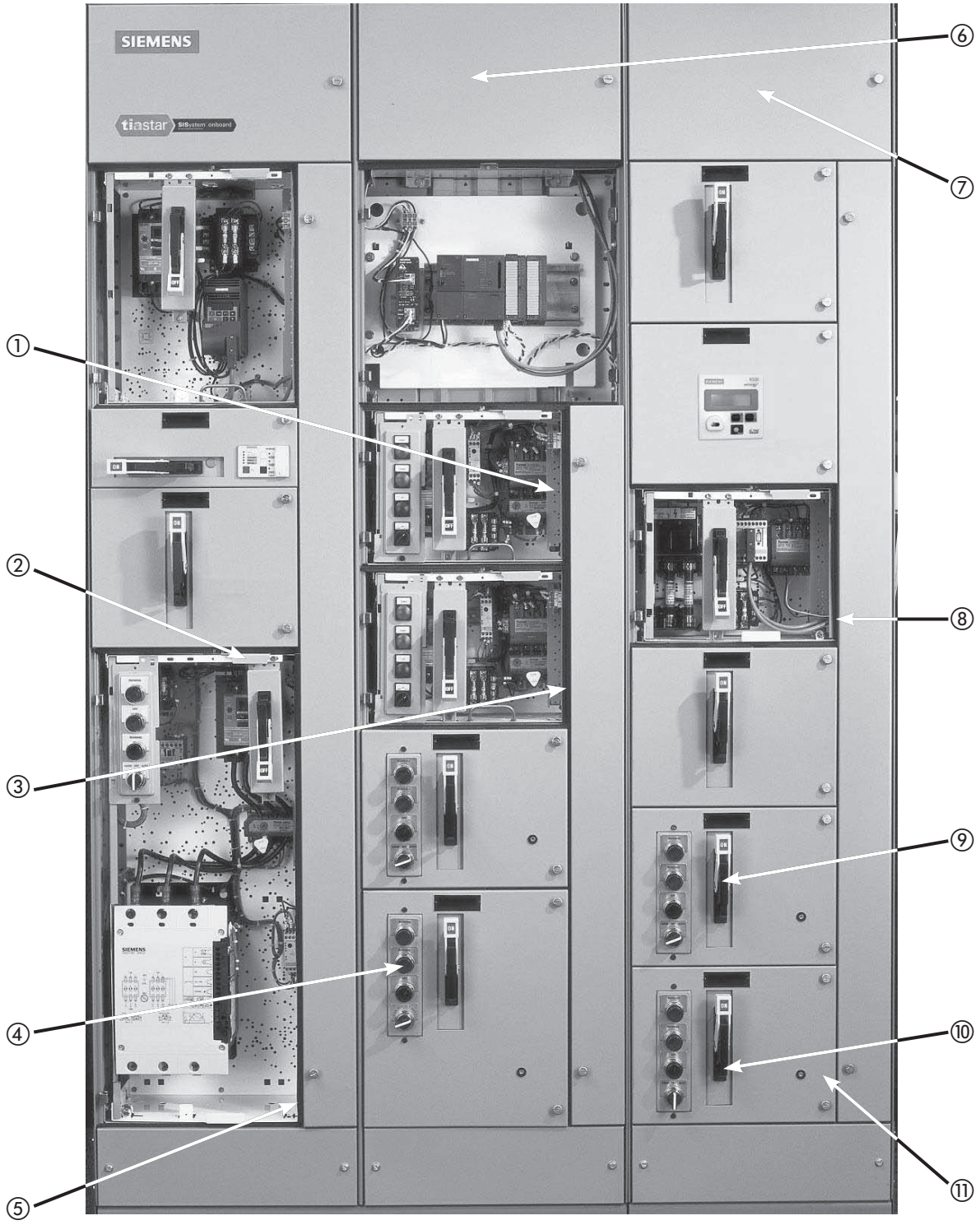
tiastar Motor Control Centers

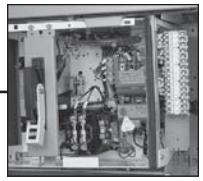
Construction Details

Product Overview

Quality Features Exceed Standards

Siemens tiastar motor control centers are composed of a number of vertical sections bolted together. That allows for future addition of MCC vertical units so the equipment can expand with customer needs. The standards structure is 90 in. (2286 mm) high, plus a 1.125 in. (29 mm) high channel sill. Front-only structures can be either 15 in. (381 mm) or 20 in. (508 mm) deep. Back-to-back mounted structures are 30 in. (762 mm) or 40 in. (1016 mm) deep, and consist of two horizontal and vertical buses. This allows for correct bus phasing on the front or rear. Siemens provides a 21 in. back-to-back design, consisting of a common horizontal and vertical bus structure, for applications where available footprint is limited.





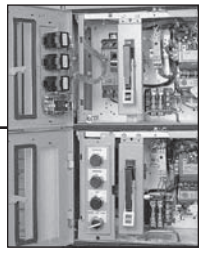
① For ease in wiring and inspection, terminal blocks are mounted on a swing-out side barrier.



② A racking lever on all plug-in units ensures that they are fully engaged with the vertical bus. An interlock with the disconnect device ensures that a plug-in unit is not inserted or removed from the vertical bus when the unit is energized.



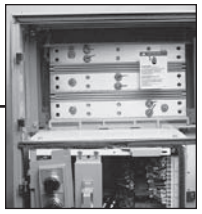
③ A positive stop in the "TEST" position indicates that a plug-in unit is fully withdrawn from the vertical bus.



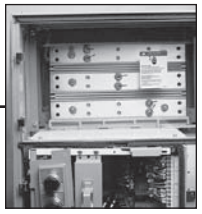
④ Pilot devices are mounted on a sturdy formed-metal panel attached with two captive screws to the MCC unit door for easy access to internal components. For unit removal and test, the pilot device panel is easily removed from the door and mountd on the unit.



⑤ A positive stop mechanism prevents the unit from falling out of the structure during unit removal.



⑥ The horizontal bus compartment is isolated from the horizontal wireways by a crystal clear polycarbonate barrier that makes visible and infrared maintenance inspection a breeze. The barrier is easily removed when access to the horizontal bus is required.



⑦ Horizontal bus design keeps the bus in the top 12" of the structure, never behind units, for easy maintenance and accessibility.



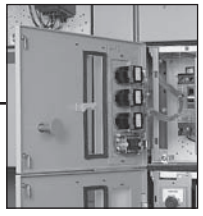
⑧ A copper clip on plug-in units engages and grounds units at all times.



⑨ The unit disconnect operating handle features a simple, rugged design. "ON" and "OFF" are clearly indicated by position, color and word. The "TRIP" indication is clearly displayed on circuit breaker equipped units.



⑩ A screwdriver operated defeater mechanism allows access to an energized unit by authorized personnel.



⑪ All doors swing open a minimum of 110° for easy unit access and removal.



Plug-in unit stab assemblies include self-aligning stab clips with spring steel backup springs. Wires from the stab clips to the line-side of the circuit breaker or disconnect switch are contained in the stab housing and are isolated phase-to-phase until the wires enter the MCC.

Important Additional Features:

- All wiring and components meet or exceed the requirements of UL, CSA, NEMA, EEMAC, and NEC
- Pre-wired components are professionally harnessed to industrial terminal blocks
- Full depth wire tie rods are standard in each vertical wireway
- White interior increases visibility for easy wiring, maintenance and inspection
- Modular units are fully interchangeable
- Each tiastar MCC is designed to satisfy your most exacting specifications
- White on black base operating handle is easy to identify

Dimensions

Structure		
Height	91.125 in.	(2315 mm)
Front Mounted Only Structure (FO)		
Width	20 in. 24 in. 30 in.	(508 mm) (610 mm) (762 mm)
Depth	15 in. 20 in.	(381 mm) (508 mm)
Back to Back Structure (BTB)		
Width	20 in. 30 in.	(508 mm) (762 mm)
Depth	21 in.	(533 mm)
Vertical Wireway		
Height	72 in.	(1829 mm)
Width	4 in.	(102 mm)
Depth	10 in.	(254 mm)
Cross Section	38.25 sq. in.	(972 sq. mm.)
Top Horizontal Wireway		
Height	12 in.	(305 mm)
Depth	7 in.	(178 mm)
Bottom Horizontal Wireway		
Height	6 in.	(152 mm)
Depth * BTB	15 in. 20 in. 30 in.* 40 in.*	(381 mm) (508 mm) (762 mm)* (1016 mm)*
Enclosure Types		
NEMA 1		Indoor
NEMA 1A	Gasketed	Indoor
NEMA 2	Drip proof	Indoor
NEMA 12	Dust tight	Indoor
NEMA 3R	Rainproof	Outdoor (Non walk-in)
Pull Box (Top Hat)		
Height	12 in. 18 in. 24 in.	
Width	20 in. 30 in.	
Depth	15 in. 20 in.	

Bus

Horizontal Bus (A)	600A 800A 1200A 1600A 2000A 2500A 600A 800A 1200	Cu Cu Cu Cu Cu Cu Al Al Al
Vertical Bus (A)	300A 600A	Cu Cu
Neutral Bus (Bottom Mounted) (A)	600A 800A 1200A 1600A	Cu Cu Cu Cu
Options	Full Neutral Cu Neutral Landing Pad	
Bus Bracing (KA Sym)	42KA 65KA 100KA*	 * Cu Only
Barriers		
Isolation Barrier	Grounded sheet steel with stab openings	
Insulated & Isolated Barrier	Glass filled polyester sandwich that isolates and insulates each phase from the others and the bus from the front and rear compartments	
Removable covers	Inserts to cover unused openings in V-bus barrier	
Automatic shutter mechanism	Option available for the stab in location of each plug-in unit and requested future space	
Ground Bus		
Horizontal (Bottom Mounted) (A) Required for UL labeling	300A 600A 600A	Cu Cu Al
Vertical (A)*	300A	Cu
* Available with motor ground terminations		

Plating
All power bus, tin plated is Standard
Silver plating available by request (Cu only)
Incoming Line Terminations
Incoming line arrangements are available in many configurations from 600A to 2500A

Structural Gauge Chart

Structural Parts	
Divider Sheets	14 ga.
Side Sheets	14 ga.
Center Bottom Cross Ties	12 ga.
Rear Channel (FO)	13 ga.
Channel Sills	7 ga.
Center-Top Channel	13 ga.
Vertical Bus Mounting Angles	14 ga.
Lifting Angles	7 ga.
Rear Covers	16 ga.
Top Plates	13 ga.
End Covers	16 ga.
Separator Angles	12 ga.
Shelf Brackets	10 ga.
Unit Parts	
Top and Bottom Unit Barriers	14 ga.
Back Pan	13 ga. 14 ga.
Side Barrier Plate	18 ga.
Angles	14 ga.
Doors	13 ga. 14 ga.
Finish (Ext.)	
ANSI 61 Light Gray	
Electrostatically applied dry powder paint in Standard	

Weight Table

Dimensions Inches (mm)				Shipping weight per Section in lbs (Kg)
H	**W**	**D**	**Type**	
91.125 (2315)	20 (508)	15 (381)	FO	550 (250)
	20 (508)	20 (508)	FO	650 (295)
	30 (762)	15 (381)	FO	700 (318)
	30 (762)	20 (508)	FO	850 (386)
	20 (508)	21 (533)	BTB	670 (304)
	30 (762)	21 (533)	BTB	880 (400)

Wiring Specifications

Control on Units	16 ga.	
	19 strand bonded copper	
	105°C	
	600V	
Interconnection control wiring between Units	14 ga.	
	19 strand copper	
	105°C	
	600V	
Power wiring–Sized to suit maximum HP rating of unit	12 ga. to 2 ga.	19 strand copper
		105°C
		600V
	1 ga. to 500 MCM	19 strand to 37 strand copper
		105°C
		600V

Wiring Classifications

Siemens MCC's are available as either Class I or Class II assemblies utilizing either Type A, Type B, or Type C wiring as defined in NEMA ICS18-2001(3.1) and NEMA ICS18-2001(3.3). Below are the NEMA class and type definitions:

Class I — Independent Units (NEMA ICS18-2001(3.2.1))

Class I motor control centers shall consist of mechanical groupings of combination motor control units, feeder tap units, other units, and electrical devices arranged in a convenient assembly. The manufacturer shall furnish drawings that include:

a. Overall dimensions of the motor control center, identification of units and their location in the motor control center, locations of incoming line terminals, mounting dimensions, available conduit entrance areas, and the location of the master terminal board if required (Type C wiring only).

b. Manufacturer's standard diagrams for individual units and master terminal boards (Type C wiring only) consist of one or more drawing(s) that:

1. Identify electrical devices.
2. Indicate electrical connections.
3. Indicate terminal numbering designations.

Note: When a combination schematic and / or wiring diagram for a unit is supplied showing optional devices, the manufacturer shall provide information to indicate which devices are actually furnished.

Class II — Interconnected Units (NEMA ICS18-2001(3.2.2))

Class II motor control centers shall be the same as Class I motor control centers with the addition of manufacturer furnished electrical interlocking and wiring between units as specified in overall control system diagrams supplied by the purchaser. In addition to the drawings furnished for Class I motor control centers, the manufacturer shall furnish drawings that indicate factory interconnections within the motor control center.

Class I-S and II-S — Motor Control Centers With Custom Drawing Requirements (NEMA ICS18-2001(3.2.3))

Class I-S and II-S motor control centers shall be the same as Class I and II except custom drawings shall be provided in lieu of standard drawings as specified by the user. Examples of custom drawings are:

- Special identifications for electrical devices
- Special terminal numbering designations
- Special sizes of drawings

The drawings supplied by the manufacturer shall convey the same information as drawings provided with Class I and II motor control centers, additionally modified as specified by the user.

Types of Wiring — NEMA ICS18-2001(3.3.1)

Type A (NEMA ICS18-2001 (3.3.1.1))

User field wiring shall connect directly to device terminals internal to the unit and shall be provided only on Class I motor control centers.

Type B (NEMA ICS18-2001(3.3.1.2))

a. Type B user field load wiring for combination motor control units size 3 or smaller shall be designated as B-D or B-T, according to the following:

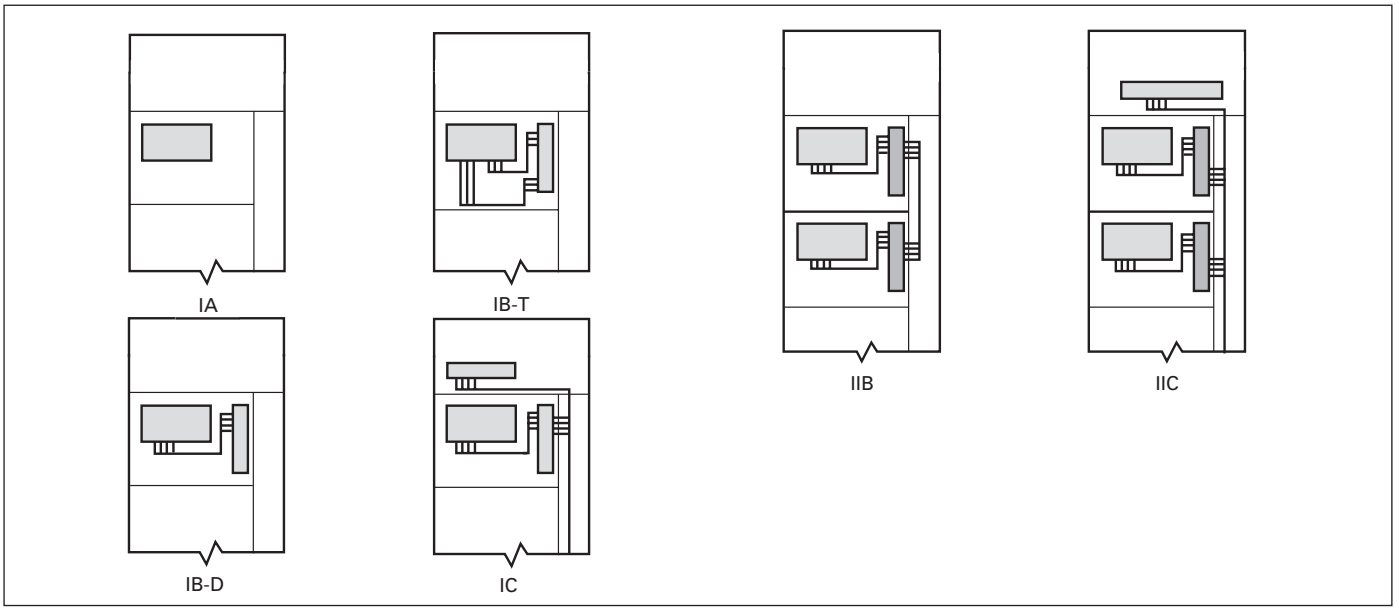
- B-D connects directly to the device terminals, which are located immediately adjacent and readily accessible to the vertical wireway.
- B-T connects directly to a **load** terminal block in, or adjacent to, the unit.

b. Type B user field load wiring for combination motor control units larger than size 3, and for feeder tap units, shall connect directly to unit device terminals.

c. Type B user field **control** wiring shall connect directly to unit terminal block(s) located in, or adjacent to, each combination motor control unit.

Type C (NEMA ICS18-2001(3.3.1.3))

User field control wiring shall connect directly to master terminal blocks mounted at the top or bottom of those vertical sections that contain combination motor control units or control assemblies which shall be factory wired to their master terminal blocks. User field load wiring for combination motor control units, size 3 or smaller, shall connect directly to master terminal blocks mounted at the top or bottom of vertical sections. Motor control unit load wiring shall be factory wired to the master terminal blocks. User field load wiring for combination motor control units larger than size 3, and for feeder tap units, shall connect directly to unit device terminals.



The National Electrical Code establishes very specific guidelines for minimum cable bending space within motor control centers. Figures 1 through 5 below describe the most common arrangements for terminating main incoming power cables in the MCC. Consult Siemens for incoming line compartment braced for 100,000 amperes symmetrical, short circuit.

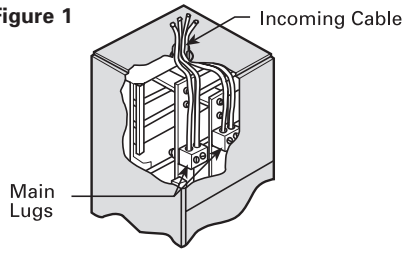
Incoming Cable Space

Description of Incoming Service	Top or Bottom Incoming Section	Cable Entry Top or Bottom	Space Requirements in Inches (mm)	Notes
≤ 350 kcmil Two per Phase	Top — Directly on Main Bus	Either	None	See Figure 3
≤ 600 kcmil One or Two per Phase	Top	Either	Top Wireway plus 12.0 (305) or 18.0 (457)	See Figure 1
≤ 600 kcmil Three or Four per Phase	Top	Top	Top Wireway plus 18.0 (457)	See Figure 1
750 kcmil One or Two per Phase	Top	Top	Top Wireway plus 24.0 (607)	—
350 kcmil One or Two per Phase	Bottom	Bottom	Bottom Wireway plus 18.0 (457)	600 A Maximum See Figure 2
≤ 600 kcmil One or Two per Phase	Bottom	Bottom	Bottom Wireway plus 24.0 (610)	600 A Maximum See Figure 2
≤ 750 kcmil, up to eight per phase	Top or Bottom	Either	Full Structure	Consult Siemens
≤ 500 kcmil One or Two per Phase ≤ 750 kcmil One per Phase to Main Breaker	Top	Bottom	See Breaker / Disconnect	See Figure 4
≤ 500 kcmil One to Four per Phase ≤ 750 kcmil One per Phase to Main Breaker	Top	Top	See Breaker / Disconnect	See Figure 5
Busway or Cable Feed to Line Reactor	Top or Bottom	Either	Consult Siemens	Consult Siemens

Siemens MCC's are equipped with a 12 in. (305 mm) high, full-width horizontal wireway in the top and 6 in. (152 mm) in the bottom of each structure. A separate vertical wireway connects the top and bottom wiring areas in each vertical section. This wireway is 4 in. (102 mm) wide by 10 in. (254 mm) deep.

Note: All standard Siemens termination schemes shown herein do comply with applicable cable bending requirements of UL and the NEC.

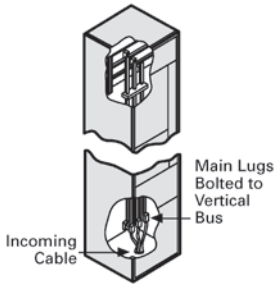
Figure 1



Main Lugs at Top with Top Cable Entry

Can accommodate up to two 600 kcmil cables per phase when using Siemens standard mechanical lugs. A total height of 24 in. (610 mm). This includes 12 in. (305 mm) for the top wireway plus 12 in. (305mm) of unit space. Compression lugs require extra vertical space or the addition of a top hat.

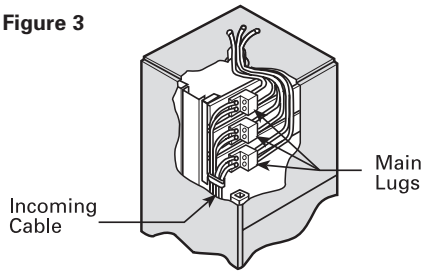
Figure 2



Main Lugs at Bottom with Bottom Cable Entry

Lugs are bolted directly to the bottom of the vertical bus. Can accommodate up to two 350 kcmil per phase in 24 in. (610 mm) high compartment. This includes 6 in. (152 mm) for the bottom wireway plus 18 in. (457 mm) of unit space. Can accommodate up to two 600 kcmil per phase in 30 in. (762 mm) high compartment. This includes 6 in. (152 mm) for the bottom wireway plus 24 in. (610 mm) of unit space.

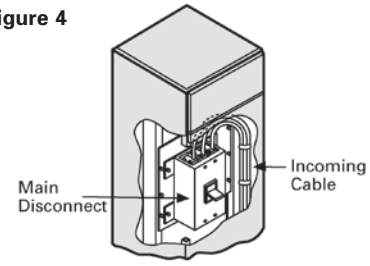
Figure 3



Main Lugs at Top with Top or Bottom Cable Entry

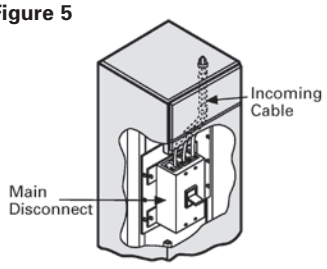
In this arrangement the lugs mount directly on the horizontal bus, eliminating the need to use unit mounting space. The limitation here is 350 kcmil cable per phase.

Figure 4



Main Disconnect with Bottom Cable Entry

Figure 5



Main Disconnect with Top Cable Entry

If bottom entry is used, cables must be properly laced and supported based upon the available short circuit current. See dimensional requirements for molded case breakers and fused switches, consult local sales office.

Heavy Duty Starters

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)



Solid State Starter Class 14

Application

Heavy Duty starters are designed for across the line starting of single phase and polyphase motors.

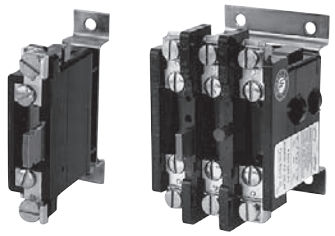
These controls are available in NEMA Sizes 00 through 8. In addition to the usual NEMA Starter Sizes, Siemens offers three exclusive Half Sizes; 1¾, 2½ and 3½. These integral sizes offer the same rugged, industrial construction as our NEMA Sizes and ensure efficient operating performance. Half Sizes 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.

Overload Protection

Siemens understands customer needs vary from motor to motor. That is why we offer 4 lines of overload protection. For basic needs you can specify bi-metal ambient compensated overloads. If single phase is a concern our customers can specify ESP200, and for the most advanced motor protection, customers can consider SIMOCODE overloads that provide detailed information and control.



Ambient Compensated Bimetal Single Phase and Three Phase

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.

- **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
  - —±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°F for a given heater rating
- UL Listed File #E22655 or Component Recognized
- CSA Certified File #LR6535



ESP200 Solid State Overload

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 restart.

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.

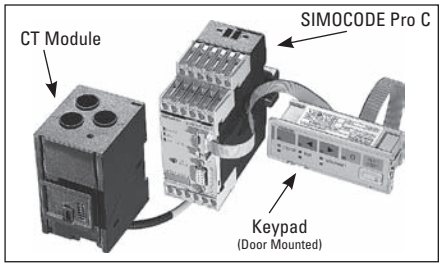
SIMOCODE Pro

SIMOCODE Pro is the latest generation of Motor Management System ("Smart Overload") bringing a new level of flexibility and functionality within the Siemens smart motor control center. By means of a PROFIBUS DP interface, it can easily be linked to higher-level automation systems. SIMOCODE Pro implements all motor protection and control functions, determines operational, diagnostic and statistical data and organizes the communication between the automation system and MCC bucket.

The SIMOCODE Pro consists of two device series with different levels of functionality:

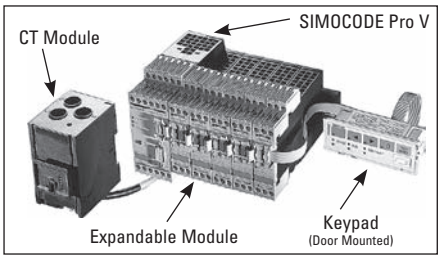
SIMOCODE Pro C (Compact)

The compact motor management system can be used for Full Voltage Non-reversing (FVNR) starters, Full Voltage Reversing (FVR) starters, and base overload functionality.



SIMOCODE Pro V (Variable)

The variable motor management system has an even greater range of functions, including voltage and power monitoring and expandable modules for additional I/O, as well as temperature and ground fault protection.



Note: For detailed information on the SIMODE Pro please contact the local Siemens Sales Office.

SIRIUS Soft Starters

Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and soft stop
- 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 mechanical reduced voltage starters
- Maintenance-free switching
- Fits perfectly in the SIRIUS modular system

SIRIUS 3RW40

SIRIUS 3RW40 soft starters include soft start and soft stop, and internal bypass. At the same time they come with additional functions, i.e. selectable solid-state motor overload, intrinsic device protection and adjustable current limiting, as well as a new patented two-phase control method (Polarity Balancing) that is unique in this rating range.

SIRIUS 3RW40 soft starters are part of the SIRIUS modular system. This results in advantages such as identical sizes and a uniform connection system. Thanks to their particularly compact design, SIRIUS 3RW40 soft starters are only half as big as comparable wye-delta starters. Hence they can be mounted in compact space requirements in the control cabinet. Configuring and installation are carried out quickly and easily thanks to the 3-wire connection.



SIRIUS 3RW40 for three-phase motors Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase power systems. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of the SIRIUS 3RW40 soft starters.

Applicable standards

- IEC 60947-2
- UL/CSA #E143112

Application areas

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines
- Operating mechanisms

SIRIUS 3RW44

In addition to soft starting and soft stopping, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a rating range up to 900Hp at 460 V in the inline 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 these 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 control-gear 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.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the applicationspecific requirements. Operating and commissioning can be performed by means of the user-friendly keypad and a menuprompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected 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 #E143112

Application areas, e.g.

- Pumps
- Mills
- Ventilators
- Saws
- Compressors
- Crushers
- Water transport
- Mixers
- Conveying systems and lifts
- Centrifuges
- Hydraulics
- Industrial cooling and refrigerating systems



MICROMASTER family of products

MICROMASTER 440

Application

The MICROMASTER 440 inverter is suitable for a variety of variable-speed drive applications. Its flexibility provides for a wide spectrum of applications. These also include cranes and hoisting gear, high-bay warehouses, production machines for food, beverages and tobacco, packaging machines etc.; i.e. applications which require the frequency inverter to have a higher functionality and dynamic response than usual. The inverter is especially characterized by its customer-oriented performance and easeof- use. Its large mains voltage range enables it to be used all over the world.

Design

The MICROMASTER 440 inverter has a modular design. The operator panels and modules can be easily exchanged.

International standards

- The MICROMASTER 440 inverter complies with the requirements of the EU lowvoltage guideline
- The MICROMASTER 440 inverter has the CE marking
- acc. to UL and cUL certified
- c-tick

Main characteristics

- Easy, guided start-up
- Modular construction allows maximum configuration flexibility
- Six programmable isolated digital inputs
- Two scaleable analog inputs (0 V to 10 V, 0 mA to 20 mA) can also be used as a 7th/8th digital input
- Two programmable analog outputs (0 mA to 20 mA)
- Three programmable relay outputs (30 V DC/5 A resistive load; 250 V AC/2A inductive load)
- Low-noise motor operation thanks to high pulse frequencies, adjustable (observe derating if necessary)
- Complete protection for motor and inverter.

Options (overview)

- EMC filter, Class A/B
- LC filter and sinusoidal filter
- Line commutating chokes
- Output chokes
- Gland plates
- Basic Operator Panel (BOP) for parameterizing the inverter
- Plain text Advanced Operator Panel (AOP) with multilanguage display
- Communication modules

– PROFIBUS
– DeviceNet
– CANopen

- Pulse encoder evaluation module
- PC connection kits
- Mounting kits for installing the operator panels in the control cabinet doors
- PC start-up tools executable under Windows 98 and NT/2000/ME/XP Professional
- TIA integration with Drive ES

Power Monitoring

Siemens line of power meters provides market leading technology for power quality measurement. These products continually change to meet growing needs for power quality and energy monitoring. Siemens tiastar MCCs are fully capable of installing any of Siemens power meters for your needs.



PAC3200



PAC4200

PAC3100

The **SENTRON PAC3100** is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications, where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 25 parameters or as part of an industrial control, building automation or global power monitoring system. Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub-billing or cost allocation installations.

The PAC3100 has many features not usually found in this price class of meters. A large graphical display supports multiple languages and easy to use menus that can be used to set up the meter. The meter also has built in Modbus RTU communications via a RS485 interface. The meter comes standard with two digital inputs and outputs. One output is suitable for pulse output for export/import real and reactive energy. The other output is controllable from an outside source by way of a Modbus register.

PAC3200

The **SENTRON PAC3200** is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 50 parameters or as part of an industrial control, building automation or global power monitoring system. Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub billing or cost allocation installations with multiple tariffs.

The SENTRON PAC3200 provides open communications using Modbus RTU/TCP, PROFIBUS-DP, and PROFINET protocols for easy integration into any local or remote monitoring system. Simple configuration of the meter can be done from the front display.

PAC4200

The **SENTRON PAC4200** is a feature packed power monitoring device that is suitable for use in industrial, government and commercial applications where basic to advanced metering, logging, and I/O is required. The meter may be used as a stand alone device monitoring over 200 parameters or as part of an industrial control, building automation or global enterprise wide monitoring system.

Advanced power quality monitoring and logging applications range from single low voltage breaker / building metering to sub-station main feeder monitoring, sub-billing or cost allocation installations with multiple tariffs. Whether your goal is to reduce operation cost, reduce your carbon footprint or to maintain your power assets, the PAC 4200 meter should be an important part of your power monitoring system.

The SENTRON PAC4200 provides open communication using the standard built-in Ethernet Modbus TCP and has the capability of communicating through Optional Modbus RTU, PROFIBUS-DP, and PROFINET protocol modules simultaneously. This allows for easy integration into any local or remote monitoring system. The gateway functionality of this device reduces installation cost by replacing other gateway devices and simplifying wiring.

TPS3 Integral or Internally Mounted SPDs for MCCs

Siemens Integral TPS3s are UL 1449 3rd Edition, factory installed SPDs within our MCCs, utilizing optimal electrical system connections to minimize impedance losses. This results in the some of the industry's best "installed" Voltage Protection Ratings. This SPD has the following features:

TPS3 01 Features

- UL 1449 3rd Edition and UL 1283
- UL Type 1 (consult factory) or Type 4 tested as Type 1 or 2 SPDs
- 20 kA In (most models)
- 100 - 300 kA per phase surge current capacity
- EMI/RFI filtering or Sine Wave tracking
- Standard 6 in bucket
- LED, Audible Alarm, Dry Contacts, and Ground Integrity Monitoring Diagnostics
- 200 kA SCCR (most models)
- UL96A Lightning Protection Master Label Compliant



TPS3 01 Module



TPS3 01 MCC Installation

Ordering Information

Catalog # TPS3 ☐ 01 ☐☐ ☐ 0 M

Voltage Code
A = 120/240 V, 1Ø, 3W
B = 120/240 V, 3Ø, 4W
C = 120/208 V, 3Ø, 4W
D = 240 V, 3Ø, 3W
E = 277/480 V, 3Ø, 4W
F = 480 V, 3Ø, 3W
G = 600 V, 3Ø, 3W
K = 380/220 V, 3Ø, 4W
L = 600/347 V, 3Ø, 4W
S = 400/230 V, 3Ø, 4W

Please consult the factory for applications requiring SPDs with larger per phase surge current capacities and/or 10-mode style configurations.

Surge Current (kA)
10 = 100 kA per phase
15 = 150 kA per phase
20 = 200 kA per phase
25 = 250 kA per phase
30 = 300 kA per phase

M = MCC Application

X= Surge Counter

- Example: TPS3C0120X0M = Type 4 SPD intended for use in Type 1 applications, for a 208/120 V MCC with a surge current capacity of 200 kA per phase and a surge counter option
- When an option is not selected, include a zero (0) in the field
- Available Accessory: Ordered Separately
  RMSIE = Remote monitor

MCC Starter Ratings and Dimensions

NEMA Size	Maximum Horsepower Rating 208V	230V	460V	Circuit Breaker Type (For Maximum HP at 460V) Standard Breaker Type	Dimensions in inches (mm) Unit Height① W= Width, D= Depth	kA Interrupting Rating at 480V②③	Fusible Type (For Maximum HP at 460V) Standard Disconnect Sw/Fuse Clip Sizes	Dimensions in inches (mm) Unit Height① W= Width, D= Depth	kA Interrupting Rating at 480V②③

Full Voltage — UL Listed

					FVNR	FVR	IR Std/Opt		FVNR	FVR	IR
1	7.5	7.5	10		12 (305)	18 (457)		30/30	12 (305)	18 (457)	
2	10	15	25		12 (305)	24 (610)		60/60	12 (305)	24 (610)	
3	25	30	50		18 (457)	30 (762)		100/100	24 (610)	36 (914)	
4	40	50	100	MCP	24 (610)	36 (914)		200/200	42 (1067)	48 (1219)	
5	75	100	200		36 (914)	48 (1219)	42/100	JD6MCS/400	60 (1524)	60 (1524)	100
6④	150	200	400		48 (1219)	72 (1829) 30W (762W)		LD6MCS/600	72 (1829)	72 (1829) 30W (762W)	
7④	—	300	600	ND6	72 (1829) 30W x 20D (762W x 508D)	N/A		ND6MCS/1200	72 (1829) 40W x 20D (1016W x 508D)	N/A	

Two Speed, Constant or Variable Torque — UL Listed

					2S2W	2S1W	IR Std/Opt		2S2W	2S1W	IR
1	7.5	7.5	10		24 (610)	24 (610)		30/30	24 (610)	24 (610)	
2	10	15	25		24 (610)	24 (610)		60/60	24 (610)	24 (610)	
3	25	30	50		30 (762)	36 (914)		100/100	36 (914)	48 (1219)	
4	40	50	100	MCP	36 (914)	48 (1219)	42/100	200/200	48 (1219)	60 (1524)④	100
5④	75	100	200		72 (1829) 30W (762W)	72 (1829) 30W (762W)		JD6MCS/400	72 (1829) 30W (762W)	72 (1829) 30W (762W)	
6④	150	200	400		72 (1829) 30W (672W)	Consult Siemens		MD6MCS/600	72 (1829) 40W (1016W)	Consult Siemens	

Two Speed, Constant Horsepower — UL Listed

					2S2W-CH	2S1W-CH	IR Std/Opt		2S2W-CH	2S1W-CH	IR
1	5	5	7.5		24 (610)	24 (610)		30/30	24 (610)	24 (610)	
2	7.5	10	20		24 (610)	24 (610)		60/60	24 (610)	24 (610)	
3	20	25	40		30 (762)	36 (914)		100/100	36 (914)	48 (1219)	
4④	30	40	75	MCP	30 (762)	48 (1219)	42/100	200/200	48 (1219)	60 (1524)	100
5④	60	75	150		72 (1829) 30W (762W)	72 (1829) 30W (762W)		JD6MCS/400	72 (1829) 30W (672W)	72 (1829) 30W (672W)	
6④	100	150	300		72 (1829) 30W (762W)	Consult Siemens		MD6MCS/600	72 (1829) 40W (1016W)	Consult Siemens	

Reduced Voltage Autotransformer Non-Reversing, Closed Transition — UL Listed

					RVAT	IR Std/Opt		RVAT	IR
2④	10	15	25		42 (1067)		60/60	42 (1067)	
3④	25	30	50		42 (1067)		100/100	48 (1219)	
4④	40	50	100		48 (1219)		200/200	60 (1524)	
5④	75	100	200	MCP	72 (1829) 30W (762W)	42/100	JD6MCS/400	72 (1829) 30W (762W)	100
6④	150	200	400		72 (1829) 30W (762W)		MD6MCS/800	72 (1829) 30W (762W)	
7④	300	300	600	ND6	Consult Siemens		ND6MCS/1200	Consult Siemens	

① The addition of oversized CPTs (above 50VA), relays, timers, etc. may increase unit height.
② For other available voltage ratings, consult Siemens.
③ Interrupting ratings are 25kAIC when not UL listed.
④ Fixed mounted units (not plug-in).

Note: For half size starters, contact Siemens.

MCC Starter Ratings and Dimensions (cont.)

NEMA Size	Maximum Horsepower Rating 208V	230V	460V	Circuit Breaker Type (For Maximum HP at 460V) Standard Breaker Type	Dimensions in inches (mm) Unit Height① W= Width, D= Depth	kA Interrupting Rating at 480V②③	Fusible Type (For Maximum HP at 460V) Standard Disconnect Sw/Fuse Clip Sizes	Dimensions in inches (mm) Unit Height① W= Width, D= Depth	kA Interrupting Rating at 480V②③

Reduced Voltage Wye Delta, Open and Closed Transition

					YDO	YDC	IR Std/Opt		YDO	YDC	IR
2	20	25	40		30 (762)	42 (1067)		100/100	36 (914)	48 (1219)	
3	25	30	75		36 (914)	48 (1219)		200/200	48 (1219)	60 (1524)	
4	60	60	150	MCP	36 (914)	48 (1219)	42/100	JD6MCS/400	72 (1829)	72 (1829)	100
5④	150	150	300		72 (1829) 30W (672W)	72 (1829) 30W (672W)		LD6MCS/600	72 (1829) 30W (672W)	72 (1829) 30W (672W)	

Compact Units Available, FVNR Only — UL Listed

					FVNR	IR Std/Opt
1	7.5	7.5	10	MCP	6 (152)⑤	42/100

① The addition of oversized CPTs (above 50VA), relays, timers, etc. may increase unit height.
② For other available voltage ratings, consult Siemens.
③ Interrupting ratings are 25kAIC when not UL listed.
④ Fixed mounted units (not plug-in).
⑤ The addition of relays, timers, etc. will increase unit height.

480V① Solid State Reduced Voltage — NEMA 1 MCC Enclosures②

Rating HP③	RVSS Type⑥		Rated Amperes	Dimensions - In. (mm)④⑤ Mounting Height	Structure WxD	IR
5	3RW40		9	18 (457)	20 x 15 (508 x 381)	100
10	3RW40		19			
15	3RW40		24			
20	3RW40		28			
25	3RW40		34			
30	3RW40		42			
40	3RW40		58	24 (610)		
50	3RW40		70			
75	3RW40		117	36 (914)		
100	3RW40		145			
150	3RW40		205	48 (1219)		
200	3RW40		315			
300	3RW40		385	72 (1829)⑦		
15		3RW44	26	36 (914)		
20		3RW44	32			
25		3RW44	42			
30		3RW44	52			
40		3RW44	68			
50		3RW44	82			
60		3RW44	100			
75		3RW44	117			
100		3RW44	145			
125		3RW44	180	48 (1219)⑦		
150		3RW44	215			
200		3RW44	280			
250		3RW44	385	72 (1829)⑦		
400		3RW44	494		30 x 15 (762 x 381)	
450		3RW44	562			
500		3RW44	693			
600		3RW44	850			65
750		3RW44	970	Consult Siemens		42
800		3RW44	1076	Consult Siemens		

① For other available voltage ratings, consult Siemens.
②For other enclosure types, consult Siemens.
③ Ratings are based on CLASS 20 overloads and 6 starts per Hour. Consult Siemens for other applications.
④ Dimensions shown are for circuit breaker or fusible disconnects.
⑤ RVSS with bypass and / or isolation contactors require extra mounting space. Consult Siemens for further information.
⑥ 3RW40 Units include line side isolation contactor
⑦ Fixed mounted units (not plug-in).

480V① Variable Frequency Drives — NEMA 1A MCC Enclosures②

Rating HP③	Drive Type	Rated Amperes	Dimensions - In. (mm)④⑤ Mounting Height	Structure W x D	IR
2	MM440	4	18 (457)	20 x 15 (508 x 381)	100
5		10.2	24 (610)		
7.5		16			
10		18.4	36 (914)		
15		26			
20		32			
25		38	48 (1219)^6		
30		45			
40		62			
50		75	60 (1524)^6		
60		90			
75		110	72 (1829)^6	20 x 15 (508 x 381)	
100		145			
125		178			
150		205		30 x 15 (762 x 381)	
200		250			

① For other available voltage ratings, consult Siemens.
② For other enclosure types, consult Siemens.
③ Ratings are for Variable Torque applications. Consult Siemens for other applications.
④ Dimensions shown are for circuit breaker or fusible disconnects.
⑤ Drives with bypass and / or isolation contactors require extra mounting space. Consult Siemens for further information.
⑥ Fixed mounted units (not plug-in).

Lighting Panelboards Applied in MCCs

Amp Rating	Number of Circuits	Height in Inches (mm)		
		1%, 3W 240/120	3%, 4W 208Y/120	3%, 4W 277/480
Main Lug Only				
125/250	18	30 (762)	30 (762)	30 (762)
	30	36 (914)	36 (914)	36 (914)
	42	42 (1067)	42 (1067)	42 (1067)
Main Lug Only				
125/250	18	30 (762)	30 (762)	30 (762)
	30	36 (914)	36 (914)	36 (914)
	42	42 (1067)	42 (1067)	42 (1067)

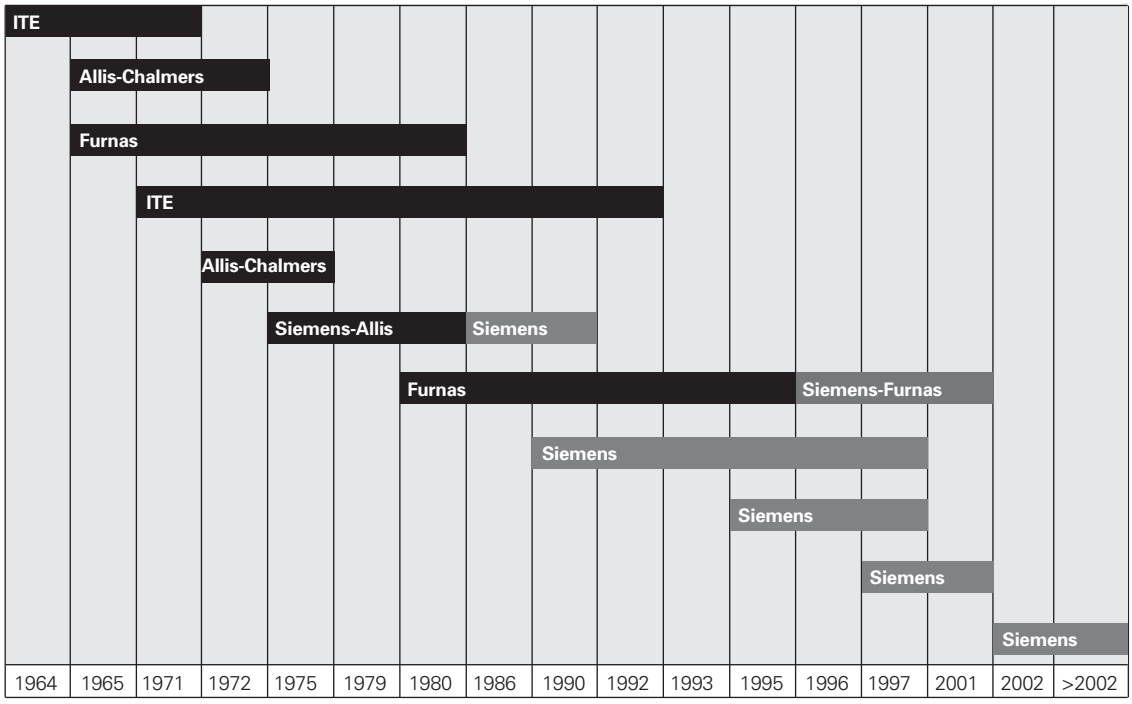
Distribution Transformers

KVA Rating	Phase	Unit Height in Inches (mm)
1	1	12 (305)①
1.5		
2		
3		
5		
7.5		18 (457)②
10		
15		
25		24 (610)②③
30		
37.5		36 (914)②③
45		
9	3③	18 (457)
15		
25		
30		
37.5		24 (610)
45		

① Plate mounted.
② Transformer mounted on brackets 6 in. (152 mm) off sills.
③ Requires 20 in. (508 mm) deep structure.

Siemens has an installed base of motor control centers dating back to 1964 due to acquisitions of Allis-Chalmers in 1978, ITE Gould in 1983 and Furnas Electric in 1996. This has resulted in eleven MCC models installed across the United States. Replacement units for these models as well as the current tiastarTM MCC offerings are built in the Siemens West Chicago plant. Siemens developed this tool to help people gain a better understanding of the wide variety of this installed base of MCCs. This should enable people to order aftermarket buckets or new MCCs much easier. In this program brochure, all the tools necessary for identifying existing MCCs to ordering forms are included. All items listed as follows: timeline, product overview, identification guide, product descriptions, work sheets and ordering check sheet. The intent of this guide is to provide a tool for Siemens customers so they can make a more educated purchasing decision. If you have any questions, please contact your local Siemens representative.

MCC Timeline



Year

Note: Timeline represents approximate values

tiastar Motor Control Centers

Product History

Aftermarket

This overview is a clear and concise snap shot of Siemens entire MCC product offering. For your convenience, typical MCC part numbers are shown for continued identification possibilities.

Furthermore, the overview covers the standard options for the product offering.

Original manufacturer	Model	Production dates①	Bucket w/ door & handle②	Factory retrofit③	Typical MCC number④ X=Letter # = Number
Siemens	tiastar	2002 – Current	X	—	Same as System89
Siemens/Furnas	System89	1980 – 2001	X	—	89BFXX### ### 89BSXX### ### 89BBXX### ### WX### (ex. WU760)
Siemens	Model 95 +	1997 – 2001	X	—	95BFXX### ### 95BSXX### ### 95BBXX### ### XX### (ex. WU760)
Siemens	Model 95	1995 – 1997	X	—	09-001-XXXX-XXXXX-XXX
Siemens	Model 90	1990 – 1997	X	—	30-001-XXXX-XXXXX
Siemens Allis	Marq 21	1975 – 1990	X	—	01-14XX-XXXXX-XX
Allis-Chalmers	Mark 2	1972 – 1975	X	—	##### (ex. 15375)
Allis-Chalmers	Mark 1	1965 – 1972	X	—	
ITE	Gould 5600	1971 – 1992	—	X	84-XXXXX-XX
ITE	Gould 9600	1964 – 1971	—	X	85-XXXXX-XX 86-XXXXX-XX
Furnas	Class89	1965 – 1979	—	X	89FVXXXX XXX 89SVXXXX XXX 89BVXXXX XXX V#### (ex. V2176)

① Dates represent approximate values only.
② Buckets exceeding 250 amps are fix mounted.
③ Contact West Chicago Aftermarket Dept. for Retrofit Program at (800) 683-6200.
④ In some instances, a generic 5 alphanumeric number is designed as the MCC sales order number. In most cases a 5 alphanumeric number within the MCC number is the sales order number. MCC numbers can be found inside the MCC bucket.

Starters 240V, 480V, 575V	NEMA size
FVNR	1-6
FVR	1-5
2S1W-CT	1-5
2S1W-VT	1-5
2S2W-CT	1-5
2S2W-VT	1-5
RVAT	2-6
RVSS	Consult factory
VFD	Consult factory

Standard options	
Amp meter + CT	Surge suppression
CT	Under voltage CB
Voltage monitor	Shunt trip
Vac. contactor	Ground stab
Transducer	High density bucket
Fuse puller	Special paint
Bypass	Timer
ASI®	4P relay
Ground fault	Extra unit space
Elapse time meter	

Aftermarket and Replacement units forms are available at www.usa.siemens.com/mcc_aftermarket

Quote request form

SIEMENS

MCC Aftermarket Units

Ordering Instructions:
Complete this form online and submit.
You will receive a replay in 48 hours with a status of your request.

1 User Contact Info

Company: _____
Name (last/first): _____ /_____
Title: _____
Phone #: (_____) _____
Email: _____
Street: _____
City: _____ State:___ ZIP:_____

2 Distributor Contact Info

❑ No distributor identified
Company: _____
Name (last/first): _____ /_____
Title: _____
Phone #: (_____) _____
Email: _____
Street: _____
City: _____ State:___ ZIP:_____

3 Existing Equipment

Serial #: _____
Order #: _____
Style #: _____
Section #: _____
System voltage: ❑ 480V ❑ 575V
System: ❑ 3∅3W AC ❑ 3∅4W AC ❑ Other_____
Control voltage: ❑ 24DC ❑ 120AC ❑ 240AC ❑ Other_____
System grounding: ❑ Solidly Grounded ❑ Ungrounded ❑ High Resistance Grounded

Short circuit withstand current: ❑ 42K ❑ 65K ❑ 100K

MCC model:

❑ Siemens tiastar™
❑ Siemens Model 95+
❑ Furnas System89
❑ Siemens Model 95
❑ Siemens Model 90
❑ Siemens-Allis Marq21
❑ Allis-Chalmers Mark 2
❑ Allis-Chalmers Mark 1*
❑ ITE Gould 9600*
❑ ITE Gould 5600*
❑ Furnas Class 89*

* Contact sales office for replacement options.

4 Aftermarket Units

a *To order additional aftermarket units, complete section 4b*

Bucket / Unit ID #: _____
Other voltage: _____
Unit type: ❑ Starter ❑ Feeder
Starter type: ❑ FVNR ❑ FVR ❑ Other_____
NEMA size: ❑1 ❑2 ❑3 ❑4 ❑5 ❑6
HP or Motor FLA: _____

Wiring diagrams:

	Yes	*No*
Supplied by the customer:	❑	❑
Required with new unit:	❑	❑
Approval drawings required:	❑	❑

Overload relays: ❑ ESP solid state ❑ Simocode ❑ Bi-metal ambient compensated

Disconnect type: ❑ Circuit breaker ❑ Fusible switch
Control Voltage: ❑ CPT ❑ Separate source
CPT sizing: ❑ Standard ❑ Extra 100 V ❑ Other*_____
*May require additional unit space

Pilot Devices:
Selector Switch: 2P/3P *Qty.* ☐ 4P *Qty.* ☐
Pilot Lights: Standard ☐ PTT ☐
Color / function: _____
(e.g. amber trip light)
Bulb: ❑ Standard ❑ LED

What is the function of this device?

_____
_____

www.usa.siemens.com/mcc_aftermarket

Quote request form

b *Complete this section to order additional aftermarket units*

Bucket / Unit ID #: _____

Other voltage: _____

Unit type: ❑ Starter ❑ Feeder

Starter type: ❑ FVNR ❑ FVR
❑ Other_____

NEMA size: ❑1 ❑2 ❑3 ❑4 ❑5 ❑6

HP or Motor FLA: _____

Wiring diagrams:

	Yes	*No*
Supplied by the customer:	❑	❑
Required with new unit:	❑	❑
Approval drawings required:	❑	❑

Overload relays: ❑ ESP solid state ❑ Simocode
❑ Bi-metal ambient compensated

Disconnect type: ❑ Circuit breaker ❑ Fusible switch

Control Voltage: ❑ CPT ❑ Separate source

CPT sizing: ❑ Standard ❑ Extra 100 V
❑ Other*_____
*May require additional unit space

Pilot Devices:

	Qty.		*Qty.*
Selector Switch:	2P/3P ☐	4P	☐
Pilot Lights:	Standard ☐	PTT	☐

Color / function: _____
(e.g. amber trip light)

Bulb: ❑ Standard ❑ LED

What is the function of this device?

_____

_____

4 Replacement Parts

Please include the part # (if available) and a brief description with application / rating details.

	Qty.		*Qty.*		*Qty.*
Handle Assembly: *Include location, Unit type / application*	☐	**Pilot Devices:**	☐	**Transformer:**	☐
Door Kit: *Include dimensions, blank, location*	☐	**Pilot Devices:**	☐	**Fuse:**	☐
Nameplate: *Include size, letter / plate color, text to be engraved*	☐	**Reset Parts:** *(Overload)*	☐	**Other:** *Please specify*	☐

5 Glossary of acronyms

FVNR: Full Voltage Non Reversing
FVR: Full Voltage Reversing
FLA: Full Load Amps
ESP: Extra Starter Protection
CPT: Control Power Transformer
PTT: Push To Test

NEMA & General Purpose Controls

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• Please note •

After the release of the 2014 Industrial Controls catalog, Section 17 of the Speedfax catalog has been updated to reflect changes made in the Industrial Controls catalog. This electronic version is more up to date than the print version of Speedfax and should be referenced when possible.

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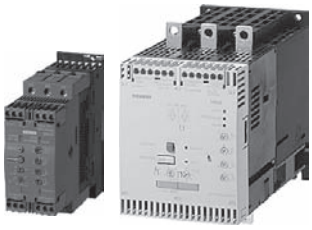
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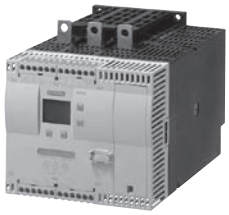
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3RW30



3RW40



3RW44



Class 73/74

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Control Products

NEMA & General Purpose Controls

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Siemens NEMA starters, pump panels, lighting contactors and solid state soft starters are known for their dependability and ruggedness, and now they are delivered faster than ever before through Controls Express.

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Class 14 NEMA Starters see pages 17-15 & 17-17

Class 17 NEMA Combination Starters see pages 17-19 to 17-24. For quick ship versions with factory modifications see on-line at www.usa.siemens.com/controls-express

Class 18 NEMA Combination Starters see pages 17-25 & 17-27.

Class 40 NEMA Contactors see page 17-62

Class 74 Enclosed Soft Starters see page 7/89

Class 87 Pump Panels see pages 17-76 & 17-77

LE Lighting Contactors see page 17-83

LC Lighting Contactors see page 17-89 & 17-90



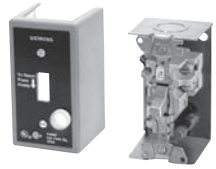
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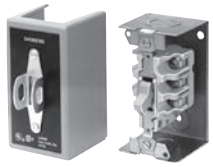
Control Products

NEMA & General Purpose Controls

Product Overview



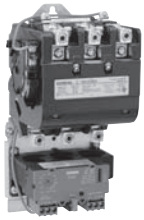
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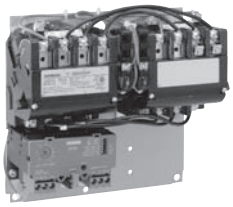
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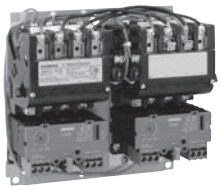
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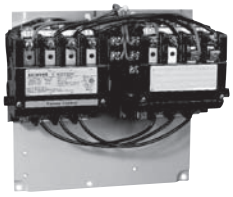
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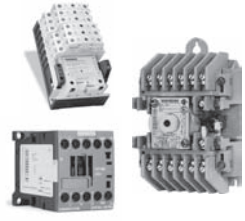
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Class SMF

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

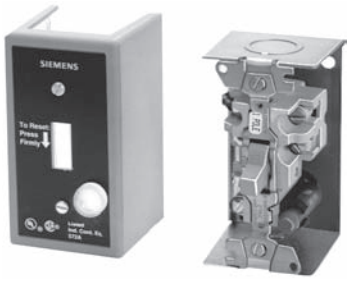
Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

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.



Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light

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.

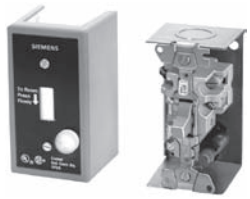
Handle Guard/Lock-Off

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.

Manual Control

Fractional HP Starters with Melting Alloy Overload, Class SMF

Selection



Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light

Ordering Information

- ► Heater Elements see page 17-122.
- ► Field Modification Kits see page 17-100.
- ► Dimensions see page 17-134.
- ► Wiring Diagrams see page 17-168.

Horsepower Ratings

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 Phase①

Type of Operator	No. of Poles	Starter Features⑤	Open Type		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	
					Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate		Standard		Oversized							
			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 Phase①

Toggle	1	Standard	—	—	④	—	④	—	④	—	SMFFG5		SMFFGJ5		—	—	SMFFW1②		SMFFR1②	
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG5P		SMFFGJ5P		—	—	SMFFW1P②		—	—
		(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		—	—	SMFFW2②		SMFFR2②	
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG6P		SMFFGJ6P		—	—	SMFFW2P②		—	—
		(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 Phase①

Type of Operator	Number of Poles	Starter Features⑤	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					
			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 Phase③

Toggle	2 Per Starter	Standard	SMFFF222		—	—	SMFFG222		—	—
		Red Pilot Light on Each Starter	SMFFF222P		SMFFS22P		SMFFG222P		—	—
Key	2 Per Starter	Red Pilot Light on Each Starter	SMFFF44P		SMFFS44P		SMFFG44P		—	—

Starter And "Auto-Off-Hand" SPDT Selector Switch (AC Only)—Class SMF, Single Phase①

Toggle	1	Standard	SMFFF71		—	—	SMFFG71		—	—
		Red Pilot Light	SMFFF71P		SMFFS71P		SMFFG71P		—	—
	2	Standard	SMFFF72		—	—	SMFFG72		—	—
		Red Pilot Light	SMFFF72P		SMFFS72P		SMFFG72P		—	—
Key	2	Red Pilot Light	SMFFF74P		SMFFS74P		SMFFG74P		—	—

Two Speed Starters (AC Only)—Class SMF, Single Phase③

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.

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

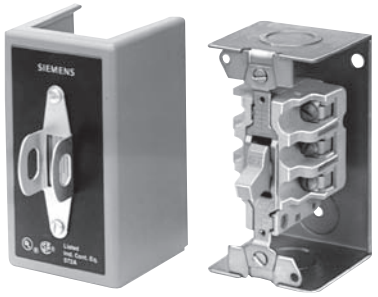
Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

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.

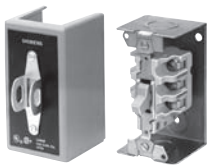
Handle Guard/Lock-Off

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.

Manual Control

Switches①, Class MMS, MRS

Selection



Class MMS Switch in a NEMA Type 1 Enclosure

Ordering Information

- Heater Elements not Required.
- Field Modification Kits see page 17-100.
- Dimensions see page 17-134.
- Wiring Diagrams see page 17-168.

Horsepower Ratings

Device	No of Poles	Motor Type AC	Maximum HP 115V	230V	450–575V	DC Ratings 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 Features④	Open Type		General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided) Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate		NEMA Type 1 General Purpose Enclosure Surface Mounting Standard		Oversized		NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover		NEMA Type 4② Watertight, Dust-tight Metallic Enclosure		NEMA Type 7 & 9② 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	MMSK01A③		MMSKF1A		MMSKS1A		MMSKSJ1A		MMSKG1A		MMSKGJ1A				MMSKW1A		—	—
		Red Pilot Light 230V AC	MMSK01B③		MMSKF1B		MMSKS1B		MMSKSJ1B		MMSKG1B		MMSKGJ1B				MMSKW1B		—	—
	3	Standard	MMSK02		MMSKF2		MMSKS2		—	—	MMSKG2		MMSKGJ2		MMSKWN2		MMSKW2		MMSKR2	
		Red Pilot Light 208-240V AC	MMSK02B③		MMSKF2B		MMSKS2B		MMSKSJ2B		MMSKG2B		MMSKGJ2B				MMSKW2B		—	—
		Red Pilot Light 440-600V AC	MMSK02C③		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) Catalog Number	List Price $	NEMA Type 1 General Purpose Enclosure Surface Mounting Catalog Number	List Price $	Replacement Switch Class MRS 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 Features④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided) Catalog Number	List Price $	NEMA Type 1 General Purpose Enclosure Surface Mounting Catalog Number	List Price $	Replacement Switch Class MRS 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 ¾" 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.

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:

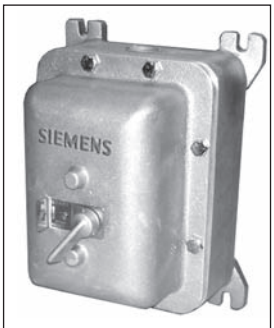
- ON/OFF rotary handle with lockout and visible trip indication
- Adjustment dial for setting to motor FLA (Starters only)
- Low Voltage Protection (LVP) Option
- Short Circuit trip at 13 times the maximum setting of the FLA dial or rated current
- Ambient compensated up to 140°F
- Phase loss sensitivity
- Test trip function
- LVP Option Meets OSHA Requirements
- UL Listed
- CSA Certified



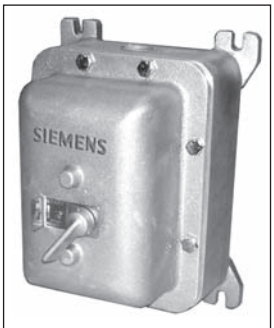
OPEN TYPE
Starter



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

Manual Control

Starters and Switches, Class 11 - 3RV

Selection



Class 11 Manual Motor Starter

Ordering Information

- ► No heaters required.
- ► Field Modification Kits see page 17-100.
- ► Dimensions see page 17-136.
- ► Wiring Diagrams see page 17-168.
- ► 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 17-101.

The coil voltage should correspond with the line voltage.

Manual Starter—Class 11 - 3RV

FLA Adjustment Range①	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 & 9④ Watertight (Outdoor use) Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
0.11-0.16	—	—	—	—	—	—	3RV1021-0AA10②		11AD3B		11AD3H		11AD3W	
0.14-0.2	—	—	—	—	—	—	3RV1021-0BA10②		11BD3B		11BD3H		11BD3W	
0.18-0.25	—	—	—	—	—	—	3RV1021-0CA10②		11CD3B		11CD3H		11CD3W	
0.22-0.32	—	—	—	—	—	—	3RV1021-0DA10②		11DD3B		11DD3H		11DD3W	
0.28-0.4	—	—	—	—	—	—	3RV1021-0EA10②		11ED3B		11ED3H		11ED3W	
0.35-0.5	—	—	—	—	—	—	3RV1021-0FA10②		11FD3B		11FD3H		11FD3W	
0.45-0.63	—	—	—	—	—	—	3RV1021-0GA10②		11GD3B		11GD3H		11GD3W	
0.55-0.8	—	—	—	—	—	½	3RV1021-0HA10②		11HD3B		11HD3H		11HD3W	
0.7-1	—	—	—	—	½	½	3RV1021-0JA10②		11JD3B		11JD3H		11JD3W	
0.9-1.25	—	—	—	—	¾	¾	3RV1021-0KA10②		11KD3B		11KD3H		11KD3W	
1.1-1.6	—	1/10	—	—	¾	1	3RV1021-1AA10②		11LD3B		11LD3H		11LD3W	
1.4-2	—	⅛	—	—	1	1 ½	3RV1021-1BA10②		11MD3B		11MD3H		11MD3W	
1.8-2.5	—	⅛	½	½	1 ½	1 ½	3RV1021-1CA10②		11ND3B		11ND3H		11ND3W	
2.2-3.2	1/10	¼	¾	¾	1 ½	2	3RV1021-1DA10②		11PD3B		11PD3H		11PD3W	
2.8-4	⅛	½	¾	1	2	3	3RV1021-1EA10②		11QD3B		11QD3H		11QD3W	
3.5-5	⅛	½	1	1	3	3	3RV1021-1FA10②		11RD3B		11RD3H		11RD3W	
4.5-6.3	¼	¾	1 ½	1 ½	5	5	3RV1021-1GA10②		11SD3B		11SD3H		11SD3W	
5.5-8	½	1	2	2	5	5	3RV1021-1HA10②		11TD3B		11TD3H		11TD3W	
7-10	½	1 ½	3	3	7 ½	10	3RV1021-1JA10②		11UD3B		11UD3H		11UD3W	
9-12.5	½	2	3	3	7 ½	10	3RV1021-1KA10②		11VD3B		11VD3H		11VD3W	
11-16	1	3	5	5	10	15③	3RV1021-4AA10②		11WD3B		11WD3H		11WD3W	
14-20	1 ½	3	5	7 ½	15	20③	3RV1021-4BA10②		11XD3B		11XD3H		11XD3W	
17-22	2	3	7 ½	7 ½	15	20③	3RV1021-4CA10②		11YD3B		11YD3H		11YD3W	
20-25	2③	5③	7 ½③	7 ½③	15③	20③	3RV1021-4DA10②		11ZD3B		11ZD3H		11ZD3W	

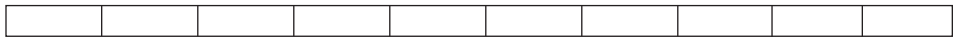
Manual Switch—Class 11 - 3RV

Rated Current①	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 Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
1	—	—	—	—	½③	½③	3RV1321-0JC10②		111D3B		111D3H		111D3W	
5	⅛③	½③	1③	1③	3③	3③	3RV1321-1FC10②		112D3B		112D3H		112D3W	
10	½③	1 ½③	3③	3③	7 ½③	10③	3RV1321-1JC10②		113D3B		113D3H		113D3W	
20	1 ½③	3③	5③	7 ½③	15③	20③	3RV1321-4BC10②		114D3B		114D3H		114D3W	
25	2③	5③	7 ½③	7 ½③	15③	20③	3RV1321-4DC10②		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 Starters

Catalog Numbering System



Class

- **17** — Combination Starter (Non Fusible, Fusible)
- **18** — Combination Starter (Circuit Breaker)
- **25** — Reversing Combination Starter (Non Fusible, Fusible)
- **26** — Reversing Combination Starter (Circuit Breaker)

Size

- **B** — 00
- **C** — 0
- **D** — 1
- **E** — 1¾
- **F** — 2
- **G** — 2½
- **H** — 3
- **I** — 3½
- **J** — 4
- **L** — 5
- **M** — 6
- **N** — 7
- **P** — 8

Model

- **U** — Solid-state OLR size 0–4 & size 7 & 8
- **P** — Thermal size 0–3½, Solid state size 5 & 6

Solid-state OLR Current Range⑤

Three Phase

- **A** — 0.25–1
- **B** — 0.75–3.4
- **C** — 3–12
- **D** — 5.5–22
- **E** — 10–40
- **F** — 13–52
- **G** — 25–100
- **H** — 50–200
- **J** — 100–300 w/ CT's
- **K** — 133–400 w/ CT's
- **L** — 200–600 w/ CT's
- **M** — 250–750 w/ CT's
- **N** — 400–1200 w/ CT's

Enclosure Size

- **92** — Standard Width
- **82** — Extra Wide

Enclosure Type

- **B** — NEMA 1
- **F** — NEMA 4X Fiberglass
- **H** — NEMA 7/9/3/4, Bolted (Class 18 & 26 only)
- **N** — NEMA 12 (Field convertible to 3/3R/4)
- **W** — NEMA 4/4X 304 Stainless Steel

Breaker HP Code② **Horsepower Rating 200, 230, 460, 575**

- **A** — ½, ½,1, 1
- **B** — 1, 1, 3, 3
- **C** — 3, 3, 5, 5
- **D** — 3, 3, 7½, 7½
- **E** — 7½, 7½, 10, 10
- **F** — —, —, 15, 15
- **G** — 10, 10, —, —
- **H** — 7½, 10, 20, 20
- **J**⑥ — 10, 15, 25, 25
- **K** — —, —, 30, 30
- **L** — 15, 20, —, —
- **M** — —, —, 30, 30
- **N** — 25, 30, 50, 50
- **P** — 30, 40, 75, 75
- **R** — 40, 50, 100, 100



Class

- **14** — Across the Line NEMA Motor Starter
- **22** — Reversing NEMA Motor Starter
- **40** — Across the Line NEMA Magnetic Contactor
- **43** — Reversing NEMA Magnetic Contactor

Size

- **B** — 00
- **C** — 0
- **D** — 1
- **E** — 1¾
- **F** — 2
- **G** — 2½
- **H** — 3
- **I** — 3½
- **J** — 4
- **L** — 5
- **M** — 6
- **N** — 7
- **P** — 8

Model

- **U** — Solid-state OLR size 00–4, Size 7 & 8
- **P** — Thermal size 00–4, Solid state sizes 5 & 6

Solid-state OLR Current Range⑤

Three Phase

- **A** — 0.25–1
- **B** — 0.75–3.4
- **C** — 3–12
- **D** — 5.5–22
- **E** — 10–40
- **F** — 13–52
- **G** — 25–100
- **H** — 50–200
- **J** — 100–300 w/ CT's
- **K** — 133–400 w/ CT's
- **L** — 200–600 w/ CT's
- **M** — 250–750 w/ CT's
- **N** — 400–1200 w/ CT's

Single Phase①

- **A** — 0.25–1
- **B** — 0.75–3.4
- **C** — 3–12
- **D** — 5.5–22

Enclosure Size

- **1** — 2 power poles,1-phase
- **3** — 3 power poles, 3-phase
- **8** — 3 power poles, 3-phase, extra wide enclosure

Pilot Control Circuit

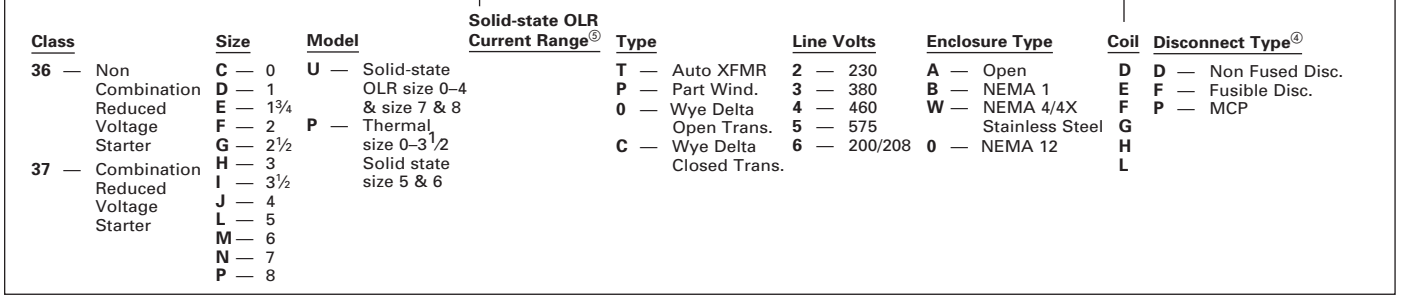
- **2** — suitable for 3-wire control (NO aux. contact incl.)

Enclosure Type

- **A** — Open
- **B** — NEMA 1
- **F** — NEMA 4X Fiberglass
- **H** — NEMA 7/9/3/4, Bolted (Class 18 & 26 only)
- **0** — NEMA 12 (Field convertible to 3/3R/4)
- **W** — NEMA 4/4X 304 Stainless Steel

Coil

- **A**③ — 110–120V/220–240V@60Hz 110V/190–220V@50Hz
- **C**③ — 220–240V/440–480V@60Hz 190–220V/380–440V@50Hz
- **D** — 200–208V@60Hz
- **E** — 550–600V@60Hz 550V@50Hz
- **F** — 120V@60Hz 110V@50Hz
- **G** — 220–240V@60Hz 190–220V@50Hz
- **H** — 440–480V@60Hz 380–440V@50Hz
- **J**⑥ — 24V@60Hz 24V@50Hz
- **L** — 277V@60Hz 240V@50Hz



Class

- **36** — Non Combination Reduced Voltage Starter
- **37** — Combination Reduced Voltage Starter

Size

- **C** — 0
- **D** — 1
- **E** — 1¾
- **F** — 2
- **G** — 2½
- **H** — 3
- **I** — 3½
- **J** — 4
- **L** — 5
- **M** — 6
- **N** — 7
- **P** — 8

Model

- **U** — Solid-state OLR size 0–4 & size 7 & 8
- **P** — Thermal size 0–3½ Solid state size 5 & 6

Solid-state OLR Current Range⑤

Type

- **T** — Auto XFMR
- **P** — Part Wind.
- **0** — Wye Delta Open Trans.
- **C** — Wye Delta Closed Trans.

Line Volts

- **2** — 230
- **3** — 380
- **4** — 460
- **5** — 575
- **6** — 200/208

Enclosure Type

- **A** — Open
- **B** — NEMA 1
- **W** — NEMA 4/4X Stainless Steel
- **0** — NEMA 12

Coil

- **D**
- **E**
- **F**
- **G**
- **H**
- **L**

Disconnect Type④

- **D** — Non Fused Disc.
- **E** — Fusible Disc.
- **F** — MCP
- **P** — MCP

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.

Heavy Duty Starters

Features and Benefit



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

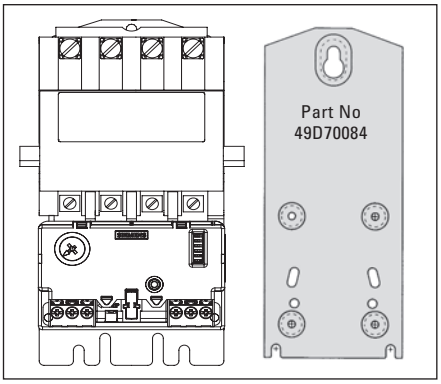
Thermoset materials resist arc tracking and the stresses of heat and severe impact.

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



Siemens Sizes 00–1¾ have as standard, universal mounting which fits the following:

Cutler Hammer—Citation Series
—Freedom Series

GE —300 Line

Square D —Type S

The Starter with its existing backplate mounts onto the piggyback mounting plate and is secured in place with three mounting screws. The piggyback mounting plate fits the following:

Allen-Bradley —Bulletin 509
—Bulletin 709

Westinghouse —Series A200

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



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.

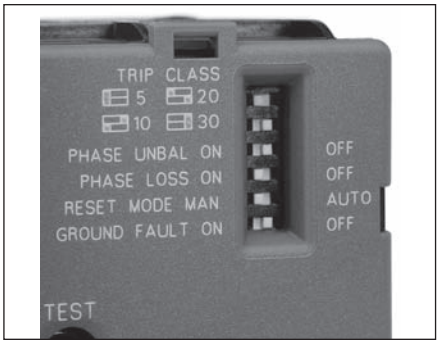
ESP200® FLA Adjustment Dial—Set the adjustment dial on the overload to the FLA of the motor.

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

Heavy Duty Motor Starters

Solid State Overload with Auto/Manual 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.
- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see pages 17-137 open and 17-153 enclosed.
- ► Wiring Diagrams see page 17-169.
- ► Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp						Overload		Enclosure											
								Open Type Standard Auxiliary Contacts⑦		NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = 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 3/3R② Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅛	½	00	—	0.25–1	A	14BUA32A*		14BUA32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
½	¾	1½	2	00	—	0.75–3.4	A	14BUB32A*		14BUB32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1½	1½	2	—	00	—	3–12	A1	14BUC32A*		14BUC32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
⅛	⅛	⅛	½	0	—	0.25–1	A	14CUA32A*		14CUA32B*		14CUA32@*		14CUA32F*		14CUA32H*		14CUA320*	
½	¾	1½	2	0	—	0.75–3.4	A	14CUB32A*		14CUB32B*		14CUB32@*		14CUB32F*		14CUB32H*		14CUB320*	
2	2	5	5	0	—	3–12	A1	14CUC32A*		14CUC32B*		14CUC32@*		14CUC32F*		14CUC32H*		14CUC320*	
3	3	—	—	0	—	5.5–22	A1	14CUD32A*		14CUD32B*		14CUD32@*		14CUD32F*		14CUD32H*		14CUD320*	
⅛	⅛	⅛	½	1	—	0.25–1	A	14DUA32A*		14DUA32B*		14DUA32@*		14DUA32F*		14DUA32H*		14DUA320*	
½	¾	1½	2	1	—	0.75–3.4	A	14DUB32A*		14DUB32B*		14DUB32@*		14DUB32F*		14DUB32H*		14DUB320*	
2	2	5	5	1	—	3–12	A1	14DUC32A*		14DUC32B*		14DUC32@*		14DUC32F*		14DUC32H*		14DUC320*	
3	3	10	10	1	—	5.5–22	A1	14DUD32A*		14DUD32B*		14DUD32@*		14DUD32F*		14DUD32H*		14DUD320*	
7½	7½	—	—	1	—	10–40	A1	14DUE32A*		14DUE32B*		14DUE32@*		14DUE32F*		14DUE32H*		14DUE320*	
10	10	15	15	—	1¾	10–40	A1	14EUE32A*		14EUE32B*		14EUE32@*		14EUE32F*		14EUE32H*		14EUE320*	
10	15	25	25	2	—	13–52	B	14FUF32A*		14FUF32B*		14FUF32@*		14FUF32F*		14FUF32H*		14FUF320*	
15	20	30	30	—	2½	25–100	B	14GUG32A*		14GUG32B*		14GUG32@*		14GUG32F*		14GUG32H*		14GUG320*	
25	30	50	50	3	—	25–100	B	14HUG32A*		14HUG32B*		14HUG32@*		14HUG32F*		14HUG32H*		14HUG320*	
30	40	75	75	—	3½	50–200	B	14IUH32A*		14IUH32B*		14IUH32@*		14IUH32F*		14IUH32H*		14IUH320*	
40	50	100	100	4	—	50–200	B	14JUH32A*		14JUH32B*		14JUH32@*		14JUH32F*		14JUH32H*		14JUH320*	
75	100	200	200	5	—	55–250	—	14LPU32A*		14LPU32B*		14LPU32E*④		—	—	14LPU32H*		14LPU320*	
150	200	400	400	6	—	160–630	—	14MPX32A*		14MPX32B*		14MPX32E*④		—	—	—	—	14MPX320*	
—	300	600	600	7*⑤	—	400–1220	A1+CT	14NUN32A*		14NUN32B*		14NUN32E*④		—	—	—	—	14NUN320*	
—	450	900	900	8⑥	—	400–1220	A1+CT	14PUN32A*		14PUN32B*		14PUN32E*④		—	—	—	—	14PUN320*	

Open Type & Standard Width Enclosure, Single Phase, 2-Pole③

Max Hp			Overload		Enclosure											
					Open Type Standard Auxiliary Contacts		NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = 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 3/3R② Industrial Use Weatherproof (Field Convertible to 3/3R)	
115 Volts	208/230 Volts	NEMA Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	¼	0	0.75–3.4	A	14CUB12A*		14CUB12B*		14CUB12@*		14CUB12F*		14CUB12H*		14CUB120*	
¼	½	0	3–12	A1	14CUC12A*		14CUC12B*		14CUC12@*		14CUC12F*		14CUC12H*		14CUC120*	
1	2	0	5.5–22	A1	14CUD12A*		14CUD12B*		14CUD12@*		14CUD12F*		14CUD12H*		14CUD120*	
⅛	¼	1	0.75–3.4	A	14DUB12A*		14DUB12B*		14DUB12@*		14DUB12F*		14DUB12H*		14DUB120*	
¼	½	1	3–12	A1	14DUC12A*		14DUC12B*		14DUC12@*		14DUC12F*		14DUC12H*		14DUC120*	
1	2	1	5.5–22	A1	14DUD12A*		14DUD12B*		14DUD12@*		14DUD12F*		14DUD12H*		14DUD120*	
3	7½	2	25-100	B	14FUG12A*		14FUG12B*		14FUG12@*		14FUG12F*		14FUG12H*		14FUG120*	
7½	15	3	25-100	B	14HUG12A*		14HUG12B*		14HUG12@*		14HUG12F*		14HUG12H*		14HUG120*	

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 17-108.
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 Enclosure is NEMA Type 4 (painted steel).
⑤ F coil 100-250V AC 50/60Hz, or DC, H coil 150-500V AC 50/60Hz, or DC
⑥ Only available F coil100-250V AC 50/60Hz, or DC

Heavy Duty Motor Starters

Solid State Overload with Auto/Manual Reset, Class 14

Selection



NEMA 1

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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-153.
- Wiring Diagrams see page 17-169.
- Replacement Parts see page 17-129.

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 17-117.

Extra Wide Enclosure, 3-Phase, 3-Pole

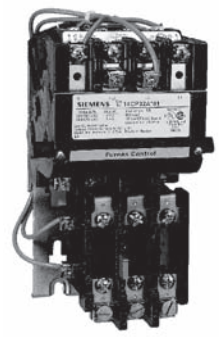
Max Hp						Overload		Enclosure							
								NEMA 1 General Purpose		**NEMA 4/4X Stainless**① Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		**NEMA 7 & 9 NEMA 3 & 4** Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		**NEMA 12 NEMA 3/3R**① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	**230 Volts**	**460 Volts**	**575 Volts**	**NEMA Size**	**Half Size**	**Amp Range**	**Frame Size**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**
⅛	⅛	½	½	00	—	0.25–1	A	**14BUA82B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
½	¾	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**	—
⅛	⅛	½	½	0	—	0.25–1	A	**14CUA82B***		**14CUA82@***		**14CUA82H***		**14CUA820***	
½	¾	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***	
⅛	⅛	½	½	1	—	0.25–1	A	**14DUA82B***		**14DUA82@***		**14DUA82H***		**14DUA820***	
½	¾	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	—	1¾	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***	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① For conduit hubs and conversion instructions, see page 17-108.

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 17-122. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.
- Field Modification Kits page 17-102.
- Factory Modifications page 17-117.
- Dimensions see page 17-137 open and 17-153 enclosed.
- Wiring Diagrams see page 17-169.
- Replacement Parts see page 17-129.
- 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 17-117.

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 Standard Auxiliary Contacts④		NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless @ = 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 3/3R② 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	—	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-Pole③

Max Hp					Enclosure											
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Half Size	Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = 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 3/3R② Industrial Use Weatherproof	
					Catalog No	$	Catalog No	$	Catalog No	$	Catalog No	$	Catalog No	$	Catalog No	$
⅓	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-Pole①

Max Hp				Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 3/3R② Industrial Use Weatherproof Class III	
							Catalog No	Price $	Catalog No	Price $	Catalog No	Price $	Catalog No	Price $
1½	1½	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	
7½	7½	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 17-169.**

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.

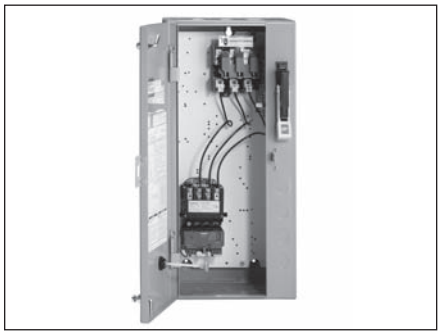
② For conduit hubs and conversion instructions, see page 17-108.

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 17-62.

Combination Heavy Duty Starters

Features and Benefits



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

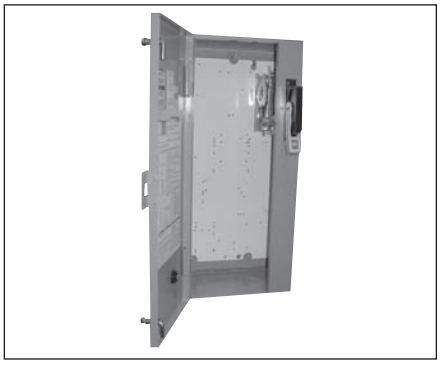
Combination starters are available in NEMA 1, 12/3/3R/4 (painted), 4/4X (stainless), 4X fiberglass and 7 & 9 enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. 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 17-113 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



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 17-22.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Standard Width Enclosure, 3 Phase, 3-Pole

Max Hp						Overload			Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 3/3R②, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	½	½	0	—	0.25–1	A	30	**17CUA92B***		**17CUA92@***		**17CUA92F***		**17CUA92N***	
½	¾	1½	2	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***	
⅛	⅛	½	½	1	—	0.25–1	A	30	**17DUA92B***		**17DUA92@***		**17DUA92F***		**17DUA92N***	
½	¾	1½	2	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***	
7½	7½	—	—	1	—	10–40	A1	60	**17DUE92B***		**17DUE92@***		**17DUE92F***		**17DUE92N***	
10	10	15	15	—	1¾	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	—	2½	25–100	B	100③	**17GUG92B***		**17GUG92@***		**17GUG92F***		**17GUG92N***	
20④	25⑤	50	50	3	—	25–100	B	100	**17HUG92B***		**17HUG92@***		**17HUG92F***		**17HUG92N***	
30	40	75	75	—	3½	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	—	400⑥	**17LPU92B***		**17LPU92E*⑦**		—	—	**17LPU92N***	
150	200	400	400	6	—	160–630	—	800	**17MPX92B***		**17MPX92E*⑦**		—	—	**17MPX92N***	
—	300	600	600	7⑨	—	400–1220	A1+CT	1200	**17NUN92B***		—	—	—	—	**17NUN92N***	
—	450	900	900	8⑩	—	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 17-108.
③ For 60A disconnect, order fusible cat. no. page 17-22.
④ For 25 HP and 200A disconnect, order fusible cat. no. page 17-22.
⑤ For 30HP and 200A disconnect, order fusible cat. no. page 17-22.
⑥ For 600A disconnect, order fusible cat. no. page 17-22.
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
⑩ 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

- 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 17-23.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240②	A
200–208	D
220–240	G
277	L
220–240/440–480②	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Extra Wide Enclosure, 3-Phase, 3-Pole

Hp						Overload			Enclosure					
									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	
200 Volts	**230 Volts**	**460 Volts**	**575 Volts**	**NEMA Size**	**Half Size**	**Amp Range**	**Frame Size**	**Disc. Amp Range**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**	**Catalog Number**	**List Price $**
⅛	⅛	⅓	½	0	—	0.25–1	A	30	**17CUA82B***		**17CUA82@***		**17CUA82N***	
½	¾	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***	
⅛	⅛	⅓	½	1	—	0.25–1	A	30	**17DUA82B***		**17DUA82@***		**17DUA82N***	
½	¾	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	—	1¾	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	100③	**17GUG82B***		**17GUG82@***		**17GUG82N***	
20④	25⑤	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 17-108.

② For 60A disconnect, order fusible cat. no. page 17-23.

③ For 25 HP and 200A disconnect, order fusible cat. no. page 17-23.

④ For 30HP and 200A disconnect, order fusible cat. no. page 17-23.

Combination Heavy Duty Starters

Non-Fusible with Ambient Compensated Bimetal Overload, Class 17



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 17-122. (3 required)
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.
- 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
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp								Enclosure							
								NEMA 1 General Purpose		NEMA 4/4X Stainless① 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	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	5	5	18	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
7½③	7½③	10	10	27	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
10	10	15	15	40	—	1¾	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
10	15	25	25	45	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
15	20	30	30	60	—	2½	100	17GP92B*81		17GP92@*81		17GP92F*81		17GP92N*81	
25④	30④	50	50	90	3	—	100	17HP92B*81		17HP92@*81		17HP92F*81		17HP92N*81	
30	40	75	75	115	—	3½	200	17IP92B*81		17IP92@*81		17IP92F*81		17IP92N*81	
40	50	100	100	135	4	—	200	17JP92B*81		17JP92@*81		17JP92F*81		17JP92N*81	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp								Enclosure					
								NEMA 1 General Purpose		NEMA 4/4X Stainless① 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	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	5	5	18	0	—	30	17CP82B*81		17CP82@*81		17CP82N*81	
7½③	7½③	10	10	27	1	—	30	17DP82B*81		17DP82@*81		17DP82N*81	
10	10	15	15	40	—	1¾	60	17EP82B*81		17EP82@*81		17EP82N*81	
10	15	25	25	45	2	—	60	17FP82B*81		17FP82@*81		17FP82N*81	
15	20	30	30	60	—	2½	100	17GP82B*81		17GP82@*81		17GP82N*81	
25④	30④	50	50	90	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						Enclosure							
						NEMA 1 General Purpose		NEMA 4/4X Stainless③ 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,③ NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
1	2	18	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
2	3	27	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
3	5	35	1P	—	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
3	7½	45	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
5	10	60	—	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 17-108.

② For 60A disc, order fusible cat. no. page 17-24.
③ For 200A disc, order fusible cat. no. page 17-24.

Combination Heavy Duty Starters

Fusible with Solid State Overload, Class 17

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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Standard Width Enclosure, 3-Phase, 3-Pole⑤

Max Hp						Overload				Enclosure							
										NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 3/3R②, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Fuse Clip Amp/Volts	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
1/8	1/8	—	—	0	—	0.25–1	A	30	30A/250V	17CUA92B*10		17CUA92@*10		17CUA92F*10		17CUA92N*10	
—	—	1/3	1/2	0	—	0.25–1	A	30	30A/600V	17CUA92B*11		17CUA92@*11		17CUA92F*11		17CUA92N*11	
1/2	3/4	—	—	0	—	0.75–3.4	A	30	30A/250V	17CUB92B*10		17CUB92@*10		17CUB92F*10		17CUB92N*10	
—	—	1½	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*10	
1/8	1/8	—	—	1	—	0.25–1	A	30	30A/250V	17DUA92B*10		17DUA92@*10		17DUA92F*10		17DUA92N*10	
—	—	1/3	1/2	1	—	0.25–1	A	30	30A/600V	17DUA92B*11		17DUA92@*11		17DUA92F*11		17DUA92N*11	
1/2	3/4	—	—	1	—	0.75–3.4	A	30	30A/250V	17DUB92B*10		17DUB92@*10		17DUB92F*10		17DUB92N*10	
—	—	1½	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	
5	5	—	—	1	—	10–40	A1	30	30A/250V	17DUE92B*10		17DUE92@*10		17DUE92F*10		17DUE92N*10	
7½	7½	—	—	1	—	10–40	A1	60	60A/250V	17DUE92B*12		17DUE92@*12		17DUE92F*12		17DUE92N*12	
—	—	15	15	—	1¾	10–40	A1	60	60A/600V	17EUE92B*13		17EUE92@*13		17EUE92F*13		17EUE92N*13	
10	10	—	—	—	1¾	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	—	2½	25–100	B	60	60A/600V	17GUG92B*13		17GUG92@*13		17GUG92F*13		17GUG92N*13	
—	—	30	—	—	2½	25–100	B	100	100A/600V	17GUG92B*15		17GUG92@*15		17GUG92F*15		17GUG92N*15	
15	20	—	—	—	2½	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	—	—	—	3½	50–200	B	200	200A/250V	17IUH92B*16		17IUH92@*16		17IUH92F*16		17IUH92N*16	
—	—	75	75	—	3½	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		17LPU92E*18④		—	—	17LPU92N*18	
—	100	—	—	5	—	55–250	—	600	600A/250V③	17LPU92B*20		17LPU92E*20④		—	—	17LPU92N*20	
—	—	—	125	5	—	55–250	—	400	200A/600V	17LPU92B*17		17LPU92E*17④		—	—	17LPU92N*17	
—	—	200	200	5	—	55–250	—	400	400A/600V	17LPU92B*19		17LPU92E*19④		—	—	17LPU92N*19	
—	—	200	—	5	—	55–250	—	600	600A/600V③	17LPU92B*21		17LPU92E*21④		—	—	17LPU92N*21	
150	200	—	—	6	—	160–630	—	600	600A/250V	17MPX92B*20		17MPX92E*20④		—	—	17MPX92N*20	
—	—	400	400	6	—	160–630	—	600	600A/600V	17MPX92B*21		17MPX92E*21④		—	—	17MPX92N*21	
—	—	400	400	6	—	160–630	—	800	800A/600V	17MPX92B*23		17MPX92E*23④		—	—	17MPX92N*23	
—	—	600	600	7⑥	—	400–1220	A1+CT	1200	1200A/600V	17NUN92B*24		—	—	—	—	17NUN92N*24	
—	—	900	900	8⑦	—	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 17-108.
③ Use Class J fuses only.
④ Enclosure is NEMA Type 4 (painted steel).
⑤ Single phase wiring page 17-169.
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

- 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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.

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 17-117.

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp						Overload				Enclosure					
										NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight, @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R①, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Range	Fuse Clip Amp/Volts	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	__	__	0	__	0.25–1	A	30	30A/250V	**17CUA82B*10**		**17CUA82@*10**		**17CUA82N*10**	
__	__	⅓	½	0	__	0.25–1	A	30	30A/600V	**17CUA82B*11**		**17CUA82@*11**		**17CUA82N*11**	
½	¾	__	__	0	__	0.75–3.4	A	30	30A/250V	**17CUB82B*10**		**17CUB82@*10**		**17CUB82N*10**	
__	__	1½	2	0	__	0.75–3.4	A	30	30A/600V	**17CUB82B*11**		**17CUB82@*11**		**17CUB82N*11**	
2	2	__	__	0	__	3–12	A1	30	30A/250V	**17CUC82B*10**		**17CUC82@*10**		**17CUC82N*10**	
__	__	5	5	0	__	3–12	A1	30	30A/600V	**17CUC82B*11**		**17CUC82@*11**		**17CUC82N*11**	
3	3	__	__	0	__	5.5–22	A1	30	30A/250V	**17CUD82B*10**		**17CUD82@*10**		**17CUD82N*10**	
⅛	⅛	__	__	1	__	0.25–1	A	30	30A/250V	**17DUA82B*10**		**17DUA82@*10**		**17DUA82N*10**	
__	__	⅓	½	1	__	0.25–1	A	30	30A/600V	**17DUA82B*11**		**17DUA82@*11**		**17DUA82N*11**	
½	¾	__	__	1	__	0.75–3.4	A	30	30A/250V	**17DUB82B*10**		**17DUB82@*10**		**17DUB82N*10**	
__	__	1½	2	1	__	0.75–3.4	A	30	30A/600V	**17DUB82B*11**		**17DUB82@*11**		**17DUB82N*11**	
2	2	__	__	1	__	3–12	A1	30	30A/250V	**17DUC82B*10**		**17DUC82@*10**		**17DUC82N*10**	
__	__	5	5	1	__	3–12	A1	30	30A/600V	**17DUC82B*11**		**17DUC82@*11**		**17DUC82N*11**	
3	3	__	__	1	__	5.5–22	A1	30	30A/250V	**17DUD82B*10**		**17DUD82@*10**		**17DUD82N*10**	
__	__	10	10	1	__	5.5–22	A1	30	30A/600V	**17DUD82B*11**		**17DUD82@*11**		**17DUD82N*11**	
5	5	__	__	1	__	10–40	A1	30	30A/250V	**17DUE82B*10**		**17DUE82@*10**		**17DUE82N*10**	
7½	7½	__	__	1	__	10–40	A1	60	60A/250V	**17DUE82B*12**		**17DUE82@*12**		**17DUE82N*12**	
__	__	15	15	__	1¾	10–40	A1	60	60A/600V	**17EUE82B*13**		**17EUE82@*13**		**17EUE82N*13**	
10	10	__	__	__	1¾	10–40	A1	60	60A/250V	**17EUE82B*12**		**17EUE82@*12**		**17EUE82N*12**	
10	15	__	__	2	__	13–52	B	60	60A/250V	**17FUF82B*12**		**17FUF82@*12**		**17FUF82N*12**	
__	__	25	25	2	__	13–52	B	60	60A/600V	**17FUF82B*13**		**17FUF82@*13**		**17FUF82N*13**	
__	__	__	30	__	2½	25–100	B	60	60A/600V	**17GUG82B*13**		**17GUG82@*13**		**17GUG82N*13**	
__	__	30	__	__	2½	25–100	B	100	100A/600V	**17GUG82B*15**		**17GUG82@*15**		**17GUG82N*15**	
15	20	__	__	__	2½	25–100	B	100	100A/250V	**17GUG82B*14**		**17GUG82@*14**		**17GUG82N*14**	
20	25	__	__	3	__	25–100	B	100	100A/250V	**17HUG82B*14**		**17HUG82@*14**		**17HUG82N*14**	
__	__	50	50	3	__	25–100	B	100	100A/600V	**17HUG82B*15**		**17HUG82@*15**		**17HUG82N*15**	
25	30	__	__	3	__	25–100	B	200	200A/250V	**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 17-108.

Combination Heavy Duty Starters

Fusible with Ambient Compensated Bimetal Overload, Class 17

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 17-122. (3 required)
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.
- 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 17-117.

Standard Width Enclosure, 3-Phase, 3-Pole②

Max Hp									Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless① 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	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	—	—	18	0	—	30	30A/250V	17CP92B*1081		17CP92@*1081		17CP92F*1081		17CP92N*1081	
—	—	5	5	18	0	—	30	30A/600V	17CP92B*1181		17CP92@*1181		17CP92F*1181		17CP92N*1181	
5	5	—	—	27	1	—	30	30A/250V	17DP92B*1081		17DP92@*1081		17DP92F*1081		17DP92N*1081	
—	—	10	10	27	1	—	30	30A/600V	17DP92B*1181		17DP92@*1181		17DP92F*1181		17DP92N*1181	
7½	7½	—	—	27	1	—	60	60A/250V	17DP92B*1281		17DP92@*1281		17DP92F*1281		17DP92N*1281	
10	10	—	—	40	—	1¾	60	60A/250V	17EP92B*1281		17EP92@*1281		17EP92F*1281		17EP92N*1281	
—	—	15	15	40	—	1¾	60	60A/600V	17EP92B*1381		17EP92@*1381		17EP92F*1381		17EP92N*1381	
10	15	—	—	45	2	—	60	60A/250V	17FP92B*1281		17FP92@*1281		17FP92F*1281		17FP92N*1281	
—	—	25	25	45	2	—	60	60A/600V	17FP92B*1381		17FP92@*1381		17FP92F*1381		17FP92N*1381	
—	—	—	30	60	—	2½	60	60A/600V	17GP92B*1381		17GP92@*1381		17GP92F*1381		17GP92N*1381	
—	—	30	—	60	—	2½	100	100A/600V	17GP92B*1581		17GP92@*1581		17GP92F*1581		17GP92N*1581	
15	20	—	—	60	—	2½	100	100A/250V	17GP92B*1481		17GP92@*1481		17GP92F*1481		17GP92N*1481	
20	25	—	—	90	3	—	100	100A/250V	17HP92B*1481		17HP92@*1481		17HP92F*1481		17HP92N*1481	
—	—	50	50	90	3	—	100	100A/600V	17HP92B*1581		17HP92@*1581		17HP92F*1581		17HP92N*1581	
25	30	—	—	90	3	—	200	200A/250V	17HP92B*1681		17HP92@*1681		17HP92F*1681		17HP92N*1681	
30	40	—	—	115	—	3½	200	200A/250V	17IP92B*1681		17IP92@*1681		17IP92F*1681		17IP92N*1681	
—	—	75	75	115	—	3½	200	200A/600V	17IP92B*1781		17IP92@*1781		17IP92F*1781		17IP92N*1781	
40	50	—	—	135	4	—	200	200A/250V	17JP92B*1681		17JP92@*1681		17JP92F*1681		17JP92N*1681	
—	—	100	100	135	4	—	200	200A/600V	17JP92B*1781		17JP92@*1781		17JP92F*1781		17JP92N*1781	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp									Enclosure					
									NEMA 1 General Purpose		NEMA 4/4X Stainless① 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	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	—	—	18	0	—	30	30A/250V	17CP82B*1081		17CP82@*1081		17CP82N*1081	1405.00
—	—	5	5	18	0	—	30	30A/600V	17CP82B*1181		17CP82@*1181		17CP82N*1181	1423.00
5	5	—	—	27	1	—	30	30A/250V	17DP82B*1081		17DP82@*1081		17DP82N*1081	1447.00
—	—	10	10	27	1	—	30	30A/600V	17DP82B*1181		17DP82@*1181		17DP82N*1181	1465.00
7½	7½	—	—	27	1	—	60	60A/250V	17DP82B*1281		17DP82@*1281		17DP82N*1281	1465.00
10	10	—	—	40	—	1¾	60	60A/250V	17EP82B*1281		17EP82@*1281		17EP82N*1281	1595.00
—	—	15	15	40	—	1¾	60	60A/600V	17EP82B*1381		17EP82@*1381		17EP82N*1381	1612.00
10	15	—	—	45	2	—	60	60A/250V	17FP82B*1281		17FP82@*1281		17FP82N*1281	2034.00
—	—	25	25	45	2	—	60	60A/600V	17FP82B*1381		17FP82@*1381		17FP82N*1381	2051.00
—	—	—	30	60	—	2½	60	60A/600V	17GP82B*1381		17GP82@*1381		17GP82N*1381	2998.00
—	—	30	—	60	—	2½	100	100A/600V	17GP82B*1581		17GP82@*1581		17GP82N*1581	3075.00
15	20	—	—	60	—	2½	100	100A/250V	17GP82B*1481		17GP82@*1481		17GP82N*1481	3075.00
20	25	—	—	90	3	—	100	100A/250V	17HP82B*1481		17HP82@*1481		17HP82N*1481	3471.00
—	—	50	50	90	3	—	100	100A/600V	17HP82B*1581		17HP82@*1581		17HP82N*1581	3471.00
25	30	—	—	90	3	—	200	200A/250V	17HP82B*1681		17HP82@*1681		17HP82N*1681	3987.00

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 17-108.

② Single phase wiring page 17-169.

Combination Heavy Duty Starters

MCP Type with Solid State 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.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Overload		Enclosure									
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = 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 3/3R②, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	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	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*	
½	½	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 ½	10	1	—	25	5.5–22	A1	18DUD92B*		18DUD92@*		18DUD92F*		18DUD92H*		18DUD92N*	
7 ½	7 ½	10	—	1	—	30	10–40	A1	18DUE92B*		18DUE92@*		18DUE92F*		18DUE92H*		18DUE92N*	
—	—	15	15	—	1¾	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 ½	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 ½	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	—	18LPU92B*		18LPU92E*③		—	—	—	—	18LPU92N*	
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	7④	—	800	400–1220	A1+CT	18NUV92B*		—	—	—	—	—	—	18NUV92N*	
—	300	600	600	7④	—	1000	400–1220	A1+CT	18NUY92B*		—	—	—	—	—	—	18NUY92N*	
—	400	800	800	8⑤	—	1200	400–1220	A1+CT	18PUW92B*		—	—	—	—	—	—	18PUW92N*	
—	450	900	900	8⑤	—	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 17-108.

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

- 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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-155.
- Wiring Diagrams see page 17-170.
- Replacement Parts see page 17-129.

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 17-117.

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp							Overload		Enclosure					
									NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R①, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	½	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***	
½	½	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	7½	10	1	—	25	5.5–22	A1	**18DUD82B***		**18DUD82@***		**18DUD82N***	
7½	7½	10	—	1	—	30	10–40	A1	**18DUE82B***		**18DUE82@***		**18DUE82N***	
—	—	15	15	—	1¾	40	10–40	A1	**18EUE82B***		**18EUE82@***		**18EUE82N***	
10	15	25	25	2	—	50	13–52	B	**18FUF82B***		**18FUF82@***		**18FUF82N***	
15	20	30	30	—	2½	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 17-108.

Combination Heavy Duty Starters

MCP Type with Ambient Compensated Bimetal Overload, Class 18



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 17-122. (3 required)
- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-155.
- ► Wiring Diagrams see page 17-170.
- ► Replacement Parts see page 17-129.
- ► 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 17-117.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp								Enclosure									
								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 Class I Groups C & D Class II Groups E, F & G		**NEMA 7 & 9** **NEMA 3 & 4** 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	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	½	1	1	18	0	—	3	18CP92BA*81		18CP92@A*81		18CP92FA*81		18CP92HA*81		18CP92NA*81	
1	1	3	3	18	0	—	10	18CP92BB*81		18CP92@B*81		18CP92FB*81		18CP92HB*81		18CP92NB*81	
3	3	5	5	18	0	—	25	18CP92BC*81		18CP92@C*81		18CP92FC*81		18CP92HC*81		18CP92NC*81	
½	½	1	1	27	1	—	3	18DP92BA*81		18DP92@A*81		18DP92FA*81		18DP92HA*81		18DP92NA*81	
1	1	3	3	27	1	—	10	18DP92BB*81		18DP92@B*81		18DP92FB*81		18DP92HB*81		18DP92NB*81	
3	3	7½	7½	27	1	—	25	18DP92BD*81		18DP92@D*81		18DP92FD*81		18DP92HD*81		18DP92ND*81	
7½	7½	10	10	27	1	—	30	18DP92BE*81		18DP92@E*81		18DP92FE*81		18DP92HE*81		18DP92NE*81	
—	—	15	15	40	—	1¾	40	18EP92BF*81		18EP92@F*81		18EP92FF*81		18EP92HF*81		18EP92NF*81	
10	10	—	—	40	—	1¾	50	18EP92BG*81		18EP92@G*81		18EP92FG*81		18EP92HG*81		18EP92NG*81	
—	—	20	20	45	2	—	40	18FP92BH*81		18FP92@H*81		18FP92FH*81		18FP92HH*81		18FP92NH*81	
10	15	25	25	45	2	—	50	18FP92BJ*81		18FP92@J*81		18FP92FJ*81		18FP92HJ*81		18FP92NJ*81	
10	15	30	30	60	—	2½	50	18GP92BK*81		18GP92@K*81		18GP92FK*81		18GP92HK*81		18GP92NK*81	
15	20	—	—	60	—	2½	100	18GP92BL*81		18GP92@L*81		18GP92FL*81		18GP92HL*81		18GP92NL*81	
—	—	30	30	90	3	—	50	18HP92BM*81		18HP92@M*81		18HP92FM*81		18HP92HM*81		18HP92NM*81	
25	30	50	50	90	3	—	125	18HP92BN*81		18HP92@N*81		18HP92FN*81		18HP92HN*81		18HP92NN*81	
30	40	75	75	115	—	3½	125	18IP92BP*81		18IP92@P*81		18IP92FP*81		18IP92HP*81		18IP92NP*81	
40	50	100	100	135	4	—	150	18JP92BR*81		18JP92@R*81		18JP92FR*81		18JP92HR*81		18JP92NR*81	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp								Enclosure					
								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	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	½	1	1	18	0	—	3	18CP82BA*81		18CP82@A*81		18CP82NA*81	
1	1	3	3	18	0	—	10	18CP82BB*81		18CP82@B*81		18CP82NB*81	
3	3	5	5	18	0	—	25	18CP82BC*81		18CP82@C*81		18CP82NC*81	
½	½	1	1	27	1	—	3	18DP82BA*81		18DP82@A*81		18DP82NA*81	
1	1	3	3	27	1	—	10	18DP82BB*81		18DP82@B*81		18DP82NB*81	
3	3	7½	7½	27	1	—	25	18DP82BD*81		18DP82@D*81		18DP82ND*81	
7½	7½	10	10	27	1	—	30	18DP82BE*81		18DP82@E*81		18DP82NE*81	
—	—	15	15	40	—	1¾	40	18EP82BF*81		18EP82@F*81		18EP82NF*81	
10	10	—	—	40	—	1¾	50	18EP82BG*81		18EP82@G*81		18EP82NG*81	
—	—	20	20	45	2	—	40	18FP82BH*81		18FP82@H*81		18FP82NH*81	
10	15	25	25	45	2	—	50	18FP82BJ*81		18FP82@J*81		18FP82NJ*81	
10	15	30	30	60	—	2½	50	18GP82BK*81		18GP82@K*81		18GP82NK*81	
15	20	—	—	60	—	2½	100	18GP82BL*81		18GP82@L*81		18GP82NL*81	
—	—	30	30	90	3	—	50	18HP82BM*81		18HP82@M*81		18HP82NM*81	
25	30	50	50	90	3	—	125	18HP82BN*81		18HP82@N*81		18HP82NN*81	

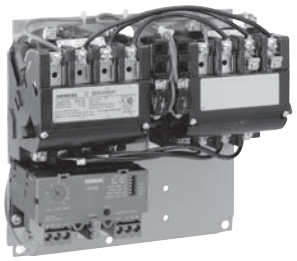
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 17-108.

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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-139 open and 17-158 enclosed.
- Wiring Diagrams see page 17-172.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp						Overload		Enclosure											
								Open Type Standard Auxiliary Contacts⑥		**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**② Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	00	—	0.25–1	A	**22BUA32A***		**22BUA32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
½	¾	1½	2	00	—	0.75–3.4	A	**22BUB32A***		**22BUB32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
1½	1½	2	—	00	—	3–12	A1	**22BUC32A***		**22BUC32B***		**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—	**Use Size 0**	—
⅛	⅛	⅓	1⁄2	0	—	0.25–1	A	**22CUA32A***		**22CUA32B***		**22CUA32W***		**22CUA32F***		**22CUA32H***		**22CUA320***	
½	¾	1½	2	0	—	0.75–3.4	A	**22CUB32A***		**22CUB32B***		**22CUB32W***		**22CUB32F***		**22CUB32H***		**22CUB320***	
2	2	5	5	0	—	3–12	A1	**22CUC32A***		**22CUC32B***		**22CUC32W***		**22CUC32F***		**22CUC32H***		**22CUC320***	
3	3	—	—	0	—	5.5–22	A1	**22CUD32A***		**22CUD32B***		**22CUD32W***		**22CUD32F***		**22CUD32H***		**22CUD320***	
⅛	⅛	⅓	½	1	—	0.25–1	A	**22DUA32A***		**22DUA32B***		**22DUA32W***		**22DUA32F***		**22DUA32H***		**22DUA320***	
½	¾	1½	2	1	—	0.75–3.4	A	**22DUB32A***		**22DUB32B***		**22DUB32W***		**22DUB32F***		**22DUB32H***		**22DUB320***	
2	2	5	5	1	—	3–12	A1	**22DUC32A***		**22DUC32B***		**22DUC32W***		**22DUC32F***		**22DUC32H***		**22DUC320***	
3	3	10	10	1	—	5.5–22	A1	**22DUD32A***		**22DUD32B***		**22DUD32W***		**22DUD32F***		**22DUD32H***		**22DUD320***	
7½	7½	—	—	1	—	10–40	A1	**22DUE32A***		**22DUE32B***		**22DUE32W***		**22DUE32F***		**22DUE32H***		**22DUE320***	
10	10	15	15	—	1¾	10–40	A1	**22EUE32A***		**22EUE32B***		**22EUE32W***		**22EUE32F***		**22EUE32H***		**22EUE320***	
10	15	25	25	2	—	13–52	B	**22FUF32A***		**22FUF32B***		**22FUF32W***		**22FUF32F***		**22FUF32H***		**22FUF320***	
15	20	30	30	—	2½	25–100	B	**22GUG32A***		**22GUG32B***		**22GUG32W***		**22GUG32F***		**22GUG32H***		**22GUG320***	
25	30	50	50	3	—	25–100	B	**22HUG32A***		**22HUG32B***		**22HUG32W***		**22HUG32F***		**22HUG32H***		**22HUG320***	
30	40	75	75	—	3½	50–200	B	**22IUH32A***		**22IUH32B***		**22IUH32W***		**22IUH32F***		**22IUH32H***		**22IUH320***	
40	50	100	100	4	—	50–200	B	**22JUH32A***		**22JUH32B***		**22JUH32W***		**22JUH32F***		**22JUH32H***		**22JUH320***	
75	100	200	200	5	—	55–250	—	**22LPU32A***		**22LPU32B***		**22LPU32E***③		—	—	—	—	**22LPU320***	
150	200	400	400	6	—	160–630	—	**22MPX32A***		**22MPX32B***		**22MPX32E***③		—	—	—	—	**22MPX320***	
—	300	600	600	7④	—	400–1220	A1+CT	**22NUN32A***		**22NUN32B***		—	—	—	—	—	—	**22NUN320***	
—	450	900	900	8⑤	—	400–1220	A1+CT	**22PUN32A***		**22PUN32B***		—	—	—	—	—	—	**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 17-108.

③ Enclosure is rated only NEMA 4 (painted steel).

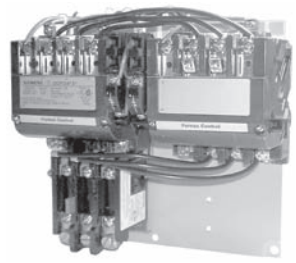
④ Only available
F coil 100-250V AC 50/60Hz, or DC
H coil 150-500V AC 50/60Hz, or DC

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 17-122. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.
- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see pages 17-139 open and 17-158 enclosed.
- ► Wiring Diagrams see page 17-171.
- ► Replacement Parts see page 17-129.
- ► 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 17-117.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure											
							Open Type③		NEMA 1 General Purpose		NEMA 4/4X Stainless① 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 12① NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	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		22CP320*81	
7½	7½	10	10	27	1	—	22DP32A*81		22DP32B*81		22DP32W*81		22DP32F*81		22DP32H*81		22DP320*81	
10	10	15	15	40	—	1¾	22EP32A*81		22EP32B*81		22EP32W*81		22EP32F*81		22EP32H*81		22EP320*81	
10	15	25	25	45	2	—	22FP32A*81		22FP32B*81		22FP32W*81		22FP32F*81		22FP32H*81		22FP320*81	
15	20	30	30	60	—	2½	22GP32A*81		22GP32B*81		22GP32W*81		22GP32F*81		22GP32H*81		22GP320*81	
25	30	50	50	90	3	—	22HP32A*81		22HP32B*81		22HP32W*81		22HP32F*81		22HP32H*81		22HP320*81	
30	40	75	75	115	—	3½	22IP32A*81		22IP32B*81		22IP32W*81		22IP32F*81		22IP32H*81		22IP320*81	
40	50	100	100	135	4	—	22JG32A*81		22JG32B*81		22JG32W*81		22JG32F*81		22JG32H*81		22JG320*81	

Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole②

Max Hp				Enclosure											
				Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless① 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 12① NEMA 3/3R Industrial Use Weatherproof	
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅓	1	9	00	22BP12A*81		22BP12B*81		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		22CP120*81	
2	3	27	1	22DP12A*81		22DP12B*81		22DP12W*81		22DP12F*81		22DP12H*81		22DP120*81	
3	5	35	1P	22EP12A*81		22EP12B*81		22EP12W*81		22EP12F*81		22EP12H*81		22EP120*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 17-108.
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

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 17-122.
- Fuse clips see page 17-118.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-160.
- Wiring Diagrams see page 17-173.
- Replacement Parts see page 17-129.
- For NO/NC SPDT contact on overload, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp						Overload			Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Disc. Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	½	½	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***	
⅛	⅛	½	½	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	—	1¾	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	—	3½	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	7④	—	400–1220	A1+CT	1200	**25NUN92B***		—	—	—	—	**25NUN92N***	
—	450	900	900	8⑤	—	400–1220	A1+CT	1600	**25PUN92B***		—	—	—	—	**25PUN92N***	

Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

Max Hp								Enclosure							
								NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12② NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	5	5	18	0	—	30	**25CP92B*81**		**25CP92W*81**		**25CP92F*81**		**25CP92N*81**	
7½	7½	10	10	27	1	—	30	**25DP92B*81**		**25DP92W*81**		**25DP92F*81**		**25DP92N*81**	
10	10	15	15	40	—	1¾	60	**25EP92B*81**		**25EP92W*81**		**25EP92F*81**		**25EP92N*81**	
10	15	25	25	45	2	—	60	**25FP92B*81**		**25FP92W*81**		**25FP92F*81**		**25FP92N*81**	
15	20	30	30	60	—	2½	100	**25GP92B*81**		**25GP92W*81**		**25GP92F*81**		**25GP92N*81**	
25	30	50	50	90	3	—	100	**25HP92B*81**		**25HP92W*81**		**25HP92F*81**		**25HP92N*81**	
30	40	75	75	115	—	3½	200	**25IP92B*81**		**25IP92W*81**		**25IP92F*81**		**25IP92N*81**	
40	50	100	100	135	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 17-108.

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 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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-160.
- Wiring Diagrams see page 17-173.
- Replacement Parts see page 17-129.
- 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
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp							Overload		Enclosure									
									NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 3/3R②, NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	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	—	1¼	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	—	26LPU92B*		26LPU92E*③		—	—	—	—	26LPU92N*	
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	8⑤	—	1200	400–1220	A1+CT	26PUW92B*		—	—	—	—	—	—	26PUW92N*	
—	450	900	900	8⑤	—	1600	400–1220	A1+CT	26PUZ92B*		—	—	—	—	—	—	26PUZ92N*	

Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

½	½	1	1	0	—	3	18		26CP92BA*81		26CP92WA*81		26CP92FA*81		26CP92HA*81		26CP92NA*81	
1	1	3	3	0	—	10	18		26CP92BB*81		26CP92WB*81		26CP92FB*81		26CP92HB*81		26CP92NB*81	
3	3	5	5	0	—	25	18		26CP92BC*81		26CP92WC*81		26CP92FC*81		26CP92HC*81		26CP92NC*81	
½	½	1	1	1	—	3	27		26DP92BA*81		26DP92WA*81		26DP92FA*81		26DP92HA*81		26DP92NA*81	
1	1	3	3	1	—	10	27		26DP92BB*81		26DP92WB*81		26DP92FB*81		26DP92HB*81		26DP92NB*81	
3	3	7½	7½	1	—	25	27		26DP92BD*81		26DP92WD*81		26DP92FD*81		26DP92HD*81		26DP92ND*81	
7½	7½	10	10	1	—	30	27		26DP92BE*81		26DP92WE*81		26DP92FE*81		26DP92HE*81		26DP92NE*81	
—	—	15	15	—	1¾	40	40		26EP92BF*81		26EP92WF*81		26EP92FF*81		26EP92HF*81		26EP92NF*81	
10	10	—	—	—	1¾	50	40		26EP92BG*81		26EP92WG*81		26EP92FG*81		26EP92HG*81		26EP92NG*81	
—	—	20	20	2	—	40	45		26FP92BH*81		26FP92WH*81		26FP92FH*81		26FP92HH*81		26FP92NH*81	
10	15	25	25	2	—	50	45		26FP92BJ*81		26FP92WJ*81		26FP92FJ*81		26FP92HJ*81		26FP92NJ*81	
10	15	30	30	—	2½	50	60		26GP92BK*81		26GP92WK*81		26GP92FK*81		26GP92HK*81		26GP92NK*81	
15	20	—	—	—	2½	100	60		26GP92BL*81		26GP92WL*81		26GP92FL*81		26GP92HL*81		26GP92NL*81	
—	—	30	30	3	—	50	90		26HP92BM*81		26HP92WM*81		26HP92FM*81		26HP92HM*81		26HP92NM*81	
25	30	50	50	3	—	125	90		26HP92BN*81		26HP92WN*81		26HP92FN*81		26HP92HN*81		26HP92NN*81	
30	40	75	75	—	3½	125	115		26IP92BP*81		26IP92WP*81		26IP92FP*81		26IP92HP*81		26IP92NP*81	
40	50	100	100	4	—	150	135		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 17-108.

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

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.

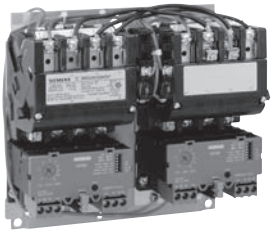
These controls may be modified for compelling or acceleration pilot control.

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.

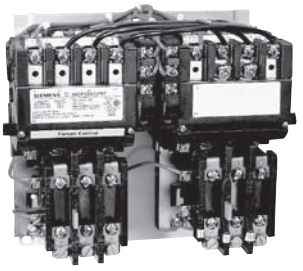
Compelling Control requires that the motor always be started at the lower speed and that the push buttons be operated in speed sequence to go to the next higher speed. To change to a lower speed, the stop button must be depressed and then the push buttons operated in speed sequence until the desired speed is reached. Compelling control can be added from the factory modification section page 17-120.

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 17-120.

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 17-120.



Open Style Two Speed Starter
(ESP100 Overload)

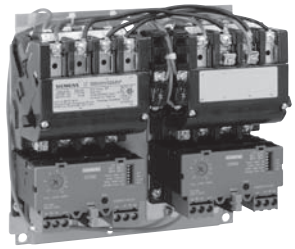


Open Style Two Speed Starter
(Ambient Compensated Overload)

Two Speed Heavy Duty Starters

Constant or Variable Torque with Solid Overload, Class 30

Selection



2S2W Starter
(ESP200 Overload)

Ordering Information

- 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.②
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-147.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.

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 17-117.

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						Overload		Enclosure									
								Open Type Standard Auxiliary Contacts③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	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†32A2V*		30CUB†32B2V*		30CUB†32W2V*		30CUC†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	—	1¾	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						Overload		Enclosure									
								Open Type③ Standard Auxiliary Contacts		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel 316 Stainless Steel (Optional)		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	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	—	1¾	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).

① For conduit hubs and conversion instructions, see page 17-108.

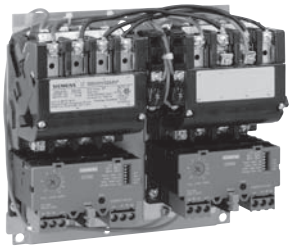
② If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts 30C-30E 4th pole built-in 30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant HP with Solid Overload, Class 30

Selection



2S2W Starter
(ESP200 Overload)

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 FLA in High/Low Speed FLA Table.②
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-147.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.

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 17-117.

High/Low Speed FLA Table②

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

* 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 Contacts③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R① 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††3202H*	
5	5	7½	7½	1	—	30DU††32A2H*		30DU††32B2H*		30DU††32W2H*		30DU††32F2H*		30DU††3202H*	
7½	7½	10	10	—	1¾	30EU††32A2H*		30EU††32B2H*		30EU††32W2H*		30EU††32F2H*		30EU††3202H*	
7½	10	20	20	2	—	30FU††32A2H*		30FU††32B2H*		30FU††32W2H*		30FU††32F2H*		30FU††3202H*	
10	15	25	25	—	2½	30GU††32A2H*		30GU††32B2H*		30GU††32W2H*		30GU††32F2H*		30GU††3202H*	
20	25	40	40	3	—	30HU††32A2H*		30HU††32B2H*		30HU††32W2H*		30HU††32F2H*		30HU††3202H*	
25	30	50	50	—	3½	30IU††32A2H*		30IU††32B2H*		30IU††32W2H*		30IU††32F2H*		30IU††3202H*	
30	40	75	75	4	—	30JU††32A2H*		30JU††32B2H*		30JU††32W2H*		30JU††32F2H*		30JU††3202H*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
						Open Type Standard Auxiliary Contacts③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R① 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††3201H*	
5	5	7½	7½	1	—	30DU††32A1H*		30DU††32B1H*		30DU††32W1H*		30DU††32F1H*		30DU††3201H*	
7½	7½	10	10	—	13/4	30EU††32A1H*		30EU††32B1H*		30EU††32W1H*		30EU††32F1H*		30EU††3201H*	
7½	10	20	20	2	—	30FU††32A1H*		30FU††32B1H*		30FU††32W1H*		30FU††32F1H*		30FU††3201H*	
10	15	25	25	—	2½	30GU††32A1H*		30GU††32B1H*		30GU††32W1H*		30GU††32F1H*		30GU††3201H*	
20	25	40	40	3	—	30HU††32A1H*		30HU††32B1H*		30HU††32W1H*		30HU††32F1H*		30HU††3201H*	
25	30	50	50	—	3½	30IU††32A1H*		30IU††32B1H*		30IU††32W1H*		30IU††32F1H*		30IU††3201H*	
30	40	75	75	4	—	30JU††32A1H*		30JU††32B1H*		30JU††32W1H*		30JU††32F1H*		30JU††3201H*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

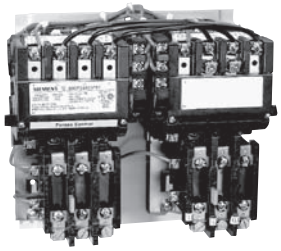
① For conduit hubs and conversion instructions, see page 17-108.

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 17-122 (6 required)②
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see pages 17-140 open and 17-147 enclosed.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.
- 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 17-117.

One Winding Consequent Pole, 3 Phase (Constant or Variable Torque)

Max Hp				Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure									
							Open Type③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12① NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts				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		30CP3202V*81	
7½	7½	10	10	27	1	—	30DP32A2V*81		30DP32B2V*81		30DP32W2V*81		30DP32F2V*81		30DP3202V*81	
10	10	15	15	40	—	1¾	30EP32A2V*81		30EP32B2V*81		30EP32W2V*81		30EP32F2V*81		30EP3202V*81	
10	15	25	25	45	2	—	30FP32A2V*81		30FP32B2V*81		30FP32W2V*81		30FP32F2V*81		30FP3202V*81	
15	20	30	30	60	—	2½	30GP32A2V*81		30GP32B2V*81		30GP32W2V*81		30GP32F2V*81		30GP3202V*81	
25	30	50	50	90	3	—	30HP32A2V*81		30HP32B2V*81		30HP32W2V*81		30HP32F2V*81		30HP3202V*81	
30	40	75	75	115	—	3½	30IP32A2V*81		30IP32B2V*81		30IP32W2V*81		30IP32F2V*81		30IP3202V*81	
40	50	100	100	135	4	—	30JG32A2V*81		30JG32B2V*81		30JG32W2V*81		30JG32F2V*81		30JG3202V*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure									
							Open Type③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12① NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts				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		30CP3201V*81	
7½	7½	10	10	27	1	—	30DP32A1V*81		30DP32B1V*81		30DP32W1V*81		30DP32F1V*81		30DP3201V*81	
10	10	15	15	40	—	1¾	30EP32A1V*81		30EP32B1V*81		30EP32W1V*81		30EP32F1V*81		30EP3201V*81	
10	15	25	25	45	2	—	30FP32A1V*81		30FP32B1V*81		30FP32W1V*81		30FP32F1V*81		30FP3201V*81	
15	20	30	30	60	—	2½	30GP32A1V*81		30GP32B1V*81		30GP32W1V*81		30GP32F1V*81		30GP3201V*81	
25	30	50	50	90	3	—	30HP32A1V*81		30HP32B1V*81		30HP32W1V*81		30HP32F1V*81		30HP3201V*81	
30	40	75	75	115	—	3½	30IP32A1V*81		30IP32B1V*81		30IP32W1V*81		30IP32F1V*81		30IP3201V*81	
40	50	100	100	135	4	—	30JG32A1V*81		30JG32B1V*81		30JG32W1V*81		30JG32F1V*81		30JG3201V*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 17-108.

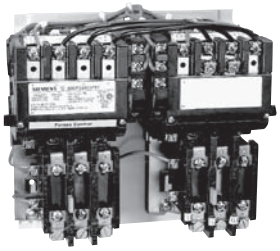
② If motor FLA are unknown, select heater elements on the basis that low speed FLA will be no greater than 50% of high speed FLA.

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 17-122 (6 required)②
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see pages 17-140 open and 17-147 enclosed.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.
- 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 17-117.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp							Enclosure									
							Open Type③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12① NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	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	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							Enclosure									
							Open Type③		NEMA 1 General Purpose		NEMA 4/4X Stainless① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12① NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	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	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 17-108.
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.③
- Fuse clips see page 17-118.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

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	0-1 3/4	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						Overload		Disc.	Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Amp Range	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†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*	
½	¾	1½	1½	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*	
7½	7½	—	—	1	—	10–40	A1	60	32DUE†92B2V2*		32DUE†92W2V2*		32DUE†92F2V2*		32DUE†92N2V2*	
10	10	15	15	—	1¾	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	—	2½	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	—	3½	50–200	B	200	32IUH†92B2V2*		32IUH†92W2V2*		32IUH†92F2V2*		32IUH†92N2V2*	
40	50	100	100	4	—	50–200	B	200	32JUH†92B2V2*		32JUH†92W2V2*		32JUH†92F2V2*		32JUH†92N2V2*	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp						Overload		Disc.	Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Amp Range	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	—	1¾	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 17-108.

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

- 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.③
- Fuse clips see page 17-118.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies see Factory Modifications page 17-117.

High/Low Speed FLA Table③

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

* 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						Overload		Disc.	Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Amp Range	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
2	2	3	3	0	—	—	—	30	32CU††92B2H2*		32CU††92W2H2*	4054.00	32CU††92F2H2*		32CU††92N2H2*	
5	5	7½	7½	1	—	—	—	30	32DU††92B2H2*		32DU††92W2H2*	4173.00	32DU††92F2H2*		32DU††92N2H2*	
7½	7½	10	10	—	1¾	—	—	60	32EU††92B2H2*		32EU††92W2H2*	4873.00	32EU††92F2H2*		32EU††92N2H2*	
7½	10	20	20	2	—	—	—	60	32FU††92B2H2*		32FU††92W2H2*	6146.00	32FU††92F2H2*		32FU††92N2H2*	
10	15	25	25	—	2½	—	—	100	32GU††92B2H2*		32GU††92W2H2*	7219.00	32GU††92F2H2*		32GU††92N2H2*	
20	25	40	40	3	—	—	—	100	32HU††92B2H2*		32HU††92W2H2*	9321.00	32HU††92F2H2*		32HU††92N2H2*	
25	30	50	50	—	3½	—	—	200	32IU††92B2H2*		32IU††92W2H2*	18079.00	32IU††92F2H2*		32IU††92N2H2*	
30	40	75	75	4	—	—	—	200	32JU††92B2H2*		32JU††92W2H2*	19263.00	32JU††92F2H2*		32JU††92N2H2*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Overload		Disc.	Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Amp Range	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
2	2	3	3	0	—	—	—	30	32CU††92B1H2*		32CU††92W1H2*		32CU††92F1H2*		32CU††92N1H2*	
5	5	7½	7½	1	—	—	—	30	32DU††92B1H2*		32DU††92W1H2*		32DU††92F1H2*		32DU††92N1H2*	
7½	7½	10	10	—	1¾	—	—	60	32EU††92B1H2*		32EU††92W1H2*		32EU††92F1H2*		32EU††92N1H2*	
7½	10	20	20	2	—	—	—	60	32FU††92B1H2*		32FU††92W1H2*		32FU††92F1H2*		32FU††92N1H2*	
10	15	25	25	—	2½	—	—	100	32GU††92B1H2*		32GU††92W1H2*		32GU††92F1H2*		32GU††92N1H2*	
20	25	40	40	3	—	—	—	100	32HU††92B1H2*		32HU††92W1H2*		32HU††92F1H2*		32HU††92N1H2*	
25	30	50	50	—	3½	—	—	200	32IU††92B1H2*		32IU††92W1H2*		32IU††92F1H2*		32IU††92N1H2*	
30	40	75	75	4	—	—	—	200	32JU††92B1H2*		32JU††92W1H2*		32JU††92F1H2*		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.

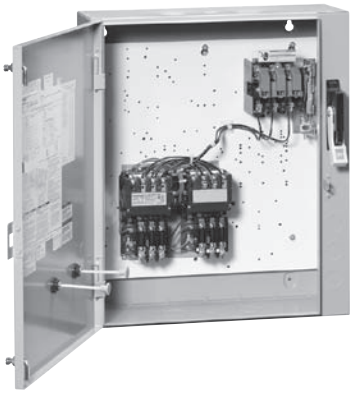
② For conduit hubs and conversion instructions, see page 17-108.

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

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 17-122. (6 required)
- Fuse clips see page 17-118.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.
- 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
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp								Enclosure							
								NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	5	5	18	0	—	30	32CP92B2V2*81		32CP92W2V2*81		32CP92F2V2*81		32CP92N2V2*81	
7½	7½	10	10	27	1	—	30	32DP92B2V2*81		32DP92W2V2*81		32DP92F2V2*81		32DP92N2V2*81	
10	10	15	15	40	—	1¾	60	32EP92B2V2*81		32EP92W2V2*81		32EP92F2V2*81		32EP92N2V2*81	
10	15	25	25	45	2	—	60	32FP92B2V2*81		32FP92W2V2*81		32FP92F2V2*81		32FP92N2V2*81	
15	20	30	30	60	—	2½	100	32GP92B2V2*81		32GP92W2V2*81		32GP92F2V2*81		32GP92N2V2*81	
20	25	50	50	90	3	—	100	32HP92B2V2*81		32HP92W2V2*81		32HP92F2V2*81		32HP92N2V2*81	
30	40	75	75	115	—	3½	200	32IP92B2V2*81		32IP92W2V2*81		32IP92F2V2*81		32IP92N2V2*81	
40	50	100	100	135	4	—	200	32JP92B2V2*81		32JP92W2V2*81		32JP92F2V2*81		32JP92N2V2*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp								Enclosure							
								NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
3	3	5	5	18	0	—	30	32CP92B1V2*81		32CP92W1V2*81		32CP92F1V2*81		32CP92N1V2*81	
7½	7½	10	10	27	1	—	30	32DP92B1V2*81		32DP92W1V2*81		32DP92F1V2*81		32DP92N1V2*81	
10	10	15	15	40	—	1¾	60	32EP92B1V2*81		32EP92W1V2*81		32EP92F1V2*81		32EP92N1V2*81	
10	15	25	25	45	2	—	60	32FP92B1V2*81		32FP92W1V2*81		32FP92F1V2*81		32FP92N1V2*81	
15	20	30	30	60	—	2½	100	32GP92B1V2*81		32GP92W1V2*81		32GP92F1V2*81		32GP92N1V2*81	
20	25	50	50	90	3	—	100	32HP92B1V2*81		32HP92W1V2*81		32HP92F1V2*81		32HP92N1V2*81	
30	40	75	75	115	—	3½	200	32IP92B1V2*81		32IP92W1V2*81		32IP92F1V2*81		32IP92N1V2*81	
40	50	100	100	135	4	—	200	32JP92B1V2*81		32JP92W1V2*81		32JP92F1V2*81		32JP92N1V2*81	

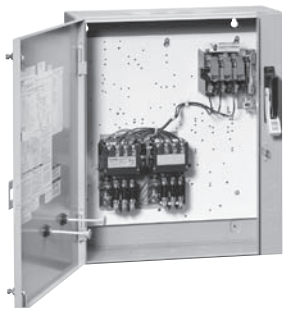
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in modified starters.
② For conduit hubs and conversion instructions, see page 17-108.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant Horsepower with 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 17-122. (6 Required)
- Fuse clips see page 17-118.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.
- 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
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Enclosure							
								NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts					Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
2	2	3	3	18	0	—	30	32CP92B2H2*81		32CP92W2H2*81		32CP92F2H2*81		32CP92N2H2*81	
5	5	7½	7½	27	1	—	30	32DP92B2H2*81		32DP92W2H2*81		32DP92F2H2*81		32DP92N2H2*81	
7½	7½	10	10	40	—	1¾	60	32EP92B2H2*81		32EP92W2H2*81		32EP92F2H2*81		32EP92N2H2*81	
7½	10	20	20	45	2	—	60	32FP92B2H2*81		32FP92W2H2*81		32FP92F2H2*81		32FP92N2H2*81	
10	15	25	25	60	—	2½	100	32GP92B2H2*81		32GP92W2H2*81		32GP92F2H2*81		32GP92N2H2*81	
20	25	40	40	90	3	—	100	32HP92B2H2*81		32HP92W2H2*81		32HP92F2H2*81		32HP92N2H2*81	
25	30	50	50	115	—	3½	200	32IP92B2H2*81		32IP92W2H2*81		32IP92F2H2*81		32IP92N2H2*81	
30	40	75	75	135	4	—	200	32JP92B2H2*81		32JP92W2H2*81		32JP92F2H2*81		32JP92N2H2*81	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Disc Amp Rating	Enclosure							
								NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts					Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
2	2	3	3	18	0	—	30	32CP92B1H2*81		32CP92W1H2*81		32CP92F1H2*81		32CP92N1H2*81	
5	5	7½	7½	27	1	—	30	32DP92B1H2*81		32DP92W1H2*81		32DP92F1H2*81		32DP92N1H2*81	
7½	7½	10	10	40	—	1¾	60	32EP92B1H2*81		32EP92W1H2*81		32EP92F1H2*81		32EP92N1H2*81	
7½	10	20	20	45	2	—	60	32FP92B1H2*81		32FP92W1H2*81		32FP92F1H2*81		32FP92N1H2*81	
10	15	25	25	60	—	2½	100	32GP92B1H2*81		32GP92W1H2*81		32GP92F1H2*81		32GP92N1H2*81	
20	25	40	40	90	3	—	100	32HP92B1H2*81		32HP92W1H2*81		32HP92F1H2*81		32HP92N1H2*81	
25	30	50	50	115	—	3½	200	32IP92B1H2*81		32IP92W1H2*81		32IP92F1H2*81		32IP92N1H2*81	
30	40	75	75	135	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 17-108.

Combination Two Speed Heavy Duty Starters

MCP Type, Constant or Variable Torque with Solid State 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.③
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

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							Overload		Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	¾	1½	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*	
½	¾	1½	1½	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*	
7½	7½	—	—	1	—	30	10–40	A1	32DUE†92B2V*		32DUE†92W2V*		32DUE†92F2V*		32DUE†92N2V*	
—	—	15	15	—	1¾	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	—	2½	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	—	3½	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							Overload		Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	¾	1½	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*	
½	¾	1½	1½	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*	
7½	7½	—	—	1	—	30	10–40	A1	32DUE†92B1V*		32DUE†92W1V*		32DUE†92F1V*		32DUE†92N1V*	
—	—	15	15	—	1¾	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	—	2½	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	—	3½	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.

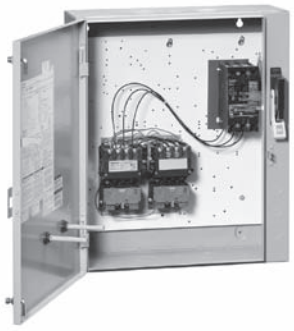
② For conduit hubs and conversion instructions, see page 17-108.

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

- 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.③
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies see Factory Modifications page 17-117.

High/Low Speed FLA Table③

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

* 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							Overload		Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	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	—	1¾	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							Overload		Enclosure							
									NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R②, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interruter ETI Amps	Amp Range	Frame Size	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	—	3½	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.

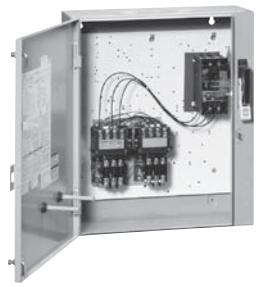
② For conduit hubs and conversion instructions, see page 17-108.

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 with 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 17-122. (6 Required)
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.
- 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
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp							Enclosure							
							NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
½	½	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	
1½	1½	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	7½	7½	1	—	25	32DP92B2VD*81		32DP92W2VD*81		32DP92F2VD*81		32DP92N2VD*81	
7½	7½	10	10	1	—	30	32DP92B2VE*81		32DP92W2VE*81		32DP92F2VE*81		32DP92N2VE*81	
—	—	15	15	—	1¾	40	32EP92B2VF*81		32EP92W2VF*81		32EP92F2VF*81		32EP92N2VF*81	
10	10	—	—	—	1¾	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	—	2½	50	32GP92B2VK*81		32GP92W2VK*81		32GP92F2VK*81		32GP92N2VK*81	
15	20	—	—	—	2½	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	—	3½	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							Enclosure							
							NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	CatalogNumber	List Price $
½	½	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	
½	½	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	7½	7½	1	—	25	32DP92B1VD*81		32DP92W1VD*81		32DP92F1VD*81		32DP92N1VD*81	
7½	7½	10	10	1	—	30	32DP92B1VE*81		32DP92W1VE*81		32DP92F1VE*81		32DP92N1VE*81	
—	—	15	15	—	1¾	40	32EP92B1VF*81		32EP92W1VF*81		32EP92F1VF*81		32EP92N1VF*81	
10	10	—	—	—	1¾	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	—	2½	50	32GP92B1VK*81		32GP92W1VK*81		32GP92F1VK*81		32GP92N1VK*81	
15	20	—	—	—	2½	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	—	3½	125	32IP92B1VP*81		32IP92W1VP*81		32IP92F1VP*81		32IP92N1VP*81	
40	50	100	100	4	—	150	32JP92B1VR*81		32JP92W1VR*81		32JP92F1VR*81		32JP92N1VR*81	

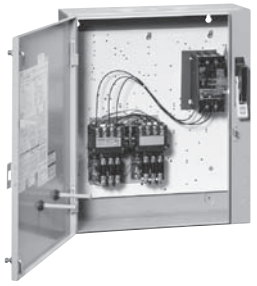
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in modified starters.
② For conduit hubs and conversion instructions, see page 17-108.

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 17-122. (6 Required)
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-162.
- Wiring Diagrams see page 17-174.
- Replacement Parts see page 17-129.
- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact..

Coil Table

60Hz Voltage	Letter
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120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp							Enclosure							
							NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	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	—	1¾	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							Enclosure							
							NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	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	—	1¾	40	32EP92B1HF*81		32EP92W1HF*81		32EP92F1HF*81		32EP92N1HF*81	
7½	7½	—	—	—	1¾	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 17-108.

Reduced Voltage Heavy Duty Starters

Features and Benefits

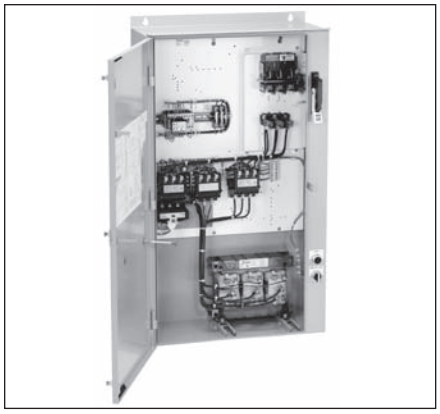
General

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:

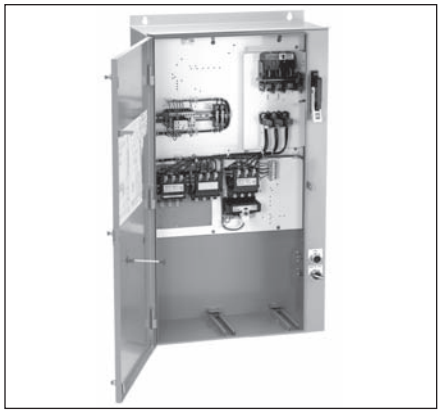
- Reduces inrush current
- Provides smoother acceleration of the load
- Reduces starting torque
- Reduces stresses on mechanical linkages

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).



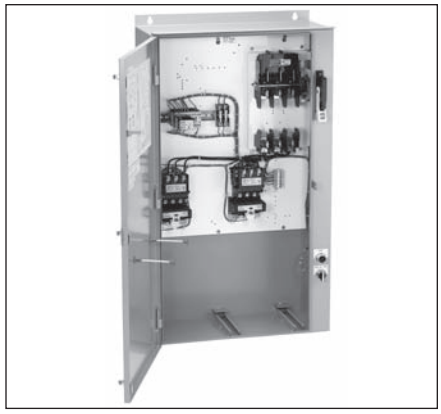
Auto Transformer Starter

- 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 50% Tap	Autotransformer 65% Tap	Autotransformer 80% Tap	Part-Winding 2 step	Wye-Delta
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% Increases slightly with speed	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-177.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 1 General Purpose Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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 $
	10	(1¾)	10–40	A1	**36EUET6BD**		60	**37EUET6BDD**		60A/250V	**37EUET6BDF**		50	**37EUET6BDP**	
	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**	
200	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**	
	150	6	160–630	—	**36MPXT6BD**		600	**37MPXT6BDD**		600A/250V	**37MPXT6BDF**		600	**37MPXT6BDP**	
	10	(1¾)	10–40	A1	**36EUET2BG**		60	**37EUET2BGD**		60A/250V	**37EUET2BGF**		50	**37EUET2BGP**	
	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**	
230	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**	
	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	(1¾)	10–40	A1	**36EUET4BH**		60	**37EUET4BHD**		60A/600V	**37EUET4BHF**		50	**37EUET4BHP**	
	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**	
460	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**	
	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	(1¾)	10–40	A1	**36EUET5BE**		60	**37EUET5BED**		60A/600V	**37EUET5BEF**		50	**37EUET5BEP**	
	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**	
575	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



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-177.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 4 Painted Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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 $
	10	(1¾)	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**	
200	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**	
	10	(1¾)	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**	
230	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**	
	15	(1¾)	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**	
460	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**	
	15	(1¾)	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**	
575	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-177.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	10–40	A1	**36EUET6WD**		60	**37EUET6WDD**		60A/250V	**37EUET6WDF**		50	**37EUET6WDP**	
	10	2	13–52	B	**36FUFT6WD**		60	**37FUFT6WDD**		60A/250V	**37FUFT6WDF**		50	**37FUFT6WDP**	
	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	(1¾)	10–40	A1	**36EUET2WG**		60	**37EUET2WGD**		60A/250V	**37EUET2WGF**		50	**37EUET2WGP**	
	15	2	13–52	B	**36FUFT2WG**		60	**37FUFT2WGD**		60A/250V	**37FUFT2WGF**		50	**37FUFT2WGP**	
	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	(1¾)	10–40	A1	**36EUET4WH**		60	**37EUET4WHD**		60A/600V	**37EUET4WHF**		50	**37EUET4WHP**	
	25	2	13–52	B	**36FUFT4WH**		60	**37FUFT4WHD**		60A/600V	**37FUFT4WHF**		50	**37FUFT4WHP**	
	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	(1¾)	10–40	A1	**36EUET5WE**		60	**37EUET5WED**		60A/600V	**37EUET5WEF**		50	**37EUET5WEP**	
	25	2	13–52	B	**36FUFT5WE**		60	**37FUFT5WED**		60A/600V	**37FUFT5WEF**		50	**37FUFT5WEP**	
	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



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-177.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)①

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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 $
	10	(1¾)	10–40	A1	**36EUET6ND**		60	**37EUET6NDD**		60A/250V	**37EUET6NDF**		50	**37EUET6NDP**	
	10	2	13–52	B	**36FUFT6ND**		60	**37FUFT6NDD**		60A/250V	**37FUFT6NDF**		50	**37FUFT6NDP**	
	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**	
200	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**	
	150	6	160–630	—	**36MPXT6ND**		600	**37MPXT6NDD**		600A/250V	**37MPXT6NDF**		600	**37MPXT6NDP**	
	10	(1¾)	10–40	A1	**36EUET2NG**		60	**37EUET2NGD**		60A/250V	**37EUET2NGF**		50	**37EUET2NGP**	
	15	2	13–52	B	**36FUFT2NG**		60	**37FUFT2NGD**		60A/250V	**37FUFT2NGF**		50	**37FUFT2NGP**	
	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**	
230	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**	
	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	(1¾)	10–40	A1	**36EUET4NH**		60	**37EUET4NHD**		60A/600V	**37EUET4NHF**		50	**37EUET4NHP**	
	25	2	13–52	B	**36FUFT4NH**		60	**37FUFT4NHD**		60A/600V	**37FUFT4NHF**		50	**37FUFT4NHP**	
	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**	
460	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**	
	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	(1¾)	10–40	A1	**36EUET5NE**		60	**37EUET5NED**		60A/600V	**37EUET5NEF**		50	**37EUET5NEP**	
	25	2	13–52	B	**36FUFT5NE**		60	**37FUFT5NED**		60A/600V	**37FUFT5NEF**		50	**37FUFT5NEP**	
	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**	
575	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 17-108 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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page page 17-163.
- ► Wiring Diagrams see page 17-176.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 1 General Purpose Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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 $
	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	(1¾)	10–40	A1	**36EUEP6BD**		100	**37EUEP6BDD**		100A/250V	**37EUEP6BDF**		100	**37EUEP6BDP**	
	20	2	13–52	B	**36FUFP6BD**		100	**37FUFP6BDD**		100A/250V	**37FUFP6BDF**		100	**37FUFP6BDP**	
	30	(2½)	25–100	B	**36GUGP6BD**		200	**37GUGP6BDD**		200A/250V	**37GUGP6BDF**		125	**37GUGP6BDP**	
200	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**	
	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	**36FUFP2BG**		100	**37FUFP2BGD**		100A/250V	**37FUFP2BGF**		100	**37FUFP2BGP**	
	30	(2½)	25–100	B	**36GUGP2BG**		200	**37GUGP2BGD**		200A/250V	**37GUGP2BGF**		100	**37GUGP2BGP**	
230	50	3	25–100	B	**36HUGP2BG**		200	**37HUGP2BGD**		200A/250V	**37HUGP2BGF**		150	**37HUGP2BGP**	
	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	(1¾)	10–40	A1	**36EUEP4BH**		60	**37EUEP4BHD**		60A/600V	**37EUEP4BHF**		50	**37EUEP4BHP**	
	40	2	13–52	B	**36FUFP4BH**		100	**37FUFP4BHD**		100A/600V	**37FUFP4BHF**		100	**37FUFP4BHP**	
	60	(2½)	25–100	B	**36GUGP4BH**		200	**37GUGP4BHD**		200A/600V	**37GUGP4BHF**		100	**37GUGP4BHP**	
460	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**	
	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	(1¾)	10–40	A1	**36EUEP5BE**		60	**37EUEP5BED**		60A/600V	**37EUEP5BEF**		50	**37EUEP5BEP**	
	40	2	13–52	B	**36FUFP5BE**		60	**37FUFP5BED**		60A/600V	**37FUFP5BEF**		50	**37FUFP5BEP**	
	60	(2½)	25–100	B	**36GUGP5BE**		100	**37GUGP5BED**		100A/600V	**37GUGP5BEF**		100	**37GUGP5BEP**	
575	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**	
	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



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page page 17-163.
- ► Wiring Diagrams see page 17-176.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	10–40	A1	**36EUEP6ED**		100	**37EUEP6EDD**		100A/250V	**37EUEP6EDF**		100	**37EUEP6EDP**	
	20	2	13–52	B	**36FUFP6ED**		100	**37FUFP6EDD**		100A/250V	**37FUFP6EDF**		100	**37FUFP6EDP**	
	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**	
	100	5	55–250	—	—		—	—		—	—		600	**37LPSP6EDP**	
	150	5	55–250	—	**36LPUP6ED**		600	**37LPUP6EDD**		600A/250V	**37LPUP6EDF**		600	**37LPUP6EDP**	
230	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	**36FUFP2EG**		100	**37FUFP2EGD**		100A/250V	**37FUFP2EGF**		100	**37FUFP2EGP**	
	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**	
	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	**37LPSP2EGP**	
	150	5	55–250	—	**36LPUP2EG**		600	**37LPUP2EGD**		600A/250V	**37LPUP2EGF**		600	**37LPUP2EGP**	
	300	6	160–630	—	**36MPXP2EG**		1200	**37MPXP2EGD**		1200A/250V	**37MPXP2EGF**		1200	**37MPXP2EGP**	
460	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	(1¾)	10–40	A1	**36EUEP4EH**		60	**37EUEP4EHD**		60A/600V	**37EUEP4EHF**		50	**37EUEP4EHP**	
	40	2	13–52	B	**36FUFP4EH**		100	**37FUFP4EHD**		100A/600V	**37FUFP4EHF**		100	**37FUFP4EHP**	
	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	**37LPSP4EHP**	
	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	(1¾)	10–40	A1	**36EUEP5EE**		60	**37EUEP5EED**		60A/600V	**37EUEP5EEF**		50	**37EUEP5EEP**	
	40	2	13–52	B	**36FUFP5EE**		60	**37FUFP5EED**		60A/600V	**37FUFP5EEF**		50	**37FUFP5EEP**	
	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**	
	250	5	55–250	—	—		—	—		400A/600V	**37LPSP5EEF**		—	—	
	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page page 17-163.
- ► Wiring Diagrams see page 17-176.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	10–40	A1	**36EUEP6WD**		100	**37EUEP6WDD**		100A/250V	**37EUEP6WDF**	100	**37EUEP6WDP**	
	20	2	13–52	B	**36FUFP6WD**		100	**37FUFP6WDD**		100A/250V	**37FUFP6WDF**	100	**37FUFP6WDP**	
	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**	
	75	4	50–200	B	**36JUHP6WD**		400	**37JUHP6WDD**		400A/250V	**37JUHP6WDF**	400	**37JUHP6WDP**	
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	**36FUFP2WG**		100	**37FUFP2WGD**		100A/250V	**37FUFP2WGF**	100	**37FUFP2WGP**	
	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**	
	75	4	50–200	B	**36JUHP2WG**		400	**37JUHP2WGD**		400A/250V	**37JUHP2WGF**	250	**37JUHP2WGP**	
460	10	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	(1¾)	10–40	A1	**36EUEP4WH**		60	**37EUEP4WHD**		60A/600V	**37EUEP4WHF**	50	**37EUEP4WHP**	
	40	2	13–52	B	**36FUFP4WH**		100	**37FUFP4WHD**		100A/600V	**37FUFP4WHF**	100	**37FUFP4WHP**	
	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**	
	150	4	50–200	B	**36JUHP4WH**		400	**37JUHP4WHD**		400A/600V	**37JUHP4WHF**	250	**37JUHP4WHP**	
575	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	(1¾)	10–40	A1	**36EUEP5WE**		60	**37EUEP5WED**		60A/600V	**37EUEP5WEF**	50	**37EUEP5WEP**	
	40	2	13–52	B	**36FUFP5WE**		60	**37FUFP5WED**		60A/600V	**37FUFP5WEF**	50	**37FUFP5WEP**	
	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



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page page 17-163.
- ► Wiring Diagrams see page 17-176.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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 $
	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	(1¾)	10–40	A1	**36EUEP6ND**		100	**37EUEP6NDD**		100A/250V	**37EUEP6NDF**		100	**37EUEP6NDP**	
	20	2	13–52	B	**36FUFP6ND**		100	**37FUFP6NDD**		100A/250V	**37FUFP6NDF**		100	**37FUFP6NDP**	
200	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	**37LPSP6NDP**	
	150	5	55–250	—	**36LPUP6ND**		600	**37LPUP6NDD**		600A/250V	**37LPUP6NDF**		600	**37LPUP6NDP**	
	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	**36FUFP2NG**		100	**37FUFP2NGD**		100A/250V	**37FUFP2NGF**		100	**37FUFP2NGP**	
	30	(2½)	25–100	B	**36GUGP2NG**		200	**37GUGP2NGD**		200A/250V	**37GUGP2NGF**		100	**37GUGP2NGP**	
230	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	**37LPSP2NGP**	
	150	5	55–250	—	**36LPUP2NG**		600	**37LPUP2NGD**		600A/250V	**37LPUP2NGF**		600	**37LPUP2NGP**	
	300	6	160–630	—	**36MPXP2NG**		1200	**37MPXP2NGD**		1200A/250V	**37MPXP2NGF**		1200	**37MPXP2NGP**	
	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	(1¾)	10–40	A1	**36EUEP4NH**		60	**37EUEP4NHD**		60A/600V	**37EUEP4NHF**		50	**37EUEP4NHP**	
	40	2	13–52	B	**36FUFP4NH**		100	**37FUFP4NHD**		100A/600V	**37FUFP4NHF**		100	**37FUFP4NHP**	
	60	(2½)	25–100	B	**36GUGP4NH**		200	**37GUGP4NHD**		200A/600V	**37GUGP4NHF**		100	**37GUGP4NHP**	
460	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	**37LPSP4NHP**	
	350	5	55–250	—	**36LPUP4NH**		600	**37LPUP4NHD**		600A/600V	**37LPUP4NHF**		600	**37LPUP4NHP**	
	600	6	160–630	—	**36MPXP4NH**		1200	**37MPXP4NHD**		1200A/600V	**37MPXP4NHF**		1200	**37MPXP4NHP**	
	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	(1¾)	10–40	A1	**36EUEP5NE**		60	**37EUEP5NED**		60A/600V	**37EUEP5NEF**		50	**37EUEP5NEP**	
	40	2	13–52	B	**36FUFP5NE**		60	**37FUFP5NED**		60A/600V	**37FUFP5NEF**		50	**37FUFP5NEP**	
	60	(2½)	25–100	B	**36GUGP5NE**		100	**37GUGP5NED**		100A/600V	**37GUGP5NEF**		100	**37GUGP5NEP**	
575	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	**37LPSP5NEF**		—	—	
	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 17-108 for conduit hubs and conversion instructions.

