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Circuit Protection

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Fuji Electric UL 489 Rated Molded Case Circuit Breakers (MCCBs)

BW Series Fuji Molded Case Circuit Breakers are more compact (especially 100A, 125A, 250A frames) than any breakers on the market, so control panels take up less space than ever before. This product group maintains conformity to all Worldwide standards, including cULus / IEC / CE Marking / JIS (Japan) / CCC (China).

starting at **$203.00**

- Suitable for branch circuit protection
- 5 frame sizes, rated current of 15 to 800A, max 600V
- Standard type and high-interrupting capacities are available in identically sized breakers
- Shunt Trip, Undervoltage Release and other accessories are available
- Auxiliary Switch and Shunt Trip can be installed in the field

3P Series UL 489 Molded Case Circuit Breakers (MCCBs)

The 3P series provides branch and feeder circuit protection in industrial control panels.

- UL 489
- Up to 600 amps
- 65kA @ 240 VAC interrupting rating
- G-frame size 15 to 100 amps
- F-frame size 100 to 225 amps
- K-frame size 250 to 400 amps
- L-frame size 400 to 600 amps

starting at **$280.00**

EATON

Eaton FAZ-NA and FAZ-NA-L Series UL 489 Miniature Circuit Breakers

starting at **$14.50**

The FAZ-NA and FAZ-NA-L series are DIN-rail mountable and can be used in branch circuit applications up to 63 amps and are available with B, C or D trip characteristics.

- UL 489
- DIN-rail mounted
- Up to 63 amps
- 1, 2, or 3-pole available
- 10kAIC @ 277/480VAC

Socomec DIRIS A Power Measurement Devices

Socomec DIRIS A Power Monitors provide high accuracy readings of a system's energy quality via a detailed breakdown of harmonics identifying: troughs outages, overvoltages, and overcurrents. These measurements enable you to monitor energy quality and costs, reduce production losses, improve efficiency and enhance performance.

- Easy to use solution for industry, infrastructure and data centers
- Integrated temperature sensor (A10 model)
- Detects wiring errors
- Panel mount (A20) and DIN rail mount (A10)
- Compact design
- Compliant with ANSI C12.20 and IEC 61557-12
- Revenue grade accuracy

starting at **$230.00**

Gladiator UL 489 Rated Miniature Circuit Breakers (MCBs)

Gladiator® from AutomationDirect

Gladiator GMCBU series miniature circuit breakers are quality and affordable AC and DC rated DIN-rail mountable true branch circuit breakers and can be used in feeder and branch circuit applications up to 63 amps. These circuit breakers are available with B, C or D trip characteristics in accordance with UL 489.

starting at **$13.00**

- True branch circuit protection (UL489) circuit breakers.
- Up to 63 amps
- AC and DC rated
- Single-pole, two-pole and three-pole models
- B, C and D trip curves
- Trip-free design – breaker cannot be defeated by holding the handle in the "ON" position
- Captive screws cannot be lost
- Can also be used in applications for which UL 1077 or CSA C22.2 No.235 are also allowed
- Field installable shunt trip and auxiliary switches, side mountable shunt and undervoltage trip
- Contact position indicator (red / green)
- Small size and 35mm DIN rail mountable
- Suitable for reverse feed

Gladiator UL 1077 Rated Miniature Supplementary Protectors

starting at **$7.00**

Gladiator UL 1077 rated GMCB series miniature supplementary protectors provide overcurrent protection where branch protection is already provided or not required. The units can be installed as a component within, or as a part of, an appliance or a piece of electrical equipment and are ideal replacements for fuses that are applied as a supplementary protector. Their advantage over fuses is that it is resettable and the device's status is easily and clearly identified by the position of the handle and the flag indicator.

- AC and DC rated
- Single-pole, two-pole and three-pole models
- Thermal magnetic overcurrent protection; B, C and D trip curves
- Trip-free design – breaker cannot be defeated by holding the handle in the "ON" position
- Small size
- 35mm DIN-rail mountable
- Box terminals accept #14 to #4 wire
- Color coded status indicator window: Red = ON or Green = OFF
- IP20 finger protection
- Captive screws cannot be lost
- Suitable for reverse feed applications

Gladiator GMCB and GMCBU Series Accessories

Auxiliary Contact

Auxuliary contacts are available for both series of MCBs and supplementary protectors. Auxiliary contacts act as secondary switching devices that work together with a primary device, to serve as an interlock or to provide indication of its current operation status.

Alarm Contacts

Alarm contacts are available for both series of MCBs and supplementary protectors. Alarm contacts are designed to change its position when the breaker or protector go to the tripped position, thus indicating an alarm condition for the device.

Shunt Trips

Shunt trips are available for both series of MCBs and supplementary protectors. Shunt trips provide a way to switch the breaker or supplementary protector OFF remotely.

Undervoltage Trips

Undervoltage trips are available for the GMCBU series miniature circuit breakers. Undervoltage trips force the circuit breaker to trip when an unnaccceptable voltage drop is detected, preventing damage to equipment and devices from the voltage drop. In addition, prevents non-critical loads from energizing when power returns to normal.

Locking Device

The locking device is available for both series, GMCBU MCBs and GMCB supplementary protectors. This locking device prevents accidental or intentional manual flipping of the operating handle. This locking device also allows for a keyed padlock to be inserted to further ensure only an authorized individual can unlock the operating handle.

starting at **$12.00**

Circuit

Gladiator® from AutomationDirect

Gladiator CFS Series UL 98 and UL 508 Rated Fusible Disconnect Switches

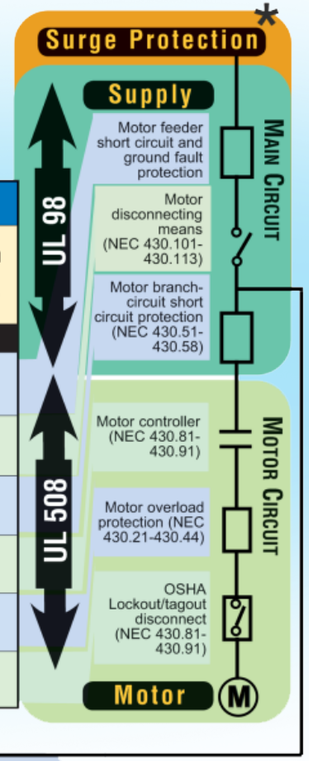
- UL 98 version, Class CC fuse, 30A, DIN rail mount
- UL 508 version, Midget class fuse, 30A, DIN rail mount
- 1, 2 and 3-pole models
- Provide open fuse indication for faster troubleshooting and reduced downtime
- Lockout / Tagout capability and finger safe construction
- Positive visible circuit isolation via the disconnect switch
- Uses only 1/3 the space of a molded circuit breaker and 2/3 the space of a traditional fusible switch

For Control Circuit - Supplementary Protection

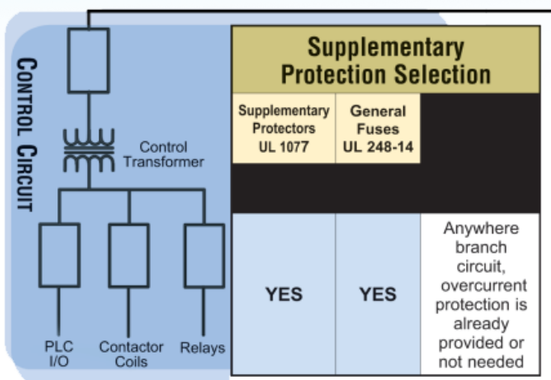
Which type of Circuit Protection are you looking for?

Circuit Protection Selection

	Molded Case and DIN rail mounted UL489 Circuit Breakers	Current Limiting Fuses UL 248	Disconnect Switches UL 98	Manual Motor Starters (MMS) UL 508	Load Switches UL 508	Supplementary Protectors UL 1077	General Fuses UL 248
Short circuit and ground fault protection for feeder and branch circuits	YES	YES	YES	NO	NO	NO	NO
Motor disconnecting means (NEC 430.101-430.113)	YES	YES	YES	NO	NO	NO	NO
Motor branch-circuit short circuit protection (NEC 430.51-430.58)	YES	YES	YES	NO	NO	NO	NO
Motor controller (NEC 430.81-430.91)	YES	YES	YES	NO	NO	NO	NO
Motor overload protection (NEC 430.21-430.44)	YES	YES	YES	YES	NO	NO	NO
OSHA Lockout/tagout disconnect (NEC 430.81-430.91)	YES	YES	YES	YES	YES	NO	NO



*Optional Feeder protection, required for Safety Interlock circuits NEC 670.6 (2017)



Protection (continued)

for single Class T

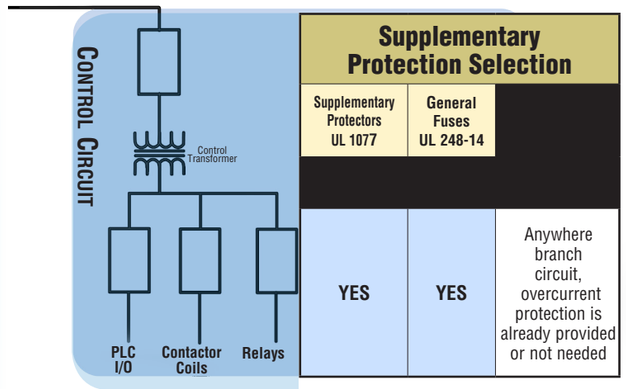
Edison Single and Dual-element Fuses

Industry standard extremely fast-acting, single element Class T and dual element time delay Class RK5, RK1, and Class J current limiting short circuit protection is available up to 600 amps.

NEW! High-speed Class J (JHL) combines electronic and motor branch circuit protection in one fuse.

These fuses are recommended for AC power distribution feeder and branch circuits; they provide ideal protection for motors and all general purpose applications including lighting, heating, inductive and non-inductive loads.

New Class L fast-acting current limiting fuses are particularly suited for protection of circuit breakers with lower interrupting ratings, non-inductive loads such as lighting and heating circuits and drive protection applications.



Supplementary FAZ series Protectors UL1077

Supplementary protectors are UL 1077 recognized and are used in applications where branch circuit protection is not required or is already provided.

FAZ Series

- DIN rail mountable
- Full line of auxiliary switches, alarm switches and padlock lockout accessories
- B trip curve 1 to 63 amps
- C trip curve 0.5 to 63 amps
- D trip curve 0.5 to 40 amps

Edison Current-limiting Fuses

We carry industry standard current limiting class CC, general purpose class M (Midget) and small dimension glass and ceramic circuit protection, fuse holders and accessories.

They provide ideal supplementary protection up to 30 amps to branch circuits and end of line equipment.

Modular and Power Distribution Fuse Blocks

Modular Class CC/ Midget/ J/ R Fuse Blocks

- Class R, 250V & 600V, 30-600A; Class J 600V, 30-600A
- CC and midget 600V, 30A
- Modular snap-together design
- New blocks have phase barriers between phases
- Snap on covers have lockout feature, blown fuse indication available
- DIN rail mountable up to 60A

Modular Class J Power Distribution Fuse Blocks

- Class J, 600V, 100-600A
- Combines power distribution block into fuse block body
- Saves space and labor

Circuit Protection (continued)

Merz UL 508 Non-Fusible Disconnect Switches

starting at $50.00

The Merz line of disconnect switches are designed to activate motor loads ON and OFF and isolate equipment from other loads as needed. Disconnects safely terminate circuit power to equipment for servicing, and are tested to withstand high fault short circuits to remain operational following overloads.

These disconnects are manual motor controllers (MMC) capable of across the line starting/stopping of a motor according to UL508.

The NEC requires each motor controller to have a disconnect within line of sight (article 430.102). The code also recognizes that a controller and disconnect can be the same unit (article 430.109). See Figure

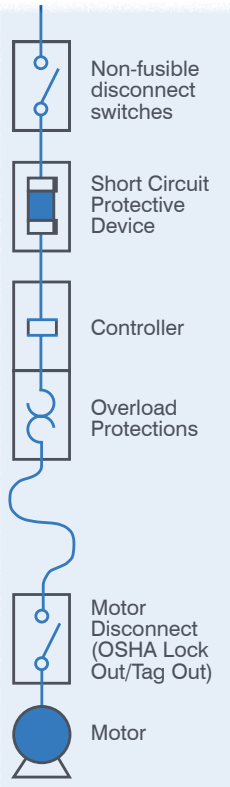
Merz has designed and tested these devices as both a controller and disconnect into one switch. For the motor controller is a UL 508 listed motor controller "Suitable as Motor Disconnect" to comply with both the controller and disconnect requirements of the NEC. Merz disconnect switches start at just $17.00.

Open switches/disconnects

- 3-Pole; 16-125A
- Shafts/handles/Accessories

Enclosed Disconnects

- 3-Pole; 25-125A
- 3-Pole + N; 40 & 63A



Merz Non-UL CAM Changeover Switches

starting at $21.00

CAM switches are CSA rated MMC's and are also rated for switching of other power circuits, such as heaters, but motor loads are the primary use. These Cam switches are capable of across the line switching of 2- or 3-pole motor loads OFF and ON. They are 3-position switches with:

- Transfer functions; I-OFF-II
- Reversing; Forward-OFF-Reverse

Socomec UL 98 and UL 508 Disconnects

Socomec rotary disconnect switches are available in many varieties to match any application. Socomec offers fused and non-fused switches in either small compact frames or larger heavy duty switches for more demanding uses. All of the Socomec rotary disconnects provide a high short circuit current rating, and are rated to make or break while under load to provide safe isolation.

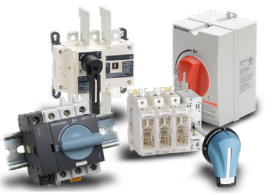
FUSERBLOC Series Fused Disconnects (30-600 Amps)

- UL 98 and UL 489 ratings
- 30A to 600A compact and large heavy duty frame
- 100kA-200kA SCCR @ 600VAC
- Front or side operated UL 98 Class J fusible rotary switch

SIRCO and SIRCO M Series Non- Fused Disconnects (16-600 Amps)

starting at $20.50

- UL 98, UL 98B, and UL 508 ratings
- 65kA-200kA SCCR (AC switches) 20kA @ 600VDC (DC switches)
- 3 and 4-pole
- 16A to 600A ratings
- Enclosed, DIN rail, panel mount options



Socomec SIRCOVER UL 1008 Manual Transfer Switch

Socomec SIRCOVER family of switches are manual transfer switches rated UL 1008. These switches are extremely durable and are tested and approved for use in the most demanding applications, such as resistive load or total system applications.

- Transferring between normal and generator power supplies
- Bypass operations
- 3 Stable completely isolated positions
- Compact design

starting at $313.00

UL 489 or UL 1077?
What are your Circuit Protection Requirements?

An understanding of circuit types and circuit protection products is critical to ensure their proper application.
See NEC Sections 100, 430 and 409 for definitions.

The proper sizing of an overcurrent protection device is the responsibility of the customer and should be determined using the application standards of the NEC (National Electric Code), CEC (Canadian Electrical Code) or other applicable standards. Per fine print note of 2008 NEC Section 100 "A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Therefore, the rules for overcurrent protection are specific for particular situations."

UL 489
Branch Protection

UL 1077
Supplementary Protection

What You Need to Know and Look For In Specifications
Certifications – Standards – Acceptance

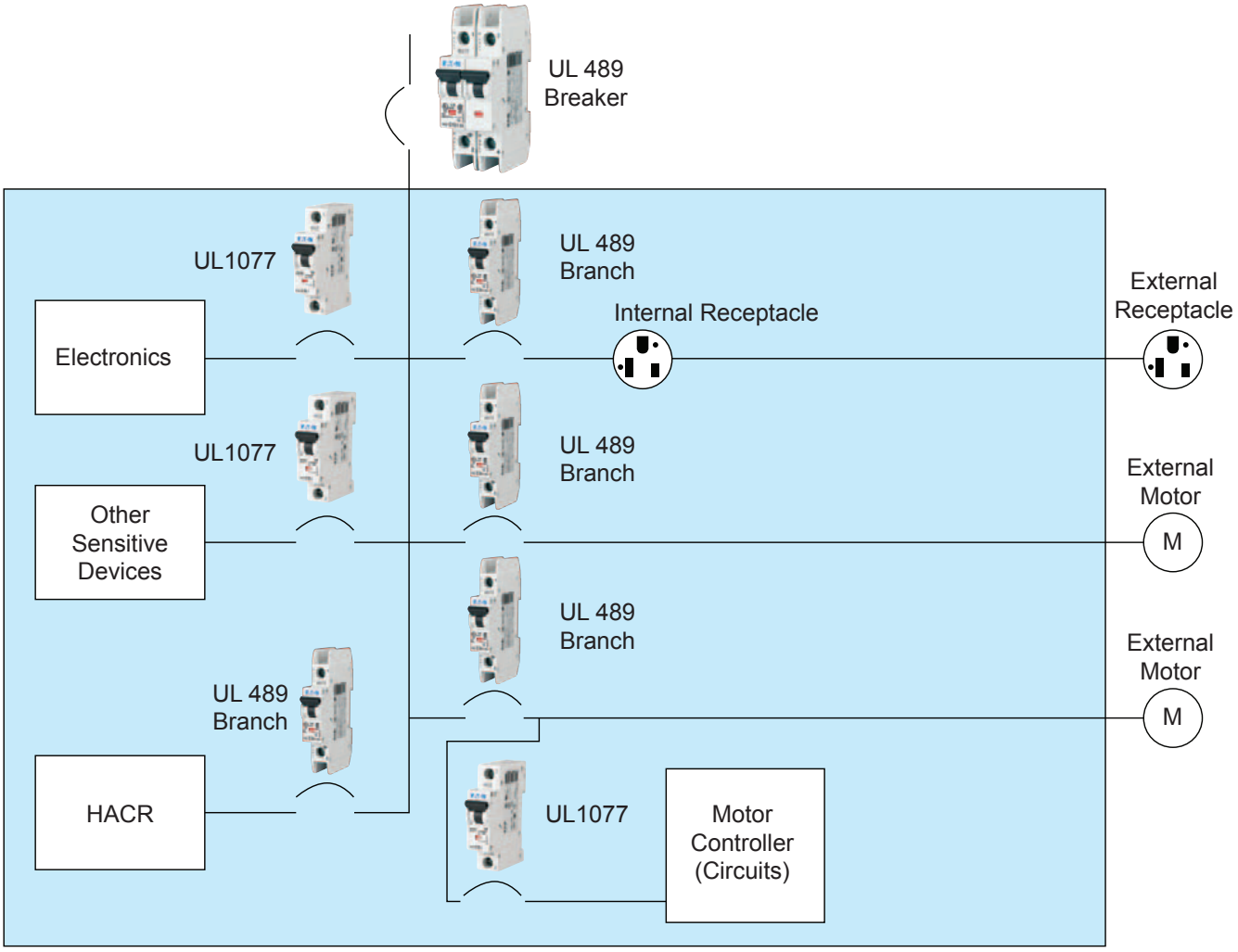
UL 489 Branch Protection	UL 1077 Supplementary Protection
• UL 489 Listed or Recognized • CSA C22.2 No. 5 • International ratings available depending on breaker type	• UL Recognized under UL 1077 • CSA 22.2 No. 285 • IEC 60947-2 or IEC 898
Function	
• Opens automatically on Overload and Short Circuit when properly applied within its ratings • Protects wire and cable against Overload and Short Circuit	• Opens automatically on Overload and Short Circuit • Provides additional equipment protection where branch circuit protection is already provided or not required • Not suitable for the protection of branch circuit conductors
Applications	
• Branch circuit protection in control panels, panelboards, switchboards and motor control centers • Motor overload and motor short circuit protection (UL 489 Recognized motor circuit protectors) for control panels and motor control centers	• Used within appliances or other electrical equipment such as control circuits, control power transformers, relays, PLC I/O points and lighting circuits • Ideal replacement for fuses that are applied as supplementary protection
Features	
• Bolted down or DIN rail mounted • External handle mechanisms available • Field mounted accessories • Stand alone branch circuit protection • Various levels of protection (curve type) • High voltage and interruption levels (up to 100 kAIC @ 480V)	• DIN rail mounted • Field mounted accessories • Various levels of protection (curve type) • 10 kAIC @ 240 VAC • 10 kAIC @ 277 VAC and 5 kAIC @ 480VAC • 10 kAIC @ 48VDC

kAIC = thousands of Amps interrupt capacity

Summary

A Supplementary Protector can't be used for Branch Circuit Protection.
Understanding the difference between Branch Circuit Protection and Supplementary Protection helps to ensure their proper use.

UL 1077 Supplementary Protectors and UL 489 Circuit Breakers Application Guidelines



Example of UL 489 and UL 1077 Application

UL489 circuit breakers

Used for branch circuit protection, internal/external receptacles, external motors and HACR equipment (heating, air conditioning and refrigeration).

UL1077 supplementary protectors

Used for overcurrent protection within appliances or electrical equipment, where branch circuit protection is already provided or not required.

Note: UL489 devices can be used in place of UL1077; UL1077 devices cannot be used in place of UL489.

Fuji Molded Case Circuit Breakers Overview

Overview

Fuji Molded Case Circuit Breakers are more compact (especially 100A, 125A, 250A frames) than any breakers on the market, so they take up less space in control panels.

This product group maintains conformity to all Worldwide standards.

Agency Approvals

- UL listed, MCCB, File: E90584
- UL listed, Accessories, File E93289
- CE marked
- CCC marked
- TUV certified

Standards

- UL 489
- CSA C22.2 No.5
- IEC 60947-2
- EN 60947-2
- GB 14048.2
- JIS C8201-2-1, 2 (ANN.1, 2)

Features

- Thermal-magnetic 15A through 800A
- Suitable for branch circuit protection
- Rated current of 15 to 800A, max 600V
- Standard type and high-interrupting capacities available in identically sized breakers
- Shunt Trip, Undervoltage Release and other accessories available
- Line and load lug terminals included on all MCCBs
- Auxiliary switch, Alarm switch and Shunt Trip can be installed in the field
- Door-mounted or flange-mounted, flex shaft operating handles
- All frame sizes suitable for reverse-feed applications
- All breakers include mounting hardware
- Terminal covers included for BW125 and BW250 frames. Terminal covers available for BW400, BW630 and BW800 frames.

Fuji Electric
e-Front runners

Fuji Electric Molded Case Circuit Breakers Technical Specifications

Circuit Breaker Type	Ampere Rating at 40°C	No. Poles	Volts		Type of Trip*	UL 489 Interrupting Ratings (rms Symmetrical Amperes) (kA)			
			AC	DC		Volts AC (50/60 Hz)			Volts DC
						240	*480*	*600*	*250***
BW125JAGU	15-125	3	600	250	N.I.T.U	50	30	10	10
BW250JAGU	125-250	3	600	250	N.I.T.U	50	30	10	10
BW400SAGU	250-400	3	480	250	N.I.T.U	50	35	–	10
BW630RAGU	500-600	3	480	250	N.I.T.U	100	50	–	10
BW800RAGU	700-800	3	480	250	N.I.T.U	100	50	–	10

Note: N.I.T.U denotes non-interchangeable trip unit.
****Note: For DC or 1-phase AC applications, use the two outside poles of the 3-pole circuit breaker***

Fuji Molded Case Circuit Breakers – 125A Frame

Fuji Electric
e-Front runners

BW125JAGU-3P125SB

Fuji BW125A series MCCBs are 125 amp frame, 3-pole, non-adjustable magnetic trip, molded case circuit breakers (MCCB). The BW125 series is suitable for reverse feed applications. Included with each MCCB are Line and Load-side lug terminals, terminal covers and mounting hardware. Accessories are not pre-installed and are sold separately.

BW125-Frame Series Three-Pole Molded Case Circuit Breakers

Part Number	Price	Frequency	Rated Interrupting Capacity (kA)						
			Rated Current	UL489 CAN/CSA C22.2 No. 5		IEC60947-2, JIS C 8201-2-1 Icu/Ics		GB14048.2 Icu/Ics	
			Ampere Rating	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity
BW125JAGU-3P015SB	$203.00	50/60 Hz	15	600V/Y AC 480V/Δ AC 480V/Y AC 240V AC 250V DC	10 kA 30 kA 30 kA 50 kA 10 kA	500V AC 440V AC 400V AC 380V AC 240V AC 250V DC	15/8 kA 30/15 kA 30/15 kA 30/15 kA 50/25 kA 15/8 kA	400V AC 230V AC	30/15 kA 50/25 kA
BW125JAGU-3P020SB	$203.00		20						
BW125JAGU-3P030SB	$203.00		30						
BW125JAGU-3P040SB	$203.00		40						
BW125JAGU-3P050SB	$203.00		50						
BW125JAGU-3P060SB	$203.00		60						
BW125JAGU-3P070SB	$203.00		70						
BW125JAGU-3P075SB	$203.00		75						
BW125JAGU-3P080SB	$203.00		80						
BW125JAGU-3P090SB	$203.00		90						
BW125JAGU-3P100SB	$203.00		100						
BW125JAGU-3P125SB	$203.00		125						

Note: SCCR = UL489 interrupting capacity

BW125-Frame Accessory Selection Guide

Part Number	Price	Description
BW9W1SG0	$27.00	Field installable auxiliary contact switch, use with BW125 and BW250 series MCCBs. SPDT. 20AWG lead wires, 19.69" long, left side mount only
BW9FRG0	$55.00	Field installable DC shunt trip, use with BW125 and BW250 series MCCBs; 24 VDC/AC, 20 AWG lead wires 19.69" long, left and right side mount
BW9FAG0	$55.00	Field installable AC shunt trip, use with BW125 and BW250 series MCCBs; 100-120 VAC, 20 AWG lead wires 19.69" long, left and right side mount
BW9RGAR	$55.00	Field installable DC undervoltage release, use with BW125and BW250 series MCCBs; 24 VDC, 20AWG lead wires, 19.69" long, left side mount only
BW9RGAT	$55.00	Field installable AC undervoltage release, use with BW125and BW250 series MCCBs; 110-130 VAC, 20AWG lead wires, 19.69" long, left side mount only
BW9SL0CA-3	$56.00	Replacement lugs for BW125-frame MCCBs,. package of 3
BW9V0CA	$50.00	NEMA 12 rotary handle for BW125-Frame. Position indicating; lock-off feature. Shaft length: 0.39"
BW9VSG0	$12.00	NEMA 12 rotary handle shaft for BW9V0CA and BW9V0GA, BW125 and BW250 Frames. Steel shaft length: 6.06" (154 mm)
BW9VSG0-24	$32.50	NEMA 12 rotary handle shaft for BW9V0CA and BW9V0GA, BW125 and BW250 Frames. Steel shaft length: 24" (610 mm)
BW9F0CA-15A	$264.00	NEMA 12 flexible shaft handle for BW125-Frame. Flange mounted. Lockable. Flex cable shaft length: 4.92' (1.5m)
BW9F0CA-20A	$275.00	NEMA 12 flexible shaft handle for BW125-Frame. Flange mounted. Lockable. Flex cable shaft length: 6.56' (2m)
BW9Q1CA	$13.50	Lockout attachment, use to lock out BW125 and BW250 series MCCBs. Lock not included.

Note: Short-type terminal covers (gray-white) are supplied as standard.

BW9V0CA

BW9F0CA-15A

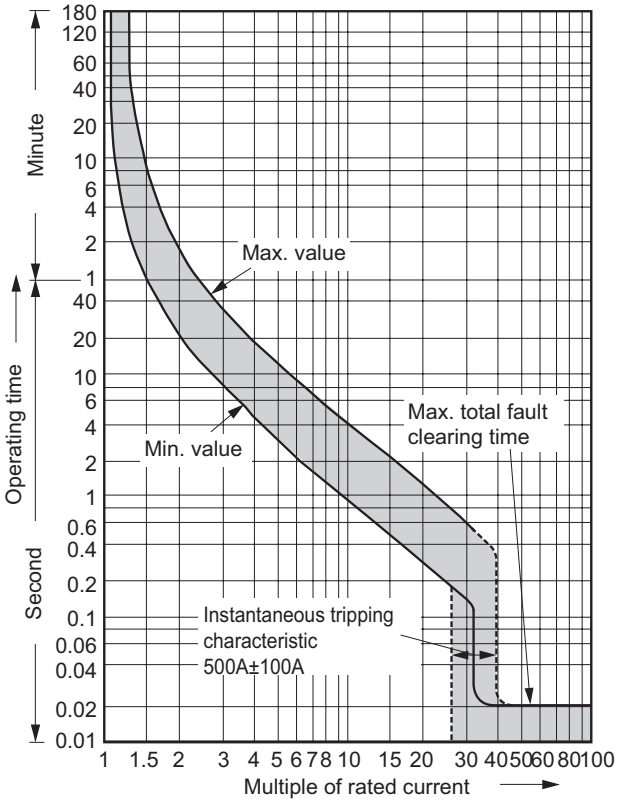
BW9FAG0

BW9RGAR

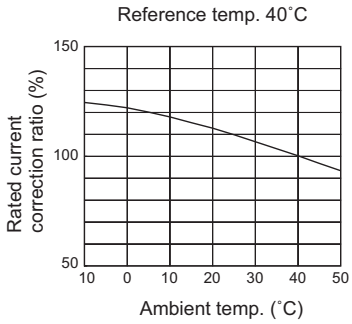
BW9Q1CA

Fuji Molded Case Circuit Breakers – 125A Frame Characteristic Curves

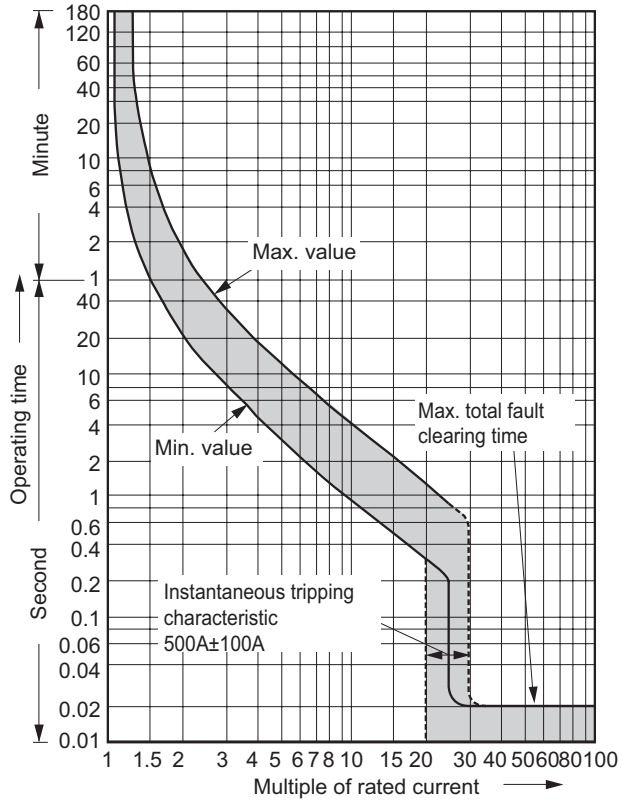
BW125 Rated Current 15A



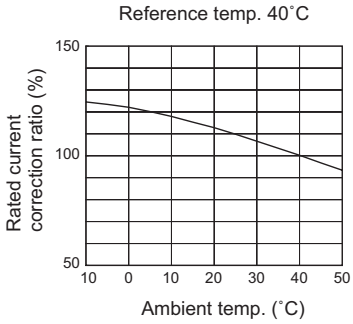
BW125 (rated current 15A)



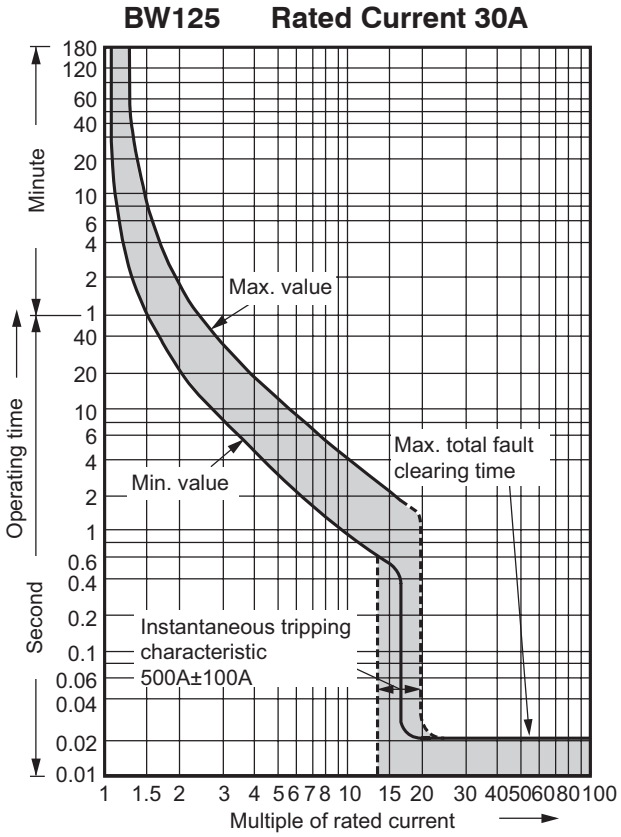
BW125 Rated Current 20A



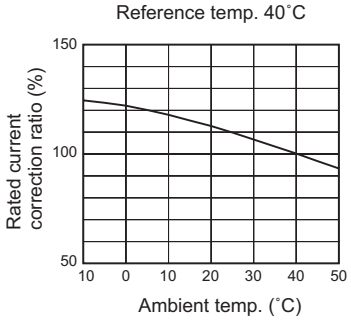
BW125 (rated current 20A)

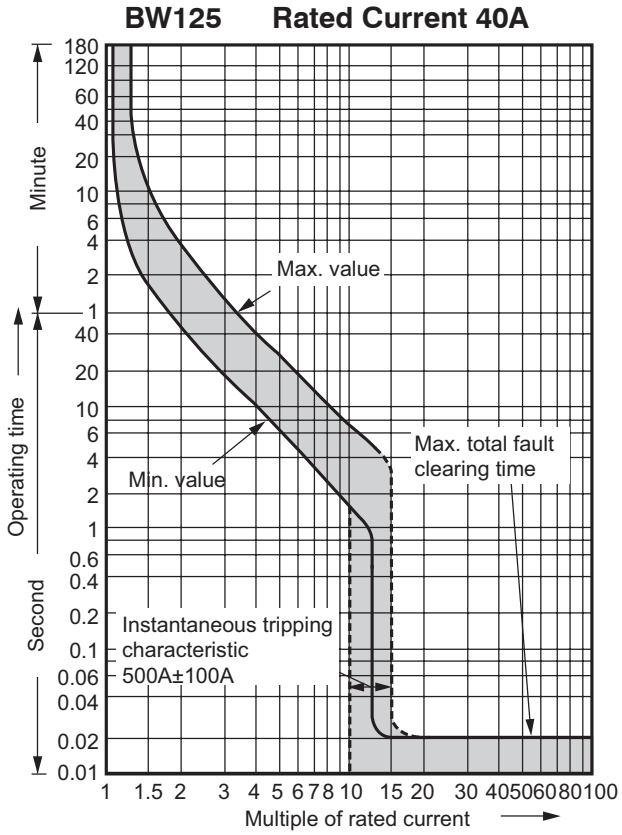


Fuji Molded Case Circuit Breakers – 125A Frame Characteristic Curves

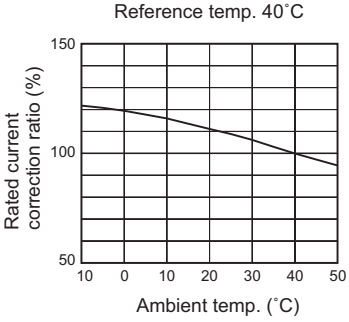


BW125 (Rated current: 30A)



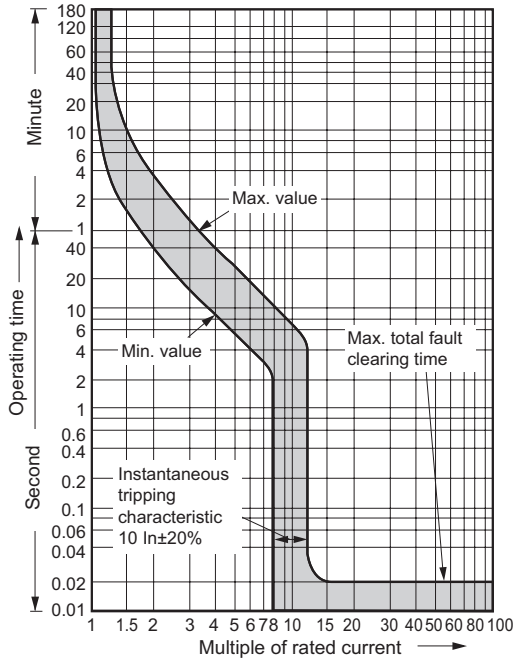


BW125 (Rated current: 40A)



Fuji Molded Case Circuit Breakers – 125A Frame Characteristic Curves

BW125 Current Range 50 -125A



Note: Instantaneous tripping = 10 x (rated current) ± 20%
In = rated current

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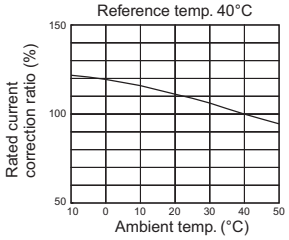
e-Front runners

BW125 (Rated current: 50 - 125A)



Fuji Molded Case Circuit Breakers – 250A Frame

BW250JAGU-3P125SB

Fuji Electric
e-Front runners

Fuji BW250A series MCCBs are 250 amp frame, 3-pole, non-adjustable magnetic trip, molded case circuit breakers (MCCB). The BW250 series is suitable for reverse feed applications.

Included with each MCCB are Line and Load-side lug terminals, terminal covers and mounting hardware. Accessories are not pre-installed and are sold separately.

BW250-Frame Series Three-Pole Molded Case Circuit Breakers

Part Number	Price	Frequency	Rated Interrupting Capacity (kA)						
			Rated Current	UL489 CAN/CSA C22.2 No. 5		IEC60947-2, JIS C 8201-2-1 Icu/Ics		GB14048.2 Icu/Ics	
			Ampere Rating	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity
BW250JAGU-3P125SB	$456.00	50/60 Hz	125	600V/Y AC 480V/Δ AC 480V/Y AC 240V AC 250V DC	10 kA 30 kA 30 kA 50 kA 10 kA	500V AC 440V AC 400V AC 380V AC 240V AC 250V DC	18/9 kA 30/15 kA 30/15 kA 30/15 kA 50/25 kA 20/10 kA	400V AC 230V AC	30/15 kA 50/25 kA
BW250JAGU-3P150SB	$456.00		150						
BW250JAGU-3P160SB	$456.00		160						
BW250JAGU-3P175SB	$456.00		175						
BW250JAGU-3P200SB	$456.00		200						
BW250JAGU-3P225SB	$456.00		225						
BW250JAGU-3P250SB	$456.00		250						

Note: SCCR = UL489 interrupting capacity

BW250-Frame Accessory Selection Guide

Part Number	Price	Description
BW9W1SG0	$27.00	Field installable auxiliary contact switch, use with BW125 and BW250 series MCCBs. SPDT. 20AWG lead wires, 19.69" long, left side mount only
BW9FRG0	$55.00	Field installable DC shunt trip, use with BW125 and BW250 series MCCBs; 24 VDC/AC, 20 AWG lead wires 19.69" long, left and right side mount
BW9FAG0	$55.00	Field installable AC shunt trip, use with BW125 and BW250 series MCCBs; 100-120 VAC, 20 AWG lead wires 19.69" long, left and right side mount
BW9RGAR	$55.00	Field installable DC undervoltage release, use with BW125and BW250 series MCCBs; 24 VDC, 20AWG lead wires, 19.69" long, left side mount only
BW9RGAT	$55.00	Field installable AC undervoltage release, use with BW125and BW250 series MCCBs; 110-130 VAC, 20AWG lead wires, 19.69" long, left side mount only
BW9SL0GA-3	$63.00	Replacement lugs for BW250-frame MCCBs up to 175A, package of 3
BW9SL1GA-3	$70.00	Replacement lugs for BW250-frame MCCBs 175A to 250A, package of 3
BW9V0GA	$50.00	NEMA 12 rotary handle for BW250-Frame. Position indicating; lock-off feature. Shaft length: 0.39"
BW9VSG0	$12.00	NEMA 12 rotary handle shaft for BW9V0CA and BW9V0GA, BW125 and BW250 Frames. Steel shaft length: 6.06" (154 mm)
BW9VSG0-24	$32.50	NEMA 12 rotary handle shaft for BW9V0CA and BW9V0GA, BW125 and BW250 Frames. Steel shaft length: 24" (610 mm)
BW9F0GA-15A	$275.00	NEMA 12 flexible shaft handle for BW250-Frame. Flange mounted. Lockable. Flex cable shaft length: 4.92' (1.5m)
BW9F0GA-20A	$288.00	NEMA 12 flexible shaft handle for BW250-Frame. Flange mounted. Lockable. Flex cable shaft length: 6.56' (2m)
BW9Q1CA	$13.50	Lockout attachment, use to lock out BW125 and BW250 series MCCBs. Lock not included.

Note: Short-type terminal covers (gray-white) are supplied as standard.

BW9V0GA

BW9F0GA-15A

BW9FRG0

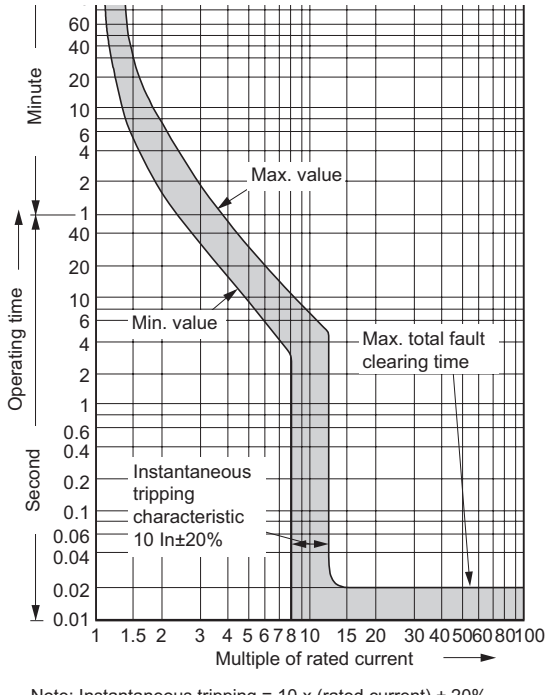
BW9RGAR

BW9Q1CA

Wiring Specifications chart is on page CP-31

Fuji Molded Case Circuit Breakers – 250A Frame Characteristic Curves

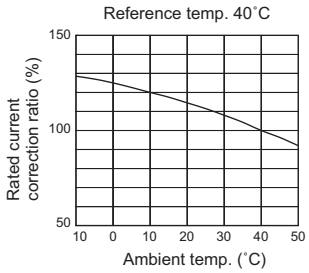
BW250 Current Range 125 - 250A



Note: Instantaneous tripping = 10 x (rated current) ± 20%

Fuji Electric
e-Front runners

BW250 (Current Range: 125 - 250A)



Fuji Molded Case Circuit Breakers – 400A Frame

Fuji Electric
e-Front runners

BW400SAGU-3P250SB

Fuji BW400A series MCCBs are 400 amp frame, 3-pole, non-adjustable magnetic trip, molded case circuit breakers (MCCB). The BW400 series is suitable for reverse feed applications. Included with each MCCB are Line and Load-side lug terminals and mounting hardware. Accessories are not pre-installed and are sold separately.

BW400-Frame Series Three-Pole Molded Case Circuit Breakers

Part Number	Price	Frequency	Rated Interrupting Capacity (kA)						
			Rated Current	UL489 CAN/CSA C22.2 No. 5		IEC60947-2, JIS C 8201-2-1 Icu/Ics		GB14048.2 Icu/Ics	
			Ampere Rating	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity
BW400SAGU-3P250SB	$836.00	50/60 Hz	250	480V/Δ AC 480V/Y AC 240V AC 250V DC	35 kA 35 kA 50 kA 10 kA	690V AC 500V AC 440V AC 400V AC 380V AC 240V AC 250V DC	10/5 kA 20/10 kA 36/18 kA 36/18 kA 36/18 kA 85/43 kA 20/10 kA	400V AC 230V AC	36/18 kA 85/43 kA
BW400SAGU-3P300SB	$836.00		300						
BW400SAGU-3P350SB	$839.00		350						
BW400SAGU-3P400SB	$836.00		400						

Note: SCCR = UL489 interrupting capacity

BW400-Frame Accessory Selection Guide

Part Number	Price	Description
BW9W1SHA	$25.00	Field installable auxiliary contact switch, use with BW400, BW630 and BW800 series MCCBs. SPDT. 20AWG lead wires, 19.69" long, left side mount only
BW9FHA-R	$55.00	Field installable DC shunt trip, use with BW400, BW630 and BW800 series MCCBs; 24 VDC/AC, 20 AWG lead wires 19.69" long, left and right side mount
BW9FHA-A	$55.00	Field installable AC shunt trip, use with BW400, BW630 and BW800 series MCCBs; 100-120 VAC, 20 AWG lead wires 19.69" long, left and right side mount
BW9RHA-R	$53.00	Field installable DC undervoltage release, for BW400, BW630 and BW800 series MCCBs; 24-48 VDC, 20AWG lead wires, 19.69" long, left side mount only
BW9RHA-1	$55.00	Field installable AC undervoltage release, for BW400, BW630 and BW800 series MCCBs; 120-130 VAC, 20AWG lead wires, 19.69" long, left side mount only
BW9BTHA-L3W*	$55.00	Terminal cover for BW400-frame MCCBs, line and load side, package of 2
BW9V0HA	$75.00	NEMA 12 rotary handle for BW400-Frame. Position indicating; lock-off feature. Shaft length: 0.39"
BZ-VS2	$10.00	NEMA 12 rotary handle shaft for BW9V0HA and BW9V0JA, BW400, BW630 and BW800 Frames. Steel shaft length: 3.48" (88 mm)
BZ-VS2-24	$32.50	NEMA 12 rotary handle shaft for BW9V0HA and BW9V0JA, BW400, BW630 and BW800 Frames. Steel shaft length: 24" (610 mm)
BW9F0HA-15A**	$400.00	NEMA 12 flexible shaft handle for BW400-Frame. Flange mounted. Lockable. Flex cable shaft length: 4.92' (1.5m)
BW9F0HA-20A**	$412.00	NEMA 12 flexible shaft handle for BW400-Frame. Flange mounted. Lockable. Flex cable shaft length: 6.56' (2m)
BW9QNHA	$32.50	Lockout attachment, use to lock out BW400, BW630 and BW800 series MCCBs. Lock not included.

Terminal covers are not supplied as standard.
****Terminal covers for line side and load side included with Flange Disconnects. 2/pk***
Note: Terminals are factory-installed only. No replacement terminals available.