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-178 .
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	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	(1¾)	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	(1¾)	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	(1¾)	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



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-178 .
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	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	(1¾)	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	(1¾)	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	(1¾)	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-178 .
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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 $
	10	1	10–40	A1	**36DUE06WD**		60	**37DUE06WDD**		60A/250V	**37DUE06WDF**		50	**37DUE06WDP**	
	15	(1¾)	10–40	A1	**36EUE06WD**		100	**37EUE06WDD**		100A/250V	**37EUE06WDF**		100	**37EUE06WDP**	
	20	2	13–52	B	**36FUF06WD**		100	**37FUF06WDD**		100A/250V	**37FUF06WDF**		100	**37FUF06WDP**	
200	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**	
	10	1	10–40	A1	**36DUE02WG**		60	**37DUE02WGD**		60A/250V	**37DUE02WGF**		50	**37DUE02WGP**	
	15	(1¾)	10–40	A1	**36EUE02WG**		60	**37EUE02WGD**		60A/250V	**37EUE02WGF**		50	**37EUE02WGP**	
	25	2	13–52	B	**36FUF02WG**		100	**37FUF02WGD**		100A/250V	**37FUF02WGF**		100	**37FUF02WGP**	
230	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**	
	15	1	5.5-22	A1	**36DUD04WH**		30	**37DUD04WHD**		30A/600V	**37DUD04WHF**		30	**37DUD04WHP**	
	30	(1¾)	10–40	A1	**36EUE04WH**		60	**37EUE04WHD**		60A/600V	**37EUE04WHF**		50	**37EUE04WHP**	
	40	2	13–52	B	**36FUF04WH**		100	**37FUF04WHD**		100A/600V	**37FUF04WHF**		100	**37FUF04WHP**	
460	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**	
	15	1	5.5-22	A1	**36DUD05WE**		30	**37DUD05WED**		30A/600V	**37DUD05WEF**		30	**37DUD05WEP**	
	30	(1¾)	10–40	A1	**36EUE05WE**		60	**37EUE05WED**		60A/600V	**37EUE05WEF**		50	**37EUE05WEP**	
	40	2	13–52	B	**36FUF05WE**		100	**37FUF05WED**		100A/600V	**37FUF05WEF**		50	**37FUF05WEP**	
575	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



Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-178 .
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)①

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	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	(1¾)	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	(1¾)	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	(1¾)	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 17-108 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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-179.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	10–40	A1	**36EUEC6BD**		100	**37EUEC6BDD**		100A/250V	**37EUEC6BDF**		100	**37EUEC6BDP**	
	20	2	13–52	B	**36FUFC6BD**		100	**37FUFC6BDD**		100A/250V	**37FUFC6BDF**		100	**37FUFC6BDP**	
	30	(2½)	25–100	B	**36GUGC6BD**		200	**37GUGC6BDD**		200A/250V	**37GUGC6BDF**		125	**37GUGC6BDP**	
	40	3	25–100	B	**36HUGC6BD**		200	**37HUGC6BDD**		200A/250V	**37HUGC6BDF**		150	**37HUGC6BDP**	
	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**	
	150	5	55–250	—	**36LPUC6BD**		600	**37LPUC6BDD**		600A/250V	**37LPUC6BDF**		600	**37LPUC6BDP**	
	300	6	160–630	—	**36MPXC6BD**		1200	**37MPXC6BDD**		1200A/250V	**37MPXC6BDF**		1200	**37MPXC6BDP**	
230	10	1	10–40	A1	**36DUEC2BG**		60	**37DUEC2BGD**		60A/250V	**37DUEC2BGF**		50	**37DUEC2BGP**	
	15	(1¾)	10–40	A1	**36EUEC2BG**		60	**37EUEC2BGD**		60A/250V	**37EUEC2BGF**		50	**37EUEC2BGP**	
	25	2	13–52	B	**36FUFC2BG**		100	**37FUFC2BGD**		100A/250V	**37FUFC2BGF**		100	**37FUFC2BGP**	
	30	(2½)	25–100	B	**36GUGC2BG**		200	**37GUGC2BGD**		200A/250V	**37GUGC2BGF**		100	**37GUGC2BGP**	
	50	3	25–100	B	**36HUGC2BG**		200	**37HUGC2BGD**		200A/250V	**37HUGC2BGF**		150	**37HUGC2BGP**	
	60	(3½)	50–200	B	**36IUHC2BG**		200	**37IUHC2BGD**		200A/250V	**37IUHC2BGF**		250	**37IUHC2BGP**	
	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**	
460	15	1	5.5-22	A1	**36DUDC4BH**		30	**37DUDC4BHD**		30A/600V	**37DUDC4BHF**		30	**37DUDC4BHP**	
	30	(1¾)	10–40	A1	**36EUEC4BH**		60	**37EUEC4BHD**		60A/600V	**37EUEC4BHF**		50	**37EUEC4BHP**	
	40	2	13–52	B	**36FUFC4BH**		100	**37FUFC4BHD**		100A/600V	**37FUFC4BHF**		100	**37FUFC4BHP**	
	60	(2½)	25–100	B	**36GUGC4BH**		200	**37GUGC4BHD**		200A/600V	**37GUGC4BHF**		100	**37GUGC4BHP**	
	75	3	25–100	B	**36HUGC4BH**		200	**37HUGC4BHD**		200A/600V	**37HUGC4BHF**		125	**37HUGC4BHP**	
	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**	
575	15	1	5.5-22	A1	**36DUDC5BE**		30	**37DUDC5BED**		30A/600V	**37DUDC5BEF**		30	**37DUDC5BEP**	
	30	(1¾)	10–40	A1	**36EUEC5BE**		60	**37EUEC5BED**		60A/600V	**37EUEC5BEF**		50	**37EUEC5BEP**	
	40	2	13–52	B	**36FUFC5BE**		100	**37FUFC5BED**		100A/600V	**37FUFC5BEF**		50	**37FUFC5BEP**	
	60	(2½)	25–100	B	**36GUGC5BE**		100	**37GUGC5BED**		100A/600V	**37GUGC5BEF**		100	**37GUGC5BEP**	
	75	3	25–100	B	**36HUGC5BE**		200	**37HUGC5BED**		200A/600V	**37HUGC5BEF**		125	**37HUGC5BEP**	
	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

Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-179.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

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 Circit 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	(1¾)	10–40	A1	**36EUEC6ED**		100	**37EUEC6EDD**		100A/250V	**37EUEC6EDF**		100	**37EUEC6EDP**	
	20	2	13–52	B	**36FUFC6ED**		100	**37FUFC6EDD**		100A/250V	**37FUFC6EDF**		100	**37FUFC6EDP**	
	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**	
	300	6	160–630	—	**36MPXC6ED**		1200	**37MPXC6EDD**		1200A/250V	**37MPXC6EDF**		1200	**37MPXC6EDP**	
230	10	1	10–40	A1	**36DUEC2EG**		60	**37DUEC2EGD**		60A/250V	**37DUEC2EGF**		50	**37DUEC2EGP**	
	15	(1¾)	10–40	A1	**36EUEC2EG**		60	**37EUEC2EGD**		60A/250V	**37EUEC2EGF**		50	**37EUEC2EGP**	
	25	2	13–52	B	**36FUFC2EG**		100	**37FUFC2EGD**		100A/250V	**37FUFC2EGF**		100	**37FUFC2EGP**	
	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**	
	150	5	55–250	—	**36LPUC2EG**		600	**37LPUC2EGD**		600A/250V	**37LPUC2EGF**		600	**37LPUC2EGP**	
	350	6	160–630	—	**36MPXC2EG**		1200	**37MPXC2EGD**		1200A/250V	**37MPXC2EGF**		1200	**37MPXC2EGP**	
460	15	1	5.5-22	A1	**36DUDC4EH**		30	**37DUDC4EHD**		30A/600V	**37DUDC4EHF**		30	**37DUDC4EHP**	
	30	(1¾)	10–40	A1	**36EUEC4EH**		60	**37EUEC4EHD**		60A/600V	**37EUEC4EHF**		50	**37EUEC4EHP**	
	40	2	13–52	B	**36FUFC4EH**		100	**37FUFC4EHD**		100A/600V	**37FUFC4EHF**		100	**37FUFC4EHP**	
	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**	
	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**	
575	15	1	5.5-22	A1	**36DUDC5EE**		30	**37DUDC5EED**		30A/600V	**37DUDC5EEF**		30	**37DUDC5EEP**	
	30	(1¾)	10–40	A1	**36EUEC5EE**		60	**37EUEC5EED**		60A/600V	**37EUEC5EEF**		50	**37EUEC5EEP**	
	40	2	13–52	B	**36FUFC5EE**		100	**37FUFC5EED**		100A/600V	**37FUFC5EEF**		50	**37FUFC5EEP**	
	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-179.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 4/4X Stainless Steel Enclosures

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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 $
	10	1	10–40	A1	**36DUEC6WD**		60	**37DUEC6WDD**		60A/250V	**37DUEC6WDF**		50	**37DUEC6WDP**	
	15	(1¾)	10–40	A1	**36EUEC6WD**		100	**37EUEC6WDD**		100A/250V	**37EUEC6WDF**		100	**37EUEC6WDP**	
	20	2	13–52	B	**36FUFC6WD**		100	**37FUFC6WDD**		100A/250V	**37FUFC6WDF**		100	**37FUFC6WDP**	
200	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**	
	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	(1¾)	10–40	A1	**36EUEC2WG**		60	**37EUEC2WGD**		60A/250V	**37EUEC2WGF**		50	**37EUEC2WGP**	
	25	2	13–52	B	**36FUFC2WG**		100	**37FUFC2WGD**		100A/250V	**37FUFC2WGF**		100	**37FUFC2WGP**	
230	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**	
	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	(1¾)	10–40	A1	**36EUEC4WH**		60	**37EUEC4WHD**		60A/600V	**37EUEC4WHF**		50	**37EUEC4WHP**	
	40	2	13–52	B	**36FUFC4WH**		100	**37FUFC4WHD**		100A/600V	**37FUFC4WHF**		100	**37FUFC4WHP**	
460	60	(2½)	25–100	B	**36GUGC4WH**		200	**37GUGC4WHD**		200A/600V	**37GUGC4WHF**		100	**37GUGC4WHP**	
	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	(1¾)	10–40	A1	**36EUEC5WE**		60	**37EUEC5WED**		60A/600V	**37EUEC5WEF**		50	**37EUEC5WEP**	
	40	2	13–52	B	**36FUFC5WE**		100	**37FUFC5WED**		100A/600V	**37FUFC5WEF**		50	**37FUFC5WEP**	
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

Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-163.
- ► Wiring Diagrams see page 17-179.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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".

NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)①

			Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circit Breaker		
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	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	(1¾)	10–40	A1	**36EUEC6ND**		100	**37EUEC6NDD**		100A/250V	**37EUEC6NDF**		100	**37EUEC6NDP**	
	20	2	13–52	B	**36FUFC6ND**		100	**37FUFC6NDD**		100A/250V	**37FUFC6NDF**		100	**37FUFC6NDP**	
	30	(2½)	25–100	B	**36GUGC6ND**		200	**37GUGC6NDD**		200A/250V	**37GUGC6NDF**		125	**37GUGC6NDP**	
	40	3	25–100	B	**36HUGC6ND**		200	**37HUGC6NDD**		200A/250V	**37HUGC6NDF**		150	**37HUGC6NDP**	
	50	(3½)	50–200	B	**36IUHC6ND**		200	**37IUHC6NDD**		200A/250V	**37IUHC6NDF**		250	**37IUHC6NDP**	
	60	4	50–200	B	**36JUHC6ND**		400	**37JUHC6NDD**		400A/250V	**37JUHC6NDF**		250	**37JUHC6NDP**	
	75	5	55–250	—	**36LPSC6ND**		400	**37LPSC6NDD**		400A/250V	**37LPSC6NDF**		400	**37LPSC6NDP**	
	150	5	55–250	—	**36LPUC6ND**		600	**37LPUC6NDD**		600A/250V	**37LPUC6NDF**		600	**37LPUC6NDP**	
	300	6	160–630	—	**36MPXC6ND**		1200	**37MPXC6NDD**		1200A/250V	**37MPXC6NDF**		1200	**37MPXC6NDP**	
230	10	1	10–40	A1	**36DUEC2NG**		60	**37DUEC2NGD**		60A/250V	**37DUEC2NGF**		50	**37DUEC2NGP**	
	15	(1¾)	10–40	A1	**36EUEC2NG**		60	**37EUEC2NGD**		60A/250V	**37EUEC2NGF**		50	**37EUEC2NGP**	
	25	2	13–52	B	**36FUFC2NG**		100	**37FUFC2NGD**		100A/250V	**37FUFC2NGF**		100	**37FUFC2NGP**	
	30	(2½)	25–100	B	**36GUGC2NG**		200	**37GUGC2NGD**		200A/250V	**37GUGC2NGF**		100	**37GUGC2NGP**	
	50	3	25–100	B	**36HUGC2NG**		200	**37HUGC2NGD**		200A/250V	**37HUGC2NGF**		150	**37HUGC2NGP**	
	60	(3½)	50–200	B	**36IUHC2NG**		200	**37IUHC2NGD**		200A/250V	**37IUHC2NGF**		250	**37IUHC2NGP**	
	75	4	50–200	B	**36JUHC2NG**		400	**37JUHC2NGD**		400A/250V	**37JUHC2NGF**		250	**37JUHC2NGP**	
	100	5	55–250	—	**36LPSC2NG**		400	**37LPSC2NGD**		400A/250V	**37LPSC2NGF**		400	**37LPSC2NGP**	
	150	5	55–250	—	**36LPUC2NG**		600	**37LPUC2NGD**		600A/250V	**37LPUC2NGF**		600	**37LPUC2NGP**	
	350	6	160–630	—	**36MPXC2NG**		1200	**37MPXC2NGD**		1200A/250V	**37MPXC2NGF**		1200	**37MPXC2NGP**	
460	15	1	5.5-22	A1	**36DUDC4NH**		30	**37DUDC4NHD**		30A/600V	**37DUDC4NHF**		30	**37DUDC4NHP**	
	30	(1¾)	10–40	A1	**36EUEC4NH**		60	**37EUEC4NHD**		60A/600V	**37EUEC4NHF**		50	**37EUEC4NHP**	
	40	2	13–52	B	**36FUFC4NH**		100	**37FUFC4NHD**		100A/600V	**37FUFC4NHF**		100	**37FUFC4NHP**	
	60	(2½)	25–100	B	**36GUGC4NH**		200	**37GUGC4NHD**		200A/600V	**37GUGC4NHF**		100	**37GUGC4NHP**	
	75	3	25–100	B	**36HUGC4NH**		200	**37HUGC4NHD**		200A/600V	**37HUGC4NHF**		125	**37HUGC4NHP**	
	100	(3½)	50–200	B	**36IUHC4NH**		200	**37IUHC4NHD**		200A/600V	**37IUHC4NHF**		150	**37IUHC4NHP**	
	150	4	50–200	B	**36JUHC4NH**		400	**37JUHC4NHD**		400A/600V	**37JUHC4NHF**		250	**37JUHC4NHP**	
	200	5	55–250	—	**36LPSC4NH**		400	**37LPSC4NHD**		400A/600V	**37LPSC4NHF**		400	**37LPSC4NHP**	
	300	5	55–250	—	**36LPUC4NH**		600	**37LPUC4NHD**		600A/600V	**37LPUC4NHF**		600	**37LPUC4NHP**	
	700	6	160–630	—	**36MPXC4NH**		1600	**37MPXC4NHD**		1600A/600V	**37MPXC4NHF**		1200	**37MPXC4NHP**	
575	15	1	5.5-22	A1	**36DUDC5NE**		30	**37DUDC5NED**		30A/600V	**37DUDC5NEF**		30	**37DUDC5NEP**	
	30	(1¾)	10–40	A1	**36EUEC5NE**		60	**37EUEC5NED**		60A/600V	**37EUEC5NEF**		50	**37EUEC5NEP**	
	40	2	13–52	B	**36FUFC5NE**		100	**37FUFC5NED**		100A/600V	**37FUFC5NEF**		50	**37FUFC5NEP**	
	60	(2½)	25–100	B	**36GUGC5NE**		100	**37GUGC5NED**		100A/600V	**37GUGC5NEF**		100	**37GUGC5NEP**	
	75	3	25–100	B	**36HUGC5NE**		200	**37HUGC5NED**		200A/600V	**37HUGC5NEF**		125	**37HUGC5NEP**	
	100	(3½)	50–200	B	**36IUHC5NE**		200	**37IUHC5NED**		200A/600V	**37IUHC5NEF**		150	**37IUHC5NEP**	
	150	4	50–200	B	**36JUHC5NE**		400	**37JUHC5NED**		400A/600V	**37JUHC5NEF**		250	**37JUHC5NEP**	
	200	5	55–250	—	**36LPSC5NE**		400	**37LPSC5NED**		400A/600V	**37LPSC5NEF**		250	**37LPSC5NEP**	
	300	5	55–250	—	**36LPUC5NE**		600	**37LPUC5NED**		600A/600V	**37LPUC5NEF**		400	**37LPUC5NEP**	
	700	6	160–630	—	**37MPXC5NF**		1600	**37MPXC5NED**		1600A/600V	**37MPXC5NEF**		1600	**37MPXC5NEP**	

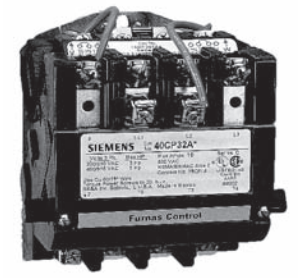
Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 17-108 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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see pages 17-141 open and 17-153 enclosed.
- Wiring Diagrams see page 17-180.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure											
							Open Type⑥		NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 12② NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Cont-actor Amp Rating	NEMA Size	Half Size	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*		40CP320*	
7½	7½	10	10	27	1	—	40DP32A*		40DP32B*		40DP32W*		40DP32F*		40DP32H*		40DP320*	
10	10	15	15	40	—	1¾	40EP32A*		40EP32B*		40EP32W*		40EP32F*		40EP32H*		40EP320*	
10	15	25	25	45	2	—	40FP32A*		40FP32B*		40FP32W*		40FP32F*		40FP32H*		40FP320*	
15	20	30	30	60	—	2½	40GP32A*		40GP32B*		40GP32W*		40GP32F*		40GP32H*		40GP320*	
25	30	50	50	90	3	—	40HP32A*		40HP32B*		40HP32W*		40HP32F*		40HP32H*		40HP320*	
30	40	75	75	115	—	3½	40IP32A*		40IP32B*		40IP32W*		40IP32F*		40IP32H*		40IP320*	
40	50	100	100	135	4	—	40JG32A*		40JG32B*		40JG32W*		40JG32F*		40JG32H*		40JG320*	
75	100	200	200	270	5	—	40LP32A*		40LP32B*		40LP32E*③		—	—	40LP32H*		40LP320*	
150	200	400	400	540	6	—	40MP32A*		40MP32B*		40MP32E*③		—	—	—	—	40MP320*	
—	300	600	600	810	7④⑦	—	40NH32A*		40NH32B*		40NH32E*③		—	—	—	—	40NH320*	
—	450	900	900	1215	8⑤⑦	—	40PH32A*		40PH32B*		40PH32E*③		—	—	—	—	40PH320*	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure							
							NEMA 1⑥ General Purpose		NEMA 4/4X Stainless② 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 12② NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Range	NEMA Size	Half Size	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*		40CP820*	
7½	7½	10	10	27	1	—	40DP82B*		40DP82W*		40DP82H*		40DP820*	
10	10	15	15	40	—	1¾	40EP82B*		40EP82W*		40EP82H*		40EP820*	
10	15	25	25	45	2	—	40FP82B*		40FP82W*		40FP82H*		40FP820*	
15	20	30	30	60	—	2½	40GP82B*		40GP82W*		40GP82H*		40GP820*	
25	30	50	50	90	3	—	40HP82B*		40HP82W*		40HP82H*		40HP820*	
30	40	75	75	115	—	3½	40IP82B*		40IP82W*		40IP82H*		40IP820*	
40	50	100	100	135	4	—	40JG82B*		40JG82W*		40JG82H*		40JG820*	

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 17-108.
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 coil100-250V AC 50/60Hz, or DC

⑥

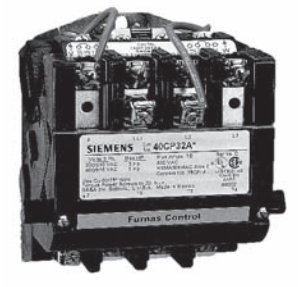
Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

⑦ Lugs are not included, refer to page 17-106.

Heavy Duty Contactors

Single Phase, 4-Pole & Vacuum, 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 17-102.
- Factory Modifications see page 17-117.
- Dimensions see pages 17-141 open and 17-153 enclosed.
- Wiring Diagrams see page 17-180.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Open Type & Standard Width Enclosure, Single Phase, 2-Pole③④

Max Hp					Enclosure											
					Open Type⑤		NEMA 1 General Purposes		NEMA 4/4X Stainless② 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 3/3R② Industrial Use Weatherproof	
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Half Size	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $
1/3	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	7½	45	2	—	40FP12A*		40FP12B*		40FP12W*		40FP12F*		40FP12H*		40FP120*	
5	10	60	—	2½	40GP12A*		40GP12B*		40GP12W*		40GP12F*		40GP12H*		40GP120*	
7½	15	90	3	—	40HP12A*		40HP12B*		40HP12W*		40HP12F*		40HP12H*		40HP120*	
—	—	115	—	3½	40IP12A*		40IP12B*		40IP12W*		40IP12F*		40IP12H*		40IP120*	

Open Type & Standard Width Enclosure, 4-Pole

Max Hp							Enclosure											
							Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 3/3R② Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $
1/3	1½	2	2	9	00	—	40BP22A*		40BP22B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
2	3	5	5	18	0	—	40CP22A*		40CP22B*		40CP22W*		40CP22F*		40CP22H*		40CP220*	
3	7½	10	10	27	1	—	40DP22A*		40DP22B*		40DP22W*		40DP22F*		40DP22H*		40DP220*	
5	10	15	15	40	—	1¾	40EP22A*		40EP22B*		40EP22W*		40EP22F*		40EP22H*		40EP220*	

Vacuum Contactors, 3-Phase, 3-Pole①



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 9/115 for a complete list of available coil voltages.

② For conduit hubs and conversion instructions, see page 9/106.

③ To order single phase contactor in an extra wide enclosure, order the enclosure kit from Page 9/109 and the open style contactor as separate items.

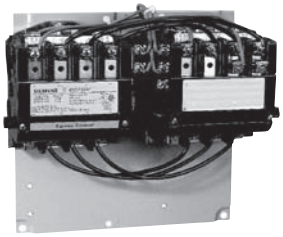
④ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

⑤ 1 NO Auxiliary.

Reversing Heavy Duty Contactors

Class 43

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 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see pages 17-142 open and 17-158 enclosed.
- ► Wiring Diagrams see page 17-180.
- ► Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240①	A
200–208	D
220–240	G
277	L
220–240/440–480①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 17-117.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp							Enclosure											
							Open Type⑦		NEMA 1 General Purpose		NEMA 4/4X Stainless② 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 12② NEMA 3/3R Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	Contactor Amp Rating	NEMA Size	Half Size	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-Pole④

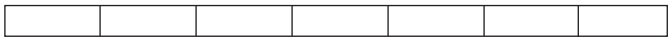
Max Hp				Enclosure											
				Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12② NEMA 3/3R Industrial Use Weatherproof	
115 Volts	208/230 Volts	Contactor Amp Rating	NEMA Size	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $
1⅓	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 17-108.
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

Heavy Duty Control

Catalog Numbering System



Class
48 — Overload

Size
A — Frame A
B — Frame B

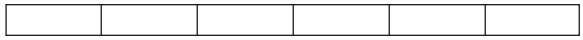
Model
T — ESP200

Current Range
A — 0.25–1①
B — 0.75–3.4①
C — 3–12①
D — 5.5–22①
E — 10–40
F — 13–52
G — 25–100
H — 50–200
J — 100–300 (3.33-10 current range with 300:5 CT and 1 loop with frame A1 (3-12A)-device)
K — 133–400 (3.33-10 current range with 400:5 CT and 1 loop with frame A1 (3-12A)-device)
L — 200–600 (3.33-10 current range with 600:5 CT and 1 loop with frame A1 (3-12A)-device)
M — 250–750 (3.33-10 current range with 750:5 CT and 1 loop with frame A1 (3-12A)-device)
N — 400–1200 (3.33-10.17 currant range with 1200:5 CT and 1 loop with frame A1 (3-12A)-device)

No. of Poles
3 — 3 Phase
1 — Single Phase

Reset
S — Selectable (Man/Auto)

Trip Curve
00 — Class 5, 10, 20 or 30 Selectable



Class
958 — Overload

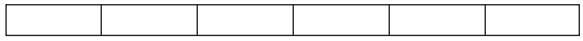
Amp Range
E — 10–40
G — 25–100
H — 50–200

Model
B — ESP200

No. of Poles
3 — 3 phase

Type
S — Selectable (Man/Auto)

Trip Curve
A — 958



Class
958L — Overload

Amp Range
D — 5.5–22
E — 10–40
F — 13–52
G — 25–100
H — 50–200

Model
B — ESP200

No. of Poles
3 — 3 phase

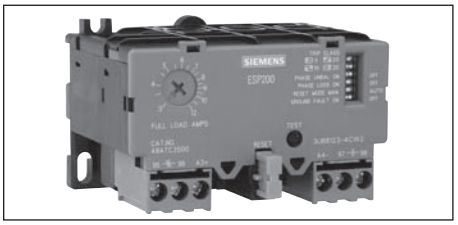
Type
S — Selectable (Man/Auto)

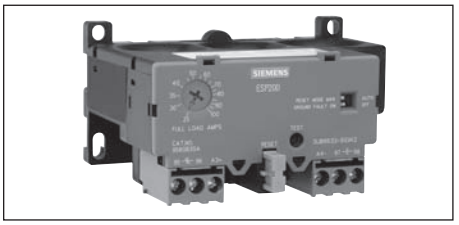
Trip Curve
A — 958L

① Ranges available in Single or 3-phase.

Overload Relays

Solid State ESP200, Class 48, 958 and 958L





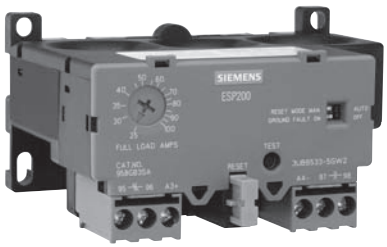
Features	Benefits
▪ Trip Classes - 5, 10, 20, or 30 Selectable by DIP-switches	▪ Field changeable reduces time and inventory. Suitable for light, normal and heavy starting conditions
▪ Phase Loss Protection - Trips in less than 3 Seconds	▪ Protects motor burn out and minimizes motor heating up
▪ Phase Unbalance - Trips based on Trip Class selected	▪ Minimizes temperature rise of the motor on a asymmetrical three-phase-system
▪ Ground Fault - Trips 60% of Motor Current	▪ 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
▪ Trip Indicator - Visible	▪ Save time, faster to identify overload Trip
▪ Ambient Insensitive	▪ Prevents nuisance tripping
▪ No Heaters Required	▪ Saves cost and eliminates time for installation of heaters
▪ Self-Powered - No outside source required	▪ Reduce cost for external power supply
▪ FLA dial with wide Adjustment - 4:1 ratio	▪ Provides wide range, reduces inventory
▪ Self Protected in short circuit condition (when used with proper fuses or motor starter protector)	▪ Unlike bimetal overloads, this eliminates replacement of the overload heaters after short circuit
▪ Test Button - Tests Electronics	▪ Tests the complete electronic functions including the trip mechanism. Increases up time
▪ Thermal Memory	▪ Prevents re-starting motor when it is still hot
▪ Conformally coated circuit board	▪ Resists against environmental conditions
▪ 1 NO and 1NC Contacts Standard. B600, R300	▪ Makes it easier for user to wire local contacts
▪ Operating Temperature: -25 °C - 65 °C	▪ Wide operating temperature range prevents nuisance tripping with temperature changes
▪ Repeat Accuracy <1%.	▪ For more precise settings and reduced nuisance tripping
▪ Removable Terminal Block	▪ Terminal Block can be removed without removing wires. Saves time for replacements
▪ Automatic reset	▪ 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
▪ Remote reset	▪ 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
▪ DIN Rail Mounted	▪ Reduces installation time
▪ Touch - Safe Terminals	▪ Protects against accidental touching of live circuits
▪ UL listed CSA certified	▪ Third party approval standard

Overload Relays

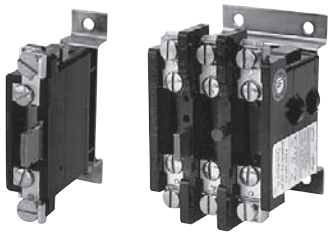
Solid State ESP200, Class 48, 958, 958L and Bimetal



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
  - —±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°F for a given heater rating
- UL Listed File #E22655 or Component Recognized
- CSA Certified File #LR6535

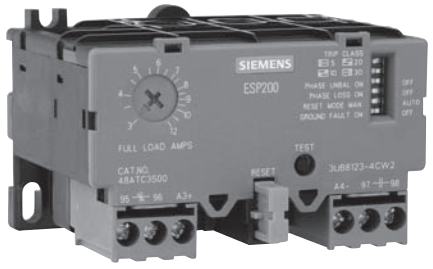
Ambient Compensated Bimetal Overloads

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 17-69.
- Dimensions see page 17-143.
- 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 17-106.

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" ⑧	**48ATK3S00**	**3UB81234KW2**	
200–600	3	"A1" ④	**48ATL3S00**	**3UB81234LW2**	
250–750	3	"A1" ⑦	**48ATM3S00**	**3UB81234MW2**	
400–1220	3	"A1" ⑤	**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—3RB206③⑥, 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 Size①	Retrofit Plate Suffix	Plate Kit Separate	Price Adder $
Size 00–1¾ 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)

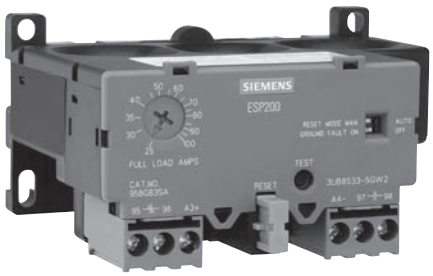
Poles	Amp Rating	Auxiliary Contacts	Contact Rating	Catalog Number	List Price $
1	25 60 100 180	1 NC 1 NC 1 NC 1 NC	5A (B600) & 5A (P300)	**48DA18AA4** **48GA18AA4** **48HA18AA4** **48JA18AA4**	
3	30 30 60 60	1 NC 1 NO/NC 1 NC 1 NO/NC	10A (A600) & 5A (P300)	**48DC38AA4** **48DC39AA4** **48GC38AA4** **48GC39AA4**	
	100 180	3 NC 3 NC	5A (B600) & 5A (P300)	**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 17-143.

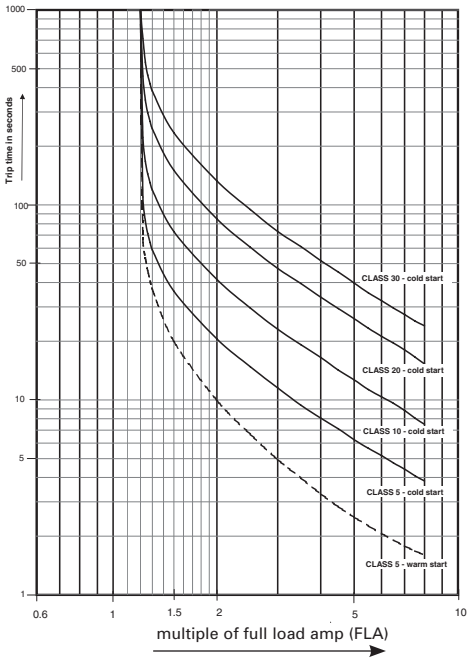
Current Transformers

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**	

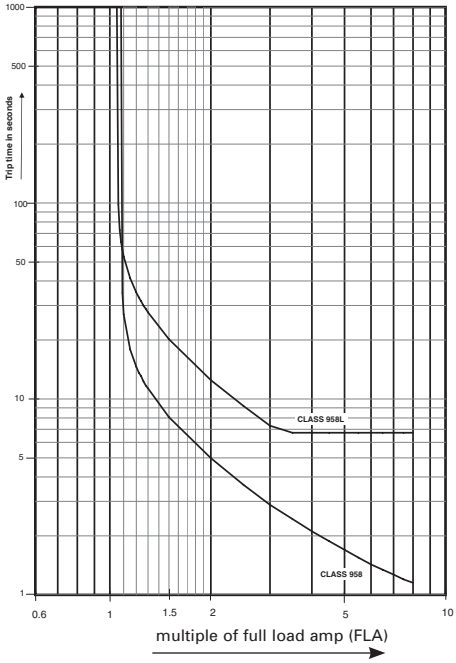
Solid State—Class 958 and 958L

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"	**958LDB3SA**	**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**	

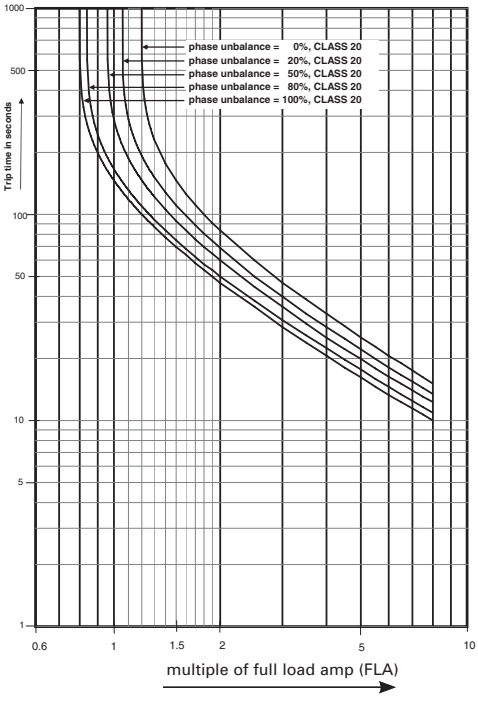
Time - Current - Characteristics CLASS 48



Time - Current - Characteristics CLASS 958, 958L



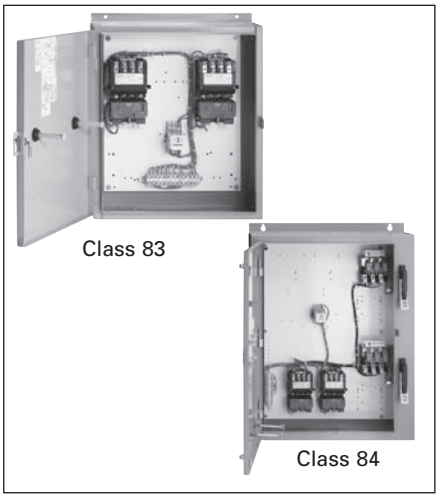
Trip - curve depending on unbalance CLASS 20



① Temperature rating −25° to +60°C.

Duplex Heavy Duty Controllers

• Revised •
03/01/14



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 and Service Equipment
- 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 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.

Duplex Heavy Duty Controllers

Non-Combination, Class 83

Selection

Ordering Information

- 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 17-122 (6-Required).
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-164.
- Wiring Diagrams see page 17-181.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24②	J
120	F
200–208②	D
220–240②	G
277②	L
440–480②	H
550–600②	E

Non-Combination (with Solid-State Overload)

Max Hp						Overload		Enclosure							
								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 3/3R① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	0	—	0.25–1	A	83CUA92BF		83CUA92WF		83CUA92EF		83CUA920F	
½	¾	1½	2	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	
⅛	⅛	⅓	½	1	—	0.25–1	A	83DUA92BF		83DUA92WF		83DUA92EF		83DUA920F	
½	¾	1½	2	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	
7½	7½	—	—	1	—	10–40	A1	83DUE92BF		83DUE92WF		83DUE92EF		83DUE920F	
10	10	15	15	—	1¼	10–40	A1	83EUE92BF		83EUE92WF		83EUE92EF		83EUE920F	
10	15	25	25	2	—	13–52	B	83FUF92BF		83FUF92WF		83FUF92EF		83FUF920F	
15	20	30	30	—	2½	25–100	B	83GUG92BF		83GUG92WF		83GUG92EF		83GUG920F	
25	30	50	50	3	—	25–100	B	83HUG92BF		83HUG92WF		83HUG92EF		83HUG920F	
30	40	75	75	—	3½	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						Enclosure							
						NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R① Industrial Use Weatherproof	
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 $
3	3	5	5	0	—	83CP92BF81		83CP92WF81		83CP92EF81		83CP920F81	
7½	7½	10	10	1	—	83DP92BF81		83DP92WF81		83DP92EF81		83DP920F81	
10	10	15	15	—	1¾	83EP92BF81		83EP92WF81		83EP92EF81		83EP920F81	
10	15	25	25	2	—	83FP92BF81		83FP92WF81		83FP92EF81		83FP920F81	
15	20	30	30	—	2½	83GP92BF81		83GP92WF81		83GP92EF81		83GP920F81	
25	30	50	50	3	—	83HP92BF81		83HP92WF81		83HP92EF81		83HP920F81	
30	40	75	75	—	3½	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 17-108.
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

- 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 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.
- Heater elements for bimetal overloads see page 17-122 (6-Required).
- For factory installed fusible disconnect, see page 17-118.
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-164.
- Wiring Diagrams see page 17-181.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24②	J
120	F
200–208②	D
220–240②	G
277②	L
440–480②	H
550–600②	E

Two Disconnect Switches with Solid-State Overload

Max Hp						Overload		Disc. Amp Range	Enclosure							
									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 3/3R① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size		Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	½	0	—	0.25–1	A	30	**84CUA92BDF**		**84CUA92WDF**		**84CUA92EDF**		**84CUA920DF**	
½	¾	1½	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**	
⅛	⅛	⅓	½	1	—	0.25–1	A	30	**84DUA92BDF**		**84DUA92WDF**		**84DUA92EDF**		**84DUA920DF**	
½	¾	1½	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**	
7½	7½	—	—	1	—	10–40	A1	30	**84DUE92BDF**		**84DUE92WDF**		**84DUE92EDF**		**84DUE920DF**	
10	10	15	15	—	1¾	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	—	2½	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	—	3½	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							Enclosure							
							NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R① Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Disc Amp Range	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**	
7½	7½	10	10	1	—	30	**84DP92BDF81**		**84DP92WDF81**		**84DP92EDF81**		**84DP920DF81**	
10	10	15	15	—	1¾	60	**84EP92BDF81**		**84EP92WDF81**		**84EP92EDF81**		**84EP920DF81**	
10	15	25	25	2	—	60	**84FP92BDF81**		**84FP92WDF81**		**84FP92EDF81**		**84FP920DF81**	
15	20	30	30	—	2½	100	**84GP92BDF81**		**84GP92WDF81**		**84GP92EDF81**		**84GP920DF81**	
20	25	50	50	3	—	100	**84HP92BDF81**		**84HP92WDF81**		**84HP92EDF81**		**84HP920DF81**	
30	40	75	75	—	3½	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 17-108.
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

- 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 17-122 (6-Required).
- Field Modification Kits see page 17-102.
- Factory Modifications see page 17-117.
- Dimensions see page 17-164.
- Wiring Diagrams see page 17-181.
- Replacement Parts see page 17-129.

Coil Table

60Hz Voltage	Letter
24②	J
120	F
200–208②	D
220–240②	G
277②	L
440–480②	H
550–600②	E

2 Motor Circuit Protectors (with Solid-State Overload)

Max Hp						Overload		Motor Circuit Interrupter ETI	Enclosure							
									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 3/3R① Industrial Use, Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size		Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
⅛	⅛	⅓	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	
⅛	⅛	⅓	½	1	—	0.25–1	A	3	84DUA92BMF		84DUA92WMF		84DUA92EMF		84DUA920MF	
½	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	—	1¾	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							Enclosure							
							NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R① Industrial Use Weatherproof	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Motor Circuit Interrupter ETI	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	—	1¾	40	84EPF92BMF81		84EPF92WMF81		84EPF92EMF81		84EPF920MF81	
10	10	—	—	—	1¾	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 17-108.

② Not available on standard alternator style ('92' in the catalog number).

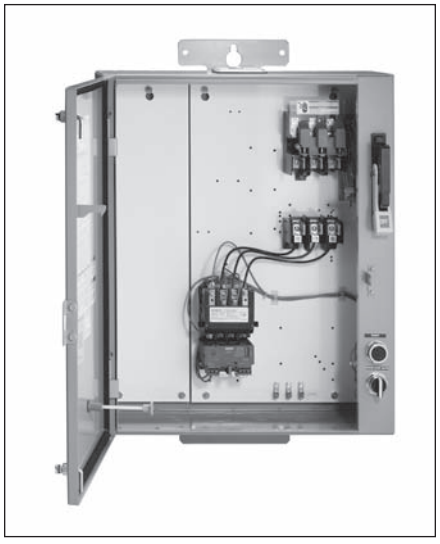
③ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Pump Control Panels

Class 87, 88

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.

Pump Control Panels

Class 87, 88

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 weatherproof 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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-165.
- ► Wiring Diagrams see page 17-183.
- ► Replacement Parts see page 17-129.
- ► 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.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A①
200–208	D
220–240	G
220–240/440–480	C①
277	L
440–480	H
550–600	E

Fusible Disconnect

Max Hp						Overload		Disc.	Fuse		
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	Amp Range	Clip Amp / Volts	Catalog Number	List Price $
—	—	1	1	1	—	0.75–3.4②	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	—	1¾	10–40	A1	30	30A/600V	**87EUE6FC**	
—	—	15	15	—	1¾	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	**87LPU6FH**	
—	—	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	—	—	—	1¾	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	**87LPU6LG**	

Circuit Breaker

Max Hp						Overload		Motor Circuit Interrupter		
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size	ETI Amps	Catalog Number	List Price $
½	½	1	1	1	—	0.75–3.4②	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	—	1¾	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	**87LPU6MH**	
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

- ► Heater elements for bimetal overloads see page 17-122 (3-Required).
- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-165.
- ► Wiring Diagrams see page 17-183.
- ► Replacement Parts see page 17-129.
- ► 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.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A①
200–208	D
220–240	G
220–240/440–480	C①
277	L
440–480	H
550–600	E

Fusible Disconnect

Max HP 200V	230V	460V	575V	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Amps/Volts	Catalog Number	List Price $
—	—	10	10	1	—	30	30A/600V	87DAE6FC	
—	—	10	10	1	—	60	60A/600V	87DAE60C	
—	—	15	15	—	1¾	30	30A/600V	87EAF6FC	
—	—	15	15	—	1¾	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	—	—	—	1¾	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 200V	230V	460V	575V	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price $
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	—	1¾	40	87EAF6MC	
10	10	—	—	—	1¾	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

• Revised •
03/01/14

Ordering Information

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-165.
- ► Wiring Diagrams see page 17-183.
- ► Replacement Parts see page 17-129.
- ► Replace the (*) in the catalog number with a letter from the coil table.
- ► Refer to page 17-49 for information on the 958L OLR

Coil Table

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				Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts	NEMA Size	Overload Relay Range	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				Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts	NEMA Size	Overload Relay Range	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-165.
- ► Wiring Diagrams see pages 17-176 and 17-177.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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.
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"

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	—	1¾	100A/250V	**88EUEP2FG**		100	**88EUEP2MG**	
	25	13–52	B	2	—	100A/250V	**88FUFP2FG**		100	**88FUFP2MG**	
	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	—	1¾	100A/600V	**88EUEP4FH**		100	**88EUEP4MH**	
	40	13–52	B	2	—	100A/600V	**88FUFP4FH**		100	**88FUFP4MH**	
	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

- ► Field Modification Kits see page 17-102.
- ► Factory Modifications see page 17-117.
- ► Dimensions see page 17-165.
- ► Wiring Diagrams see pages 17-178 and 17-179.
- ► Replacement Parts see page 17-129.

Coil and Control Voltage

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.
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"

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			
								Fusible Disconnect		Circuit Breaker		Fusible Disconnect		Circuit Breaker	
		Amp Range	Frame Size					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	—	1¾	100A/250V	100	88EUE06FD		88EUE06MD		88EUEC6FD		88EUEC6MD	
	20	13–52	B	2	—	100A/250V	100	88FUF06FD		88FUF06MD		88FUFC6FD		88FUFC6MD	
	30	25–100	B	—	2½	200A/250V	125	88GUG06FD		88GUG06MD		88GUGC6FD		88GUGC6MD	
	40	25–100	B	3	—	200A/250V	150	88HUG06FD		88HUG06MD		88HUGC6FD		88HUGC6MD	
	50	50–200	B	—	3½	200A/250V	250	88IUH06FD		88IUH06MD		88IUHC6FD		88IUHC6MD	
	60	50–200	B	4	—	400A/250V	250	88JUH06FD		88JUH06MD		88JUHC6FD		88JUHC6MD	
	75	55–250	—	5	—	400A/250V	400	88LPS06FD		88LPS06MD		88LPSC6FD		88LPSC6MD	
	150	55–250	—	5	—	600A/250V	600	88LPU06FD		88LPU06MD		88LPUC6FD		88LPUC6MD	
	300	160–630	—	6	—	—	800	—		88MSX06MD		—		88MSXC6MD	
230	10	10–40	A1	1	—	60A/250V	50	88DUE02FG		88DUE02MG		88DUEC2FG		88DUEC2MG	
	15	10–40	A1	—	1¾	60A/250V	50	88EUE02FG		88EUE02MG		88EUEC2FG		88EUEC2MG	
	25	13–52	B	2	—	100A/250V	100	88FUF02FG		88FUF02MG		88FUFC2FG		88FUFC2MG	
	30	25–100	B	—	2½	200A/250V	100	88GUG02FG		88GUG02MG		88GUGC2FG		88GUGC2MG	
	50	25–100	B	3	—	200A/250V	150	88HUG02FG		88HUG02MG		88HUGC2FG		88HUGC2MG	
	60	50–200	B	—	3½	200A/250V	250	88IUH02FG		88IUH02MG		88IUHC2FG		88IUHC2MG	
	75	50–200	B	4	—	400A/250V	250	88JUH02FG		88JUH02MG		88JUHC2FG		88JUHC2MG	
	100	55–250	—	5	—	400A/250V	400	88LPS02FG		88LPS02MG		88LPSC2FG		88LPSC2MG	
	150	55–250	—	5	—	600A/250V	600	88LPU02FG		88LPU02MG		88LPUC2FG		88LPUC2MG	
	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	—	1¾	60A/600V	50	88EUE04FH		88EUE04MH		88EUEC4FH		88EUEC4MH	
	40	13–52	B	2	—	100A/600V	100	88FUF04FH		88FUF04MH		88FUFC4FH		88FUFC4MH	
	60	25–100	B	—	2½	200A/600V	100	88GUG04FH		88GUG04MH		88GUGC4FH		88GUGC4MH	
	75	25–100	B	3	—	200A/600V	125	88HUG04FH		88HUG04MH		88HUGC4FH		88HUGC4MH	
	100	50–200	B	—	3½	200A/600V	150	88IUH04FH		88IUH04MH		88IUHC4FH		88IUHC4MH	
	150	50–200	B	4	—	400A/600V	250	88JUH04FH		88JUH04MH		88JUHC4FH		88JUHC4MH	
	200	55–250	—	5	—	400A/600V	400	88LPS04FH		88LPS04MH		88LPSC4FH		88LPSC4MH	
	300	55–250	—	5	—	600A/600V	600	88LPU04FH		88LPU04MH		88LPUC4FH		88LPUC4MH	
	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	—	1¾	60A/600V	50	88EUE05FE		88EUE05ME		88EUEC5FE		88EUEC5ME	
	40	13–52	B	2	—	100A/600V	50	88FUF05FE		88FUF05ME		88FUFC5FE		88FUFC5ME	
	60	25–100	B	—	2½	200A/600V	100	88GUG05FE		88GUG05ME		88GUGC5FE		88GUGC5ME	
	75	25–100	B	3	—	200A/600V	125	88HUG05FE		88HUG05ME		88HUGC5FE		88HUGC5ME	
	100	50–200	B	—	3½	200A/600V	150	88IUH05FE		88IUH05ME		88IUHC5FE		88IUHC5ME	
	150	50–200	B	4	—	400A/600V	250	88JUH05FE		88JUH05ME		88JUHC5FE		88JUHC5ME	
	200	55–250	—	5	—	400A/600V	400	88LPS05FE		88LPU05ME		88LPSC5FE		88LPSC5ME	
	300	55–250	—	5	—	600A/600V	400	88LPU05FE		88LPU05ME		88LPUC5FE		88LPUC5ME	
	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

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

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Selection



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	NA①	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.

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:				
0NC / 3NO	0NC / 3NO	0NC / 3NO	0NC / 3NO	0NC / 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:				
NA①	NA ①	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



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.

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/12②, 4③	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**

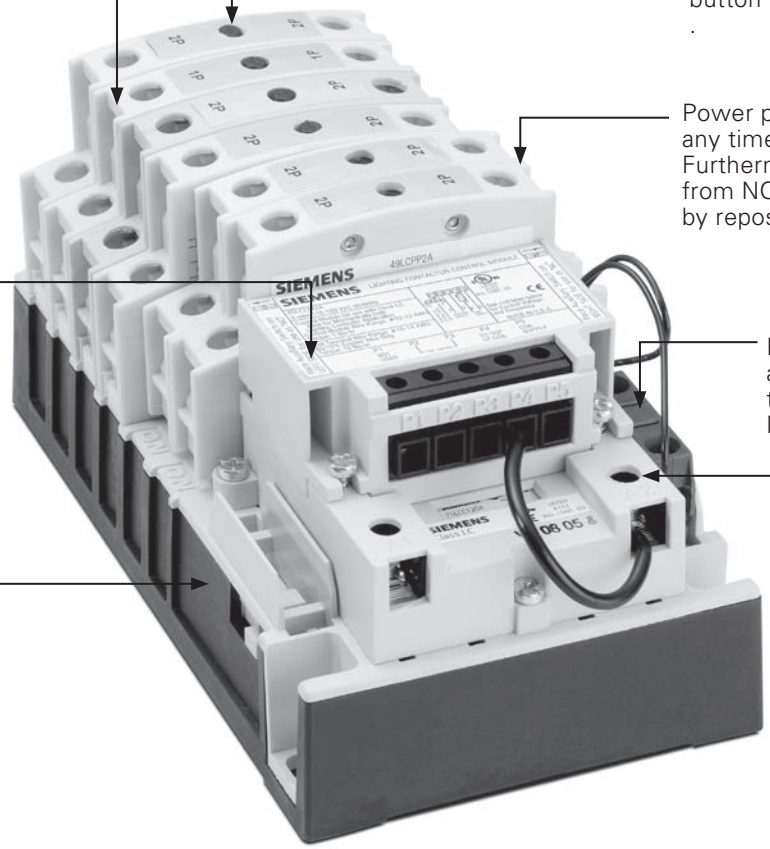
① Not available on 200 - 400A contactors.
② Type 12 field convertible to type 3/3R.
③ Type 4 painted enclosure through 100 Amp only.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

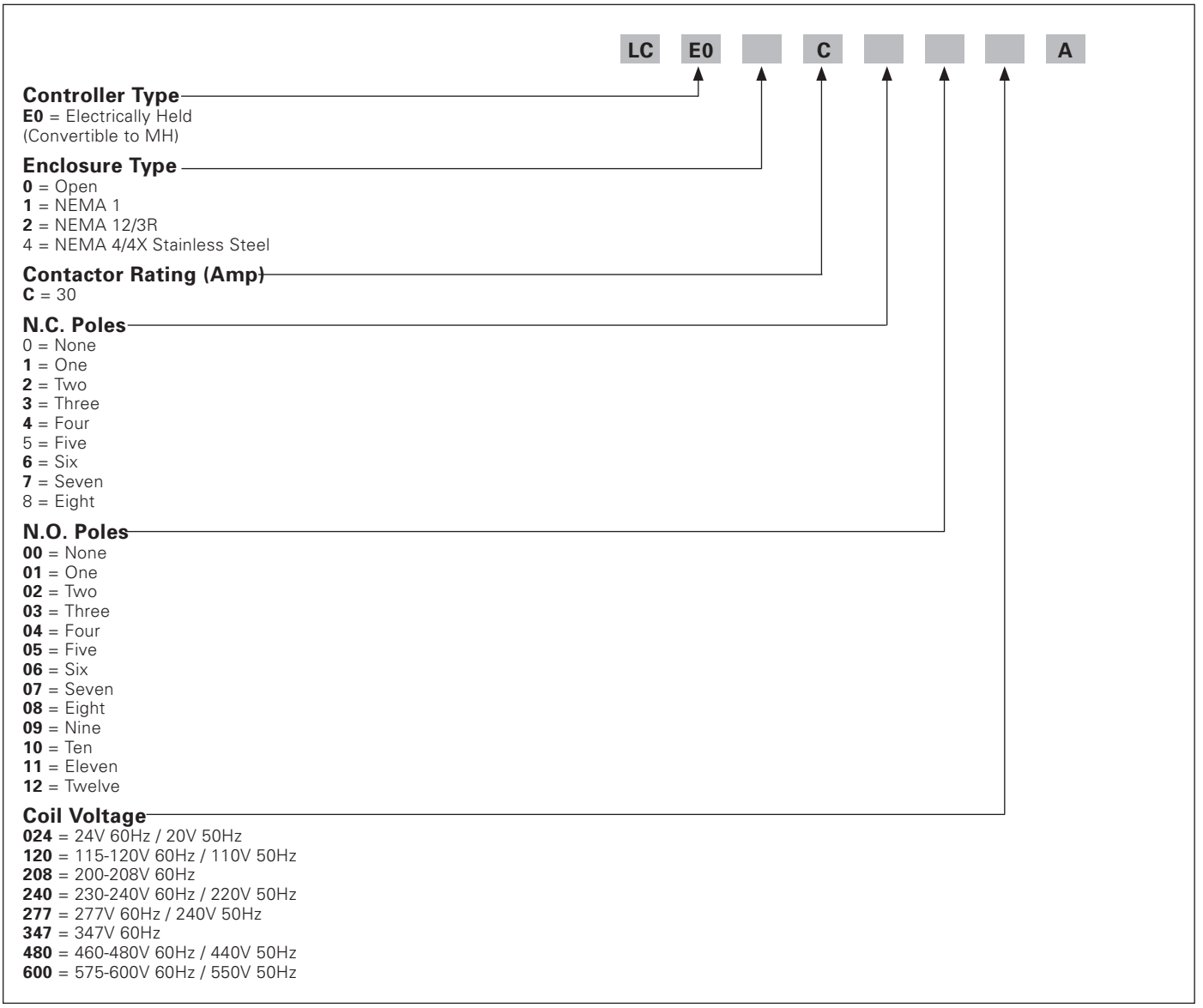
Features

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.



- 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

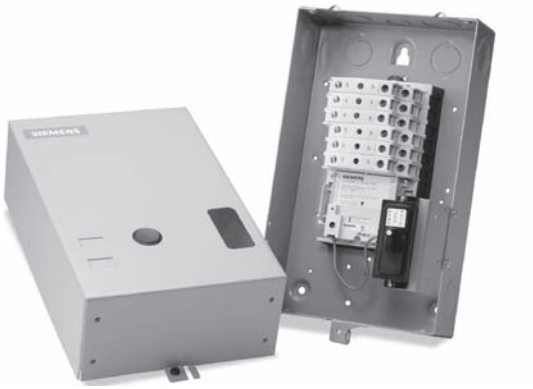
Catalog Numbering System



Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Selection



- 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 14.
- To convert standard electrically held contactor to mechanically held in the field, select catalog number from tables below and select conversion module kit from page 15.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347	347
480	480
600	600

Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12①	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:

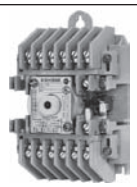
Input Volt. (AC)	Steady State Current @ Rated Volts (mA)	Max. VA
24	*80*	*5*
115-120	*83*	*12*
200-277	*91*	*30*

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

Selection


CLM 20 Amp


CLM 100 Amp

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 cells①
- Energy management systems①
- Microprocessors①
- Occupancy sensors①

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.

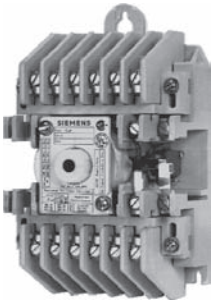
Opening – When the "Trip" pushbutton is operated, the trip solenoid coil is energized, unhooking the latch lever from the latch pin, which allows the contactor to open. As the contactor opens, the coil-clearing auxiliary contact de-energizes the trip solenoid coil.

① Operation through control modules.

Lighting Control

Mechanically and Magnetically Held Lighting Contactors, Class CLM

Selection



Ordering Information

- Replace *** with a number from the coil table.
- Field modification kits see page 17-102.
- Factory modifications see page 17-117.
- Dimensions see page 17-149 open page 17-166 enclosed.
- Wiring Diagrams see page 17-187.
- Replacement parts see page 17-132.

Coil Table

60Hz Voltage	Number
24②	024
120	120
208	208
240	240
277	277
480	480
600⑤	600

Open and Non-combination Enclosed Contactors

Max Amp Rating	Number of Poles	Open Type④		Enclosure					
				NEMA 1 General Purpose		NEMA 12 NEMA 3/3R③ Industrial Use Weatherproof		NEMA 4/4X Stainless Steel③ Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel	
		Catalog Number	List Price $	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***	
	12			CLM1B12***		CLM2B12***		CLMSB12***	
30	2	CLM0C02***		CLM1C02***		CLM2C02***		CLMSC02***	
	3	CLM0C03***		CLM1C03***		CLM2C03***		CLMSC03***	
	4	CLM0C04***		CLM1C04***		CLM2C04***		CLMSC04***	
	5	CLM0C05***		CLM1C05***		CLM2C05***		CLMSC05***	
	6	CLM0C06***		CLM1C06***		CLM2C06***		—	—
	8	CLM0C08***		CLM1C08***		CLM2C08***		—	—
	9	CLM0C09***		CLM1C09***		CLM2C09***		—	—
	10	CLM0C10***		CLM1C10***		CLM2C10***		—	—
	12	CLM0C12***		CLM1C12***		CLM2C12***		—	—
60	2	CLM0D02***		CLM1D02***		CLM2D02***		CLMSD02***	
	3	CLM0D03***		CLM1D03***		CLM2D03***		CLMSD03***	
	4	CLM0D04***		CLM1D04***		CLM2D04***		CLMSD04***	
	5	CLM0D05***		CLM1D05***		CLM2D05***		CLMSD05***	
	6	CLM0D06***		CLM1D06***		CLM2D06***		—	—
	8	CLM0D08***		CLM1D08***		CLM2D08***		—	—
	9	CLM0D09***		CLM1D09***		CLM2D09***		—	—
	10	CLM0D10***		CLM1D10***		CLM2D10***		—	—
	12	CLM0D12***		CLM1D12***		CLM2D12***		—	—
100	2	CLM0E02***		CLM1E02***		CLM2E02***		CLMSE02***	
	3	CLM0E03***		CLM1E03***		CLM2E03***		CLMSE03***	
	4	CLM0E04***		CLM1E04***		CLM2E04***		CLMSE04***	
	5	CLM0E05***		CLM1E05***		CLM2E05***		CLMSE05***	
200	2	CLM0F02***		CLM1F02***		CLM2F02***		CLMSF02***	
	3	CLM0F03***		CLM1F03***		CLM2F03***		CLMSF03***	
	4	CLM0F04***		CLM1F04***		CLM2F04***		CLMSF04***	
	5	CLM0F05***		CLM1F05***		CLM2F05***		CLMSF05***	
300	2	CLM0G02***		CLM1G02***		CLM2G02***		—	—
	3	CLM0G03***		CLM1G03***		CLM2G03***		—	—
400	2	CLM0H02***		CLM1H02***		CLM2H02***		—	—
	3	CLM0H03***		CLM1H03***		CLM2H03***		—	—

Open 20 Amp Contactors

Max Amp Rating	Number of Poles①	110–120V Coil 50/60Hz		208–240V Coil 50/60Hz		265–277V Coil 50/60Hz		440–480V Coil 50/60Hz	
		Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
20	2	CLM22031		CLM22061		CLM22071		CLM22091	
	3	CLM32031		CLM32061		CLM32071		CLM32091	
	4	CLM42031		CLM42061		CLM42071		CLM42091	
	6	CLM62031		CLM62061		CLM62071		CLM62091	
	8	CLM82031		CLM82061		CLM82071		CLM82091	
	10	CLM102031		CLM102061		CLM102071		CLM102091	
	12	CLM122031		CLM122061		CLM122071		CLM122091	

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 17-108.

④ CLM 30 & 60A 6-12-pole can be field assembled. Order mounting kit **49MCMPMA** and the appropriate number of 2-5 pole contactors.

⑤ 600 volt coils are not available on 20 amp contactors.

Lighting Control

Combination Mechanically and Magnetically Held Lighting Contactors, Class CLM *Selection*



Ordering Information

- Replace *** with a number from the coil table.
- Field modification kits see page 17-102.
- Factory modifications see page 17-117.
- Dimensions see page 17-166.
- Wiring Diagrams see page 17-187.
- Replacement parts see page 17-132.

Coil Table

60Hz Voltage	Number
24①	024
120	120
208	208
240	240
277	277
480	480
600③	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 3/3R② 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 17-108.

③ 600 volt coils are not available on 20 amp contactors.

Industrial Control Power Transformers

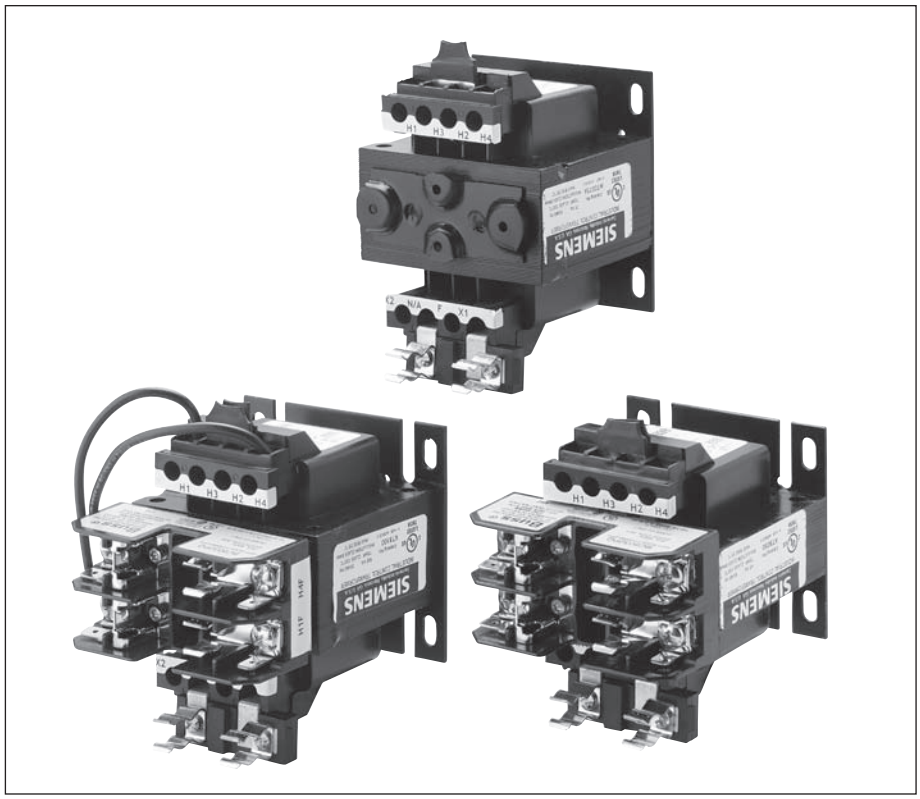
Class MT

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.



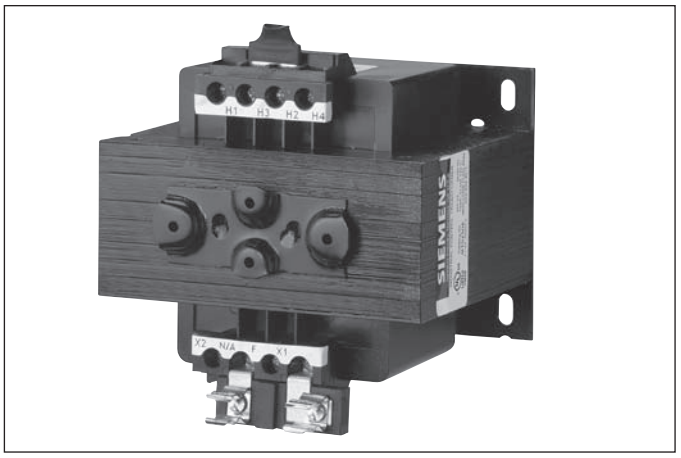
Industrial Control Power Transformers are specifically designed and built to provide adequate voltage to the load while accommodating the high current levels present at inrush. These transformers deliver excellent secondary voltage regulation and meet or exceed the standards established by NEMA, ANSI, 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
- UL 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 105°C (221°F) insulation system. 55°C (131°F) temperature rise. (50–100VA typical)
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (150-750VA 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

Industrial Control Power Transformers

Class MTG



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 105°C (221°F) insulation system. 55°C (131°F) temperature rise. (50–100VA typical)
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (150-750VA 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 transformers

Optional Field Installed Fuse Clip Kits For Panel Mounting

- 2-Pole primary Class CC fuse block
- 1-Pole secondary midget fuse block for 13⁄32 × 1½ 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:

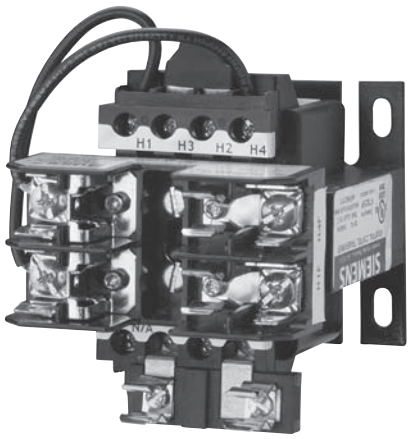
1. Determine the Application Inrush VA by using the following industry accepted formula:
   Application Inrush VA = $\sqrt{(\text{Inrush VA})^2 + (\text{Sealed VA})^2}$
2. Refer to the Regulation Data Chart. If the primary voltage is basically stable and does not vary by more than 5% from nominal, the 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
1000①	15000/——	21000/——	27000/——
1000②	9000/——	13000/——	18500/——
1500	10500/——	15000/——	205000/——
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.

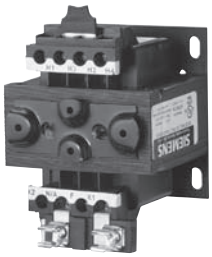


Primary Fuse Kit Installation—Class MT Transformer with Primary Fuse Kit, KCCFPX2R

Industrial Control Power Transformers

Domestic, Class MT

Selection



Ordering Information

- Use the Voltage Table to determine the primary and secondary voltage required.
- Field Modifications see page 17-110.
- Dimensions see page 17-151.
- Wiring Diagrams see page 17-189.

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 A①②		Voltage Letter B②③		Voltage Letter C②③		Voltage Letter D②③		Voltage Letter E①②		Voltage Letter F①②	
	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		—	—	—	—	—	—	—	—	—	—

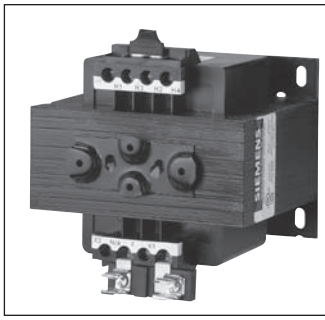
VA Rating	Voltage Letter G①②		Voltage Letter H②④		Voltage Letter I②④		Voltage Letter J②③		Voltage Letter L①②		Voltage Letter M②④	
	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $	Catalog No	List Price $
50	MT0050G		MT0050H		MT0050I		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		—	—	—	—	—	—
1500	MT1500G		MT1500H		MT1500I		—	—	—	—	—	—
2000	MT2000G		MT2000H		MT2000I		—	—	—	—	—	—
3000	MT3000G		MT3000H		MT3000I		—	—	—	—	—	—
5000	MT5000G		MT5000H		—	—	—	—	—	—	—	—

① Includes secondary fuse clip on sizes 50–750VA.
② A 2-pole primary Class CC fuse kit is available for field installation. See page 9/95 for details. Catalog Number: **KCCFPX2R**.
③ Includes secondary fuse clip on sizes 50–500VA.
④ Does not include secondary fuse clip on any size.

Industrial Control Power Transformers

International, Class MTG

Selection



Ordering Information

- Use the Voltage Table to determine the primary and secondary voltage required.
- Field Modifications see page 17-110.
- Dimensions see page 17-151.
- Wiring Diagrams see page 17-189.

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	List Price $	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	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		—	—	—	—	—	—	—	—	—	—	—	—

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**	

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, MRS①

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price $	Catalog Number	List Price $
Class SMF	115–277V AC	**SMFPL10**		**SMFPL10G**	

Pilot Light Kits—Class MMS, MRS①

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 SMF

Enclosure Type	For Use With SMF	Catalog Number	List Price $
Standard Size NEMA 1 General Purpose	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	**SMFFE2**	
Oversized NEMA Type 1 General Purpose	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	**SMFFE1**	
NEMA 3R, 4, 12 Watertight Dust-tight	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	**SMF40BC2**	

Enclosures—Class MMS

Enclosure Type	For Use With MMS	Catalog Number	List Price $
Standard Size NEMA 1 General Purpose	KO1, KO1P, KO1B, KO2, KO2A, KO2B, KO3, KO3A, KO3B, KO4, KO4A, KO4B	**MMSKE3**	
Oversized NEMA Type 1 General Purpose	KO1, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C, KO2	**SMFKE1**	
Jumbo NEMA Type 1 General Purpose	KO1, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C, KO2	**SMFKE2**	
NEMA 3R, 4, 12 Watertight Dust-tight	KO1, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C	**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**	

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**	

Replacement Parts—Class SMF, MMS

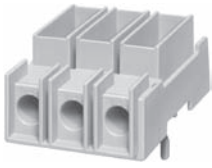
Description	Catalog Number	List Price $
Replacement Toggle Kits:Type FW and KW (NEMA 4 Metallic Enclosure)	**SMFHW1**	

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.

Field Modification Kits

Class 11 - 3RV

Selection

	Description	Type		Catalog Number	List Price $
 3RV1901-1D	**Auxiliary Contact Blocks**				
	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 contact④		**3RV1901-1D** **3RV1901-1E** **3RV1901-1G**	
 3RV1901-1A	**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		**3RV1901-1A** **3RV1901-1B** **3RV1901-1C** **3RV1901-1J**	
	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.		**3RV1921-1M**	
	Auxiliary Releases				
 3RV1912-1CP0	**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	**3RV1902-1AF0** **3RV1902-1AM1** **3RV1902-1AP0** **3RV1902-1AV1**	
	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	**3RV1922-1CP0** **3RV1922-1CV1**	
 3RV1902-1DP0	**Shunt trip** 1 shunt trip per 3RV mountable at the right-hand side. Cannot be fitted together with undervoltage release.	AC 50Hz/60Hz① 20–24V 90–110V 200–240V 350–415V	DC② 20–70V 70–190V 190–330V 330–500V	**3RV1902-1DB0** **3RV1902-1DF0** **3RV1902-1DP0** **3RV1902-1DV0**	
	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	
	Lug Kit				
 3RV1928-1H	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		**3RV1928-1H**	
	Mounting				
	Push-in Mounting Hole Kit For screw panel mounting of the 3RV	Four mounting holes required for each 3RV.		**3RB1900-0B**	
	Sealing device				
	Adjustment Dial covers	For sealing the FLA adjustment dial (Kit includes 10 covers)		**3RV1908-0P**	
	Front mount auxiliary cover	For sealing the front mount auxiliary opening. (Kit includes 10 covers)		**3RV1901-0H**	
 3RV1901-0H	**Door Operators**				
	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	**3RV1926-0B**	
			330 mm depth with supporting bracket	**3RV1926-0K**	

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

Selection

Push Buttons and Selector Switches	Class	Enclosure Type	Controller Size or (Lighting Rating)	Type	Catalog Number	List Price $
 **49SBPB5**	14, 40, LEN, CLM①	Open	00-4	Start, Stop Push Buttons	**49SAPB5**	
				Hand-Off-Auto Selector Switch	**49SASB1**	
				Off-On Selector Switch	**49SASB4**	
		1	00-4 or (20–100A)	Start, Stop Push Buttons	**49SBPB5**	
				Hand-Off-Auto Selector Switch	**49SBSB1**	
				Off-On Selector Switch	**49SBSB4**	
			5-8 or (200–400A)	Start, Stop Push Buttons	**49SAP05**	
				Hand-Off-Auto Selector Switch	**49SAS01**	
				Keyed Hand-Off-Auto (key removable in all positions)	**49SAS09**	
				Off-On Selector Switch	**49SAS04**	
 **49SBSB1**		12, 4/4X	00-8 or (20–400A)	Start, Stop Push Buttons	**49SAP05**	
				Hand-Off-Auto Selector Switch	**49SAS01**	
				Keyed Hand-Off-Auto (key removable in all positions)	**49SAS09**	
				Off-On Selector Switch	**49SAS04**	
	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**	
				Forward-Off-Reverse Selector Switch	**49SAS02**	
		12, 4/4X	0-8	Forward, Reverse, Stop Push Buttons	**49SAP02**	
				Forward-Off-Reverse Selector Switch	**49SAS02**	
 **49SAP05**	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**	
				High-Off-Low Selector Switch	**49SAS03**	
		12, 4/4X	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**	
 **49SAS01**	17, 18, 36, 37, 83, 84, LED,LEF, LEB, CMN①, CMF①, CMB①	1, 12, 4/4X	0-8 (20-400A)	Start, Stop Push Buttons	**49SAP05**	
				Hand-Off-Auto Selector Switch	**49SAS01**	
				Keyed Hand-Off-Auto (key removable in all positions)	**49SAS09**	
				Off-On Selector Switch	**49SAS04**	
	25, 26	1, 12, 4/4X	0-8	Forward, Reverse, Stop Push Buttons	**49SAP02**	
				Forward-Off-Reverse Selector Switch	**49SAS02**	
	32	1, 12, 4/4X	0-4	High, Low, Stop Push Buttons	**49SAP03**	
				High-Off-Low Selector Switch	**49SAS03**	

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.

Field Modification Kits

Pilot Lights

Selection

Description	Class	Enclosure Type	Controller Size or (Lighting Rating)	Lens Color(s)	Legend(s)	Voltage	Catalog Number	List Price $
 **49SBLBF**	14, 40, 22②, 43②, 30 (2S2W)③, LEN, CLM	1	00–4 or (20–200A)	Red, Green, Amber	ON, RUN, OFF①, OL TRIPPED⑤, FORWARD, REVERSE, LOW, HIGH	24 Vac	**49SBLBJ**	
						120 Vac	**49SBLBF**	
						208/240/277 Vac	**49SBLBG**	
						480 Vac	**49SBLBH**	
						600 Vac	**49SBLBE**	
		1	5–8 or (300–400A)	Red (Transformer Type)	ON	24 Vac (Full Voltage)	**49SPL0BRJ**	
						120 Vac	**49SPL0BRF**	
						240 Vac	**49SPL0BRG**	
						480 Vac	**49SPL0BRH**	
						600 Vac	**49SPL0BRE**	
		12, 4/4X	0–8 or (20–400A)	Green (Transformer Type)	OFF④	24 Vac (Full Voltage)	**49SPL0AGJ**	
						120 Vac	**49SPL0AGF**	
						240 Vac	**49SPL0AGG**	
						480 Vac	**49SPL0AGH**	
						600 Vac	**49SPL0AGE**	
 **49SPL0BRF**	30 (2S1W)②	1	0–4	Red, Green, Amber	ON, RUN, OFF①, OL TRIPPED⑤, FORWARD, REVERSE, LOW, HIGH	24 Vac	**49SBLBJ**	
						120 Vac	**49SBLBF**	
						208/240/277 Vac	**49SBLBG**	
						480 Vac	**49SBLBH**	
						600 Vac	**49SBLBE**	
		1	2–4	Red (Transformer Type)	ON	24 Vac (Full Voltage)	**49SPL0BRJ**	
						120 Vac	**49SPL0BRF**	
						240 Vac	**49SPL0BRG**	
						480 Vac	**49SPL0BRH**	
						600 Vac	**49SPL0BRE**	
		12, 4/4X	0–4	Green (Transformer Type)	OFF④	24 Vac (Full Voltage)	**49SPL0AGJ**	
						120 Vac	**49SPL0AGF**	
						240 Vac	**49SPL0AGG**	
						480 Vac	**49SPL0AGH**	
						600 Vac	**49SPL0AGE**	
	17, 18, 25②, 26②, 32②, 36, 37, 81, 83, 84, 87, 88, LED, LEF, LEB, CMN, CMF, CMB	1, 12, 4/4X	0–6 (20–400A)	Red (Transformer Type)	ON	24 Vac (Full Voltage)	**49SPL0BRJ**	
						120 Vac	**49SPL0BRF**	
						240 Vac	**49SPL0BRG**	
						480 Vac	**49SPL0BRH**	
						600 Vac	**49SPL0BRE**	
				Green (Transformer Type)	OFF④	24 Vac (Full Voltage)	**49SPL0AGJ**	
						120 Vac	**49SPL0AGF**	
						240 Vac	**49SPL0AGG**	
						480 Vac	**49SPL0AGH**	
						600 Vac	**49SPL0AGE**	
 **49SBLBL**	Lens Kit ONLY (30 (2S1W)) (14, 40, 22, 43, 30 (2S2W), LEN, CLM)	1	0–1 ¾ 00–4 or (20–200A)	Red, Green, Amber	—	—	**49SBLBL**	

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.

Field Modification Kits

NEMA, Lighting and Heating Contactors, 20 Amp CLM, CMB, CMF, CMN

Selection

Solid State Control Module Kits For Lighting and Heating Contactors①



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		CLM4379771			CLM4379781			CLM4379791	
24V AC/DC, 50/60 Hz	47	CLM4379772		48	CLM4379782		49	CLM4379792	
240/277V AC, 50/60 Hz	(2-Wire Control) (2W)	CLM4379773		(3-Wire Control) (3W)	CLM4379783		(Start/Stop Control) (3WS)	CLM4379793	
12V AC/DC, 50/60 Hz		CLM4379774			CLM4379784			CLM4379794	

Protective Shielding for NEMA Products



Class 14

Class 40



Disconnect with protective shield

Class 14, 22, 30, 40, 43

Contactor or Starter Size	00–1¼	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	49LCPP1A 49LCPP2A

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.

Field Modification Kits

NEMA, Reduced Voltage and Lighting

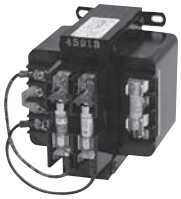
Starter/Contactor Auxiliary Contact Kits

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**	
	14, 17, 18, 22, 25, 26, 36, 37, 40, 43, 87, 88	5, 6	2 NO	**3RH1921-1EA20**	
			1 NO & 1 NC	**3RH1921-1DA11**	
			2 NC	**3RH1921-1EA02**	
	14, 17, 18, 22, 25, 26 40, 43	7, 8	1 NO & 1 NC (Inside L or R)	**49CAL18-11**	
			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**	
	CLM, CMN, CMF, CMB	20 Amps	1 NO/NC SPDT	**CLM4097291**	
			2 NO/NC SPDT	**CLM4097292**	
		30-200 Amps	1 NO & 1 NC	**CLMFCAK11**	
			2 NC	**CLMFCAK02**	
			2 NO	**CLMFCAK20**	
			1 Coil Clearing NO & NC	**CLMFCCK11**	
		300-400 Amps	1 NO & 1 NC	**CLMHCAK11**	
			2 NC	**CLMHCAK02**	
			2 NO	**CLMHCAK20**	
			1 Coil Clearing NO & NC	**CLMHCCK11**	

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 Kits①③

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 50③	45 VA	**KT*050**②③		120	24	**1**
	3–3½	75	50 VA	**KT*050P**③		208	24	**G**
	4	100	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 0-1¾

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

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	**49ASMP1**	
		B	2 -2 1/2	**49ASMP2**	
		B	3-4	**49ASMP3**	
	Starter Mounting Adaptor Plate			**49D70084**	
	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**	
	Oil Tight Boot For Single and Multi Unit using 49MARSR Resets Enclosure type 4, 4X			**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**	

Field Modification Kits

NEMA Accessories

Selection

Miscellaneous Kits

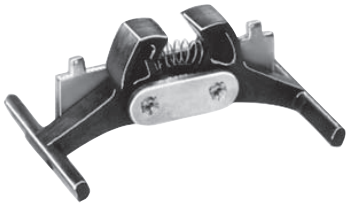
Description		Class	Enclosure Type	Controller Size	Catalog Number	List Price $
 Mechanical Interlock for Horizontally Mounted Contactors	Includes wire	14, 40	Open	00–1 1¾ 2, 2½ 3, 3½ 4	**49CCF22H** **49EEF22H** **49GGF22H** **49HHP22H** **49JJG22H**	
	Interlock Only	14, 40	Open	5, 6	**3RA1954-2A**	
	Wire Kit Only			5 6	**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 1¾ 2, 2½ 3, 3½ 4	**49CCF22HP** **49EEF22HP** **49GGF22HP** **49HHP22HP** **49JJG22HP**	
	Includes mounting plate (Different Frame Sizes)	14, 40	Open	Left / Right 2, 2½ / 3, 3½ 3, 3½ / 2, 2½	**49L107944** **49L107945**	
 Surge Suppressor	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	00–4①	**49D26344**	
 Auxiliary Power Pole	NO 36A at 600V AC Max NC 25A at 600V AC Max	All but Class LC, LE, CLM	All	00–1¼	**49SAF0** **49SAFC**	
 Main Contacts Lighting Contactors	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**	
 Load Side Power Take Off Kit	Includes 3 power lugs for making extra connections to the load side of the contactor	All but Class LC, LE, CLM	All	00–1¾	**49SAE**	
 Lug Kit for Contactors Item / Wire Range 49SAAF / 2-14 49SAAH / 2/0-14 75D35994001 / 250MCM-6	For AL/CU Wire	14, 40	All	2-2½ 3-3½ 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	
 Ground Lug Kit Meets CSA Standard 22.2 No 14-1973	1 Conductor 2-14 For AL/CU Wire	All	All	All	**49D11960001**	
 Lightning Arrestor		All	All	All	**49D45584002**	
 Backspin Timer	On delay timer that reduces risk of starting into a backspin	87, 88	All	All	**3RP2025-1AQ30** **3RP2025-1AP30**	
 Hole Plug	Covers the hole that is typically used for the conduit hub	87	All	1-4	**49D41149006**	

Illustration	Description	Contactor	Wire Size	Catalog Number	List Price $
 **3RT1966-4G**	**Lug Kit** 1 Kit = 1 Terminal block. 1 kit necessary for each line and load.	NEMA size 4 (Vacuum) NEMA size 5 NEMA size 6	2/0 to 600 MCM, max. one 500MCM & one 600MCM	3RT1966-4G	

① Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil. For size 4 panel mount.

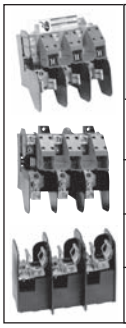
② Only 3 lugs are suplied for line or load. If lugs for line and load are required order 2 kits.

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

Fused and Non-Fused Disconnect Switch Kits②



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 H③	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)
					100A, 600V	HBB63				
200	HNB64		HFB64		200A, 250V	—	—	HBB64		#6-300 AWG (Cu/Al)
					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 ½" NPT.		51AADB	
Hole Plugs		For tapered NPT conduit openings.	½ ¾ 1 1½ 2 2½	51AAHA 51AAHB 51AAHC 51AAHD 51AAHE 51AAHF	
Reducer Bushings		Cast aluminum, UL Recognized and CSA Certified. Used to reduce existing tapered NPT conduit opening when required.	¾–½ 1–½ 1½–¾ 1½–1	51AARBA 51AARCA 51AARDB 51AARDC	
			2½–¾ 2½–1 2½–1½ 2½–2	51AARFB 51AARFC 51AARFD 51AARFE	
			3–1 3–1½ 3–2 3–2½	51AARGC 51AARGD 51AARGE 51AARGF	

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	¾" 1" 1½" 2" 2½"	All	All	12, 3, 3R, 4	49MACML 49MACMD 49MACMN 49MACMF 49MACMG	
	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" 1½" 2" 2½"	81, 87	All	3R	75D41149001 75D41149003 75D41149004 75D41149005	

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.

Field Modification Kits

NEMA, Overload Relays

Selection

Sirius 3RB20

Illustration	Description		For Overload Type	Catalog Number	List Price $
	Reset mechanisms				
 Reset plunger with reset button	**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 reset	**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

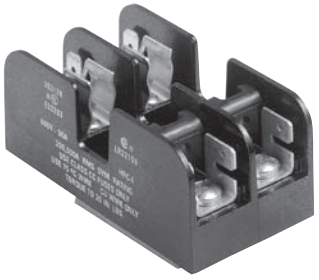
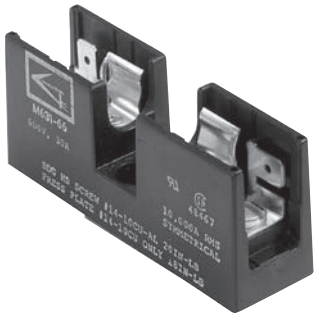
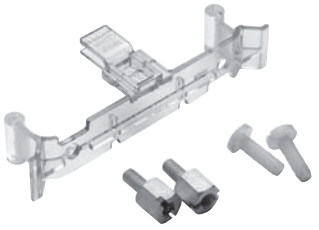
Class	Size	Model Type	21 - 27V		96 - 127V		200 - 277V	
			Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
All	5	P	–	–	**3RT1965-5PF31**		**3RT1965-5PP31**	
		V	–	–	**3RT1966-5PF31**		**3RT1966-5PP31**	
	6	P	–	–	**3RT1975-5PF31**		**3RT1975-5PP31**	
		V	–	–	**3RT1976-5PF31**		**3RT1976-5PP31**	

Field Modification Kits

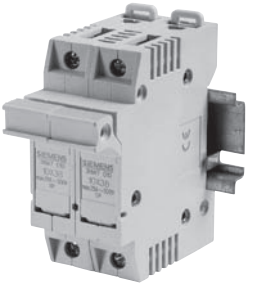
Class MT, MTG

Selection

Fuse Blocks, Touch-Safe Terminal Covers

Catalog Number	Description	List Price $
 **KCCFP2RG**	2-Pole Primary Class CC Fuse Block for domestic fusing. Max 600V.-(Single- ole cover kits, if required are listed below. One cover kit required per pole.)	
 **KCCF1G**	1-Pole Secondary Midget Fuse Block for 13/32 × 1½ domestic Fusing. Max 250V. (Single pole cover kits, if required are listed below.)	
 **KCCFBCK**	Single Pole Fuse Block cover Kit for domestic fuse blocks listed above. (For primary or secondary) 2-Kits required for 2-pole fuse block.	
 **KTTSC4P** (cover for 4 and 6 terminals)	Snap-On Transformer Terminal Touch-Safe Cover Kit. (Includes primary and secondary covers for both 4 and 6 terminals.)	
49FCCPT	Fuse Clips 2 per pack	
49JUCPT	Terminals Jumper	

International Fusing①

Catalog Number	Description	List Price $
 **8WA1011-1SF12**	1-Pole Fuse Block, Touch-Safe. Up to 6.3A for 5 mm × 20 mm or 5 mm × 25 mm (Requires DIN Rail Mounting)	
 **3NW7011**	1-Pole Fuse Block, Touch-Safe 25A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 **3NW7021**	2-Pole Fuse Block, Touch-Safe 25A, for 10 × 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 **3NW7111**	1-Pole Fuse Block, Touch-Safe 4-50A, for 14 × 51 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
 **8WA1815**	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.)	

① Product Category: IEC.

Product Category: NEMA

Heavy Duty Control

Non-Combination Enclosure Kits, Class 49

Selection

49	E	B	14	E	B	11	07	05	R

Class
49 — Field Kit

Type
E — Enclosure Only

Model
B — Model
C — 2002

Product Class
14 — Class 14, 40
22 — Class 22, 43
30 — Class 30

Starter Size
E — 00, 0, 1, 1¾
G — 2, 2½
I — 3, 3½
J — 4

NEMA Type
B — NEMA 1
0 — NEMA 12
W — NEMA 4 S.S.

Height (In Inches)

Width (In Inches)

Depth (In Inches)

Reset Installation
R — Reset

Non-Reversing Starters & Contactors Class 14, 40

	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		
Size	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 $
00–1¾	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

	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		
Size	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 $
00–1¾	49EC14IB201208R		49EC14IB201208R	200		49EB22EW131306R		49EB22EW131306R			49EB22E0131306R		49EB22E0131306R		
2, 2½	49EC14IB201208R		49EC14IB201208R	200		49EB22GW161406R		49EB22GW161406R			49EB22G0161406R		49EB22G0161406R		
3, 3½	49EC14JB251409R		49EC14JB251409R	250		49EB22IW261808R		49EB22JW302410R			49EB22I0261808R		49EB22J0302410R		
4	49EC14JB251409R		49EC14JB251409R	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Two-Speed Two-Winding Starters Class 30

	NEMA 1					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		
Size	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 $
0–1¾	49EC14IB201208R②		49EC14JB251409R②	200		49EB30EW131306R		49EB30GW161808R			49EB30E0131306R		49EB30G0161808R		
2, 2½	49EC14IB201208R②		49EC14JB251409R②	200		49EB30GW161406R		49EB30GW161808R			49EB30G0161406R		49EB30G0161808R		
3, 3½	49EC14JB251409R②		49EB22JB302410R③	300		49EB30IW261808R		49EB22JW302410R			49EB30I0261808R		49EB22J0302410R		
4	49EC14JB251409R②		49EB22JB302410R③	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Two-Speed One-Winding Starters Class 30

	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		
Size	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 $
0–1¾	49EC14IB201208R②		49EC14JB251409R②	200		49EB30EW131306R		49EB30GW161808R			49EB30E0131306R		49EB30G0161808R		
2, 2½	49EB30GB161808R③		49EB22JB302410R③	300		49EB30GW161808R		49EB22IW261808R			49EB30G0161808R		49EB22I0261808R		
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 17-153.

① For conduit hubs and conversion instructions, see page 17-108.

② Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 17-102.

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 17-102.

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

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	**49EB14JW261408R**	**49EB14JW261408R**		**49EB14J0261408R**	**49EB14J0261408R**	
LE 30A 12P	**49EC14IB201208R**	**49EC14JB251409R**	250	**49EB14JW261408R**	**49EB14JW261408R**		**49EB14J0261408R**	**49EB14J0261408R**	
LE 60A 3P	**49EC14GB140807R**	**49EC14IB201208R**	200	**49EB22GW161406R**	**49EB22GW161406R**		**49EB22G0161406R**	**49EB22G0161406R**	
LE 60A 6-9P	**49EC14IB201208R**	**49EC14IB201208R**	200	**49EB14JW261408R**	**49EB14JW261408R**		**49EB14J0261408R**	**49EB14J0261408R**	
LE 60A 12P	**49EC14IB201208R**	**49EC14IB201209R**	250	**49EB14JW261408R**	**49EB14JW261408R**		**49EB14J0261408R**	**49EB14J0261408R**	
LE 100A 3P	**49EC14IB201208R**	**49EC14IB201208R**	200	**49EB14JW261408R**	**49EB14JW261408R**		**49EB14J0261408R**	**49EB14J0261408R**	

Lighting & Heating Contactors Class CLM

		NEMA 1 General Purpose (Clamshell)②④					NEMA 4/4X Stainless① Watertight, Corrosion Resistant③⑥					NEMA 12/3/3R① Industrial Use③⑤				
		Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
		Model C/B Enclosure		Model C/B Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
Size	Pole	Catalog Number	List Price $	Catalog Number	Max CPT	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT	List Price $	Catalog Number	List Price $	Catalog Number	Max CPT	List Price $
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		**49EB30GW161808R**		**49EB30GW161808R**	—		**49EB30G0161808R**		**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 17-166.

① For conduit hubs and conversion instructions, see page 17-108.

② Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 17-102.

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 17-102.

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.

Combination Starter Enclosure Kits

Features and Benefits

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

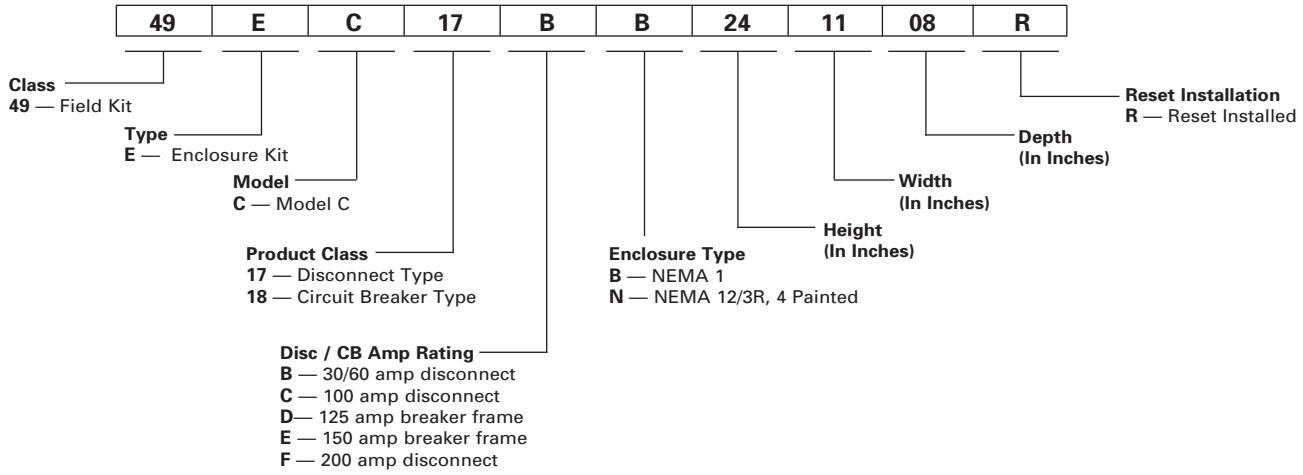
MCP Type Enclosure Kit

- 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

1. From the catalog, select a class 14 open type starter with the required starter size and overload relay type.
2. 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.
3. 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



Combination Starter Enclosure Kits

• Revised •
03/01/14

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	100	**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	**ED63A003**	3	**ED63A003**
	3-12	10	**ED63A010**	10	**ED63A010**
	5.5-22	25	**ED63A025**	25	**ED63A025**
1	0.75-3.4	3	**ED63A003**	3	**ED63A003**
	3-12	10	**ED63A010**	10	**ED63A010**
	5.5-22	25	**ED63A025**	25	**ED63A025**
	10-40	30	**ED63A030**	30	**ED63A030**
1 ¾	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 17-108.

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	A①
200–208	D
220–240	G
220–240/440–480	C①
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

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	A①
200–208	D
220–240	G
220–240/440–480	C①
277	L
440–480	H
550–600	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	
87DAE6FC	**49EB87GF242008**	14DP32A*81	HFB612	HBB612	HR612	—	
87DAE60C	**49EB87GF242008**	14DP32A*81	HFB62	HBB62	HR62	—	
87EAF6FC	**49EB87GF242008**	14EP32A*81	HFB612	HBB612	HR612	—	
87EAF60C	**49EB87GF242008**	14EP32A*81	HFB62	HBB62	HR62	—	
87FAJ6FC	**49EB87GF242008**	14FP32A*81	HFB62	HBB62	HR62	—	
87FAJ60C	**49EB87GF242008**	14FP32A*81	HFB63	HBB63	HR63	—	
87GAK6FC	**49EB87GF242008**	14GP32A*81	HFB62	HBB62	HR62	—	
87GAK60C	**49EB87GF242008**	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6FC	**49EB87JF362408**	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN60C	**49EB87JM362408**	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6FC	**49EB87JM362408**	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6FC	**49EB87JM362408**	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAE6LC	**49EB87GF242008**	14DP32A*81	HFB21	HBB21	HR21	—	
87DAE6PC	**49EB87GF242008**	14DP32A*81	HFB22	HBB22	HR612	—	
87EAG6LC	**49EB87GF242008**	14EP32A*81	HFB22	HBB22	HR612	—	
87FAJ6LC	**49EB87GF242008**	14FP32A*81	HFB22	HBB22	HR612	—	
87FAJ6PC	**49EB87GF242008**	14FP32A*81	HFB63	HBB63	HR63	—	
87GAL6LC	**49EB87GF242008**	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6LC	**49EB87JF362408**	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN6PC	**49EB87JM362408**	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6LC	**49EB87JM362408**	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6LC	**49EB87JM362408**	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAA6MC	**49EB87GB242008**	14DP32A*81	—	—	—	ED63A003	
87DAB6MC	**49EB87GB242008**	14DP32A*81	—	—	—	ED63A010	
87DAD6MC	**49EB87GB242008**	14DP32A*81	—	—	—	ED63A025	
87DAE6MC	**49EB87GB242008**	14DP32A*81	—	—	—	ED63A030	
87EAF6MC	**49EB87GB242008**	14EP32A*81	—	—	—	ED63A040	
87EAG6MC	**49EB87GB242008**	14EP32A*81	—	—	—	ED63A050	
87FAH6MC	**49EB87GB242008**	14FP32A*81	—	—	—	ED63A040	
87FAJ6MC	**49EB87GB242008**	14FP32A*81	—	—	—	ED63A050	
87GAK6MC	**49EB87GB242008**	14GP32A*81	—	—	—	ED63A050	
87GAL6MC	**49EB87GB242008**	14GP32A*81	—	—	—	ED63A100	
87HAN6MC	**49EB87IB362408**	14HP32A*81	—	—	—	ED63A100	
87IAP6MC	**49EB87IB362408**	14IP32A*81	—	—	—	ED63A125	
87JAR6MC	**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.

Factory Modifications

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	
	Test Push Buttons	83, 84	All	K1	
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	FL④	FW	FS	FT	FU	FE①
14, 40, 17, 18, 36, 37, 87, 88, LC, LE, CLM, CM	All													
22, 25, 26, 30, 32, 43, 83, 84	All				⑧	⑧								

Coil Options

Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83⑥, 84⑥, 87, 88					
Volts 60 HZ	Volts 50 HZ	Coil Letter Change	Controller Size — List Price $		
			00–2½	3, 3½	4
24	24	J			
120	110	F			
110–120/220–240	110/190–220	A			
200–208	—	D			
220–240	190–220	G			
277	240	L			
220–240/440–480	190–220/380–440	C			
440–480	380–440	H			
575–600	550	E			
DC Coil③	24V	S⑦	.		
	48V	U			
	125V	V			
	250V	W			

AC (50–60 HZ) or DC	Coil Letter Change	Controller Size 4 (Vacuum Only) Size 5 & 6 (ALL)
23–26V	J	
42–48V	U	
110–127V	F	
200–220V	D	
220–240V	G	
240–277V	L	
380–420V	K	
440–480V	H	
575–600V	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

► Replace (*) with letter from Transformer Table.

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 Transformers②

Description	Modification Code	Product Class	Enclosure Type	20–60	100	—	200	300–400	—	—
				0–2½	3	3½, 4	5	6	7	8
Standard Capacity① with 1-Secondary Fuse	B*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83③, 84③, 87, LE	1, 3, 4, 12		—	—	—	—	—	—
			7 & 9		—	—	—	—	—	—
Standard Capacity with 2-Primary and 1-Secondary Fuse	D*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83③, 84③, 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,	1, 3, 4, 12							
		43, 83③, 84③, 87, LC, LE, CLM, CM	7 & 9							
		36, 37, 88	All						—	—
150VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*1	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83③, 84③, 87, LC, LE, CLM, CM	1, 3, 4, 12							
		36, 37, 88	All						—	—

← Lighting & Heating Ratings (Amps)
← Motor Controller Size

Factory Assembled Fuse Clips—Class 25, 32, 84④

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	Modication Code	Controller Size — List Price $			
				00–1¾	2–4	5–6	7–8
14, 17, 18, 40, 83③, 84③	—	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**		—	—	—
	5	—	**G50**			—	—
	5	1	**G51**		—	—	—
	5	3	**G53**		—	—	—
	6	—	**G60**		—	—	—
	6	2	**G62**		—	—	—
	7	1	**G71**		—	—	—
	8	—	**G80**		—	—	—
22, 25, 26, 43 & 30, 32 (2-winding)	—	2	**G02**①			—	—
	2	—	**G20**①			—	—
	2	2	**G22**①				—
	4	0	**G40**①				—
	4	4	**G44**①			—	—
	6	2	**G62**①			—	—
	8	0	**G80**①			—	—
30, 32 (1-winding)	0	2	**G02**①	—		—	—
	2	—	**G20**①	—		—	—
	2	2	**G22**①			—	—
	4	—	**G40**①			—	—
	4	4	**G44**①	—		—	—
	6	2	**G62**①	—		—	—
	8	—	**G80**①	—		—	—
LE, CLM, CM	1	1	**G11**		—	—	—
LC	0	1	**G01**				
	1	0	**G10**				
	1	1	**G11**				
	0	2	**G02**				
	2	0	**G20**				
LE, CLM, CM	0	2	**G02**①		—	—	—
	2	0	**G20**①		—	—	—
	2	2	**G22**①		—	—	—

Description	Class	Modification Code	Controller Size - Price Deduction $					
			0, 1	1¼ - 2½	3	3½, 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

• Revised •
03/01/14

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 Coil②	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 Reversing in one speed only 2 speed 2 winding Reversing in both speeds 2 speed 1 winding Reversing in both speeds 2 speed 2 winding	30, 32	**R6** **R7** **R8** **R9**									— — — —
Reversing for Reduced Voltage	36, 37	**R**									

Motor Management with PROFIBUS DP Communications③

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.

Factory Modifications

Control Relays

Description		Class	Enclosure Type	Modification Code	List Price $
Control Relay 4-Poles Max	4 NO	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	All	R5	
Electronic On Delay Relay (.15s–100h) 24V/120V		All	1, 3, 4, 7, 9, 12	T1	
Electronic On Delay Relay (.15s–100h) 24V/240V①				T2	
Electronic Off Delay Relay (.15s–100s) 120V				T3	
Electronic Off Delay Relay (.15s–100s) 240V①				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	List② Price $
Ammeter (includes a C.T. if necessary)	14, 17, 18, 22, 25, 26, 30⑤, 32⑤, 36, 37, 40, 43, 83, 84, 87, 88	1, 3, 4, 4X, 12	M1	
Ammeter and Switch (3-Phase with 3 C.T.'s)			M2	
Voltmeter			M3	
Voltmeter and Switch (3-Phase)			M4	
Elapsed Time Meter③			M5	
Wattmeter			M6	

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	TC3④	
6 Point Terminal		TC6④	
9 Point Terminal		TC9④	

Special Ratings

Description	Class	Modification Code	List Price $
Service Entrance Rating	17, 18, 25, 26, 32, 37, 84, 87	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 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

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
⅛	4.4	2.2
¼	5.8	2.9
⅓	7.2	3.6
½	9.8	4.9
¾	13.8	6.9
1	16	8
1 ½	20	10
2	24	12
3	34	17
5	56	28
7 ½	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	380 Volts
¼	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
⅓	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
½	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
¾	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	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
	900	4.95	4.30	2.15	1.72	2.60
1½	3600	5.01	4.36	2.18	1.74	2.69
	1800	5.59	4.86	2.43	1.94	2.94
	1200	6.07	5.28	2.64	2.11	3.20
	900	6.44	5.60	2.80	2.24	3.39
2	3600	6.44	5.60	2.80	2.24	3.39
	1800	7.36	6.40	3.20	2.56	3.84
	1200	7.87	6.84	3.42	2.74	4.14
	900	9.09	7.90	3.95	3.16	4.77
3	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
	900	13.1	11.4	5.70	4.55	6.80
5	3600	15.5	13.5	5.76	5.41	8.20
	1800	16.6	14.4	7.21	5.78	8.74
	1200	18.2	15.8	7.91	6.32	9.59
	900	18.3	15.9	7.92	6.33	9.60
7½	3600	22.4	19.5	9.79	7.81	11.50
	1800	24.7	21.5	10.7	8.55	13.00
	1200	25.1	21.8	10.9	8.70	13.20
	900	26.5	23.0	11.5	9.19	13.90
10	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
	900	35.1	30.5	15.2	12.2	18.50
15	3600	41.9	36.4	18.2	14.5	22.00
	1800	45.1	39.2	19.6	15.7	23.70
	1200	47.6	41.4	20.7	16.5	25.00
	900	51.2	44.5	22.2	17.8	26.90
20	3600	58.0	50.4	25.2	20.1	30.50
	1800	58.9	51.2	25.6	20.5	31.00
	1200	60.7	52.8	26.4	21.1	31.90
	900	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	380 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
	900	77.4	67.3	33.7	27.0	40.70
30	3600	84.8	73.7	36.8	29.4	—
	1800	86.9	75.6	37.8	30.2	45.70
	1200	90.6	78.8	39.4	31.5	47.60
	900	94.1	81.8	40.9	32.7	49.50
40	3600	111	96.4	48.2	38.5	—
	1800	116	101	50.4	40.3	61.00
	1200	117	102	50.6	40.4	61.20
	900	121	105	52.2	41.7	63.20
50	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
	900	150	130	65.0	52.0	78.50
60	3600	164	143	71.7	57.3	—
	1800	171	149	74.5	59.4	90.00
	1200	173	150	75.0	60.0	91.10
	900	177	154	77.0	61.5	93.10
75	3600	206	179	89.6	71.7	—
	1800	210	183	91.6	73.2	111.00
	1200	212	184	92.0	73.5	112.00
	900	222	193	96.5	77.5	117.00
100	3600	266	231	115	92.2	—
	1800	271	236	118	94.8	144.00
	1200	275	239	120	95.6	145.00
	900	290	252	126	101	153.00
125	3600	—	292	146	116	—
	1800	—	293	147	117	177.00
	1200	—	298	149	119	180.00
	900	—	305	153	122	186.00
150	3600	—	343	171	137	—
	1800	—	348	174	139	210.00
	1200	—	350	174	139	210.00
	900	—	365	183	146	211.00
200	3600	—	458	229	184	—
	1800	—	452	226	181	274.00
	1200	—	460	230	184	276.00
	900	—	482	241	193	279.00
250	3600	—	559	279	223	—
	1800	—	568	284	227	343.00
	1200	—	573	287	229	345.00
	900	—	600	300	240	347.00
300	1800	—	278	339	271	392.00
	1200	—	684	342	274	395.00
400	1800	—	896	448	358	—

Formula—Approximate Full Load Amps for Other Motors

208 Volt Full Load Amp ≈ 230 Volt current × 110%
2-Phase FLA ≈ 0.866 × the 3-Phase FLA
2-Phase, 3-wire current in common wire ≈ 1.41 × that in the other 2 lines

25Hz 1500 RPM, amps ≈ amps of 60Hz, 3600 RPM
25Hz 750 RPM, amps ≈ amps of 60Hz, 1800 RPM
Service factor 1.0 ≈ amps × 0.9
50°C–55°C motor ≈ amps × 0.9

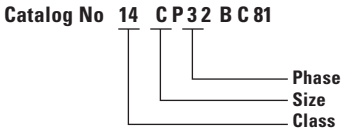
Overload Relay Heater Tables

Selection of Heater Elements for Overload Relays

General

To Select Heater Catalog Number Use

- Product Class
- Controller Size
- Motor Amp
- Phase



1. 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.

2. 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 17-124			
	Magnetic						
14, 22	Non-reversing, Reversing	00-4	**B–J**	213	233	313	332
17, 18 25, 26 30, 32① 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



Heater Elements Class SMF

Ordering Information

1. Determine number of heater elements required from Table A.
2. Determine motor full load current and service factor.
   NOTE: If motor amps are unknown, an approximate value may be found on page 17-122. These values should be used with caution and only when motor amps are not available.
3. If the motor and controller are in the same ambient temperature:
   a. For 1.15 to 1.25 service factor motors use 100% of motor full load current for heater element selection.
   b. For 1.0 service factor motors use 90% of motor full load current for heater element selection.
   c. Heater elements are class 20.
4. 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.
5. Select proper heater element from table below.
6. 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

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 1¾	Size 2, 2½	Size 3, 3½	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**	
—	—	—	72.5–80.0	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

Table 313 for Class 14, 22 (1-Phase)

Full Load Amps			Heater	
Size 00, 0, 1	Size 1P	Size 2, 2½	Catalog No	List Price $
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	
48DA	48GA	48HA	48JA	Catalog No	List Price $
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

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 1¾	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**	

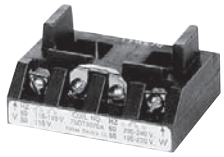
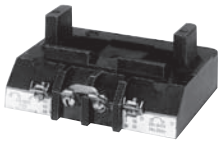
Replacement Parts

Starters and Contactors – AC Coils

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 60Hz	Volts 50Hz	Catalog Number	List Price $
	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 17-130.

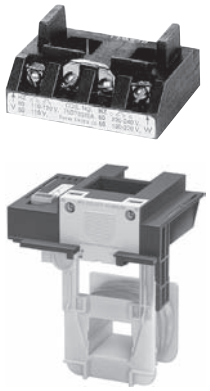
Replacement Parts

Starters and Contactors – DC Coils, Late Break Aux Contacts, Rectifiers, Contact Kits *Selection*

Ordering Information

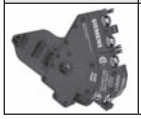
- ► 4th character of starter or contactor catalog number indicates model.
- ► DC Coils for Size 00-4 require Late Break Interlock.

DC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43

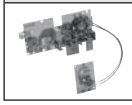
	Size	Model	Volts DC	Catalog Number	List Price $
	00–2½	P U (ESP200)	12 24 32 48 125 250	**75D73070R** **75D73070S** **75D73070T** **75D73070U** **75D73070V** **75D73070W**	
	3, 3½	P U (ESP200)	12 24 32 48 125 250	**75D73251R** **75D73251S** **75D73251T** **75D73251U** **75D73251V** **75D73251W**	
	4	G U (ESP200)	48 125 250	**75D70131U** **75D70131V** **75D70131W**	
	4, 5	V (Vacuum)	23-26 42-48 110-127 240-277	**3RT1966-5AB31** **3RT1966-5AD31** **3RT1966-5AF31** **3RT1966-5AU31**	

Note: For sizes 7 & 8 contactors the AC coils are used for DC see page 17-127.

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 $
 Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	Internal Aux Contact (00-1-¾) 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 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	3	H	**49ZL750**	
	8	3	H	**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	Contactor 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 Relays①② – 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**			
—	1¾	P	3	**48EC38AA3**		**48EC39AA3**	
2	—	P	1 3	**48GC18AA3** **48GC38AA3**		**48GC39AA3**	
—	2½	P	1 3	**48GC18AA3** **48GC38AA3**		**48GC39AA3**	
3	—	P	3	**48HC38AA3**			
—	3½	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 17-101.

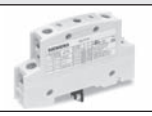
① For replacement Solid State overload relays, please see the Overload Relay section found starting on page 17-66.

② Includes overload mounting plate to be coupled to contactor mounting plate.

Replacement Parts

Lighting and Heating Contactors, Type LC, LE, CLM, CMF, CMN

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	**49LCPP1A** **49LCPP2A**

Replacement Pole 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	NA	**NA**
		60	24VAC 50/60Hz 110VAC 50Hz / 120VAC 60Hz 208VAC 50/60Hz 220VAC 50Hz / 240VAC 60Hz 277VAC 60Hz 347VAC 60Hz 480VAC 60Hz 600VAC 60Hz	**3RT19455AC21** **3RT19455AK61** **3RT19455AM21** **3RT19455AP61** **3RT19455AU61** **3RT19455AW61** **3RT19455AV61** **3RT19455AT61**
		100	24VAC 50/60Hz 110VAC 50Hz / 120VAC 60Hz 208VAC 50/60Hz 220VAC 50Hz / 240VAC 60Hz 277VAC 60Hz 347VAC 60Hz 480VAC 60Hz 600VAC 60Hz	**3RT19455AC21** **3RT19455AK61** **3RT19455AM21** **3RT19455AP61** **3RT19455AU61** **3RT19455AW61** **3RT19455AV61** **3RT19455AT61**
Replacement Contact Kits	**Class**	**Enclosure type**	**Description**	**Catalog No.**
	LC	30	NA	**NA**
	LE	20, 30	NA	**NA**
		60 100 200 300 400	1 contact kit includes 3 moving and 6 fixed contacts.	**3RT1935-6A** **3RT1945-6A** **3RT1956-6A** **3RT1965-6A** **3RT1975-6A**

AC Coils 20 Amps②

	Type	Contactor Size	Number of Poles	120V, 60Hz 110V, 50Hz	List Price $	240V, 60Hz 208V, 50Hz	List Price $	277V 50/60Hz	List Price $	480V, 60Hz 440V, 50Hz	List Price $
 **CLM4097341**	CLM	20 Amp	2–12	**CLM4097341**		**CLM4097342**		**CLM4097343**		**CLM4097344**	

AC Coils 30–400 Amps③

	Type	Contactor Size	Number of Poles	Catalog Number 24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	List Price $
 **CLMC4C120**	CLM†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**	
	CLM†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**	
 **CLMGU3C120**	CLM†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**	
	CLM†G Latching Coil	300/400 Amp	2–3-Pole	—	**CLMGL3C120**	**CLMGL3C208**	**CLMGL3C240**	**CLMGL3C277**	**CLMGL3C480**	**CLMGL3C600**	
	Unlatch Coil		2–3-Pole	—	**CLMGU3C120**	**CLMGU3C208**	**CLMGU3C240**	**CLMGU3C277**	**CLMGU3C480**	**CLMGU3C600**	

Control Module Rectifier③

Type	Device	Contactor Size	Number of Poles	Catalog Number	List Price $
CLM	CLM†C to CLM†F	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.

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

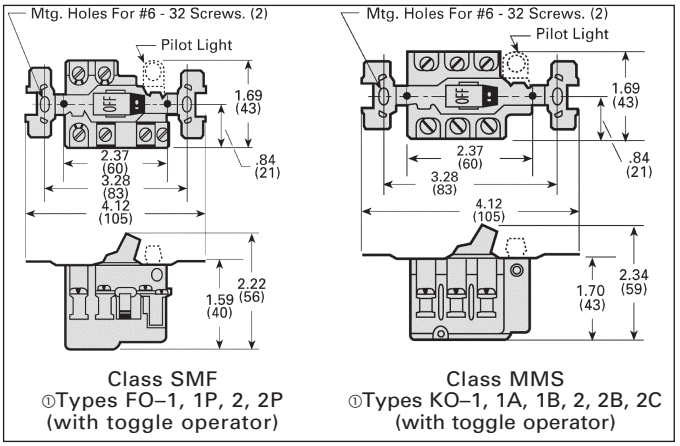
Description		Class	Enclosure Type	Catalog Number	List Price $
	Quarter-Turn Latch	17, 18, 25, 26, 32, 87 & 88	1, 3/3R & 12	75D46260004	
			4 & 4X	75D46260005	

Manual Control

Class SMF, MMS

Dimensions

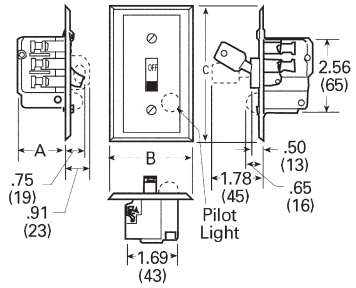
Class SMF and MMS Open Type



Class SMF
①Types FO–1, 1P, 2, 2P
(with toggle operator)

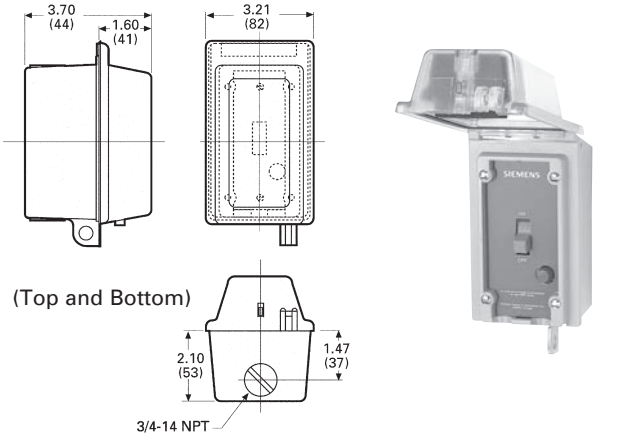
Class MMS
①Types KO–1, 1A, 1B, 2, 2B, 2C
(with toggle operator)

NEMA Type 1B General Purpose Flush Mounting



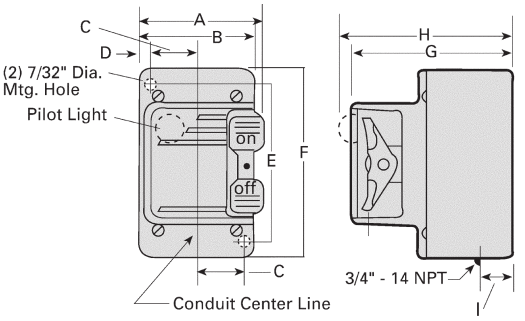
Device	Type of Operator	Type	Dimensions in Inches (mm) A	B	C
Class SMF Fractional HP Starter	Toggle	**FF1, 1P, 2, 2P** **FS1, 1P, 2, 2P**	1.44 (37)	2.75 (70)	4.50 (114)
		FSJ1P, 2P	1.44 (37)	3.50 (89)	5.25 (133)
	Key	**FF3, 3P, 4, 4P** **FS3, 3P, 4, 4P**	1.44 (37)	2.75 (70)	4.50 (114)
		FSJ3P, 4P	1.44 (37)	3.50 (89)	5.25 (133)
Class MMS Motor Starting Switch	Toggle	**KF1, 1A, 1B, 2, 2B, 2C** **KS1, 1A, 1B, 2, 2B, 2C**	1.75 (44)	2.75 (70)	4.50 (114)
		KSJ1A, 1B, 2B, 2C	1.75 (44)	3.50 (89)	5.25 (133)
	Key	**KF3, 3A, 3B, 4, 4B, 4C** **KS3, 3A, 3B, 4, 4B, 4C**	1.75 (44)	2.75 (70)	4.50 (114)
		KSJ3A, 3B, 4B, 4C	1.75 (44)	3.50 (89)	5.25 (133)

NEMA Type 3R, 4 and 12



Device	Class	Type
Fractional HP Starter	SMF	**FWN1, 1P, FWN2, 2P** **FWN3, 3P, FW4, 4P**
Motor Starting Switch	MMS	**KWN1, 1A, 1B, KWN2, 2B, 2C** **KWN3, 3A, 3B, KWN4, 4B, 4C**

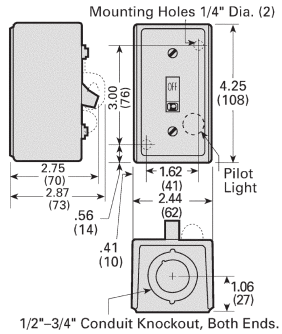
NEMA Type 4 Watertight Die Cast Zinc Enclosure



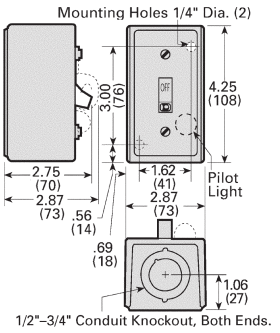
Dimensions in Inches (mm) A	B	C	D	E	F	G	H	I
3.00 (76)	2.75 (70)	1.13 (28)	0.25 (6)	3.75 (95)	4.69 (119)	4.25 (108)	4.56 (116)	0.78 (20)

Device	Class	Type
Fractional HP Starter	SMF	**FW1, 1P, 2, 2P**
Motor Starting Switch	MMS	**KW1, 1A, 1B, 2, 2B, 2C**

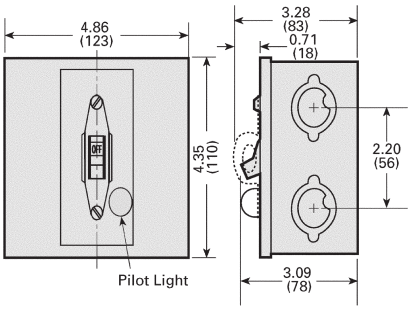
NEMA Type 1 General Purpose Surface Mounting Enclosures



Standard Size—Class SMF and MMS
Types FG & KG (Single-Unit)



Oversized—Class SMF and MMS
Types FGJ & KGJ (Single-Unit)



Jumbo MMSKE2
½"–¾" Knock-Out On Back and Sides

Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

① Dimensions typical for key operator devices.

Manual Control

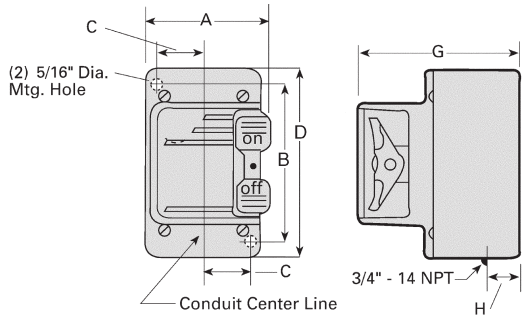
Class SMF, MMS

Dimensions

NEMA Type 7 and 9 Cast Aluminum Enclosure

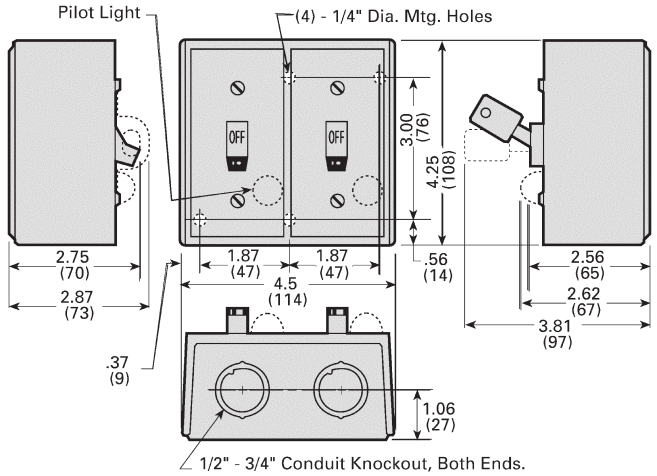
Dimensions in Inches (mm)					
A	**B**	**C**	**D**	**G**	**H**
4.00 (101)	5.75 (146)	1.38 (35)	6.36 (161)	4.38 (111)	1.20 (30)

Device	Class	Type
Fractional HP Starter	SMF	**FR1, FR2**
Motor Starting Switch	MMS	**KR1, KR2**



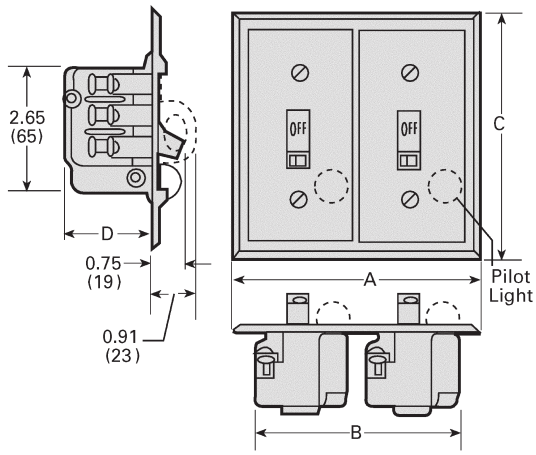
NEMA Type 1 General Purpose Enclosure For Two Unit Devices

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. Switch①	Toggle	SMF	**FG71, 71P, 72, 72P**
	Key	SMF	**FG74P**
Reversing Switch②	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

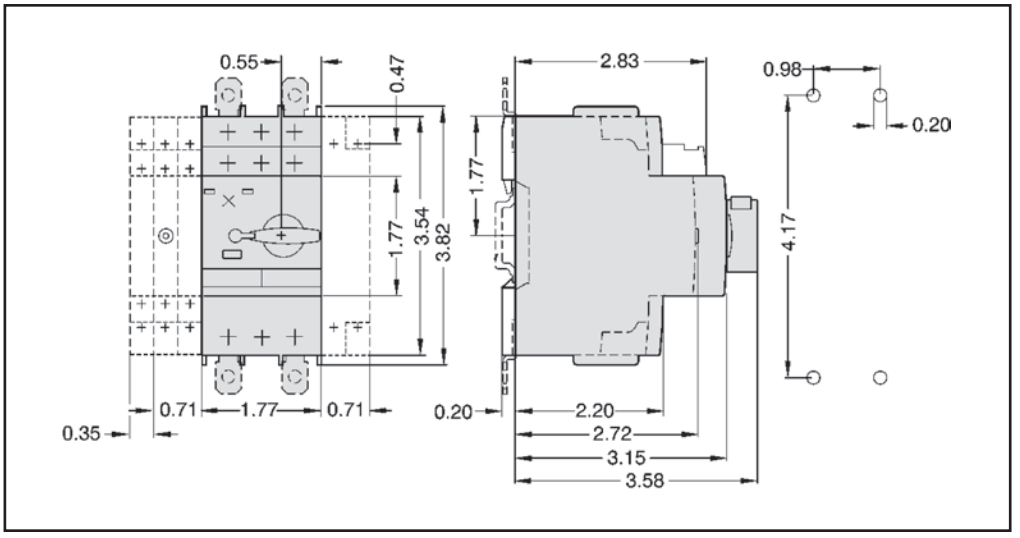
Device③	Type of Operator	Class	Type	A	B	C	D
Two Starters	Toggle	SMF	**FF22, 22P**	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS22P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
	Key	SMF	**FF44P**	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS44P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
One Starter and One Selector Switch④	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)



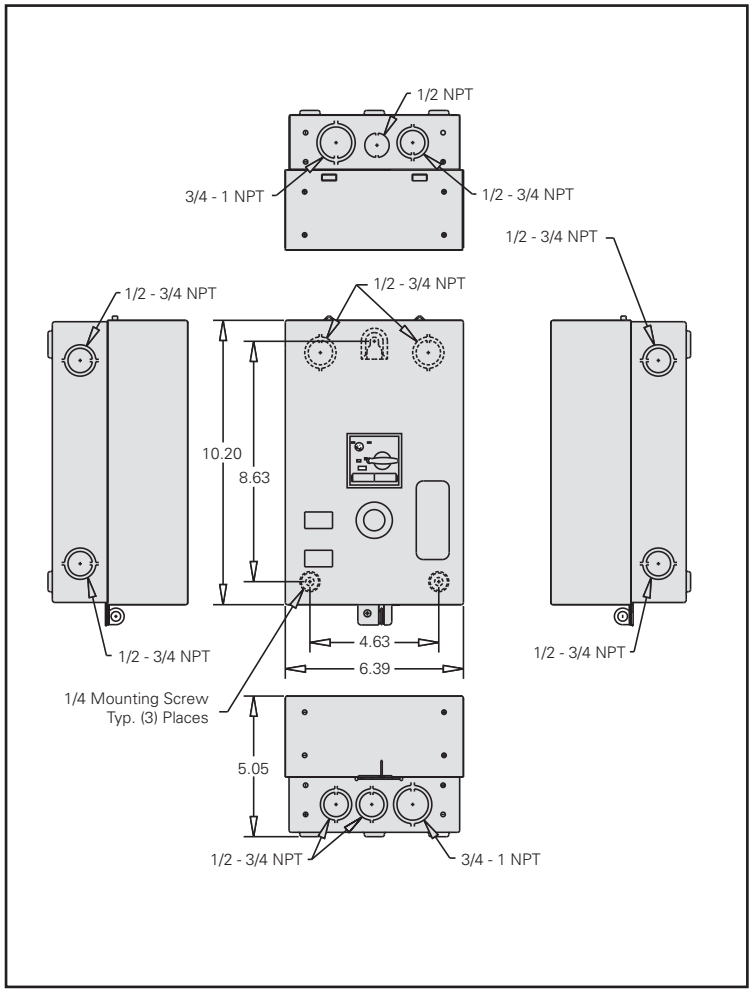
Note: Dimensions for reference, not for construction. Dimensions are in inches (mm).

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.

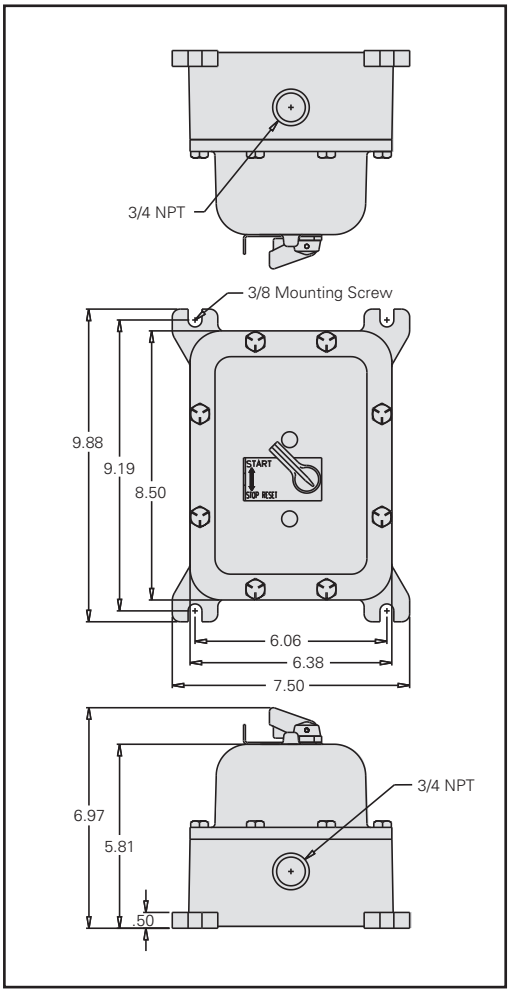
3RV102



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

Figure 1

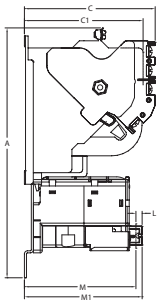


Figure 2

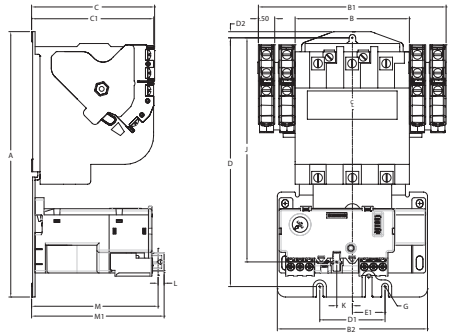


Figure 3

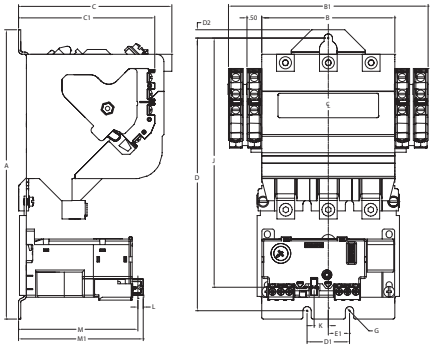


Figure 4

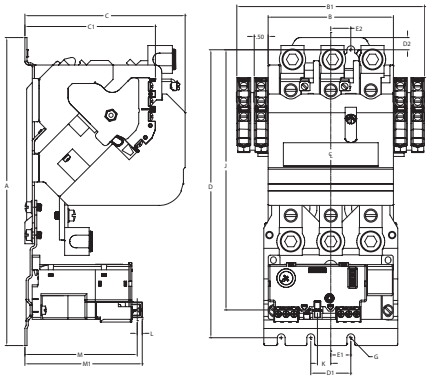
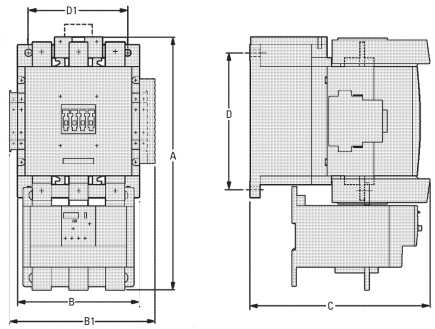


Figure 5



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
00–1¾	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

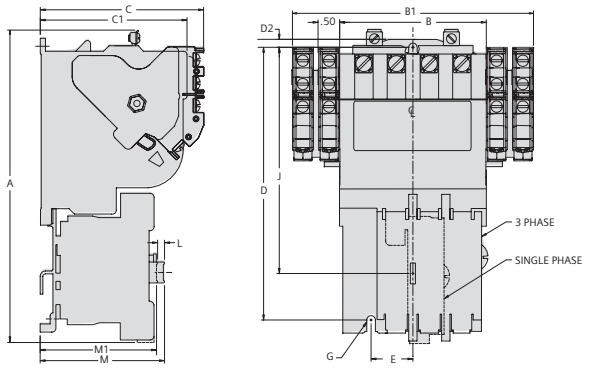


Figure 2

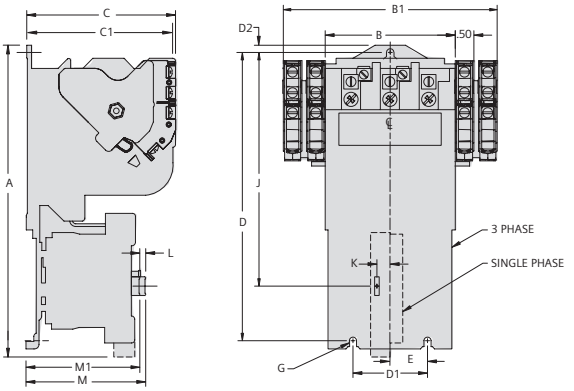


Figure 3

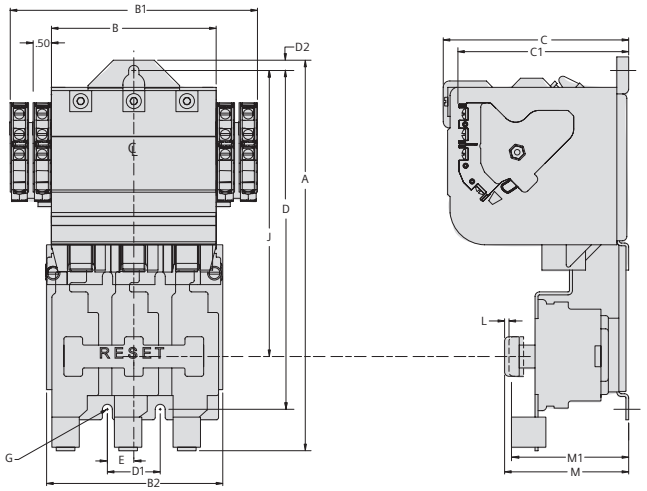
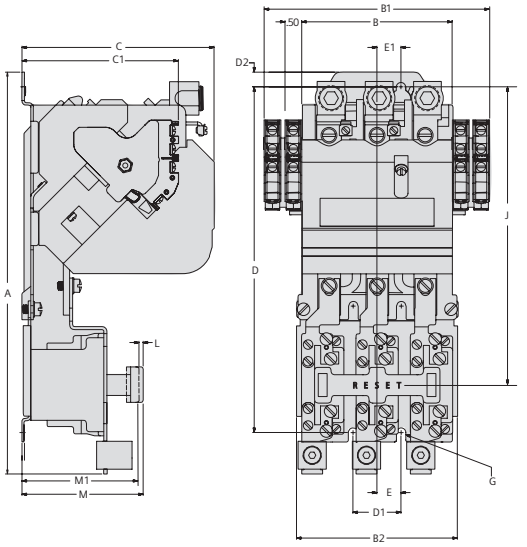


Figure 4



Open Type Ambient Compensated Bimetal Overload

Size	Figure	Outline Dimensions A	B	B1	C	C1	Mounting Dimensions D	D1	D2	E	E1	Mounting Screw G	Reset Dimensions J	K	L	M	M1
00–1¾	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

Figure 1

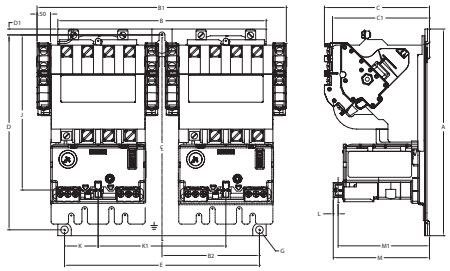


Figure 2

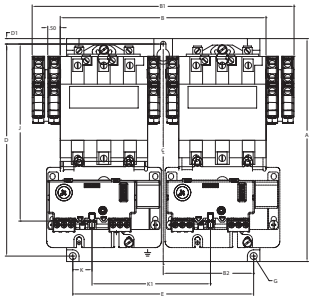


Figure 3

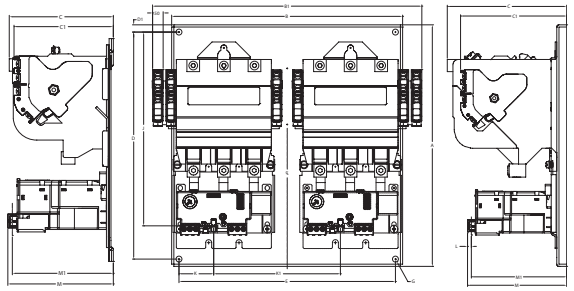


Figure 4

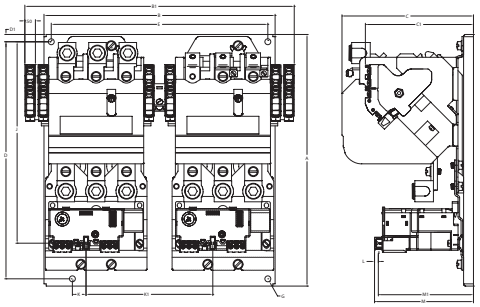


Figure 5

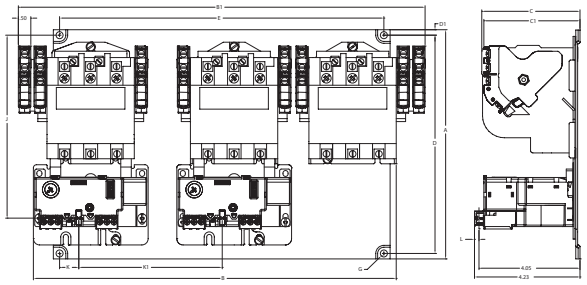


Figure 6

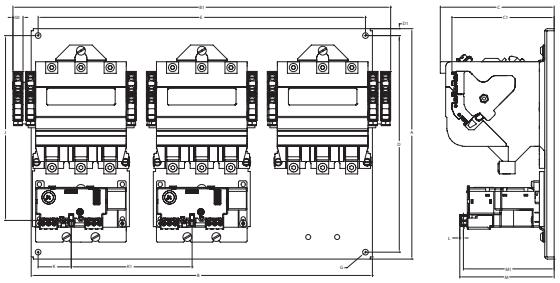
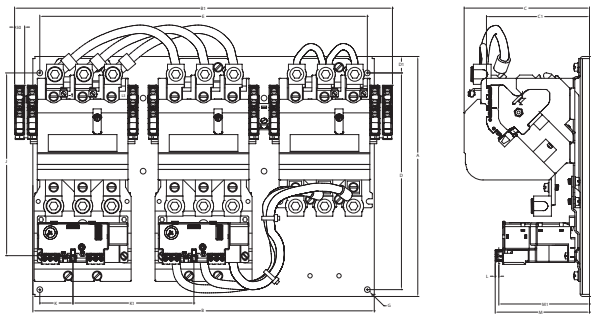


Figure 7



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	G	J	K	K1	L	M	M1
00–1¾	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	G	J	K	K1	L	M	M1
00–1¾	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

Figure 1a

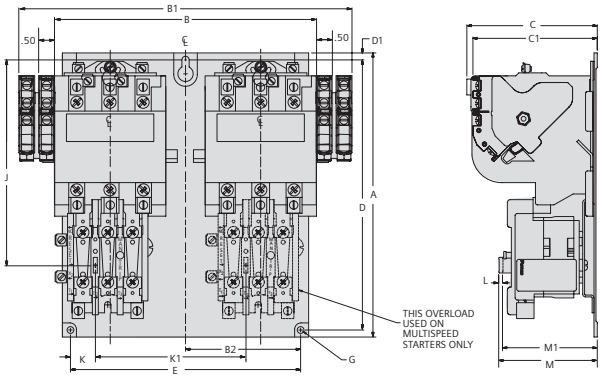


Figure 1b

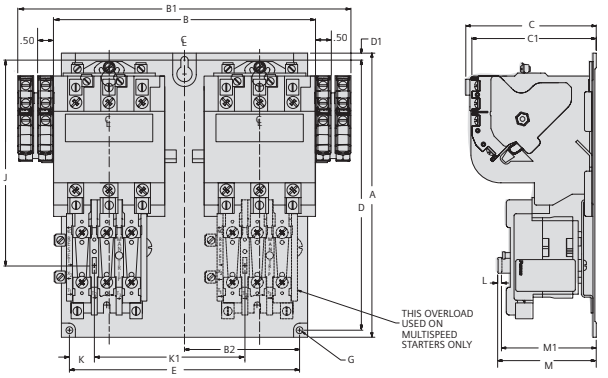


Figure 2

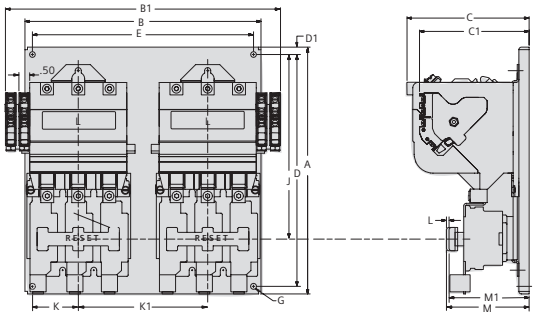


Figure 3

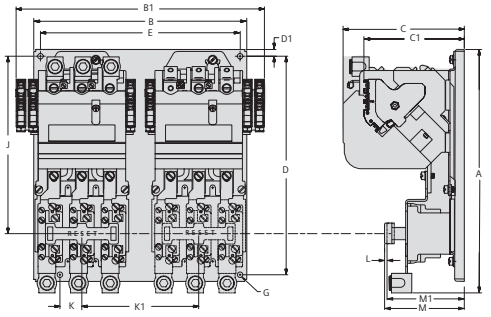


Figure 4

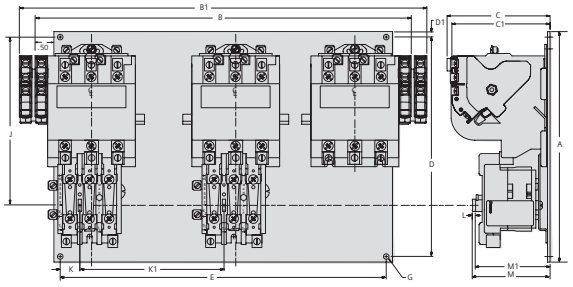
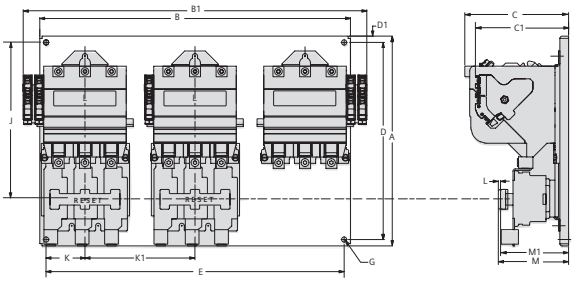


Figure 5



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	G	J	K	K1	L	M	M1
00–1¾	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	G	J	K	K1	L	M	M1
00–1¾	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).

Full Voltage Open Type NEMA Contactor Size 00-8

Figure 1

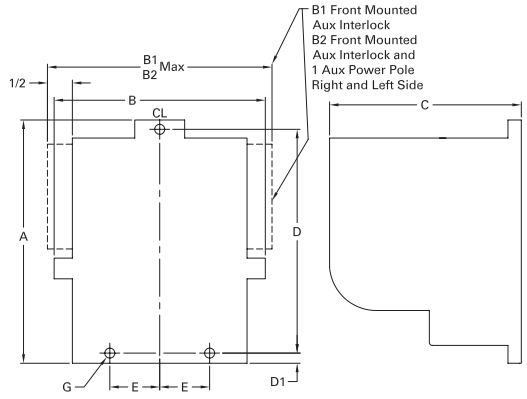


Figure 2

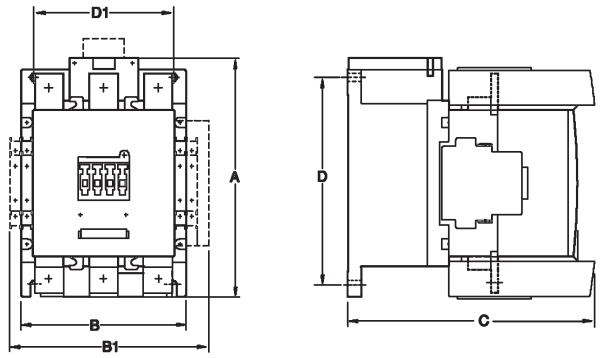


Figure 3

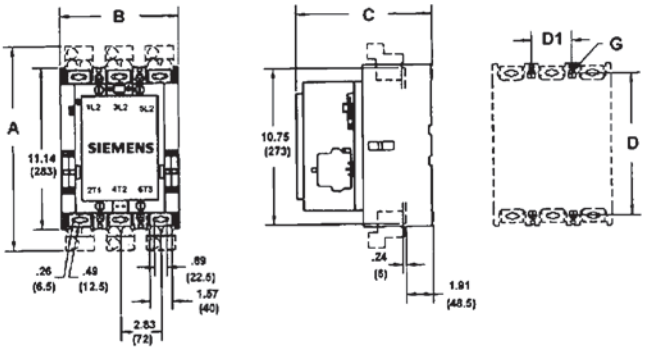
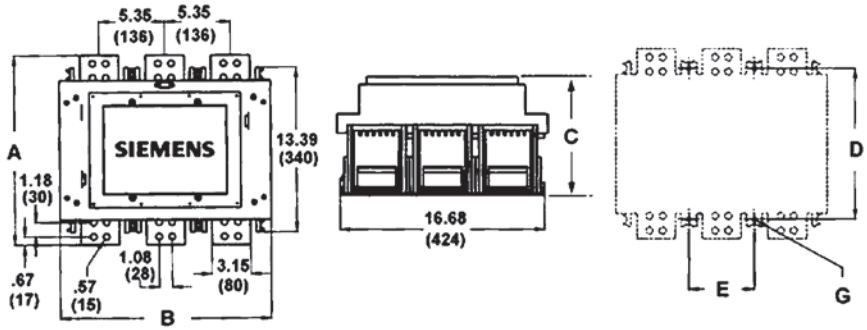


Figure 4



Open Type

Size	3rd Character of Catalog No.①	Outline Dimensions						Mounting Dimensions			Mounting Screw
		Fig	A	B	B1	B2	C	D	D1	E	G
00–1¾	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.