BW9V0HA

BW9F0HA-15A

BW9FHA-R

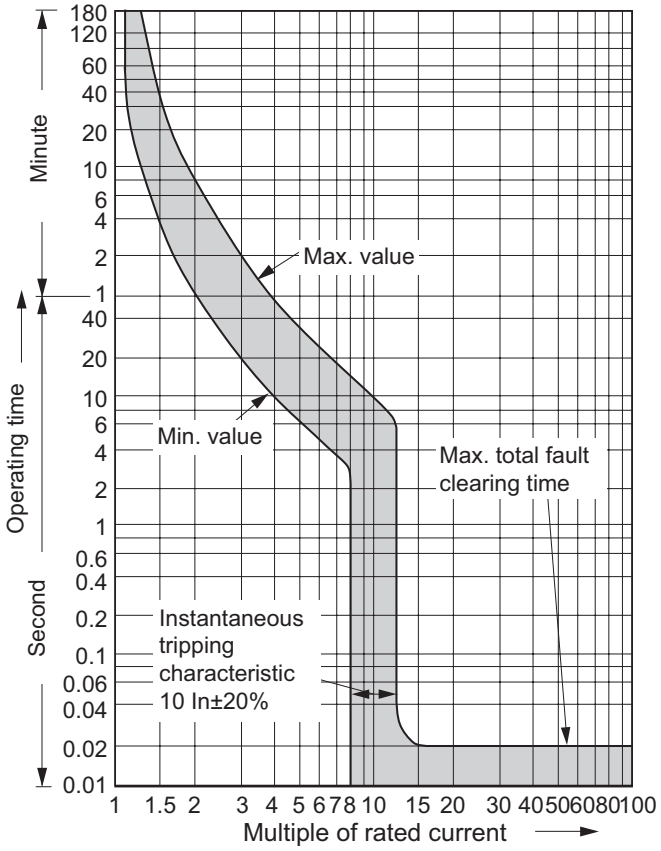
BW9RHA-R

BW9QNHA

Wiring Specifications chart is on page CP-31

Fuji Molded Case Circuit Breakers – 400A Frame Characteristic Curves

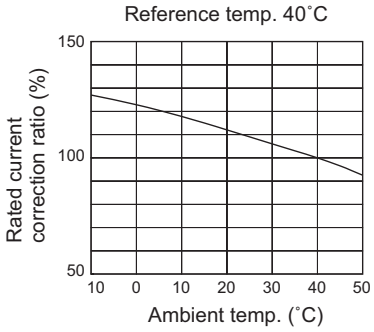
BW400 Current Range 250 - 400A



Note: Instantaneous tripping = 10 x (rated current) ± 20%
In = rated current

Fuji Electric
e-Front runners

BW400 (Current Range: 250 - 400A)



Fuji Molded Case Circuit Breakers – 630A Frame

Fuji Electric
e-Front runners

Fuji BW630A series MCCBs are 630 amp frame, 3-pole, non-adjustable magnetic trip, molded case circuit breakers (MCCB). The BW630 series is suitable for reverse feed applications. Included with each MCCB are Line and Load-side lug terminals and mounting hardware. Accessories are not pre-installed and are sold separately.

BW630RAGU-3P500SB

BW630-Frame Series Three Pole Molded Case Circuit Breakers									
Part Number	Price	Frequency	Rated Interrupting Capacity (kA)						
			Rated Current	UL489 CAN/CSA C22.2 No. 5		IEC60947-2, JIS C 8201-2-1 Icu/Ics		GB14048.2 Icu/Ics	
			Ampere Rating	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity
BW630RAGU-3P500SB	$1,240.00	50/60 Hz	500	480V/Δ AC 480V/Y AC 240V AC 250V DC	50 kA 50 kA 100 kA 10 kA	690V AC 500V AC 440V AC 400V AC 380V AC 240V AC 250V DC	15/8 kA 36/18 kA 50/25 kA 50/25 kA 50/25 kA 100/50 kA 40/20 kA	400V AC 230V AC	50/25 kA 100/50 kA
BW630RAGU-3P600SB	$1,240.00		600						

Note: SCCR = UL489 interrupting capacity

BW630-Frame Accessory Selection Guide		
Part Number	Price	Description
BW9W1SHA	$25.00	Field installable auxiliary contact switch, use with BW400, BW630 and BW800 series MCCBs. SPDT. 20AWG lead wires, 19.69" long, left side mount only
BW9FHA-R	$55.00	Field installable DC shunt trip, use with BW400, BW630 and BW800 series MCCBs; 24 VDC/AC, 20 AWG lead wires 19.69" long, left and right side mount
BW9FHA-A	$55.00	Field installable AC shunt trip, use with BW400, BW630 and BW800 series MCCBs; 100-240 VAC/100-220 VDC, 20 AWG lead wires 19.69" long, left and right side mount
BW9RHA-R	$53.00	Field installable DC undervoltage release, for BW400, BW630 and BW800 series MCCBs; 24-48 VDC, 20AWG lead wires, 19.69" long, left side mount only
BW9RHA-1	$55.00	Field installable AC undervoltage release, for BW400, BW630 and BW800 series MCCBs; 120-130 VAC, 20AWG lead wires, 19.69" long, left side mount only
BW9BTJA-L3W*	$58.00	Terminal cover for BW400-frame MCCBs, line and load side, package of 2
BW9V0JA	$89.00	NEMA 12 rotary handle for BW630-Frame. Position indicating; lock-off feature. Shaft length: 0.39"
BZ-VS2	$10.00	NEMA 12 rotary handle shaft for BW9V0HA and BW9V0JA, BW400, BW630 and BW800 Frames. Steel shaft length: 3.48" (88 mm)
BZ-VS2-24	$32.50	NEMA 12 rotary handle shaft for BW9V0HA and BW9V0JA, BW400, BW630 and BW800 Frames. Steel shaft length: 24" (610 mm)
BW9F0JA-15A**	$432.00	NEMA 12 flexible shaft handle for BW630 and BW800 frames. Flange mounted. Lockable. Flex cable shaft length: 4.92' (1.5m)
BW9F0JA-20A**	$445.00	NEMA 12 flexible shaft handle for BW630 and BW800 frames. Flange mounted. Lockable. Flex cable shaft length: 6.56' (2m)
BW9QNHA	$32.50	Lockout attachment, use to lock out BW400, BW630 and BW800 series MCCBs. Lock not included.

**Terminal covers are not supplied as standard.*
***Terminal covers for line side and load side included with Flange Disconnects. 2/pk*
Note: Terminals are factory-installed only. No replacement terminals available.

BW9V0JA

BW9F0JA-15A

BW9FHA-R

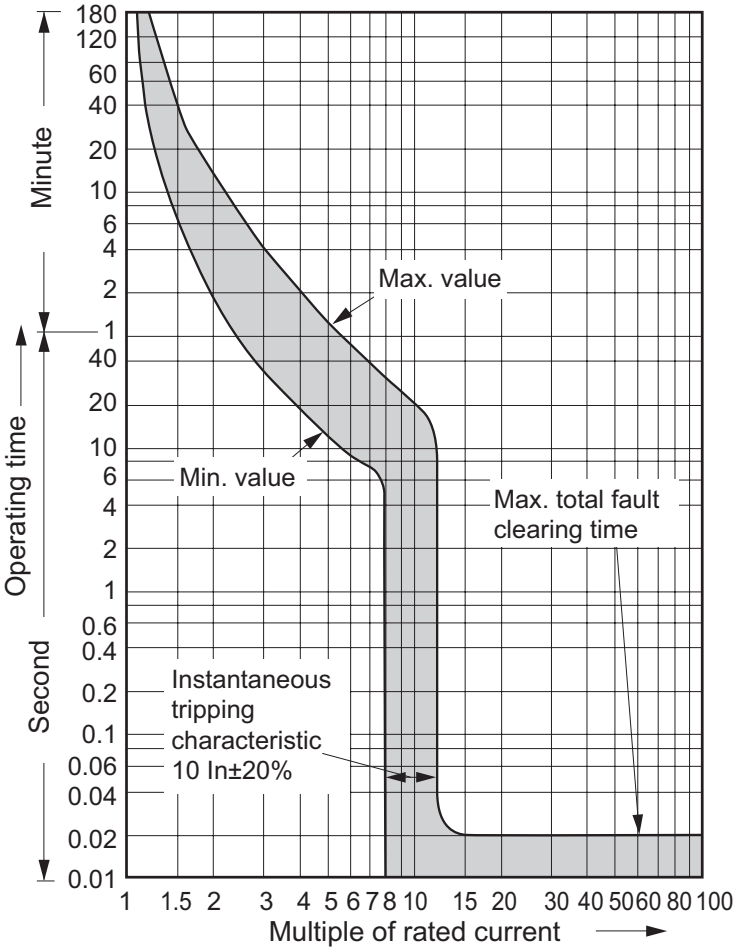
BW9RHA-R

BW9QNHA

Wiring Specifications chart is on page CP-31

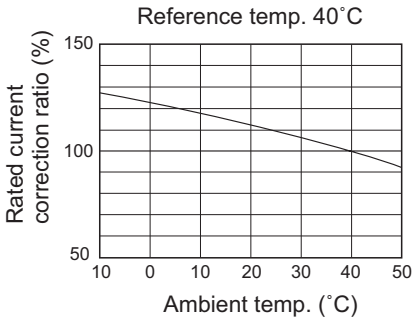
Fuji Molded Case Circuit Breakers – 630A Frame Characteristic Curves

BW630 Current Range 500 - 600A



Fuji Electric
e-Front runners

BW630 (Current Range: 500 - 600A)



Fuji Molded Case Circuit Breakers – 800A Frame

BW800RAGU-3P700SB

Fuji Electric
e-Front runners

Fuji BW800A series MCCBs are 800 amp frame, 3-pole, non-adjustable magnetic trip, molded case circuit breakers (MCCB). The BW800 series is suitable for reverse feed applications. Included with each MCCB are Line and Load-side lug terminals and mounting hardware. Accessories are not pre-installed and are sold separately.

BW800-Frame Series Three-Pole Molded Case Circuit Breakers

Part Number	Price	Frequency	Rated Interrupting Capacity (kA)						
			Rated Current	UL489 CAN/CSA C22.2 No. 5		IEC60947-2, JIS C 8201-2-1 Icu/Ics		GB14048.2 Icu/Ics	
			Ampere Rating	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity	Voltage	Interrupt Capacity
BW800RAGU-3P700SB	$1,705.00	50/60 Hz	700	480V/Δ AC 480V/Y AC 240V AC 250V DC	50 kA 50 kA 100 kA 10 kA	690V AC 500V AC 440V AC 400V AC 380V AC 240V AC 250V DC	15/8 kA 36/18 kA 50/25 kA 50/25 kA 50/25 kA 100/50 kA 40/20 kA	400V AC 230V AC	50/25 kA 100/50 kA
BW800RAGU-3P800SB	$1,705.00		800						

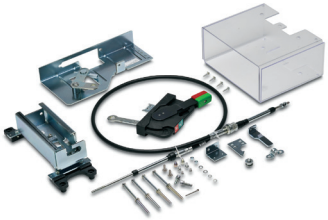
Note: SCCR = UL489 interrupting capacity

BW800-Frame Accessory Selection Guide

Part Number	Price	Description
BW9W1SHA	$25.00	Field installable auxiliary contact switch, use with BW400, BW630 and BW800 series MCCBs. SPDT. 20AWG lead wires, 19.69" long, left side mount only
BW9FHA-R	$55.00	Field installable DC shunt trip, use with BW400, BW630 and BW800 series MCCBs; 24 VDC/AC, 20 AWG lead wires 19.69" long, left and right side mount
BW9FHA-A	$55.00	Field installable AC shunt trip, use with BW400, BW630 and BW800 series MCCBs; 100-120 VAC, 20 AWG lead wires 19.69" long, left and right side mount
BW9RHA-R	$53.00	Field installable DC undervoltage release, for BW400, BW630 and BW800 series MCCBs; 24-48 VDC, 20AWG lead wires, 19.69" long, left side mount only
BW9RHA-1	$55.00	Field installable AC undervoltage release, for BW400, BW630 and BW800 series MCCBs; 120-130 VAC, 20AWG lead wires, 19.69" long, left side mount only
BW9BTJA-L3W*	$58.00	Terminal cover for BW400-frame MCCBs, line and load side, package of 2
BW9V0JA	$89.00	NEMA 12 rotary handle for BW800-Frame. Position indicating; lock-off feature. Shaft length: 0.39"
BZ-VS2	$10.00	NEMA 12 rotary handle shaft for BW9V0HA and BW9V0JA, BW400, BW630 and BW800 Frames. Steel shaft length: 3.48" (88 mm)
BZ-VS2-24	$32.50	NEMA 12 rotary handle shaft for BW9V0HA and BW9V0JA, BW400, BW630 and BW800 Frames. Steel shaft length: 24" (610 mm)
BW9F0JA-15A**	$432.00	NEMA 12 flexible shaft handle for BW630 and BW800 frames. Flange mounted. Lockable. Flex cable shaft length: 4.92' (1.5m)
BW9F0JA-20A**	$445.00	NEMA 12 flexible shaft handle for BW630 and BW800 frames. Flange mounted. Lockable. Flex cable shaft length: 6.56' (2m)
BW9QNHA	$32.50	Lockout attachment, use to lock out BW400, BW630 and BW800 series MCCBs. Lock not included.

**Terminal covers are not supplied as standard.*
***Terminal covers for line side and load side included with Flange Disconnects. 2/pk*
Note: Terminals are factory-installed only. No replacement terminals available.

BW9V0JA



BW9F0JA-15A

BW9FHA-R

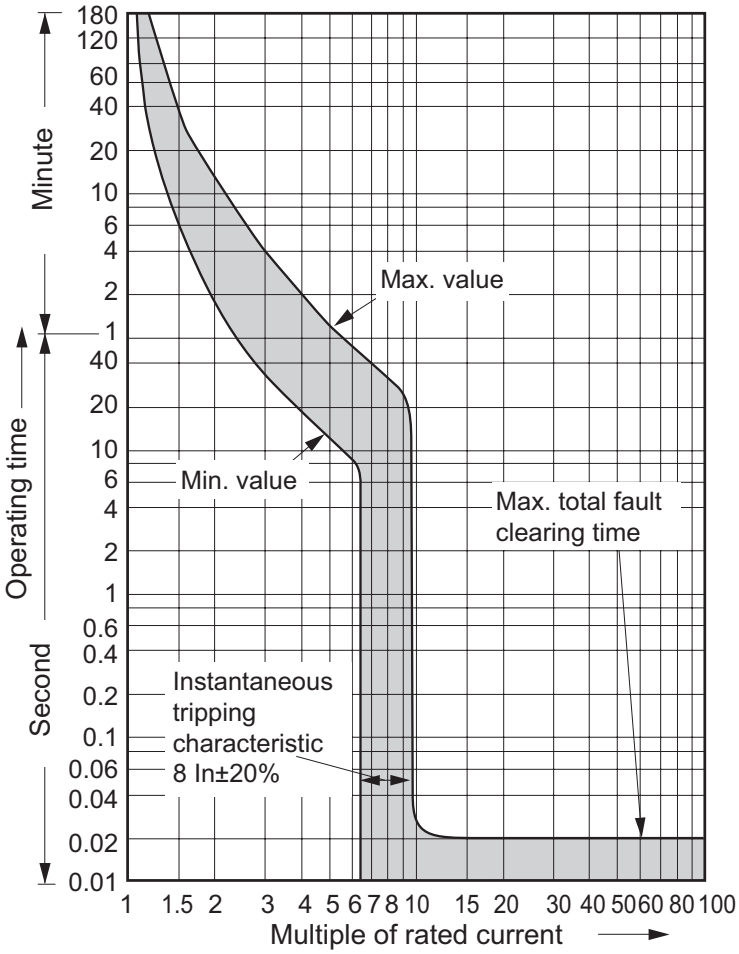
BW9RHA-R

BW9QNHA

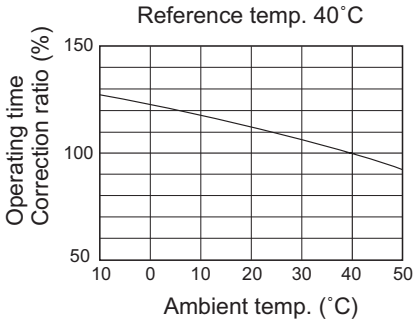
Wiring Specifications chart is on page CP-31

Fuji Molded Case Circuit Breakers – 800A Frame Characteristic Curves

BW800 Current Range 700 - 800A



BW800 (Current Range: 700 - 800A)

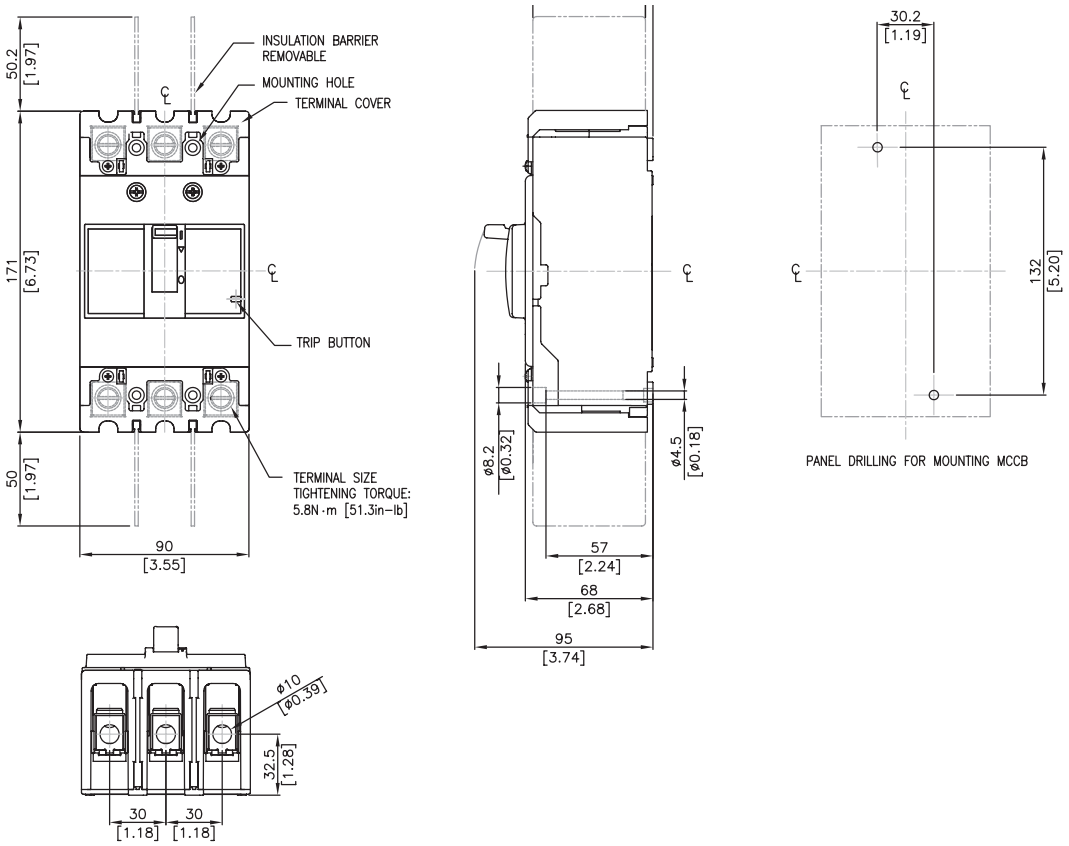


Fuji Molded Case Circuit Breakers – Dimensions

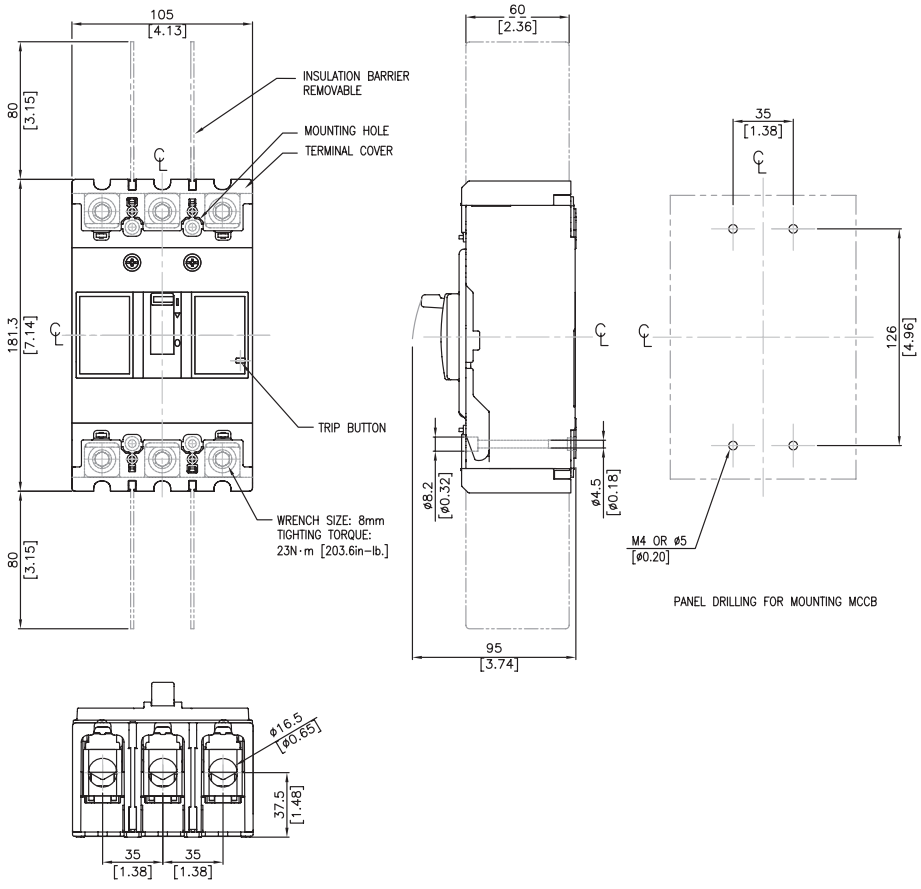
Dimensions

Units: mm [inches]

15 to 125A
BW125A Frame



125 to 250A
BW250A Frame

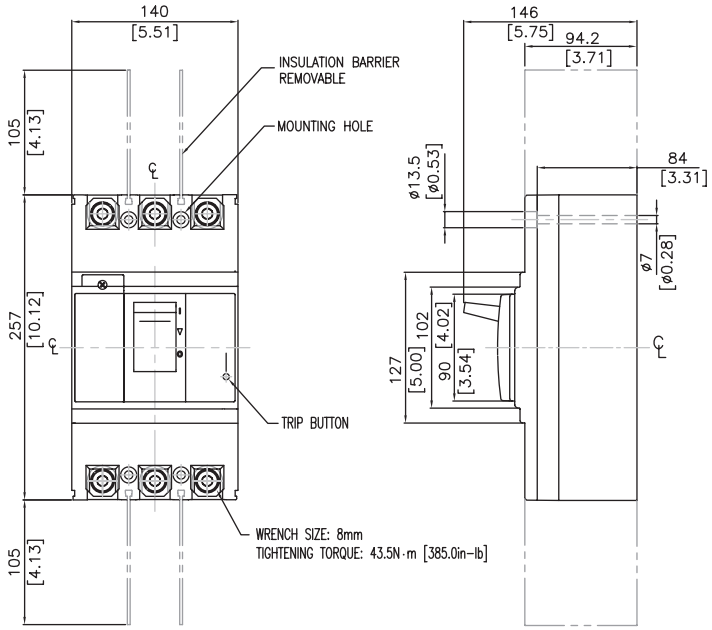


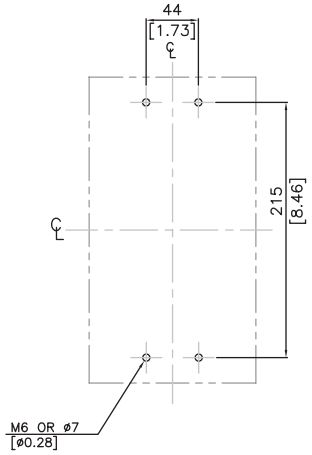
Fuji Molded Case Circuit Breakers – Dimensions

Dimensions

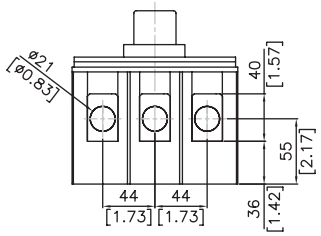
Units: mm [inches]

250A to 350A BW400 Frame



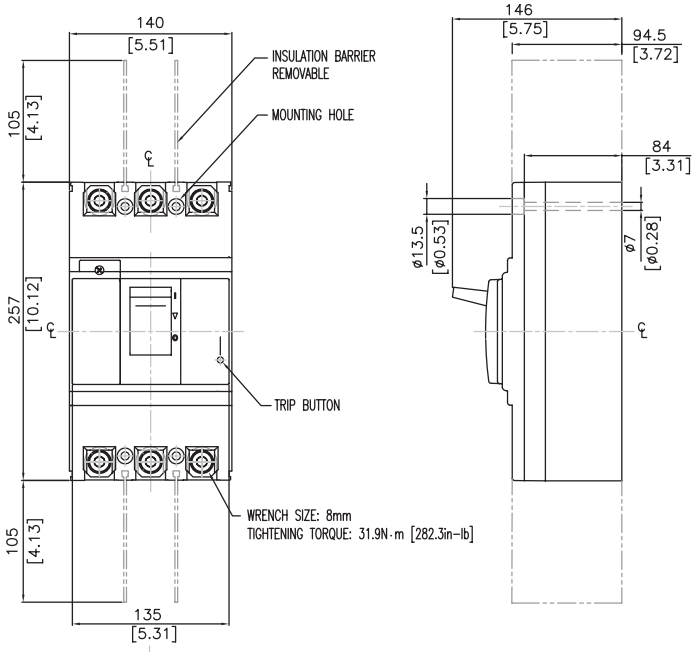


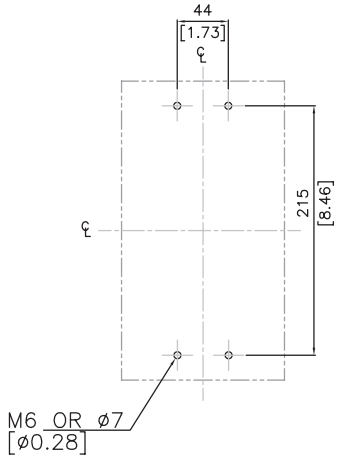
PANEL DRILLING FOR MOUNTING MCCB



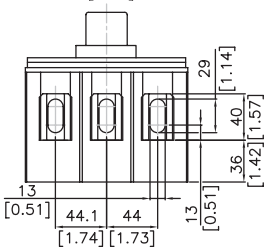
RATED CURRENT 250, 300, 350A

400A BW400 Frame





PANEL DRILLING FOR MOUNTING MCCB



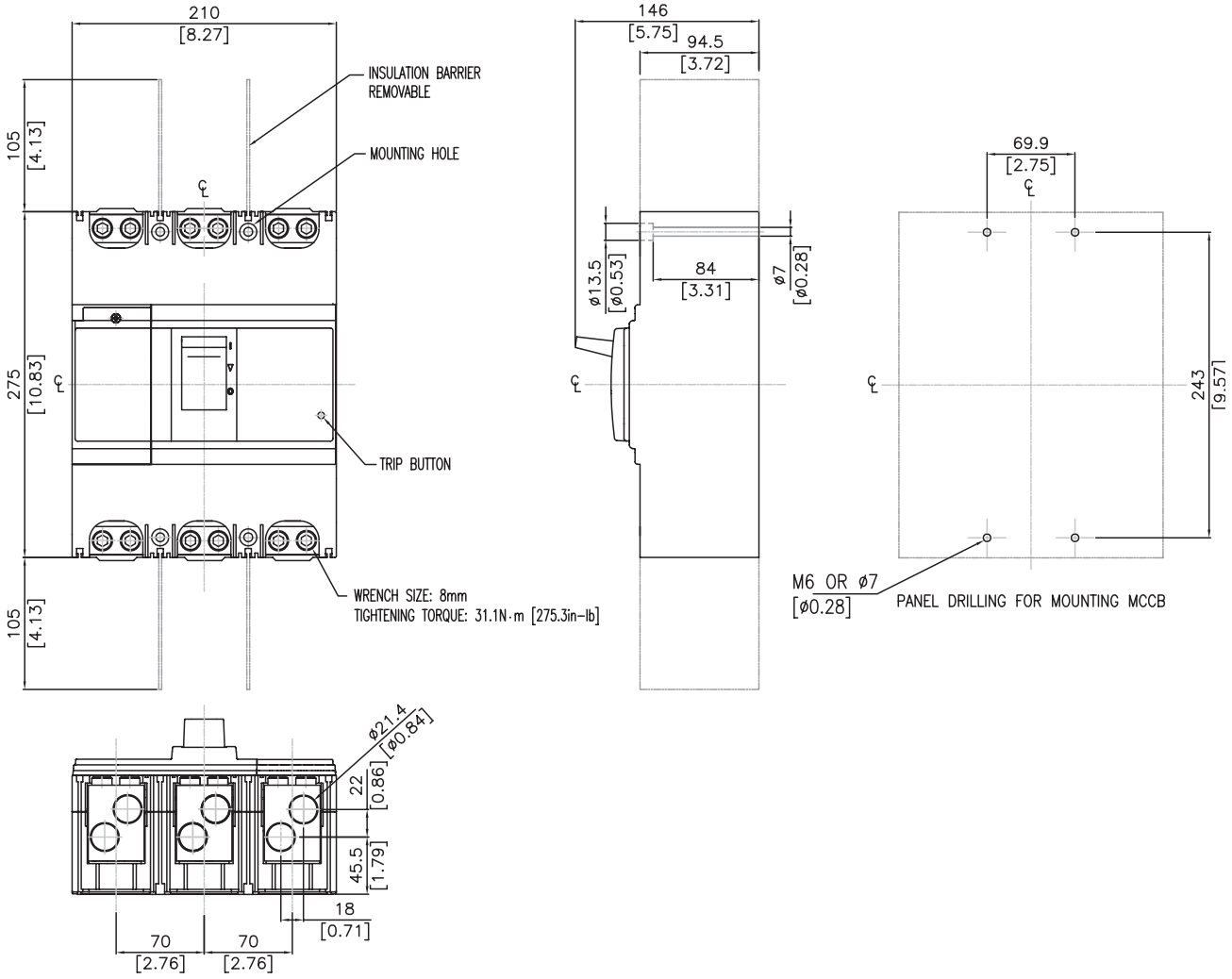
RATED CURRENT 400A

Fuji Molded Case Circuit Breakers – Dimensions

Dimensions

Units: mm [inches]

500A to 600A
BW630 Frame

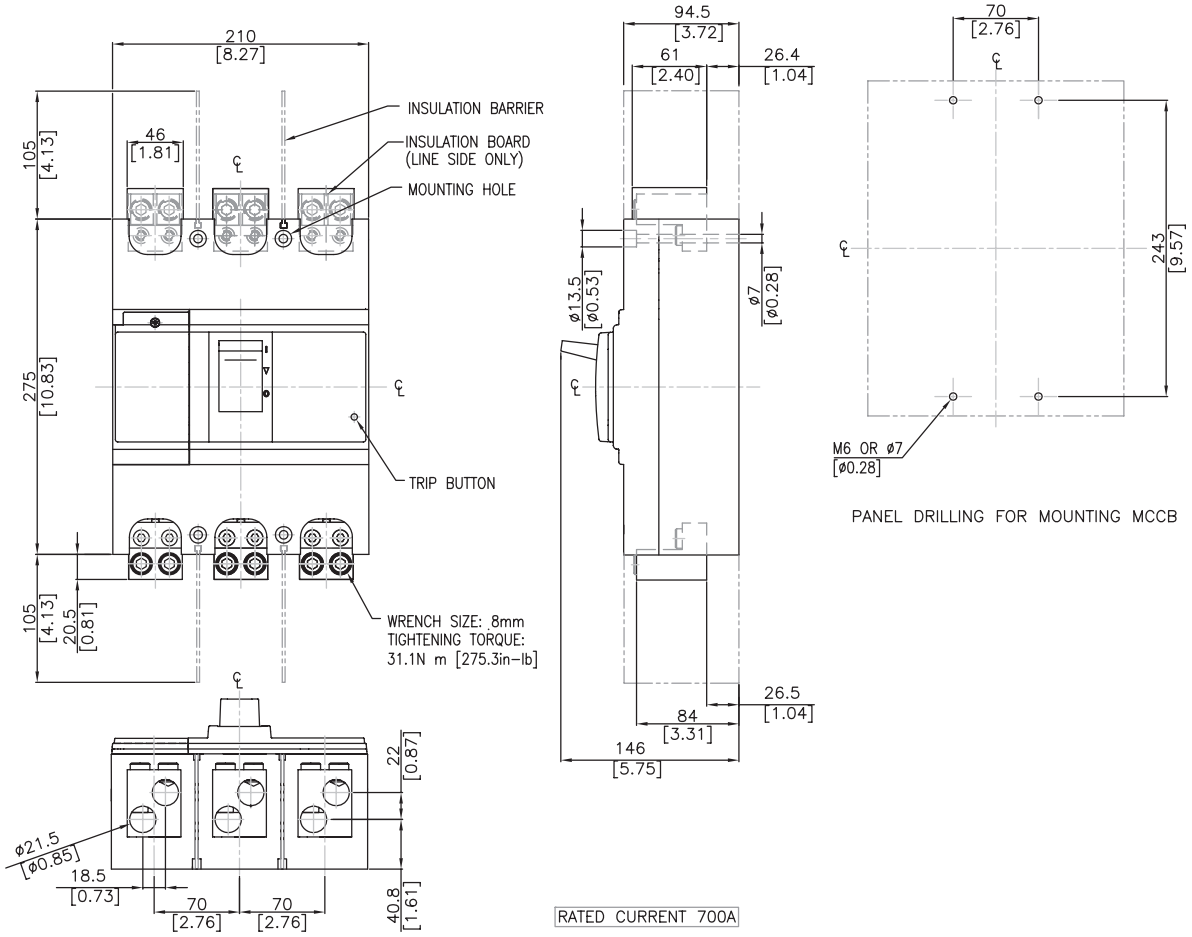


Fuji Molded Case Circuit Breakers – Dimensions

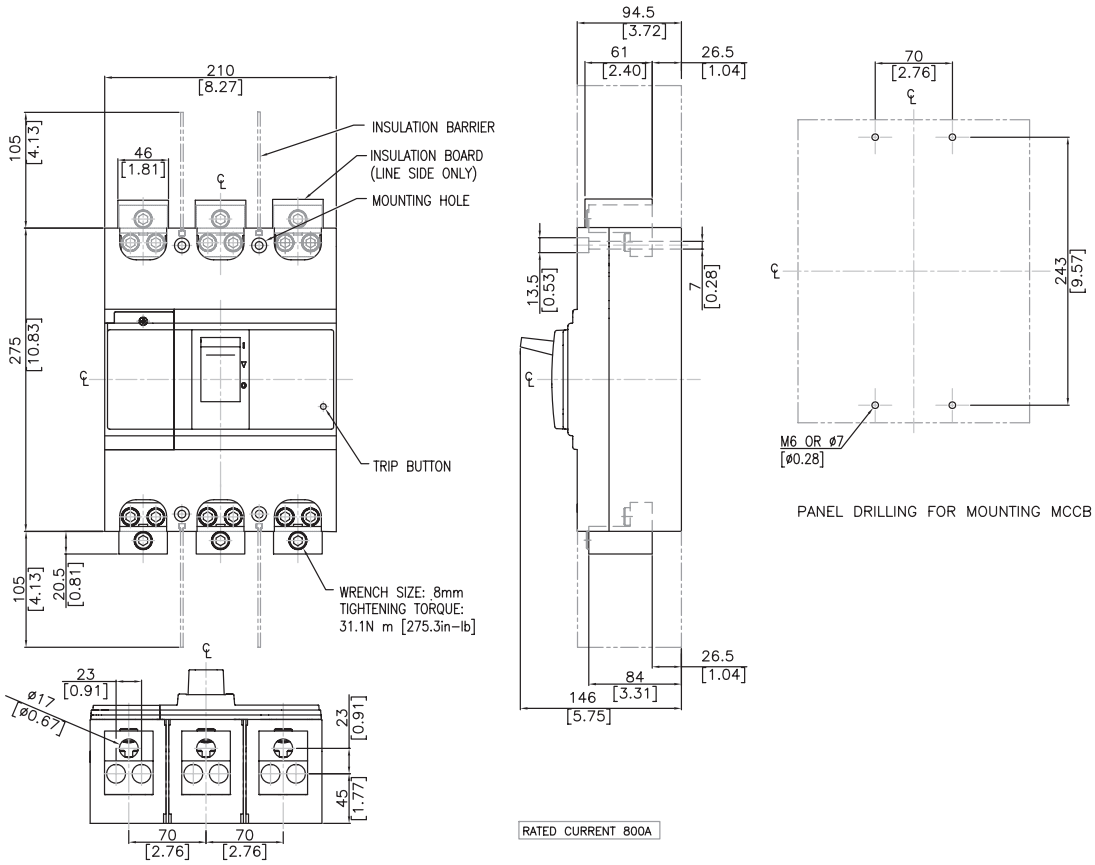
Dimensions

Units: mm [inches]

700A
BW800 Frame



800A
BW800 Frame

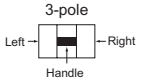


Fuji Molded Case Circuit Breakers – Products And Accessory Compatibility

Match the Accessories with Fuji Molded Case Circuit Breakers						
Part Number	**Description**	**BW125JAGU**	**BW250JAGU**	**BW400SAGU**	**BW630RAGU**	**BW800RAGU**
BW9W1SG0	Auxiliary Switch (Mounting Left and right side)	X	X			
BW9W1SHA	Auxiliary Switch (Mounting Left side ONLY)			X	X	X
BW9FRG0	Shunt Trip 24 VAC/VDC (Mounting both Left and Right sides)	X	X			
BW9FHA-R	Shunt Trip 24-48 VAC/VDC (Mounting Left side ONLY)			X	X	X
BW9FAG0	Shunt Trip 100-120 VAC, 100-110 VDC (Mounting both Left and Right sides)	X	X			
BW9FHA-A	Shunt Trip 100-280 VAC, 100-220 VDC (Mounting Left side ONLY)			X	X	X
BW9RGAR	UnderVoltage Release 24VDC (Left side ONLY)	X	X			
BW9RHA-R	UnderVoltage Release 24 VAC/VDC (Left side ONLY)			X	X	X
BW9RGAT	UnderVoltage Release 110-130 VAC (Left side ONLY)	X	X			
BW9RHA-1	UnderVoltage Release 120-130 VAC, 125VDC (Left side ONLY)			X	X	X
BW9SL0CA-3	Replacement Lugs Kit for 125 Amp frame	X				
BW9SL0GA-3	Replacement Lugs Kit for 250 Amp frame up to 175A		X			
BW9SL1GA-3	Replacement Lugs Kit for 250 Amp frame 200A to 250A		X			
BW9V0CA	Rotary Handle	X				
BW9V0GA	Rotary Handle		X			
BW9VSG0	Optional Shaft for BW9V0CA and BW9V0GA, 6.063"	X	X			
BW9VSG0-24	Optional Shaft for BW9V0CA and BW9V0GA, 24"	X	X			
BW9V0HA	Rotary Handle,			X		
BW9V0JA	Rotary Handle,				X	X
BZ-VS2	Optional Shaft for BW9V0HA and BW9V0JA, 3.48"			X	X	X
BZ-VS2-24	Optional Shaft for BW9V0HA and BW9V0JA, H = 24"			X	X	X
BW9F0CA-15A	Flange Handle (flex shaft), NEMA 12, 59" (1.5m) cable, 125 Amp frame	X				
BW9F0CA-20A	Flange Handle (flex shaft), NEMA 12, 78.7" (2.0m) cable, 125 Amp frame	X				
BW9F0GA-15A	Flange Handle (flex shaft), NEMA 12, 59" (1.5m) cable, 250 Amp frame		X			
BW9F0GA-20A	Flange Handle (flex shaft), NEMA 12, 78.7" (2.0m) cable, 250 Amp frame		X			
BW9F0HA-15A	Flange Handle (flex shaft), NEMA 12, 59" (1.5m) cable, 400 Amp frame			X		
BW9F0HA-20A	Flange Handle (flex shaft), NEMA 12, 78.7" (2.0m) cable, 400 Amp frame			X		
BW9F0JA-15A	Nema 12 flexible shaft handle for 630A or 800A frame. 59.06" (1.5m) cable				X	X
BW9F0JA-20A	Nema 12 flexible shaft handle for 630A or 800A frame. 78.74" (2m) cable				X	X
BW9BTHA-L3W	Terminal Cover for the 400A frame			X		
BW9BTJA-L3W	Terminal Cover for the 630A AND 800A frame				X	X
BW9Q1CA	Lockout Attachment 125A and 250A frames	X	X			
BW9QNHA	Lockout Attachment 400A, 630A and 800A frames			X	X	X

Internal Accessory Combinations for BW Series

Available configurations



Undervoltage trip

Shunt trip

Auxiliary switch

MCCB	BW125 BW250	BW400 BW630 BW800
Pole	3	3
Auxiliary switch SPDT		
Shunt trip		
Undervoltage trip		
Auxiliary Switch + Shunt Trip		
Undervoltage + Auxiliary Switch		

Fuji Molded Case Circuit Breakers – Field-mountable Accessories

BW9V0CA shown

Fuji Electric
e-Front runners

Defeatable Rotary Handle Operating Mechanisms

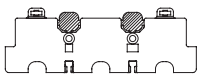
Rotary Operating Handles for Fuji MCCBs – Selection Guide

Breaker Type	V-type Handle	Price	V-type Handle	With the optional shaft (x= 6.102 (155))		With the optional shaft (x= 24.567 (624))		Mounting Screw	V-type Handle Mass lb. (kg)
			H: inch(mm)	Max. Mounting Depth H: inch(mm)	Range in which the hinge with H can be installed	Max. Mounting Depth H: inch(mm)	Range in which the hinge with H can be installed		
BW125	BW9V0CA	$50.00	4.134±0.078 (105±2)	9.843±0.078 (250±2)	5.512 to 9.843 (140 to 250)	28.307±0.078 (719±2)	28.307 - 5.591 (124 - 719)	M4 x 3.35 (85)	1.48 (0.67)
BW250	BW9V0GA	$50.00							

Dimensions

Units: inches [mm]

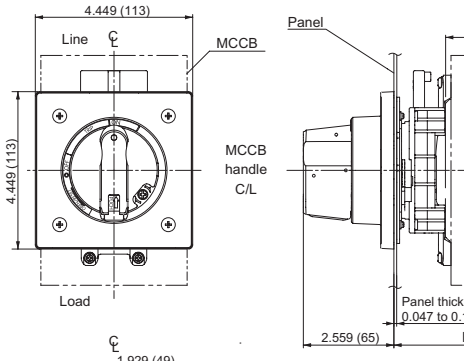
***Notes:** • Handle is an operating mechanism only; not for sealing enclosure door.*
• Not available for side mounting
• For BW250 Series only: When mounting a terminal cover, cut away part of it because it hides the mounting screws for the breaker.

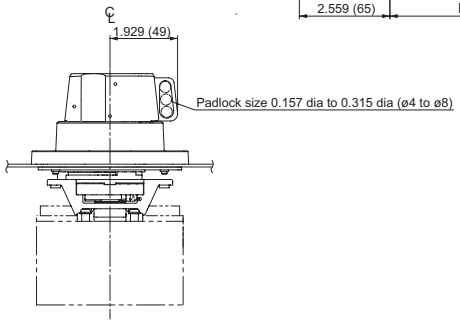


Remove the shaded parts in the figure .

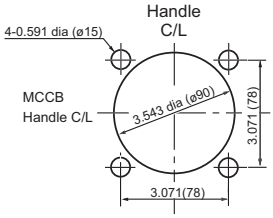
125A, 250A Frame V type handle

• BW9V0CA, BW9V0GA (BW9VSG0, BW9VSG0-24: optional shafts)

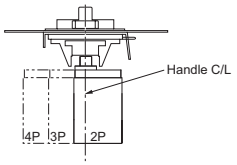




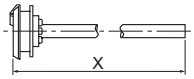
Door panel cutting



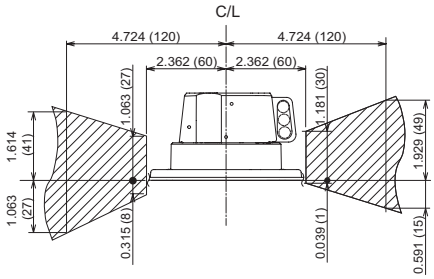
Note: Align the center of the hole cut in the panel with the center of the breaker handle.



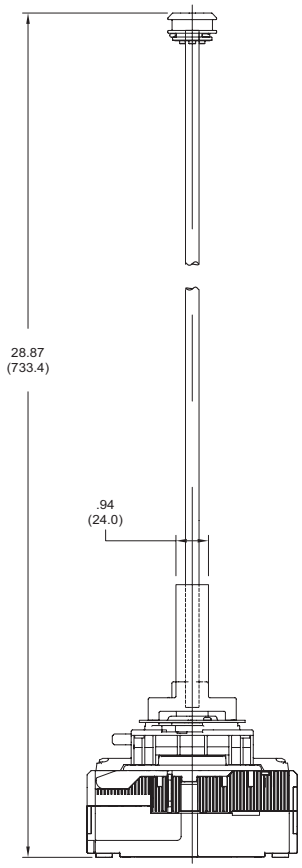
Optional shafts
BW9VSG0
X = 6.102 (155)
BW9VSG0-24
X = 24.567 (624)



Installation caution area



Use caution that any item mounted in shaded area can move freely.



BW9VSG0-24 optional shaft Breaker and Shaft Assembly

Fuji Molded Case Circuit Breakers – Field-mountable Accessories

Fuji Electric
e-Front runners

Rotary Operating Handles for Fuji MCCBs – Selection Guide									
Breaker Type	V-type Handle	Price	V-type Handle	With the optional shaft (x= 3.504 (89))		With the optional shaft (x= 24 (609.6))		Mounting Screw	V-type Handle Mass lb. (kg)
			H: inch(mm)	Max. Mounting Depth H: inch(mm)	Range in which the hinge with H can be installed	Max. Mounting Depth H: inch(mm)	Range in which the hinge with H can be installed		
BW400	BW9V0HA	$75.00	7.48±0.078 (190±2)	9.843±0.078 (250±2)	7.95 to 9.843 (202to 250)	30.35±0.078 (771±2)	7.95 - 30.35 (202 - 771)	M4 x 3.35 (85)	1.48 (0.67)
BW630 BW800	BW9V0JA	$89.00							

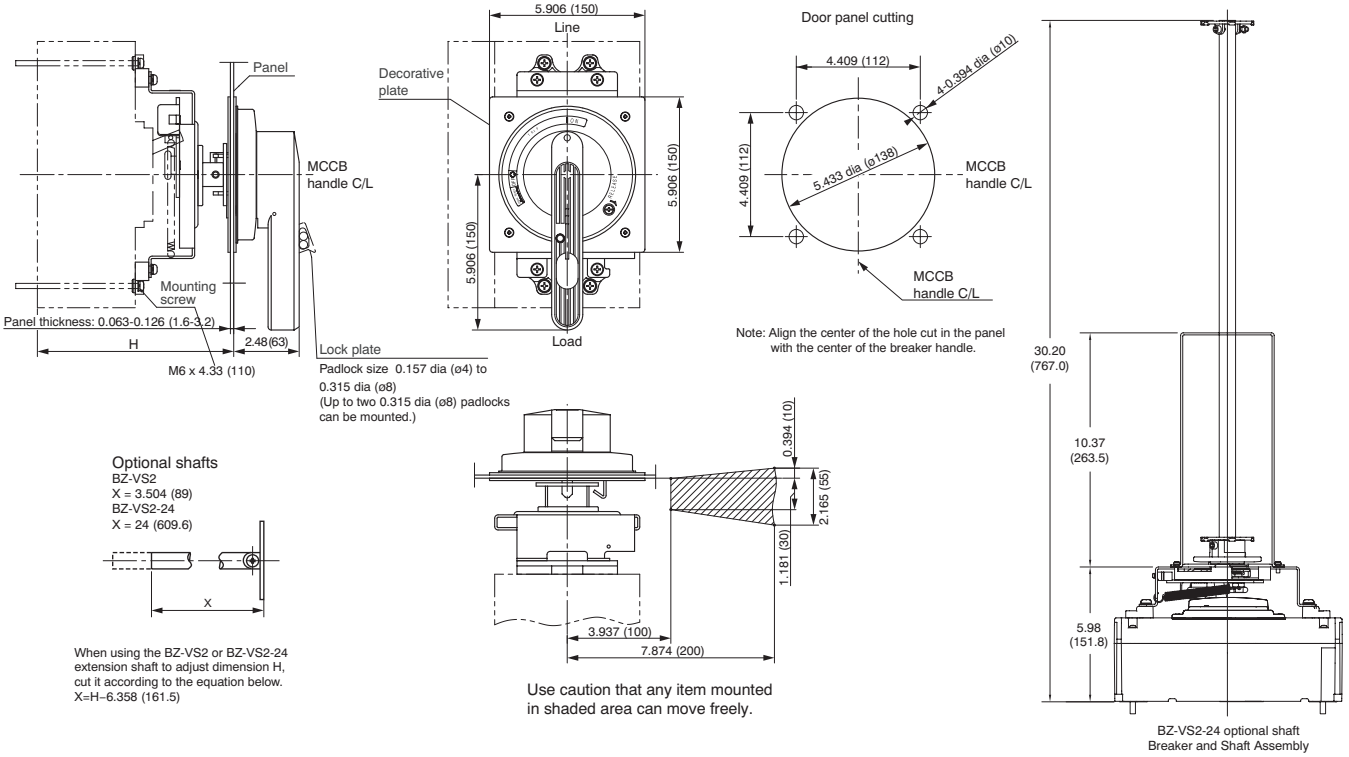
Notes: • Handle is an operating mechanism only; not for sealing enclosure door.
• Not available for side mounting

Dimensions

Units: inches [mm]

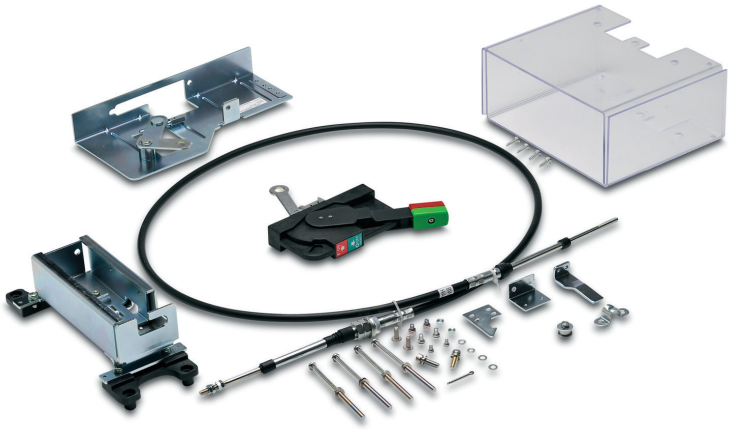
400A, 630A, 800A Frame V type handle

• **BW9V0HA, BW9V0JA (BZ-VS2, BZ-VS2-24: optional shafts)**



Fuji Molded Case Circuit Breakers – Field-mountable Accessories

Defeatable Flexible Handle Operating Mechanisms



BW9F0JA-20A shown

Fuji Electric
e-Front runners

Flex Shaft Handles for Fuji MCCBs – Selection Guide			
Breaker Type	***Handle Type***	***Price***	***Description***
BW125	***BW9F0CA-15A***	$264.00	Nema 12 flexible shaft handle for 125A frame. 59.06" (1.5m)cable
	BW9F0CA-20A	$275.00	Nema 12 flexible shaft handle for 125A frame. 78.74" (2m) cable
BW250	***BW9F0GA-15A***	$275.00	Nema 12 flexible shaft handle for 250A frame. 59.06" (1.5m)cable
	BW9F0GA-20A	$288.00	Nema 12 flexible shaft handle for 250A frame. 78.74" (2m) cable
BW400*	***BW9F0HA-15A***	$400.00	Nema 12 flexible shaft handle for 400A frame. 59.06" (1.5m)cable
	BW9F0HA-20A	$412.00	Nema 12 flexible shaft handle for 400A frame. 78.74" (2m) cable
BW630*& BW800*	***BW9F0JA-15A***	$432.00	Nema 12 flexible shaft handle for 630A or 800A frame. 59.06" (1.5m)cable
	BW9F0JA-20A	$445.00	Nema 12 flexible shaft handle for 630A or 800A frame. 78.74" (2m) cable

Terminal covers for line side and load side included with Flange Disconnects. 2/pk

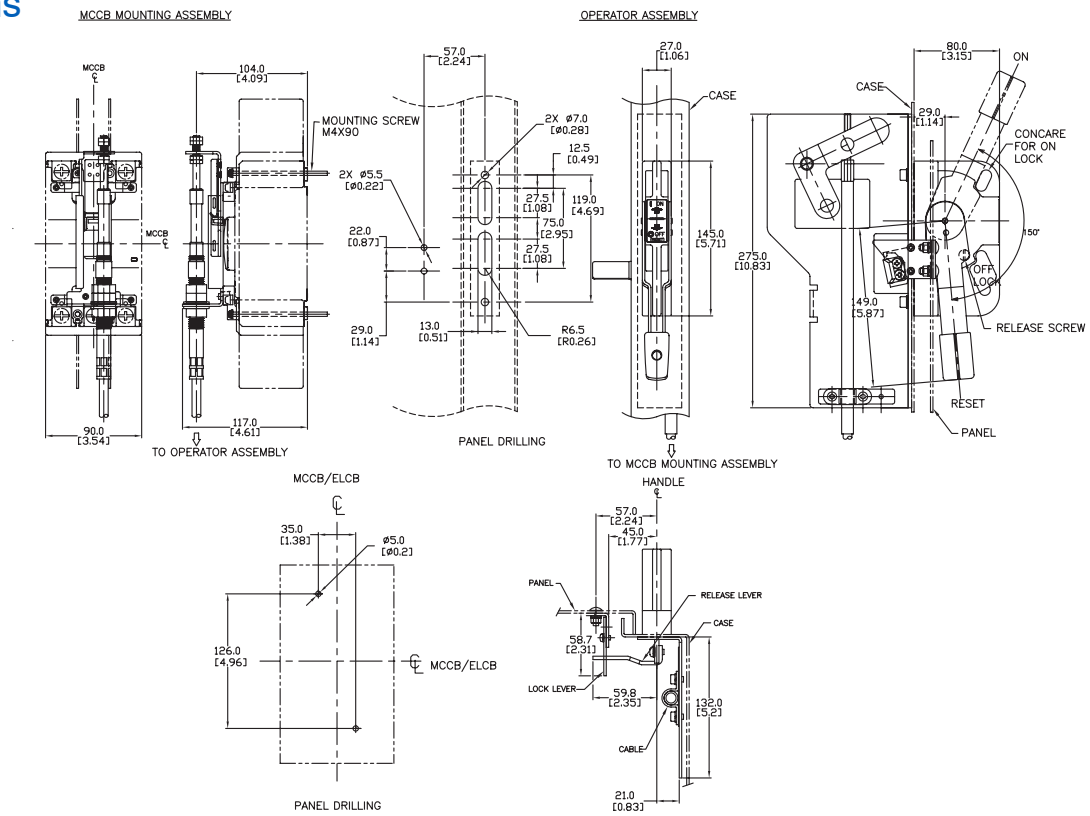
Flex Handle Specifications				
Operating instructions	• Operating handle facing up, Breaker is in ON position. • Operating handle facing down, Breaker is in OFF position or is reset. • Panel door cannot be opened when in ON, OFF or Trip position. In order to open the door, the handle must be turned toward reset position. • Release screw is standard. If you want to open a panel door in ON position, please turn the release screw using flat head screwdriver.			
Frame Size	***125A frame***	***250A frame***	***400A frame***	***630A/800 frame***
Mechanical Endurance (cycles)	10,000	8,000	6,000	6,000
Ambient Temperature	14 to 140F (- 10 to 40°C)			
Relative Humidity	less than 95% RH			
Protection	NEMA Type12 IP54 (IEC60529)			
Conforming Standards	NFPA 79(2007), ANSI(Lockout), OSHA(1910.147, Lockout/tagout), UL489(cUL)			
Environment	No excessive dust, smoke, corrosive gases, flammable gases, steam or salt.			

Fuji Molded Case Circuit Breakers – Field-mountable Accessories

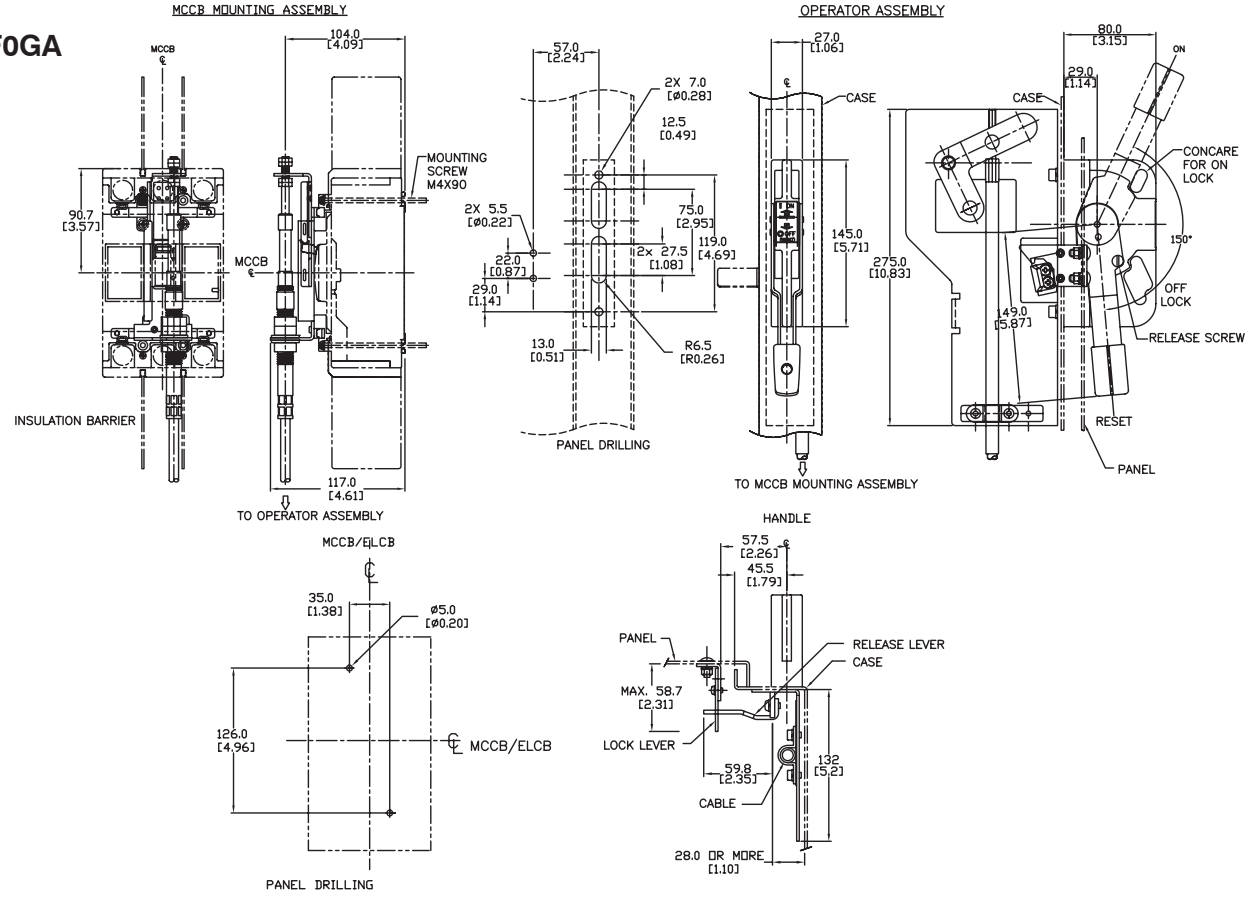
Dimensions

Units: mm [inches]

BW9F0CA



BW9F0GA

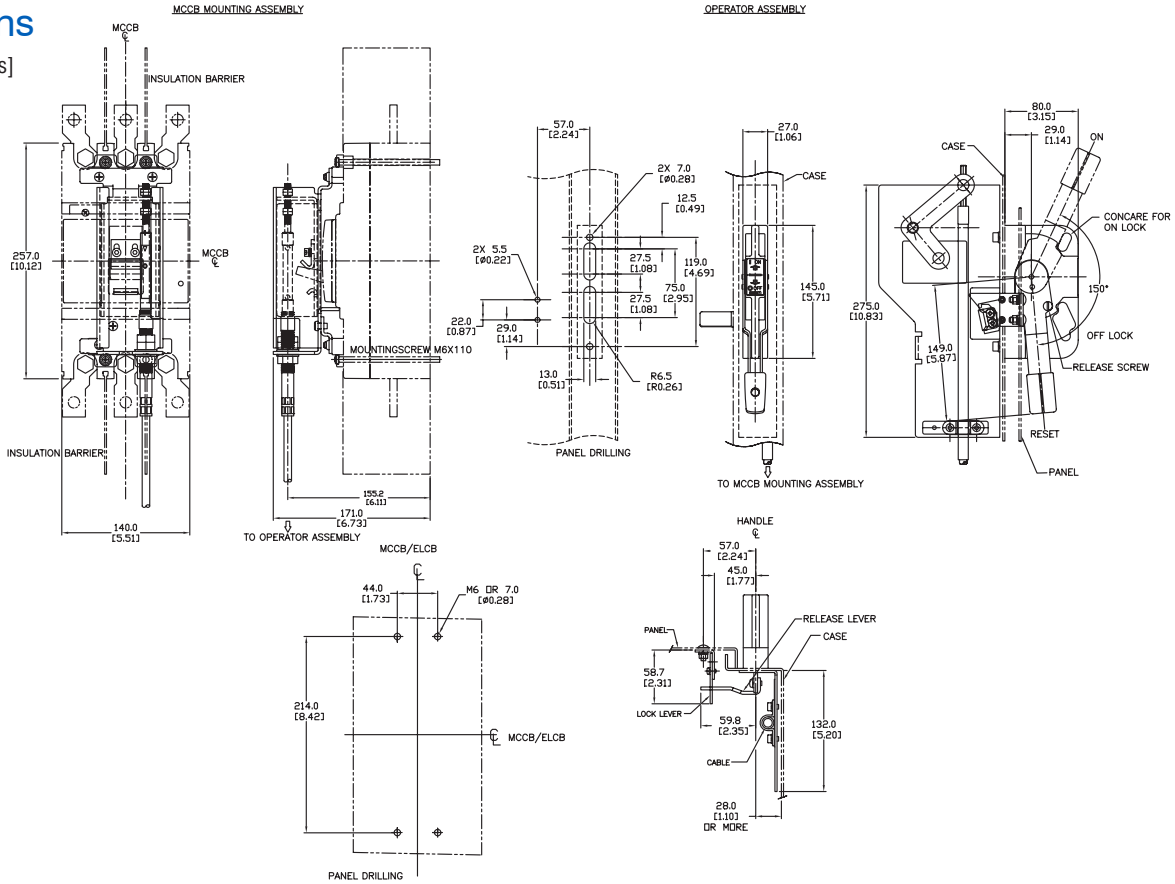


Fuji Molded Case Circuit Breakers – Field-mountable Accessories

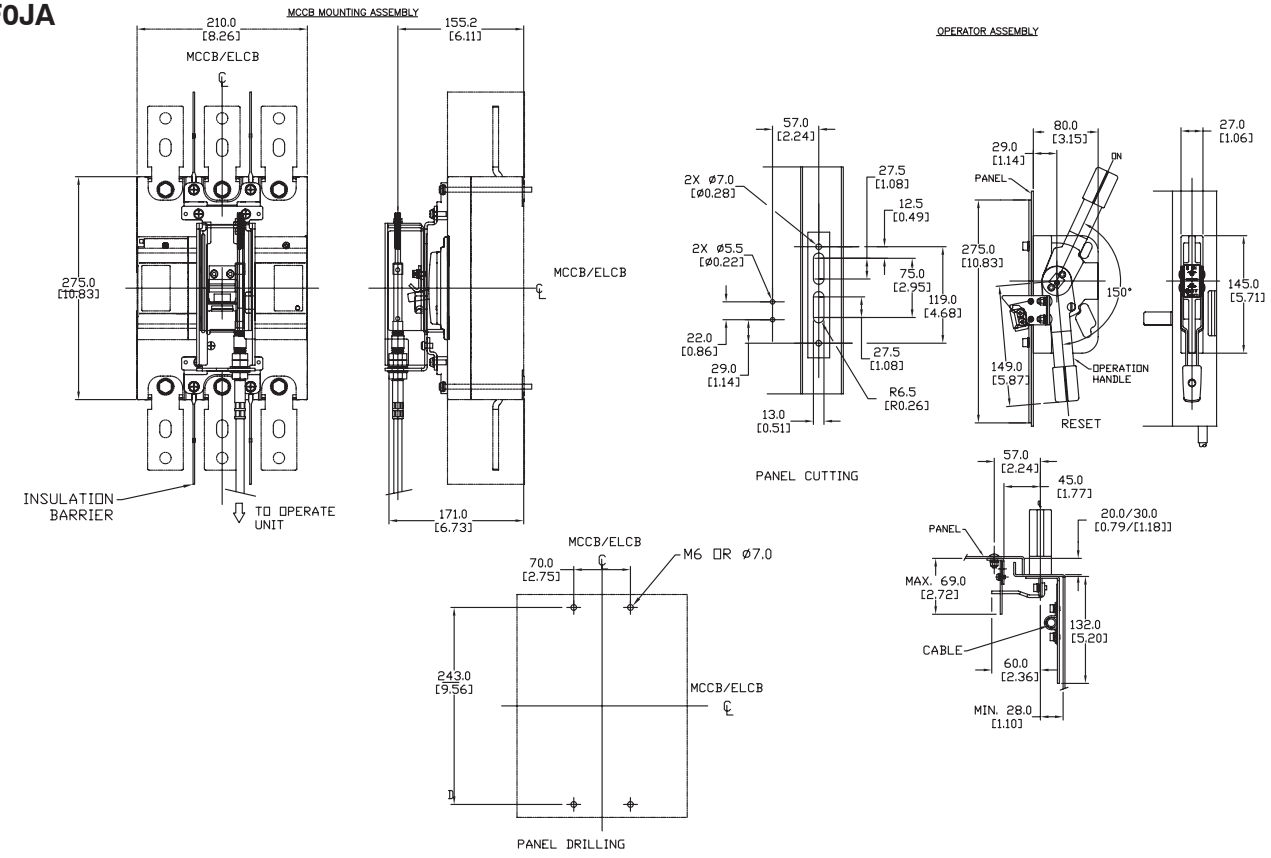
Dimensions

Units: mm [inches]

BW9F0HA

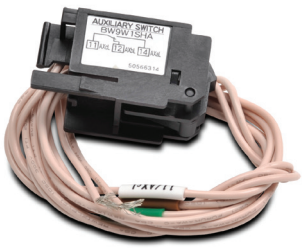


BW9F0JA



Fuji Molded Case Circuit Breakers – Accessories

Fuji Electric
e-Front runners



BW9W1SHA shown

Auxiliary Contacts

The auxiliary contacts are accessory contacts for the indication of circuit breaker open-closed or tripped.

Auxiliary Contacts for Fuji MCCBs – Selection Guide

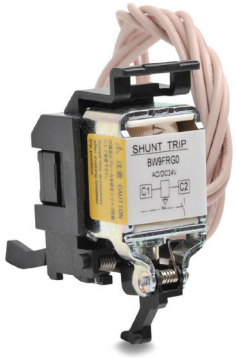
Breaker Type	Part Number	Price	Description
BW125 BW250	BW9W1SG0	$27.00	Auxiliary switch for for 125A and 250A frame. Mounting left and right side
BW400 BW630 BW800	BW9W1SHA	$25.00	Auxiliary switch for for 400A , 630A and 800A frame. Mounting left side ONLY

Ratings of Auxiliary Switches

Standard Type

Breaker Type	Rated Thermal Current (A)	Make/Break Current (A)						Minimum Load Current
		AC			DC			
		Voltage (V)	Res. Load	Ind. Load	Voltage (V)	Res. Load	Ind. Load	
BW125, BW250, BW400 BW630, BW800	5	24	5	5	24	4	3	5V DC 160 mA 30V DC 30 mA
		48	5	5	48	2.5	1	
		125	5	3	125	0.4	0.4	
		250	3	2	250	0.2	0.2	

Operation of auxiliary switches



BW9FRG0 shown

Shunt Trips

Shunt Trip is for remote tripping (opening) of crircuit breaker.

Shunt Trips for Fuji MCCBs – Selection Guide

Part Number	Price	Description
BW9FRG0	$55.00	Field installable 24 VAC/VDC shunt trip for BW125 and BW250 series MCCB. Left and right side mounting. Lead wires 20AWG, 19.69" long.
BW9FHA-R	$55.00	Field installable 24/48 VAC/VDC shunt trip for BW400, BW630 and BW800 series MCCB. Left side mounting only. Lead wires 20AWG, 19.69" long.
BW9FAG0	$55.00	Field installable 100/120 VAC, 100-110 VDC shunt trip for BW125 and BW250 series MCCB. Left and right side mounting. Lead wires 20AWG, 19.69" long.
BW9FHA-A	$55.00	Field installable 100/240 VAC, 100-220 VDC shunt trip for BW400, BW630 and BW800 series MCCB. Left side mounting only. Lead wires 20AWG, 19.69" long.

Ratings of Shunt Trips

Breaker Type	AC		DC		Time Rating of Coil	Operating Time (ms)
	Voltage (V)	VA	Voltage (V)	W		
BW125, BW250	24	50	24	50	Continuous (with 1 N.O. contact to prevent coil burnout)	13-21
	100-120	50	100-110	50		
BW400, BW630, BW800	24-48	2	24-48	2	Continuous	8-20
	100-240	3	100-220	3		

Note: Allowable operating voltage *AC voltage: 85% to 110% of coil rated voltage*
DC voltage: 75% to 125% of coil rated voltage

Fuji Molded Case Circuit Breakers – Accessories

Fuji Electric
e-Front runners

Undervoltage Releases

Undervoltage Release will trip the circuit breaker when the connected voltage drops to less than 70% of undervoltage release voltage rating. It will allow the circuit breaker to close (ON) when voltage is approximately 85% of rated voltage.

Undervoltage Releases for Fuji MCCBs – Selection Guide

Breaker Type	Part Number	Price	Description
BW125, BW250	BW9RGAR	$55.00	Undervoltage Release 24V DC (Left side ONLY)
BW125, BW250	BW9RGAT	$55.00	Undervoltage Release 110 to 130 VAC VAC/VDC (Left side ONLY)
BW400, BW630, BW800	BW9RHA-R	$53.00	Undervoltage Release 24 VAC/VDC (Left side ONLY)
BW400, BW630, BW800	BW9RHA-1	$55.00	Undervoltage Release 120 to 130 VAC 125 VDC (Left side ONLY)

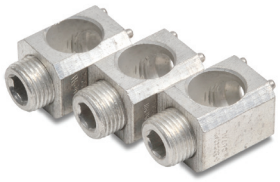
BW9RGAR shown

Ratings of Undervoltage Trip

Breaker Type	AC		DC	
	Voltage (V)	VA	Voltage (V)	W
BW125*1 BW250*1	–	–	24	5
	110 - 130	5	–	–
BW400*2 BW630*2 BW800*2	24	2	24	2
	120 - 130	3	125	3

Note: Allowable operating voltage: AC voltage: 85% to 110% of coil rated voltage
DC voltage: 75% to 125% of coil rated voltage.

**1 Reset-allowed type: When the breaker handle is in the OFF or RESET state, tripping does not occur, even if the undervoltage trip coil is not energized.*
Turning ON with the undervoltage trip coil not energized causes normal tripping.
**2 Reset-prohibited type: When the undervoltage trip coil is not energized, reset operation cannot reset the tripped breaker to the OFF state.*



BW9SL0GA-3 shown

Replacement Lugs

Replacement Lug Kits for Fuji MCCBs – Selection Guide

Part Number	Price	Description
BW9SL0CA-3	$56.00	Replacement lug kit for BW125 series MCCB. 75°C. Cu only Package of 3
BW9SL0GA-3	$63.00	Replacement lug kit for BW250 series up to 175A MCCB. 75°C. Cu only Package of 3
BW9SL1GA-3	$70.00	Replacement lug kit for BW250 MCCB series 200A to 250A. 75°C. Cu only Package of 3

Note: Terminals are factory-installed only for BW400, BW630 and BW800 series. No replacement terminals available.

Fuji Molded Case Circuit Breakers – Accessories

Fuji Electric
e-Front runners

Terminal Covers

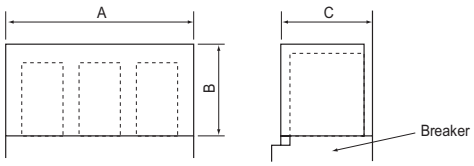
Terminal covers act as guards to shield the operator from touching live terminations. They fit either the line or load side.

BW9BTHA-L3W shown

Terminal Covers for Fuji MCCBs – Selection Guide						
Breaker Type	***Part Number***	***Price***	***Description***	***Dimensions inch (mm)***		
				A	B	C
BW400	***BW9BTHA-L3W***	$55.00	Gray-white Long type terminal cover for Fuji MC-CBs. For line side and load side. 2/pk	6.772 (172)	4.331 (110)	3.858 (98)
BW630, BW800	***BW9BTJA-L3W***	$58.00	Gray-white Long type terminal cover for Fuji MC-CBs. For line side and load side. 2/pk	8.268 (210)	6.102 (155)	3.858 (98)

Note: Gray-white short type terminal covers are provided with breakers as standard for 125 and 250 Amp frames.

Dimensions of Terminal Covers: inch (mm)



Lockout Attachment

Lockout Attachments for Fuji MCCBs – Selection Guide			
Breaker Type	***Part Number***	***Price***	***Description***
BW125 BW250	***BW9Q1CA***	$13.50	Use to lock out BW125 and BW 250 series MCCBs. Lock not included
BW400, BW630, BW800	***BW9QNHA***	$32.50	Use to lock out BW400, BW600 and BW800 MCCBs. Lock not included.

BW9Q1CA shown

Fuji Molded Case Circuit Breakers – Wire Range Specifications

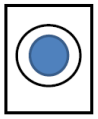
Fuji Electric
e-Front runners

Wiring

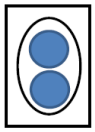
- When connecting the wires, follow NEC (National Electric Code, USA) or CEC (Canadian Electrical code Part 1, Canada) instructions.
- Use copper wire rated for 75°C (167°F) for connecting. UL or CSA approved wire is recommended.
- Tighten the wire connections adequately, as a very large electromagnetic force will be generated when short circuit current is generated.
- Perform additional tightening of the terminal screws periodically.

Allowable Wire Specifications for Lug Terminals	
Wire Size AWG or MCM (mm²)	***Number of Wire Strands***
14 to 2 (2.1 to 33.6)	7
1 to 4/0 (42.4 to 107.2)	19
250 to 500 (127 to 250)	37

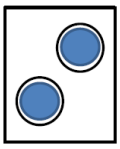
- Adhere to the allowable number of strands of wire indicated in the table on the left.
- Two wires cannot be connected together to a single connecting hole of lug terminal except BW400SAGU-3P400SB.
- Follow the number of strands of wire indicated on the table. (Wire size and number of wire strands not listed on table can not be connected)
- Do not solder the end of the wire.



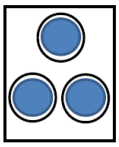
Rated current 15A to 350A



Rated current 400A 3/0 AWG x 2 19 strands each



Rated current 500A to 700A



Rated current 800A 300 MCM x 3 37 strands each

Allowable Wire Sizes and Tightening Torque			
Type	***Rated Current (A)***	***Wire Size AWG or MCM (mm2)***	***Tightening Torque Lug Terminal****
BW125	15	14 AWG (2.1 mm²)	51 lb•in (5.8 N•m)
	20	12 AWG (3.3 mm²)	
	30	10 AWG (5.3 mm²)	
	40	8 AWG (8.4 mm²)	
	50	8 AWG (8.4 mm²)	
	60	6 AWG (13.3 mm²)	
	70	4 AWG (21.1 mm²)	
	75	4 AWG (21.1 mm²)	
	80	4 AWG (21.1 mm²)	
	90	3 AWG (26.7 mm²)	
	100	3 AWG (26.7 mm²)	
	125	1 AWG (42.4 mm²)	
BW250	125	1 AWG (42.4 mm²)	204 lb•in (23 N•m)
	150	1/0 AWG (53.5 mm²)	
	175	2/0 AWG (67.4 mm²)	
	200	3/0 AWG (85.0 mm²)	
	225	4/0 AWG (107.2 mm²)	
	250	250 MCM (127 mm²)	
BW400	250	250 MCM (127mm²)	385 lb•in (43.5 N•m)
	300	350 MCM (177mm²)	
	350	500 MCM (253mm²)	
	400	3/0 AWGx2 (85.0 mm²x2)	282 lb•in (31.9 N•m)
BW630	500	250 MCMx2	275 lb•in (31.07 N•m)
	600	350 MCMx2	
BW800	700	500 MCMx2	275 lb•in (31.07 N•m)
	800	300 MCMx3	

Lug terminals are supplied as standard.
Note: Terminals are factory-installed only for BW400, BW630 and BW800 series. No replacement terminals available.

3P Series Molded Case Circuit Breakers Overview

Overview

Designed to provide branch and feeder circuit protection in industrial control panels, this line of Molded Case Circuit Breakers supplies protection against overload in conductors and short circuit in connected equipment such as motors. They are UL listed for installation in UL 508 control panels. Their small size, in relation to standard circuit breakers or other comparable devices, saves panel space. Four frame sizes and all standard accessories are available.

Listings

- UL 489 MCCB, File: E7819
- Field-installed accessories: UL file E64983
- CSA 22.2 No.5, File: 43556
- IEC 157-1
- NEMA Standards Pub. No. AB1-1993

Features

- UL489 listed performance for branch circuit overcurrent protection and disconnecting means
- Patented contact conductor designs featuring high-speed "blow-open" action, providing superior performance when high level fault currents produce extra-ordinary electromechanical forces
- Advanced arc extinguishing technology
- Toggle handle provides three positions (on/off/tripped) along with visual indicators
- Manufactured in ISO 9000 certified facilities
- HACR (heating, air conditioning and refrigeration) rated
- G-Frame and F-Frame breakers are suitable for reverse feed
- K-Frame and L-Frame breakers include 3-pole adjustable magnetic trip.

Manufactured by Eaton Corporation

Note: These parts available for sale to North American locations only.

Molded Case Circuit Breakers Technical Specifications

Circuit Breaker Type	Ampere Rating at 40°C	No. Poles	Volts		Type of Trip*	Federal Specification W-C-375b	UL 489 Interrupting Ratings (rms Symmetrical Amperes) (kA)			
			AC	DC			Volts AC (50/60 Hz)			Volts DC
							240	480	600	250**
G-Frame	15 -100	3	480	250	N.I.T.U	13b	65	22	–	10
F-Frame	60 - 225	3	600	250	N.I.T.U	22a	65	35	18	10
K-Frame	250 - 400	3	600	250	I.T.U	23a	65	35	25	10
L-Frame	400 - 600	3	600	250	I.T.U	23a	65	35	25	22

***Note: N.I.T.U denotes non-interchangeable trip unit. I.T.U denotes interchangeable trip unit.**
****Note: For DC or 1-phase AC applications, use the two outside poles of the 3-pole circuit breaker**

Molded Case Circuit Breakers Part Numbering System

G 3P - 020 - AUX

Accessory Description Code
AUX: auxiliary contact
STAC: shunt trip AC
STDC: shunt trip DC
UVAC: undervoltage release
UVDC: undervoltage release

Amp Rating

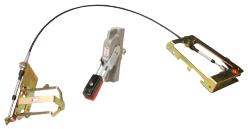
3 Pole

Molded Case Circuit Breaker Series (by frame size)
G: 15 to 100 Amp
F: 60 to 225 Amp
K: 250 to 400 Amp
L: 400 to 600 Amp

3P Series Molded Case Circuit Breakers 15-100 Amp G-Frame

G3P-40

GHMVD12B



F0S03C

3TA100G6K

GDIN

G-Frame circuit breakers are available as a single unit, or with accessories pre-installed only. Accessories are not field installable on this frame size. G-Frame breakers are suitable for reverse feed use. All breakers include base mounting hardware for panel mount applications.

G-Frame Series Three Pole Molded Case Circuit Breakers

Part Number	Price	Description	Pre-Installed Accessories*	Ampere Rating	Voltage	Interrupt Capacity
G3P-015	$280.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	15	240VAC 480VAC	65kA 22kA 10kA
G3P-015-AUX	$334.00		With auxiliary contact, SPDT			
G3P-020	$280.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	20		
G3P-020-AUX	$334.00		With auxiliary contact, SPDT			
G3P-025	$280.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	25		
G3P-030	$280.00		None	30		
G3P-030-AUX	$334.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	With auxiliary contact, SPDT			
G3P-030-STAC	$334.00		With 120 VAC shunt trip			
G3P-030-STDC	$334.00		With 24 VDC shunt trip			
G3P-030-UVAC	$334.00		With 120 VAC undervoltage release			
G3P-040	$280.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	40		
G3P-050	$280.00		None	50		
G3P-060	$280.00		None	60		
G3P-060-AUX	$334.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	With auxiliary contact, SPDT			
G3P-060-STAC	$334.00		With 120 VAC shunt trip			
G3P-060-STDC	$334.00		With 24 VDC shunt trip			
G3P-060-UVAC	$334.00		With 120 VAC undervoltage release			
G3P-070	$280.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	70		
G3P-080	$280.00		None	80		
G3P-090	$280.00		None	90		
G3P-100	$280.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	100		
G3P-100-AUX	$334.00		With auxiliary contact, SPDT			
G3P-100-STAC	$334.00		With 120 VAC shunt trip			
G3P-100-STDC	$334.00		With 24 VDC shunt trip			
G3P-100-UVAC	$334.00		With 120 VAC undervoltage release			

*Note: Available accessories are pre-installed on G-Frame and F-Frame Molded Case Circuit Breakers. They are not field installable or interchangeable. G-frame terminals are factory-installed only. No replacement terminals available.

** For DC or 1-phase AC applications, use the two outside poles of the 3-pole circuit breaker

G-Frame Accessory Selection Guide

Part Number	Price	Description
GHMVD06B	$72.00	NEMA 1/12 rotary handle for G-Frame. Position indicating; lock-off feature. Shaft length: 6"
GHMVD12B	$80.00	NEMA 1/12 rotary handle for G-Frame. Position indicating; lock-off feature. Shaft length: 12"
F0S03C	$310.00	NEMA 1/12 flex shaft cable operator for G-Frame. Flange mounted. Lockable. Cable length: 3'
F0S06C	$346.00	NEMA 1/12 flex shaft cable operator for G-Frame. Flange mounted. Lockable. Cable length: 6'
3TA100G6K	$56.00	Multi-wire connector to allow 6 wires to be connected to the G-frame. UL for copper only. 14-6AWG. Package of 3
GDIN	$9.75	DIN rail clip adapter to allow mounting of G-Frame unit on 35mm DIN rail. Pkg of 1 includes mounting hardware.

AWG Wire Range Specifications

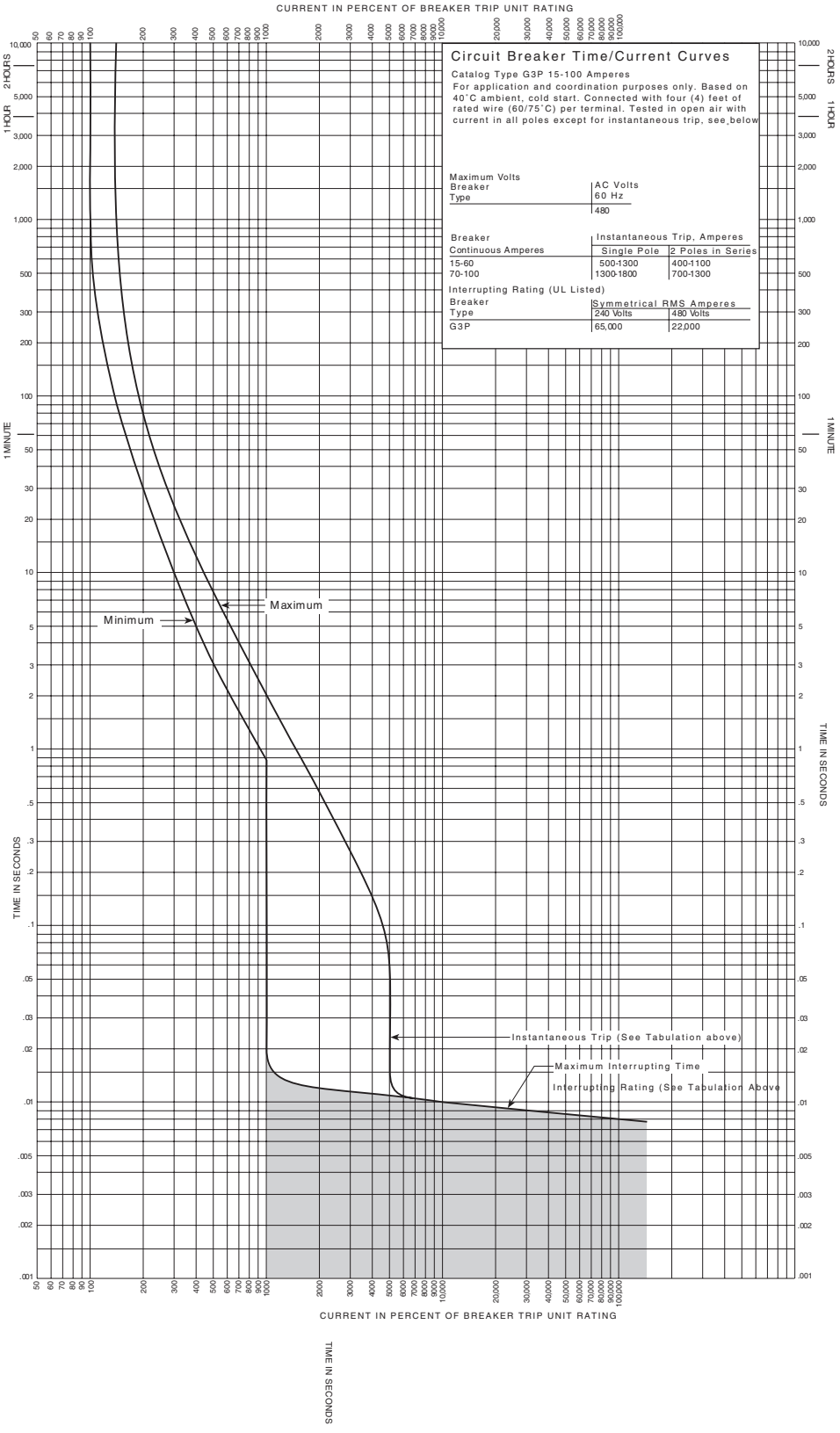
Circuit Breaker	Ampere Rating	Wire Type	AWG Wire Range	Metric Wire Range mm²
G-Frame	15 - 20	Cu/Al	14 - 10	2.5 - 4
	25 - 100		10 - 1/0	4 - 50

G-Frame Electrical Ratings

	Volts	Frequency	Amperes	Contact Arrangement
G-Frame Auxiliary Switch	240 VAC	50/60 Hz	6	1a/1b - SPDT
G-Frame Shunt Trip	120 VAC	50/60 Hz	1.1	
	24 VDC	DC	5.7	
G-Frame Undervoltage Release Mechanism	120 VAC	50/60 Hz	0.05	
	Dropout Voltage		Pickup Voltage	
	Min	Max	Max	
	38.5 VAC	77.0 VAC	93.5 VAC	

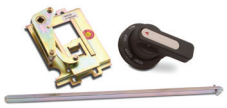
3P Series Molded Case Circuit Breakers 15-100 Amp G-Frame

Type G3P 15-100 Amperes 3 Pole



3P Series Molded Case Circuit Breakers 60-225 Amp F-Frame

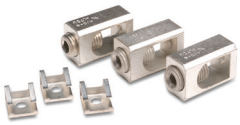
F3P-200



FHMVD12B

F1S03C

3TA150F6K



3TA225FD

F-Frame circuit breakers are available as a single unit, or with accessories pre-installed only. Accessories are not field installable on this frame size.

This frame size is suitable for reverse feed use. All breakers include base mounting hardware for panel mount applications.

F-Frame Series Three Pole Molded Case Circuit Breakers

Part Number	Price	Description	Pre-Installed Accessories*	Ampere Rating	Voltage	Interrupt Capacity
F3P-060	$618.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	60	240VAC 480VAC 600VAC 250VDC**	65kA 35kA 18kA 10kA
F3P-070	$663.00		None	70		
F3P-080	$663.00		None	80		
F3P-090	$625.00		None	90		
F3P-100	$663.00		None	100		
F3P-125	$663.00		None	125		
F3P-150	$663.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	150		
F3P-150-AUX	$728.00		auxiliary contact, SPDT			
F3P-150-STAC	$728.00		120 VAC shunt trip			
F3P-150-STDC	$728.00		24 VDC shunt trip			
F3P-150-UVAC	$728.00		120 VAC undervoltage release			
F3P-175	$663.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	175		
F3P-200	$663.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	200		
F3P-200-AUX	$728.00		auxiliary contact, SPDT			
F3P-200-STAC	$728.00		120 VAC shunt trip			
F3P-200-STDC	$728.00		24 VDC shunt trip			
F3P-200-UVAC	$728.00		120 VAC undervoltage release			
F3P-225	$663.00	Molded case circuit breaker with non-adjustable thermal magnetic trip; line and load lug terminals included.	None	225		

*Note: Available accessories are pre-installed on G-Frame and F-Frame Molded Case Circuit Breakers. They are not field installable or interchangeable.