• Revised •
03/01/14

Figure 1

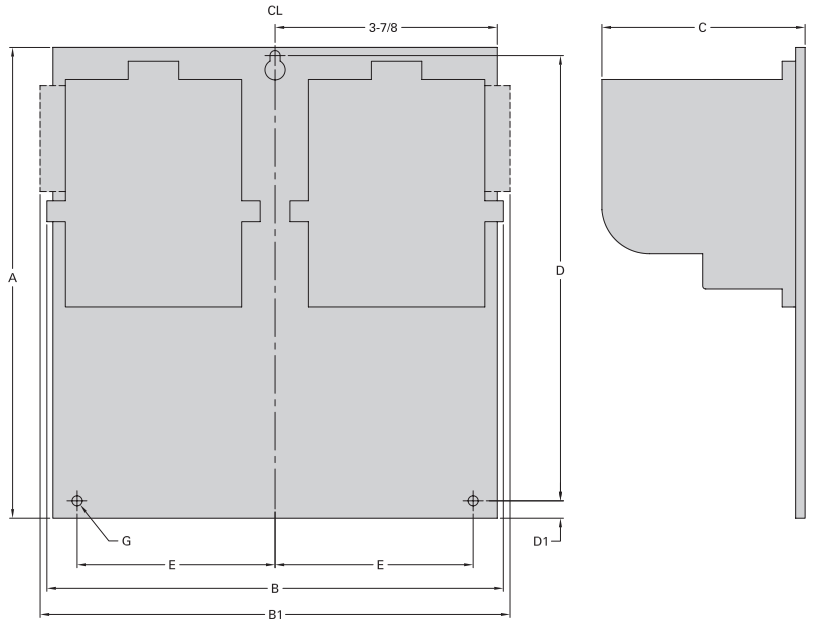
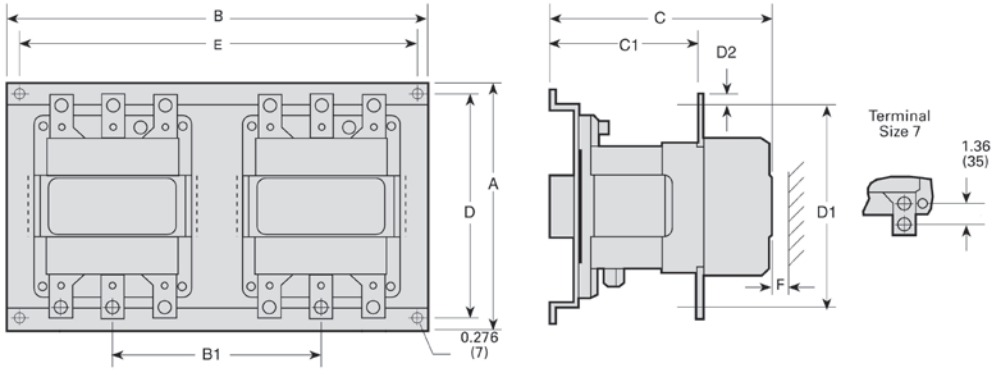


Figure 2



Open Type Horizontal Mounted

Size	Fig.	Outline Dimensions A	B	B1	C	C1	Mounting Dimensions D	D1	E	F	Mouning Screw G
00–1¾	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)	—

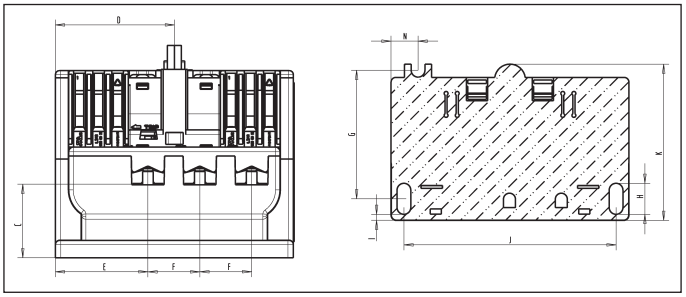
Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

Overload Relays & Current Transformers

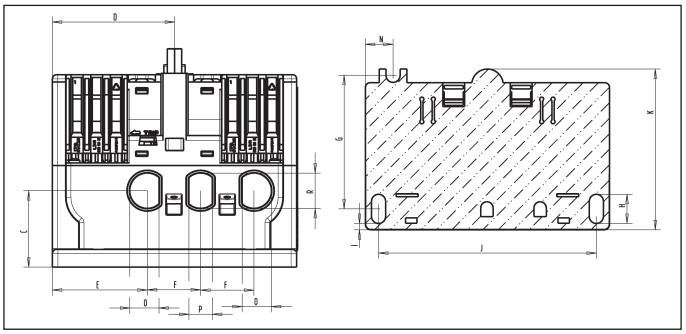
Solid State Overload

Dimensions

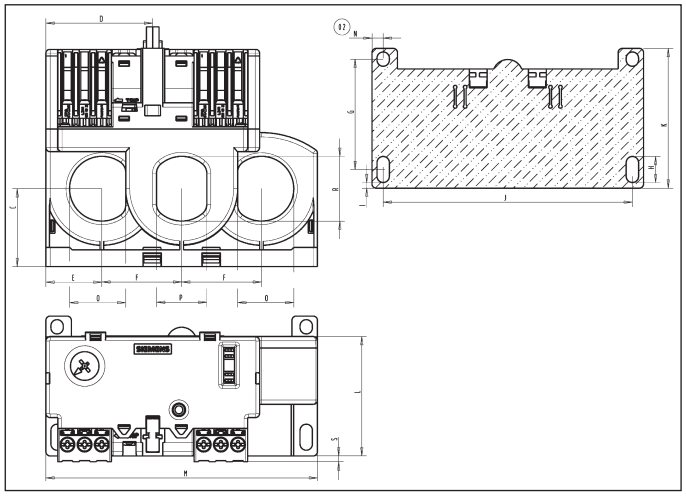
Dimensions "A" Frame—ESP200 Solid State Overload



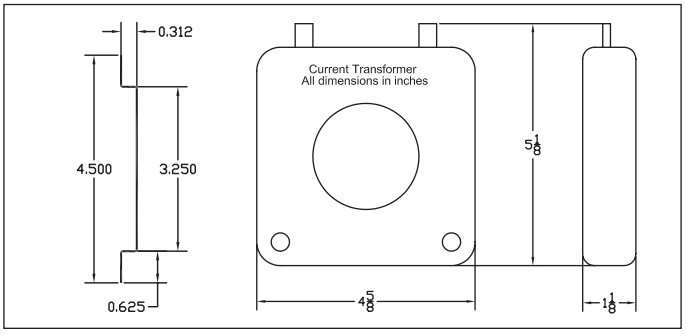
Dimensions "A1" Frame—ESP200 Solid State Overload



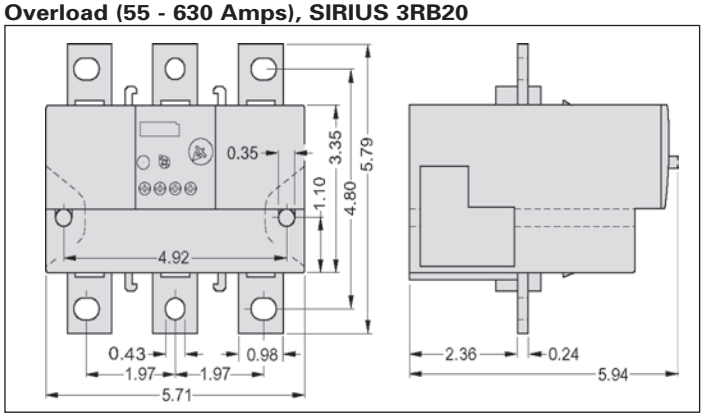
Dimensions "B" Frame—ESP200 Solid State Overload



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

Figure 1

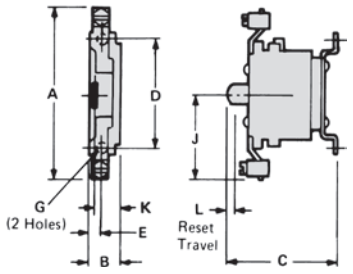


Figure 2

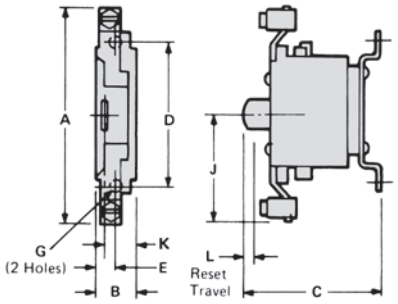


Figure 3

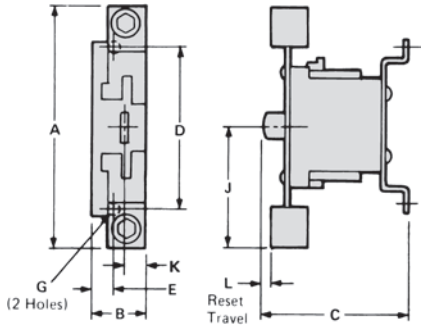


Figure 4

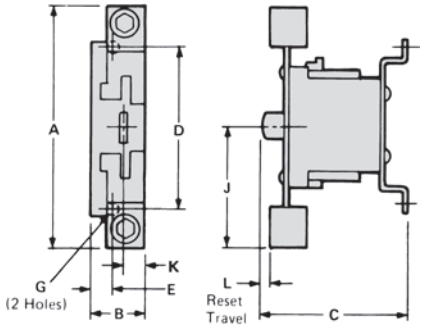


Figure 5

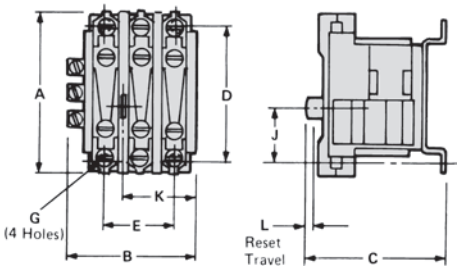


Figure 6

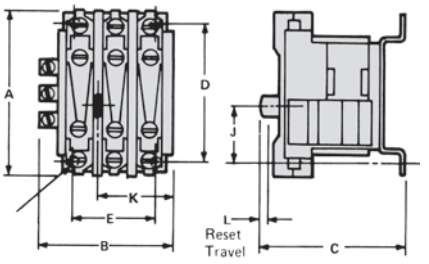


Figure 7

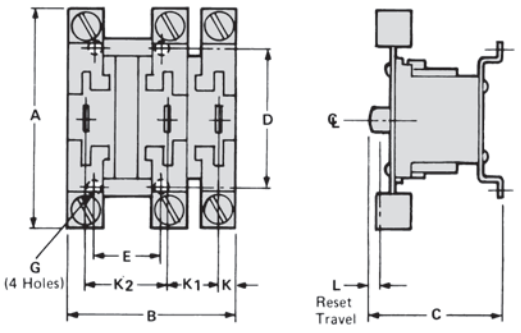
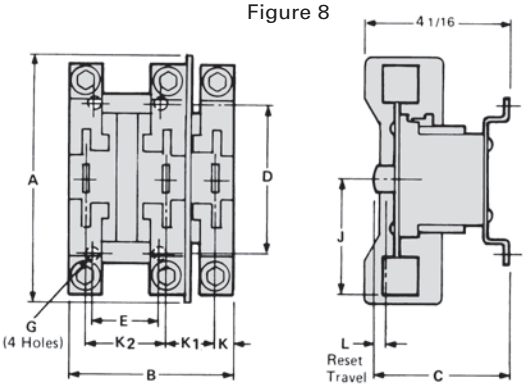


Figure 8



Description	Amp Rating	Fig	Outline Dimensions A	B	C	Mounting Dimensions D	E	Reset Dimensions J	K	L	Mounting Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
1-Pole	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 7/8 (124)	7/8 (22)	3 3/16 (81)	3 (76)	1/2 (13)	2 1/16	3/4 (19)	1/8 (3)	#10	1	2 (1)	D51830
Ambient	100	3	4 7/8 (124)	1 1/4 (32)	3 9/16 (90)	3 1/2 (89)	9/16 (14)	2 1/16	1/2 (13)	1/8 (3)	#10	00	3 (1)	D51833
Compensated	180	4	5 15/16 (151)	1 1/4 (32)	3 9/16 (90)	3 1/2 (89)	9/16 (14)	3 (76)	1/2 (13)	1/8 (3)	#10	250 MCM	4 (2)	D52206

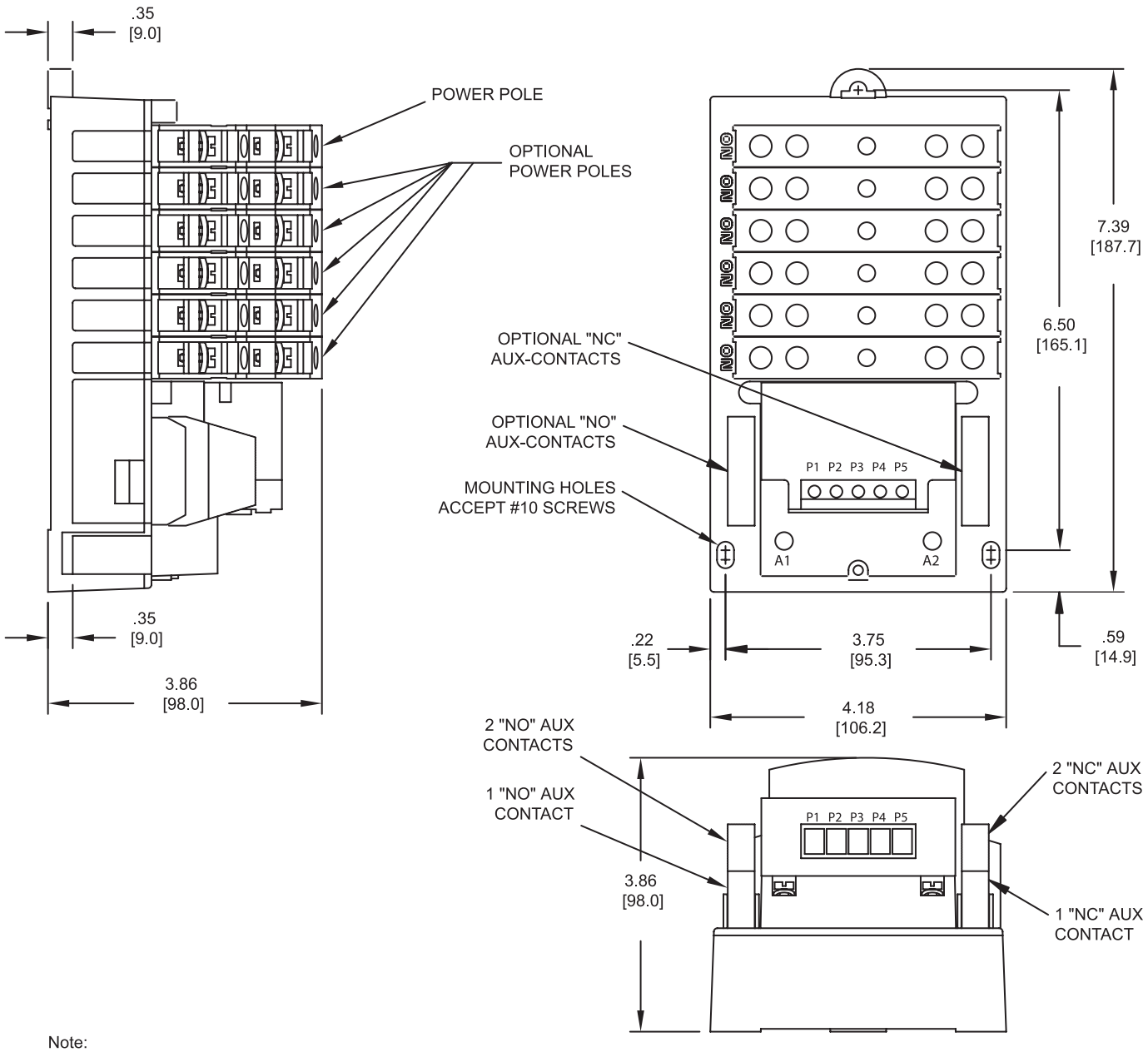
Description	Amp Rating	Fig	Outline Dimensions A	B	C	Mounting Dimensions D	E	Reset Dimensions J	K	K1	K2	L	Mtg Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
3-Pole	30	5	3 5/8 (92)	3 1/16 (78)	3 1/8 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	8	3 (1)	D54791
Bimetal	60	6	3 7/8 (98)	3 1/16 (78)	3 1/8 (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 7/8 (124)	4 7/16 (113)	3 9/16 (90)	3 1/2 (89)	1 5/8 (41)	2 1/16 (62)	9/16 (14)	1 15/16 (49)	2 (51)	1/8 (3)	#10	00	4 (2)	D51868
Compensated	180	8	6 1/2 (165)	4 7/16 (113)	3 9/16 (90)	3 1/2 (89)	1 5/8 (41)	3 (76)	9/16 (14)	1 15/16 (49)	2 (51)	1/8 (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

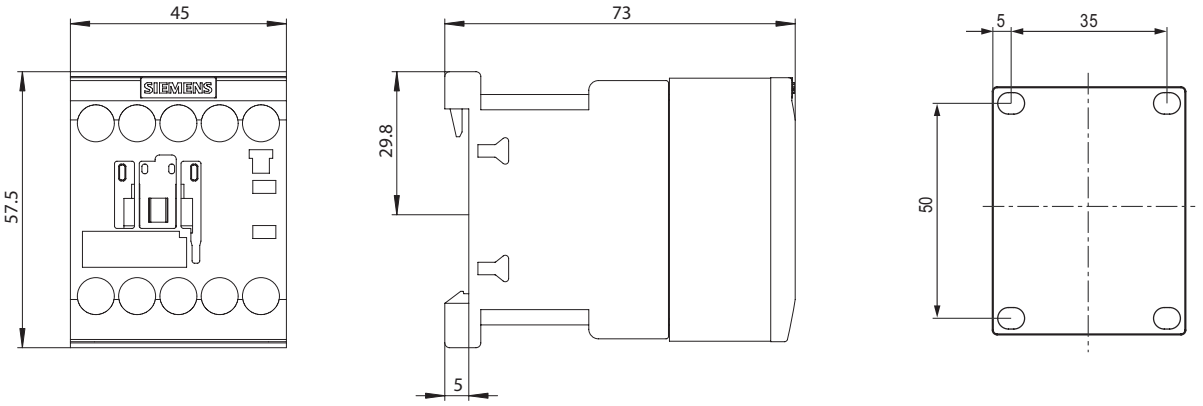
4) Same Power Pole can be configured as NO type or NC type

Lighting & Heating Contactors

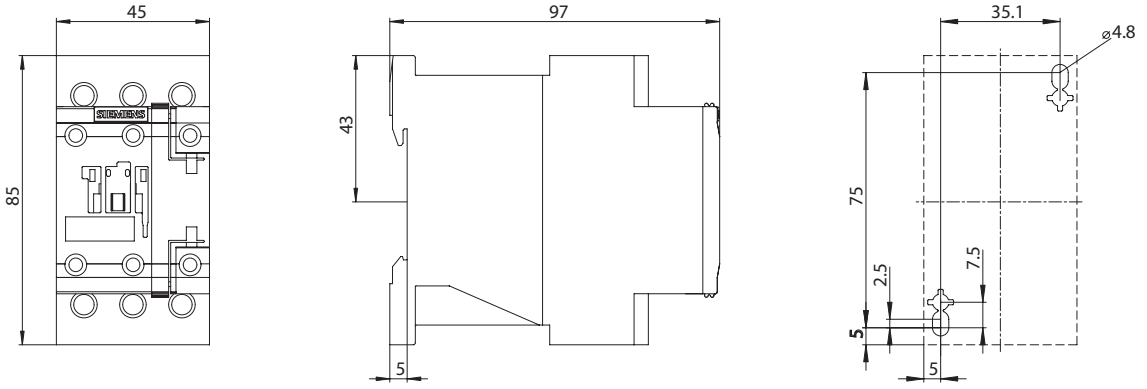
Open Contactors, Class LE

Dimensions

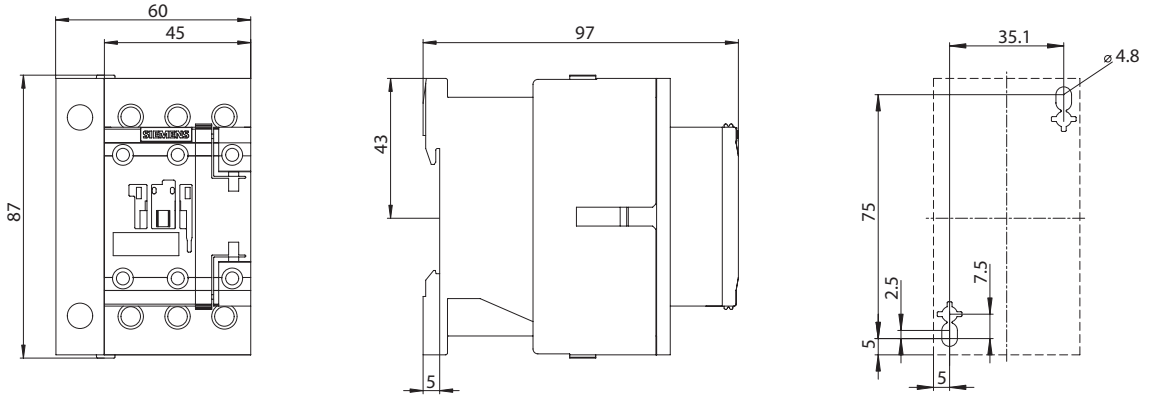
LEN00B (20A 3 Pole and 4 Pole)



LEN00C003 (30A 3 Pole)

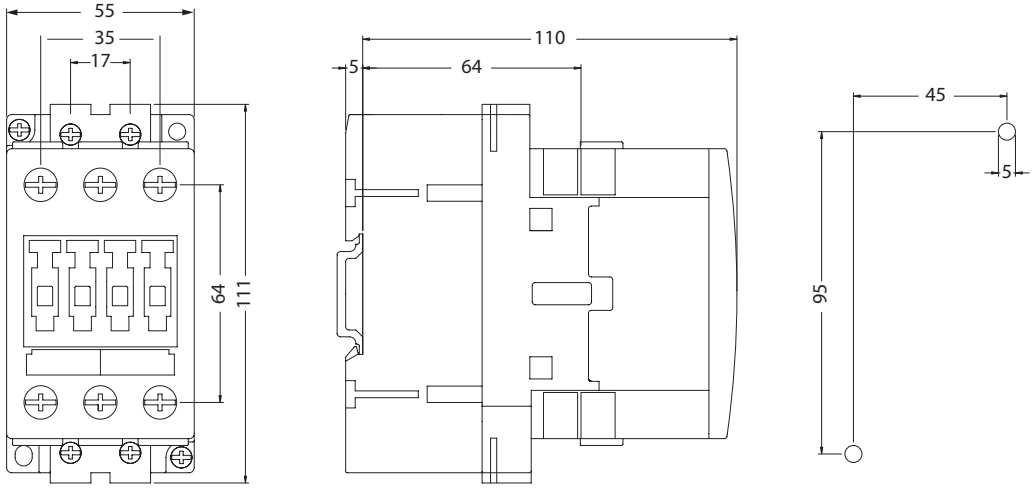


LEN00C004 (30A 4 Pole)

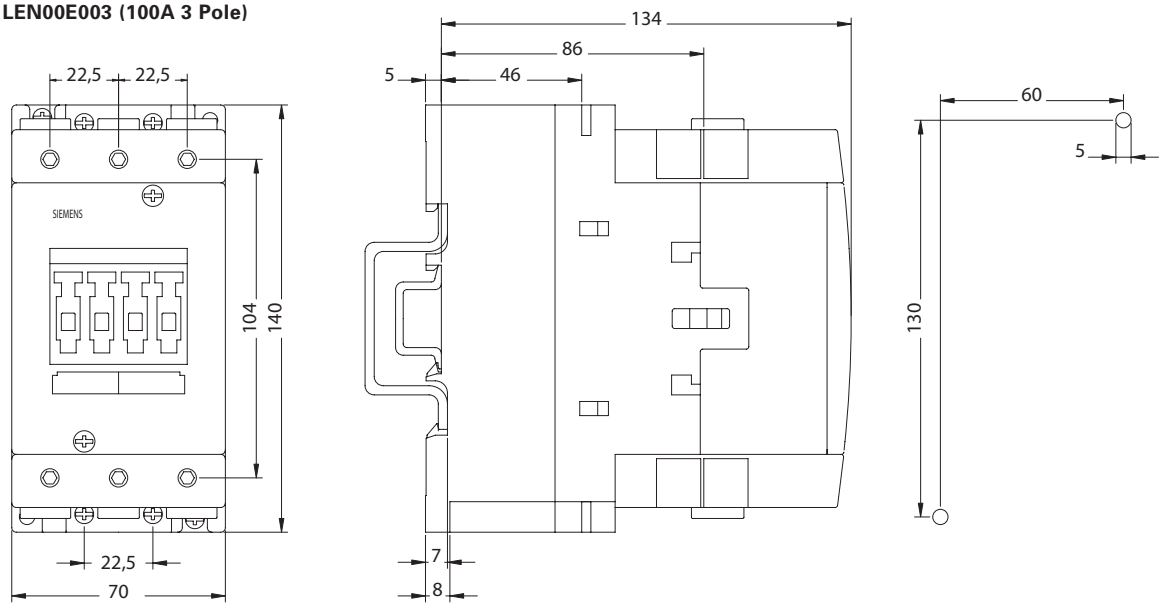


• Revised •
03/01/14

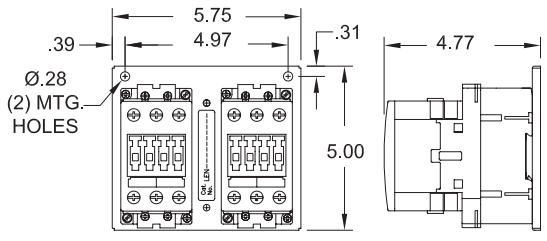
LEN00D003 (60A 3 Pole)



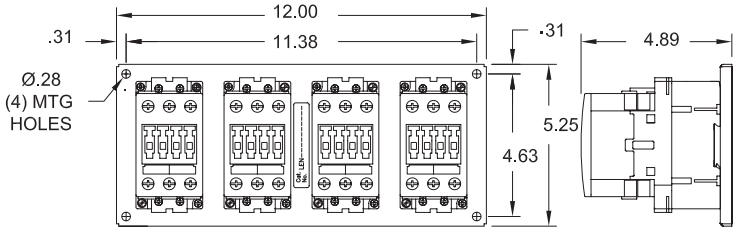
LEN00E003 (100A 3 Pole)



LEN00C006 (30A 6 Pole)
LEN00D006 (60A 6 Pole)



LEN00C009 (30A 9 Pole) and LEN00D009 (60A 9 Pole)
LEN00C012 (30A 12 Pole) and LEN00D012 (60A 12 Pole)



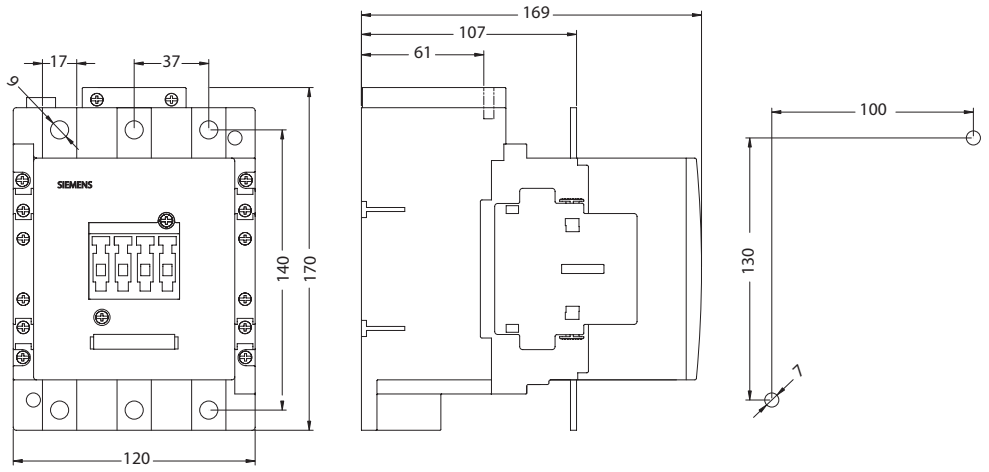
Note – Only the 12 pole contactor is shown. However, the dimensions of the mounting plate are the same for the 9 pole contactor.

Lighting & Heating Contactors

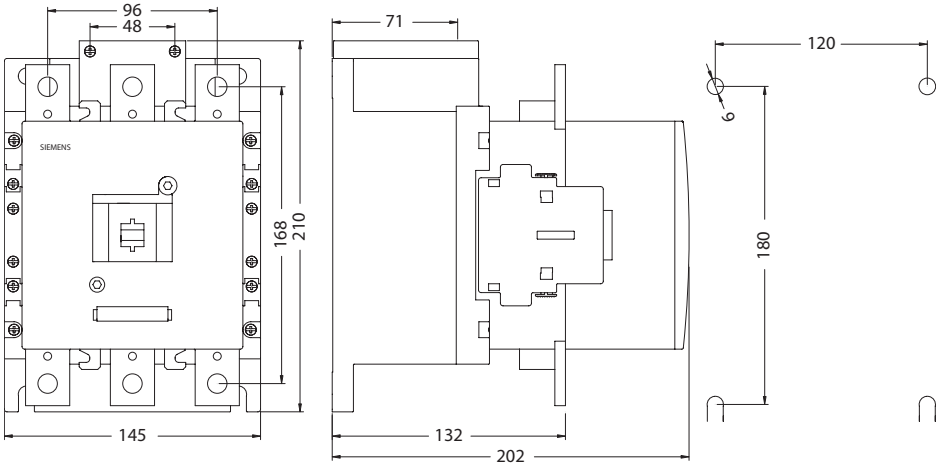
Open Contactors, Class LE

Dimensions

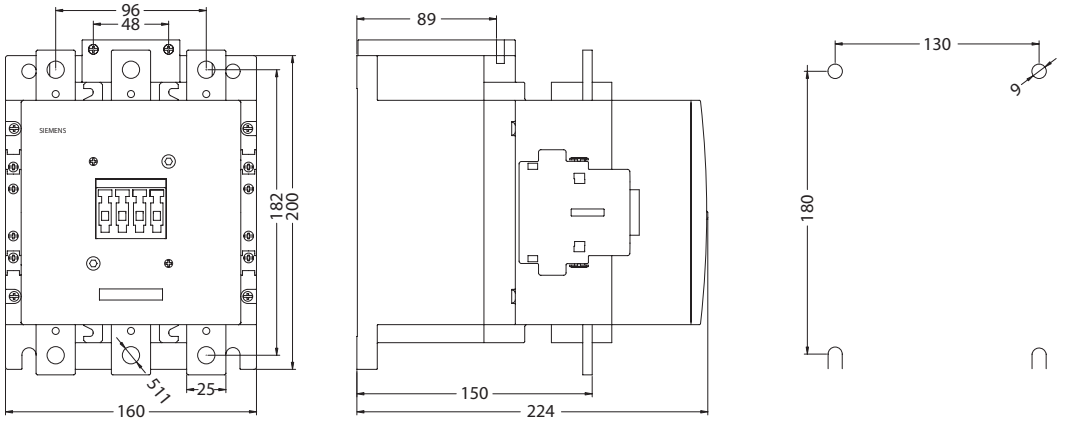
LEN00F003 (200A 3 Pole)



LEN00G003 (300A 3 Pole)



LEN00H003 (400A 3 Pole)



Lighting & Heating Contactors

Mechanically / Magnetically Held Lighting Contactors, Class CLM

Dimensions

CLM Contactor, 20 Amp

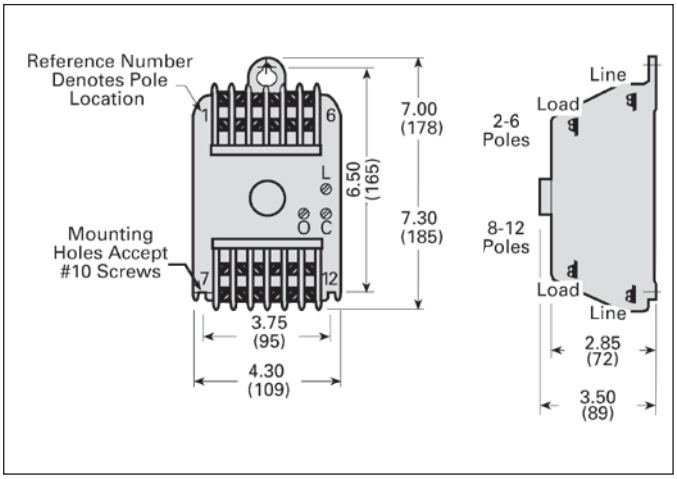


Figure 1

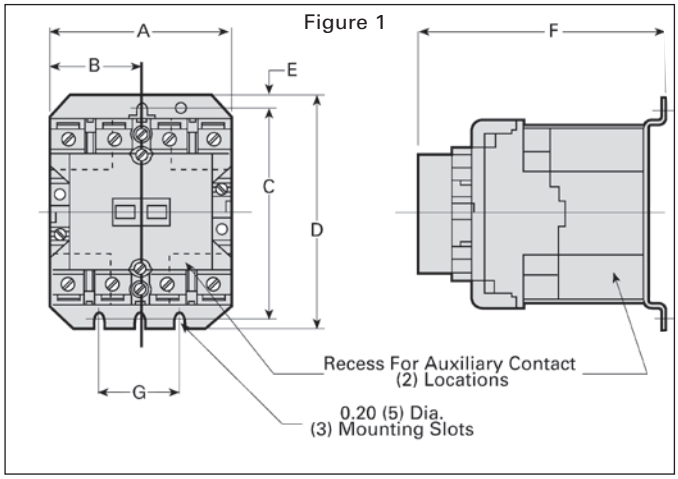


Figure 2

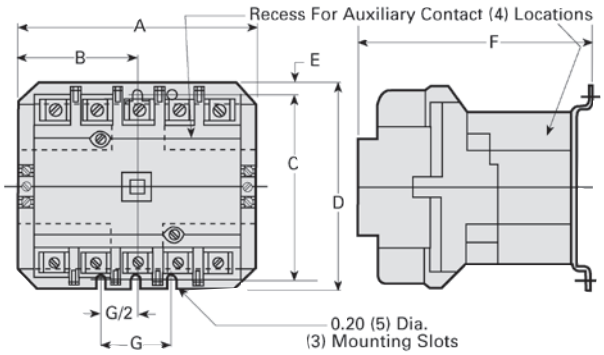
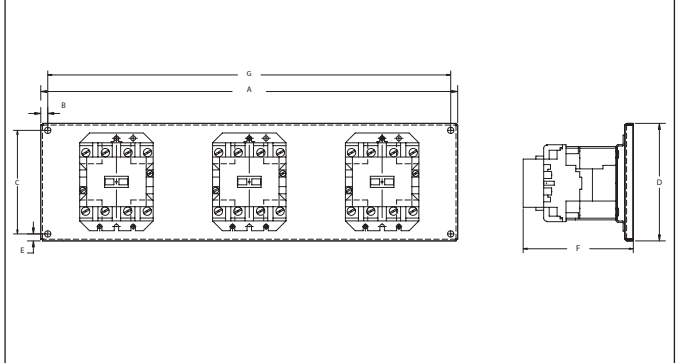


Figure 3

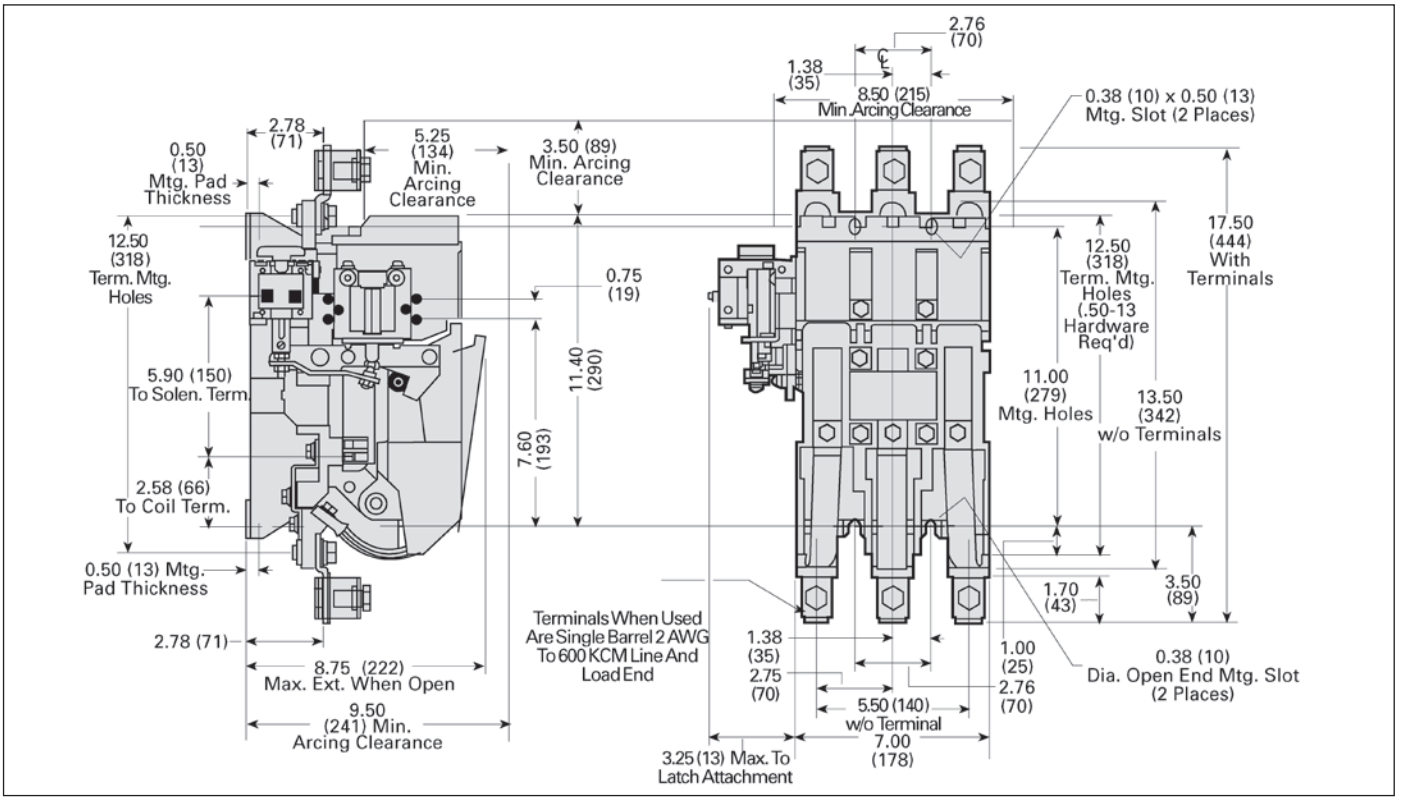


Open Type Lighting and Heating Contactors

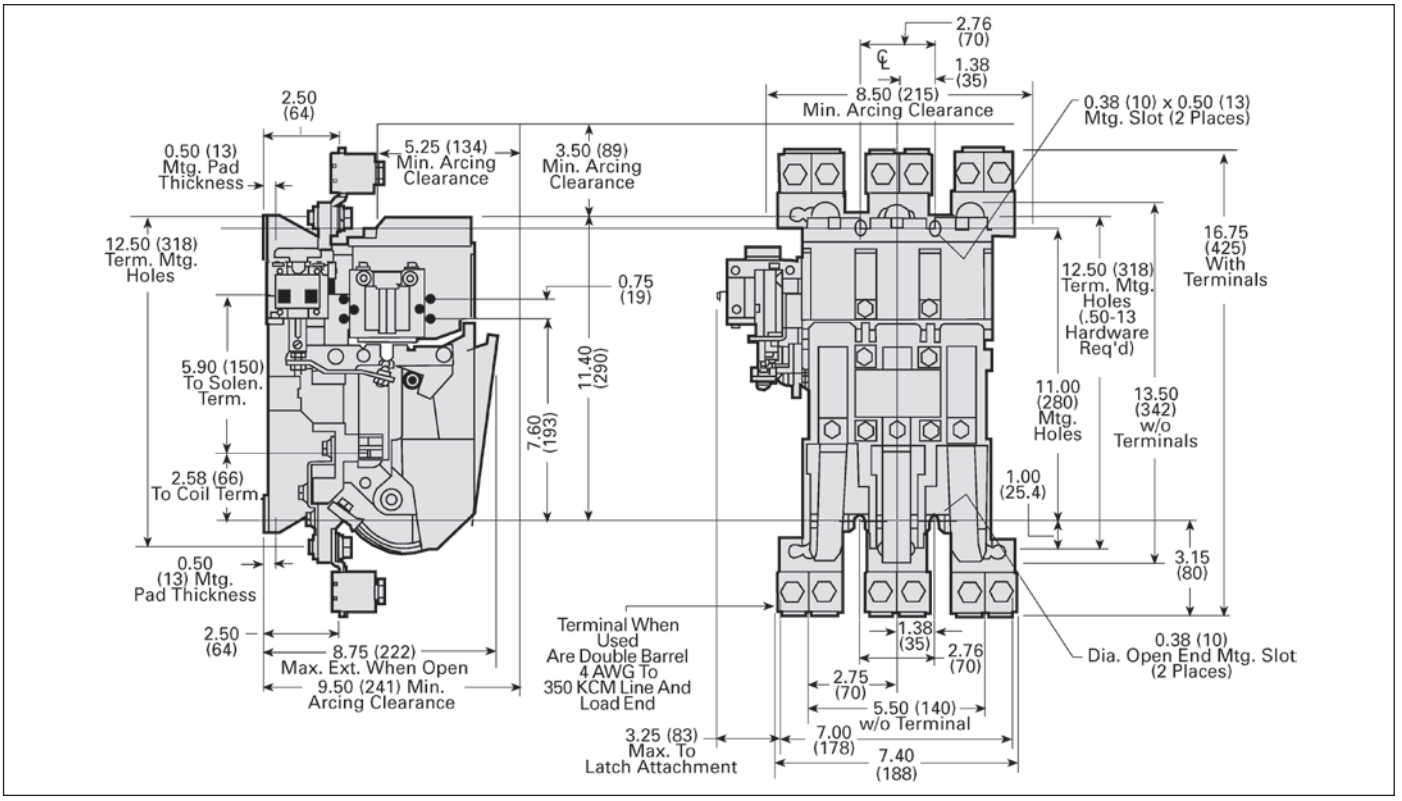
Class	Figure Number	Amp Rating	Number of Poles	A	B	C	D	E	F	G
CLM	1	30	2–4	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
	1	30	5	4.19 (106)	2.09 (53)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
	2	60	2, 3	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
	2	60	4, 5	5.06 (129)	2.53 (64)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
	2	100	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
	2	100	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
	2	200	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
	2	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, 60	6-12	18.62	0.312	4.62	5.25	0.312	4.98	18.00

Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

CLM Contactors 300 Amp



CLM Contactors 400 Amp

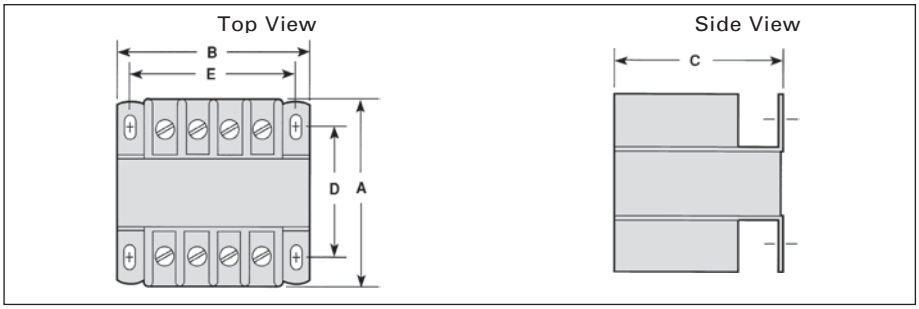


Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

Industrial Control Power Transformers

Class MT

Dimensions



Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

Dimension "C" does not include the added height required for secondary fuse clips—0.50 in. (13 mm) maximum for type "K" clips.

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.

① A 2-pole Primary Class CC Fuse Block Kit is available for field installation. See page 17-97 for details. Catalog Number **KCCFPX2R**

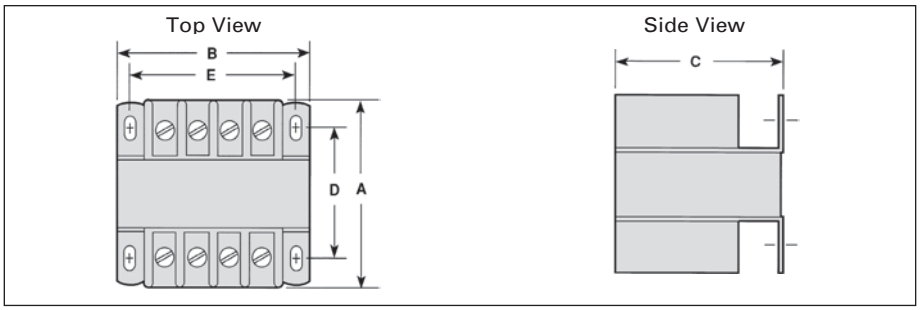
Class MT

VA Rating	Voltage Letters	Approximate Dimensions Inches (mm) Approx A	B	C	D	E	Mounting Slots	Ship Wt Lbs (Kg)
50①	A, B, C, D, E, F, I, M	3.00 (76)	3.00 (76)	2.56 (65)	2.00 (51)	2.50 (64)	13/64 (5) X 3/8 (10)	2.6 (1)
	G	3.13 (79)	3.00 (76)	2.56 (65)	2.13 (54)	2.50 (64)	13/64 (5) X 3/8 (10)	2.8 (1)
	H	3.00 (76)	3.00 (76)	3.00 (76)	2.56 (65)	2.50 (64)	13/64 (5) X 3/8 (10)	3.5 (2)
	J	3.25 (83)	3.00 (76)	2.56 (65)	2.25 (57)	2.50 (64)	13/64 (5) X 3/8 (10)	3.4 (2)
	L	4.00 (102)	3.38 (86)	2.88 (73)	2.44 (62)	2.81 (71)	13/64 (5) X 3/8 (10)	4.0 (2)
75①	A, B, C, D, E, F, I, M	3.50 (89)	3.00 (76)	2.56 (65)	2.50 (64)	2.50 (64)	13/64 (5) X 3/8 (10)	3.5 (2)
	G	3.38 (86)	3.38 (86)	2.88 (73)	2.38 (60)	2.81 (71)	13/64 (5) X 3/8 (10)	4.3 (2)
	H	3.13 (79)	3.38 (86)	2.88 (73)	2.38 (60)	2.81 (71)	13/64 (5) X 3/8 (10)	4.5 (2)
	J	3.50 (89)	3.38 (86)	2.88 (73)	2.50 (64)	2.81 (71)	13/64 (5) X 3/8 (10)	4.8 (2)
100①	A, B, C, D, E, F, I, M	3.38 (86)	3.38 (86)	2.88 (73)	2.38 (60)	2.81 (71)	13/64 (5) X 3/8 (10)	4.2 (2)
	G	3.69 (94)	3.38 (86)	2.88 (73)	2.69 (68)	2.81 (71)	13/64 (5) X 3/8 (10)	4.9 (2)
	H	3.88 (98)	3.38 (86)	2.88 (73)	2.88 (73)	2.81 (71)	13/64 (5) X 3/8 (10)	6.0 (3)
	J	3.63 (92)	3.75 (95)	3.19 (81)	2.50 (64)	3.13 (79)	13/64 (5) X 3/8 (10)	5.9 (3)
	L	4.63 (117)	3.38 (86)	3.19 (81)	3.06 (78)	3.13 (79)	13/64 (5) X 3/8 (10)	6.6 (3)
150①	A, B, C, D, E, F, I, M	4.00 (102)	3.75 (95)	3.19 (81)	2.88 (73)	3.13 (79)	13/64 (5) X 3/8 (10)	6.7 (3)
	G	4.19 (106)	3.75 (95)	3.19 (81)	3.06 (78)	3.13 (79)	13/64 (5) X 3/8 (10)	7.4 (3)
	H	4.25 (108)	3.75 (95)	3.19 (81)	3.25 (83)	3.13 (79)	13/64 (5) X 3/8 (10)	7.7 (4)
	J	4.38 (111)	3.75 (95)	3.19 (81)	3.25 (83)	3.13 (79)	13/64 (5) X 3/8 (10)	7.9 (4)
	L	4.44 (113)	4.50 (114)	3.81 (97)	2.88 (73)	3.75 (95)	13/64 (5) X 3/8 (10)	8.8 (4)
200①	A, B, C, D, E, F, I, M	4.00 (102)	4.50 (114)	3.81 (97)	2.50 (64)	3.75 (95)	13/64 (5) X 3/8 (10)	8.5 (4)
	G	4.25 (108)	4.50 (114)	3.81 (97)	2.75 (70)	3.75 (95)	13/64 (5) X 3/8 (10)	9.4 (4)
	H	4.25 (108)	4.50 (114)	3.81 (97)	2.75 (70)	3.75 (95)	13/64 (5) X 3/8 (10)	9.0 (4)
	J	4.50 (114)	4.50 (114)	3.81 (97)	3.00 (76)	3.75 (95)	13/64 (5) X 3/8 (10)	10.6 (5)
250①	A, B, C, D, E, F, I, M	4.38 (111)	4.50 (114)	3.81 (97)	2.88 (73)	3.75 (95)	13/64 (5) X 3/8 (10)	10.0 (5)
	G	4.75 (121)	4.50 (114)	3.81 (97)	3.25 (83)	3.75 (95)	13/64 (5) X 3/8 (10)	11.1 (5)
	H	4.75 (121)	4.50 (114)	3.81 (97)	3.19 (81)	3.75 (95)	13/64 (5) X 3/8 (10)	9.7 (4)
	J	5.25 (133)	4.50 (114)	3.81 (97)	3.75 (95)	3.75 (95)	13/64 (5) X 3/8 (10)	13.9 (6)
	L	5.86 (149)	4.50 (114)	3.81 (97)	4.38 (111)	3.75 (95)	13/64 (5) X 3/8 (10)	14.7 (7)
300①	A, B, C, D, E, F, I, M	4.75 (121)	4.50 (114)	3.81 (97)	3.25 (83)	3.75 (95)	13/64 (5) X 3/8 (10)	11.3 (5)
	G	5.25 (133)	4.50 (114)	3.81 (97)	3.75 (95)	3.75 (95)	13/64 (5) X 3/8 (10)	13.6 (6)
	H	5.13 (130)	4.50 (114)	3.81 (97)	3.63 (92)	3.75 (95)	13/64 (5) X 3/8 (10)	11.7 (5)
	J	5.13 (130)	5.25 (133)	4.75 (121)	3.88 (98)	4.38 (111)	5/16 (8) X 11/16 (17)	15.5 (7)
350①	A, B, C, D, E, F, I, M	5.25 (133)	4.50 (114)	3.81 (97)	3.75 (95)	3.75 (95)	13/64 (5) X 3/8 (10)	13.6 (6)
	G	8.25 (149)	4.50 (114)	3.81 (97)	4.38 (111)	3.75 (95)	13/64 (5) X 3/8 (10)	15.6 (7)
	H	5.00 (127)	4.50 (114)	3.81 (97)	3.75 (95)	4.38 (111)	13/64 (5) X 3/8 (10)	16.5 (8)
	J	5.38 (137)	5.25 (133)	4.75 (121)	4.13 (105)	4.38 (111)	5/16 (8) X 11/16 (17)	16.8 (8)
	L	5.63 (143)	5.25 (133)	4.44 (113)	4.75 (121)	4.38 (111)	5/16 (8) X 11/16 (17)	18.6 (8)
500①	A, B, C, D, E, F, I, M	5.50 (140)	5.25 (133)	4.75 (121)	4.25 (108)	4.38 (111)	5/16 (8) X 11/16 (17)	19.2 (9)
	G	6.00 (152)	5.25 (133)	4.75 (121)	4.75 (121)	4.38 (111)	5/16 (8) X 11/16 (17)	21.0 (9)
	H	5.88 (149)	5.25 (133)	4.75 (121)	4.63 (117)	4.38 (111)	5/16 (8) X 11/16 (17)	21.5 (10)
	J	6.86 (175)	5.25 (133)	4.75 (121)	5.25 (133)	4.38 (111)	5/16 (8) X 11/16 (17)	21.5 (10)
	L	7.00 (178)	5.25 (133)	4.44 (113)	6.13 (156)	4.38 (111)	5/16 (8) X 11/16 (17)	23.4 (11)
750	A, B, E, F, I	7.00 (178)	5.25 (133)	4.75 (121)	5.75 (146)	4.38 (111)	5/16 (8) X 11/16 (17)	28.1 (13)
	G	7.38 (187)	5.25 (133)	4.75 (121)	5.75 (146)	4.38 (111)	5/16 (8) X 11/16 (17)	30.0 (14)
	H	7.00 (178)	5.25 (133)	4.75 (121)	5.75 (146)	4.38 (111)	5/16 (8) X 11/16 (17)	28.0 (13)
	L	5.63 (143)	6.75 (171)	5.75 (146)	4.13 (105)	6.06 (154)	5/16 (8) X 9/16 (14)	30.5 (14)
1000	A, E, I	7.86 (200)	5.25 (133)	4.44 (113)	5.50 (140)	4.38 (111)	9/32 (7) X 13/32 (10)	28.1 (13)
	G	7.13 (181)	6.38 (162)	5.38 (137)	4.50 (114)	5.19 (132)	5/16 (8) X 11/16 (17)	30.0 (14)
	H	7.50 (191)	6.38 (162)	5.38 (137)	4.50 (114)	5.19 (132)	5/16 (8) X 11/16 (17)	29.2 (13)
1500	A, I	6.75 (171)	6.75 (171)	5.69 (144)	3.56 (90)	6.06 (154)	9/32 (7) X 9/16 (14)	30.0 (14)
	G	7.50 (191)	6.75 (171)	5.69 (144)	4.44 (113)	6.06 (154)	9/32 (7) X 9/16 (14)	33.5 (15)
	H	8.25 (210)	6.75 (171)	5.69 (144)	5.25 (133)	6.06 (154)	9/32 (7) X 9/16 (14)	33.5 (15)
2000	A, I	7.00 (178)	6.75 (171)	5.69 (144)	4.44 (113)	6.06 (154)	9/32 (7) X 9/16 (14)	38.0 (17)
	G	8.25 (210)	6.75 (171)	5.69 (144)	5.25 (133)	6.06 (154)	9/32 (7) X 9/16 (14)	42.5 (19)
	H	7.56 (192)	9.00 (229)	7.31 (186)	4.56 (116)	6.50 (165)	9/32 (7) X 9/16 (14)	42.5 (19)
3000	A, I	7.50 (191)	9.00 (229)	7.56 (192)	4.04 (103)	6.50 (165)	7/16 (11) X 3/4 (19)	53.0 (24)
	G	8.00 (203)	9.00 (229)	7.56 (192)	4.63 (117)	6.50 (165)	7/16 (11) X 3/4 (19)	63.7 (29)
	H	8.63 (219)	9.00 (229)	7.56 (192)	5.25 (133)	6.50 (165)	7/16 (11) X 3/4 (19)	63.7 (29)
5000	A	10.0 (254)	9.00 (229)	7.56 (192)	7.50 (190)	7.20 (183)	7/16 (11) X 3/4 (19)	140.0 (64)
	G	10.50 (267)	9.00 (229)	10.19 (259)	6.50 (165)	6.50 (165)	7/16 (11) X 3/4 (19)	102.0 (46)
	H	13.50 (343)	9.00 (229)	10.56 (268)	8.25 (210)	6.50 (165)	7/16 (11) X 3/4 (19)	102.0 (46)

Industrial Control Power Transformers

Class MTG

Dimensions



Dimension "C" does not include the added height required for secondary fuse clips—0.50 in. (13 mm) maximum for type "K" clips.

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.

Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

Class MTG

VA Rating	Voltage Letters	Approximate Dimensions Inches (mm)						Approx Ship Wt Lbs (Kg)
		A	B	C	D	E	Mounting Slots	
50	A	3.38 (86)	3.00 (76)	3.00 (76)	2.50 (64)	2.50 (64)	13/64 (5) X 15/32 (12)	3.5 (2)
	B, C, P	3.25 (83)	3.00 (76)	3.00 (76)	2.25 (57)	2.50 (64)	13/64 (5) X 15/32 (12)	3.4 (2)
	E, I	3.38 (86)	3.00 (76)	3.00 (76)	2.50 (64)	2.50 (64)	13/64 (5) X 15/32 (12)	3.5 (2)
	J	3.25 (83)	3.38 (86)	3.25 (83)	2.25 (57)	2.81 (71)	13/64 (5) X 15/32 (12)	4.2 (2)
75	A	3.50 (89)	3.38 (86)	3.25 (83)	2.50 (64)	2.81 (71)	13/64 (5) X 15/32 (12)	4.8 (2)
	B, C, P	3.25 (83)	3.38 (86)	3.25 (83)	2.25 (57)	2.81 (71)	13/64 (5) X 15/32 (12)	4.2 (2)
	E, I	3.50 (89)	3.38 (86)	3.25 (83)	2.50 (64)	2.81 (71)	13/64 (5) X 15/32 (12)	4.8 (2)
	J	3.63 (92)	3.75 (95)	3.50 (89)	2.50 (64)	3.13 (79)	13/64 (5) X 15/32 (12)	5.9 (3)
100	A	3.63 (92)	3.75 (95)	3.50 (89)	2.50 (64)	3.13 (79)	13/64 (5) X 15/32 (12)	5.9 (3)
	B, C, P	3.63 (92)	3.75 (95)	3.50 (89)	2.50 (64)	3.13 (79)	13/64 (5) X 15/32 (12)	5.9 (3)
	E, I	3.63 (92)	3.75 (95)	3.50 (89)	2.50 (64)	3.13 (79)	13/64 (5) X 15/32 (12)	5.9 (3)
	J	4.38 (111)	3.75 (95)	3.50 (89)	3.19 (81)	3.13 (79)	13/64 (5) X 15/32 (12)	7.9 (4)
150	A	4.00 (102)	4.50 (114)	4.00 (102)	2.50 (64)	3.75 (95)	13/64 (5) X 15/32 (12)	8.5 (4)
	B, C, P	4.00 (102)	4.50 (114)	4.00 (102)	2.50 (64)	3.75 (95)	13/64 (5) X 15/32 (12)	8.5 (4)
	E, I	4.00 (102)	4.50 (114)	4.00 (102)	2.50 (64)	3.75 (95)	13/64 (5) X 15/32 (12)	8.5 (4)
	J	4.00 (102)	4.50 (114)	4.00 (102)	2.81 (71)	3.75 (95)	13/64 (5) X 15/32 (12)	8.5 (4)
200	A	4.50 (114)	4.50 (114)	4.00 (102)	3.19 (81)	3.75 (95)	13/64 (5) X 15/32 (12)	10.6 (5)
	B, C, P	4.38 (111)	4.50 (114)	4.00 (102)	2.81 (71)	3.75 (95)	13/64 (5) X 15/32 (12)	10.0 (5)
	E, I	4.50 (114)	4.50 (114)	4.00 (102)	3.19 (81)	3.75 (95)	13/64 (5) X 15/32 (12)	10.6 (5)
	J	5.00 (127)	4.50 (114)	4.00 (102)	3.50 (89)	3.75 (95)	13/64 (5) X 15/32 (12)	10.6 (5)
250	A	4.38 (111)	4.50 (114)	4.00 (102)	3.19 (81)	3.75 (95)	13/64 (5) X 15/32 (12)	11.3 (5)
	B, C, P	4.75 (121)	4.50 (114)	4.00 (102)	3.19 (81)	3.75 (95)	13/64 (5) X 15/32 (12)	11.3 (5)
	E, I	4.75 (121)	4.50 (114)	4.00 (102)	3.19 (81)	3.75 (95)	13/64 (5) X 15/32 (12)	11.3 (5)
	J	5.50 (140)	4.50 (114)	4.00 (102)	4.06 (103)	3.75 (95)	13/64 (5) X 15/32 (12)	15.2 (7)
300	A	5.13 (130)	4.50 (114)	4.00 (102)	3.75 (95)	3.75 (95)	13/64 (5) X 15/32 (12)	13.2 (6)
	B, C, P	5.13 (130)	4.50 (114)	4.00 (102)	3.75 (95)	3.75 (95)	13/64 (5) X 15/32 (12)	13.2 (6)
	E, I	5.13 (130)	4.50 (114)	4.00 (102)	3.75 (95)	3.75 (95)	13/64 (5) X 15/32 (12)	13.2 (6)
	J	5.38 (137)	5.25 (133)	4.50 (114)	4.25 (108)	4.38 (111)	5/16 (8) X 11/16 (17)	16.8 (8)
350	A	5.00 (127)	5.25 (133)	4.50 (114)	3.75 (95)	4.38 (111)	5/16 (8) X 11/16 (17)	14.9 (7)
	B, C, P	5.00 (127)	5.25 (133)	4.50 (114)	3.75 (95)	4.38 (111)	5/16 (8) X 11/16 (17)	14.9 (7)
	E, I	5.00 (127)	5.25 (133)	4.50 (114)	3.75 (95)	4.38 (111)	5/16 (8) X 11/16 (17)	14.9 (7)
	J	5.50 (140)	5.25 (133)	4.50 (114)	4.25 (108)	4.38 (111)	5/16 (8) X 11/16 (17)	19.2 (9)
500	A	6.00 (152)	5.25 (133)	4.50 (114)	4.75 (121)	4.38 (111)	5/16 (8) X 11/16 (17)	21.0 (9)
	B, C, P	5.50 (140)	5.25 (133)	4.50 (114)	4.25 (108)	4.38 (111)	5/16 (8) X 11/16 (17)	19.2 (9)
	E, I	6.00 (152)	5.25 (133)	4.50 (114)	4.75 (121)	4.38 (111)	5/16 (8) X 11/16 (17)	21.0 (9)
	J	7.25 (184)	5.25 (133)	4.50 (114)	6.00 (153)	4.38 (111)	5/16 (8) X 11/16 (17)	27.0 (12)
750	A	7.38 (187)	5.25 (133)	4.50 (114)	5.75 (146)	4.38 (111)	5/16 (8) X 11/16 (17)	30.0 (14)
	B, C, P	7.00 (178)	5.25 (133)	4.50 (114)	5.38 (137)	4.38 (111)	5/16 (8) X 11/16 (17)	28.1 (13)
	E, I	7.38 (187)	5.25 (133)	4.50 (114)	5.75 (146)	4.38 (111)	5/16 (8) X 11/16 (17)	30.0 (14)
	J	5.56 (141)	6.38 (162)	7.19 (183)	4.38 (111)	5.31 (135)	5/16 (8) X 11/16 (17)	30.0 (14)
1000	A	5.31 (135)	6.38 (162)	5.31 (135)	4.06 (103)	5.31 (135)	5/16 (8) X 11/16 (17)	26.3 (12)
	B, C	5.56 (141)	6.38 (162)	7.19 (183)	4.31 (110)	5.31 (135)	5/16 (8) X 11/16 (17)	26.3 (12)
	J	7.00 (178)	6.38 (162)	7.19 (183)	5.75 (146)	5.31 (135)	5/16 (8) X 11/16 (17)	40.0 (18)
1500	A	6.13 (156)	6.75 (171)	7.50 (191)	4.94 (125)	6.13 (156)	9/32 (7) X 9/16 (14)	40.0 (18)
2000	A	6.44 (164)	6.75 (171)	7.50 (191)	5.25 (133)	6.13 (156)	9/32 (7) X 9/16 (14)	45.1 (21)
3000	A	6.25 (159)	9.00 (229)	9.38 (238)	4.56 (116)	6.50 (165)	7/16 (11) X 3/4 (19)	65.2 (30)
5000	A	8.75 (222)	9.00 (229)	9.38 (238)	6.50 (165)	6.50 (165)	7/16 (11) X 3/4 (19)	104.8 (48)

Heavy Duty Motor Starters & Contactors

Enclosed, Class 14, 40

Dimensions

Figure 1

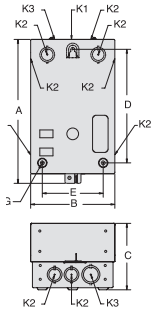
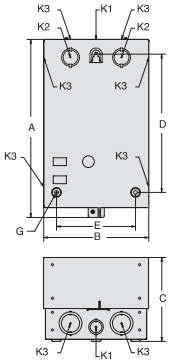


Figure 2



View is typical for bottom and top

Figure 3

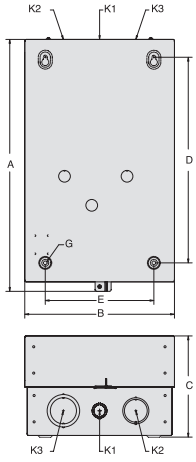


Figure 4

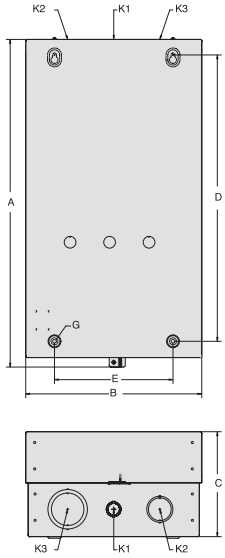
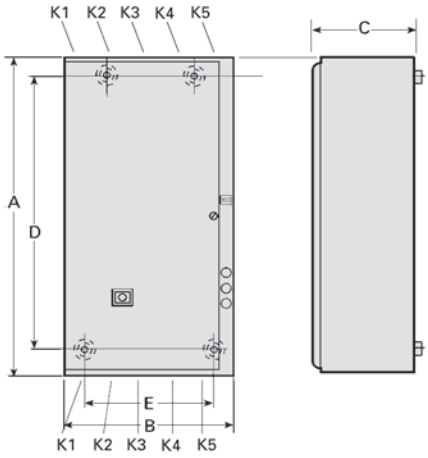


Figure 5



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	G	K1	K2	K3	K4	K5		
00–1¾	w/o CPT	1	10 31/32 (279)	6 13/32 (163)	5 1/32 (128)	8 7/32 (209)	4 5/8 (117)	1/4	1/2	1/2–3/4	3/4–1	—	—	10 (5)	D68870
2–2½	w/o CPT	2	13 17/32 (344)	7 31/32 (202)	6 3/8 (162)	10 1/4 (260)	6 (152)	1/4	1/2–3/4	3/4–1	1–1 1/4	—	—	15 (7)	D68870
3–3½	(100VA)	3	19 1/8 (486)	11 3/8 (289)	7 11/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2–3/4	1–1 1/4	1 1/2–2	—	—	26 (12)	D68870
4	(300VA)	4	24 3/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2–3/4	1 1/4–1 1/2	2–2 1/2	—	—	37 (17)	D68870
5	(300VA)	5	40 (1016)	20 (508)	11 (279)	37 5/8 (956)	15 1/4 (387)	1/4	2–3	1 1/4–1 1/2	1/2–3/4	1 1/4–1 1/2	2–3	135 (36)	D65608
6, 7	(300VA)	5	48 (1219)	20 (508)	12 1/2 (317)	45 3/16 (1148)	10 (254)	1/4	2–2 1/2	1 1/4–1 1/2	1/2–3/4	1 1/4–1 1/2	2–2 1/2	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	G	K1	K2	K3	K4	K5		
00–1¾	(200VA)	3	19 1/8 (486)	11 3/8 (289)	7 11/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2–3/4	1–1 1/4	1 1/2–2	—	—	26 (12)	D68870
2–2½	(200VA)	3	19 1/8 (486)	11 3/8 (289)	7 11/16 (195)	15 5/8 (397)	8 1/4 (210)	1/4	1/2–3/4	1–1 1/4	1 1/2–2	—	—	26 (12)	D68870
3–3½	(250VA)	4	24 1/8 (632)	13 3/8 (340)	8 1/8 (206)	21 3/4 (552)	9 (229)	1/4	1/2–3/4	1–1 1/4–1 1/2	2–2 1/2	—	—	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

Dimensions

Figure 1

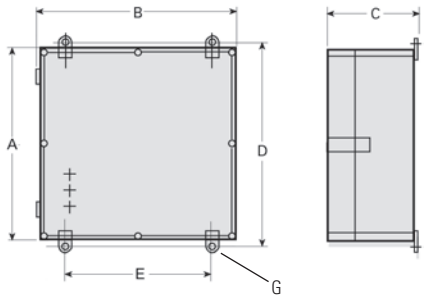
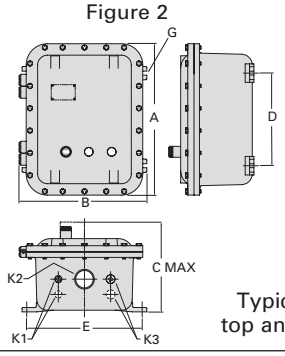


Figure 2



Typical view top and bottom

Figure 3

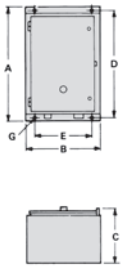
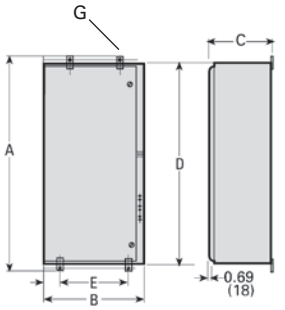


Figure 4



NEMA 4X Fiberglass Enclosures (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾ w/o CPT	2	15.250 (387)	10.688 (272)	10.000 (254)	8.500 (216)	9.125 (132)	⅜	½	1½	¾	33 (14.9)	24-139-865-002
2–2½ (0–1¾ w/ CPT)	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	⅜	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)	⅜	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)	21⅛ (533)	⅝	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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–2½①	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	⅜	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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	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)	⅜	—	—	—	64 (29)	D17150
5	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	⅜	—	—	—		D65608007
6, 7	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	⅜	—	—	—		D65608009
8	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	⅜	—	—	—	275 (125)	D65632006

NEMA 4/4X Stainless Steel Enclosure (Standard width for use without CPT)

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	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)	13.125 (333)	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)	5⁄16	—	—	—	64 (29)	D43292
5 (Painted)	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	⅜	—	—	—		D65608007
6, 7 (Painted)	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	⅜	—	—	—		D65608009
8 (Painted)	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	⅜	—	—	—	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

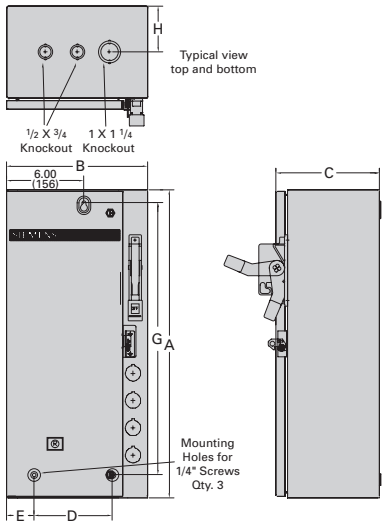


Figure 2

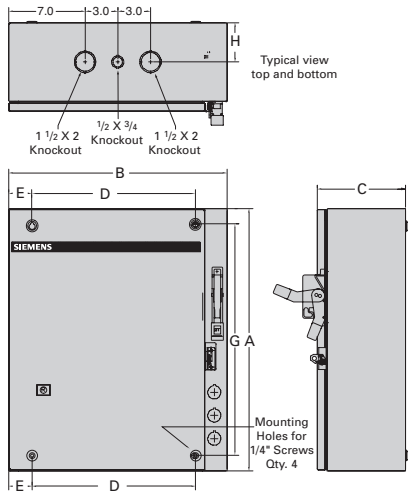


Figure 3

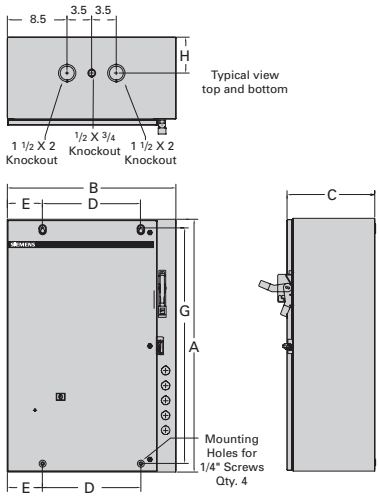
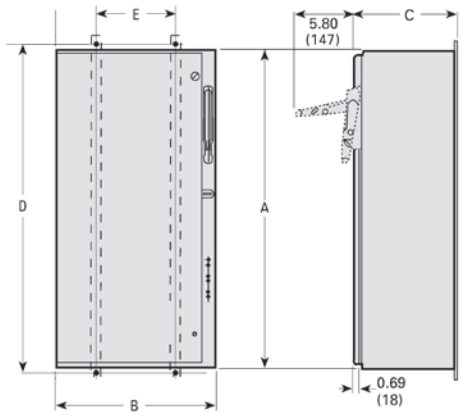


Figure 4



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
2½, 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

Figure 1

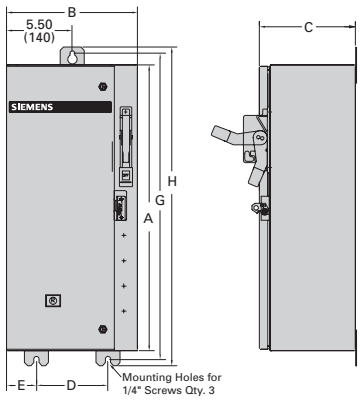


Figure 2

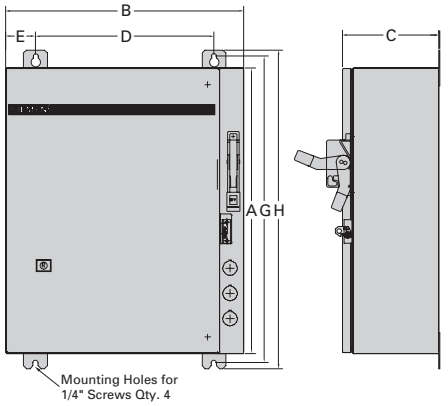


Figure 3

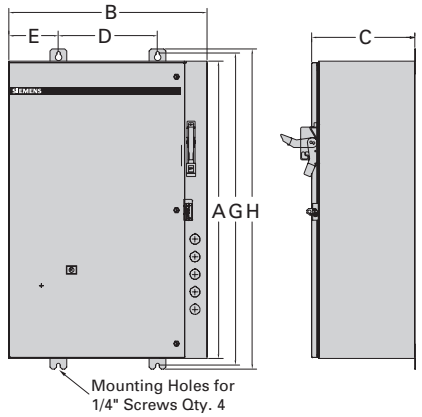


Figure 4

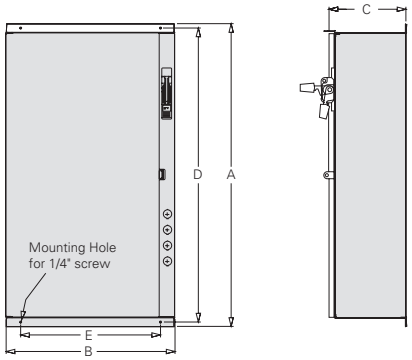
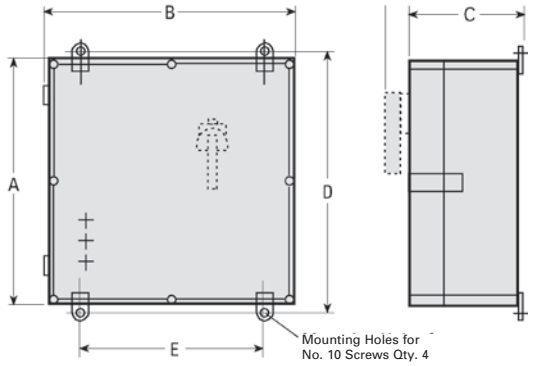


Figure 5



NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0–6

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
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 A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (654)	49 (22)	D56033
2½, 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 A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	5	23.75 (603)	14.62 (371)	7.12 (181)	24.09 (612)	12.20 (310)	—	—	42 (19)	—
2–3½	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)	—

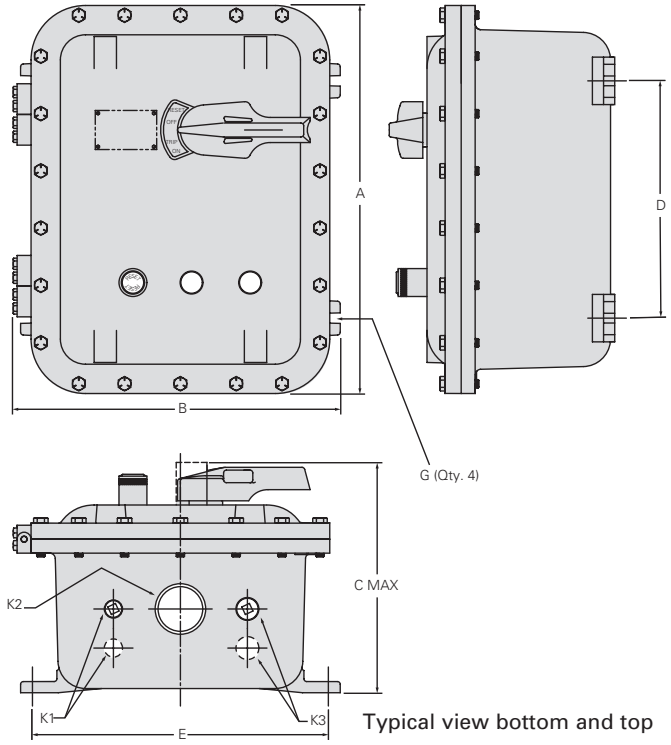
Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

Combination Heavy Duty Starters

Enclosed, Class 18

Dimensions

Figure 1



Typical view bottom and top

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	G	K1	K2	K3		
0–1¾	1	17.38 (441)	14.69 (373)	10.38 (264)	10.63 (270)	13.25 (337)	⅜	¾	2	½	60 (27)	24-139-865-003
2–3½	1	28.25 (718)	17.75 (451)	11.19 (284)	18.38 (467)	15.75 (400)	⅜	¾	2½	½	160 (72)	24-139-865-004
4	1	32.25 (819)	20.00 (508)	11.50 (292)	22.50 (572)	17.75 (451)	⅝	¾	2½	½	250 (113)	24-139-865-005
5	1	40.875 (1038)	22.875 (581)	14.875 (378)	29 (737)	21.75 (552)	⅝	½	3	¾	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

Figure 1

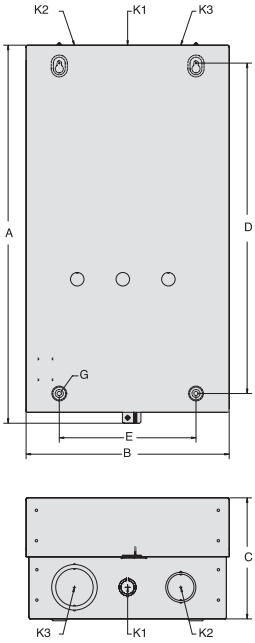


Figure 2

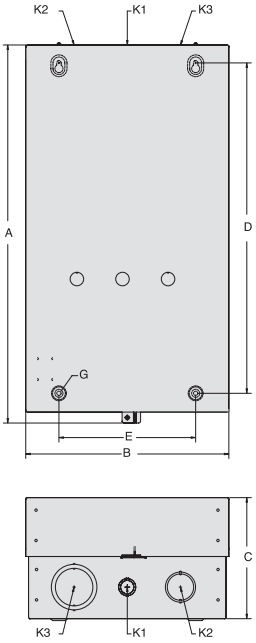


Figure 3

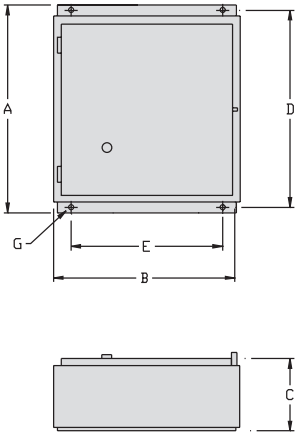
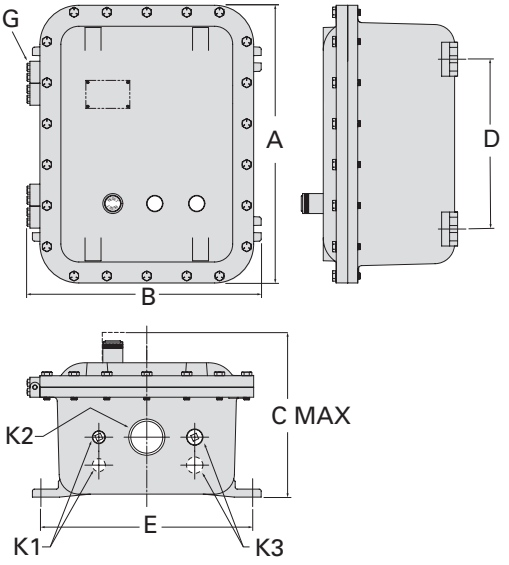


Figure 4



View is typical for bottom and top

NEMA 1 General Purpose Enclosure (Standard width for use with and without CPT)

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mounting Screw G	Conduit Size K1	K2	K3	K4	Approx Ship Wt Lbs (Kg)	Ref Dwg
00–2½ (200 VA)	1	19⅛ (486)	11⅜ (289)	7 11⁄16 (195)	15⅝ (397)	8¼ (210)	¼	½–¾	1–1¼	1½–2	—	30 (14)	D68870
3–4 (300 VA)	2	24⅞ (632)	13⅜ (340)	8⅛ (206)	21¾ (552)	9 (229)	¼	½–¾	1¼–1½	2–2½	—	52 (24)	D68870
5 (300 VA)		40 (1016)	20 (508)	11 (279)	37⅝ (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)	45 11⁄16 (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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	3	13 (330)	12⅝ (321)	5⅜ (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	25 1⁄16 (637)	17 3⁄16 (437)	7⅜ (187)	24 5⁄16 (618)	14 (356)	¼	—	—	—	53 (24)	D17423
3–3½ (w/ CPT)	3	29 (737)	23 3⁄16 (589)	9¼ (235)	27½ (699)	20 (508)	5⁄16	—	—	—	64 (29)	D43292
4												
5 (Painted)		40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	⅜	—	—	—		D65608007
6, 7 (Painted)		48(1219)	20 (508)	12½ (317)	49 (1244)	10 (254)	⅜	—	—	—		65608009

NEMA 7/9/3/4 Hazardous Location Enclosure (with or without CPT)

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–2½	4	28¼ (718)	16¼ (413)	9¼ (235)	18⅜ (467)	15¾ (400)	½	½	3	¾	140	24-139-865-004
3–4	4	32¼ (819)	18¼ (464)	9 3⁄16 (243)	22½ (572)	17¾ (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.

Reversing Heavy Duty Starters & Contactors

Enclosed, Class 22, 43

Dimensions

Figure 5

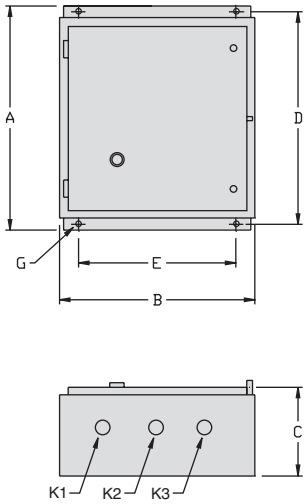


Figure 6

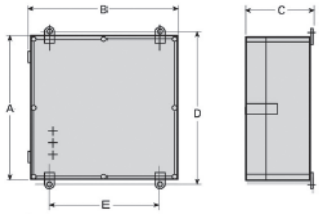
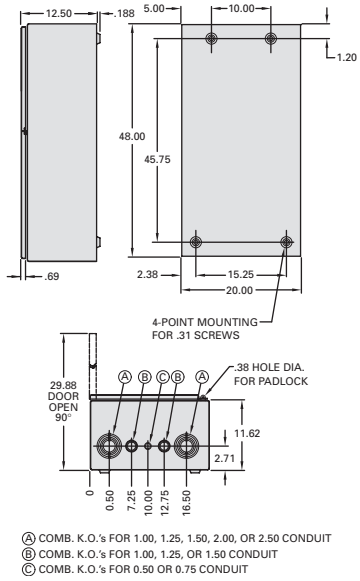


Figure 7



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	G	K1	K2	K3		
0–1¾	5	13 (330)	12⅝ (321)	5⅜ (137)	12¼ (311)	10 (254)	¼	—	—	—	30 (14)	D17150
2–2½	5	16 (406)	13¼ (337)	6⅛ (156)	15¼ (387)	11 (279)	¼	—	—	—	33 (15)	D17150
3–3½ (w/o CPT)	5	25⁵⁄₁₆ (637)	17⁹⁄₁₆ (437)	7⅜ (187)	24⁹⁄₁₆ (618)	14 (356)	¼	—	—	—	53 (24)	D17150
3–3½ (w/ CPT)	5	29⁵⁄₁₆ (738)	23⁹⁄₁₆ (589)	9¼ (235)	27⁹⁄₁₆ (700)	20 (508)	⁵⁄₁₆	—	—	—	64 (29)	D17150
4												
5	7	40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	⅜	—	—	—		D65608007
6 (300 VA CPT max.)	7	48 (1219)	20 (508)	12½ (318)	45¾ (1162)	10 (254)	¼	—	—	—		

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	G	K1	K2	K3		
0–2½	6	23.78 (604)	14.68 (373)	6.89 (175)	22⅕ (579)	13⅕ (351)	¼	—	—	—	35	—
3–4	6	23.78 (604)	23.78 (604)	6.89 (175)	22⅕ (579)	22⅕ (579)	¼	—	—	—	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

Figure 1

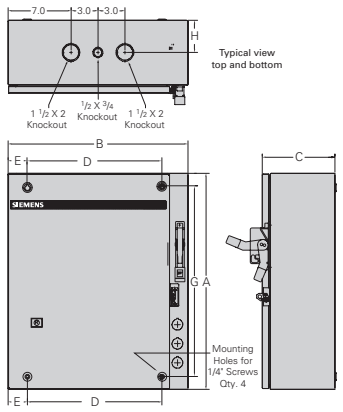


Figure 2

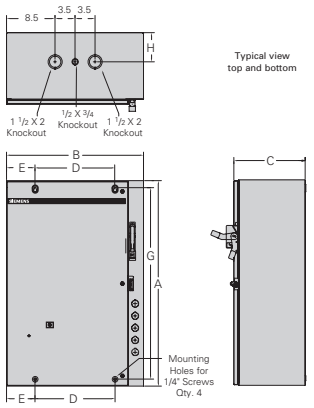


Figure 3

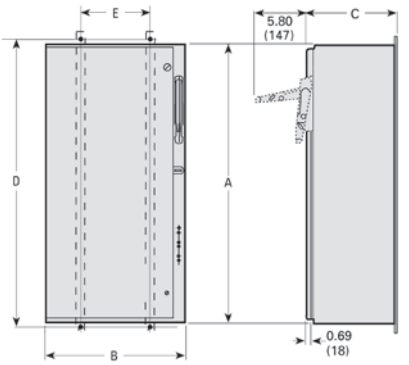


Figure 4

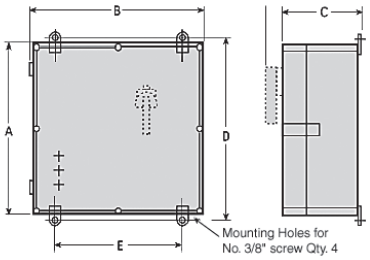


Figure 5

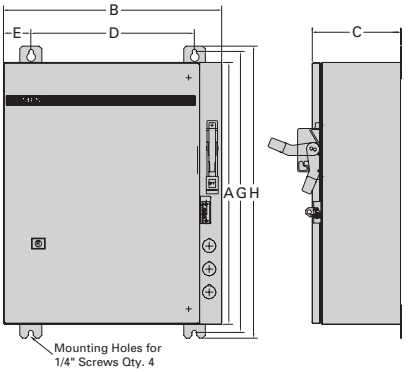
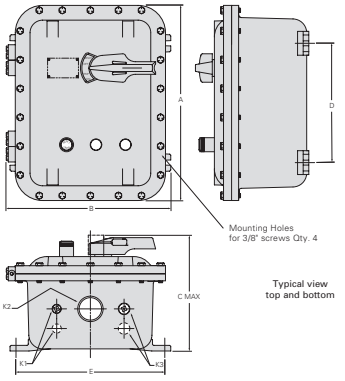


Figure 6



NEMA 1 Standard Width 0–6

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
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 A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–2½	4	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (612.7)	12.250 (311)	⅜	—	—	—	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)	⅜	—	—	—	28 (12.7)	24-139-861-003

NEMA 7/9/3/4 Hazardous Location 0–4

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–2½	6	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750. (400)	⅜	½	3	¾	140 (63.5)	24-139-865-004
3–4		Contact Sales Office										

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

Figure 1

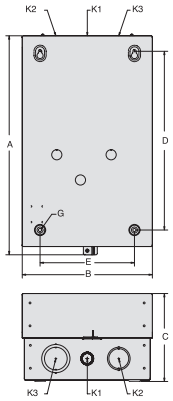


Figure 1a

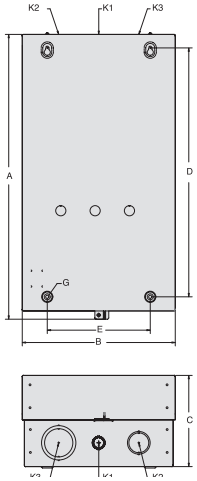


Figure 2

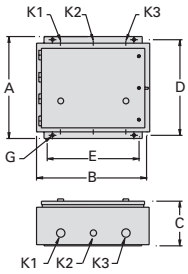


Figure 3

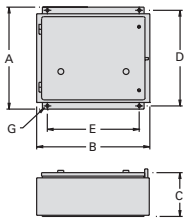
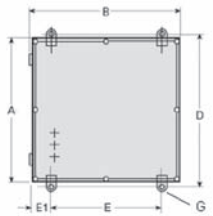


Figure 4



2 Speed 1 Winding

Size	Fig	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)												
0–1 ¾ w/o CPT	1	19 ⅛ (486)	11 ⅜ (289)	7 11/16 (195)	15 ⅝ (397)	8 ¼ (210)	¼	½–¾	1–1 ¼	1 ½–2	26 (12)	D68870
0–1 ¾ (200 VA)	1a	24 ⅛ (632)	13 ⅜ (340)	8 ⅛ (206)	21 ¾ (552)	9 (229)	¼	½–¾	1 ¼–1 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	1 ¼–1 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	1 ¼–1 ½	½–¾	1 ½–2	60 (27)	D72956002
4	3	29 (737)	23 3/16 (589)	9 ¼ (235)	27 ½ (699)	20 (508)	5/16	—	—	—	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 ⅝ (321)	5 ⅜ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	D41917000
0–1 ¾ w/ CPT	3	16 (406)	17 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)	
2–2 ½ w/o CPT	3	16 (406)	17 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)	
2–2 ½ w/ CPT	3	25 1/16 (637)	17 3/16 (437)	7 ⅜ (187)	24 5/16 (618)	14 (355)	¼	—	—	—	55 (25)	
3–3 ½	3	29 (737)	23 3/16 (589)	9 ¼ (235)	27 ½ (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001
4	3	29 (737)	23 3/16 (589)	9 ¼ (235)	27 ½ (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001
NEMA 12/3/3R Industrial Use Enclosure (Standard width for use with or without CPT)												
0–1 ¾ w/o CPT	3	13 (330)	12 ⅝ (321)	5 ⅜ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	
0–1 ¾ w/ CPT	3	16 (406)	17 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)	D17150010
2–2 ½ w/o CPT	3	16 (406)	17 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)	D17150010
2–2 ½ w/ CPT	3	25 1/16 (637)	17 3/16 (437)	7 ⅜ (187)	24 5/16 (618)	14 (355)	¼	—	—	—	55 (25)	
3–4	3	29 (737)	23 3/16 (589)	9 ¼ (235)	27 ½ (699)	20 (508)	5/16	—	—	—	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

Size	Fig	Outline Dimensions A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)												
0–2 ½ w/o CPT	1	19 ⅛ (486)	11 ⅜ (289)	7 11/16 (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 ⅛ (632)	13 ⅜ (340)	8 ⅛ (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 ⅛ (632)	13 ⅜ (340)	8 ⅛ (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 ⅜ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	
0–1 ¾ w/ CPT	3	16 (406)	17 ⅛ (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 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)	
3–3 ½ w/o CPT	3	25 1/16 (637)	17 3/16 (187)	7 ⅜ (187)	24 5/16 (618)	14 (355)	¼	—	—	—	55 (25)	
3–3 ½ w/ CPT	3	29 (737)	23 3/16 (589)	9 ¼ (235)	27 ½ (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001
4	3	29 (737)	23 3/16 (589)	9 ¼ (235)	27 ½ (699)	20 (508)	5/16	—	—	—	61 (28)	D43292001
NEMA 12/3/3R Industrial Use Enclosure (Standard width for use with or without CPT)												
0–1 ¾ w/o CPT	3	13 (330)	12 ⅝ (321)	5 ⅜ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	
0–1 ¾ w/CPT	3	16 (406)	17 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)	D17150010
2–2 ½ w/o CPT	3	16 (406)	13 ¼ (337)	6 ⅛ (156)	15 ¼ (387)	11 (279)	¼	—	—	—	41 (19)	
2–2 ½ w/CPT	3	16 (406)	17 ⅛ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)	D17150010
3–3 ½ w/o CPT	3	25 1/16 (637)	17 3/16 (187)	7 ⅜ (187)	24 5/16 (618)	14 (355)	¼	—	—	—	55 (25)	
3–4 w/CPT	3	29 1/16 (738)	23 3/16 (589)	9 ¼ (235)	27 9/16 (700)	20 (508)	5/16	—	—	—	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

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

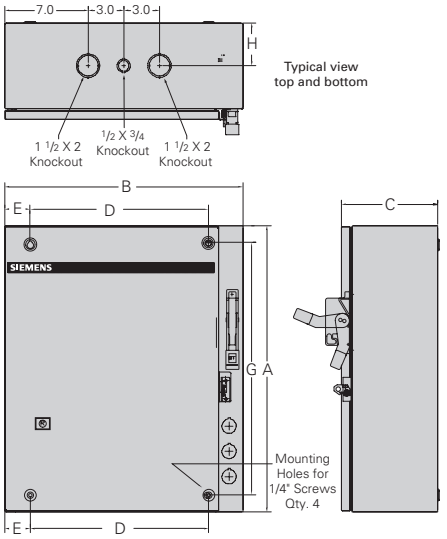


Figure 2

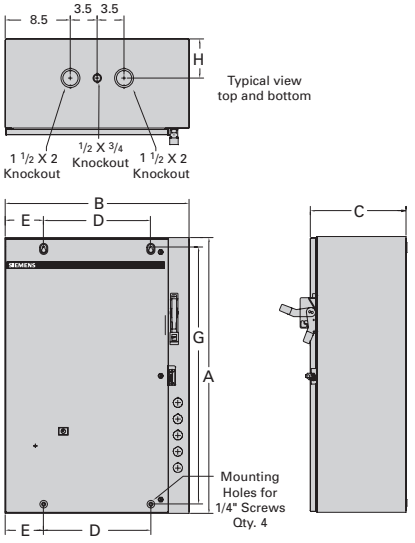


Figure 3

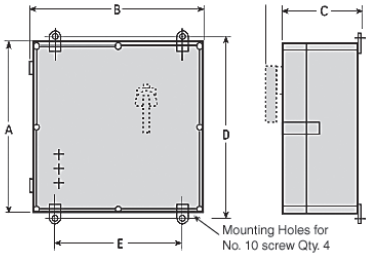
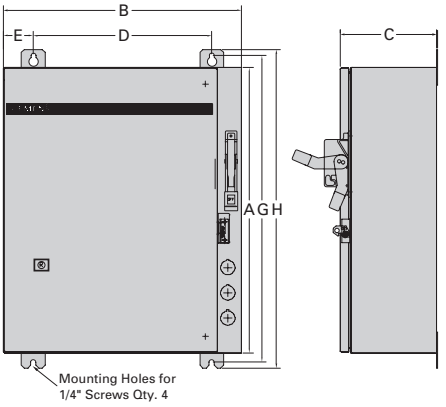


Figure 4



NEMA 1 Standard Width 0–4

Size	Figure	Outline Dimensions A	B	C	Mounting Dimensions D	E	G	H	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾ (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
0–2½ (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

0–1¾ (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
0–2½ (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 A	B	C	Mounting Dimensions D	E	Mtg Screw G	Conduit Size K1	K2	K3	Approx Ship Wt Lbs (Kg)	Ref Dwg
0–1¾	3	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (613)	12.250 (311)	¼	—	—	—	18 (8)	—
2–4	3	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (613)	21.250 (540)	¼	—	—	—	28 (13)	—

Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

• Revised •
03/01/14

Figure 1

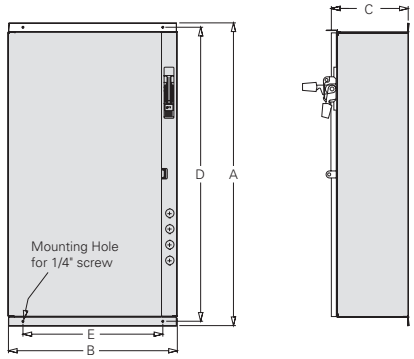
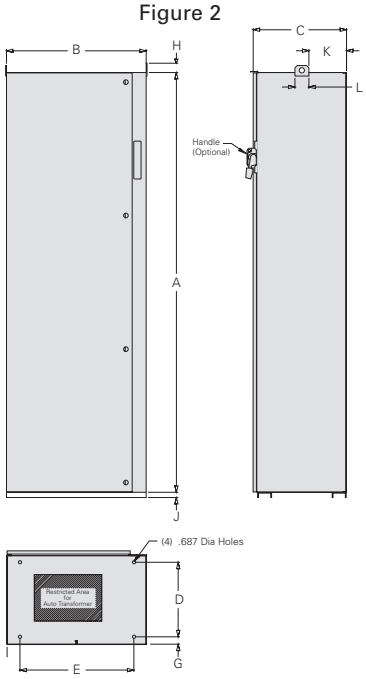


Figure 2



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 21/32	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

Duplex Heavy Duty Controllers

Class 83, 84

Dimensions

Figure 1

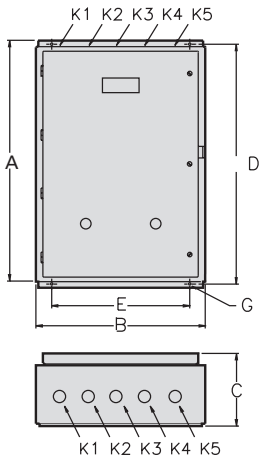


Figure 2

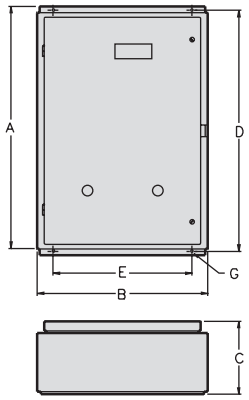
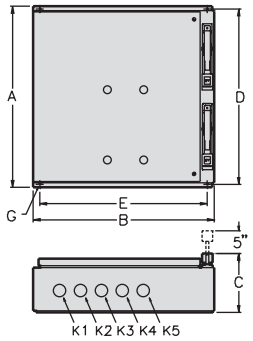


Figure 3



Class 83 Non-Combination Type

Enclosure Type	Size	Outline Dimensions				Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt
		Figure	A	B	C	D	E	G	K1	K2	K3	K4	K5	Lbs
NEMA 1	0–1¾	1	19½	16⅛	6½	18¾	13	¼	1¼–1½	½–¾	½	½–¾	1¼–1½	20
	2, 2½	1	25 1/16	17 3/16	7⅜	24 5/16	14	¼	1¼–1½	½–¾	½–¾	1¼–1½	1½–2	57
	3–4	1	29 11/16	23 3/16	9¼	27 9/16	20	5/16	2–2½	1¼–1½	½–¾	1¼–1½	2–2½–3	93
NEMA 12	0–1¾	2	19½	16⅛	6½	18¾	13	¼	—	—	—	—	—	20
	2, 2½	2	25 1/16	17 3/16	7⅜	24 5/16	14	¼	—	—	—	—	—	57
	3–4	2	23½	23 3/16	11¼	27 9/16	20	5/16	—	—	—	—	—	93
NEMA 4/4X②	0–1¾	2	19½	16⅛	6½	18¾	13	¼	—	—	—	—	—	20
	2, 2½	2	25 1/16	17 3/16	7⅜	24 5/16	14	¼	—	—	—	—	—	57
	3–4	2	29 1/16	23 3/16	9¼	27 9/16	20	5/16	—	—	—	—	—	93

Class 84 Combination Type

Enclosure Type	Size	Outline Dimensions				Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt
		Figure	A	B	C	D	E	G	K1	K2	K3	K4	K5	Lbs
NEMA 1	0–2½	3	34⅛	24⅝	7 9/16	33	20	⅜	⅞–1⅛	⅞–1⅛	1⅛–1 23/64	1⅛–1 23/64	1 23/64–1 23/32	70
	3–4	3	56	28½	9 11/16	54 13/16	24¼	⅜	—	—	—	—	—	106
NEMA 4/4X/12②	0–4①	3	34⅛	24⅝	7 9/16	33	20	⅜	—	—	—	—	—	—

① Dimensions may vary for size 3 & 4 stainless steel enclosures.

② NEMA 4 Painted, 4X Stainless Steel.

Pump Control Panels

Class 87, 88

Dimensions

Outline Drawings

Figure 1

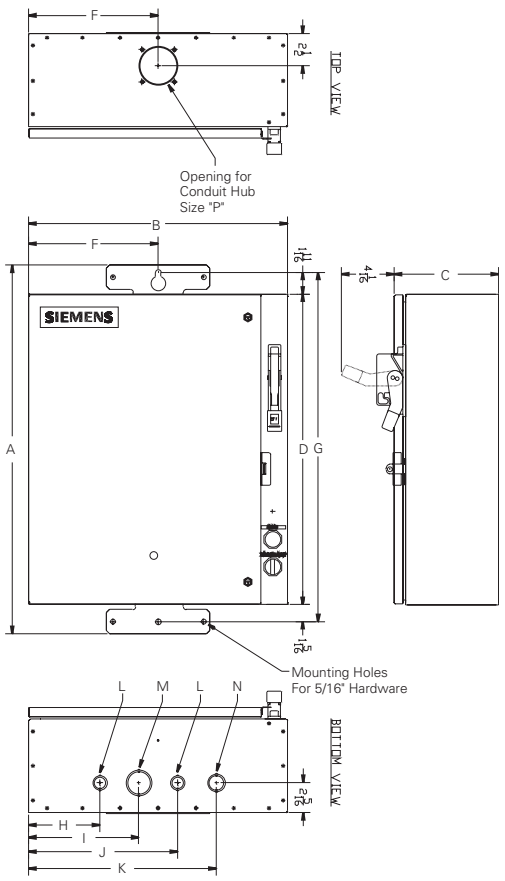


Figure 2

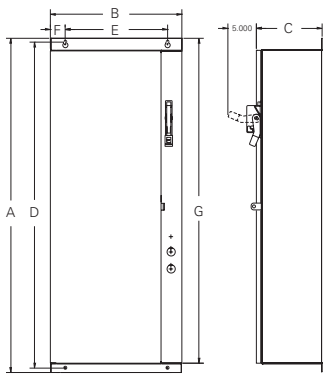


Figure 3

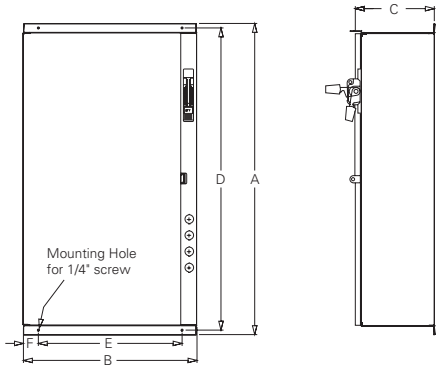
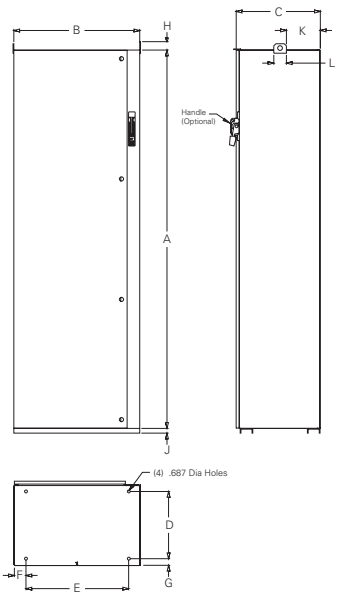


Figure 4



Class 87 Standard and Vacuum Starter Pump Panel

Size	Figure	A	B	C	D	E	F	G	H	I	J	K	Conduit Knockout L	Conduit Knockout M	Conduit Knockout N	Hub P
1 – 2½	1	28½	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	40½	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	10	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: Fusible Disconnect	Part Winding & Wye Delta: Circuit Breaker	Figure	A	B	C	D	E	F	H	I	J	K	L
2–2½	1–2	1–2½	3	43 5/16	24 5/32	11	42 11/32	20	2 1/16	—	—	—	—	—
3–3½	2½–3½	3–3½	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

Dimensions

Figure 1

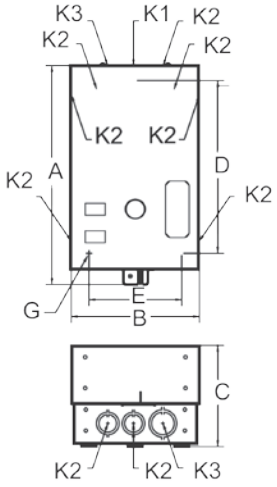


Figure 2

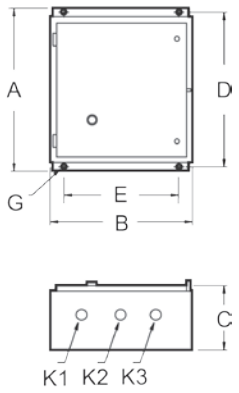
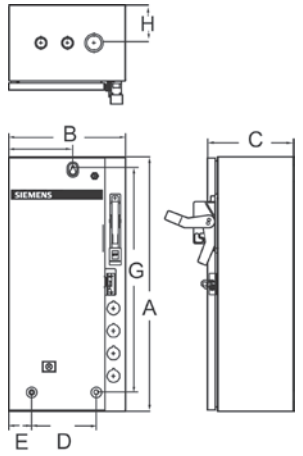


Figure 3



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 20/30A 3-4P, LC 30A 2-12P, LE 60A 3P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LE 30/60A 6-12P, LE 100A 3P	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	200-100A	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.

Lighting Contactors

Enclosed Contactors, Class CLM, CM

Dimensions

Figure 1

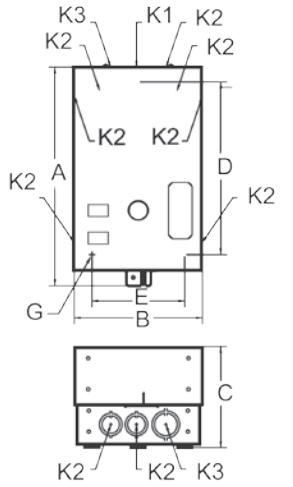


Figure 2

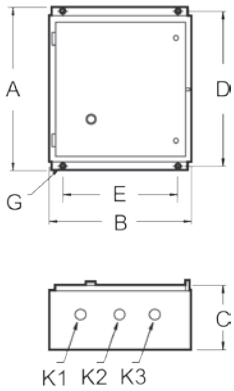
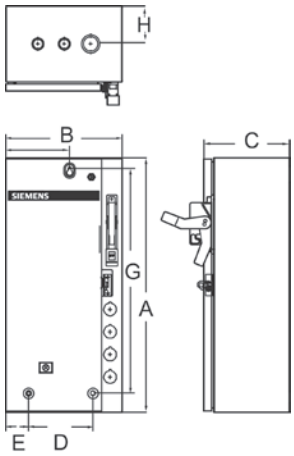


Figure 3

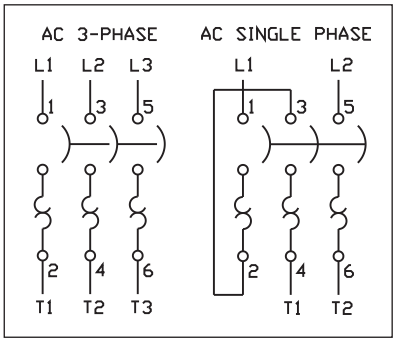


Enclosure Type	Contactor Rating (Class CLM)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	30–60A (2-5p)	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75–1	—	—
	20A (2–12p)	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	30–60A (6-12p)	2	16.00	17.12	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 (2–5p)	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 (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	—	—	—	—	—

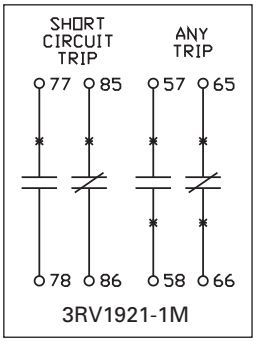
Enclosure Type	Type (Class CM)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20–60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	200-100A	3	24	11	8

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.

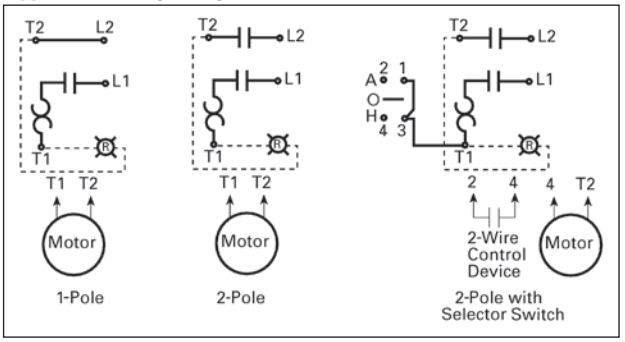
Class 11 - 3RV



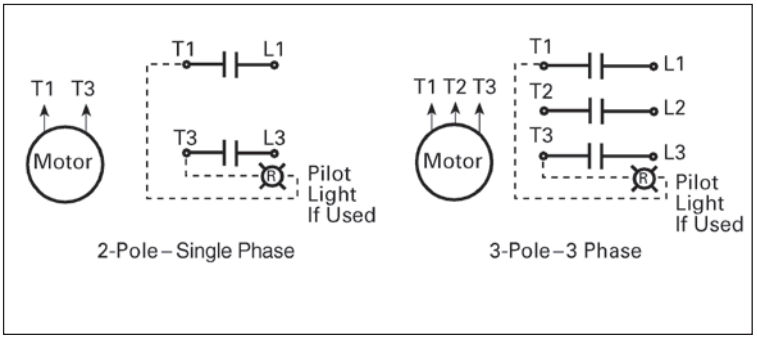
Signaling Contact for Class 11 - 3RV



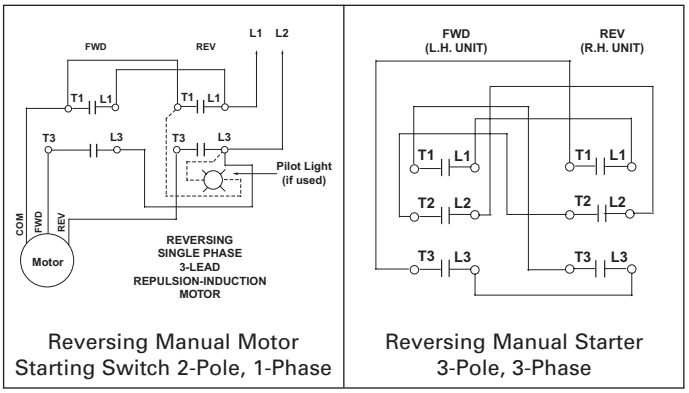
Typical Wiring Diagrams—Class SMF



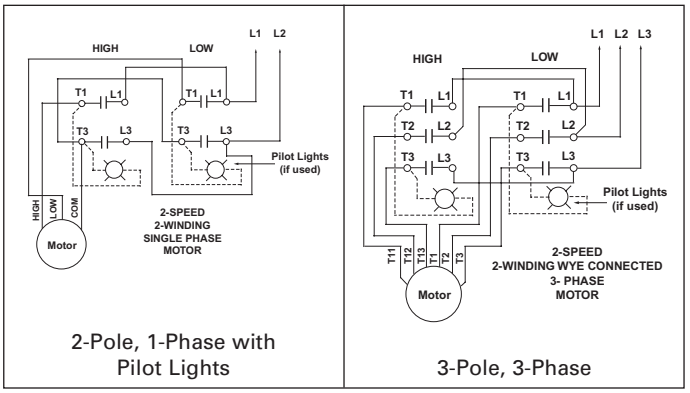
Typical Wiring Diagrams—MMS



AC Reversing Manual Starter and Manual Motor Starting Switches

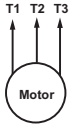


AC 2-Speed Manual Motor Starting Switches

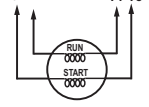


3-Pole Reversing Switches

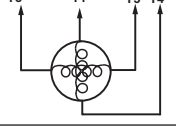
THREE PHASE MOTOR			
LINE AND MOTOR LEADS		L.H. UNIT	R.H. UNIT
Line	L1 to L2 to L3 to	— — —	L1 L2 L3
Meter	T1 to T2 to T3 to	T1 T2 T3	— — —
Pilot Light Leads to		— —	T1 T3



SINGLE PHASE CAPACITOR OR SPLIT PHASE MOTOR			
LINE AND MOTOR LEADS		L.H. UNIT	R.H. UNIT
Line	L1 to L2 to	— —	L1 L2
Meter	T1 to T4 to T5 to T8 to	T1 T3 L1 T2	— — — —
Furnish Jumper		L3 to	T2
Pilot Light Leads to		— —	T1 T3



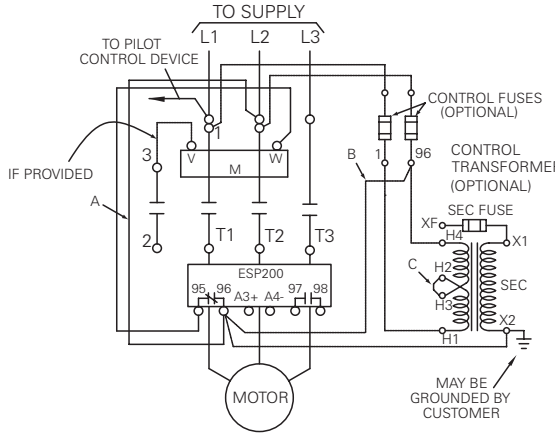
SINGLE PHASE 4-LEAD REPULSION - INDUCTION MOTOR			
LINE AND MOTOR LEADS		L.H. UNIT	R.H. UNIT
Line	L1 to L2 to	— —	L1 L2
Meter	T1 to T4 to T5 to T8 to	T2 L3 T3 T1	— — — —
Furnish Jumper		L3 to	T2
Pilot Light Leads to		— —	L1 T2



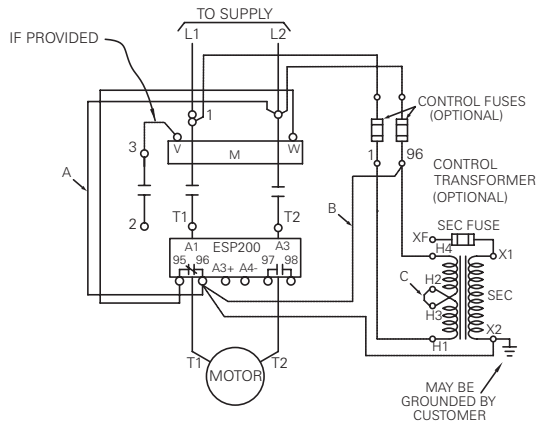
• Revised •
03/01/14

3-Phase and Single Phase Magnetic Starters

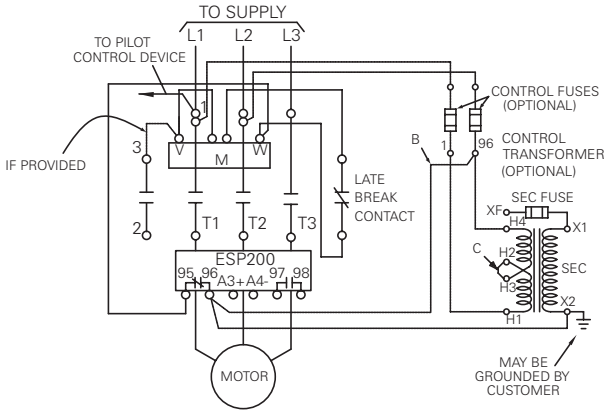
Three Phase Magnetic Starter, Size 00–4



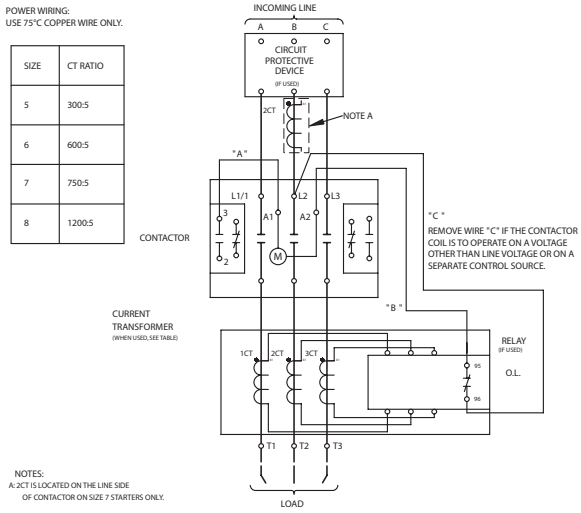
Single Phase Magnetic Starter①②



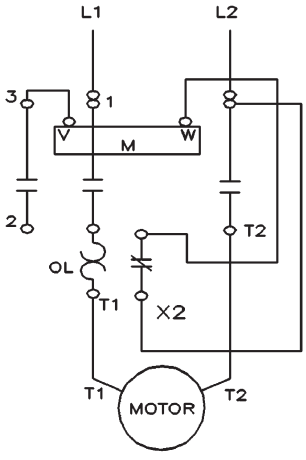
Three Phase Magnetic Starter with DC Coil, Sizes 00–4



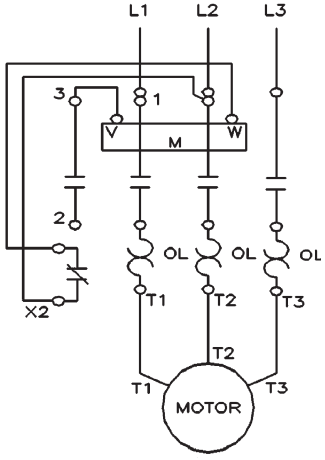
Solid State Overload 3-Phase Sizes 5-8



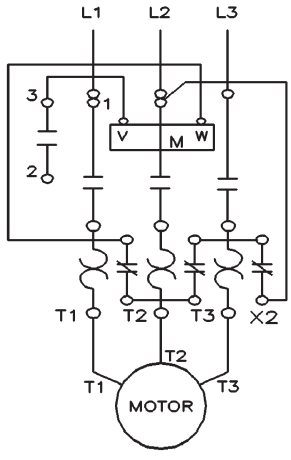
Ambient Compensated Single Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 3-4

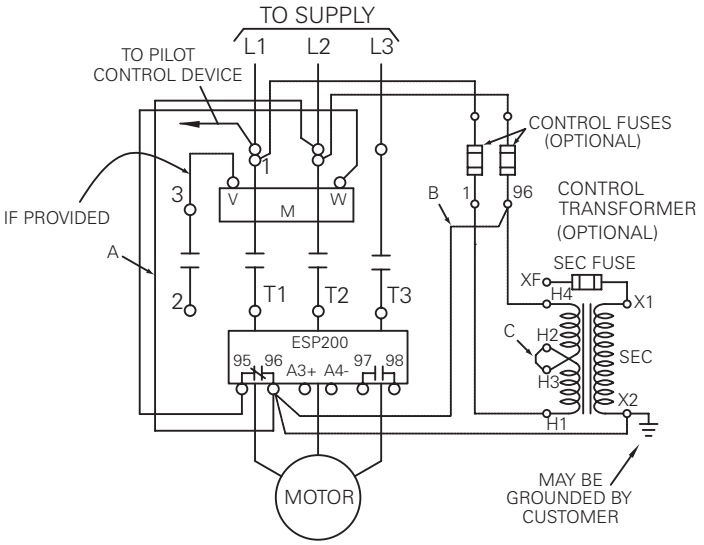


① Warning: The ESP200 Starter and Single Phase Motor must be wired as shown above. For L1, L2 do not use the middle terminal or hole.

② Full Load Amps (FLA): Adjustment of the ESP200 solid state overload relay accommodates the single phase motor.

3-Phase

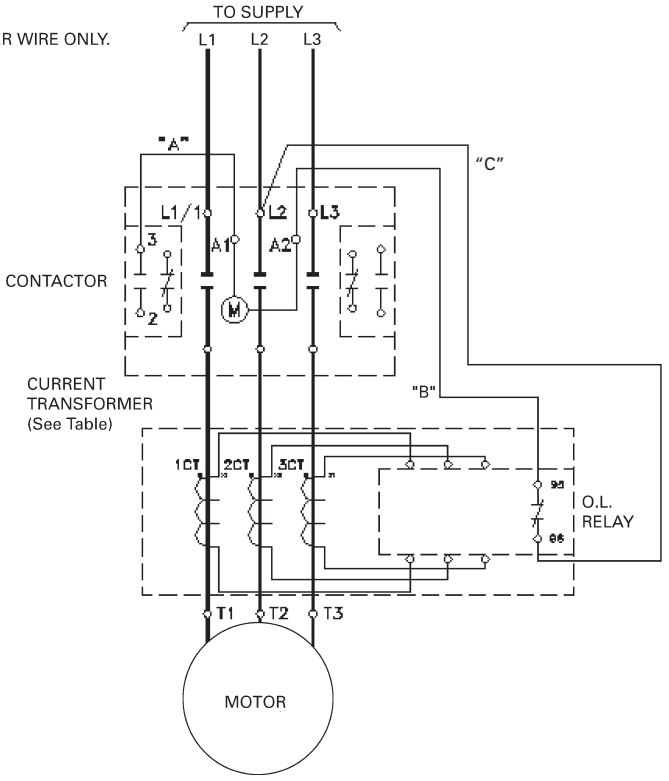
Size 00–4①



Size 5–8②

POWER WIRING:
USE 75°C COPPER WIRE ONLY.

SIZE	CT RATIO
5	300:5
6	600:5
7	750:5
8	1200:5

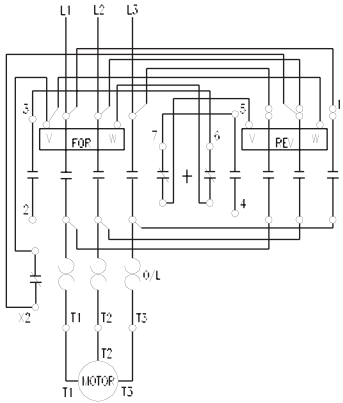


① Remove wire "C" if control transformer is used. For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse line terminals.

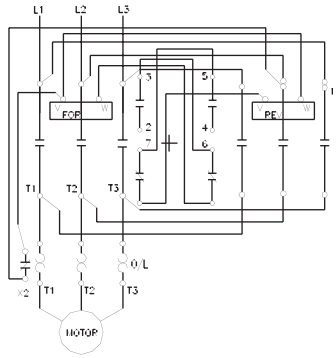
② Remove wire "C" if the contactor coil is to operate on a voltage other than line voltage or in a separate control source.

3-Phase Ambient Compensated Overload

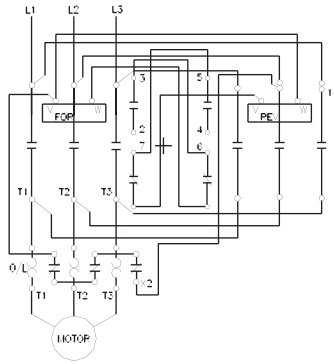
Bimetal Overload
Sizes 0-1 3/4



Bimetal Overload
Sizes 2-2 1/2

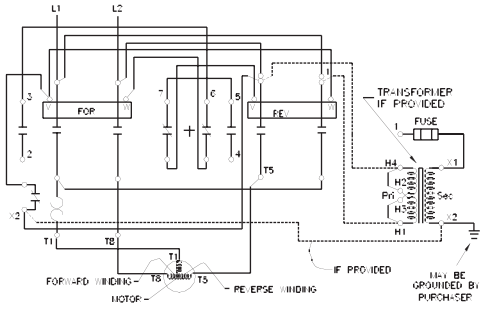


Bimetal Overload
Sizes 3-4



Single Phase Ambient Compensated Overload

3-Wire, 2-Pole Sizes 0-1 3/4



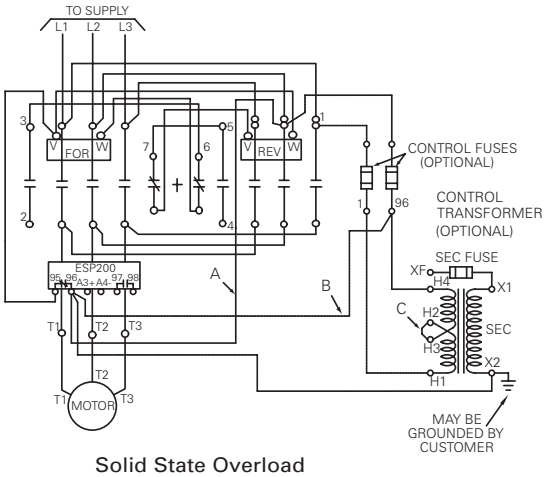
Reversing Heavy Duty Starters

Class 22

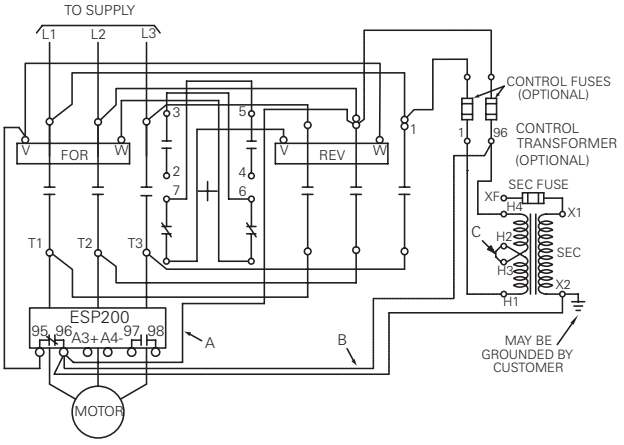
Wiring Diagrams

3-Phase Solid State Overload

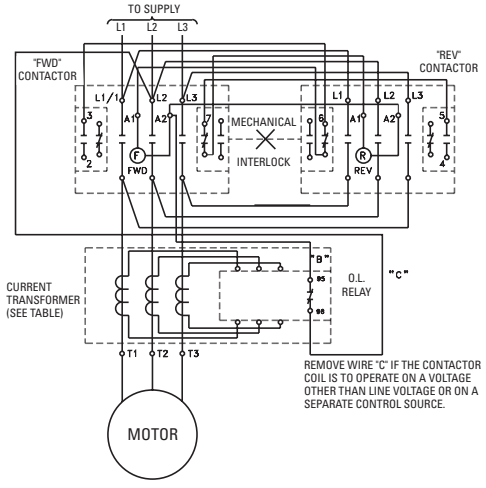
3-Phase Reversing Magnetic Starter
Sizes 00–1¾



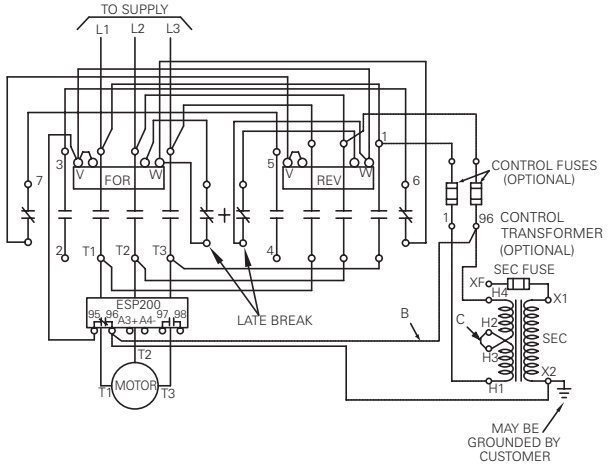
3-Phase Reversing Magnetic Starter
Sizes 2–4



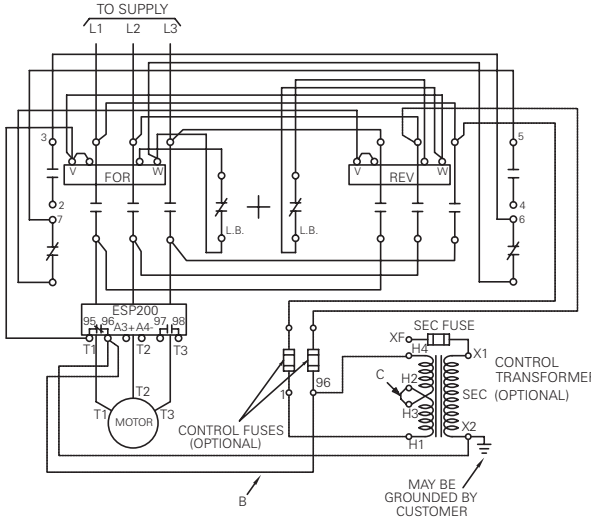
Solid State Overload
Sizes 5–6



3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 00–1¾

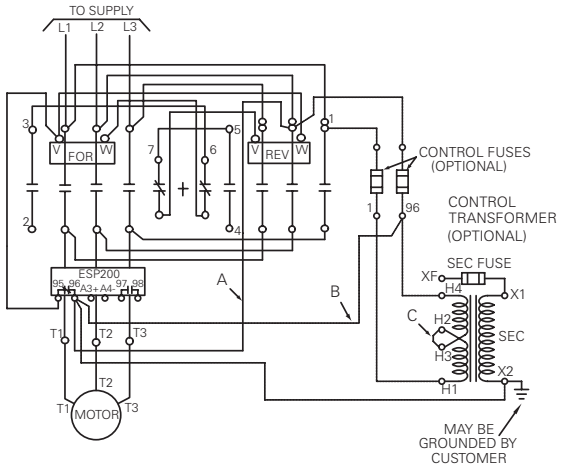


3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 2–4

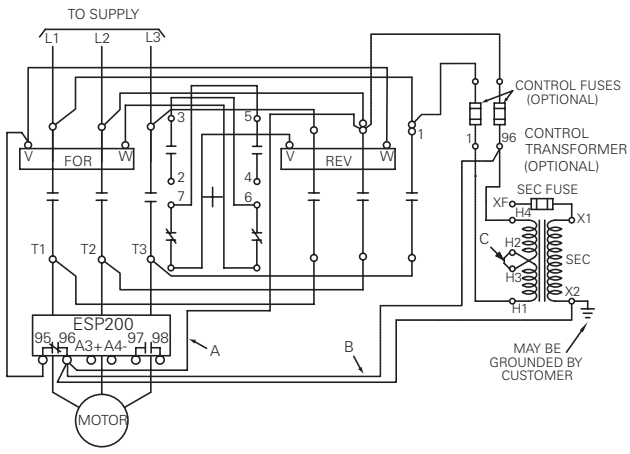


3-Phase

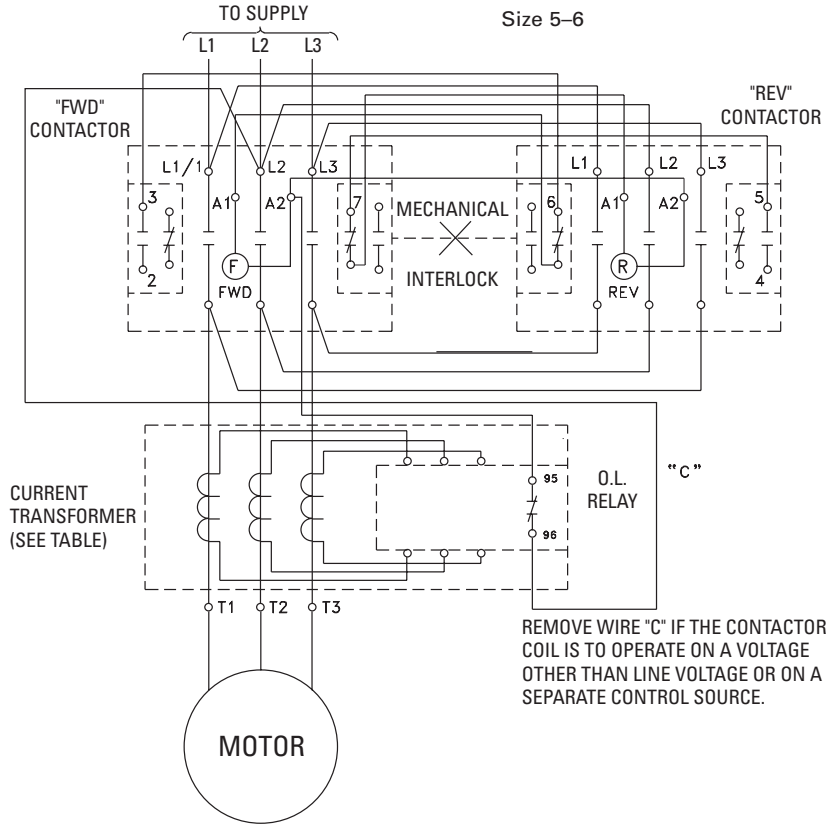
3-Phase Reversing Magnetic Starter
Sizes 00–1¾



3-Phase Reversing Magnetic Starter
Sizes 2–4



Size 5–6



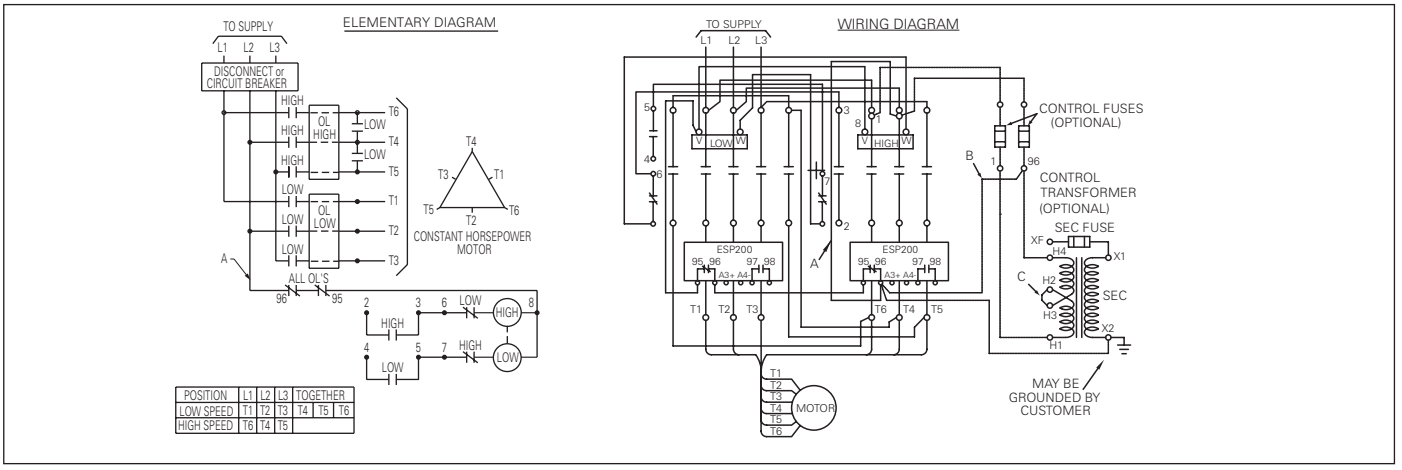
SIZE	CT RATIO
5	300:5
6	600:5

Two Speed Heavy Duty Starters

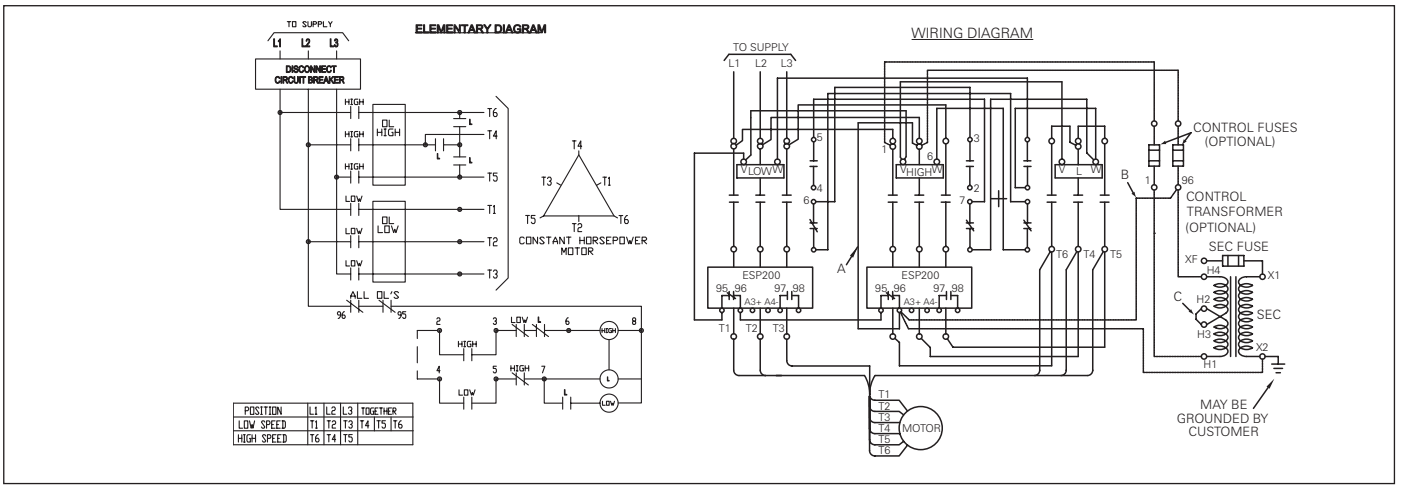
Class 30 & 32 Non-Combination and Combination Starters

Wiring Diagrams

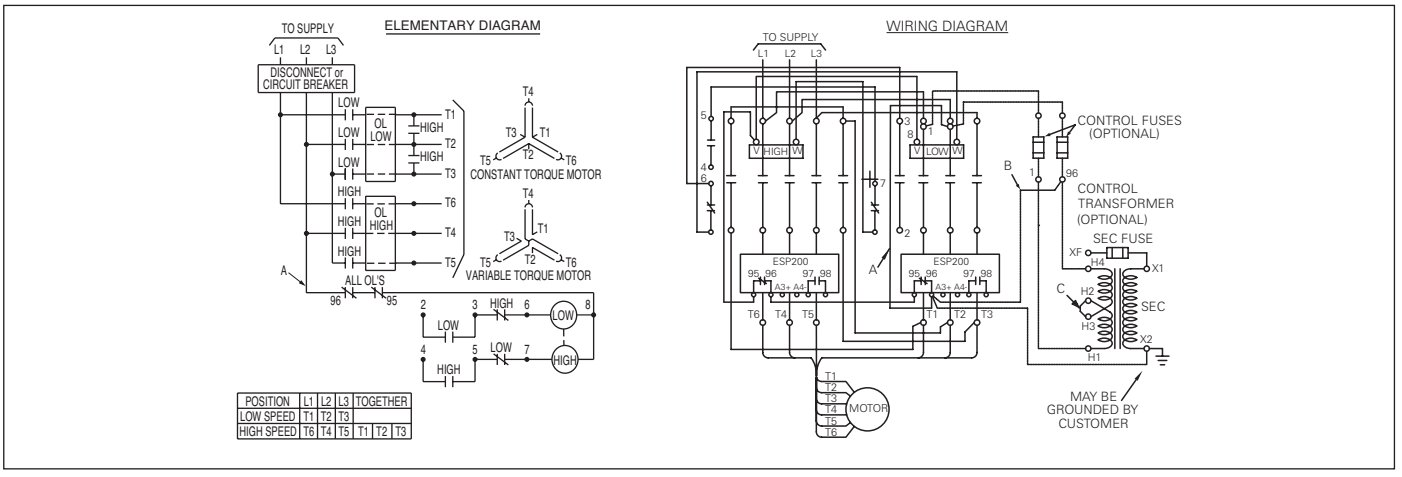
1 Winding Constant Horsepower Size 0–1 3/4



1 Winding Constant Horsepower Size 2–4



1 Winding Constant or Variable Torque Size 0–1 3/4



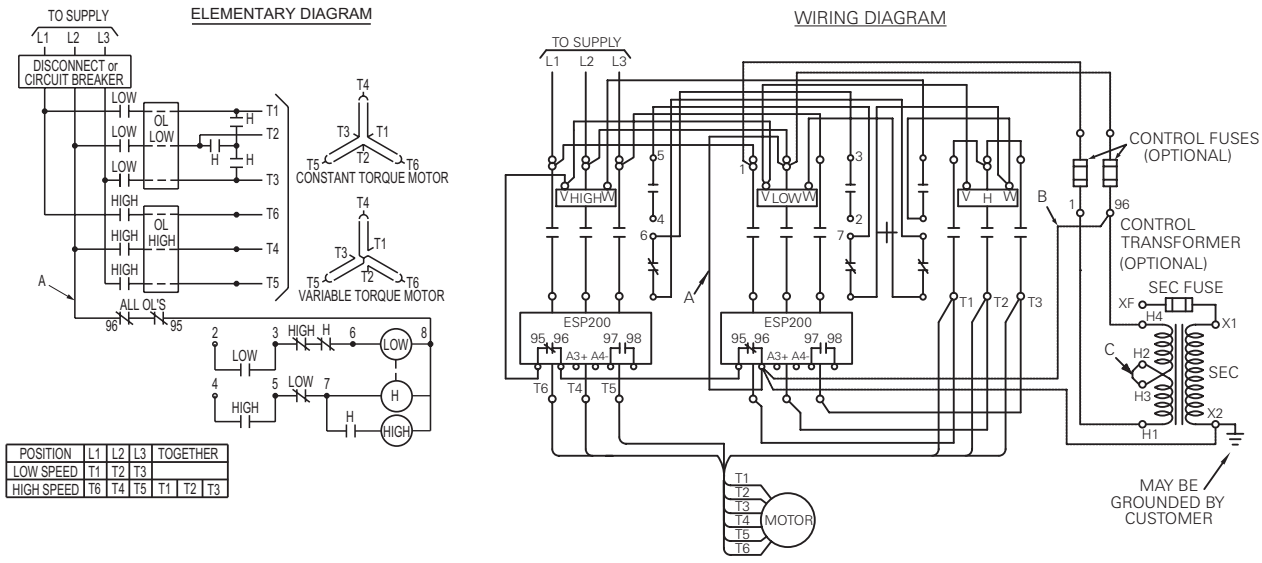
Note: For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

Two Speed Heavy Duty Starters

Class 30 & 32 Non-Combination and Combination Starters

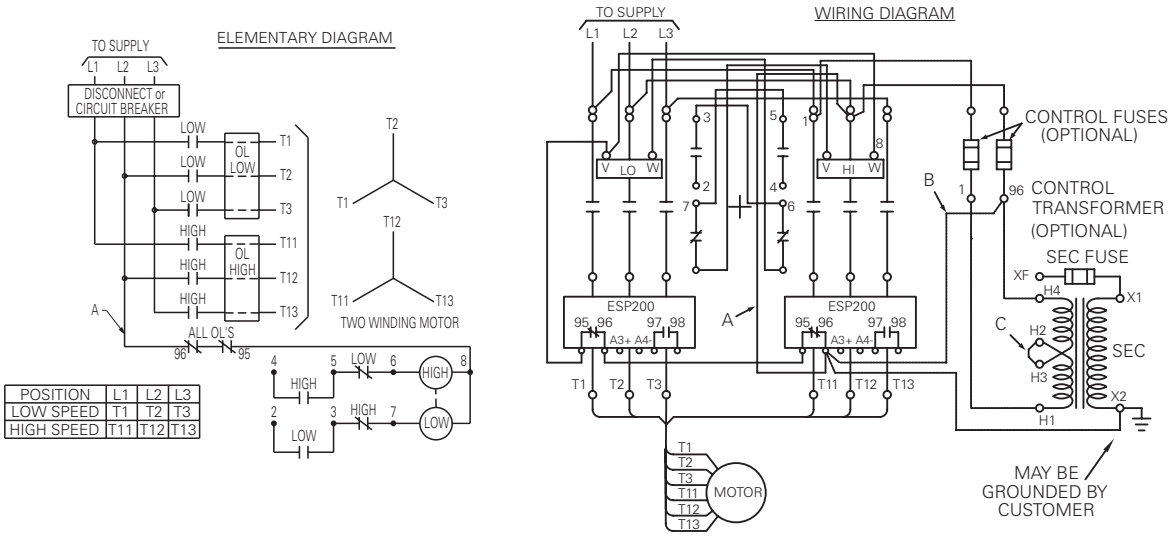
Wiring Diagrams

1 Winding Constant or Variable Torque Size 2–4



D68784002

2 Winding Constant Horsepower & 2 Winding Constant or Variable Torque Size 0–4

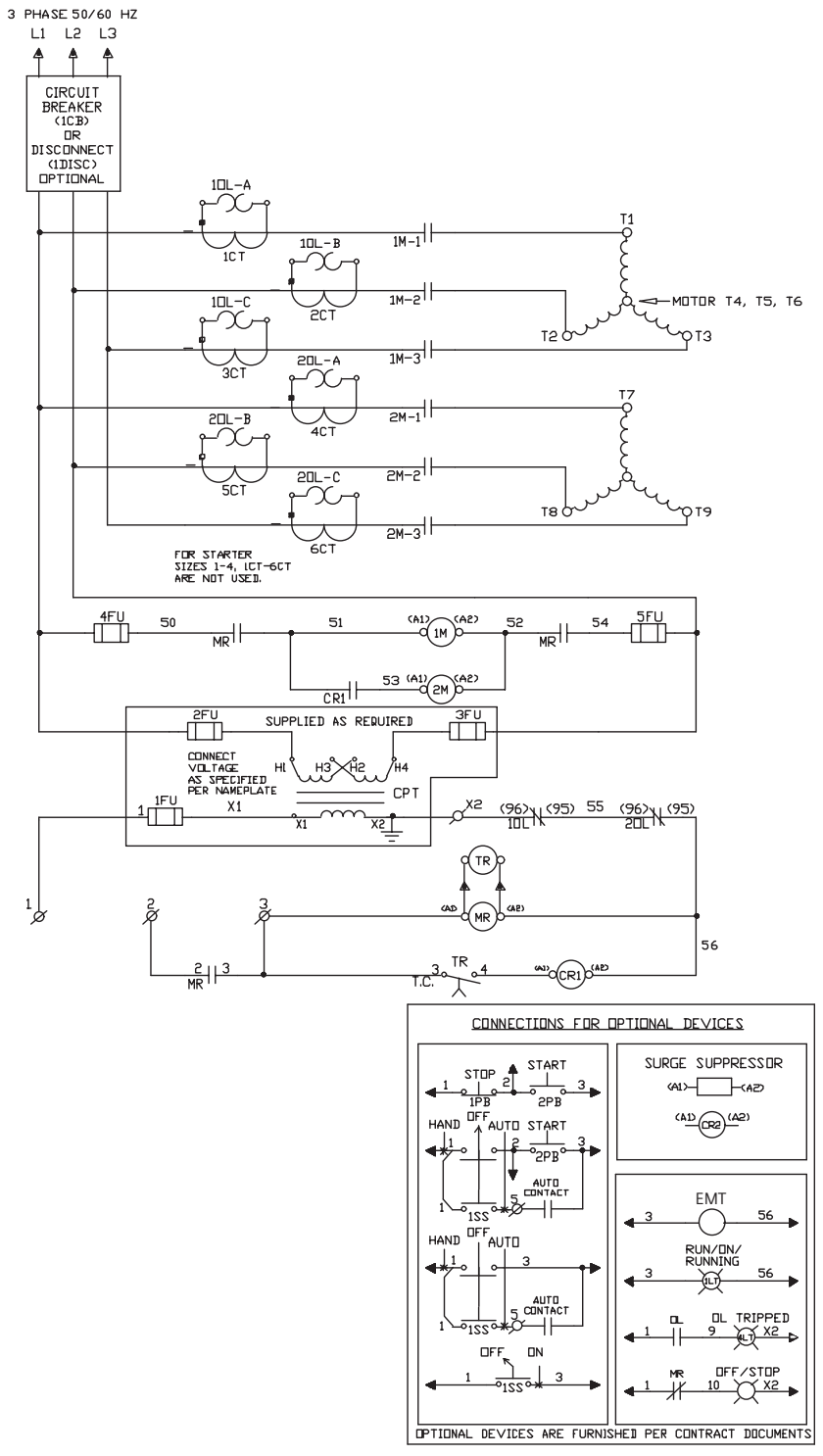


D68786001

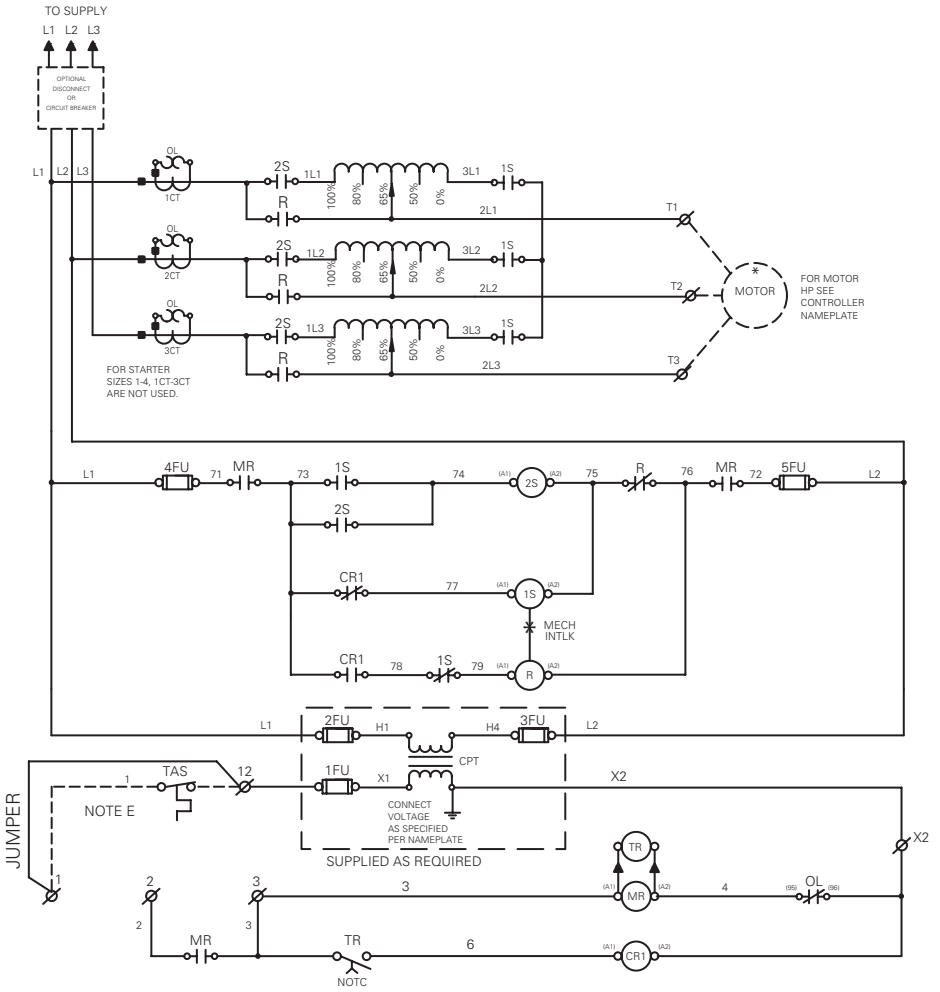
Note: For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

• Revised •
03/01/14

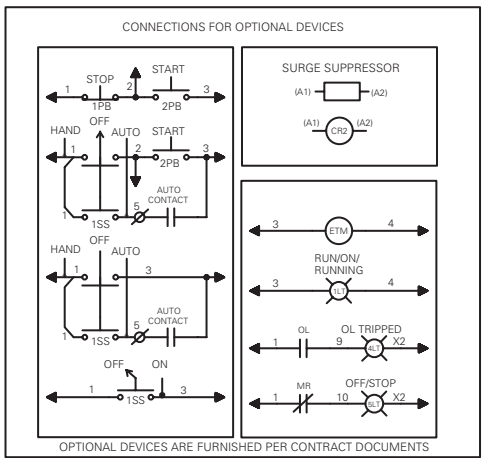
Part Winding



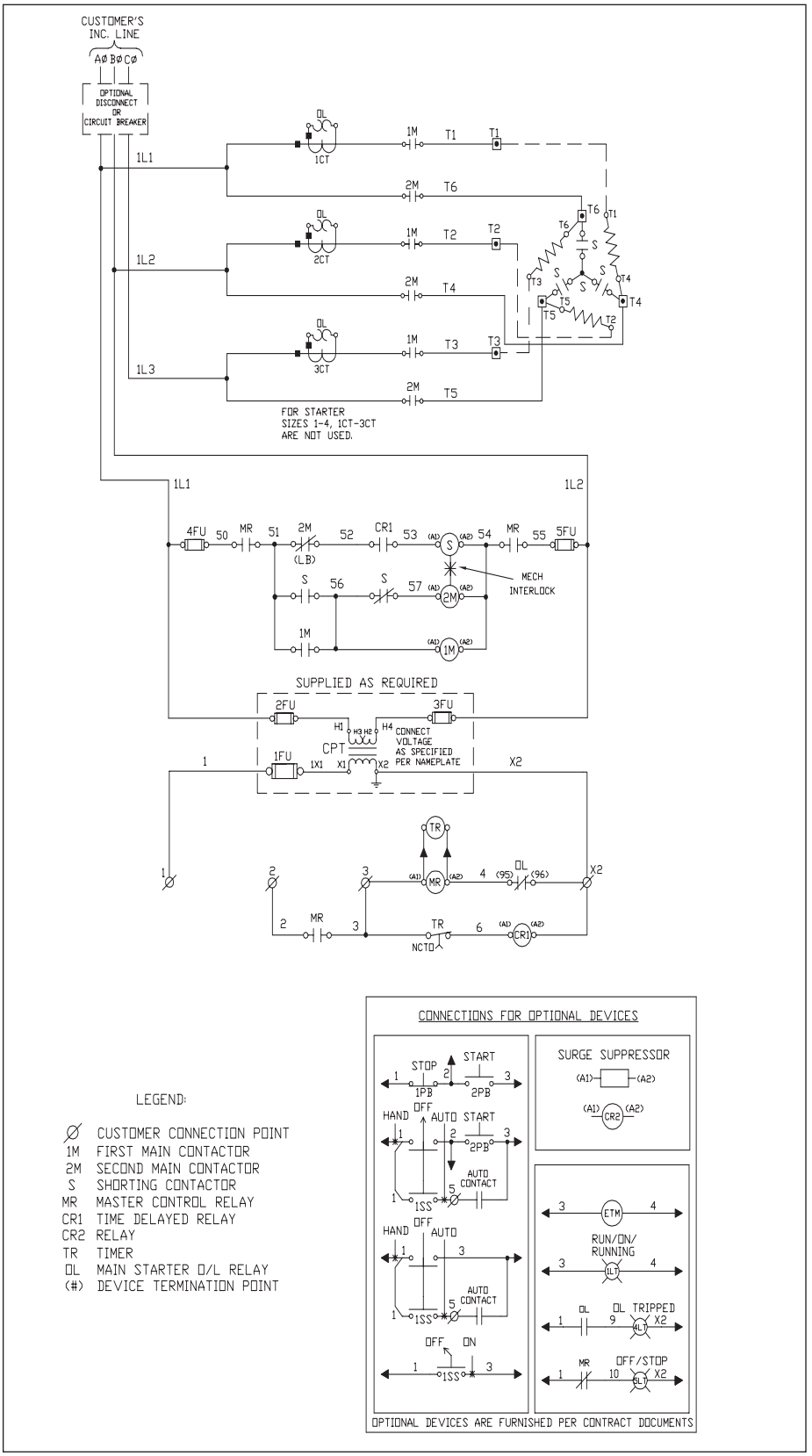
Auto Transformer



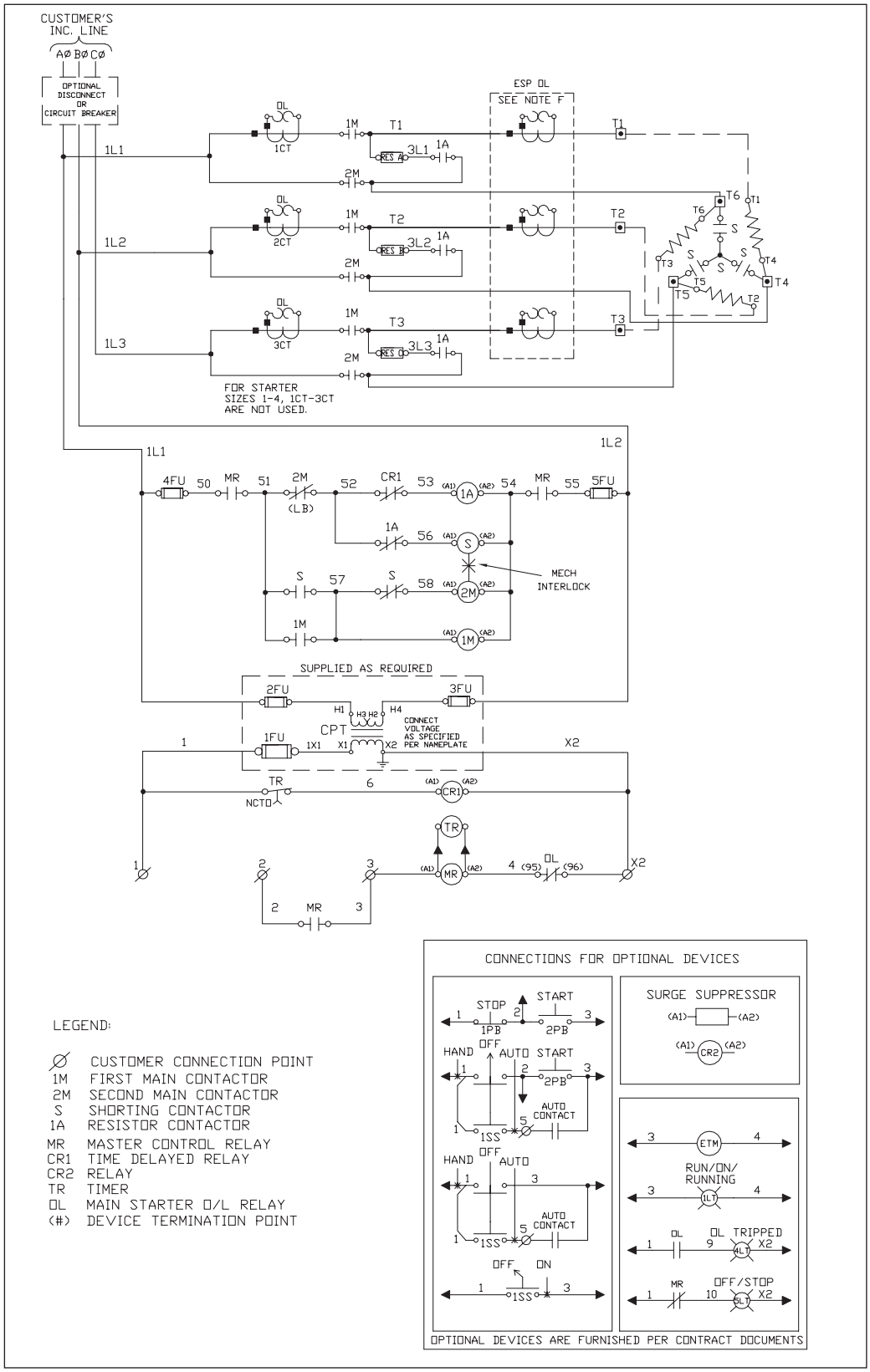
Note E:
Remove jumper if thermal protection switch is provided.