**Note: For DC or 1-phase AC applications, use the two outside poles of the 3-pole circuit breaker

F-Frame Accessory Selection Guide

Part Number	Price	Description
FHMVD12B	$80.00	NEMA 1/12 rotary handle for F-frame. Position indicating. Lock-off feature. Shaft length: 12"
HM1R12X	$113.00	NEMA 4/4X rotary handle for F-frame. Position indicating. Lock-off feature. Shaft length: 12"
HM1R24X	$127.00	NEMA 4/4X rotary handle for F-frame. Position indicating. Lock-off feature. Shaft length: 24"
F1S03C	$346.00	NEMA 1/12 flex shaft cable operator for F-frame. Flange mountable. Lockable. Cable length: 3'
F1S06C	$376.00	NEMA 1/12 flex shaft cable operator for F-frame. Flange mountable. Lockable. Cable length: 6'
3TA150F6K	$56.00	Multi-wire connector to allow 6 wires to be connected to the F-frame. UL for copper only. 14-6 AWG. Package of 3
3TA225FD	$84.00	Replacement lug kit for F-frame. Package of 3

F-Frame Electrical Ratings [1,2]

	Max Volts	Frequency	Max Amperes	Dielectric Withstand Voltage	Notes
F-Frame Auxiliary Switch	125 VAC[3]	50/60 Hz	1	2500	1. Endurance: 5000 electrical operations plus 4000 mechanical operatons. 2. Pigtail wire size: 18 AWG (0.82 mm2) 3. Minimum switching circuit capabilities of 100 micro-amperes and 15 VDC minimum. 4. Non-inductive load
	600 VAC	50/60 Hz	6		
	125 VDC	DC	0.50[4]		
	250 VDC	DC	0.25[4]		

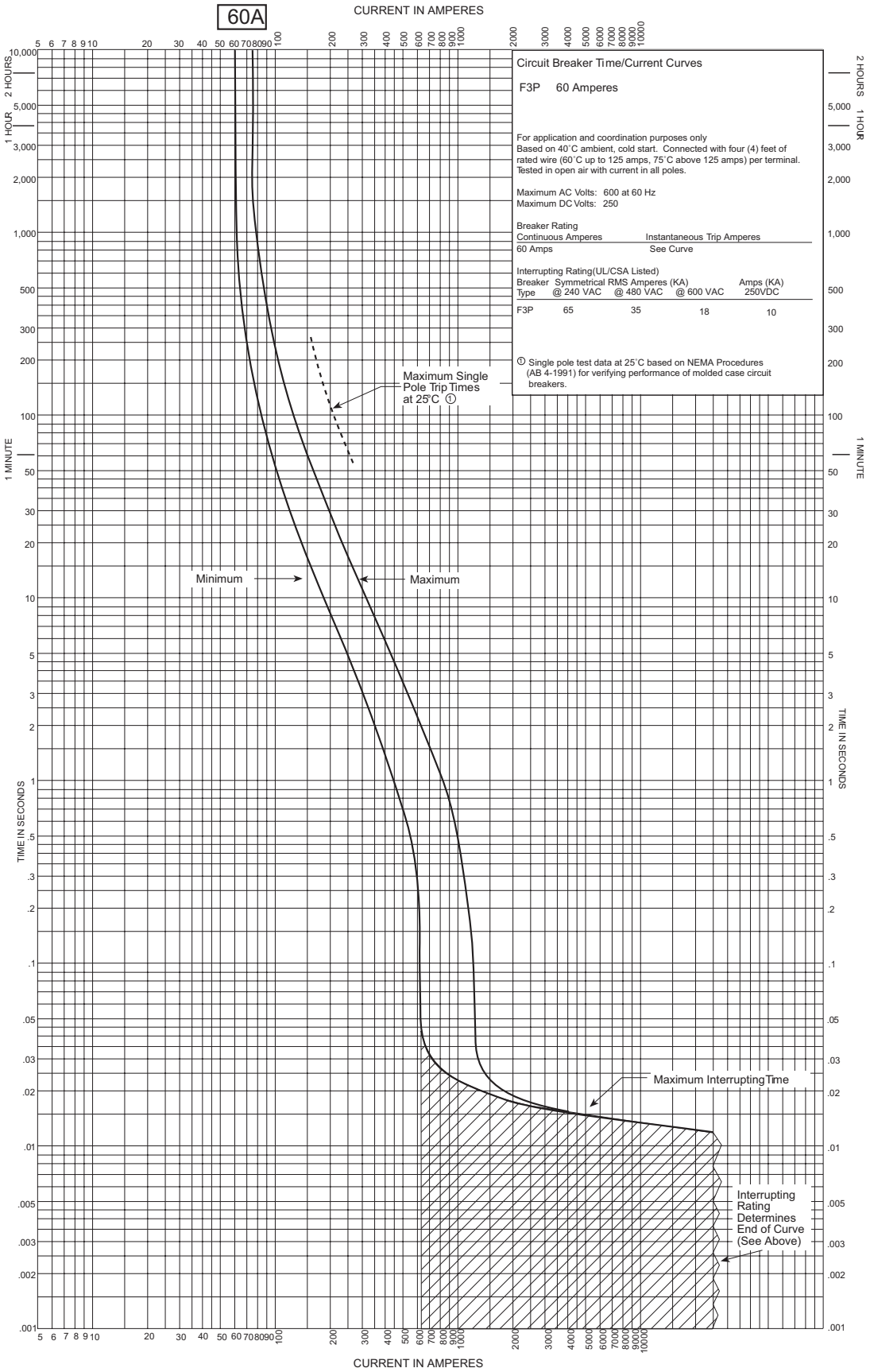
F-Frame Shunt Trip	Supply Voltage	Min Operating Voltage	VA
	120 VAC	36 VAC	570
	24 VDC	9 VDC	400

F-Frame Under-voltage Release Mechanism	Supply Voltage	Dropout Voltage		Pickup Voltage	VA
		Min	Max	Maximum	
	120 VAC	44.5 VAC	77.0 VAC	93.5 VAC	1.5

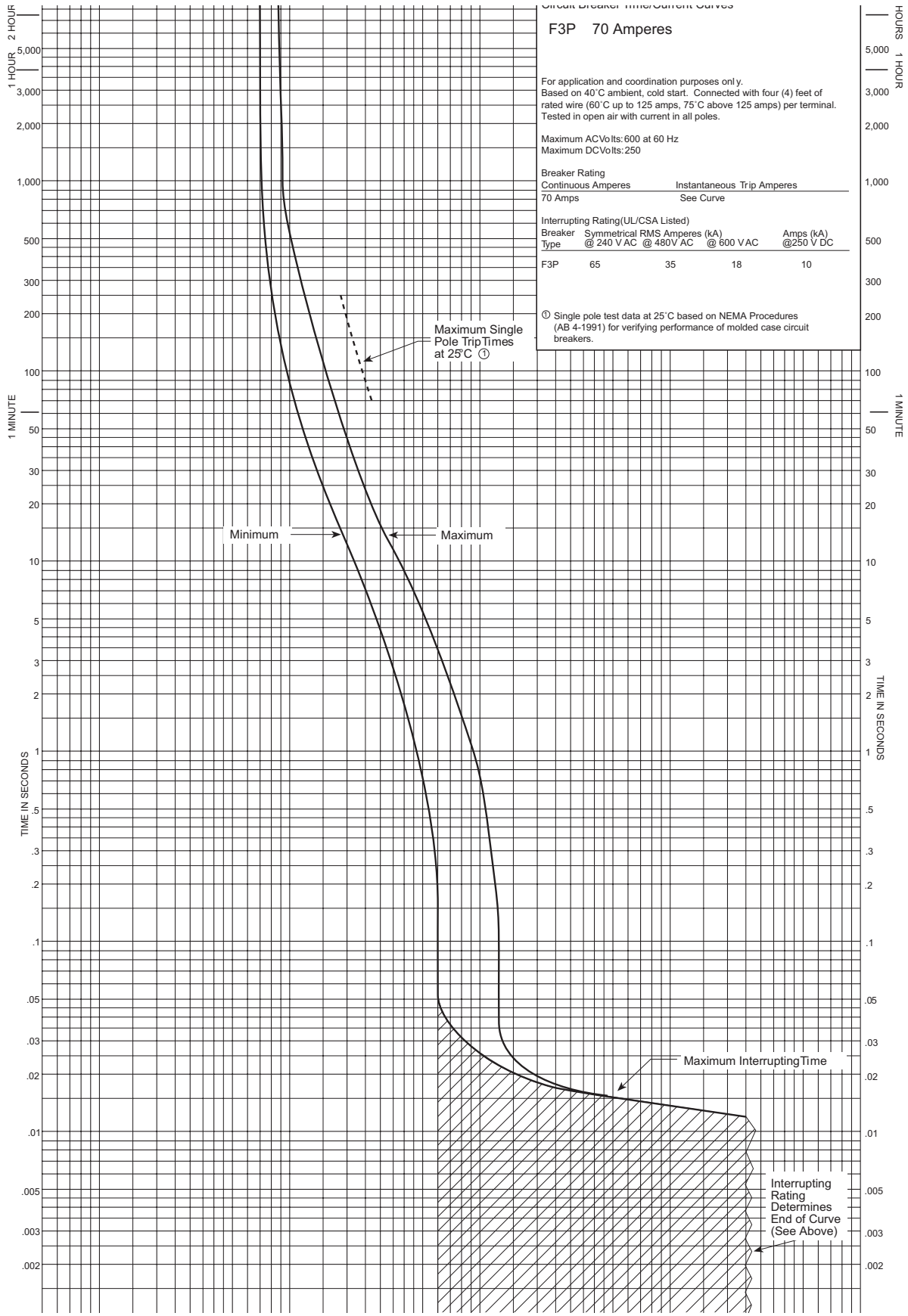
AWG Wire Range Specifications

Circuit Breaker	Ampere Rating	Wire Type	AWG Wire Range	Metric Wire Range mm²
F-Frame	60 - 100	Cu/Al	14 - 1/0	2.5 - 50
	125 - 225		4 - 4/0	25 - 95

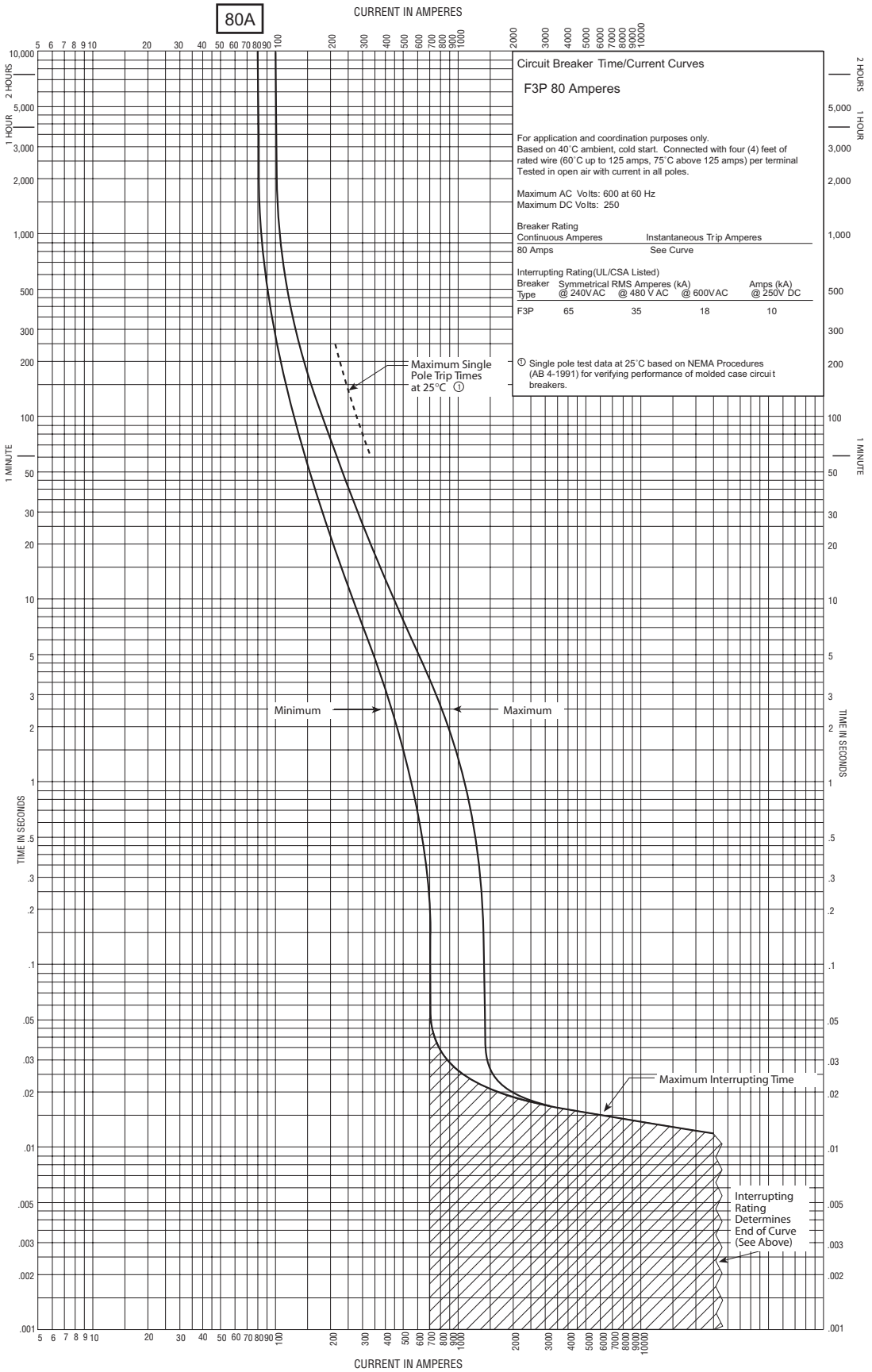
3P Series Molded Case Circuit Breakers
60 Amp F-Frame



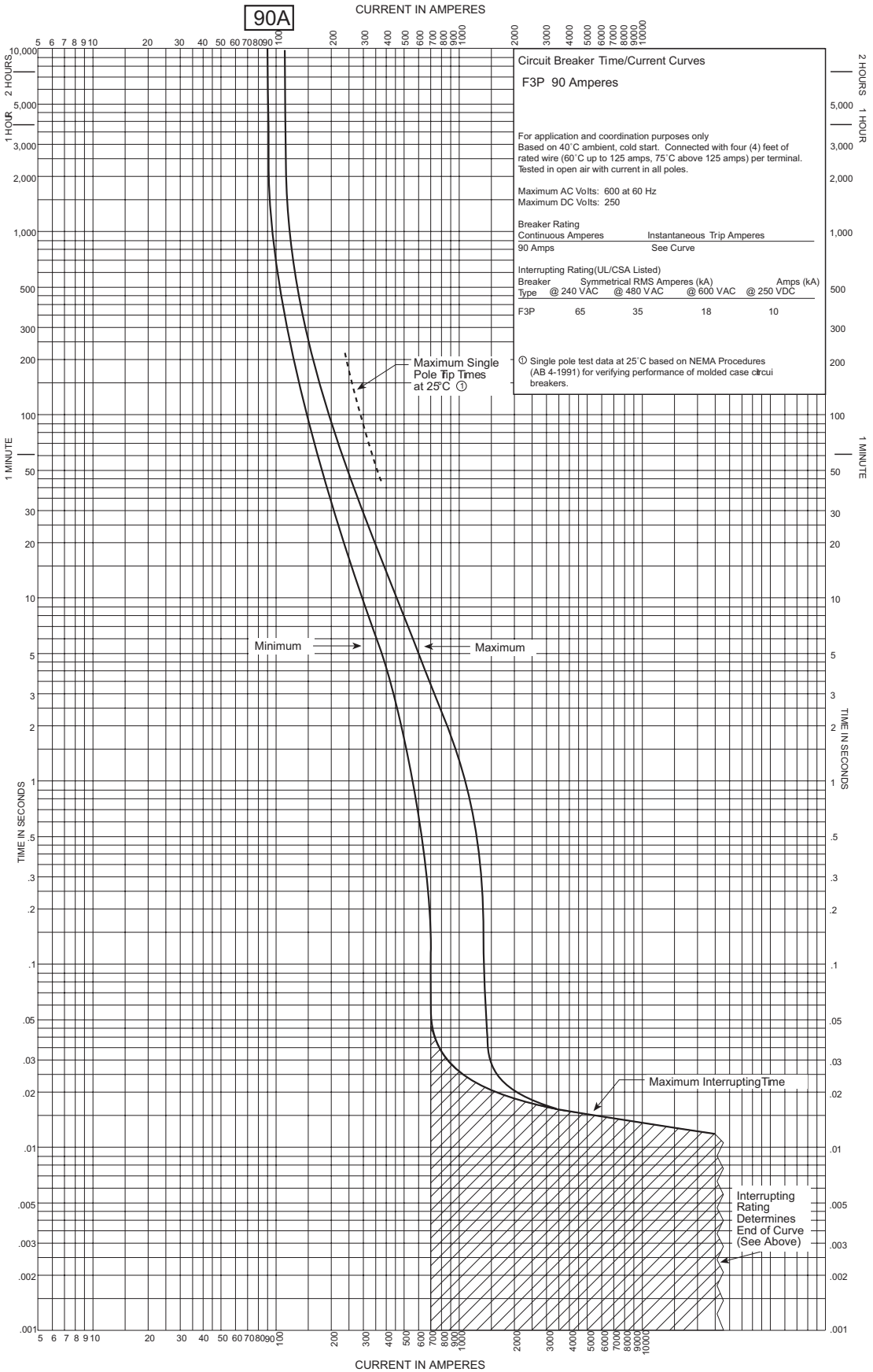
3P Series Molded Case Circuit Breakers
70 Amp F-Frame



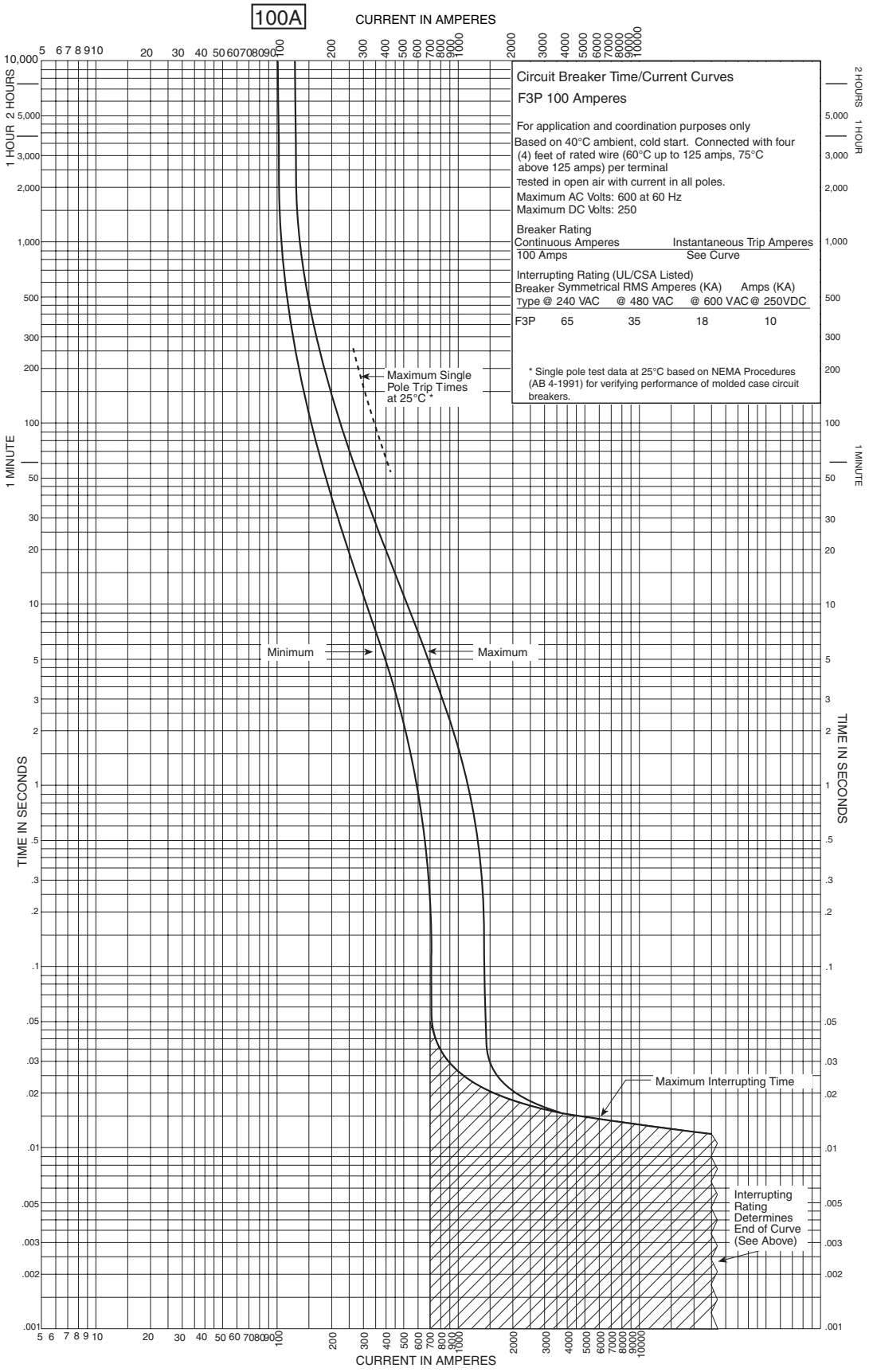
3P Series Molded Case Circuit Breakers
80 Amp F-Frame



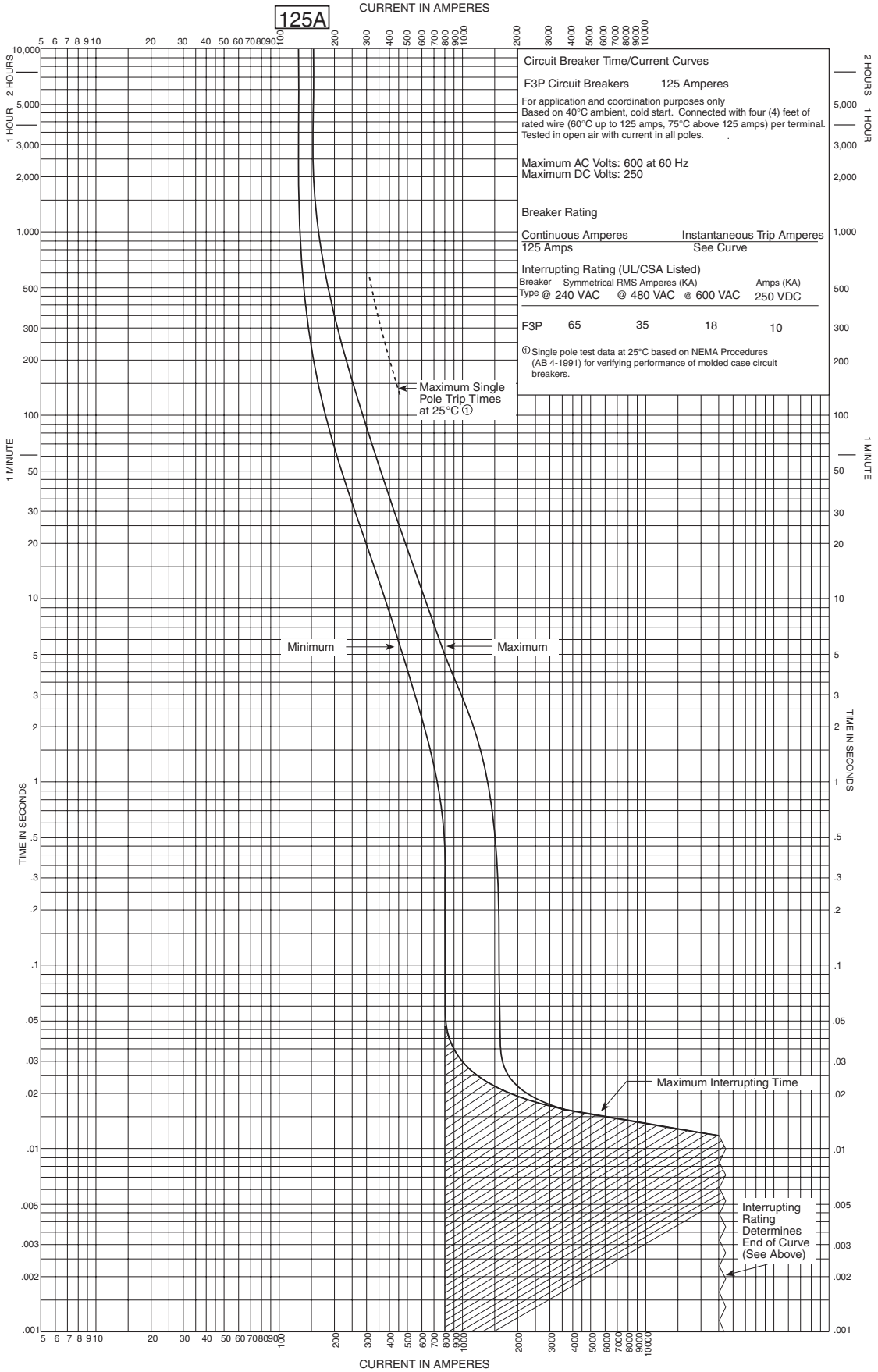
3P Series Molded Case Circuit Breakers
90 Amp F-Frame



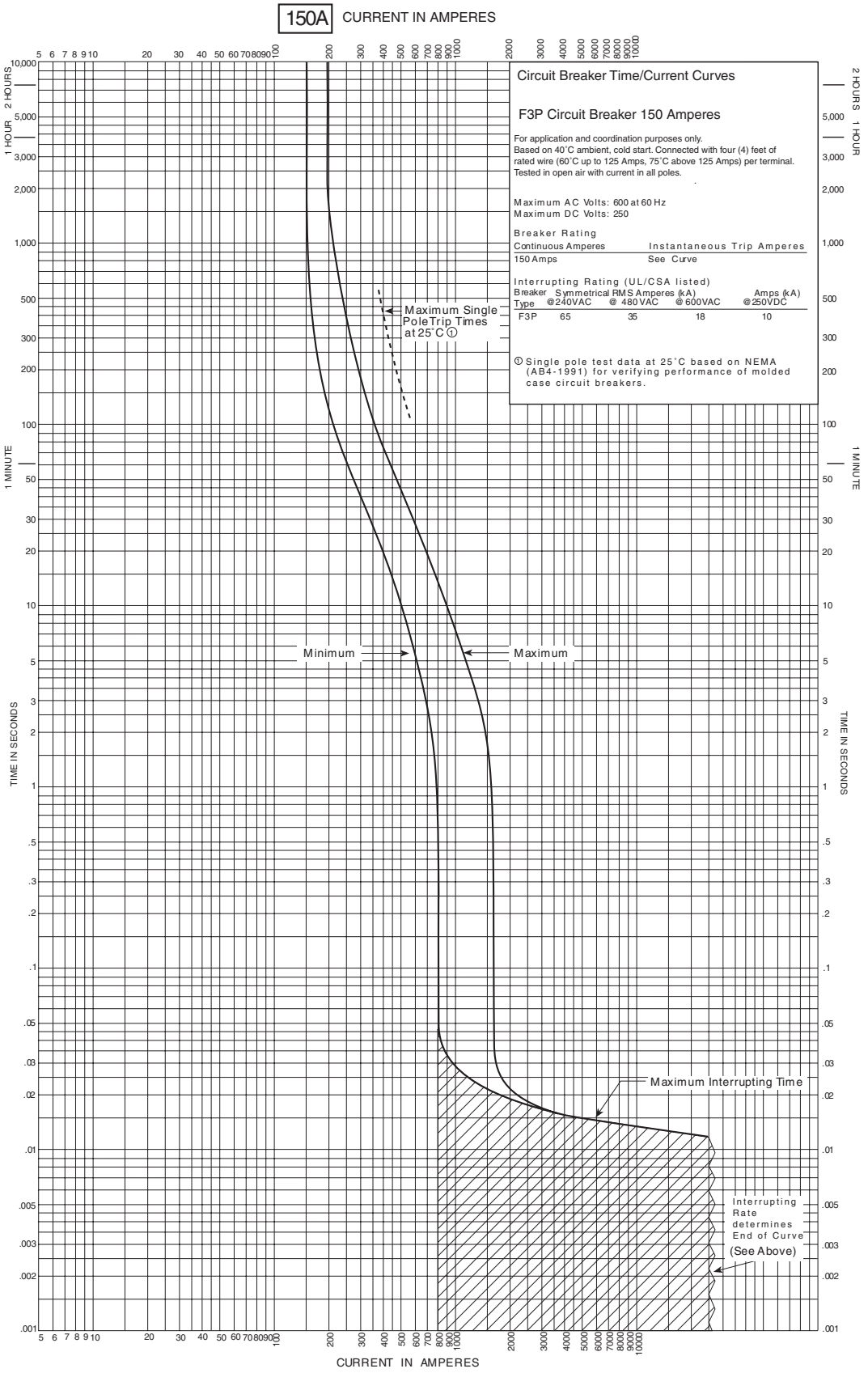
3P Series Molded Case Circuit Breakers
100 Amp F-Frame



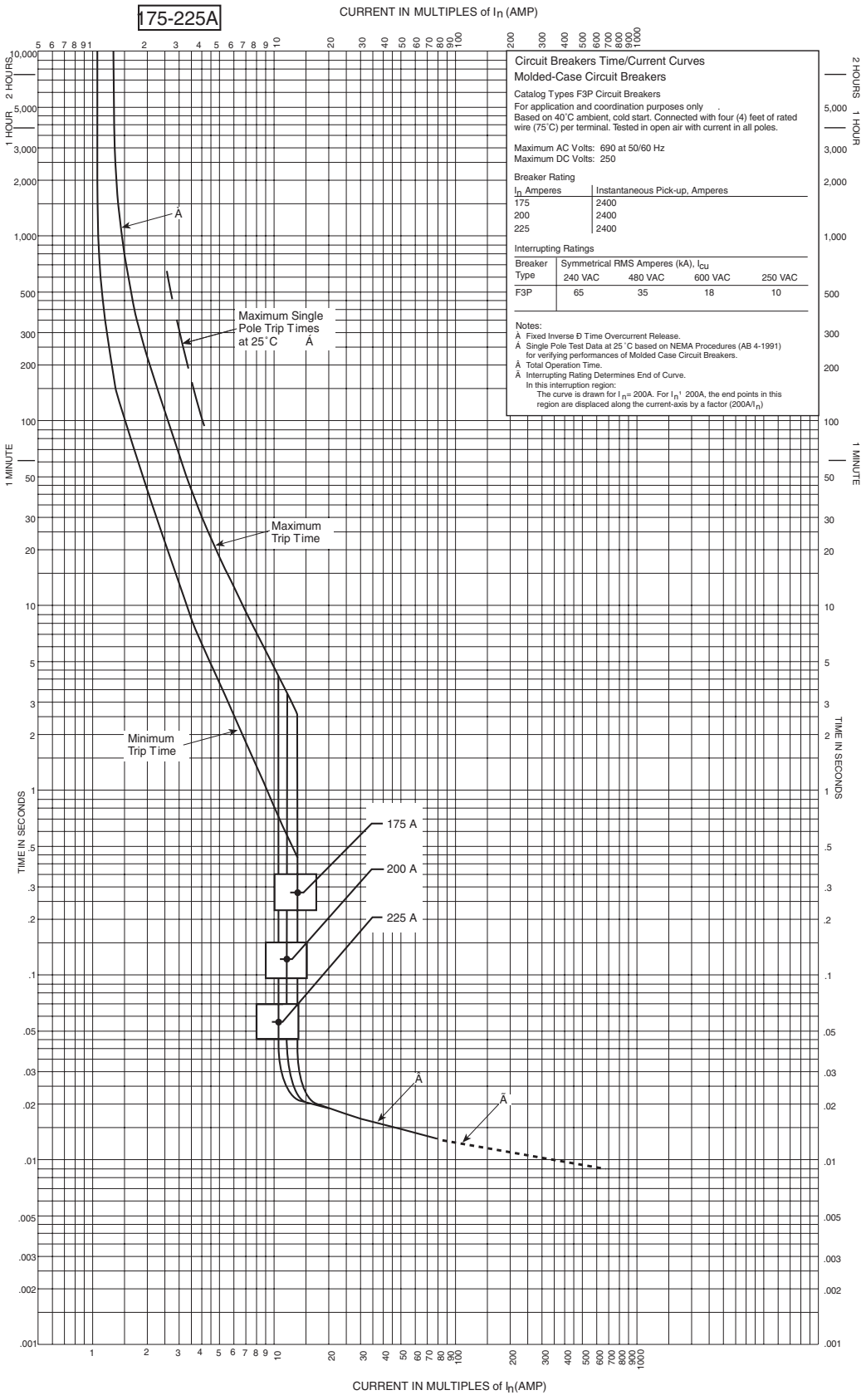
3P Series Molded Case Circuit Breakers
125 Amp F-Frame



3P Series Molded Case Circuit Breakers
150 Amp F-Frame



3P Series Molded Case Circuit Breakers
175-225 Amp F-Frame

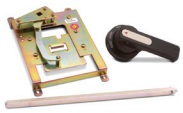


3P Series Molded Case Circuit Breakers 250-400 Amp K-Frame

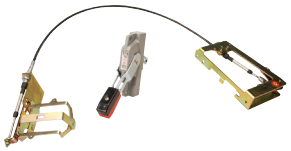
K-Frame circuit breakers are available as individual components or in a kit. Breaker frame includes 3-pole adjustable magnetic trip. Available accessories are field installable on this frame size.

All breakers include base mounting hardware for panel mount applications.

K3P-400



KHMVD12B



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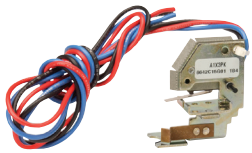


A1X3PK

SNT3P04K

3TA401K

UVH3LP08K

K-Frame Series Three Pole Molded Case Circuit Breakers						
Part Number	**Price**	**Description**	**Kits**	**Ampere Rating**	**Voltage**	**Interrupt Capacity**
K3P-250	$1,201.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	250	240VAC 480VAC 600VAC 250VDC	65kA 35kA 25kA 10kA*
K3P-250-AUX	$1,286.00		Kit includes K3P-250 and A1X3PK			
K3P-250-STAC	$1,371.00		Kit includes K3P-250 and SNT3P11K			
K3P-250-STDC	$1,371.00		Kit includes K3P-250 and SNT3P04K			
K3P-250-UVAC	$1,371.00		Kit includes K3P-250 and UVH3LP08K			
K3P-250-UVDC	$1,371.00		Kit includes K3P-250 and UVH3LP21K			
K3P-300	$1,201.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	300		
K3P-300-AUX	$1,287.00		Kit includes K3P-300 and A1X3PK			
K3P-300-STAC	$1,371.00		Kit includes K3P-300 and SNT3P11K			
K3P-300-STDC	$1,371.00		Kit includes K3P-300 and SNT3P04K			
K3P-300-UVAC	$1,371.00		Kit includes K3P-300 and UVH3LP08K			
K3P-300-UVDC	$1,371.00		Kit includes K3P-300 and UVH3LP21K			
K3P-350	$1,201.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	350		
K3P-350-AUX	$1,287.00		Kit includes K3P-350 and A1X3PK			
K3P-350-STAC	$1,371.00		Kit includes K3P-350 and SNT3P11K			
K3P-350-STDC	$1,371.00		Kit includes K3P-350 and SNT3P04K			
K3P-350-UVAC	$1,371.00		Kit includes K3P-350 and UVH3LP08K			
K3P-350-UVDC	$1,371.00		Kit includes K3P-350 and UVH3LP21K			
K3P-400	$1,201.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	400		
K3P-400-AUX	$1,287.00		Kit includes K3P-400 and A1X3PK			
K3P-400-STAC	$1,371.00		Kit includes K3P-400 and SNT3P11K			
K3P-400-STDC	$1,371.00		Kit includes K3P-400 and SNT3P04K			
K3P-400-UVAC	$1,371.00		Kit includes K3P-400 and UVH3LP08K			
K3P-400-UVDC	$1,371.00		Kit includes K3P-400 and UVH3LP21K			

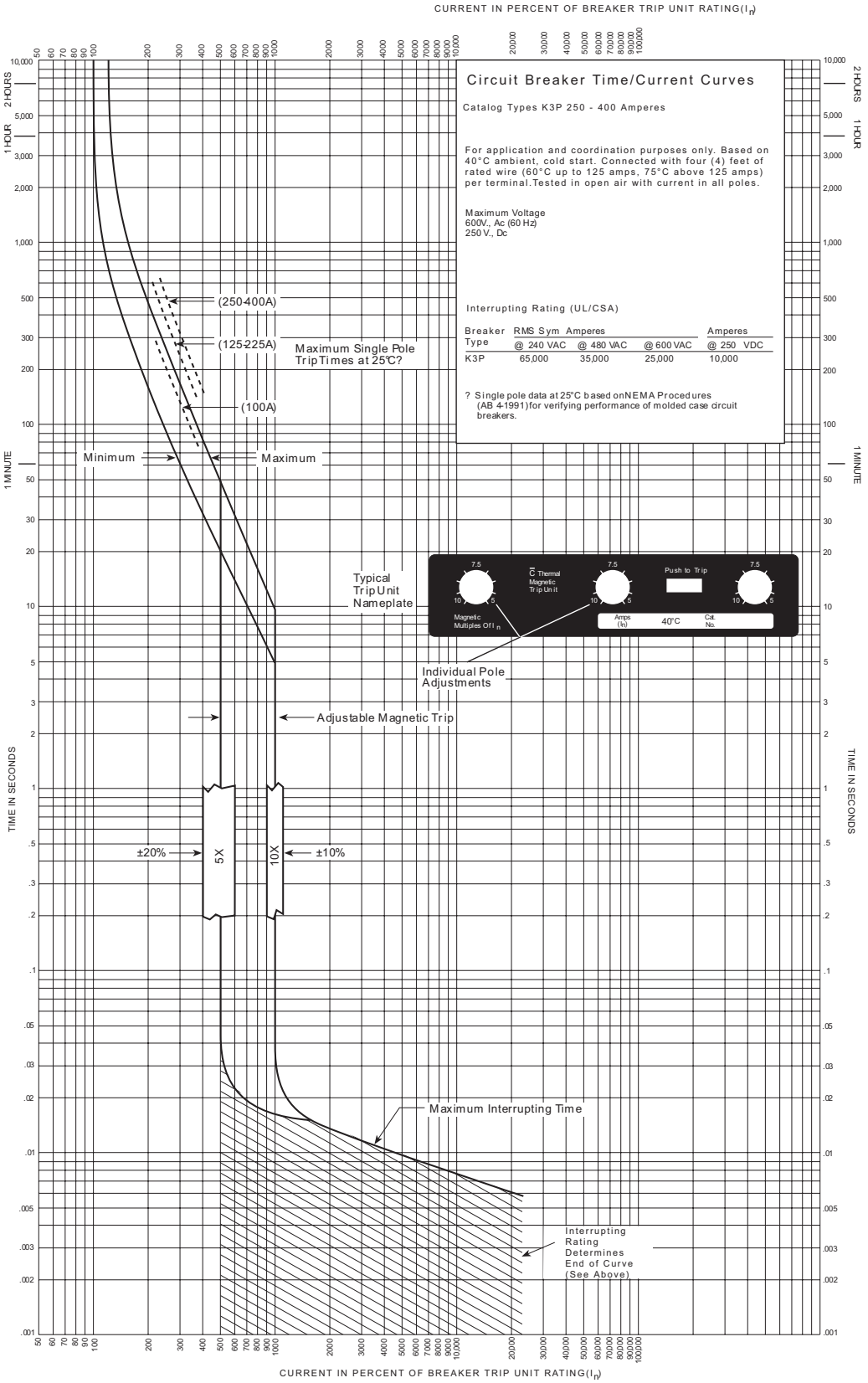
***Note: For DC or 1-phase AC applications, use the two outside poles of the 3-pole circuit breaker**

K-Frame Accessory Selection Guide		
Part Number	**Price**	**Description**
KHMVD12B	$115.00	NEMA 1/12 rotary handle for K-Frame.. Position indicating. Lock-off feature. Shaft length: 12"
HM3R12X	$139.00	NEMA 4/4X rotary handle for K-Frame.. Position indicating. Lock-off feature. Shaft length: 12"
HM3R24X	$155.00	NEMA 4/4X rotary handle for K-Frame.. Position indicating. Lock-off feature. Shaft length: 24"
F3S03C	$413.00	NEMA 1/12 flexible shaft cable operator for K-Frame. Flange Mounted. Lockable. Cable length: 3'
F3S06C	$435.00	NEMA 1/12 flexible shaft cable operator for K-Frame. Flange Mounted. Lockable. Cable length: 6'
A1X3PK	$204.00	Field installable auxiliary contact for K-Frame MCCB, SPDT, 18" pigtail leads
SNT3P11K	$315.00	Field installable 110 - 240 VAC / 110 - 125 VDC shunt trip for K-Frame, 18" pigtail leads
SNT3P04K	$315.00	Field installable 12/24 VDC / VAC shunt trip for K-Frame, 18" pigtail leads
3TA401K	$88.00	Replacement lug kit for K-Frame. Package of 3
UVH3LP08K	$315.00	Field installable 110 - 127 VAC undervoltage release for K-Frame, 18" pigtail leads
UVH3LP21K	$315.00	Field installable 24 VDC undervoltage release for K-Frame, 18" pigtail leads

Note: See 3P Series Molded Case Circuit Breakers Accessories catalog pages for accessory electrical specifications.

AWG Wire Range Specifications				
Circuit Breaker	**Ampere Rating**	**Wire Type**	**AWG Wire Range**	**Metric Wire Range mm²**
K-Frame	250 - 350	Cu/Al	250 - 500 (1)	120 - 240
	400		3/0 - 250 (2)	95 - 120

3P Series Molded Case Circuit Breakers 250-400 Amp K-Frame



3P Series Molded Case Circuit Breakers 400-600 Amp L-Frame

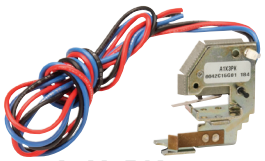
L-Frame circuit breakers are available as individual components or in a kit. Breaker frame includes 3-pole adjustable magnetic trip. Available accessories are field installable on this frame size.

All breakers include base mounting hardware for panel mount applications.

L3P-600

LHMVD12B

F4S04C



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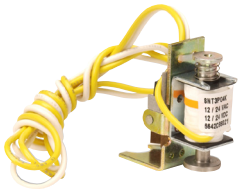
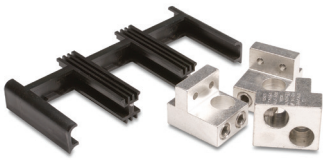


SNT4RP03K



3TA603LDK

UVH4LP08K

L-Frame Series Three Pole Molded Case Circuit Breakers

Part Number	Price	Description	Kits	Ampere Rating	Voltage	Interrupt Capacity
L3P-400	$1,652.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	400	240VAC 480VAC 600VAC 250VDC	65kA 35kA 25kA 22kA*
L3P-400-AUX	$1,719.00		Kit includes L3P-400 and A1X4PK			
L3P-400-STAC	$1,871.00		Kit includes L3P-400 and SNT4RP11K			
L3P-400-STDC	$1,871.00		Kit includes L3P-400 and SNT4RP03K			
L3P-400-UVAC	$1,871.00		Kit includes L3P-400 and UVH4LP08K			
L3P-400-UVDC	$1,871.00		Kit includes L3P-400 and UVH4LP21K			
L3P-500	$1,652.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	500		
L3P-500-AUX	$1,719.00		Kit includes L3P-500 and A1X4PK			
L3P-500-STAC	$1,871.00		Kit includes L3P-500 and SNT4RP11K			
L3P-500-STDC	$1,871.00		Kit includes L3P-500 and SNT4RP03K			
L3P-500-UVAC	$1,871.00		Kit includes L3P-500 and UVH4LP08K			
L3P-500-UVDC	$1,871.00		Kit includes L3P-500 and UVH4LP21K			
L3P-600	$1,652.00	Molded case circuit breaker with adjustable thermal magnetic trip; line and load lug terminals included.	MCCB only	600		
L3P-600-AUX	$1,719.00		Kit includes L3P-600 and A1X4PK			
L3P-600-STAC	$1,871.00		Kit includes L3P-600 and SNT4RP11K			
L3P-600-STDC	$1,871.00		Kit includes L3P-600 and SNT4RP03K			
L3P-600-UVAC	$1,871.00		Kit includes L3P-600 and UVH4LP08K			
L3P-600-UVDC	$1,871.00		Kit includes L3P-600 and UVH4LP21K			

Note: For DC or 1-phase AC applications, use the two outside poles of the 3-pole circuit breaker

L-Frame Accessory Selection Guide

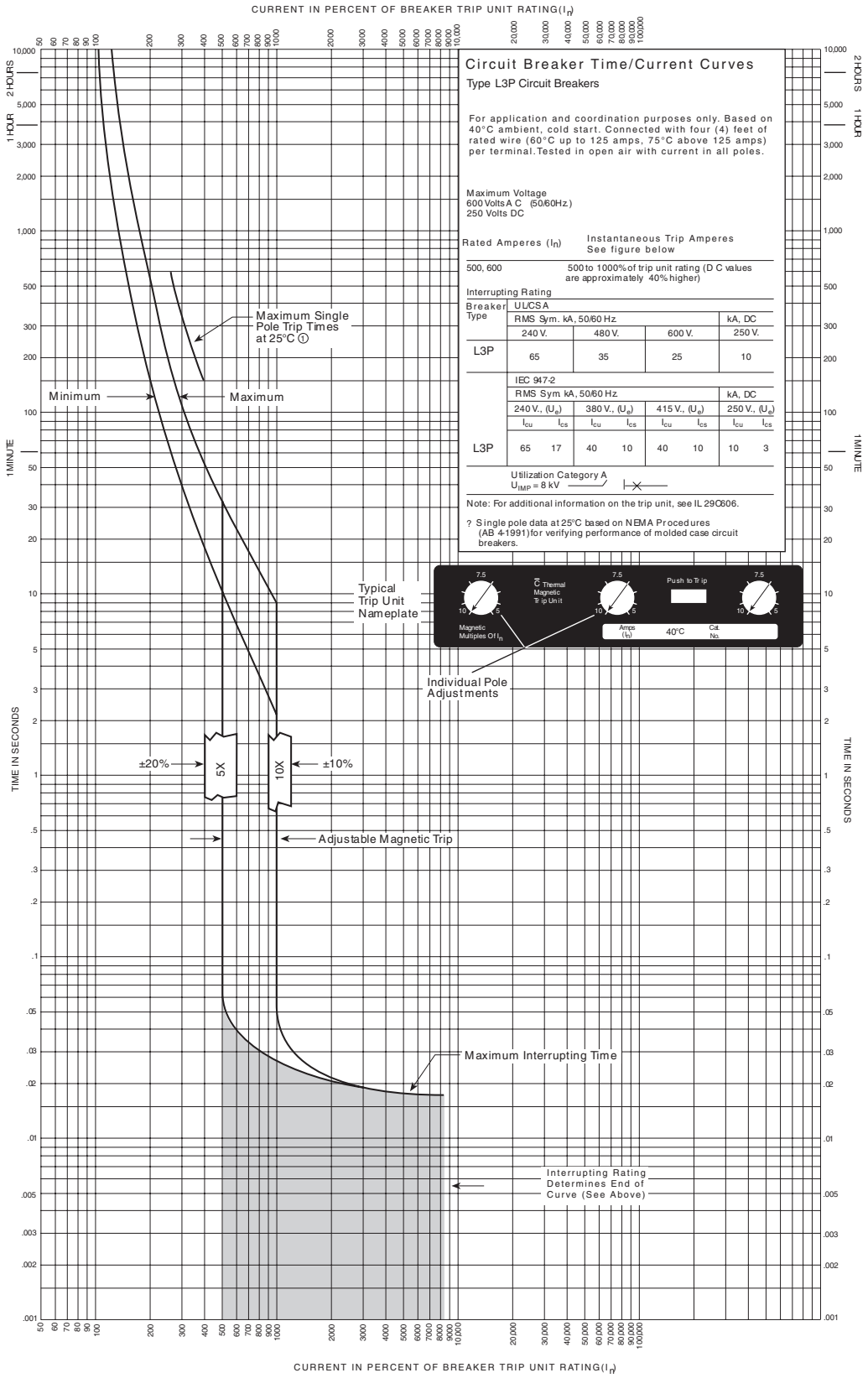
Part Number	Price	Description
LHMVD12B	$133.00	NEMA 1/12 rotary handle for L-Frame. Position indicating. Lock-off feature. Shaft length: 12"
HM4R12X	$181.00	NEMA 4/4X rotary handle for L-Frame. Position indicating. Lock-off feature. Shaft length: 12"
HM4R24X	$191.00	NEMA 4/4X rotary handle for L-Frame. Position indicating. Lock-off feature. Shaft length: 24"
F4S04C	$472.00	NEMA 1/12 flex shaft cable operator for L-Frame. Flange mounted. Lockable. Cable length: 4'
F4S06C	$545.00	NEMA 1/12 flex shaft cable operator for L-Frame. Flange mounted. Lockable. Cable length: 6'
A1X4PK	$209.00	Field installable auxiliary contact for L-Frame MCCB, SPDT, 18" pigtail leads
SNT4RP11K	$361.00	Field installable 110 - 240 VAC shunt trip for L-Frame, 18" pigtail leads
SNT4RP03K	$361.00	Field installable 12/24 VDC / VAC shunt trip for L-Frame, 18" pigtail leads
3TA603LDK	$109.00	Replacement lug kit for L-Frame. Rated 600A. Package of 3
UVH4LP08K	$337.00	Field installable 110 - 127 VAC undervoltage release for L-Frame, 18" pigtail leads
UVH4LP21K	$361.00	Field installable 24 VDC undervoltage release for L-Frame, 18" pigtail leads

Note: See 3P Series Molded Case Circuit Breakers Accessories catalog pages for accessory electrical specifications.

AWG Wire Range Specifications

Circuit Breaker	Ampere Rating	Wire Type	AWG Wire Range	Metric Wire Range mm²
L-Frame	400	Cu/Al	3/0 - 350 (2)	95 - 150
	500		3/0 - 350 (2)	95 - 150
	600		400 - 500 (2)	185 - 240

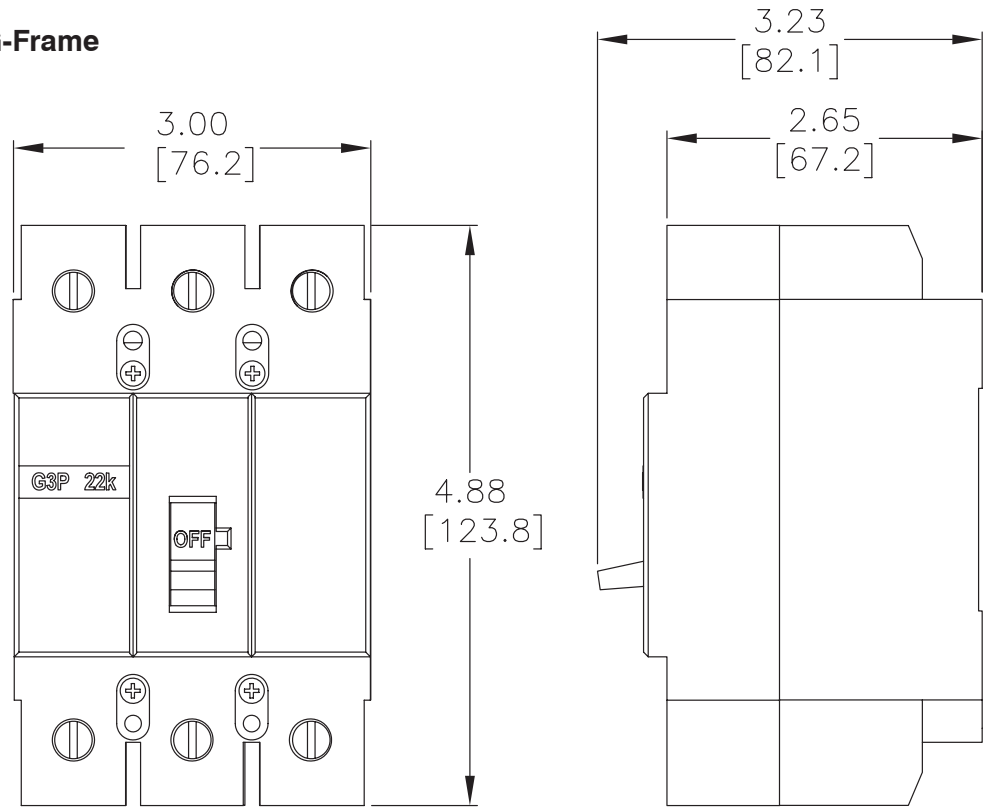
3P Series Molded Case Circuit Breakers
400-600 Amp L-Frame



3P Series Molded Case Circuit Breakers Dimensions

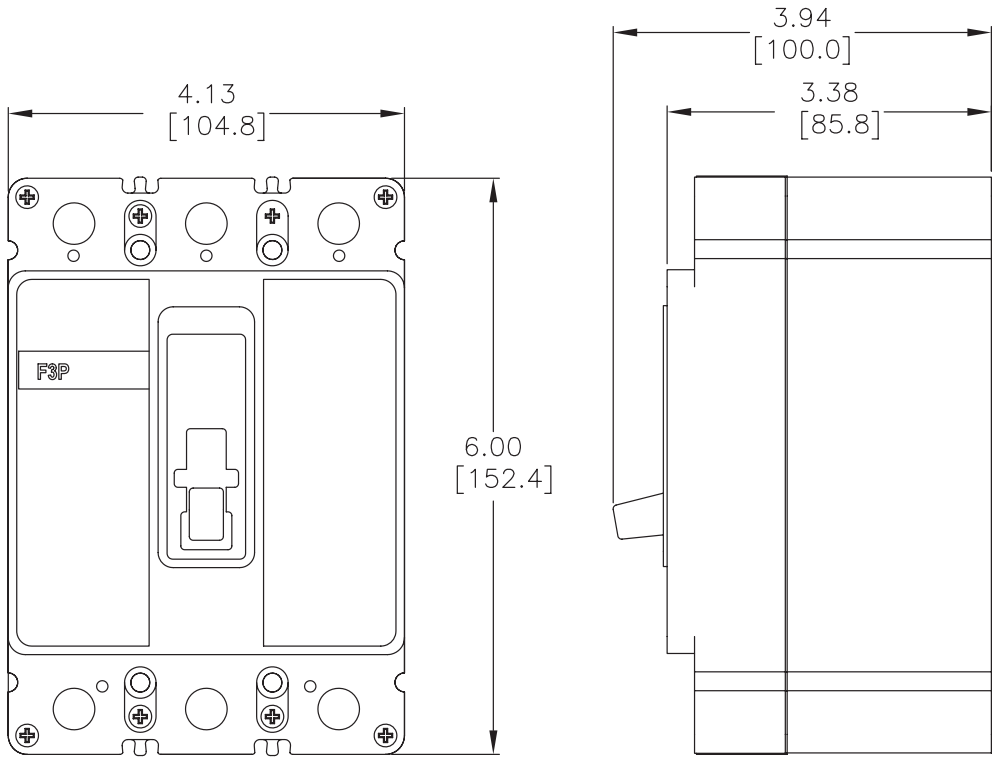
15 - 100 Amp G-Frame

inches (mm)



60 - 225 Amp F-Frame

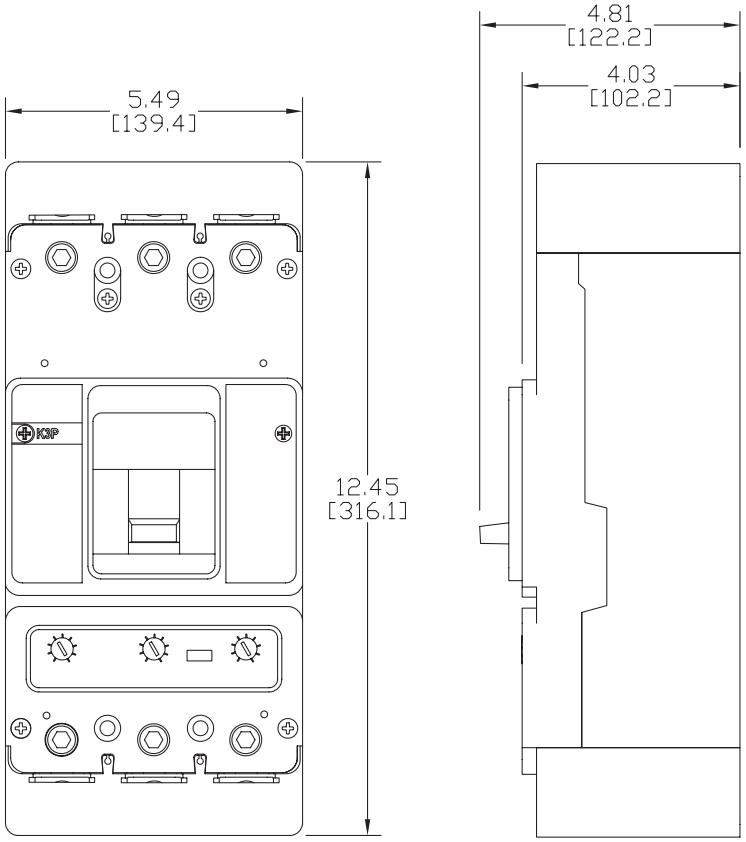
inches (mm)



3P Series Molded Case Circuit Breakers Dimensions

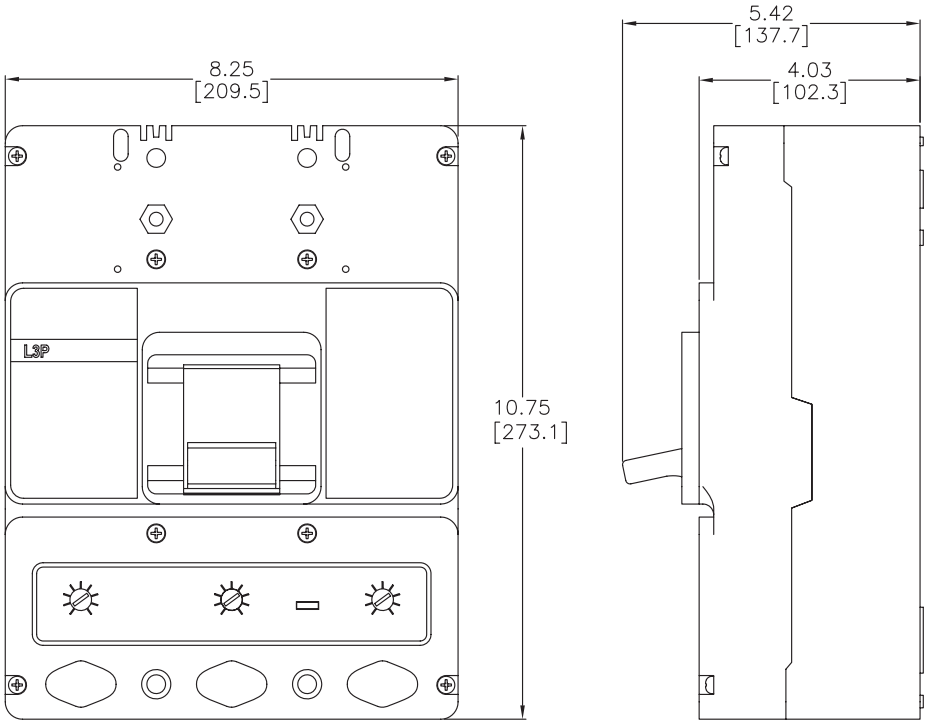
250 - 400 Amp K-Frame

inches (mm)



400 - 600 Amp L-Frame

inches (mm)



3P Series Molded Case Circuit Breakers Accessories

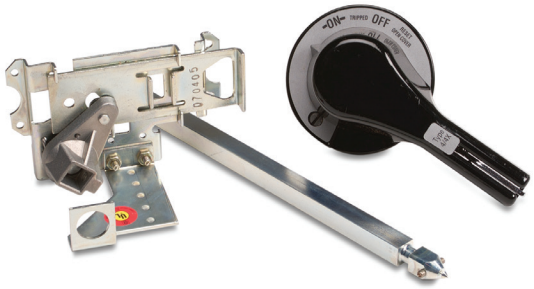
Field Mountable Accessories

Rotary Handle

A universal rotary handle is available for each frame size of molded case circuit breaker. The handles are suitable for use with NEMA 1, 12, 4 or 4x enclosures. Features include the following:

- Large handle easily accommodates gloves
- Global ON/OFF markings (I/ON, O/OFF) and TRIP indication on handle
- Access Handle Lock-Off by pressing arrow on handle insert
- Door interlock and defeater
- Metal shaft and base
- Pipe valve operation (ON=Vertical, OFF=Horizontal) with 90 degree rotation
- UL 489, IEC 947-1/-2, CSA

GHMVD12B



HM1R12X

Rotary Handle Accessory Selection Guide		
Part Number	Price	Description
GHMVD06B	$72.00	NEMA 1/12 black rotary handle for G-Frame MCCB. Shaft length: 6"
GHMVD12B	$80.00	NEMA 1/12 black rotary handle for G-Frame MCCB. Shaft length: 12"
FHMVD12B	$80.00	NEMA 1/12 black rotary handle for F-Frame MCCB. Shaft length: 12"
HM1R12X	$113.00	NEMA 4/4X black rotary handle for F-Frame MCCB. Shaft length: 12"
HM1R24X	$127.00	NEMA 4/4X black rotary handle for F-Frame MCCB. Shaft length: 24"
KHMVD12B	$115.00	NEMA 1/12 black rotary handle for K-Frame MCCB. Shaft length: 12"
HM3R12X	$139.00	NEMA 4/4X black rotary handle for K-Frame MCCB. Shaft length: 12"
HM3R24X	$155.00	NEMA 4/4X black rotary handle for K-Frame MCCB. Shaft length: 24"
LHMVD12B	$133.00	NEMA 1/12 black rotary handle for L-Frame MCCB. Shaft length: 12"
HM4R12X	$181.00	NEMA 4/4X black rotary handle for L-Frame MCCB. Shaft length: 12"
HM4R24X	$191.00	NEMA 4/4X black rotary handle for L-Frame MCCB. Shaft length: 24"

Flex Shaft™ Flexible Handle

Meeting crucial time limits for shutdown procedures is easier with an externally mounted handle. The flexible handle makes it possible to operate the circuit breaker externally and can be used in enclosures of varying depths and heights. It can be used with NEMA 1, NEMA 3R and NEMA 12 enclosures, and it accepts up to three padlock shackles.

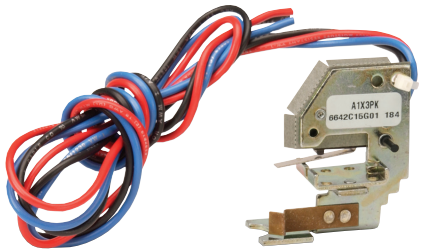
Note: A minimum bending radius of four inches is necessary for proper operation.

F0S03C

Flexible Handle Accessory Selection Guide		
Part Number	Price	Description
F0S03C	$310.00	NEMA 1/12 flex shaft cable operator for G-Frame MCCB. Cable length: 3'
F0S06C	$346.00	NEMA 1/12 flex shaft cable operator for G-Frame MCCB. Cable length: 6'
F1S03C	$346.00	NEMA 1/12 flex shaft cable operator for F-Frame MCCB. Cable length: 3'
F1S06C	$376.00	NEMA 1/12 flex shaft cable operator for F-Frame MCCB. Cable length: 6'
F3S03C	$413.00	NEMA 1/12 flex shaft cable operator for K-Frame MCCB. Cable length: 3'
F3S06C	$435.00	NEMA 1/12 flex shaft cable operator for K-Frame MCCB. Cable length: 6'
F4S04C	$472.00	NEMA 1/12 flex shaft cable operator for L-Frame MCCB. Cable length: 4'
F4S06C	$545.00	NEMA 1/12 flex shaft cable operator for L-Frame MCCB. Cable length: 6'

3P Series Molded Case Circuit Breakers Accessories

Field Mountable Accessories



A1X3PK

Auxiliary Contact

The auxiliary contact provides circuit breaker contact status information by monitoring the position of the molded cross bar which contains the moving contact arms. The auxiliary switch is used for remote indication and interlock system verification, and consists of one SPDT switch housed in a plug-in module. Each SPDT switch has one 'a' and one 'b' contact. When the circuit breaker contacts are open, the 'a' contact is open and the 'b' contact is closed.

Note: Field installable auxiliary contacts are not available for the G and F frame breakers. For G and F frame auxiliary contacts, order breakers with -AUX as part of the part number. Please see G and F-frame sections for available selections.

Auxiliary Contact Accessory Selection Guide

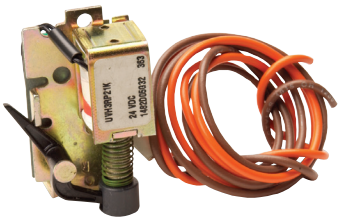
Part Number	Price	Description
A1X3PK	$204.00	Field installable auxiliary contact for K-Frame MCCB, SPDT, 18" pigtail leads
A1X4PK	$209.00	Field installable auxiliary contact for L-Frame MCCB, SPDT, 18" pigtail leads

K-Frame Electrical Ratings [1,2]

	Max Volts	Frequency	Max Amperes	Dielectric Withstand Voltage	Notes
K-Frame Auxiliary Switch	600	50/60 Hz	6	2500	1. Endurance: 5000 electrical operations plus 1000 mechanical operatorns. 2. Pigtail wire size: 18 AWG (0.82 mm²) 3. Non-inductive load
	125	DC	0.50[3]		
	250	DC	0.25[3]		

L-Frame Electrical Ratings [1,2]

	Max Volts	Frequency	Max Amperes	Dielectric Withstand Voltage	Notes
L-Frame Auxiliary Switch	600	50/60 Hz	6	2500	1. Endurance: 5000 electrical operations plus 1000 mechanical operatorns. 2. Pigtail wire size: 18 AWG (0.82 mm²) 3. Non-inductive load
	125	DC	0.50[3]		
	250	DC	0.25[3]		



UVH3LP21K

Undervoltage Release

This product monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70% and 35% of the solenoid coil rating. It consists of a continuous rated solenoid, with a plunger and tripping lever mounted in a plug-in module.

Note: The undervoltage release is a pre-installed accessory on G-Frame and F-Frame breakers.

Undervoltage Release Accessory Selection Guide

Part Number	Price	Description
UVH3LP08K	$315.00	Field installable 110 - 127 VAC undervoltage release for K-Frame MCCB
UVH4LP08K	$337.00	Field installable 110 - 127 VAC undervoltage release for L-Frame MCCB
UVH3LP21K	$315.00	Field installable 24 VDC undervoltage release for K-Frame MCCB
UVH4LP21K	$361.00	Field installable 24 VDC undervoltage release for L-Frame MCCB

	Supply Voltage	Dropout Voltage		Pickup Voltage	VA	Notes
		Min	Max	Max		
K-Frame Undervoltage Release Mechanism	24 VDC	8.4	16.8	20.4	3.1	1. Endurance: 5000 electrical operations plus 1000 mechanical operatons. 2. 50/60 Hz
	110 VAC[2]	44.5	77.0	93.5	1.8	
	120 VAC[2]				2.1	
	127 VAC[2]				2.4	

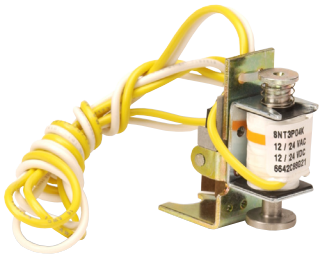
	Supply Voltage	Dropout Voltage		Pickup Voltage	VA	Notes
		Min	Max	Max		
L-Frame Undervoltage Release Mechanism	24 VDC	8.4	16.8	20.4	3.1	1. Endurance: 5000 electrical operations plus 1000 mechanical operatons. 2. 50/60 Hz
	110 VAC[2]	44.5	77.0	93.5	1.8	
	120 VAC[2]				2.1	
	127 VAC[2]				2.4	

3P Series Molded Case Circuit Breakers Accessories

Field Mountable Accessories

Shunt Trip

The Shunt Trip provides remote controlled tripping of the circuit breaker. Consisting of an intermittent rated solenoid with a tripping plunger and a cutoff switch assembled to a plug-in module, shunt trip coils are designed to be applied at specific AC or DC voltages.



SNT3P04K

Shunt Trip Accessory Selection Guide		
Part Number	***Price***	***Description***
SNT3P11K	$315.00	Field installable 110/240 VAC / 110/125 VDC shunt trip for K-Frame MCCB.
SNT4RP11K	$361.00	Field installable 110/240 VAC shunt trip for L-Frame MCCB
SNT3P04K	$315.00	Field installable 12/24 VAC/DC shunt trip for K-Frame MCCB
SNT4RP03K	$361.00	Field installable 12/24 VAC/DC shunt trip for L-Frame MCCB

	Supply Voltage	***Min Operating Voltage***	***VA***	***Supply Voltage***	***Min Operating Voltage***	***VA***	***Notes***
	VAC 50/60 Hz			VDC			
K-Frame Shunt Trip	12	9	45	12	8.4	35	1. Endurance: 5000 electrical operations plus 1000 mechanical operatons. 2. Approx. unlatching time: 6 ms Approx. total circuit breaker contact opening time: 8 ms
	24		200	24		170	
	110	60	100	110	77	110	
	120		120	120	77	130	
	127		140	125	77	140	
	208		420	–	–	–	
	220		470	–	–	–	
	240		550	–	–	–	

	Supply Voltage	***Min Operating Voltage***	***VA***	***Supply Voltage***	***Min Operating Voltage***	***VA***	***Notes***
	VAC 50/60 Hz			VDC			
L-Frame Shunt Trip	12	9	45	12	9	35	1. Endurance: 5000 electrical operations plus 1000 mechanical operatons. 2. Approx. unlatching time: 6 ms Approx. total circuit breaker contact opening time: 18 ms
	24		200	24		170	
	110	60	100	–	–	–	
	120		120	–	–	–	
	127		140	–	–	–	
	208		420	–	–	–	
	220		470	–	–	–	
	240		550	–	–	–	

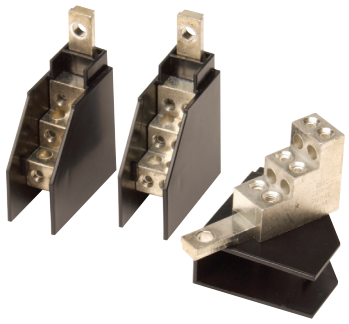
3P Series Molded Case Circuit Breakers Accessories

Field Mountable Accessories

Six-wire Connector

This is a field installable multi-wire connector which allows six wires to be connected to the load side (OFF) end terminals. It is used to distribute the load from the circuit breaker to multiple devices without the use of separate distribution terminal blocks. UL listed for copper only as used on the load side (OFF) end. Includes mounting hardware, insulators and tin-plated aluminum connectors.

Six-wire Connector Accessory Selection Guide		
Part Number	***Price***	***Description***
3TA100G6K	$56.00	For G-Frame MCCBs. Pkg. of 3. Wire size: 14 - 6 AWG, copper
3TA150F6K	$56.00	For F-Frame MCCBs. Pkg. of 3. Wire size: 14 - 6 AWG, copper



3TA100G6K

Replacement Lug Kit

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. Replacement lugs will accept wire types Cu/Al as standard.

Replacement Lug Kit Accessory Selection Guide		
Part Number	***Price***	***Description***
3TA225FD	$84.00	Replacement lug kit for F-Frame MCCB. Wire range (1) #4-4/0 (25-95 mm²). Package of (3) terminals.
3TA401K	$88.00	Replacement lug kit for K-Frame MCCB. Wire range (2) 2/0-250 kcmil or (1) 2/0-500 kcmil (70-240 mm²). 3-pole kit (one terminal per pole and one terminal cover).
3TA603LDK	$109.00	Replacement lug kit for L-Frame MCCB. 3-pole kit (one terminal per pole and one terminal cover). Wire range 400-500 AWG (185-240 m²), 2 conductors.

Note: G-frame terminals are factory-installed only. No replacement terminals available.

3TA401K

Din Rail Mounting Clip

Din Rail Mount Clip Accessory Selection Guide		
Part Number	***Price***	***Description***
GDIN	$9.75	Clip for mounting G-Frame to 35 mm Din rail. Mounting hardware included. Pkg of 1

GDIN

NEMA 12 Safety Door Hardware

Type C361 door interlocking safety handle kits are designed for use with AutomationDirect 3P series MCCBs and flexible handle, when mounted in an SDN12, or equivalent, enclosure. These handles secure the SDN12 enclosure, protecting against unauthorized entry while the MCCB is in the ON position. Use them on enclosures with right side flanges only and material thickness from 16 gauge through 3/16". All mounting hardware is included for enclosures up to 40" tall. The addition of the C361KR roller kit is necessary for enclosures taller than 40" that require a 3-point latch. See SDN12 Enclosures section for enclosure specifications

Safety Door Hardware Selection Guide		
Part Number	***Price***	***Description***
C361KJ4	$251.00	Handle length: 4". Mounting hardware included for enclosures up to 40" tall. For taller enclosures that require a 3-point latch, the C361KR (purchase separately) will also be needed.
C361KJ6	$264.00	Handle length: 6". Mounting hardware included for enclosures up to 40" tall. For taller enclosures that require a 3-point latch, the C361KR (purchase separately) will also be needed.
C361KR	$57.00	Door Interlocking safety roller kit for use with the C361KJ4 and C361KJ6 safety handle kits when the SDN12 series enclosure is taller than 40 inches and 3-point latching is required. Kit includes roller and all hardware.

Note: The 1/4" x 1/2" standard mill rectangular locking bar is not supplied with these kits. The bar is supplied with the enclosures.

Safety Handle shown on enclosure

Eaton Quality at AutomationDirect Prices

1, 2 and 3-pole models

FAZ Series Supplementary Protectors

FAZ Supplementary Protectors are UL 1077 recognized for applications where branch circuit protection is not required or is already provided. They are thermal magnetic and protect against short circuit (see ratings chart) and overload conditions.

These DIN-rail mounted supplementary protectors come in one, two and three pole configurations and are available in three trip curves.

The B curve magnetic trip point is 3 to 5 times the rated current and is typically used for computers and electronic loads with very low current loads.

The C curve magnetic trip point is 5 to 10 times the rated current and is typically used for small transformers, pilot devices, etc.

The D curve magnetic trip point is 10 to 20 times the rated current and is typically used for transformers or with very high inductive loads.

Shunt trips are available for remotely tripping the protector with an external voltage from a control system or alarm device.

A padlocking feature is also available for preventing unauthorized operation. Maintenance personnel can safely work on protected equipment without electrical safety concerns.

Third party Certification and marking

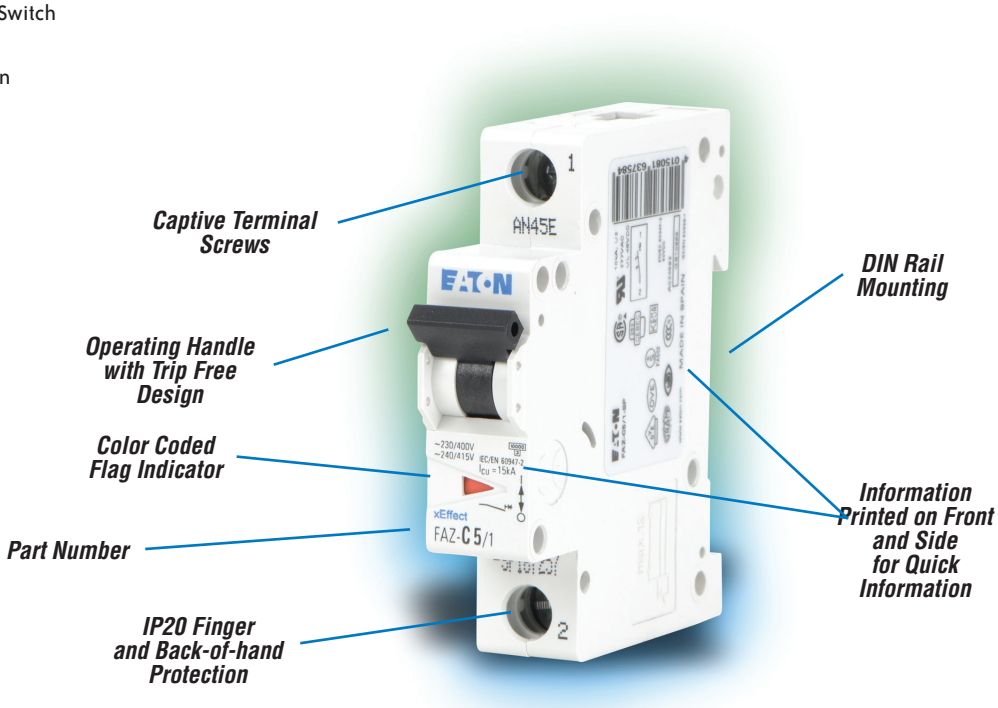
- UL recognized under UL 1077 Category QVNU2, File E177451
- CSA 22.2, No. 235 File 204453
- CE File LVD 2006/95/EC
- IEC 60898
- IEC 60947-2

Full line of field installable accessories

- Auxiliary switch
- Alarm/Auxiliary Switch
- Shunt trip
- Padlock provision
- Busbar systems

Trip curves

- B [3-5 I_n]
- C [5-10 I_n]
- D [10-20 I_n]



EATON FAZ Supplementary Protectors

Overview

The Eaton FAZ supplementary protectors are used to provide overcurrent protection where branch protection (for example, UL 489 MCCB) is already provided or not required. The units can be installed as a component within, or as a part of an appliance or a piece of electrical equipment. Supplementary protectors are ideal replacements for fuses that are applied as a supplementary protector, i.e. in addition to branch protection (if required). They are 35mm DIN-rail mountable, utilizing spring clips. These are standard protectors, recognized by UL and CSA under UL 1077 and CSA 22.2. They are CE marked in accordance with Low Voltage Directive (LVD) (73/23/EEC).

Product Specification

The FAZ supplementary protector is a dual-rated product for both AC and DC supplies, in accordance with UL 1077 and CSA 22.2 standards and is marked with CE in accordance with the Low Voltage Directive. With this dual standard product, you can include it in your design, knowing that in most cases wherever your equipment is used, the product will conform to the local UL, CSA or IEC (International) requirements.

The supplementary protector is designed to be applied in conjunction with a branch circuit protector (if branch protection is required) and can be a replacement for similarly applied fuses. Its advantage over fuses is that it is resettable and the device's status is easily and clearly identified by the position of the handle and the flag indicator.

In addition, you can select a device that provides maximum reliability and accuracy to fit various applications due to the availability of a wide range of current ratings from 0.5 to 63 amperes in three overcurrent characteristic curves, B, C and D.

Features and Benefits

- Dual rated for AC or DC Applications
- Box terminals accept #18 to #4 wire (1 to 25mm²) for one wire connection or #18 to #8 for two wire connection.
- Thermal magnetic overcurrent protection: three levels, categorized by B, C and D curves in direct relation to continuous rating of the device

  B curve magnetic trip point:
  3 to 5 times the rated current, typically used for computers and electronic loads with very low inrush currents (PLC wiring).

  C curve magnetic trip point:
  5 to 10 times the rated current, typically used for small transformers, pilot devices, etc.

  D curve magnetic trip point:
  10 to 20 times the rated current, typically used for transformers or devices with very high inductive loads.
- Trip Free Design: Protector cannot be defeated by holding the handle in the "ON" position.
- Module width of only 17.7 mm per pole
- Color coded status indicator window – Red = ON or Green = OFF
- IP20 finger protection
- 35mm DIN-rail mountable, utilizing spring clip
- Captive screws cannot be lost
- Suitable for reverse feed applications

Listings

- UL recognized under UL 1077 Category QVNU2 File E177451
- CSA 22.2, No. 235 File 204453
- CE File LVD 2006/95/EC
- IEC/EN 60898
- IEC/EN 60947-2

Applications

FAZ Supplementary protectors are recognized per UL 1077 and certified per CSA C22.2 No. 235 as a Supplementary Protector and can be fully utilized per the NEC and CEC Codes in that capacity. For international purposes, the entire FAZ family is CE marked and in full conformity with the applicable IEC standards for miniature circuit breakers, EN/IEC 60898 and IEC/EN 60947-2.

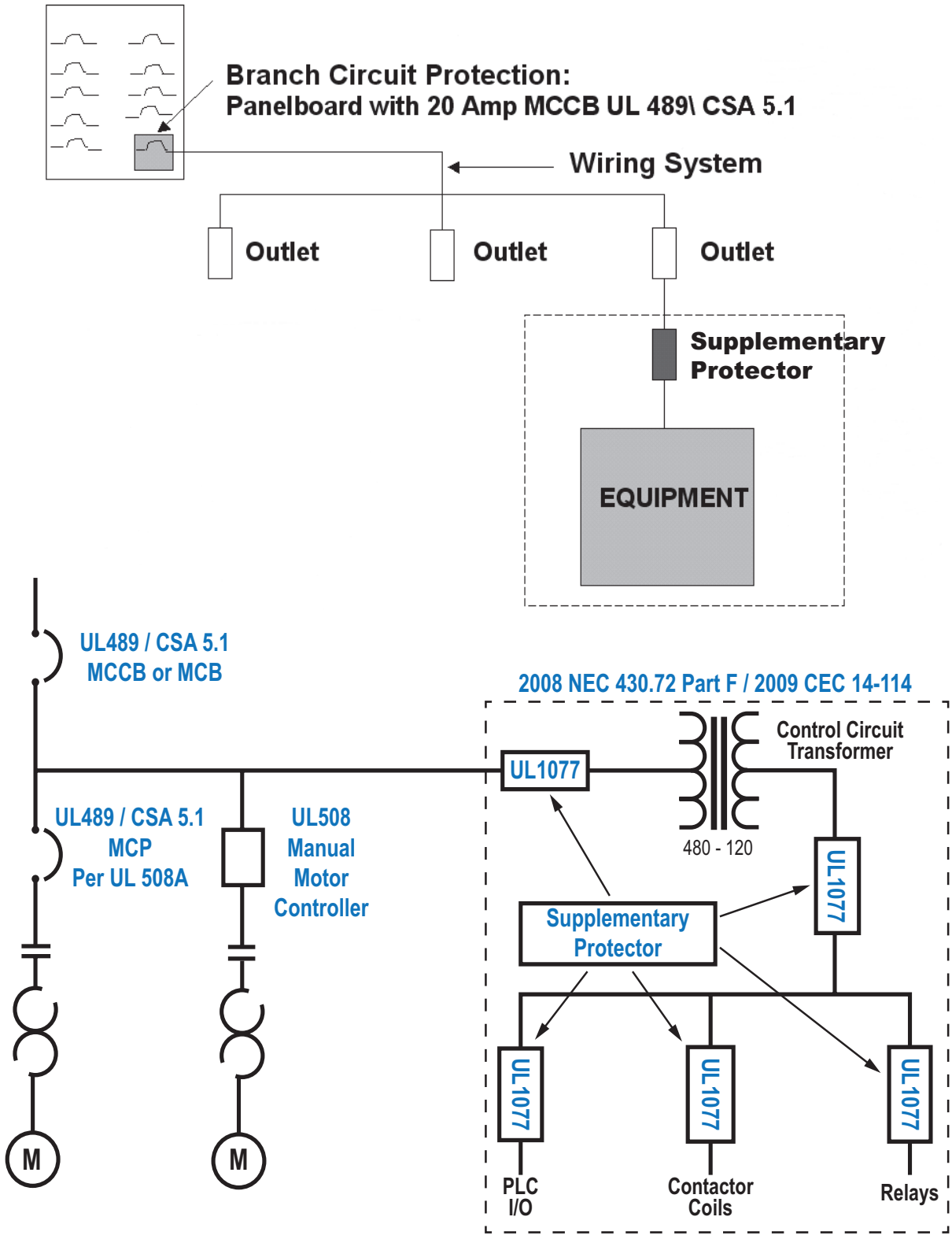
Outside North America, they can be used in both residential and industrial applications as feeder and branch circuit protective devices. In North America, most European Miniature Circuit Breakers are only UL recognized and CSA certified as "Supplementary Protectors", meaning they cannot be utilized as feeder or branch circuit protective devices per the local electrical codes (2008 NEC 240.10 and CEC Part 1 C22.1). This commonly restricts their use to applications where "closer" protection is desired than that offered by a branch circuit protection device.

Eaton FAZ Supplementary Protectors are ideal for providing protection in many applications, including:

- Control power transformers (D curve)
- Relays
- Contactor coils
- PLC I/O points
- Lighting circuits
- Power supplies
- Computers
- Electronic equipment
- Control circuits

EATON FAZ Supplementary Protectors

Supplementary Protectors Sample Applications



Supplementary protectors are not to be used in feeder circuits or motor circuits. Use them only in applications where branch protection is already provided or is not required.

FAZ Supplementary Protectors Selection Guide

Single-Pole

Note: Eaton product part numbers will contain a [.] instead of [P] and a [/] instead of a [-].
Example: FAZ-C0P5-1-SP = FAZ-C0.5/1-SP

FAZ - Single-Pole Selection Guide						
Ampere Rating	B Curve Part Number	Price	C Curve Part Number	Price	D Curve Part Number	Price
0.5	–	–	FAZ-C0P5-1-SP	$11.00	FAZ-D0P5-1-SP	$11.00
1	FAZ-B1-1-SP	$11.00	FAZ-C1-1-SP		FAZ-D1-1-SP	
2	FAZ-B2-1-SP		FAZ-C2-1-SP		FAZ-D2-1-SP	
3	FAZ-B3-1-SP		FAZ-C3-1-SP		FAZ-D3-1-SP	
4	FAZ-B4-1-SP		FAZ-C4-1-SP		FAZ-D4-1-SP	
5	FAZ-B5-1-SP		FAZ-C5-1-SP		FAZ-D5-1-SP	
6	FAZ-B6-1-SP		FAZ-C6-1-SP		FAZ-D6-1-SP	
7	FAZ-B7-1-SP		FAZ-C7-1-SP		FAZ-D7-1-SP	
8	FAZ-B8-1-SP		FAZ-C8-1-SP		FAZ-D8-1-SP	
10	FAZ-B10-1-SP		FAZ-C10-1-SP		FAZ-D10-1-SP	
13	FAZ-B13-1-SP		FAZ-C13-1-SP		FAZ-D13-1-SP	
15	FAZ-B15-1-SP		FAZ-C15-1-SP		FAZ-D15-1-SP	
16	FAZ-B16-1-SP		FAZ-C16-1-SP		FAZ-D16-1-SP	
20	FAZ-B20-1-SP		FAZ-C20-1-SP		FAZ-D20-1-SP	
25	FAZ-B25-1-SP		FAZ-C25-1-SP		FAZ-D25-1-SP	
30	FAZ-B30-1-SP		FAZ-C30-1-SP		FAZ-D30-1-SP	
32	FAZ-B32-1-SP		FAZ-C32-1-SP		FAZ-D32-1-SP	
40	FAZ-B40-1-SP		FAZ-C40-1-SP		FAZ-D40-1-SP	
50	FAZ-B50-1-SP		FAZ-C50-1-SP		–	–
63	FAZ-B63-1-SP		FAZ-C63-1-SP		–	–

Two-Pole

Note: Eaton parts available for sale to North America locations only.

FAZ - Two-Pole Selection Guide						
Ampere Rating	B Curve Part Number	Price	C Curve Part Number	Price	D Curve Part Number	Price
0.5	–	–	FAZ-C0P5-2	$21.50	FAZ-D0P5-2	$21.50
1	FAZ-B1-2	$21.50	FAZ-C1-2		FAZ-D1-2	
2	FAZ-B2-2		FAZ-C2-2		FAZ-D2-2	
3	FAZ-B3-2		FAZ-C3-2		FAZ-D3-2	
4	FAZ-B4-2		FAZ-C4-2		FAZ-D4-2	
5	FAZ-B5-2		FAZ-C5-2		FAZ-D5-2	
6	FAZ-B6-2		FAZ-C6-2		FAZ-D6-2	
7	FAZ-B7-2		FAZ-C7-2		FAZ-D7-2	
8	FAZ-B8-2		FAZ-C8-2		FAZ-D8-2	
10	FAZ-B10-2		FAZ-C10-2		FAZ-D10-2	
13	FAZ-B13-2		FAZ-C13-2		FAZ-D13-2	
15	FAZ-B15-2		FAZ-C15-2		FAZ-D15-2	
16	FAZ-B16-2		FAZ-C16-2		FAZ-D16-2	
20	FAZ-B20-2		FAZ-C20-2		FAZ-D20-2	
25	FAZ-B25-2		FAZ-C25-2		FAZ-D25-2	
30	FAZ-B30-2		FAZ-C30-2		FAZ-D30-2	
32	FAZ-B32-2		FAZ-C32-2		FAZ-D32-2	
40	FAZ-B40-2		FAZ-C40-2		FAZ-D40-2	
50	FAZ-B50-2		FAZ-C50-2		–	–
63	FAZ-B63-2		FAZ-C63-2		–	–

EATON FAZ Supplementary Protectors Selection Guide

FAZ - Three-Pole Selection Guide						
Ampere Rating	B Curve Part Number	Price	C Curve Part Number	Price	D Curve Part Number	Price
0.5	–	–	FAZ-C0P5-3	$29.00	FAZ-D0P5-3	$29.00
1	FAZ-B1-3	$29.00	FAZ-C1-3		FAZ-D1-3	
2	FAZ-B2-3		FAZ-C2-3		FAZ-D2-3	
3	FAZ-B3-3		FAZ-C3-3		FAZ-D3-3	
4	FAZ-B4-3		FAZ-C4-3		FAZ-D4-3	
5	FAZ-B5-3		FAZ-C5-3		FAZ-D5-3	
6	FAZ-B6-3		FAZ-C6-3		FAZ-D6-3	
7	FAZ-B7-3		FAZ-C7-3		FAZ-D7-3	
8	FAZ-B8-3		FAZ-C8-3		FAZ-D8-3	
10	FAZ-B10-3		FAZ-C10-3		FAZ-D10-3	
13	FAZ-B13-3		FAZ-C13-3		FAZ-D13-3	
15	FAZ-B15-3		FAZ-C15-3		FAZ-D15-3	
16	FAZ-B16-3		FAZ-C16-3		FAZ-D16-3	
20	FAZ-B20-3		FAZ-C20-3		FAZ-D20-3	
25	FAZ-B25-3		FAZ-C25-3		FAZ-D25-3	
30	FAZ-B30-3		FAZ-C30-3		FAZ-D30-3	
32	FAZ-B32-3		FAZ-C32-3		FAZ-D32-3	
40	FAZ-B40-3		FAZ-C40-3		FAZ-D40-3	
50	FAZ-B50-3		FAZ-C50-3		–	–
63	FAZ-B63-3		FAZ-C63-3		–	–

Three-Pole

Note: Eaton product part numbers will contain a [.] instead of [P] and a [/] instead of a [-].
Example: FAZ-C0P5-3 = FAZ-C0.5/3

EATON FAZ Series Technical Specifications

UL 1077 Supplementary Protectors – UL/CSA				
		B Curve	C Curve	D Curve
Short Circuit Trip Response		3 - 5 *I*n	5 - 10 *I*n	10 - 20 *I*n
Current Range		1 - 63 A	0.5 - 63 A	0.5 - 40 A
Maximum Voltage Ratings UL / CSA	1 pole	277VAC, 48VDC		
	2 pole / 3 pole	480Y / 277VAC*		
	2 poles in series	96VDC Max		
Thermal Tripping Characteristics	1 pole	1.35 *I*n@40°C		
	Multi-pole	1.45 *I*n@40°C		
Short Circuit Ratings (@ maximum voltage)	1 pole	10kA (5kA for 40 - 63 A)		5kA
		10kA @ 48VDC		
	2 pole	10kA (5kA for 40 - 63 A)		5kA
	3 pole			
	2 poles in series	10kA @ 96VDC		
Agency Approvals		File E177451, UL 1077, File 204453 CSA 22.2 No. 235, CE		

Note: To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

IEC/EN 60947-2 Miniature Circuit Breaker				
		B Curve	C Curve	D Curve
Short Circuit Trip Response		3 - 5 *I*n	5 - 10 *I*n	10 - 20 *I*n
Current Range		1 - 63 A	0.5 - 63 A	0.5 - 63 A
Maximum Voltage Ratings - IEC/EN 60947-2	1 pole	240VAC, 48VDC		
	2 pole / 3 pole	240/415 VAC		
	2 poles in series	96VDC		
Thermal Tripping Characteristics	1 pole	> 1 hour @ 1.05 *I*n		
	Multi-pole	< 1 hour @ 1.3 *I*n		
Interrupt Ratings (At Max Voltage)		15kA		
Operational Switching Capacity		7.5 kA		
Max. Back-up Fuse		125A gL/gG		
Rated impulse withstand - *U*imp		4000VAC		
Rated insulation voltage - *U*i		440VAC		

General Specifications		
Selectivity Class		3
Lifespan		>10,000 (1 operation = ON/OFF)
Operating Temperature		-40 to +167°F (–40 to +75°C)
Storage Temperature		-40 to +185°F (–40 to +85°C)
Shock (IEC68-2-22)		10g - 120ms
Housing Material		Nylon
Weight	1 pole	0.28 lb (127g)
	2 pole	0.54 lb (245g)
	3 pole	0.84 lb (381g)

Mechanical Specifications	
Terminal Protection	Finger and back-of-hand proof to IEC 536
Mounting Width Per Pole	17.5 mm
Mounting	IEC/EN 60715 top-hat rail, DIN rail
Degree of Protection	IP20
Terminals Top and Bottom	Twin-purpose terminals
Supply Connection	Line or load side
Mounting Position	Without limitation

Wire Size and Torque Setting				
Ampere Rating	Conductor Size			Tightening Torque
0.5 - 63	1 wire	0.75 to 25mm²	18 to 4 AWG	21.2 lb·in (2.4 N·m)
	2 wires	0.75 to 10mm²	18 to 8 AWG	

**A circuit breaker with a 480Y/277 VAC rating can be applied in a solidly grounded circuit where the nominal voltage of any conductor to ground does not exceed the lower value of the circuit breaker's rating (e.g., 277VAC) and the nominal voltage between any two conductors does not exceed its higher value (480VAC). These ratings typically can be found on protective devices such as molded-case circuit breakers and self-protected "Type E" combination motor controllers.*

EATON FAZ Series Technical Data

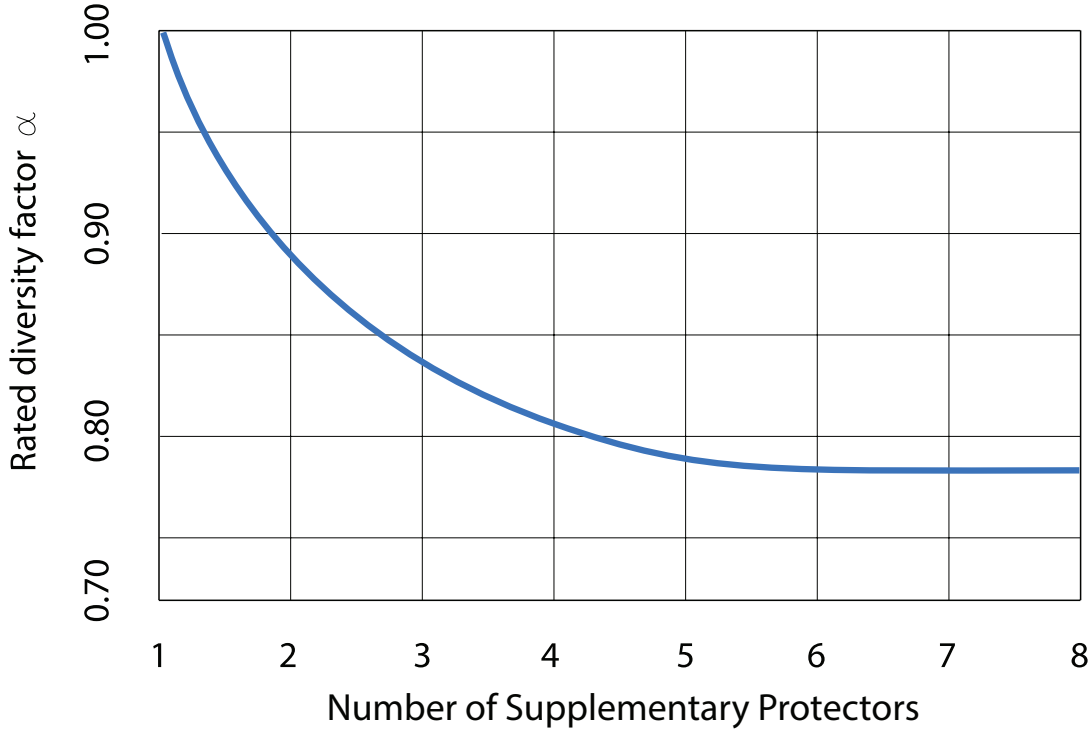
Corrected values of the rated current dependent on the ambient temperature

Influence of the Ambient Temperature on the Thermal Tripping Behavior																	
Rated Current (Amps)	Ambient Temperature °C																
	-40	-30	-20	-10	0	10	20	30	35	40	45	50	55	60	65	70	75
0.50	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.48	0.47	0.46	0.45	0.44	0.43	0.42	0.41
1.00	1.30	1.20	1.20	1.20	1.10	1.10	1.00	1.00	0.99	0.97	0.95	0.93	0.90	0.89	0.87	0.85	0.83
2.00	2.60	2.50	2.40	2.30	2.20	2.20	2.10	2.00	2.00	1.90	1.90	1.90	1.80	1.80	1.70	1.70	1.70
3.00	3.80	3.70	3.60	3.50	3.40	3.30	3.10	3.00	3.00	2.90	2.80	2.80	2.70	2.70	2.60	2.50	2.50
4.00	5.10	5.00	4.80	4.70	4.50	4.30	4.20	4.00	3.90	3.90	3.80	3.70	3.60	3.50	3.50	3.40	3.30
5.00	6.40	6.20	6.00	5.80	5.60	5.40	5.20	5.00	4.90	4.80	4.70	4.60	4.50	4.40	4.30	4.20	4.10
6.00	7.70	7.50	7.20	7.00	6.70	6.50	6.30	6.00	5.90	5.80	5.70	5.60	5.40	5.30	5.20	5.10	5.00
7.00	9.00	8.70	8.40	8.20	7.80	7.60	7.40	7.00	6.90	6.80	6.70	6.50	6.30	6.20	6.10	6.00	5.80
8.00	10.20	9.90	9.60	9.30	9.00	8.70	8.40	8.00	7.90	7.70	7.60	7.40	7.20	7.10	6.90	6.80	6.60
10.00	13.00	12.00	12.00	12.00	11.00	11.00	10.00	10.00	9.90	9.70	9.50	9.30	9.00	8.90	8.70	8.50	8.30
13.00	17.00	16.00	16.00	15.00	15.00	14.00	14.00	13.00	13.00	13.00	12.00	12.00	12.00	12.00	11.00	11.00	11.00
15.00	19.00	19.00	18.00	17.00	17.00	16.00	16.00	15.00	15.00	15.00	14.00	14.00	14.00	13.00	13.00	13.00	12.00
16.00	20.00	20.00	19.00	19.00	18.00	17.00	17.00	16.00	16.00	15.00	15.00	15.00	14.00	14.00	14.00	14.00	13.00
20.00	26.00	25.00	24.00	23.00	22.00	22.00	21.00	20.00	20.00	19.00	19.00	19.00	18.00	18.00	17.00	17.00	17.00
25.00	32.00	31.00	30.00	29.00	28.00	27.00	26.00	25.00	25.00	24.00	24.00	23.00	23.00	22.00	22.00	21.00	21.00
32.00	41.00	40.00	38.00	37.00	36.00	35.00	33.00	32.00	32.00	31.00	30.00	30.00	29.00	28.00	28.00	27.00	26.00
40.00	51.00	50.00	48.00	47.00	45.00	43.00	42.00	40.00	39.00	39.00	38.00	37.00	36.00	35.00	35.00	34.00	33.00
50.00	64.00	62.00	60.00	58.00	56.00	54.00	52.00	50.00	49.00	48.00	47.00	46.00	45.00	44.00	43.00	42.00	41.00
63.00	81.00	78.00	76.00	73.00	71.00	68.00	66.00	63.00	62.00	61.00	60.00	58.00	57.00	56.00	55.00	53.00	52.00

Influence of the mains system frequency on the tripping behavior I_{MA} of the instantaneous release

Influence of the Mains Frequency							
Mains Frequency f (Hz)	16 2/3	50	60	100	200	300	400
$I_{MA}(f)$ $I_{MA}(50Hz)$ [%]	91	100	101	106	115	134	141

Load Carrying Capacity of Adjoining Supplementary Protectors



EATON FAZ Series Technical Data

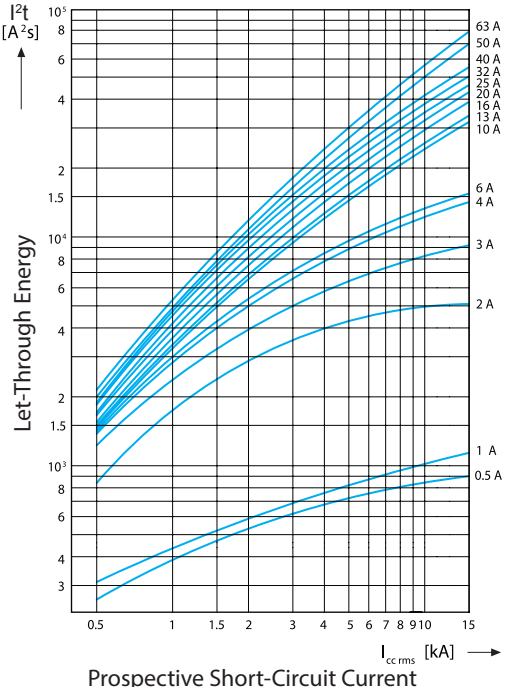
Characteristic Curves

- The X axis shows the prospective short-circuit current levels.
- The Y axis indicates the actual let-through values at those prospective fault ratings for each FAZ device plotted.

As can be interpreted from the bend in the plotted curves, each device acts to limit the damaging let-through energy (and current) at those values of short-circuit current.