Wye Delta (Open Transition)



Wye Delta (Closed Transition)



LEGEND:

∅	CUSTOMER CONNECTION POINT
1M	FIRST MAIN CONTACTOR
2M	SECOND MAIN CONTACTOR
S	SHORTING CONTACTOR
1A	RESISTOR CONTACTOR
MR	MASTER CONTROL RELAY
CR1	TIME DELAYED RELAY
CR2	RELAY
TR	TIMER
OL	MAIN STARTER O/L RELAY
(#)	DEVICE TERMINATION POINT

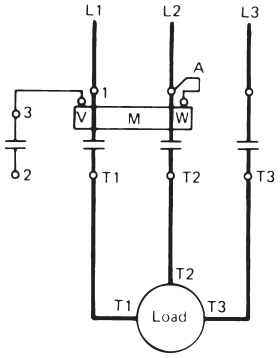
Heavy Duty Contactors and Reversing Contactors

Class 40, 43

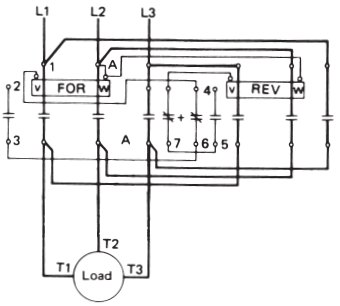
Wiring Diagrams

3-Phase Magnetic Contactors and Reversing Contactors

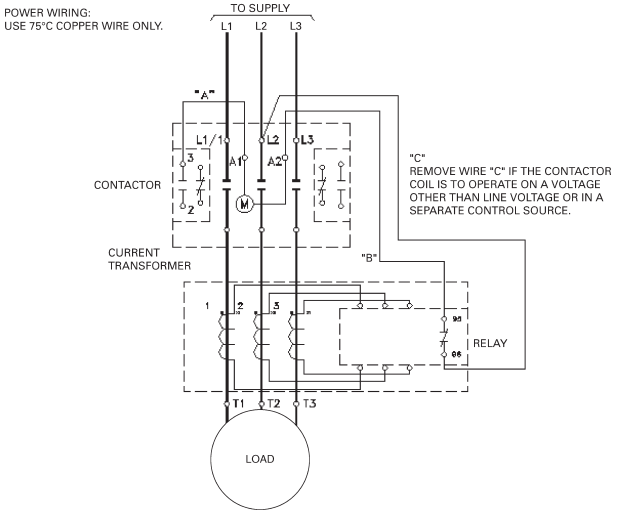
3-Phase Contactors—Size 00–4



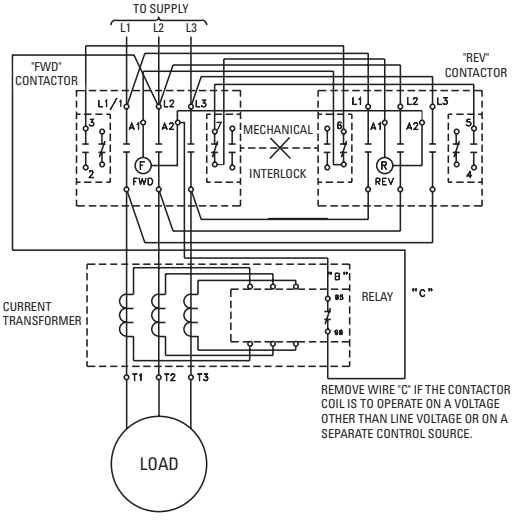
3-Phase Reversing Contactors—Size 00–4



3-Phase Contactors—Size 5, 6

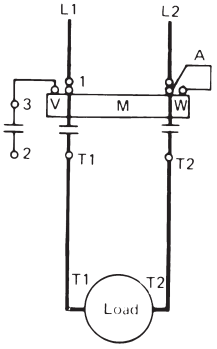


3-Phase Reversing Contactors—Size 5, 6

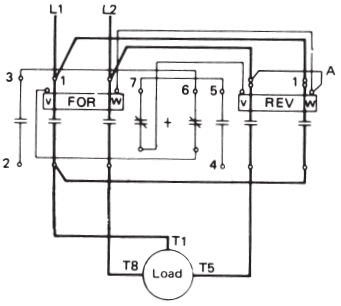


Single Phase Magnetic Contactors and Reversing Contactors

Single Phase Contactors—Size 00–4



Single Phase Reversing Contactors—Size 00–1P

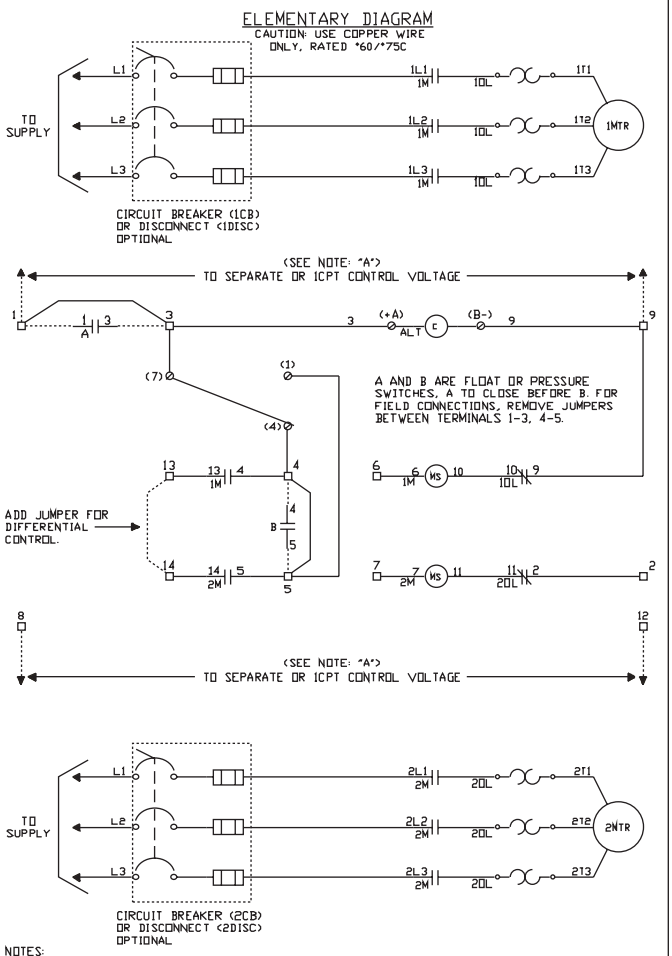


Duplex Heavy Duty Controllers

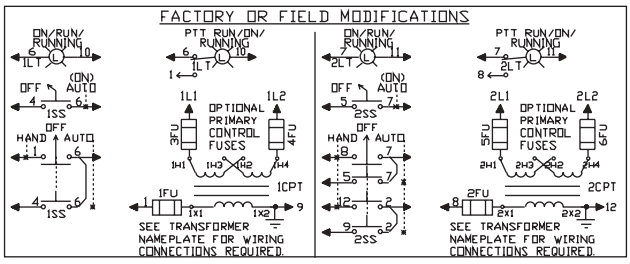
Class 83, 84

Wiring Diagrams

Standard Duplex Pump Panel (92)



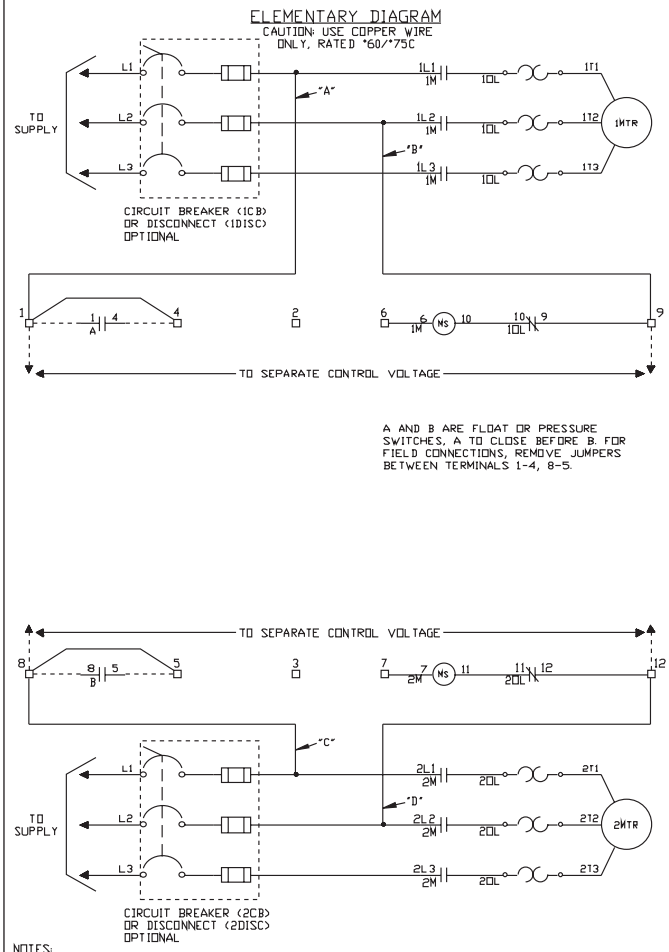
NOTES:
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE: CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 4-6, 5-7, AND 9-2.
D. FOR TWO POSITION SELECTOR SWITCHES, WIRE AS SHOWN ALSO ADD JUMPER BETWEEN TERMINALS 9-2.
E. LINE OR SEPARATE SOURCE CONNECTIONS TO TERMINALS 8 AND 12 ARE REQUIRED ONLY WHEN THREE POSITION SELECTOR SWITCH IS BUILT IN.



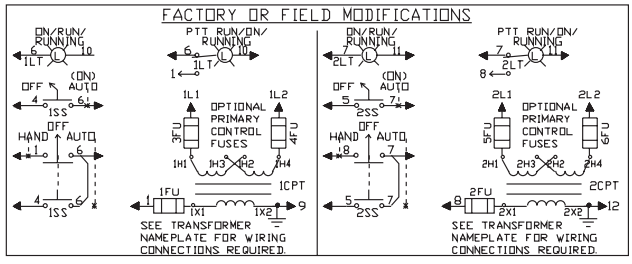
TB LAYOUT (REF)

1	2	3	4	5	6	7	8	9	12	13	14

Duplex Panel w/o alternator (95)



NOTES:
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE, REMOVE JUMPERS "A","B","C", AND "D" AND CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 4-6, 5-7.

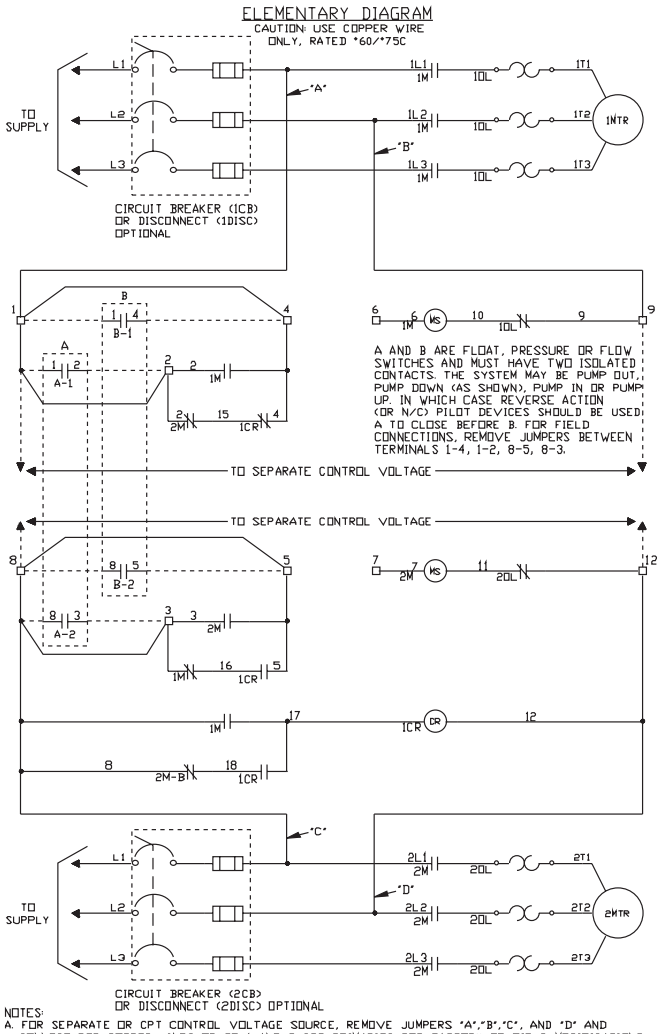


Duplex Heavy Duty Controllers

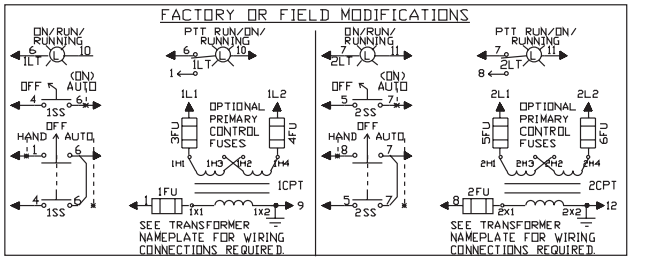
Class 83, 84

Wiring Diagrams

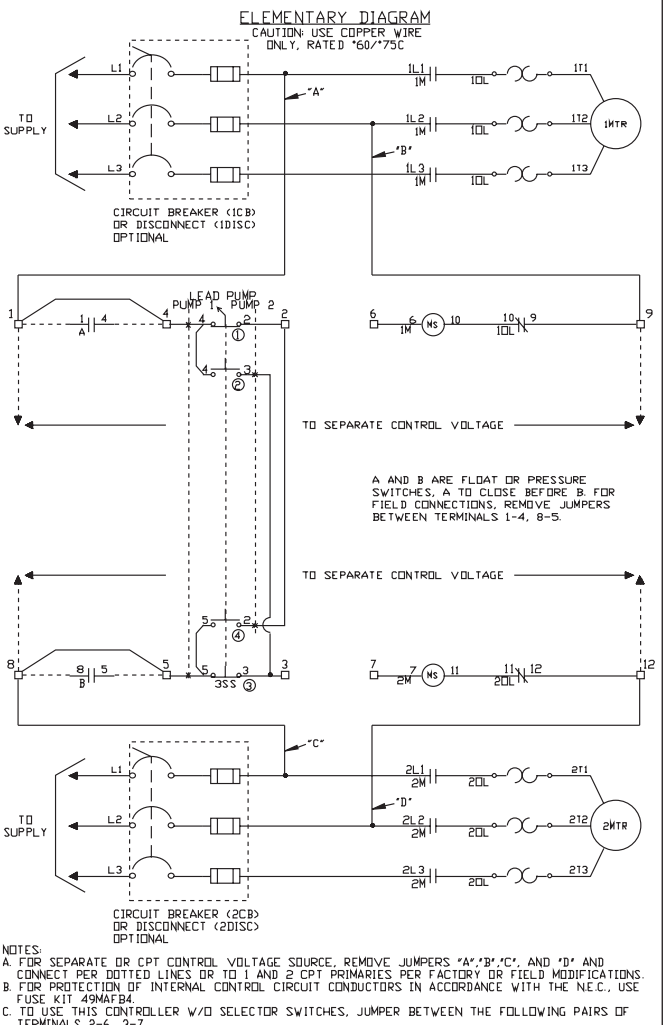
Duplex Panel with Relay Alternation (93)



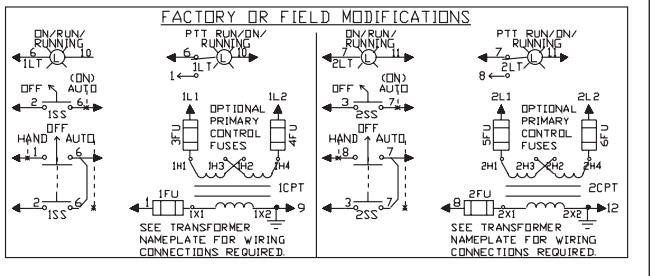
NOTES:
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE, REMOVE JUMPERS "A","B","C", AND "D" AND CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.



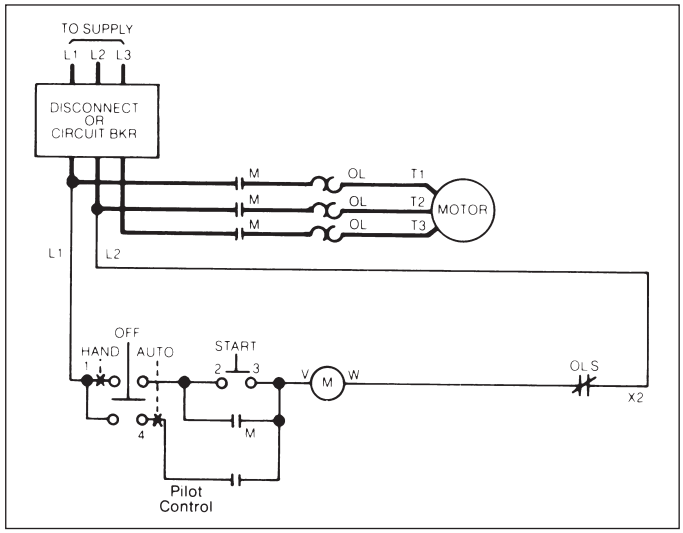
Duplex Panel with Lead Pump Transfer Switch (94)



NOTES:
A. FOR SEPARATE OR CPT CONTROL VOLTAGE SOURCE, REMOVE JUMPERS "A","B","C", AND "D" AND CONNECT PER DOTTED LINES OR TO 1 AND 2 CPT PRIMARIES PER FACTORY OR FIELD MODIFICATIONS.
B. FOR PROTECTION OF INTERNAL CONTROL CIRCUIT CONDUCTORS IN ACCORDANCE WITH THE N.E.C., USE FUSE KIT 49MAFB4.
C. TO USE THIS CONTROLLER W/O SELECTOR SWITCHES, JUMPER BETWEEN THE FOLLOWING PAIRS OF TERMINALS 2-6, 3-7.
D. Ⓗ = SELECTOR SWITCH CONTACT LOCATION



Standard Class 87 Pump Panel

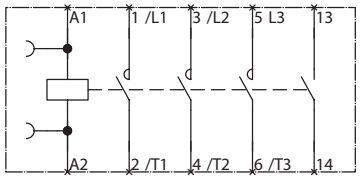


Duplex Heavy Duty Controllers

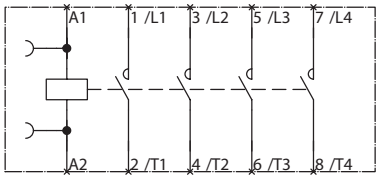
Class LC and LE Electrically Held Contactors

Wiring Diagrams

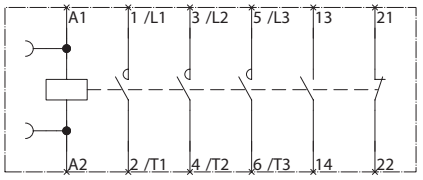
LEN00B003 (20A 3 Pole)



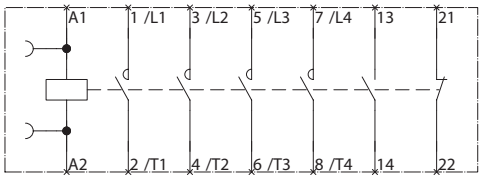
LEN00B004 (20A 4 Pole)



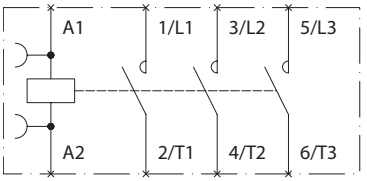
LEN00C003 (30A 3 Pole)



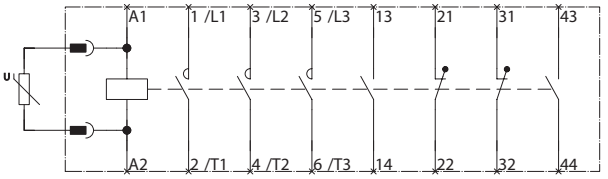
LEN00C004 (30A 4 Pole)



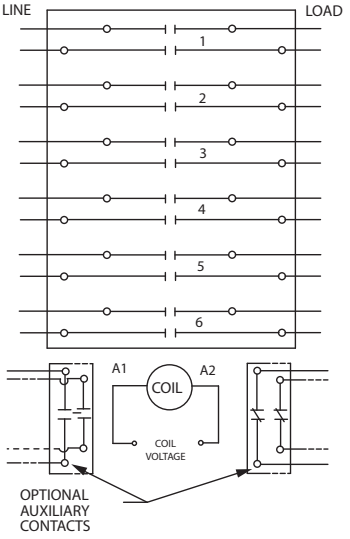
LEN00D003 (60A 3 Pole)
LEN00E003 (100A 3 Pole)



LEN00F003 (200A 3 Pole)
LEN00G003 (300A 3 Pole)
LEN00H003 (400A 3 Pole)



LCE00C (30A 2-12 Pole)



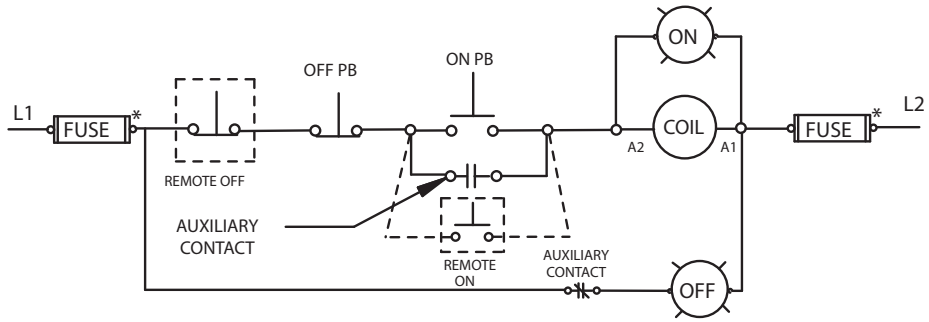
Duplex Heavy Duty Controllers

Class LC and LE Electrically Held Contactors

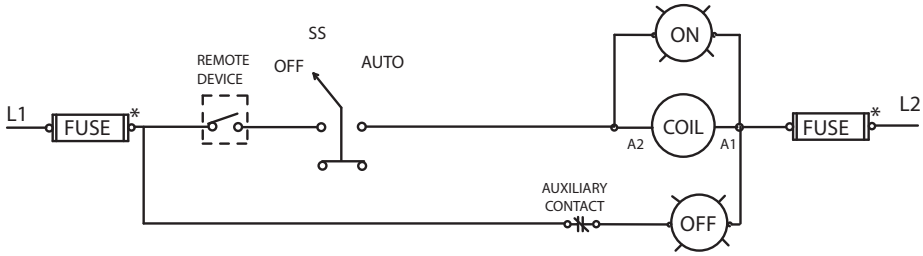
Wiring Diagrams

Optional Pilot Devices for Electrically Held Contactor

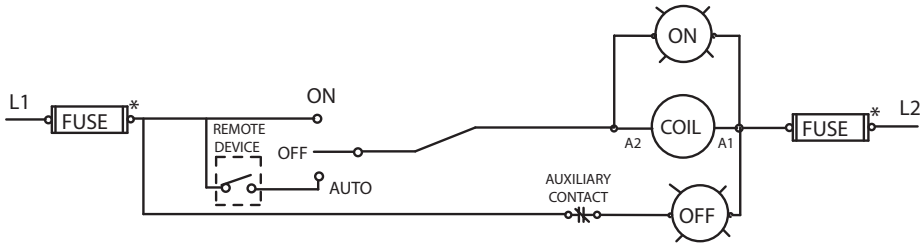
ON and OFF Push buttons



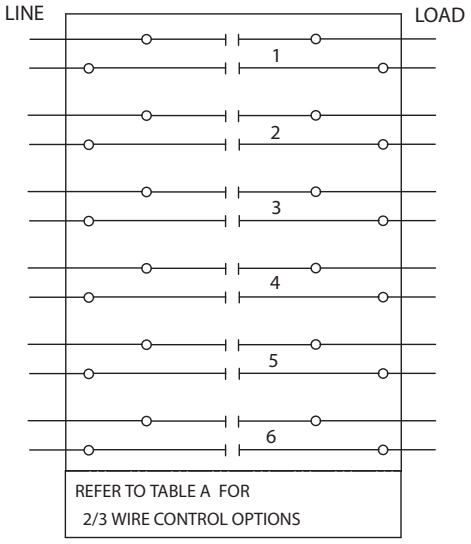
OFF-ON or OFF-AUTO Selector Switch

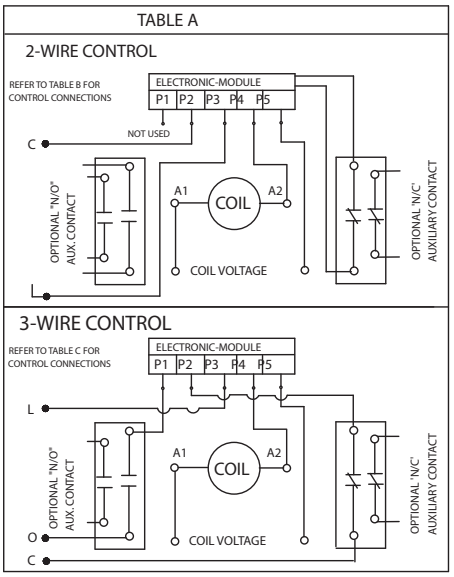


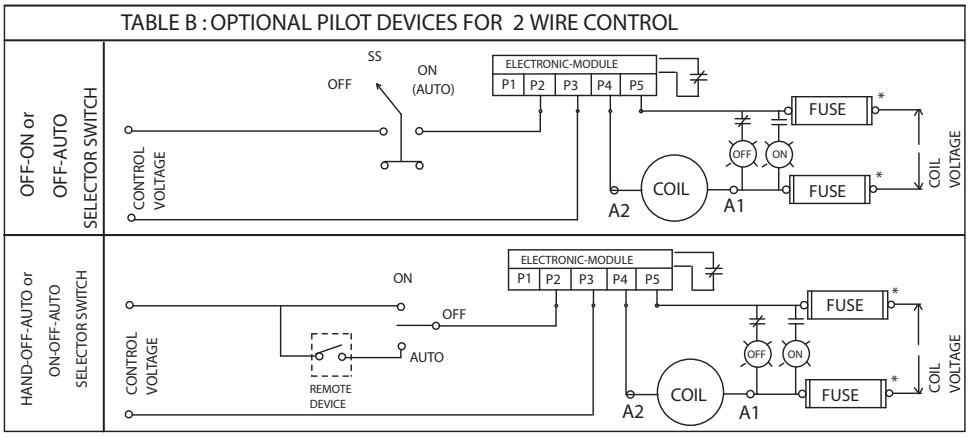
OFF-ON-AUTO HAND-OFF-AUTO Selector Switch

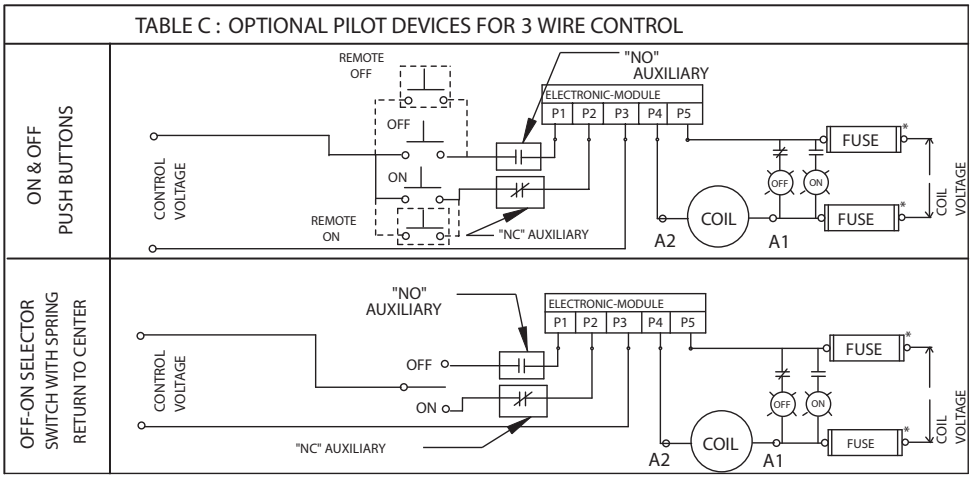


* -- IF USED


LINE
LOAD
1
2
3
4
5
6
REFER TO TABLE A FOR
2/3 WIRE CONTROL OPTIONS


TABLE A
2-WIRE CONTROL
REFER TO TABLE B FOR CONTROL CONNECTIONS
ELECTRONIC-MODULE
P1 P2 P3 P4 P5
NOT USED
C
OPTIONAL "N/O" AUX. CONTACT
A1
COIL
A2
COIL VOLTAGE
OPTIONAL "N/C" AUXILIARY CONTACT
3-WIRE CONTROL
REFER TO TABLE C FOR CONTROL CONNECTIONS
L
O
C


TABLE B : OPTIONAL PILOT DEVICES FOR 2 WIRE CONTROL
OFF-ON or OFF-AUTO SELECTOR SWITCH
SS
OFF
ON (AUTO)
ELECTRONIC-MODULE
P1 P2 P3 P4 P5
CONTROL VOLTAGE
FUSE
OFF
ON
COIL
A2
A1
COIL VOLTAGE
HAND-OFF-AUTO or ON-OFF-AUTO SELECTOR SWITCH
ON
OFF
AUTO
REMOTE DEVICE

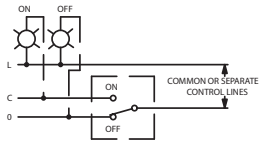

TABLE C : OPTIONAL PILOT DEVICES FOR 3 WIRE CONTROL
ON & OFF PUSH BUTTONS
REMOTE OFF
"NO" AUXILIARY
ELECTRONIC-MODULE
P1 P2 P3 P4 P5
OFF
ON
REMOTE ON
"NC" AUXILIARY
CONTROL VOLTAGE
FUSE
COIL
A2
A1
COIL VOLTAGE
OFF-ON SELECTOR SWITCH WITH SPRING RETURN TO CENTER

* -- IF USED

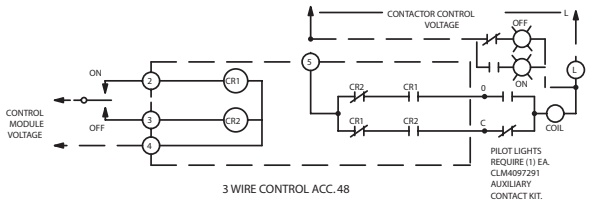
Lighting and Heating Contactors

Mechanically Latched 20 Amp, Class CLM

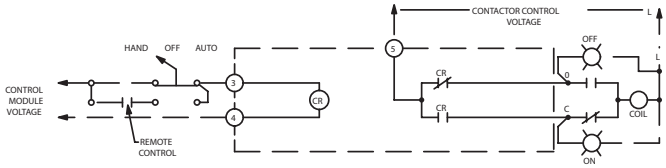
Wiring Diagrams



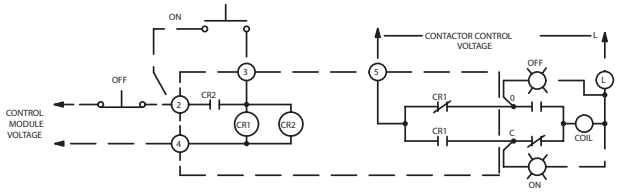
TYPICAL OFF-ON SELECTOR SWITCH



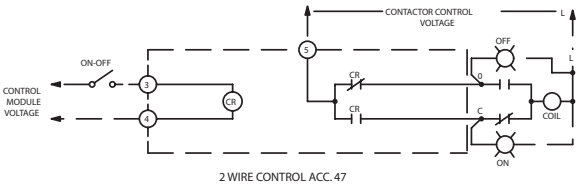
3 WIRE CONTROL ACC. 48



2 WIRE CONTROL ACC. 47



ON-OFF (FORM 3) CONTROL ACC. 49



2 WIRE CONTROL ACC. 47

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

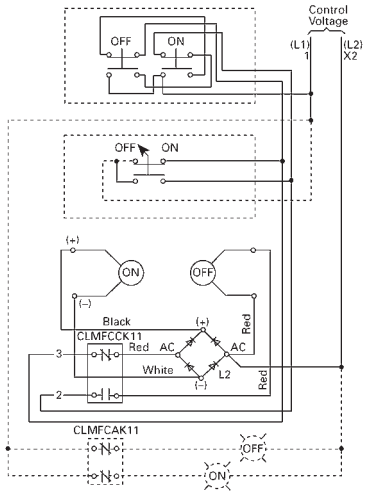
* FOR 24 VDC CONTROL MODULES CONNECT TERMINAL 4 TO NEGATIVE (-)

Lighting and Heating Contactors

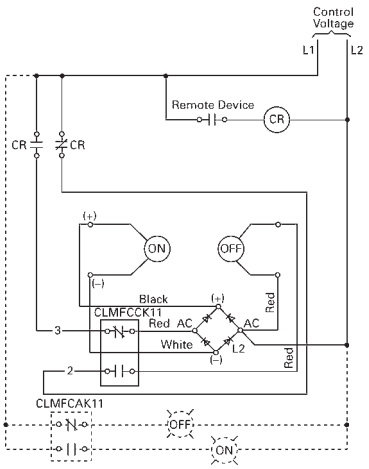
Mechanically Latched 30-400 Amps, Class CLM

Wiring Diagrams

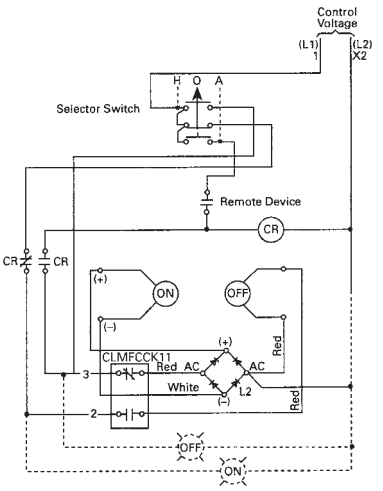
Mechanically Latched, CLM 30–200 Amps①



Connection Diagram for Common/Separate Control with Momentary Pushbutton or ON-OFF Selector Switch **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

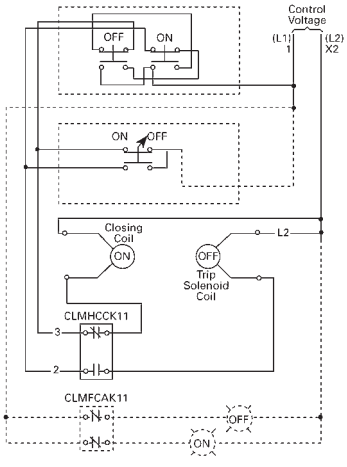


Connection for 2-Wire Control **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

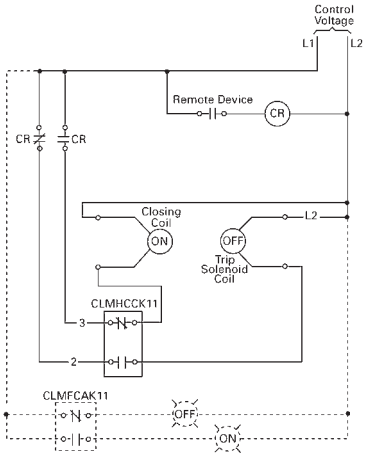


Connection for Hand/Off/Auto Control **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

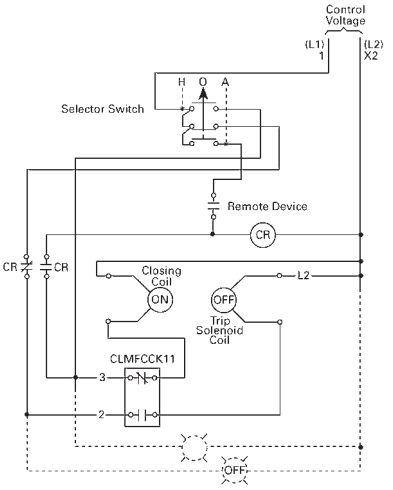
Mechanically Latched Type CLM 300 and 400 Amp①



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**

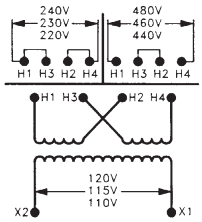
① Control relay is required for 2-wire and Hand/Off/Auto Control, as shown in diagram.

Industrial Control Power Transformers

Class MT, MTG

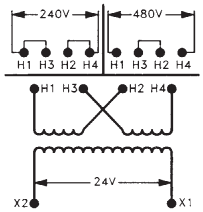
Wiring Diagrams

Voltage Letter
A①③



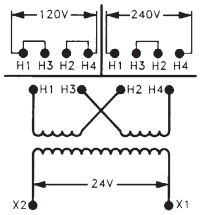
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
B②③



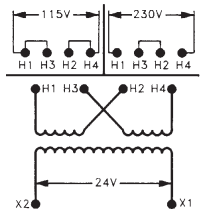
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
C②③



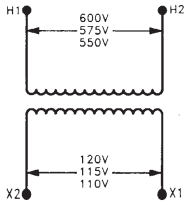
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
D②



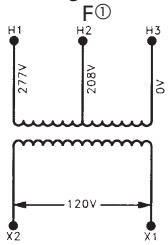
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
E①③



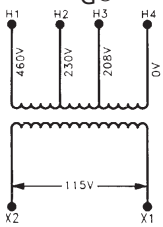
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
F①



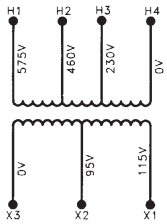
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
G①



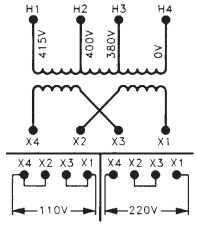
When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
H



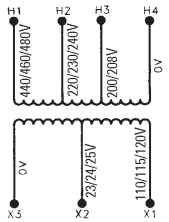
Does not include secondary fuse clips

Voltage Letter
I



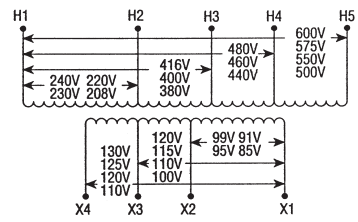
Does not include secondary fuse clips

Voltage Letter
J②③



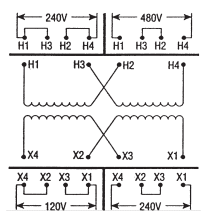
When secondary fuse clips are installed, Terminal X3 becomes XF

Voltage Letter
L



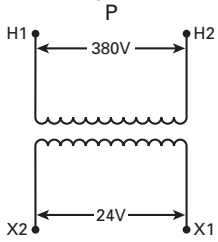
Does not include secondary fuse clips

Voltage Letter
M①



When secondary fuse clips are installed, Terminal X1 becomes XF

Voltage Letter
P



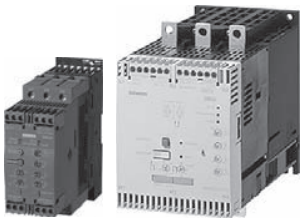
Does not include secondary fuse clips

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.

Overview



3RW30



3RW40



3RW44



Class 73/74 Enclosed

		Order No.	Page
For operation in the control cabinet			
3RW soft starters for standard applications			
	• Application areas - Fans - Building/construction machines - Escalators - Air conditioning systems - Assembly lines - Operating mechanisms - Pumps - Presses - Transport systems - Fans - Compressors and coolers		
3RW30 soft starters	• 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**	17-192
3RW40 soft starters	• SIRIUS 3RW40 soft starters with the integral functions - 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**	17-196
3RW soft starters for high-feature applications			
	• Application areas - Pumps - Compressors - Industrial refrigerating systems - Conveying systems - Machine tools - Fans - Cooling systems - Water transport - Hydraulics - Mills		
3RW44 soft starters	• 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 - Up to 900 Hp (at 460 V) in inline circuit and - Up to 1600 Hp (at 460 V) in inside-delta circuit	**3RW44**	17-204
For enclosed applications			
Enclosures in NEMA 1, 3, 4, & 12 types UL/CSA listed	• Complete starter includes 3RW40 or 3RW44 and CPT • Performance Range of up to 600 Hp (at 460 V)	**Class 73/74**	17-270
	• Combination options include circuit breaker or fusible disconnect		
	• Application areas: - Compressors - Pumps - Stamping presses - Cooling towers - Molding and extruding - Chippers and debarkers - Lumber processing - Pulp & paper processing - Conveyors - Textiles - HVAC		

Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down [1)]
- 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

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.

1) Actual motor start times are load dependent.

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

Selection and ordering data


3RW30 18-1BB14


3RW30 28-1BB14


3RW30 38-1BB14


3RW30 47-1BB14


3RW30 03-2CB54

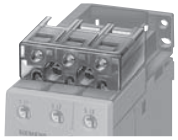
Ambient temperature 40 °C				Ambient temperature 50 °C					Size	Order No.	List Price $ per PU	PS*	Weight per PU approx.
Rated operational current I_e [1]	Rated power of induction motors for rated operational voltage U_e			Rated operational current I_e [1]	Rated power of induction motors for rated operational 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										**1**			
• With spring-type terminals [2]										**2**			
Order No. supplement for rated control supply voltage U_s													
• 24 V AC/DC										**0**			
• 110 ... 230 V										**1**			
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				
• With screw terminals										**3RW30 03-1CB54**		1 unit	0.207
• With spring-type terminals										**3RW30 03-2CB54**		1 unit	0.188

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 17-231).

Accessories

	For soft starters Type	Size	Motor starter protectors Size	Order No.	List Price $ per PU	PS*	Weight per PU approx. 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	**S00**	**S0**	**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 instructions[1)]							
	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)						
 3RP1 902	**Sealable covers**	For securing against unauthorized adjustment of setting knobs	**3RP1 902**		5 units	0.004
 3RP1 903	**Push-in lugs** For screw fixing		**3RP1 903**		10 units	0.002

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 300 % $I_{n\ motor}$),
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.

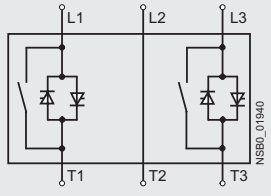
If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

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.

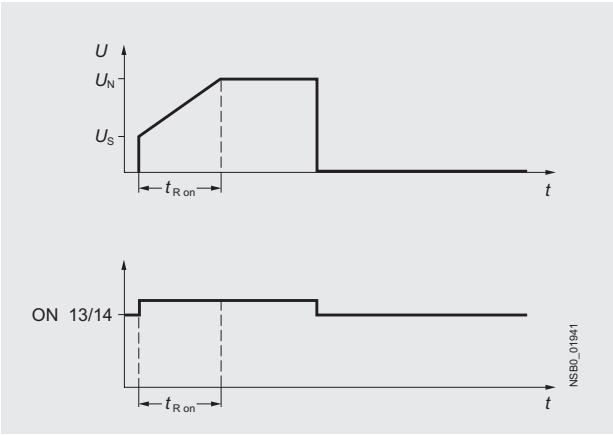
Note:
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the 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

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 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 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 **1**
- With spring-type terminals[2] **2**

Order No. supplement for rated control supply voltage U_s

- 24 V AC/DC **0**
- 110 ... 230 V AC/DC **1**

[1] Stand-alone installation without auxiliary fan.

[2] Power connection: screw terminals.

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 17-243



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 **1**
• With spring-type terminals[2] **2**

[1] Stand-alone installation without auxiliary fan.

[2] Power connection: screw terminals.

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 17-243

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 types[2]

- With screw terminals — **6**
- With spring-type terminals — **2**

Order No. supplement for the rated control supply voltage U_s[3]

- 115 V AC — **3**
- 230 V AC — **4**

1) Stand-alone installation.

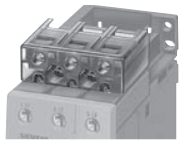
2) Power connection: busbar connection.

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° C, see technical information on page 17-243

Accessories

For soft starters Type	Size	Version	Order No.	List Price $ per PU	PS*	Weight per PU approx. kg
Box terminal blocks for soft starters						
 **For round and flat wires**						
3RW40 5.	**S6**	• Up to 70 mm² • Up to 120 mm²	**3RT19 55-4G** **3RT19 56-4G**		1 unit 1 unit	0.230 0.260
3RW40 7.	**S12**	• Up to 240 mm²	**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**						
3RW40 4.	**S3**	For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)	**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 RESET[1]						
 **Modules for remote RESET, electrical** Operating range 0.85 ... 1.1 x U_s, 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	**3RU19 00-1A**		1 unit	0.038
		• Suitable pushbutton IP65, Ø 22 mm, 12 mm stroke	**3SB30 00-0EA11**		1 unit	0.020
		• Extension plunger	**3SX13 35**		1 unit	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 soft starters Type	Size	Motor starter protectors Size	Order No.	List Price $ per PU	PS*	Weight per PU approx. kg
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. 3RW40 3. 3RW40 4.	**S0** **S2** **S3**		**3ZX10 12-0RW40-1AA1**			
3RW40 5. 3RW40 7.	**S6** **S12**		**3ZX10 12-0RW40-2DA1**			

[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 Type	Size	Version Rated control supply voltage U_s	Order No.	List Price $ per PU	PS*	Weight per PU approx. kg
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

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n\ motor}$),
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	40
- Starting time	s	10	10	10	10	10
- Current limit value		5 x I_M	5 x I_M	4 x I_M	4 x I_M	4 x 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 % $I_{n\ motor}$),
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	40
- Starting time	s	20	20
- Current limit value		4 x I_M	4 x 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.

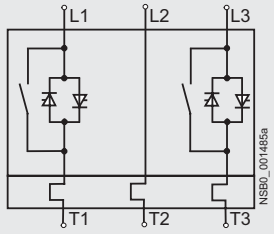
In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Industrial Controls catalog Chapter 11 “Function Relays, Interfaces and Converters“.

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.

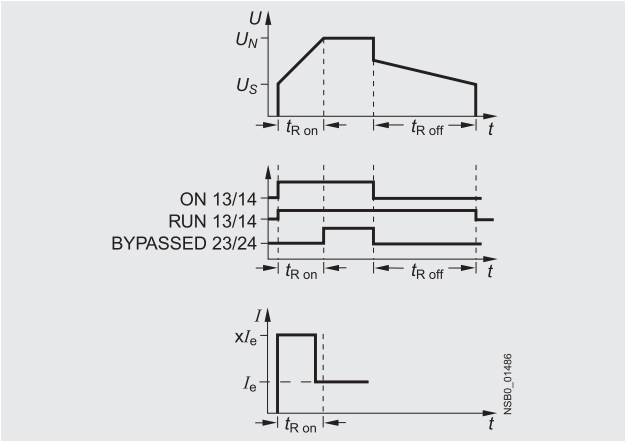
Note:
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the 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 graphs[1)]



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

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 occuring 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 Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e				Order No.	List Price $ per PU	PS*	Weight per PU approx.
	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					**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 17-263.

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 x J_{Motor}; starting current 350 % x 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.

Ambient temperature 50 °C Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e				Order No.	List Price $ per PU	PS*	Weight per PU approx.
	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 17-263.

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 x J_{Motor}; starting current 350 % x 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.

Ambient temperature 50 °C Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e				Order No.	List Price $ per PU	PS*	Weight per PU approx.
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	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								
• With spring-type terminals					**3**			
• With screw terminals					**1**			
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					**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.

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 x J_{Motor}; starting current 350 % x 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.

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).

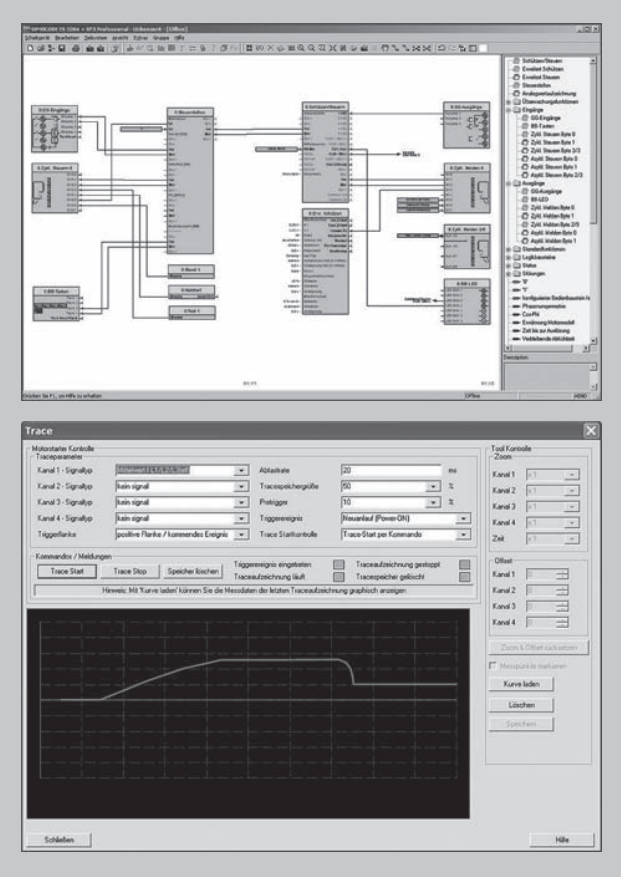
SIRIUS ES	Basic	Standard	Premium
Local interface on the device (system interface)	✔	✔	✔
Basic functions for parameterizing the devices			
• Parameter assignment	✔	✔	✔
• Operating	✔	✔	✔
• Diagnostics	✔	✔	✔
• Test	✔	✔	✔
Standard functionality			
• Parameterizing with the integrated graphics editor[1)]	--	✔	✔
• 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

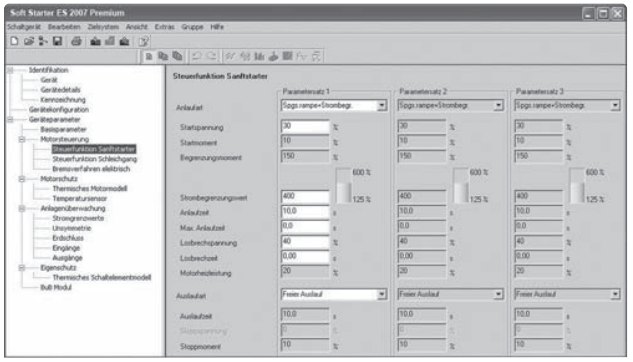
The programs of the SIRIUS ES software family are available as follows:

- 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).

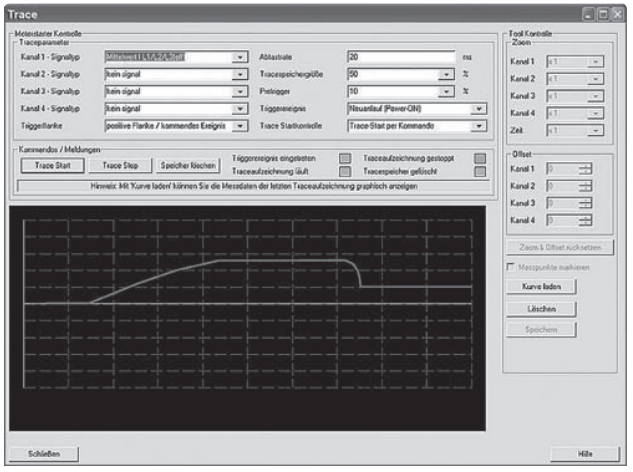
Following delivery versions are available in addition for the programs of the SIRIUS ES software family:

- 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

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 typicals 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 ≥ *E04* [1]	**Firmware version ≥ *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	≥ Pentium 800 MHz/≥ 1 GHz (Windows Vista)	
RAM	≥ 512 MB/≥ 1 GB (Windows Vista)	
Free space on hard disk	≥ 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 ≥ *E04*. Installed in starters delivered after December 2005.

2) SIRIUS 3RW44 with firmware version ≥ *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

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 / Type	Order No.	List Price $ per PU	PS*	Weight per PU approx. kg
PROFIBUS communication modules					
 3RW49 00-0KC00	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
PROFINET communication modules					
 3RW49 00-0NC00	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
External display and operator modules					
 3RW49 00-0AC00	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
	Connection cables				
	From the device interface (serial) of the 3RW44 soft starter to the external display and operator module				
	• Length 0.5 m, flat	**3UF7 932-0AA00-0**		1 unit	0.020
	• Length 0.5 m, round	**3UF7 932-0BA00-0**		1 unit	0.050
	• Length 1.0 m, round	**3UF7 937-0BA00-0**		1 unit	0.100
	• Length 2.5 m, round	**3UF7 933-0BA00-0**		1 unit	0.150
Box terminal blocks for soft starters					
 3RT19	**Box terminal blocks**				
	3RW44 2. Included in the scope of supply				
	3RW44 3. • Up to 70 mm^2	**3RT19 55-4G**		1 unit	0.230
	3RW44 3. • Up to 120 mm^2	**3RT19 56-4G**		1 unit	0.260
	3RW44 4. • Up to 240 mm^2	**3RT19 66-4G**		1 unit	0.676

Spare parts

	For soft starters / Type	Version	Order No.	List Price $ per PU	PS*	Weight per PU approx. kg
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
 3RT19 .6-4EA1	**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 instructions[1]						
	For 3RW44 soft starters		**3ZX10 12-0RW44-1AA1**			
Fans						
 3RW49	**Fans**					
	3RW44 2. and 3RW44 3.	115 V AC	**3RW49 36-8VX30**		1 unit	0.300
		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 3RW44 6.[2]	115 V AC	**3RW49 57-8VX30**		1 unit	0.800
		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 % $I_{n\ motor}$),
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[1]							
• 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 x I_M	4 x 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 % $I_{n\ motor}$),
The soft starter has to be selected one rating class higher than the motor used.

Application		Mixer	Centrifuge	Milling machine
Starting parameters[1]				
• Voltage ramp and current limiting				
- Starting voltage	%	30	30	30
- Starting time	s	30	30	30
- Current limit value		4 x I_M	4 x I_M	4 x 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 % $I_{n\ motor}$),
The soft starter has to be selected two rating classes higher than the motor used.

Application		Large fan	Mill	Crushers	Circular saw/bandsaw
Starting parameters[1]					
• Voltage ramp and current limiting					
- Starting voltage	%	30	50	50	30
- Starting time	s	60	60	60	60
- Current limit value		4 x I_M	4 x I_M	4 x I_M	4 x 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.

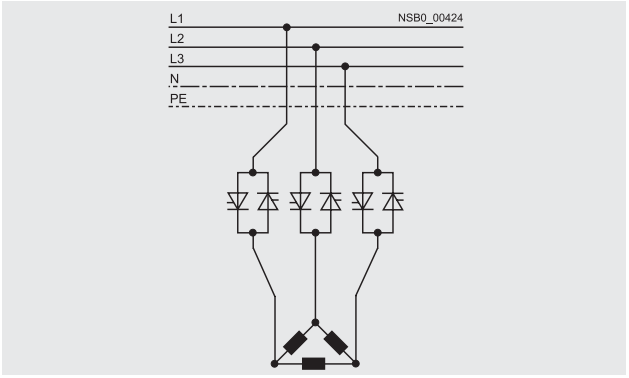
[1] Actual motor starting times are load dependent.

Circuit concept

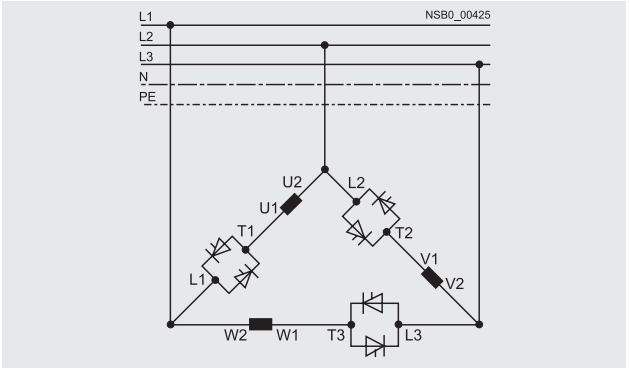
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

- 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_e corresponds to the rated motor current I_n,
3 cables to the motor



Inside-delta circuit:
Rated current I_e 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 loading 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 sever 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 6/40[1)]

Example:
3RW44, N12, CB disconnect, 460V, 200HP with a start/stop and red run light

Order No.
74MT34BFAP A1 FC

Product Nomenclature

74	Q	T	3	4	B	F	A	T

Class Type
73 = Non-combination
74 = Combination

Size Rating

3RW40new	3RW40	3RW44
A = 11	**A** = 117	**A** = 26
B = 23	**B** = 145	**B** = 32
C = 29	**C** = 205	**C** = 42
D = 34	**D** = 248	**D** = 51
E = 42	**E** = 315	**E** = 68
F = 58	**F** = 385	**F** = 82
G = 62		**G** = 100
H = 73		**H** = 117
J = 98		**J** = 145
		K = 180
		L = 215
		M = 280
		N = 315
		P = 385
		Q = 494
		R = 551
		S = 615
		T = 693
		W = 780
		X = 960
		Y = 1040

Model Type
R = 3RW40new
S = 3RW40
T = 3RW44

Phases
3 = 3 phase

Supply Voltage
6 = 200
2 = 230
3 = 380/415
4 = 460
5 = 575

Enclosure Type
B = NEMA 1
0 = NEMA 12
D = NEMA 3R
E = NEMA 4
W = NEMA 4X SS

Mod Box Type
F = Standard
G = Modified

Control Voltage
A = None

Enclosure Type
Blank = None
P = MCP
T = Thermal Magnetic
F = Fusible

1) Some modifications will require a larger 'Modified' box than the standard box e.g. Isolation contactor, space heater, etc. See page 17-230 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 17-230.
- ► For complete derating and application info see page 17-246
- ► For dimensional drawings see page 17-282.

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

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

3RW40 for Standard Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP①				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	List Price $
11	3	3	7.5	—	6	3RW4024-1BB14	73AR3_BFA		73AR3_DFA		73AR3_0FA		73AR3_EFA		73AR3_WFA	
23	5	7.5	15	—	13	3RW4026-1BB14	73BR3_BFA		73BR3_DFA		73BR3_0FA		73BR3_EFA		73BR3_WFA	
29	7.5	10	20	—	16	3RW4027-1BB14	73CR3_BFA		73CR3_DFA		73CR3_0FA		73CR3_EFA		73CR3_WFA	
34	10	10	25	—	18	3RW4028-1BB14	73DR3_BFA		73DR3_DFA		73DR3_0FA		73DR3_EFA		73DR3_WFA	
42	10	15	30	—	23	3RW4036-1BB14	73ER3_BFA		73ER3_DFA		73ER3_0FA		73ER3_EFA		73ER3_WFA	
58	15	20	40	—	31	3RW4037-1BB14	73FR3_BFA		73FR3_DFA		73FR3_0FA		73FR3_EFA		73FR3_WFA	
62	20	20	40	—	33	3RW4038-1BB14	73GR3_BFA		73GR3_DFA		73GR3_0FA		73GR3_EFA		73GR3_WFA	
73	20	25	50	—	39	3RW4046-1BB14	73HR3_BFA		73HR3_DFA		73HR3_0FA		73HR3_EFA		73HR3_WFA	
98	30	30	75	—	52	3RW4047-1BB14	73JR3_BFA		73JR3_DFA		73JR3_0FA		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



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 17-230.
- ► For complete derating and application info see page 17-246
- ► For dimensional drawings see page 17-282.

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

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

3RW40 for Standard Applications

Enclosed Circuit Breaker Combination (Starter With Circuit Breaker Disconnect)

Rated Operating Current	MAX HP①				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	List Price $
11	3	3	7.5	—	6	3RW4024-1BB14	**74AR3_BFAP**		**74AR3_DFAP**		**74AR3_0FAP**		**74AR3_EFAP**		**74AR3_WFAP**	
23	5	7.5	15	—	13	3RW4026-1BB14	**74BR3_BFAP**		**74BR3_DFAP**		**74BR3_0FAP**		**74BR3_EFAP**		**74BR3_WFAP**	
29	7.5	10	20	—	16	3RW4027-1BB14	**74CR3_BFAP**		**74CR3_DFAP**		**74CR3_0FAP**		**74CR3_EFAP**		**74CR3_WFAP**	
34	10	10	25	—	18	3RW4028-1BB14	**74DR3_BFAP**		**74DR3_DFAP**		**74DR3_0FAP**		**74DR3_EFAP**		**74DR3_WFAP**	
42	10	15	30	—	23	3RW4036-1BB14	**74ER3_BFAP**		**74ER3_DFAP**		**74ER3_0FAP**		**74ER3_EFAP**		**74ER3_WFAP**	
58	15	20	40	—	31	3RW4037-1BB14	**74FR3_BFAP**		**74FR3_DFAP**		**74FR3_0FAP**		**74FR3_EFAP**		**74FR3_WFAP**	
62	20	20	40	—	33	3RW4038-1BB14	**74GR3_BFAP**		**74GR3_DFAP**		**74GR3_0FAP**		**74GR3_EFAP**		**74GR3_WFAP**	
73	20	25	50	—	39	3RW4046-1BB14	**74HR3_BFAP**		**74HR3_DFAP**		**74HR3_0FAP**		**74HR3_EFAP**		**74HR3_WFAP**	
98	30	30	75	—	52	3RW4047-1BB14	**74JR3_BFAP**		**74JR3_DFAP**		**74JR3_0FAP**		**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

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 Size S0-S3 Fusible



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 17-230.
- ► For complete derating and application info see page 17-246
- ► For dimensional drawings see page 17-282.

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

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

3RW40 for Standard Applications

Enclosed Fusible Combination (Starter With Fusible Disconnect)

Rated Operating Current	MAX HP①				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	List Price $
11	3	3	7.5	—	6	3RW4024-1BB14	**74AR3_BFAF**		**74AR3_DFAF**		**74AR3_0FAF**		**74AR3_EFAF**		**74AR3_WFAF**	
23	5	7.5	15	—	13	3RW4026-1BB14	**74BR3_BFAF**		**74BR3_DFAF**		**74BR3_0FAF**		**74BR3_EFAF**		**74BR3_WFAF**	
29	7.5	10	20	—	16	3RW4027-1BB14	**74CR3_BFAF**		**74CR3_DFAF**		**74CR3_0FAF**		**74CR3_EFAF**		**74CR3_WFAF**	
34	10	10	25	—	18	3RW4028-1BB14	**74DR3_BFAF**		**74DR3_DFAF**		**74DR3_0FAF**		**74DR3_EFAF**		**74DR3_WFAF**	
42	10	15	30	—	23	3RW4036-1BB14	**74ER3_BFAF**		**74ER3_DFAF**		**74ER3_0FAF**		**74ER3_EFAF**		**74ER3_WFAF**	
58	15	20	40	—	31	3RW4037-1BB14	**74FR3_BFAF**		**74FR3_DFAF**		**74FR3_0FAF**		**74FR3_EFAF**		**74FR3_WFAF**	
62	20	20	40	—	33	3RW4038-1BB14	**74GR3_BFAF**		**74GR3_DFAF**		**74GR3_0FAF**		**74GR3_EFAF**		**74GR3_WFAF**	
73	20	25	50	—	39	3RW4046-1BB14	**74HR3_BFAF**		**74HR3_DFAF**		**74HR3_0FAF**		**74HR3_EFAF**		**74HR3_WFAF**	
98	30	30	75	—	52	3RW4047-1BB14	**74JR3_BFAF**		**74JR3_DFAF**		**74JR3_0FAF**		**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. Ie = 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

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 17-230.
- ► For complete derating and application info see page 17-257.
- ► For dimensional drawings see page 17-282.

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 HP①				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_BFAP		74AS3_DFAP		74AS3_0FAP		74AS3_EFAP		74AS3_WFAP	
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_0FAP		74BS3_EFAP		74BS3_WFAP	
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_0FAP		74CS3_EFAP			
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_0FAP		74DS3_EFAP			
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_0FAP		74ES3_EFAP			
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_0FAP		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 HP①				KW	Class 20 Severe Duty (350% * Ie 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	List Price $
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP		74AS3_DFAP		74AS3_0FAP		74AS3_EFAP		74AS3_WFAP	
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_0FAP		74BS3_EFAP		74BS3_WFAP	
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_0FAP		74CS3_EFAP			
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_0FAP		74DS3_EFAP			
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_0FAP		74ES3_EFAP			
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_0FAP		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

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 17-230.
- ► For complete derating and application info see page 17-257.
- ► For dimensional drawings see page 17-282.

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)

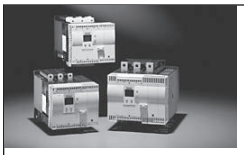
Rated Operating Current	MAX HP①				KW	Class 10 Light Duty (350% * Im for 10s)②											
	200V	230V	460V	575V	380V	OPEN Style (Starter Only)	NEMA 1	List Price $	NEMA 3R	List Price $	NEMA 12	List Price $	NEMA 4	List Price $	NEMA 4/4X Stainless Steel	List Price $
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		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 HP①				KW	Class 20 Severe Duty (350% * Ie 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	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 17-230.
- ► For complete derating and application info see page 17-257.
- ► For dimensional drawings see page 17-282.

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, ect.

Class 73 starters are built to UL and CSA standards.

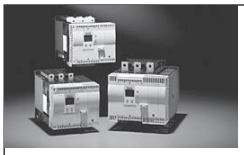
3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP①				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 $
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_0FA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_0FA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_0FA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_0FA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_0FA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_0FA		73FT3_EFA		73FT3_WFA	
100	30	30	75	—	56	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_0FA		73GT3_EFA		73GT3_WFA	
117	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_0FA		73HT3_EFA		73HT3_WFA	
145	40	50	100	—	75	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_0FA		73JT3_EFA		73JT3_WFA	
180	60	60	125	—	93	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_0FA		73KT3_EFA		73KT3_WFA	
215	60	75	150	—	112	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_0FA		73LT3_EFA		73LT3_WFA	
280	75	100	200	—	149	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_0FA		73MT3_EFA		73MT3_WFA	
315	100	125	250	—	186	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_0FA		73NT3_EFA		73NT3_WFA	
385	125	150	300	—	224	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_0FA		73PT3_EFA		73PT3_WFA	
494	150	200	400	—	298	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_0FA		73QT3_EFA			
551	150	200	450	—	336	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_0FA		73RT3_EFA			
615	200	250	500	—	373	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_0FA		73ST3_EFA			
693	200	250	550	—	410	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_0FA		73TT3_EFA			
780	200	250	600	—	447	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_0FA					
970	350	350	800	—	597	3RW4465-6BC34	73YT3_BFA				73YT3_0FA					
1076	350	400	900	—	972	3RW4466-6BC34	73ZT3_BFA				73ZT3_0FA					
						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		73AT350FA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT350FA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT350FA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT350FA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET350FA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT350FA		73FT35EFA		73FT35WFA	
100	—	—	75	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT350FA		73GT35EFA		73GT35WFA	
117	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT350FA		73HT35EFA		73HT35WFA	
145	—	—	100	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT350FA		73JT35EFA		73JT35WFA	
180	—	—	125	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT350FA		73KT35EFA		73KT35WFA	
215	—	—	150	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT350FA		73LT35EFA		73LT35WFA	
280	—	—	200	250	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT350FA		73MT35EFA		73MT35WFA	
315	—	—	250	300	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT350FA		73NT35EFA		73NT35WFA	
385	—	—	300	400	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT350FA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT350FA		73QT35EFA			
551	—	—	450	600	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT350FA		73RT35EFA			
615	—	—	500	700	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST350FA		73ST35EFA			
693	—	—	550	750	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT350FA		73TT35EFA			
780	—	—	600	850	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT350FA		73WT35EFA			
970	—	—	800	1000	—	3RW4465-6BC35	73YT35BFA				73YT350FA					
1076	—	—	900	1100	—	3RW4466-6BC35	73ZT35BFA				73ZT350FA					

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 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 17-230.
- ▶ For complete derating and application info see page 17-257.
- ▶ For dimensional drawings see page 17-282.

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.

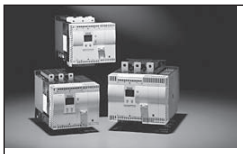
3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP①				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	List Price $
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_0FA		73AT3_EFA		73AT3_WFA	
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_0FA		73BT3_EFA		73BT3_WFA	
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_0FA		73CT3_EFA		73CT3_WFA	
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_0FA		73DT3_EFA		73DT3_WFA	
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_0FA		73ET3_EFA		73ET3_WFA	
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_0FA		73FT3_EFA		73FT3_WFA	
97	30	30	60	—	45	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_0FA		73GT3_EFA		73GT3_WFA	
113	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_0FA		73HT3_EFA		73HT3_WFA	
134	40	50	75	—	56	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_0FA		73JT3_EFA		73JT3_WFA	
175	50	60	100	—	75	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_0FA		73KT3_EFA		73KT3_WFA	
195	60	75	125	—	93	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_0FA		73LT3_EFA		73LT3_WFA	
243	75	75	150	—	112	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_0FA		73MT3_EFA		73MT3_WFA	
263	75	100	200	—	149	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_0FA		73NT3_EFA		73NT3_WFA	
326	100	125	250	—	186	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_0FA		73PT3_EFA		73PT3_WFA	
494	150	150	400	—	224	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_0FA		73QT3_EFA			
551	150	200	450	—	298	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_0FA		73RT3_EFA			
615	200	200	500	—	336	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_0FA		73ST3_EFA			
634	200	250	500	—	373	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_0FA		73TT3_EFA			
650	200	250	550	—	410	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_0FA		73WT3_EFA			
880	300	350	700	—	522	3RW4465-6BC34	73YT3_BFA				73YT3_0FA					
940	300	350	750	—	559	3RW4466-6BC34	73ZT3_BFA				73ZT3_0FA					
						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		73AT350FA		73AT35EFA		73AT35WFA	
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT350FA		73BT35EFA		73BT35WFA	
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT350FA		73CT35EFA		73CT35WFA	
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT350FA		73DT35EFA		73DT35WFA	
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET350FA		73ET35EFA		73ET35WFA	
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT350FA		73FT35EFA		73FT35WFA	
97	—	—	60	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT350FA		73GT35EFA		73GT35WFA	
113	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT350FA		73HT35EFA		73HT35WFA	
134	—	—	75	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT350FA		73JT35EFA		73JT35WFA	
175	—	—	100	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT350FA		73KT35EFA		73KT35WFA	
195	—	—	125	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT350FA		73LT35EFA		73LT35WFA	
243	—	—	150	200	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT350FA		73MT35EFA		73MT35WFA	
263	—	—	200	250	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT350FA		73NT35EFA		73NT35WFA	
326	—	—	250	300	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT350FA		73PT35EFA		73PT35WFA	
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT350FA		73QT35EFA			
551	—	—	450	550	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT350FA		73RT35EFA			
615	—	—	500	600	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST350FA		73ST35EFA			
693	—	—	500	650	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT350FA		73TT35EFA			
780	—	—	550	700	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT350FA		73WT35EFA			
880	—	—	700	850	—	3RW4465-6BC35	73YT35BFA				73YT350FA					
940	—	—	750	900	—	3RW4466-6BC35	73ZT35BFA				73ZT350FA					

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 17-230.
- ► For complete derating and application info see page 17-257.
- ► For dimensional drawings see page 17-282.
- ► 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.

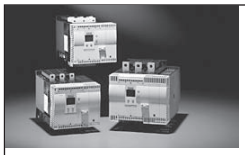
3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP①				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 $
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_0FAP		74AT3_EFAP		74AT3_WFAP	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_0FAP		74BT3_EFAP		74BT3_WFAP	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_0FAP		74CT3_EFAP		74CT3_WFAP	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_0FAP		74DT3_EFAP		74DT3_WFAP	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_0FAP		74ET3_EFAP		74ET3_WFAP	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_0FAP		74FT3_EFAP		74FT3_WFAP	
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_0FAP		74GT3_EFAP		74GT3_WFAP	
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_0FAP		74HT3_EFAP		74HT3_WFAP	
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_0FAP		74JT3_EFAP		74JT3_WFAP	
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_0FAP		74KT3_EFAP			
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_0FAP		74LT3_EFAP			
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_0FAP		74MT3_EFAP			
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_0FAP		74NT3_EFAP			
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_0FAP		74PT3_EFAP			
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_0FAT		74QT3_EFAT			
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_0FAT		74RT3_EFAT			
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_0FAT		74ST3_EFAT			
693	200	250	550	—	410	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_0FAT		74TT3_EFAT			
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_0FAT		74WT3_EFAT			
970	350	350	800	—	597	3RW4465-6BC34	74YT3_BFAT				74YT3_0FAT					
1076	350	400	900	—	672	3RW4466-6BC34	74ZT3_BFAT				74ZT3_0FAT					
						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		74AT350FAP		74AT35EFAP		74AT35WFAP	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT350FAP		74BT35EFAP		74BT35WFAP	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT350FAP		74CT35EFAP		74CT35WFAP	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT350FAP		74DT35EFAP		74DT35WFAP	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET350FAP		74ET35EFAP		74ET35WFAP	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT350FAP		74FT35EFAP		74FT35WFAP	
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT350FAP		74GT35EFAP		74GT35WFAP	
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT350FAP		74HT35EFAP		74HT35WFAP	
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT350FAP		74JT35EFAP		74JT35WFAP	
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT350FAP		74KT35EFAP			
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT350FAP		74LT35EFAP			
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT350FAP		74MT35EFAP			
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT350FAP		74NT35EFAP			
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT350FAP		74PT35EFAP			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT350FAT		74QT35EFAT			
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT350FAT		74RT35EFAT			
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST350FAT		74ST35EFAT			
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT350FAT		74TT35EFAT			
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT350FAT		74WT35EFAT			
970	—	—	800	1000	—	3RW4465-6BC35	74YT35BFAT				74YT350FAT					
1076	—	—	900	1100	—	3RW4466-6BC35	74ZT35BFAT				74ZT350FAT					

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

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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.

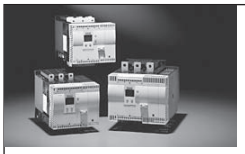
Class 74 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP①				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	List Price $
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_0FAP		74AT3_EFAP		74AT3_WFAP	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_0FAP		74BT3_EFAP		74BT3_WFAP	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_0FAP		74CT3_EFAP		74CT3_WFAP	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_0FAP		74DT3_EFAP		74DT3_WFAP	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_0FAP		74ET3_EFAP		74ET3_WFAP	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_0FAP		74FT3_EFAP		74FT3_WFAP	
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_0FAP		74GT3_EFAP		74GT3_WFAP	
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_0FAP		74HT3_EFAP		74HT3_WFAP	
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_0FAP		74JT3_EFAP		74JT3_WFAP	
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_0FAP		74KT3_EFAP			
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_0FAP		74LT3_EFAP			
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_0FAP		74MT3_EFAP			
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_0FAP		74NT3_EFAP			
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_0FAP		74PT3_EFAP			
494	150	150	400	—	224	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_0FAT		74QT3_EFAT			
551	150	200	450	—	298	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_0FAT		74RT3_EFAT			
615	200	200	500	—	336	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_0FAT		74ST3_EFAT			
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_0FAT		74TT3_EFAT			
650	200	250	550	—	410	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_0FAT		74WT3_EFAT			
880	300	350	700	—	522	3RW4465-6BC34	74YT3_BFAT				74YT3_0FAT					
940	300	350	750	—	559	3RW4466-6BC34	74ZT3_BFAT				74ZT3_0FAT					
						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		74AT350FAP		74AT35EFAP		74AT35WFAP	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT350FAP		74BT35EFAP		74BT35WFAP	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT350FAP		74CT35EFAP		74CT35WFAP	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT350FAP		74DT35EFAP		74DT35WFAP	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET350FAP		74ET35EFAP		74ET35WFAP	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT350FAP		74FT35EFAP		74FT35WFAP	
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT350FAP		74GT35EFAP		74GT35WFAP	
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT350FAP		74HT35EFAP		74HT35WFAP	
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT350FAP		74JT35EFAP		74JT35WFAP	
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT350FAP		74KT35EFAP			
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT350FAP		74LT35EFAP			
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT350FAP		74MT35EFAP			
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT350FAP		74NT35EFAP			
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT350FAP		74PT35EFAP			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT350FAT		74QT35EFAT			
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT350FAT		74RT35EFAT			
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST350FAT		74ST35EFAT			
693	—	—	500	650	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT350FAT		74TT35EFAT			
780	—	—	550	700	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT350FAT		74WT35EFAT			
880	—	—	700	850	—	3RW4465-6BC35	74YT35BFAT				74YT350FAT					
940	—	—	750	900	—	3RW4466-6BC35	74ZT35BFAT				74ZT350FAT					

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 17-230.
- ► For complete derating and application info see page 17-257.
- ► For dimensional drawings see page 17-282.

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.

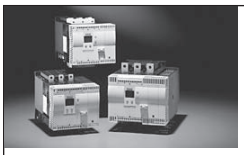
3RW44 For High Feature Applications

Enclosed Combination with Fusible Disconnect

Rated Operating Current	MAX HP①				KW	Class 10 Light Duty② (350% * Im for 10s)											
	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 $
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_0FAF		74AT3_EFAF		74AT3_WFAF	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_0FAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_0FAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_0FAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_0FAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_0FAF		74FT3_EFAF		74FT3_WFAF	
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_0FAF		74GT3_EFAF		74GT3_WFAF	
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_0FAF		74HT3_EFAF		74HT3_WFAF	
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_0FAF		74JT3_EFAF		74JT3_WFAF	
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_0FAF		74KT3_EFAF			
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_0FAF		74LT3_EFAF			
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_0FAF		74MT3_EFAF			
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_0FAF		74NT3_EFAF			
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_0FAF		74PT3_EFAF			
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_0FAF					
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_0FAF					
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_0FAF					
693	200	250	550	—		3RW4456-6BC34	74TT3_BFAF				74TT3_0FAF					
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAF				74WT3_0FAF					
						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		74AT350FAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT350FAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT350FAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT350FAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET350FAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT350FAF		74FT35EFAF		74FT35WFAF	
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT350FAF		74GT35EFAF		74GT35WFAF	
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT350FAF		74HT35EFAF		74HT35WFAF	
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT350FAF		74JT35EFAF		74JT35WFAF	
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT350FAF		74KT35EFAF			
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT350FAF		74LT35EFAF			
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT350FAF		74MT35EFAF			
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT350FAF		74NT35EFAF			
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT350FAF		74PT35EFAF			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT350FAF					
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAF				74RT350FAF					
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAF				74ST350FAF					
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAF				74TT350FAF					
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAF				74WT350FAF					

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

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3RW44 For High Feature Applications

Enclosed Combination with Fusible Disconnect

Rated Operating Current	MAX HP①				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	List Price $
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_0FAF		74AT3_EFAF		74AT3_WFAF	
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_0FAF		74BT3_EFAF		74BT3_WFAF	
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_0FAF		74CT3_EFAF		74CT3_WFAF	
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_0FAF		74DT3_EFAF		74DT3_WFAF	
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_0FAF		74ET3_EFAF		74ET3_WFAF	
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_0FAF		74FT3_EFAF		74FT3_WFAF	
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_0FAF		74GT3_EFAF		74GT3_WFAF	
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_0FAF		74HT3_EFAF		74HT3_WFAF	
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_0FAF		74JT3_EFAF		74JT3_WFAF	
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_0FAF		74KT3_EFAF			
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_0FAF		74LT3_EFAF			
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_0FAF		74MT3_EFAF			
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_0FAF		74NT3_EFAF			
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_0FAF		74PT3_EFAF			
494	150	150	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_0FAF					
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_0FAF					
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634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAF				74TT3_0FAF					
650	200	250	550	—	373	3RW4457-6BC34	74WT3_BFAF				74WT3_0FAF					
						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		74AT350FAF		74AT35EFAF		74AT35WFAF	
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT350FAF		74BT35EFAF		74BT35WFAF	
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT350FAF		74CT35EFAF		74CT35WFAF	
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT350FAF		74DT35EFAF		74DT35WFAF	
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET350FAF		74ET35EFAF		74ET35WFAF	
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT350FAF		74FT35EFAF		74FT35WFAF	
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT350FAF		74GT35EFAF		74GT35WFAF	
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT350FAF		74HT35EFAF		74HT35WFAF	
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT350FAF		74JT35EFAF		74JT35WFAF	
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT350FAF		74KT35EFAF			
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT350FAF		74LT35EFAF			
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT350FAF		74MT35EFAF			
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT350FAF		74NT35EFAF			
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT350FAF		74PT35EFAF			
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT350FAF					
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAF				74RT350FAF					
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAF				74ST350FAF					
693	—	—	550	650	—	3RW4456-6BC35	74TT35BFAF				74TT350FAF					
780	—	—	600	700	—	3RW4457-6BC35	74WT35BFAF				74WT350FAF					

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.

Modification Available modifications in STANDARD enclosure	3RW Version	Enclosed Style	Enclosure NEMA Type	Mod Suffix	List Price Adder $
Pilot Devices					
Push Buttons					
Start/Stop	3RW40/44	73/74	ALL	A1	
Emergency Stop	3RW40/45	73/75	ALL	ES	
Selector Switches					
Hand-Off-Auto	3RW40/44	73/74	ALL	A3	
Hand-Off-Auto with 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	N1, N12	K1	
Elapse time meter	3RW40/44		N1, N12 (120V)	M5	
Control Options					
Profibus Communication Module (installed-connection cable not supplied)		73/74	ALL	P1	
Ground Lug - 1 Conductor	3RW40/44	73/74	ALL	L10	
Alarm Package - Includes horn, light, relay & push button	3RW40/44	73/74	N1, N3, N12	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)			ALL	R04	
				R22	
				R40	
Circuit Breaker Shunt Trip (included std in 3RW40 versions)	3RW44	74	ALL	L6	
Function identification plate, with marking as specified	3RW40/43	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	

A12 Box Options	3RW Version	Enclosed Style	Enclosed NEMA Type	Mod Suffix	List Price Adder $								
	3RW40 new current size (3rd character)	73/74	N1/12/3R/4	A12	11-23 A,B	29-42 C,D,E	58-73 F,G,H	98 J					
	3RW40 current size (3rd character)						117 A	145-205 B,C	248 D	315-385 E,F			
	3RW44 current size (3rd character)				26-42 A,B,C	51-68 D,E	82-117 F,G,H	145-215 J,K,L	280 M	315-385 N,P	494 Q	551-780 R,S,T,W	970-1076 Y,Z
Emergency HP Rated Bypass Starter	3RW40②	73/74	N1/12/3R/4	A12									
	3RW44	73	N1/12/3R/4	A12									
		74	N1/12/3R/4	A12									

Options Requiring the MODIFIED OPTIONS Box Size

To be used with the selections ending in GA*	3RW Version	Enclosed Style	Enclosed NEMA Type	Mod Suffix	List Price Adder $								
	3RW40 current size (3rd character)						117 A	145-205 B,C	248 D	315-385 E,F			
	3RW44 current size (3rd character)				26-42 A,B,C	51-68 D,E	82-117 F,G,H	145-215 J,K,L	280 M	315-385 N,P	494 Q	551-780 R,S,T,W	970-1076 Y,Z
Contactor Options													
Isolation contactor③	3RW40/44	73/74	N1/12/3R/4	IC									
Extra Capacity CPT													
100 VA Extra	3RW40/44	73/74	ALL	CA									
Control Options													
Space Heater (120V separate control)	3RW40/44	73/74	ALL	SH									
Space Heater with Thermostat (120V separate control)	3RW40/44	73/74	ALL	ST									
Lightning Arrestor	3RW40/44	73/74	ALL	L									

① Limited to N4SS offering

② An isolation contactor is included for 3RW40 version with bypass.

③ An isolation contactor is standard on all 3RW40 new styles

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".

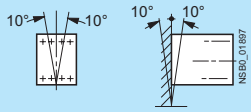
- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 % to 100 % and the ramp time t_R can be set from 0 s to 20 s
- Integrated bypass contact system to minimize power loss
- Setting with two potentiometers
- Simple mounting and commissioning
- Mains voltages at 50/60 Hz, 200 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 17-241)

Technical specifications

Type				3RW30 1., 3RW30 2.		3RW30 3., 3RW30 4.	
Control electronics							
Rated values		Terminal					
Rated control supply voltage		A1/A2	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,			
			A	1 DC-13 at 24 V			
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 time[1)]					
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.

Type		3RW30 1.-.BB.4 ... 3RW30 4.-.BB.4
Power electronics		
Rated operational voltage Tolerance	V AC %	200 ... 480 -15/+10
Rated frequency Tolerance	Hz %	50/60 ±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 Operation Storage	 °C °C	 -25 ... +60; (derating from +40) -40 ... +80
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. • During starting with 300 % I_M (40 °C)	W W	0.25 6	0.5 13	1 20	2 20	4 29
Permissible rated motor current and starts per hour for normal starting (Class 10)						
- Rated motor current I_M[2], starting time 10 s - Starts per hour[3]	A 1/h	3.6/**3.3**/3 200/**150**/70	6.5/**6**/5.5 87/**60**/50	9/**8**/7 50	12.5/**12**/11 85/**70**/60	17.6/**17**/14 62/**46**/60
- Rated motor current I_M[2], starting time 20 s - Starts per hour[3]	A 1/h	3.6/**3.3**/3 150/**100**/50	6.5/**6**/5.5 64/**46**/28	9/**8**/7 35	12.5/**12**/11 62/**47**/37	17.6/**17**/14 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. • During starting with 300 % I_M (40 °C)	W W	8 47	13 55	19 64
Permissible rated motor current and starts per hour for normal starting (Class 10)				
- Rated motor current I_M[2], starting time 10 s - Starts per hour[3]	A 1/h	25/**23**/21 23	32/**29**/26 23	38/**34**/31 19
- Rated motor current I_M[2], starting time 20 s - Starts per hour[3]	A 1/h	25/**23**/21 15	32/**29**/26 16	38/**34**/31 12

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M.

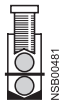
3) For intermittent duty S4 with ON period = 30 %, T_u = 40 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

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						
• 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
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 for normal starting (Class 10)						
- Rated motor current I_M[2], starting time 10 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], starting time 20 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

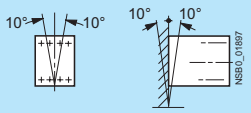
1) Measurement at 60 °C according to UL/CSA not required.

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.

Soft starters	Type		3RW30 1.	3RW30 2.	3RW30 3.	3RW30 4.
Conductor cross-sections						
Screw terminals	**Main conductors**					
Front clamping point connected  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	AWG	2 x (16 ... 12)	2 x (16 ... 12)		
	- Solid or stranded	AWG	2 x (14 ... 10)	2 x (14 ... 10)	1 x (18 ... 2)	1 x (10 ... 2/0)
	- Stranded	AWG	1 x 8	1 x 8	--	--
Rear clamping point connected	• Solid	mm^2	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Finely stranded with end sleeve	mm^2	--	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
 NSB00480	• 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)
Both clamping points connected	• Solid	mm^2	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Stranded	mm^2	--	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• Finely stranded with end sleeve	mm^2	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
 NSB00481	• 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)	AWG	16 ... 14	16 ... 10	--	--
	- Stranded	AWG	16 ... 12	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	AWG	2 x (20 ... 14)
	- Finely stranded with end sleeve	AWG	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 load[1] (% 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	mm²	1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
	- Finely stranded with end sleeve	mm²	1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
	- Stranded	mm²	--
	- 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	mm²	1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
	- Finely stranded with end sleeve	mm²	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	mm²	2 x (0.25 ... 1.5)
	• Finely stranded with end sleeve	mm²	2 x (0.25 ... 1)
	• AWG cables, solid or stranded	mm²	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.

	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	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 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	Recommended filters[1)]		
	Soft starters	Voltage range 200 ... 480 V		
		Filter type	Rated current filters	Terminals
	A		A	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_e.

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

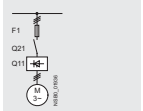
For solid-state motor controller, Type 3RW301: Applicable in an enclosure with minimum overall dimensions of 200 by 120 by 200 mm.
For solid-state motor controller, Type 3RW302: Applicable in an enclosure with minimum overall dimensions of 370 by 175 by 195 mm.
For solid-state motor controller, Type 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)



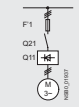
Soft starters ToC 1	Rated current	Line protection, maximum	Rated current	Size	Line contactors (optional)
Q11 Type	A	F1 Type	A		Q21
Type of coordination "1"[1]: I_q = 65 kA at 480 V 10 %					
3RW30 03[2]	3	3NA3 805[3]	20	000	3RT10 15
3RW30 13	3.6	3NA3 803-6	10	000	3RT10 15
3RW30 14	6.5	3NA3 805-6	16	000	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 kA at 400 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 ToC 2	Rated current	All-range fuses	Rated current	Size	Line contactors (optional)
Q11 Type	A	F'1 Type	A		Q21
Type of coordination "2"[1]: I_q = 65 kA at 480 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 kA at 400 V.

3) No SITOR fuse required!
Alternatively: 3NA3 803 (LV HRC00), 5SB2 21 (DIAZED), 5SE2 206 (NEOZED).

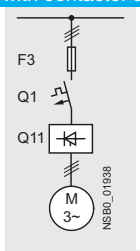
ToC 1 Type of coordination "1"

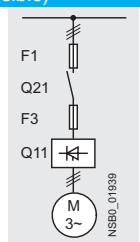
ToC 2 Type of coordination "2"

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.

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		
ToC 2	Rated current		Rated current	Size		Rated current	Size		Rated current	Size
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 480 V 10 %										
3RW30 03[2]	3	--	--	--	--	--	--			
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		Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
ToC 2	Rated current		Rated current	Size		Rated current	Size		Rated current	Size		Rated current
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A		F3 Type	A
Type of coordination "2"[1]: I_q = 65 kA at 480 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		Line contactors	Motor starter protectors		Line protection, maximum		
ToC 2	Rated current	(optional)	400 V +10 %	Rated current		Rated current	Size
Q11 Type	A	Q21	Q1 Type	A	F1 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 480 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

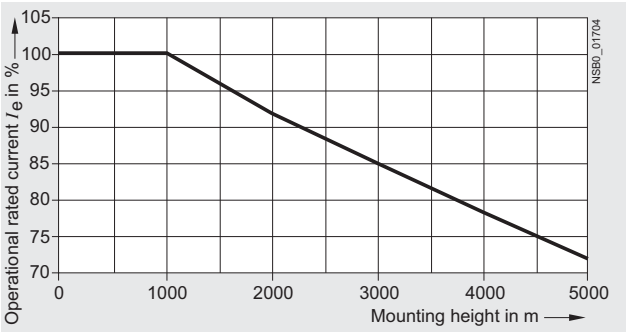
[1] The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

[2] I_q = 50 kA at 400 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 % $I_{n\ motor}$),
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.

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.

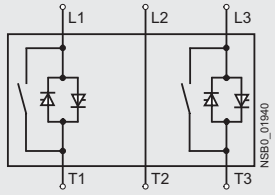
If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

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.

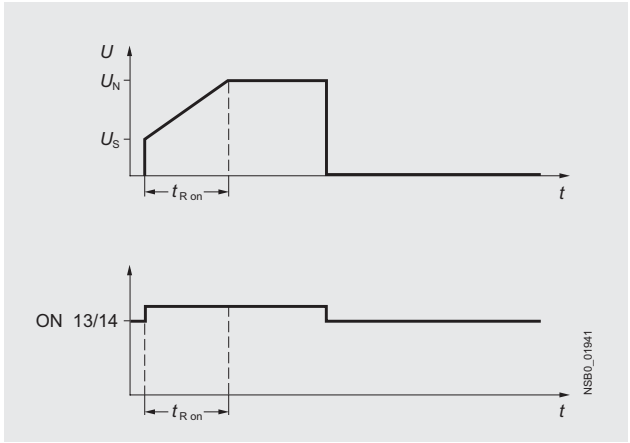
Note:
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the 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 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 ATEXdirective 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".

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 17-256)

Technical specifications

Type				3RW40 2.		3RW40 3., 3RW40 4.	
Control electronics							
Rated values		Terminal					
Rated control supply voltage		A1/A2	V	24	110 ... 230	24	110 ... 230
• Tolerance			%	±20	-15/+10	±20	-15/+10
Rated control supply current							
• STANDBY			mA	< 150	< 50	< 200	< 50
• During pick-up			mA	< 200	< 100	< 5000	< 1500
• ON without fan			mA	< 250	< 50	< 200	< 50
• ON with fan			mA	< 300	< 70	< 250	< 70
Rated frequency			Hz	50/60			
• Tolerance			%	±10			
Control inputs							
IN				ON/OFF			
Rated operational current							
• AC			mA	Approx. 12	3/6	Approx. 12	3/6
• DC			mA	Approx. 12	1.5/3	Approx. 12	1.5/3
Relay outputs							
Output 1	ON/RUN mode[1)]	13/14		Operating indication (NO)			
Output 2	BYPASSED	23/24		Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98		Overload/error indication (NC/NO)			
Rated operational current			A	3 AC-15/AC-14 at 230 V,			
			A	1 DC-13 at 24 V			
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)			

[1)] Factory default: ON mode.

Type				3RW40 5.		3RW40 7.	
Control electronics							
Rated values		Terminal					
Rated control supply voltage		A1/A2	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)			
Output 2	BYPASSED	23/24		Bypass indication (NO)			
Output 3	OVERLOAD/FAILURE	95/96/98		Overload/error indication (NC/NO)			
Rated operational current			A	3 AC-15/AC-14 at 230 V,			
			A	1 DC-13 at 24 V			
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)			

[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.

Type		3RW40 2., 3RW40 3., 3RW40 4.		
Control electronics				
Operating indications	LEDs	**DEVICE**	**STATE/BYPASSED/FAILURE**	**OVERLOAD**
Off		Green	Off	Off
Start		Green	Green flashing	Off
Bypass		Green	Green	Off
Ramp-down		Green	Green flashing	Off
Alarm signals				
I_e/Class setting not permissible		Green	Not relevant	Red flashing
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Off
Error signals				
• 24 V: $U < 0.75 \times U_s$ or $U > 1.25 \times U_s$		Off	Red	Off
• 110 ... 230 V: $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Red	Off
Non-permissible I_e/Class setting for edge 0 –> 1 on input IN		Green	Red	Red flashing
Motor protection shut-down (overload thermistor)		Green	Off	Red
Thermistor defective (open circuit, short-circuit)		Green	Off	Red flickering
Thermal overloading of the thyristors		Yellow	Red	Off
Missing mains voltage, phase failure, missing load		Green	Red	Off
Device fault		Red	Red	Off

Type		3RW40 5. and 3RW40 7.			
Control electronics					
Operating indications	LEDs	**DEVICE**	**STATE/BYPASSED**	**FAILURE**	**OVERLOAD**
Off		Green	Off	Off	Off
Start		Green	Green flashing	Off	Off
Bypass		Green	Green	Off	Off
Ramp-down		Green	Green flashing	Off	Off
Alarm signals					
I_e/Class setting not permissible		Green	Not relevant	Not relevant	Red flashing
Start inhibited/thyristors too hot		Yellow flashing	Not relevant	Not relevant	Off
Error signals					
$U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Off	Red	Off
Non-permissible I_e/Class setting for edge 0 –> 1 on input IN		Green	Off	Red	Red flashing
Motor protection shut-down		Green	Off	Off	Red
Thermal overloading of the thyristors		Yellow	Off	Red	Off
Missing mains voltage, phase failure, missing load		Green	Off	Red	Off
Device fault		Red	Off	Red	Off

For Operation in the Control Cabinet

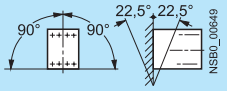
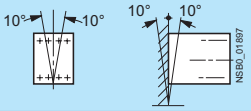
3RW Soft Starters

Type			3RW40 ..	Factory default
Protection functions				
Motor protection functions				
Trips in the event of			Thermal overloading of the motor	
Trip class to IEC 60947-4-1		Class	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		ON	ON
	Ramp-down end		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 Tolerance	V AC %	200 ... 480 -15/+10	400 ... 600 -15/+10	200 ... 460 -15/+10	400 ... 600 -15/+10
Maximum blocking voltage (thyristor)	V AC	1600		1400	1800
Rated frequency Tolerance	Hz %	50/60 ±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 • With auxiliary fan (for 3RW40 2. ... 3RW40 4.)					
• Without auxiliary fan (for 3RW40 2. ... 3RW40 4.)				-- (fan integrated in the soft starter)	
Permissible ambient temperature Operation Storage	 °C °C	 -25 ... +60; (derating from +40) -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. • During starting with 300 % I_M (40°C)	W W	2 17	8 47	13 55	19 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.

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 %[2] 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)
 NSB00479	• 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)		
	- Solid or stranded	AWG	2 x (14 ... 10)	1 x (18 ... 2)	2 x (10 ... 1/0)
	- Stranded	AWG	1 x 8	--	--
Rear clamping point connected	• 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)
 NSB00480	• Stranded	mm^2	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables				
	- Solid or stranded	AWG	--	1 x (16 ... 2)	2 x (10 ... 1/0)
Both clamping points connected	• 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)
 NSB00481	• 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 without 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)

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  NSB00479	• Finely stranded with end sleeve	mm^2	16 ... 70	70 ... 240
	• Finely stranded without end sleeve	mm^2	16 ... 70	70 ... 240
	• Stranded	mm^2	16 ... 70	95 ... 300
	• Ribbon cable conductors (number x width x thickness)	mm	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5
	• AWG cables, solid or stranded	AWG	6 ... 2/0	3/0 ... 600 kcmil
Rear clamping point connected  NSB00480	• Finely stranded with end sleeve	mm^2	16 ... 70	120 ... 185
	• Finely stranded without end sleeve	mm^2	16 ... 70	120 ... 185
	• Stranded	mm^2	16 ... 70	120 ... 240
	• Ribbon cable conductors (number x width x thickness)	mm	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5
	• AWG cables, solid or stranded	AWG	6 ... 2/0	250 ... 500 kcmil
Both clamping points connected  NSB00481	• Finely stranded with end sleeve	mm^2	Max. 1 x 50, 1 x 70	Min. 2 x 50; max. 2 x 185
	• Finely stranded without end sleeve	mm^2	Max. 1 x 50, 1 x 70	Min. 2 x 50; max. 2 x 185
	• Stranded	mm^2	Max. 2 x 70	Max. 2 x 70; max. 2 x 240
	• Ribbon cable conductors (number x width x thickness)	mm	Max. 2 x (6 x 15.5 x 0.8)	Max. 2 x (20 x 24 x 0.5)
	• AWG cables, solid or stranded	AWG	Max. 2 x 1/0	Min. 2 x 2/0 Max. 2 x 500 kcmil
	• Terminal screws		M10 (hexagon socket, A/F4)	M12 (hexagon socket, A/F5)
	- Tightening torque	NM lb.in	10 ... 12 90 ... 110	20 ... 22 180 ... 195
Screw terminals	**Main conductors**			
With box terminal			3RT19 56-4G	
Front or rear clamping point connected  NSB00479  NSB00480	• Finely stranded with end sleeve	mm^2	16 ... 120	
	• Finely stranded without end sleeve	mm^2	16 ... 120	
	• Stranded	mm^2	16 ... 120	
	• Ribbon cable conductors (number x width x thickness)	mm	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	
	• AWG cables, solid or stranded	AWG	6 ... 250 kcmil	
Both clamping points connected  NSB00481	• Finely stranded with end sleeve	mm^2	Max. 1 x 95, 1 x 120	
	• Finely stranded without end sleeve	mm^2	Max. 1 x 95, 1 x 120	
	• Stranded	mm^2	Max. 2 x 120	
	• Ribbon cable conductors (number x width x thickness)	mm	Max. 2 x (10 x 15.5 x 0.8)	
	• AWG cables, solid or stranded	AWG	Max. 2 x 3/0	
Screw terminals	**Main conductors**			
	Without box terminal/busbar connection			
	• Finely stranded with cable lug	mm^2	16 ... 95[1)]	50 ... 240[2)]
	• Stranded with cable lug	mm^2	25 ... 120[1)]	70 ... 240[2)]
	• AWG cables, solid or stranded	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
	• Connecting bar (max. width)	mm	17	25
	• Terminal screws		M8 x 25 (A/F13)	M10 x 30 (A/F17)
	- Tightening torque	NM lb.in	10 ... 14 89 ... 124	14 ... 24 124 ... 210

[1)] When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm^2 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 mm^2 and more as well as DIN 46235 for cond. cross-sections of 185 mm^2 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		
	• 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		
	- Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 10.3
	Spring-type terminals		
	• Solid		
	- 3RW40 2. ... 3RW40 4.	mm^2	2 x (0.25 ... 2.5)
	- 3RW40 5., 3RW40 7.	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 ... 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

	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	Recommended filters[1)]		
	Soft starters	Voltage range 200 ... 480 V		
		Filter type	Rated current filters	Terminals
	A		A	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_e.

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.

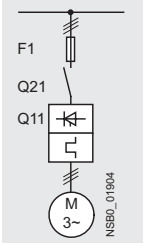
High capacity short circuit ratings 3RW40				
3RW40 24	50 A	50 A	42 kA	600 V
3RW40 26	60 A	100 A	42 kA	600 V
3RW40 27	60 A	125 A	42 kA	600 V
3RW40 28	60 A	125 A	42 kA	600 V
3RW40 36	100 A	175 A	30 kA	600 V
3RW40 37	100 A	200 A	30 kA	600 V
3RW40 38	100 A	200 A	30 kA	600 V
3RW40 46	110 A	200 A	42 kA	600 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.

Circuit Breaker SCCR

ToC 1		Circuit Brakers																	
		Thermal Magnetic						Instantaneous Trip						Fuse					
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
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			

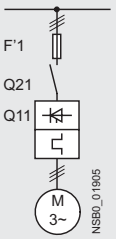
Fused version (line protection only)



Soft starters ToC 1		Line protection, maximum			Line contactors (optional)
Q11 Type	Rated current A	F1 Type	Rated current A	Size	Q21
Type of coordination "1"[1]: I_q = 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		All-range fuses			Line contactors
ToC 2	Rated current		Rated current	Size	(optional)
Q11 Type	A	F'1 Type	A		Q21
Type of coordination "2"[1]: 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.

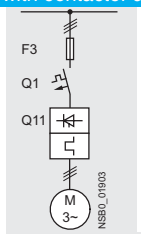
ToC 1 Type of coordination "1"

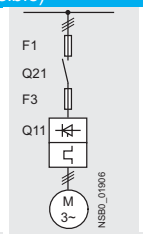
ToC 2 Type of coordination "2"

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.

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 rwww.siemens.com/sitor —>"Products" —>"BETA Protecting" —>"SITOR"

Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
ToC 2	Rated current		Rated current	Size		Rated current	Size		Rated current	Size
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 600 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	--	--	--

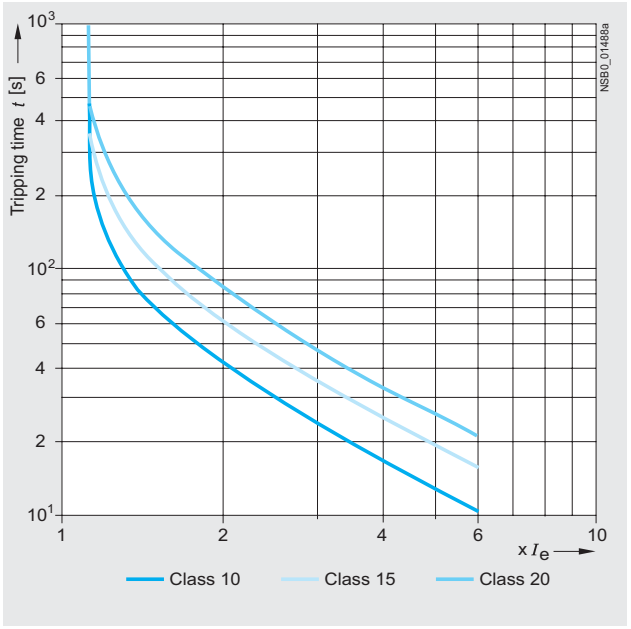
Soft starters		Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
ToC 2	Rated current		Rated current	Size		Rated current	Size		Rated current	Size		Rated current
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A		F3 Type	A
Type of coordination "2"[1]: I_q = 65 kA at 600 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		
ToC 2	Rated current	(optional)	400 V +10 %	Rated current	575 V +10 %	Rated current		Rated current	Size
Q11 Type	A	Q21	Q1 Type	A	Q1 Type	A	F1 Type	A	
Type of coordination "2"[1]: I_q = 65 kA at 600 V +5 %									
3RW40 24	12.5	3RT10 24	3RV1 021-4KA10	55	--	--	3NA3 820-6	50	00
3RW40 26	25	3RT10 26	3RV1 021-4DA10	55	--	--	3NA3 822-6	63	00
3RW40 27	32	3RT10 34	3RV1 031-4EA10	55	--	--	3NA3 824-6	80	00
3RW40 28	38	3RT10 35	3RV1 031-4FA10	55	--	--	3NA3 824-6	80	00
3RW40 36	45	3RT10 36	3RV1 031-4GA10	20	--	--	3NA3 130-6	100	1
3RW40 37	63	3RT10 44	3RV1 041-4JA10	20	--	--	3NA3 132-6	125	1
3RW40 38	72	3RT10 45	3RV1 041-4KA10	20	--	--	3NA3 132-6	125	1
3RW40 46	80	3RT10 45	3RV1 041-4LA10	11	--	--	3NA3 136-6	160	1
3RW40 47	106	3RT10 46	3RV1 041-4MA10	11	--	--	3NA3 136-6	160	1
3RW40 55	134	3RT10 55-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2
3RW40 56	162	3RT10 56-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2
3RW40 73	230	3RT10 65-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3
3RW40 74	280	3RT10 66-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3
3RW40 75	356	3RT10 75-6A.36	3VL4 740	400	3VL5 740	400	2 x 3NA3 365-6	2 x 500	3
3RW40 76	432	3RT10 76-6A.36	3VL5 750	500	3VL5 750	500	2 x 3NA3 365-6	2 x 500	3

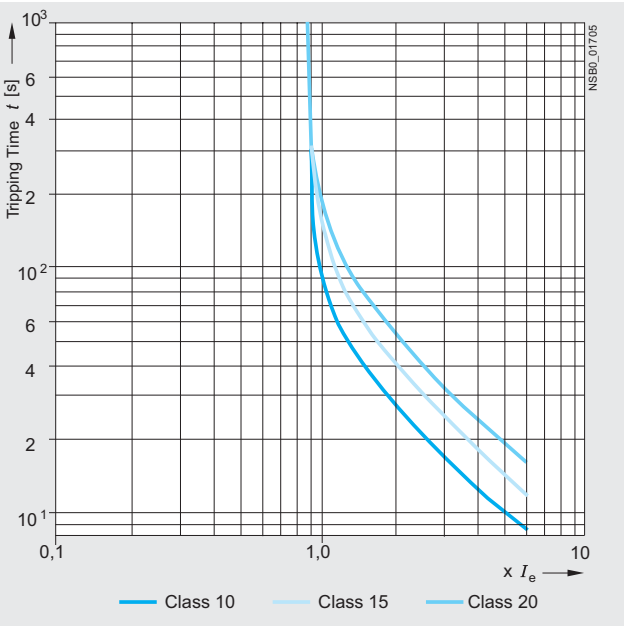
[1] The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

Characteristic curves

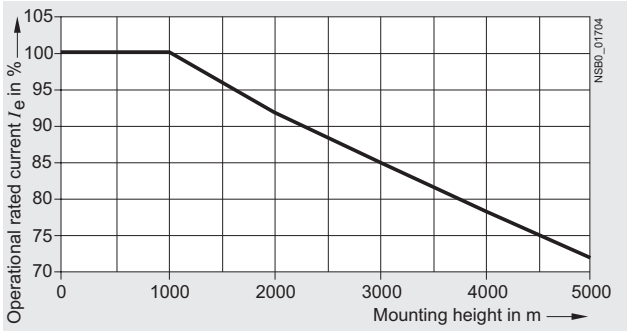
Motor protection tripping characteristics for 3RW40 (with symmetry)



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.

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n\ motor}$),
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	40
- Starting time	s	10	10	10	10	10
- Current limit value		5 x I_M	5 x I_M	4 x I_M	4 x I_M	4 x 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 % $I_{n\ motor}$),
The soft starter has to be selected at least one performance class higher than the motor used.

Application		Stirrer	Compressor	Centrifuge
Starting parameters				
• Voltage ramp and current limiting				
- Starting voltage	%	40	50	40
- Starting time	s	20	10	20
- Current limit value		4 x I_M	4 x I_M	4 x 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.

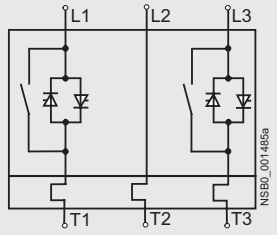
In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Catalog LV 1.

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.

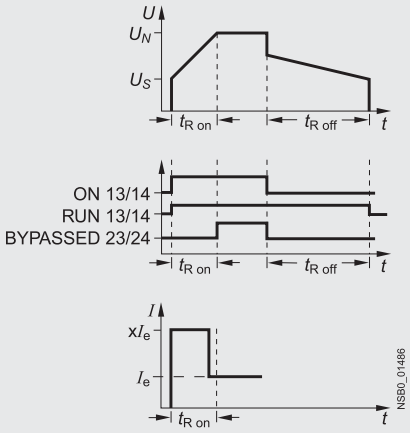
Note:
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the 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 mitagate 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 occuring 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 SITOR 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.

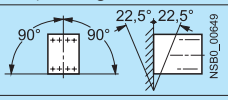
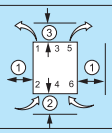
As a further option the SIRIUS 3RW44 soft starters can be upgraded with a PROFIBUS DP module. Thanks to their communication capability and their programmable control inputs and relay outputs the SIRIUS 3RW44 soft starters can be very easily and quickly integrated in higher-level controllers.

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				
Installation type		Stand-alone installation  ① ≥ 5 mm (≥ 0.2 in) ② ≥ 75 mm (≥ 3 in) ③ ≥ 100 mm (≥ 4 in)		
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_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 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	A	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	A	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
- Rtarts 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.

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	A	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	8	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	A	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 V [2]																	
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												**3**					
• With screw terminals												**1**					
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												**2**					
• With screw terminals												**6**					
Order No. supplement for the rated control supply voltage U_s [3]																	
• 115 V AC												**3**					
• 230 V AC												**4**					

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 % x 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.

• Revised •
03/01/14

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												**3**					
• With screw terminals												**1**					
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												**2**					
• With screw terminals												**6**					
Order No. supplement for the rated control supply voltage U_s [3]																	
• 115 V AC												**3**					
• 230 V AC												**4**					

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 % x 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.

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		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	1
Device protection trip	s	30	
Setting options for starting			
Voltage ramp for starting voltage	%	20 ... 100	30
Torque control for starting torque	%	10 ... 100	10
Torque control for limit torque	%	20 ... 200	150
Starting time	s	0 ... 360[3]	20
Maximum starting time	s	1 ... 1000	Deactivated
Current limit value	%	125 ... 550[1]	450
Breakaway voltage	%	40 ... 100	80
Breakaway time	s	0 ... 2	Deactivated
Motor heat output	%	1 ... 100	20
Creep mode Left/Right running			
Speed factor as function of rated speed ($n = n_{rated}$/factor)		3 ... 21	7
Creep torque[2]	%	20 ... 100	50
Setting options for ramp-down			
Torque control for stopping torque	%	10 ... 100	10
Ramp-down time	s	0 ... 360[3]	10
Dynamic braking torque	%	20 ... 100	50
DC braking torque	%	20 ... 100	50
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 • L1 • L2 • L3 Missing load phase • T1 • T2 • T3 Failure • Contact element 1 (thyristor) • Contact element 2 (thyristor) • Contact element 3 (thyristor) Flash memory faulty Supply voltage • Below 75 % • Below 85 % • Over 110 % Current unbalance exceeded Thermal motor model overload Prewarning limit exceeded • 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 • Overheated • Overheating	

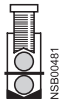
[1] Max. current limit value for 3RW44 53 ... 3RW44 57: 500 % and for 3RW44 58 ... 3RW44 66: 450 %.

[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.

Type	3RW44 ..	Factory default
Control times and parameters		
Warnings/error signals (continued)	Temperature sensor • Overload • Open circuit • Short-circuit Ground fault • Detected Connection abort in manual operating mode Max. number of starts exceeded I_e limit value overshoot/undershoot Heat sink sensor • Open circuit • Short-circuit Quick-stop active Switching block defective I_e/class setting not permissible No external start-up parameters received PAA fault	
Control inputs		
Input 1		Motor right parameter set 1
Input 2		No action
Input 3		No action
Input 4		Trip reset
Parameterizing options for control inputs 1 ... 4	No action Local manual mode Emergency start Creep speed Quick-stop Trip reset Motor right parameter set 1 Motor left parameter set 1[1)] Motor right parameter set 2 Motor left parameter set 2[1)] Motor right parameter set 3 Motor left parameter set 3[1)]	
Relay outputs		
Output 1		ON period
Output 2		No action
Output 3		No action
Output 4		Group fault
Parameterizing options for relay outputs 1 ... 3	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	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				3RT19 55-4G (55 kW)	3RT19 66-4G	--
Front clamping point connected  NSB00479	• Finely stranded with end sleeve	mm^2	2.5 ... 35	16 ... 70	70 ... 240	--
	• Finely stranded without end sleeve	mm^2	4 ... 50	16 ... 70	70 ... 240	--
	• Solid	mm^2	2.5 ... 16	--	--	--
	• Stranded	mm^2	4 ... 70	16 ... 70	95 ... 300	--
	• Ribbon cable conductors (number x width x thickness)	mm	6 x 9 x 0.8	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5	--
	• AWG cables, solid or stranded	AWG	10 ... 2/0	6 ... 2/0	3/0 ... 600 kcmil	--
Rear clamping point connected  NSB00480	• Finely stranded with end sleeve	mm^2	2.5 ... 50	16 ... 70	120 ... 185	--
	• Finely stranded without end sleeve	mm^2	10 ... 50	16 ... 70	120 ... 185	--
	• Solid	mm^2	2.5 ... 16	--	--	--
	• Stranded	mm^2	10 ... 70	16 ... 70	120 ... 240	--
	• Ribbon cable conductors (number x width x thickness)	mm	6 x 9 x 0.8	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5	--
	• AWG cables, solid or stranded	AWG	10 ... 2/0	6 ... 2/0	250 ... 500 kcmil	--
Both clamping points connected  NSB00481	• Finely stranded with end sleeve	mm^2	2 x (2.5 ... 35)	Max. 1 x 50, 1 x 70	Min. 2 x 50 Max. 2 x 185	--
	• Finely stranded without end sleeve	mm^2	2 x (4 ... 35)	Max. 1 x 50, 1 x 70	Min. 2 x 50 Max. 2 x 185	--
	• Solid	mm^2	2 x (2.5 ... 16)	--	--	--
	• Stranded	mm^2	2 x (4 ... 50)	Max. 2 x 70	Max. 2 x 70 Max. 2 x 240	--
	• Ribbon cable conductors (number x width x thickness)	mm	2 x (6 x 9 x 0.8)	Max. 2 x (6 x 15.5 x 0.8)	Max. 2 x (20 x 24 x 0.5)	--
	• AWG cables, solid or stranded	AWG	2 x (10 ... 1/0)	Max. 2 x 1/0	Min. 2 x 2/0 Max. 2 x 500 kcmil	--
	• Terminal screws		M6 (hexagon socket, A/F4)	M10 (hexagon socket, A/F4)	M12 (hexagon socket, A/F5)	--
	- Tightening torque	NM lb.in	4 ... 6 36 ... 53	10 ... 12 90 ... 110	20 ... 22 180 ... 195	-- --
Screw terminals	**Main conductors**					
With box terminal			--	3RT19 56-4G	--	--
Front or rear clamping point connected  NSB00479  NSB00480	• Finely stranded with end sleeve	mm^2	--	16 ... 120	--	--
	• Finely stranded without end sleeve	mm^2	--	16 ... 120	--	--
	• Stranded	mm^2	--	16 ... 120	--	--
	• Ribbon cable conductors (number x width x thickness)	mm	--	Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8	--	--
	• AWG cables, solid or stranded	AWG	--	6 ... 250 kcmil	--	--
Both clamping points connected  NSB00481	• Finely stranded with end sleeve	mm^2	--	Max. 1 x 95, 1 x 120	--	--
	• Finely stranded without end sleeve	mm^2	--	Max. 1 x 95, 1 x 120	--	--
	• Stranded	mm^2	--	Max. 2 x 120	--	--
	• Ribbon cable conductors (number x width x thickness)	mm	--	Max. 2 x (10 x 15.5 x 0.8)	--	--
	• AWG cables, solid or stranded	AWG	--	Max. 2 x 3/0	--	--
Screw terminals	**Main conductors**					
	Without box terminal/busbar connection					
	• Finely stranded with cable lug	mm^2	--	16 ... 95[1]	50 ... 240[2]	50 ... 240[2]
	• Stranded with cable lug	mm^2	--	25 ... 120[1]	70 ... 240[2]	70 ... 240[2]
	• AWG cables, solid or stranded	AWG	--	4 ... 250 kcmil	2/0 ... 500 kcmil	2/0 ... 500 kcmil
	• Connecting bar (max. width)	mm	--	17	25	60
	• Terminal screws		--	M8 x 25 (A/F13)	M10 x 30 (A/F17)	M12 x 40
	- Tightening torque	NM lb.in	-- --	10 ... 14 89 ... 124	14 ... 24 124 ... 210	20 ... 35 177 ... 310

1) When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm^2 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 mm^2 and more as well as DIN 46235 for conductor cross-sections of 185 mm^2 and more to keep the phase clearance.

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		
	- Tightening torque	NM	0.8 ... 1.2
		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	

For Operation in the Control Cabinet

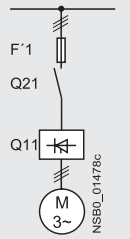
3RW Soft Starters

Circuit Breaker SCCR

Soft starters		Circuit Brakers																	
ToC 1		Thermal Magnetic						Instantaneous Trip						Fuse					
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	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	Others permitted
ED63A	HED63A, HHED63A or CED63A
FXD63A	HFXD63A or CFD63A
JXD63A	HJXD63A or CJD63A
ED63B	HED63B, HHED63B or CED63B
FD63B	HFD63B, HHFD63B or CFD63B
JD63B	HJ63B, HHJD63B or CJD63B
HND6	HNXD6 or CND6

Inline circuit fused version with 3NE1 SITOR all-range fuse (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"

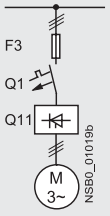
Soft starters		All-range fuses				Line contactors up to 400 V	Braking contactors[1)2)] (for example circuit see page 17-257)	
ToC 2	Rated current		Rated current	Voltage	Size	(optional)		
Q11 Type	A	F'1 Type	A	V		Q21 Type	Q91 Type	Q92 Type
Type of coordination "2"[3)]: I_q = 65 kA								
3RW44 22	29	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

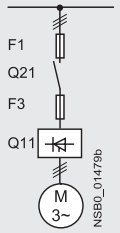
1) If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the 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 rwww.siemens.com/sitor —>"Products" —>"BETA Protecting" —>"SITOR"

Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
ToC 2	Rated current	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"[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			

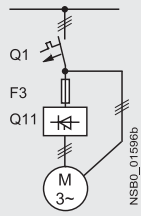
Soft starters		Line contactors up to 400 V	Braking contactors[1)2)] (for example circuit see page 17-251)		Motor starter protectors/ circuit breakers		Line protection, maximum		
ToC 2	Rated current	(optional)			440 V +10 %	Rated current	690 V +5 %	Rated current	Size
Q11 Type	A	Q21 Type	Q91 Type	Q92 Type	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

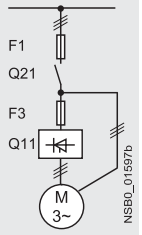
1) If the ramp-down function "Combined braking" is selected, no braking contactor is required. If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the 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".

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		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
ToC 2	Rated current	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			

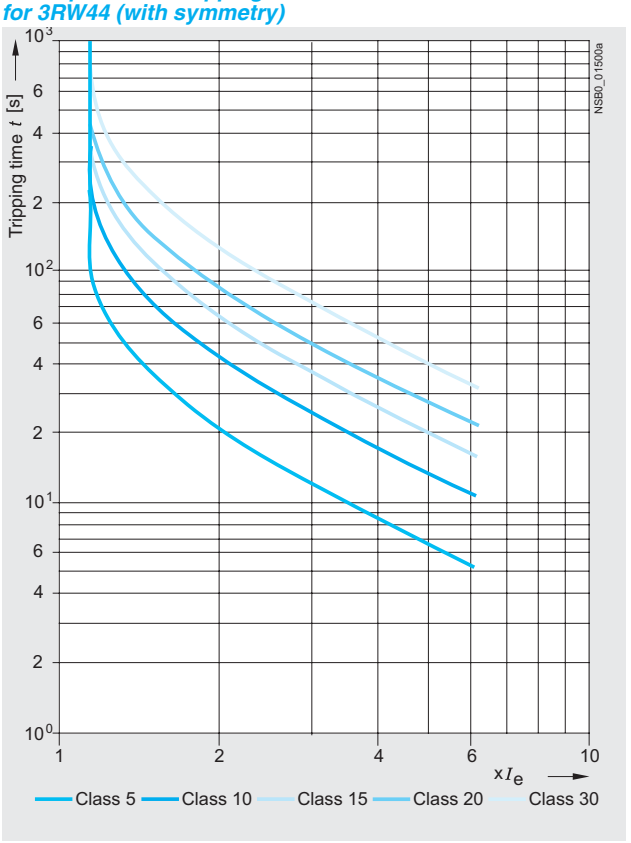
Soft starters		Line contactors up to 400 V	Motor starter protectors/ circuit breakers		Line protection, maximum		
ToC 2	Rated current	(optional)	440 V +10 %	Rated current	690 V +5 %	Rated current	Size
Q11 Type	A	Q21 Type	Q1 Type	A	F1 Type	A	
Type of coordination "2" [1]							
3RW44 22	50	3RT10 36-1AP04	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 44-0CM7	3VL57 63	800	3 x 3NA3 365-6	3 x 500	3
3RW44 46	617	3TF68 44-0CM7	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.

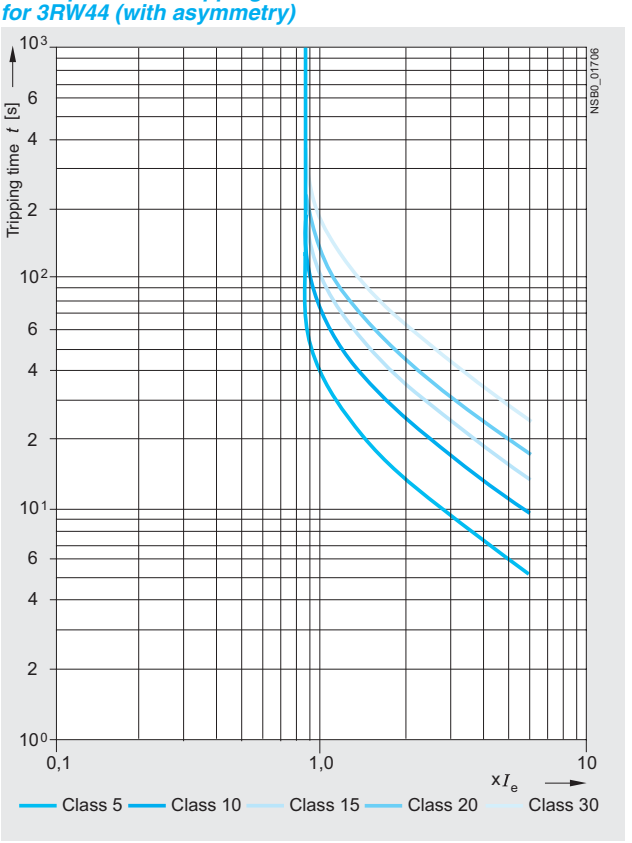
The types of coordination are explained under "3RA1 Fuseless Load Feeders".

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.

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n\ motor}$),
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 x I_M	4 x 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 % $I_{n\ motor}$),
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 x I_M	4 x I_M	4 x 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 % $I_{n\ motor}$),
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 x I_M	4 x I_M	4 x I_M	4 x 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.

For Operation in the Control Cabinet

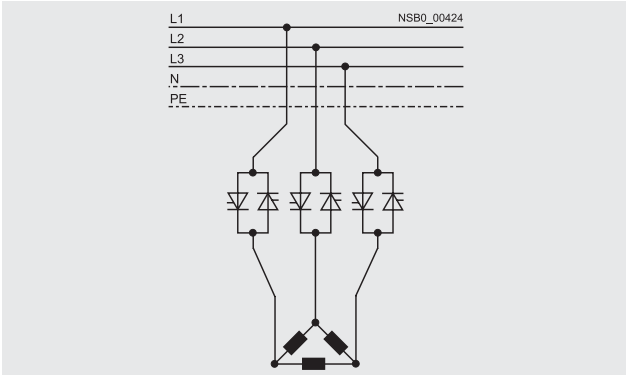
3RW Soft Starters

Circuit concept

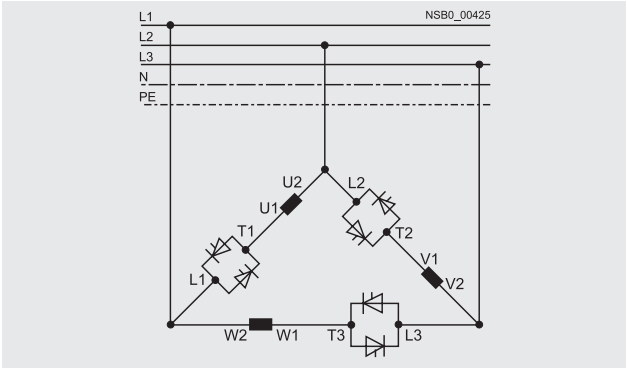
The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

- 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_e corresponds to the rated motor current I_n,
3 cables to the motor



Inside-delta circuit:
Rated current I_e 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 loading 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



Controls Express

Soft Starters at the speed you need

We have taken the most popular modifications in our Class 74 family of enclosed 3RW44 soft starters, included them in a standard part number, and have them in stock and ready to ship within 1-3 days. By ordering the select styles, customers can now receive these enclosed soft starters 85% faster than standard lead times.

Faster delivery is not the only benefit. By offering a limited range of select styles with modifications, selection is simple.

The Controls Express Soft Starter stock offering includes the following:

- 3RW44 for handling the widest range of applications
- Circuit breaker disconnect to provide short circuit protection
- NEMA 4 rated enclosure to provide flexible application including outdoor ratings and can be used in place of NEMA 1, 12 or 3R enclosures
- 480/240V - 120V Control Power Transformer built-in (factory configured for 480V)
- Built-in pilot devices include a run pilot light, a start pushbutton, and a HOA selector switch for the most common user interaction

Controls Express lead times apply to orders of up to 2 units of the Class 74 starters in the table below.

Please contact customer service at 1-866-663-7324 for lead times of larger order volumes.

For more information on Controls Express and a complete list of available products, please visit our website at www.usa.siemens.com/controls-express.

Rated Operating Current	Max HP				Coil Voltage	Enclosure
	200 Volts	230 Volts	460 Volts	575 Volts		NEMA 4
						Catalog Number
117	30	40	75	—	120V	**74HT34EFAPS3FA**
145	40	50	100	—	120V	**74JT34EFAPS3FA**
215	60	75	150	—	120V	**74LT34EFAPS3FA**
280	75	100	200	—	120V	**74MT34EFAPS3FA**
385	125	150	300	—	120V	**74PT34EFAPS3FA**

*HP ratings are at standard Class 10 light duty rating (350% * FLA for less than 10s). Start times greater than 10s should be derated one ize up for a maximum 20s start time.*

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.

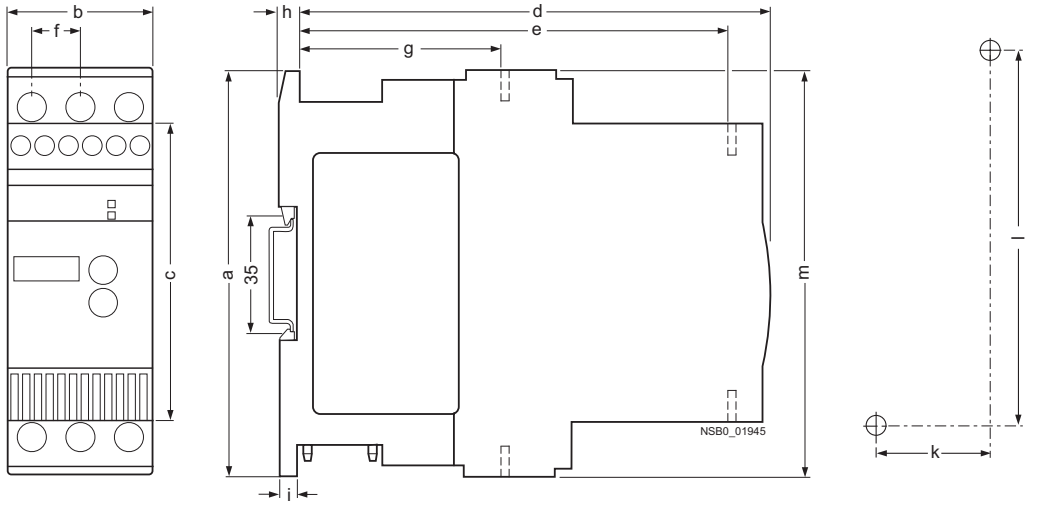
The Win-Soft Starter selection and simulation program can be downloaded from: www.usa.siemens.com > Software

More information can be found on the Internet at: www.usa.siemens.com

Dimensional drawings

3RW30 for standard applications

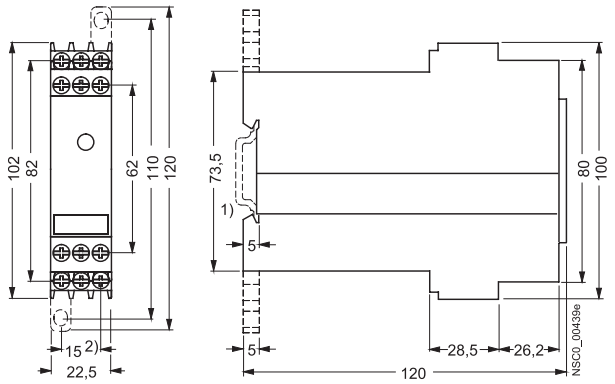
3RW30 1. ... 3RW30 4.



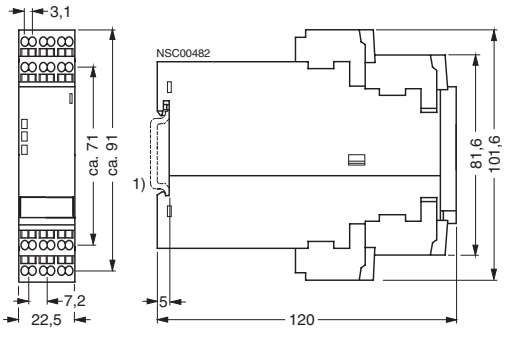
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW30 1.-1.	95	45	62	146	126	14.4	63	5	6.5	35	85	95
3RW30 1.-2.	95	45	62	146	126	14.4	63	5	6.5	35	85	117.2
3RW30 2.-1.	125	45	92	146	126	14.4	63	5	6.5	35	115	125
3RW30 2.-2.	125	45	92	146	126	14.4	63	5	6.5	35	115	150
3RW30 3.	160	55	110	163	140	18	63	5	6.5	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)



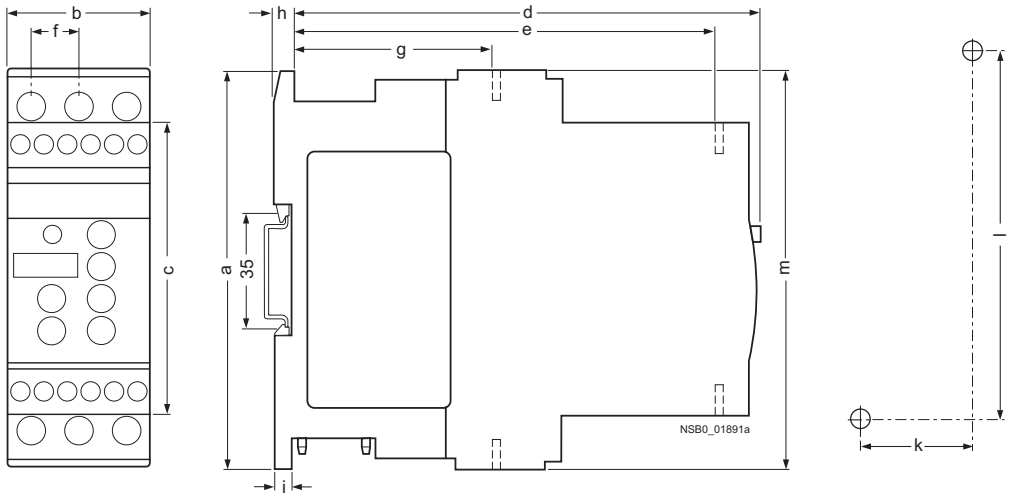
3RW30 03-2. (spring-type terminals)



1) For mounting onto standard mounting rail TH 35 according to EN 60715.

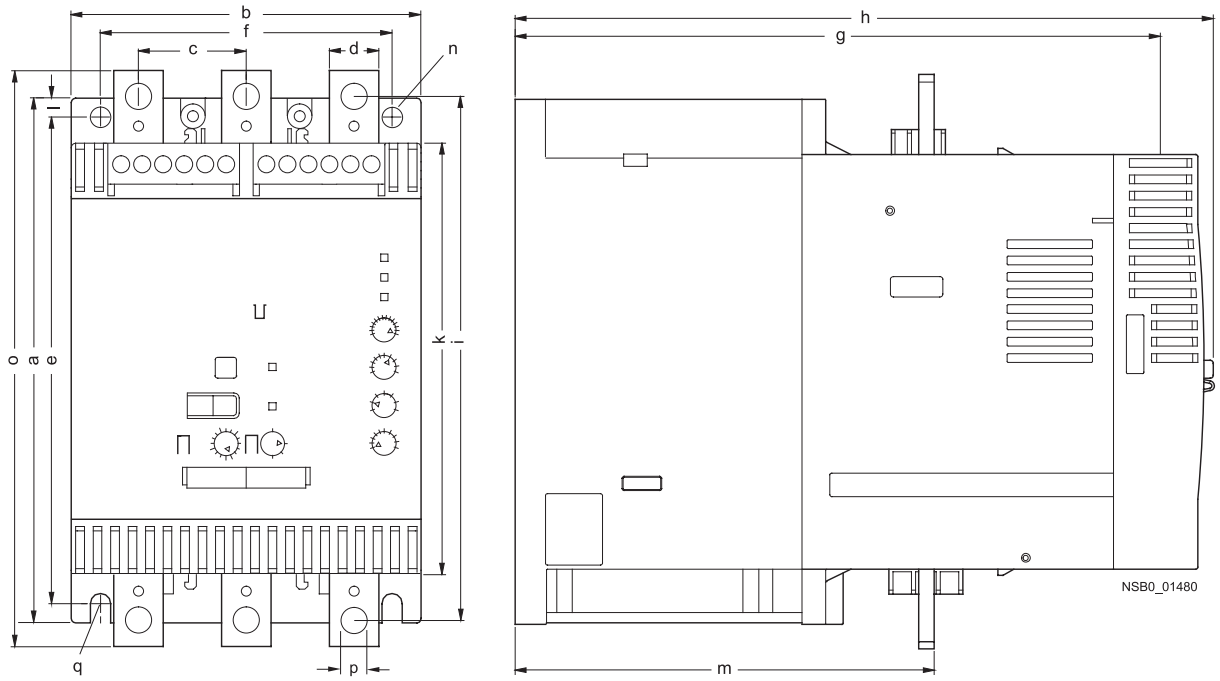
2) Dimension for screw fixing.
Screw fixing with two 3RP1 903 push-in lugs per 3RW30 03 device.

3RW40 for standard applications



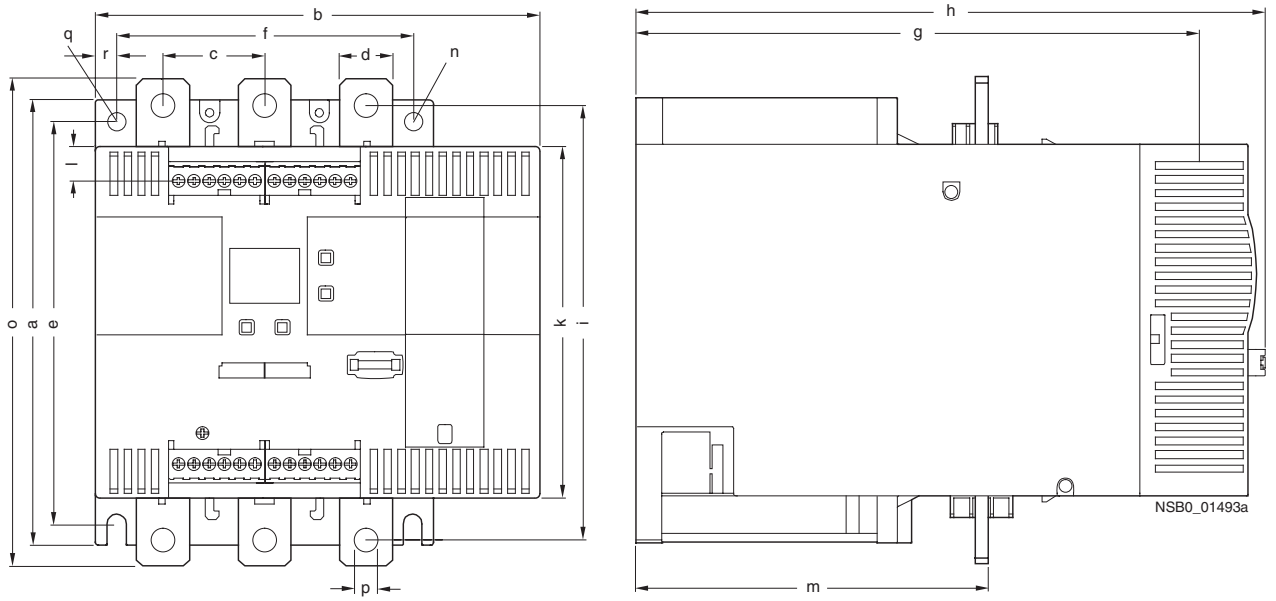
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW40 2.-1.	125	45	92	149	126	14.4	63	5	6.5	35	115	125
3RW40 2.-2.	125	45	92	149	126	14.4	63	5	6.5	35	115	150
3RW40 3.	170	55	110	165	140	18	63	5	6.5	30	150	144
3RW40 4.	170	70	110	183	158	22.5	85	5	10	60	160	160

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



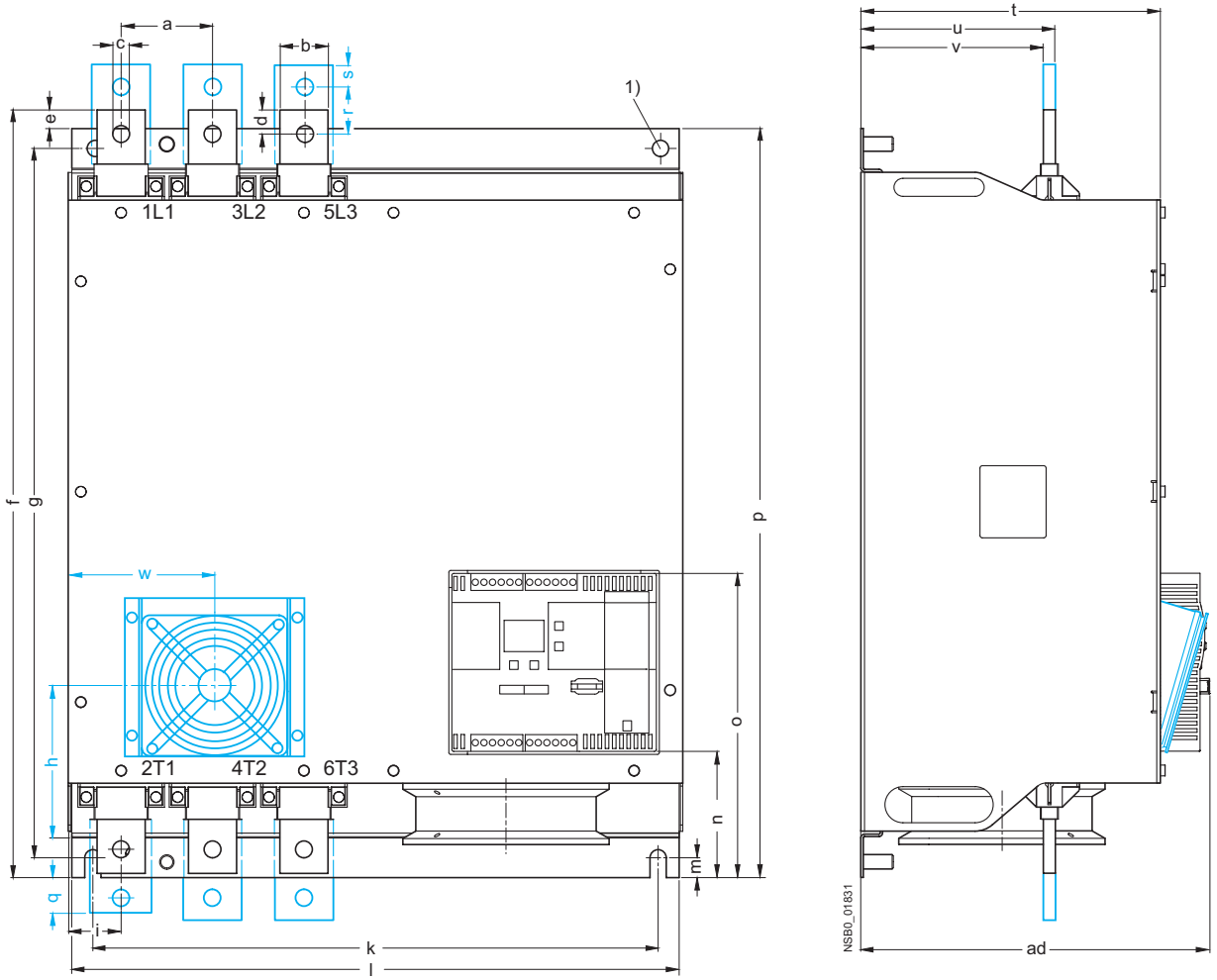
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
3RW40 5.	180	120	37	17	167	100	223	250	180	148	6.5	153	7	198	9	M6, 10 Nm
3RW40 7.	210	160	48	25	190	140	240	278	205	166	10	166	9	230	11	M8, 15 Nm

3RW44 2., 3RW44 3. and 3RW44 4. for High-Feature applications



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

3RW44 5. and 3RW44 6. for High-Feature applications

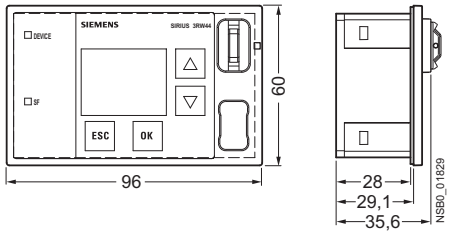


1) For M12 screw, tightening torque max. 35 Nm (310 lb.in).