Let-through energy I²t

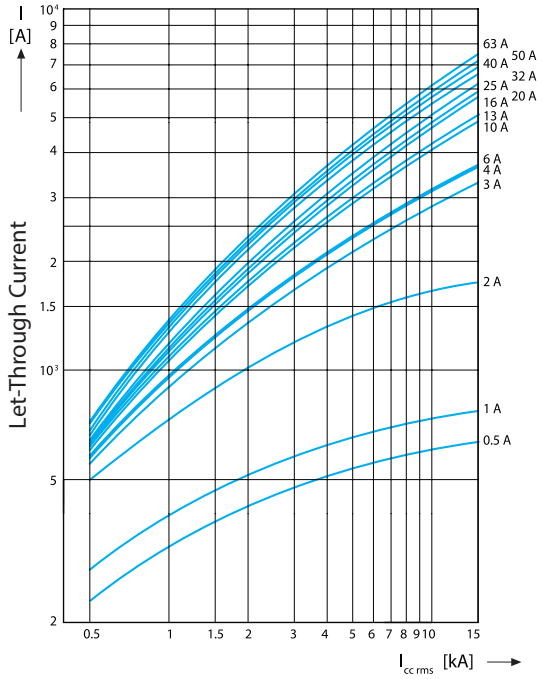
Characteristic B and C



Prospective Short-Circuit Current

Let-through current I

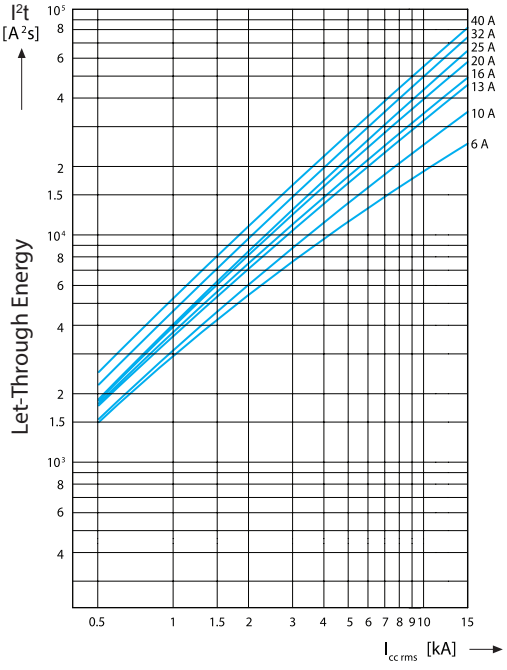
Characteristic B and C



Prospective Short-Circuit Current

Let-through energy I²t

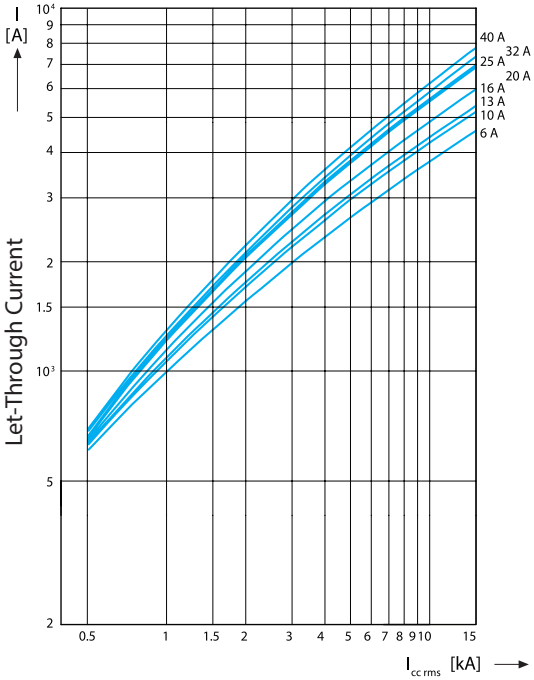
Characteristic D



Prospective Short-Circuit Current

Let-through current I

Characteristic D

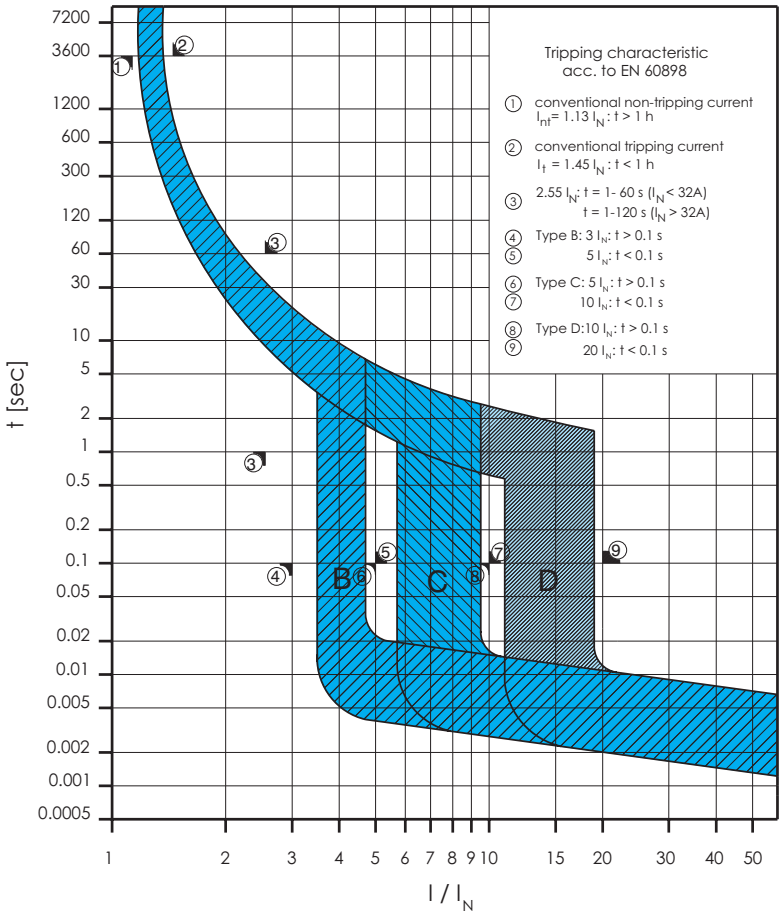


Prospective Short-Circuit Current

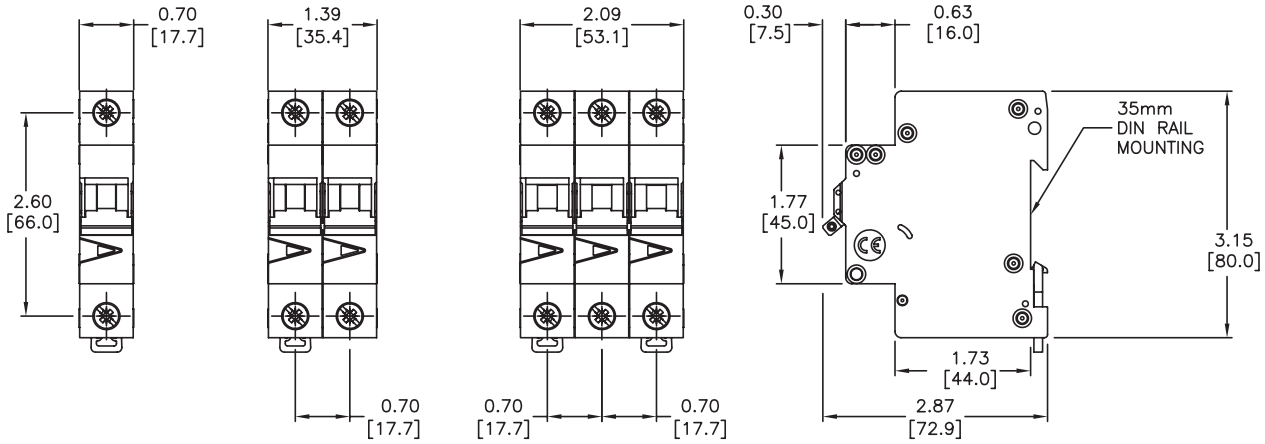
EATON FAZ Series Technical Data

Time-current characteristic

Type B, C and D



FAZ Supplementary Protector Dimensions **in [mm]**

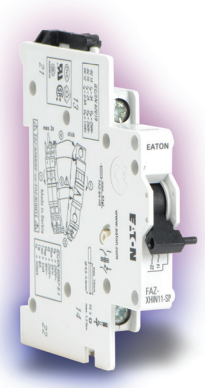


Please see our website www.AutomationDirect.com for complete engineering drawings.Dimensions are approximate. Not for construction purposes.

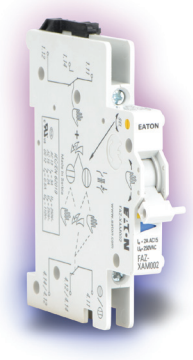
EATON FAZ Series Accessories

Field Mountable Accessories

- Auxiliary switch
- Alarm switch
- Shunt trip
- No tools required for mounting



FAZ-XHIN11-SP
Auxiliary Contact



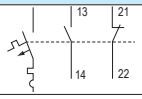
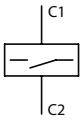
FAZ-XAM002
Alarm/Aux Contact

FAZ-XAA-C12-110V
FAZ-XAA-C110-415V
Shunt Trip

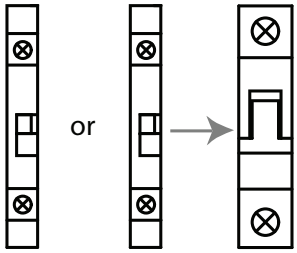
FAZ Series Auxiliary Contacts and Shunt Trip Release

Part Number	Description	Contacts	Module Width	Module Weight	Price
FAZ-XHIN11-SP	• 1 NO / 1 NC • Installs on left side of FAZ or shunt trip • Maximum one per FAZ (1077) device • Switches when FAZ is tripped electrically or manually	(1) DPST	0.35 in [8.9 mm]	0.15 lb [68g]	$24.00
FAZ-XAM002	• Small selector screw changes mode • Two form C (one set changeover) contacts • Installs on left side of FAZ or shunt trip • Auxilary contacts switch when FAZ is tripped electrically or manually • Trip indicating contact switches only when FAZ is tripped electrically	(2) Form C Contacts SPDT			
Part Number	**Description**	**Trip Voltage**	**Module Width**	**Module Weight**	**Price**
FAZ-XAA-C110-415V	• Allows remote trip of FAZ • Installs on left side of FAZ	110 – 415 VAC 110 – 230 VDC	0.69 in [17.5 mm]	0.28 lb [127g]	$42.00
FAZ-XAA-C12-110V		12 – 110 VAC 12 – 60 VDC			

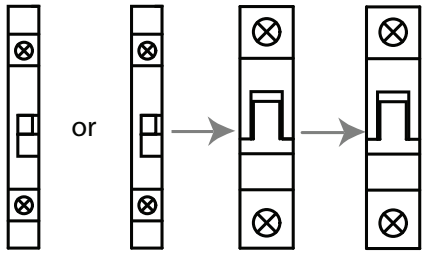
Auxiliary Contacts and Voltage Trips Technical Specifications

Part Number	Circuit Diagram	Electrical Characteristics	Mechanical Characteristics	Wire Size (Solid and Stranded)		Tightening Torque	
				mm²	AWG	N·m	lb·in
FAZ-XHIN11-SP		Rated for general use 2A at 230/240 VAC 0.5 A at 110/120 VDC rated frequency 50/60 Hz	FAZ mounting, IP40 protection, IEC 536 protection against electric shock, lift terminals	0.5 - 2.5	18 - 14	0.8 - 1.0	7.1 - 9.0
FAZ-XAM002	See FAZ-XAM002 diagrams on dimensions page	1 SPDT auxiliary contact and 1 SPDT alarm contact that can be configured and used as an auxiliary contact, rated for general use, 2A at 230/240 VAC, 0.5 A at 110/120 VDC, rated frequency 50/60 Hz	FAZ mounting, IP40 protection, IEC 536 protection against electric shock, lift terminals				
FAZ-XAA-C110-415V		110 - 415 VAC, 110 - 230 VDC operating range, max inrush current 2.1 A (AC) / 1A (DC), rated frequency 50/60 Hz	IEC/EN 30715 top-hat rail or DIN rail mounting, IP40 protection, IEC 536 protection against electric shock, twin-purpose terminals	1 - 2.5	18 - 12	2.4	21.2
FAZ-XAA-C12-110V		12 - 110 VAC, 12 - 60 VDC operating range, maximum inrush current 15A (AC) / 21A (DC), rated frequency 50/60 Hz					

Allowable Combinations of Accessories



FAZ-XHIN11-SP Standard Auxilary | FAZ-XAM002 Auxilary Alarm Switch | FAZ Supplementary Protector

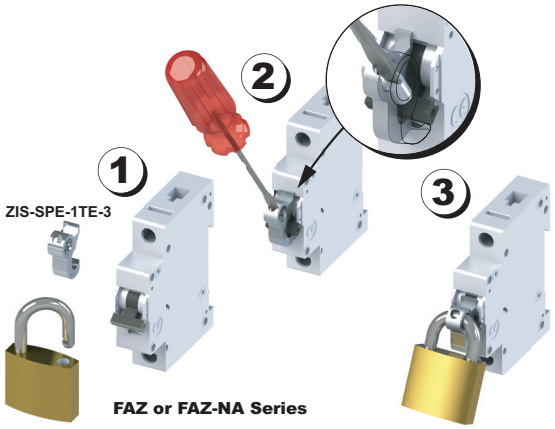


FAZ-XHIN11-SP Standard Auxilary | FAZ-XAM002 Auxilary Alarm Switch | FAZ-XAA-xxx Shunt Trip | FAZ Supplementary Protector

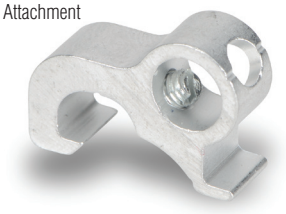
EATON FAZ Series Accessories

Protective Accessories

FAZ Series Protective Accessories			
Part Number	**Description**	**Quantity**	**Price**
ZIS-SPE-1TE-3	Lockout attachment for Eaton FAZ series supplementary protectors and FAZ mini circuit breakers, suitable to prevent unauthorized activation of a de-energized circuit, accepts lock shackles up to 9/32 in. (7.1 mm) in diameter	3 per pack	$29.50
BBIP-5	Busbar protection shroud, covers up to 5 unused terminals (break off unused pieces to size), for use with Eaton BBUL series busbar.	10 per pack	$47.50
BBIP-5-5		5 per pack	$29.50



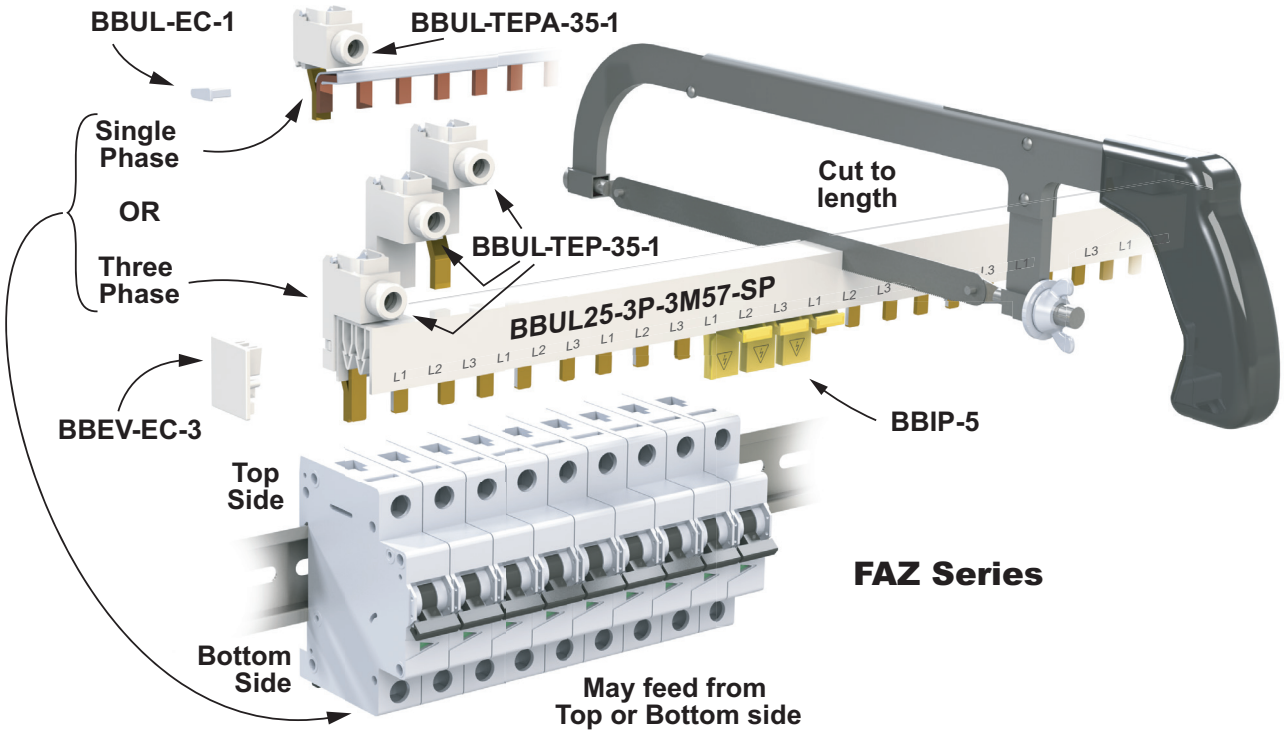
ZIS-SPE-1TE-3
Lockout Attachment



Busbar System

Without auxiliary contacts

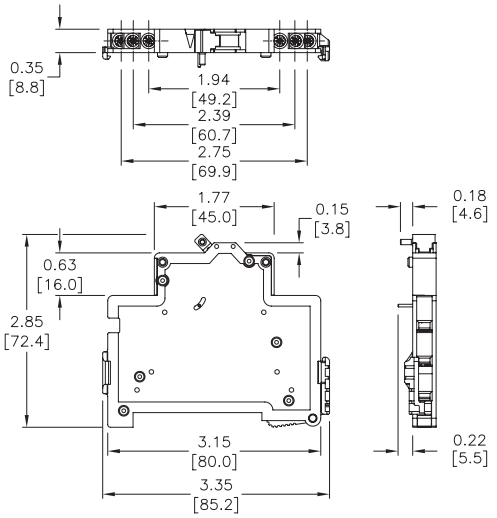
BBUL Series Busbars for use with FAZ Series Supplementary Protectors				
	Description	**Rated Operational Current**	**Qty**	**Price**
BBUL25-1P-1M57-SP	Busbar, 1 pole, 57-position, 480VAC	100A, fed from end	1	$40.50
BBUL25-2P-2M56-SP	Busbar, 2 pole, 56-position, 480VAC		1	$76.00
BBUL25-3P-3M57-SP	Busbar, 3 pole, 57-position, 480VAC		1	$114.00
Busbar Accessories				
	Description			
BBUL-EC-1	Busbar end cover for use with 1-pole Eaton BBUL series busbar.		10	$11.00
BBUL-EC-1-2			2	$4.25
BBEV-EC-3	Busbar cover end for use with 2-pole and 3-pole Eaton BBUL series busbar.		10	$15.00
BBEV-EC-3-2			2	$4.00
BBUL-TEPA-35-1	Busbar terminal lug, connects wiring to busbar system, for use with 1-pole Eaton BBUL series busbar, accepts 10AWG to 1/0 AWG copper wire, 115A, 1000V AC/DC.		1	$13.00
BBUL-TEPA-35-3			3	$37.00
BBUL-TEP-35-1	Busbar terminal lug, connects wiring to busbar system, for use with 2-pole and 3-pole Eaton BBUL series busbar, accepts 10AWG to 1/0 AWG copper wire, 115A, 1000V AC/DC.		1	$13.00
BBUL-TEP-35-3			3	$37.00



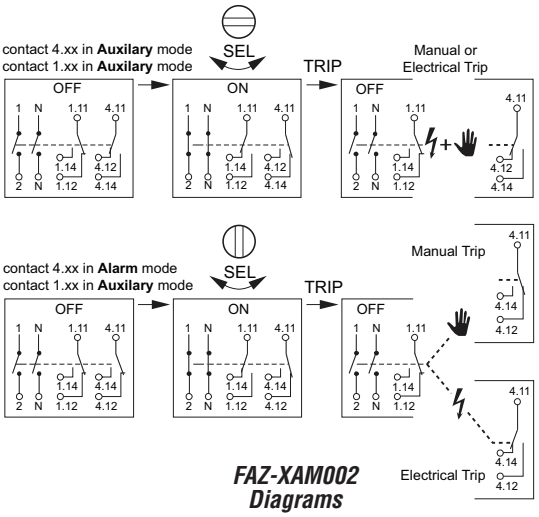
EATON FAZ Series Accessories

Accessories Dimensions

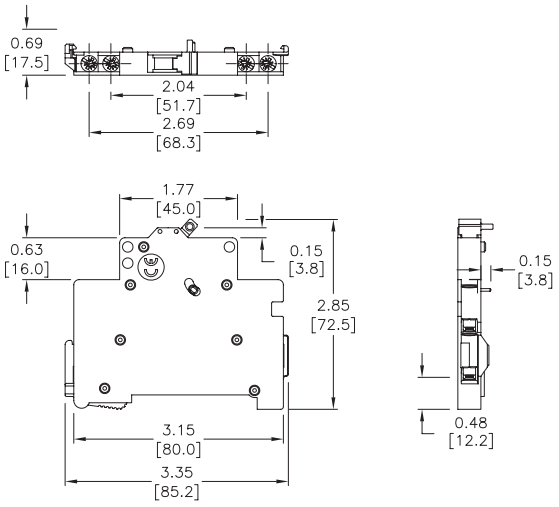
in [mm]



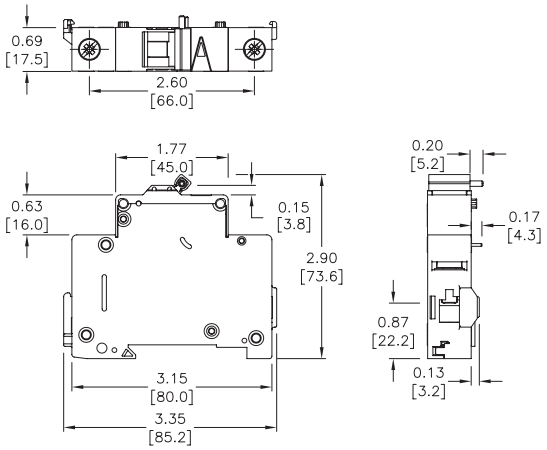
FAZ-XAM002



FAZ-XAM002 Diagrams



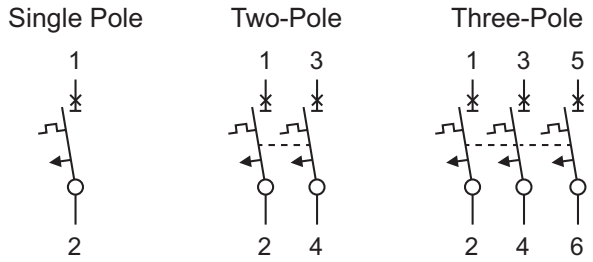
FAZ-XHIN11-SP



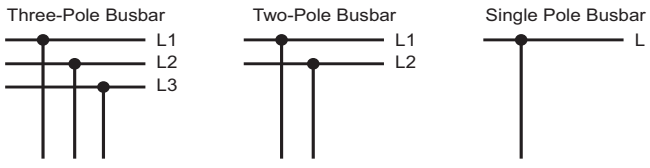
FAZ-XAA-C-xxx

FAZ Series
Miniature Circuit Breakers

Connection Diagrams



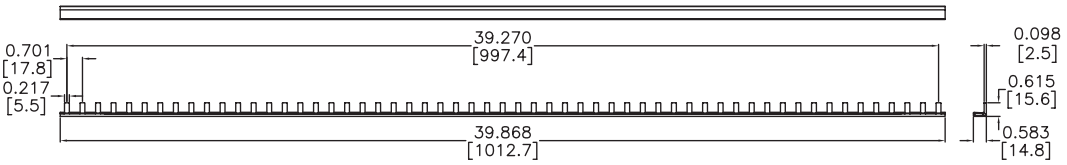
Busbar Connection Diagrams



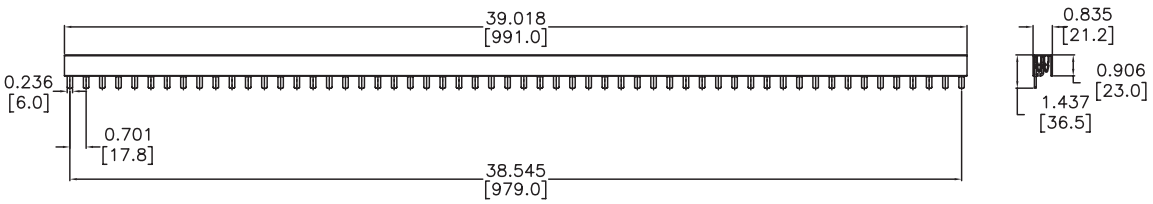
Please see our website www.AutomationDirect.com for complete engineering drawings.

EATON FAZ Series Accessories

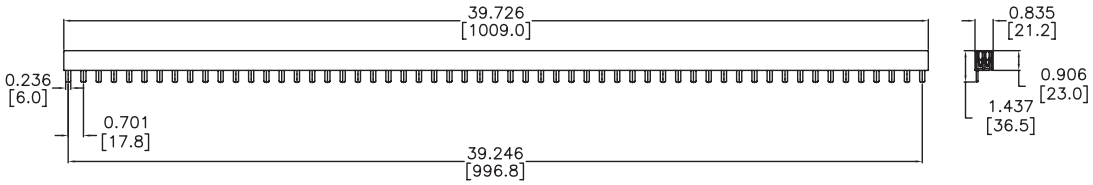
Accessories Dimensions in [mm]



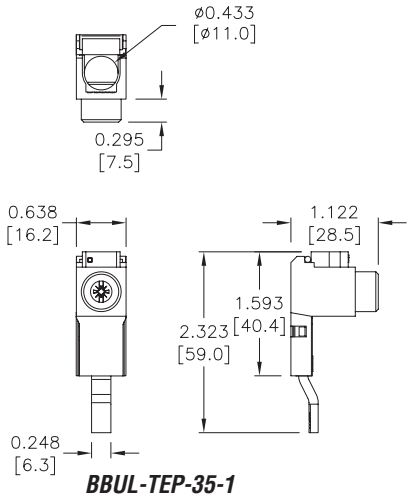
BBUL25-1P-1M57-SP



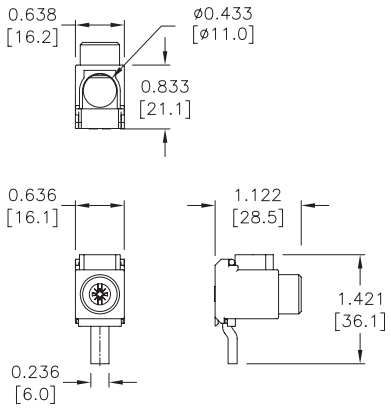
BBUL25-2P-2M56-SP



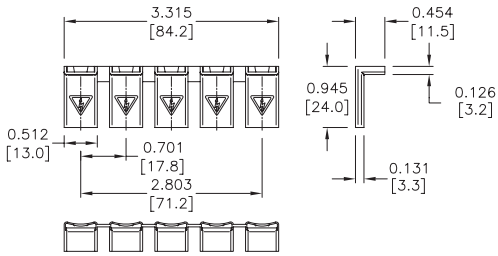
BBUL25-3P-3M57-SP



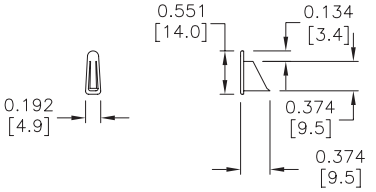
BBUL-TEP-35-1



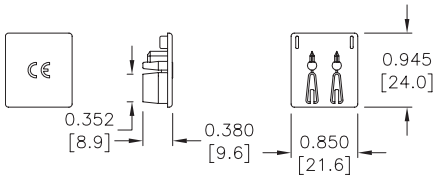
BBUL-TEPA-35-1



BBIP-5



BBUL-EC-1



BBEV-EC-3

Please see our website www.AutomationDirect.com for complete engineering drawings.

EATON FAZ-NA Miniature Circuit Breakers

Overview

Eaton FAZ-NA and FAZ-NA-L miniature circuit breakers offer optimum and efficient protection for branch and control circuits up to 63 amps. The FAZ-NA and FAZ-NA-L series is available with B, C or D trip characteristics in accordance with UL 489. These circuit breakers are current limiting, which means they interrupt fault currents within one half cycle of the fault. The FAZ-NA and FAZ-NA-L series units are DIN-rail mountable and can be used in feeder and branch circuit applications.

Listings

- UL Listed under UL 489
  Category DIVQ File E235139
  Busbar Accessory
  Category NMTR2.E257181
  Category DIHS E257181
  Category NMTR E307559
- CSA 22.2, No. 5 File 204453
- CE LVD 2014/35/EU
- CE RoHS 2011/65/EU
- IEC/EN 60947-2

Features and Benefits

- Dual rated for AC or DC applications
- Complete range of UL 489 listed DIN rail mounted miniature circuit breakers up to 63 amp current rating
- Single-pole, two-pole and three-pole models
- Current limiting design provides fast short circuit interruption that reduces the let-through energy, which can damage the circuit
- Suitable for reverse feed applications
- Suitable for branch circuit device protection
- Thermal-magnetic overcurrent protection – three levels of short circuit protection, categorized by B, C and D curves

  B-curve magnetic trip point:
  3 to 5 times the rated current, typically used for resistive loads such as conductors or heaters.

  C-curve magnetic trip point:
  5 to 10 times the rated current, typically used for small transformers, pilot devices, etc.

  D-curve magnetic trip point:
  10 to 20 times the rated current, typically used for transformers or very high inductive loads.
- Trip-free design – breaker cannot be defeated by holding the handle in the “ON” position
- Captive screws cannot be lost
- SWD (switching duty) rated circuit breaker – suitable for switching fluorescent lighting loads (In ≤ 20A)
- Fulfills UL 489, CSA C22.2 No.5 and also IEC 60947-2 Standard
- Can also be used in applications for which UL 1077 or CSA C22.2 No.235 are also allowed
- Field installable shunt trip and auxiliary switch subsequent mounting
- Module width of only 17.7 mm [0.70 in] (per pole)
- Contact position indicator (red / green)
- 35mm DIN-rail mountable, utilizing spring clip

Applications

Feeder and Branch Circuit Protection

- PLC I/O points
- Motor control circuits
- Control instrumentation
- Power supplies
- Relays
- Convenience receptacle circuits (internal / external)
- Load circuits leaving the equipment (external)
- HACR Equipment (Heating Air Conditioning, Refrigeration)
- Computers
- UPS
- Power conditioners

EATON FAZ-NA Miniature Circuit Breakers

Tripping Characteristics

Eaton FAZ-NA and FAZ-NA-L miniature circuit breakers are available with "B" or "C" or "D" tripping characteristics.

Type B trip curve: 3 to 5 times I_n

B-curve devices are suitable for resistive loads such as conductors or heaters.

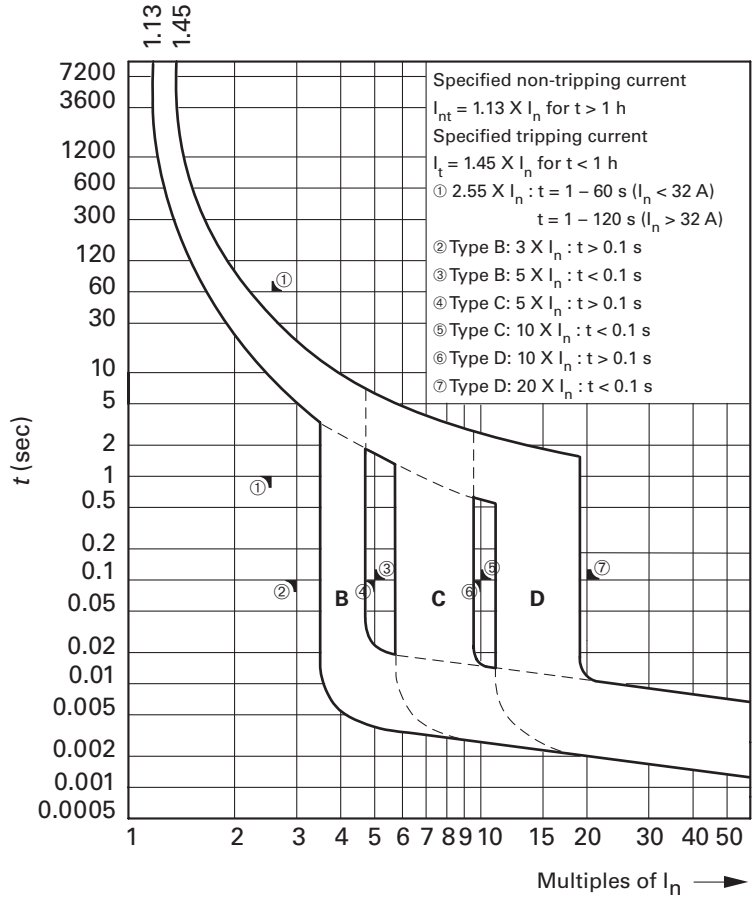
Type C trip curve: 5 to10 times I_n

C-curve devices are suitable for applications where medium levels of inrush current are expected. Applications include small transformers, lighting, pilot devices, control circuits and coils. C-curve devices provide a medium magnetic trip point.

Type D trip curve: 10 to 20 times I_n

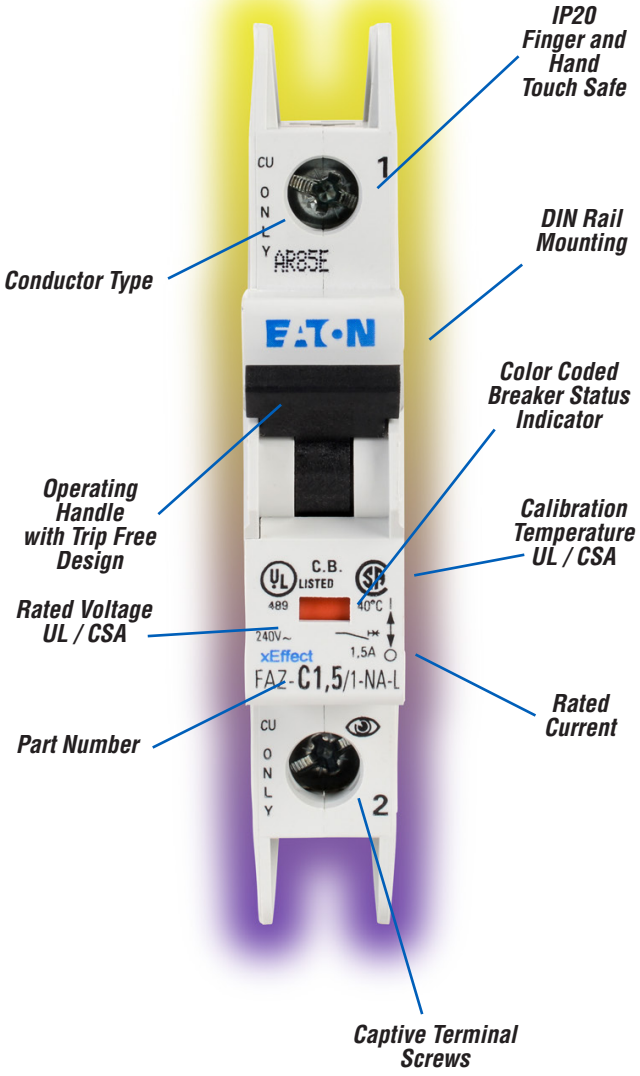
D-curve devices are suitable for applications where high levels of inrush current are expected. The high magnetic trip point prevents nuisance tripping in high inductive applications such as motors, transformers and power supplies.

Eaton FAZ-NA and FAZ-NA-L devices are current limiting, which means they interrupt fault currents within one half cycle of the fault. Current limiting devices offer superior protection by reducing peak let-through current and energy.



Labeling

The front of each Eaton FAZ-NA and FAZ-NA-L miniature circuit breaker is labeled for positive identification.



EATON FAZ-NA Series Selection Guide

Single-Pole

FAZ-NA – Single-Pole 480/277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
0.5	–		FAZ-C0P5-1-NA-SP	$21.50	FAZ-D0P5-1-NA-SP	$21.50
1	FAZ-B1-1-NA-SP	$21.00	FAZ-C1-1-NA-SP	$21.50	FAZ-D1-1-NA-SP	$21.50
1.5	FAZ-B1P5-1-NA-SP	$21.00	FAZ-C1P5-1-NA-SP	$21.50	FAZ-D1P5-1-NA-SP	$21.50
2	FAZ-B2-1-NA-SP	$21.00	FAZ-C2-1-NA-SP	$21.50	FAZ-D2-1-NA-SP	$21.50
3	FAZ-B3-1-NA-SP	$21.00	FAZ-C3-1-NA-SP	$21.50	FAZ-D3-1-NA-SP	$21.50
4	FAZ-B4-1-NA-SP	$21.00	FAZ-C4-1-NA-SP	$21.50	FAZ-D4-1-NA-SP	$21.50
5	FAZ-B5-1-NA-SP	$21.00	FAZ-C5-1-NA-SP	$21.50	FAZ-D5-1-NA-SP	$21.50
6	FAZ-B6-1-NA-SP	$21.00	FAZ-C6-1-NA-SP	$21.50	FAZ-D6-1-NA-SP	$21.50
7	FAZ-B7-1-NA-SP	$21.00	FAZ-C7-1-NA-SP	$21.50	FAZ-D7-1-NA-SP	$21.50
8	FAZ-B8-1-NA-SP	$21.00	FAZ-C8-1-NA-SP	$21.50	FAZ-D8-1-NA-SP	$21.50
10	FAZ-B10-1-NA-SP	$21.00	FAZ-C10-1-NA-SP	$21.50	FAZ-D10-1-NA-SP	$21.50
13	FAZ-B13-1-NA-SP	$21.00	FAZ-C13-1-NA-SP	$21.50	FAZ-D13-1-NA-SP	$21.50
15	FAZ-B15-1-NA-SP	$21.00	FAZ-C15-1-NA-SP	$21.50	FAZ-D15-1-NA-SP	$21.50
16	FAZ-B16-1-NA-SP	$21.00	FAZ-C16-1-NA-SP	$21.50	FAZ-D16-1-NA-SP	$21.50
20	FAZ-B20-1-NA-SP	$21.00	FAZ-C20-1-NA-SP	$21.50	FAZ-D20-1-NA-SP	$21.50
25	FAZ-B25-1-NA-SP	$21.00	FAZ-C25-1-NA-SP	$21.50	FAZ-D25-1-NA-SP	$21.50
30	FAZ-B30-1-NA-SP	$21.00	FAZ-C30-1-NA-SP	$21.50	FAZ-D30-1-NA-SP	$21.50
32	FAZ-B32-1-NA-SP	$21.00	FAZ-C32-1-NA-SP	$21.50	FAZ-D32-1-NA-SP	$21.50

Two-Pole

FAZ-NA – Two-Pole 480/277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
0.5	–		FAZ-C0P5-2-NA	$42.00	FAZ-D0P5-2-NA	$42.00
1	FAZ-B1-2-NA	$41.00	FAZ-C1-2-NA	$42.00	FAZ-D1-2-NA	$42.00
1.5	FAZ-B1P5-2-NA	$41.00	FAZ-C1P5-2-NA	$42.00	FAZ-D1P5-2-NA	$42.00
2	FAZ-B2-2-NA	$41.00	FAZ-C2-2-NA	$42.00	FAZ-D2-2-NA	$42.00
3	FAZ-B3-2-NA	$41.00	FAZ-C3-2-NA	$42.00	FAZ-D3-2-NA	$42.00
4	FAZ-B4-2-NA	$41.00	FAZ-C4-2-NA	$42.00	FAZ-D4-2-NA	$42.00
5	FAZ-B5-2-NA	$41.00	FAZ-C5-2-NA	$42.00	FAZ-D5-2-NA	$42.00
6	FAZ-B6-2-NA	$41.00	FAZ-C6-2-NA	$42.00	FAZ-D6-2-NA	$42.00
7	FAZ-B7-2-NA	$41.00	FAZ-C7-2-NA	$42.00	FAZ-D7-2-NA	$42.00
8	FAZ-B8-2-NA	$41.00	FAZ-C8-2-NA	$42.00	FAZ-D8-2-NA	$42.00
10	FAZ-B10-2-NA	$41.00	FAZ-C10-2-NA	$42.00	FAZ-D10-2-NA	$42.00
13	FAZ-B13-2-NA	$41.00	FAZ-C13-2-NA	$42.00	FAZ-D13-2-NA	$42.00
15	FAZ-B15-2-NA	$41.00	FAZ-C15-2-NA	$42.00	FAZ-D15-2-NA	$42.00
16	FAZ-B16-2-NA	$41.00	FAZ-C16-2-NA	$42.00	FAZ-D16-2-NA	$42.00
20	FAZ-B20-2-NA	$41.00	FAZ-C20-2-NA	$42.00	FAZ-D20-2-NA	$42.00
25	FAZ-B25-2-NA	$41.00	FAZ-C25-2-NA	$42.00	FAZ-D25-2-NA	$42.00
30	FAZ-B30-2-NA	$41.00	FAZ-C30-2-NA	$42.00	FAZ-D30-2-NA	$42.00
32	FAZ-B32-2-NA	$41.00	FAZ-C32-2-NA	$42.00	FAZ-D32-2-NA	$42.00

Note: Eaton product part numbers will contain a [.] instead of [P] and a [/] instead of a [-]. Example: FAZ-C0P5-3-NA = FAZ-C0.5/3-NA

Note: Eaton parts available for sale to North America locations only.

EATON FAZ-NA Series Selection Guide

Three-Pole

FAZ-NA – Three-Pole 480/277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
0.5	–		FAZ-C0P5-3-NA	$65.00	FAZ-D0P5-3-NA	$65.00
1	FAZ-B1-3-NA	$63.00	FAZ-C1-3-NA	$65.00	FAZ-D1-3-NA	$65.00
1.5	FAZ-B1P5-3-NA	$63.00	FAZ-C1P5-3-NA	$65.00	FAZ-D1P5-3-NA	$65.00
2	FAZ-B2-3-NA	$63.00	FAZ-C2-3-NA	$65.00	FAZ-D2-3-NA	$65.00
3	FAZ-B3-3-NA	$63.00	FAZ-C3-3-NA	$65.00	FAZ-D3-3-NA	$65.00
4	FAZ-B4-3-NA	$63.00	FAZ-C4-3-NA	$65.00	FAZ-D4-3-NA	$65.00
5	FAZ-B5-3-NA	$63.00	FAZ-C5-3-NA	$65.00	FAZ-D5-3-NA	$65.00
6	FAZ-B6-3-NA	$63.00	FAZ-C6-3-NA	$65.00	FAZ-D6-3-NA	$65.00
7	FAZ-B7-3-NA	$63.00	FAZ-C7-3-NA	$65.00	FAZ-D7-3-NA	$65.00
8	FAZ-B8-3-NA	$63.00	FAZ-C8-3-NA	$65.00	FAZ-D8-3-NA	$65.00
10	FAZ-B10-3-NA	$63.00	FAZ-C10-3-NA	$65.00	FAZ-D10-3-NA	$65.00
13	FAZ-B13-3-NA	$63.00	FAZ-C13-3-NA	$65.00	FAZ-D13-3-NA	$65.00
15	FAZ-B15-3-NA	$63.00	FAZ-C15-3-NA	$65.00	FAZ-D15-3-NA	$65.00
16	FAZ-B16-3-NA	$63.00	FAZ-C16-3-NA	$65.00	FAZ-D16-3-NA	$65.00
20	FAZ-B20-3-NA	$63.00	FAZ-C20-3-NA	$65.00	FAZ-D20-3-NA	$65.00
25	FAZ-B25-3-NA	$63.00	FAZ-C25-3-NA	$65.00	FAZ-D25-3-NA	$65.00
30	FAZ-B30-3-NA	$63.00	FAZ-C30-3-NA	$65.00	FAZ-D30-3-NA	$65.00
32	FAZ-B32-3-NA	$63.00	FAZ-C32-3-NA	$65.00	FAZ-D32-3-NA	$65.00

Single-Pole

FAZ-NA and FAZ-NA-L Single-Pole 240VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
0.5	–		FAZ-C0P5-1-NA-L-SP	$14.50	FAZ-D0P5-1-NA-L-SP	$14.50
1	FAZ-B1-1-NA-L-SP	$14.50	FAZ-C1-1-NA-L-SP	$14.50	FAZ-D1-1-NA-L-SP	$14.50
1.5	FAZ-B1P5-1-NA-L-SP	$14.50	FAZ-C1P5-1-NA-L-SP	$14.50	FAZ-D1P5-1-NA-L-SP	$14.50
2	FAZ-B2-1-NA-L-SP	$14.50	FAZ-C2-1-NA-L-SP	$14.50	FAZ-D2-1-NA-L-SP	$14.50
3	FAZ-B3-1-NA-L-SP	$14.50	FAZ-C3-1-NA-L-SP	$14.50	FAZ-D3-1-NA-L-SP	$14.50
4	FAZ-B4-1-NA-L-SP	$14.50	FAZ-C4-1-NA-L-SP	$14.50	FAZ-D4-1-NA-L-SP	$14.50
5	FAZ-B5-1-NA-L-SP	$14.50	FAZ-C5-1-NA-L-SP	$14.50	FAZ-D5-1-NA-L-SP	$14.50
6	FAZ-B6-1-NA-L-SP	$14.50	FAZ-C6-1-NA-L-SP	$14.50	FAZ-D6-1-NA-L-SP	$14.50
7	FAZ-B7-1-NA-L-SP	$14.50	FAZ-C7-1-NA-L-SP	$14.50	FAZ-D7-1-NA-L-SP	$14.50
8	FAZ-B8-1-NA-L-SP	$14.50	FAZ-C8-1-NA-L-SP	$14.50	FAZ-D8-1-NA-L-SP	$14.50
10	FAZ-B10-1-NA-L-SP	$14.50	FAZ-C10-1-NA-L-SP	$14.50	FAZ-D10-1-NA-L-SP	$14.50
13	FAZ-B13-1-NA-L-SP	$14.50	FAZ-C13-1-NA-L-SP	$14.50	FAZ-D13-1-NA-L-SP	$14.50
15	FAZ-B15-1-NA-L-SP	$14.50	FAZ-C15-1-NA-L-SP	$14.50	FAZ-D15-1-NA-L-SP	$14.50
16	FAZ-B16-1-NA-L-SP	$14.50	FAZ-C16-1-NA-L-SP	$14.50	FAZ-D16-1-NA-L-SP	$14.50
20	FAZ-B20-1-NA-L-SP	$14.50	FAZ-C20-1-NA-L-SP	$14.50	FAZ-D20-1-NA-L-SP	$14.50
25	FAZ-B25-1-NA-L-SP	$14.50	FAZ-C25-1-NA-L-SP	$14.50	FAZ-D25-1-NA-L-SP	$14.50
30	FAZ-B30-1-NA-L-SP	$14.50	FAZ-C30-1-NA-L-SP	$14.50	FAZ-D30-1-NA-L-SP	$14.50
32	FAZ-B32-1-NA-L-SP	$14.50	FAZ-C32-1-NA-L-SP	$14.50	FAZ-D32-1-NA-L-SP	$14.50
35	FAZ-B35-1-NA-SP	$21.00	FAZ-C35-1-NA-SP	$21.50	FAZ-D35-1-NA-SP	$21.50
40	FAZ-B40-1-NA-SP	$21.00	FAZ-C40-1-NA-SP	$21.50	FAZ-D40-1-NA-SP	$21.50
50	FAZ-B50-1-NA-SP	$21.00	FAZ-C50-1-NA-SP	$21.00	–	
63	FAZ-B63-1-NA-SP	$21.00	FAZ-C63-1-NA-SP	$21.00	–	

Note: Eaton product part numbers will contain a [.] instead of [P] and a [/] instead of a [-]. Example: FAZ-C0P5-3-NA = FAZ-C0.5/3-NA

Note: Eaton parts available for sale to North America locations only.

EATON FAZ-NA Series Selection Guide

Two-Pole

FAZ-NA and FAZ-NA-L Two-Pole 240VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
0.5	–		FAZ-C0P5-2-NA-L	$30.00	FAZ-D0P5-2-NA-L	$30.00
1	FAZ-B1-2-NA-L	$30.00	FAZ-C1-2-NA-L	$30.00	FAZ-D1-2-NA-L	$30.00
1.5	FAZ-B1P5-2-NA-L	$30.00	FAZ-C1P5-2-NA-L	$30.00	FAZ-D1P5-2-NA-L	$30.00
2	FAZ-B2-2-NA-L	$30.00	FAZ-C2-2-NA-L	$30.00	FAZ-D2-2-NA-L	$30.00
3	FAZ-B3-2-NA-L	$30.00	FAZ-C3-2-NA-L	$30.00	FAZ-D3-2-NA-L	$30.00
4	FAZ-B4-2-NA-L	$30.00	FAZ-C4-2-NA-L	$30.00	FAZ-D4-2-NA-L	$30.00
5	FAZ-B5-2-NA-L	$30.00	FAZ-C5-2-NA-L	$30.00	FAZ-D5-2-NA-L	$30.00
6	FAZ-B6-2-NA-L	$30.00	FAZ-C6-2-NA-L	$30.00	FAZ-D6-2-NA-L	$30.00
7	FAZ-B7-2-NA-L	$30.00	FAZ-C7-2-NA-L	$30.00	FAZ-D7-2-NA-L	$30.00
8	FAZ-B8-2-NA-L	$30.00	FAZ-C8-2-NA-L	$30.00	FAZ-D8-2-NA-L	$30.00
10	FAZ-B10-2-NA-L	$30.00	FAZ-C10-2-NA-L	$30.00	FAZ-D10-2-NA-L	$30.00
13	FAZ-B13-2-NA-L	$30.00	FAZ-C13-2-NA-L	$30.00	FAZ-D13-2-NA-L	$30.00
15	FAZ-B15-2-NA-L	$30.00	FAZ-C15-2-NA-L	$30.00	FAZ-D15-2-NA-L	$30.00
16	FAZ-B16-2-NA-L	$30.00	FAZ-C16-2-NA-L	$30.00	FAZ-D16-2-NA-L	$30.00
20	FAZ-B20-2-NA-L	$30.00	FAZ-C20-2-NA-L	$30.00	FAZ-D20-2-NA-L	$30.00
25	FAZ-B25-2-NA-L	$30.00	FAZ-C25-2-NA-L	$30.00	FAZ-D25-2-NA-L	$30.00
30	FAZ-B30-2-NA-L	$30.00	FAZ-C30-2-NA-L	$30.00	FAZ-D30-2-NA-L	$30.00
32	FAZ-B32-2-NA-L	$30.00	FAZ-C32-2-NA-L	$30.00	FAZ-D32-2-NA-L	$30.00
35	FAZ-B35-2-NA	$41.00	FAZ-C35-2-NA	$42.00	FAZ-D35-2-NA	$42.00
40	FAZ-B40-2-NA	$41.00	FAZ-C40-2-NA	$42.00	FAZ-D40-2-NA	$42.00
50	FAZ-B50-2-NA	$41.00	FAZ-C50-2-NA	$41.00	–	
63	FAZ-B63-2-NA	$41.00	FAZ-C63-2-NA	$41.00	–	

Three-Pole

FAZ-NA and FAZ-NA-L Three-Pole 240VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
0.5	–		FAZ-C0P5-3-NA-L	$45.00	FAZ-D0P5-3-NA-L	$45.00
1	FAZ-B1-3-NA-L	$45.00	FAZ-C1-3-NA-L	$45.00	FAZ-D1-3-NA-L	$45.00
1.5	FAZ-B1P5-3-NA-L	$45.00	FAZ-C1P5-3-NA-L	$45.00	FAZ-D1P5-3-NA-L	$45.00
2	FAZ-B2-3-NA-L	$45.00	FAZ-C2-3-NA-L	$45.00	FAZ-D2-3-NA-L	$45.00
3	FAZ-B3-3-NA-L	$45.00	FAZ-C3-3-NA-L	$45.00	FAZ-D3-3-NA-L	$45.00
4	FAZ-B4-3-NA-L	$45.00	FAZ-C4-3-NA-L	$45.00	FAZ-D4-3-NA-L	$45.00
5	FAZ-B5-3-NA-L	$45.00	FAZ-C5-3-NA-L	$45.00	FAZ-D5-3-NA-L	$45.00
6	FAZ-B6-3-NA-L	$45.00	FAZ-C6-3-NA-L	$45.00	FAZ-D6-3-NA-L	$45.00
7	FAZ-B7-3-NA-L	$45.00	FAZ-C7-3-NA-L	$45.00	FAZ-D7-3-NA-L	$45.00
8	FAZ-B8-3-NA-L	$45.00	FAZ-C8-3-NA-L	$45.00	FAZ-D8-3-NA-L	$45.00
10	FAZ-B10-3-NA-L	$45.00	FAZ-C10-3-NA-L	$45.00	FAZ-D10-3-NA-L	$45.00
13	FAZ-B13-3-NA-L	$45.00	FAZ-C13-3-NA-L	$45.00	FAZ-D13-3-NA-L	$45.00
15	FAZ-B15-3-NA-L	$45.00	FAZ-C15-3-NA-L	$45.00	FAZ-D15-3-NA-L	$45.00
16	FAZ-B16-3-NA-L	$45.00	FAZ-C16-3-NA-L	$45.00	FAZ-D16-3-NA-L	$45.00
20	FAZ-B20-3-NA-L	$45.00	FAZ-C20-3-NA-L	$45.00	FAZ-D20-3-NA-L	$45.00
25	FAZ-B25-3-NA-L	$45.00	FAZ-C25-3-NA-L	$45.00	FAZ-D25-3-NA-L	$45.00
30	FAZ-B30-3-NA-L	$45.00	FAZ-C30-3-NA-L	$45.00	FAZ-D30-3-NA-L	$45.00
32	FAZ-B32-3-NA-L	$45.00	FAZ-C32-3-NA-L	$45.00	FAZ-D32-3-NA-L	$45.00
35	FAZ-B35-3-NA	$63.00	FAZ-C35-3-NA	$65.00	FAZ-D35-3-NA	$65.00
40	FAZ-B40-3-NA	$63.00	FAZ-C40-3-NA	$65.00	FAZ-D40-3-NA	$65.00
50	FAZ-B50-3-NA	$63.00	FAZ-C50-3-NA	$63.00	–	
63	FAZ-B63-3-NA	$63.00	FAZ-C63-3-NA	$63.00	–	

Note: Eaton product part numbers will contain a [.] instead of [P] and a [/] instead of a [-]. Example: FAZ-C0P5-3-NA = FAZ-C0.5/3-NA

Note: Eaton parts available for sale to North America locations only.

EATON FAZ-NA Series Technical Specifications

FAZ-NA and FAZ-NA-L Miniature Circuit Breakers – UL/CSA				
		B-Curve	***C-Curve***	***D-Curve***
Short Circuit Trip Response		3-5 x I_n	5-10 x I_n	10-20 x I_n
Current Range		1-63 A	0.5-63 A	0.5-40 A
Maximum Voltage Ratings UL / CSA	0.5-32 A	277/480Y VAC (FAZ-NA), 240VAC (FAZ-NA-L)		
	35-63 A	240VAC		
	Per pole	48VDC		
	2 poles in series	96VDC Max		
Thermal Tripping Characteristics	Single pole	40°C [104°F]		
	Multi-pole			
Short Circuit Ratings (@ maximum voltage)	1 pole	10kA *Note: 14 kAIC at select amperages* *B and C curves (15-25 A)* *D curve (13-20 A)*		
	2 pole			
	3 pole			
Rated Frequency		50/60 Hz		
Agency Approvals		UL File #E235139, CSA #204453		

Notes: Line voltage connection suitable for reverse feed

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

FAZ-NA and FAZ-NA-L Miniature Circuit Breaker - IEC				
		B-Curve	***C-Curve***	***D-Curve***
Short Circuit Trip Response		3-5 x I_n	5-10 x I_n	10-20 x I_n
Current Range		1-63 A	0.5-63 A	0.5-40 A
Maximum Voltage Ratings - IEC/EN 60947-2	1 pole	240/415 VAC		
	2 pole / 3 pole			
	2 poles in series			
Thermal Tripping Characteristics	Single pole	30°C [86°F]		
	Multi-pole			
Interrupt Ratings (At Max Voltage)		15kA		
Rated Frequency		50/60 Hz		

General Specifications		
Lifespan / Endurance		≥20,000 (1 operation = ON/OFF)
Operating Temperature		UL 489, CSA C22.2 No.5 = 40°C IEC 60947-2 = 30°C
Shock (UL 489)		10g 20-25 ms
Housing Material		Nylon
Mounting Position		Vertical
Weight	1 pole	0.3 lb (136g)
	2 pole	0.6 lb (272g)
	3 pole	0.9 lb (408g)

Wire Size		
Ampere Rating	***Conductor Size***	
0.5 - 63	One wire	18 to 6 AWG (0.75 to 13 mm²)
	Two wires	18 to 10 AWG (0.75 to 5 mm²)

Note: Eaton does not recommend the use of wire ferrules or crimping terminals. The wire gauges are specified above and in the installation instructions included with each circuit breaker.

Tightening Torque	
Conductor Size	***Tightening Torque***
18-12 AWG	21 lb·in (2.4 N·m)
10-8 AWG	25 lb·in (2.8 N·m)
6AWG	36 lb·in (4.1 N·m)

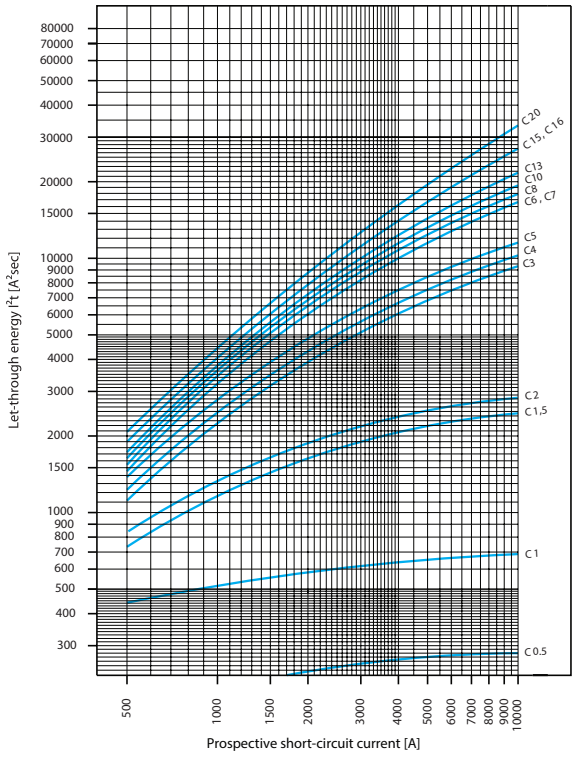
EATON FAZ-NA Series Technical Data

Let-Through Energy

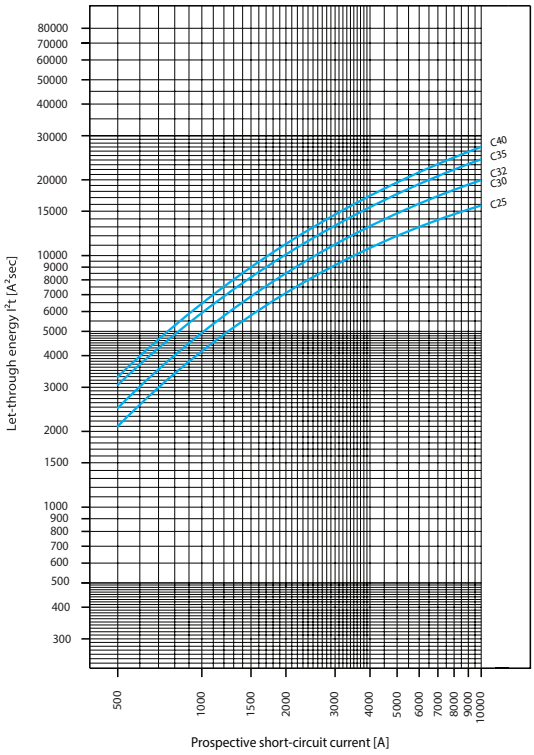
- The X axis shows the prospective short-circuit current levels.
- The Y axis indicates the actual let-through values at those prospective fault ratings for each FAZ-NA device plotted.

As can be interpreted from the bend in the plotted curves, each device acts to limit the damaging let-through energy at those values of short-circuit current.

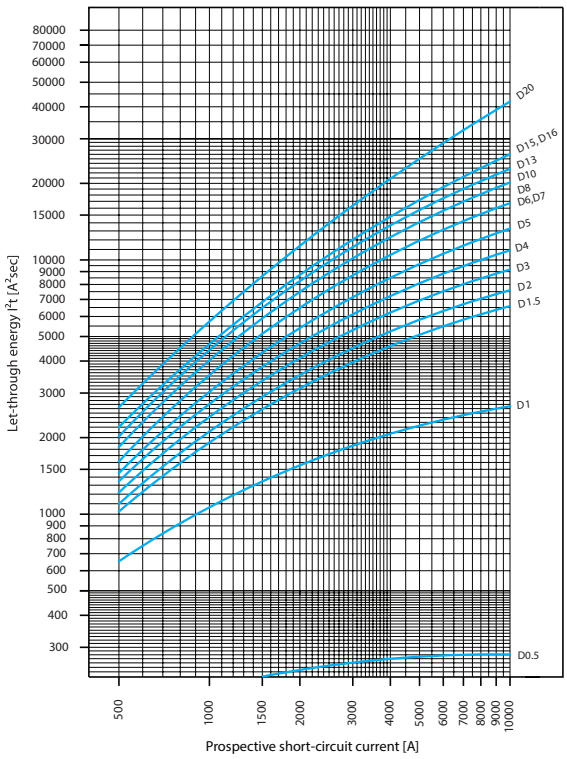
Characteristic C (0.5-20A), 277V



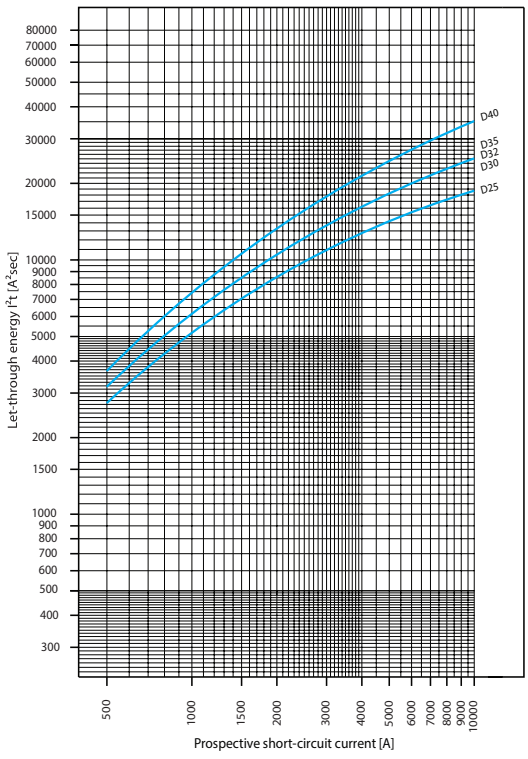
Characteristic C (25-40A), 240V



Characteristic D (0.5-20A), 277V



Characteristic D (25-40A), 240V



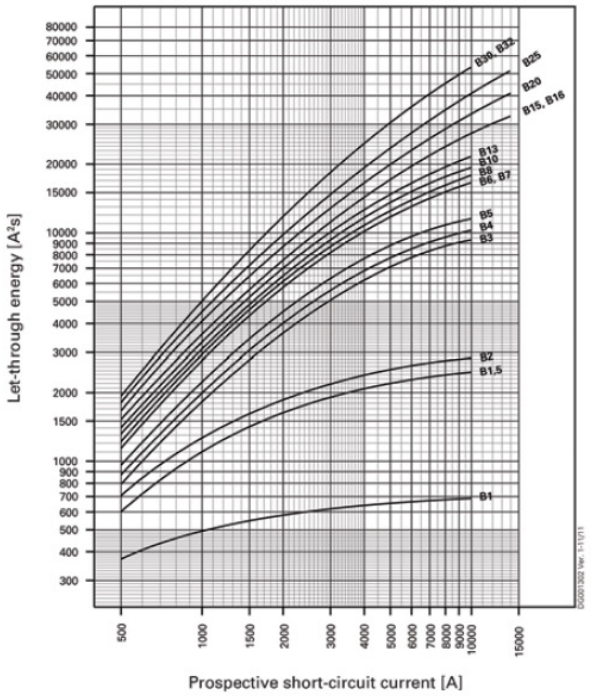
EATON FAZ-NA Series Technical Data

Let-Through Energy

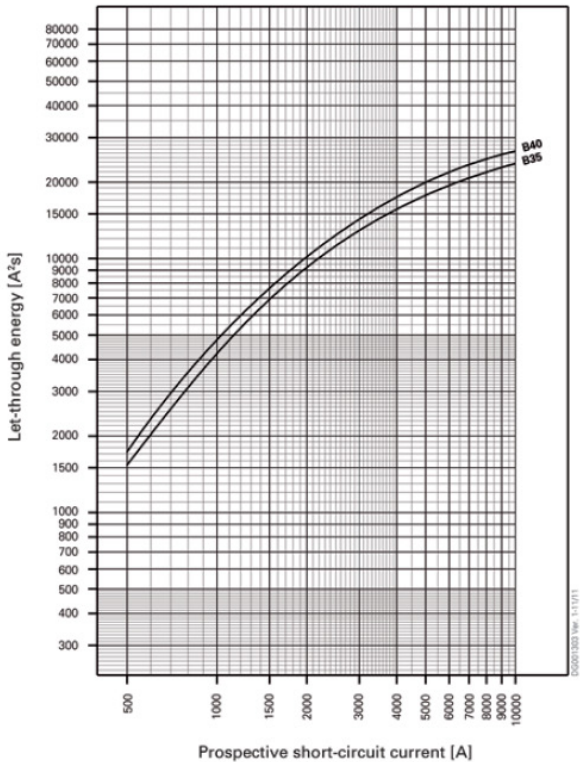
- The X axis shows the prospective short-circuit current levels.
- The Y axis indicates the actual let-through values at those prospective fault ratings for each FAZ-NA device plotted.

As can be interpreted from the bend in the plotted curves, each device acts to limit the damaging let-through energy at those values of short-circuit current.

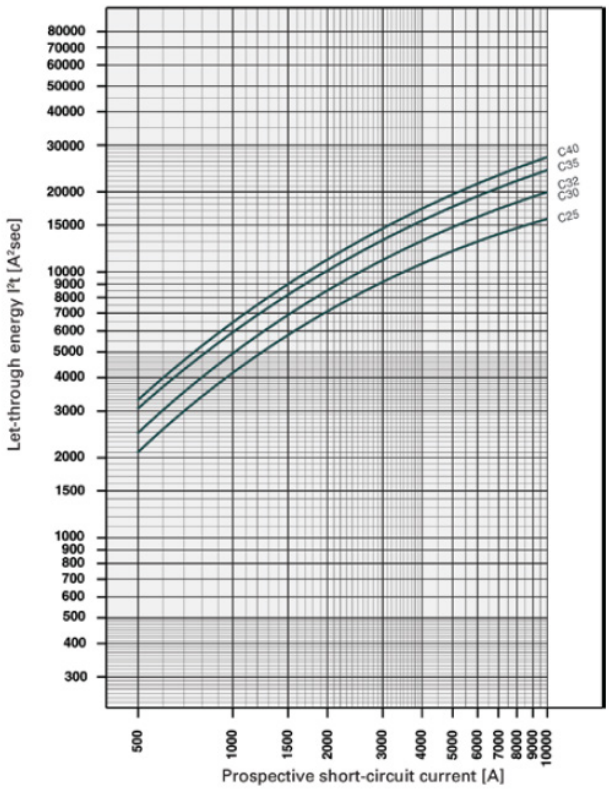
Characteristic B (1–32 A), 277 V



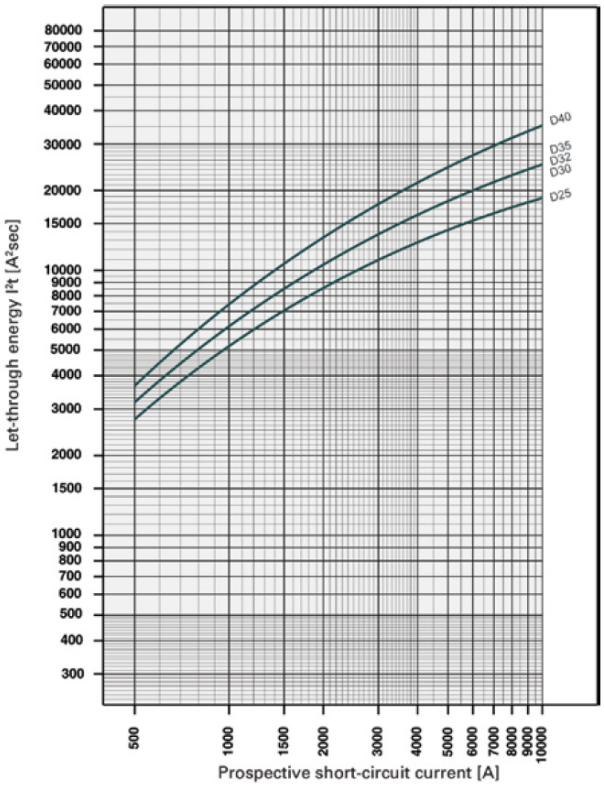
Characteristic B (35–63 A), 240 V



Characteristic C (35–63 A), 240 V



Characteristic D (35–63 A), 240 V



EATON FAZ-NA Series Technical Data

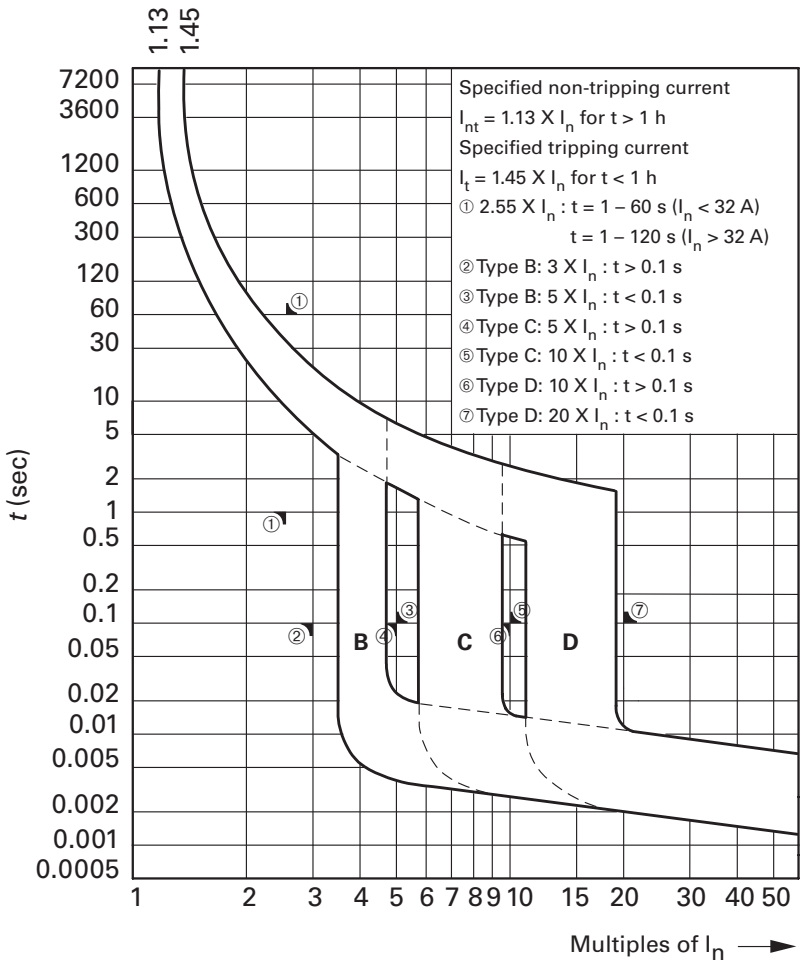
Power Loss at I_n

Power Loss at I_n Characteristic B			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
0.5	-	-	-
1	1.1	2.2	3.4
1.5	2.2	4.4	6.6
2	1.4	2.8	4.3
3	2.1	4.2	6.4
4	1.4	2.9	4.3
5	1.8	3.7	5.5
6	1.7	3.5	5.2
7	2.0	4.0	6.0
8	2.0	3.9	5.9
10	1.8	3.6	5.3
13	2.4	4.7	7.1
15	1.9	3.8	5.8
16	2.1	4.3	6.4
20	2.9	5.8	8.7
25	3.1	6.2	9.3
30	3.0	6.0	9.0
32	3.4	6.8	10.2
35	4.0	8.1	12.1
40	4.0	8.1	12.1
50	4.4	8.8	13.2
63	5.5	11.0	16.5

Power Loss at I_n Characteristic C			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
0.5	1.6	3.2	4.7
1	1.1	2.2	3.4
1.5	1.3	2.6	3.9
2	1.4	2.8	4.3
3	1.2	2.4	3.6
4	1.4	2.9	4.3
5	1.9	3.7	5.6
6	1.2	2.3	3.5
7	1.4	2.8	4.3
8	1.4	2.8	4.2
10	1.8	3.6	5.3
13	2.4	4.7	7.1
15	1.9	3.8	5.6
16	2.1	4.3	6.4
20	2.9	5.8	8.7
25	3.1	6.2	9.3
30	3.0	6.0	9.0
32	3.4	6.8	10.2
35	3.7	7.4	11.0
40	4.0	8.1	12.1
50	4.4	8.8	13.2
63	5.5	11.0	16.5

Power Loss at I_n Characteristic D			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
0.5	1.6	3.2	4.8
1	0.8	1.5	2.3
1.5	1.0	2.1	3.1
2	1.0	2.1	3.1
3	1.2	2.4	3.6
4	1.4	2.9	4.3
5	1.5	2.9	4.4
6	1.2	2.3	3.5
7	1.4	2.8	4.3
8	1.2	2.4	3.7
10	1.5	3.0	4.5
13	2.0	4.1	6.1
15	1.5	3.1	4.6
16	1.7	3.5	5.2
20	1.8	3.7	5.5
25	2.6	5.1	7.7
30	2.7	5.4	8.1
32	3.1	6.2	9.3
35	3.8	7.6	11.3
40	3.9	7.8	11.6
50	–	–	–
63	–	–	–

Tripping Curves



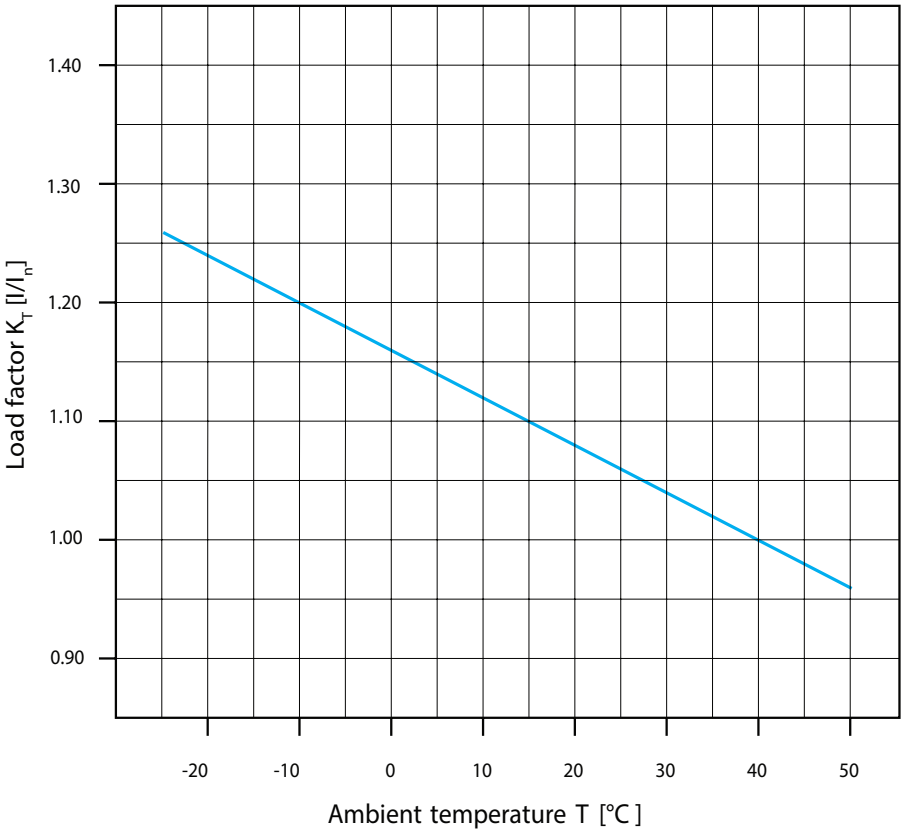
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

EATON FAZ-NA Series Technical Data

FAZ-NA Miniature Circuit Breakers Dimensions

EATON FAZ-NA Series Technical Data

Influence of Ambient Temperature T on Load Carrying Capacity								
Device Market Current Rating In (A) at 40°C	*In (A) at Higher Ambient Temperature*							
	15°C	*20°C*	*25°C*	*30°C*	*40°C*	*50°C*	*55°C*	*60°C*
0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.0	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9
1.5	1.7	1.6	1.6	1.6	1.5	1.4	1.4	1.4
2.0	2.2	2.2	2.1	2.1	2.0	1.9	1.9	1.8
3.0	3.3	3.2	3.2	3.1	3.0	2.9	2.9	2.8
4.0	4.4	4.3	4.2	4.2	4.0	3.8	3.8	3.7
5.0	5.5	5.4	5.3	5.2	5.0	4.8	4.7	4.6
6.0	6.6	6.5	6.4	6.2	6.0	5.8	5.6	5.5
7.0	7.7	7.6	7.4	7.3	7.0	6.7	6.6	6.4
8.0	8.8	8.6	8.5	8.3	8.0	7.7	7.5	7.4
10.0	11.0	10.8	10.6	10.4	10.0	9.6	9.4	9.2
13.0	14.3	14.0	13.8	13.5	13.0	12.5	12.5	12.0
15.0	16.5	16.2	15.9	15.6	15.0	14.4	14.1	13.8
16.0	17.6	17.3	17.0	16.6	16.0	15.4	15.0	14.7
20.0	22.0	21.6	21.2	20.8	20.0	19.2	18.8	18.4
25.0	27.5	27.0	26.5	26.0	25.0	24.0	23.3	23.0
30.0	33.0	32.4	31.8	31.2	30.0	28.8	28.2	27.6
32.0	35.2	34.6	33.9	33.3	32.0	30.7	30.1	29.4
35.0	38.5	37.8	37.1	36.4	35.0	33.6	32.9	32.2
40.0	44.0	43.2	42.4	41.6	40.0	38.4	37.6	36.8
50.0	55.0	54.0	53.0	52.0	50.0	48.0	47.0	46.0
63.0	69.3	68.0	66.8	65.5	63.0	60.5	59.2	58.0



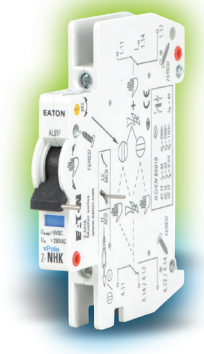
Maximum load I_L at ambient temperature T:
$I_L(T) = I_n K_T(T)$

I_L = Maximum Load
T = Ambient Temperature
I_N = Rated Current in Amps
K_T = Load Factor

EATON FAZ-NA Series Accessories

Field Mountable Accessories

- Auxiliary switch
- Alarm switch
- Shunt trip
- No tools required for mounting



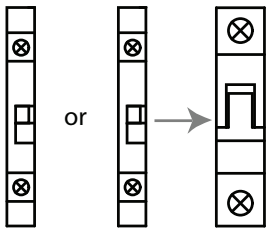
ZNHK
Alarm/Aux Contact

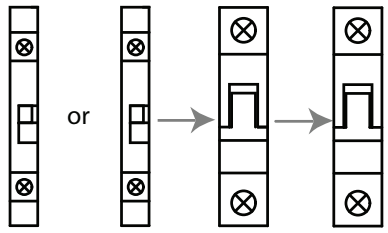
ZIHK-NA
Auxiliary Contact

		ZNHK*	ZIHK-NA
Price		$24.00	$19.00
Electrical Data			
Contact function		2 Form C (one set changeover) (SPDT)	1 NO + 1 NC (DPST)
Rated voltage		230VAC / 110V AC/DC	600VAC / 230VAC / 120VAC
Frequency		50/60 Hz	
Rated current		2A / 0.5 A	1.2 A / 2A / 6A
Rated thermal current I_{th} 60947-5-1		2A / 250VAC	6A / 250VAC
60947-5-1 Rated operational current I_e	***Utilization category AC13***	3A / 250VAC	
	Utilization category AC15	2A / 250VAC	
	Utilization category DC12	0.5 A / 110VDC	0.5 A / 110VDC 0.25 A / 220VDC
Rated insulation voltage U_i		250VAC	
Minimal operational voltage per Contact U_{min}		5VDC	
Minimum operational current I_{min}		10mA DC	10 mA AC/DC
Rated peak withstand voltage U_{imp} (1.2/50µ)		2.5 kV	4kV
Conditional short-circuit current I_k w/ backup fuse 6A		1kA	1kA
Mechanical Data			
Tripping indicator "electrical tripping"		Blue/white	–
Frame size		45mm	
Mounting		Onto FAZ-NA	
Degree of protection, built-in		IP40	
Terminal protection		Finger and hand touch safe according to BGV A3, OVE-EN 6	
Terminals		Lift terminals	
Terminal capacity		20-18 AWG (0.75 - 2.5 mm²)	20-14 AWG (0.5 - 2.5 mm²)
Terminal screws		M3 (Posidrive Z0 - Phillips)	
Fastening torque of terminal screws		7 lb·in (0.79 N·m)	Max. 10.6 lb·in (1.2 N·m)

Voltage of the FAZ-NA circuit breaker is limited to 300V with contact installed.

Allowable Combinations of Accessories

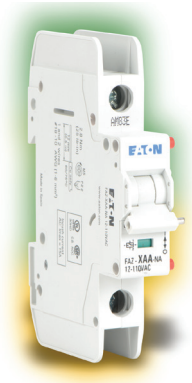




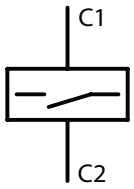
EATON FAZ-NA Series Accessories

Shunt Trip Release

- Remote release for subsequent mounting onto FAZ-NA
- Additional installation of standard auxiliary switch is possible
- Position indicator red-green



FAZ-XAA-NA Series



Circuit Diagram

	FAZ-XAA-NA12-110V	FAZ-XAA-NA110-415V
Price	$35.00	$35.00
Electrical Data		
Can be mounted onto	FAZ-NA	
Operational voltage range	12-110 VAC 12-60 VDC	110-415 VAC 110-230 VDC
Maximum inrush current	15A	2.1 A
Frequency	50/60 Hz	
Mechanical Data		
Frame size	45mm	
Height	4.13 in (105mm)	
Width	0.69 in (17.5 mm)	
Weight	0.28 lb (127g)	
Mounting	Quick fastening with two lock-in positions on EN 50022	
Degree of protection, built-in	IP40	
Terminal protection	Finger and hand touch safe according to BGV A3, OVE-EN 6	
Terminals	Open mouthed/lift	
Terminal capacity, one and two wires	18-10 AWG (0.8 - 5.3 mm²)	
Agency Approval	UL File # E257181, CSA 204453	

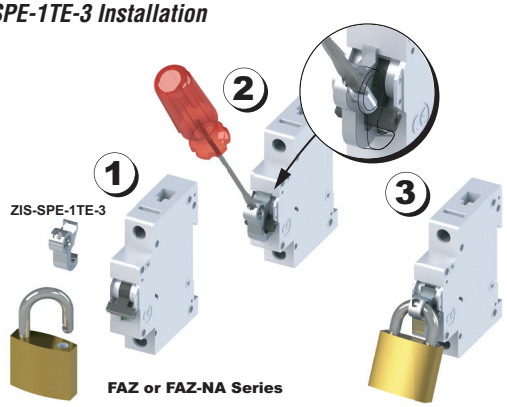
Note: To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Lockout Attachment

Lockout Attachment				
Part Number	***Description***	***Weight***	***Qty***	***Price***
ZIS-SPE-1TE-3	Lockout attachment for Eaton FAZ-NA series supplementary protectors and FAZ-NA mini circuit breakers, suitable to prevent unauthorized activation of a de-energized circuit, accepts lock shackles up to 9/32 in. (7.1 mm) in diameter	0.10 lb (45g)	3	$29.50

ZIS-SPE-1TE-3
Lockout Attachment

ZIS-SPE-1TE-3 Installation

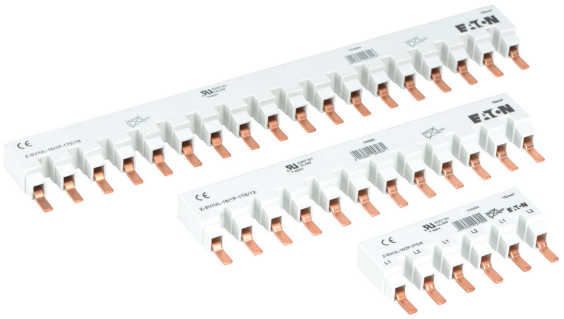


EATON FAZ-NA Series Accessories

Busbar System
(Without auxiliary contacts)

Busbar System for FAZ-NA Series Miniature Circuit Breakers		
Part Number	***Price***	***Description***
ZSVUL16-1P-1TE6SP	$10.00	Busbar for connecting up to six (6) 1-pole FAZ-NA series circuit breakers
ZSVUL16-1P-1TE12SP	$18.00	Busbar for connecting up to twelve (12) 1-pole FAZ-NA series circuit breakers
ZSVUL16-1P-1TE18SP	$27.50	Busbar for connecting up to eighteen (18) 1-pole FAZ-NA series circuit breakers
ZSVUL16-2P-2TE6SP	$11.50	Busbar for connecting up to three (3) 2-pole FAZ-NA series circuit breakers
ZSVUL16-2P-2TE12SP	$22.00	Busbar for connecting up to six (6) 2-pole FAZ-NA series circuit breakers
ZSVUL16-2P-2TE18SP	$33.00	Busbar for connecting up to nine (9) 2-pole FAZ-NA series circuit breakers
ZSVUL16-3P-3TE6SP	$12.00	Busbar for connecting up to two (2) 3-pole FAZ-NA series circuit breakers
ZSVUL16-3P-3TE12SP	$23.00	Busbar for connecting up to four (4) 3-pole FAZ-NA series circuit breakers
ZSVUL16-3P-3TE18SP	$35.00	Busbar for connecting up to six (6) 3-pole FAZ-NA series circuit breakers

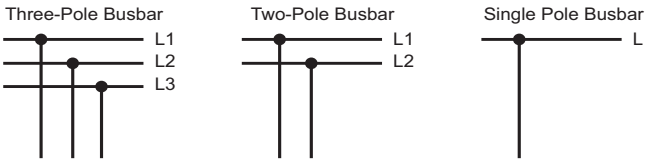
Note: FAZ-NA Busbar is not for use with FAZ supplementary protectors.

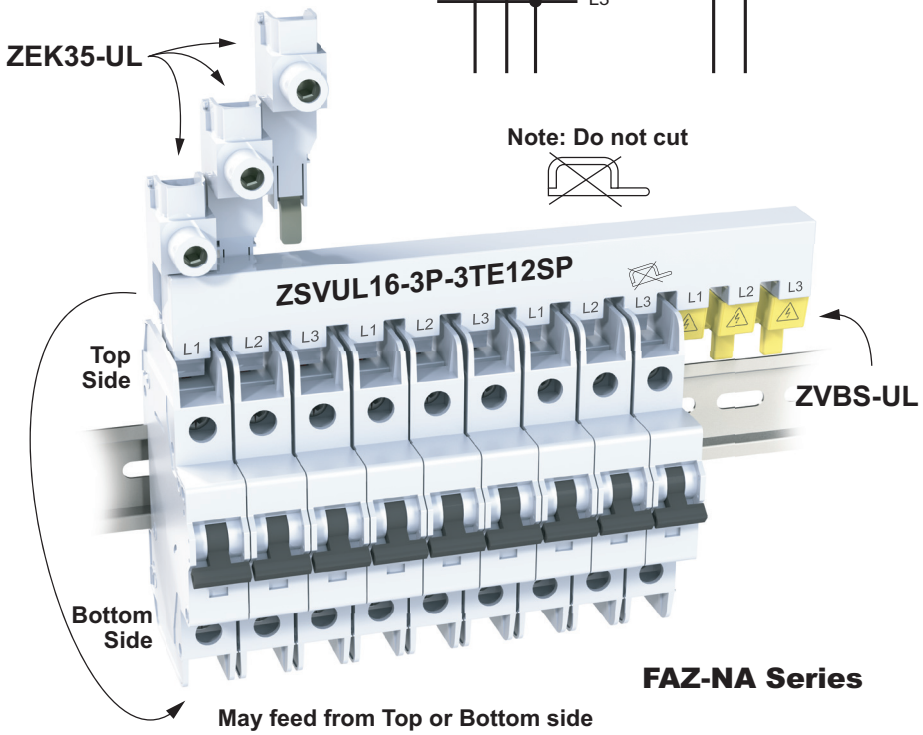


ZSVUL16-xP-xTExSP

Busbar Specifications			
Description	***UL489***		***IEC/EN60947-2***
Operating Voltage	480VAC	96VDC	240/415 VAC
Frequency	50/60 Hz	n/a	50/60 Hz
Rated Impulse Withstand U_{imp}	n/a		9.5 kV
Max Current - I_e Fed From End	80A @ 40°C		80A @ 30°C
Cross Section	n/a		16 mm²
Agency Approval	UL File #E257181		

Busbar Connection Diagrams





EATON FAZ-NA Series Accessories

Busbar Accessories

Busbar Accessories for FAZ-NA Series Miniature Circuit Breakers		
Part Number	***Price***	***Description***
ZVBS-UL	$25.00	Busbar Shroud - covers for unused bus bar terminals, (10) 3-terminal covers per package
ZVBS-UL-5	$14.00	Busbar Shroud - covers for unused bus bar terminals, (5) 3-terminal covers per package
ZEK35-UL	$37.00	Wiring Lug, 2 - 14 AWG (35mm), 3 lugs per package
ZEK35-UL-1	$13.00	Wiring Lug, 2 - 14 AWG (35mm), 1 lug per package

ZVBS-UL

ZEK35-UL

ZEK35-UL – Specifications			
Description	***UL489***		***IEC/EN60947-2***
Operating Voltage	480VAC	96VDC	240/415 VAC
Frequency	50/60 Hz	n/a	50/60 Hz
Rated impulse withstand - Uimp	n/a		9.5 kV
Max Current - Ie	80A @ 40°C		80A @ 30°C
	#2 - 14 AWG		2.5 - 35 mm^2
	0.56 in		14mm
Agency Approval	UL File # E307559		

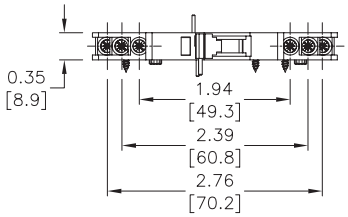
Note: To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

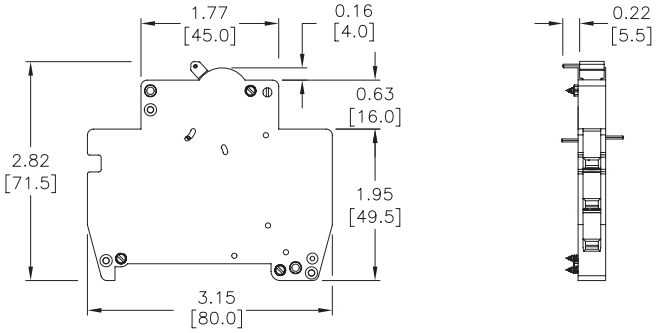
ZEK35-UL – Tightening Torque		
Tested Acc. To	***Cable Size***	***Tightening Torque***
UL 486A	#14 AWG	≥ 20 lb·in (2.3 N·m)
UL 486B	#8 - 12 AWG	≥ 25 lb·in (2.8 N·m)
UL 486E	#6 - 1 AWG	35 lb·in (4 N·m)

EATON FAZ-NA Series Accessories

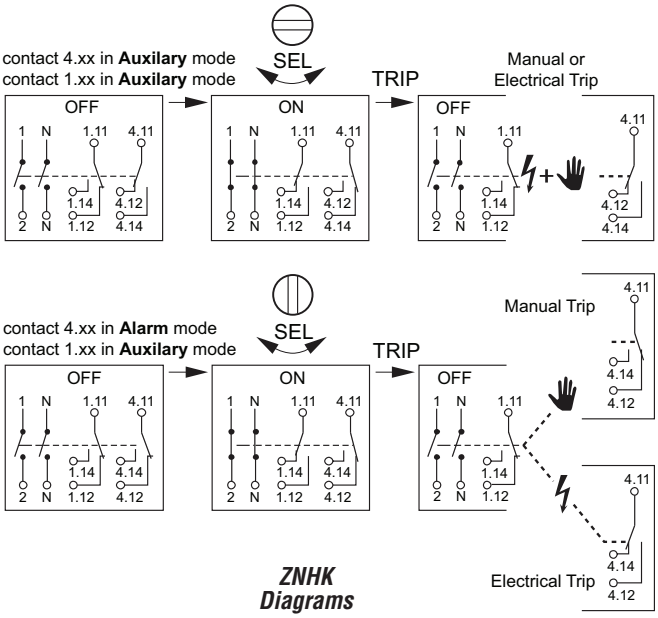
Accessories Dimensions

in [mm]

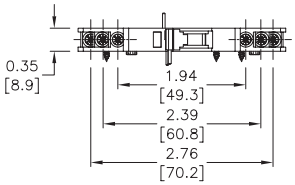


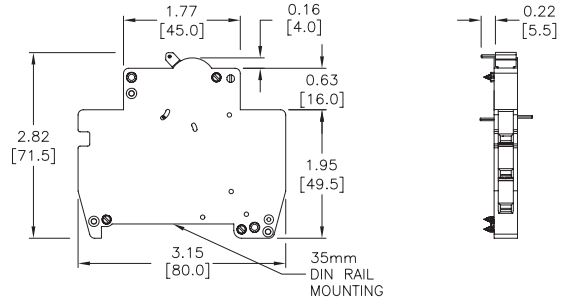


ZNHK

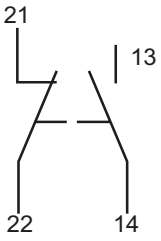


ZNHK Diagrams

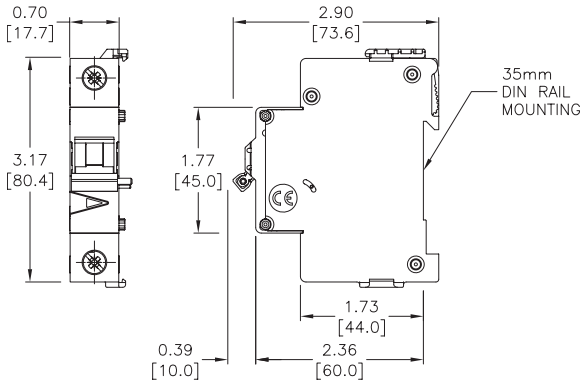




ZIHK-NA



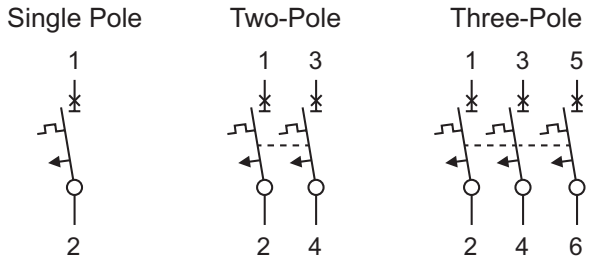
ZIHK-NA Diagram



FAZ-XAA-NA-xxx

FAZ-NA Series Miniature Circuit Breakers

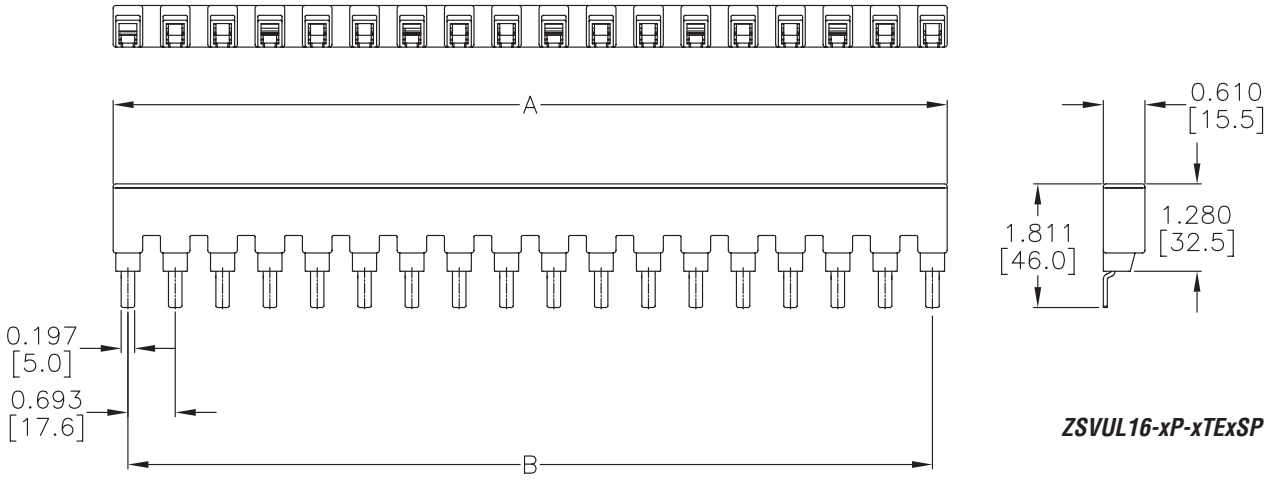
Connection Diagrams



Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

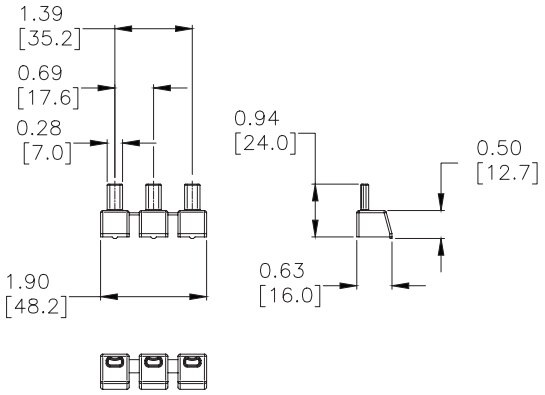
EATON FAZ-NA Series Accessories

Accessories Dimensions in [mm]

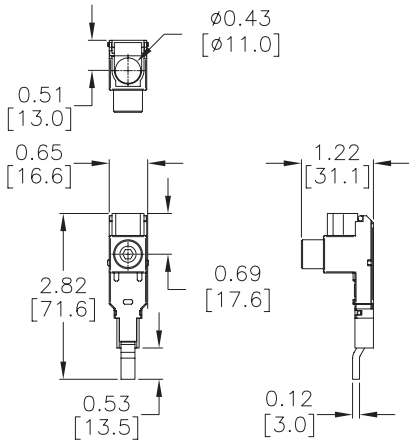


ZSVUL16-xP-xTExSP

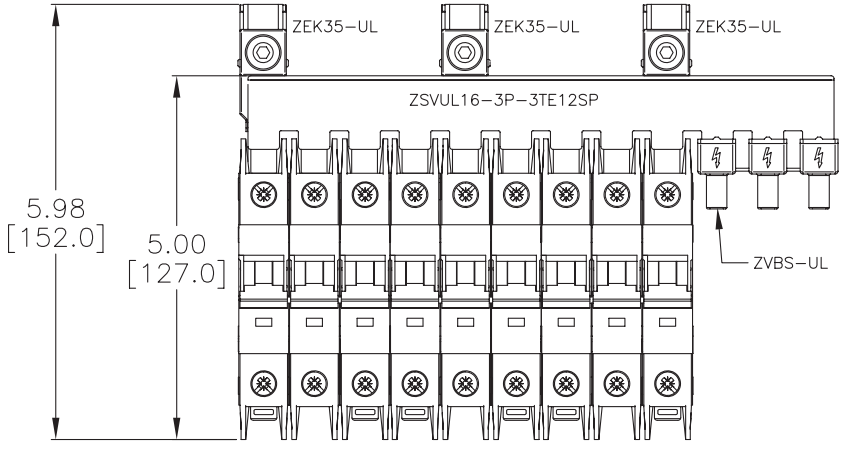
FAZ-NA Busbar Length – in [mm]		
Part Number	***A***	***B***
ZSVUL16-xP-xTE6SP	3.90 [99.0]	3.46 [88.0]
ZSVUL16-xP-xTE12SP	8.06 [204.6]	7.62 [193.6]
ZSVUL16-xP-xTE18SP	12.21 [310.2]	11.78 [299.2]



ZVBS-UL



ZEK35-UL

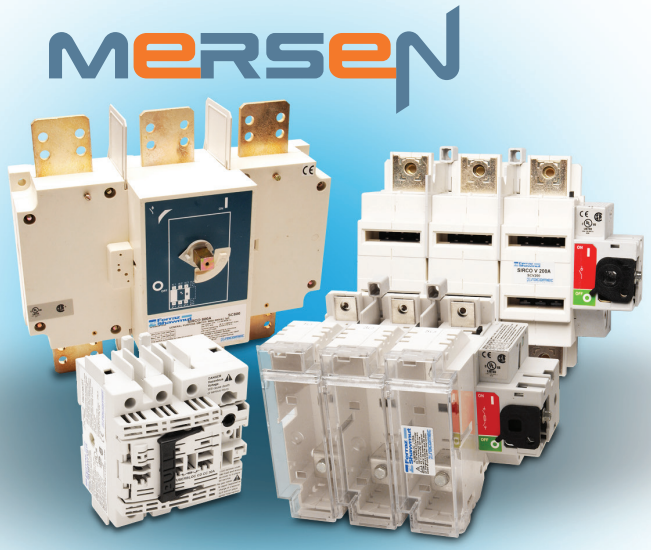


Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Which switch is right for you?