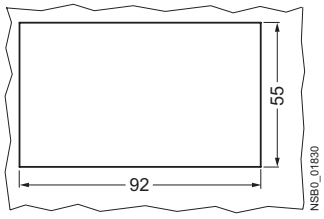
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW44 5.	76	40	14	20	15.5	638.5	590	--	44	470	510	16.5
3RW44 6.	85	50	14	--	--	667	660	160	37.5	535	576	16.5

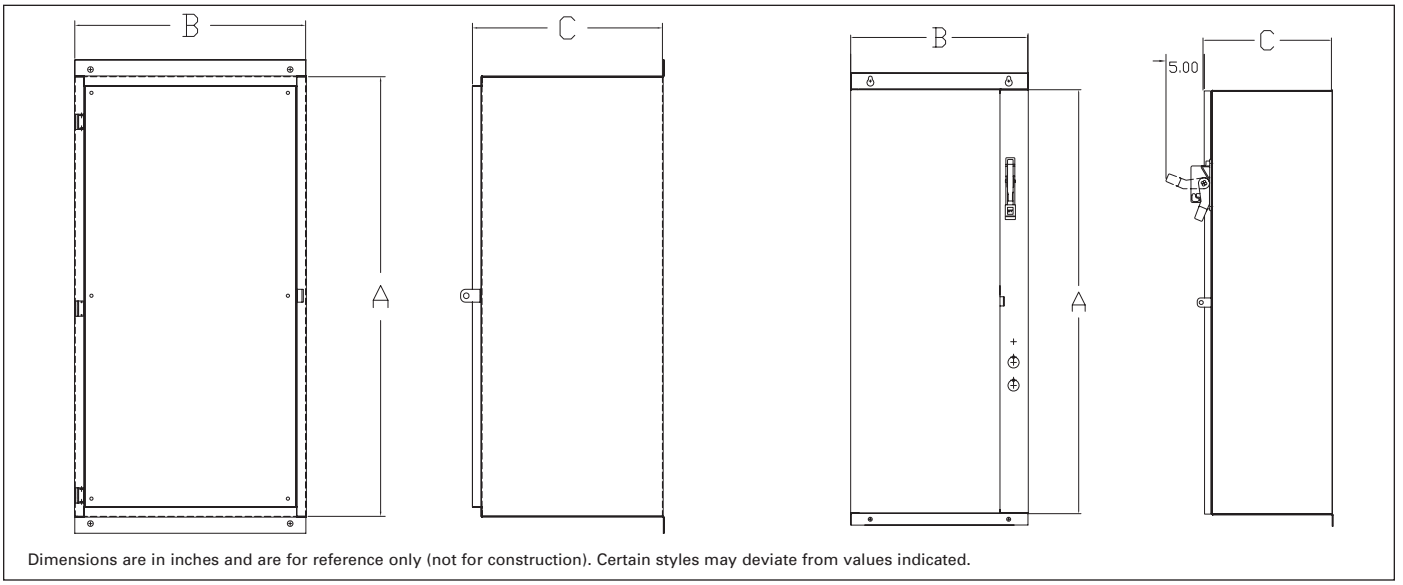
Type/Dimension (mm)	n	o	p	q	r	s	t	u	v	W	ad
3RW44 5.	105	253	623	--	--	--	249	162	152	--	290
3RW44 6.	103	251	693	43.5	40	20	249	162	151.4	123	290

3RW49 00-0AC00 external display and operator module



Installation cutout for 3RW49 00-0AC00 external display and operator module





Dimensions are in inches and are for reference only (not for construction). Certain styles may deviate from values indicated.

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

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 - 1076	90	40①	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

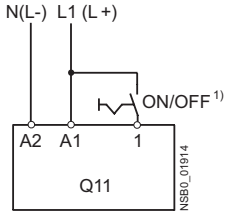
	Amps	A	B	C
3RW40	117-145	76	30	20
3RW44	26-145	76	30	20

① Add 4" for N4.

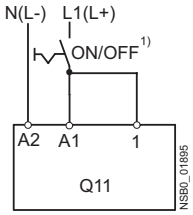
Schematics

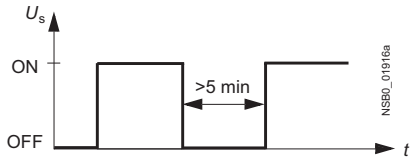
3RW30 . . connection examples for control circuit

Control using switches

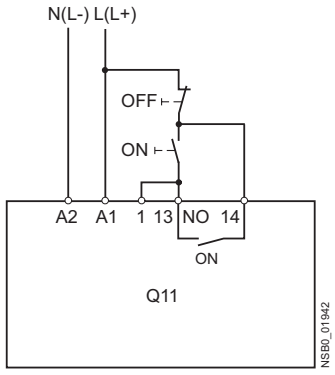


Automatic mode

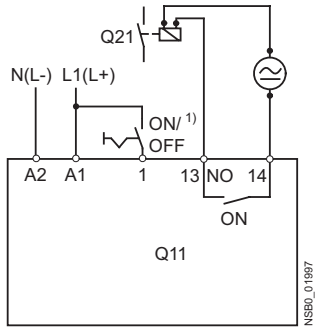




Control by pushbutton

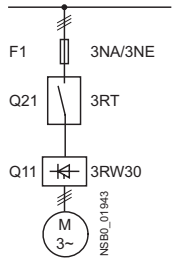


Control of a main contactor

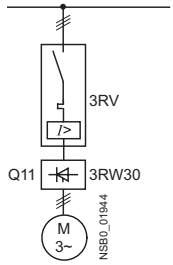


3RW30 connection examples for main circuit[2)]

3RW30 – 3-phase motor with 3NA/3NE fuse



3RV motor starter protector

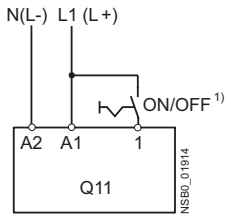


1) **Caution: Risk of restarting!**
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

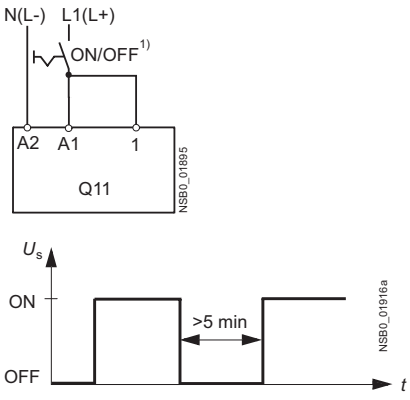
2) As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. For fuse and switching device coordination, see "Technical specifications".
The wiring diagrams are provided only as examples.

3RW40 2. ... 3RW40 4. connection examples for control circuit

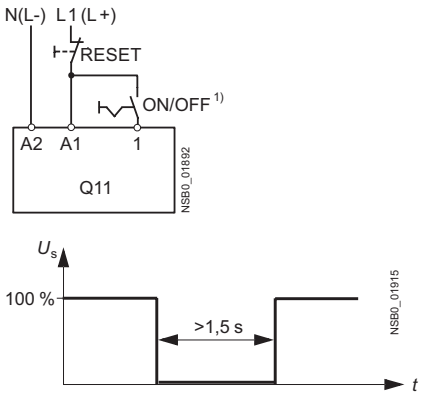
Control using switches



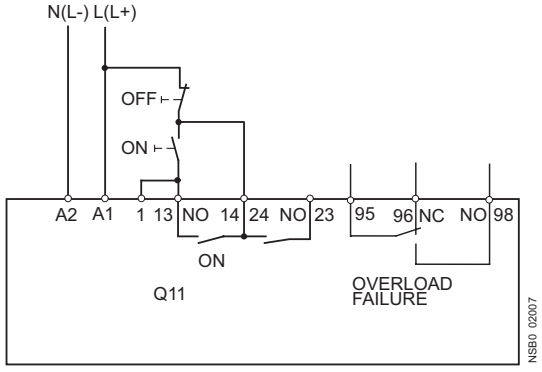
Automatic mode



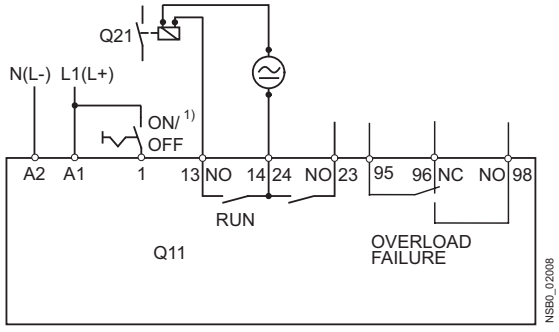
Control with remote reset



Control of 3RW40 2. ... 3RW40 4. by pushbutton

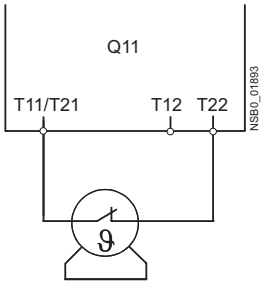


Control of a main contactor

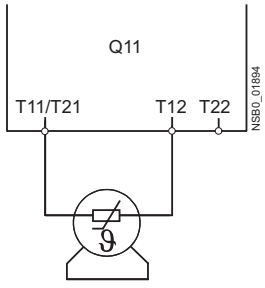


Connection example of 3RW40 2. ... 3RW40 4. for PTC sensors (thermistor motor protection)

Thermoclick



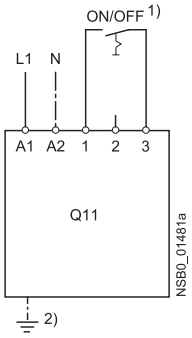
PTC type A



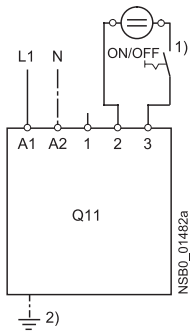
1) **Caution: Risk of restarting!**
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

3RW40 5. and 3RW40 7. connection examples for control circuit

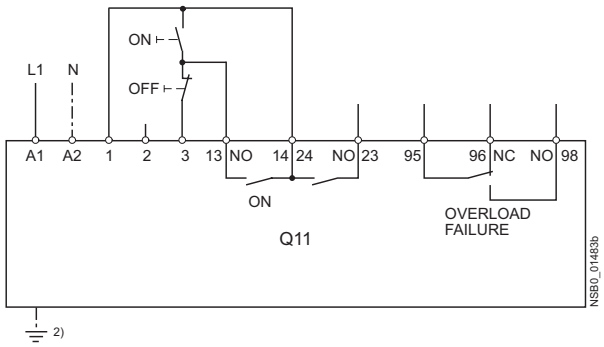
Control by switch using internal 24 V DC supply



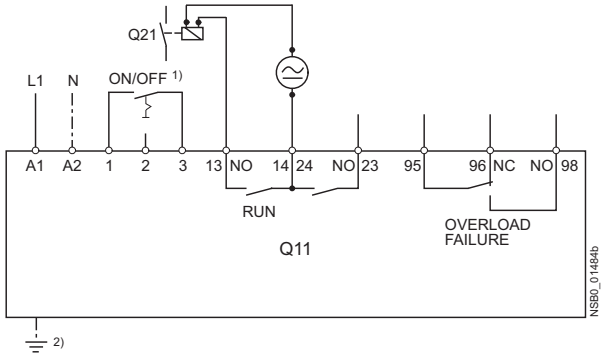
external power supply



Control by pushbutton

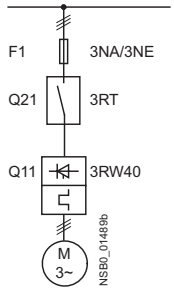


Control of a main contactor

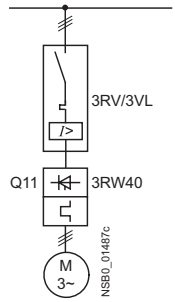


3RW40 connection examples for main circuit[3)]

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.

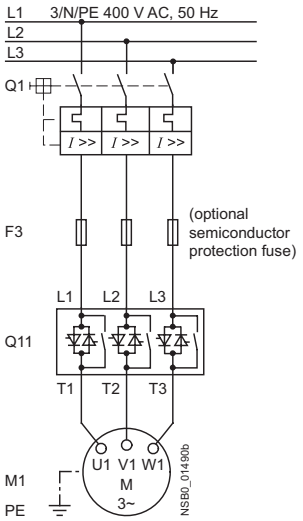
2) Grounding necessary for fan connection to 3RW40 5...

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

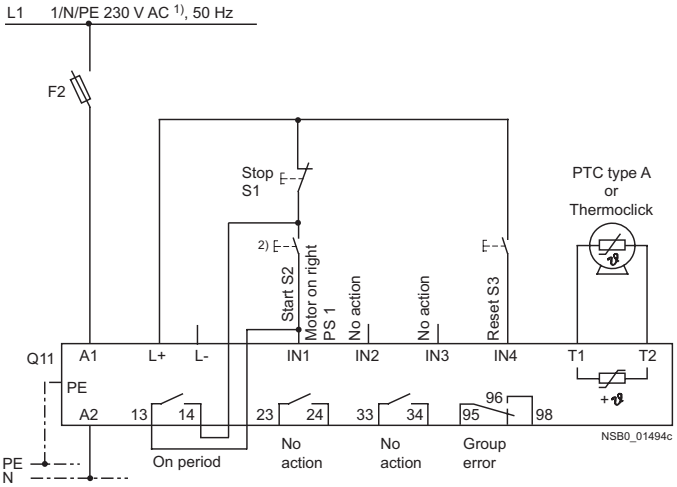
Main circuit

Possibility 1a:
Inline circuit with motor starter protector and SITOR fuse
(semiconductor protection only)



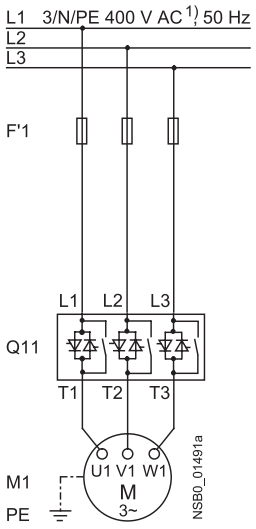
Control circuit

Possibility 1:
Control by pushbutton

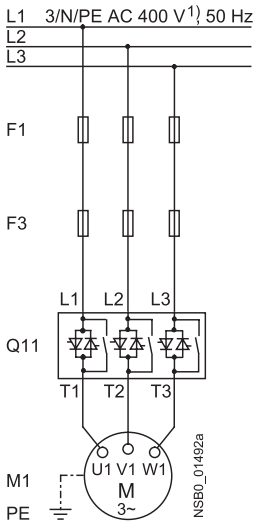


Main circuit

Possibility 1b:
Inline circuit with all-range protection
(line and semiconductor protection)



Possibility 1c:
Inline circuit with line and SITOR fuse
(semiconductor protection only)

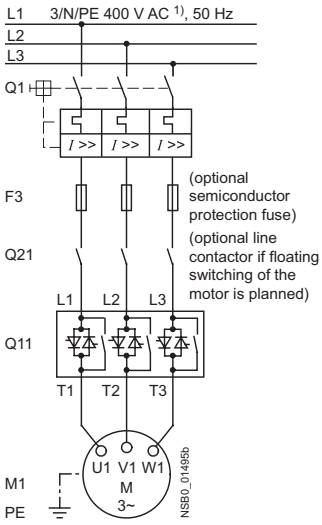


1) Permissible values for main and control voltage, see "Technical specifications".

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".

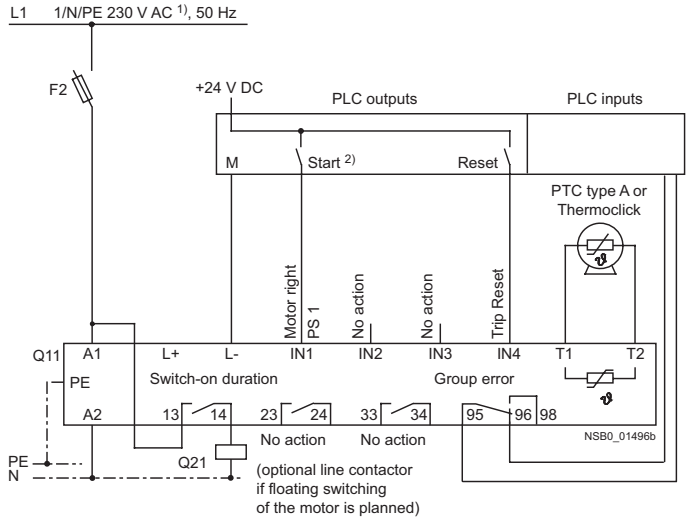
Main circuit

Possibility 2:
Inline circuit with main contactor



Control circuit

Possibility 2:
Control of a main contactor and control by means of PLC

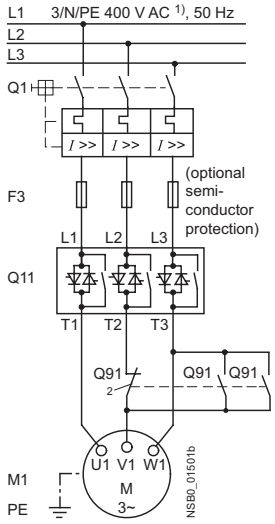


1) Permissible values for main and control voltage, see "Technical specifications".

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.

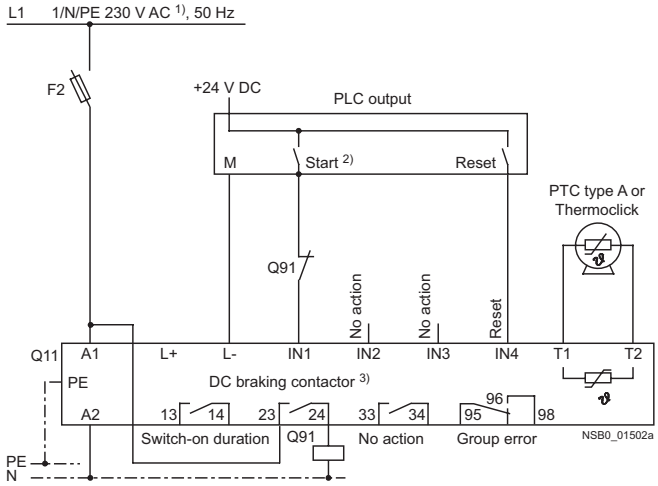
Main circuit

Possibility 3a:
Inline circuit with ramp-down function DC braking[3)]
(for device types 3RW44 22 to 3RW44 25)



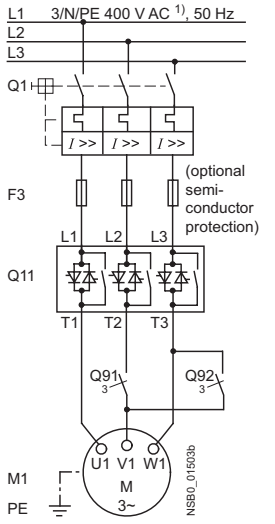
Control circuit

Possibility 3a:
Control of the DC braking contactor[3)]



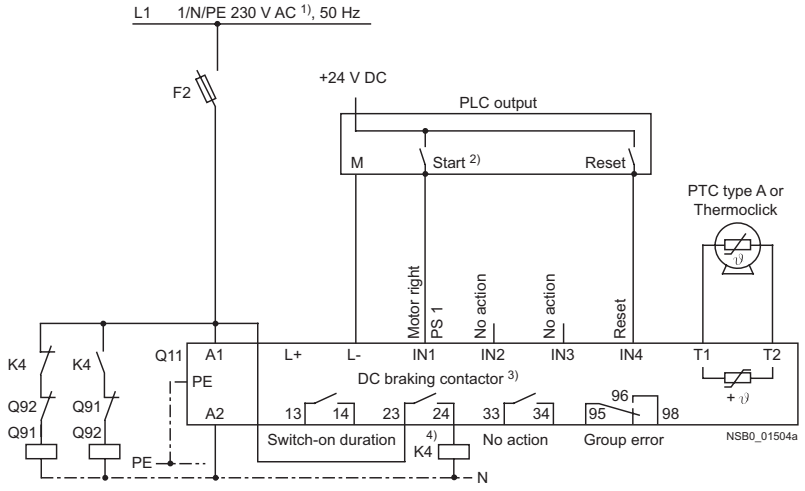
Main circuit

Possibility 3b:
Inline circuit with ramp-down function DC braking[3)]
(for device types 3RW44 26 to 3RW44 47)



Control circuit

Possibility 3b:
Control of the DC braking contactor[3)]



1) Permissible values for main and control voltage, see "Technical specifications".

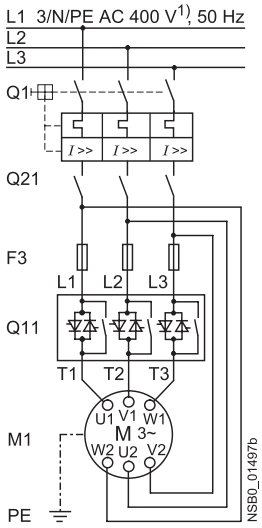
2) **Caution: Risk of restarting!**
The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.
For safety 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 17-234 to 17-236.
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".

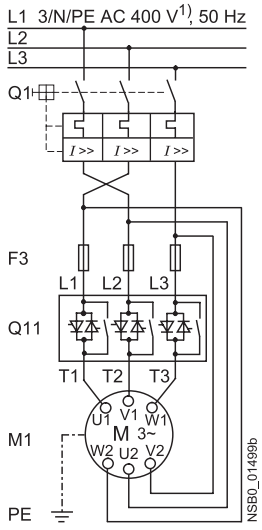
4) Auxiliary relay K4, e. g.:
LZX:RT4A4T30 (230 V AC rated control supply voltage),
LZX:RT4A4S15 (115 V AC rated control supply voltage).

Main circuit

Possibility 4a:
Inside-delta circuit

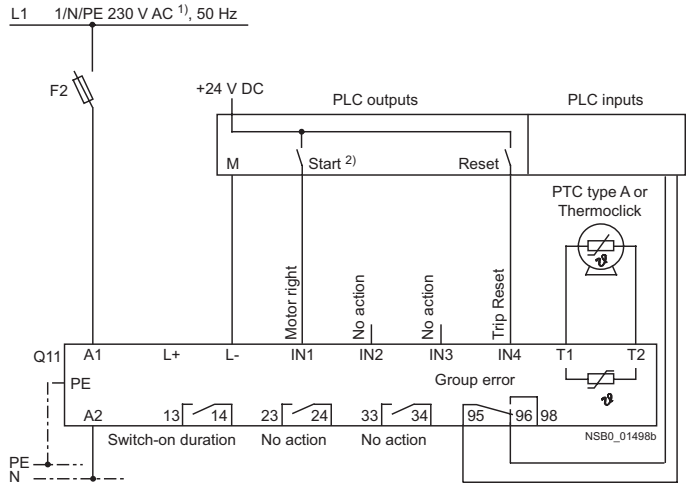


Possibility 4b:
Change of direction of rotation for inside-delta circuit



Control circuit

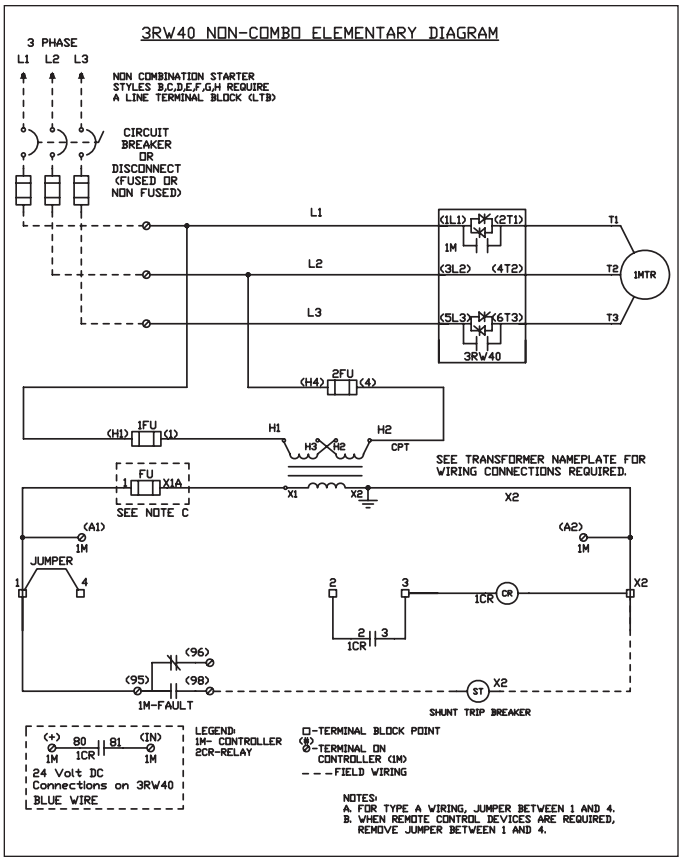
Possibility 4:
Control by means of PLC



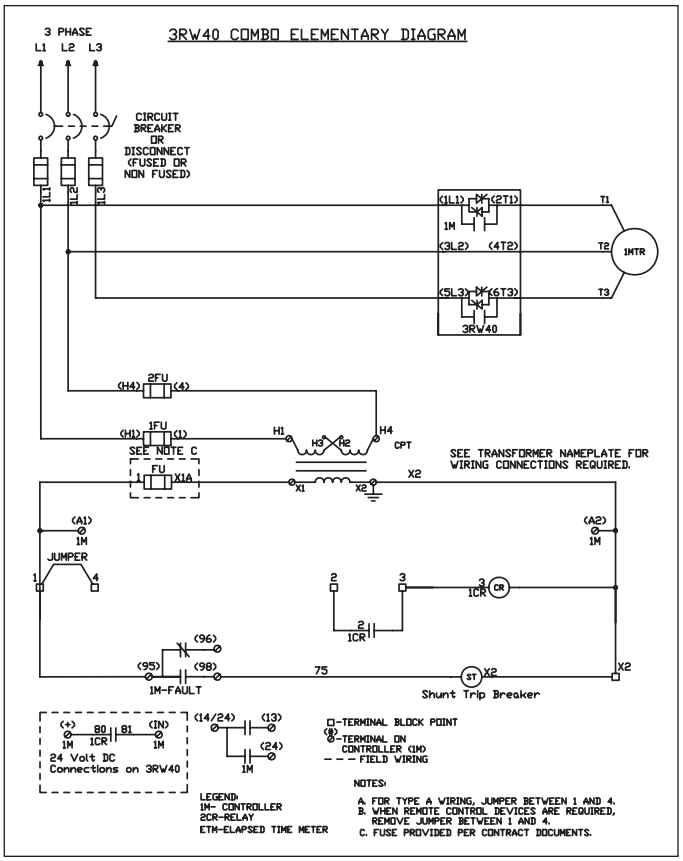
1) Permissible values for main and control voltage, see "Technical specifications".

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.

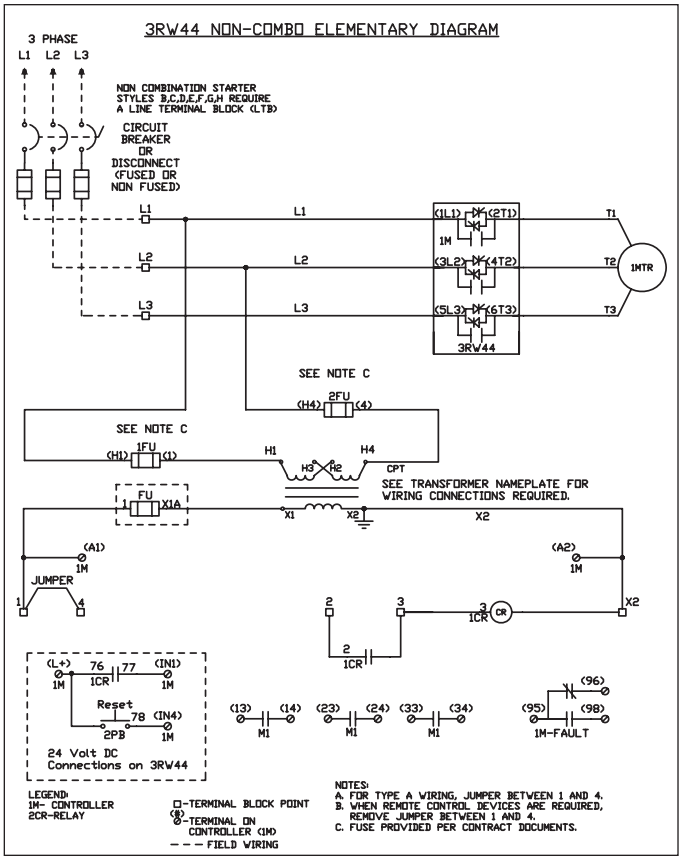
3RW40 NON-COMBO ELEMENTARY DIAGRAM



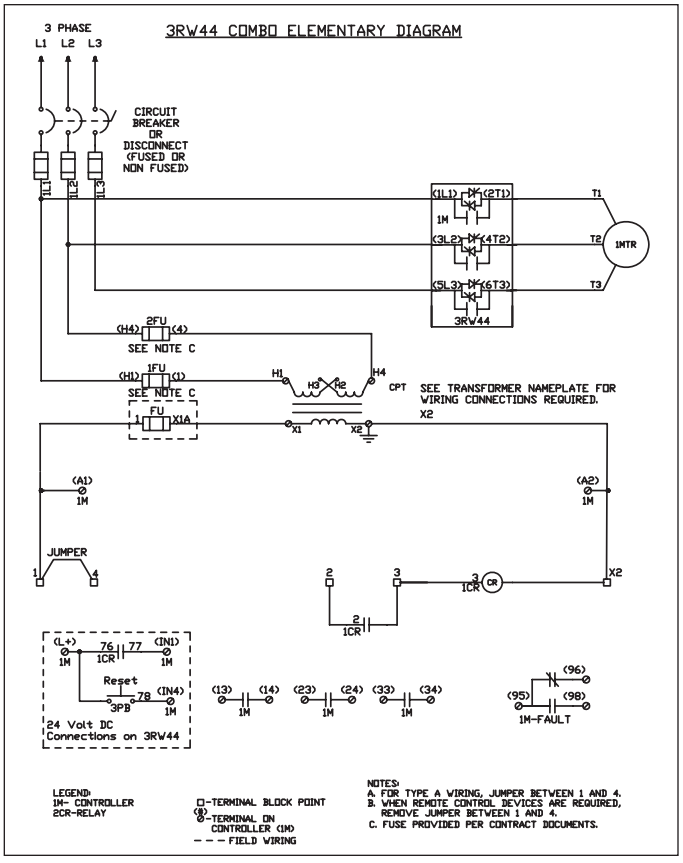
3RW40 COMBO ELEMENTARY DIAGRAM



3RW44 NON-COMBO ELEMENTARY DIAGRAM



3RW44 COMBO ELEMENTARY DIAGRAM



• Revised •
03/01/14

Notes

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

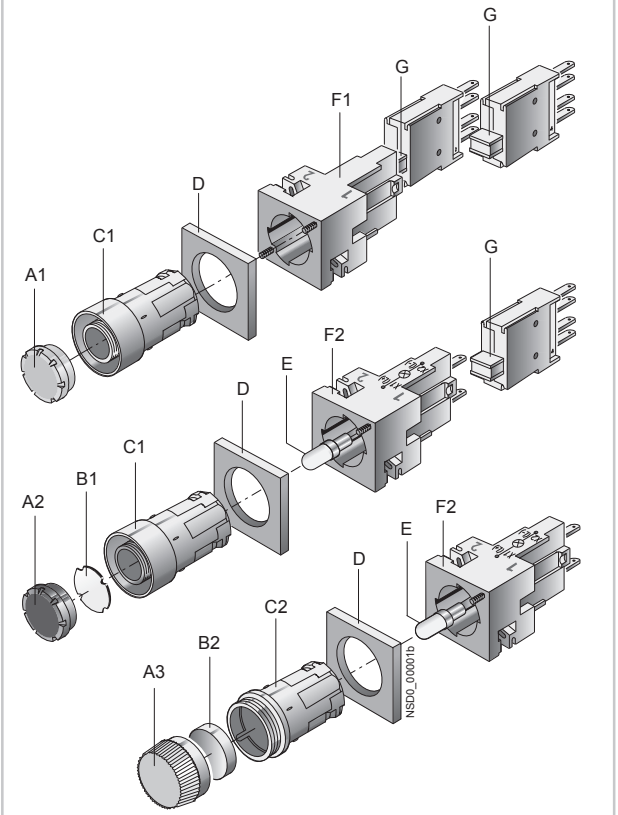
Overview

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.

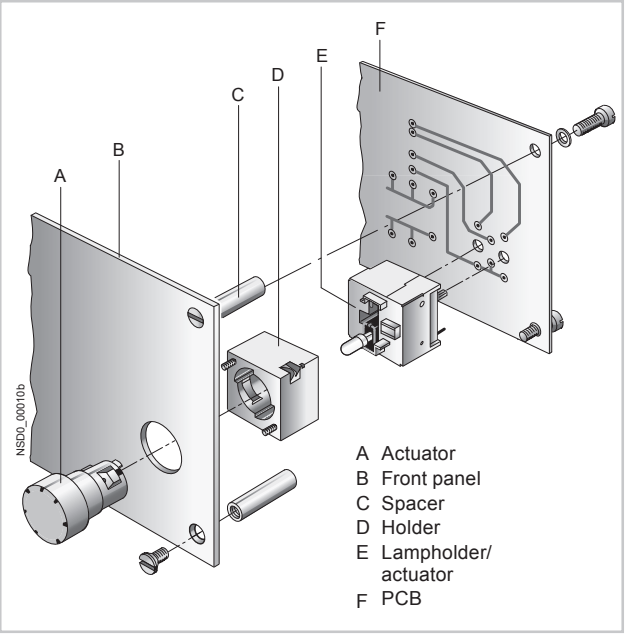
Version with flat connector



A1 Button, flat
A2 Illuminated button, flat
A3 Screw lens for indicator light
B1 Insert label, for labeling
B2 Insert cap, for labeling
C1 Collar with extruded front ring
C2 Collar for indicator light
D Frame for rectangular design
E Wedge base lamp, W2 x 4.6d
F1 Holders
F2 Lampholder with holder
G Contact blocks (1NO or 1NC) for snapping onto the holder or onto the lampholder

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 × 0.8 mm solder pins of length 3.5 mm.



A Actuator
B Front panel
C Spacer
D Holder
E Lampholder/ actuator
F PCB

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.

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 ... 230 V	A	10
• Alternating current AC-15		
- At U_e = 24 ... 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		≤ 50 *g*
• Shock duration	ms	11
• Shock form		Half-sine

More technical information see Reference manual "Commanding and Signaling Devices".

Configuration

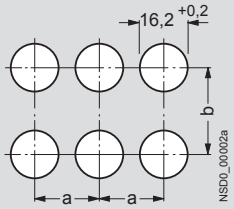
Design

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:

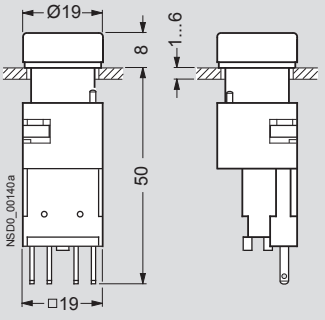
Mounting dimensions according to EN 50007
(not applicable to EMERGENCY-STOP mushroom push buttons)



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

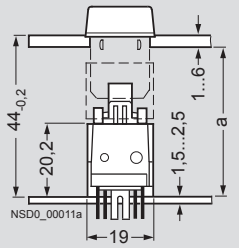
The command point comprises the actuator – e.g. 3SB2 push button, illuminated push button or indicator light –, which is mounted in the front plate, and a contact block and a lamp holder which are soldered to the PCB. For this purpose, the contact blocks and lamp holders are fitted with 0.8 mm × 0.8 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.



Length **a** of spacing bolts:
a = $44_{-0.2}$ minus front plate thickness.

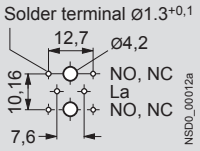
When using name plates, the length **a** is reduced by 0.8 mm.

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.



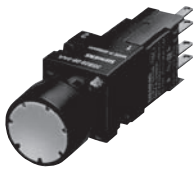
Solder pin spacing

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Complete units

Selection and ordering data

Version	Contact blocks	DT	Color of handle	Flat connectors Order No.	PS
 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
Illuminated push buttons with flat button Lamp holder W2 x 4.6 d[2]	1 NC		Red	**3SB22 07-0AC01**	1 unit
	1 NO		Yellow[1]	**3SB22 06-0AD01**	1 unit
	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
Illuminated push buttons with flat button Lamp holder W2 x 4.6 d with incandescent lamp 24 V	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
 Illuminated push button with raised button					
Push buttons with raised button	1 NO		Black	**3SB22 02-0LB01**	1 unit
	1 NC		Red	**3SB22 03-0LC01**	1 unit
	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
Illuminated push buttons with raised button Lamp holder W2 x 4.6 d[2]	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
Illuminated push buttons with raised button Lamp holder W2 x 4.6 d with incandescent lamp 24 V	1 NC		Red	**3SB22 27-0LC01**	1 unit
	1 NO		Yellow[1]	**3SB22 26-0LD01**	1 unit
	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
 EMERGENCY-STOP mushroom push button					
EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained[3] Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise, with yellow name plate, with inscription "NOT-HALT"	1 NC ➔[4]		Red	**3SB22 03-1AC01**	1 unit

[1] Inscription is possible by inserting a label.

[2] For wedge base lamps see "Accessories", page 17-306.

[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 Order No.	PS
 Selector switch	**Selector switches, 2 switch positions** Switching sequence O-I, 62° operating angle, maintained 	1 NO 1 NO 1 NO 1 NO	Black Red Green White		**3SB22 02-2AB01** **3SB22 02-2AC01** **3SB22 02-2AE01** **3SB22 02-2AG01**	1 unit 1 unit 1 unit 1 unit
	Selector switches, 3 switch positions Switching sequence I-O-II, 2 × 62° operating angle, maintained 	1 NO, 1 NO 1 NO, 1 NO 1 NO, 1 NO 1 NO, 1 NO	Black Red Green White		**3SB22 10-2DB01** **3SB22 10-2DC01** **3SB22 10-2DE01** **3SB22 10-2DG01**	1 unit 1 unit 1 unit 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 1 NO, 1 NO 1 NO, 1 NO 1 NO, 1 NO	Black Red Green White		**3SB22 10-2EB01** **3SB22 10-2EC01** **3SB22 10-2EE01** **3SB22 10-2EG01**	1 unit 1 unit 1 unit 1 unit

	Version	Contact blocks	Lock No.	Key removal position	DT	Flat connectors Order No.	PS
 CES key-operated switch	**CES key-operated switches, 2 switch positions** Switching sequence O-I, 62° operating angle, maintained 	1 NO 1 NO	SB2 SB2	O O + I		**3SB22 02-4LA01** **3SB22 02-4LB01**	1 unit 1 unit
	CES key-operated switches, 3 switch positions Switching sequence I-O-II, 2 × 62° operating angle, maintained 	1 NO, 1 NO 1 NO, 1 NO	SB2 SB2	O I + O + II		**3SB22 10-4PA01** **3SB22 10-4PB01**	1 unit 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 Order No.	PS
 Indicator light	**Indicator lights** Lamp holder W2 x 4.6 d without lamp[1]	Red Yellow Green White Clear		**3SB22 04-6BC06** **3SB22 04-6BD06** **3SB22 04-6BE06** **3SB22 04-6BG06** **3SB22 04-6BH06**	1 unit 1 unit 1 unit 1 unit 1 unit
	Indicator lights Lamp holder W2 x 4.6 d with incandescent lamp 24 V	Red Yellow Green White Clear		**3SB22 24-6BC06** **3SB22 24-6BD06** **3SB22 24-6BE06** **3SB22 24-6BG06** **3SB22 24-6BH06**	1 unit 1 unit 1 unit 1 unit 1 unit

[1] For wedge base lamps see "Accessories", page 17-306.

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Selection and ordering data

Version	Color of handle	DT	Order No.	PS
Push buttons				
 Push button and illuminated push button with flat button				
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 button and illuminated push button with raised button				
Push buttons with raised button	Black		**3SB20 00-0LB01**	1 unit
	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		**3SB20 01-0LC01**	1 unit
	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 button				
EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained[2] Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise	Red		**3SB20 00-1AC01**	1 unit

[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		**3SB20 00-2AB01**	1 unit
		Red		**3SB20 00-2AC01**	1 unit
		Green		**3SB20 00-2AE01**	1 unit
		White		**3SB20 00-2AG01**	1 unit
Selector switches with 2 switch positions Switching sequence O-I, 50° operating angle, momentary, spring return from right		Black		**3SB20 00-2BB01**	1 unit
		Red		**3SB20 00-2BC01**	1 unit
		Green		**3SB20 00-2BE01**	1 unit
Selector switches with 2 switch positions Switching sequence O-I, 90° operating angle, maintained		Black		**3SB20 00-2HB01**	1 unit
		Red		**3SB20 00-2HC01**	1 unit
		Green		**3SB20 00-2HE01**	1 unit
		White		**3SB20 00-2HG01**	1 unit
Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 62° operating angle, maintained		Black		**3SB20 00-2DB01**	1 unit
		Red		**3SB20 00-2DC01**	1 unit
		Green		**3SB20 00-2DE01**	1 unit
		White		**3SB20 00-2DG01**	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		**3SB20 00-2EB01**	1 unit
		Red		**3SB20 00-2EC01**	1 unit
		Green		**3SB20 00-2EE01**	1 unit
		White		**3SB20 00-2EG01**	1 unit
Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 90° operating angle, maintained		Black		**3SB20 00-2JB01**	1 unit

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 17-303

Selection and ordering data

Version	Diagram	Operating travel ▭ Contact closed ▭ Contact open	DT	**Flat connectors**	PS
				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

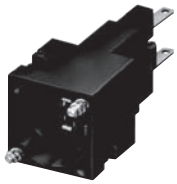


Holder

Holders for 2 contact blocks
Inscription with identification number 1-2

3SB29 08-0AA — 5 units

Lamp holders with holder for fixing the actuator and the contact blocks



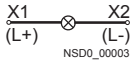
Lamp holder

Lamp holders
W2 x 4.6 d
without lamp

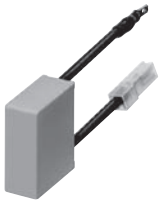


3SB23 04-2A — 1 unit

Lamp holders
W2 x 4.6 d



- With 6 V incandescent lamp — **3SB23 04-2F** — 1 unit
- With 24 V incandescent lamp — **3SB23 04-2H** — 1 unit



Voltage reducer

Voltage reducers[1]
For connecting the 3SB29 08-1AE lamp (48 V) to 230 V AC



3SB24 04-3D — 1 unit

Contact blocks for fixing in the holder or lamp holder

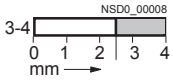


Contact block

Contact blocks with one contact[2]

1 NO

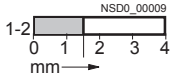




3SB24 04-0B — 1 unit

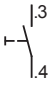
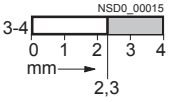
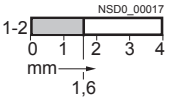
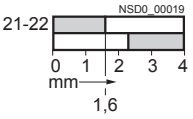
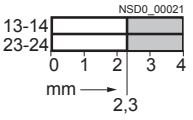
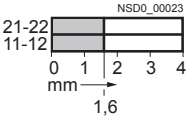
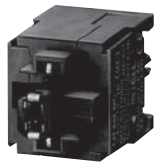
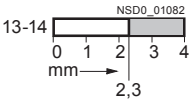
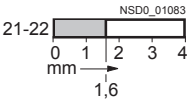
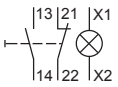
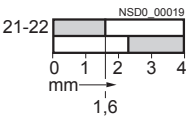
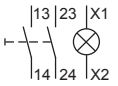
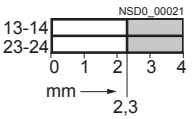
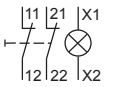
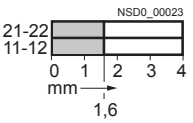
1 NC ⊖[3]





3SB24 04-0C — 1 unit

[1] Use fixpoint terminal according to IEC 60439-1.
[2] For plug-in and insulation sleeves see "Accessories", page 17-307.
[3] Positive opening according to IEC 60947-5-1, Appendix K.

Version	Diagram	Operating travel Contact closed Contact open	DT	**Solder pin connections** Order No.	PS
Contact blocks and lamp holders with solder pins					
 Holder **Holders for contact block with solder pins** For fixing the actuators in the front panel				**3SB29 08-0AB**	5 units
Lamp holders Wedge base W2 x 4.6 d[1]				**3SB24 55-2A**	1 unit
Contact blocks					
 Contact block with solder pins 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 blocks and lamp holders, wedge base W2 x 4.6 d[1]					
 Contact block and lamp holder with solder pins 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

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

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
K3Y
Z = 1118 ISO

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Name plates

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 × 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			**3SB29 01-2XZ**	
(see Options)			**K0Y**	1 unit
			K1Y, K2Y or **K3Y**	1 unit
			K5Y	1 unit
			K9Y	1 unit
Label holders				
 **Label holders for inscription labels** The label holders must not be used with the 3SB2...-1AC01 EMERGENCY-STOP mushroom push button.			**3SB29 02-0AB**	1 unit

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

Selection and ordering data

	Version	Lamp voltage V	Color	DT	Order No.	PS
Buttons and lenses[1]						
 3SB29 10-0AF	**Buttons, flat** For push buttons		Black Red Yellow Green Blue White Clear		**3SB29 10-0AB** **3SB29 10-0AC** **3SB29 10-0AD** **3SB29 10-0AE** **3SB29 10-0AF** **3SB29 10-0AG** **3SB29 10-0AH**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 3SB29 10-0CF	**Buttons, flat** For illuminated push buttons		Red Yellow Green Blue White Clear		**3SB29 10-0CC** **3SB29 10-0CD** **3SB29 10-0CE** **3SB29 10-0CF** **3SB29 10-0AG** **3SB29 10-0AH**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 3SB29 10-0BD	**Buttons, raised** For push buttons		Black Red Yellow Clear		**3SB29 10-0BB** **3SB29 10-0BC** **3SB29 10-0BD** **3SB29 10-0BH**	1 unit 1 unit 1 unit 1 unit
 3SB29 10-0DD	**Buttons, raised** For illuminated push buttons		Red Yellow Clear		**3SB29 10-0DC** **3SB29 10-0DD** **3SB29 10-0BH**	1 unit 1 unit 1 unit
 3SB29 10-1AD	**Screw lenses** With concentric rings		Red Yellow Green Blue White Clear		**3SB29 10-1AC** **3SB29 10-1AD** **3SB29 10-1AE** **3SB29 10-1AF** **3SB29 10-1AG** **3SB29 10-1AH**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 3SB29 10-1BE	**Screw lenses** Smooth, for inscription with insert cap		Red Yellow Green Blue Clear		**3SB29 10-1BC** **3SB29 10-1BD** **3SB29 10-1BE** **3SB29 10-1BF** **3SB29 10-1BH**	1 unit 1 unit 1 unit 1 unit 1 unit
Key for actuators						
 3SB29 08-2AJ	**Keys** For CES key-operated switch, lock No. SB2				**3SB29 08-2AJ**	1 unit
Lamps, wedge bases[2]						
 3SB29 08-1AE	**Incandescent lamps** Wedge base W2 × 4.6 d, 1.0 W	AC/DC 6 12 24 30 48 60	Clear		 **3SB29 08-1AA** **3SB29 08-1AB** **3SB29 08-1AC** **3SB29 08-1AD** **3SB29 08-1AE** **3SB29 08-1AF**	 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 3SB39 01-1SB	**LED lamps, super-bright** Wedge base W2 × 4.6 d	24 AC/DC	Red Yellow Green White Blue		**3SB39 01-1SE** **3SB39 01-1RB** **3SB39 01-1TB** **3SB39 01-1UB** **3SB29 08-1BD**	1 unit 1 unit 1 unit 1 unit 1 unit
 3SB29 08-1BD		28 AC/DC	Red Yellow Green White Blue		**3SB39 01-1SE** **3SB39 01-1RE** **3SB39 01-1TE** **3SB39 01-1UE** **3SB39 01-1VE**	1 unit 1 unit 1 unit 1 unit 1 unit
 3SB29 08-1AB	**Lamp extractors** For lamps with bases W2 × 4.6 d				**3SB29 08-2AB**	1 unit

[1] Included in the scope of supply of actuators or indicator lights.

[2] Included in the scope of supply of some complete units.

	Version	DT	Order No.	PS
Accessories for command points				
 3SB29 02-0AA	**Single frames** for square design[1]		**3SB29 02-0AA**	1 unit
 3SB29 08-2AG	**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
 3SB29 08-3AA	**Blanking plugs** Black plastic (degree of protection IP65)		**3SB29 08-3AA**	1 unit
 3SB29 08-1	**Protective caps, clear** Silicone, for push buttons with flat and raised button		**3SB29 08-3AB**	1 unit
Flat connectors				
 3SB29 08-8AA	**Plug-in sleeves** For flat connectors 2.8 × 0.8 mm, cross-section 0.5 ... 1.5 mm^2		**3SB29 08-8AA**	1unit
 3SB29 08-8AB	**Insulation sleeves** For flat connectors, connection from the front		**3SB29 08-8AB**	1 unit
 3SB29 08-8AD	**Complete connectors**[2] 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
 3SB29 08-8AE	**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				
 3SB29 08-2AA	**Dismantling tools** For holders and lamp holders with holder		**3SB29 08-2AA**	1 unit
 3SB29 08-2AC	**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.

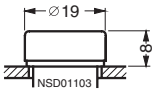
Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

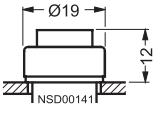
Dimension drawings (mm)

Actuators

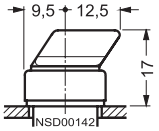
Pushbutton or illuminated pushbutton
with flat button



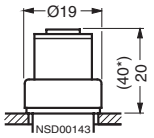
Pushbutton or illuminated pushbutton
with raised button



Selector switch

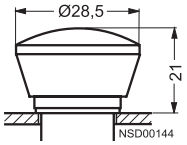


CES key-operated switch

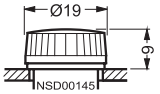


* with key

EMERGENCY-STOP mushroom pushbutton

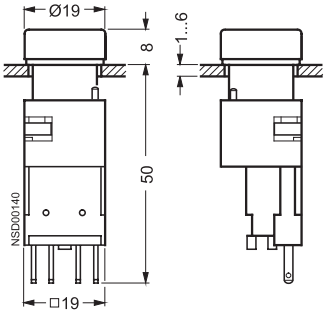


Indicator light



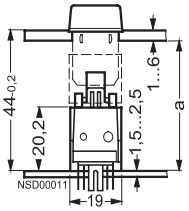
Contact blocks with push-on connection

Pushbutton and contact block
with holder for frontplate mounting



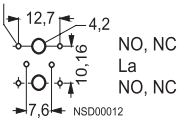
Contact blocks with soldering pins for use on printed circuit boards

Illuminated pushbutton unit
with contact block and lamp-holder with solder pins



Solder pin spacing

Solder terminal ⌀ 1.3 +0.1

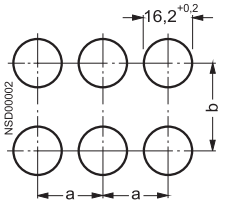


Length **a** of spacers: **a** = $44^{-0.2}$ minus front plate thickness.
When using backing plates, the length **a** is reduced by 0.8 mm.
To avoid bending of the PCB when the actuator is operated, sufficient spacers must be provided spaced as shown in the table below:

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.)

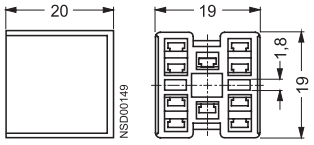
Mounting dimensions



Minimum clearance	a	b
Round design	19	19
Square design without inscription plate	21	21
Round and square designs with inscription plates	21	32
For 2 selector switches and 3 switching positions, maintained contact, side by side	21	21

Accessories

Complete connector



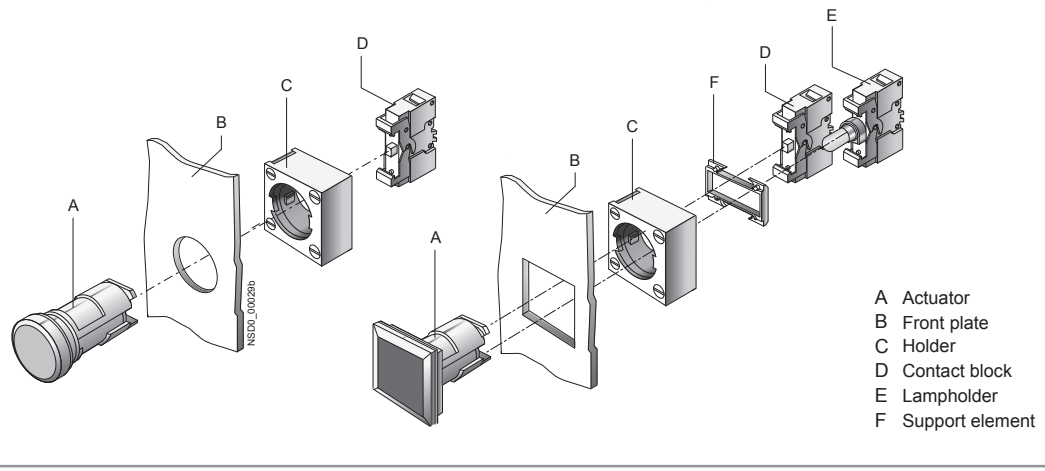
Push Button Units and Indicator Lights

3SB3 Push Buttons and Indicator Lights, 22 mm

General data

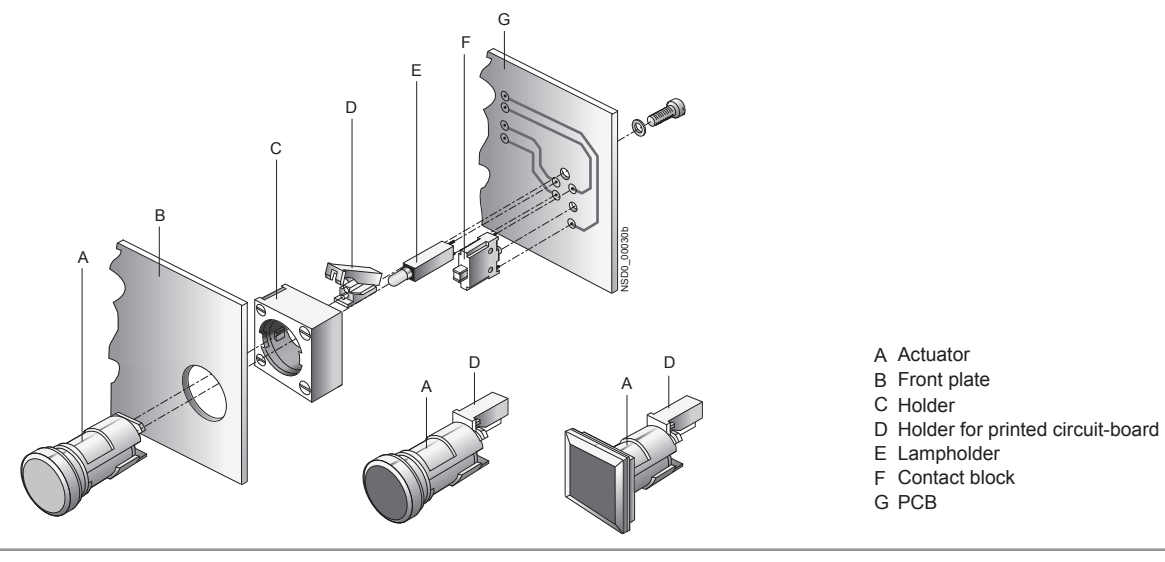
Overview

Front plate mounting



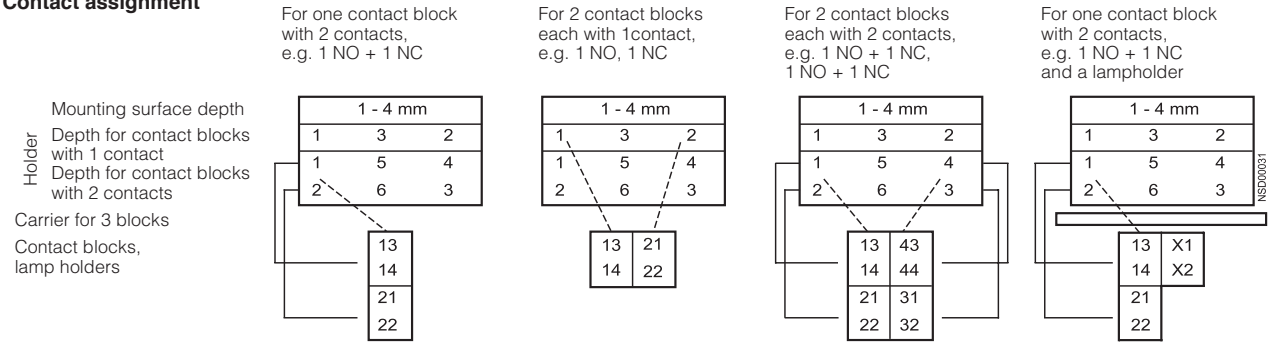
For actuators see page 17-314 to 17-352.
For contact blocks and lamp holders see page 17-353 to 17-355.
For holders see page 17-356.

Mounting on printed circuit boards



For contact blocks for use on printed circuit boards see page 17-356.

Contact assignment



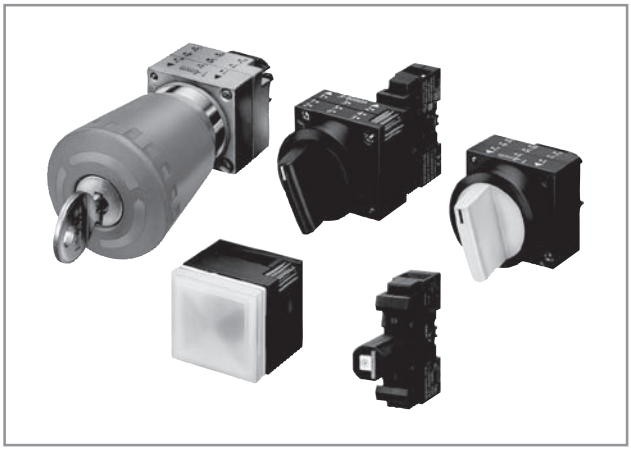
Push Button Units and Indicator Lights

3SB3 Push Buttons and Indicator Lights, 22 mm

General data

Design

The 3SB3 series is a modular range of commanding and signaling devices for front panel mounting and rear conductor connection. As an alternative, individual elements can also be supplied for use on printed circuit boards. Complete units are offered for the most commonly used applications.



Actuators and indicators and complete units

The 3SB3 series is available:

- Made of molded plastic in flat, round and square design
- Made of metal in round design.

The devices are of modern industrial design and can be mounted rapidly by a single person. The operating surfaces of the push buttons and illuminated push buttons are concave. The lenses of the indicator lights are convex.

The metal version with a high degree of protection according to IP67 and NEMA 4X is available for the world market.

One command point comprises:

- An actuator or lens assembly in front of the control panel
- A holder for mounting behind the control panel
- Up to 3 contact blocks and/or 1 lamp holder behind the control panel
- A comprehensive range of accessories for inscription

Two contact blocks can be snapped onto the actuator in the standard version.

When three contact blocks or illuminated actuators are required, an additional holder must be plugged onto the actuator from the rear.

- 3SB39 01-0AB holder for 3 contact blocks or for 2 contact blocks and 1 lamp holder
- 3SB39 01-0AC holder with pressure plates for actuating a central contact block when using a selector switch, key-operated switch and twin push button with 3 contact blocks.

For illuminated push buttons, illuminated switches and illuminated selector switches the holder is included in the scope of supply as standard.

The contact blocks are fitted with slow-action contacts with double operating 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 solid-state systems as well as conventional controls.

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.

Connection methods

The devices are available with screw terminals (box terminals), spring-type terminals or solder pins.

	Screw terminals
	Spring-type terminals
	Solder pin connections
	The terminals are indicated in the corresponding tables by the symbols shown on blue backgrounds.

Application

The devices are climate-proof (KTW 24) and suitable for standard industrial applications and operation in marine applications. For operation in oily atmospheres (organic oils/lubricants) we recommend actuators which are marked as "solvent-resistant".

AS-Interface solutions

The 3SB3 commanding and signaling devices can be connected to the AS-Interface communication system quickly and safely with the help of various solutions.

The following solutions are available:

- ASIsafe EMERGENCY-STOP mushroom push buttons (see page 17-385)
- AS-Interface enclosures with 1 to 6 command points (see page 17-384).
- AS-Interface front panel modules for 4 command points (see Catalog IK PI)

"Intrinsic safety" type of protection EEx i according to ATEX directive 94/9/EC

The push buttons and indicator lights in round design can also be used in hazardous areas. The 3SB34 ..-0. contact blocks and the 3SB34 ..-1A lamp holders (with 3SB39 01-1.A LED lamp) with screw terminals or spring-type terminals can be used.

See www.siemens.com/sirius/atex.

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 3SB3 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.

Configuration

Mounting and fixing

The 3SB3 devices can be easily and quickly mounted:

- Actuators or indicator lights are positioned in the opening of the front panel from the front
- Position the holder from the rear
- Tighten the screw on the holder
- Snap on the contact block or the lamp holder directly onto the actuator from the back

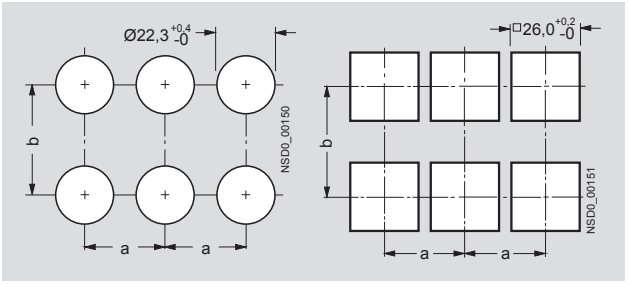
The holder for the round versions is set to a switchboard thickness of 1 to 4 mm when delivered and is placed in the direction of the arrow ↑ 1–4 mm ↑ on the actuator/indicator from the back. The fixing screw is located underneath, on the right.

For a switchboard thickness of 3 to 6 mm, the holder is reversed and mounted in the direction of the arrow at ↑ 3–6 mm ↑ and the fixing screw is located on the upper right. In this case, the fixing screw must be rotated anticlockwise to its limit before mounting the holder.

The control panel depth of 1 to 4 mm can be compensated with the holder for the square version.

When label holders, protective caps or similar accessories are used, the greatest permissible control panel thickness must be reduced by the wall thickness of the accessory part.

Mounting dimensions on front plates

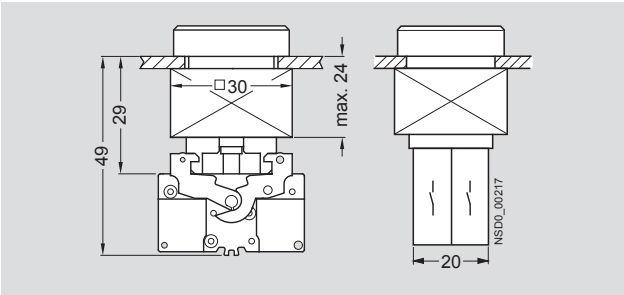


Minimum clearance	a	b
Contact blocks (1 contact) and lamp holder		
• For front plate mounting, with screw terminals	30[1]	45
• For front plate mounting with spring-type terminals	30[1]	30[1]
• For use on PCB, with solder pin connections	30[1]	30[1]
Contact blocks with 2 contacts		
• for front plate mounting	30[1]	50
When using holders for inscription labels		
• 12.5 mm × 27 mm	30[1]	45[2]
• 27.0 mm × 27 mm	30[1]	60

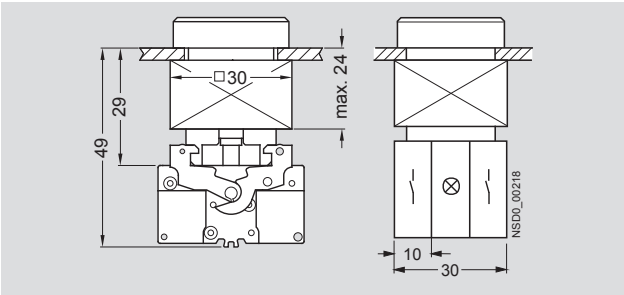
[1] For mushroom push button, EMERGENCY-STOP and push-pull button: Note mushroom diameter d = 40 mm or 60 mm.

[2] 60 mm with contact blocks having two contacts.

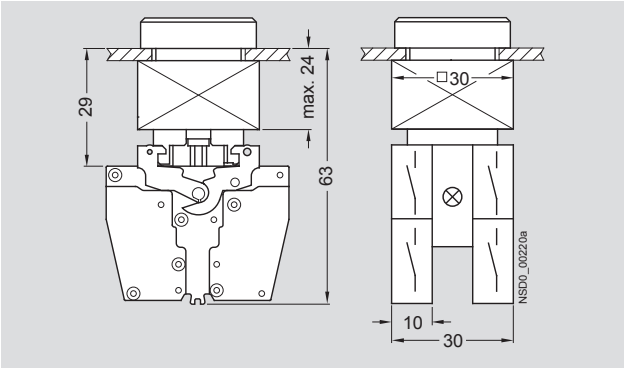
Mounting depth



Push button with two contact blocks

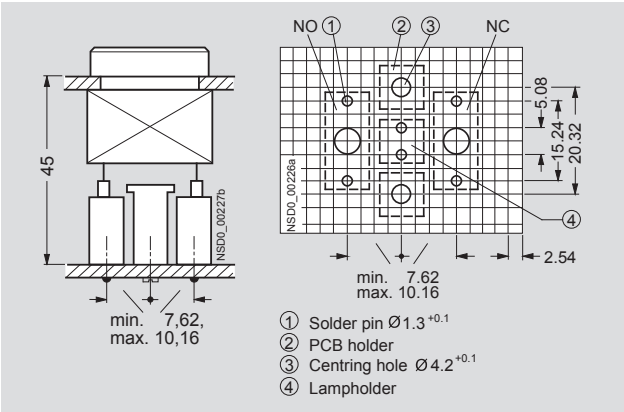


Illuminated push button with lamp holder and two contact blocks



Illuminated push button with lamp holder and two contact blocks with two contacts

Used on printed circuit boards



Illuminated push button with solder pins

Technical specifications

Type		3SB34 00-0, 3SB34 20-0	3SB14 00-0J	3SB34 00-1, 3SB34 20-1	3SB34 03-0, 3SB34 23-0	3SB34 03-1, 3SB34 23-1	3SB34 11-0	3SB34 11-1
Contact blocks and lamp holders								
Standards		IEC 60947-5-1, IEC 60947-5-5, EN 60947-5-1, EN 60947-5-5						
Connection type		Screw terminals			Spring-type terminals		Solder pins	
Rated insulation voltage U_i	V	400		250	400		250	60
For pollution degree according to IEC 60947-1		Class 3		Class 3	Class 3		Class 3	Class 3
Rated impulse withstand voltage U_{imp}	kV	4		4	4	4	4	1.5
Conventional thermal current I_{th}	A	10		—	10	—	10	—
Rated operational current I_e at rated operational voltage U_e								
• Alternating current 50/60 Hz, AC-12		10		—	10	—	10	
- At U_e = 24 ... 230 V	A	10		—	10	—	10	—
- At U_e = 400 V	A	10		—	10	—	—	—
• Alternating current 50/60 Hz, AC-15								
- At U_e = 24 ... 230 V	A	6	6	—	6	—	4	—
- At U_e = 400 V	A	3	4	—	3	—	—	—
• Direct current DC-12								
- At U_e = 24 V	A	10	10	—	10	—	10	—
- At U_e = 48 V	A	5	—	—	5	—	5	—
- At U_e = 110 V	A	2.5	2	—	2.5	—	2.5	—
- At U_e = 230 V	A	1	0.5	—	1	—	1	—
• Direct current DC-13								
- At U_e = 24 V	A	3	5	—	3	—	3	—
- At U_e = 48 V	A	1.5	—	—	1.5	—	1.5	—
- At U_e = 110 V	A	0.7	0.5	—	0.7	—	0.7	—
- At U_e = 230 V	A	0.3	0.2	—	0.3	—	0.3	—
Contact stability								
• Test voltage	V	5		—	5	—	5	—
• Test current	mA	1		—	1	—	1	—
Lamp holders		—		BA 9s	—	BA 9s	—	Wedge bases
Lamps		—		Incandescent lamps, glow lamps and LED lamps	—	Incandescent lamps, glow lamps and LED lamps	—	Incandescent lamps and LED lamps
Short-circuit protection, weld-free, acc. to IEC 60947-5-1								
• DIAZED fuse links, utilization category gG acc. to IEC 60269-3-1		Dz10 A						
• DIAZED fuse links, quick according to DIN VDE 0635		Dz 16 A						
• Miniature circuit breaker with C characteristic according to IEC 60898	A	10						
Mechanical endurance		10×10^6 operating cycles						
Electrical endurance								
• For utilization category AC-15 with 3RT20 15 to 3RT20 26 contactors		10×10^6 operating cycles						
• With utilization category DC-12, DC-13		With direct current it depends on the operational voltage, the breaking current, the circuit inductance and the switching frequency						
Switching frequency	1/h	1000 operating cycles						
Degree of protection acc. to IEC 60529								
• Connections		IP20						
• Contact chambers		IP40		—	IP40	—	IP40	—
Touch protection according to EN 61140 and BGV A3		Finger-safe			Finger-safe		—	
Conductor cross-sections[1]								
• Finely stranded, without end sleeves	mm^2	—			2 × (0.25 ... 1.5)		—	
• Finely stranded, with end sleeves to DIN 46228	mm^2	2× (0.5 ... 1.5)			2 × (0.25 ... 0.75)		—	
• Solid	mm^2	2× (1 ... 1.5)			2 × (0.25 ... 1.5)		—	
• Solid with end sleeves to DIN 46228	mm^2	2× (0.5 ... 0.75)			—		—	
• AWG cables, solid or stranded		2× AWG 18 ... 14			2× AWG 24 ... 16		—	
Tightening torque, terminal screw	Nm	0.8			—		—	
Solder pins	mm^2	—			—		0.8× 0.8	

[1] For standard screwdriver size 2 or Pozidriv 2.

Push Button Units and Indicator Lights

3SB3 Push Buttons and Indicator Lights, 22 mm

General data

Type		3SB34 00-0, 3SB34 20-0	3SB34 00-1, 3SB34 20-1	3SB34 03-0, 3SB34 23-0	3SB34 03-1, 3SB34 23-1	3SB34 11-0	3SB34 11-1
Data according to UL and CSA							
Rated operational voltage	V AC	300	—	300	—	300	—
Conventional thermal current (uninterrupted current)	A	10	—	10	—	10	—
Switching capacity		A 300, R 300, A 600 same polarity					
Rated voltage (lamps)							
• Lamp with BA 9s base	V AC	—	125	—	125	—	—
• Lamp with wedge base	V AC	—	60	—	60	—	60
• Lamp holders with integrated LED	V	—	24 AC/DC, 110 AC, 230 AC	—	24 AC/DC, 110 AC, 230 AC	—	—
Rated power (lamps)	W	—	2.5	—	2.5	—	1

Type		3SB30, 3SB32 (3SB31)	3SB31, 3SB33	3SB35, 3SB36
Actuators and indicators				
Enclosure material		Plastic		Metal
Design		Round	Square	Round
Terminal designation acc. to EN 50013		Identification number on the holder, function digit on the contact block		
Device identification		Snap-on label		
Tightening torques				
• Screw on holder	Nm	max. 1		
Mechanical endurance				
• Push buttons		10×10^6 operating cycles		
• Illuminated push buttons		3×10^6 operating cycles		
• Actuators, rotary or maintained		3×10^5 operating cycles		
• Key-operated switch with key monitoring		1×10^5 operating cycles		
Switching frequency	1/h	1000 operating cycles		
Climatic withstand capability acc. to EN ISO 6270-2		Climate-proof KTW24; suitable for marine applications		
Ambient temperature				
• During operation, non-illuminated and 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 and NEMA Standards				
• Actuators and indicators, standard		IP66; NEMA Type 1,3,4,4X, 12	IP65; NEMA Type 1,3,4,4X, 12	IP67; NEMA Type 1,3,4,4X, 12
- with protective caps		IP67; NEMA Type 1,3,4,4X, 12	IP67; NEMA Type 1,3,4,4X, 12	—
• Key-operated switch with key monitoring		IP54; NEMA Type 1,3,4,4X, 12	—	—
• Twin push buttons (3SB31)		IP65; NEMA Type 1,3,4,4X, 12	—	—
Protective measures		Protective measures are met automatically when the actuators and lens assemblies are mounted on metal front plates and enclosures. When mounted in insulated enclosures, the "total insulation" protective measures are met.		Grounding is necessary for operation with protective extra-low voltage (PELV).
Shock resistance according to IEC 60068-2-27 for half-sine shock type, 11 ms shock duration				
• Devices without incandescent lamp		≤ 50 *g*		
• Devices with incandescent lamp		≤ 30 *g*		
Vibration resistance acc. to IEC 60068-2-6				
• Acceleration at frequency 20 ... 200 Hz		5 *g*		

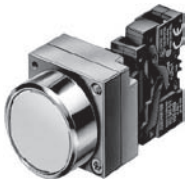
Type	3SB38 0.-0, 3SB38 0.-1	—	3SB38 0.-2, 3SB38 0.-3
Enclosures			
Enclosure material	Plastic		Metal
Actuators and indicators	Plastic, round		Metal, round
Degree of protection acc. to IEC 60529	IP65		IP67 and NEMA Type 4
Resistance to extreme climates acc. to DIN 50017	KTW 24		KTW 24

Push Button Units and Indicator Lights

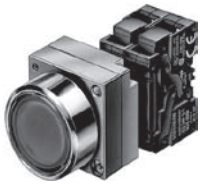
3SB3, Metal, Round, 22 mm

Complete Units

Selection and ordering data



Push button with flat button



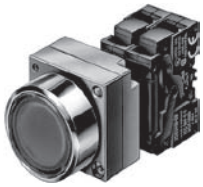
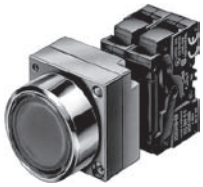
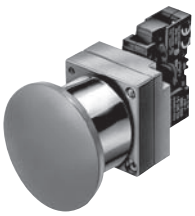
Illuminated push button with flat button

Rated voltage of lamp	Color of handle	Contacts for front plate mounting	DT	Screw terminals Configurator	DT	Spring-type terminals Configurator
V				Order No.		Order No.
Push buttons						
Push buttons with flat button						
	Black	1 NO		3SB36 02-0AA11		3SB36 02-0AA11-0CC0
	Black	1 NC		3SB36 03-0AA11		3SB36 03-0AA11-0CC0
	Red	1 NC		3SB36 03-0AA21		3SB36 03-0AA21-0CC0
	Yellow	1 NO		3SB36 02-0AA31		3SB36 02-0AA31-0CC0
	Green	1 NO		3SB36 02-0AA41		3SB36 02-0AA41-0CC0
	Blue	1 NO		3SB36 02-0AA51		3SB36 02-0AA51-0CC0
	White	1 NO		3SB36 02-0AA61		3SB36 02-0AA61-0CC0
	Black	1 NO + 1 NC		3SB36 01-0AA11		3SB36 01-0AA11-0CC0
	Red	1 NO + 1 NC		3SB36 01-0AA21		3SB36 01-0AA21-0CC0
	Yellow	1 NO + 1 NC		3SB36 01-0AA31		3SB36 01-0AA31-0CC0
	Green	1 NO + 1 NC		3SB36 01-0AA41		3SB36 01-0AA41-0CC0
	Blue	1 NO + 1 NC		3SB36 01-0AA51		3SB36 01-0AA51-0CC0
	White	1 NO + 1 NC		3SB36 01-0AA61		3SB36 01-0AA61-0CC0
	Clear	1 NO + 1 NC		3SB36 01-0AA71		–
Push button unit with extended button						
	Black	1 NO		3SB36 02-0BA11		–
	Black	1 NC		3SB36 03-0BA11		–
	Red	1 NC		3SB36 03-0BA21		–
	Yellow	1 NO		3SB36 02-0BA31		–
	Blue	1 NO		3SB36 02-0BA51		–
	White	1 NO		3SB36 02-0BA61		–
	Black	1 NO + 1 NC		3SB36 01-0BA11		–
	Red	1 NO + 1 NC		3SB36 01-0BA21		–
	Yellow	1 NO + 1 NC		3SB36 01-0BA31		–
	Green	1 NO + 1 NC		3SB36 01-0BA41		–
	Blue	1 NO + 1 NC		3SB36 01-0BA51		–
	White	1 NO + 1 NC		3SB36 01-0BA61		–
Illuminated push buttons with flat button momentary with integrated LED (incl. holder for 3 elements)						
24 AC/DC	Red[1]	1 NC		3SB36 46-0AA21		3SB36 46-0AA21-0CC0
	Yellow[1]	1 NO		3SB36 45-0AA31		3SB36 45-0AA31-0CC0
	Green[1]	1 NO		3SB36 45-0AA41		3SB36 45-0AA41-0CC0
	Blue[1]	1 NO		3SB36 45-0AA51		3SB36 45-0AA51-0CC0
	White	1 NO		3SB36 45-0AA61		3SB36 45-0AA61-0CC0
	Clear[1]	1 NO		3SB36 45-0AA71		3SB36 45-0AA71-0CC0
	Red[1]	1 NO + 1 NC		3SB36 47-0AA21		3SB36 47-0AA21-0CC0
	Yellow[1]	1 NO + 1 NC		3SB36 47-0AA31		3SB36 47-0AA31-0CC0
	Green[1]	1 NO + 1 NC		3SB36 47-0AA41		3SB36 47-0AA41-0CC0
	Blue[1]	1 NO + 1 NC		3SB36 47-0AA51		3SB36 47-0AA51-0CC0
	White	1 NO + 1 NC		3SB36 47-0AA61		3SB36 47-0AA61-0CC0
	Clear[1]	1 NO + 1 NC		3SB36 47-0AA71		3SB36 47-0AA71-0CC0
110 AC	Red[1]	1 NC		3SB36 50-0AA21		–
	Yellow[1]	1 NO		3SB36 57-0AA31		–
	Green[1]	1 NO		3SB36 57-0AA41		–
	Blue[1]	1 NO		3SB36 57-0AA51		–
	White	1 NO		3SB36 57-0AA61		–
	Clear[1]	1 NO		3SB36 57-0AA71		–
	Red[1]	1 NO + 1 NC		3SB36 51-0AA21		–
	Yellow[1]	1 NO + 1 NC		3SB36 51-0AA31		–
	Green[1]	1 NO + 1 NC		3SB36 51-0AA41		–
	Blue[1]	1 NO + 1 NC		3SB36 51-0AA51		–
	White	1 NO + 1 NC		3SB36 51-0AA61		–
	Clear[1]	1 NO + 1 NC		3SB36 51-0AA71		–
230 AC	Red[1]	1 NC		3SB36 54-0AA21		3SB36 54-0AA21-0CC0
	Yellow[1]	1 NO		3SB36 53-0AA31		3SB36 53-0AA31-0CC0
	Green[1]	1 NO		3SB36 53-0AA41		3SB36 53-0AA41-0CC0
	Blue[1]	1 NO		3SB36 53-0AA51		3SB36 53-0AA51-0CC0
	White	1 NO		3SB36 53-0AA61		3SB36 53-0AA61-0CC0
	Clear[1]	1 NO		3SB36 53-0AA71		3SB36 53-0AA71-0CC0
	Red[1]	1 NO + 1 NC		3SB36 55-0AA21		3SB36 55-0AA21-0CC0
	Yellow[1]	1 NO + 1 NC		3SB36 55-0AA31		3SB36 55-0AA31-0CC0
	Green[1]	1 NO + 1 NC		3SB36 55-0AA41		3SB36 55-0AA41-0CC0
	Blue[1]	1 NO + 1 NC		3SB36 55-0AA51		3SB36 55-0AA51-0CC0
	White	1 NO + 1 NC		3SB36 55-0AA61		3SB36 55-0AA61-0CC0
	Clear[1]	1 NO + 1 NC		3SB36 55-0AA71		3SB36 55-0AA71-0CC0

For online configurator see www.siemens.com/sirius/configurators .

[1] Inscription is possible by inserting a label.

• Revised •
03/01/14

	Rated voltage of lamp	Color of handle	Contacts for front plate mounting	DT	Screw terminals Configurator	DT	Spring-type terminals Configurator
	V				Order No.		Order No.
Push buttons							
 Illuminated push button with flat button	**Illuminated push buttons with flat button** with BA 9s lamp holder, without lamp (incl. holder for 3 elements)						
	—	Red[1]	1 NC		**3SB36 07-0AA21**		**3SB36 07-0AA21-0CC0**
		Amber[1]	1 NO		**3SB36 06-0AA01**		**—**
		Yellow[1]	1 NO		**3SB36 06-0AA31**		**3SB36 06-0AA31-0CC0**
		Green[1]	1 NO		**3SB36 06-0AA41**		**3SB36 06-0AA41-0CC0**
		Blue[1]	1 NO		**3SB36 06-0AA51**		**3SB36 06-0AA51-0CC0**
		White	1 NO		**3SB36 06-0AA61**		**3SB36 06-0AA61-0CC0**
		Clear[1]	1 NO		**3SB36 06-0AA71**		**3SB36 06-0AA71-0CC0**
		Red[1]	1 NO + 1 NC		**3SB36 05-0AA21**		**3SB36 05-0AA21-0CC0**
		Amber[1]	1 NO + 1 NC		**3SB36 05-0AA01**		**—**
		Yellow[1]	1 NO + 1 NC		**3SB36 05-0AA31**		**3SB36 05-0AA31-0CC0**
		Green[1]	1 NO + 1 NC		**3SB36 05-0AA41**		**3SB36 05-0AA41-0CC0**
		Blue[1]	1 NO + 1 NC		**3SB36 05-0AA51**		**3SB36 05-0AA51-0CC0**
		White	1 NO + 1 NC		**3SB36 05-0AA61**		**3SB36 05-0AA61-0CC0**
		Clear[1]	1 NO + 1 NC		**3SB36 05-0AA71**		**3SB36 05-0AA71-0CC0**
 Illuminated push button with flat button	**Illuminated push buttons with flat, solvent-resistant button**[2], with integrated LED (incl. holder for 3 elements)						
	24 AC/DC	Red[1]	1 NC		**3SB36 46-0AA21-0PA0**		**—**
		Yellow[1]	1 NO		**3SB36 45-0AA31-0PA0**		**—**
		Green[1]	1 NO		**3SB36 45-0AA41-0PA0**		**—**
		Blue[1]	1 NO		**3SB36 45-0AA51-0PA0**		**—**
		White	1 NO		**3SB36 45-0AA61-0PA0**		**—**
		Clear[1]	1 NO		**3SB36 45-0AA71-0PA0**		**—**
		Red[1]	1 NO + 1 NC		**3SB36 47-0AA21-0PA0**		**—**
		Yellow[1]	1 NO + 1 NC		**3SB36 47-0AA31-0PA0**		**—**
		Green[1]	1 NO + 1 NC		**3SB36 47-0AA41-0PA0**		**—**
		Blue[1]	1 NO + 1 NC		**3SB36 47-0AA51-0PA0**		**—**
		White	1 NO + 1 NC		**3SB36 47-0AA61-0PA0**		**—**
		Clear[1]	1 NO + 1 NC		**3SB36 47-0AA71-0PA0**		**—**
Mushroom push buttons							
 Mushroom push-pull button	**Mushroom push-pull buttons, Ø 40 mm**, maintained with pull-to-unlatch mechanism						
	—	Red	1 NC		**3SB36 03-1CA21**		**3SB36 03-1CA21-0CC0**
			1 NO + 1 NC		**3SB36 01-1CA21**		**3SB36 01-1CA21-0CC0**

For online configurator see www.siemens.com/sirius/configurators .

1) Inscription is possible by inserting a label.

2) Not suitable for laser inscription.

Push Button Units and Indicator Lights

3SB3, Metal, Round, 22 mm

Complete Units

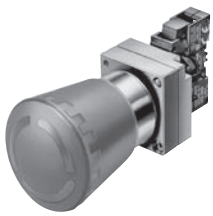
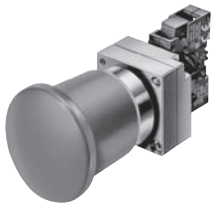
Version	Color of handle/ Lock No.	Contacts for front plate mounting	DT	Screw terminals Configurator Order No.	DT	Spring-type terminals Configurator Order No.
Selector switches						
 Selector switch **Selector switches, 2 switch positions** Switching sequence O-I, 50° operating angle						
Latching 	Black, Standard	1 NO		**3SB36 02-2KA11**		**3SB36 02-2KA11-0CC0**
		1 NO + 1 NC		**3SB36 01-2KA11**		**3SB36 01-2KA11-0CC0**
	Black, Heavy duty	1 NO		**3SB36 02-2PA11**		—
		1 NO + 1 NC		**3SB36 01-2PA11**		—
Selector switches, 3 switch positions switching sequence I-O-II, 2 x 50° operating angle						
Latching 	Black, Standard	1 NO, 1 NO		**3SB36 10-2DA11**		**3SB36 10-2DA11-0CC0**
		1 NO + 1 NC, 1 NO + 1 NC		**3SB36 08-2DA11**		**3SB36 08-2DA11-0CC0**
	Black, Heavy duty	1 NO, 1 NO		**3SB36 10-2SA11**		—
		1 NO + 1 NC, 1 NO + 1 NC		**3SB36 08-2SA11**		—
Momentary, spring return from the left and right 	Black, Standard	1 NO, 1 NO		**3SB36 10-2EA11**		**3SB36 10-2EA11-0CC0**
		1 NO + 1 NC, 1 NO + 1 NC		**3SB36 08-2EA11**		**3SB36 08-2EA11-0CC0**
	Black, Heavy duty	1 NO, 1 NO		**3SB36 10-2TA11**		—
		1 NO + 1 NC, 1 NO + 1 NC		**3SB36 08-2TA11**		—
Key-operated switches						
 RONIS key-operated switch **RONIS key-operated switch, 2 switch positions** with 2 keys, removal position O + I, switching sequence O-I, 50° operating angle						
Latching 	SB 30	1 NO		**3SB36 02-4AD11**		**3SB36 02-4AD11-0CC0**
		1 NO + 1 NC		**3SB36 01-4AD11**		**3SB36 01-4AD11-0CC0**

For online configurator see www.siemens.com/sirius/configurators .

Push Button Units and Indicator Lights

3SB3, Metal, Round, 22 mm

Complete Units

Color of handle	Contacts for front plate mounting	DT	Screw terminals Configurator Order No.	DT	Spring-type terminals Configurator Order No.
EMERGENCY-STOP devices according to ISO 13850, with yellow name plate, Ø 80 mm, with inscription					
 EMERGENCY-STOP mushroom push button with rotate-to-unlatch mechanism	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with positive maintained function,** with rotate-to-unlatch mechanism • English inscription "EMERGENCY STOP"				
Red	1 NC ⊖		**3SB36 03-1HR20**		–
	1 NC with mounting monitoring ⊖		**3SB36 66-1HR20**		–
	1 NO + 1 NC ⊖		**3SB36 01-1HR20**		–
 EMERGENCY-STOP mushroom push button with rotate-to-unlatch mechanism and switch position indication	With rotate-to-unlatch mechanism and mechanical switch position indication • English inscription "EMERGENCY STOP"				
Red	1 NC ⊖		**3SB36 03-1HR26**		–
	1 NC with mounting monitoring ⊖		**3SB36 66-1HR26**		–
	1 NO + 1 NC ⊖		**3SB36 01-1HR26**		–
 EMERGENCY-STOP mushroom push button Pull-to-unlatch mechanism	With pull-to-unlatch mechanism, solvent-resistant • English inscription "EMERGENCY STOP"				
Red	1 NC ⊖		**3SB36 03-1TR20**		–
	1 NO + 1 NC ⊖		**3SB36 01-1TR20**		–

For online configurator see www.siemens.com/sirius/configurators .

⊖ Positive opening according to IEC 60947-5-1, Appendix K.
Can be used with 3TK28 safety relays.
Certificate:

Push Button Units and Indicator Lights

3SB3, Metal, Round, 22 mm

Complete Units

Rated voltage of lamp	Color of lens	DT	Screw terminals Configurator	DT	Spring-type terminals Configurator
V			Order No.		Order No.
Indicator lights					
Indicator lights with lens with concentric rings[1] with integrated LED					
24 AC/DC	Red		**3SB36 44-6BA20**		**3SB36 44-6BA20-0CC0**
	Yellow		**3SB36 44-6BA30**		**3SB36 44-6BA30-0CC0**
	Green		**3SB36 44-6BA40**		**3SB36 44-6BA40-0CC0**
	Blue		**3SB36 44-6BA50**		**3SB36 44-6BA50-0CC0**
	White		**3SB36 44-6BA60**		**3SB36 44-6BA60-0CC0**
	Clear		**3SB36 44-6BA70**		**3SB36 44-6BA70-0CC0**
	Amber		**3SB36 44-6BA00**		—
110 AC	Red		**3SB36 48-6BA20**		**3SB36 48-6BA20-0CC0**
	Yellow		**3SB36 48-6BA30**		**3SB36 48-6BA30-0CC0**
	Green		**3SB36 48-6BA40**		**3SB36 48-6BA40-0CC0**
	Blue		**3SB36 48-6BA50**		**3SB36 48-6BA50-0CC0**
	White		**3SB36 48-6BA60**		**3SB36 48-6BA60-0CC0**
	Clear		**3SB36 48-6BA70**		**3SB36 48-6BA70-0CC0**
	Amber		**3SB36 48-6BA00**		—
230 AC	Red		**3SB36 52-6BA20**		**3SB36 52-6BA20-0CC0**
	Yellow		**3SB36 52-6BA30**		**3SB36 52-6BA30-0CC0**
	Green		**3SB36 52-6BA40**		**3SB36 52-6BA40-0CC0**
	Blue		**3SB36 52-6BA50**		**3SB36 52-6BA50-0CC0**
	White		**3SB36 52-6BA60**		**3SB36 52-6BA60-0CC0**
	Clear		**3SB36 52-6BA70**		**3SB36 52-6BA70-0CC0**
With BA 9s lamp holder, without lamp					
—	Red		**3SB36 04-6BA20**		**3SB36 04-6BA20-0CC0**
	Yellow		**3SB36 04-6BA30**		**3SB36 04-6BA30-0CC0**
	Green		**3SB36 04-6BA40**		**3SB36 04-6BA40-0CC0**
	Blue		**3SB36 04-6BA50**		**3SB36 04-6BA50-0CC0**
	White		**3SB36 04-6BA60**		**3SB36 04-6BA60-0CC0**
	Clear		**3SB36 04-6BA70**		**3SB36 04-6BA70-0CC0**



Indicator light

For online configurator see www.siemens.com/sirius/configurators .

1) Inscription by inserting a label is not possible.

Selection and ordering data

Version	Inscriptions	Color of handle	DT	Configurator	PS
				Order No.	
Push buttons with holder[1]					
 Push button with flat button					
Push buttons with flat button		Black		**3SB35 00-0AA11**	1 unit
		Red		**3SB35 00-0AA21**	1 unit
		Yellow		**3SB35 00-0AA31**	1 unit
		Green		**3SB35 00-0AA41**	1 unit
		Blue		**3SB35 00-0AA51**	1 unit
		White		**3SB35 00-0AA61**	1 unit
		Gray		**3SB35 00-0AB51**	1 unit
		Clear[2]		**3SB35 00-0AA71**	1 unit
	Up	Black		**3SB35-00-0AA11-ZED**	1 unit
	Down	Black		**3SB35-00-0AA11-ZEE**	1 unit
	Forward	Black		**3SB35-00-0AA11-ZEF**	1 unit
	Reverse	Black		**3SB35-00-0AA11-ZEG**	1 unit
	On	Green		**3SB35 00–0AA41-ZEB**	1 unit
	Start	Green		**3SB35 00–0AA41-ZEL**	1 unit
 Push button with raised button					
	I	Green		**3SB35 00-0AA81**	1 unit
	O	Red		**3SB35 00-0AB01**	1 unit
	I	White		**3SB35 00-0AB11**	1 unit
	O	Black		**3SB35 00-0AB21**	1 unit
	R	Blue		**3SB35 00-0AC81**	1 unit
 Push button with raised front ring					
Push buttons with flat solvent-resistant button[3]		Black		**3SB35 00-0AA11**	1 unit
		Red		**3SB35 00-0AA21-0PA0**	1 unit
		Yellow		**3SB35 00-0AA31-0PA0**	1 unit
		Green		**3SB35 00-0AA41-0PA0**	1 unit
		Blue		**3SB35 00-0AA51-0PA0**	1 unit
		White		**3SB35 00-0AA61-0PA0**	1 unit
Push buttons with raised button		Black		**3SB35 00-0BA11**	1 unit
		Red		**3SB35 00-0BA21**	1 unit
		Yellow		**3SB35 00-0BA31**	1 unit
		Green		**3SB35 00-0BA41**	1 unit
		Blue		**3SB35 00-0BA51**	1 unit
		White		**3SB35 00-0BA61**	1 unit
	Off	Red		**3SB35-00-0BA21-ZEC**	
	Stop	Red		**3SB35-00-0BA21-ZEK**	
 Illuminated push button with flat button					
Push buttons with raised front ring (height 15.5 mm)		Black		**3SB35 00-0AA12**	1 unit
		Red		**3SB35 00-0AA22**	1 unit
		Yellow		**3SB35 00-0AA32**	1 unit
		Green		**3SB35 00-0AA42**	1 unit
		Blue		**3SB35 00-0AA52**	1 unit
		White		**3SB35 00-0AA62**	1 unit
 Illuminated push button with raised button					
Illuminated push buttons with flat button (incl. holder for 3 elements)		Amber[2]		**3SB35 01-0AA01**	1 unit
		Red[2]		**3SB35 01-0AA21**	1 unit
		Yellow[2]		**3SB35 01-0AA31**	1 unit
		Green[2]		**3SB35 01-0AA41**	1 unit
		Blue[2]		**3SB35 01-0AA51**	1 unit
		White		**3SB35 01-0AA61**	1 unit
		Clear[2]		**3SB35 01-0AA71**	1 unit
Illuminated push buttons with flat, solvent-resistant button[3] (incl. holder for 3 elements)		Red[2]		**3SB35 01-0AA21-0PA0**	1 unit
		Yellow[2]		**3SB35 01-0AA31-0PA0**	1 unit
		Green[2]		**3SB35 01-0AA41-0PA0**	1 unit
		Blue[2]		**3SB35 01-0AA51-0PA0**	1 unit
		White		**3SB35 01-0AA61-0PA0**	1 unit
		Clear[2]		**3SB35 01-0AA71-0PA0**	1 unit
 Push button with flat button					
Illuminated push buttons with raised button (incl. holder for 3 elements)		Amber		**3SB35 01-0BA01**	1 unit
		Red		**3SB35 01-0BA21**	1 unit
		Yellow		**3SB35 01-0BA31**	1 unit
		Green		**3SB35 01-0BA41**	1 unit
		Blue		**3SB35 01-0BA51**	1 unit
		White		**3SB35 01-0BA61**	
		Clear		**3SB35 01-0BA71**	1 unit
Push buttons with flat button, maintained, unlatches by pressing again		Black		**3SB35 00-0DA11**	1 unit
		Red		**3SB35 00-0DA21**	1 unit
		Yellow		**3SB35 00-0DA31**	1 unit
		Green		**3SB35 00-0DA41**	1 unit
		Blue		**3SB35 00-0DA51**	1 unit
		White		**3SB35 00-0DA61**	1 unit
		Gray		**3SB35 00-0DB51**	1 unit
Illuminated push buttons with flat button, maintained, unlatches by pressing again (incl. holder for 3 elements)		Amber[2]		**3SB35 01-0DA01**	1 unit
		Red[2]		**3SB35 01-0DA21**	1 unit
		Yellow[2]		**3SB35 01-0DA31**	1 unit
		Green[2]		**3SB35 01-0DA41**	1 unit
		Blue[2]		**3SB35 01-0DA51**	1 unit
		White		**3SB35 01-0DA61**	1 unit
		Clear[2]		**3SB35 01-0DA71**	1 unit

For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

2) Inscription is possible by inserting a label.

3) Not suitable for laser inscription.

Push Button Units and Indicator Lights

3SB3, Metal, Round, 22 mm

Version	Color of handle	DT	Configurator Order No.	PS
Mushroom push buttons with holder[1]				
 Mushroom push button, Ø 30 mm **Mushroom push buttons, Ø 30 mm**	Black Red Yellow Green		**3SB35 00-1DA11** **3SB35 00-1DA21** **3SB35 00-1DA31** **3SB35 00-1DA41**	1 unit 1 unit 1 unit 1 unit
Mushroom push buttons, Ø 40 mm	Black Red Yellow Green		**3SB35 00-1GA11** **3SB35 00-1GA21** **3SB35 00-1GA31** **3SB35 00-1GA41**	1 unit 1 unit 1 unit 1 unit
 Mushroom push button, Ø 40 mm **Mushroom push buttons, Ø 60 mm**	Black Red Yellow Green		**3SB35 00-1QA11** **3SB35 00-1QA21** **3SB35 00-1QA31** **3SB35 00-1QA41**	1 unit 1 unit 1 unit 1 unit
Illuminated mushroom push buttons, Ø 30 mm (incl. holder for 3 elements)	Amber Yellow Green White		**3SB35 01-1DA01** **3SB35 01-1DA31** **3SB35 01-1DA41** **3SB35 01-1DA61**	1 unit 1 unit 1 unit 1 unit
 Illuminated mushroom push button, Ø 60 mm **Illuminated mushroom push buttons, Ø 40 mm** (incl. holder for 3 elements)	Amber Yellow Green White Clear		**3SB35 01-1GA01** **3SB35 01-1GA31** **3SB35 01-1GA41** **3SB35 01-1GA61** **3SB35 01-1GA71**	1 unit 1 unit 1 unit 1 unit 1 unit
Illuminated mushroom push buttons, Ø 60 mm (incl. holder for 3 elements)	Amber Yellow Green White		**3SB35 01-1QA01** **3SB35 01-1QA31** **3SB35 01-1QA41** **3SB35 01-1QA61**	1 unit 1 unit 1 unit 1 unit
 Push-pull button, Ø 30 mm **Push-pull buttons, Ø 30 mm, maintained,** pull to unlatch	Black Red		**3SB35 00-1EA11** **3SB35 00-1EA21**	1 unit 1 unit
Push-pull buttons, Ø 40 mm, maintained, pull to unlatch	Black Red Yellow Green		**3SB35 00-1CA11** **3SB35 00-1CA21** **3SB35 00-1CA31** **3SB35 00-1CA41**	1 unit 1 unit 1 unit 1 unit
 Push-pull button, Ø 40 mm **Push-pull buttons, Ø 60 mm, maintained,** pull to unlatch	Black Red		**3SB35 00-1RA11** **3SB35 00-1RA21**	1 unit 1 unit
Push-pull buttons, Ø 30 mm, maintained, pull to unlatch, **can be illuminated** (incl. holder for 3 elements)	Amber Red Yellow Green Blue Clear		**3SB35 01-1EA01** **3SB35 01-1EA21** **3SB35 01-1EA31** **3SB35 01-1EA41** **3SB35 01-1EA51** **3SB35 01-1EA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 Push-pull button, Ø 60 mm, can be illuminated **Push-pull buttons, Ø 40 mm, maintained,** pull to unlatch, **can be illuminated** (incl. holder for 3 elements)	Amber Red Yellow Green Blue Clear		**3SB35 01-1CA01** **3SB35 01-1CA21** **3SB35 01-1CA31** **3SB35 01-1CA41** **3SB35 01-1CA51** **3SB35 01-1CA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
Push-pull buttons, Ø 60 mm, maintained, pull to unlatch, **can be illuminated** (incl. holder for 3 elements)	Amber Red Yellow Green Blue Clear		**3SB35 01-1RA01** **3SB35 01-1RA21** **3SB35 01-1RA31** **3SB35 01-1RA41** **3SB35 01-1RA51** **3SB35 01-1RA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit

For online configurator see www.siemens.com/sirius/configurators .

[1] Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

Push Button Units and Indicator Lights

3SB3, Metal, Round, 22 mm

Version	Version Illumination	Color of handle	DT	Configurator	PS
				Order No.	
Selector switches with holders					
Selector switches with 2 switch positions					
 Selector switch, 2 switch positions, standard version, 90°	Switching sequence O-I, 90° operating angle, maintained 	**Non-illuminated, standard version**[1]	Black	**3SB35 00-2HA11**	1 unit
			Red	**3SB35 00-2HA21**	1 unit
			Green	**3SB35 00-2HA41**	1 unit
			White	**3SB35 00-2HA61**	1 unit
		Non-illuminated, with solvent-resistant short handle[1]	Black	**3SB35 00-2HA11-0PA0**	1 unit
			Red	**3SB35 00-2HA21-0PA0**	1 unit
			Green	**3SB35 00-2HA41-0PA0**	1 unit
		Illuminated, standard version[1] (incl. holder for 3 elements)	Amber	**3SB35 01-2HA01**	1 unit
			Red	**3SB35 01-2HA21**	1 unit
			Yellow	**3SB35 01-2HA31**	1 unit
			Green	**3SB35 01-2HA41**	1 unit
			Blue	**3SB35 01-2HA51**	1 unit
			Clear	**3SB35 01-2HA71**	1 unit
 Selector switch, 2 switch positions, standard version, 50°	Switching sequence O-I, 50° operating angle, maintained 	**Non-illuminated, standard version**[1]	Black	**3SB35 00-2KA11**	1 unit
			Red	**3SB35 00-2KA21**	1 unit
			Green	**3SB35 00-2KA41**	1 unit
			White	**3SB35 00-2KA61**	1 unit
		Non-illuminated, with solvent-resistant short handle[1]	Black	**3SB35 00-2KA11-0PA0**	1 unit
			Red	**3SB35 00-2KA21-0PA0**	1 unit
			Green	**3SB35 00-2KA41-0PA0**	1 unit
		Illuminated, standard version[1] (incl. holder for 3 elements)	Amber	**3SB35 01-2KA01**	1 unit
			Red	**3SB35 01-2KA21**	1 unit
			Yellow	**3SB35 01-2KA31**	1 unit
			Green	**3SB35 01-2KA41**	1 unit
			Blue	**3SB35 01-2KA51**	1 unit
			Clear	**3SB35 01-2KA71**	1 unit
 Selector switch, 2 switch positions, heavy-duty version		**Illuminated, with solvent-resistant short handle**[1] (incl. holder for 3 elements)	Red	**3SB35 01-2KA21-0PA0**	1 unit
			Green	**3SB35 01-2KA41-0PA0**	1 unit
			Blue	**3SB35 01-2KA51-0PA0**	1 unit
			Clear	**3SB35 01-2KA71-0PA0**	1 unit
		Non-illuminated, heavy-duty version	Black	**3SB35 00-2PA11**	1 unit
			Red	**3SB35 00-2PA21**	1 unit
			Green	**3SB35 00-2PA41**	1 unit
			White	**3SB35 00-2PA61**	1 unit
		Illuminated, heavy-duty version (incl. holder for 3 elements)	Amber	**3SB35 01-2PA01**	1 unit
			Red	**3SB35 01-2PA21**	1 unit
			Yellow	**3SB35 01-2PA31**	1 unit
			Green	**3SB35 01-2PA41**	1 unit
			Blue	**3SB35 01-2PA51**	1 unit
			Clear	**3SB35 01-2PA71**	1 unit
 Selector switch, 2 switch positions, long handle		**Non-illuminated, long handle, heavy duty version**	Black	**3SB35 00-3PA11**	1 unit
			Red	**3SB35 00-3PA21**	1 unit
			Green	**3SB35 00-3PA41**	1 unit
			White	**3SB35 00-3PA61**	1 unit
		Illuminated long handle, heavy duty version (incl. holder for 3 elements)	Red	**3SB35 01-3PA21**	1 unit
			Yellow	**3SB35 01-3PA31**	1 unit
			Green	**3SB35 01-3PA41**	1 unit
			Blue	**3SB35 01-3PA51**	1 unit
			Amber	**3SB35 01–3PA01**	1 unit
			Clear	**3SB35 01-3PA71**	1 unit

For online configurator see www.siemensv.com/sirius/configurators

1) Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

Version	Version Illumination	Color of handle	DT	Configurator	PS
				Order No.	
Selector switches with holders					
Selector switches with 2 switch positions					
Switching sequence O-I, 50° operating angle, momentary, spring return from the right 	**Non-illuminated, standard version**[1]	Black		**3SB35 00-2LA11**	1 unit
		Red		**3SB35 00-2LA21**	1 unit
		Green		**3SB35 00-2LA41**	1 unit
		White		**3SB35 00-2LA61**	1 unit
	Non-illuminated, with solvent-resistant short handle[1]	Black		**3SB35 00-2LA11-0PA0**	1 unit
		Red		**3SB35 00-2LA21-0PA0**	1 unit
		Green		**3SB35 00-2LA41-0PA0**	1 unit
	Illuminated, standard version[1] (incl. holder for 3 elements)	Amber		**3SB35 01-2LA01**	1 unit
		Red		**3SB35 01-2LA21**	1 unit
		Yellow		**3SB35 01-2LA31**	1 unit
		Green		**3SB35 01-2LA41**	1 unit
		Blue		**3SB35 01-2LA51**	1 unit
		Clear		**3SB35 01-2LA71**	1 unit
	Illuminated, with solvent-resistant short handle[1] (incl. holder for 3 elements)	Red		**3SB35 01-2LA21-0PA0**	1 unit
		Green		**3SB35 01-2LA41-0PA0**	1 unit
		Blue		**3SB35 01-2LA51-0PA0**	1 unit
		Clear		**3SB35 01-2LA71-0PA0**	1 unit
	Non-illuminated, heavy-duty version	Black		**3SB35 00-2QA11**	1 unit
		Red		**3SB35 00-2QA21**	1 unit
		Green		**3SB35 00-2QA41**	1 unit
		White		**3SB35 00-2QA61**	1 unit
	Illuminated, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-2QA01**	1 unit
		Red		**3SB35 01-2QA21**	1 unit
		Yellow		**3SB35 01-2QA31**	1 unit
		Green		**3SB35 01-2QA41**	1 unit
		Blue		**3SB35 01-2QA51**	1 unit
		Clear		**3SB35 01-2QA71**	1 unit
	Non-illuminated, long handle, heavy-duty version	Black		**3SB35 00-3QA11**	1 unit
		Red		**3SB35 00-3QA21**	1 unit
		Green		**3SB35 00-3QA41**	1 unit
		White		**3SB35 00-3QA61**	
	Illuminated long handle, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-3QA01**	1 unit
		Red		**3SB35 01-3QA21**	1 unit
		Yellow		**3SB35 01-3QA31**	1 unit
		Green		**3SB35 01-3QA41**	1 unit
		Blue		**3SB35 01-3QA51**	1 unit
		Clear		**3SB35 01-3QA71**	1 unit



Selector switch, 2 switch positions, standard version



Selector switch, 2 switch positions, heavy-duty version



Selector switch, 2 switch positions, long handle

For online configurator see www.siemens.com/sirius/configurators .

[1] Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

Version	Version Illumination	Color of handle	DT	Configurator Order No.	PS
Selector switches with holders					
Selector switches with 3 switch positions					
 Selector switch, 3 switch positions, standard version					
Switching sequence I-O-II, 2 x 50° operating angle, maintained 	**Non-illuminated, standard version**[1]	Black		**3SB35 00-2DA11**	1 unit
		Red		**3SB35 00-2DA21**	1 unit
		Green		**3SB35 00-2DA41**	1 unit
		White		**3SB35 00-2DA61**	1 unit
	Non-illuminated, with solvent-resistant short handle[1]	Black		**3SB35 00-2DA11-0PA0**	1 unit
		Red		**3SB35 00-2DA21-0PA0**	1 unit
		Green		**3SB35 00-2DA41-0PA0**	1 unit
	Illuminated, standard version[1] (incl. holder for 3 elements)	Amber		**3SB35 01-2DA01**	1 unit
		Red		**3SB35 01-2DA21**	1 unit
		Yellow		**3SB35 01-2DA31**	1 unit
		Green		**3SB35 01-2DA41**	1 unit
		Blue		**3SB35 01-2DA51**	1 unit
		Clear		**3SB35 01-2DA71**	1 unit
	Illuminated, with solvent-resistant short handle[1] (incl. holder for 3 elements)	Red		**3SB35 01-2DA21-0PA0**	1 unit
		Green		**3SB35 01-2DA41-0PA0**	1 unit
		Blue		**3SB35 01-2DA51-0PA0**	1 unit
		Clear		**3SB35 01-2DA71-0PA0**	1 unit
	Non-illuminated, heavy-duty version	Black		**3SB35 00-2SA11**	1 unit
		Red		**3SB35 00-2SA21**	1 unit
		Green		**3SB35 00-2SA41**	1 unit
		White		**3SB35 00-2SA61**	1 unit
	Illuminated, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-2SA01**	1 unit
		Red		**3SB35 01-2SA21**	1 unit
		Yellow		**3SB35 01-2SA31**	1 unit
		Green		**3SB35 01-2SA41**	1 unit
		Blue		**3SB35 01-2SA51**	1 unit
		Clear		**3SB35 01-2SA71**	1 unit
	Non-illuminated, long handle, heavy-duty version	Black		**3SB35 00-3SA11**	1 unit
		Red		**3SB35 00-3SA21**	1 unit
		Green		**3SB35 00-3SA41**	1 unit
		White		**3SB35 00-3SA61**	1 unit
	Illuminated long handle, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-3SA01**	1 unit
		Red		**3SB35 01-3SA21**	
		Yellow		**3SB35 01-3SA31**	1 unit
		Green		**3SB35 01-3SA41**	1 unit
		Blue		**3SB35 01-3SA51**	1 unit
		Clear		**3SB35 01-3SA71**	1 unit
 Selector switch, 3 switch positions, heavy-duty version					
 Selector switch, 3 switch positions, long handle					
Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from the left and right 	**Non-illuminated, standard version**[1]	Black		**3SB35 00-2EA11**	1 unit
		Red		**3SB35 00-2EA21**	1 unit
		Green		**3SB35 00-2EA41**	1 unit
		White		**3SB35 00-2EA61**	1 unit
	Non-illuminated, with solvent-resistant short handle[1]	Black		**3SB35 00-2EA11-0PA0**	1 unit
		Red		**3SB35 00-2EA21-0PA0**	1 unit
		Green		**3SB35 00-2EA41-0PA0**	1 unit
	Illuminated, standard version[1] (incl. holder for 3 elements)	Amber		**3SB35 01-2EA01**	1 unit
		Red		**3SB35 01-2EA21**	1 unit
		Yellow		**3SB35 01-2EA31**	1 unit
		Green		**3SB35 01-2EA41**	1 unit
		Blue		**3SB35 01-2EA51**	1 unit
		Clear		**3SB35 01-2EA71**	1 unit
	Illuminated, with solvent-resistant short handle[1] (incl. holder for 3 elements)	Red		**3SB35 01-2EA21-0PA0**	1 unit
		Green		**3SB35 01-2EA41-0PA0**	1 unit
		Blue		**3SB35 01-2EA51-0PA0**	1 unit
		Clear		**3SB35 01-2EA71-0PA0**	1 unit
	Non-illuminated, heavy-duty version	Black		**3SB35 00-2TA11**	1 unit
		Red		**3SB35 00-2TA21**	1 unit
		Green		**3SB35 00-2TA41**	1 unit
		White		**3SB35 00-2TA61**	1 unit
	Illuminated, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-2TA01**	1 unit
		Red		**3SB35 01-2TA21**	1 unit
		Yellow		**3SB35 01-2TA31**	1 unit
		Green		**3SB35 01-2TA41**	1 unit
		Blue		**3SB35 01-2TA51**	1 unit
		Clear		**3SB35 01-2TA71**	1 unit
	Non-illuminated, long handle, heavy-duty version	Black		**3SB35 00-3TA11**	1 unit
		Red		**3SB35 00-3TA21**	1 unit
		Green		**3SB35 00-3TA41**	1 unit
		White		**3SB35 00-3TA61**	1 unit
	Illuminated long handle, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-3TA01**	1 unit
		Red		**3SB35 01-3TA21**	1 unit
		Yellow		**3SB35 01-3TA31**	1 unit
		Green		**3SB35 01-3TA41**	1 unit
		Blue		**3SB35 01-3TA51**	1 unit
		Clear		**3SB35 01-3TA71**	1 unit

Selector switches with holders



Selector switch, 3 switch positions, standard version



Selector switch, 3 switch positions, heavy-duty version



Selector switch, 3 switch positions, long handle

Version	Version Illumination	Color of handle	DT	Configurator Order No.	PS
Selector switches with 3 switch positions (cont)					
Switching sequence I-O-II, 2 x 50° operating angle, momentary to the left, spring return from the left, maintained to the right 	**Non-illuminated, standard version**[1]	Black		**3SB35 00-2GA11**	1 unit
		Red		**3SB35 00-2GA21**	1 unit
		Green		**3SB35 00-2GA41**	1 unit
		White		**3SB35 00-2GA61**	1 unit
	Illuminated, standard version[1] (incl. holder for 3 elements)	Amber		**3SB35 01-2GA01**	1 unit
		Red		**3SB35 01-2GA21**	1 unit
		Yellow		**3SB35 01-2GA31**	1 unit
		Green		**3SB35 01-2GA41**	1 unit
		Blue		**3SB35 01-2GA51**	1 unit
		Clear		**3SB35 01-2GA71**	1 unit
	Non-illuminated, heavy-duty version	Black		**3SB35 00-2VA11**	1 unit
		Red		**3SB35 00-2VA21**	1 unit
		Green		**3SB35 00-2VA41**	1 unit
		White		**3SB35 00-2VA61**	1 unit
	Illuminated, heavy-duty version	Amber		**3SB35 01-2VA01**	1 unit
		Red		**3SB35 01-2VA21**	1 unit
		Yellow		**3SB35 01-2VA31**	1 unit
		Green		**3SB35 01-2VA41**	1 unit
		Blue		**3SB35 01-2VA51**	1 unit
		Clear		**3SB35 01-2VA71**	1 unit
	Non-illuminated, heavy-duty version	Black		**3SB35 00-3VA11**	1 unit
		Red		**3SB35 00-3VA21**	1 unit
		Green		**3SB35 00-3VA41**	1 unit
		White		**3SB35 00-3VA61**	1 unit
	Illuminated, long handle, heavy-duty version	Amber		**3SB35 01-3UA01**	1 unit
		Red		**3SB35 01-3UA21**	1 unit
		Yellow		**3SB35 01-3UA31**	1 unit
		Green		**3SB35 01-3UA41**	1 unit
		Blue		**3SB35 01-3UA51**	1 unit
		Clear		**3SB35 01-3UA71**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, maintained to the left, momentary, to the right, spring return from the right 	**Non-illuminated, standard version**[1]	Black		**3SB35 00-2FA11**	1 unit
		Red		**3SB35 00-2FA21**	1 unit
		Green		**3SB35 00-2FA41**	1 unit
		White		**3SB35 00-2FA61**	1 unit
	Illuminated, standard version[1] (incl. holder for 3 elements)	Amber		**3SB35 01-2FA01**	1 unit
		Red		**3SB35 01-2FA21**	1 unit
		Yellow		**3SB35 01-2FA31**	1 unit
		Green		**3SB35 01-2FA41**	1 unit
		Blue		**3SB35 01-2FA51**	1 unit
		Clear		**3SB35 01-2FA71**	1 unit
	Non-illuminated, heavy-duty version	Black		**3SB35 00-2UA11**	1 unit
		Red		**3SB35 00-2UA21**	1 unit
		Green		**3SB35 00-2UA41**	1 unit
		White		**3SB35 00-2UA61**	1 unit
	Illuminated, heavy-duty version	Amber		**3SB35 01-2UA01**	1 unit
		Red		**3SB35 01-2UA21**	1 unit
		Yellow		**3SB35 01-2UA31**	1 unit
		Green		**3SB35 01-2UA41**	1 unit
		Blue		**3SB35 01-2UA51**	1 unit
		Clear		**3SB35 01-2UA71**	1 unit
	Non-illuminated, long handle	Black		**3SB35 00-3UA11**	1 unit
		Red		**3SB35 00-3UA21**	1 unit
		Green		**3SB35 00-3UA41**	1 unit
		White		**3SB35 00-3UA61**	1 unit
	Illuminated, long handle, heavy-duty version (incl. holder for 3 elements)	Amber		**3SB35 01-3UA01**	1 unit
		Red		**3SB35 01-3UA21**	1 unit
		Yellow		**3SB35 01-3UA31**	1 unit
		Green		**3SB35 01-3UA41**	1 unit
		Blue		**3SB35 01-3UA51**	1 unit
		Clear		**3SB35 01-3UA71**	1 unit

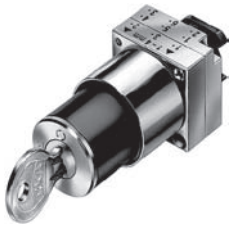
For online configurator see www.siemens.com/sirius/configurators .

[1] Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

Version	Lock version Type	Lock No./ color	Key removal position	DT	Configurator / Order No.	PS
Key-operated switches with holder[1]						
Key-operated switches with 2 keys, 2 switch positions						
Switching sequence O-I, 50° operating angle, maintained 	RONIS	SB 30	O+I		**3SB35 00-4AD11**	1 unit
			O		**3SB35 00-4AD01**	1 unit
			I		**3SB35 00-4AD21**	1 unit
	CES	SSG 10	O+I		**3SB35 00-4LD11**	1 unit
			O		**3SB35 00-4LD01**	1 unit
			I		**3SB35 00-4LD21**	1 unit
		LSG 1	O+I		**3SB35 00-4LF01**	1 unit
			O		**3SB35 00-4LF11**	1 unit
	BKS	S1	O+I		**3SB35 00-5AD11**	1 unit
			O		**3SB35 00-5AD01**	1 unit
			I		**3SB35 00-5AD21**	1 unit
	O.M.R.[2]	73038 Light blue	O+I		**3SB35 00-3AG11**	1 unit
			O		**3SB35 00-3AG01**	1 unit
			I		**3SB35 00-3AG21**	1 unit
		73037 Red	O+I		**3SB35 00-3AH11**	1 unit
			O		**3SB35 00-3AH01**	1 unit
			I		**3SB35 00-3AH21**	1 unit
		73034 Black	O+I		**3SB35 00-3AJ11**	1 unit
			O		**3SB35 00-3AJ01**	1 unit
			I		**3SB35 00-3AJ21**	1 unit
		73033 Yellow	O+I		**3SB35 00-3AK11**	1 unit
			O		**3SB35 00-3AK01**	1 unit
			I		**3SB35 00-3AK21**	1 unit
Switching sequence O-I, 50° operating angle, momentary, spring return from the right 	RONIS	SB 30	O		**3SB35 00-4BD01**	1 unit
	CES	SSG 10	O		**3SB35 00-4MD01**	1 unit
		LSG 1	O		**3SB35 00-4MF11**	1 unit
	BKS	S1	O		**3SB35 00-5BD01**	1 unit
	O.M.R.[2]	73038 Light blue	O		**3SB35 00-3BG01**	1 unit
		73037 Red	O		**3SB35 00-3BH01**	1 unit
		73034 Black	O		**3SB35 00-3BJ01**	1 unit
		73033 Yellow	O		**3SB35 00-3BK01**	1 unit


RONIS key-operated switch


CES key-operated switch


BKS key-operated switch


O.M.R. key-operated switch

⚙ For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

2) According to FIAT standards; also available for other users.

For BKS and CES special locks see page 17-357

Push Button Units and Indicator Lights

3SB3, Metal, Round, 22 mm

Version	Lock version Type	Lock No./ color	Key removal position	DT	Configurator / Order No.	PS
Key-operated switches with holder[1]						
Key-operated switches with 2 keys, 3 switch positions						
Switching sequence I-O-II, 2 x 50° operating angle, maintained 	RONIS	SB 30	I+O+II		**3SB35 00-4DD11**	1 unit
			O		**3SB35 00-4DD01**	1 unit
			I+II		**3SB35 00-4DD41**	1 unit
			I		**3SB35 00-4DD21**	1 unit
			II		**3SB35 00-4DD31**	1 unit
			O+I		**3SB35 00-4DD51**	1 unit
	CES	SSG 10	O+I+II		**3SB35 00-4PD11**	1 unit
			O		**3SB35 00-4PD01**	1 unit
			I+II		**3SB35 00-4PD41**	1 unit
			I		**3SB35 00-4PD21**	1 unit
			II		**3SB35 00-4PD31**	1 unit
	BKS	S1	O		**3SB35 00-5DD01**	1 unit
			O+I+II		**3SB35 00-5DD11**	1 unit
			I		**3SB35 00-5DD21**	
			II		**3SB35 00-5DD31**	
			I+II		**3SB35 00-5DD41**	
	O.M.R.[2]	73038 Light blue	I+O+II		**3SB35 00-3DG11**	1 unit
		73037 Light blue	I+O+II		**3SB35 00-3DH11**	1 unit
			O		**3SB35 00-3DG01**	1 unit
		73034 Black	I+O+II		**3SB35 00-3DJ11**	1 unit
			O		**3SB35 00-3DJ01**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from the left and right 	RONIS	SB 30	O		**3SB35 00-4ED01**	1 unit
	CES	SSG 10	O		**3SB35 00-4QD01**	1 unit
	BKS	S1	O		**3SB35 00-5ED01**	1 unit
	O.M.R.	73034 Black	O		**3SB35 00-3EJ01**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary to the left, spring return from the left, maintained to the right 	RONIS	SB 30	O + II		**3SB35 00-4GD61**	1 unit
			O		**3SB35 00-4GD01**	1 unit
			II		**3SB35 00-4GD31**	1 unit
	CES	SSG 10	O + II		**3SB35 00-4SD61**	1 unit
			O		**3SB35 00-4SD01**	1 unit
			II		**3SB35 00-4SD31**	1 unit
	BKS	S1	O + II		**3SB35 00-5GD61**	1 unit
			O		**3SB35 00-5GD01**	1 unit
			II		**3SB35 00-5GD31**	1 unit
	O.M.R.	73033 Yellow	II		**3SB35 00-3GK31**	1 unit
		73034 Black	II		**3SB35 00-3GJ31**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, maintained to the left, momentary to the right, spring return from the right 	RONIS	SB 30	O+I		**3SB35 00-4FD51**	1 unit
			O		**3SB35 00-4FD01**	1 unit
			I		**3SB35 00-4FD21**	1 unit
	CES	SSG 10	O+I		**3SB35 00-4RD51**	1 unit
			O		**3SB35 00-4RD01**	1 unit
			I		**3SB35 00-4RD21**	1 unit
	BKS	S1	O+I		**3SB35 00-5FD51**	1 unit
			O		**3SB35 00-5FD01**	1 unit
			I		**3SB35 00-5FD21**	1 unit


RONIS key-operated switch


CES key-operated switch


BKS key-operated switch

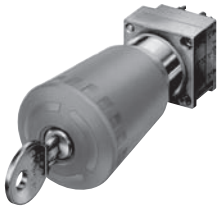

O.M.R. key-operated switch

For online configurator see www.siemens.com/sirius/configurators .

[1] Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

[2] According to FIAT standards; also available for other users.

For BKS and CES special locks see page 17-357

	Version	Color of handle	Approval	DT	Configurator Order No.	PS
EMERGENCY-STOP devices according to ISO 13850 and IEC 60947-5-5, with holder[1)2)]. Can also be used with 3TK28 safety relays.						
 Mushroom diameter 32 mm	**EMERGENCY-STOP mushroom push buttons, Ø 32 mm,** with positive latching according to ISO 13850, with rotate-to-unlatch mechanism					
	• Standard version				**3SB35 00-1FA20**	1 unit
	• Solvent-resistant				**3SB35 00-1FA20-0PA0**	1 unit
 Mushroom diameter 40 mm, with rotate-to-unlatch mechanism, with switch position indication	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm,** with positive latching according to ISO 13850, with rotate-to-unlatch mechanism	Red				
	• Without switch position indicator				**3SB35 00-1HA20**	1 unit
	• Without switch position indicator, solvent-resistant				**3SB35 00-1HA20-0PA0**	1 unit
	• With mechanical switch position indication				**3SB35 00-1HA26**	1 unit
 Mushroom diameter 40 mm, pull-to-unlatch mechanism	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm,** with positive latching according to ISO 13850, with pull-to-unlatch mechanism	Red			**3SB35 00-1TA20**	1 unit
 Mushroom diameter 60 mm	**EMERGENCY-STOP mushroom push buttons, Ø 60 mm,** with positive latching according to ISO 13850, with rotate-to-unlatch mechanism	Red			**3SB35 00-1AA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm with positive latching function with IKON lock Lock No. 360012K1, supplied with 2 keys, unlocking only possible using key	Red			**3SB35 00–1UA20**	1 unit
 Mushroom diameter 40 mm, with RONIS key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with RONIS key-operated switch** (with 2 keys), lock No. SB 30, with positive latching according to ISO 13850, unlocking only possible using key	Red			**3SB35 00-1BA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with CES key-operated switch, (with 2 keys), lock No. SSG 10, with positive latching according to ISO 13850, unlocking only possible using key	Red			**3SB35 00-1KA20**	1 unit
 Mushroom diameter 40 mm, with CES key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with BKS key-operated switch,** (with 2 keys), lock No. S1, with positive latching according to ISO 13850, unlocking only possible using key	Red			**3SB35 00-1LA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with O.M.R. key-operated switch (with 2 keys), lock No. 73037, with positive latching according to ISO 13850, unlocking only using key	Red			**3SB35 00-1MA20**	1 unit
	Wobble Stick				**3SB35 00–7CB61**	

For online configurator see www.siemens.com/sirius/configurators

1) Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

2) Yellow backing plates must be ordered separately; see "Accessories" on page 17-372.

For BKS and CES special locks see page 17-357

Version	Color of lens	DT	Configurator Order No.	PS
Signaling elements with holder[1]				
 Indicator light with smooth lens				
Indicator lights with lens with concentric rings[2]	Amber		**3SB35 01-6BA00**	1 unit
	Red		**3SB35 01-6BA20**	1 unit
	Yellow		**3SB35 01-6BA30**	1 unit
	Green		**3SB35 01-6BA40**	1 unit
	Blue		**3SB35 01-6BA50**	1 unit
	White		**3SB35 01-6BA60**	1 unit
	Clear		**3SB35 01-6BA70**	1 unit
Indicator lights with smooth lens[2]	Amber		**3SB35 01-6AA00**	1 unit
	Red		**3SB35 01-6AA20**	1 unit
	Yellow		**3SB35 01-6AA30**	1 unit
	Green		**3SB35 01-6AA40**	1 unit
	Blue		**3SB35 01-6AA50**	1 unit
	White		**3SB35 01-6AA60**	1 unit
	Clear		**3SB35 01-6AA70**	1 unit
Indicator lights with smooth solvent-resistant lens[2)3)]	Red		**3SB35 01-6AA20-0PA0**	1 unit
	Yellow		**3SB35 01-6AA30-0PA0**	1 unit
	Green		**3SB35 01-6AA40-0PA0**	1 unit
	Blue		**3SB35 01-6AA50-0PA0**	1 unit
	White		**3SB35 01-6AA60-0PA0**	1 unit
	Clear		**3SB35 01-6AA70-0PA0**	1 unit

For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

2) Inscription by inserting a label is not possible.

3) Not suitable for laser inscription.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units

Selection and ordering data

Rated voltage of lamp	Color of handle	Contacts for front plate mounting	DT	Screw terminals Configurator Order No.	DT	Spring-type terminals Configurator Order No.
V						
Push buttons						
Push buttons with flat button						
—	Black	1 NO		3SB32 02-0AA11		3SB32 02-0AA11-0CC0
	Black	1 NC		3SB32 03-0AA11		3SB32 03-0AA11-0CC0
	Red	1 NC		3SB32 03-0AA21		3SB32 03-0AA21-0CC0
	Yellow	1 NO		3SB32 02-0AA31		3SB32 02-0AA31-0CC0
	Green	1 NO		3SB32 02-0AA41		3SB32 02-0AA41-0CC0
	Blue	1 NO		3SB32 02-0AA51		3SB32 02-0AA51-0CC0
	White	1 NO		3SB32 02-0AA61		3SB32 02-0AA61-0CC0
	Black	1 NO + 1 NC		3SB32 01-0AA11		3SB32 01-0AA11-0CC0
	Red	1 NO + 1 NC		3SB32 01-0AA21		3SB32 01-0AA21-0CC0
	Yellow	1 NO + 1 NC		3SB32 01-0AA31		3SB32 01-0AA31-0CC0
	Green	1 NO + 1 NC		3SB32 01-0AA41		3SB32 01-0AA41-0CC0
	Blue	1 NO + 1 NC		3SB32 01-0AA51		3SB32 01-0AA51-0CC0
	White	1 NO + 1 NC		3SB32 01-0AA61		3SB32 01-0AA61-0CC0
Push Button with extended button monentary						
	Black	1 NO		3SB3202-0BA11		—
	Black	1 NC		3SB3203-0BA11		—
	Red	1 NC		3SB3203-0BA21		—
	Yellow	1 NO		3SB3202-0BA31		—
	Blue	1 NO		3SB3202-0BA51		—
	White	1 NO		3SB3202-0BA61		—
	Black	1 NO + 1 NC		3SB3201-0BA11		—
	Red	1 NO + 1 NC		3SB3201-0BA21		—
	Yellow	1 NO + 1 NC		3SB3201-0BA31		—
	Blue	1 NO + 1 NC		3SB3201-0BA51		—
	White	1 NO + 1 NC		3SB3201-0BA61		—
Illuminated push buttons with flat button with integrated LED (incl. holder for 3 elements)						
24 AC/DC	Red[1]	1 NC		3SB32 46-0AA21		3SB32 46-0AA21-0CC0
	Yellow[1]	1 NO		3SB32 45-0AA31		3SB32 45-0AA31-0CC0
	Green[1]	1 NO		3SB32 45-0AA41		3SB32 45-0AA41-0CC0
	Blue[1]	1 NO		3SB32 45-0AA51		3SB32 45-0AA51-0CC0
	White	1 NO		3SB32 45-0AA61		3SB32 45-0AA61-0CC0
	Clear[1]	1 NO		3SB32 45-0AA71		3SB32 45-0AA71-0CC0
24 AC/DC	Red[1]	1 NO + 1 NC		3SB32 47-0AA21		3SB32 47-0AA21-0CC0
	Yellow[1]	1 NO + 1 NC		3SB32 47-0AA31		3SB32 47-0AA31-0CC0
	Green[1]	1 NO + 1 NC		3SB32 47-0AA41		3SB32 47-0AA41-0CC0
	Blue[1]	1 NO + 1 NC		3SB32 47-0AA51		3SB32 47-0AA51-0CC0
	White	1 NO + 1 NC		3SB32 47-0AA61		3SB32 47-0AA61-0CC0
	Clear[1]	1 NO + 1 NC		3SB32 47-0AA71		3SB32 47-0AA71-0CC0
110 AC	Red[1]	1 NC		3SB32 50-0AA21		—
	Yellow[1]	1 NO		3SB32 57-0AA31		—
	Green[1]	1 NO		3SB32 57-0AA41		—
	Blue[1]	1 NO		3SB32 57-0AA51		—
	White	1 NO		3SB32 57-0AA61		—
	Clear[1]	1 NO		3SB32 57-0AA71		—
110 AC	Red[1]	1 NO + 1 NC		3SB32 51-0AA21		—
	Yellow[1]	1 NO + 1 NC		3SB32 51-0AA31		—
	Green[1]	1 NO + 1 NC		3SB32 51-0AA41		—
	Blue[1]	1 NO + 1 NC		3SB32 51-0AA51		—
	White	1 NO + 1 NC		3SB32 51-0AA61		—
	Clear[1]	1 NO + 1 NC		3SB32 51-0AA71		—
230 AC	Red[1]	1 NC		3SB32 54-0AA21		3SB32 54-0AA21-0CC0
	Yellow[1]	1 NO		3SB32 53-0AA31		3SB32 53-0AA31-0CC0
	Green[1]	1 NO		3SB32 53-0AA41		3SB32 53-0AA41-0CC0
	Blue[1]	1 NO		3SB32 53-0AA51		3SB32 53-0AA51-0CC0
	White	1 NO		3SB32 53-0AA61		3SB32 53-0AA61-0CC0
	Clear[1]	1 NO		3SB32 53-0AA71		3SB32 53-0AA71-0CC0
230 AC	Red[1]	1 NO + 1 NC		3SB32 55-0AA21		3SB32 55-0AA21-0CC0
	Yellow[1]	1 NO + 1 NC		3SB32 55-0AA31		3SB32 55-0AA31-0CC0
	Green[1]	1 NO + 1 NC		3SB32 55-0AA41		3SB32 55-0AA41-0CC0
	Blue[1]	1 NO + 1 NC		3SB32 55-0AA51		3SB32 55-0AA51-0CC0
	White	1 NO + 1 NC		3SB32 55-0AA61		3SB32 55-0AA61-0CC0
	Clear[1]	1 NO + 1 NC		3SB32 55-0AA71		3SB32 55-0AA71-0CC0



Push button with flat button



Illuminated push button with flat button

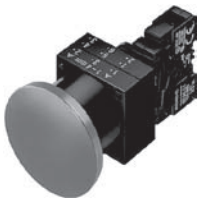
For online configurator see www.siemens.com/sirius/configurators .

1) Inscription is possible by inserting a label.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units

Color of handle	Contacts for front plate mounting	DT	Screw terminals Configurator Order No.	DT	Spring-type terminals Configurator Order No.
Push buttons					
 Illuminated push button with flat button	**Illuminated push buttons with flat button** with BA 9s lamp holder, without lamp (incl. holder for 3 elements)				
Red[1]	1 NC		**3SB32 07-0AA21**		**3SB32 07-0AA21-0CC0**
Yellow[1]	1 NO		**3SB32 06-0AA31**		**3SB32 06-0AA31-0CC0**
Green[1]	1 NO		**3SB32 06-0AA41**		**3SB32 06-0AA41-0CC0**
Blue[1]	1 NO		**3SB32 06-0AA51**		**3SB32 06-0AA51-0CC0**
White	1 NO		**3SB32 06-0AA61**		**3SB32 06-0AA61-0CC0**
Clear[1]	1 NO		**3SB32 06-0AA71**		**3SB32 06-0AA71-0CC0**
Red[1]	1 NO + 1 NC		**3SB32 05-0AA21**		**3SB32 05-0AA21-0CC0**
Yellow[1]	1 NO + 1 NC		**3SB32 05-0AA31**		**3SB32 05-0AA31-0CC0**
Green[1]	1 NO + 1 NC		**3SB32 05-0AA41**		**3SB32 05-0AA41-0CC0**
Blue[1]	1 NO + 1 NC		**3SB32 05-0AA51**		**3SB32 05-0AA51-0CC0**
White	1 NO + 1 NC		**3SB32 05-0AA61**		**3SB32 05-0AA61-0CC0**
Clear[1]	1 NO + 1 NC		**3SB32 05-0AA71**		**3SB32 05-0AA71-0CC0**
	Illuminated push buttons with flat button with BA 9s lamp holder with incandescent lamp 24 V AC/DC				
Red	1 NC		**3SB3213-0AA21**		–
Red	1 NO + 1 NC		**3SB3221-0AA21**		–
Yellow	1 NO + 1 NC		**3SB3221-0AA31**		–
Green	1 NO + 1 NC		**3SB3221-0AA41**		–
Blue	1 NO + 1 NC		**3SB3221-0AA51**		–
White	1 NO + 1 NC		**3SB3221-0AA61**		–
Clear	1 NO + 1 NC		**3SB3221-0AA71**		–
	Illuminated push buttons with flat button with BA 9s lamp holder with incandescent lamp 230 V AC/DC				
Red	1 NC		**3SB3216-0AA21**		–
Yellow	1 NO		**3SB3214-0AA31**		–
Green	1 NO		**3SB3214-0AA41**		–
Blue	1 NO		**3SB3214-0AA51**		–
White	1 NO		**3SB3214-0AA61**		–
Clear	1 NO		**3SB3214-0AA71**		–
Red	1 NO + 1 NC		**3SB3213-0AA21**		–
Yellow	1 NO + 1 NC		**3SB3213-0AA31**		–
Green	1 NO + 1 NC		**3SB3213-0AA41**		–
Blue	1 NO + 1 NC		**3SB3213-0AA51**		–
White	1 NO + 1 NC		**3SB3213-0AA61**		–
Clear	1 NO + 1 NC		**3SB3213-0AA71**		–
Mushroom push buttons					
 Mushroom push-pull button	**Mushroom push-pull buttons, Ø 40 mm, maintained,** with pull-to-unlatch mechanism				
Red	1 NC		**3SB32 03-1CA21**		**3SB32 03-1CA21-0CC0**
	1 NO + 1 NC		**3SB32 01-1CA21**		**3SB32 01-1CA21-0CC0**

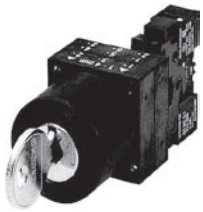
For online configurator see www.siemens.com/sirius/configurators .

[1] Inscription is possible by inserting a label.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units

Version	Color of handle/ Lock No.	Contacts for front plate mounting	DT	Screw terminals Configurator Order No.	DT	Spring-type terminals Configurator Order No.
Selector switches						
 Selector switch						
Selector switches, 2 switch positions Switching sequence O-I, 50° operating angle						
Latching 	Black	1 NO		**3SB32 02-2KA11**		**3SB32 02-2KA11-0CC0**
		1 NO + 1 NC		**3SB32 01-2KA11**		**3SB32 01-2KA11-0CC0**
Selector switches, 2 switch positions Switching sequence O-I, 90° operating angle						
Latching 	Black	1 NO		**3SB32 02-2HA11**		–
		1 NO + 1 NC		**3SB32 01-2HA11**		–
Selector switches, 3 switch positions switching sequence I-O-II, 2 x 50° operating angle						
Latching 	Black	1 NO, 1 NO		**3SB32 10-2DA11**		**3SB32 10-2DA11-0CC0**
		1 NO + 1 NC, 1 NO + 1 NC		**3SB32 08-2DA11**		**3SB32 08-2DA11-0CC0**
Momentary, spring return from left and right 	Black	1 NO, 1 NO		**3SB32 10-2EA11**		**3SB32 10-2EA11-0CC0**
		1 NO + 1 NC, 1 NO + 1 NC		**3SB32 08-2EA11**		**3SB32 08-2EA11-0CC0**
Key-operated switches						
 RONIS key-operated switch						
RONIS key-operated switches, 2 switch positions with 2 keys, removal position O + I, switching sequence O-I, 50° operating angle						
Latching 	SB 30	1 NO		**3SB32 02-4AD11**		**3SB32 02-4AD11-0CC0**
		1 NO + 1 NC		**3SB32 01-4AD11**		**3SB32 01-4AD11-0CC0**
Switching sequence I–O–II, maintained, operating angle 2 x 50°						
Latching 	SB 30	1 NO, 1 NO		**3SB32 10–4DD11**		–
		1 NO + 1 NC, 1 NO + 1 NC		**3SB32 08–4DD11**		–
Twin push buttons						
 Twin push button with flat buttons						
Twin push buttons, with flat, square buttons[1)]						
With I/O inscription	White/White	1 NO + 1 NC, 1 NO + 1 NC		**3SB31 00-8AC61**		–

For online configurator see www.siemens.com/sirius/configurators .

1) Mounting the twin push buttons in 3SB38 enclosure is not possible.
For accessories see page 17-343.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units

Color of handle	Contacts for front plate mounting	DT	Screw terminals Configurator Order No.	DT	Spring-type terminals Configurator Order No.
EMERGENCY-STOP devices according to ISO 13850, with yellow name plate, Ø 80 mm, with inscription					
 With rotate-to-unlatch mechanism	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with positive maintained function,** with rotate-to-unlatch mechanism • English inscription "EMERGENCY STOP"				
Red	1 NC	➔	**3SB32 03-1HR20**		–
	1 NC with mounting monitoring	➔	**3SB32 66-1HR20**		–
Red	1 NO + 1 NC	➔	**3SB32 01-1HR20**		–
 With rotate-to-unlatch mechanism and switch position indication	With rotate-to-unlatch mechanism and mechanical switch position indication • English inscription "EMERGENCY STOP"				
Red	1 NC	➔	**3SB32 03-1HR26**		–
	1 NC with mounting monitoring	➔	**3SB32 66-1HR26**		–
Red	1 NO + 1 NC	➔	**3SB32 01-1HR26**		–
 With pull-to-unlatch mechanism	With pull-to-unlatch mechanism • English inscription "EMERGENCY STOP"				
Red	1 NC	➔	**3SB32 03-1TR20**		–
Red	1 NO + 1 NC	➔	**3SB32 01-1TR20**		–

For online configurator see www.siemens.com/sirius/configurators .

➔ Positive opening according to IEC 60947-5-1, Appendix K.
Can be used with 3TK28 safety relays.
Certificate:

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units

Rated voltage of lamp	Color of lens	DT	Screw terminals Configurator	DT	Spring-type terminals Configurator
V			Order No.		Order No.
Indicator lights					
Indicator lights with smooth lens[1] with integrated LED					
24 AC/DC	Red		**3SB32 44-6AA20**		**3SB32 44-6AA20-0CC0**
	Yellow		**3SB32 44-6AA30**		**3SB32 44-6AA30-0CC0**
	Green		**3SB32 44-6AA40**		**3SB32 44-6AA40-0CC0**
	Blue		**3SB32 44-6AA50**		**3SB32 44-6AA50-0CC0**
	White		**3SB32 44-6AA60**		**3SB32 44-6AA60-0CC0**
	Clear		**3SB32 44-6AA70**		**3SB32 44-6AA70-0CC0**
110 AC	Red		**3SB32 48-6AA20**		–
	Yellow		**3SB32 48-6AA30**		–
	Green		**3SB32 48-6AA40**		–
	Blue		**3SB32 48-6AA50**		–
	White		**3SB32 48-6AA60**		–
	Clear		**3SB32 48-6AA70**		–
230 AC	Red		**3SB32 52-6AA20**		**3SB32 52-6AA20-0CC0**
	Yellow		**3SB32 52-6AA30**		**3SB32 52-6AA30-0CC0**
	Green		**3SB32 52-6AA40**		**3SB32 52-6AA40-0CC0**
	Blue		**3SB32 52-6AA50**		**3SB32 52-6AA50-0CC0**
	White		**3SB32 52-6AA60**		**3SB32 52-6AA60-0CC0**
	Clear		**3SB32 52-6AA70**		**3SB32 52-6AA70-0CC0**
With BA 9s lamp holder, without lamp					
	Red		**3SB32 04-6AA20**		**3SB32 04-6AA20-0CC0**
	Yellow		**3SB32 04-6AA30**		**3SB32 04-6AA30-0CC0**
	Green		**3SB32 04-6AA40**		**3SB32 04-6AA40-0CC0**
	Blue		**3SB32 04-6AA50**		**3SB32 04-6AA50-0CC0**
	White		**3SB32 04-6AA60**		**3SB32 04-6AA60-0CC0**
	Clear		**3SB32 04-6AA70**		**3SB32 04-6AA70-0CC0**
With BA 9s lamp holde with lamp (130 V)					
24 V AC/DC	Red		**3SB32 17-6AA20**		–
	Yellow		**3SB32 17-6AA30**		–
	Green		**3SB32 17-6AA40**		–
	Blue		**3SB32 17-6AA50**		–
	White		**3SB32 17-6AA60**		–
	Clear		**3SB32 17-6AA70**		–
With BA 9s lamp holder with lamp (130 V)					
230 V AC/DC	Red		**3SB32 12-6AA20**		**3SB32 12-6AA20-0CC0**
	Yellow		**3SB32 12-6AA30**		**3SB32 12-6AA30-0CC0**
	Green		**3SB32 12-6AA40**		**3SB32 12-6AA40-0CC0**
	Blue		**3SB32 12-6AA50**		**3SB32 12-6AA50-0CC0**
	White		**3SB32 12-6AA60**		**3SB32 12-6AA60-0CC0**
	Clear		**3SB32 12-6AA70**		**3SB32 12-6AA70-0CC0**



Indicator light with smooth lens

For online configurator see www.siemens.com/sirius/configurators .

1) Inscription by inserting a label is not possible.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units



Indicator light with lens with concentric rings

Rated voltage of lamp	Color of lens	DT	Screw terminals Configurator	DT	Spring-type terminals Configurator
V			Order No.		Order No.
Indicator lights					
Indicator lights with lens with concentric rings[1] with integrated LED					
24 AC/DC	Red		**3SB32 44-6BA20**		**3SB32 44-6BA20-0CC0**
	Yellow		**3SB32 44-6BA30**		**3SB32 44-6BA30-0CC0**
	Green		**3SB32 44-6BA40**		**3SB32 44-6BA40-0CC0**
	Blue		**3SB32 44-6BA50**		**3SB32 44-6BA50-0CC0**
	White		**3SB32 44-6BA60**		**3SB32 44-6BA60-0CC0**
	Clear		**3SB32 44-6BA70**		**3SB32 44-6BA70-0CC0**
110 AC	Red		**3SB32 48-6BA20**		–
	Yellow		**3SB32 48-6BA30**		–
	Green		**3SB32 48-6BA40**		–
	Blue		**3SB32 48-6BA50**		–
	White		**3SB32 48-6BA60**		–
	Clear		**3SB32 48-6BA70**		–
230 AC	Red		**3SB32 52-6BA20**		**3SB32 52-6BA20-0CC0**
	Yellow		**3SB32 52-6BA30**		**3SB32 52-6BA30-0CC0**
	Green		**3SB32 52-6BA40**		**3SB32 52-6BA40-0CC0**
	Blue		**3SB32 52-6BA50**		**3SB32 52-6BA50-0CC0**
	White		**3SB32 52-6BA60**		**3SB32 52-6BA60-0CC0**
	Clear		**3SB32 52-6BA70**		**3SB32 52-6BA70-0CC0**
With BA 9s lamp holder, without lamp					
	Amber		**3SB32 04-6BA00**		–
	Red		**3SB32 04-6BA20**		**3SB32 04-6BA20-0CC0**
	Yellow		**3SB32 04-6BA30**		**3SB32 04-6BA30-0CC0**
	Green		**3SB32 04-6BA40**		**3SB32 04-6BA40-0CC0**
	Blue		**3SB32 04-6BA50**		**3SB32 04-6BA50-0CC0**
	White		**3SB32 04-6BA60**		**3SB32 04-6BA60-0CC0**
	Clear		**3SB32 04-6BA70**		**3SB32 04-6BA70-0CC0**
With BA 9s lamp holder, with LED					
130 AC	Amber		**3SB32 40-6BA00**		–
	Red		**3SB32 40-6BA20**		–
	Yellow		**3SB32 40-6BA30**		–
	Green		**3SB32 40-6BA40**		–
	Blue		**3SB32 40-6BA50**		–
	White		**3SB32 40-6BA60**		–
	Clear		**3SB32 40-6BA70**		–
With BA 9s lamp holder with LED lamp					
24 V AC/DC	Red		**3SB32 36-6BA20**		–
	Yellow		**3SB32 36-6BA30**		–
	Green		**3SB32 36-6BA40**		–
	Blue		**3SB32 36-6BA50**		–
	White		**3SB32 36-6BA60**		–
	Clear		**3SB32 36-6BA70**		–
With integrated LED					
230 AC	Red		**3SB32 52-6BA20**		**3SB32 52-6BA20-0CC0**
	Yellow		**3SB32 52-6BA30**		**3SB32 52-6BA30-0CC0**
	Green		**3SB32 52-6BA40**		**3SB32 52-6BA40-0CC0**
	Blue		**3SB32 52-6BA50**		**3SB32 52-6BA50-0CC0**
	White		**3SB32 52-6BA60**		**3SB32 52-6BA60-0CC0**
	Clear		**3SB32 52-6BA70**		**3SB32 52-6BA70-0CC0**

For online configurator see www.siemens.com/sirius/configurators

[1] Inscription by inserting a label is not possible.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Complete units

Version	Rated voltage of lamp	Color of lens	DT	Screw terminals / Configurator	PS
	V			Order No.	

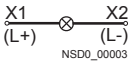
Signaling devices

Acoustic signaling devices, IP65[1]



Acoustic signaling device

Continuous tone 2.4 kHz, operational current min. 4 mA, sound pressure min. 80 dB/10 cm	24 AC/DC	Black	**3SB32 33-7BA10**	1 unit
	115 AC/DC		**3SB32 34-7BA10**	1 unit
	230 AC/DC		**3SB32 35-7BA10**	1 unit



For online configurator see www.siemens.com/sirius/configurators .

[1] Mounting in 3SB38 enclosures only with the 3SB3400-1A lamp holder for front plate mounting, which is included.

Version	Degree of protection	Color of handle	DT	Without connection	PS
				Order No.	

Special devices

Actuators for potentiometers[2][3]



Potentiometer drive

With shaft Ø 6 mm, 30 ... 32 mm long	IP65	—	**3SB10 00-7CH07**	1 unit

Push buttons with extended stroke[2] for actuating relays



Push buttons with 12 mm stroke

12 mm stroke	IP65	Black	**3SB30 00-0EA11**	1 unit

Mechanical Reset[]

Overload reset adapter Reset Push Button IP65 Ø 22mm, 12 mm stroke	S00 to S10/S12	—	**3RU19 00-1A**	1 unit
Reset extension	S10/S12		**3SX1335**	1 unit
Complete assembly			**3SBES-RESET**	1 unit

[2] Mounting in 3SB38 enclosure is not possible.

[3] The potentiometer is not included in the scope of supply.

Selection and ordering data

Version	Inscriptions	Color of handle	DT	Configurator / Order No.	PS
Push buttons with holder[1]					
 With flat button					
Push buttons with flat button		Black		**3SB30 00-0AA11**	1 unit
		Red		**3SB30 00-0AA21**	1 unit
		Yellow		**3SB30 00-0AA31**	1 unit
		Green		**3SB30 00-0AA41**	1 unit
		Blue		**3SB30 00-0AA51**	1 unit
		White		**3SB30 00-0AA61**	1 unit
		Gray		**3SB30 00-0AB51**	1 unit
		Clear[2]		**3SB30 00-0AA71**	1 unit
	I	Green		**3SB30 00-0AA81**	1 unit
	O	Red		**3SB30 00-0AB01**	1 unit
	I	White		**3SB30 00-0AB11**	1 unit
	O	Black		**3SB30 00-0AB21**	1 unit
	R	Blue		**3SB30 00-0AC81**	1 unit
 With raised button					
	Down	Black		**3SB30 00-0AA11-ZEE**	1 unit
	Up	Black		**3SB30 00-0AA11-ZED**	
	Forward	Black		**3SB30 00-0AA11-ZEF**	
	Reverse	Black		**3SB30 00-0AA11-ZEG**	
	On	Green		**3SB30 00-0AA11-ZEB**	
	Start	Red		**3SB30 00-0AA11-ZEL**	
	Reset	Blue		**3SB30 00-0AA11-ZEM**	
Push buttons with raised button		Black		**3SB30 00-0BA11**	1 unit
		Red		**3SB30 00-0BA21**	1 unit
		Yellow		**3SB30 00-0BA31**	1 unit
		Green		**3SB30 00-0BA41**	1 unit
		Blue		**3SB30 00-0BA51**	1 unit
		White		**3SB30 00-0BA61**	1 unit
	Off	Red		**3SB30 00-0BA21-ZEC**	
	Stop	Red		**3SB30 00-0BA21-ZEK**	
 With raised button, maintained					
Push buttons with raised button, maintained by pressing in and turning to the right, unlatches by turning to the left		Black		**3SB30 00-0CA11**	1 unit
		Red		**3SB30 00-0CA21**	1 unit
Push buttons with raised front ring (height 13 mm)		Black		**3SB30 00-0AA12**	1 unit
		Red		**3SB30 00-0AA22**	1 unit
		Yellow		**3SB30 00-0AA32**	1 unit
		Green		**3SB30 00-0AA42**	1 unit
		Blue		**3SB30 00-0AA52**	1 unit
		White		**3SB30 00-0AA62**	1 unit
 With raised front ring					
Push buttons with raised front ring, castellated (height 13 mm)		Black		**3SB30 00-0AA13**	1 unit
		Red		**3SB30 00-0AA23**	1 unit
		Yellow		**3SB30 00-0AA33**	1 unit
		Green		**3SB30 00-0AA43**	1 unit
		Blue		**3SB30 00-0AA53**	
		White		**3SB30 00-0AA63**	
Illuminated push buttons with flat button (incl. holder for 3 elements)		Amber[2]		**3SB30 01-0AA01**	1 unit
		Red[2]		**3SB30 01-0AA21**	1 unit
		Yellow[2]		**3SB30 01-0AA31**	1 unit
		Green[2]		**3SB30 01-0AA41**	1 unit
		Blue[2]		**3SB30 01-0AA51**	1 unit
		White		**3SB30 01-0AA61**	1 unit
		Clear[2]		**3SB30 01-0AA71**	1 unit
 With raised front ring, castellated					
Illuminated push buttons with raised button (incl. holder for 3 elements)		Red		**3SB30 01-0BA21**	1 unit
		Yellow		**3SB30 01-0BA31**	1 unit
		Green		**3SB30 01-0BA41**	1 unit
		Blue		**3SB30 01-0BA51**	1 unit
		Clear		**3SB30 01-0BA71**	1 unit
Push buttons with flat button, **maintained**, unlatches by pressing again		Black		**3SB30 00-0DA11**	1 unit
		Red		**3SB30 00-0DA21**	1 unit
		Yellow		**3SB30 00-0DA31**	1 unit
		Green		**3SB30 00-0DA41**	1 unit
		Blue		**3SB30 00-0DA51**	1 unit
		White		**3SB30 00-0DA61**	1 unit
		Gray		**3SB30 00-0DB51**	1 unit
 Illuminated push button with raised button					
Illuminated push buttons with flat button, **maintained**, unlatches by pressing again (incl. holder for 3 elements)		Red[2]		**3SB30 01-0DA21**	1 unit
		Yellow[2]		**3SB30 01-0DA31**	1 unit
		Green[2]		**3SB30 01-0DA41**	1 unit
		Blue[2]		**3SB30 01-0DA51**	1 unit
		White		**3SB30 01-0DA61**	1 unit
		Clear[2]		**3SB30 01-0DA71**	1 unit

For online configurator see www.siemens.com/sirius/configurators .

[1] Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

[2] Inscription is possible by inserting a label.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

	Version	Color of handle	DT	Configurator Order No.	PS
Mushroom push buttons with holder[1)2)]					
	**Mushroom push buttons, Ø 30 mm**	Black Red Yellow Green		**3SB30 00-1DA11** **3SB30 00-1DA21** **3SB30 00-1DA31** **3SB30 00-1DA41**	1 unit 1 unit 1 unit 1 unit
	**Mushroom push buttons, Ø 40 mm**	Black Red Yellow Green		**3SB30 00-1GA11** **3SB30 00-1GA21** **3SB30 00-1GA31** **3SB30 00-1GA41**	1 unit 1 unit 1 unit 1 unit
	**Mushroom push buttons, Ø 60 mm**	Black Red Yellow Green		**3SB30 00-1QA11** **3SB30 00-1QA21** **3SB30 00-1QA31** **3SB30 00-1QA41**	1 unit 1 unit 1 unit 1 unit
	**Illuminated mushroom push buttons, Ø 30 mm** (incl. holder for 3 elements)	Red Yellow Green Blue White Clear		**3SB30 01-1DA21** **3SB30 01-1DA31** **3SB30 01-1DA41** **3SB30 01-1DA51** **3SB30 01-1DA61** **3SB30 01-1DA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
	**Illuminated mushroom push buttons, Ø 40 mm** (incl. holder for 3 elements)	Yellow Green White		**3SB30 01-1GA31** **3SB30 01-1GA41** **3SB30 01-1GA61**	1 unit 1 unit 1 unit
	**Push-pull buttons, Ø 30 mm, maintained**, pull to unlatch	Black Red		**3SB30 00-1EA11** **3SB30 00-1EA21**	1 unit 1 unit
	Push-pull buttons, Ø 40 mm, maintained, pull to unlatch	Black Red		**3SB30 00-1CA11** **3SB30 00-1CA21**	1 unit 1 unit
	Push-pull buttons, Ø 60 mm, maintained, pull to unlatch	Black Red		**3SB30 00-1RA11** **3SB30 00-1RA21**	1 unit 1 unit
	**Push-pull buttons, Ø 30 mm, can be illuminated, maintained**, pull to unlatch, (incl. holder for 3 elements)	Red Yellow Green Blue Clear		**3SB30 01-1EA21** **3SB30 01-1EA31** **3SB30 01-1EA41** **3SB30 01-1EA51** **3SB30 01-1EA71**	1 unit 1 unit 1 unit 1 unit 1 unit
	Push-pull buttons, Ø 40 mm, can be illuminated, maintained, pull to unlatch (incl. holder for 3 elements)	Red Yellow Green Blue Clear		**3SB30 01-1CA21** **3SB30 01-1CA31** **3SB30 01-1CA41** **3SB30 01-1CA51** **3SB30 01-1CA71**	1 unit 1 unit 1 unit 1 unit 1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with "**-Z**" and quote order code "**B01**". Price reduction on request.

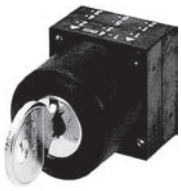
2) Maximum permissible equipment: 3 single-pole or 2 double-pole contact blocks. When using the 3SB39 01-0AB holder, the central command point must not be empty.

Version	Version Illumination	Color of handle	DT	Configurator ⚙ Order No.	PS
Selector switches with holder[1)]					
Selector switches with 2 switch positions					
 Non-illuminated Switching sequence O-I, 90° operating angle, maintained 	**Non-illuminated**	Black		**3SB30 00-2HA11**	1 unit
		Red		**3SB30 00-2HA21**	1 unit
		Green		**3SB30 00-2HA41**	1 unit
		White		**3SB30 00-2HA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2HA21**	1 unit
		Yellow		**3SB30 01-2HA31**	1 unit
		Green		**3SB30 01-2HA41**	1 unit
		Blue		**3SB30 01-2HA51**	1 unit
		Clear		**3SB30 01-2HA71**	1 unit
 Illuminated Switching sequence O-I, 50° operating angle, maintained 	**Non-illuminated**	Black		**3SB30 00-2KA11**	1 unit
		Red		**3SB30 00-2KA21**	1 unit
		Green		**3SB30 00-2KA41**	1 unit
		White		**3SB30 00-2KA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2KA21**	1 unit
		Yellow		**3SB30 01-2KA31**	1 unit
		Green		**3SB30 01-2KA41**	1 unit
		Blue		**3SB30 01-2KA51**	1 unit
		Clear		**3SB30 01-2KA71**	1 unit
Switching sequence O-I, 50° operating angle, momentary, spring apart from right 	**Non-illuminated**	Black		**3SB30 00-2LA11**	1 unit
		Red		**3SB30 00-2LA21**	1 unit
		Green		**3SB30 00-2LA41**	1 unit
		White		**3SB30 00-2LA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2LA21**	1 unit
		Yellow		**3SB30 01-2LA31**	1 unit
		Green		**3SB30 01-2LA41**	1 unit
		Blue		**3SB30 01-2LA51**	1 unit
		Clear		**3SB30 01-2LA71**	1 unit
Selector switches with 3 switch positions					
 Non-illuminated Switching sequence I-O-II, 2 x 50° operating angle, maintained 	**Non-illuminated**	Black		**3SB30 00-2DA11**	1 unit
		Red		**3SB30 00-2DA21**	1 unit
		Green		**3SB30 00-2DA41**	1 unit
		White		**3SB30 00-2DA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2DA21**	1 unit
		Yellow		**3SB30 01-2DA31**	1 unit
		Green		**3SB30 01-2DA41**	1 unit
		Blue		**3SB30 01-2DA51**	1 unit
		Clear		**3SB30 01-2DA71**	1 unit
 Illuminated Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right 	**Non-illuminated**	Black		**3SB30 00-2EA11**	1 unit
		Red		**3SB30 00-2EA21**	1 unit
		Green		**3SB30 00-2EA41**	1 unit
		White		**3SB30 00-2EA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2EA21**	1 unit
		Yellow		**3SB30 01-2EA31**	1 unit
		Green		**3SB30 01-2EA41**	1 unit
		Blue		**3SB30 01-2EA51**	1 unit
		Clear		**3SB30 01-2EA71**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary to the left, spring return to the left, maintained to the right 	**Non-illuminated**	Black		**3SB30 00-2GA11**	1 unit
		Red		**3SB30 00-2GA21**	1 unit
		Green		**3SB30 00-2GA41**	1 unit
		White		**3SB30 00-2GA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2GA21**	1 unit
		Yellow		**3SB30 01-2GA31**	1 unit
		Green		**3SB30 01-2GA41**	1 unit
		Blue		**3SB30 01-2GA51**	1 unit
		Clear		**3SB30 01-2GA71**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, maintained to the left, momentary to the right, spring return from the right 	**Non-illuminated**	Black		**3SB30 00-2FA11**	1 unit
		Red		**3SB30 00-2FA21**	1 unit
		Green		**3SB30 00-2FA41**	1 unit
		White		**3SB30 00-2FA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB30 01-2FA21**	1 unit
		Yellow		**3SB30 01-2FA31**	1 unit
		Green		**3SB30 01-2FA41**	1 unit
		Blue		**3SB30 01-2FA51**	1 unit
		Clear		**3SB30 01-2FA71**	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

Version	Lock version Type	Lock No./ color	Key removal position	DT	Configurator / Order No.	PS
Key-operated switches with holder[1]						
Key-operated switches with 2 keys, 2 switch positions						
Switching sequence O-I, 50° operating angle, maintained	RONIS	SB 30	O+I		**3SB30 00-4HD11**	1 unit
			O		**3SB30 00-4HD01**	1 unit
			I		**3SB30 00-4HD21**	1 unit
Switching sequence O-I, 50° operating angle, maintained	RONIS	SB 30	O+I		**3SB30 00-4AD11**	1 unit
			O		**3SB30 00-4AD01**	1 unit
			I		**3SB30 00-4AD21**	1 unit
	CES	SSG 10	O+I		**3SB30 00-4LD11**	1 unit
			O		**3SB30 00-4LD01**	1 unit
			I		**3SB30 00-4LD21**	1 unit
		LSG 1	O+I		**3SB30 00-4LF01**	1 unit
			O		**3SB30 00-4LF11**	1 unit
	CES with key monitoring[2]	SSG 10	O		**3SB30 00-4LD05**	1 unit
	BKS	S1	O+I		**3SB30 00-5AD11**	1 unit
			O		**3SB30 00-5AD01**	1 unit
			I		**3SB30 00-5AD21**	1 unit
	O.M.R.[3]	73038 Light blue	O+I		**3SB30 00-3AG11**	1 unit
			O		**3SB30 00-3AG01**	1 unit
		73037 Red	O+I		**3SB30 00-3AH11**	1 unit
			O		**3SB30 00-3AH01**	1 unit
		73034 Black	O+I		**3SB30 00-3AJ11**	1 unit
			O		**3SB30 00-3AJ01**	1 unit
			I		**3SB30 00-3AJ21**	1 unit
		73033 Yellow	O+I		**3SB30 00-3AK11**	1 unit
			O		**3SB30 00-3AK01**	1 unit
Switching sequence O-I, 50° operating angle, momentary, spring return from the right	RONIS	SB 30	O		**3SB30 00-4BD01**	1 unit
	CES	SSG 10	O		**3SB30 00-4MD01**	1 unit
		LSG 1	O		**3SB30 00-4MF11**	1 unit
	BKS	S1	O		**3SB30 00-5BD01**	1 unit
	O.M.R.[3]	73038 Light blue	O		**3SB30 00-3BG01**	1 unit
		73037 Red	O		**3SB30 00-3BH01**	1 unit
		73034 Black	O		**3SB30 00-3BJ01**	1 unit
		73033 Yellow	O		**3SB30 00-3BK01**	1 unit



RONIS key-operated switch



CES key-operated switch



BKS key-operated switch



O.M.R. key-operated switch

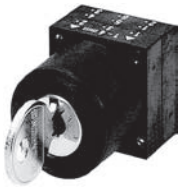
For online configurator see www.siemens.com/sirius/configurators .

[1] Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

[2] For locks with key monitoring the supplied 3SB39 01-0AB holder must be used.
The key scan is performed by a 3SB34 single-pole NC contact block which must be snap-mounted in the center position. Scanning of the switch positions must be performed by additional contact blocks which are snap-mounted on the actuator.
Special locks can be ordered only with order code "Y01".

[3] According to FIAT standards; also available for other users.

For BKS and CES special locks see page 17-357.



RONIS key-operated switch



CES key-operated switch



BKS key-operated switch



O.M.R. key-operated switch

Version	Lock version Type	Lock No./ color	Key removal position	DT	Configurator / Order No.	PS
Key-operated switches with holder[1]						
Key-operated switches with 2 keys, 3 switch positions						
Switching sequence I-O-II, 2 x 50° operating angle, maintained 	RONIS	SB 30	I+O+II		**3SB30 00-4DD11**	1 unit
			O		**3SB30 00-4DD01**	1 unit
			I+II		**3SB30 00-4DD41**	1 unit
			I		**3SB30 00-4DD21**	1 unit
			II		**3SB30 00-4DD31**	1 unit
			O+I		**3SB30 00-4DD51**	1 unit
	CES	SSG 10	I+O+II		**3SB30 00-4PD11**	1 unit
			O		**3SB30 00-4PD01**	1 unit
			O+I		**3SB30 00-4PD51**	1 unit
			I+II		**3SB30 00-4PD41**	1 unit
			I		**3SB30 00-4PD21**	1 unit
			II		**3SB30 00-4PD31**	1 unit
	CES with key monitoring	SSG 10 [2]	O		**3SB30 00-4PD05**	1 unit
	BKS	S1	I+O+II		**3SB30 00-5DD11**	1 unit
			II		**3SB30 00-5DD31**	1 unit
			O		**3SB30 00–5DD01**	1 unit
	O.M.R.[3]	73038 Light blue	I+O+II		**3SB30 00-3DG11**	1 unit
			O		**3SB30 00-3DG01**	1 unit
		73037 Red	O		**3SB30 00-3DH01**	1 unit
			O+I		**3SB30 00-3DH51**	1 unit
		73034 Black	I+O+II		**3SB30 00-3DJ11**	1 unit
			O		**3SB30 00-3DJ01**	1 unit
		73033 Yellow	I+O+II		**3SB30 00-3DK11**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right 	RONIS	SB 30	O		**3SB30 00-4ED01**	1 unit
	CES	SSG 10	O		**3SB30 00-4QD01**	1 unit
	BKS	S1	O		**3SB30 00-5ED01**	1 unit
	O.M.R.[3]	73034 Black	O		**3SB30 00-3EJ01**	1 unit
		73037 Red	O		**3SB30 00–3EH01**	
Switching sequence I-O-II, 2 x 50° operating angle, momentary to the left, spring return from the left, maintained to the right 	RONIS	SB 30	O + II		**3SB30 00-4GD61**	1 unit
			O		**3SB30 00-4GD01**	1 unit
			II		**3SB30 00-4GD31**	1 unit
	CES	SSG 10	O + II		**3SB30 00-4SD61**	1 unit
			O		**3SB30 00-4SD01**	1 unit
	BKS	S1	O		**3SB30 00-5GD01**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, maintained to the left, momentary to the right, spring return from the right 	RONIS	SB 30	O+I		**3SB30 00-4FD51**	1 unit
			O		**3SB30 00-4FD01**	1 unit
			I		**3SB30 00-4FD21**	1 unit
	CES	SSG 10	O+I		**3SB30 00-4RD51**	1 unit
			O		**3SB30 00-4RD01**	1 unit
			I		**3SB30 00-4RD21**	1 unit
	BKS	S1	O+I		**3SB30 00-5FD51**	1 unit
			O		**3SB30 00-5FD01**	1 unit
			I		**3SB30 00-5FD21**	1 unit
	O.M.R.[3]	73038 Light blue	O		**3SB30 00-3FG01**	1 unit
		73034 Black	I		**3SB30 00-3FJ21**	1 unit

For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

2) For locks with key monitoring the supplied 3SB39 01-0AB holder must be used.
The key scan is performed by a 3SB34 single-pole NC contact block which must be snap-mounted in the center position. Scanning of the switch positions must be performed by additional contact blocks which are snap-mounted on the actuator.
Special locks can be ordered only with order code "Y01".

3) According to FIAT standards; also available for other users.

For BKS and CES special locks see page 17-357.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

	Version	Color of handle	Approval	DT	Configurator Order No.	PS
EMERGENCY-STOP devices according to ISO 13850 and IEC 60947-5-5, with holder[1)2)]. Can also be used with 3TK28 safety relays.						
 Mushroom diameter 32 mm	**EMERGENCY-STOP mushroom push buttons, Ø 32 mm,** with positive maintained according to ISO 13850, with rotate-to-unlatch mechanism	Red			**3SB30 00-1FA20**	1 unit
 Mushroom diameter 40 mm, with rotate-to-unlatch mechanism, with switch position indication	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm,** with positive maintained according to ISO 13850, with rotate-to-unlatch mechanism	Red				
	• Without switch position indicator				**3SB30 00-1HA20**	1 unit
	• With mechanical switch position indication				**3SB30 00-1HA26**	1 unit
	• Flat head style				**3SB30 00-1XA20**	
 Mushroom diameter 40 mm, pull-to-unlatch mechanism	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm,** with positive maintained according to ISO 13850, with pull-to-unlatch mechanism	Red			**3SB30 00-1TA20**	1 unit
 Mushroom diameter 60 mm	**EMERGENCY-STOP mushroom push buttons, Ø 60 mm,** with positive maintained according to ISO 13850, with rotate-to-unlatch mechanism	Red			**3SB30 00-1AA20**	1 unit
 Mushroom diameter 40 mm, with RONIS key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with RONIS lock,** lock No. SB 30, with positive maintained acc. to ISO 13850, unlocking only possible using key	Red			**3SB30 00-1BA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with CES lock, lock No. SSG 10, with positive maintained according to ISO 13850, unlocking only possible using key	Red			**3SB30 00-1KA20**	1 unit
 Mushroom diameter 40 mm, with CES key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with BKS lock,** lock No. S1, with positive maintained according to ISO 13850, unlocking only possible using key	Red			**3SB30 00-1LA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with O.M.R. lock, lock No. 73037, with positive maintained according to ISO 13850, unlocking only possible using key	Red			**3SB30 00-1MA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with "EMO" marking for SEMI S2 compliance with mechanical maintained function acc. to EN418, turn short handle to left to unlatch	Red (flat)			**3SB30 00-1XB80**	1 unit

For online configurator see www.siemens.com/sirius/configurators

1) Also available without holder. Supplement Order No. with **"–Z"** and quote order code **"B01"**. Price reduction on request.

2) Yellow backing plates must be ordered separately; see "Accessories" on page 17-372..

For BKS and CES special locks see page 17-357.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Signaling elements with holder[1]

Version	Color of lens	DT	Configurator Order No.	PS
Indicator lights with smooth lens[2]	Amber		**3SB30 01-6AA00**	1 unit
	Red		**3SB30 01-6AA20**	1 unit
	Yellow		**3SB30 01-6AA30**	1 unit
	Green		**3SB30 01-6AA40**	1 unit
	Blue		**3SB30 01-6AA50**	1 unit
	White		**3SB30 01-6AA60**	1 unit
	Clear		**3SB30 01-6AA70**	1 unit
Indicator lights with lens with concentric rings[2]	Amber		**3SB30 01-6BA00**	1 unit
	Red		**3SB30 01-6BA20**	1 unit
	Yellow		**3SB30 01-6BA30**	1 unit
	Green		**3SB30 01-6BA40**	1 unit
	Blue		**3SB30 01-6BA50**	1 unit
	White		**3SB30 01-6BA60**	1 unit
	Clear		**3SB30 01-6BA70**	1 unit
Acoustic signaling devices, IP40[3] For acoustic signal transformer 24 V DC[4] (without BA 9s base)	Black		**3SB30 00-7AA10**	1 unit



Indicator light with concentric rings



Acoustic signaling device

For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

2) Inscription by inserting a label is not possible.

3) For acoustic signaling devices, IP65, see "Complete Units".

4) Following must be ordered separately:
- 3SB1902-2BN acoustic signal transformer, see "Accessories".
- 3SB34 00-1A lamp holder for front plate mounting or 3SB34 20-1A lamp holder for base mounting, both with screw terminals.

Devices assembled in this way are suitable for use in enclosures. Lamp holders with spring-type terminals cannot be used.

Twin push buttons with indicator light with holder[1][2]

Version	Inscriptions	Color of handle	DT	Configurator Order No.	PS
Twin push buttons with indicator light, IP65 with flat, square buttons, incl. holder for 3 elements	I/O[3]	Green/Red		**3SB31 01-8BC21**	1 unit
	I/O[3]	White/Black		**3SB31 01-8BC31**	1 unit
	↑ / ↓ [3]	Green/Red		**3SB31 01-8BC81**	1 unit
Twin push buttons with indicator light, IP65 with flat and raised, square buttons, incl. holder for 3 elements	I/O[3]	Green/Red		**3SB31 01-8DC21**	1 unit
	I/O[3]	White/Black		**3SB31 01-8DC31**	1 unit



Twin push button with indicator light, with flat buttons



Twin push buttons with indicator light, with flat and raised buttons

For online configurator see www.siemens.com/sirius/configurators.

1)Mounting the twin push buttons in 3SB38 enclosure is not possible.

2)Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

3)Black inscription for green, red and white

Version	Inscriptions	Color of handle	DT	Configurator Order No.	PS
Twin push buttons with holder[1)2)]					
Twin push buttons, IP65 with flat, square buttons	I/O[3)]	Green/Red		**3SB31 00-8AC21**	1 unit
	I/O[3)]	White/Black		**3SB31 00-8AC31**	1 unit
	↑ / ↓ [3)]	White/White		**3SB31 00-8AC61-0AD0**	1 unit
Twin push buttons, IP65 with flat and raised, square buttons	I/O[3)]	Green/Red		**3SB31 00-8CC21**	1 unit
	I/O[3)]	White/Black		**3SB31 00-8CC31**	1 unit



Twin push button with flat buttons

For online configurator see www.siemens.com/sirius/configurators .

1) Mounting the twin push buttons in 3SB38 enclosure is not possible.

2) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

3) Black inscription for green, red and white buttons; white inscription on black button.

Version	Use	DT	Order No.	PS
Accessories for twin push buttons				
Label holders 70 mm x 30 mm for inscription label 12.5 mm x 27 mm[1)]	Twin push buttons		**3SB39 22-0AY**	5 units
Protective caps, clear Silicone, for degree of protection IP67	Twin push buttons with flat buttons		**3SB39 21-0AQ**	1 unit



Label holder



Protective cap

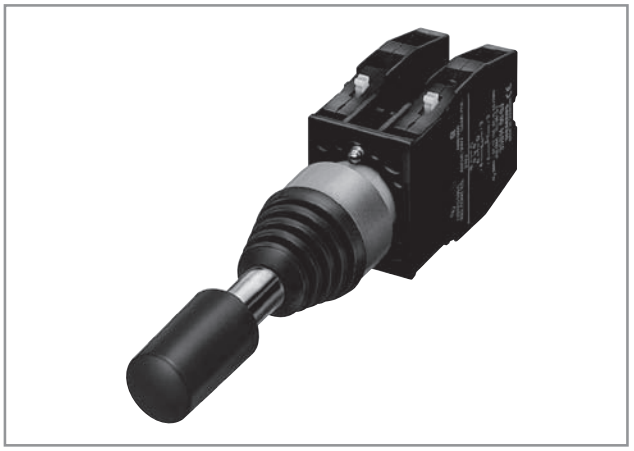
1) Mounting in 3SB38 enclosure is not possible.
For inscription labels see pages 17-363 and 17-364.

Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Coordinate switches, complete

Overview



Coordinate switch with contact blocks

Coordinate switches control auxiliary circuits permitting movements in various directions of machines and equipment.

The switches are designed for front panel mounting. They are climate-proof.

Operation

The 3SB14 00-0J contact block is used, which due to its depth cannot be built into 3SB38 enclosures.

Switches are available as follows:
- With 2 or 4 switch positions
- Latching or momentary contact type
- With or without mechanical interlocking

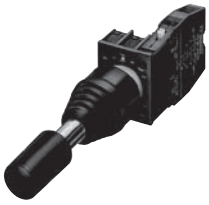
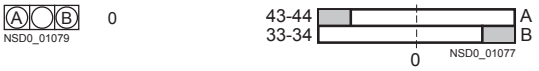
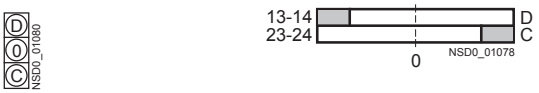
In the case of switches with mechanical interlock in O position, the switch is unlatched with the unlatching button at the front of the actuating lever.

Inscriptions

A name plate consisting of a black, plastic label holder and two or four adhesive, silver-colored inscription labels of 27 mm x 27 mm in size is available for labeling purposes. These labels can be supplied with and without customized inscription.

Note mounting dimensions!

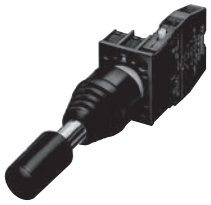
Selection and ordering data

Version	Operating travel Contact closed Contact open	DT	Screw terminals Order No.	PU (UNIT, SET, M)	PS
Coordinate switches					
	2 switch positions, 1 NO per direction				
 Coordinate switch, 2 switch positions	**Horizontal, momentary contact type** 				
	Without mechanical interlocking in the O position				
	• With plastic front ring, black	C	**3SB12 01-7DV01**	1	1 unit
	• With metal front ring	C	**3SB12 01-7DV20**	1	1 unit
	With mechanical interlocking in the O position				
	• With plastic front ring, black	C	**3SB12 01-7DW01**	1	1 unit
	• With metal front ring	C	**3SB12 01-7DW20**	1	1 unit
	Vertical, momentary contact type 				
	Without mechanical interlocking in the O position				
	• With plastic front ring, black	C	**3SB12 01-7FV01**	1	1 unit
	• With metal front ring	C	**3SB12 01-7FV20**	1	1 unit
	With mechanical interlocking in the O position				
	• With plastic front ring, black	C	**3SB12 01-7FW01**	1	1 unit
	• With metal front ring	C	**3SB12 01-7FW20**	1	1 unit

• Revised •
03/01/14

Version	Operating travel Contact closed Contact open	DT	Screw terminals Order No.	PS

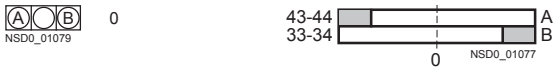
Coordinate switches



Coordinate switch,
2 switch positions

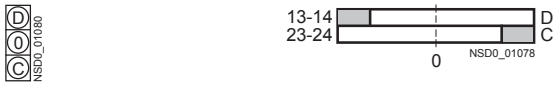
2 switch positions, 1 NO per direction

Horizontal, maintained

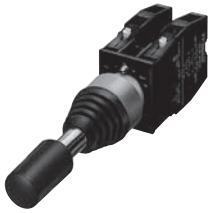


Without mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 01-7EV01**	1 unit
• With metal front ring	**3SB12 01-7EV20**	1 unit
With mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 01-7EW01**	1 unit
• With metal front ring	**3SB12 01-7EW20**	1 unit

Vertical, maintained



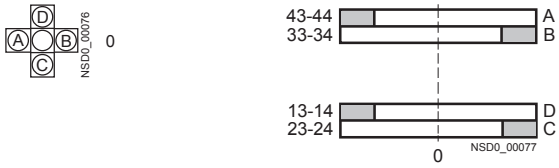
Without mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 01-7GV01**	1 unit
• With metal front ring	**3SB12 01-7GV20**	1 unit
With mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 01-7GW01**	1 unit
• With metal front ring	**3SB12 01-7GW20**	1 unit



Coordinate switch,
4 switch positions

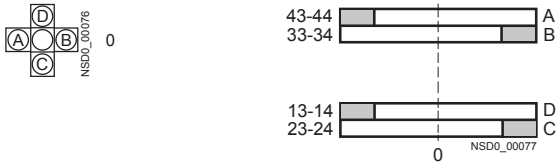
4 switch positions, 1 NO per direction

Momentary contact type



Without mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 08-7JV01**	1 unit
• With metal front ring	**3SB12 08-7JV20**	1 unit
With mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 08-7JW01**	1 unit
• With metal front ring	**3SB12 08-7JW20**	1 unit

Latching



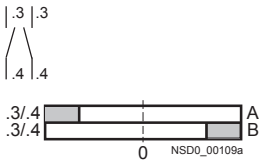
Without mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 08-7KV01**	1 unit
• With metal front ring	**3SB12 08-7KV20**	1 unit
With mechanical interlocking in the O position		
• With plastic front ring, black	**3SB12 08-7KW01**	1 unit
• With metal front ring	**3SB12 08-7KW20**	1 unit

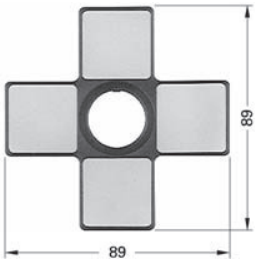
Push Button Units and Indicator Lights

3SB3, Plastic, Round, 22 mm

Coordinate switches, complete

Accessories

Version Contact blocks	Symbols/ operating travel Contact closed Contact open	DT	Screw terminals Order No.	PS
Spare contact blocks				
 3SB14 00-0J	**Contact blocks with 2 contacts** 1 NO, 1 NO (included in scope of supply of switch) 		**3SB14 00-0J**	1 unit

Version	DT	Order No.	PS
Name plates			
 3SB19 06-0AV	**Label holders for coordinate switches**		
	2 switch positions, horizontal, 89 mm × 30 mm		**3SB19 06-0AU** 1 unit
	2 switch positions, vertical, 30 mm × 89 mm		**3SB19 06-0AV** 1 unit
	4 switch positions		**3SB19 06-0AW** 1 unit
	Inscription labels 27 mm × 27 mm, silver-colored, for sticking in place		
	Without inscription		**3SB19 06-2AA** 1 unit
	With inscription (engraved)		**3SB19 06-2XZ**
	• Text lines (up to 5 lines each with 11 characters)		**K0Y, K1Y, K2Y,** or **K5Y** 1 unit
	• Graphic symbol with number according to ISO 7000 or IEC 60417		**K3Y** 1 unit
	• Any inscription or symbol		**K9Y** 1 unit
 3SB19 06-0AW			

For black plastic labels see page 17-364.

Options

Customized inscriptions

These labeling plates can be inscribed with text or symbols. 5 lines with 11 characters each in a letter height of 4 mm are possible.

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"): **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 symbol 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.

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 =Lower".

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417.

For special symbols (order code K9Y), a CAD drawing in DXF format can be submitted.

Ordering example

A label inscribed with symbol No. 1117 according to ISO 7000 is required:

3SB19 06-2XZ
K3Y
Z = 1117 ISO

For other ordering examples see page 17-360.

Push Button Units and Indicator Lights

3SB3, Plastic, Square, 22 mm

Complete Units

Selection and ordering data

Version	Rated voltage of lamp	Color of handle	Contacts for front plate mounting	DT	Screw terminals / Configurator	PS
	V				Order No.	
Push buttons						
 Push button						
Push buttons with flat button	—	Black	1 NO		**3SB33 02-0AA11**	1 unit
		Black	1 NC		**3SB33 03-0AA11**	1 unit
		Red	1 NC		**3SB33 03-0AA21**	1 unit
		Yellow	1 NO		**3SB33 02-0AA31**	1 unit
		Green	1 NO		**3SB33 02-0AA41**	1 unit
		Blue	1 NO		**3SB33 02-0AA51**	1 unit
		White	1 NO		**3SB33 02-0AA61**	1 unit
		Black	1 NO + 1 NC		**3SB33 01-0AA11**	1 unit
		Red	1 NO + 1 NC		**3SB33 01-0AA21**	1 unit
		Yellow	1 NO + 1 NC		**3SB33 01-0AA31**	1 unit
		Green	1 NO + 1 NC		**3SB33 01-0AA41**	1 unit
		Blue	1 NO + 1 NC		**3SB33 01-0AA51**	1 unit
		White	1 NO + 1 NC		**3SB33 01-0AA61**	1 unit
 Illuminated push button						
Illuminated push buttons with flat button with integrated LED (incl. holder for 3 elements)	24 AC/DC	Red[1]	1 NC		**3SB33 46-0AA21**	1 unit
		Yellow[1]	1 NO		**3SB33 45-0AA31**	1 unit
		Green[1]	1 NO		**3SB33 45-0AA41**	1 unit
		Blue[1]	1 NO		**3SB33 45-0AA51**	1 unit
		White	1 NO		**3SB33 45-0AA61**	1 unit
		Clear[1]	1 NO		**3SB33 45-0AA71**	1 unit
		Red[1]	1 NO + 1 NC		**3SB33 47-0AA21**	1 unit
		Yellow[1]	1 NO + 1 NC		**3SB33 47-0AA31**	1 unit
		Green[1]	1 NO + 1 NC		**3SB33 47-0AA41**	1 unit
		Blue[1]	1 NO + 1 NC		**3SB33 47-0AA51**	1 unit
		White	1 NO + 1 NC		**3SB33 47-0AA61**	1 unit
		Clear[1]	1 NO + 1 NC		**3SB33 47-0AA71**	1 unit
Illuminated push buttons with flat button with integrated LED (incl. holder for 3 elements)	230 AC	Red[1]	1 NC		**3SB33 54-0AA21**	1 unit
		Yellow[1]	1 NO		**3SB33 53-0AA31**	1 unit
		Green[1]	1 NO		**3SB33 53-0AA41**	1 unit
		Blue[1]	1 NO		**3SB33 53-0AA51**	1 unit
		White	1 NO		**3SB33 53-0AA61**	1 unit
		Clear[1]	1 NO		**3SB33 53-0AA71**	1 unit
		Red[1]	1 NO + 1 NC		**3SB33 55-0AA21**	1 unit
		Yellow[1]	1 NO + 1 NC		**3SB33 55-0AA31**	1 unit
		Green[1]	1 NO + 1 NC		**3SB33 55-0AA41**	1 unit
		Blue[1]	1 NO + 1 NC		**3SB33 55-0AA51**	1 unit
		White	1 NO + 1 NC		**3SB33 55-0AA61**	1 unit
		Clear[1]	1 NO + 1 NC		**3SB33 55-0AA71**	1 unit
Illuminated push buttons with flat button with BA 9s lamp holder without lamp (incl. holder for 3 elements)		Red[1]	1 NC		**3SB33 07-0AA21**	1 unit
		Yellow[1]	1 NO		**3SB33 06-0AA31**	1 unit
		Green[1]	1 NO		**3SB33 06-0AA41**	1 unit
		Blue[1]	1 NO		**3SB33 06-0AA51**	1 unit
		White	1 NO		**3SB33 06-0AA61**	1 unit
		Clear[1]	1 NO		**3SB33 06-0AA71**	1 unit
		Red[1]	1 NO + 1 NC		**3SB33 05-0AA21**	1 unit
		Yellow[1]	1 NO + 1 NC		**3SB33 05-0AA31**	1 unit
		Green[1]	1 NO + 1 NC		**3SB33 05-0AA41**	1 unit
		Blue[1]	1 NO + 1 NC		**3SB33 05-0AA51**	1 unit
		White	1 NO + 1 NC		**3SB33 05-0AA61**	1 unit
		Clear[1]	1 NO + 1 NC		**3SB33 05-0AA71**	1 unit

For online configurator see www.siemens.com/sirius/configurators .

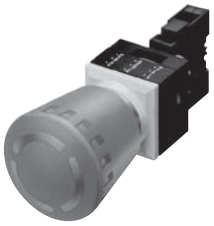
1) Inscription is possible by inserting a label.

Push Button Units and Indicator Lights

3SB3, Plastic, Square, 22 mm

Complete units

Version	Color of handle	Contacts for front plate mounting	DT	Screw terminals / Configurator / Order No.	PS
EMERGENCY-STOP devices acc. to ISO 13850, with yellow name plate, Ø 80 mm, with inscription[1]. Can also be used with 3TK28 safety relays.					
EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with positive maintained function, with rotate-to-unlatch mechanism	Red	1 NC	➔	**3SB33 03-1HA20**	1 unit
		1 NO + 1 NC	➔	**3SB33 01-1HA20**	1 unit



EMERGENCY-STOP mushroom push button with rotate-to-unlatch mechanism

⚙ For online configurator see www.siemens.com/sirius/configurators .

➔ Positive opening according to IEC 60947-5-1, Appendix K. Can be used with 3TK28 safety relays.
Certificate:

VDE

1) German inscription "NOT-HALT".

Version	Rated voltage of lamp	Color of lens	DT	Screw terminals / Configurator / Order No.	PS
	V				
Signaling devices					
Indicator lights with integrated LED	24 AC/DC	Red		**3SB33 44-6AA20**	1 unit
		Yellow		**3SB33 44-6AA30**	1 unit
		Green		**3SB33 44-6AA40**	1 unit
		Blue		**3SB33 44-6AA50**	1 unit
		White		**3SB33 44-6AA60**	1 unit
		Clear		**3SB33 44-6AA70**	1 unit
Indicator lights with integrated LED	230 AC	Red		**3SB33 52-6AA20**	1 unit
		Yellow		**3SB33 52-6AA30**	1 unit
		Green		**3SB33 52-6AA40**	1 unit
		Blue		**3SB33 52-6AA50**	1 unit
		White		**3SB33 52-6AA60**	1 unit
		Clear		**3SB33 52-6AA70**	1 unit
Indicator lights with BA 9s lamp holder (without lamp)	–	Red		**3SB33 04-6AA20**	1 unit
		Yellow		**3SB33 04-6AA30**	1 unit
		Green		**3SB33 04-6AA40**	1 unit
		Blue		**3SB33 04-6AA50**	1 unit
		White		**3SB33 04-6AA60**	1 unit
		Clear		**3SB33 04-6AA70**	1 unit



Indicator light

⚙ For online configurator see www.siemens.com/sirius/configurators .

Push Button Units and Indicator Lights

3SB3, Plastic, Square, 22 mm

Selection and ordering data

	Version	Color of handle	DT	Configurator Order No.	PS
Push buttons and switches with holder[1]					
 Push button	**Push buttons with flat button**	Black Red Yellow Green Blue White Clear[2]		**3SB31 10-0AA11** **3SB31 10-0AA21** **3SB31 10-0AA31** **3SB31 10-0AA41** **3SB31 10-0AA51** **3SB31 10-0AA61** **3SB31 10-0AA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 Push button with raised front ring	**Push buttons with raised front ring** (height 13 mm)	Black Red Green White		**3SB31 10-0AA12** **3SB31 10-0AA22** **3SB31 10-0AA42** **3SB31 10-0AA62**	1 unit 1 unit 1 unit 1 unit
 Push button with raised front ring, castellated	**Push buttons with raised front ring, castellated** (height 13 mm)	Black Red Yellow Green White		**3SB31 10-0AA13** **3SB31 10-0AA23** **3SB31 10-0AA33** **3SB31 10-0AA43** **3SB31 10-0AA63**	1 unit 1 unit 1 unit 1 unit 1 unit
 Illuminated push button	**Illuminated push buttons with flat button** (incl. holder for 3 elements)	Red[2] Yellow[2] Green[2] Blue[2] White Clear[2]		**3SB31 11-0AA21** **3SB31 11-0AA31** **3SB31 11-0AA41** **3SB31 11-0AA51** **3SB31 11-0AA61** **3SB31 11-0AA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 Push button	**Push buttons, maintained, with flat button,** unlocking by pressing again	Black Red Yellow Green Blue White		**3SB31 10-0DA11** **3SB31 10-0DA21** **3SB31 10-0DA31** **3SB31 10-0DA41** **3SB31 10-0DA51** **3SB31 10-0DA61**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 Illuminated push button	**Illuminated push buttons, maintained, with flat button** (incl. holder for 3 elements), unlatches by pressing again,	Red[2] Yellow[2] Green[2] Blue[2] White Clear[2]		**3SB31 11-0DA21** **3SB31 11-0DA31** **3SB31 11-0DA41** **3SB31 11-0DA51** **3SB31 11-0DA61** **3SB31 11-0DA71**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit

For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

2) Inscription is possible by inserting a label.

Version	Version Illumination	Color of handle	DT	Configurator ⚙ Order No.	PS
Selector switches with holder[1)]					
Selector switches with 2 switch positions					
 Selector switch Switching sequence O-I, 50° operating angle, maintained 	**Non-illuminated**	Black		**3SB31 10-2KA11**	1 unit
		Red		**3SB31 10-2KA21**	1 unit
		Green		**3SB31 10-2KA41**	1 unit
		White		**3SB31 10-2KA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB31 11-2KA21**	1 unit
		Yellow		**3SB31 11-2KA31**	1 unit
		Green		**3SB31 11-2KA41**	1 unit
		Blue		**3SB31 11-2KA51**	1 unit
		Clear		**3SB31 11-2KA71**	1 unit
 Selector switch, illuminated Switching sequence O-I, 50° operating angle, momentary, spring return from the left 	**Non-illuminated**	Black		**3SB31 10-2LA11**	1 unit
		Red		**3SB31 10-2LA21**	1 unit
		Green		**3SB31 10-2LA41**	1 unit
		White		**3SB31 10-2LA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB31 11-2LA21**	1 unit
		Yellow		**3SB31 11-2LA31**	1 unit
		Green		**3SB31 11-2LA41**	1 unit
		Blue		**3SB31 11-2LA51**	1 unit
		Clear		**3SB31 11-2LA71**	1 unit
Selector switches with 3 switch positions					
 Selector switch Switching sequence I-O-II, 2 x 50° operating angle, maintained 	**Non-illuminated**	Black		**3SB31 10-2DA11**	1 unit
		Red		**3SB31 10-2DA21**	1 unit
		Green		**3SB31 10-2DA41**	1 unit
		White		**3SB31 10-2DA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB31 11-2DA21**	1 unit
		Yellow		**3SB31 11-2DA31**	1 unit
		Green		**3SB31 11-2DA41**	1 unit
		Blue		**3SB31 11-2DA51**	1 unit
		Clear		**3SB31 11-2DA71**	1 unit
 Selector switch, illuminated Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from the left and right 	**Non-illuminated**	Black		**3SB31 10-2EA11**	1 unit
		Red		**3SB31 10-2EA21**	1 unit
		Green		**3SB31 10-2EA41**	1 unit
		White		**3SB31 10-2EA61**	1 unit
	Illuminated (incl. holder for 3 elements)	Red		**3SB31 11-2EA21**	1 unit
		Yellow		**3SB31 11-2EA31**	1 unit
		Green		**3SB31 11-2EA41**	1 unit
		Blue		**3SB31 11-2EA51**	1 unit
		Clear		**3SB31 11-2EA71**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary to the left, spring return from the left, maintained to the right 	**Non-illuminated**	Black		**3SB31 10-2GA11**	1 unit
		Green		**3SB31 10-2GA41**	1 unit
		White		**3SB31 10-2GA61**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, maintained to the left, momentary to the right, spring return from the right 	**Non-illuminated**	Black		**3SB31 10-2FA11**	1 unit
		Red		**3SB31 10-2FA21**	1 unit
		Green		**3SB31 10-2FA41**	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

Version	Lock version Type	Lock No./ color	Key removal position	DT	Configurator / Order No.	PS
Key-operated switches with holder[1]						
Key-operated switches with 2 keys, 2 switch positions						
Switching sequence O-I, 50° operating angle, maintained 	RONIS	SB 30	O+I O I		**3SB31 10-4AD11** **3SB31 10-4AD01** **3SB31 10-4AD21**	1 unit 1 unit 1 unit
	CES	SSG 10	O+I O I		**3SB31 10-4LD11** **3SB31 10-4LD01** **3SB31 10-4LD21**	1 unit 1 unit 1 unit
		LSG 1	O+I O		**3SB31 10-4LF01** **3SB31 10-4LF11**	1 unit 1 unit
	BKS	S1	O+I O		**3SB31 10-5AD11** **3SB31 10-5AD01**	1 unit 1 unit
	O.M.R.[2]	73037 Red	O		**3SB31 10-3AH01**	1 unit
		73034 Black	O+I		**3SB31 10-3AJ11**	1 unit
		73037 Red	O+I		**3SB31 10-3AH11**	
Switching sequence O-I, 50° operating angle, momentary, spring return from the right 	RONIS	SB 30	O		**3SB31 10-4BD01**	1 unit
	CES	SSG 10	O		**3SB31 10-4MD01**	1 unit
Key-operated switches with 2 keys, 3 switch positions						
Switching sequence I-O-II, 2 x 50° operating angle, maintained 	RONIS	SB 30	I+O+II		**3SB31 10-4DD11**	1 unit
	CES	SSG 10	I+O+II O		**3SB31 10-4PD11** **3SB31 10-4PD01**	1 unit 1 unit
	BKS	S1	O		**3SB31 10-5BD01**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from the left and right 	RONIS	SB 30	O		**3SB31 10-4ED01**	1 unit
	CES	SSG 10	O		**3SB31 10-4QD01**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, momentary to the left, spring return from the left, maintained to the right 	CES	SSG 10	O		**3SB31 10-4SD01**	1 unit
Switching sequence I-O-II, 2 x 50° operating angle, maintainedmaintainedmain-tained to the left, momentary to the right, spring return from the right 	CES	SSG 10	O+I		**3SB31 10-4RD51**	1 unit



RONIS key-operated switch



CES key-operated switch



O.M.R. key-operated switch

For online configurator see www.siemens.com/sirius/configurators .

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

2) According to FIAT standards; also available for other users.

For BKS and CES special locks see page 17-357

Push Button Units and Indicator Lights

3SB3, Plastic, Square, 22 mm

Version	Color of handle	Approval	DT	Configurator / Order No.	PS
EMERGENCY-STOP devices according to ISO 13850 and IEC 60947-5-5, with holder[1)2)]. Can also be used with 3TK28 safety relays.					
 EMERGENCY-STOP mushroom push button with rotate-to-unlatch mechanism	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm**, with positive latching according to ISO 13850, with rotate-to-unlatch mechanism	Red		**3SB31 10-1HA20**	1 unit
 EMERGENCY-STOP mushroom push button with RONIS key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with RONIS key-operated switch** (with 2 keys), lock No. SB 30, with positive latching according to ISO 13850, unlocking only possible using key	Red		**3SB31 10-1BA20**	1 unit
 EMERGENCY-STOP mushroom push button with CES key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with CES key-operated switch** (with 2 keys), lock No. SSG 10, with positive latching according to ISO 13850, unlocking only possible using key	Red		**3SB31 10-1KA20**	1 unit
	EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with BKS key-operated switch (with 2 keys), lock No. S1, with positive latching according to ISO 13850, unlocking only possible using key	Red		**3SB31 10-1LA20**	1 unit
 EMERGENCY-STOP mushroom push button with O.M.R. key-operated switch	**EMERGENCY-STOP mushroom push buttons, Ø 40 mm, with O.M.R. key-operated switch** (with 2 keys), lock No. 73037 with positive latching according to ISO 13850, unlocking only using key	Red		**3SB31 10-1MA20**	1 unit

For online configurator see www.siemens.com/sirius/configurators.

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

2) Yellow backing plates must be ordered separately; see "Accessories" on page 17-372.

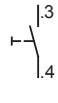
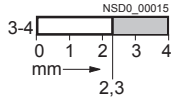
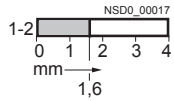
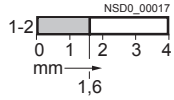
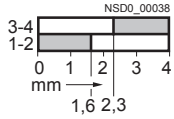
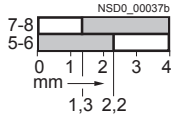
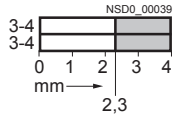
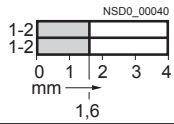
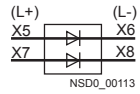
For BKS and CES special locks see page 17-357

Version	Color of lens	DT	Configurator / Order No.	PS
Signaling elements with holder[1)]				
 Indicator lights	**Indicator lights**	Red	**3SB31 11-6AA20**	1 unit
		Yellow	**3SB31 11-6AA30**	1 unit
		Green	**3SB31 11-6AA40**	1 unit
		Blue	**3SB31 11-6AA50**	1 unit
		Clear	**3SB31 11-6AA70**	1 unit
		White	**3SB31 11-6AA60**	1 unit

For online configurator see www.siemens.com/sirius/configurators.

1) Also available without holder. Supplement Order No. with **"-Z"** and quote order code **"B01"**. Price reduction on request.

Selection and ordering data

Version	Diagram	Operating travel Contact closed Contact open	DT	Screw terminals Order No.	PS
Contact blocks for front plate mounting					
Contact blocks with one contact					
• Mounting depth: 50 mm					
1 NO				**3SB34 00-0B**	1 unit
1 NO with gold-plated contacts				**3SB34 00-0BA**	1 unit
1 NC				**3SB34 00-0C**	1 unit
1 NC with gold-plated contacts				**3SB34 00-0CA**	1 unit
1 NC with mounting monitoring contact[1]				**3SB34 00-0M**	1 unit
• Mounting depth: 63 mm					
Contact block with 2 contacts Mounting depth 63 mm (including unit labeling plate)					
1 NO + 1 NC				**3SB34 00-0A**	1 unit
1 NO + 1 NC with gold-plated contacts				**3SB34 00-0AA**	1 unit
1 NO + 1 NC with dust protection[2]				**3SB34 00-0N**	1 unit
1 NO leading + 1 NC lagging				**3SB34 00-0H**	1 unit
1 NO leading + 1 NC lagging with gold-plated contacts				**3SB34 00-0HA**	1 unit
2 NO				**3SB34 00-0D**	1 unit
2 NO with gold-plated contacts				**3SB34 00-0DA**	1 unit
2 NO with dust protection[2]				**3SB34 00-0P**	1 unit
2 NC				**3SB34 00-0E**	1 unit
2 NC with gold-plated contacts				**3SB34 00-0EA**	1 unit
2 NC with dust protection[2]				**3SB34 00-0Q**	1 unit
Blocks with 2 diodes type 1N 4007 Mounting depth: 63 mm U_{RMS} = max. 250 V I_{FAV} = 0.8 A at T_u = 60 °C				**3SB34 00-2A**	1 unit


3SB34 00-0B


3SB34 00-0M


3SB34 00-0A


3SB34 00-2A

Positive opening according to IEC 60947-5-1, Appendix K.

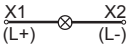
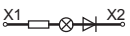
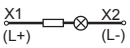
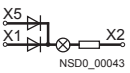
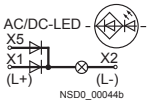
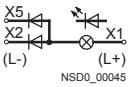
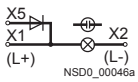
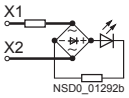
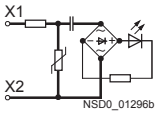
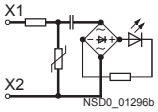
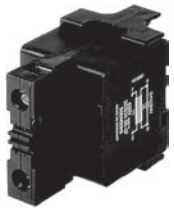
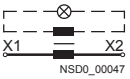
1) The NC contact opens automatically upon disconnection of the actuator. On delivery, the contact is open (= safe state). Activation (= NC contacts on the non-actuated control device are closed) takes place upon first-time actuation after the contact block is snapped onto the actuator. Not suitable for mounting in 3SB38 enclosures.

2) With 3SB30 01-0CH dust protection shield

Push Button Units and Indicator Lights

3SB3, Components for Actuators and Indicators, 22 mm

Contact blocks and lamp holders

Version	Diagram	Rated voltage V	DT	Screw terminals ⏚ Order No.	PS
Contact blocks for front plate mounting					
 3SB34 00-1A **BA 9s lamp holders**, mounting depth 50 mm					
Without lamp	 NSD0_00003	Acc. to lamp		**3SB34 00-1A**	1 unit
With 24 V incandescent lamp (3SX1 344)		24 AC/DC		**3SB34 00-1D**	1 unit
BA 9s lamp holders, mounting depth 50 mm					
With integrated voltage reducer and with 130 V lamp (3SX1 731)[1]	 NSD0_00042	230 / 240 AC		**3SB34 00-1C**	1 unit
BA 9s lamp holders, mounting depth 50 mm					
With built-in resistor for longer endurance and with 130 V lamp (3SX1 731)[1]	 NSD0_00041	110/130 AC/DC		**3SB34 00-1B**	1 unit
 3SB34 00-1F **BA 9s lamp holders** with separate lamp test function[2][3]					
With integrated voltage reducer and with 130 V lamp (3SX1 731)[1]	 NSD0_00043	230 / 240 AC		**3SB34 00-1F**	1 unit
Without lamp For incandescent lamp, max. 2.6 W; for LED lamp, 24/48/230 V AC/DC[4]	 NSD0_00044b	Acc. to lamp		**3SB34 00-1G**	1 unit
Without lamp For incandescent lamp, max. 2.6 W; for LED lamp, AC or DC[5]	 NSD0_00045	Acc. to lamp		**3SB34 00-1L**	1 unit
Without lamp For incandescent lamp, max. 2.6 W; for glow lamp, AC	 NSD0_00046a	Acc. to lamp		**3SB34 00-1H**	1 unit
 3SB34 00-1PA **Lamp holders with integrated LED** Mounting depth: 50 mm					
Yellow Red Green Blue White	 NSD0_01292b	24 AC/DC		**3SB34 00-1PA** **3SB34 00-1PB** **3SB34 00-1PC** **3SB34 00-1PD** **3SB34 00-1PE**	1 unit 1 unit 1 unit 1 unit 1 unit
Yellow Red Green Blue White	 NSD0_01296b	110 AC		**3SB34 00-1QA** **3SB34 00-1QB** **3SB34 00-1QC** **3SB34 00-1QD** **3SB34 00-1QE**	1 unit 1 unit 1 unit 1 unit 1 unit
Yellow Red Green Blue White	 NSD0_01296b	230 AC		**3SB34 00-1RA** **3SB34 00-1RB** **3SB34 00-1RC** **3SB34 00-1RD** **3SB34 00-1RE**	1 unit 1 unit 1 unit 1 unit 1 unit
 3SB34 00-3. **Transformers** For snapping onto 3SB34 00-1A lamp holder For incandescent lamp AC, max. 2 W Mounting depth: 97 mm	 NSD0_00047	127 / 24 240 / 24 260 / 24 400 / 24 127 / 6 240 / 6 400 / 6 480 / 6 600 / 6		**3SB34 00-3A** **3SB34 00-3C** **3SB34 00-3E** **3SB34 00-3F** **3SB34 00-3M** **3SB34 00-3P** **3SB34 00-3S** **3SB34 00-3U** **3SB34 00-3W**	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit

1) Use these lamps only.

2) The lamp holder with separate lamp test function can not be installed in an enclosure.

3) For circuit examples see Reference manual "Commanding and Signaling Devices".

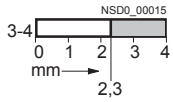
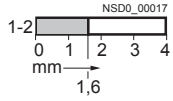
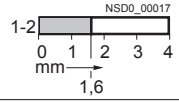
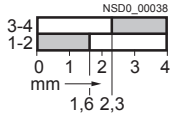
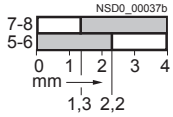
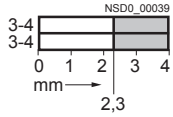
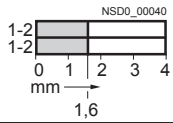
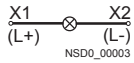
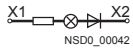
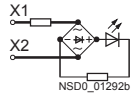
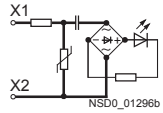
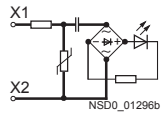
4) Not suitable for LEDs which are suitable only for AC or DC.

5) Not suitable for LED for 24/48/230 V AC/DC.
For connecting to DC, X5 must be connected to L–.

Push Button Units and Indicator Lights

3SB3, Components for Actuators and Indicators, 22 mm

Contact blocks and lamp holders

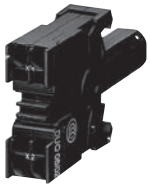
Version	Rated voltage of lamp/ Diagram V	Operating travel/color ▭ Contact closed ▭ Contact open	DT	Spring-type terminals Order No.	PS
Contact blocks for front plate mounting					
Contact blocks with one contact, mounting depth 50 mm					
1 NO				**3SB34 03-0B**	1 unit
1 NO with gold-plated contacts				**3SB34 03-0BA**	1 unit
1 NC				**3SB34 03-0C**	1 unit
1 NC with gold-plated contacts				**3SB34 03-0CA**	1 unit
1 NC with mounting monitoring contact[1] • Mounting depth: 63 mm				**3SB34 03-0M**	1 unit
Contact blocks with 2 contacts, mounting depth 63 mm					
1 NO + 1 NC				**3SB34 03-0A**	1 unit
1 NO + 1 NC with gold-plated contacts				**3SB34 03-0AA**	1 unit
1 NO leading + 1 NC lagging				**3SB34 03-0H**	1 unit
1 NO leading + 1 NC lagging with gold-plated contacts				**3SB34 03-0HA**	1 unit
2 NO				**3SB34 03-0D**	1 unit
2 NO with gold-plated contacts				**3SB34 03-0DA**	1 unit
2 NC				**3SB34 03-0E**	1 unit
2 NC with gold-plated contacts				**3SB34 03-0EA**	1 unit
BA 9s lamp holders, mounting depth 50 mm					
Without lamp[2]	Acc. to lamp 			**3SB34 03-1A**	1 unit
With integrated voltage reducer and with 130 V lamp (3SX1 731)[2)3)]	230/240 V AC 			**3SB34 03-1C**	1 unit
Lamp holders with integrated LED Mounting depth: 50 mm	24 V AC/DC 	Yellow Red Green Blue White		**3SB34 03-1PA** **3SB34 03-1PB** **3SB34 03-1PC** **3SB34 03-1PD** **3SB34 03-1PE**	1 unit 1 unit 1 unit 1 unit 1 unit
	110 V AC 	Yellow Red Green Blue White		**3SB34 03-1QA** **3SB34 03-1QB** **3SB34 03-1QC** **3SB34 03-1QD** **3SB34 03-1QE**	1 unit 1 unit 1 unit 1 unit 1 unit
	230 V AC 	Yellow Red Green Blue White		**3SB34 03-1RA** **3SB34 03-1RB** **3SB34 03-1RC** **3SB34 03-1RD** **3SB34 03-1RE**	1 unit 1 unit 1 unit 1 unit 1 unit


3SB34 03-0B


3SB34 03-0M


3SB34 03-0A


3SB34 03-1C

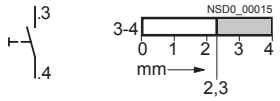
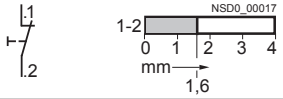
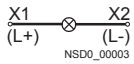

3SB3403-1PA

Positive opening according to IEC 60947-5-1, Appendix K.

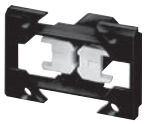
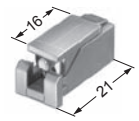
1) The NC contact opens automatically upon disconnection of the actuator. On delivery, the contact is open (= safe state). For more explanations see footnote, page 17-353. Not suitable for mounting in 3SB38 enclosures.

2) Not suitable for square command devices.

3) Use these lamps only.

Version	Diagram	Operating travel Contact closed Contact open	DT	Solder pin connections Order No.	PS
Contact blocks for use on printed circuit boards					
 3SB34 11-0B	**Contact blocks with one contact** Mounting depth 44 mm 1 NO			**3SB34 11-0B**	1 unit
	1 NC ➔			**3SB34 11-0C**	1 unit
 3SB34 11-1A	**Wedge base lamp holders** W2 x 4.6 d Mounting depth: 44 mm Without lamp			**3SB34 11-1A**	1 unit

➔ Positive opening according to IEC 60947-5-1, Appendix K.

Version	DT	Order No.	PS
Holders for 3 contact blocks, for front panel mounting			
 3SB39 01-0AB	**Holders for push buttons and switches**[1] for snapping on 3 blocks (for illuminated push buttons and illuminated selector switches the holder is included in the scope of supply)		**3SB39 01-0AB**	20 units
 3SB39 01-0AC	**Holders for selector switches, key-operated switches and twin push buttons** With pressure plate for actuating the central contact block of 3 contact blocks		**3SB39 01-0AC**	10 units
Pressure plates for use on printed circuit boards			
 3SB39 01-0AW	**Pressure plates for selector switches and key-operated switches** For actuating the central contact block of 3 contact blocks		**3SB39 01-0AW**	10 units
Accessories for printed circuit boards			
 3SB39 01-0AA	**Holders for printed circuit boards** for mounting the command devices on the printed circuit board (screw is included in the scope of supply)		**3SB39 01-0AA**	10 units

[1] Holder also for mushroom push button and push-pull button.

Options

Special locks for key-operated switches

The BKS and CES plastic and metal key-operated switches, round and square versions, can be optionally equipped with special locks.

In this case the Order No. of the matching key-operated switch must be supplemented with **"-Z"**, the matching order code **"Y01"** or **"Y02"** and the required lock number.

Order code	**Y01**	**Y02**
In accordance with the table of special locks	No	Yes
Normal delivery time	25 working days	5 working days
Additional price per unit	On request	On request
Ordering example	3SB30 00-4LD01-Z Y01 Z = SSG18	3SB30 00-4LD01-Z Y02 Z = SSG11

Available special locks with order code **"Y02"**	Order No. with order code
Key-operated switch	
CES SSG 11 to SSG 15	**3SB3. ..-4LD01-Z Y02** **3SB3. ..-4LD11-Z Y02** **3SB3. ..-4LD21-Z Y02** **3SB3. ..-4MD01-Z Y02** **3SB3. ..-4PD..-Z Y02** **3SB3. ..-4QD..-Z Y02** **3SB3. ..-4RD..-Z Y02** **3SB3. ..-4SD..-Z Y02**
BKS E1, E2, E7, E9[1)]	**3SB3. ..-5AD..-Z Y02** **3SB3. ..-5BD01-Z Y02** **3SB3. ..-5DD..-Z Y02** **3SB3. ..-5ED01-Z Y02** **3SB3. ..-5FD01-Z Y02** **3SB3. ..-5GD01-Z Y02**
BKS E9[1)]	**3SB3. ..-5FD51-Z Y02**
EMERGENCY-STOP mushroom push buttons	
CES SSP 9	**3SB3. ..-1KA20-Z Y02**
BKS E2, E7, E9[1)]	**3SB3. ..-1LA20-Z Y02**

[1)] Delivery of these BKS key-operated switches (locks for VW) without key.

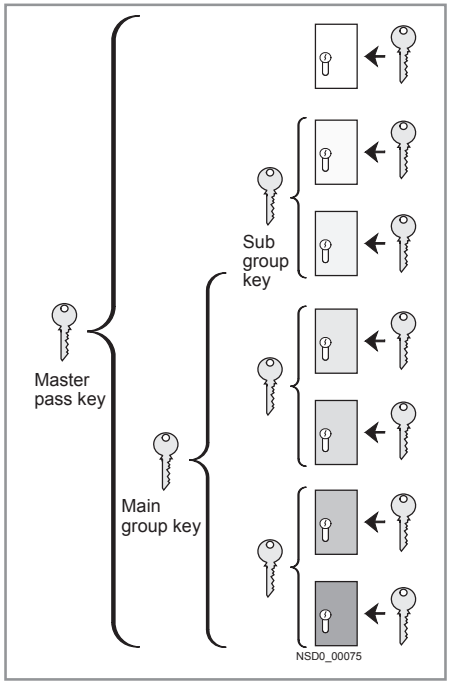
Master and master-pass key systems

The following key systems can be supplied with BKS or CES 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"**.

Please enquire for price and delivery time.



Example of master-pass key system

Ordering notes

- For all special locks, an additional price applies.
- The order code **"Y01"** or **"Y02"** must be quoted in accordance with the table above. 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.

Push Button Units and Indicator Lights

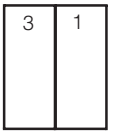
3SB3, Components for Actuators and Indicators, 22 mm

Contact block position

Selection and ordering data

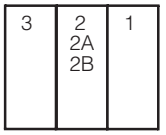
Switch Position (front of switch)			Circuit	Contact Block	Block Postion[1)2)]
Two-Position Selector Contact Block Selection					
O		X	1 NO	**3SB34 00–0B**	Any Postion
X		O	1 NC	**3SB34 00–0C**	Any Postion
O X		X O	1 NO/1 NC	**3SB34 00–0A**	Any Postion
O O		X X	2 NO	**3SB34 00–0D**	Any Postion
X X		O O	2 NC	**3SB34 00–0E**	Any Postion
Three-Position Selector Contact Block Selection					
X	O	O	1 NO	**3SB34 00–0B**	1 or 2A
X	O	X	1 NO	**3SB34 00–0B**	2
O	O	X	1 NO	**3SB34 00–0B**	3 or 2B
O	X	X	1 NC	**3SB34 00–0C**	1 or 2A
O	X	O	1 NC	**3SB34 00–0C**	2
X	X	O	1 NC	**3SB34 00–0C**	3 or 2B
X O	O X	O X	1 NO/1 NC	**3SB34 00–0A**	1 or 2A
X O	O X	X O	1 NO/1 NC	**3SB34 00–0A**	2
O X	O X	X O	1 NO/1 NC	**3SB34 00–0A**	3 or 2B
X X	O O	O O	2 NO	**3SB34 00–0D**	1 or 2A
X X	O O	X X	2 NO	**3SB34 00–0D**	2
O O	O O	X X	2 NO	**3SB34 00–0D**	3 or 2B
O O	X X	X X	2 NC	**3SB34 00–0E**	1 or 2A
O O	X X	O O	2 NC	**3SB34 00–0E**	2
X X	X X	O O	2 NC	**3SB34 00–0E**	3 or 2B
Three-Position Push-Pull Contact Block Selection					
Out	Center	In			
X	O	O	1 NO	**3SB34 00–0B**	1 or 2A
O	O	X	1 NO	**3SB34 00–0B**	3 or 2B
X	X	O	1 NC	**3SB34 00–0C**	3 or 2B
O	X	X	1 NC	**3SB34 00–0C**	1 or 2A
O X	X O	X O	1 NO/1 NC	**3SB34 00–0A**	1 or 2A
X O	X O	O X	1 NO/1 NC	**3SB34 00–0A**	3 or 2B
O X	X O	O X	1 NO/1 NC	**3SB34 00–0A**	2

Rear View of Switch



Operator without Contact Block Carrier

For Mounting Contacts Directly to Operator



Operator with Contact block carrier

For Mounting Contacts with Carrier

X — Contact Closed
0 — Contact Open
2 — Both Pushers Inserted
2A—Left Pusher Inserted
2B—Right Pusher Inserted



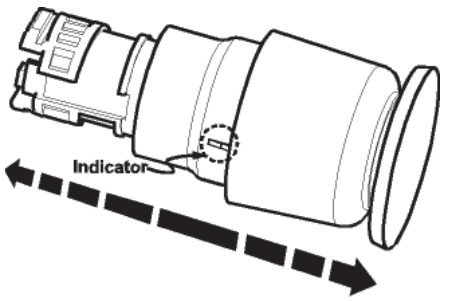
3SB39 01-0AC for operating center position. Shown with both pushers inserted (Sold separately)



3SB39 01-0AB included with illuminated devices

Orienting 3-Position Push-Pull Devices

1. Pull the operator to the out position and locate the device orientation mark.
2. With the mark located, insert into panel with the mark on the left side of the device as you face the panel.



1) Positions 2, 2A and 2B cannot be used on illuminated selector switches. Position is occupied by lamp module.
2) For illuminated transformer-type devices, an extra-deep lampholder is required when using two-element contact blocks.

Push Button Units and Indicator Lights

3SB3, Inscriptions, 22 mm

Overview

Inscription of actuators and indicators

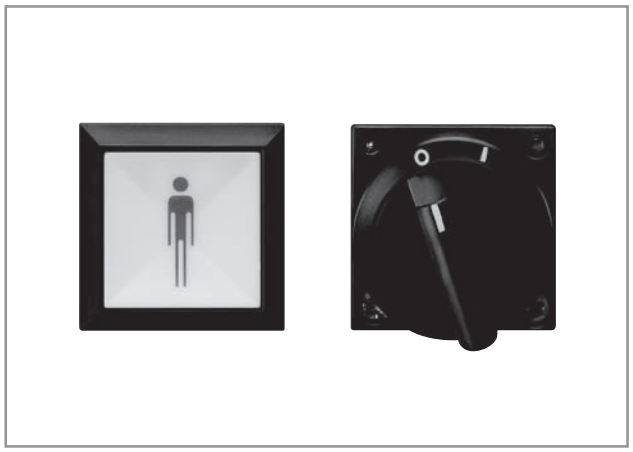
Actuators and indicators of plastic as well as metal version can be optionally inscribed with a laser.



Pushbutton (metal) with laser inscription

The actuators of the push buttons, illuminated push buttons, mushroom push buttons and illuminated mushroom push buttons can be inscribed as well as the lenses of the indicator lights.

Selector switches can be inscribed only if they are made of plastic (only one text line on the front ring).



Pushbutton and selector switch (plastic) with laser inscription

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.

For round buttons and lenses, the 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

On square buttons and lenses, 10 characters are possible per line.

Ordering notes

When ordering, supplement the Order No. of the actuator 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 OFF"): **Y11**
- Text in lower case (e.g. "lift off"): **Y12**
- Text in upper/lower case, all words begin with capital letters (e.g. "Lift Off"): **Y15**
- Symbol with number according to ISO 7000 or IEC 60417: **Y13**
- Any inscription or symbol according to order form supplement: **Y19**

Additional price per unit for Y10 to Y19 on request.

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 (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).

For special symbols (order code Y19), a CAD drawing in DXF format can be submitted.

Ordering example 1

A round push button with the inscription "Reset" is required:

3SB30 00–0AA41–Z
Y10
Z = Reset (English)

Ordering example 2

A square push button inscribed with symbol No. 5389 according to IEC 60417 is required:

3SB31 10–0AA31–Z
Y13
Z = 5389 IEC

Ordering example 3

A round push button inscribed with symbol No. 1118 according to ISO 7000 is required:

3SB30 00–0AA41–Z
Y13
Z = 1118 ISO

Options

Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data.

Insert Labels

By default, a letter height of 4 mm (for a single line of text) or 3 mm (for 2 or 3 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

On square insert labels, 10 characters are possible per line.

Name plates

The following letter heights are used as standard for text inscriptions:

- Label size 12.5 mm × 27 mm: maximum 3 lines with letter height 4 mm (1-line), 3.5 mm (2-line) or 2.5 mm (3-line)
- Label size 27 mm × 27 mm: maximum 5 lines with letter height 4 mm (1- to 5-line)
- Label size 17.5 mm × 28 mm: maximum 3 lines with letter height 4 mm (1- and 2-line) or 3 mm (3-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.

Inscription labels for enclosures

A letter height of 4 mm is used as standard 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.

Ordering notes

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 symbol 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.

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 K9Y), a CAD drawing in DXF format should be submitted to sirius-attach.aud@siemens.com

Ordering example 1

A label with 2 lines of text is required:

3SB39 02–1XZ
K1Y
Z1 = LIFT
Z2 = LOWER

Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SB39 02–1XZ
K3Y
Z = 5011 IEC

Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:

3SB39 02–1XZ
K3Y
Z = 1118 ISO

Examples for customized inscription



Two-line inscription in upper/lower case lettering (K0Y)
(Insert labels)



Single-line inscription in upper case lettering (K1Y)
(Name plates)



Three-line inscription in lower case lettering (K2Y)



Symbol number 5011 according to IEC 60417 (K3Y)



Any symbol according to order form supplement (K9Y)
(Inscription labels for enclosures)

Push Button Units and Indicator Lights

3SB3, Inscriptions, 22 mm

Inscriptions by laser printer

Overview

Label inscriptions

Using the *Label Designer* software, which can be downloaded from the Internet, and the inscription labels 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 (see Name plates). Round labels are provided for inserting in illuminated push buttons and switches.

The labels are suitable for printing with one to three lines of text or symbols.

For applications with more exacting requirements we recommend factory-printed inscription labels and insert labels (laser-printed or engraved depending on the type).

You can find the *Label Designer* software on the Internet at:

www.siemens.com/sirius-label-designer

Selection and ordering data

Version	Color	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS
Labels for printing						
 **Insert labels** for inserting in round illuminated push buttons and illuminated switches	Milky	A	**3SB39 01-2AB**		100	480 units
Inscription labels 12.5 mm x 27 mm for sticking onto label holder	White	A	**3SB39 02-2AA**		100	480 units
Inscription labels 27 mm x 27 mm for sticking onto label holder	White	A	**3SB39 03-2AA**		100	480 units
Inscription labels 17.5 mm x 28 mm for snapping onto label holder	White	A	**3SB39 05-2AA**		100	720 units
Inscription labels 22 mm x 22 mm for sticking onto enclosure	White	A	**3SB39 06-2AA**		100	700 units

Push Button Units and Indicator Lights

3SB3, Inscriptions, 22 mm

Overview

Push buttons (clear) and illuminated push buttons with a flat button can be fitted with insert labels for identification purposes, but indicator lights cannot.

These insert labels are made of clear, transparent plastic with black inscription; 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 (see page 17-360).

The insert labels without inscription are suitable for user marking with permanent pen.

Selection and ordering data

Inscription/Symbol		Symbol No.	DT	Round range Order No.	Price per PU	DT	Square range Order No.	Price per PU
Insert labels								
For self-inscription								
Blank			B	**3SB19 01-4AS**		B	**3SB39 40-4AA**	
With inscription								
On			B	**3SB19 01-4EB**		B	**3SB39 40-4EB**	
Off			B	**3SB19 01-4EC**		B	**3SB39 40-4EC**	
Up			B	**3SB19 01-4ED**		B	**3SB39 40-4ED**	
Down			B	**3SB19 01-4EE**		B	**3SB39 40-4EE**	
Forward			B	**3SB19 01-4EF**		B	**3SB39 40-4EF**	
Reverse			B	**3SB19 01-4EG**		B	**3SB39 40-4EG**	
Right			C	**3SB19 01-4EH**			—	
Left			C	**3SB19 01-4EJ**			—	
Open			B	**3SB19 01-4EP**		B	—	
Close			B	**3SB19 01-4EQ**			—	
Fast			B	**3SB19 01-4ER**			—	
Slow			B	**3SB19 01-4ES**			—	
Running			B	**3SB19 01-4EV**			**3SB39 40–4EV**	
Fault			B	**3SB19 01-4EW**			**3SB39 40–4EW**	
Reset			B	**3SB19 01-4EM**		B	**3SB39 40-4EM**	
Test			B	**3SB19 01-4EN**			—	
Start			B	**3SB19 01-4EK**		B	**3SB39 40-4EK**	
Stop			B	**3SB19 01-4EL**		B	**3SB39 40-4EL**	
With graphic symbol								
O (Off)		5008 IEC	B	**3SB19 01-4MB**		B	**3SB39 40-4MB**	
I (On)		5007 IEC	B	**3SB19 01-4MC**		B	**3SB39 40-4MC**	
II (On)		—	B	**3SB19 01-4MD**		B	**3SB39 40-4MD**	
Electric motor		0011 ISO	B	**3SB19 01-4PA**			**3SB39 40–4PA**	
Motion in direction of arrow		5022 IEC	B	**3SB19 01-4NA**		B	**3SB39 40-4NA**	
Increase, plus		5005 IEC	B	**3SB19 01-4NG**		B	**3SB39 40-4NG**	
Decrease, minus		5006 IEC	B	**3SB19 01-4MC**		B	**3SB39 40-4MC**	
With customized inscription								
For inscriptions or symbols see "Options"				**3SB19 01-4AZ**			**3SB39 40-4AZ**	
• Text line(s) or symbol with No.			B	**K0Y, K1Y, K2Y, K3Y** or **K5Y**		B	**K0Y. K1Y. K2Y. K3Y** or **K5Y**	
• Any inscription or symbol			B	**K9Y**		B	**K9Y**	

For customized inscriptions see page 17-360.

Push Button Units and Indicator Lights

3SB3, Inscriptions, 22 mm

Overview

The name plates consist of a black plastic label holder and an inscription label (black with white print or silver-colored with black print) for sticking or snapping in place. They are not suitable for EMERGENCY-STOP push buttons.

Note mounting dimensions!

Inscriptions

The inscriptions have upper case initial letters. The typeface is Arial. Graphic symbols, including those not listed in the tables, are according to ISO 7000 or IEC 60417 (see page 17-360).

Self-adhesive labels

There are 2 sizes available for the round and square ranges:

- Label holders 30 mm × 45 mm × 7 mm with inscription label 12.5 mm × 27 mm.
- Label holders 30 mm × 60 mm × 7 mm with inscription label 27 mm × 27 mm.

Snap-on labels

The following version is available for the round range:

- Label holders 29.8 mm × 51 mm × 3 mm with inscription label 17.5 mm × 28 mm (inscription area: 17.5 mm × 27 mm)

Selection and ordering data

Inscription labels, self-adhesive, 12.5 mm × 27 mm



Inscriptions	DT	Black Order No.	DT	Silver-colored Order No.
For self-inscription				
Blank	►	**3SB39 02-1AA**	B	**3SB19 01-2AA**
With inscription				
On	B	**3SB39 02-1EB**	B	**3SB19 01-2EB**
Off	B	**3SB39 02-1EC**	B	**3SB19 01-2EC**
Up	B	**3SB39 02-1ED**	B	**3SB19 01-2ED**
Down	B	**3SB39 02-1EE**	B	**3SB19 01-2EE**
Emerg. Stop		**3SB39 02–1AU**		
Hand O Auto		**3SB39 02–1BE**		
Jog		**3SB39 02–1BG**		
Man O Auto		**3SB39 02–1ET**		
Power Off		**3SB39 02–1BH**		
Power On		**3SB39 02–1BJ**		
Reset		**3SB39 02–1EM**		
Run		**3SB39 02–1EX**		
Forward	B	**3SB39 02-1EF**		
Reverse	B	**3SB39 02-1EG**		
Right	B	**3SB39 02-1EH**	B	**3SB19 01-2EH**
Left	B	**3SB39 02-1EJ**	B	**3SB19 01-2EJ**
Open	B	**3SB39 02-1EP**	B	**3SB19 01-2EP**
Close	B	**3SB39 02-1EQ**	B	**3SB19 01-2EQ**
Fast		**—**	B	**3SB19 01-2ER**
Slow		**—**	B	**3SB19 01-2ES**
Stop	B	**3SB39 02-1EK**	B	**3SB19 01-2EK**
Start	B	**3SB39 02-1EL**	B	**3SB19 01-2EL**
Test	B	**3SB39 02-1EN**	B	**3SB19 01-2EN**
Running		**—**	B	**3SB19 01-2EV**
Fault	B	**3SB39 02-1EW**	B	**3SB19 01-2EW**
Reset		**—**	B	**3SB19 01-2EM**
Stop Start	B	**3SB39 02-1BC**	B	**3SB19 01-2BC**
Hand Auto	B	**3SB39 02-1BA**	B	**3SB19 01-2BA**
Man Auto	B	**3SB39 02-1EU**	B	**3SB19 01-2EU**
Hand O Auto		**—**	B	**3SB19 01-2BE**
Man O Auto		**—**	B	**3SB19 01-2ET**
Off On		**3SB39 02–1EA**		

For label holders see page 17-366.
For customized inscriptions see page 17-360..

Inscriptions	DT	Black Order No.	DT	Silver-colored Order No.
Inscription labels, self-adhesive, 12.5 mm × 27 mm				
				
With graphic symbol				
O	B	**3SB39 02-1MB**	B	**3SB19 01-2MB**
I	B	**3SB39 02-1MC**	B	**3SB19 01-2MC**
II		**—**	C	**3SB19 01-2MD**
III		**—**	B	**3SB19 01-2ME**
O I	B	**3SB39 02-1MF**	B	**3SB19 01-2MF**
I O II	B	**3SB39 02-1MG**	B	**3SB19 01-2MG**
1 O 2		**—**	B	**3SB19 01-2MK**
1 2	B	**3SB39 02-1ML**		**—**
	B	**3SB39 02-1NJ**	B	**3SB19 01-2NA**
	B	**3SB39 02-1NA**	B	**3SB19 01-2NJ**
				
With customized inscription				
For inscriptions or symbols see "Options"		**3SB39 02-1XZ**		**3SB19 01-2XZ**
• Text line(s)	B	**K0Y**	B	**K0Y**
• Text line(s) or symbol with No.	B	**K1Y, K2Y, K3Y** or **K5Y**	B	**K1Y. K2Y. K3Y** or **K5Y**
• Any inscription or symbol	B	**K9Y**	B	**K9Y**

Inscriptions	DT	Black Order No.	DT	Silver-colored Order No.
Inscription labels, self-adhesive, 27 mm × 27 mm				
				
For self-inscription				
Blank	B	**3SB39 03-1AA**	B	**3SB19 06-2AA**
With inscription				
On	B	**3SB39 03-1EB**		**—**
Off	B	**3SB39 03-1EC**		**—**
Start	B	**3SB39 03-1EL**		**—**
Emerg. Stop	B	**3SB39 03–1AU**		**—**
Hand O Auto	B	**3SB39 03–1BE**		**—**
Jog	B	**3SB39 03–1BG**		**—**
Man O Auto	B	**3SB39 03–1ET**		**—**
Power Off	B	**3SB39 03–1BH**		**—**
Power On	B	**3SB39 03–1BJ**		**—**
Reset	B	**3SB39 03–1EM**		**—**
Run	B	**3SB39 03–1EX**		**—**
Forward	B	**3SB39 03–1EF**		**—**
Reverse	B	**3SB39 03–1EG**		**—**
Right	B	**3SB39 03–1EH**		**—**
Left	B	**3SB39 03–1EJ**		**—**
Up	B	**3SB39 03–1ED**		**—**
Down	B	**3SB39 03–1EE**		**—**
Open	B	**3SB39 03–1EP**		**—**
Close	B	**3SB39 03–1EQ**		**—**
Test	B	**3SB39 03–1EN**		**—**
Stop	B	**3SB39 03–1EK**		**—**
Man Auto	B	**3SB39 03–1EU**		**—**
Off On	B	**3SB39 03–1EA**		**—**
Stop Start	B	**3SB39 03-1BC**		**—**
Hand Auto	B	**3SB39 03-1BA**		**—**
				
With graphic symbol				
O	B	**3SB39 03-1MB**		**—**
O I	B	**3SB39 03-1MF**		**—**
	B	**3SB39 03-1NA**		**—**
				
With customized inscription				
For inscriptions or symbols see "Options"		**3SB39 03-1XZ**		**3SB19 06-2XZ**
• Text line(s)	B	**K0Y**	B	**K0Y**
• Text line(s) or symbol with No.	B	**K1Y, K2Y, K3Y** or **K5Y**	B	**K1Y. K2Y. K3Y** or **K5Y**
• Any inscription or symbol	B	**K9Y**	B	**K9Y**

For label holders see page 17-366.
For customized inscriptions see page 17-360.

Push Button Units and Indicator Lights

3SB3, Inscriptions, 22 mm

Name plates

Inscriptions	DT	Black Order No.	DT	Silver-colored Order No.
Inscription labels, for snapping on, 17.5 mm × 28 mm				
For self-inscription				
Blank	B	**3SB39 05-1AA**	B	**3SB19 04-2AA**
With inscription				
On	B	**3SB39 05-1EB**	B	**3SB19 04-2EB**
Off	B	**3SB39 05-1EC**	B	**3SB19 04-2EC**
Up	B	**3SB39 05-1ED**		**—**
Down	B	**3SB39 05-1EE**		**—**
Forward	B	**3SB39 05-1EF**	B	**—**
Reverse	B	**3SB39 05-1EG**	B	**3SB19 04-2EG**
Right	B	**3SB39 05-1EH**		**—**
Left	B	**3SB39 05-1EJ**		**—**
Open	B	**3SB39 05-1EP**		**—**
Close	B	**3SB39 05-1EQ**		**—**
Stop	B	**3SB39 05-1EK**	B	**3SB19 04-2EK**
Start	B	**3SB39 05-1EL**	B	**3SB19 04-2EL**
Test		**—**	B	**3SB19 04-2EN**
Running	B	**3SB39 05-1EV**		**—**
Fault	B	**3SB39 05-1EW**	B	**3SB19 04-2EW**
Reset		**—**	B	**3SB19 04-2EM**
Stop Start	B	**3SB39 05-1BC**	B	**3SB19 04-2BC**
Hand Auto	B	**3SB39 05-1BA**	B	**3SB19 04-2BA**
Man Auto	B	**3SB39 05-1EU**	C	**3SB19 04-2EU**
Man O Auto		**—**	B	**3SB19 04-2ET**
With graphic symbol				
O	B	**3SB39 05-1MB**	B	**3SB19 04-2MB**
I	B	**3SB39 05-1MC**	B	**3SB19 04-2MC**
O I	B	**3SB39 05-1MF**	B	**3SB19 04-2MF**
I O II		**—**	B	**3SB19 04-2MG**
1 O 2		**—**	B	**3SB19 04-2MK**
	B	**3SB39 05-1NA**	B	**3SB19 04-2NA**
	B	**3SB39 05-1NJ**	B	**3SB19 04-2NJ**
With customized inscription				
For inscriptions or symbols see "Options"		**3SB39 05-1XZ**		**3SB19 04-2XZ**
• Text line(s)	B	**K0Y**	B	**K0Y**
• Text line(s) or symbol with No.	B	**K1Y, K2Y, K3Y** or **K5Y**	B	**K1Y. K2Y. K3Y** or **K5Y**
• Any inscription or symbol	B	**K9Y**	B	**K9Y**

For label holders see page 17-366.
For customized inscriptions see page 17-360.

Push Button Units and Indicator Lights

3SB3, Inscriptions, 22 mm

Name plates

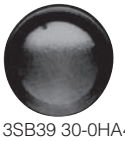
Version	DT	Black Order No.	PU (UNIT, SET, M)	PS
Label holders for inscription labels 12.5 mm × 27 mm				
 3SB39 22-0AV				
For round range, flat	B	**3SB39 22-0AV**	100	10 units
For potentiometer drives 3SB10 00-7CH07[1)]	B	**3SB39 22-0AS**	1	1 unit
For square range, flat	B	**3SB39 42-0AX**	100	5 units
Label holders for inscription labels 27 mm × 27 mm				
 3SB39 23-0AV				
For round range, flat	B	**3SB39 23-0AV**	100	10 units
For round range, raised	C	**3SB39 23-0AX**	1	10 units
For potentiometer drives, flat	B	**3SB39 23-0AS**	1	1 unit
For square range, flat	B	**3SB39 43-0AX**	100	1 unit
Label holders for inscription labels 17.5 mm × 28 mm				
 3SB39 25-0AV				
For round design	►	**3SB39 25-0AV**	100	10 units

1) This label holder can also be used for push buttons with dust covers if the front panel thickness of 3 mm is not exceeded.

Push Button Units and Indicator Lights

3SB3, Accessories and spare parts, 22 mm

Selection and ordering data

Version	Color	DT	Order No.	PU (UNIT, SET, M)	PS
Buttons and lenses for round version[1]					
3SB39 30-0CA6					
Buttons, flat for round illuminated push buttons and illuminated switches, plastic version	Red	B	**3SB39 30-0CA2**	1	10 units
	Yellow	B	**3SB39 30-0CA3**	1	10 units
	Green	B	**3SB39 30-0CA4**	1	10 units
	Blue	B	**3SB39 30-0CA5**	1	10 units
	White	B	**3SB39 30-0CA6**	1	10 units
	Clear	B	**3SB39 30-0CA7**	1	10 units
 3SB39 30-0EA3					
Buttons, flat for round push buttons and switches, metal version	Black	B	**3SB39 30-0EA1**	1	10 units
	Red	B	**3SB39 30-0EA2**	1	10 units
	Yellow	B	**3SB39 30-0EA3**	1	10 units
	Green	B	**3SB39 30-0EA4**	1	10 units
	Blue	B	**3SB39 30-0EA5**	1	10 units
	White	B	**3SB39 30-0EA6**	1	10 units
	Clear	B	**3SB39 30-0EA7**	1	10 units
 3SB39 30-0DA4					
Buttons, raised for round illuminated push buttons and illuminated switches, plastic version	Red	B	**3SB39 30-0DA2**	1	10 units
	Green	B	**3SB39 30-0DA4**	1	10 units
	Clear	B	**3SB39 30-0DA7**	1	10 units
Buttons, raised for round push buttons and switches, metal version	Black	D	**3SB39 30-0FA1**	1	10 units
	Red	C	**3SB39 30-0FA2**	1	10 units
	Yellow	C	**3SB39 30-0FA3**	1	10 units
	Green	C	**3SB39 30-0FA4**	1	10 units
	Blue	C	**3SB39 30-0FA5**	1	10 units
	White	C	**3SB39 30-0FA6**	1	10 units
	Clear	C	**3SB39 30-0FA7**	1	10 units
 3SB39 30-0FA4					
Buttons, flat for round illuminated push buttons and illuminated switches, metal version	Amber	B	**3SB39 30-0GA0**	1	10 units
	Red	B	**3SB39 30-0GA2**	1	10 units
	Yellow	B	**3SB39 30-0GA3**	1	10 units
	Green	B	**3SB39 30-0GA4**	1	10 units
	Blue	B	**3SB39 30-0GA5**	1	10 units
	White	B	**3SB39 30-0GA6**	1	10 units
	Clear	B	**3SB39 30-0GA7**	1	10 units
 3SB39 30-0GA3					
Buttons, flat, solvent-resistant[2], for round illuminated push buttons and switches, metal version	Red	B	**3SB39 30-0GA20-0PA0**	1	10 units
	Yellow	B	**3SB39 30-0GA30-0PA0**	1	10 units
	Green	B	**3SB39 30-0GA40-0PA0**	1	10 units
	Blue	B	**3SB39 30-0GA50-0PA0**	1	10 units
	White	B	**3SB39 30-0GA60-0PA0**	1	10 units
	Clear	B	**3SB39 30-0GA70-0PA0**	1	10 units
 3SB39 30-0HA4					
Buttons, raised for round illuminated push buttons and illuminated switches, metal version	Amber	C	**3SB39 30-0HA0**	1	10 units
	Red	C	**3SB39 30-0HA2**	1	10 units
	Yellow	C	**3SB39 30-0HA3**	1	10 units
	Green	C	**3SB39 30-0HA4**	1	10 units
	Blue	C	**3SB39 30-0HA5**	1	10 units
	White	C	**3SB39 30-0HA6**	1	10 units
	Clear	C	**3SB39 30-0HA7**	1	10 units
 3SB39 30-6BA3					
Lenses, smooth For round indicator lights, plastic and metal version	Amber	C	**3SB39 30-6BA0**	1	10 units
	Red	B	**3SB39 30-6BA2**	1	10 units
	Yellow	B	**3SB39 30-6BA3**	1	10 units
	Green	B	**3SB39 30-6BA4**	1	10 units
	Blue	B	**3SB39 30-6BA5**	1	10 units
	White	B	**3SB39 30-6BA6**	1	10 units
	Clear	B	**3SB39 30-6BA7**	1	10 units
 3SB39 30-6CA3					
Lenses with concentric rings For round indicator lights, plastic and metal version	Amber	B	**3SB39 30-6CA0**	1	10 units
	Red	B	**3SB39 30-6CA2**	1	10 units
	Yellow	B	**3SB39 30-6CA3**	1	10 units
	Green	B	**3SB39 30-6CA4**	1	10 units
	Blue	B	**3SB39 30-6CA5**	1	10 units
	White	B	**3SB39 30-6CA6**	1	10 units
	Clear	B	**3SB39 30-6CA7**	1	10 units
Buttons and lenses for square version					
3SB39 50-0CA6					
Buttons, flat For square illuminated push buttons and illuminated switches, plastic version	Red	B	**3SB39 50-0CA2**	1	10 units
	Yellow	B	**3SB39 50-0CA3**	1	10 units
	Green	B	**3SB39 50-0CA4**	1	10 units
	Blue	B	**3SB39 50-0CA5**	1	10 units
	White	B	**3SB39 50-0CA6**	1	10 units
	Clear	B	**3SB39 50-0CA7**	1	10 units
 3SB39 50-6AA2					
Lenses, smooth For square indicator lights, plastic version	Red	B	**3SB39 50-6AA2**	1	10 units
	Yellow	B	**3SB39 50-6AA3**	1	10 units
	Green	B	**3SB39 50-6AA4**	1	10 units
	Blue	B	**3SB39 50-6AA5**	1	10 units
	White	B	**3SB39 50-6AA6**	1	10 units
	Clear	B	**3SB39 50-6AA7**	1	10 units

[1] In scope of supply of push buttons or indicator lights.

[2] Not suitable for laser inscription.

Push Button Units and Indicator Lights

3SB3, Accessories and spare parts, 22 mm

Lamps, acoustic signal transformers and keys

Selection and ordering data

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS
	V					
Lamps, BA 9s bases[1]						
Incandescent lamps 1.2 W, length up to 28 mm, max. bulb diameter 10 mm	24 AC/DC	Clear	A	**3SB19 02-0AY**	1	10 units
Incandescent lamps 2 W, length up to 28 mm, max. bulb diameter 10 mm	6 AC/DC	Clear	A	**52AABN**	1	1 units
	12 AC/DC		A	**52AACN**	1	1 units
	24 AC/DC		A	**52AADN1**	1	1 units
	30 AC/DC		B	**3SB19 02-2AF**	1	10 units
	48 AC/DC		B	**3SB19 02-1AP**	1	10 units
	60 AC/DC		A	**3SR94 24**	1	10 units
Incandescent lamps 2.6 W, length 28 mm, bulb diameter 10 mm	110 ... 130 AC/DC[2]	Clear	▶	**3SX1 731**	1	10 units
Incandescent lamps 3 W, length 28 mm, bulb diameter 10 mm	120V #120 MB	Clear	▶	**52AAENC**	1	1 units
Multi-incandescent lamps 1.2 W, endurance 25 000 h, high resistance to vibration	24 AC/DC		B	**3SB19 02-2BU**	1	10 units
LED lamps, super-bright Length up to 28 mm, max. bulb diameter 10 mm, max. operational current 15 mA	24 V AC/DC	Red	▶	**52AED2**	1	1 units
		Green	B	**52AED3**	1	1 units
		Yellow	▶	**52AED4**	1	1 units
		White	B	**52AEDB**	1	1 units
		Blue	▶	**52AED5**	1	1 units
	48 AC/DC	Red	B	**3SB39 01-1CC**	1	10 units
		Yellow	B	**3SB39 01-1BC**	1	10 units
		Green	B	**3SB39 01-1DC**	1	10 units
		Blue	B	**3SB39 01-1PC**	1	10 units
		White	B	**3SB39 01-1QC**	1	10 units
	120 AC/DC	Red	B	**52AEE2**	1	1 units
		Green	B	**52AEE3**	1	1 units
		Yellow	B	**52AEE4**	1	1 units
		White	B	**52AEEB**	1	1 units
		Blue	B	**52AEE5**	1	1 units
	230 AC, 110 ... 160 DC, if X1 at "+"	Red	B	**3SB39 01-1CF**	1	10 units
		Yellow	B	**3SB39 01-1BF**	1	10 units
		Green	B	**3SB39 01-1DF**	1	10 units
		Blue	B	**3SB39 01-1PF**	1	10 units
		White	B	**3SB39 01-1QF**	1	10 units
	230 AC/DC	Red	B	**3SB39 01-1CG**	1	10 units
		Yellow	B	**3SB39 01-1BG**	1	10 units
		Green	B	**3SB39 01-1DG**	1	10 units
		Blue	B	**3SB39 01-1PG**	1	10 units
		White	B	**3SB39 01-1QG**	1	10 units
LED lamps Length up to 28 mm, max. bulb diameter 10 mm, max. operational current 15 mA	22 ... 32 DC	Red	D	**3SB19 02-4AJ**	1	10 units
		Yellow	D	**3SB19 02-4BJ**	1	10 units
		Green	D	**3SB19 02-4CJ**	1	10 units
LED lamps, flashing (1.4 Hz), length up to 28 mm, bulb diameter 10 mm, operational current 24 ... 29 mA	24 DC	Red	B	**3SB19 02-4LC**	1	10 units
		Yellow	C	**3SB19 02-4MC**	1	10 units
		Green	C	**3SB19 02-4NC**	1	10 units
Glow lamps[3] length 28 mm, bulb diameter 10 mm, operational current approx. 1.8 mA	110 AC	Clear	A	**3SX1 703**	1	10 units
	220 AC	Clear	A	**3SX1 701**	1	10 units
	220 AC	Green	C	**3SX1 702**	1	10 units
Lamp extractors For lamps with BA 9s base			▶	**3SB19 02-2AD**	1	1 unit


3SB19 02-0AY


3SB39 01-1PA


3SB19 02-4MC


3SX1 703


3SB19 02-2AD

1) Essential accessories when using lamp holders with BA 9s base and delivery without lamp.

2) Also for 230 V when used with a 3SB34 00-1C voltage reducer.

3) Due to the inherent orange color of glow lamps and their lower luminance level compared to incandescent lamps, it is recommended that they should only be used with clear or red screw lenses and in areas where ambient light levels are not very high.

Push Button Units and Indicator Lights

3SB3, Accessories and spare parts, 22 mm

Lamps, acoustic signal transformers and keys

	Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS
		V					
Lamps, Wedge bases[1]							
 3SB29 08-1AE	**Incandescent lamps** Wedge base W2 × 4.6 d, 1.0 W	6 AC/DC	Clear	C	**3SB29 08-1AA**	100	10 units
		12 AC/DC		B	**3SB29 08-1AB**	100	10 units
		24 AC/DC		▶	**3SB29 08-1AC**	100	10 units
		30 AC/DC		A	**3SB29 08-1AD**	100	10 units
		48 AC/DC		B	**3SB29 08-1AE**	1	10 units
		60 AC/DC		B	**3SB29 08-1AF**	1	10 units
 3SB39 01-1SB	**LED lamps, super-bright** Wedge base W2 × 4.6 d, operational current 10 mA	24 AC/DC	Red	B	**3SB39 01-1SB**	1	10 units
			Yellow	B	**3SB39 01-1RB**	1	10 units
			Green	B	**3SB39 01-1TB**	1	10 units
			White	B	**3SB39 01-1UB**	1	10 units
			Blue	B	**3SB29 08-1BD**	1	10 units
 3SB39 01-1VE		28 AC/DC	Red	B	**3SB39 01-1SE**	1	10 units
			Yellow	B	**3SB39 01-1RE**	1	10 units
			Green	B	**3SB39 01-1TE**	1	10 units
			White	B	**3SB39 01-1UE**	1	10 units
			Blue	D	**3SB39 01-1VE**	1	10 units
 3SB29 08-2AB	**Lamp extractors** for lamps with bases W2× 4.6 d			▶	**3SB29 08-2AB**	1	1 unit
 3SB19 02-1AU	**Lamp adapters** For fitting a lamp with a wedge base socket into a BA 9s lamp holder			C	**3SB19 02-1AU**	1	1 unit
Acoustic signal transformers, BA 9s base							
 3SB19 02-2BN	**Acoustic signal transformers** for acoustic signaling devices[2] operational current 25 mA, 0.6 W, sound pressure 80 dB/10 cm	24 ... 28 DC		B	**3SB19 02-2BN**	1	1 unit

1) Can be used with lamp adapters in lamp holders with BA 9s base.

2) For increased protection, the IP65 acoustic signaling device (complete unit) can be used.

	Version Lock Manufacturer	Lock No.	Color	DT	Order No.	PU (UNIT, SET, M)	PS
Keys for actuators[1]							
 3SY1 054	RONIS	SB 30	—	B	**3SB39 10-4A**	1	1 unit
	BKS	S1	—	A	**3SY1 066**	1	1 unit
	CES	LSG 1	—	B	**3SB19 10-2F**	1	1 unit
		SSG 10	—	B	**3SY1 054**	1	1 unit
		SSP 9	—	A	**3SY1 052**	1	1 unit
	O.M.R.	73038	Light blue	C	**3SB19 10-2L**	1	1 unit
		73037	Red	B	**3SB19 10-2M**	1	1 unit
		73034	Black	B	**3SB19 10-2N**	1	1 unit
		73033	Yellow	D	**3SB19 10-2P**	1	1 unit

1) Included in scope of supply of the key-operated switches and the EMERGENCY-STOP mushroom push buttons with key-operated switch. Also available with special lock. Supplement Order No. with **"-Z"** and quote the required lock in plain text. Additional price on request. This does not include locks for VW and main and general locking systems.

Selection and ordering data

	Version	Use	Color	DT	Order No.	PU (UNIT, SET, M)	PS
Protective caps[1], degree of protection IP67							
	Material: elastolan						
 3SB39 21-0AJ	**Protective caps** For round version	Flat button (plastic)	Clear	B	**3SB39 21-0AJ**	1	1 unit
		Flat button (metal), raised button (plastic)	Clear	B	**3SB39 21-0AM**	1	1 unit
	• PVC	Raised button (metal)	Clear	C	**3SB19 02-2AN**	1	1 unit
 3SB39 41-0AJ	**Protective caps** For square version	Flat button (plastic)	Clear	B	**3SB39 41-0AJ**	1	1 unit
	Material: silicone						
 3SB39 21-0AH	**Protective caps** For round version	Flat button (plastic)	Clear	B	**3SB39 21-0AH**	1	1 unit
 3SB19 02-0AK		Flat button (metal), raised button (plastic)	Clear	B	**3SB19 02-0AK**	1	1 unit
 3SB19 02-0AN		Raised button (metal)	Clear	B	**3SB19 02-0AN**	1	1 unit
 3SB39 21-0BA	**Protective caps** For round version	Selector switch (plastic and metal, normal handle)	Clear	B	**3SB39 21-0BA**	1	1 unit
 3SB19 02-2BH	**Protective caps** For round version	Mushroom push-pull button, Ø 40 mm (plastic and metal)	Clear	B	**3SB19 02-2BH**	1	1 unit
 3SB39 21-0BU		EMERGENCY-STOP mushroom pushbutton, Ø 40 mm (plastic and metal)	Clear	B	**3SB39 21-0BU**	1	1 unit
 3SB39 41-0AH	**Protective caps** For square version	Flat button (plastic)	Clear	B	**3SB39 41-0AH**	1	1 unit

[1] Protective caps are not suitable for use with 3SB38 plastic enclosures. With 3SB38 metal enclosures, protective caps can only be used with 3SB34 00 single-pole contact blocks for front plate mounting. Not to be used with label holder.

	Version	Use	Color	DT	Order No.	PU (UNIT, SET, M)	PS
Other protective caps[1]							
 3SB19 02-0AL	**Sealable caps** For round version	Flat button (plastic)	Black	B	**3SB19 02-0AL**	1	1 unit
		Flat button (metal), raised button (plastic)	Clear	B	**3SB19 02-2AR**	1	1 unit
 3SB19 02-2AR							
 3SB39 21-0BT	**Dust covers** For use in dusty environments	BKS, CES, O.M.R. key-operated switch	Clear	B	**3SB39 21-0BT**	1	1 unit
Protective collars for front plates							
 3SB39 21-0AX	**Protective collars for EMERGENCY-STOP**[2] For round version	EMERGENCY-STOP mushroom push button without key-operated switch	Yellow	▶	**3SB39 21-0AK**	1	1 unit
			Gray	C	**3SB39 21-0AP**	1	1 unit
		EMERGENCY-STOP mushroom pushbutton with key-operated switch	Yellow	B	**3SB39 21-0AX**	1	1 unit
 3SB39 21-0CG	**Protective collars for EMERGENCY-STOP for 5 padlocks**[2] For round version	3SB3...-1AA20 EMERGENCY-STOP mushroom push button	Yellow	▶	**3SB39 21-0CG**	1	1 unit
 3SB39 21-0AS	**Sun collars** For round version	Illuminated push buttons	Black	B	**3SB39 21-0AS**	1	1 unit
Blanking plugs for spare command points for front plates							
 3SB39 21-0AA	**Blanking plugs** For round version	Plastic version	Black	▶	**3SB39 21-0AA**	1	10 units
 3SB39 41-0AA	**Blanking plugs** For square version	Plastic version	Black	B	**3SB39 41-0AA**	1	1 unit
 3SB19 02-0AQ	**Blanking plugs** (plastic) for round version	Metal version	Alumi-nized	B	**3SB19 02-0AQ**	1	10 units

1) Not suitable for mounting in 3SB38 enclosures.
Not to be used with label holder.

2) The protective collar must only be used to protect against inadvertent actuating and must be fitted to allow unimpeded actuation of the EMERGENCY-STOP mushroom pushbutton.

Push Button Units and Indicator Lights

3SB3, Accessories and spare parts, 22 mm

Miscellaneous accessories

Selection and ordering data

	Version	Use	Inscriptions	DT	Order No.	PU (UNIT, SET, M)	PS
Yellow name plates for EMERGENCY-STOP							
	For use on front plates						
 3SB39 21-0AC	**Name plates, round** Self-adhesive, external diameter 60 mm, internal diameter 23 mm	EMERGENCY-STOP mushroom push button (round version)	Blank	B	**3SB39 21-0DY**	1	1 unit
	Name plates, round Self-adhesive, external diameter 80 mm, internal diameter 23 mm	EMERGENCY-STOP mushroom push button (round version)	Blank	B	**3SB39 21-0AB**	1	1 unit
			EMERGENCY STOP	B	**3SB39 21-0AD**	1	1 unit
 3SB39 21-0BW	**Name plates, round** Self-adhesive, external diameter 80 mm, cutout 26 mm × 26 mm	EMERGENCY-STOP mushroom push buttons (square version)	Blank	B	**3SB39 41-0AB**	1	1 unit
			EMERGENCY STOP	B	**3SB39 41-0AD**	1	1 unit
	Name plates, round 1 mm thick, external diameter 75 mm, internal diameter 22.5 mm	EMERGENCY-STOP mushroom push button (round version)	Blank	B	**3SB19 02-2BA**	1	1 unit
 3SB39 21-0DA	**Name plates, round** Self-adhesive, external diameter 60 mm, internal diameter 23 mm[1]	EMERGENCY-STOP mushroom push button (round version)	Blank	B	**3SB39 21-0DA**	1	1 unit
	Illuminated, suitable as signaling device for EMERGENCY-STOP, with plug-in connection for 24 V AC/DC[2]		EMERGENCY STOP	B	**3SB39 21-0DD**	1	1 unit
Inscription labels							
 3SB39 01-0CH	**Inscription labels** For supporting dust resistance	Contact blocks		B	**3SB39 01-0CH**	100	10 units
 3TX4 210-0H	**Unit labeling plates**	Contact blocks		B	**3TX4 210-0H**	100	100 units
Lockouts							
 3SB3921-0BS	**Locking cover**	Prevents access to pushbuttons, knob type selector switches and will work with both metal and plastic devices			**3SB39 21-0BS**	1	1 unit
 3SB3921-0BG	**Lockout**	for metal flush pushbutton for metal extended pushbutton for metal mushroom cap (40 mm) pushbutton			**3SB39 21–0BG** **3SB39 21–0BH** **3SB39 21–0BJ**	1 1 1	1 unit 1 unit 1 unit
 3SB3921-0BK	**2 Position Selector Switch Lockouts** [3]	Lock in left postion Lock in right postion			**3SB39 21–0BK** **3SB39 21–0BL**	1 1	1 unit 1 unit
 3SB3921-0BN	**3 Position Selector Switch Lockouts** [3]	Lock in left postion Lock in center postion Lock in right postion Lock out -left postion only Lock out -right postion only			**3SB39 21–0BM** **3SB39 21–0BN** **3SB39 21–0BP** **3SB39 21–0BQ** **3SB39 21–0BR**	1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit

1) For front panel thickness of max. 4 mm.

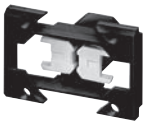
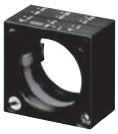
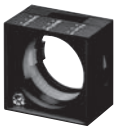
2) The illuminated label can also be operated through the AS-Interface F adapter (see page 17-385).

3) For metal devices only.

Push Button Units and Indicator Lights

3SB3, Accessories and spare parts, 22 mm

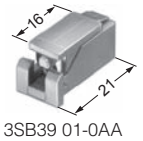
Miscellaneous accessories

	Version	Use	DT	Order No.	PU (UNIT, SET, M)	PS
Holders and pressure plates						
 3SB39 01-0AB	**Holders** For snapping on 3 blocks[1]	Push buttons, push-pull buttons, mushroom push buttons with front plate mounting	▶	**3SB39 01-0AB**	100	20 units
 3SB39 01-0AC	**Holders with pressure plate** For actuating the central contact block of 3 contact blocks[2]	Selector switches, key-operated switches and twin push buttons with front plate mounting	▶	**3SB39 01-0AC**	100	10 units
 3SB39 01-0AW	**Pressure plates** For actuating the central contact block of 3 contact blocks[2]	Selector switches and key-operated switches for use on PCBs or with base mounting	B	**3SB39 01-0AW**	100	10 units
Holders for commanding and signaling elements[3]						
 3SB39 31-0AA	**Holders** For plastic version, round	As-supplied state for front panel thickness 1 ... 4 mm	▶	**3SB39 31-0AA**	1	10 units
 3SB39 51-0AA	**Holders** For plastic version, square		B	**3SB39 51-0AA**	1	1 unit
 3SB39 31-0AC	**Holders** For metal version, round		▶	**3SB39 31-0AC**	1	10 units
 3SB39 21-0BD	**Grounding screws** For grounding metal actuators for fitting in front plates made of non-conducting materials		B	**3SB39 21-0BD**	100	50 units
	Bolt for enclosure Ring nut wretch			**3SB39 31–0AB**		
Guards						
 3SB3921-0BE	**Pushbutton Guard**	For standard pushbuttons, flush and extended. Also fits 30mm mushroom head devices		**3SB39 21–0BE**	1	1 unit
 3SB3921-0BF	**Guard**	For 40mm mushroom head devices standard momentary or 2 position push-pull		**3SB39 21–0BF**	1	1 unit

1) The holder for illuminated commanding devices is included in the scope of supply.

2) The pressure plates can be removed one by one to meet individual requirements.

3) The matching holder for actuators and indicators is included in the scope of supply (exception: Order with order code **"B01"**).

	Version	Use	Color	DT	Order No.	PU (UNIT, SET, M)	PS
Tools							
 3SB39 41-0AF	**Blanking tools** 26 mm × 26 mm, for square version			B	**3SB39 41-0AF**	1	1 unit
 3SB19 02-2BG	**Hole drilling templates** for 30 mm × 30 mm grid, horizontal, for round and square versions			C	**3SB19 02-2BG**	1	1 unit
 3SB39 21-0BC	**Mounting tools** For buttons and lenses, metal version			B	**3SB39 21-0BC**	1	1 unit
 3SX1 707	**Mounting tools** For potentiometer drives and for push buttons with extended stroke			C	**3SX1 707**	1	1 unit
 3SB39 01-0CB	**Dismantling tools** For contact blocks and lamp holders	Blocks with screw terminals		B	**3SB39 01-0CB**	1	1 unit
	Dismantling tools For contact blocks and lamp holders	With spring-type terminals		C	**3SB39 01-0CG**	1	1 unit
Various accessories							
 3SB39 21-0AU	**Single frames** For square design of the round version		Black	C	**3SB39 21-0AU**	1	1 unit
 3SB39 21-0AE	**Adapter parts** Adapters for 30.5 mm mounting hole, comprising a metal disk with an adhesive layer on one side, degree of protection IP65	As thrust ring for a thin molded-plastic front plate		B	**3SB39 21-0AE**	1	1 unit
 3SB39 01-0AA	**Printed circuit board holders** For mounting the command devices on the printed circuit board (screw is included in the scope of supply)	Contact blocks and lamp holders for solder connection		B	**3SB39 01-0AA**	100	10 units
 3SX1 335	**Extension plungers** For compensation of the distance between a push button and the unlatching button of an overload relay	Push buttons with extended stroke		A	**3SX1 335**	1	1 unit

Push Button Units and Indicator Lights

3SB3, Enclosures, 22 mm

Overview



Enclosures with standard and customized equipment

Enclosed push buttons and indicator lights are used as hand operated control devices for separately allocated control units and cabinets.

Enclosures with handle are available for suspension (e.g. for crane control units).

The enclosed push buttons and indicator lights are available with conventional controls as well as for connection to the AS-Interface bus system.

The following versions are available:

- Enclosures with standard fittings with 1 to 3 command points
- Enclosures with customized equipment with 1 to 6 command points
- Empty enclosures (individual parts must be ordered separately)

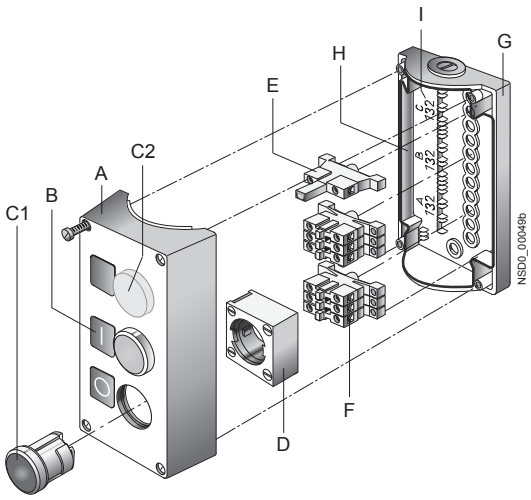
Customer-specific enclosures

On request enclosures with more than 6 command points can also be supplied with AS-Interface connection.

Use the configurator for selection.

For AS-Interface enclosures see page 17-384).

Enclosures with standard fittings



A Top part of enclosure
B Inscription labels
C1 Pushbutton
C2 Indicator light
D Holder
E Contact designations
F Contact blocks, lampholders for floor mounting
G Bottom part of enclosure
H Identification letters for the command points
I Identification number

Standards

IEC 60947-5-1, EN 60947-5-1

Application

The devices are climate-proof (KTW 24) according to EN ISO 6270-2 and suitable for stationary use (weather-protected) and for use in marine applications.

Technical specifications

Type	3SB38 0.-0, 3SB38 0.-1	3SB38 0.-2, 3SB38 0.-3
Enclosures		
Enclosure material	Plastic	Metal
Actuators and indicators	Plastic, round	Metal, round
Degree of protection acc. to IEC 60529	IP65	IP67 and NEMA Type 4
Climatic withstand capability according to EN ISO 6270-2	KTW 24	
Shock resistance according to IEC 60068-2-27 for half-sine shock type, 11 ms shock duration		
• Devices without incandescent lamp	≤ 50 *g*	
• Devices with incandescent lamp	≤ 30 *g*	
Vibration resistance acc. to IEC 60068-2-6		
• Acceleration at frequency 20 ... 200 Hz	5 *g*	

Push Button Units and Indicator Lights

3SB3, Enclosures, 22 mm

Enclosures with standard fittings

Overview

Enclosures with standard fittings are available with:

- 1 to 3 command points
- Operational 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 blocks and lamp holders for base mounting (are snapped into the enclosure base); screw terminals (box terminals) as standard; some versions also with spring-type terminals (Order No. ends with -0CC0)

Color of enclosure cover:

- Gray, RAL 7035
- Yellow, RAL 1004

Color of enclosure base:

- Black, RAL 9005

Selection and ordering data

Equipment	Contact block function	Number of command points	DT	Screw terminals / Configurator Order No.	PU (UNIT, SET, M)	PS
Plastic enclosures with standard fittings						
Cable entry top and bottom each 1 x M20						
 3SB38 01-0DA3 A = Pushbutton green, label "I"	1 NO	1	B	**3SB38 01-0DA3**	1	1 unit
A = Pushbutton red, label "O"	1 NC	1	B	**3SB38 01-0DB3**	1	1 unit
A = Pushbutton white, label "I"	1 NO	1	B	**3SB38 01-0DD3**	1	1 unit
A = Pushbutton black, label "O"	1 NC	1	B	**3SB38 01-0DE3**	1	1 unit
 3SB38 01-0.F3 A = EMERGENCY-STOP mushroom pushbutton, Ø 40 mm, with positive latching according to ISO 13850 and rotate-to-unlatch mechanism						
• With yellow top part, without protective collar	1 NC ⊖	1	B	**3SB38 01-0DG3**	1	1 unit
	2 NC ⊖	1	B	**3SB38 01-0EG3**	1	1 unit
• With yellow top part, with protective collar[1]	1 NC ⊖	1	B	**3SB38 01-0DF3**	1	1 unit
	2 NC ⊖	1	B	**3SB38 01-0EF3**	1	1 unit
 3SB38 02-0DA3 B = Pushbutton green, label "I" A = Pushbutton red, label "O"	1 NO, 1 NC	2	B	**3SB38 02-0DA3**	1	1 unit
B = Pushbutton white, label "I" A = Pushbutton black, label "O"	1 NO, 1 NC	2	B	**3SB38 02-0DB3**	1	1 unit
 3SB38 03-0DA3 C = Indicator light clear, label without inscription, B = Pushbutton green, label "I", A = Pushbutton red, label "O"	BA 9s[2], 1 NO, 1 NC	3	B	**3SB38 03-0DA3**	1	1 unit
C = Pushbutton black, label "II" B = Pushbutton black, label "I", A = Pushbutton red, label "O"	1 NO, 1 NO, 1 NC	3	C	**3SB38 03-0DB3**	1	1 unit
C = Indicator light clear, label without inscription, B = Pushbutton white, label "I", A = Pushbutton black, label "O"	BA 9s[2], 1 NO, 1 NC	3	C	**3SB38 03-0DC3**	1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊖ Positive opening according to IEC 60947-5-1, Appendix K.

1) The protective collar must only be used to protect against inadvertent actuating and must be fitted to allow unimpeded access to the EMERGENCY-STOP mushroom pushbutton.

2) Only lamp holder; order lamp separately.

Push Button Units and Indicator Lights

3SB3, Enclosures, 22 mm

Enclosures with standard fittings

Equipment	Contact block function	Number of command points	DT	Screw terminals / Spring-type terminals[3] / Configurator — Order No.	PU (UNIT, SET, M)	PS
Metal enclosures with standard fittings						
Cable entry top and bottom each 1 x M20						
A = Pushbutton green, label "I"	1 NO	1	B	**3SB38 01-2DA3**	1	1 unit
A = Pushbutton red, label "O"	1 NC	1	B	**3SB38 01-2DB3**	1	1 unit
A = Pushbutton white, label "I"	1 NO	1	B	**3SB38 01-2DD3**	1	1 unit
A = Pushbutton black, label "O"	1 NC	1	B	**3SB38 01-2DE3**	1	1 unit
A = EMERGENCY-STOP mushroom pushbutton, Ø 40 mm, with positive latching according to ISO 13850 and rotate-to-unlatch mechanism						
• With yellow top part, without protective collar	1 NC ➔	1	B	**3SB38 01-2DG3**	1	1 unit
	2 NC ➔	1	B	**3SB38 01-2EG3**	1	1 unit
- With M12 socket	2 NC ➔ [2]	1	C	**3SB38 01-2EG10-0CC0**	1	1 unit
• With yellow top part, with protective collar[1]	1 NC ➔	1	B	**3SB38 01-2DF3**	1	1 unit
	2 NC ➔	1	B	**3SB38 01-2EF3**	1	1 unit
A = EMERGENCY-STOP mushroom pushbutton, Ø 60 mm, with positive latching according to ISO 13850 and rotate-to-unlatch mechanism						
• With yellow top part, with protective collar for 5 padlocks	2 NC ➔	1	B	**3SB38 01-2EA30**	1	1 unit
	2 NC ➔ [2]	1	B	**3SB38 01-2EA30-0CC0**	1	1 unit
A = mushroom pushbutton, Ø 60 mm, black, with positive latching and rotate-to-unlatch mechanism						
• With gray top part, with protective collar for 5 padlocks	2 NC[2]	1	B	**3SB38 01-2EB30-0CC0**	1	1 unit
B = Pushbutton green, label "I" A = Pushbutton red, label "O"	1 NO, 1 NC	2	B	**3SB38 02-2DA3**	1	1 unit
B = Pushbutton white, label "I" A = Pushbutton black, label "O"	1 NO, 1 NC	2	B	**3SB38 02-2DB3**	1	1 unit
C = Indicator light clear, label without inscription, B = Pushbutton green, label "I", A = Pushbutton red, label "O"	BA 9s[3], 1 NO, 1 NC	3	B	**3SB38 03-2DA3**	1	1 unit
C = Pushbutton black, label "II" B = Pushbutton black, label "I", A = Pushbutton red, label "O"	1 NO, 1 NO, 1 NC	3	B	**3SB38 03-2DB3**	1	1 unit
C = Indicator light clear, label without inscription, B = Pushbutton white, label "I", A = Pushbutton black, label "O"	BA 9s[3], 1 NO, 1 NC	3	B	**3SB38 03-2DC3**	1	1 unit


3SB38 01-2DB3


3SB38 01-2.F3


3SB38 01-2EB30-0CC0


3SB38 02-2DA3


3SB38 03-2DA3


3SB38 03-2DB3

For online configurator see www.siemens.com/sirius/configurators .

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) The protective collar must only be used to protect against inadvertent actuating and must be fitted to allow unimpeded access to the EMERGENCY-STOP mushroom pushbutton.

2) **-0CC0**: Contact blocks with spring-type terminals.

3) Only lamp holder; order lamp separately.

Selection and ordering data

Version	Number of command points	DT	Configurator / Order No.	PU (UNIT, SET, M)	PS
Empty enclosures, plastic					
 3SB38 02-0AA3					
Cable entry top and bottom each 1 x M20 for 1 to 3 command points, each 1 x M25 for 4 and 6 command points					
For contact blocks, lamp holders and accessories with snap-on base mounting, also single-pole front plate blocks can be used (switching state is maintained upon opening), with gray top part	1	B	**3SB38 01-0AA3**	1	1 unit
	2	B	**3SB38 02-0AA3**	1	1 unit
	3	B	**3SB38 03-0AA3**	1	1 unit
	4	B	**3SB38 04-0AA3**	1	1 unit
	6	B	**3SB38 06-0AA3**	1	1 unit
 3SB38 01-0AB3					
For EMERGENCY-STOP, for contact blocks, lamp holders and accessories with snap-on base mounting, also single-pole front plate blocks can be used (switching state is maintained upon opening)					
• With yellow top part, without protective collar	1	B	**3SB38 01-0AB3**	1	1 unit
• With yellow top part, with protective collar[1)]	1	B	**3SB38 01-0AD3**	1	1 unit
Empty enclosures, metal					
 3SB38 04-2AA3					
Cable entry top and bottom each 1 x M20 for 1 to 3 command points, each 1 x M25 for 4 and 6 command points					
For contact blocks, lamp holders and accessories with snap-on base mounting, also single-pole front plate blocks can be used (switching state is maintained upon opening), with gray top part	1	B	**3SB38 01-2AA3**	1	1 unit
	2	B	**3SB38 02-2AA3**	1	1 unit
	3	B	**3SB38 03-2AA3**	1	1 unit
	4	B	**3SB38 04-2AA3**	1	1 unit
	6	B	**3SB38 06-2AA3**	1	1 unit
 3SB38 01-2AB3					
For EMERGENCY-STOP, for contact blocks, lamp holders and accessories with snap-on base mounting, also single-pole front plate blocks can be used (switching state is maintained upon opening)					
• With yellow top part, without protective collar	1	B	**3SB38 01-2AB3**	1	1 unit
• With yellow top part, with protective collar[1)]	1	B	**3SB38 01-2AD3**	1	1 unit
 3SB38 01-2AD3					
• With gray top part, with protective collar	1	B	**3SB38 01-2AE3**	1	1 unit
• With yellow top part, with protective collar for 3 padlocks, for mushroom Ø 40 mm, can be locked (BKS, CES, O.M.R.)	1	B	**3SB38 01-2EC3**	1	1 unit
 3SB38 01-2EC3					

For online configurator see www.siemens.com/sirius/configurators.

1) The protective collar must only be used to protect against inadvertent actuating and must be fitted to allow unimpeded access to the EMERGENCY-STOP mushroom pushbutton.

Push Button Units and Indicator Lights

3SB3, Enclosures, 22 mm

Customized enclosures

Overview

Customized enclosures are available with:
- 1 to 6 command points
- Operational voltage up to 400 V

One command point comprises:
- 1 actuator or indicator
- Up to 3 contact blocks or up to 2 contact blocks + 1 lamp holder
- 1 inscription label

For plastic enclosures the command points are equipped as standard with plastic actuators and indicators, for metal enclosures they are equipped with metal actuators and indicators.

For cable entry in each case, a hole is provided at the top and bottom:
- For M20 for 1 to 3 command points
- For M25 for 4 and 6 command points

Ordering notes (selection by configurator)

To order customized enclosures with the 3SB3 control devices (except suspended push buttons), use the 3SB3/3SF5 configurator to select the blocks for equipping. An electronic order form will be generated for the additional options. The configurator is available in the electronic catalog CA 01 on DVD or in the online catalog (Mall) on the Internet:

www.siemens.com/industrymall

Supplement the Order No. with the order code **"K0Y"** (as already listed in the selection table).

The list price of the complete enclosure is generated in the configurator for the customized equipment.

Please send the resulting electronic order form along with your order by e-mail to our Competence Center at

sirius-attach.aud@siemens.com

If you are unable to access either catalog, please contact our Technical Assistance.

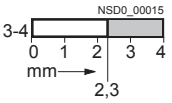
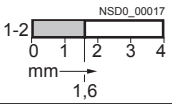
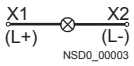
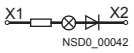
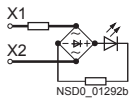
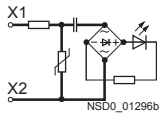
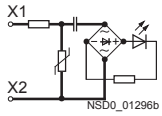
Selection and ordering data

Version	Number of command points	DT	Configurator ⚙ Order No.	PU (UNIT, SET, M)	PS
Plastic enclosures					
 3SB38 03-.AZ					
With contact blocks and lamp holders for base mounting	1	C	**3SB38 01-0AZK0Y**	1	1 unit
	2	C	**3SB38 02-0AZK0Y**	1	1 unit
	3	C	**3SB38 03-0AZK0Y**	1	1 unit
	4	B	**3SB38 04-0AZK0Y**	1	1 unit
	6	B	**3SB38 06-0AZK0Y**	1	1 unit
With single-pole contact blocks and lamp holders for front plate mounting	1	C	**3SB38 01-1AZK0Y**	1	1 unit
	2	C	**3SB38 02-1AZK0Y**	1	1 unit
	3	C	**3SB38 03-1AZK0Y**	1	1 unit
	4	B	**3SB38 04-1AZK0Y**	1	1 unit
	6	B	**3SB38 06-1AZK0Y**	1	1 unit
Metal enclosures					
 3SB38 03-.AZ					
With contact blocks and lamp holders for base mounting	1	C	**3SB38 01-2AZK0Y**	1	1 unit
	2	C	**3SB38 02-2AZK0Y**	1	1 unit
	3	C	**3SB38 03-2AZK0Y**	1	1 unit
	4	C	**3SB38 04-2AZK0Y**	1	1 unit
	6	C	**3SB38 06-2AZK0Y**	1	1 unit
With single-pole contact blocks and lamp holders for front plate mounting	1	C	**3SB38 01-3AZK0Y**	1	1 unit
	2	C	**3SB38 02-3AZK0Y**	1	1 unit
	3	C	**3SB38 03-3AZK0Y**	1	1 unit
	4	C	**3SB38 04-3AZK0Y**	1	1 unit
	6	C	**3SB38 06-3AZK0Y**	1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

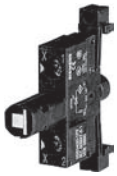
Selection and ordering data

For self-equipping of the enclosures

Version	Rated voltage/ Diagram	Operating travel/color Contact closed Contact open	DT	Screw terminals Order No.	PU (UNIT, SET, M)	PS
Contact blocks for base mounting						
Contact blocks with one contact						
1 NO			▶	**3SB34 20-0B**	1	1 unit
1 NO with gold-plated contacts			B	**3SB34 20-0BA**	1	1 unit
1 NC ➔			▶	**3SB34 20-0C**	1	1 unit
1 NC with gold-plated contacts ➔			C	**3SB34 20-0CA**	1	1 unit
BA 9s lamp holders						
Without lamp	Acc. to lamp 		▶	**3SB34 20-1A**	1	1 unit
With integrated voltage reducer and with 130 V lamp (3SX1 731)[1]	230/240 V AC 	Clear	B	**3SB34 20-1C**	1	1 unit
Lamp holders with integrated LED	24 V AC/DC 	Yellow	B	**3SB34 20-1PA**	1	1 unit
		Red	▶	**3SB34 20-1PB**	1	1 unit
		Green	▶	**3SB34 20-1PC**	1	1 unit
		Blue	B	**3SB34 20-1PD**	1	1 unit
		White	▶	**3SB34 20-1PE**	1	1 unit
	110 V AC 	Yellow	B	**3SB34 20-1QA**	1	1 unit
		Red	B	**3SB34 20-1QB**	1	1 unit
		Green	B	**3SB34 20-1QC**	1	1 unit
		Blue	D	**3SB34 20-1QD**	1	1 unit
		White	B	**3SB34 20-1QE**	1	1 unit
	230 V AC 	Yellow	B	**3SB34 20-1RA**	1	1 unit
		Red	B	**3SB34 20-1RB**	1	1 unit
		Green	B	**3SB34 20-1RC**	1	1 unit
		Blue	B	**3SB34 20-1RD**	1	1 unit
		White	B	**3SB34 20-1RE**	1	1 unit
Fixpoint terminals		Black	B	**3SB39 01-0AG**	1	1 unit
		Blue	B	**3SB39 01-0AH**	1	1 unit
		Green/Yellow	B	**3SB39 01-0AJ**	1	1 unit


3SB34 20-0B


3SB34 20-1A


3SB34 20-1PE


3SB39 01-0AH

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Only use with this lamp.

Version	Rated voltage/ Diagram	Operating travel/color ▭ Contact closed ▭ Contact open	DT	Spring-type terminals Order No.	PU (UNIT, SET, M)	PS
Contact blocks for base mounting						
Contact blocks with one contact						
1 NO	.3 .4	NSD0_00015 3-4 0 1 2 3 4 mm 2,3	B	**3SB34 23-0B**	1	1 unit
1 NO with gold-plated contacts			D	**3SB34 23-0BA**	1	1 unit
1 NC ➔	.1 .2	NSD0_00017 1-2 0 1 2 3 4 mm 1,6	B	**3SB34 23-0C**	1	1 unit
1 NC with gold-plated contacts ➔			B	**3SB34 23-0CA**	1	1 unit
Lamp holders with integrated LED	24 V AC/DC	Yellow	B	**3SB34 23-1PA**	1	1 unit
		Red	B	**3SB34 23-1PB**	1	1 unit
		Green	B	**3SB34 23-1PC**	1	1 unit
		Blue	B	**3SB34 23-1PD**	1	1 unit
		White	B	**3SB34 23-1PE**	1	1 unit
	110 V AC	Yellow	B	**3SB34 23-1QA**	1	1 unit
		Red	D	**3SB34 23-1QB**	1	1 unit
		Green	D	**3SB34 23-1QC**	1	1 unit
		Blue	D	**3SB34 23-1QD**	1	1 unit
		White	D	**3SB34 23-1QE**	1	1 unit
	230 V AC	Yellow	D	**3SB34 23-1RA**	1	1 unit
		Red	B	**3SB34 23-1RB**	1	1 unit
		Green	B	**3SB34 23-1RC**	1	1 unit
		Blue	B	**3SB34 23-1RD**	1	1 unit
		White	B	**3SB34 23-1RE**	1	1 unit
Fixpoint terminals		Black	B	**3SB34 23-2F**	1	1 unit
		Blue	B	**3SB34 23-2G**	1	1 unit
		Green/Yellow	B	**3SB34 23-2H**	1	1 unit


3SB34 23-0B


3SB34 23-2G

➔ Positive opening according to IEC 60947-5-1, Appendix K.

Version	DT	Order No.	PU (UNIT, SET, M)	PS
Accessories				
Pressure plates for selector switches and key-operated switches For actuating the central contact block of 3 contact blocks	B	**3SB39 01-0AW**	100	10 units


3SB39 01-0AW

Overview

Inscription labels

The inscription labels (black with white inscription or silver-colored with black print) have an adhesive layer on the back. The size of the labels is 22 mm x 22 mm.

Inscriptions

The inscriptions have upper case initial letters. The typeface is Arial. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417 (see page 17-383).

Selection and ordering data

Inscriptions	DT	Black Order No.	DT	Silver-colored Order No.
Inscription labels, self-adhesive, 22 mm × 22 mm				
				
For self-inscription				
Blank	B	**3SB39 06-1AA**	B	**3SB19 01-3AA**
With inscription				
On	B	**3SB39 06-1EB**	B	**3SB19 01-3EB**
Off	B	**3SB39 06-1EC**	B	**3SB19 01-3EC**
Up	B	**3SB39 06-1ED**	B	**3SB19 01-3ED**
Down	B	**3SB39 06-1EE**	B	**3SB19 01-3EE**
Open	B	**3SB39 06-1EP**	B	**3SB19 01-3EP**
Close	B	**3SB39 06-1EQ**	B	**3SB19 01-3EQ**
Forward	B	**3SB39 06-1EF**	B	**3SB19 01-3EF**
Reverse	B	**3SB39 06-1EG**	B	**3SB19 01-3EG**
Right	B	**3SB39 06-1EH**		—
Left	B	**3SB39 06-1EJ**		—
Fast	B	**3SB39 06-1ER**		—
Slow	B	**3SB39 06-1ES**		—
Running	B	**3SB39 06-1EV**	B	**3SB19 01-3EV**
Fault	B	**3SB39 06-1EW**		—
Operation	B	**3SB39 06 -1AP**		—
Start	B	**3SB39 06-1EL**	B	**3SB19 01-3EL**
Reset	B	**3SB39 06-1EM**	B	**3SB19 01-3EM**
Test	B	**3SB39 06-1EN**	B	**3SB19 01-3EN**
Stop	B	**3SB39 06-1EK**	B	**3SB19 01-3EK**
EMERGENCY STOP	B	**3SB39 06-1EY**	B	**3SB19 01-3EY**
Equipment				
Fan	B	**3SB39 06 -1CA**		—
Pump	B	**3SB39 06 -1CB**		—
Cooling	B	**3SB39 06 -1CC**		—
Heating	B	**3SB39 06 -1CD**		—
Lighting	B	**3SB39 06 -1CE**		—
Filter	B	**3SB39 06 -1CF**		—
Motor	B	**3SB39 06 -1CG**		—
Compressor	B	**3SB39 06 -1CH**		—
With graphic symbol				
O	B	**3SB39 06-1MB**	B	**3SB19 01-3MB**
I	B	**3SB39 06-1MC**	B	**3SB19 01-3MC**
II	B	**3SB39 06-1MD**	B	**3SB19 01-3MD**
III	B	**3SB39 06-1ME**	B	**3SB19 01-3ME**
O I (horizontal)	B	**3SB39 06-1MF**	B	**3SB19 01-3MF**
I O II (horizontal)	B	**3SB39 06-1MG**	B	**3SB19 01-3MG**
I O (vertical)	B	**3SB39 06-1MH**	B	**3SB19 01-3MH**
II O I (vertical)	B	**3SB39 06-1MW**	C	**3SB19 01-3MW**
	B	**3SB39 06-1NA**	B	**3SB19 01-3NA**

Inscriptions	DT	Black Order No.	DT	Silver-colored Order No.
Inscription labels, self-adhesive, 22 mm × 22 mm				
				
With customized inscription				
For inscriptions or symbols see "Options"		**3SB39 06-0XZ**		**3SB19 01-3XZ**
• Text line(s)	B	**K0Y**	B	**K0Y**
• Text line(s) or symbol with No.	B	**K1Y, K2Y, K3Y** or **K5Y**	B	**K1Y, K2Y, K3Y** or **K5Y**
• Any inscription or symbol	B	**K9Y**	B	**K9Y**

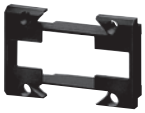
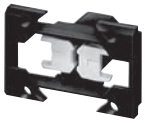
For customized inscriptions see page 17-360.

Push Button Units and Indicator Lights

3SB3, Enclosures, 22 mm

Accessories for enclosures

Selection and ordering data

	Version	Color/ inscription	DT	Order No.	PU (UNIT, SET, M)	PS
Blanking plugs for spare command points						
 3SB39 21-0AA	**Blanking plugs** For plastic version, round	Black	►	**3SB39 21-0AA**	1	10 units
 3SB19 02-0AQ	**Blanking plugs** (plastic) For metal version, round	Aluminized	B	**3SB19 02-0AQ**	1	10 units
Holders and pressure plates						
 3SB39 01-0AB	**Holders for push buttons and switches** For snapping on 3 blocks,[1] for front plate mounting		►	**3SB39 01-0AB**	100	20 units
 3SB39 01-0AC	**Holders for selector switches and key-operated switches with pressure plate** For actuating a central contact block, for front plate mounting[2]		►	**3SB39 01-0AC**	100	10 units
 3SB39 01-0AW	**Pressure plates for selector switches and key-operated switches** For actuating a central contact block, for base mounting[2]		B	**3SB39 01-0AW**	100	10 units
Accessories for enclosures						
	**Yellow name plates** As backing plate for EMERGENCY-STOP, self-adhesive	Without inscription	D	**3SB19 02-1AQ**	1	1 unit
		With recess for inscription label	B	**3SB39 21-0BV**	1	1 unit
 3SB39 01-0CK	**Cable gland** includes hexagonal nut					
	• M20		B	**3SB39 01-0CK**	1	1 unit
	• M25		B	**3SB39 01-0CM**	1	1 unit
	• Pg 16		B	**3SB39 01–0AK**	1	1 unit
	• Pg 22		B	**3SB39 01–0AM**	1	1 unit
 3SB39 01-0CL	**Hexagonal nuts** For cable glands					
	• M25		B	**3SB39 01-0CL**	100	10 units
	• M20		B	**3SB39 01-0CN**	100	10 units
	• Pg 16		B	**3SB39 01–0AL**	100	10 units
	• Pg 22		B	**3SB39 01–0AN**	100	10 units
 3SB39 01-0CS	**Connecting pieces** For connecting 2 plastic enclosures					
	• M20/M20		B	**3SB39 01-0CS**	1	1 unit
	• M20/M25[3]		B	**3SB39 01-0CT**	1	1 unit
	• M25/M25		B	**3SB39 01-0CU**	1	1 unit
 3SB39 01-0CP	**Connecting pieces** For connecting 2 metal enclosures					
	• M20/M20		B	**3SB39 01-0CP**	1	1 unit
	• M20/M25		B	**3SB39 01-0CQ**	1	1 unit
	Pg 16 terminal for AS interface cable suitable receptacles: crimp snap-in contacts 0.2–0.56 mm2		B	**3SB39 01–0AF**	1	1 unit

[1] The holder for illuminated commanding devices is included in the scope of supply.

[2] The pressure plates can be removed one by one to meet individual requirements.

[3] Not suitable for plastic enclosures with 6 command points.

Push Button Units and Indicator Lights

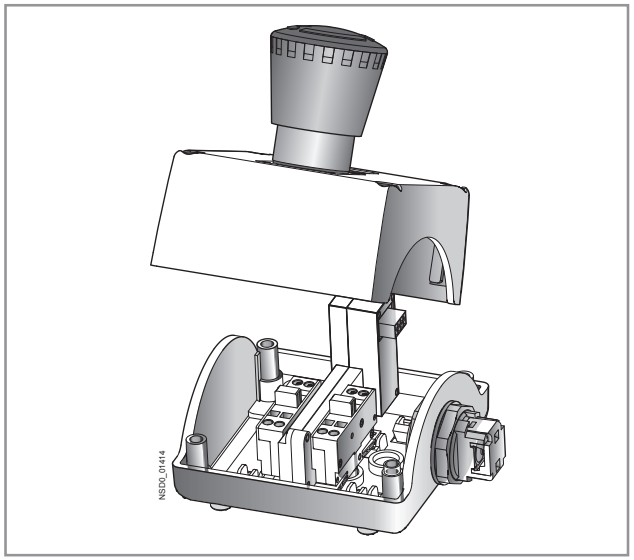
3SB3, Enclosures for AS-Interface, 22 mm

Overview



AS-Interface enclosure with customized equipment

Distributed command devices of the 3SB3 series can be quickly connected to the AS-Interface using AS-Interface enclosures. Using suitable components you can make your own enclosures with integrated AS-Interface or flexibly modify existing enclosures.



EMERGENCY-STOP enclosure

Enclosures

Color of enclosure cover:

- Gray, RAL 7035, or
- Yellow, RAL 1004, for EMERGENCY-STOP.

Color of enclosure base:

- Black, RAL 9005

Installation of AS-Interface slaves

The following slave types are available for connecting the command points:

- Slave in A/B technology with 4 inputs and 3 outputs
- Slave with 4 inputs and 4 outputs
- F Slave with two secure inputs for EMERGENCY-STOP mushroom pushbutton

The following table shows the maximum number of equippable slaves:

Enclosures for	Number of slaves for enclosures without EMERGENCY-STOP	Number of slaves for enclosures with EMERGENCY-STOP
1 command point	Not available	1 x F slave
2 command points	1 x slave 4I/4O or 4I/3O	Not available
3 command points	1 x slave 4I/4O or 4I/3O	1 x slave 4I/4O or 4I/3O + 1 x F slave
4 command points	2 x slave 4I/4O or 4I/3O[1)]	2 x slave 4I/4O or 4I/3O + 1 x F slave[1)]
6 command points	2 x slave 4I/4O or 4I/3O	2 x slave 4I/4O or 4I/3O + 1 x F slave

[1)] For metal enclosures with 4 command points, only 1 x slave 4I/4O or 4I/3O is possible.

Connection

One set of links is required in each case to connect a slave to contact blocks, to lamp holders and to the connection element.

The connection elements are mounted in the front-end cable glands and are used for connection of the AS-Interface or for bringing unused inputs or outputs out of the enclosure.

For connection to AS-Interface it can be selected between:

- 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 command 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.

Customized enclosures (selection by configurator)

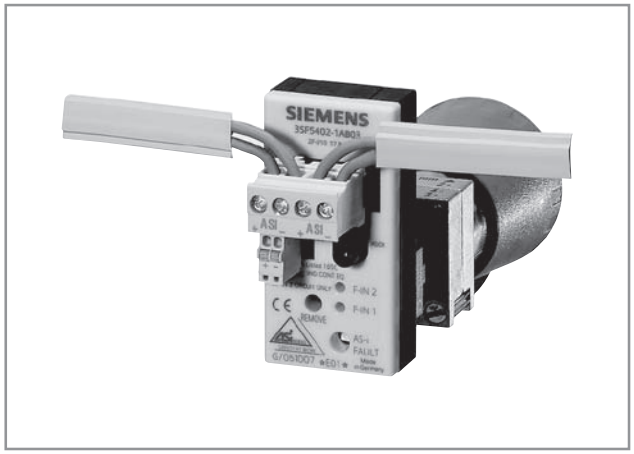
To order customized 3SF58 AS-Interface enclosures with the 3SB3 control devices, use the 3SB3/3SF5 configurator to select the blocks for equipping. An electronic order form will be generated for the additional options.

For related ordering notes see page 17-379

Push Button Units and Indicator Lights

3SB3, Components for Actuators and Indicators, 22 mm — *F adapters for EMERGENCY-STOP devices*

Overview



EMERGENCY-STOP mushroom push button with F adapter for bus connection

The AS-Interface F adapter is used to connect an EMERGENCY-STOP device according to ISO 13850 from the 3SB3 series to the AS-Interface bus system. The F adapter is suitable for control devices with mounting on front plates.

The F adapter has a safe AS-Interface 2I slave and is snapped from behind onto the EMERGENCY-STOP mushroom push button. In the 2I/1O expanded version, an output is also available for actuating an indicator light with LED.

Depending on the version, screw terminals or spring-type terminals or the insulation piercing method are used for connecting to the AS-Interface bus cable. Addressing is performed using the AS-Interface connection or the integrated addressing socket.

Safety category 4 (SIL 3) is achieved with the adapter.

Selection and ordering data

Version	DT	Screw terminals Order No.	PS
AS-Interface F adapter for 3SB3 EMERGENCY-STOP mushroom push buttons For mounting on front plates			
• 2I		**3SF5 402-1AA03**	1 unit
• 2I/1O, with output for LED control		**3SF5 402-1AB03**	1 unit



3SF5 402-1AA03

Version	DT	Spring-type terminals Order No.	PS
AS-Interface F adapter for 3SB3 EMERGENCY-STOP mushroom push buttons For mounting on front plates			
• 2I		**3SF5 402-1AA04**	1 unit
• 2I/1O, with output for LED control		**3SF5 402-1AB04**	1 unit



3SF5 402-1AA04

Version	DT	Insulation piercing method Order No.	PS
AS-Interface F adapter for 3SB3 EMERGENCY-STOP mushroom push buttons For mounting on front plates			
• 2I		**3SF5 402-1AA05**	1 unit
• 2I/1O, with output for LED control		**3SF5 402-1AB05**	1 unit



3SF5 402-1AA05

Push Button Units and Indicator Lights

3SB3, Enclosures for AS-Interface, 22 mm

AS-Interface enclosures with standard fittings

Overview

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 user module with 4I/3O; the enclosures with EMERGENCY-STOP mushroom push buttons have a safe AS-Interface slave integrated in the enclosure.

Enclosures with EMERGENCY-STOP mushroom push buttons are fitted with two NC contact blocks, which are wired to the safe slave. The contact blocks and lamp holders (with spring-type terminals) of the control device, and the AS-Interface slaves, are mounted in the base of the enclosure and are cable-connected.

The plastic enclosures are designed with a connection for the AS-Interface flat cable (the cable is run passed the outside of the enclosure). For metal enclosures, the AS-Interface cable is run inside the enclosure.

The housing with EMERGENCY-STOP mushroom push buttons with an M12 connector is also available.

Selection and ordering data

Equipping options (A, B, C = identification letters of the command points)	Number of command points	DT	Configurator ⚙ Order No.	PU (UNIT, SET, M)	PS
AS-Interface enclosures, plastic					
 3SF5 811-0AA08					
With M12 top connector					
A = EMERGENCY-STOP mushroom push buttons, with rotate-to-unlatch mechanism, 1 NC, 1 NC, yellow enclosure top	1	B	**3SF5 811-0AA10**	1	1 unit
With terminal for insulation piercing method at top					
A = EMERGENCY-STOP mushroom push buttons, with rotate-to-unlatch mechanism, 1 NC, 1 NC					
• Yellow enclosure top	1	A	**3SF5 811-0AA08**	1	1 unit
• Yellow enclosure top, with protective collar	1	A	**3SF5 811-0AB08**	1	1 unit
 3SF5 812-0DA00					
B = Pushbutton green, label "I", 1 NO A = Pushbutton red, label "O", 1 NO	2	A	**3SF5 812-0DA00**	1	1 unit
B = Pushbutton white, label "I", 1 NO A = Pushbutton black, label "O", 1 NO	2	A	**3SF5 812-0DB00**	1	1 unit
C = Indicator lights clear, label without inscription B = Pushbutton green, label "I", 1 NO A = Pushbutton red, label "O", 1 NO	3	A	**3SF5 813-0DA00**	1	1 unit
C = Indicator lights clear, label without inscription B = Pushbutton white, label "I", 1 NO A = Pushbutton black, label "O", 1 NO	3	A	**3SF5 813-0DC00**	1	1 unit
C = Pushbutton black, label "II", 1 NO B = Pushbutton black, label "I", 1 NO A = Pushbutton red, label "O", 1 NO	3	A	**3SF5 813-0DB00**	1	1 unit
AS-Interface enclosures, metal					
 3SF5 811-2AB08					
With M12 top connector					
A = EMERGENCY-STOP mushroom push buttons, with rotate-to-unlatch mechanism, 1 NC, 1 NC					
• Yellow enclosure top	1	C	**3SF58 11-2AA10**	1	1 unit
• Yellow enclosure top, with protective collar	1	C	**3SF58 11-2AB10**	1	1 unit
With cable gland at top					
A = EMERGENCY-STOP mushroom push buttons, with rotate-to-unlatch mechanism, 1 NC, 1 NC					
• Yellow enclosure top	1	A	**3SF5 811-2AA08**	1	1 unit
• Yellow enclosure top, with protective collar	1	A	**3SF5 811-2AB08**	1	1 unit
 3SF5 813-2DA00					
B = Pushbutton green, label "I", 1 NO A = Pushbutton red, label "O", 1 NO	2	A	**3SF5 812-2DA00**	1	1 unit
B = Pushbutton white, label "I", 1 NO A = Pushbutton black, label "O", 1 NO	2	A	**3SF5 812-2DB00**	1	1 unit
C = Indicator lights clear, label without inscription B = Pushbutton green, label "I", 1 NO A = Pushbutton red, label "O", 1 NO	3	A	**3SF5 813-2DA00**	1	1 unit
C = Indicator lights clear, label without inscription B = Pushbutton white, label "I", 1 NO A = Pushbutton black, label "O", 1 NO	3	A	**3SF5 813-2DC00**	1	1 unit
C = Pushbutton black, label "II", 1 NO B = Pushbutton black, label "I", 1 NO A = Pushbutton red, label "O", 1 NO	3	A	**3SF5 813-2DB00**	1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators .

Selection and ordering data

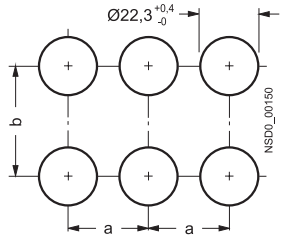
For self-equipping of the enclosures

	Version	Number of command points	DT	Order No.	PU (UNIT, SET, M)	PS
For plastic enclosures						
	AS-Interface slaves					
 3SF5 500-0BA	F slave, 2 safe inputs, for plastic enclosure, EMERGENCY-STOP, without protective collar	1 ... 6	A	**3SF5 500-0BA**	1	1 unit
	F slave, 2 safe inputs, for plastic or metal enclosure, EMERGENCY-STOP, with protective collar	1	A	**3SF5 500-0DA**	1	1 unit
 3SF5 500-0BB	A/B slave, 4I/3O for plastic enclosure	2 ... 6	A	**3SF5 500-0BB**	1	1 unit
	Slave, 4I/4O, for plastic enclosure	2 ... 6	A	**3SF5 500-0BC**	1	1 unit
	Sets of links					
 3SF5 900-0CA	For F slave		A	**3SF5 900-0BA**	1	1 unit
	For slave 4I/4O or A/B slave 4I(3O)		A	**3SF5 900-0BB**	1	1 unit
	Connection elements					
	For AS-Interface shaped cable, connection by insulation piercing method, for plastic enclosure	1 ... 3	A	**3SF5 900-0CA**	1	1 unit
		4 ... 6	B	**3SF5 900-0CB**	1	1 unit
 3SF5 900-0CC	For AS-Interface connection using M12 plug, for plastic enclosure	1 ... 3	B	**3SF5 900-0CC**	1	1 unit
		4 ... 6	B	**3SF5 900-0CD**	1	1 unit
	For bringing out unused inputs/outputs through an M12 socket, for plastic enclosure	1 ... 3	B	**3SF5 900-0CE**	1	1 unit
		4 ... 6	B	**3SF5 900-0CF**	1	1 unit
 3SF5 900-0CG	For AS-Interface shaped cable, cable is routed into the enclosure, for plastic or metal enclosure	1 ... 3	A	**3SF5 900-0CG**	1	1 unit
		4 ... 6	A	**3SF5 900-0CH**	1	1 unit
	For round cable, cable is routed into the enclosure, for plastic or metal enclosure	1 ... 3	A	**3SF5 900-0CJ**	1	1 unit
		4 ... 6	A	**3SF5 900-0CK**	1	1 unit
For metal enclosures						
	AS-Interface slaves					
 3SF5 500-0CB	F slave, 2 safe inputs, for metal enclosure, EMERGENCY-STOP, without protective collar	1 ... 6	A	**3SF5 500-0CA**	1	1 unit
	F slave, 2 safe inputs, for plastic or metal enclosure, EMERGENCY-STOP, with protective collar	1	A	**3SF5 500-0DA**	1	1 unit
	A/B slave, 4I/3O, for metal enclosure	2 ... 6	A	**3SF5 500-0CB**	1	1 unit
	Slave, 4I/4O, for metal enclosure	2 ... 6	A	**3SF5 500-0CC**	1	1 unit
	Sets of links					
 3SF5 900-0CG	For F slave		A	**3SF5 900-0BA**	1	1 unit
	For slave 4I/4O or A/B slave 4I(3O)		A	**3SF5 900-0BB**	1	1 unit
	Connection elements					
	For AS-Interface connection using M12 plug, for metal enclosure	1 ... 3	B	**3SF5 900-2CC**	1	1 unit
		4 ... 6	B	**3SF5 900-2CD**	1	1 unit
 3SF5 900-0CJ	For bringing out unused inputs/outputs through an M12 socket, for metal enclosure	1 ... 3	B	**3SF5 900-2CE**	1	1 unit
		4 ... 6	B	**3SF5 900-2CF**	1	1 unit
	For AS-Interface shaped cable, cable is routed into the enclosure, for plastic or metal enclosure	1 ... 3	A	**3SF5 900-0CG**	1	1 unit
		4 ... 6	A	**3SF5 900-0CH**	1	1 unit
	For round cable, cable is routed into the enclosure, for plastic or metal enclosure	1 ... 3	A	**3SF5 900-0CJ**	1	1 unit
		4 ... 6	A	**3SF5 900-0CK**	1	1 unit

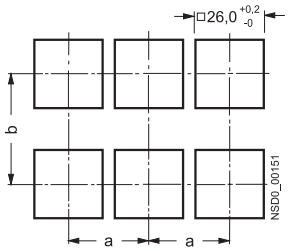
Dimension drawings

Mounting dimensions

Round design



Square design



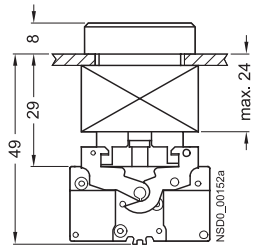
Minimum clearance	a	b
Switch blocks (1 contact) and lampholder		
• for front plate mounting, with screw terminals	30 1)	45
• for front plate mounting, with spring-loaded terminals	30 1)	30 1)
• for use on PCB, with solder pins	30 1)	30 1)
Switch blocks with 2 contacts		
• for front plate mounting	30 1)	50
When using holders for labeling plates		
• 12.5 mm × 27 mm	30 1)	45 2)
• 27.0 mm×27 mm	30 1)	60

1) For mushroom pushbutton, EMERGENCY-STOP and push-pull button:
Note mushroom diameter d = 40 mm or 60 mm.

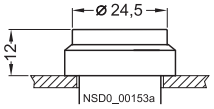
2) 60 mm with switch blocks having two contacts.

Molded-plastic version, round

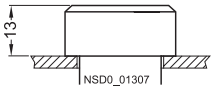
Pushbutton or illuminated pushbutton
with flat pushbutton
and single-pole switch block
(and lampholder)



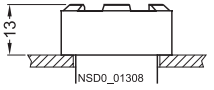
Pushbutton or illuminated pushbutton
with raised button



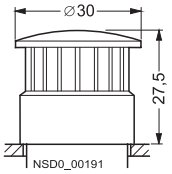
Pushbutton
with raised front ring



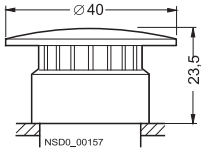
Pushbutton
with raised front ring castellated



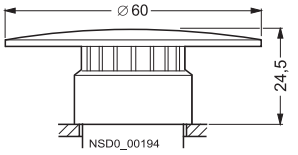
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button,
? 30 mm



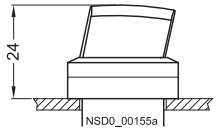
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button,
? 40 mm



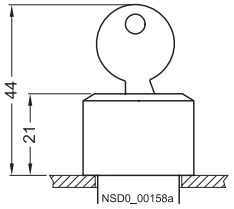
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button,
? 60 mm



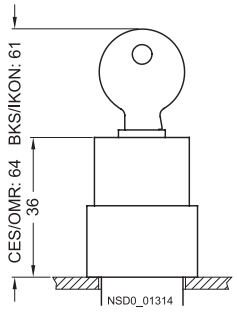
Selector switch or illuminated selector switch



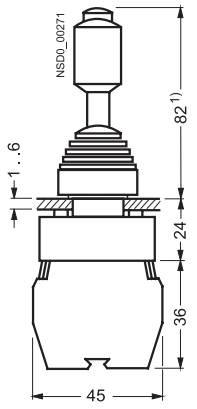
RONIS key-operated switch



BKS, CES, IKON, O.M.R. key-operated switches

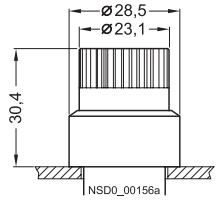


Joystick switch

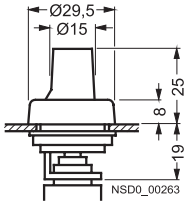


1) 82 with mechanical interlock,
77 without mechanical interlock

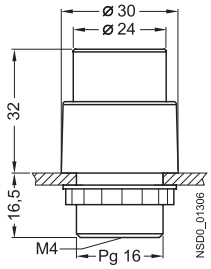
Pushbutton
with raised button, latchable



Operating mechanism for potentiometer
with shaft Ø 6 mm,
30 ... 32 mm long



Pushbutton with extended stroke

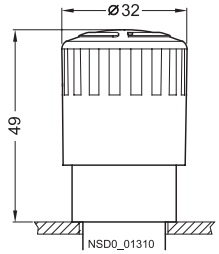


Push Button Units and Indicator Lights

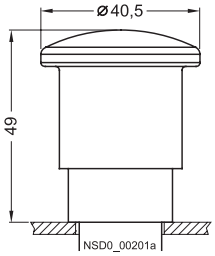
SIRIUS 3SB3

Dimension drawings (mm) Operator and indicator elements

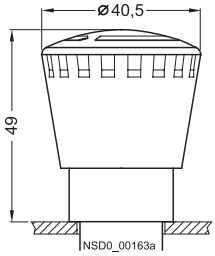
EMERGENCY-STOP mushroom pushbutton,
Ø 32 mm, pull to unlatch



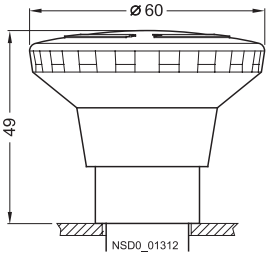
EMERGENCY-STOP mushroom pushbutton,
Ø 40 mm, pull to unlatch



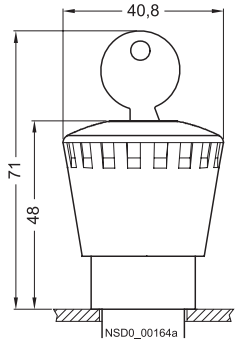
EMERGENCY-STOP mushroom pushbutton,
Ø 40 mm, pull to unlatch



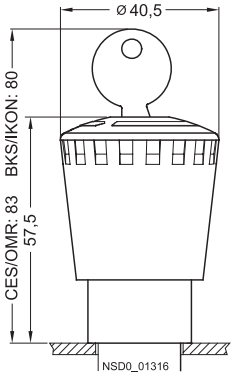
EMERGENCY-STOP mushroom pushbutton,
Ø 60 mm, rotate to unlatch



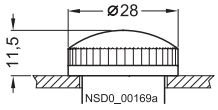
EMERGENCY-STOP mushroom pushbutton
with RONIS key-operated switch



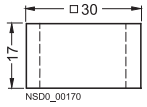
EMERGENCY-STOP mushroom pushbutton
with BKS, CES, IKON, O.M.R. key-operated switch



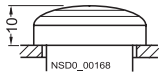
Indicator light



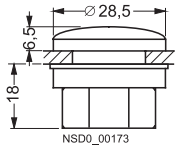
Gear Holder



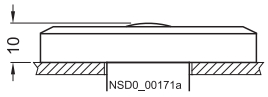
Audible signal device



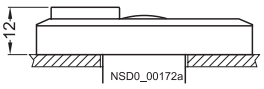
Hole plug



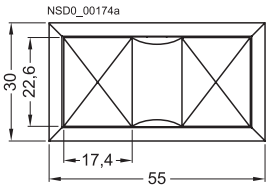
On-Off pushbutton
with flat buttons



On-Off pushbutton
with raised buttons

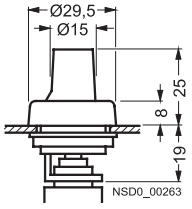


On-Off pushbutton
with or without indicator light

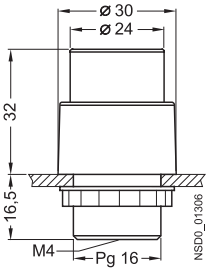


Top view

Operating mechanism for potentiometer
with shaft Ø 6 mm,
30 ... 32 mm long



Pushbutton with extended stroke



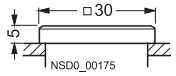
Push Button Units and Indicator Lights

SIRIUS 3SB3

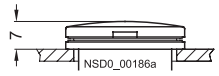
Dimension drawings (mm) Operator and indicator elements

Plastic version, square

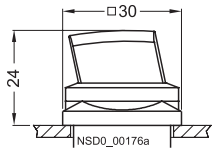
Pushbutton or illuminated pushbutton
with flat pushbutton



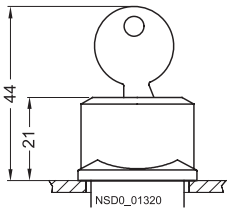
Indicator light



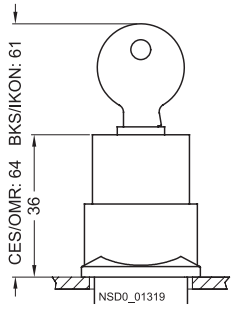
Selector switch or illuminated selector switch



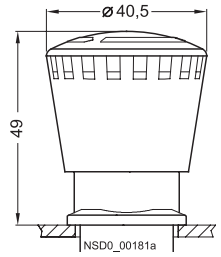
RONIS key-operated switch



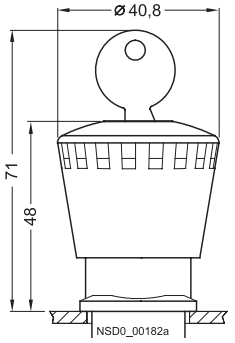
BKS, CES, IKON, O.M.R. key-operated switch



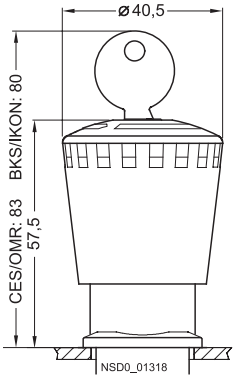
EMERGENCY-STOP mushroom pushbutton
with safety lock



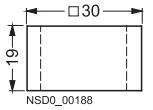
EMERGENCY-STOP mushroom pushbutton
with RONIS key-operated switch



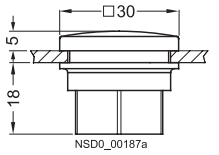
EMERGENCY-STOP mushroom pushbutton
with BKS, CES, IKON, O.M.R. key-operated switch



Gear Holder



Hole plug



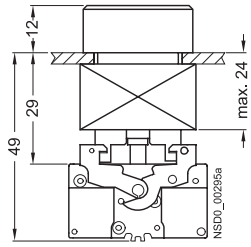
Push Button Units and Indicator Lights

SIRIUS 3SB3

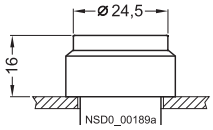
Dimension drawings (mm) Operator and indicator elements

Metal version, round

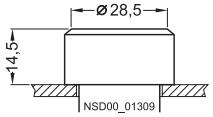
Pushbutton or illuminated pushbutton with flat button and single-pole switch block (and lampholder)



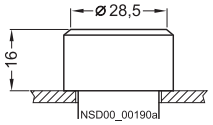
Pushbutton or illuminated pushbutton with raised button



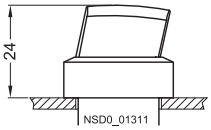
Pushbutton or illuminated pushbutton, latching, with flat button



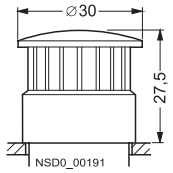
Pushbutton with raised front ring



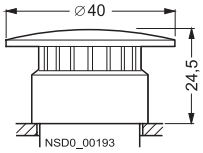
Selector switch or illuminated selector switch, standard



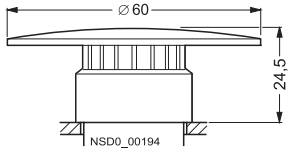
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button, ? 30 mm



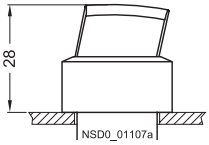
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button, ? 40 mm



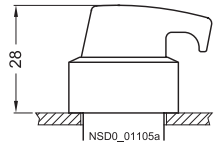
Mushroom pushbutton, illuminated mushroom pushbutton, push-pull-button or illuminated push-pull-button, ? 60 mm



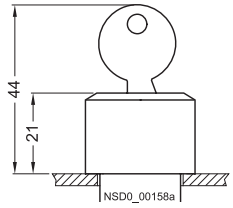
Selector switch or illuminated selector switch, heavy duty



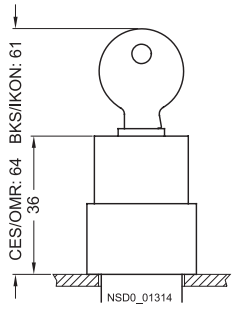
Selector switch or illuminated selector switch with long handle



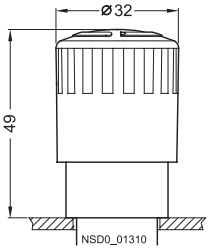
RONIS key-operated switch



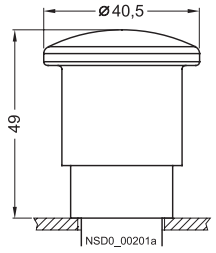
BKS, CES, IKON, O.M.R. key-operated switches



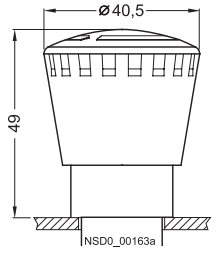
EMERGENCY-STOP mushroom pushbutton, Ø 32 mm, rotate to unlatch



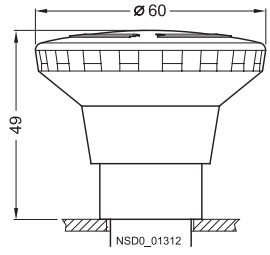
EMERGENCY-STOP mushroom pushbutton, Ø 40 mm, pull to unlatch



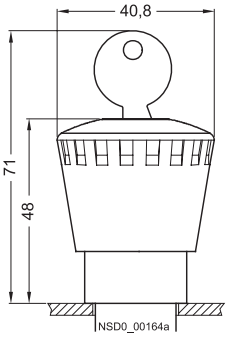
EMERGENCY-STOP mushroom pushbutton, Ø 40 mm, rotate to unlatch



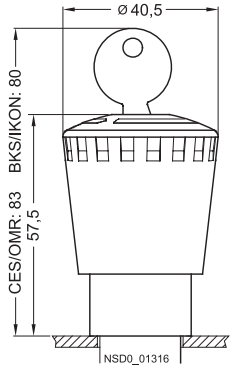
EMERGENCY-STOP mushroom pushbutton, Ø 60 mm, rotate to unlatch



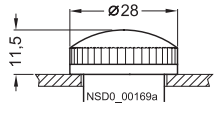
EMERGENCY-STOP mushroom pushbutton with RONIS key-operated switch



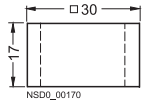
EMERGENCY-STOP mushroom pushbutton with BKS, CES, IKON, O.M.R. key-operated switch



Indicator light



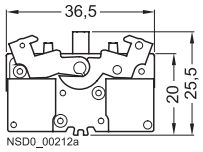
Gear Holder



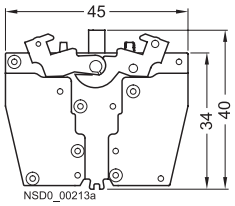
Contact blocks and lampholders

Screw connection, for front plate mounting

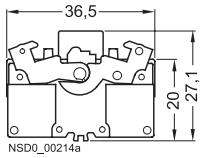
Switch block with 1 contact



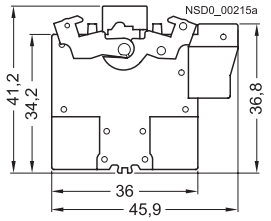
Switch block with 2 contacts



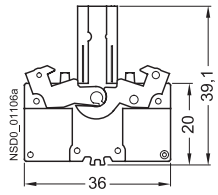
BA 9s lampholder
with or without integrated voltage reducer



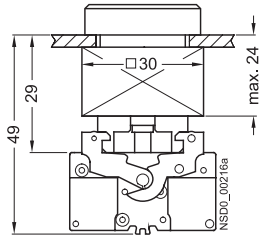
BA 9s lampholder
with separate lamp test function



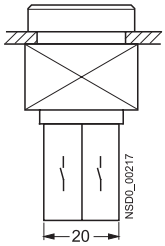
Lampholder with integrated LED



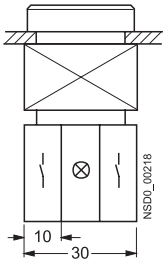
Pushbutton or illuminated pushbutton with switch blocks with 1 contact



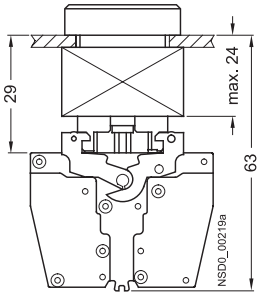
Pushbutton with switch blocks with 1 contact



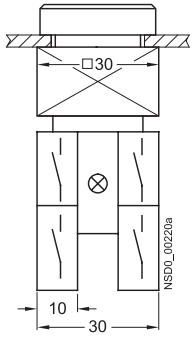
Illuminated pushbutton with switch blocks with 1 contact and lampholder



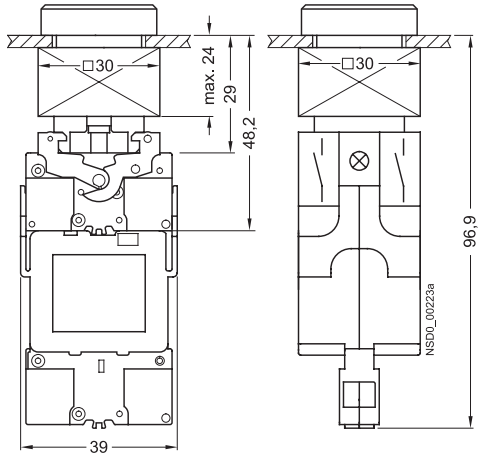
Pushbutton or illuminated pushbutton with switch blocks with 2 contacts



Illuminated pushbutton with switch blocks with 2 contacts and lampholder

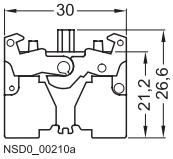


Illuminated pushbutton with switch blocks with 1 contact and lampholder with snapped-on transformer

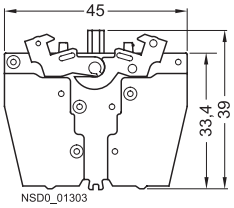


Spring-loaded terminals, for front plate mounting

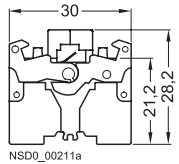
Switch block with 1 contact



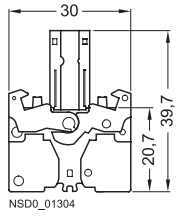
Switch block with 2 contacts



Lampholder BA 9s

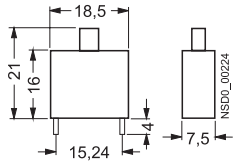


Lampholder with integrated LED

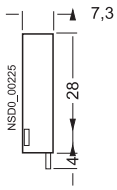


With solder pins, for use on PCB

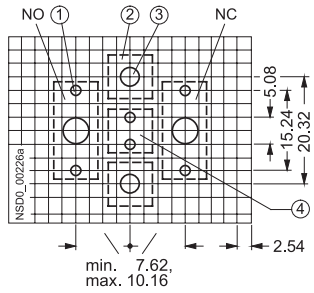
Contact block 1 NO and 1 NC



Lampholder

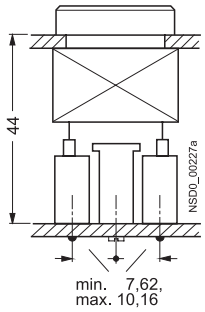


Solder pin spacing



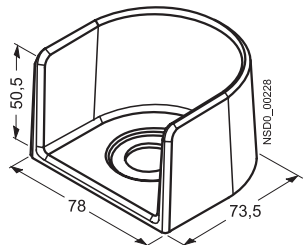
① Solder pin Ø1.3 +0.1
② PCB holder
③ Centering hole Ø4.2 +0.1
④ Lampholder

Pushbutton or illuminated pushbutton with contact blocks with 1 contact and PCB support

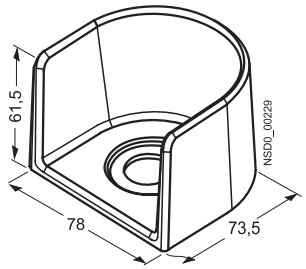


Accessories

3SB39 21–0AK shroud
for front plate mounting [1]
for EMERGENCY-STOP mushroom pushbutton without key-operated switch.



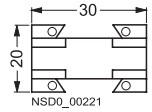
3SB39 21–0AX shroud
for front plate mounting [1]
for EMERGENCY-STOP mushroom pushbutton with key-operated switch.



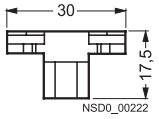
1) Can be used with a front plate thickness up to 4mm.

Holder for mounting 3 elements

Holder for pushbuttons

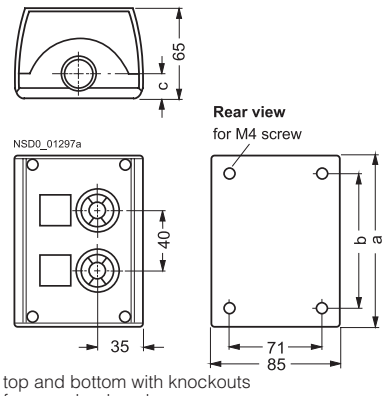


Holder for selector switch, key-operated switch and On-Off pushbutton,
with pressure plate



Enclosures

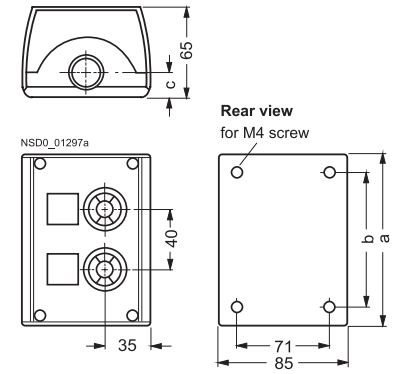
Enclosure without shroud, molded plastic



top and bottom with knockouts
for one gland each

Number of command points	Length a	Spacing b	Spacing c
1	85	54	17,5
2	114	83	17,5
3	154	123	17,5
4	194	163	17,5
6	280	249	20,5

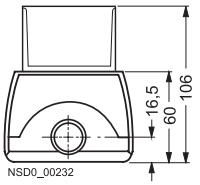
Enclosure without shroud, metal



top and bottom with opening
for one gland each

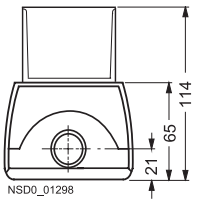
Number of command points	Length a	Spacing b	Spacing c
1	85	54	21
2	114	83	21
3	154	123	21
4	194	163	21
6	280	249	21

Enclosure with shroud, molded plastic



top and bottom with knockouts
for one gland each

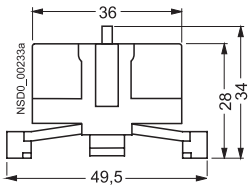
Enclosure with shroud, metal



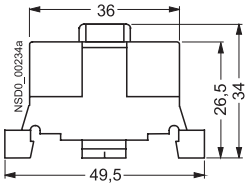
top and bottom with opening
for one gland each

Screw connection, for base mounting

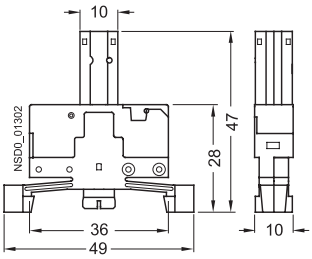
Contact block with 1 contact



BA9s lampholder with or without integrated voltage reducer

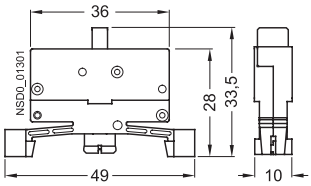


Lampholder with integrated LED

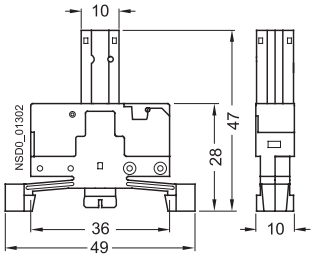


Spring-loaded terminals, for base mounting

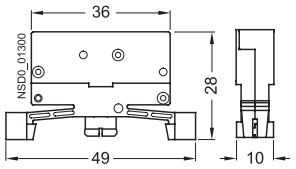
Contact block with 1 contact



Lampholder with integrated LED

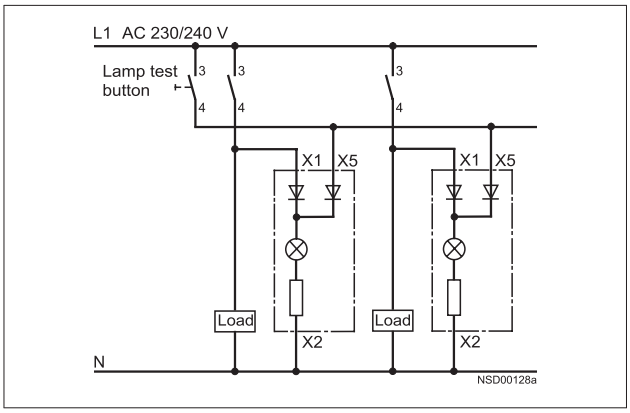


Support terminal

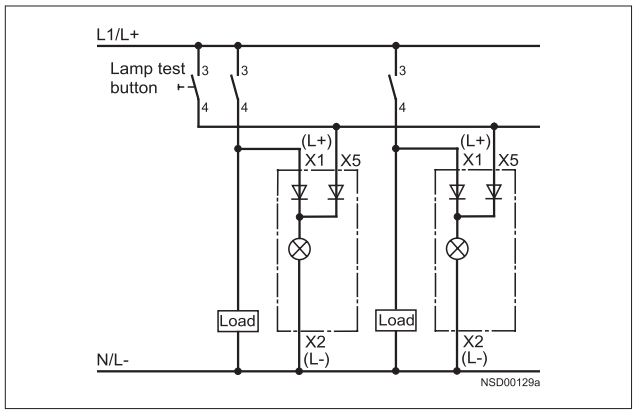


Typical circuits

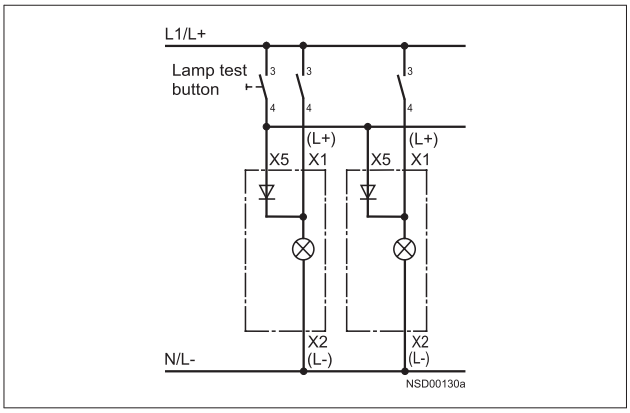
3SB14 00–2N or 3SB34 00–1F lampholder
incl. 130 V incandescent lamp



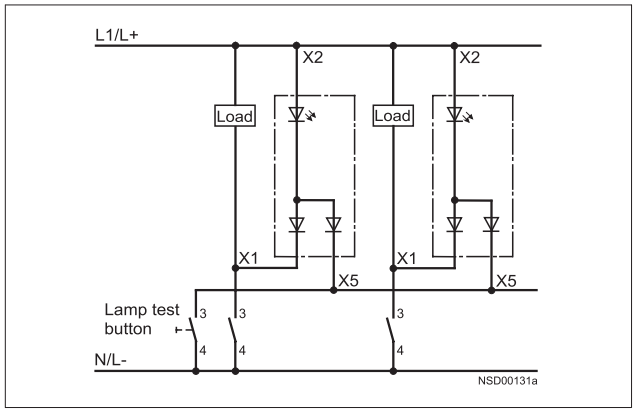
3SB14 00–2P or 3SB34 00–1G lampholder
for incadescent lamps up to 2.6 W or AC/DC LED lamps



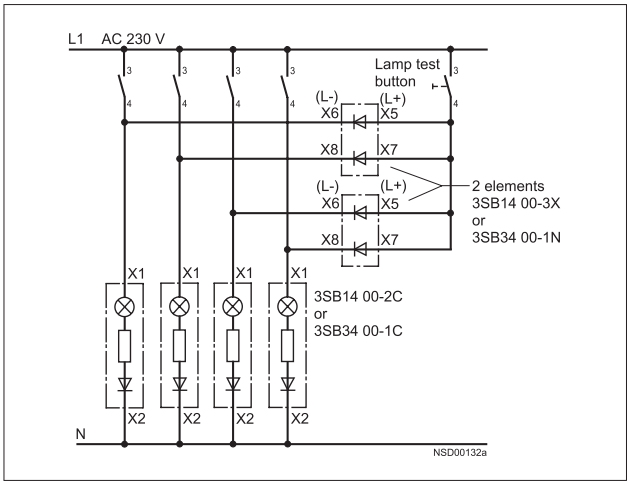
3SB14 00–2Q or 3SB34 00–1H lampholder
for incandescent lamp to 2.6 W or
AC neon bulbs or AC/DC LED lamps



3SB34 00–1L lampholder
for incandescent lamp up to 2.6 W or
DC LED lamps



Typical lamp test circuit with
with 3SB14 00–3X or 3SB34 00–1N



Application examples for 3SB14 00–3X and 3SB34 00–1N diode elements

- Lamp test circuit,
- Interference suppression,
- Limiting voltage peaks,
- Limiting DC coils,
- Diode gates,
- Rectifier circuits.

The diode element contains two 1N 4007 diodes. The element can be snapped onto the gear holder as required.

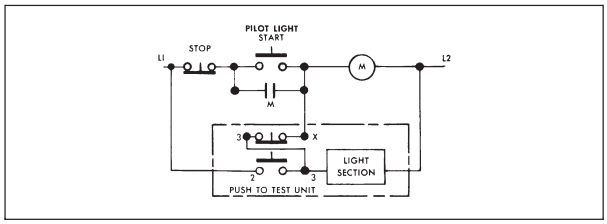
Notes on using the lampholders with separate lamp test function

When connected in parallel with inductive loads (e.g. contactors), surge suppression required.

The 3SB14 00–2Q and 3SB34 00–1H elements are not suitable for use with a parallel load.

Example of a typical push to test circuit using a standard, illuminated push-button transformer type with 1 NO + 1 NC contact. e.g. Illuminated Pilot Light components require to make-up a 120 V red raised push to test transformer type use (1) each of the following components:

- 3SB3 001-0BA21
- 3SB3 400-1A
- 52AABN
- 3SB3 400-3M
- 3SB3 400-0B
- 3SB3 400-0C

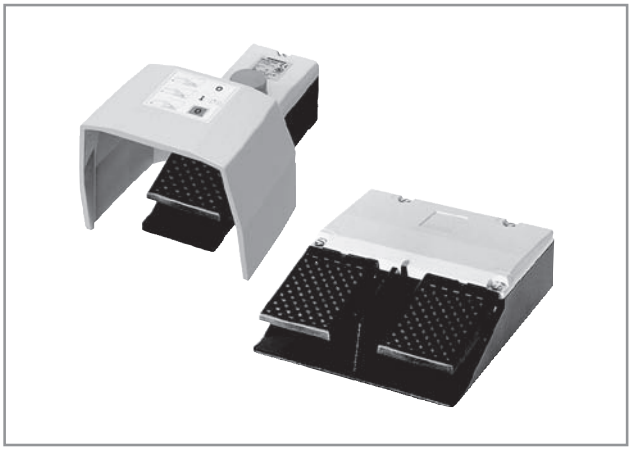


Push Button Units and Indicator Lights

3SE2, 3SE3 Foot Switches

Plastic and metal enclosures

Overview



Foot switches with metal enclosures

Standard switches

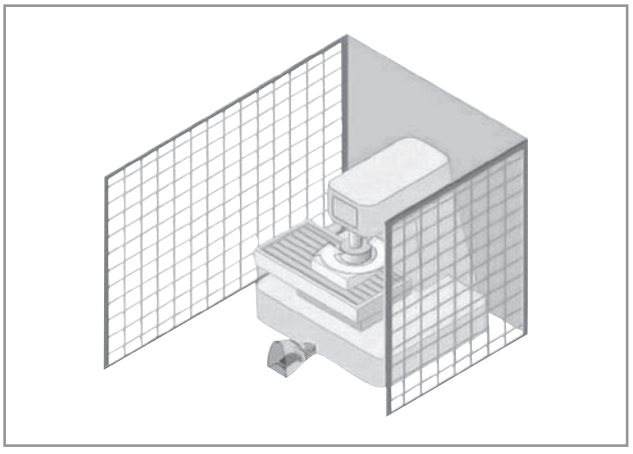
The 3SE2 9 and 3SE3 9 foot switch range encompasses versions in a metal enclosure for rugged applications as well as versions with plastic enclosure for less harsh environments. The devices can be supplied with or without a cover and have fixing holes for them to be screwed to the floor.

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
	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
 3SE2 932-.AB20	**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
	2 NO + 2 NC ⊖	B	**3SE2 932-1AB20**	1	1 unit
 3SE2 932-.AA20					
• 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	Microswitch			
• 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
 3SE3 934-5CB20	• Two pedals, without hood	2 × 1 CO	B	**3SE3 934-5CB20**	1	1 unit

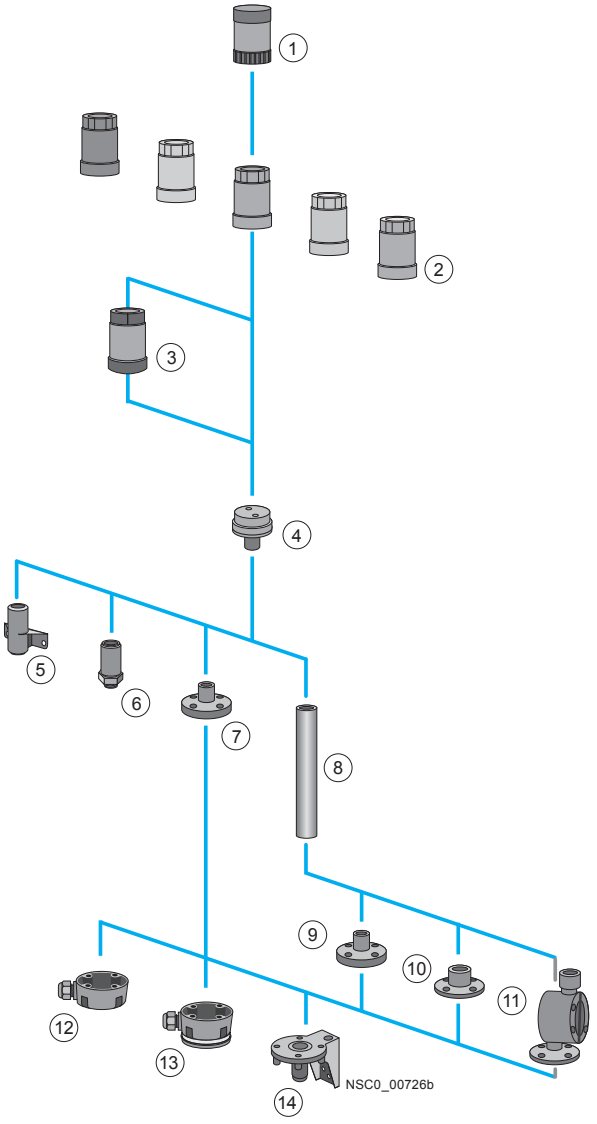
⊖ Positive opening according to IEC 60947-5-1, Appendix K.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

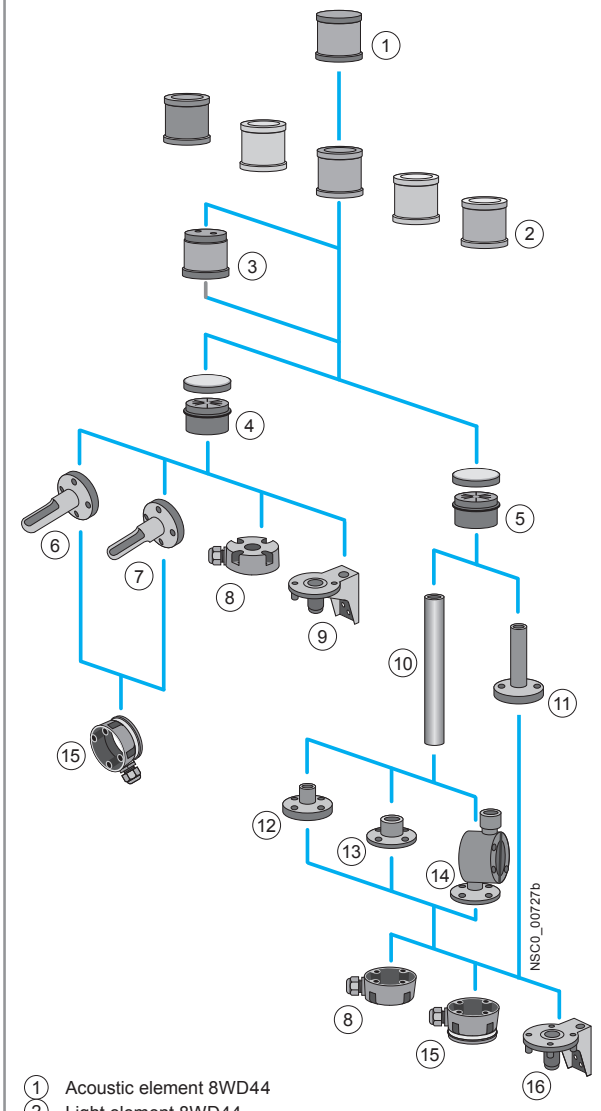
Overview

The 8WD4 signaling columns are flexible in design and versatile in use.



1 Acoustic element 8WD42 .0-0FA
2 Light element 8WD42
3 AS-Interface adapter element 8WD42 28-0BB
4 Connection element 8WD42 08-0AA
5 Bracket for wall mounting 8WD42 08-0CD
6 Adapter for single-hole mounting 8WD42 08-0EH
7 Foot for mounting 8WD42 08-0DE
8 Pipe 8WD42 08-0EF/8WD43 08-0E.
9 Foot for mounting with pipe 8WD43 08-0DB
10 Foot for mounting with pipe (> 400 mm) 8WD43 08-0DC
11 Adjustable-angle foot for mounting on pipes 8WD44 08-0DF
12 Socket 8WD43 08-0DD
13 Socket (magnetic fixing) 8WD43 08-0DE
14 Bracket for mounting with foot 8WD44 08-0CC

8WD42 signaling columns (width 50 mm) with up to 4 elements



1 Acoustic element 8WD44
2 Light element 8WD44
3 AS-Interface adapter element 8WD44 28-0BD/8WD44 28-0BE
4 Connection element for mounting on bracket, base and floor 8WD44 08-0AB/8WD44 08-0AE
5 Connection element for mounting on pipe 8WD44 08-0AA/8WD44 08-0AD
6 Bracket for wall mounting 8WD43 08-0CA
7 Bracket for wall mounting (two-sided) 8WD43 08-0CB
8 Socket 8WD43 08-0DD
9 Bracket for base mounting 8WD44 08-0CD
10 Pipe 8WD42 08-0EF/8WD43 08-0E.
11 Foot with pipe 8WD43 08-0DA
12 Foot for mounting with pipe 8WD43 08-0DB
13 Foot for mounting with pipe (> 400 mm) 8WD43 08-0DC
14 Adjustable-angle foot for mounting on pipes 8WD44 08-0DF
15 Socket (magnetic fixing) 8WD43 08-0DE
16 Bracket for mounting with foot 8WD44 08-0CC

8WD44 signaling columns (width 70 mm) with up to 5 elements

Push Button Units and Indicator Lights

8WD4 Signaling Columns

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.

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	max. 5	7
• Flashlight, flash energy	Ws	–	2
Endurance			
• Flashlights		4×10^6 flashes	4×10^6 flashes
AS-Interface adapter elements			
IO code/ID code		8/F	8/E
Power supply		Through bus cable	Through bus cable
• Operational voltage	V	18.5 ... 31.6	18.5 ... 31.6
• Power consumption I_{max}	mA	50	100
Protective measures			
• Watchdog		✓	✓
• Short-circuit/overload protection		External back-up fuse M 1.6 A	✓
• Reverse polarity protection		✓	✓
• Induction protection		N/A	✓
Outputs		4 Relay outputs	3 solid-state outputs
• Load voltage		External auxiliary voltage	through bus cable or external auxiliary voltage, switch-selectable
	V	0 ... 30 DC	
	V	0 ... 230 AC	
• Current carrying capacity ΣI_{max}			
- With external auxiliary voltage	A	1.5	0.3
- Without external auxiliary voltage	A	—	0.2
Operating temperature	°C	–20 ... +50	–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	–20 ... +50
Connection		M3 screw terminal	Spring-type terminals/M3 screw terminals
• Conductor cross-sections	mm^2	Max. 2.5	Max. 2.5
• Tightening torque	Nm	Max. 0.5	– / 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, adjustable 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 elements 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 17-406.

[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, adjustable 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

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

	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 17-406

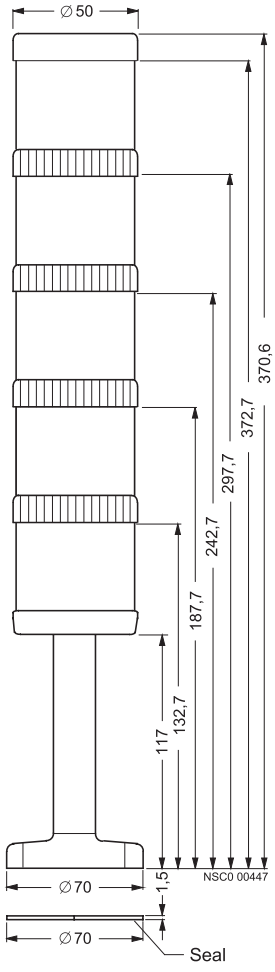
[1] Lamp not included in scope of supply. Please order separately.

Push Button Units and Indicator Lights

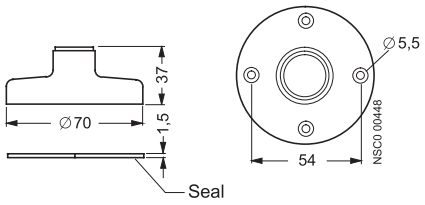
8WD4 Signaling Columns

Dimension drawings

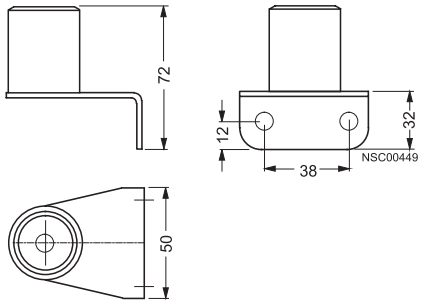
Signaling column (4-tier)



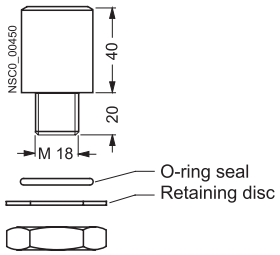
Foot



Bracket for wall mounting

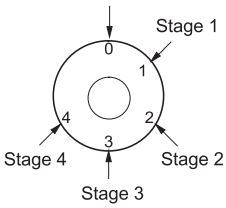


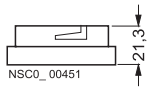
Adapter for single-hole mounting

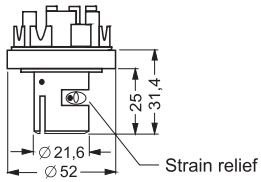


Connection element

Connection diagram
Common conductor

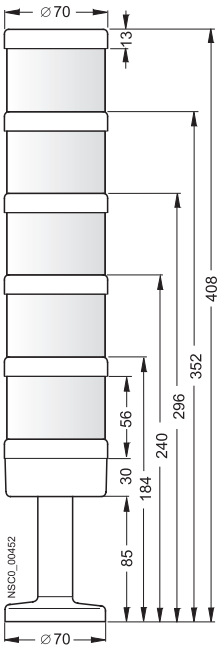




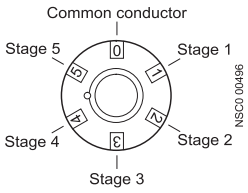


Dimension drawings

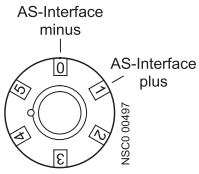
Signaling column (5-tier)



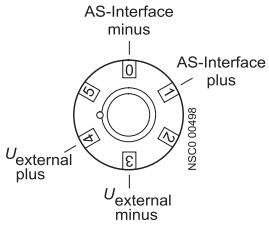
Connection diagrams



conventional

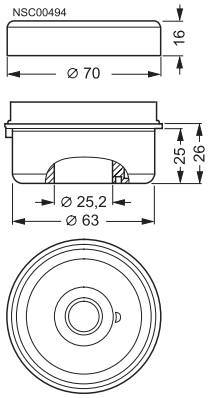


with AS-Interface, without external auxiliary voltage

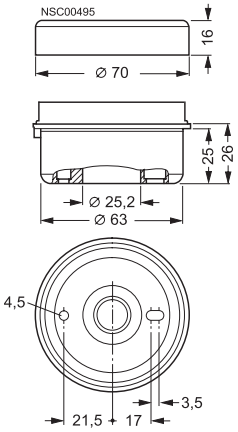


with external auxiliary voltage

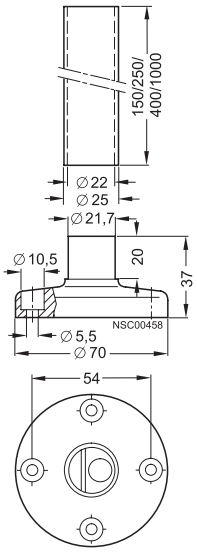
Connection element and cover for mounting on pipes



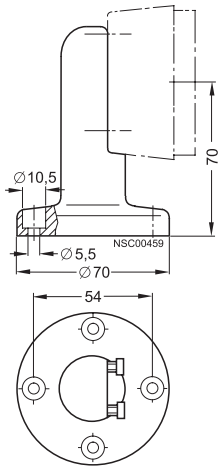
Connection element and cover for mounting on floor/bracket



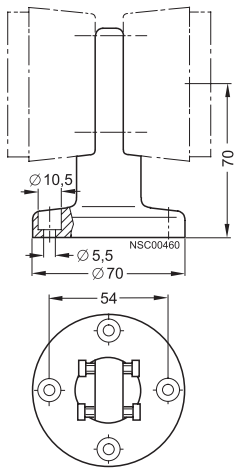
Foot with pipe



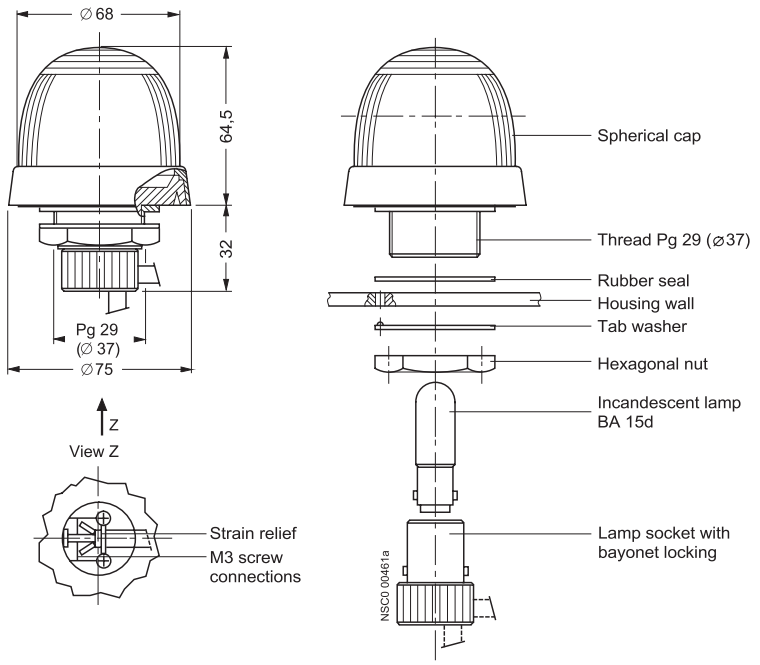
Bracket for single-sided mounting



Bracket for double-sided mounting



Dimension drawings



Push Button Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

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 17-418.
- Accessories see page 17-418.



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

Push Button 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
1 unit surface mount-momentary pushbutton 	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
1 unit flush mount-momentary pushbutton 	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
2 unit surface mount-momentary pushbutton 	B = Momentary pushbutton green, surface, label "START" A = Momentary pushbutton red, surface, label "STOP"	NEMA 1	1NO, 1NC (50ZAC2)	2	**50CA3DE**	1
	B = Momentary pushbutton green, surface, label "START" A = Momentary raised pushbutton red, surface, label "STOP"	NEMA 1	1NO, 1NC (50ZAC2)	2	**50CA3DF**	1
	B = Momentary pushbutton green, surface, label "START" A = Momentary mushroom head pushbutton red, surface, label "STOP"	NEMA 1	1NO, 1NC (50ZAC2)	2	**50CA3DG**	1
	B = Momentary pushbutton, less insert, surface A = Momentary pushbutton, less insert, surface	NEMA 1	1NO, 1NC (50ZAC2)	2	**50CA3AA**	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO (50ZAC3)	2	**50DA3KL**	1

Push Button 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 interlocked (50ZA3C w/ 50ZAM)	2	**50RA3KL**	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	**50RA3HJ**	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	**50RA3NP**	1
	B = Momentary pushbutton, surface, label "ON" A = Momentary pushbutton, surface, label "OFF"	NEMA 1	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	**50RA334**	1
	B = Momentary pushbutton, less insert surface A = Momentary pushbutton, less insert, surface	NEMA 1	2 NO mechanically interlocked (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
2 unit flush mount-momentary pushbutton 	B = Momentary pushbutton green, flush, label "START" A = Momentary pushbuton 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
	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

Push Button 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 Unit
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

Push Button 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" A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	1NO, 1NC (50ZAC1) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50FA3DC3**	1
	B = Momentary pushbutton less insert, surface A = Maintained selector switch, multiple legends, surface	NEMA 1	1NO, 1NC (50ZAC1) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50FA3AB9**	1
	B = Indicator light, red, surface A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50HA3YC3**	1
2 unit surface mount-momentary pushbutton and indicator light	B = Indicator light, red, surface A = Maintained selector switch, multiple legends, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50HA32B9**	1
	B = Indicator light, green, surface A = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	**50GA3ZY**	1
	B = Indicator light, less lens, surface A = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	**50GA322**	1
2 unit flush mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, flush, label "START" A = Maintained selector switch, flush, label "HAND-OFF-AUTO"	NEMA 1B	1NO, 1NC (50ZAC1) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50FA2DC3**	1
	B = Momentary pushbutton less insert, flush A = Maintained selector switch, multiple legends, flush	NEMA 1B	1NO, 1NC (50ZAC1) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50FA2AB9**	1
	B = Momentary pushbutton less insert chrome plate, flush A = Maintained selector switch, multiple legends, flush	NEMA 1B	1NO, 1NC (50ZAC1) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50FA6AB9**	1
	B = Indicator light, red, flush A = Maintained selector switch, flush, label "HAND-OFF-AUTO"	NEMA 1B	120/240V dual voltage (120PSB lamp) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50HA2YC3**	1
	B = Indicator light, less lens, flush A = Maintained selector switch, multiple legends, flush	NEMA 1B	120/240V dual voltage (120PSB lamp) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50HA22B9**	1
	B = Indicator light, less lens, chrome plate, flush A = Maintained selector switch, multiple legends, flush	NEMA 1B	120/240V dual voltage (120PSB lamp) 2 NO 2SPDT w/ common jumper (50ZAC8)	2	**50HA62B9**	1
2 unit flush mount-momentary pushbutton and indicator light	B = Indicator light, green, flush A = Indicator light, red, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	**50GA2ZY**	1
	B = Indicator light, less lens, flush A = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	**50GA222**	1
	B = Indicator light, less lens, chrome plate, flush A = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	**50GA622**	1
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "FORWARD" B = Momentary pushbutton, surface, label "REVERSE" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	**50MA3KLE**	1
	C = Momentary pushbutton, surface, label "UP" B = Momentary pushbutton, surface, label "DOWN" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	**50MA3NPE**	1
	C = Momentary pushbutton, surface, label "OPEN" B = Momentary pushbutton, surface, label "CLOSE" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	**50MA3HJE**	1

Push Button 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" B = Momentary pushbutton, surface, label "SLOW" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	**50MA3TUE**	1
	C = Momentary pushbutton, surface, label "START" B = Momentary pushbutton, surface, label "JOG" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	**50MA3DME**	1
	C = Momentary pushbutton, surface, label less insert B = Momentary pushbutton, surface, label less insert A = Momentary pushbutton, surface. label less insert	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	**50MA3AAA**	1
3 unit surface mount-momentary pushbutton and selector switch 	C = Momentary pushbutton, surface, label "START" B = Momentary pushbutton, surface, label "STOP" A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	**50LA3DEC3**	1
	C = Momentary pushbutton, less insert, surface B = Momentary pushbutton, less insert, surface A = Maintained selector switch, multiple legends, surface	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	**50LA3AAB9**	1
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, red, surface B = Momentary pushbutton, surface, label "START" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	**50JA3YDE**	1
	C = Indicator light, green, surface B = Momentary pushbutton, surface, label "START" A = Momentary pushbutton, surface, label "STOP"	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	**50JA3ZDE**	1
	C = Indicator light, less lens, surface B = Momentary pushbutton, less insert, surface A = Momentary pushbutton, less insert, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	**50JA32AA**	1
	C = Indicator light, green, surface B = Indicator light, red, surface A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	**50NA3ZYC3**	1
	C = Indicator light, less lens, surface B = Indicator light, less lens, surface A = Maintained selector switch, multiple legends, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	**50NA322B9**	1

Push Button 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" A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC 1NO - 1NC	2	**50HA2E1**	1
	B = Momentary pushbutton green, surface, label "FORWARD" A = Momentary pushbutton red, surface, label "REVERSE"	NEMA 4	1NO - 1NC 1NO - 1NC	2	**50HA2E2**	1
	B = Momentary pushbutton green, surface, label "UP" A = Momentary pushbutton red, surface, label "DOWN"	NEMA 4	1NO - 1NC 1NO - 1NC	2	**50HA2E3**	1
	B = Momentary pushbutton green, surface, label "OPEN" A = Momentary pushbutton red, surface, label "CLOSE"	NEMA 4	1NO - 1NC 1NO - 1NC	2	**50HA2E4**	1
	B = Momentary pushbutton green, surface, label "FAST" A = Momentary pushbutton red, surface, label "SLOW"	NEMA 4	1NO - 1NC 1NO - 1NC	2	**50HA2E5**	1
	C = Momentary pushbutton green, surface, label "FORWARD" B = Momentary pushbutton green, surface, label "REVERSE" A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**50HA3E1**	1
	C = Momentary pushbutton green, surface, label "UP" B = Momentary pushbutton green, surface, label "DOWN" A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**50HA3E2**	1
	C = Momentary pushbutton green, surface, label "OPEN" B = Momentary pushbutton green, surface, label "CLOSE" A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**50HA3E3**	1
	C = Momentary pushbutton green, surface, label "START" B = Momentary pushbutton green, surface, label "JOG" A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**50HA3E9**	1
	C = Momentary pushbutton green, surface, label "FAST" B = Momentary pushbutton green, surface, label "SLOW" A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**50HA3E4**	1

Push Button 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



50ZAC1



50ZAC2



50ZAC8



50ZAC3

Version	Suitable for	Color	Order No.	Pack Unit
Mushroom head		Red	**50ZMH**	1
Padlock attachment	Used only for raised buttons		**50ZAL**	1
Mechanical interlock kit			**50ZAM**	1
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 Slide base, lamp type 120PSB	Class 50 type 1, 1B 120V		**50D21983001**	1

Heavy duty station accessories

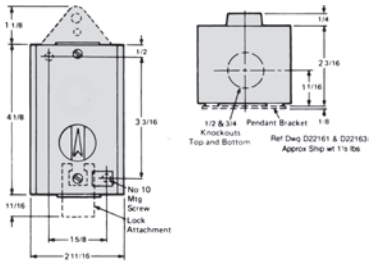
Version	Suitable for	Color	Order No.	Pack Unit
Pushbutton caps	NEMA 4 control stations	Red	**BHP15X**	1
	NEMA 4 control stations	Black	**BHP16X**	1

Push Button Units and Indicator Lights

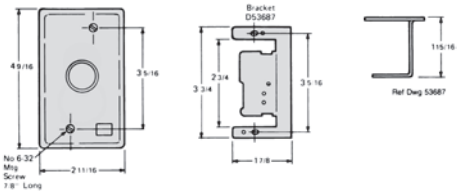
Class 50 Standard Duty Pushbutton Stations

Standard duty - 5A 600V AC NEMA B600

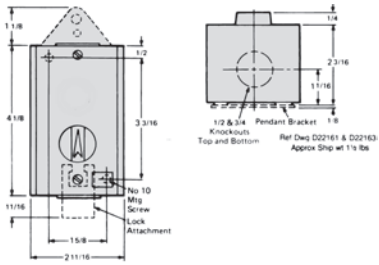
1 Unit Station Surface Mounting—Type 1



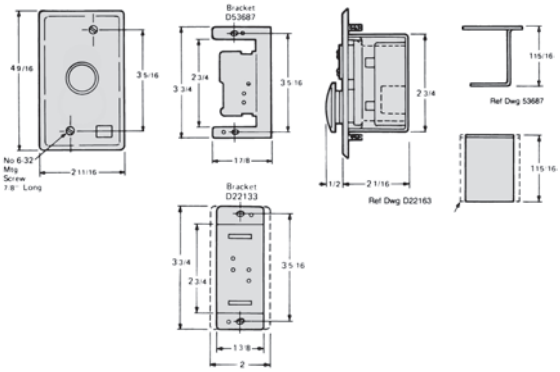
1 Unit Station Flush Mounting—Type 1B



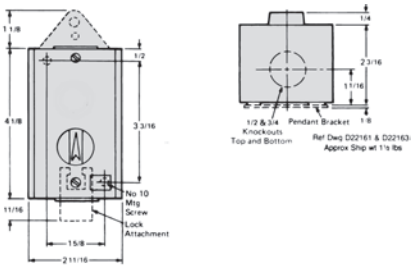
2 Pushbutton Stations Surface Mounting—Type 1



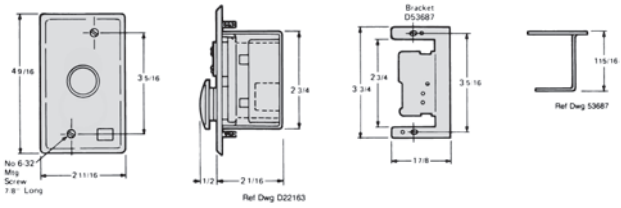
2 Pushbutton Stations Flush Mounting—Type 1B



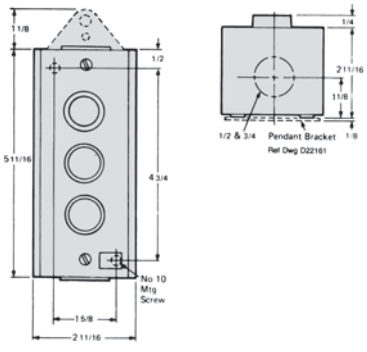
2 Unit Stations Surface Mounting—Type 1



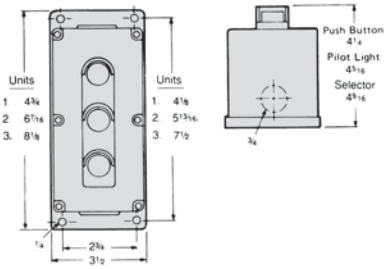
2 Unit Station Flush Mounting—Type 1B



3 Unit Stations Surface Mounting



1 Unit Stations—Type 4



Push Button Units and Indicator Lights

Class 51 Pilot Devices

Hazardous location

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 en-closure, 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 de-vices 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 "0" 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

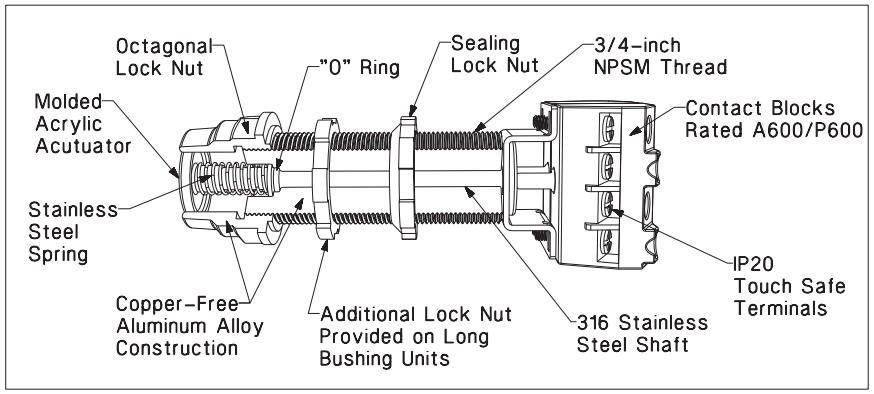
NEMA AC Ratings 50/60Hz

Nema A600 10 Continuous Amps

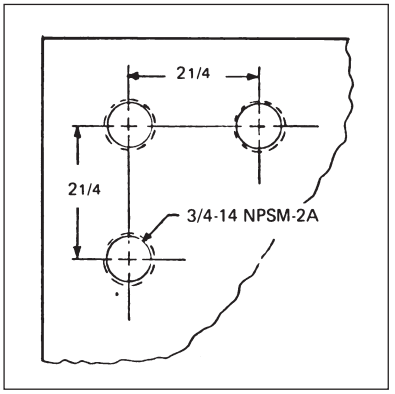
Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

Ordering Information

- Accessories see page 17-428-17-429.
- Selector Operating Position and Contact Operation page 17-426.
- Legend Plates see page 17-465.
- Enclosures see page 17-427.
- Technical Specifications: page 17-467.



Panel Spacing



Push Button 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 Red Green		**51PA8A1** **51PA8A2** **51PA8A3**	**51PA8A1LB** **51PA8A2LB** **51PA8A3LB**	1 1 1
Pushbutton with extended cap 	**Pushbutton with extended cap**	Black Red Green		**51PA8B1** **51PA8B2** **51PA8B3**	**51PA8B1LB** **51PA8B2LB** **51PA8B3LB**	1 1 1
Dual pushbutton 	**Dual Pushbutton**	Flush Black Raised Red		**51PD8A1B2**	**51PD8A1B2LB**	1
	Pushbutton with mushroom cap 1 5/8"(41.3mm)	Black Red Green		**51PA9D1** **51PA9D2** **51PA9D3**	**51PA9D1LB** **51PA9D2LB** **51PA9D3LB**	1 1 1
	Pushbutton with mushroom cap 2 1/2"(63.5mm)	Black Red Green Less head		**51PA9E1** **51PA9E2** **51PA9E3** **51PA9**	**51PA9E1LB** **51PA9E2LB** **51PA9E3LB** **51PA9LB**	1 1 1 1
2 position push-pull 	**2 Position Push Pull Maintained, Non Illuminated** Small Plastic Mushroom Head, 1 5/8" (41.3 mm)	Black Red Green		**51PA2D1** **51PA2D2** **51PA2D3**	**51PA2D1LB** **51PA2D2LB** **51PA2D3LB**	1 1 1
	Large Plastic Mushroom Head, 2 1/4" (57.2 mm)	Black Red Green Less head		**51PA2E1** **51PA2E2** **51PA2E3** **51PA2**	**51PA2E1LB** **51PA2E2LB** **51PA2E3LB** **51PA2LB**	1 1 1 1
	2 Position Push Pull Maintained, Non Illuminated Small Mushroom Head, 1 5/8"(41.3mm)	Black Red Green	1NC + 1NO 1NC + 1NO 1NC + 1NO	**51PA2D1A** **51PA2D2A** **51PA2D3A**	**51PA2D1LBA** **51PA2D2LBA** **51PA2D3LBA**	1 1 1
	Large Mushroom Head, 2 1/2"(63.5mm)	Black Red Green	1NC + 1NO 1NC + 1NO 1NC + 1NO	**51PA2E1A** **51PA2E2A** **51PA2E3A**	**51PA2E1LBA** **51PA2E2LBA** **51PA2E3LBA**	1 1 1
3 position push-pull 	**3 Position Push Pull Momentary, Non Illuminated** Small Mushroom Head, 1 5/8"(41.3mm)	Black Red Green	1NC + 1NO 1NC + 1NO 1NC + 1NO	**51PA3A1U** **51PA3A2U** **51PA3A3U**	**51PA3A1ULB** **51PA3A2ULB** **51PA3A3ULB**	1 1 1

Push Button Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Indicator light

Selection and ordering data

Indicator light-full voltage



Indicator light-transformer type



Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit
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 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.

Push Button Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Push to test complete units

Selection and ordering data

Push to test full voltage



Push to test transformer type





Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit
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	1NO + 1NC	**51PC6D2A**	**51PC6D2ALB**	1
	Amber	1NO + 1NC	**51PC6D3A**	**51PC6D3ALB**	1
	Green	1NO + 1NC	**51PC6D9A**	**51PC6D9ALB**	1
	Less lens	1NO + 1NC	**51PC6DNA**	**51PC6DNALB**	1
Operators with LED Lamp [2] 6-8V with BA9 type LED	Red	1NO + 1NC	**51PE6B2A**	**51PE6B2ALB**	1
	Green	1NO + 1NC	**51PE6B3A**	**51PE6B3ALB**	1
	Amber	1NO + 1NC	**51PE6B9A**	**51PE6B9ALB**	1
24V with BA9 type LED	Red	1NO + 1NC	**51PE6D2A**	**51PE6D2ALB**	1
	Green	1NO + 1NC	**51PE6D3A**	**51PE6D3ALB**	1
	Amber	1NO + 1NC	**51PE6D9A**	**51PE6D9ALB**	1
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	1NO + 1NC	**51PC6H2A**	**51PC6H2ALB**	1
	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	1NO + 1NC	**51PC6J2A**	**51PC6J2ALB**	1
	Green	1NO + 1NC	**51PC6J3A**	**51PC6J3ALB**	1
	Amber	1NO + 1NC	**51PC6J9A**	**51PC6J9ALB**	1
	Less lens	1NO + 1NC	**51PC6JNA**	**51PC6JNALB**	1
600V with 6V 755 type lamp	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	1NO + 1NC	**51PE6H2A**	**51PE6H2ALB**	1
	Green	1NO + 1NC	**51PE6H3A**	**51PE6H3ALB**	1
	Amber	1NO + 1NC	**51PE6H9A**	**51PE6H9ALB**	1
480V with 6V BA9 type LED	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	1NO + 1NC	**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.

Push Button 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
Selector switches with 2 switching positions Maintained operation	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	A	**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 17-426.

Selection and ordering data



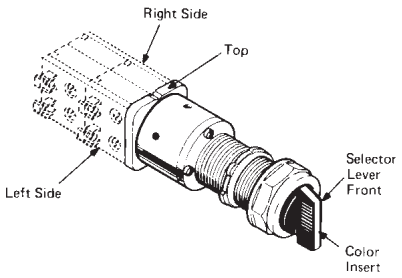
Version	Key removal position	Lock number	CAM Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
Key-operated selector switches with 2 switching positions	Both	550CH	A	**51SA6AE**	**51SA6AELB**	1
	Left	550CH	A	**51SA6AF**	**51SA6AFLB**	
Maintained operation						
Spring return from right operation	Left	550CH	A	**51SA6AC**	**51SA6ACLB**	1
Key-operated selector switches with 3 switching positions	All	550CH	B	**51SA6BE**	**51SA6BELB**	1
			C	**51SA6CE**	**51SA6CELB**	
Maintained operation			D	**51SA6DE**	**51SA6DELB**	
			E	**51SA6EE**	**51SA6EELB**	
			G	**51SA6GE**	**51SA6GELB**	
	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**	
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			E	**51SA6EV**	**51SA6EVLB**	
			G	**51SA6GV**	**51SA6GVLB**	
				▲ 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 17-426.

Selection and ordering data

Design	Ordering Information
	• Contact blocks are ordered separately, see page 17-429. • 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. **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 **51SA2**D**A.** **Size Requirements** • 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.

Push Button 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" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	**51C201H**	1
	B = Momentary flush pushbutton black, label " FORWARD" A = Momentary flush pushbutton red, label "REV"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	**51C204H**	1
	B = Momentary flush pushbutton black, label "START" A = Momentary 1 5/8" mushroom head pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	**51C202H**	1
	B = Indicator light, red, 120 V A = Indicator light, green, 120 V	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	**51C230H**	1
	C = Momentary flush pushbutton black, label "FORWARD" B = Momentary flush pushbutton black, label "REVERSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**51C301H**	1
	C = Momentary flush pushbutton black, label "OPEN" B = Momentary flush pushbutton black, label "CLOSE" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	**51C303H**	1
	C = Indicator light, green, 120 V B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC 1NO - 1NC	3	**51C307H**	1

Enclosures only[2]

	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 2 3	**51EA1H** **51EA2H** **51EA3H**	1 1 1

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 17-465.

Push Button 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
Mushroom head cap - Plastic	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**	
Mushroom head cap - Plastic	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**	
Glass lens			Blue	**51RC4G5**	
			Amber	**51RC4G9**	
			Clear	**51RC4GA**	
Replacement lens for push to test/illuminated pushbuttons			Red	**51RC5G2**	1
			Green	**51RC5G3**	
Glass lens			Amber	**51RC5G9**	
Guards			Chrome	**51AAGM**	1
Prevents accidental operation	Non-illuminated Pushbuttons & Push Pull Operators with Mushroom Head Caps 1 5/8" to 1 3/4" in diameter.				
Lever inserts			Red	**52RA2A2**	1
Short lever			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

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**	

Selection and ordering data



52BAJ



52BAK



52BAR

Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
Touchsafe contact blocks with gold flashing					
1 NO				**52BAK**	1
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 UL listed for class 1 division 2 .25A Max, 200V AC, 10 Watt max .5A Max, 200V DC, 10 Watt max			**52BAR** 1)	
1 NC extra late break				**52BAU**	

① Hermetically sealed.
② ⊖ Positive opening according to IEC 60947-5-1, Appendix K.

Push Button 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 17-454 – 17-457
- Selector Position and Contact Operation: page 17-452 – 17-453.
- Legend Plates: page 17-465.
- Enclosures: page 17-466.
- Technical Specifications: page 17-467.

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.

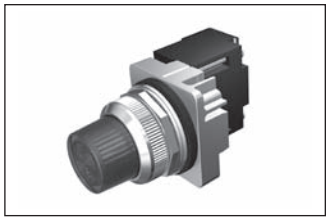
Integrated LED Module Type Pilot Lights

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.).

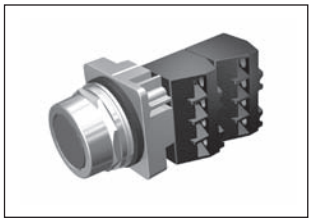
Selector Operators

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.

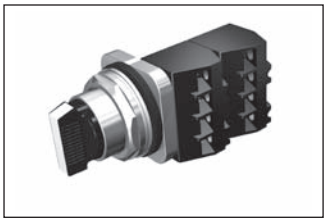
Lever color inserts are available in 8 colors.



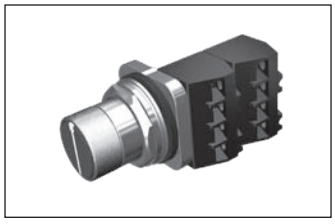
Indicator Light



Push Button



Selector Switch



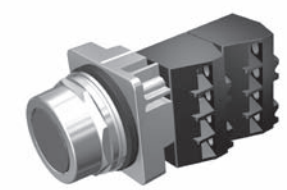
Selector Push Button

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Selection Guid

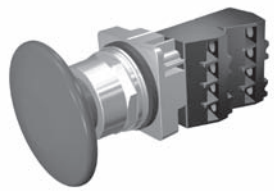
Momentary Push Button - Non-Illuminated



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.

Selection Tables

Momentary Push Button - Non-Illumniated

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**
Mushroom Head Plastic Ø 2 1/2”	—	Red	**52PM9V2**	**52BM9V2**
	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.

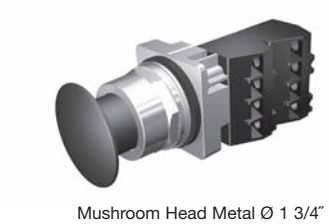
Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

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	____ a	P 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.

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	**52PP2A2A**[1]	**52BP2A2A**[1]	**52PP2W2A**[1]	**52BP2W2A**[1]	**52PP2V2A**[1]	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

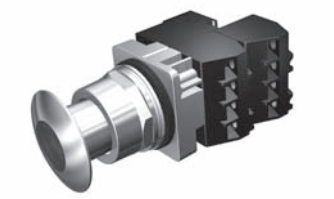
Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Pull & Push Button

Selection Guide

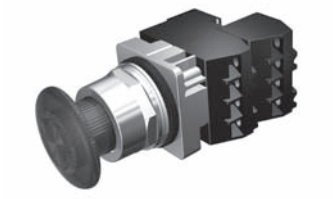
2 & 3 Position Push-Pull Mushroom Head Devices - Illuminated



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 Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Pull

Selection Tables

Type	Lamp Type	Voltage	Color	Contacts	Operator Type: 2 pos - maintained — Metal Ø 1 3/4" Chrome	Metal Ø 1 3/4" Black Max	Plastic Ø 1 3/4" Chrome	Plastic Ø 1 3/4" Black Max
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC	**52PP2D2AB[1]**	**52BP2D2AB[1]**	**52PP2DRAB[1]**	52BP2DRAB[1]
			Green	1 NO - 1 NC	**52PP2D3AB**	52BP2D3AB	52PP2DSAB	52BP2DSAB
	Incandescent	24V	Red	1 NO - 1 NC	**52PP2D2A[1]**	52BP2D2A[1]	**52PP2DRA[1]**	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	**52PP2G2AB[1]**	52BP2G2AB[1]	52PP2GRAB[1]	52BP2GRAB[1]
			Green	1 NO - 1 NC	**52PP2G3AB**	52BP2G3AB	52PP2GSAB	52BP2GSAB
	Incandescent	120V	Red	1 NO - 1 NC	**52PP2G2A[1]**	52BP2G2A[1]	**52PP2GRA[1]**	52BP2GRA[1]
			Green	1 NO - 1 NC	**52PP2G3A**	**52BP2G3A**	**52PP2GSA**	52BP2GSA

Type	Lamp Type	Voltage	Color	Contacts	Operator Type: 3 pos - momentary in - momentary out — Metal Ø 1 3/4" Chrome	Metal Ø 1 3/4" Black Max	Plastic Ø 1 3/4" Chrome	Plastic Ø 1 3/4" Black Max
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB	52PP3D3UB	52BP3D3UB	52PP3DRUB	52BP3DRUB
	Incandescent	24V	Green	1 NO - 1 NCELB	52PP3D3U	52BP3D3U	52PP3DSU	52BP3DSU
			Red	1 NO - 1 NCELB	52PP3D2U	52BP3D2U	52PP3DRU	52BP3DRU
		120V	Red	—	52PP3E2	52BP3E2	52PP3ER	52BP3ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP3G2UB	52BP3G2UB	52PP3GRUB	52BP3GRUB
			Green	1 NO - 1 NCELB	**52PP3G3UB**	52BP3G3UB	52PP3GSUB	52BP3GSUB
	Incandescent	120V	Red	1 NO - 1 NCELB	52PP3G2U	52BP3G2U	52PP3GRU	52BP3GRU
			Green	1 NO - 1 NCELB	52PP3G3U	52BP3G3U	52PP3GRU	52BP3GRU

Type	Lamp Type	Voltage	Color	Contacts	Operator Type: 3 pos - maintained in - momentary out — Metal Ø 1 3/4" Chrome	Metal Ø 1 3/4" Black Max	Plastic Ø 1 3/4" Chrome	Plastic Ø 1 3/4" Black Max
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB	52PP7D3UB	52BP7D3UB	52PP7DSUB	52BP7DSUB
	Incandescent	24V	Green	1 NO - 1 NCELB	52PP7D3U	52BP7D3U	52PP7DSU	52BP7DSU
			Red	1 NO - 1 NCELB	52PP7D2U	52BP7D2U	52PP7DRU	52BP7DRU
		120V	Red	—	52PP7E2	52BP7E2	52PP7ER	52BP7ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP7G2UB	52BP7G2UB	52PP7GRUB	52BP7GRUB
			Green	1 NO - 1 NCELB	52PP7G3UB	52BP7G3UB	52PP7GSUB	52BP7GSUB
	Incandescent	120V	Red	1 NO - 1 NCELB	52PP7G2U	52BP7G2U	52PP7GRU	52BP7GRU
			Green	1 NO - 1 NCELB	52PP7G3U	52BP7G3U	52PP7GRU	52BP7GRU

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

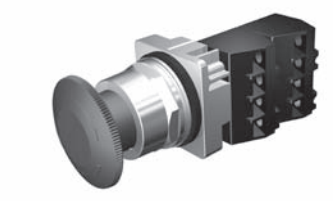
Push Button Units and Indicator Lights

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	____ a	R b	8 c	W d	____ e	____ f[2]

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.

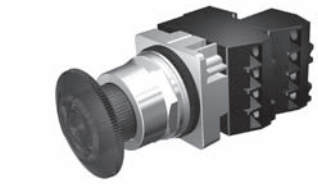
Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

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 b	8 c	____ d	____ e	____ f	____ g

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.

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Selection Guide

Indicator Light



Plastic Lens



Glass Lens

Part Number	52	____ a	L b	____ c	____ d	____ e	____ 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.

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**
	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**
		480V	Red	**52PL4J2**	**52BL4J2**
			Green	**52PL4J3**	**52BL4J3**
			Amber	**52PL4J9**	**52BL4J9**

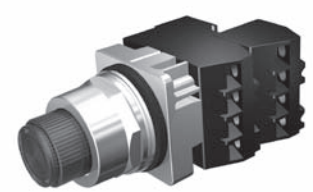
Readily available items are in **bold**.
This is a small representation of stocked items.

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52 *Illuminated Push Button & Push-to-Test*

Selection Guide

Push Button & Push-to-Test - Illuminated



Extended Lens



Flush Lens

Part Number	52	____ a	T b	____ c	____ d	____ e	____ f	____ g

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.

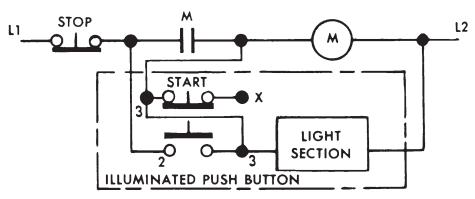
3 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "No Lens".

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.

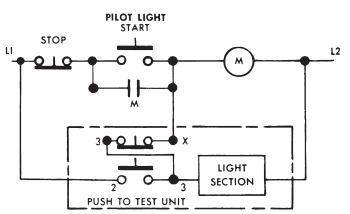
5 Not available in 240V.

Wiring Diagrams

Illuminated Push Button



Push to Test



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**
		120V	Red	1 NO - 1 NC	**52PT6E2AB**	**52BT6E2AB**
			Green	1 NO - 1 NC	**52PT6E3AB**	**52BT6E3AB**
	Incandescent	24V	Red	1 NO - 1 NC	**52PT6D2A**	**52BT6D2A**
			Green	1 NO - 1 NC	**52PT6D3A**	**52BT6D3A**
			Blue	1 NO - 1 NC	**52PT6D5A**	**52BT6D5A**
			Amber	1 NO - 1 NC	**52PT6D9A**	**52BT6D9A**
			White	1 NO - 1 NC	**52PT6DBA**	**52BT6DBA**
		120V	Red	1 NO - 1 NC	**52PT6E2A**	**52BT6E2A**
			Green	1 NO - 1 NC	**52PT6E3A**	**52BT6E3A**
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**
		240V	Red	1 NO - 1 NC	**52PT6H2AB**	**52BT6H2AB**
			Green	1 NO - 1 NC	**52PT6H3AB**	**52BT6H3AB**
	Incandescent	120V	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**
			No Lens	1 NO - 1 NC	**52PT6GNA**	**52BT6GNA**
		240V	Green	1 NO - 1 NC	**52PT6H3A**	**52BT6H3A**
		480V	Clear	1 NO - 1 NC	**52PT6JAA**	**52BT6JAA**

Readily available items are in **bold**.
This is a small representation of stocked items.

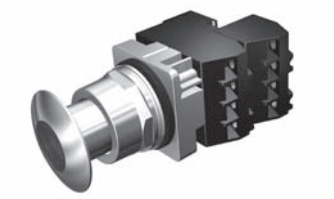
Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Button

Selection Guide

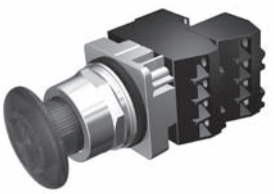
Push Button Mushroom Head Devices – Illuminated[4]



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 b	9 c	____ d	____ e	____ f	____ g

a

Code	Finish
P	Chrome-Command 52
B	Epoxy Coated-Black Max

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.

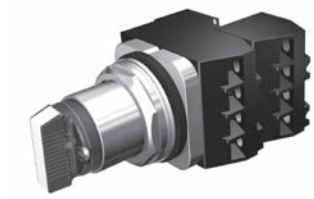
Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Selector Switches

Selection Guide

Selector Switches – Illuminated



Short Lever – Chrome



Short Lever – Black Max

Part Number	52	S (a)	____ (b)	7 (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	
	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

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 17-452.

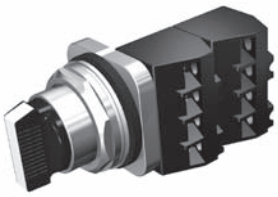
Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Selector Switch

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 17-452.

2 For operator without contact blocks leave positions g and h blank.

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Selector Switch

Selector Switch, Non-Illuminated[1)]

Contact Type	Contact	Switch Position Left	Switch Position Right	Type M = Maintained S = Spring Return	Chrome Short Lever	Chrome Long Lever	Black Max Short Lever	Black Max 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 Left	Switch Position Center	Switch Position Right	Type M = Maintained S = Spring Return	Chrome Short Lever	Chrome Long Lever	Black Max Short Lever	Black Max 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					
1 N.C.	B	X	O	O	M M M	**52SA2GABJ2K1**	**52SB2GABJ2K1**	**52SX2GABJ2K1**	**52SW2GABJ2K1**
1 N.C.	C	O	X	O					

Contact Type	Contact	Switch Position Left	Switch Position Left Center	Switch Position Right Center	Switch Position Right	Type M = Maintained S = Spring Return	Chrome Short Lever	Chrome Long Lever	Black Max Short Lever	Black Max Long Lever
							4-Position Operator			
No Contacts	—	—	—	—	—	M M M M	**52SA2HAB**	**52SB2HAB**	**52SX2HAB**	52SW2HAB
1 N.O.	A	X	O	O	O					
1 N.C.	B	O	X	O	O	M M M M	**52SA2HABJ2K1**	52SB2HABJ2K1	52SX2HABJ2K1	52SW2HABJ2K1
1 N.C.	C	O	O	X	O					
1 N.O.	A	O	O	O	X					
1 N.O.	B	X	O	O	O					
1 N.C.	C	O	X	O	O	M M M M	**52SA2HABJ2K2**	**52SB2HABJ2K2**	52SX2HABJ2K2	52SW2HABJ2K2
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 Postion: CAM B
C	3 Postion: CAM C [2]
D	3 Postion: CAM D
E	3 Postion: CAM E
G	3 Postion: CAM G
H	4 Postion: 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

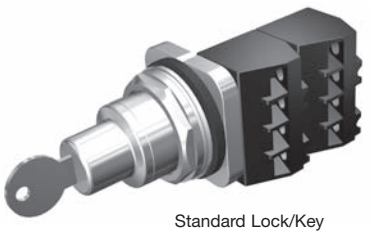
Code	Contact Blocks
A	1 NO - 1 NC
J	1 NC
K	1 NO
E	1 NC (LB)
H	1 NO (EM)

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).

Per order, line will be uniquely keyed.

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 17-452.

3 For operator without contact blocks leave positions f and g blank.

Key-operated Selector Switch, Non-Illuminated[1)]

Contact Type	Contact	Switch Position Left	Switch Position Right	Type M = Maintained S = Spring Return	Key Removal Left	Key Removal 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 Left ↖	Switch Position Center ↑	Switch Position Right ↗	Type M = Maintained S = Spring Return	Key Removal Left	Key Removal Right	Key Removal Center	Key Removal Left & Center	Key Removal Left & Right	Key Removal Center & Right	Key Removal 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**
					S--->M M	—	52SC6CWA1	52SC6CTA1	—	—	52SC6CYA1	—
1 N.C.	B	X	O	O	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								
1 N.C.	B	X	O	O	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	**52SC6GEJ2K1**
1 N.C.	C	O	X	O								

Contact Type	Contact	Switch Position Left ↖	Switch Position Left Center ↖	Switch Position Right Center ↗	Switch Position Right ↗	Type M = Maintained S = Spring Return	Key Removal Right	Key Removal All Positions
						4-Position Operator		
No Contacts	—	—	—	—	—	M M M M	**52SC6HG**	52SC6HE
1 N.O.	A	X	O	O	O			
1 N.C.	B	O	X	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	C	O	O	X	O			
1 N.O.	A	O	O	O	X			
1 N.O.	B	X	O	O	O			
1 N.C.	C	O	X	O	O	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.C.	D	O	O	X	O			

Note: X = Closed / O = Open

All Operatores listed above are furnished with Lock No. 501CH

1) Readily available items are in bold.

This is a small representation of stocked items.

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	O	NC	Left
J1	X	O	X	X	O	O	NC	Right
K0	O	O	O	X	O	X	NO	Left
K1	O	X	O	O	O	X	NO	Right

Note: X = Closed / O = Open 1 For operator without contact blocks leave position f blank

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Special devices

Selection and ordering data

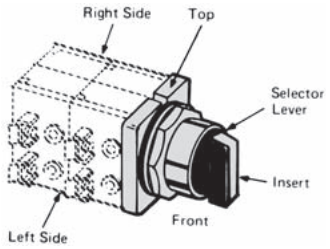
	Version	Ohms / color	Order no.	Pack Unit
	Potentiometer operator 2 Watts, 500 V AC/DC (NEMA Type 4)	50 150 250 500 750 1 K 2.5 K 5 K 10 K 15 K 25 K 50 K 100 K 150 K 250 K 500 K 1 M 1.5 M 2 M 5 M	**52MA3B01** **52MA3B03** **52MA3B04** **52MA3B06** **52MA3B07** **52MA3B08** **52MA3B10** **52MA3B12** **52MA3B14** **52MA3B15** **52MA3B16** **52MA3B18** **52MA3B20** **52MA3B21** **52MA3B22** **52MA3B24** **52MA3B26** **52MA3B27** **52MA3B28** **52MA3B31**	1
	2 Button maintained operator	black (flush) / red (flush) black (flush) / red (extended) black (flush) / yellow (mushroom) green (flush) / red (flush) green (flush) / red (extended) green (flush) / red (mushroom) green (flush) / green (mushroom)	**52MA2A1A2** **52MA2A1B2** **52MA2A1D4** **52MA2A3A2** **52MA2A3B2** **52MA2A3D2** **52MA2A3D3**	1
	Button remains depressed when pushed	less caps	**52MA2**	
	Wobble stick 2.5" operator			
	For use with 52BAJ (NC) contact block	red green grey	**52ABW2**① **52ABW3**① **52ABW6**①	1
	Maintained toggle operator		**52ABT**	1

① For use with 52BAJ (NC) contact block

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Selection and ordering data



Ordering Information

- Contact blocks are ordered separately, see page 17-452
- 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 **52SX2**D**AB.**

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 Left	Right	Contact Blocks	CAM	Mounting Left		Right
X	O	NC (52BAJ)	A	L	or	R
O	X	NO (52BAK)	A	L	or	R

3 Selector Positions Left	Center	Right	Contact Blocks	CAM	Mounting 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 Left	Left Center	Right Center	Right	Contact Blocks	CAM	Mounting 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 Left	Right	Contact Blocks	CAM	Mounting Left	Right
X	O	NC (52BAJ)	A	L	
O	X	NO (52BAK)	A	L	

3 Selector Positions Left	Center	Right	Contact Blocks	CAM	Mounting 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 Left N	Left D	Right N	Right D	Contact Blocks	CAM	Mounting Left		Right
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 Left N	Left D	Center N	Center D	Right N	Right D	Contact Blocks	CAM	Mounting Left	Right
X	O	O	O	O	O	NC (52BAJ)	S	L	
X	O	X	X	O	O	NC (52BAJ)	S		R
O	X	O	O	O	X	NO (52BAK)	S		R
O	O	O	X	O	X	NO (52BAK)	S	L	

Push Button 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: X O O
O O X
HAND-OFF-AUTO Maintained Switch
Catalog No **52SA2CAB A 1 = 52A2CABA1**
(**52BJK** block mounted on right side)

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**

Block Suffix
A = 1 NO - 1 NC, **52BJK**
E = NC Late Break, **52BAE**
H = NO Early Make, **52BAH**
J = NC, **52BAJ**
K = NO, **52BAK**

Position Suffix		
	Quantity and Location	
Suffix	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

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

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	**52RA1A1**
			red	**52RA1A2**
			green	**52RA1A3**
			yellow	**52RA1A4**
			blue	**52RA1A5**
			gray	**52RA1A6**
			orange	**52RA1A8**
			kit- all colors	**52RA1AN**
	**Extended actuator lens cap**	For extended type, non-illuminated pushbuttons bag of 20 caps	black	**52RA1B1**
			red	**52RA1B2**
			green	**52RA1B3**
			yellow	**52RA1B4**
			blue	**52RA1B5**
			gray	**52RA1B6**
			orange	**52RA1B8**
			1 of each color cap	**52RA1BN**
	**Mushroom head cap - Plastic set-screw type**	For large 2 1/2"(63.5mm) type, set screw non-illuminated mushroom pushbuttons	black	**52RB3E1**
			red	**52RB3E2**
			green	**52RB3E3**
			yellow	**52RB3E4**
			blue	**52RB3E5**
			gray	**52RB3E6**
			orange	**52RB3E8**
			1 kit of each color cap	**52RB3EN**
		For small 1 5/8"(41.3mm) type, non-illuminated mushroom pushbuttons	black	**52RB3D1**
			red	**52RB3D2**
			green	**52RB3D3**
			yellow	**52RB3D4**
			blue	**52RB3D5**
			gray	**52RB3D6**
			orange	**52RB3D8**
			1 of each color cap	**52RB3DN**
	**Mushroom head cap - Metal set-screw type**	For small 1 5/8"(41.3mm) type, set screw non-illuminated mushroom pushbuttons	chrome	**52RB3FC**
			red	**52RB3F2**
			green	**52RB3F3**
	**Replacement Lens for Indicator Lights**	For catalog numbers starting with 52PL or 52BL①②		
		Plastic	red	**52RA4S2**
			green	**52RA4S3**
			blue	**52RA4S5**
			amber	**52RA4S9**
			clear	**52RA4SA**
			white	**52RA4SB**
			1 of each color	**52RA4SN**
		Glass	red	**52RA4T2**
			green	**52RA4T3**
			blue	**52RA4T5**
			amber	**52RA4T9**
			clear	**52RA4TA**
			white	**52RA4TB**
			1 of each color	**52RA4TN**
	**Replacement Lens forPush to Test/Illuminated Pushbuttons**	For catalog numbers starting with 52PT or 52BT②③		
		Plastic	red	**52RA5S2**
			green	**52RA5S3**
			blue	**52RA5S5**
			amber	**52RA5S9**
			clear	**52RA5SA**
			white	**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.

Push Button 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.
	Mushroom head push pull illuminated plastic screw-on type	For small 1 3/4" type, push-pull units	red	**52RC3JR**
			green	**52RC3JS**
			amber	**52RC3JT**
		For large 2 1/2" type, push-pull units	red	**52RC3KR**
			green	**52RC3KS**
			amber	**52RC3KT**
	**Mushroom head push pull illuminated metal screw-on type**	Chrome, for small 1 3/4" type, push-pull units	red	**52RB3H2**
			green	**52RB3H3**
			amber	**52RB3H9**
			white	**52RB3HB**
		BlackMax, for small 1 3/4" type, push-pull units	red	**52RX3H2**
			green	**52RX3H3**
			amber	**52RX3H9**
			white	**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 or 52BP)①	black	**52RC3D1**
			red	**52RC3D2**
			green	**52RC3D3**
			yellow	**52RC3D4**
			blue	**52RC3D5**
			gray	**52RC3D6**
			orange	**52RC3D8**
			1 of each color	**52RC3DN**
		For large 2 1/2" type, push-pull units (catalog numbers starting with 52PP or 52BP)①	black	**52RC3E1**
			red	**52RC3E2**
			green	**52RC3E3**
			yellow	**52RC3E4**
			blue	**52RC3E5**
			gray	**52RC3E6**
			orange	**52RC3E8**
			1 of each color	**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	**52RC3F2**
			green	**52RC3F3**
			chrome	**52RC3FC**
	**Twist to release head illuminated plastic screw-on type**	For small twist to release units	red	**52RC3RR**
			green	**52RC3RS**
			amber	**52RC3RT**
	**Twist to release head non-illuminated plastic screw-on type**	For small twist to release units	red	**52RC3R2**
			green	**52RC3R3**
			yellow	**52RC3R4**
	**Replacement lens kit for Illuminated selector switches (Knob with Insert)**		red	**52RA6P2**
			green	**52RA6P3**
			blue	**52RA6P5**
			amber	**52RA6P9**
			clear	**52RA6PA**
			white	**52RA6PB**
	**Lever inserts Short lever**		red	**52RA2A2**
			green	**52RA2A3**
			yellow	**52RA2A4**
			blue	**52RA2A5**
			gray	**52RA2A6**
			orange	**52RA2A8**
			white	**52RA2AB**
	**Long lever**		red	**52RA2B2**
			green	**52RA2B3**
			yellow	**52RA2B4**
			blue	**52RA2B5**
			gray	**52RA2B6**
			orange	**52RA2B8**
			white	**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 17-452.

Push Button 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 sub-stances from interfering with button operation	Flush pushbutton operations	clear black	**52AABA** **52AAB1**
	**Guards** Prevents accidental operation	Non-illuminated basic pushbuttons	chrome blackmax	**52AAGP** **52AXGP**
		1 5/8" mushroom pushbuttons, 1 3/4" push-pull units①, and twist to release units	chrome blackmax	**52AAGM** **52AXGM**
		Push to test/illuminated pushbutton and indicator lights	chrome blackmax	**52AAGL** **52AXGL**
	**EMERGENCY-STOP Lock Out**	Class 52 Illuminated Mushroom Head Pushbuttons; 304 Stainless Steel	chrome (304 SS)	**52AALE**
	EMERGENCY-STOP Backing Ring	Yellow 90mm E-STOP Backing Ring		**52AAR**
	**Locknuts** Replacement front ring	Non-illuminated basic pushbuttons	chrome blackmax	**52AANP** **52AXNP**
		Non-illuminated mushroom pushbuttons	chrome blackmax	**52AANL** **52AXNL**
		Push-pull and twist-to-release units (only for push-pull units starting with 52PP or 52BP)②	chrome blackmax	**52CANP** **52CXNP**
		Indicator Lights	blue amber	**52AANL** **52AXNL**
		Selector switches	chrome blackmax	**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			**52BAK** **52BAJ**④ **52BJK**④
 52 BAK	1 NO early make 1 NC late break 1 NO - 1 NC	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		**52BAH** **52BAE** **52BAR**③
 52 BAR	1 NC extra late break			**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.

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

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		**52AAPN**
Candelabra, 120V, 3W, Full voltage type 3S6/5	52 older revision styles	120 V		**52AAENC**
LED bulbs①				
LED, BA9s type②	Class 52	6 V AC/DC		**52AEB□**
		24 V AC/DC		**52AED□**
		120 V AC/DC		**52AEE□**
Super-Bright LED②	Class 52	6 V AC/DC		**52AEB□7**
		24 V AC/DC		**52AED□7**
		120 V AC/DC		**52AEE□7**
		120 V DC		**52AEV□7**
LED lighting module with integrated LED.				
Single LED (Rated 35 mA Maximum)	Class 52	24 V AC/DC		**52AAIL□**
		120 V AC		**52AAIM□**
		240 V AC		**52AAIN□**
Full voltage lighting module accessory with BA9s type lamp①				
LED②	Class 52	6 V AC/DC		**52AAFB□B**
		24 V AC/DC		**52AAFD□B**
		120 V AC/DC		**52AAFE□B**
Super-Bright LED②	Class 52	6 V AC/DC		**52AAFB□Y**
		24 V AC/DC		**52AAFD□Y**
		120 V AC/DC		**52AAFE□Y**
Incandescent bulb	Class 52	6 V AC/DC		**52AAFB**
		24 V AC/DC		**52AAFD**
		120 V AC/DC		**52AAFE**
Transformer lighting module accessory with BA9s type lamp①				
LED	Class 52	120 V AC		**52AATG□B**
		240 V AC		**52AATH□B**
		480 V AC		**52AATJ□B**
		600 V AC		**52AATK□B**
Super-Bright LED	Class 52	120 V AC		**52AATG□Y**
		240 V AC		**52AATH□Y**
		480 V AC		**52AATJ□Y**
		600 V AC		**52AATK□Y**
Incandescent bulb	Class 52	120 V AC		**52AATGN**
		240 V AC		**52AATHN**
		480 V AC		**52AATJN**
		600 V AC		**52AATKN**
		Color options:	red	**2**
			green	**3**
			yellow/amber	**4**
			blue	**5**
			white/clear	**B**

① Standard LED lamps are recommended for indoor applications, Super-Bright LED Lamps are recommended for outdoor applications.

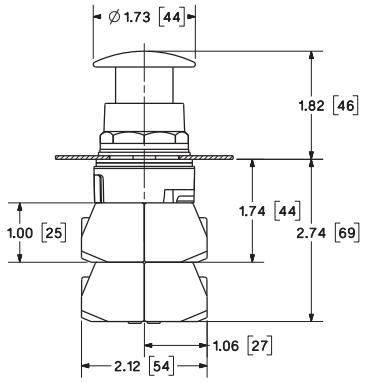
② 6V, 24V (Super Bright only) and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

Push Button Units and Indicator Lights

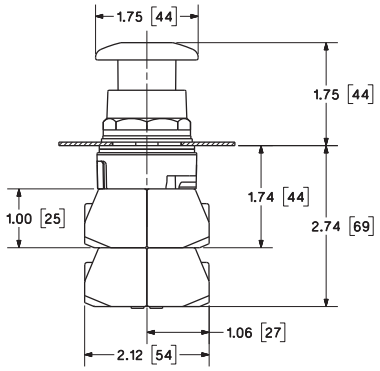
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

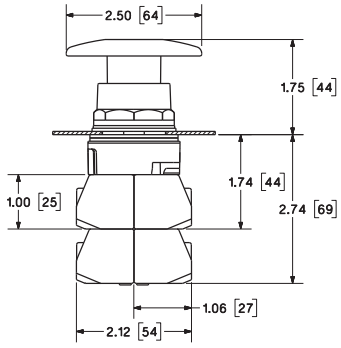
Non-Illuminated Push-Pull Metal Mushroom Head



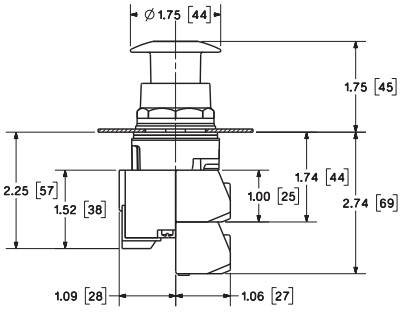
Non-Illuminated Push-Pull Small Plastic Mushroom Head



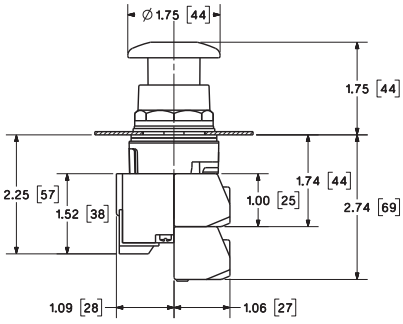
Non-Illuminated Push-Pull Large Plastic Mushroom Head



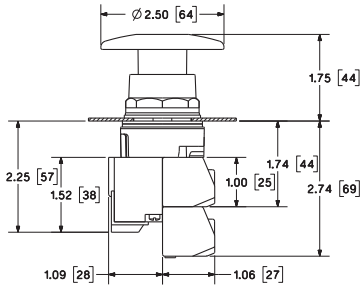
Illuminated Push-Pull Metal Mushroom Head



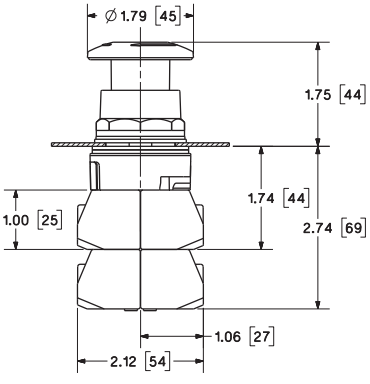
Fully Illuminated Push-Pull Small Plastic Mushroom Head



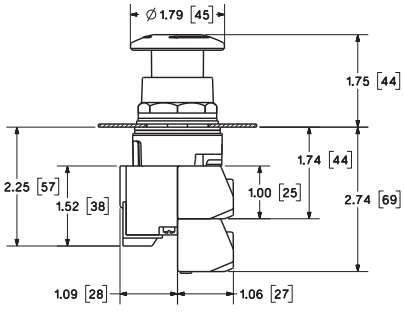
Illuminated Push-Pull Large Plastic Mushroom Head



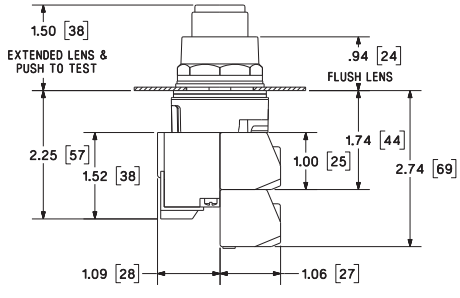
Non-Illuminated Twist Release Plastic Mushroom Head



Illuminated Twist Release Plastic Mushroom Head



Illuminated Pushbutton Flush Lens
Illuminated Pushbutton Extended Lens
Illuminated Push to Test

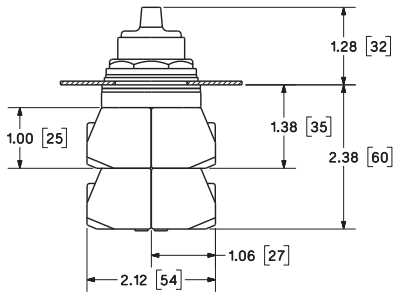


Push Button Units and Indicator Lights

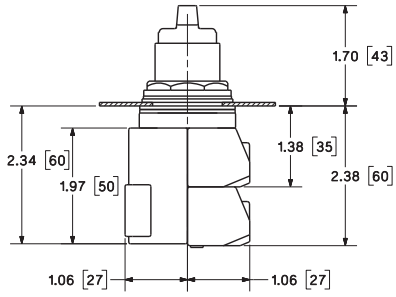
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

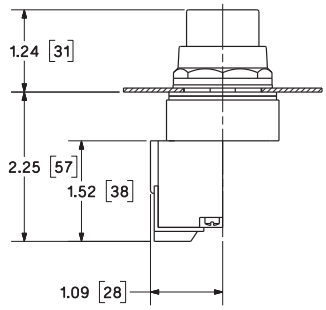
Selector Switch
Non-Illuminated



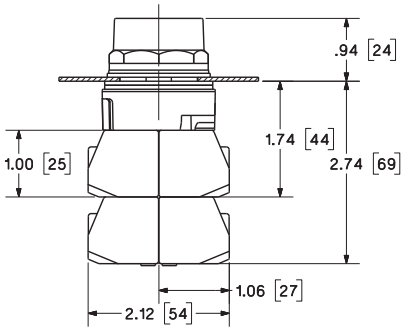
Selector Switch
Illuminated



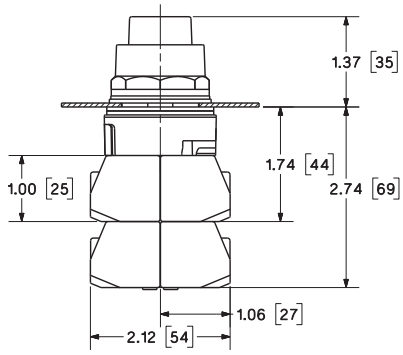
Indicator Light
Plastic Lens



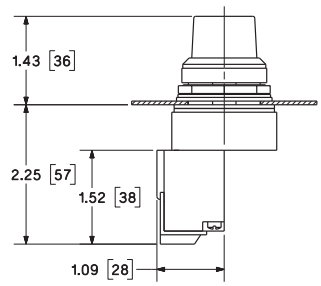
Momentary Pushbutton
Non-Illuminated Flush Cap



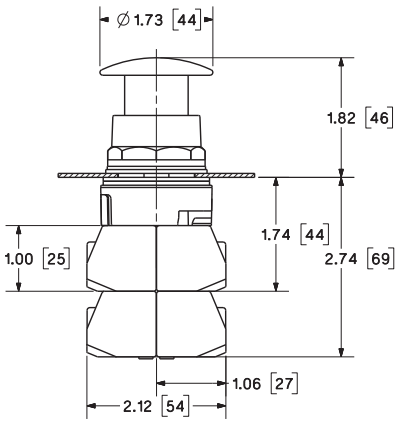
Momentary Pushbutton
Non-Illuminated Raised Cap



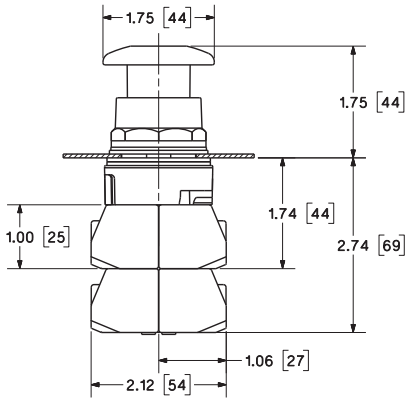
Indicator Light
Glass Lens



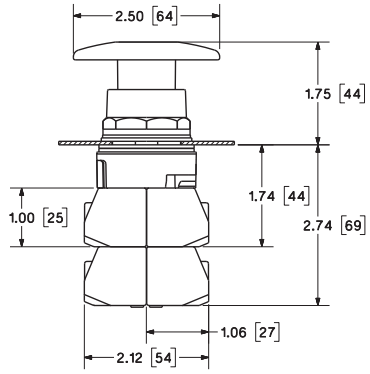
Momentary Pushbutton
Metal Mushroom Head



Momentary Pushbutton
Small Plastic Mushroom Head



Momentary Pushbutton
Large Plastic Mushroom Head

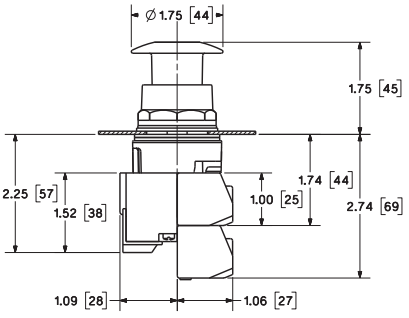


Push Button Units and Indicator Lights

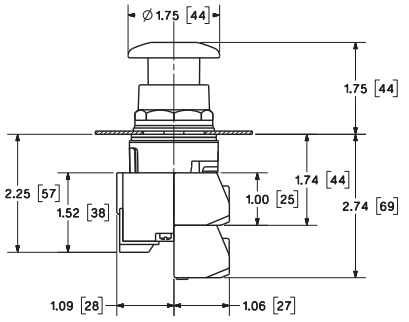
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

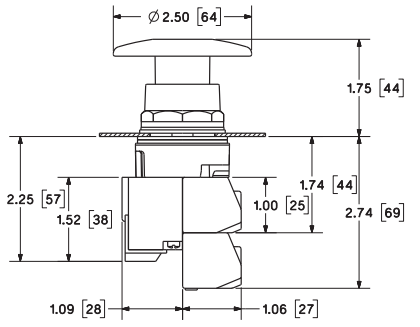
Illuminated Momentary Pushbutton Metal Mushroom Head



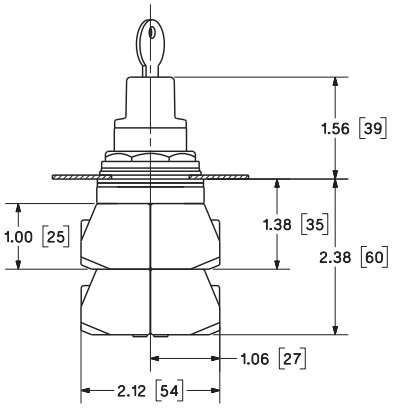
Illuminated Momentary Pushbutton Small Plastic Mushroom Head



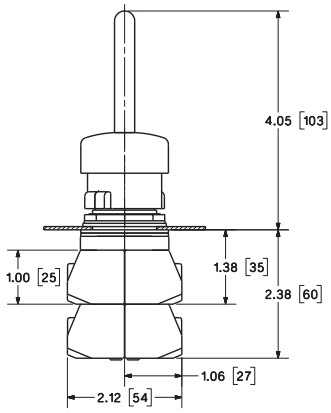
Illuminated Momentary Pushbutton Large Plastic Mushroom Head



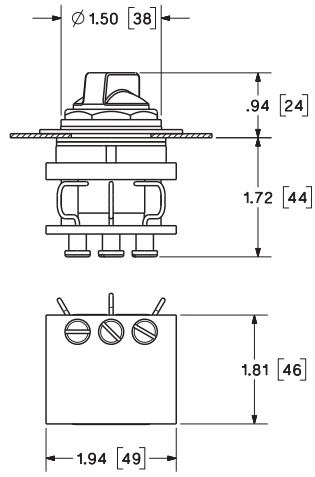
Selector Switch Keyed



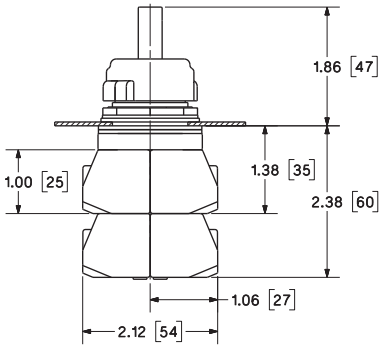
Wobble Switch



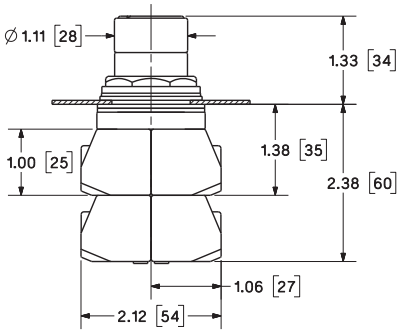
Potentiometer Switch



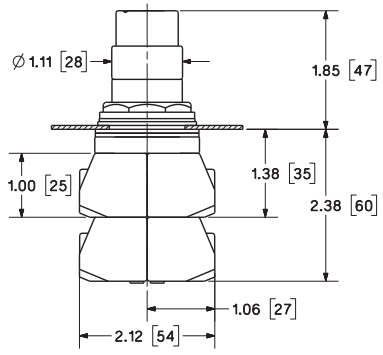
Toggle Switch



Selector Pushbutton Switch Flush Cap



Selector Pushbutton Switch Raised Cap

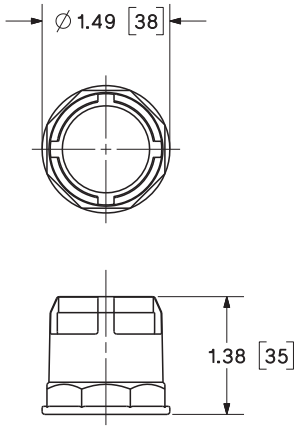


Push Button Units and Indicator Lights

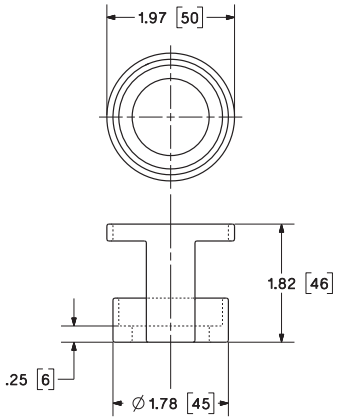
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

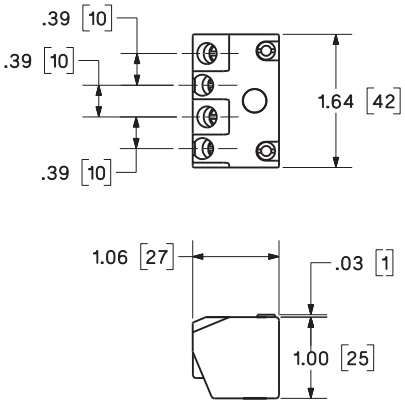
Momentary Pushbutton Guard
Illuminated Push to Test Guard



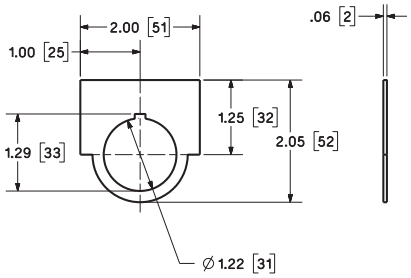
Mushroom Head Guard



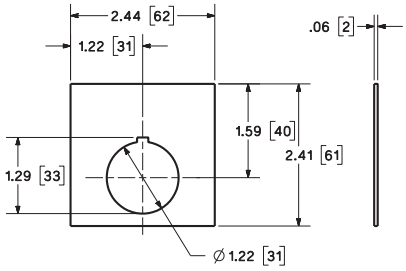
Contact Block



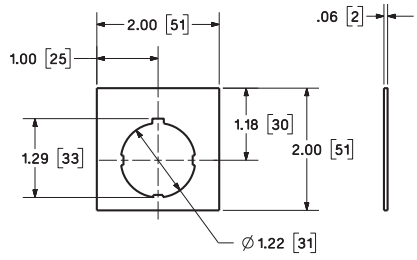
Large Metal Legend Plate



Automotive Metal Legend Plate



Large Plastic Legend Plate



Push Button 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 protection①	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.

Push Button 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 protection①	Contact / voltage	No. of command points	Order no.	Pack Unit
3 unit control station 	C = Indicator light, red B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 12	120V 1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C307A**	
	C = Momentary flush pushbutton black, label “FORWARD” B = Momentary flush pushbutton black, label “REVERSE” A = Momentary raised pushbutton red, label “STOP”	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C301A**	
	C = Momentary flush pushbutton black, label “UP” B = Momentary flush pushbutton black, label “DOWN” A = Momentary raised pushbutton red, label “STOP”	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C332A**	
	C = Momentary flush pushbutton black, label “OPEN” B = Momentary flush pushbutton black, label “CLOSE” A = Momentary raised pushbutton red, label “STOP”	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C333A**	
	C = Momentary flush pushbutton black, label “HI” B = Momentary flush pushbutton, black label “LOW” A = Momentary raised pushbutton red, label “STOP”	NEMA 12	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C334A**	
	C = Indicator light, red B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	120V 1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C307S**	
	C = Momentary flush pushbutton black, label “FORWARD” B = Momentary flush pushbutton black, label “REVERSE” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C301S**	
	C = Momentary flush pushbutton black, label “UP” B = Momentary flush pushbutton black, label “DOWN” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C332S**	
	C = Momentary flush pushbutton black, label “OPEN” B = Momentary flush pushbutton black, label “CLOSE” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C333S**	
	C = Momentary flush pushbutton black, label “HI” B = Momentary flush pushbutton, black label “LOW” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C334S**	
	C = Indicator light, red B = Momentary flush pushbutton black, label “START” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	120V 1NO, 1NC 1NO, 1NC	3	**52C307X**	
	C = Momentary flush pushbutton black, label “FORWARD” B = Momentary flush pushbutton black, label “REVERSE” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C301X**	
	C = Momentary flush pushbutton black, label “UP” B = Momentary flush pushbutton black, label “DOWN” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C332X**	
	C = Momentary flush pushbutton black, label “OPEN” B = Momentary flush pushbutton black, label “CLOSE” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C333X**	
	C = Momentary flush pushbutton black, label “HI” B = Momentary flush pushbutton, black label “LOW” A = Momentary raised pushbutton red, label “STOP”	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC 1NO, 1NC	3	**52C334X**	

① NEMA 4X Stainless Steel Enclosure is 304 SS.

Push Button Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant - Class 52

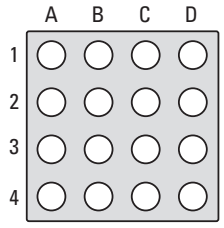
Empty enclosures

Selection and ordering data



Version	Number of command points	Degree of protection	Order No.①	Pack Unit
Standard enclosures come with 2 1/4" leg center for legend spacing. Automotive end plates require 2 1/2 " spacing. For more than 2 contact blocks on the right or left, use extra deep enclosure. Mounting hole arrangement 1 thu 4 are in one row 6 holes are 3 down and 2 across 9 holes are 3 down and 3 across 12 holes are 4 down and 3 across 16 holes are 4 down and 4 across	1	NEMA Type 12/13	**P30EMS01**	
	1	NEMA Type 12/13 extra deep	**P30EMS01D**	
	1	NEMA Type 4/4X stainless steel	**P30EMS014**	
	1	NEMA Type 4/4X Fiberglass	**P30EMS01X**	
	2	NEMA Type 12/13	**P30EMS02**	
	2	NEMA Type 12/13 extra deep	**P30EMS02D**	
	2	NEMA Type 4/4X stainless steel	**P30EMS024**	
	2	NEMA Type 4/4X Fiberglass	**P30EMS02X**	
	3	NEMA Type 12/13	**P30EMS03**	
	3	NEMA Type 12/13 extra deep	**P30EMS03D**	
	3	NEMA Type 4/4X stainless steel	**P30EMS034**	
	3	NEMA Type 4/4X Fiberglass	**P30EMS03X**	
	4	NEMA Type 12/13	**P30EMS04**	
	4	NEMA Type 12/13 extra deep	**P30EMS04D**	
	4	NEMA Type 4/4X stainless steel	**P30EMS044**	
	4	NEMA Type 4/4X Fiberglass	**P30EMS04X**	
	6	NEMA Type 12/13	**P30EMS06**	
	6	NEMA Type 12/13 extra deep	**P30EMS06D**	
	6	NEMA Type 4/4X stainless steel	**P30EMS064**	
	9	NEMA Type 12/13	**P30EMS09**	
	9	NEMA Type 12/13 extra deep	**P30EMS09D**	
	9	NEMA Type 4/4X stainless steel	**P30EMS094**	
	12	NEMA Type 12/13	**P30EMS12**	
	12	NEMA Type 12/13 extra deep	**P30EMS12D**	
	12	NEMA Type 4/4X stainless steel	**P30EMS124**	
	16	NEMA Type 12/13	**P30EMS16**	
	16	NEMA Type 12/13 extra deep	**P30EMS16D**	
	16	NEMA Type 4/4X stainless steel	**P30EMS164**	

Order Form



Enclosure Hole Arrangement

Ordering Information

To order non-standard control stations select catalog numbers from the previous pages, determine the required position in the enclosure and fill in the table below. If a special legend plate is required, specify description in the table. The combined list prices of the components is the list price of the station.

- Select enclosure
- Vertical or Horizontal. Outline Diagram at left starting at the top left-hand corner. Example: 3 unit vertical outline location No. 1A, 2A and 3A. 3 unit horizontal outline location No. 1A, 1B, and 1C
- List location No. and applicable catalog numbers in the table below. Use complete catalog numbers where possible

Order No./Item No.

Customer

Enclosure Catalog No.

Location	Operator PB-SEL.-PL	Accessories Key Lock, Boot, Etc,	Legend Plate Legend or Blank	Special Marking

① NEMA 4X Stainless Steel Enclosure is 304 SS.

Push Button Units and Indicator Lights

30 mm Heavy Duty, Watertight/Oiltight, Class 52

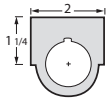
Legend plates for Class 51 and 52

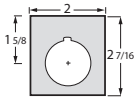
Design

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





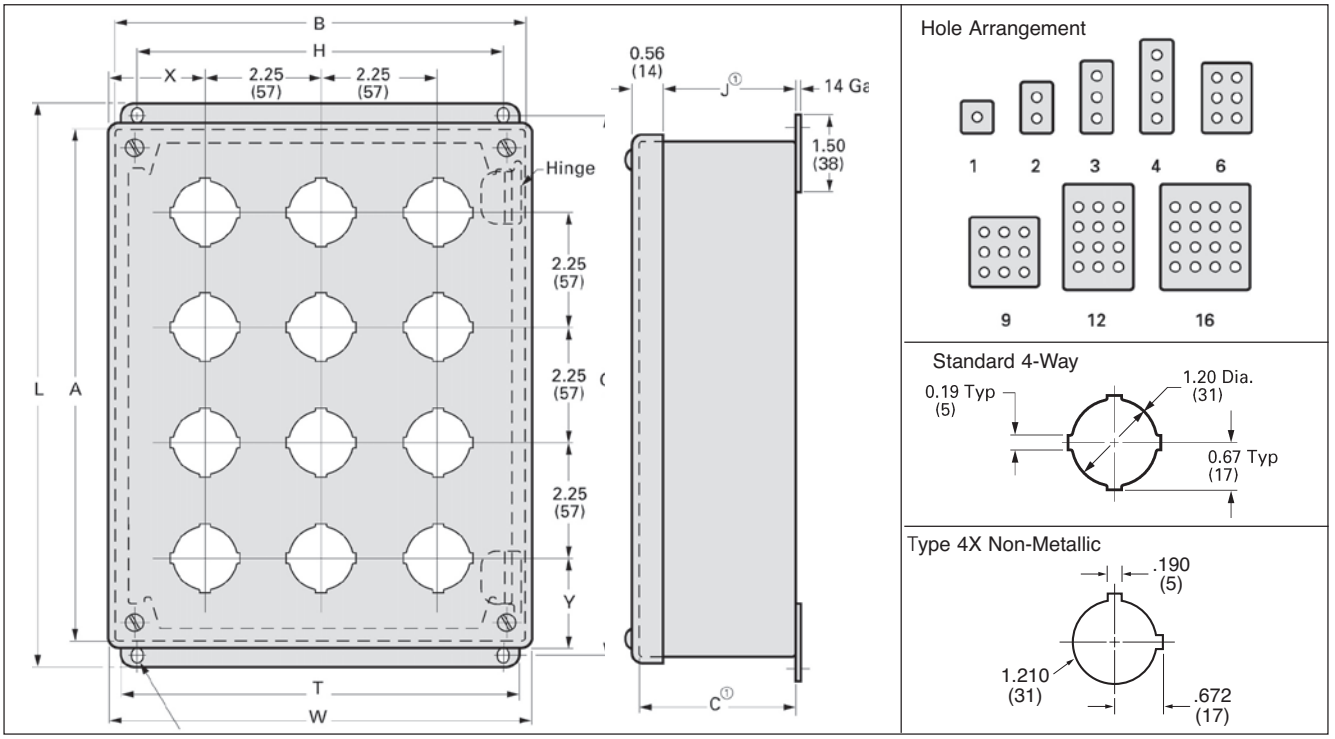
Inscription	Large (1 7/16" x 2") Order No.	Automotive① (2 7/16" x 2 7/16") Order No.	Large Plastic② (1 7/16" x 2") Order No.	Automotive Plastic①② (2 7/16" x 2 7/16") Order No.
"Blank (brushed aluminum)"	**52NL02**	**52NA02**	—	—
"Blank (red)"	**52NL02R**	**52NA02R**	**52ND02R**	**52NE02R**
"Blank (Black)"	**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.

Push Button Units and Indicator Lights

30mm Heavy Duty, Watertight/Oiltight, Class 52

Dimensional drawings



Type 12/13 and 4X Stainless Steel

	Enclosure Size			Mounting		Overall					
Units	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

	Enclosure Size			Mounting		Overall					
Units	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

	Enclosure Size			Mounting		Overall	
Units	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.

Push Button Units and Indicator Lights

30 mm Pilot Devices

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

Voltage AC	Make Amps	Break Amps
120V	**60**	**6**
240V	**30**	**3**
480V	**15**	**1.5**
600V	**12**	**1.2**
Total VA	**7200**	**720**

NEMA P600 – Rating Codes for DC Control Circuit Application

Thermal Continuous Test Current Amps	5.0
Maximum Make or Break; Current / Amps	
125V	1.10
250V	0.55
301-600V	0.20
Maximum Make or Break Volt amperes at 300V or Less	138

Contact Blocks	52BAK, -BAJ①, -BAH, -BAU, -BJK① 52BAR	600VAC Maximum, Heavy Duty 200VAC .25 Amp, 10 Watt Maximum 200VDC .50 Amp, 10 Watt Maximum	
① Ⓟ 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 LED Module Transformer Type	52PL4/52PL5 or 52BL4/52BL5	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V) -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600V AC Max., 50/60 Hz
Push-to-Test	Full Voltage LED Module Transformer Type	52PT6 or 52BT6	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), -N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
Illuminated Push-Pull	Full Voltage LED Module Transformer	52PP2(3,7) or 52BP2(3,7)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), - N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
Twist-to-Release	Full Voltage LED Module Transformer	52BR8 or 52PR8	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -L (24V), -M (120V), - N (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 240V AC Max. 600VAC Max., 50/60 Hz
Illuminated Selector Switch	Full Voltage Transformer	52SA7(A,B,C) or 52SX7(A,B,C)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V) -G (120V), -H (240V), -J (480V), -K (600V)	240V AC/DC Max. 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 Momentary, Illuminated	5,000,000 Operating Cycles 300,000 Operating Cycles
Push-Pull	Maintained Momentary	300,000 Operating Cycles 2,000,000 Operating Cycles
Twist-to-Release		300,000 Operating Cycles
Selector Switches	Non-illuminated Illuminated, Key-operated	2,000,000 Operating Cycles 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 Storage	31F to +158F (-35C to +70C) 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).

• Revised •
03/01/14

Notes

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Standby Power Systems

Introduction

Siemens is proud to introduce our updated generator catalog. This catalog contains all of our air cooled, liquid cooled, and diesel generators, along with all available accessories

Air Cooled, page 18-4



Liquid Cooled, page 18-4



Diesel Generators, page 18-??



Standby Power Systems

Catalog Logic

Easy order selection guide

Standby power generators		kW ratings[5]	Voltage R = 120/240V, 1Ø C = 120/208V, 3Ø J = 120/240V, 3Ø I = 277/480V, 3Ø	Fuel G = Natural Gas P = Liquid propane vapor B = Accepts both	Enclosure S = Steel A = Aluminum	Speed Blank = 3600 RPM L = 1800 RPM T = Turbo Charge[2]	Emissions E = Catalyst[3]
Air cooled	ASGE	8[6]	R	B	S		
		11[6]	R	B	S, A		
		16	R	B	S, A		
		20	R	B	S		
		22	R	B	S		
Liquid cooled	SGN	22	R, C, J	B	A	L	
		25	R, C, J	B	S		
		27	R, C, J	B	A	L	
		30	R, C, J	B	S		
		36	R, C, J, I	B	A	L	
		45	R, C, J, I	B	S		E
		48	R, C, J, I	B	A	L	E
		60	R, C, J, I	G, P	S, A	T	
		70	R, C, J, I	G, P	A	L	E
		80	R, C, J, I	G, P	A		
		100	R, C, J, I	G, P	A	L[1]	E
		130	R, C, J, I	G, P	A		E
		150	R, C, J, I	G, P	A		E

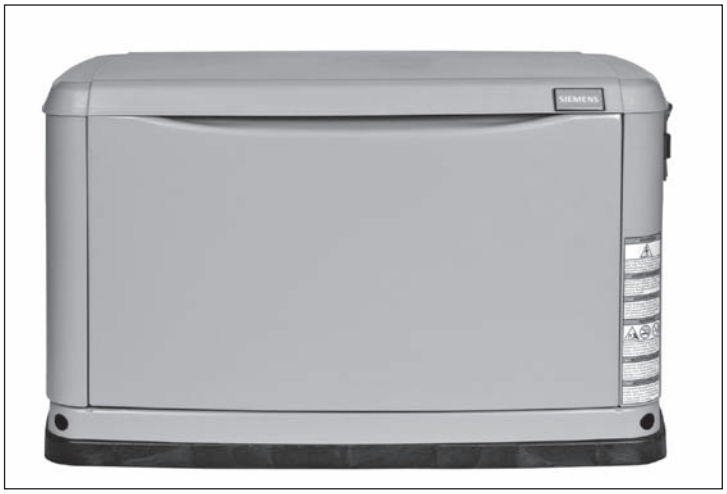
Transfer Switches ST = Indoor Branch Circuit SL = Outdoor SE = Outdoor	Amperage	Voltage R = 120/240V, 1Ø C = 120/208V, 3Ø J = 120/240V, 3Ø I = 277/480V, 3Ø	Service disconnect Blank = No D = Yes	Branch circuits
ST	50	R		10C, 12C,
	100			14C, 16C
SL	100, 150, 200, 400, 600, 800	R, C, J, I	Blank, D[4]	
SE	100, 150, 200, 300, 400	R	Blank, D[4]	16C

[1] 2300 RPM
[2] 3600 RPM
[3] Catalyst option on 45, 48, and 70kW models. Catalyst factory installed on 100-130kW models
Catalyst meets CARB/EPA requirements for CA and MA. 36, 60, and 80kW models do not meet CARB/EPA requirements for CA and MA.
[4] Disconnect only available on 100, 150, 200, and 400A SL single phase transfer switches.
[5] Battery not included with 8-60kW.
[6] Catalyst factory installed. Catalyst meets CARB/EPA requirements for CA and MA. There will NOT be an "E" suffix on the catalog number.

Standby Power Systems

Air Cooled Generators

8, 11, 16, 20, & 22 kW, 120/240V single phase



Standard features

- UL 2200 Listed
- Four-cycle industrial engines provide durable, reliable, long life
- Operate on either natural gas or propane vapor①
- Composite mounting pad approved to eliminate need to pour concrete pad②
- Automatic high temperature, low oil pressure, over speed, and over crank shut down
- Low battery voltage indicator
- Standard safety fuse
- Provided with Type "E" Evolution controller

Typical load requirements③

Description	kW
Electric Heat per 1,000 ft.②	12.0
Heat Pump Elements per 1,000 ft.②	7.0
Dryer	5.5
Hot Tub	5.0
Range Oven	5.0
Hot Water Heater	4.5
Stove Top Burner	1.5
General Receptacles per 1,000 ft.②	1.0
Dishwasher	1.5
Blow Dryer	1.3
AC (per ton)	1.0
Microwave	1.0
Toasters	1.0
Lighting per 1,000 ft.②	0.8



Air Cooled Generators are ideal for smaller single family residential constructions, or partial loads on larger residential constructions. These panels can help support critical loads most required when power is interrupted.

Catalog No.	kW rating③	Fuel①	Enclosure	Engine size	Speed	Weight (lbs.)	Dimensions (in.)	Maintenance Kits
ASGE008RBS	8	Both	Steel	410CC	3600 RPM	360	48 x 25 x 29	**GENMKIT19**
ASGE011RBS	11	Both	Steel	530CC	3600 RPM	407		**GENMKIT20**
ASGE011RBA	11	Both	Aluminum	530CC	3600RPM	407		**GENMKIT20**
ASGE016RBS	16	Both	Steel	992CC	3600 RPM	513		**GENMKIT21**
ASGE016RBA	16	Both	Aluminum	992CC	3600 RPM	448		**GENMKIT21**
ASGE020RBS	20	Both	Steel	999CC	3600 RPM	516		**GENMKIT22**
ASGE022RBA	22	Both	Aluminum	999CC	3600 RPM	526		**GENMKIT22**

① Product ships ready for natural gas. Minor adjustments required for liquid propane vapor use. See owners manual.
② Check local code requirements.
③ Battery not included with air cooled models 8-22kw. Refer to page 12 [reference from S&A guide] for 26R battery.

• Revised •
12/01/14



Evolution controller for air cooled generators

Type "E" Evolution Digital LCD Controller

Functions include monitoring utility power, triggering the automatic transfer switch, starting and stopping the generator, exercising the generator, and monitoring the generator for any system faults.

■ **High Voltage Shutdown**

Shuts down the generator at >130% rated voltage for 200 milliseconds or >110% for 5 seconds to better protect home owner appliances or connected items.

Industry leading system controls

■ **Low Voltage Shutdown**

Shuts down the generator at <60% voltage for 5 seconds to better protect home owners appliances or connected items.

■ **Internal Fault Shutdown**

Shuts down the generator when a failure is detected within the Evolution Controller for more protection and easier diagnostics.

■ **Battery Sentinel**

Monitors the battery and charging system to indicate that the battery is trending towards failure or that it has failed.

■ **Event Log**

All generators 8-22 kW feature a full event log capable of recording 50 events.

■ **Smart Battery Charger**

Only delivers a charge to the battery when needed. Battery charge depends on ambient air temperature.

■ **Voltage Regulation**

With the combination into the Evolution Controller, the voltage regulation delivers an industry leading voltage regulation +/- 1%.

■ **Product Activation**

Requires each generator to be activated via website or phone before automatic function is enabled - Allows a warranty activation start point for every generator sold.

■ **External Common Fault Alarm**

The Evolution Controller has a provision to connect to a set of contacts that will allow for a common alarm when any of the generator shut downs occur- This will allow individuals to connect into security systems, home automation systems or simply drive a different alarm within a home or business.

■ **Adjustable generator start time**

When utility fails, the control is factory set to delay 10 seconds prior to starting the engine. There is also the capability to change the delay time between 2-1500 seconds .

■ **Incorrect Wiring Error**

Eliminates the potential of damaging the Evolution Controller if it is not connected properly, a warning message is displayed that must be corrected before the controller is allowed to be fully operational.

Air Cooled Evolution Controller Stack up

Gray text indicates a new feature or different way of annunciation

Display	Alarms	Dealer service features/menus	Key miscellaneous
✓LCD Display	✓Generator Over Voltage	✓Improved Smart Battery Charger	✓Compatible with Cellular Monitoring
✓LED Backlit Membrane Keypad	✓Generator Under Voltage	✓Charging Status	✓Product Activation
✓Time & Date	✓Underspeed/Fail to Xfer	✓Battery Voltage	✓Voltage Regulator
✓Alarm Log	✓Low Battery Voltage	✓USB Port	✓Exercise not set error
✓Run Log	✓High Engine Temperature	✓Generator Output Voltage	
✓Maintenance Log & Reminders	✓Low Oil Pressure	✓Output Frequency & RPM	
✓Set Exercise via Display	✓Overcrank	✓Utility Input Voltage	
✓Run Hour Display	✓Overspeed	✓Software & Hardware Version	
✓Battery Condition	✓RPM Sensor Loss	✓Boot Loader Version	
✓Quad-lingual Display (Portuguese)	✓Internal Fault	✓Command Status	
✓Quiet Test Selection	✓Low Fuel Pressure (QT only)	✓Voltage Calibration	
✓Fuel Selection	✓Wiring Error	✓Parameter Group	
✓Elimination of "Inspect" prompt	✓External common fault alarm	✓Votage Code	
✓Capture of Dismissal of Maintenance Reminder Prompt	✓Overload Warning/Cooldown	✓Maintenance Hard Reset	
✓Variable Start Up Delay between 2-1500 seconds	✓Low Battery/Battery Problem	✓Edit Run Hours (controller replacement)	
	✓Charger Warning	✓Maintenance Schedule	
	✓Charger Missing AC	✓Service/Monitoring Port	
	✓Stepper Over Current	✓Serial Number	
	✓Fuse Problem	✓Debug	
	✓Radio Signal Indication	✓Updateable Firmware Prompts	
		✓Brown Out Voltage	

•Certain faults will also have an associated E-code after the general message to specifically call out what the exact problem for more exact/quick diagnosis

Standby Power Systems

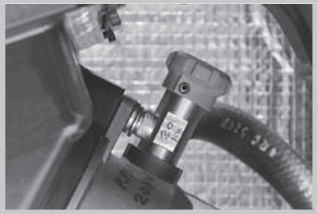
Air Cooled Generator Features

Substructure

Galvannealed substructure for excellent rust protection.

Natural gas/liquid propane fuel setup

The 8 - 22 kW units ship from the factory ready for use with natural gas. The conversion to propane is as simple as turning a knob.
No tools required!



Exhaust enclosure

Verify spacing with local code and inspector, prior to installation. Typically, the generator must be placed away from any opening in the house due to exhaust regulations from NFPA guidelines.

Wind resistant housing

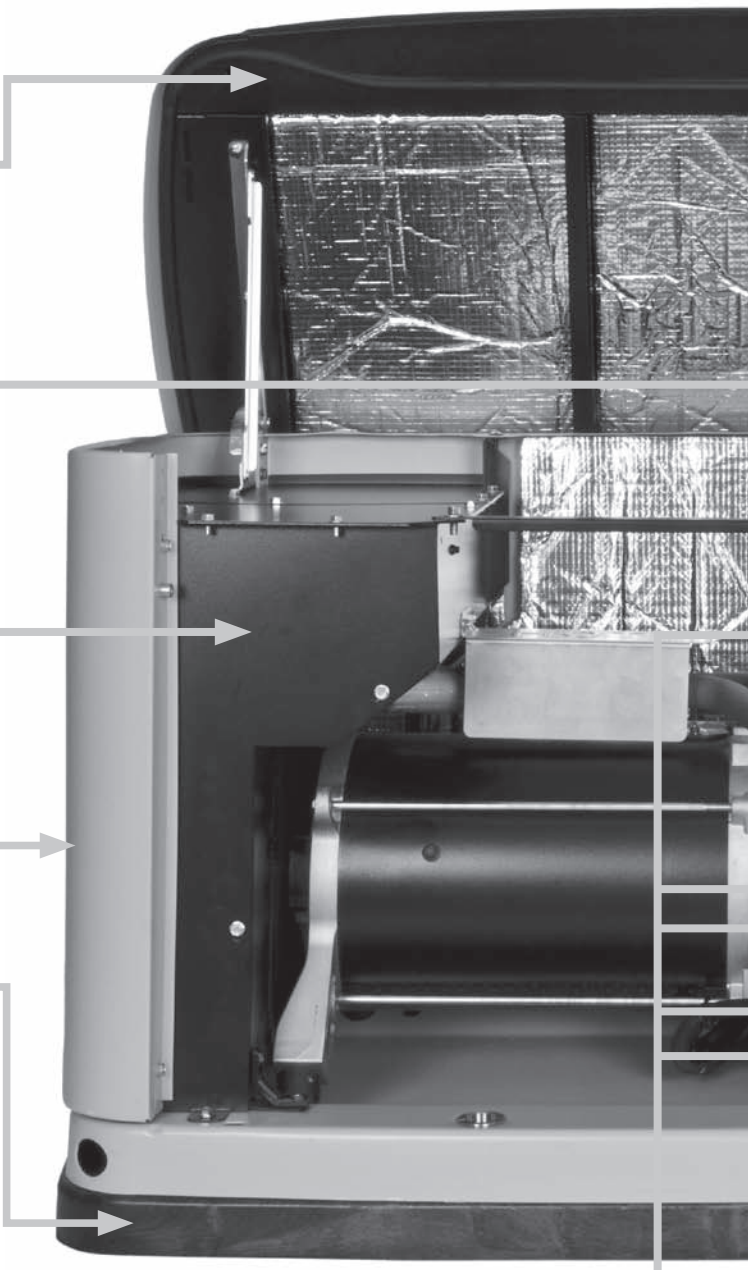
150 MPH wind resistant design on both steel and aluminum units, ASCE 7 Standards. Electrostatically applied textured epoxy paint for added durability.

Composite base

Air cooled units are provided with composite mounting pad. Liquid cooled units require a concrete slab.

Oil dipstick, low oil switch, high temperature switch, oil filter, oil drain hose

Break in periods are not required on Siemens standby generators to initiate the warranty, but are recommended.



Snap-in cover plate

Easy access for remote wireless monitor. Refer to page 12 for monitor offering.

Fuel line connection

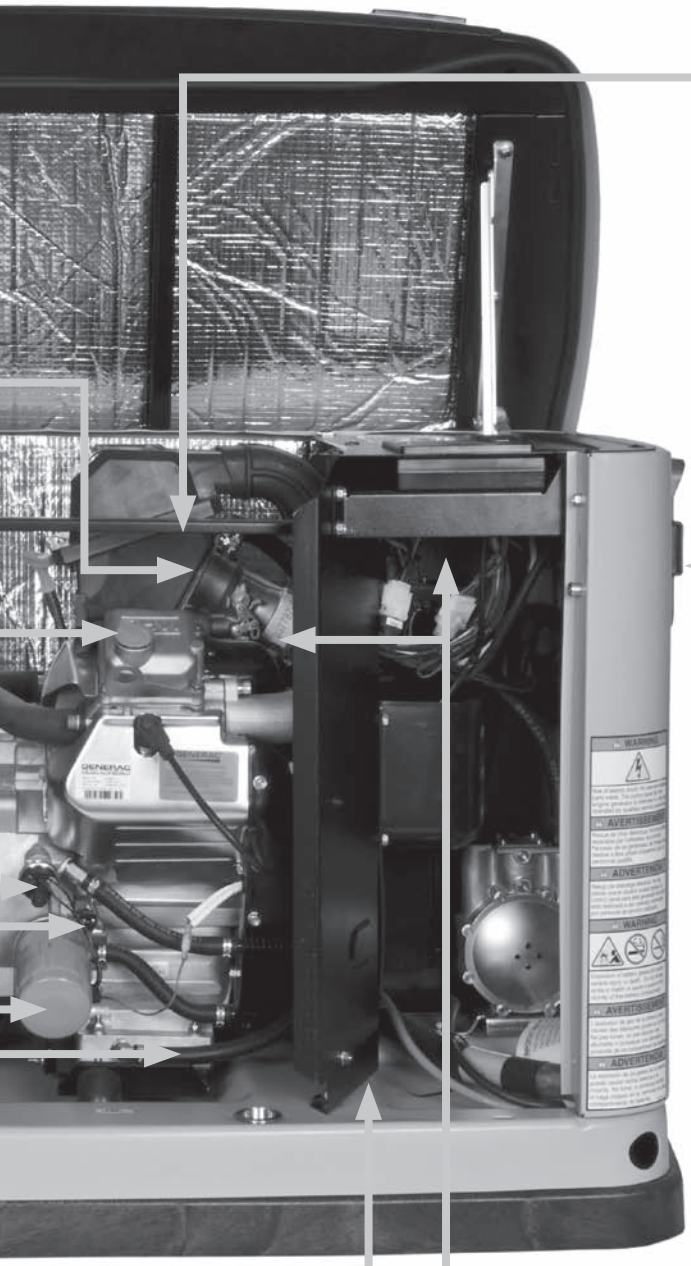
A section of UL or AGA approved flexible fuel line is required to protect the rigid fuel line connections against generator vibration. 1' flexible fuel line connector is included.

Generator back view



Standby Power Systems

Air Cooled Generator Features



Air filter

Prolong the life of your engine through routine maintenance and ensure warranty requirements are met.

Maintenance is recommended annually or every 200 hours. For 8 - 17 kW and every 100 hours for 22 kW.

Refer to page 12 for maintenance kit offerings.

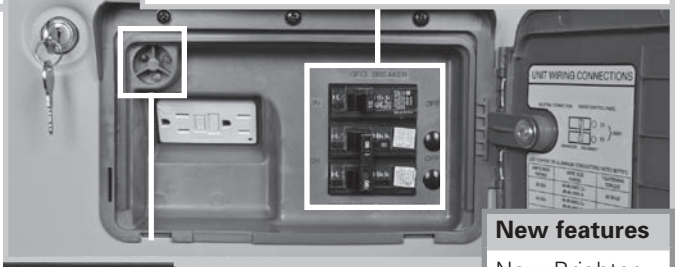


External breaker connections

180º swing door capability and prop rod allows full range of motion for ease of access during installation as well as servicing on 8 - 22 kW units.

External mainline circuit breaker

Power shutdown eliminates the need to open the enclosure. Meets fire marshall code.





LED indicator lights included on 8-22 kW

- Green = Generator OK
- Yellow = Maintenance needed (not on 8-14kW)
- Red = Contact dealer

New features

New Brighter LED indicator lights

Door improvement with lip to prevent water from leaking in.

Control panel

Evolution controller functions include monitoring utility power, triggering the automatic transfer switch, starting and stopping the generator, exercising the generator, and monitoring the generator for any system faults. Combines the voltage regulator, engine control board and battery charger into one single item

Brings more functionality to the generator control for a smarter power solution

Product Activation is required on all Evolution Controlled Models to engage automatic transfer mode. Generator will operate in manual mode until activation code is entered. Easy, one-time activation process can be completed in shop or on-site.

Data label is located inside the generator. Serial number is required for generator activation.





Larger battery compartment

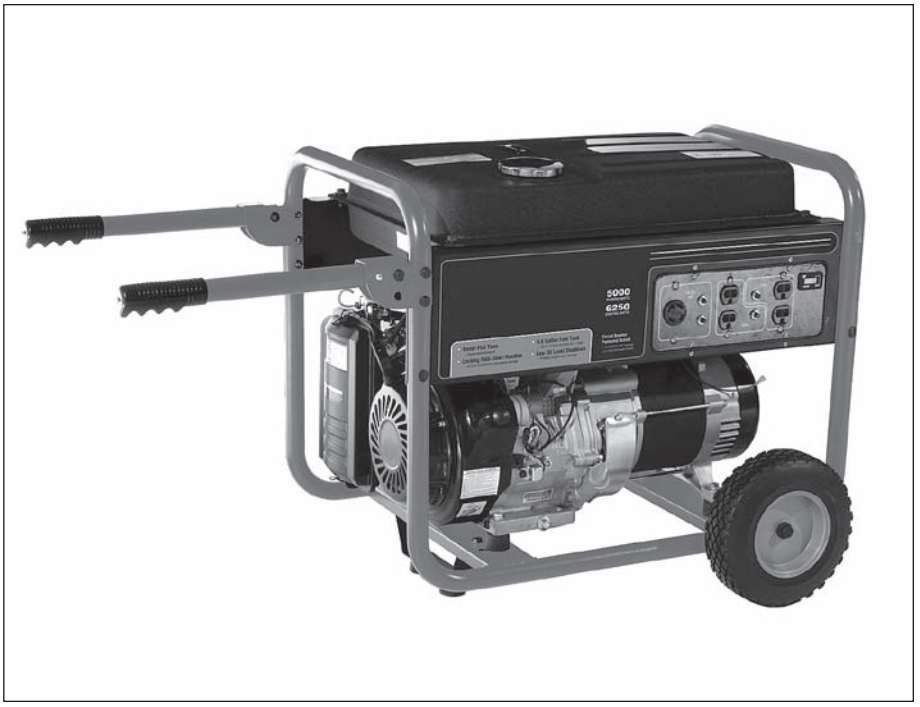
Batteries are not included and must be purchased separately.
The recommended battery is a 26 frame battery capable of 525-550cca.



Standby Power Systems

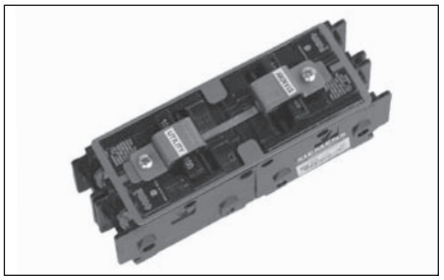
Portable Generators

5.5, 6.5, 7.5, 8, 15, 17.5 kW



Features and ratings

- Ideal for residential emergency and job-site power
- Gasoline powered, OHV engine
- Include handles and wheels for easy movement
- Hour meter included
- Large variety of outlets
- Low noise muffler
- 2 year residential warranty
- Easily integrated into home electrical systems with Siemens breaker interlock kits (pictured below)



	PG0055	PG0065	PG0075E①	PG0080E①	PG015①	PG017①
Rated Power	5.5 kW	6.5 kW	7.5 kW	8 kW	15 kW	17.5 kW
Surge	6.875 kW	8 kW	9.37 kW	10 kW	22.5 kW	26.2 kW
Rated Amps @ 60Hz 120/240, 1Ø, 1.0 pf	22.9	27.1	31.2	33.3	62.5	73
Engine RPM	3600	3600	3600	3600	3600	3600
Fuel Capacity (gallons)	6.6	6.6	8	8	16	16
Dimensions (inches)	34 x 26.5 x 27.5	34 x 27 x 28	28.75 x 26.75 x 26	34 x 27 x 28	39 x 31 x 49	39 x 31 x 49
Weight (lbs)	180	172	201	192	450	475

① Manual Electric Starter



Portable Accessories:

- 5715 - Lifting Beam Kit; 6.5 kW & 8.0 kW

Refer to page 12 for Portable Maintenance Kits

Standby Power Systems

Liquid Cooled Standby Generators

Industry leading system controls



Type "N" Nexus Digital LCD Controller

Functions include monitoring utility power, triggering the automatic transfer switch, starting and stopping the generator, exercising the generator, and monitoring the generator for any system faults.

- **Expanded event log capability**
  Records up to 50 events within the controller on ALL units.
- **High Voltage Shutdown**
  Shuts down the generator at >130% rated voltage for 200 milliseconds or >110% for 5 seconds to better protect home owner appliances or connected items.
- **Low Voltage Shutdown**
  Shuts down the generator at <60% voltage for 5 seconds to better protect home owner appliances or connected items.
- **Internal Fault Shutdown**
  Shuts down the generator when a failure is detected within the Nexus Controller for more protection and easier diagnostics.
- **Battery Sentinel**
  Monitors the battery and charging system to indicate that the battery is trending towards failure or that it has failed.
- **Smart Battery Charger**
  Only delivers a charge to the battery when needed - Varies battery charge depending on ambient air temperature to increase or decrease charge depending on the temperature.
- **Improved Voltage Regulation**
  With the combination into the Nexus Controller, the improved voltage regulation delivers an industry leading voltage regulation +/- 1%.
- **Product Activation**
  Requires each generator to be activated via website or phone before automatic function is enabled - Allows a warranty activation start point for every generator sold.
- **External Common Fault Alarm**
  The Nexus Controller has a provision to connect to a set of contacts that will allow for a common alarm when any of the generator shut downs occur- This will allow individuals to connect into security systems, home automation systems or simply drive a different alarm within a home or business.
- **Adjustable generator start time**
  When utility fails, the control is factory set to delay 10 seconds prior to starting the engine. There is also the capability to change the delay time between 10-30 seconds.
- Incorrect Wiring Error
  Eliminates the potential of damaging the Nexus Controller if it is not connected properly, a warning message is displayed that must be corrected before the controller is allowed to be fully operational.

Standby Power Systems

Liquid Cooled Generators

1800, 2300, and 3600 RPM, 1Ø and 3Ø



Standard features

- UL 2200 Listed
- Meets EPA Emission Regulations
- Operate on either natural gas or propane vapor
- Automatic high temperature, low coolant, low oil pressure, and over speed shutdown
- Automatic voltage regulator with over voltage protection
- Isochronous Electronic Governor
- Safety fuse included
- Smart Battery Charger
- Quiet run weekly self test
- Provided with Type "N" Nexus controller
- Compatible with "SE" and "SL" Type ATS's

Catalog number				
120/240V, 1Ø	120/208V, 3Ø	120/240V, 3Ø	277/480V, 3Ø	kW rating③
SGN022RBAL	SGN022CBAL	SGN022JBAL	—	22
SGN025RBS	SGN025CBS	SGN025JBS	—	25
SGN027RBAL	SGN027CBAL	SGN027JBAL	—	27
SGN030RBS	SGN030CBS	SGN030JBS	—	30
SGN036RBAL	SGN036CBAL	SGN036JBAL	SGN036IBAL	36
SGN045RBS	SGN045CBS	SGN045JBS	SGN045IBS	45
SGN045RBSE	SGN045CBSE	SGN045JBSE	SGN045IBSE	
SGN048RBAL	SGN048CBAL	SGN048JBAL	SGN048IBAL	48
SGN048RBALE	SGN048CBALE	SGN048JBALE	SGN048IBALE	
SGN060RGST	SGN060CGST	SGN060JGST	SGN060IGST	60
SGN060RPST	SGN060CPST	SGN060JPST	SGN060IPST	
SGN060RGAT	SGN060CGAT	SGN060JGAT	SGN060IGAT	
SGN060RPAT	SGN060CPAT	SGN060JPAT	SGN060IPAT	
SGN070RGAL	SGN070CGAL	SGN070JGAL	SGN070IGAL	70
SGN070RPAL	SGN070CPAL	SGN070JPAL	SGN070IPAL	
SGN070RGALE	SGN070CGALE	SGN070JGALE	SGN070IGALE	
SGN070RPALE	SGN070CPALE	SGN070JPALE	SGN070IPALE	
SGN080RGA	SGN080CGA	SGN080JGA	SGN080IGA	80
SGN080RPA	SGN080CPA	SGN080JPA	SGN080IPA	
SGN100RGALE	SGN100CGALE	SGN100JGALE	SGN100IGALE	100
SGN100RPALE	SGN100CPALE	SGN100JPALE	SGN100IPALE	
SGN130RGAE	SGN130CGAE	SGN130JGAE	SGN130IGAE	130
SGN130RPAE	SGN130CPAE	SGN130JPAE	SGN130IPAE	
SGN150RGAE	SGN150CGAE	SGN150JGAE	SGN150IGAE	150
SGN150RPAE	SGN150CPAE	SGN150JPAE	SGN150IPAE	

Standby Power Systems

Liquid Cooled Generators

1800, 2300, and 3600 RPM, 1Ø and 3Ø



25 and 30 kW generators are ideal for whole house back up for larger home and small businesses.



45 and 60 kW generators are ideal for most commercial applications including small office buildings, churches, retail centers, schools, and restaurants. Being light weight makes them appropriate for roof mounting.



130 kW and 150 kW generators are ideal for large commercial applications requiring sophisticated monitoring.

Fuel	Enclosure	Engine size	Speed	Weight (lbs.)	Dimensions (in.) H x W x D
Both	Aluminum	2.4 L	1800 RPM	843	62.2 x 29 x 33.5
Both	Steel	1.5 L	3600 RPM	875	62.2 x 29 x 33.5
Both	Aluminum	2.4 L	1800 RPM	891	62.2 x 29 x 33.5
Both	Steel	1.5 L	3600 RPM	935	62.2 x 29 x 33.5
Both	Aluminum	2.4 L	1800 RPM	1271	76.8 x 33.5 x 45.1
Both	Steel	2.4 L	3600 RPM	1414	76.8 x 33.5 x 45.1
Both	Aluminum	5.4 L	1800 RPM	1740	76.8 x 33.5 x 45.1
Natural gas	Steel	2.4 L	3600 RPM	1539	77 x 33.5 x 45.1
Liquid propane					
Natural gas	Aluminum	2.4 L	3600 RPM	1422	
Liquid propane					
Natural gas	Aluminum	6.8 L	1800 RPM	2040	97 x 37 x 47
Liquid propane					
Natural gas					
Liquid propane					
Natural gas	Aluminum	4.6 L	3600 RPM	1836	116 x 37 x 55
Liquid propane					
Natural gas	Aluminum	6.8 L	2300 RPM	2531	116 x 37 x 55
Liquid propane					
Natural gas	Aluminum	6.8 L	3600 RPM	2699	116 x 37 x 55
Liquid propane					
Natural gas	Aluminum	6.8 L	3600 RPM	2492	116 x 37 x 55
Liquid propane					

Standby Power Systems

Protector™ Series Automatic Standby Diesel Generators



Protector™ Series Automatic Standby Diesel Generator

All the conveniences of modern living—heat, central air, refrigeration, communication—are nothing without power. When the power supply is disrupted, our lives and businesses can come to a sudden halt. An automatic standby generator protects you from power failures, restoring power within seconds of an outage, so you can have peace of mind and the power you need.

Siemens' new Protector™ Series diesel generators raise the bar for residential and light commercial diesel generators. Building and zoning codes can vary wildly from one region to another. In the past, the only answer was to order expensive, custom-configured solutions.

Until now.

Siemens' diesel-powered Protector Series features Code Ready,

a set of popular preconfigured options and a range of code-driven accessories, so you can feel confident that your generator will be able to conform to the required local codes. The Protector Series is versatile, adaptable, meets UL requirements, and is an affordable optional standby diesel generator for your backup power needs.

Standby Power Systems

Protector™ Series Automatic Standby Diesel Generators

Pre-order checklist

- ☐ The local fire marshal has confirmed that the generator must be located a minimum of _____ feet from a house or other structure.

  NOTE: A minimum clearance of five feet is recommended.

- ☐ The local AHJ has advised me regarding the requirements for electrical and/or building permits, as well as those regulations relating to emissions and fuel storage.

- ☐ I have been advised of the local requirements for construction of a concrete base pad, and whether anchoring requirements are needed for installation on a flood plain.

- ☐ I have confirmed with the appropriate authorities that the generator must be located a minimum of _____ feet from a property line.

- ☐ I have been advised whether the local fire marshal (or other third party) is required to be present at start up.

- ☐ I have confirmed that the installation site is applicable to optional standby only and does not require an NFPA 110 capable generator.

- ☐ The local fire marshal has confirmed that I am required to extend the fuel tank vents _____ feet above the surrounding grade.

- ☐ The local fire marshal has confirmed that local codes require installation of the diesel product safety accessories designated below.

Item	Description	Catalog no.	Required
	Emergency Stop Switch	**6510**	☐ Yes ☐ No
	90% Fuel Level Alarm	**6504**	☐ Yes ☐ No
	Five Gallon Spill Box	**6502**	☐ Yes ☐ No
	Spill Box Drain Back	**6511**	☐ Yes ☐ No
	Anti-Static Fuel Fill Tube	**6507**	☐ Yes ☐ No
	Fuel Tank Support Risers	**6505 (15 & 20 kW)** **6506 (30 & 50 kW)**	☐ Yes ☐ No
	Stainless Steel Fuel Lines	**6513 (15 & 20 kW)** **6517 (30 kW)** **6516 (50 kW)**	☐ Yes ☐ No

Standby Power Systems

Protector™ Series Automatic Standby Diesel Generators

Features

- Two line LCD multilingual digital Evolution Controller (English, Spanish, French, Portuguese) with external viewing window for easy indication of generator status and breaker position.
- Isochronous Electronic Governor
- Sound Attenuated Enclosure
- Smart Battery Charger
- UV/Ozone Resistant Hoses
- +-1 % Voltage Regulation
- Integrated Base Tank provides 24 hour run time minimum at ½ load
- UL/CUL2200/UL 142 Listed
- Meets code requirements for External Vent and Fill



15 - 50 kW Diesel Generator Catalog Numbers

	Catalog logic				Generator information				
Catalog No.	Diesel	kW Size 015 - 15kW 020 - 20kW 030 - 30kW 048 - 48kW 050 - 50kW	Engine Size in Liters 23 - 2.3L 24 - 2.4L 34 - 3.4L	Voltage & Phase 120/240V, 1 Ø - ADSE 120/208V, 3 Ø - GDSE 120/240V, 3 Ø - JDSE 277/480V, 3 Ø - KDSE	Enclosure	Speed	Weight (lbs.)	Dimensions (in.)	db(A) at exercise full load
RD01523ADSE	RD	015	23L	ADSE	Steel	1800 RPM	1,474	49.4 x 80.8 x 30.55	65 / 70
RD01523GDSE	RD	015	23L	GDSE	Steel	1800 RPM	1,474	49.4 x 80.8 x 30.55	65 / 70
RD01523JDSE	RD	015	23L	JDSE	Steel	1800 RPM	1,474	49.4 x 80.8 x 30.55	65 / 70
RD02023ADSE	RD	020	23L	ADSE	Steel	1800 RPM	1,574	49.4 x 80.8 x 30.55	65 / 70
RD02023GDSE	RD	020	23L	GDSE	Steel	1800 RPM	1,574	49.4 x 80.8 x 30.55	65 / 70
RD02023JDSE	RD	020	23L	JDSE	Steel	1800 RPM	1,574	49.4 x 80.8 x 30.55	65 / 70
RD03024ADSE	RD	030	24L	ADSE	Steel	1800 RPM	1,755	55.4 x 95.4 x 35	65 / 70
RD03024GDSE	RD	030	24L	GDSE	Steel	1800 RPM	1,755	55.4 x 95.4 x 35	65 / 70
RD03024JDSE	RD	030	24L	JDSE	Steel	1800 RPM	1,755	55.4 x 95.4 x 35	65 / 70
RD03024KDSE	RD	030	24L	KDSE	Steel	1800 RPM	1,755	55.4 x 95.4 x 35	65 / 70
RD04834ADSE	RD	048	34L	ADSE	Steel	1800 RPM	2,114	55.4 x 95.4 x 35	65 / 70
RD05034GDSE	RD	050	34L	GDSE	Steel	1800 RPM	2,114	55.4 x 95.4 x 35	65 / 70
RD05034JDSE	RD	050	34L	JDSE	Steel	1800 RPM	2,114	55.4 x 95.4 x 35	65 / 70
RD05034KDSE	RD	050	34L	KDSE	Steel	1800 RPM	2,114	55.4 x 95.4 x 35	65 / 70

Standby Power Systems

Protector™ Series Automatic Standby Diesel Generators

Diesel Generators

Siemens diesel generators are fully configured and tested. A fully configured diesel generator means you receive the generator and the fuel tank together. Our generators are prototyped tested, system torsional tested, NEMA MG1-22 evaluation, and motor starting ability tested. The prototype testing includes total commitment to component testing, reliability testing, environmental testing, destruction and life testing, plus testing to applicable CSA, NEMA, EGSA, and other standers. All models also come standard with a state of the art power maximizing regulation system. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque matching the surge loads to the engine and digital regulated the voltage at +-1%. All this allows you to choose a Siemens diesel generator with confidence that these systems will provide superior performance

15 - 50 kW Diesel Generator Specifications

	15 kW	**20 kW**	**30 kW**	**48 / 50 kW**
Model no.	**RD015**	**RD020**	**RD030**	**RD048* / RD050**
Engine/Alternator RPM	1800/1800			
Engine	In-line 4-cylinder			
Fuel Type	Diesel			
Output Voltage 120/240 V, 1Ø, 1.0 pf	62	83	125	200
Output Voltage 120/208 V, 3Ø, 0.8 pf	52	69	104	173
Output Voltage 120/240 V, 3Ø, 0.8 pf	45	60	90	150
Output Voltage 277/480 V, 3Ø, 0.8 pf	n/a	n/a	45	75
Fuel Consumption @ 1/2 load - gal/hr (L/hr)	0.79 (2.99)	1.05 (3.97)	1.45 (5.5)	2.3 (8.71)
Fuel Consumption @ full load - gal/hr (L/hr)	1.48 (5.58)	1.98 (7.48)	2.74 (10.4)	4.3 (16.36)
Quiet-Test Mode	Yes			
db(A) at exercise	65			
db(A) at normal operating load	70			
Enclosure	Steel			
Enclosure Color	Gray			
Warranty	5-year limited			
Dimensions (L" x W" x H")	49.4 x 80.8 x 30.55		55.4 x 95.4 x 35	
Weight (lbs.)	1474	1574	1755	2114
EPA Emission Regulations	Yes			

***1Ø only**

Standby Power Systems

Protector™ Series Automatic Standby Diesel Generators

Easy Order Selection Guide

To determine the correct product codes for a diesel generator and transfer switch follow the steps below. A product code is required to order. To place an order, e-mail or fax the product codes to your inside sales representative or place your order online. If you have questions, call 1-888-Generac. Freight is FOB factory. Charges will be determined at the time of order.

Diesel Generators

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
	kW Ratings e.g. (15 kW = 015)	**Engine** e.g. (2.3L = 23)	**Voltage** 120/240 1Ø = A 120/208 3Ø = G 120/240 3Ø = J 277/480 3Ø = K	**Fuel** Diesel = D	**Enclosure** Steel = S	**Tank** Extended Tank = E
All diesel product codes begin with RD	015 020 030 048* 050*	2.3L @1800 RPM 2.3L @ 1800 RPM 2.4L @ 1800 RPM 3.4L @ 1800 RPM 3.4L @ 1800 RPM	A, G, J A, G, J A, G, J, K A*, G, J, K A, G, J, K	D D D D D	S S S S S	E E E E E
Sample	0 3 0	2 4	G	D	S	E
R D						

Product Number
(Enter on Order Form)

* = 48kW in single phase configuration only. 50kW in three phase configuation only.

Transfer Switches

	Step 1	Step 2	Step 3	Step 4
Selection Criteria	**Transfer Switch used with Generator Controller** Nexus Controller = SL Evolution Controller = SE	**Amp Rating** e.g. (200 Amp = 200)	**Voltage** 120/208V, 1 Ø = R 120/208V, 3 Ø = C 120/240V, 3 Ø = J 277/480V, 3 Ø = I	**Service Disconnect Rated** Blank = No D = Yes
For Standby Generators 8 - 150 kW	SL, SE	100, 150, 200, 300, 400, 600, 800	R, C, J, I	D
Sample →	E	2 0 0	R	D

Product Number
(Enter on Order Form)

NOTE: There are no returns, changes or cancellations on Siemens DIESEL orders. This equipment is built -to-order once payment is received.

Standby Power Systems

Protector™ Series Automatic Standby Diesel Generators

Additional Information

- These units are not available with ALL enclosures.
- MUST USE A CERTIFIED GENERAC WARRANTY DEALER TO DO ANY AND ALL WARRANTY WORK ON THESE UNITS. A technician will be required to go through certification training prior to being able to file a warranty claim for diesel product.
- This product is currently NOT compatible with Mobile Link™.
- Extended warranties are currently NOT available for these units.
- These units will not ship with a battery. Battery requirements are Group 27F, 700 CCA for 15kW – 50kW.
- If you must connect your diesel generator to a day tank it is possible.

  THIS WILL VOID YOUR WARRANTY and Generac will not support the connection to a day tank.
- These are standby only, and will not have a limited prime rating.
- These units are NOT LIFE SAFETY RATED.
- These units CANNOT run on heating oil.
- MUST GET LOCAL FIRE MARSHAL'S APPROVAL BEFORE INSTALLATION. Fire Marshal is required for Diesel generator installations with tanks. Diesel cannot be added to the tank without approval and or witness by the fire marshal. It is also important to check with all other local, regional, and/or state codes that are required for installation. If diesel is added to the tank without the proper authority's approval, the unit can be flagged for hazardous material. This will result in an expensive removal process that the customer will be responsible for.
- NON RETURNABLE.
- Compatible with single and three phase SL and SE series automatic transfer switches.
- Cold weather kits are necessary when the temp regularly falls below 32°F.
- Mobile Link is compatible with Protector Series Diesel

Standby Power Systems

SE & SL Type Transfer Switches



Features and ratings

- 100–800A
- Outdoor NEMA 3R aluminum enclosure
- Open transition
- Compatible with Evolution & Nexus controllers
- Cover more circuits with a smaller generator
- Service rated and non-service rated
- Cover every circuit when paired with a higher kW generator

Transfer Switches

Catalog no.	Amp	Phase	Withstand rating (Amps)	Weight (lb.)	Dimensions (in.)
SE100R	100	120/240V, 1Ø	10,000	20	20 x 14.6 x 7.09
SE100RD		120/240V, 1Ø	10,000	23	20 x 14.6 x 7.09
SL100C		120/208V, 3Ø	10,000	20	24.1 x 20.2 x 7.1
SL100J		120/480V, 3Ø	14,000	53	24.1 x 20.2 x 7.1
SL100I		277/480V, 3Ø	14,000	105	36.1 x 24 x 10
SE150RD	150	120/240V, 1Ø	10,000	39	30 x 13.5 x 6.3
SE200R	200	120/240V, 1Ø	10,000	20	20 x 14.6 x 7.09
SE200RD		120/240V, 1Ø	10,000	39	30 x 13.5 x 6.3
SL200C		120/208V, 3Ø	10,000	20	24.1 x 20.2 x 7.1
SL200J		120/480V, 3Ø	25,000	53	24.1 x 20.2 x 7.1
SL200I		277/480V, 3Ø	25,000	105	24.1 x 20.2 x 7.1
SE200RDPM		120/240V, 1Ø	10,000	80	42.3 x 20.1 x 7.9
SE300RD	300	120/240V, 1Ø	22,000	140	48 x 21.82 x 10.06
SE400R	400	120/240V, 1Ø	22,000	133	36 x 24 x 10.06
SE400RD		120/240V, 1Ø	22,000	140	48 x 21.82 x 10.06
SL400C		120/208V, 3Ø	18,000	133	36.1 x 24 x 10
SL400J		120/480V, 3Ø	18,000	133	36.1 x 24 x 10
SL400I		277/480V, 3Ø	18,000	133	36.1 x 24 x 10
SL600R	600	120/240V, 1Ø	42,000	439	66 x 36 x 21
SL600C		120/208V, 3Ø	42,000	439	66 x 36 x 21
SL600J		120/480V, 3Ø	42,000	439	66 x 36 x 21
SL600I		277/480V, 3Ø	42,000	439	66 x 36 x 21
SL800R	800	120/240V, 1Ø	65,000	469	66 x 36 x 21
SL800C		120/208V, 3Ø	65,000	469	66 x 36 x 21
SL800J		120/480V, 3Ø	65,000	469	66 x 36 x 21
SL800I		277/480V, 3Ø	65,000	469	66 x 36 x 21

Standby Power Systems

Generator Accessories

A complete listing of all the accessories available for each generator type. Listed in the tables following.

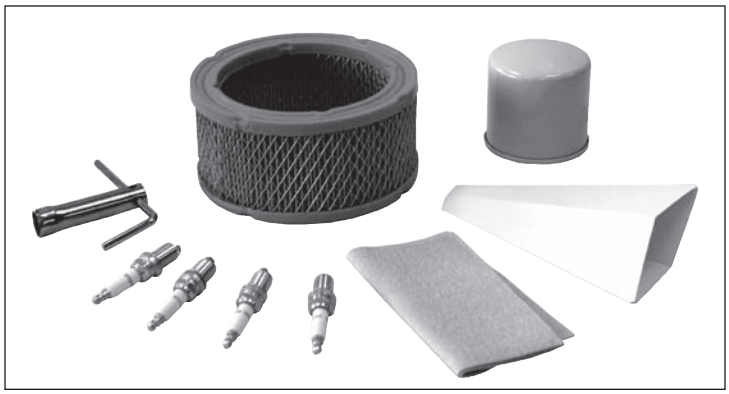


Mobile Link

Cellular remote monitoring system for your generator. Check the status of your generator and receive notifications from any location.

Maintenance Kits

Just like an engine in an automobile, generator engines require routine maintenance. Service kits, which include oil and air filters, are available and are selected based on engine size. Touch up paint is also provided to help cover minor scratches.



Model #	Product	Description
Battery	22-45kW & 60kW*	525cca group 26R
	For 48kW*	525cca group 24F
	70-150kW	These generators ship with battery
5621	Auxiliary transfer switch contact	
GENPAINT	Paint	Gray touch up paint for 2007 units
GENPAINT2	Paint	Generator spray paint gray, textured
GENSHELL2	Generator shell	Display shell, gray
6186	PMM module	
6199	PMM Starter Kit	Kit consists of a 24 VAC, field installed transformer that enables the use of the 24 VAC Power Management Modules (PMMs) and one PMM. The standard controller (without starter kit) can control two HVAC loads with no additional hardware. Not compatible with pre-wired switches.
6424	Brown out kit	
5951	Wireless generator monitoring system	Provides remote monitoring capability for convenient indoor observation. By adding this item, a generator owner can observe generator function, set certain operation parameters and receive maintenance reminders. Advanced Wireless Remote in Home Monitor
5928	Wireless remote	Standard wireless remote in home monitor
GENCART	Generator transport cart	Designed to allow a single individual to move and position any of the air-cooled generators without the need for additional people or equipment. By attaching the cart to the generator through the lifting holes, the
		generator is lifted from the pallet by leverage and is easily wheeled to the appropriate location for final setting

*These batteries are not available thru Siemens. The information advises what battery can be bought from any auto parts store.

Standby Power Systems

Generator Accessories

Model #	Product	Description
5666	Pad skirt	Snaps together around the bottom of the new 20kW generators. This offers a sleek, contoured appearance as well as offering protection from rodents and insects by covering the lifting holes located in the base. Available in grey, the pad skirt fits 20kW generators manufactured after 4/2008.
6502	Spill box	The 5-gallon spill box screws into the existing fuel fill port of the base tank. It captures and contains fuel if over-fueling or spilling occurs.
6505 - 15 & 20kW **6506 - 30 & 50kW**	Tank risers	Tank risers are required in some municipalities to help avoid potential base tank corrosion caused by mounting on rough surfaces.
6507	Fuel fill drop tube	A powder coat painted, steel fuel fill drop tube is required in some municipalities to prevent sparking due to static electricity buildup, which can be caused by the fuel dropping into the tank from the fill area. Using a drop tube also results in submerged filling, which increases the fuel delivery flow rate and reduces vapors, foam and potential tank evaporation.
6513 - 15 & 20 kW 6517 - 30 kW **6516 - 50 kW**	Stainless steel fuel lines	Some municipalities require the use of stainless steel fuel lines instead of the standard hoses provided with the diesel generator products. These stainless steel lines are fire resistant for additional safety.
6510	E-Stop	E-stop allows for immediate fuel shutoff and generator shutdown in the event of and emergency.
6511	Spill box drainback kit	The spill box drainback kit allows fuel that was captured in the 5-gallon spill box to be drained directly back into the fuel tank to avoid vapors.
6512	Lockable fuel cap	The cast iron, lockable fuel cap provides the ability to lock the fuel system to prevent unwanted fuel tampering or fuel siphoning.
6572 - 15 & 20 kW **6571 - 30 kW** **6570 - 50 kW**	Maintenance Kit	The Protector Maintenance Kits offer all the hardware necessary to perform complete maintenance on Generac Protector generators.
6576	Fuel maintenance kit	The Fuel Maintenance Kit contains everything needed to maintain and clean a diesel fuel system.
5704	Paint kit	If the generator enclosure is scratched or damaged, it is important to touch-up the paint to protect from future corrosion. The paint kit includes the necessary paint to properly maintain or touch-up a generator enclosure.
5928	Basic wireless remote	Completely wireless and battery powered, Generac's wireless remote monitor provides you with instant status information without ever leaving the house.
5951	Advanced wireless remote	Remotely control generator functions with the advanced model's LCD display. In addition to remote testing of the generator, set the exercise cycle and maintenance interval reminders.
6186	Power management module (50Amps)	Power Management Modules are used in conjunction with the Smart Switch to increase its power management capabilities. It gives the Smart Switch additional power management flexibility not found in any other transfer switch. Not compatible with pre-wired switches. Note: PMM Starter Kit 6199 required.
6588	Vent extension support kit	The Vent extension support kit consists of 2 aluminum plates with the appropriate pipe cutouts to secure the bent extension pipes coming through the top of the generator enclosure. It helps to minimize stress on the NPT fittings integrated on the tank and also helps protect against pests.
6463	Mobile link	Mobile Link is designed for use with a generator equipped with an LCD display . Mobile Link sends status updates to StandbyStatus.com.
6478	Extension cable	Extension cable to connect Mobile link to the diesel generators.

Standby Power Systems

Generator Accessories

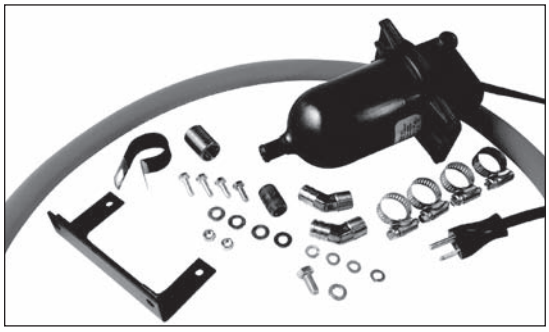
Oil and Air Filter Kits

ASGE

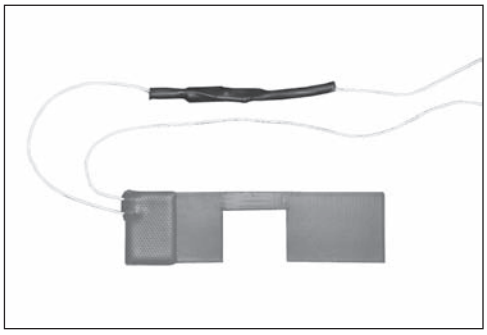
Catalog #	Usage
GENMKIT19	8kW 410cc
GENMKIT20	11kW 530cc
GENMKIT21	14, 16kW 992cc
GENMKIT22	20, 22kW 999cc

ASGN

Catalog #	Usage
GENMKIT10	8kW 410cc
GENMKIT2	10kW 530cc
GENMKIT3	14, 17kW 990cc
GENMKIT11	20kW 990cc
PORTMKIT1	Portable 15, 17.5kW
PORTMKIT2	Portable 5, 6.5kW
PORTMKIT3	Portable 8kW



Block heater



Battery warmer

Catalog #	kW	Engine Size	Description
Cold Weather Kits			
5629*	25, 30	1.6L	Battery Warmer Only
5630	27, 36,45, 60	2.4L	
5631*	48	4.2L	
5632	48, 60	3.0, 4.6, 5.4, 6.8L	
5633	70, 100, 130, 150	6.8L	
6175	25, 30	1.5L	
Block Heaters			
5615*	25, 30	1.6L	Must order a Cold Weather Kit to order a Block Heater
5616	27, 36, 45, 60	2.4L	
5617	36, 60	2.4L	
5618*	48	4.2L	
5619	80	4.6L	
5620	70, 100, 130	6.8L	
5667	150	6.8L	
6174	25, 30	1.5L	
6204	48	5.4L	

Notes

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• Revised •
04/18/14

Renewable Energy Products

Siemens Microinverter Features and Technical Data

Productive
- Maximize energy production
- Resilient to dust, debris, and shading
- Performance monitoring per module

Safe
- Low voltage DC
- Reduced Fire Risk

Smart
- Quick & simple design, installation, and management
- 24/7 monitoring and analysis

Reliable
- System availability greater than 99.8%
- No single point of system failure



SMIINV215R60XX

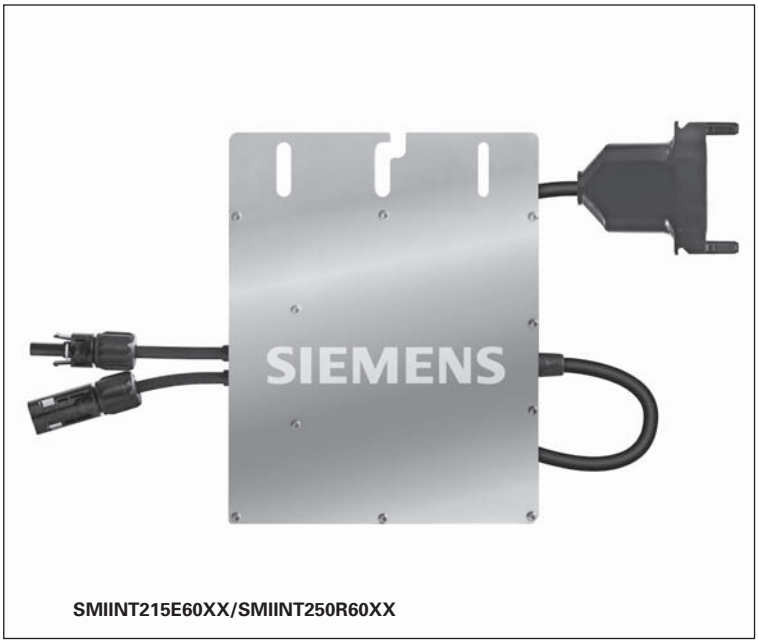
Input Data (DC)	SMIINV215R60XX	
Recommended maximum input power (STC)	190 – 260 W	
Maximum input DC voltage	45 V	
Operating range	16 - 36 V	
Maximum DC short circuit current	15 A	
Maximum input current	10.5 A	
Compatibility	Pairs with most 60-cell PV modules	
Output Data (AC)	@ 208 VAC	**@ 240 VAC**
Rated (continuous) output power	215 W	215 W
Nominal output current	1.0 A_{RMS} (@ $V_{nominal}$)	0.9 A_{RMS} (@ $V_{nominal}$)
Nominal voltage / range	208 / 183 – 229 V	240 / 211 – 264 V
Nominal frequency / range	60.0 / 59.4 – 60.5 Hz	60.0 / 59.3 – 60.5 Hz
Power factor	> 0.95	
Maximum units per 20 A branch circuit	25 (three phase)	17 (single phase)
Maximum output fault current	1.05 A_{RMS} over 3 cycles; 2.52 A_{peak} 1.74 ms duration	
Efficiency		
CEC weighted efficiency	96.00%	
Peak inverter efficiency	96.30%	
Night time power consumption	46 mW	
Mechanical Data		
Operating temperature range (internal)	-40º C to +85º C	
Dimensions (W x H X D)	17.3 cm x 16.4 cm x 2.5 cm (6.8” x 6.5” x 1.0”)	
Weight	1.6 kg (3.5 lbs)	
Enclosure environmental rating	Outdoor – NEMA 6	
Features		
Communication	Power line carrier	
Warranty	25 years	
Compliance	UL1741/IEEE1547, FCC Part 15 Class B, CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01	
Integrated Ground	The DC circuit meets the requirements for ungrounded PV arrays in NEC 690.35. Equipment ground is provided in the Trunk and Drop Cable. No additional GEC or ground is required. Ground fault protection (GFP) is integrated into the microinverter.	

Renewable Energy Products

Siemens Microinverter Features and Technical Data

NEW Microinverters with integrated ground

The newly introduced Microinverters with integrated ground delivers increased energy harvest and reduces design and installation complexity with its all-AC approach. With the advanced SMIINT215R60XX or SMIINT250R60XX, the DC circuit is isolated and insulated from ground, so no Ground Electrode Conductor (GEC) is required for the microinverter. This further simplifies installation, enhances safety, and saves on labor and materials costs.



SMIINT215E60XX/SMIINT250R60XX

Productive

- Maximize energy production
- Resilient to dust, debris, and shading
- No single point of system failure

Simple

- No GEC needed for microinverter
- No DC design or string calculation required
- Easy installation with Engage Cable

Input Data (DC)	**SMIINT215R60XX**		**SMIINT250R60XX**	
Recommended max. input power (STC)	190 – 270 W		210 – 300 W	
Maximum input DC voltage	48 V		48 V	
Operating range	27 – 39 V		27 – 39 V	
Maximum DC short circuit current	16 – 48 V		16 – 48 V	
Maximum input current	10 A		9.8 A	
Compatibility	Compatible with 60-cell PV modules.		Compatible with 60-cell PV modules.	
Output Data (AC)	**@ 208 VAC**	**@ 240 VAC**	**@ 208 VAC**	**@ 240 VAC**
Peak output power	225 W	225 W	250 W	250 W
Rated (continuous) output power	215 W	215 W	240 W	240 W
Nominal output current	1.1 A_{RMS} (@ $V_{nominal}$)	0.9 A_{RMS} (@ $V_{nominal}$)	1.5 A_{RMS} (@ $V_{nominal}$)	1.0 A_{RMS} (@ $V_{nominal}$)
Nominal voltage / range	208 / 183 – 229 V	240 / 211 – 264 V	208 / 183 – 229 V	240 / 211 – 264 V
Nominal frequency / range	60.0 / 57 – 61 Hz		60.0 / 57 – 61 Hz	
Power factor	> 0.95		> 0.95	
Maximum units per 20 A branch circuit	25 (three phase)	17 (single phase)	24 (single phase)	16 (single phase)
Maximum output fault current	850 mA_{RMS} for 6 cycles		850 mA_{RMS} for 6 cycles	
Efficiency	**@ 208 VAC**	**@ 240 VAC**	**@ 208 VAC**	**@ 240 VAC**
CEC weighted efficiency	96.50%		96.50%	
Peak inverter efficiency	96.50%		96.50%	
Night time power consumption	65 mW max.		65 mW max.	
Mechanical Data				
Operating temperature range (internal)	-40º C to +85º C		-40º C to +85º C	
Dimensions (W x H X D)	16.3 cm x 17.3 cm x 2.5 cm (6.4" x 6.8" x 1.0")*		17.1 cm x 17.3 cm x 3.0 cm (6.7" x 6.8" x 1.2")*	
Weight	1.6 kg (3.4 lbs)		2.0 kg (4.4 lbs)	
Enclosure environmental rating	Outdoor – NEMA 6		Outdoor – NEMA 6	
Features				
Communication	Power line		Power line	
Warranty	25 years		25 years	
Compliance	UL1741/IEEE1547, FCC Part 15 Class B, CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01		UL1741/IEEE1547, FCC Part 15 Class B, CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01	
Integrated Ground	The DC circuit meets the requirements for ungrounded PV arrays in NEC 690.35. Equipment ground is provided in the Trunk and Drop Cable. No additional GEC or ground is required. Ground fault protection (GFP) is integrated into the microinverter.			

Renewable Energy Products

Catalog Logic

Siemens Microinverter System

SMI	INV	215	R	60	MC

Product System
SMI = Siemens Microinverter System

Product Type
INV or I = Inverter
INT = Integrated Ground Inverter

Output Power
215 = 215 Watts
250 = 250 Watts

Voltage
R = 120 V

Compatible PV Module Cell Count
60 = 60 Cell

PV Module Connector Type
MC = MC-4 Connector
TY = Tyco Connector
SM = SMK Connector

Trunk and Drop Cabling

ET	17	208	30

Product System
ET = Trunk and Drop Cable System

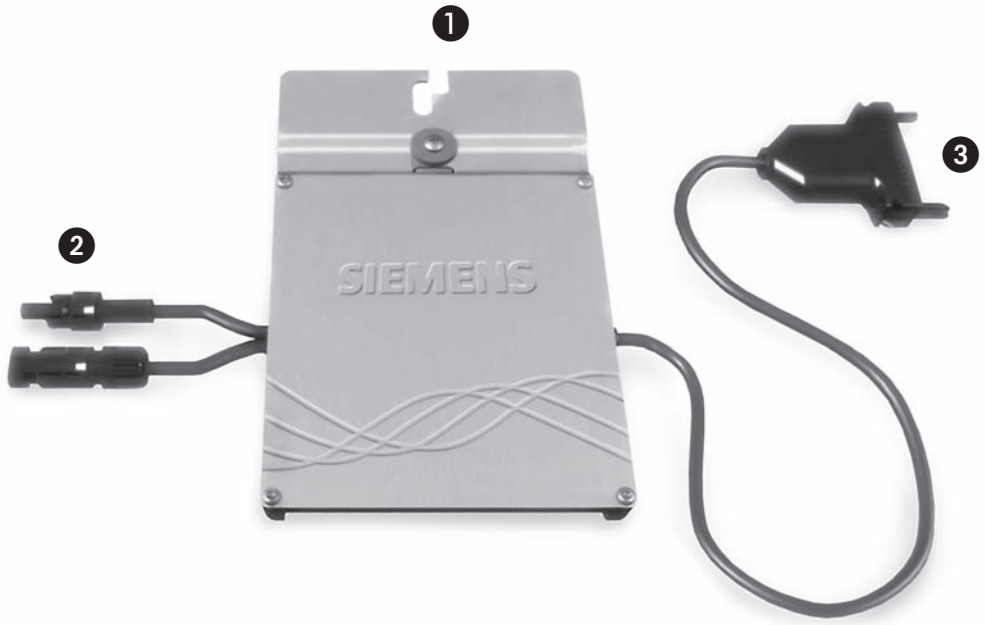
Spacing Between Trunk and Drop Locations
10 = 1.0 m
17 = 1.7 m

System Voltage
240 = 240 VAC, Single Phase
208 = 208 VAC, Three Phase

Drop Count
30 = 30 drop
40 = 40 drops
BULK = 240 drops

Renewable Energy Products

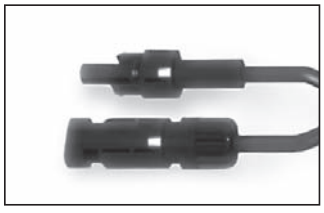
Siemens Microinverter System



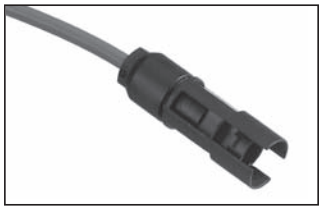
Microinverter Overview

- One Inverter per PV Module
- Mounts to Racking ❶
- MC or Tyco Connector ❷
- AC out to Trunk-and Drop Cabling ❸

Catalog #	Output (Watts)	Phase Voltage (V)	Connector Type
SMIINV215R60MC	215	120	MC-4
SMIINV215R60TY	215	120	TYCO
SMIINT215R60MC	215	120	MC-4
SMIINT215R60TY	215	120	TYCO
SMIINT215R60SM	215	120	SMK
SMIINT250R60MC	250	120	MC-4
SMIINT250R60TY	250	120	TYCO
SMIINT250R60SM	250	120	SMK



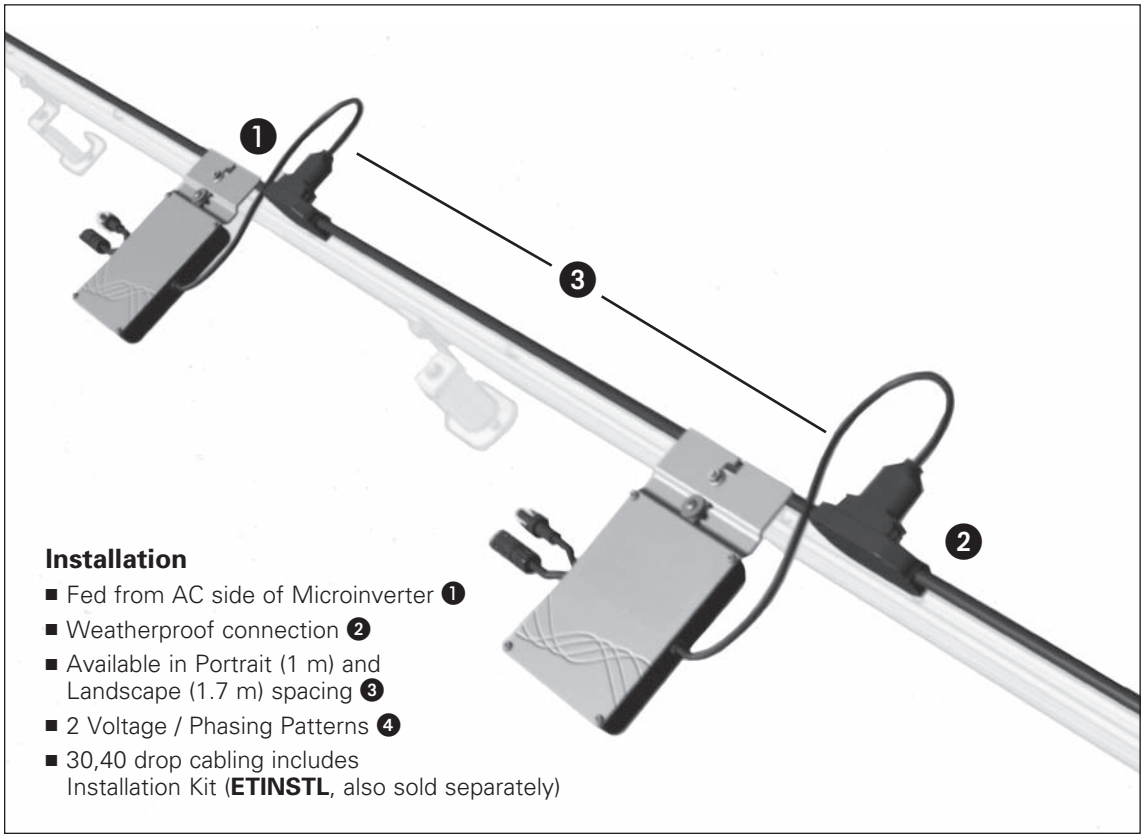
MC-4 Connector



Tyco Connector

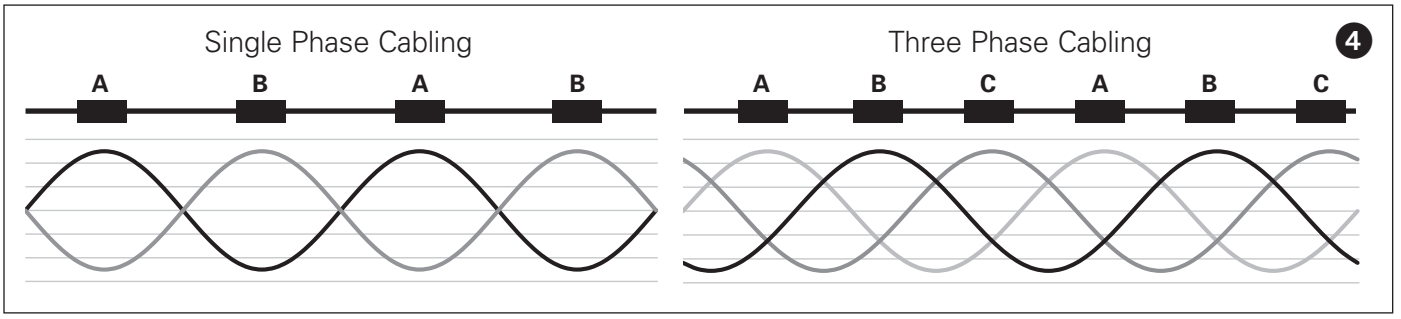
Renewable Energy Products

Microinverter Trunk and Drop Cabling



Installation

- Fed from AC side of Microinverter ❶
- Weatherproof connection ❷
- Available in Portrait (1 m) and Landscape (1.7 m) spacing ❸
- 2 Voltage / Phasing Patterns ❹
- 30,40 drop cabling includes Installation Kit (**ETINSTL**, also sold separately)



Catalog #	Cable Type	Length (m)	Voltage Rating (V)	Phase	Number of Drops
ET1024040	Trunk & Drop	1	240	Single	40
ET10240BULK	Trunk & Drop	1	240	Single	240
ET1724040	Trunk & Drop	1.7	240	Single	40
ET17240BULK	Trunk & Drop	1.7	240	Single	240
ET1020830	Trunk & Drop	1	208	Three	30
ET10208BULK	Trunk & Drop	1	208	Three	240
ET1720830	Trunk & Drop	1.7	208	Three	30
ET17208BULK	Trunk & Drop	1.7	208	Three	240

Renewable Energy Products

Microinverter System Components

Envoy

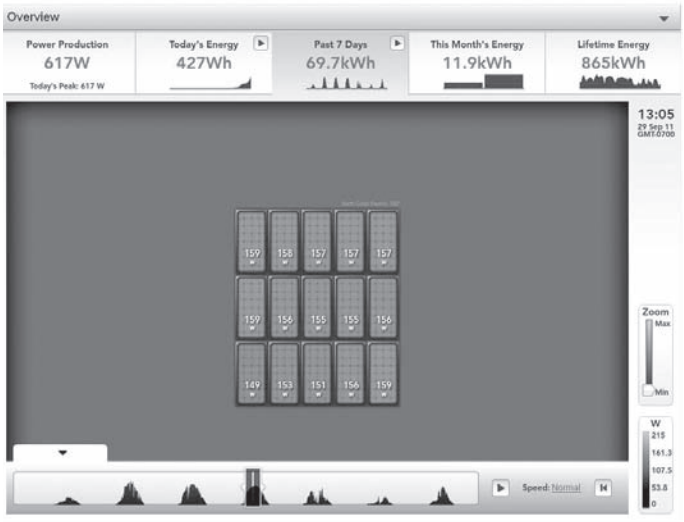
- Plugs into standard 120 V wall outlet and Ethernet cable
- Reads Power Line Carrier (PLC) Signal from each inverter
- Communicates via PLC or Wi-Fi to display monitoring data on Enlighten.
- Transmits software / firmware updates from Enphase servers to each inverter
- UL 60950 Listed
- Dim: 8.8" x 4.4" x 1.7"



Catalog #	Description
IEMU03	Envoy Communications Gateway, indoor, PLC Bridge, Monitoring Included
IEMU03WIFI	Envoy Communications Gateway, indoor, Wi-Fi enabled, Monitoring Included
EPLC01	Power Line Carrier Ethernet Bridge
ELCF120001	Line Communication Filter, Envoy Included

Enlighten

- Online monitoring service
- Allows for 24/7 monitoring of individual PV modules
- Web and smart phone accessible
- Can mimic roof layout for easy understanding
- Can aggregate over several installs
- Easily troubleshoot faulty modules



Lifetime subscription included with each Envoy

Renewable Energy Products

Microinverter Accessories



Terminator Cap

Part Number: **ETTERM10**
Required for end of each cable run



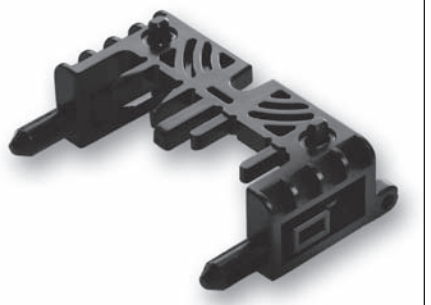
Seal Cap

Part Number: **ETSEAL10**
Used to Fill unused Drop Positions on Trunk Cable



Splice Kit

Part Number: **ETSPLK05**
Used to splice cables



Disconnect Tool

Part Number: **ETDISC05**
Needed to remove Seal Cap

Catalog #	Part Description	Order Multiple
ETINSTL	Installation Kit (4x Terminator Cap, 4x Seal Cap, 1x Disconnect Tool)	1
ETTERM10	Terminator Cap, 5 Pole	10
ETSPLK05	Splice Kit	5
ETDISC05	Disconnect Tool	5
ETSEAL10	Seal Cap for unused drop	10
ETCLIP100	Cable Clip for Trunk and Drop Cables	100

Renewable Energy Products

VersiCharge Features and Benefits



Easy, 2 Button Controls

- Indicating Halo for easy status check
- Left Button stops and restarts charging
- Right Button sets 2, 4, 6, or 8 hour Charge Delay
- LED Indicators for each



Cord Management

- Enclosure is designed for cord to be looped when not in use
- Built in J-Plug Holster stores and protects plug from weather, debris, and damage
- All VersiCharge units come with long flexible cord for easy charging



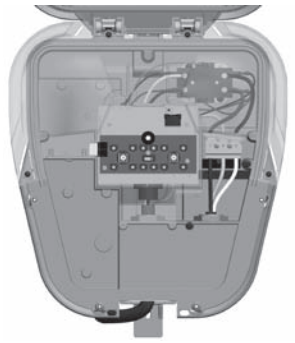
Load Control Compatible

- Inputs to remotely turn unit on or off
- Allows for control by home automation system or utility company



Adjustable Amperage

- Allows for changing charge rate to accommodate for customer preference, circuit capability and car charging rate capacity



Hinged Lid for Speed and Ease

- Hinged cover stays in place for easy maintenance
- No components in cover mean no risk of damage
- Ample spacing to work inside device
- One hand open / close
- Cover uses only 4 screws compared to up to 12 for competitors



NEMA 4 Rated Enclosure

- Rated for direct water spray by sprinklers, hoses, or any weather
- ~50% recycled plastic content
- Glass impregnated plastic for strength and fire safety

Electric Vehicle Supply Equipment

VC	30	GRY	U

Product System
VC = Versicharge

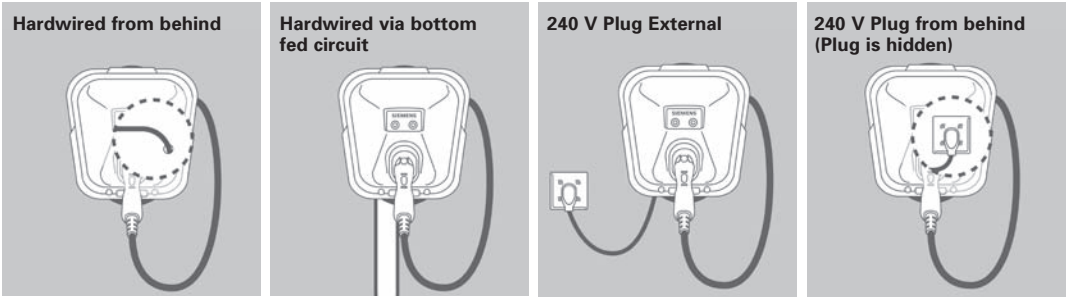
Output Amperage
30 = 30 A

Color
GRY = Light Grey

Installation Option
U = Universal (bottom/rear fed, hardwired/permanent)
HW = Hardwired/permanent

Renewable Energy Products

VersiCharge EVSE and Accessories



Flexible Install Options



Parameters

	Attribute	Universal Model	Hardwired Model
Essentials	Part Number	**VC30XXXU**	**VC30XXXHW**
	Amperage	30 Amps	
	Input voltage	208 - 240 V_{AC}	
	Cord Length	20 ft	14 ft
	Wall Weight	14.5 lbs	12.5 lbs
	Dimensions	14.5" W x 16.0" H x 6.5" D	
	Output power	1.8 to 7.2 kW	
	Enclosure	NEMA 4	NEMA 1
	Plug in Installation	Yes (below or behind unit)	No
	Permanent Installation	Yes	Yes
Electrical	Circuit requirement	40 Amperes*	
	Input power connections	Line 1, Line 2, Earth Ground	
	Recommended branch breaker	40 Ampere double pole (Siemens: Q240 plug in type, B240 bolt on type)	
Mechanical	Connector	SAE J1772	
Safety and Operational	Standards Compliance	UL, SAE J1772, NEC 625	
	EMC	FCC Part 15 Class B	
	Operating temperature	-30°C to +50° C	
	Storage temperature	-40°C to +60°C	
	Operating humidity	Maxiumum 95% non-condensing	

*Adjustment of amperage output possible via dial in the unit, will effect the power output of charger

Electric Vehicle Chargers

Part number	Model	Output amperage	Color	Feeder location
VC30GRYU	Universal VersiCharge	30 A	Grey	Rear/Bottom/Hardwired
VC30GRYHW	Hardwired VersiCharge	30 A	Grey	Hardwired

Accessories

Catalog #	Model
VCMNTGBRK	Mounting Bracket for VersiCharge

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Siemens Design Assistant Disc

To assist consulting electrical engineers and designers, Siemens has introduced the Design Assistant. This disc, available at no charge from your local Consultant Account Manager, includes tools and reference that will make your job easier. Some of the contents are:

Design Calculators

- Available Fault Current Calculator
- Advanced Voltage Drop Calculator
- Panelboard Schedule (Excel™ and CADD)
- Equipment Sizing Assistant
- Conduit Fill Calculator
- Circuit Breaker Time Current Curve Program
- Basic Lighting Calculator
- Switchboard Heat Output Calculator
- Switchboard Weight Calculator
- TVSS Sizing Assistant
- Motor Data Calculator
- and more…

Training

- Step2000 Training Programs (19 books in all), including Basics of Electricity, Drives, Panelboards, MCC's, PLC's and Energy Measurement.

Specifications

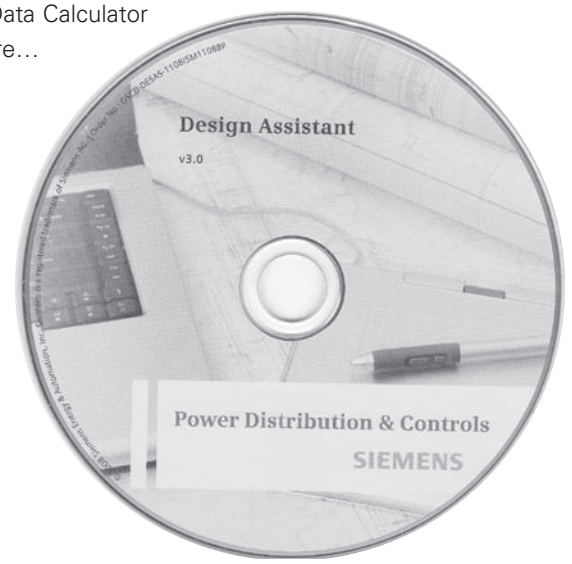
- Specifications in Microsoft Word™ format for all our Division 16 and Division 26 products (more than 45 sections), including commissioning

Technical Information

- Checklists and Common Forms
- CADD Blocks of switchboards and substations
- Technical Information and White Papers

Reference

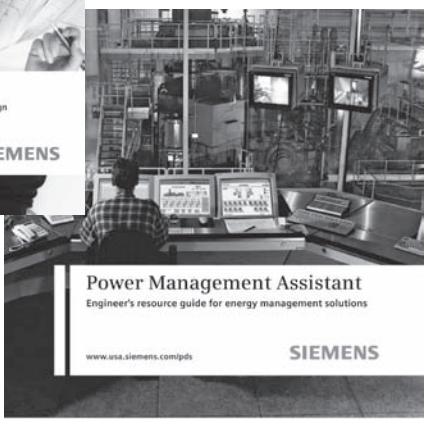
- All our Selection & Application Guides, brochures, installation manuals, and more
- Full pdf versions of our SpeedFax and Industrial Controls Catalogs



The Siemens Assistant Series

The Siemens Assistant Series of discs are designed to provide the engineer with an expert level of technical information on each product including manuals, white papers, and technical presentations. Available titles in the series now include Low Voltage Switchgear and Power Monitoring.





For a copy of the Siemens Design Assistant Disc or for information on the Assistant Series of discs, contact your local Consultant Business Developer or Sales Engineer.

Types of Power Distribution Systems

There are several basic considerations which must be included by the system design engineer to select and design the best power distribution system which will supply power to both present and future loads most economically. Among these are:

- Safety
- Reliability
- Maintenance
- Flexibility
- Voltage Regulation
- Initial Investment
- Simplicity of Operation

The characteristics of electrical service available at the building site, the types of loads, the quality of service required, and the size and configuration of building are also important factors that will influence system design and circuit arrangement.

Four basic circuit arrangements are used for the distribution of electric power. They are the radial, primary selective, secondary selective, and secondary network circuit arrangements. The following discussion of these circuit arrangements covers both the high-voltage and low-voltage circuits. The reader should recognize that the high-voltage circuits and substations may be owned by either the utility company or the building owner, depending upon the electric rates, the practice, and requirements of the particular electric utility serving the specific building site.

Radial System

If power is brought into a building at utilization voltage, the simplest and the lowest cost means of distributing the power is to use a radial circuit arrangement. The radial system is the simplest that can be used, and has the lowest system investment. It is suitable for smaller installations where continuity of service is not critical.

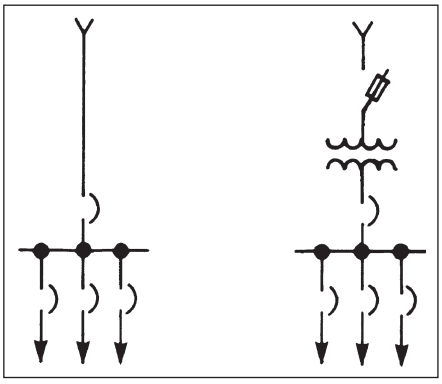


Figure 1. Radial Systems

The low voltage service entrance circuit comes into the building through service entrance equipment and terminates at a main switchgear assembly, switchboard or panelboard. Feeder circuits are provided to the loads or to other subswitchboards, distribution cabinets, or panelboards. Figure 1 shows the two forms of radial circuit arrangements most frequently used. Under normal operating conditions, the entire load is served through the single incoming supply circuit, and in the case of high voltage service, through the transformer. A fault in the supply circuit, the transformer, or the main bus will cause an interruption of service to all loads. A fault on one of the feeder or branch circuits should be isolated from the rest of the system by the circuit protective device on that circuit. Under this condition, continuity of service is maintained for all loads except those served from the faulted circuit.

The need for continuity of service often requires multiple paths of power supply as opposed to the single path of power supply in the radial system.

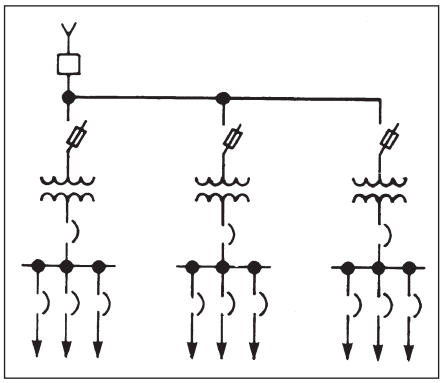


Figure 2. Expanded Radial System—Single Primary Feeder

A fault in a primary feeder in the arrangement shown in Figure 2 will cause the main protective device to operate and interrupt service to all loads. If the fault were in a transformer, service could be restored to all loads except those served from that transformer. If the fault were in a primary feeder, service could not be restored to any loads until the source of trouble had been eliminated. Since it is to be expected that more faults will occur on the feeders than in the transformers, it becomes logical to consider providing individual circuit protection on the primary feeders as shown in Figure 3. This arrangement has the advantage of

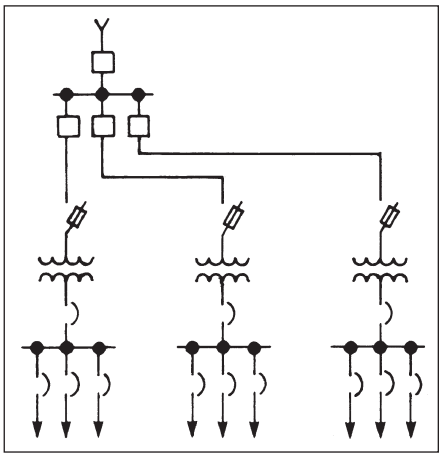


Figure 3. Expanded Radial Systems individual Primary Feeder Protection

making it possible to limit outages due to a feeder or transformer fault to the loads associated with the faulted equipment. If circuit breakers are used for primary feeder protection, the cost of this system will be high. Even if fused switches are used, the cost of the arrangement of Figure 3 will exceed the cost of the arrangement of Figure 2.

Primary Selective System

The circuit arrangement of Figure 4 provides means of reducing both the extent and duration of an outage caused by a primary feeder fault. This operating feature is provided through the use of duplicate primary feeder circuits and load interrupter switches that permit connection of each secondary substation transformer to either of the two primary feeder circuits. Each primary feeder circuit must have sufficient capacity to carry the total load in the building.

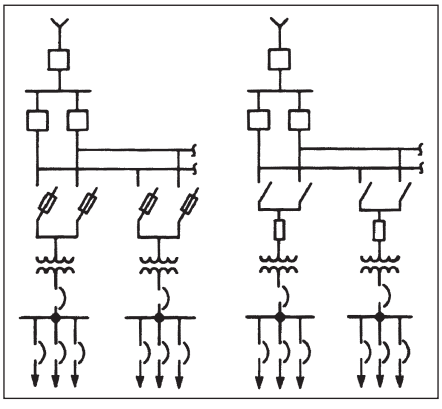


Figure 4. Primary Selective Systems

Under normal operating conditions, the appropriate switches are closed in an attempt to divide the load equally between the two primary feeder circuits. Then, should a primary feeder fault occur, there is an interruption of service to only half of the load. Service can be restored to all loads by switching the deenergized transformers to the other primary feeder circuit. The primary selective switches are usually manually operated and outage time for half the load is determined by the time it takes to accomplish the necessary switching. An automatic throwover switching arrangement could be used to avoid the interruption of service to half the load. However, the additional cost of the automatic feature may not be justified in many applications. If a fault occurs in a secondary substation transformer, service can be restored to all loads except those served from the faulted transformer.

The higher degree of service continuity afforded by the primary selective arrangement is realized at a cost somewhat higher than a simple radial system due to the extra primary cables and switchgear.

Secondary Selective System

Under normal conditions, the secondary selective arrangement of Figure 5 is operated as two separate radial systems. The secondary tie circuit breaker in each secondary substation is normally open.

The load served from a secondary selective substation should be divided equally between the two bus sections. If a fault occurs on a primary feeder or in a transformer, service is interrupted to all loads associated with the faulted feeder or transformer. Service may be restored to all secondary buses by first opening the main secondary switch or circuit breaker associated with the faulted transformer and primary feeder, and then closing the tie breaker. The two transformer secondary circuit breakers in each substation should be interlocked with the secondary tie breaker in such a manner that all three cannot be in the closed position simultaneously. This prevents parallel operation of the two transformers and thereby minimizes the interrupting duty imposed on the secondary switching devices. It also eliminates the possibility of interrupting service to all loads on the bus when a fault occurs in either a primary feeder or a transformer.

The cost of the secondary selective system will depend upon the spare capacity in the transformers and primary feeders. The minimum transformer and primary feeder capacity will be determined by essential loads that must be served under emergency operating conditions. If service is to be provided for all loads under emergency conditions, then each primary feeder should have sufficient capacity to carry the total load, and each transformer should be capable of carrying the total load in each substation.

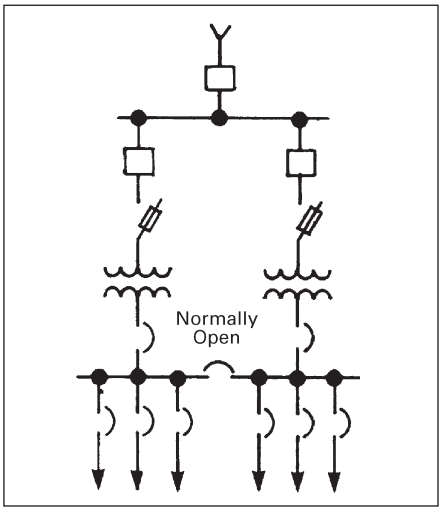


Figure 5. Secondary Selective System Using Close-Coupled Double-Ended Substation

This type of system will be more expensive than either the radial or primary selective system, but it makes restoration of service to all essential loads possible in the event of either a primary feeder or transformer fault. The higher cost results from the duplication of transformer capacity in each secondary substation. This cost may be reduced by shedding nonessential loads.

A modification of the secondary selective circuit arrangement is shown in Figure 6. In this arrangement there is only one transformer in each secondary substation, but adjacent substations are interconnected in pairs by a normally open low voltage tie circuit. When the primary feeder or transformer supplying one secondary substation bus is out of service, the essential loads on that substation bus can be supplied over the tie circuit. The operating aspects of this system are somewhat complicated if the two substations are separated by distance. The best arrangement is to use close-coupled, double-ended substations.

Secondary Network System

Many buildings with radial distribution systems are served at utilization voltage from utility secondary network systems. The network supply system assures a relatively high degree of service reliability. The utility network may take the form of a distributed network or a spot network. If the building demand is in the order of 750 kVA or higher, a spot network will often be established to serve the building. In buildings where a high degree of service reliability is required, and where spot network supply may not be available, the distributed secondary network system is often used. This is particularly true of institutional buildings such as hospitals. The network may take the form of several secondary substations interconnected by low voltage circuits. However, the most common practice is to use some form of the spot network circuit arrangement.

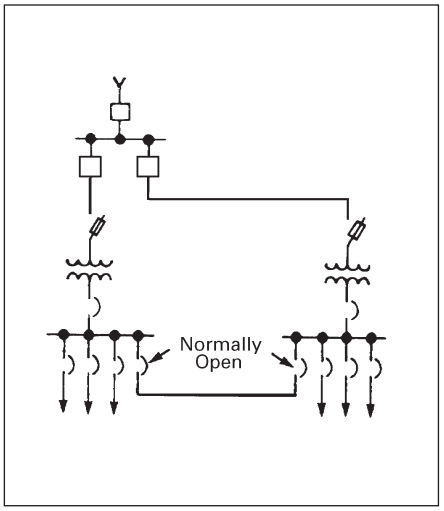


Figure 6. Secondary Selective System Using Two Single-Ended Substations With Cable or Bus Tie

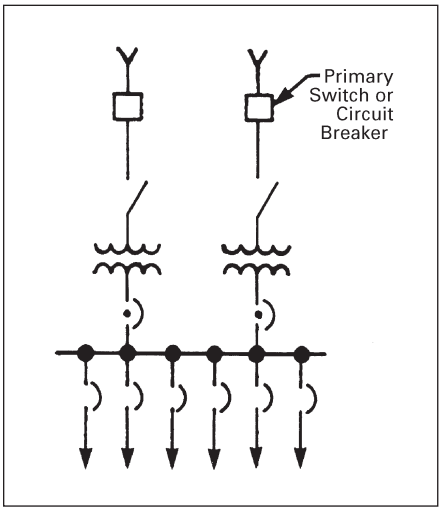


Figure 7. Simple Spot Network System

A simple spot network, such as shown in Figure 7, consists of two or more identical transformers supplied over separate primary feeder circuits. The transformers are connected to a common low voltage

bus through network protectors and are operated in parallel. A network protector is an electrically operated power circuit breaker controlled by network relays in such a way that the circuit breaker automatically opens when power flows from the low voltage bus toward the transformer. When voltages in the system are such that power would flow toward the low voltage bus from the transformer, it will close automatically.

Network protectors are normally equipped with relays which operate for faults in the network transformer or high voltage feeder only. The network is often operated on the assumption that network failure will "burn" open.

Network protectors without supplementary protection do not meet the requirements of the NEC for overcurrent, ground fault, or short circuit protection. Protection of the network or collector bus may be added by providing sensing devices, including ground fault detection, with tripping of the network protectors. The most common use of the network protector, however, has been by utilities in vaults where failure of the network devices could cause damage limited to the vault. High integrity design involving wide phase separation and the use of "catastrophe" fusing minimize the danger and extent of a network failure. A conventional circuit breaker with time overcurrent and instantaneous trip devices plus network relays can meet the NEC requirements. However, the full reliability of the network may be compromised since selectivity between these devices is difficult to obtain.

Under normal operating conditions, the total load connected to the bus is shared equally by the transformers. Should a fault occur in a transformer or on a primary feeder, the network protector associated with the faulted transformer or feeder will open on reverse power flow to isolate the fault from the low voltage bus. The remaining transformer or transformers in the substation will continue to carry the load and there will be no interruption of service to the loads, except for a voltage dip during the time that it takes for the protective equipment to operate.

If only two transformers are used in a spot network substation, each transformer must be capable of carrying the total load served from the low voltage bus. The amount of spare transformer capacity in the substation can be reduced by using a primary selective switching arrangement with each transformer, or by using three or more transformers. If the primary selective switching arrangement is used, the total load can be about 160 percent of the nameplate rating of one of the transformers. This produces an overload on one transformer until such time as the remaining transformer can be switched to the other feeder in the case of a primary feeder fault.

The interrupting duty imposed on the low voltage protective devices in a spot network substation is higher than in radial, primary selective, or secondary selective substations having the same load capability because of the spare transformer capacity required in the spot network substation and because the transformers are operated in parallel.

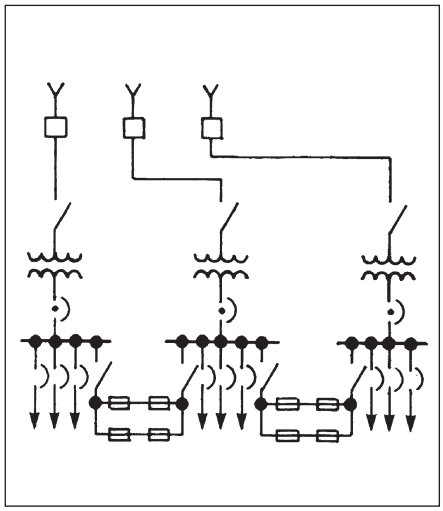


Figure 8. Secondary Network System

The spare transformer capacity, the network protectors, and the higher interrupting duty will make the secondary network arrangement much more expensive than the other arrangements. At the same time, these elements make the reliability of the network system greater than for the other system configurations.

The secondary network may also take the form shown in Figure 8. In this arrangement there is only one transformer in each secondary substation, and the substations are interconnected by normally closed low voltage tie circuits. The tie circuits permit interchange of power between substations to accommodate unequal loading on the substations and to provide multiple paths of power flow to the various load buses. In normal operation, the substations are about equally loaded and the current flowing in the tie circuits is relatively small. However, if a network protector opens to isolate a transformer on a primary feeder fault, the load on the associated bus is then carried by the adjacent network units and is supplied over the tie circuits. This arrangement provides for continuous power supply to all low voltage load buses, even though a primary feeder circuit or a transformer is taken out of service.

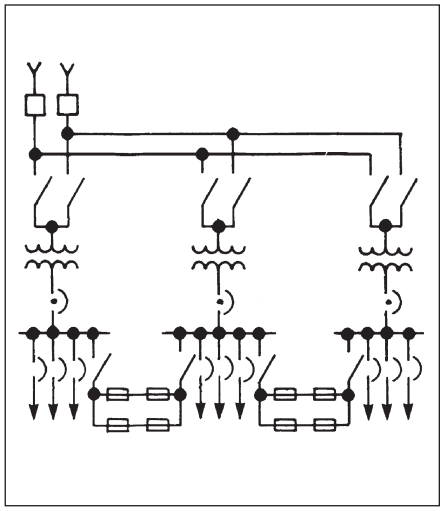


Figure 9. Primary Selective Secondary Network System

In the network arrangement in Figure 9, if there were three incoming primary feeder circuits and three transformers, the combined capacity of two of the transformers should be sufficient to carry the entire load on the three substations on the basis that only one feeder is out of service at one time. Generally, these transformers would all have the same ratings. With this arrangement, as with the spot network arrangement, a reduction in spare transformer capacity can be achieved, if a primary selective switching arrangement is used at each substation transformer. However, if three or more primary feeder circuits are available, the reduction in transformer capacity achieved through the use of a primary selective arrangement may be small.

Cable ties or busway ties, as shown in Figures 8 and 9, will require careful consideration of load distribution during contingencies and of the safety aspects with regard to backfeeds. Key or other mechanical interlocking of switches or circuit breakers may be essential.

The term "low magnitude" arcing ground fault is a deceptive description of this type fault. What is meant by this is that the fault current magnitude is low compared to that of a bolted fault. Even so, the arc energy released at the point of the fault can cause much damage and may result in a fire. A ground fault is an insulation failure between an energized conductor and ground. A phase-to-ground arcing fault, unlike a phase-to-phase bolted fault, is a high-impedance type fault. The factors that contribute to this high impedance are the resistance of the arc and the impedance of the return path. This return path is usually metal conduit, raceway, busway housing or switchboard frames. Another contributing factor is the spasmodic nature of the arc. The circuit breaker or fuse protecting the circuit detects the fault current, but the actual ground fault current magnitude is ever changing due to arc elongating blowout effects, self-clearing attempts and arc reignition.

These current limiting effects make the circuit breaker or fuse incapable of detecting the actual damage that is occurring. This is not to imply that these devices are inadequate. The problem is one of system protection because the circuit breaker must be adjusted (or fuse size selected) so as to hold without tripping under momentary overload conditions, such as motor starting current or transformer inrush current. Therefore, the circuit breaker or fuse cannot open quickly enough under relatively low magnitude faults to limit the arcing damage.

Figure 10 illustrates the basic problem. Shown is a typical distribution system with a 1600 ampere main service entrance unit with a circuit breaker (single line "a") or fused service protector (single line "b"). A ground fault of 1500 amperes on the bus would affect but would not open either device. A 4000 ampere ground fault would be cleared in approximately 35 seconds by the circuit breaker and in 230 seconds by the fuse. To allow a fault of this magnitude to persist for this length of time would create more than 92,000 kW seconds of arc energy. As a result of tests made, it has been determined that an arc with a value of 1050 kW seconds of energy would vaporize about 1.0 cubic in. of copper or 2.5 cubic in. of aluminum. Obviously a fault of the magnitude shown in Figure 10 could cause a considerable amount of damage.

The nature of low-level arcing ground faults makes impractical their detection

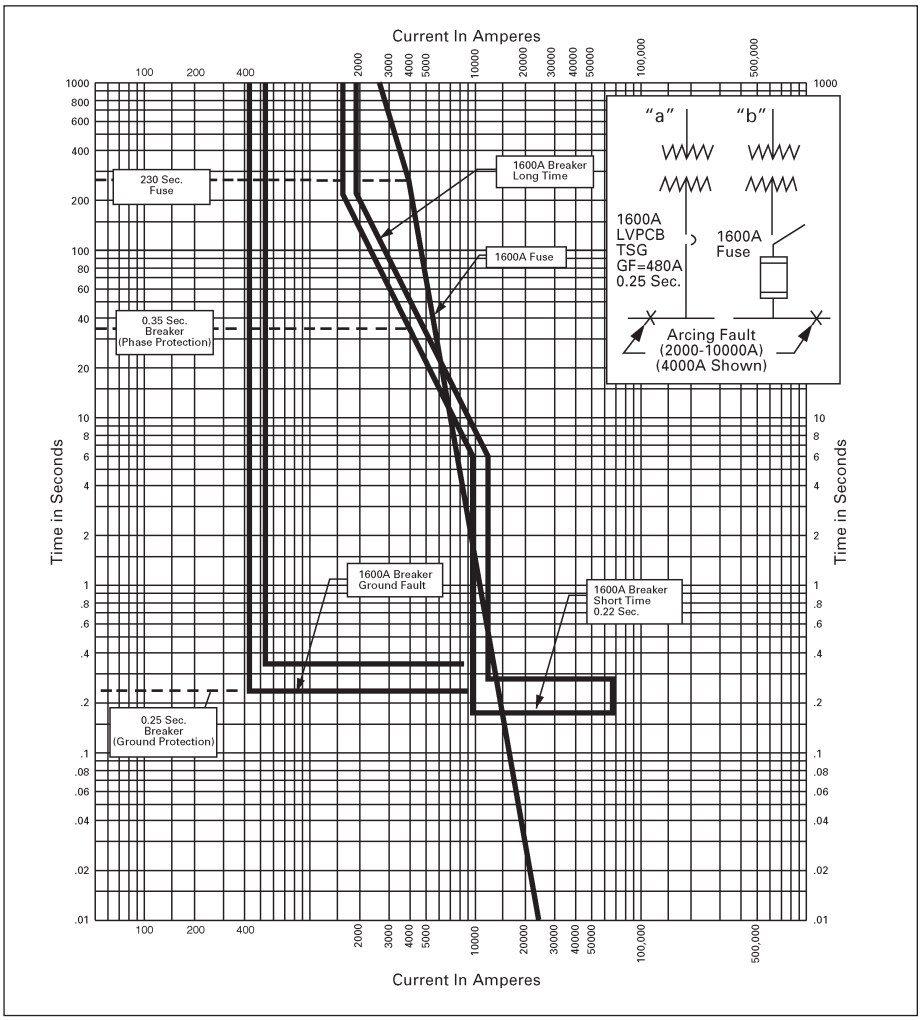


Figure 10. Ground Fault Protection

by a traditional overcurrent devices. To complete total protection of the system against all possible types of faults, other means are utilized to detect ground fault currents, including:

- **Zero sequence method**
- **Source ground current (or ground return) method**
- **Residual connection method**

Zero Sequence Method

This is commonly used when ground fault protection is provided for equipment employing electromechanical trip devices. The scheme uses a core balance type current transformer (ground sensor) which encircles all phase conductors (and neutral on four wire system) to detect ground faults.

The operation of this system is such that under normal operating conditions (eg., no ground fault on the system) there is no output from the ground sensor to the tripping relay because the vector sum of all the currents through the sensor window is zero.

$$(I_a + I_b + I_c + I_n = 0)$$

If a ground fault occurs on the system, there is now an additional current (I_g) seen by ground sensor which returns to the source by a path other than through the sensor window. The sensor now sees an unbalance caused by I_g and operates the ground relay which trips the circuit protector.

$$(I_a + I_b + I_c + I_n = I_g)$$

The ground sensor is located downstream from the point at which the system is grounded and can be mounted either on the line side or load side of the main disconnect device. This method can be used on incoming main disconnect or on feeders.

Source Ground Current (or Ground Return) Method

This method of detecting the ground fault current I_g locates the ground sensor on the neutral connection to ground at the service entrance. This means that the ground sensor only detects ground fault current. This type of detection has some limitations because it is detecting the ground fault return current. On multiple source systems with multiple connections to ground, this ground fault current can return by more than one path, therefore, some sensitivity in detecting these faults would be lost.

Residual Connection Method

Current sensors, one on each of the phase conductors and on the neutral conductors, are connected in common. This common (or residual connection) measures the vector summation of the phase currents and the neutral current. Under normal conditions, this vector summation will be zero, and no current will be applied to the ground relay.

If a fault involving ground occurs, the current summation is not equal to zero. Current flows into common connection which is applied to the relay. This method of detecting ground fault current is used in circuit breakers with electronic trip device.

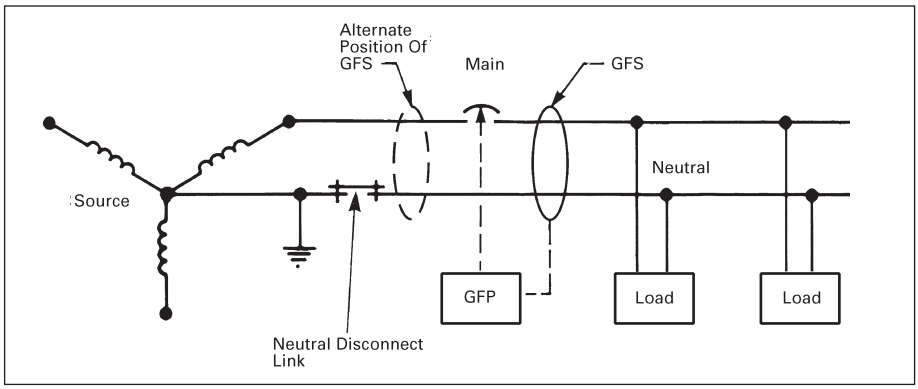


Figure 11. Schematic for Zero Sequence

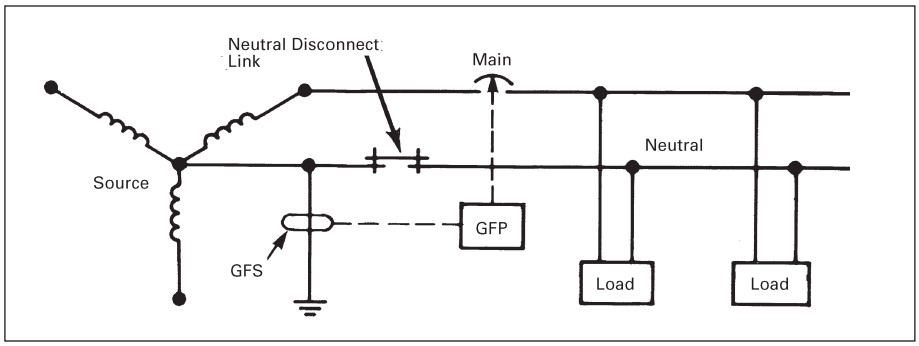


Figure 12. Schematic for Source Ground Current

GFS = Ground Fault Sensor
GFP = Ground Fault Protection (Relay or Trip Unit)

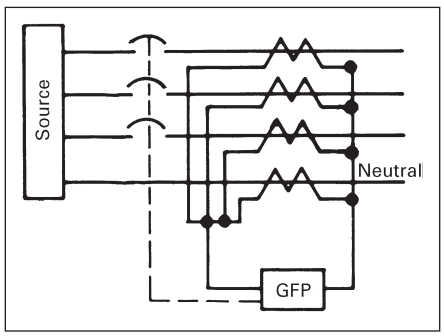


Figure 13. Schematic for Residual Method

Residual Ground Current Sensing

3-Wire System

This system is used with electronic trip units, and always includes three current sensors mounted on the circuit breaker. A trip element is connected in series with each sensor to provide phase overcurrent protection. By adding a ground trip element in the residual (neutral) circuit of the three current sensors, it will sense ground fault current only, and not load current. This permits more sensitive settings to protect against low magnitude ground faults. This scheme is shown in Figure 14.

Under normal conditions, the vector sum of the current in all of the phases equals zero. No current would flow in the GND element, which is also true under the condition of a phase-to-phase fault.

A phase-to-ground fault would cause a current to flow in the GND trip element. If the magnitude of this current exceeds the pickup setting for the required time, the trip unit will operate to trip the breaker.

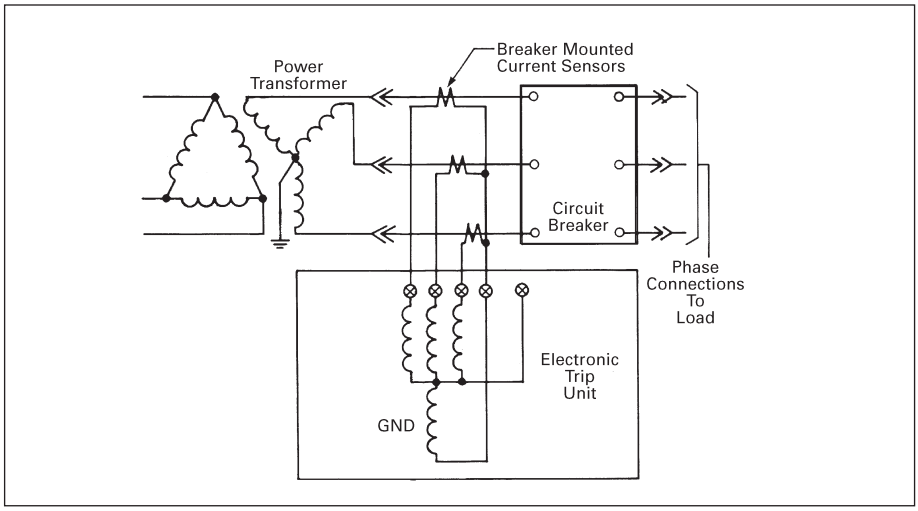


Figure 14. Schematic for Ground Protection on 3-Wire Systems, Residual Sensing

4-Wire System

To avoid false tripping, a fourth current sensor is connected in the neutral conductor to sense normal neutral current. This fourth sensor is connected so that it cancels the normal neutral current which is developed in the residual circuit as shown in Figure 15.

Under normal conditions, the vector sum of the current in all phases equals the neutral current. Disregarding the effects of the neutral sensor connection, the neutral current would flow through the GND element. Since this is normal neutral current, pickup of the GND element is not desired. Therefore, the neutral sensor is added to sense the same neutral current as the GND sensor — but opposite in polarity. The result is a circulating current between the phase sensing current sensors and the neutral sensor, with no current flowing through the GND sensor. This is similar to a differential relay circuit. When a phase-to-ground fault occurs, the vector sum of the phase currents will no longer equal the neutral current because the ground fault current returns via the ground bus and bypasses the neutral. If the magnitude of the phase-to-ground current exceeds the pickup setting of the GND element for the required time, the trip unit will operate to open the breaker.

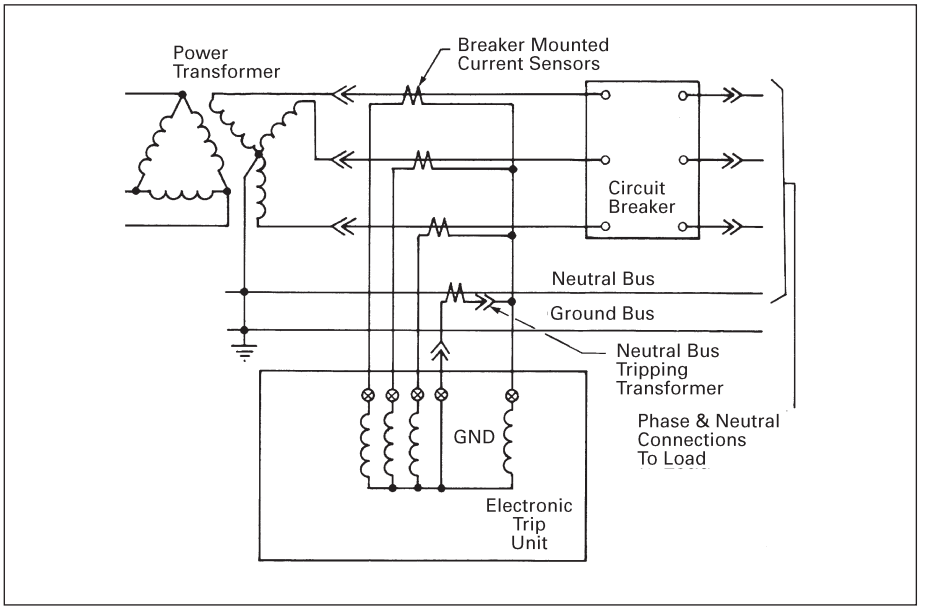


Figure 15. Schematic for Ground Protection on 4-Wire Systems, Residual Sensing

Types Of Coordinated Ground Fault Tripping Systems

There are two types of Coordinated Ground Fault Systems:

- **Time / Current Selective**
- **Zone Selective (Zone Interlock)**

Time / Current Selective

In this system the time / current characteristics of the Ground Fault Protection (GFP) devices used with each disconnect are coordinated so that the nearest disconnect supplying the ground fault location will open. Any upstream disconnects remain closed and continue to supply the remaining load current. Each set of GFP devices should have a specified time-current operating characteristic. When disconnects are connected in series, each downstream device should use a time-current setting that will cause it to open and clear the circuit before any upstream disconnect tripping mechanism is actuated. The time-current bands of disconnects in series must not overlap and must be separated from each other sufficiently to allow for the clearing time of each disconnecting means used. The time / current selective system is recommended for applications where damage levels associated with the time / current settings used are tolerable. This type of system does not require interlocking wiring between the GFP devices associated with main feeder and branch disconnecting devices.

Figure 16, on the next page, illustrates time / current selective coordination in a system involving a 4000 ampere main circuit breaker and a 1600 ampere feeder circuit breaker in an incoming service switchboard. These feed a distribution switchboard with a 600 ampere sub-feeder to a 100 ampere branch breaker. The system is coordinated so that only the circuit breaker nearest the location of the ground fault trips.

Zone Selective (Zone Interlock)

In this system each disconnecting means should open as quickly as possible when a ground fault occurs in the zone where this disconnect is the nearest supply source.

The GFP device for an upstream disconnecting means should have at least two modes of operation. If a ground fault occurs between it and the nearest downstream disconnect, it should operate in its fast tripping mode.

When a ground fault occurs beyond the downstream disconnect, the downstream GFP device should open in its fast tripping mode and simultaneously send a restraining signal to the upstream device and transfer that device to a time-delay tripping mode. The upstream time-delay tripping characteristic selected should be such that the downstream disconnect will open and clear the circuit before the upstream disconnect tripping mechanism is actuated. The time-current characteristic of the upstream device should be such as to offer backup protection in the event of malfunction of the downstream equipment.

Alternatively, a restraining signal from a downstream device may be used to prevent the tripping of an upstream disconnect on ground fault instead of causing it to operate in the time-delay tripping mode. This may be done where backup protection is less important than continuity of service to critical loads supplied by the upstream unit. There are very few instances in which this is justified, and a careful study of the entire system should be made before using this type of interlocking.

For a zone selective system, the time-current bands of disconnects in series, although used only for backup protection, should not overlap and should be separate from each other sufficiently to allow for the opening time of each disconnecting means used.

Time/Current Selective Ground Coordination

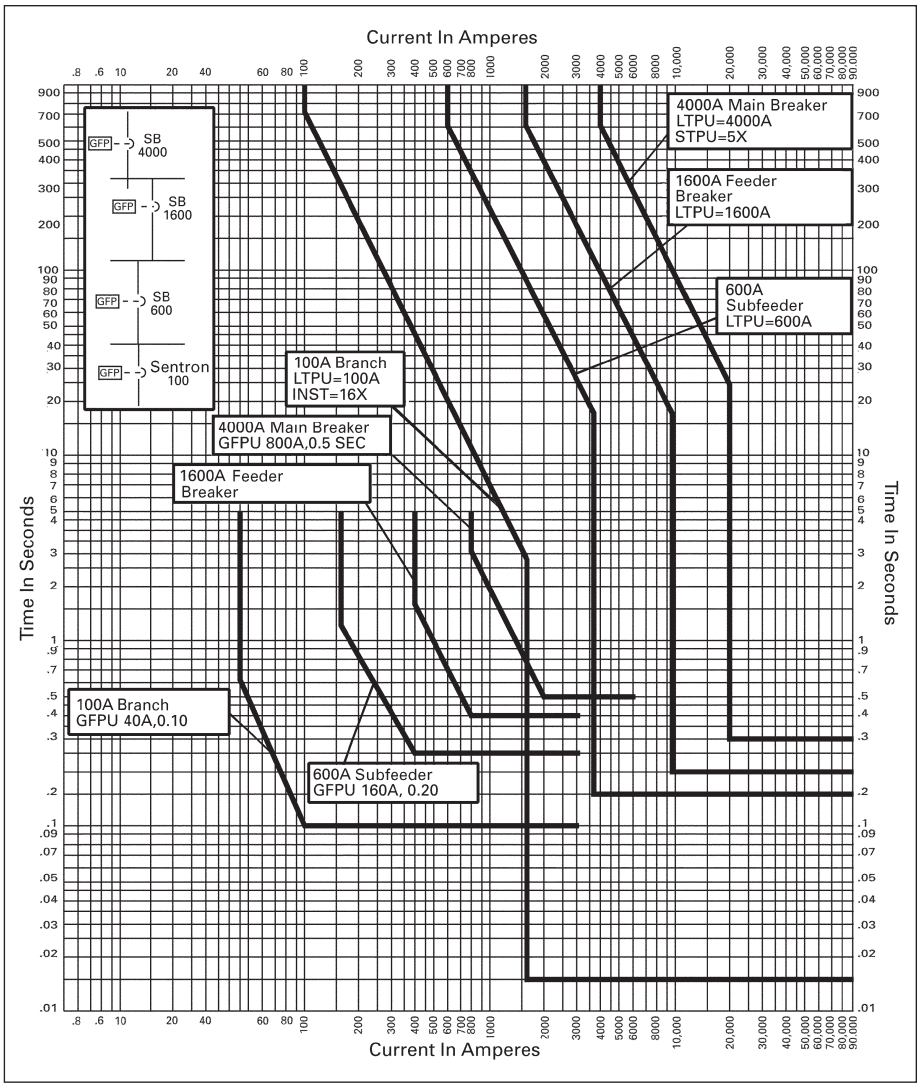


Figure 16. Fully Coordinated Multizone GFP System

The zone selective or zone interlock system provides fast tripping of the nearest disconnect upstream of the ground fault. The damage level is the lowest that is possible because the ground fault is cleared as quickly as the protective equipment can respond and the disconnect can open. Additional interlocking wiring and circuity for sending and receiving the restraining signals are required.

The zone selective or zone interlock scheme is for those few special applications where exceptionally fast tripping is necessary for all feeders throughout the entire system to reduce damage. Note that although the relay time can be reduced appreciably, the circuit breaker mechanism and arcing time (plus safety margin) will still be present.

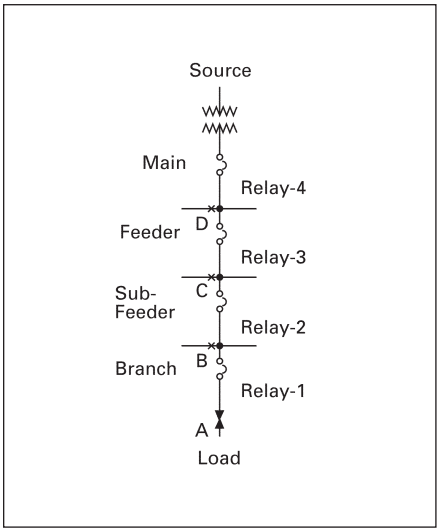


Figure 17. Zone Interlocking Scheme

Zone Selective Operation (Figure 17):

a) **Relay-1** will sense a ground fault at **A** when it exceeds 10 amperes. It will instantly initiate tripping of the **Branch** breaker and send restraining signals (transfer from instantaneous operation to time-delayed operation) to **Relay-2** and **Relay-3** (Relay-2 and Relay-3 will then back up Relay-1 on a time coordinated basis). **Relay-4** will be restrained by **Relay-2** if ground fault exceeds 100 amperes.

b) **Relay-2** will sense a ground fault at **B** when it exceeds 100 amperes. It will instantly initiate tripping of the **Sub-Feeder** breaker and send restraining signals to **Relay-3** and **Relay-4**.

c) **Relay-3** will sense a ground fault at **C** when it exceeds 400 amperes. It will instantly initiate tripping of the **Feeder** breaker and send a restraining signal to **Relay-4**.

d) **Relay-4** will sense a ground fault at **D** when it exceeds 800 amperes. It will instantly initiate tripping of the **Main** breaker.

Table 17.1

Typical Ampere Setting	Restrained Time Delay
800	0.4 SEC.
400	0.3 SEC.
100	0.2 SEC.
10	0.1 SEC.

Typical Application Diagrams

Figures 18 through 23 on this and the facing page show the basic methods of applying ground fault protection (GFP). Other types of distribution systems will require variations of these methods to satisfy other system conditions.

These diagrams show circuit breakers as the disconnects. Any disconnecting means can be utilized, providing it is suitable for use with a ground fault protection system as indicated in the scope of this application guide. The examples do not show protection against a ground fault on the supply side of the main disconnect.

Sensing device and disconnect locations define zones of protection. Source side and ground return sensors provide protection only on the load side of associated disconnects. If a vector summation method is used and its sensors are located on load side of a disconnect, the zone between a source and actual sensor location becomes the responsibility of the next upstream protective device.

Table 17.2 Recommendations for Figures 18-23

Ground Fault Protection	Figure	Sensing Method	Additional Ground Points	Recommended Use	Selectivity
On Main Disconnect Only	18	Vector Summation	Must not be downstream. May be upstream	Minimum protection only per Section 230-95 for the National Electric Code	Limited selectivity depends on location of fault and rating of overcurrent devices on the upstream side of fault.
	19	Ground Return	None		
On Main and Feeder Disconnects	20	Main and Feeders– Vector Summation	Must not be downstream of main ground fault sensor. May be upstream.	Improved service continuity is required	Main will allow feeder to trip for faults downstream of feeder sensors, but main will trip if feeder fails to operate.
	21	Main – Ground Return Feeders – Vector Summation	None		
On Main, Feeder, and Selected Branch Disconnects with Zone Selective Interlocking	22	Main and feeders 1-3 – Vector Summation MCC branch feeder A – Zero Sequence	Must not be downstream of main ground fault sensor. May be upstream.	Improved service continuity and minimum arcing fault damage are required and protection is needed on branch circuits.	Main and feeder 1-3 will provide delayed backup protection if fault is downstream of MCC branch feeder A. Main will provide delayed backup protection if fault is downstream of sensors for feeders 1-3. Main will trip on fastest curve if fault is upstream of sensors for feeders 1-3.
Double-Ended System with Protection on Main and On Tie and Feeder Disconnects	23	Main and Tie – Ground Return Feeders – Vector Summation	None	Double-ended systems with ground fault protection on tie disconnect where maximum continuity of service is essential.	When operating with tie disconnect open, main will provide delayed backup protection if fault is downstream from feeder sensors. When operating with the tie disconnect closed, the tie will trip before the main, thus sectionalizing the bus.

Ground Fault Protection on Main Disconnects Only

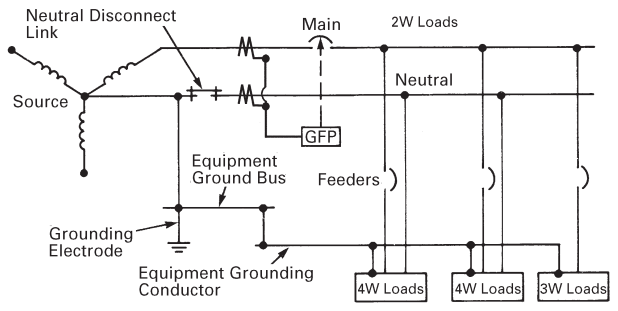


Figure 18

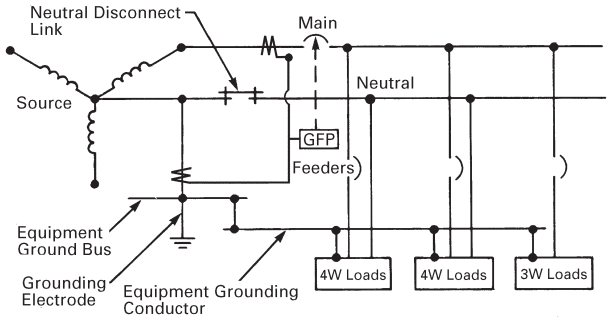


Figure 19

Ground Fault Protection on Main and Feeder Disconnects

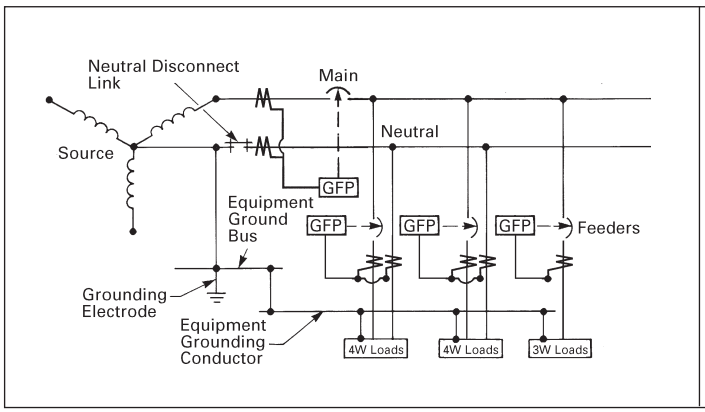


Figure 20

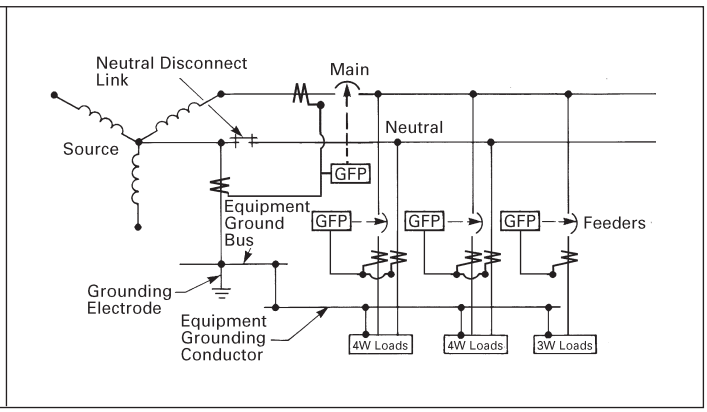


Figure 21

Ground Fault Protection on Main, Feeder and Selected Branch Disconnects with Zone Selective Interlocking

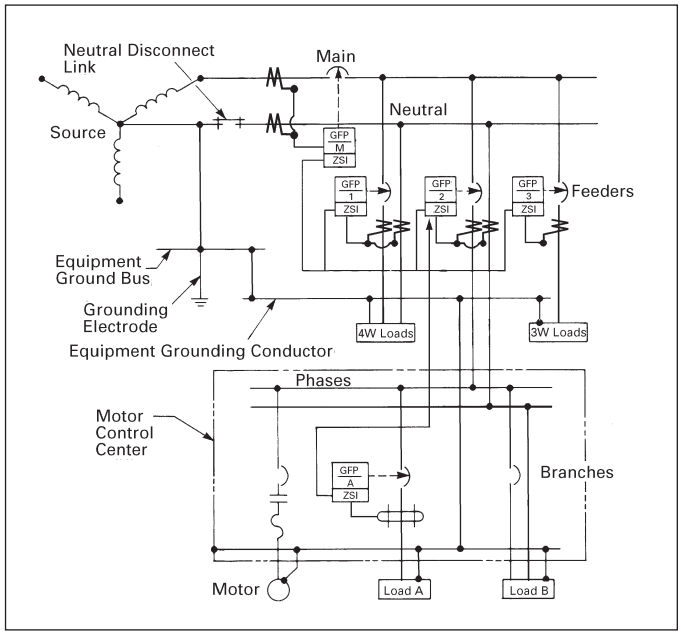


Figure 22

Double-Ended System with Ground Fault Protection on Main and on Tie and Feeder Disconnects

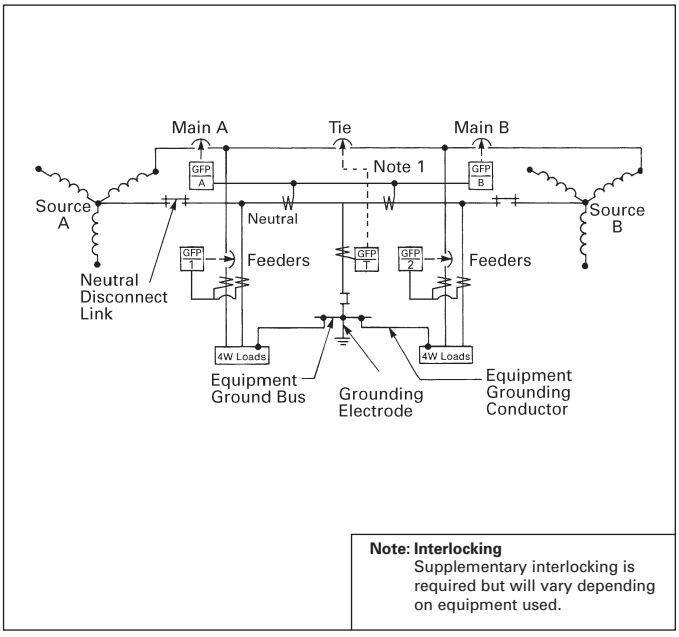


Figure 23

Coordination of a power distribution system requires that circuit protective devices be selected and set so that electrical disturbances, such as over-loads or short circuits, will be cleared promptly by isolating the faulted equipment with minimum service disruption of the distribution system. Time / Current Characteristic Curves are available for circuit protective devices, such as circuit breakers and fuses, which show how quickly they will operate at various values of overload and short circuit current. Coordination can be obtained by comparing these curves for each device in series in the system.

In developing the system, it will be noted that many compromises must be made between the various objectives:

1. System reliability.
2. Continuity of service.
3. Equipment and system protection.
4. Coordination of protective devices.
5. System cost.

Preliminary steps in Coordination study:
A) One-line diagram: used as a base on which to record pertinent data and information regarding relays, circuit breakers, fuses, current transformers, and operating equipment while at the same time, providing a convenient representation of the relationship of circuit protective devices with one another.

B) Short-circuit study: record all applicable impedances and ratings; using these values, a short-circuit study is made to determine currents available at any particular point in the system.

C) Determine maximum load currents which will exist under normal operating conditions in each of the power-system circuits, the transformer magnetizing inrush currents, and times, and the starting currents, and accelerating times of large motors. These values will determine the maximum currents which circuit protective devices must carry without operating. The upper boundary of current sensitivity will be determined by the smallest values resulting from the following considerations:

1) Maximum available short-circuit current obtained by calculation.
2) Requirements of applicable codes and standards for the protection of equipment such as cable, motors, and transformers.
3) Thermal and mechanical limitations of equipment.

D) Time / current characteristic curves of all the protective devices to be coordinated must be obtained. These should be plotted on standard log-log coordination paper to facilitate the coordination study.

Mechanics Of Achieving Coordination:
The process of achieving coordination among protective devices in series is essentially one of selecting individual units to match particular circuit or equipment protection requirements, and of plotting the time/current characteristic curves of these devices on a single overlay sheet of log-log coordination paper.

The achievement of coordination is a trial-and-error routine in which the various time / current characteristic curves of the series array of devices are matched one against another on the graph plot.

When selecting protective devices one must recognize ANSI and NEC requirements and adhere to the limiting factors of coordination such as load current, short-circuit current, and motor starting. The protective devices selected must operate within these boundaries while providing selective coordination where possible. Selective coordination is usually obtained in low voltage systems when the log-log plot of time / current characteristics displays a clear space between the characteristics of the protective devices operating in series, that is, no overlap should exist between any two time/current characteristics if full selective coordination is to be obtained. Allowance must be made for relay overtravel and for relay and fuse curve accuracy. Quite often the coordination study will stop at a point short of complete selective coordination because a compromise must be made between the competing objectives of maximum protection and maximum service continuity.

Computer Aided Coordination:
The philosophy discussed above applies to the "classical" practice of performing coordination studies manually. Today, however, there are numerous personal computer software programs available for performing coordination studies.

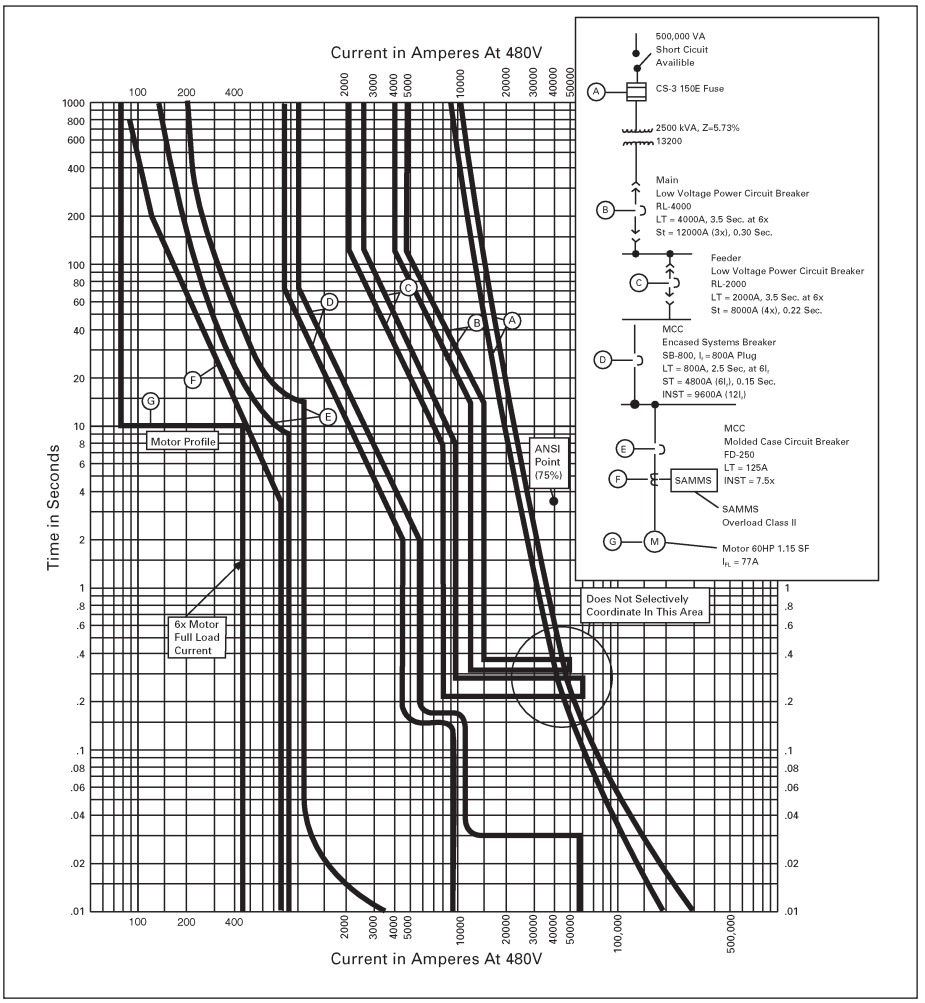


Figure 24. Coordination of Example System

General

Proper system design requires that the system be coordinated so the interrupting capacity and / or short circuit withstand capabilities of the various components in the system are not exceeded for any operating situation. Good practice also requires that the system be selective, that is, that the minimum portion of the system be interrupted on occurrence of a fault. The need for selectivity must always be balanced against the requirements of economics and coordination with the overall process needs.

At the conceptual phase of a project, several distribution system alternatives should be considered, and examined both technically and economically. This study should include sufficient detail for a thorough understanding of the system alternatives. The conceptual study should determine the optimal distribution system configuration for the project, on which definitive design can proceed.

At all stages of design, the principal objectives of personnel safety, equipment protection, process continuity, fault clearing, and service continuity should be considered.

In designing a new or modified distribution system, the following types of system studies may be needed:

1. **Short Circuit Studies:** three phase, line-to-line, and line-to-ground faults can be calculated for both close-and-latch and interrupting conditions, necessary for checking interrupting device and related equipment ratings, and setting protective devices.
2. **Circuit Breaker Application Studies:** consider the AC and DC decrements in the fault current, and the speed of the various medium voltage circuit breakers, to determine close-and-latch and interrupting duties.
3. **Protective Device Coordination Studies:** determine characteristics and settings of protective devices, e.g., relays, trip devices, fuses, etc. The coordination study should provide a balance between protection of system equipment and continuity of service.
4. **Load Flow Studies:** calculate voltages, phase angles, real and reactive power, line and transformer loadings under simulated conditions to aid in determining the performance of a new or revamped system during the planning stage.
5. **Motor Starting Studies:** determine severity of voltage dips and adequacy of load accelerating torque when starting large motors on a weak system.

Today, most studies are performed using computers. Some specialized studies require large computing resources, but many studies can now be performed on personal computers. A wide variety of software packages are available. In addition, many specialty firms exist which provide engineering service to perform such studies.

Short Circuit Calculations

The single-line diagram serves as the starting point for the system study and selection of equipment ratings. The single-line must be modified to show all power sources and capacities, and system impedances. Sources of short circuit current include utility connections, local generation, and all rotating machines connected to the system at the instant the fault occurs. The system study should consider various fault types (line-to-line and line-to-ground) and fault locations.

The value of normal load current in a circuit depends on the load connected, and is essentially independent of the capacity of the power system. On the other hand, the short circuit current depends almost entirely on the capacity of the power system, not the size of the load.

The total fault current consists of a symmetrical AC component, superimposed on a DC (offset) component. Hence, the total fault current is asymmetric with respect to the current axis. The value of the DC component depends on the point of the voltage wave at which the fault was initiated. For system studies, it is assumed that the fault is initiated at the worst point, to produce a "fully offset" fault current. This is illustrated in Figure 25.

Short circuit currents are determined by the system impedance, including both reactance and resistance. The effect of the reactance is to cause the initial fault current to be high, with the fault current declining as time proceeds. This is represented as the summation of a DC component which decays relatively rapidly over time, and an AC component, which decays at a slower rate. The rate of decay of the components depends on the system X / R ratio.

Since the reactance of rotating machines varies with the time from fault initiation, the short circuit calculations must use the appropriate machine reactance values. Subtransient reactance (X''_d) governs current flow for approximately the first 6 cycles of a fault. Then, transient reactance (X'_d) determines current flow up to around 30-120 cycles, depending on the machine. After this, synchronous reactance (X_d) applies, but studies seldom use this value as faults are not usually allowed to persist for this length of time.

For transformers, the actual tested value of the transformer impedance is used. If this is not available, use design impedance adjusted to the minimum value allowed by manufacturing tolerance of ± 7.5%. For example, a 5.75% design unit has a tolerance range of 5.32-6.18%, and 5.32% would be used in a system study prior to manufacture.

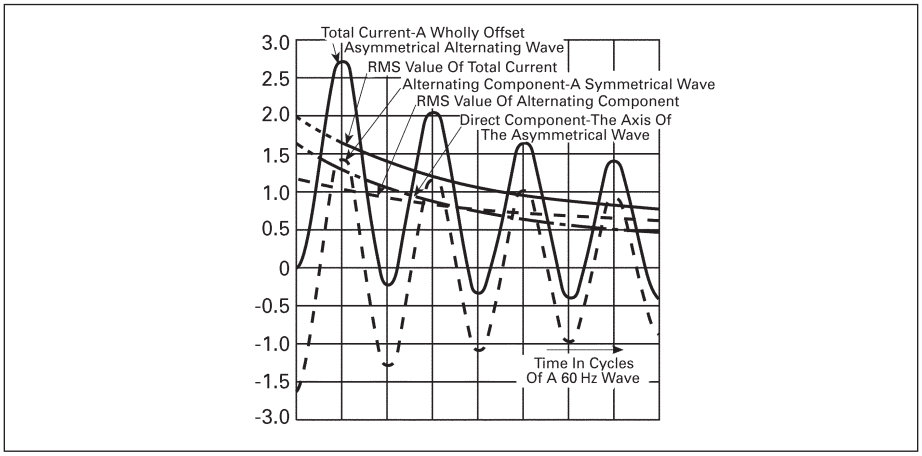


Figure 25. Structure of Asymmetrical Current Wave (Fully Offset)

Fuseless Current Limiting Circuit Breakers

The technology of Siemens Sentron® fuseless current limiting circuit breakers was developed to meet the demands of modern distribution systems. It is not uncommon for today's systems to have prospective short circuit currents approaching 200,000 amperes. Users demanded the protection and flexibility afforded by circuit breakers, without the nuisance and expense of fuse replacement.

Underwriters Laboratories, in UL489-2.4A, defines a fuseless current limiting circuit breaker as one that "does not employ a fusible element, and that when operating within its current-limiting range, limits the let-through I^2t to a value less than the I^2t of a half-cycle wave of the symmetrical prospective current."

I^2t is an expression which allows comparison of the energy available as a result of fault current flow. As used in current limiting discussions, I^2t refers to the energy released between the initiation of the fault current and the clearing of the circuit.

Figure 26 relates the "prospective I^2t" to the energy allowed by a Sentron current limiting circuit breaker, or "let-through I^2t". The upper curve represents the maximum I^2 the circuit can produce, unaltered by the presence of any protective device. The lower curve illustrates the reduction in energy allowed when Sentron current limiting circuit breakers are used.

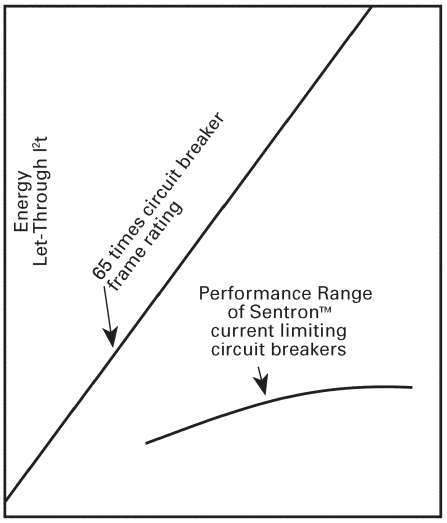


Figure 26. Reduction of I^2t Let-Through with Current-Limiting Technology

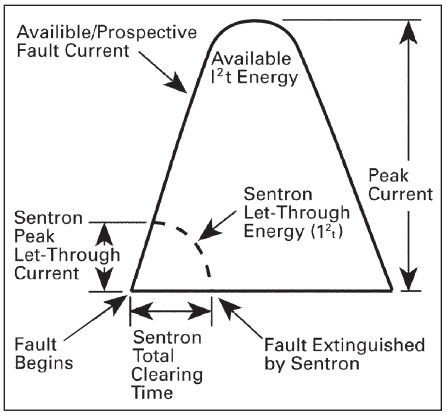


Figure 27. Current Limitation

Figure 27 illustrates how the Sentron circuit breaker limits the energy under fault conditions. The upper curve illustrates the first half-cycle wave of prospective fault current. To qualify as truly current limiting, the circuit breaker must prevent the current value from reaching the maximum value that it would reach if the circuit breaker were not connected in the circuit.

The Sentron circuit breakers use the "blow-apart" contact principle to accomplish current limitation. This principle is based on the electro-magnetic repulsion of adjacent conductors which carry current in opposite directions.

The contact arms are arranged to create opposing magnetic fields. As fault current rises, magnetic repulsion forces the contacts to separate completely. The higher the fault current, the faster this "blow-apart" action occurs.

As figure 27 illustrates, the energy let-through with the current limiting Sentron circuit breaker is decreased significantly. This provides better protection for downstream equipment, and reduces damage.

Applications and Ratings

Sentron current limiting circuit breakers are designed for use in load centers, power panelboards, distribution switchboards, secondary unit substations, and all types of individual enclosures where the available fault currents exceed the interrupting ratings of heavy duty and extra-heavy duty molded case circuit breakers.

Sentron circuit breakers have ratings of 15 through 1600 amperes, 240 through 600 volts AC, with up to 200,000 symmetrical amperes interrupting rating.

Series-Connected Combination Ratings

Series-Connected Rating

A series-connected rating can be assigned to a combination of components — typically circuit breakers — which has been tested in combination to a higher interrupting rating than that of the lowest rated protective device of the combination. These ratings must be substantiated by extensive UL testing.

General

Article 110.9 of the 2011 *National Electrical Code* states the following: "Equipment intended to interrupt current at fault levels shall have an interrupting rating not less than the nominal circuit voltage and the current that is available at the line terminals of the equipment. Equipment intended to interrupt current at other than fault levels shall have an interrupting rating at nominal circuit voltage not less than the current that must be interrupted."

The difference between the phrases "at fault levels" and "at other than fault levels" is the part of the Code which makes series-connected systems possible. For example, the traditional method of satisfying the Code was to select each breaker in the series with an interrupting rating equal to or greater than the prospective fault current. The interrupting rating of a circuit breaker — stated in RMS symmetrical amperes — is the amount of short circuit current the device can safely interrupt and continue to function as a circuit breaker.

Thus, if the prospective fault current at the line terminals of a panelboard is 100,000A RMS symmetrical, this traditional method would require that all the circuit breakers within the panelboard be rated at 100,000A RMS symmetrical or greater interrupting capacity. This is illustrated in Figure 28. In the traditional system, both the main and the feeder breaker are subjected to several short circuit peaks.

In a series-connected system, however, the individual components (or circuit breakers) *have already been tested in series and the combination has been given an interrupting rating equal to or greater than various prospective fault currents which are available*. The combination, therefore, acts as a *single entity*, and performs the same protective function as individual circuit breakers in the traditional method. The difference is that combinations in series-connected systems contain devices with lower interrupting ratings.

Siemens circuit breakers used in series combinations which have passed extensive tests required by Underwriters Laboratories are listed in the *UL Recognized Component Directory* according to manufacturer's name and type. The listing means that such circuit breakers are UL Recognized for the series interrupting ratings as noted in the Directory, and that they can be used as an entity to meet Article 110.9 of the NEC.

Using the previous example, if the prospective fault current at the line terminals of the panelboard is 100,000 amperes RMS symmetrical, the series-connected method would involve selecting a specific *combination* from the *UL Recognized Component Directory* with a rating of 100,000 amperes RMS symmetrical or greater interrupting capacity. That combination might include individual components which have lower individual interrupting ratings than 100,000 amperes RMS symmetrical.

However, all the components in the combination have been tested together and form an entity that will safety interrupt the prospective fault current of the particular situation being examined as long as the interrupting rating listed matches the prospective fault current.

With the advent of fuseless current limiting circuit breakers such as Sentron, another important development in series-connected combinations has emerged. Because of the fuseless current limiting circuit breaker's extremely fast interrupting capability, this device provides more control over high prospective fault currents than traditional series-connected systems.

The concept behind using fuseless current limiting circuit breakers as a component in a series-connected system is twofold: (1) higher interrupting ratings, and (2) increased control over peak current (i_p) and energy let-through (I^2t).

For example, a current limiting circuit breaker is placed at the side closest to the source of power and rated according to the prospective fault current available at the line-side terminals. In effect, doing this places a "shroud of protection" over the downstream components. Because of the inherent high interrupting capability of the current limiting circuit breaker, the breaker itself meets or exceeds the prospective short circuit current. Because of its current limiting action the prospective I^2t never reaches downstream components. This is illustrated in Figure 29.

It is important to recognize that the current limiting circuit breaker be an individual component in a UL tested combination, and that it is the combination itself — current limiting circuit breaker *plus* other circuit breakers — that forms entity specified in day-to-day applications.

For specific series-connected combinations that have met UL requirements and are listed in the *UL Recognized Component Directory*, check with your local Siemens sales office listed on the back cover. Since the Directory is updated every six months, please check for additional combinations which may have been tested and approved.

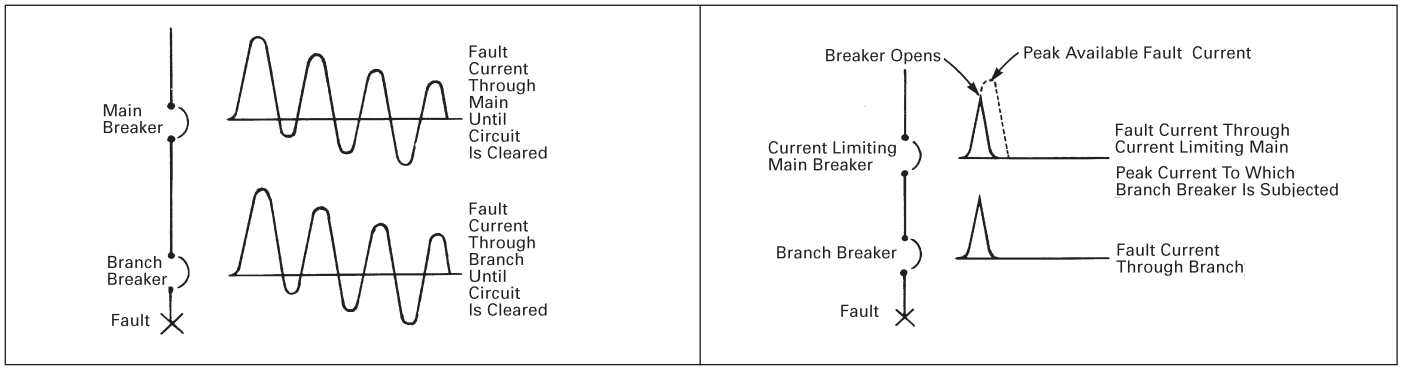


Figure 28 — Without Current Limiting

Figure 29 — Series-Connected Protective Scheme With Current Limiting Main Circuit Breaker

Non-Linear Loads

When a sinusoidal voltage is applied to a linear load, the resultant current waveform takes on the shape of a sine wave as well. Typical linear loads are resistive heating and induction motors.

In contrast, a non-linear load either:

- Draws current during only part of the cycle and acts as an open circuit for the balance of the cycle,

  or

- Changes the impedance during the cycle, hence the resultant waveform is distorted and no longer conforms to a pure sine wave shape

In recent years, the use of electronic equipment has mushroomed in both offices and industrial plants. These electronic devices are powered by switching power supplies or some type of rectifier circuit. Examples of these devices used in offices are: computers, fax machines, copiers, printers, cash registers, UPS systems, and solid-state ballasts. In industrial plants, one will find other electronic devices such as variable speed drives, HID lighting, solid-state starters and solid-state instruments. They all contribute to the distortion of the current waveform and the generation of harmonics. As the use of electronic equipment increases and it makes up a larger portion of the electrical load, many concerns are raised about its impact on the electrical power supply system.

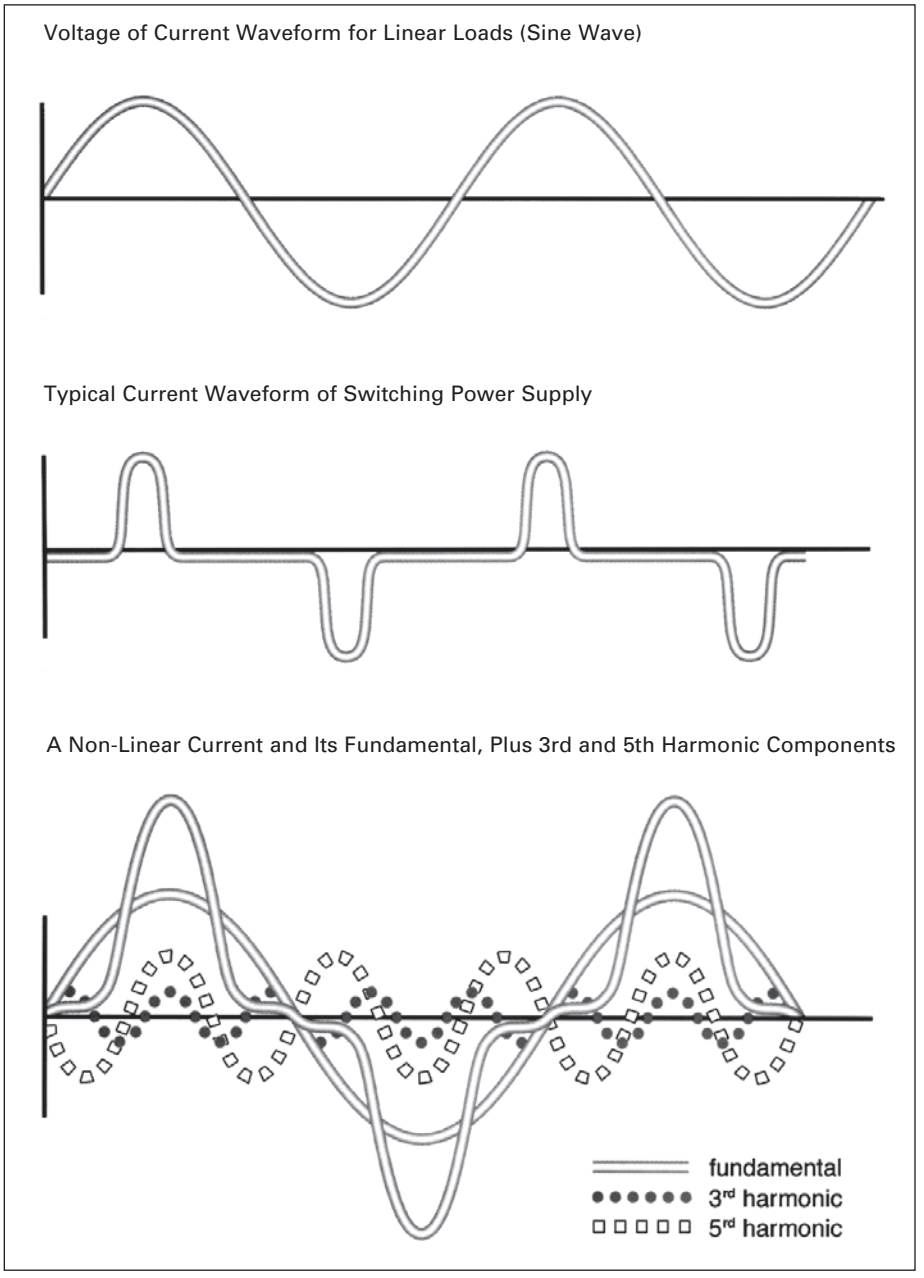


Figure 30 — Effect of Harmonics on Current Waveform

Harmonics

As defined by ANSI / IEEE Std. 519-1992, harmonic components are represented by a periodic wave or quantity having a frequency that is an integral multiple of the fundamental frequency. Harmonics are voltages or currents at frequencies that are integer multiples of the fundamental (60 Hz) frequency: 120 Hz, 180 Hz, 240 Hz, 300 Hz, etc. Harmonics are designated by their harmonic number, or multiple of the fundamental frequency. Thus, a harmonic with a frequency of 180 Hz (three times the 60 Hz fundamental frequency) is called the 3rd harmonic.

Harmonics superimpose themselves on the fundamental waveform, distorting it and changing its magnitude. For instance, when a sine wave voltage source is applied to a non-linear load connected from a phase-leg to neutral on a 3-phase, 4-wire branch circuit, the load itself will draw a current wave made up of the 60 Hz fundamental frequency of the voltage source, plus 3rd and higher order odd harmonic (multiples of the 60 Hz fundamental frequency), which are all generated by the non-linear load. Total Harmonic Distortion (THD) is calculated as the square root of the sum of the squares of all harmonics divided by the normal 60 Hz value.

$$THD = \sqrt{\frac{\left(\frac{I_{RMS}}{60\ Hz}\right)^2 \left(\frac{I_{RMS}}{180\ Hz}\right)^2 \left(\frac{I_{RMS}}{N}\right)^2}{\left(\frac{I_{RMS}}{60\ Hz}\right)^2}}$$

This yields an RMS value of distortion as a percentage of the fundamental 60 Hz waveform.

Therefore, it is the percentage amount of odd harmonics (3rd, 5th, 7th ,..., 25th,...) present in the load which can affect the transformer, and this condition is called a "Non-Linear Load" or "Non-Sinusoidal Load". To determine what amount of harmonic content is present, a K-Factor calculation is made instead of using the THD formula. The total amount of harmonics will determine the percentage of non-linear load, which can be specified with the appropriate K-Factor rating.

Typical Symptoms of Harmonic Problems

- Distribution / lighting transformers overheating even when measured load current is within transformer rating
- Neutral cable / bus overheating even with balanced load
- Fuses blowing and circuit breakers tripping at currents within rating

Effect Of Harmonics On Transformers

Non-sinusoidal current generates extra losses and heating of transformer coils thus reducing efficiency and shortening the life expectancy of the transformer. Coil losses increase with the higher harmonic frequencies due to higher eddy current loss in the conductors.

Furthermore, on a balanced linear power system, the phase currents are 120 degrees out of phase and offset one another in the neutral conductor. But with the "Triplen" harmonics (multiple of 3) the phase currents are in phase and they are additive in this neutral conductor. This may cause installations with non-linear loads to double either the size or number of neutral conductors.

Table 17.5 K-Factor Ratings

Type	Linear Load	Non-Linear Load	Total K-Factor Load Valve
K4	100%	50%	4.0
K13	100%	100%	13.0
K20	100%	125%	20.0
K30	100%	150%	30.0

Measurement of Harmonics

For existing installations, the extent of the harmonics can be measured with appropriate instruments commonly referred to as "Power Harmonic Analyzers". This service is offered by many consulting service organizations. For new construction, such information may not be obtainable. For such situations, it is best to assume the worse case condition based on experience with the type and mix of loads.

Sizing Transformers for Non-Linear Loads

ANSI / IEEE C57.110-2008 has a procedure for de-rating standard distribution transformers for non-linear loading. However this is not the only approach. A transformer with the appropriate K-Factor specifically designed for non-linear loads can be specified.

K-Factors

K-Factor is a ratio between the additional losses due to harmonics and the eddy losses at 60 Hz. It is used to specify transformers for non-linear loads. Note that K-Factor transformers do not eliminate harmonic distortion; they withstand the non-linear load condition without overheating.

Calculating K-Factor Loads

1. List the kVA value for each load category to be supplied. Next, assign a K-factor designation that corresponds to the relative level of harmonics drawn by each type of load. Refer to Table 17.7.
2. Multiply the kVA of each load or load category times the Index of Load K-rating (I_{LK}) that corresponds to the assigned K-factor rating. This result is an indexed kVA-I_{LK} value. KVA x I_{LK} = kVA-I_{LK}.
3. Tabulate the total connected load kVA for all load categories to be supplied.
4. Next, add-up the kVA-I_{LK} values for all loads or load categories to be supplied by the transformer.
5. Divide the grand total kVA-I_{LK} value by the total kVA load to be supplied. This will give an average I_{LK} for that combination of loads. Total kVA-I_{LK}/ Total kVA = average I_{LK}.
6. From Table 17.7 find the K-factor rating whose I_{LK} is equal to or greater than the calculated I_{LK}.

Table 17.7 Estimating K-Factor Loads①

Description	K-Factor	I_{LK}
Incandescent Lighting Electric Resistance Heating Motors (without solid state drives) Control Transformers / Electromagnetic Control Devices Motor-Generators (without solid state drives) Standard Distribution Transformers	K1	0.00
Electric Discharge Lighting (HID) UPS with Optional Input Filter Welders Induction Heating Equipment PLCs and Solid State Controls	K4	25.82
Telecommunications Equipment (PBX) UPS without Input Filtering Multiwire Receptacle Circuits in General Care Areas of Health Care Facilities, Schools, etc. Multiwire Receptacle Circuits Supplying Testing Equipment on an Assembly Line	K13	57.74
Main-Frame Computer Loads Solid State Motor Drives (variable speed drives) Multiwire Receptacle Circuits in Critical Care Areas in Hospitals	K20	80.94
Multiwire Receptacle Circuits in Industrial, Medical and Educational Laboratories Multiwire Receptacle Circuits in Commercial Office Spaces Small Main-Frames (mini and micro)	K30	123.54

① Typical loads and K-Factor values for estimating purposes only.

Table 1

NEC Table 310.15(B)(16) (formerly Table 310.16) Allowable Ampacities of Insulated Conductors Rated Up to and Including 2000 Volts, 60°C Through 90°C (140°F Through 194°F), Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth (Directly Buried), Based on Ambient Temperature of 30°C (86°F)①

	Copper Conductors			Aluminum Conductors Copper-Clad Aluminum Conductors			
Size	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	Size
AWG Kcmil	Types TW UF	Types RHW THW THWN XHHW USE ZW	Types TBS SA SIS FEP FEPB RHH THHN THHW XHHW	Types TW UF	Types RHW THHW THW THWN XHHW USE	Types TBS, SA, SIS, THHN THHW THW-2, THWN-2, RHH, RHW-2 USE-2 XHH, XHHW XHHW-2, ZW-2	AWG Kcmil
18	—	—	14	—	—	—	—
16	—	—	18	—	—	—	—
14②	15	20	25	—	—	—	—
12②	20	25	30	15	20①	25①	12
10②	30	35	40	25	30①	35①	10
8	40	50	55	35	40	45	8
6	55	65	75	40	50	55	6
4	70	85	95	55	65	75	4
3	85	100	115	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	145	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	195	230	260	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	350	420	475	285	340	385	600
700	385	460	520	315	375	425	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	440	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	525	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	555	665	750	470	560	630	2000

Table 2

Correction Factors for Ambient Temperature Over 30°C (86°F) Based on NEC Table 310.15(B)(2)(A)

Ambient Temperature°C	For ambient temperature over 30°C, (86°F) multiply the ampacities shown above by the appropriate factor shown below.						Ambient Temperature°F
10 or less	1.29	1.20	1.15	1.29	1.20	1.15	50 or less
11-15	1.22	1.15	1.12	1.22	1.15	1.12	51-59
16-20	1.15	1.11	1.08	1.15	1.11	1.08	60-68
21–25	1.08	1.05	1.04	1.08	1.05	1.04	69–77
26–30	1.00	1.00	1.00	1.00	1.00	1.00	78–86
31–35	.91	.94	.96	.91	.94	.96	87–95
36–40	.82	.88	.91	.82	.88	.91	96–104
41–45	.71	.82	.87	.71	.82	.87	105–113
46–50	.58	.75	.82	.58	.75	.82	114–122
51–55	.41	.67	.76	.41	.67	.76	123–131
56–60	—	.58	.71	—	.58	.71	132–140
61-65	—	0.47	0.65	—	0.47	0.65	141-149
66-70	—	0.33	0.58	—	0.33	0.58	150-158
71-75	—	—	0.50	—	—	0.50	159-167
76-80	—	—	0.41	—	—	0.41	168-176
81-85	—	—	0.29	—	—	0.29	177-185

①Refer to 310.15(B)(2) for the ampacity correction factors where the ambient temperature is other than 30°C (86°F)

②Refer to 240.4(D) for conductor overcurrent protection limitations.

Table 4A

Motor Full-Load Currents of Three Phase AC Induction Type Motors①

Motor Rating Horsepower	Current in Amperes			
	208V	230V	460V	575V
¼	1.11	.96	.48	.38
⅓	1.34	1.18	.59	.47
½	2.4	2.2	1.1	.9
¾	3.5	3.2	1.6	1.3
1	4.6	4.2	2.1	1.7
1½	6.6	6	3	2.4
2	7.5	6.8	3.4	2.7
3	10.6	9.6	4.8	3.9
5	16.7	15.2	7.6	6.1
7½	24.2	22.0	11.0	9.0
10	30.8	28.0	14.0	11.0
15	46.2	42.0	21.0	17.0
20	59.4	54	27	22
25	74.8	68	34	27
30	88	80	40	32
40	114	104	52	41
50	143	130	65	52
60	169	154	77	62
75	211	192	96	77
100	273	248	124	99
125	343	312	156	125
150	396	360	180	144
200	528	480	240	192
250	—	—	302	242
300	—	—	361	289
350	—	—	414	336
400	—	—	477	382
450	—	—	515	412
500	—	—	590	472

①Values may vary depending on manufacturer, type of motor and NEMA design. For full load currents of 200 volt motors, increase the corresponding 230 volt motor full-load current by 15 percent.

Table 5 Notes:

1. Primary source available is assumed as 500 MVA at the primary of the transformer with a source circuit X/R ratio of 12.
2. Motor contribution is included in the table at twice the full-load current for 208 volt transformers and at 4 times the full-load current for 240 volt and 480 volt transformers. These values are derived from the assumption that 208 volt systems are 50% motor load and 240 and 480 volt systems are 100% motor load.
3. All short circuit current values are in symmetrical RMS amperes.

Table 4B

Motor Full-Load Currents In Amperes, Single Phase, AC

Horsepower	115V	230V
⅛	4.4	2.2
¼	5.8	2.9
⅓	7.2	3.6
½	9.8	4.9
¾	13.8	6.9
1	16	8
1½	20	10
2	24	12
3	34	17
5	56	28
7½	80	40
10	100	50

Table 4C

Motor Full-Load Currents In Amperes, DC

Horsepower	120V	240V
¼	3.1	1.6
⅓	4.1	2.0
½	5.4	2.7
¾	7.6	3.8
1	9.5	4.7
1½	13.2	6.6
2	17	8.5
3	25	12.2
5	40	20
7½	58	29
10	76	38

Table 4D

Conversion Table of Polyphase Design B, C, D, and E Maximum Locked-Rotor Currents for Selection of Disconnecting Means and Controllers as Determined from Horsepower and Voltage Rating and Design Letter For use only with Sections 430-110, 440-12, 440-41, and 455-8(c) of the National Electric Code.

Rated HP	Maximum Motor Locked-Rotor Current Amperes Two and Three Phase Design B, C, D, and E											
	115 Volts		200 Volts		208 Volts		230 Volts		460 Volts		575 Volts	
	B, C, D	E	B, C, D	E	B, C, D	E	B, C, D	E	B, C, D	E	B, C, D	E
½	40	40	23	23	22.1	22.1	20	20	10	10	8	8
¾	50	50	28.8	28.8	27.6	27.6	25	25	12.5	12.5	10	10
1	60	60	34.5	34.5	33	33	30	30	15	15	12	12
1½	80	80	46	46	44	44	40	40	20	20	16	16
2	100	100	57.5	57.5	55	55	50	50	25	25	20	20
3	—	—	73.6	84	71	81	64	73	32	36.5	25.6	29.2
5	—	—	105.8	140	102	135	92	122	46	61	36.8	48.8
7½	—	—	146	210	140	202	127	183	63.5	91.5	50.8	73.2
10	—	—	186.3	259	179	249	162	225	81	113	64.8	90
15	—	—	267	388	257	373	232	337	116	169	93	135
20	—	—	334	516	321	497	290	449	145	225	116	180
25	—	—	420	646	404	621	365	562	183	281	146	225
30	—	—	500	775	481	745	435	674	218	337	174	270
40	—	—	667	948	641	911	580	824	290	412	232	330
50	—	—	834	1185	802	1139	725	1030	363	515	290	412
60	—	—	1001	1421	962	1367	870	1236	435	618	348	494
75	—	—	1248	1777	1200	1708	1085	1545	543	773	434	618
100	—	—	1668	2154	1603	2071	1450	1873	725	937	580	749
125	—	—	2087	2692	2007	2589	1815	2341	908	1171	726	936
150	—	—	2496	3230	2400	3106	2170	2809	1085	1405	868	1124
200	—	—	3335	4307	3207	4141	2900	3745	1450	1873	1160	1498
250	—	—	—	—	—	—	—	—	1825	2344	1460	1875
300	—	—	—	—	—	—	—	—	2200	2809	1760	2247
350	—	—	—	—	—	—	—	—	2550	3277	2040	2622
400	—	—	—	—	—	—	—	—	2900	3745	2320	2996
450	—	—	—	—	—	—	—	—	3250	4214	2600	3371
500	—	—	—	—	—	—	—	—	3625	4682	2900	3746

Table 5

Normal-Load and Fault Currents of Three Phase Transformers

Transformer Characteristics 3-Phase		AC Voltage 3-Phase					
		208V		240V		480V	
kVA Rating	% Impedance	Normal Load Continuous Amperes	Short Circuit Current	Normal Load Continuous Amperes	Short Circuit Current	Normal Load Continuous Amperes	Short Circuit Current
112.5	3.90	312	8,007	271	6,940	135	3,470
150	3.70	416	11,253	361	9,753	180	4,876
225	4.70	625	13,288	541	11,517	271	5,758
300	4.50	834	18,505	722	16,038	361	8,019
500	4.50	1388	30,842	1203	26,730	601	13,365
750	5.75	2080	36,206	1804	31,379	902	15,689
1000	5.75	2780	48,275	2406	41,838	1203	20,919
1500	5.75	4162	72,412	3610	62,575	1805	31,379
2000	5.75	—	—	4812	83,676	2406	41,838
2500	5.75	—	—	6010	104,596	3008	52,298

Table 6

Electrical Formulas for Finding Amperes, Horsepower, Kilowatts and kVA

To Find	Single Phase	Alternating Current Two Phase①, 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)	$\frac{I \times E \times \% EFF \times pf}{746}$	$\frac{I \times E \times 2 \times \% EFF \times pf}{746}$	$\frac{I \times E \times 1.73 \times \% EFF \times pf}{746}$	$\frac{I \times E \times \% EFF}{746}$
Amperes when Horsepower is Known	$\frac{HP \times 746}{E \times \% EFF \times pf}$	$\frac{HP \times 746}{2 \times E \times \% EFF \times pf}$	$\frac{HP \times 746}{1.73 \times E \times \% EFF \times pf}$	$\frac{HP \times 746}{E \times \% EFF}$
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.

Efficiencies:

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 x Power Factor);

Three phase induction motors, 25 horsepower and less	70%
Three phase induction motors above 25 horsepower	80%

These figures may be decreased slightly for single phase and two phase induction motors.

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.

Table 5 on page T-19 has been prepared to list the symmetrical RMS fault current which is available at the secondary terminals of the transformer.

Table 8②

Minimum Size Grounding Conductors for Grounding Raceways and Equipment (From NEC Table 250–122)

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	750 kcmil
5000	700 kcmil	1200 kcmil
6000	800 kcmil	1200 kcmil

Note: Where necessary to comply with 250.4(A)(5) or (B)(4), the equipment grounding conductor shall be sized larger than given in this table.

Table 7②

Grounding Electrode Conductor for AC Systems (From NEC Table 250–66)

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

①In three wire, two phase circuits the current in the common conductor is 1.41 times that in either other conductor.

②Additional information and exceptions are stated in Article 250 — Grounding, National Electrical Code.

E = Volts I = Amperes
% EFF = Per Cent Efficiency pf = Power Factor

Article 460.8 (NEC)

The ampacity of capacitor circuit conductors shall not be less than 135% of the rated current of the capacitor. The ampacity of conductors that connect a capacitor to the terminals of a motor or to motor circuit conductors shall not be less than one-third the ampacity of the motor circuit conductors and in no case less than 135% of the rated current of the capacitor.

Application

Circuit breakers and switches for use with capacitors must have a current rating in excess of rated capacitor current to provide for overcurrent from overvoltages at fundamental frequency and harmonic currents. Use the following percent of capacitor current rating to size circuit breaker or fused and non-fused switches.

- **Enclosed Circuit Breakers** 150% (Includes derating factor for enclosure)
- **Fused and non-fused switches** 165%

Due to switching surges, and possible overcurrent related to overvoltage and harmonics, Siemens recommends using 150% of the capacitor current rating to size a thermal-magnetic circuit breaker for overload protection.

If the circuit breaker is to be applied in an ambient greater than the marked rated ambient, it may be necessary to derate the continuous current rating. This is also true for applications where harmonic components are present. A basic formula to use for calculation of the capacitor current rating is as follows (assuming three phase application):

$$\frac{\text{Capacitor (Kvar) x 1000}}{\text{(Voltage / 1.732) x 3}}$$

The interrupting rating of the circuit breaker or fuse must be selected to match the system fault current available at the point of the capacitor application.

Table 17.37 Capacitor Application

Capacitor Rating		Amperage			Capacitor Rating		Amperage		
Voltage	K_{var}	Capacitor Rating	Enclosed Switch Fuse Rating	MCCB Trip Rating	Voltage	K_{var}	Capacitor Rating	Enclosed Switch Fuse Rating	MCCB Trip Rating
240	2.5	6	15	15	480 (cont'd)	125	150	250	225
	5	12	20	20		150	180	300	300
	7.5	18	30	30		160	192	350	300
	10	24.1	40	40		180	216	400	350
	15	36.1	60	60		200	241	400	400
	20	48.1	80	80		225	271	500	500
	25	60	100	90		240	289	500	500
	30	72.2	125	125		250	301	500	500
	45	108	200	175		300	361	600	600
	50	120	200	200		320	385	700	600
	60	144	250	225		360	433	800	700
	75	180	300	275		375	451	800	700
	90	217	400	350		400	481	800	800
	100	240	400	400		450	541	900	900
	120	289	500	450	600	5	4.8	15	15
	125	301	500	450		7.5	7.2	15	15
	135	325	600	500		10	9.6	20	15
	150	361	600	500		15	14.4	25	30
	180	433	800	700		20	19.2	35	30
	200	480	800	800		25	24.1	40	40
	225	541	900	900		30	28.9	50	50
	240	578	1000	900		35	33.7	60	50
	250	602	1000	900		40	38.5	70	70
	270	650	1200	1000		45	43.3	80	70
	300	720	1200	1200		50	48.1	80	100
	360	866	1600	1400		60	57.7	100	100
	375	903	1600	1400		75	72.2	125	125
480	2	2.41	15	15		80	77	150	125
	5	6	15	15		100	96.2	175	150
	7.5	9	15	15		120	115	200	175
	10	12	20	20		125	120	200	200
	15	18	30	30		150	144	250	225
	20	24	40	40		160	154	300	250
	25	30	50	50		180	173	300	300
	30	36.1	60	50		200	192	300	300
	35	42.1	70	60		225	217	400	350
	40	48.1	80	70		240	231	400	350
	45	54.1	90	80		250	241	400	400
	50	60.1	100	100		300	289	500	450
	60	72.2	125	110		320	308	600	500
	75	90.2	150	150		360	346	600	600
	80	96.2	175	150		375	361	600	600
	90	108.3	200	175		400	385	700	600
	100	120.3	200	200		450	433	800	700
	120	144	250	225					

Fraction, Decimal, and Millimeter Equivalents

Fractions to Decimals to Millimeters

Fractions	Decimals	Millimeters
1/64	0.015625	0.397
1/32	0.03125	0.794
3/64	0.046875	1.191
1/16	0.0625	1.588
5/64	0.078125	1.984
3/32	0.09375	2.381
7/64	0.109375	2.778
1/8	0.1250	3.175
9/64	0.140625	3.572
5/32	0.15625	3.969
11/64	0.171875	4.366
3/16	0.1875	4.763
13/64	0.203125	5.159
7/32	0.21875	5.556
15/64	0.234375	5.953
1/4	0.2500	6.350
17/64	0.265625	6.747
9/32	0.28125	7.144
19/64	0.296875	7.541
5/16	0.3125	7.938
21/64	0.328125	8.334
11/32	0.34375	8.731
23/64	0.359375	9.128
3/8	0.3750	9.525
25/64	0.390625	9.922
13/32	0.40625	10.319
27/64	0.421875	10.716
7/16	0.4375	11.113
29/64	0.453125	11.509
15/32	0.46875	11.906
31/64	0.484375	12.303
1/2	0.500	12.700
33/64	0.515625	13.097
17/32	0.53125	13.494
35/64	0.546875	13.891
9/16	0.5625	14.288
37/64	0.578125	14.684
19/32	0.59375	15.081
39/64	0.609375	15.478
5/8	0.6250	15.875
41/64	0.640625	16.272
21/32	0.65625	16.669
43/64	0.671875	17.066
11/16	0.6875	17.463
45/64	0.703125	17.859
23/32	0.71875	18.256
47/64	0.734375	18.653
3/4	0.7500	19.050
49/64	0.765625	19.447
25/32	0.78125	19.844
51/64	0.796875	20.241
13/16	0.8125	20.638
53/64	0.828125	21.034
27/32	0.84375	21.431
55/64	0.859375	21.828
7/8	0.8750	22.225
57/64	0.890625	22.622
29/32	0.90625	23.019
59/64	0.921875	23.416
15/16	0.9375	23.813
61/64	0.953125	24.209
31/32	0.96875	24.606
63/64	0.984375	25.003
1	1.000	25.400

Millimeters to Inches①

Millimeters	Inches	Millimeters	Inches
0.1	0.0039	46	1.8110
0.2	0.0079	47	1.8504
0.3	0.0118	48	1.8898
0.4	0.0157	49	1.9291
0.5	0.0197	50	1.9685
0.6	0.0236	51	2.0079
0.7	0.0276	52	2.0472
0.8	0.0315	53	2.0866
0.9	0.0354	54	2.1260
		55	2.1654
1	0.0394	56	2.2047
2	0.0787	57	2.2441
3	0.1181	58	2.2835
4	0.1575	59	2.3228
5	0.1969	60	2.3622
6	0.2362	61	2.4016
7	0.2756	62	2.4409
8	0.3150	63	2.4803
9	0.3543	64	2.5197
10	0.3937	65	2.5591
11	0.4331	66	2.5984
12	0.4724	67	2.6378
13	0.5118	68	2.6772
14	0.5512	69	2.7165
15	0.5906	70	2.7559
16	0.6299	71	2.7953
17	0.6693	72	2.8346
18	0.7087	73	2.8740
19	0.7480	74	2.9134
20	0.7874	75	2.9528
21	0.8268	76	2.9921
22	0.8661	77	3.0315
23	0.9055	78	3.0709
24	0.9449	79	3.1102
25	0.9843	80	3.1496
26	1.0236	81	3.1890
27	1.0630	82	3.2283
28	1.1024	83	3.2677
29	1.1417	84	3.3071
30	1.1811	85	3.3465
31	1.2205	86	3.3858
32	1.2598	87	3.4252
33	1.2992	88	3.4646
34	1.3386	89	3.5039
35	1.3780	90	3.5433
36	1.4173	91	3.5827
37	1.4567	92	3.6220
38	1.4961	93	3.6614
39	1.5354	94	3.7008
40	1.5748	95	3.7402
41	1.6142	96	3.7795
42	1.6535	97	3.8189
43	1.6929	98	3.8583
44	1.7323	99	3.8976
45	1.7717	100	3.9370

①0.001" = 0.0254 mm
1 mm = 0.03937"

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