Mersen Disconnect Switches

FERRAZ SHAWMUT IS NOW MERSEN



UL 98 Rated Disconnect Switches used for:

- **Service entrance or main panel disconnects up to 600 VAC, 800 A**
- **"Make and Break" power circuit applications on load**
- **NFPA 79 Solutions**
- **Motion disconnecting means NEC 430.101 - 403.113**

These parts will be discontinued once out of stock. Comparable replacements will be available soon.

UL 98 Rated Disconnect Switches

The AUTOMATIONDIRECT power products line includes 600 VAC / 250 VDC heavy-duty fusible and non-fusible electrical disconnects from Mersen. The SC and FB series meet UL 98 standards and are UL, CSA, CE and IEC rated. The series is designed with the most up-to-date power disconnect technology available - "make and break" power circuits on load. In addition, a wide array of handles is available, meeting OSHA padlocking requirements, NEMA configurations, defeater options and NFPA 79 requirements. These switches have been tested and approved for use in the most demanding applications, including "service entrance".

SC series

- Non-fusible rotary disconnect switches
- Makes/Breaks loads up to 800 amps
- Front operated
- Visible blade contacts
- Line side shrouding comes standard with switch

FB series

- Fusible rotary disconnect switches
- Makes/Breaks loads up to 200 amps
- Front operated
- Uses Class CC and Class J fuses
- Line side shrouding comes standard with switch
- Touch safe fuse covers standard with switch
- Can be used in "reverse" applications where the mains are fed in on the load side

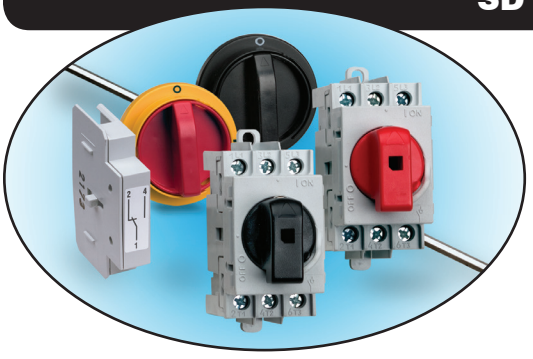
Ratings

- 600 VAC, 250 VDC
- 30, 60, 100, 200, 400, 600, and 800 amperes
- Up to 200 kA short circuit rating when Class CC, J, or L fuses are used externally

Approvals

- All SC series switches meet UL 98 requirements
- UL Listed Guide WHTY, File E191605
- CSA C22.2 # 4 Class 4652 04, File 703166
- IEC 947-3 as a load break disconnect
- CE mark

SD Series Load Switches



UL 508 Rated Load Switches used for:

- **Disconnect (device without on-load making and breaking capacity)**
- **Switches at installation head or for resistive circuits (heating, lighting, except discharge lamps, etc.)**
- **Switches in secondary circuits or reactive circuits (capacitor banks, discharge lamps, shunt motors, etc.)**

UL 508 Rated Load Switches

The SD series, our non-fused load-break disconnects allow breaking and disconnecting of equipment loads up to 600 VAC, at nominal currents from 16A to 125A. These disconnect switches are UL listed as Manual Motor Controllers and are commonly used as motor isolation disconnects in junction boxes local to the motor. When upstream short-circuit protection is provided, they may be used as enclosure disconnects.

- Loads from 16 to 125 amps
- High breaking capacity
- Double break contacts
- High electrical and mechanical endurance
- Resistant to damp heat
- IP20 degree of protection
- HACR (heating, air conditioning and refrigeration) rated
- 35mm DIN rail mountable or panel mounting
- Modular 45mm frame
- Remote handles with door interlock feature can be locked with up to three padlocks in the OFF position

Ratings

- 600 VAC
- IP 20
- 16 to 125 amps

Approvals

- UL 508/cUL File: UL E226699
- IEC/EN File No. 60947/1-3
- CE mark

Which switch is right for you?

Compact Fusible Switches

Overview

AutomationDirect Gladiator compact fusible switches provide open fuse indication for faster troubleshooting and reduced downtime. Gladiator switches have Lockout / Tagout capability and finger safe construction to promote safe workplace practices by preventing contact with live components. Positive visible circuit isolation via the disconnect switch makes it easy to view status. Each switch is 35mm DIN rail mountable for ease of installation and requires no tools. Taking up only 1/3 the space of a molded circuit breaker and 2/3 the space of a traditional fusible switch, Gladiator fusible switches save space in your panel.

Features and Benefits

- Class CC and Midget fuse options
- 200kA Short-Circuit Current Rating (SCCR) with Class CC fuses meets high assembly SCCR and reduced personal protective equipment (PPE) requirements
- Full voltage rating up to 600 VAC allows installation flexibility versus slash-rated devices at 480/277 VAC
- Horsepower rated for protecting motor circuits with Class CC units
- UL 98 disconnect rated for protection of branch circuits
- 35 mm DIN-rail mountable, utilizing spring clip

Applications

Feeder and Branch Circuit Protection

- Service Entrance or Main Panel Disconnect (UL 98 Class CC)
- Resistive Heating and Lighting Circuit
- Fusible Isolation Switch
- Convenience receptacle circuits (internal / external)
- Motor control circuits
- Load circuits leaving the equipment (external)
- HACR Equipment (Heating Air Conditioning, Refrigeration)
- Computers
- Power supplies

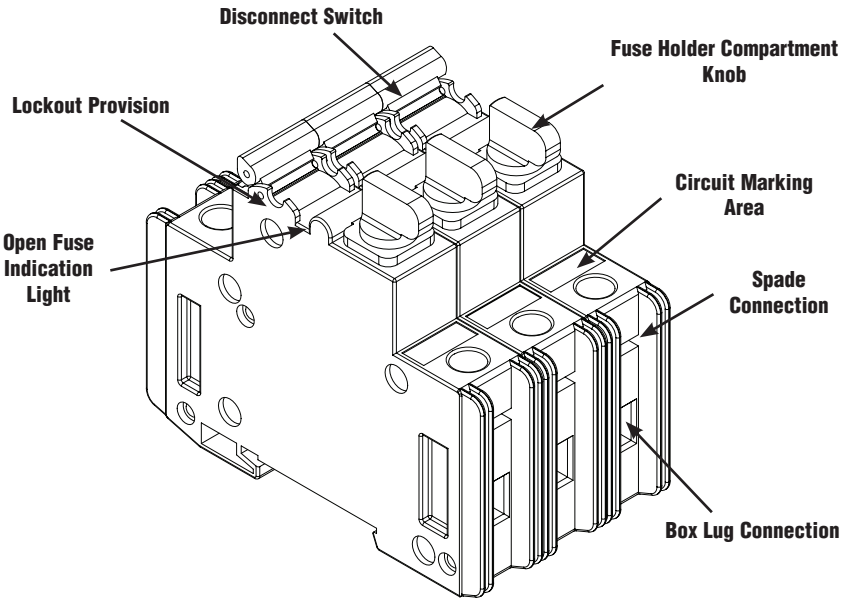
Listings

UL Class CC fuse version

- UL Listed under UL 98 File E339079, Guide WHTY
- cULus 22.2, No. 4-04 File 339079, Guide WHTY7
- CE Compliant
- RoHS

UL Class Midget fuse version

- UL Listed under UL 508 File E222847, Guide NRNT
- cULus 22.2, No. 14-05
- CE Compliant
- RoHS



Gladiator® from AutomationDirect Compact Fusible Switches

AC and DC Compact Fusible Switches

Single-Pole

Two-Pole

Three-Pole

DC Single-Pole

Compact Fusible Switch Specifications - AC Switches

Part Number	Poles	Max Fuse Ampacity	Voltage Range	Fuse Type	SCCR	Agency Approvals	HP Ratings	Price
CFS-1PCC30	1	30A	90 - 600 VAC	Class CC	200 kA	UL 98 Listed cULus 22.2 No. 4-04	0.5 HP @ 120 VAC	$24.00
CFS-1PM30			90 - 240 VAC*	UL Midget	10 kA*	UL 508 Listed CULus 22.2 No.14-05	n/a	$24.00
CFS-2PCC30	2		90 - 600 VAC	Class CC	200 kA	UL 98 Listed cULus 22.2 No. 4-04	2.0 HP @ 240 VAC	$49.50
CFS-2PM30			90 - 240 VAC*	UL Midget	10 kA*	UL 508 Listed CULus 22.2 No.14-05	n/a	$49.50
CFS-3PCC30	3		90 - 600 VAC	Class CC	200 kA	UL 98 Listed cULus 22.2 No. 4-04	3.0 HP @ 240 VAC 5.0 HP @ 480 VAC 7.5 HP @ 600 VAC	$74.00
CFS-3PM30			90 - 240 VAC*	UL Midget	10 kA*	UL 508 Listed CULus 22.2 No.14-05	n/a	$74.00

Note: The minimum enclosure size is 14 in. x 12 in. x 6 in. Minimum spacings are 2 inches over surface, 1 inch through air.
** Rating may be lower depending upon installed fuse. Refer to fuse specifications.*

Compact Fusible Switch Specifications - DC Switches

Part Number	Poles	Max Fuse Ampacity	Voltage Range	Fuse Type	SCCR	Agency Approvals	Price
CFS-1PCC30-DC	1	30A	12 - 80 VDC*	Class CC	200 kA*	UL 98 Listed cULus 22.2 No. 4-04	$24.00
CFS-1PM30-DC			12 - 80 VDC*	UL Midget	10 kA*	UL 508 Listed CULus 22.2 No.14-05	$24.00

** Rating may be lower depending upon installed fuse. Refer to fuse specifications.*

General Specifications

Construction		RoHS compliant, IP20 compliant with 10 AWG or larger wire
Operating Temperature		-20 °C to 75 °C (-4 °F to 167 °F)
Flammability Rating		UL 94V0
Frequency		50/60 Hz
Padlockable		Yes [4mm (0.16 in) shank]
Local Indication		Yes
Mounting		35 mm DIN Rail
Weight	One-Pole	0.22 lbs. (100g)
	Two-Pole	0.43 lbs. (195g)
	Three-Pole	0.65 lbs. (295g)

Wire Range

Number of Wires	Wire Size	
One Wire	4 AWG	21 mm^2
Two Wires	18 to 6 AWG	0.75 to 13 mm^2

Note: The use of wire ferrules or crimping terminals is not recommened in box lugs.

Tightening Torque

Cable Size	Tightening Torque	
18 - 10 AWG	2.3 Nm	20 lb-in
8 - 4 AWG	4.0 Nm	35 lb-in

Recommended Fuse Types

AC Voltage Class CC

Edison	Bussmann	Gould	Littlefuse
HCLR	KTK-R	ATMR	KLKR
HCTR	FNQ-R	ATQR	KLDR
EDCC	LP-CC	ATDR	CCMR

AC Voltage Class Midget

Edison	Bussmann	Gould	Littlefuse
MCL	KTK	ATM	KLK
MOL	BAF / BAN	OTM	BLF
MEQ	FNQ	ATQ	FLQ
MEN	FNM	TRM	FLM

DC Voltage Class CC

Edison	Bussmann	Gould	Littlefuse
EDCC	LP-CC	ATDR	CCMR

DC Voltage Class Midget

Edison	Bussmann	Gould	Littlefuse
N/A	KLM	ATM	KLKD
	DCM		

Gladiator® from AutomationDirect Compact Fusible Switches

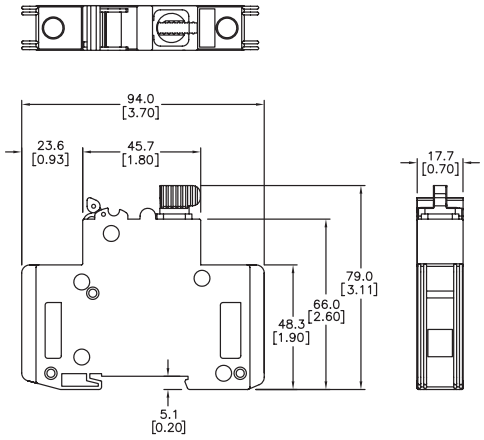
Motor Sizing - Compact Fusible Switches

Motor Sizing Chart						
Voltage	***Motor HP***	***Motor Full Load Amps***	***Fuse Type***	***Minimum Fuse Amperage***	***Code Max Fuse Amperage***	***Heavy Start Fuse Amperage***
115 VAC - 1 Phase	1/6	4.4	EDCC	9	15	15
	1/4	5.8		12	20	20
	1/3	7.2		15	25	25
	1/2	9.8		30	30	30
230 VAC - 1 Phase	1/6	2.2	EDCC	4.5	10	10
	1/4	2.9		6	10	10
	1/3	3.6		7	15	15
	1/2	4.9		10	15	15
	3/4	6.9		15	25	25
	1	8.0		25	25	30
	1-1/2	10.0		30	30	30
200 VAC - 3 Phase	1/2	2.5	EDCC	5	10	10
	3/4	3.7		7.5	15	15
	1	4.8		10	15	15
	1-1/2	6.9		15	25	25
	2	7.8		25	25	30
208 VAC - 3 Phase	1/2	2.4	EDCC	5	10	10
	3/4	3.5		7	15	15
	1	4.6		10	15	15
	1-1/2	6.6		15	20	25
	2	7.5		15	25	30
230 VAC - 3 Phase	1/2	2.2	EDCC	4.5	10	10
	3/4	3.2		7	10	12
	1	4.2		9	15	15
	1-1/2	6.0		12	20	20
	2	6.8		15	25	25
	3	9.6		30	30	30
460 VAC - 3 Phase	1/2	1.1	EDCC	2.25	6	6
	3/4	1.6		3.2	6	6.25
	1	2.1		4.5	10	10
	1-1/2	3.0		6	10	12
	2	3.4		7	15	15
	3	4.8		10	15	15
	5	7.6		25	25	30
575 VAC - 3 Phase	1/2	0.9	EDCC	1.8	3	3.5
	3/4	1.3		2.8	6	6
	1	1.7		3.5	6	6.25
	1-1/2	2.4		5	10	10
	2	2.7		5.6	10	10
	3	3.9		8	15	15
	5	6.1		15	20	20
	7-1/2	9.0		30	30	30

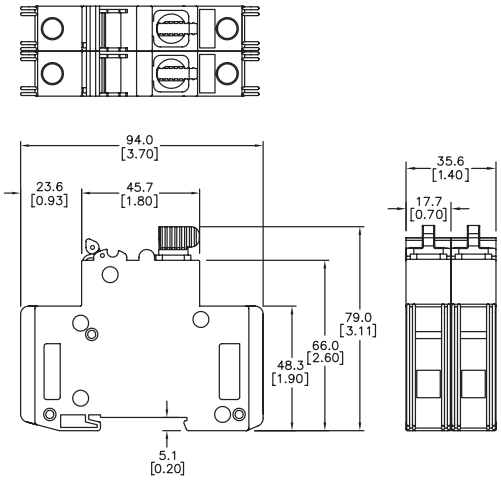
Note: NEMA motors only (no IEC or Design B Energy Efficient). Minimum size if no more than 1 start / hour. Use Code Max Fuse Amperage in low to moderate reverse / jog / plug applications. Use Heavy Start Fuse Amperage only if Code Max does not allow motor start up. For high reverse / jog / plug applications or larger horsepower motors, Class J fuses are recommended. (Refer to time-current curves for specific applications.) Per NEC 430.52

Gladiator® from AutomationDirect Compact Fusible Switches

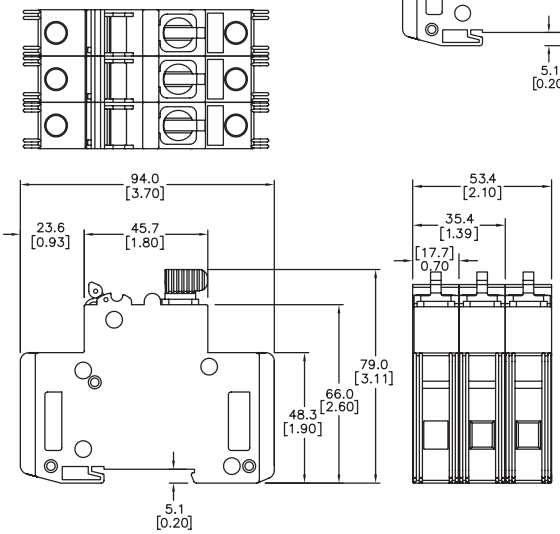
Compact Fusible Switches Dimensions



CFS-1P



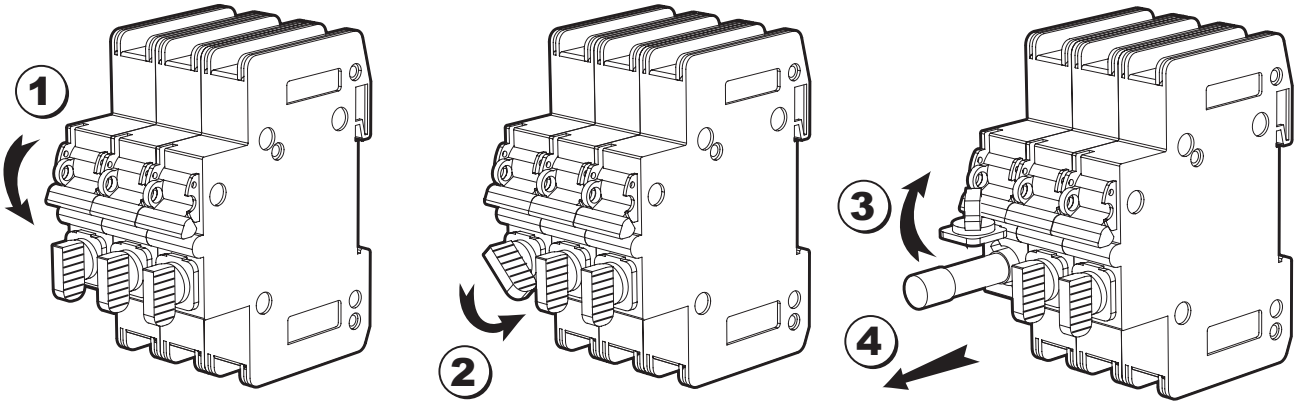
CFS-2P



CFS-3P

Dimensions are approximate, mm [inches]
- Not for construction purposes

Replacing Fuses



Steps:

1. Turn Switch Off.
2. Turn fuse holder compartment knob counterclockwise.
3. Rotate fuse holder compartment knob up.
4. *Remove fuse and replace with appropriate type CC or Midget fuse.

Note: Insert replacement CC fuse with rejection feature (tip) in first.

Gladiator® from AutomationDirect Compact Fusible Switches

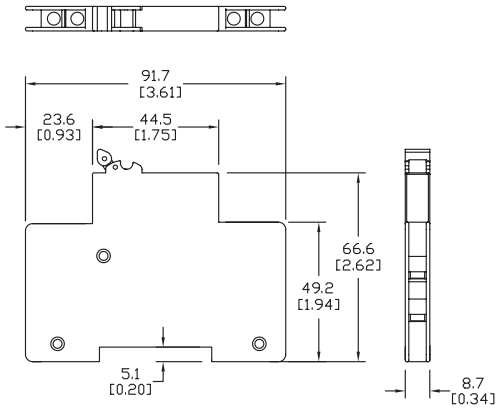
Auxiliary Contact

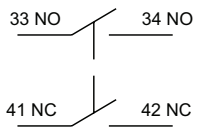
N.O. + N.C. contact output to indicate the status of the switching mechanism on the Gladiator switch.
Mounts on the right side of the switch.

CFS-AUX

General Specifications - CFS-AUX							
Part Number	***Description***	***Rated Ampacity***	***Rated Voltage***	***Flamibility Rating***	***Agency Approvals***	***Weight***	***Price***
CFS-AUX	Auxiliary contact switch 1 NO + 1 NC	5A	240 VAC	UL 94V0	UL 98 Recognized and cURus 22.2 No. 4-04, IEC 60947-5-1 AC15	0.11 lbs. (50g)	$13.00

Auxiliary Contact Dimensions





CFS-AUX

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Disconnect Switches

Starting at $48.50

Compact UL 98 Non-Fusible Switches 30 - 100 Amp Range

- Touch safe
- DIN-rail or back-plate mounted
- Direct or external operation handle
- Double breaking per pole

Starting at $124.00

UL 98 Non-Fusible Heavy Duty Switches 100 - 600 Amp Range

- Fully visible disconnection
- High thermal and dynamic withstand
- High electrical and mechanical endurance

Starting at $18.50

UL 508 Non-Fusible Switches 16 - 100 Amp Range

- Compact and modular
- Direct or external operation
- DIN-rail or base mount
- Suitable as motor disconnect

UL 508 Enclosed Non-Fusible Switches 30 - 60 Amp Range

- 1 removable ground terminal
- Ability to add 1 power pole and 1 auxiliary contact
- NEMA/UL type 1, 3R, 12, 4, 4X
- Suitable as motor disconnect

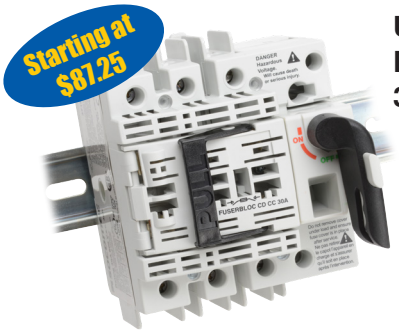
Starting at $66.00

Starting at $214.50

UL 98 Manual Multipolar Load Switches 100 - 250 Amp Range

- Ideal for photovoltaic applications
- 600VDC per UL 98 / CSA
- 1000VDC per UL98B
- Up to 1000VDC per UL IEC 60947-3 characteristics

Starting at $87.25



UL 489 Compact Fusible Disconnect Switches 30 Amp Rating

- Front operation
- Touch safe covers
- Voltage sensing terminals
- Up to 200kA SCCR

Starting at $80.75

UL 98 Fusible Disconnect Switches 30 - 600 Amp Range

- Front and side operation
- Touch safe covers
- Up to 200kA SCCR
- Double break contact

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at www.AutomationDirect.com

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Disconnect Switches

Introduction

UL®/CSA® Standards for Disconnect Switches

UL 98 – Enclosed and Deadfront Switches (CSA C22.2 No. 4)
These requirements cover enclosed or deadfront switches, with or without provision for fuses, at 600V or less. These products are used as disconnecting means without restrictions; they are heavy-duty products requiring 2 inches (50mm) minimum of creepage distance between phases, which gives maximum safety for users and installation. The short-circuit withstand of these products goes up to 200kA.

UL 489 – Molded Case Switches (CSA C22.22 No. 5)
These requirements cover molded case circuit breakers, molded case switches and fused molded case switches, rated at 600V or less and 6000A or less.

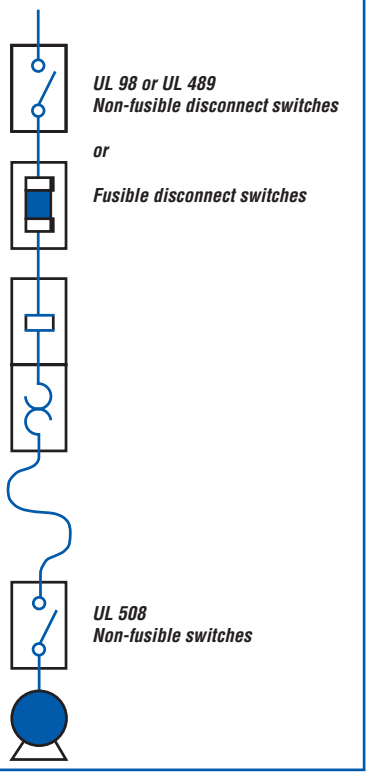
NFPA® 79 Electrical Standard for Industrial Machinery
The following types of machines are identified as industrial machinery:

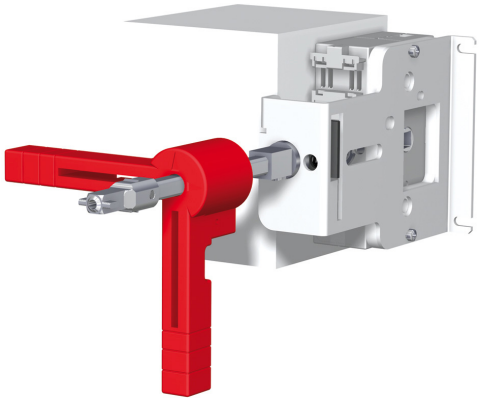
- Metalworking machine tools, including machines that cut or form metal
- Plastics machinery
- Wood machinery, including woodworking, laminating and sawmill machines
- Assembly machines
- Material handling machines, including industrial robots and transfer machines
- Inspection and testing machines, including coordinate measuring and in-process gauging machines

UL® Standards for Electrical Machinery

UL 508 – Industrial Control Equipment (CSA C22.2 No. 14)
These requirements cover manual, magnetic and solidstate starters and controllers, overload relays, pushbuttons, selector switches and control lights. These products are smaller, requiring only a creepage distance between phases of 0.50 inch (12.7 mm). Their use as a disconnecting means is limited to local disconnection of motors. These products can be used as a disconnect means only when they have been additionally tested "suitable as motor disconnect." This additional testing ensures that the switch has a proper closing capacity on a short circuit.
UL 508 devices cannot be used as main disconnect of an electrical panel, e.g., at the entrance of control panels. A manual motor controller marked "suitable as motor disconnect" shall be installed only on the load side of the branch circuit protective device [UL 508A 30.3.3 and NEC 430.109 (6)].

Typical Control Panel





Meeting the requirements of UL508A and NFPA79
The disconnect shall be operable independent of the door position.
The disconnect must be operable, by qualified persons, independent of the door position without the use of accessory tools or devices.
Note: NFPA 79; Paragraph 5.3.3.1 (5).
An operating mechanism for the disconnecting means shall be operable independent of the door position without the use of accessory tools or devices.
Note: UL 508A; Paragraph 66.6.3 c.

Non-Fusible Disconnect Switches

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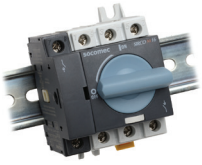
Selection Guide

- Which application?
- Which function?
- Which operation handle?
- Which type of breaking?

		Machine Control			Power Distribution	
		UL 98 Compact Non-Fusible Disconnect Switches	UL 508 Non-Fusible Disconnect Switches	UL 508 Non-Fusible Enclosed Disconnect Switches	UL 98 Non-Fusible Disconnect Switches	UL 98B DC Non-Fusible Disconnect Switches
						
		22013003 22013006 22003010-UL	22003000-UL, 22003001-UL 22003002-UL, 22003003-UL 22003004-UL, 22003006-UL 22003008-UL	22143503 22243503 22243506	27003011, 27004011 27003021, 27004021 27003041, 27003060	27DC3011 27DC4011 27DC3021 27DC4021
Applications						
Main switchboard		✓	✓	✓	✓	✓
Distribution panel		✓	✓	✓	✓	✓
Emergency disconnect		✓	✓	✓	✓	✓
Local safety disconnect (padlockable)		✓	✓	✓	✓	✓
Photovoltaic disconnect						✓
Enclosed switches		✓	✓	✓	✓	✓
Functions						
3/4 pole non-fusible disconnect switch		✓	✓	✓	✓	✓
Characteristics						
Operation	Manual (rotating)	✓	✓	✓	✓	✓
Direct operation handle	Front	✓	✓	✓	✓	✓
External operation handle	Front	✓	✓	✓	✓	✓
	Right side		✓	✓		
Indication of breaking	Positive break indication	✓	✓	✓	✓	✓
Switch body	Modular	✓	✓	✓		

Non-Fusible Disconnect Switches

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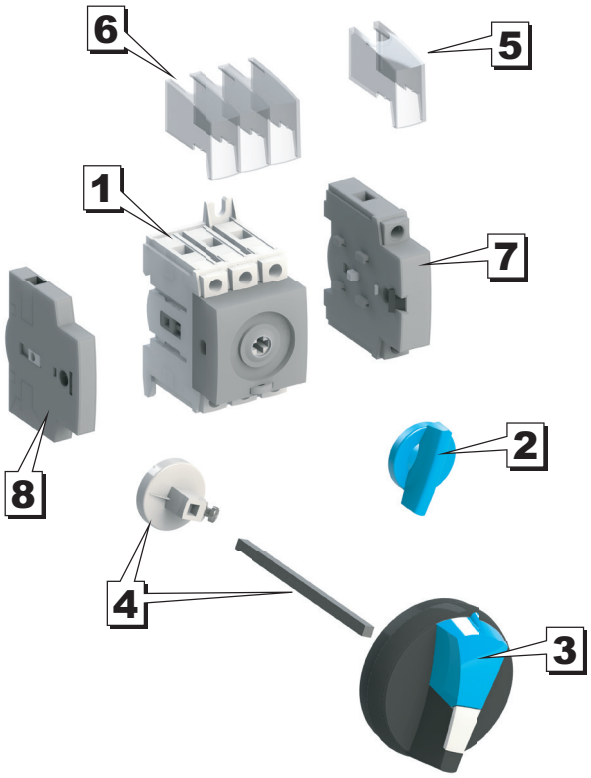
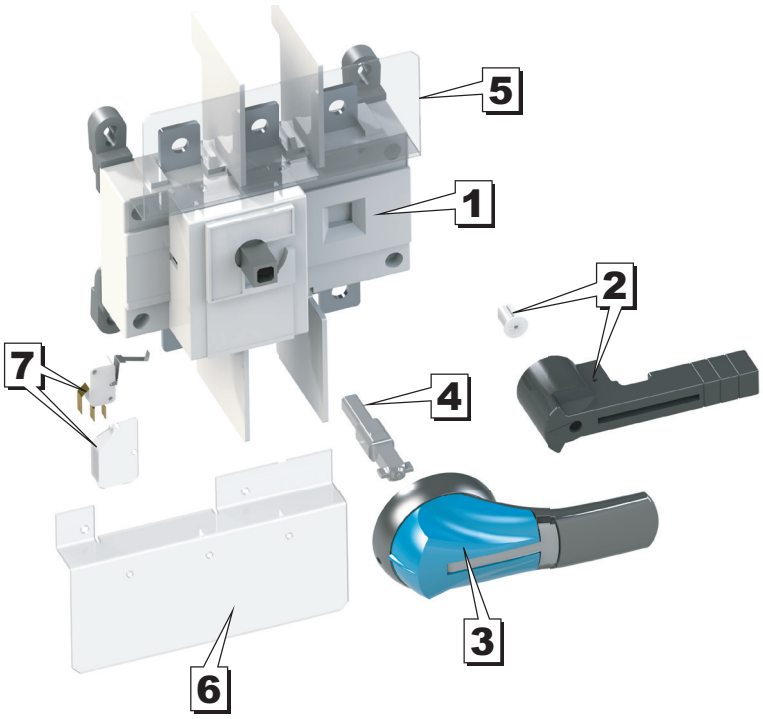
Assembly of Accessories

Non-fusible 16 - 100A Disconnect Switches Accessories



1. Switch body
2. Direct handle
3. External handle
4. Shaft and mount
5. Terminal shroud
6. Terminal shroud
7. Auxiliary contact
8. Additional pole

Non-fusible 100 - 600A Disconnect Switches Accessories



1. Switch body
2. Direct handle
3. External handle
4. Shaft
5. Terminal screen
6. Terminal screen
7. Auxiliary contacts

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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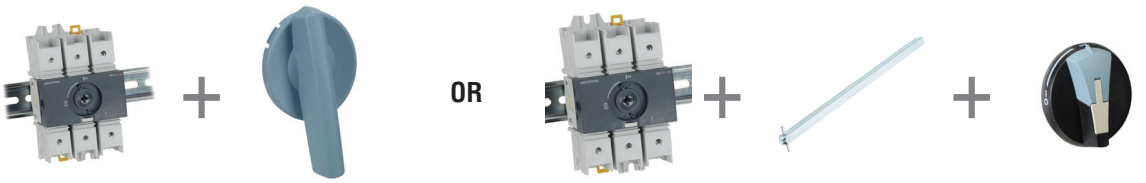
To assemble a switch, please select:

Direct Operation ***External Operation***



Switch Body **Direct Handle** **OR** **Switch Body** **Shaft** **External Handle**

UL 98 Compact Non-Fusible Disconnect Switches				
Part Number	***Description***	***Amp Rating***	***Voltage Rating***	***Price***
22013003	Non-fusible rotary 3-pole disconnect switch, M3 frame size	30	600VAC	$52.00
22013006		60	600VAC	$61.00
22003010-UL		100	600VAC	$69.00

Handles – Defeatable and Lockable						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA/ UL Type***	***Price***
22995032	Mounts directly on switch, no shaft required*	30 - 100	Blue	M01	–	$3.25
147D1111	External front and right side handles, shaft required	16 - 100	Black/Blue	S00	4, 4X	$16.50
147E1111			Red/Yellow			$16.50
14831111		16 - 100	Black/Blue	S0	1, 3R, 12	$18.50
14841111			Red/Yellow			$18.50
148D1111			Black/Blue		4, 4X	$29.50
148E1111			Red/Yellow			$29.50
140F2111			Black/Blue	S01	1, 3R, 12	$24.50
140G2111			Red/Yellow			$24.50
140D2111			Black/Blue		4, 4X	$36.00
140E2111			Red/Yellow			$36.00

****Not defeatable***

M01 Handle 22995032 ***S0 Handle 14831111***

S00 Handle 147D1111 ***S01 Handle 140F2111***

Shafts for External Handles					
Part Number	***Switch Body Rating (A)***	***Handle Type***	***Length (in)***	***Length (mm)***	***Price***
14070515	16 - 100	S00, S0	5.9	150	$3.25
14070520			7.9	200	$4.25
14070532			12.6	320	$5.75
14040520		S01	7.9	200	$8.25
14040532			12.6	320	$9.75
14040540			15.7	400	$17.00

14070515

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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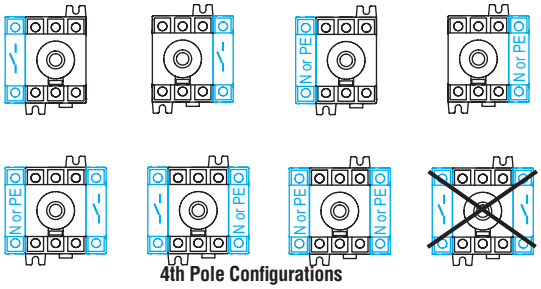
Shaft Guide for External Handle			
Part Number	**Description**	**Handle Type**	**Price**
14190000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length over 300mm. Included with longer shafts.	S00, S0	$1.75
14290000		S01, S1, S2, S3	$5.00

14190000

Additional Poles					
Part Number	**Description**	**Switch Body Rating (A)**	**No. of Poles**	**Use**	**Price**
22011003	Fourth pole module switched 600VAC 100kA SCCR	30	1	Adding one additional pole transforms a non-fusible disconnect switch from 3 poles to 4 poles	$15.50
22011006	Fourth pole module switched 600VAC 65kA SCCR	60	1		$17.50
22001010-UL	Fourth pole module switched 600VAC 100kA SCCR	100	1		$22.50
22005011	Solid neutral pole module unswitched 600VAC	30 - 100	1	Transforms the 3-pole switch into a 3-pole + solid neutral	$18.50
22009011	Grounding pole module unswitched 600VAC	30 - 100	1	Adds 1 ground module pole to the switch-disconnector	$18.50

22011003



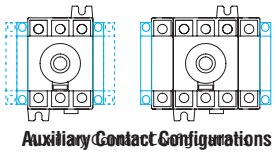
4th Pole Configurations

Terminal Shrouds				
Part Number	**Description**	**Switch Body Rating (A)**	**No. of Poles**	**Price**
22941011	Terminal shroud line/load mount, 2 per pack, offers additional protection against direct contact with the terminals.	30 - 100	1	$3.75
22943016		30 - 100	3	$6.25

22941011

Auxiliary Contacts				
Part Number	**Description**	**Switch Body Rating (A)**	**Contacts**	**Price**
22990001-UL	Auxiliary contact block module, 10A @ 240VAC, can be mounted on left or right side of switch, maximum 4 auxiliary contacts can be used (requires 2 modules)	16 - 100	1 NO / 1 NC	$15.50
22990011-UL		16 - 100	2 NO	$16.50

22990001-UL



Auxiliary Contact Configurations

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 98 / CSA 22.2#4			
	22013003	***22013006***	***22003010-UL***
General use rating (A)	30	60	100
Short-circuit rating at 480VAC (kA)	100	100	100
Short-circuit rating at 600VAC (kA)	100	100	25
Type of fuse	J	J	J
Max fuse rating (A)	30	60	100
Max. motor hp / FLA 3-phase motor max.			
220-240 VAC	10 / 28	20 / 54	20 / 54
440-480 VAC	20 / 27	40 / 52	50 / 65
600VAC	25 / 27	50 / 52	50 / 52
Max. motor hp / FLA 1-phase motor max.			
120VAC	2 / 24	3 / 34	5 / 56
240VAC	5 / 28	10 / 50	10 / 50
Wire type/temperature	Cu / 75°C (167°F)		
Product weight – lb(kg)	1.3 (0.6)		
Wire range			
Solid (AWG)	#12-10	#12-10	#12-10
Torque – lb·in (N·m)	35.4 (4)	35.4 (4)	35.4 (4)
Stranded (AWG)	#10-1	#10-1	#10-1
Torque – lb·in (N·m)	35.4 (4)	35.4 (4)	35.4 (4)
Stranded (AWG)	1/0	1/0	1/0
Torque – lb·in (N·m)	39.8 (4.5)	39.8 (4.5)	39.8 (4.5)
Stranded (AWG)	2/0	2/0	2/0
Torque – lb·in (N·m)	44.3 (5)	44.3 (5)	44.3 (5)
Mechanical characteristics			
Endurance (number of operating cycles)	10,000	10,000	10,000
Operating torque (lb·in / N·m)	12.4 / 1.4	12.4 / 1.4	12.4 / 1.4
Environmental - switch body			
Operating temperature[1]	-20°C to 70°C (-4°F to +158°F)		
Flammability rating	UL 94-V0		
Mounting	35mm DIN rail or panel mount		
Auxiliary contacts			
Electrical characteristics	A300	A300	A300
Agency approvals			
UL file # E201138 (UL 98), CSA file # 112964 (C22.2 NO. 14)			

[1] Temperature above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A.

Note: Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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Technical Characteristics (Continued)

Characteristics According to IEC 60647-3			
	22013003	***22013006***	***22003010-UL***
Thermal current I_{th} at 40°C (A)	30	60	100
Rated insulation voltage U_i (V)	800	800	800
Rated impulse withstand voltage U_{imp} (kV)	8	8	8
Rated operational currents I_e			
400VAC / AC-22A utilization category (A)[1]	32	63	100
400VAC / AC-23A utilization category (A)[1]	32	63	100
690VAC / AC-22A utilization category (A)[1]	32	63	80
690VAC / AC-23A utilization category (A)[1]	32	63	63
Operational power in AC-23 (kW)[2/3]			
@ 400VAC without prebreak AC in AC-23	15	30	45
@ 500VAC without prebreak AC in AC-23	15	30	45
@ 690VAC without prebreak AC in AC-23	18.5	30	45
Overload capacity (U_e 415VAC)			
Rated short-circuit making capacity I_{cm} (kA peak)[4]	12	12	12
Connection			
Min. connection section (mm^2)	2.5	2.5	10
Max. connection section (mm^2)	70	70	70

[1]Category with index A = frequent operation.
[2]A/B: Category with index A = frequent operation - Category with index B = infrequent operation.
[3]The power value is given for information only, the current values vary from one manufacturer to another.
[4]For a rated operating voltage Ue = 400VAC

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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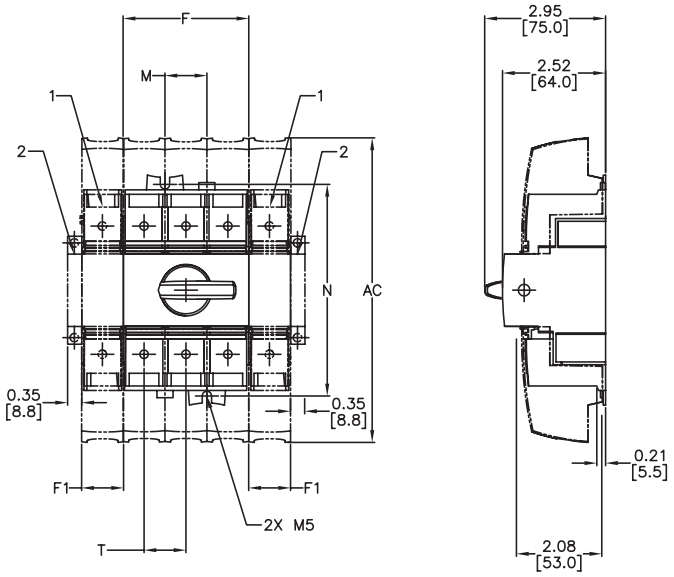
Dimensions [inches/mm]

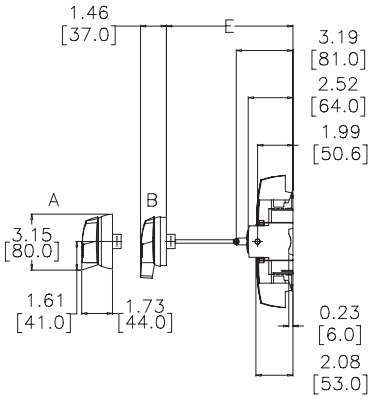
Direct operation with handle



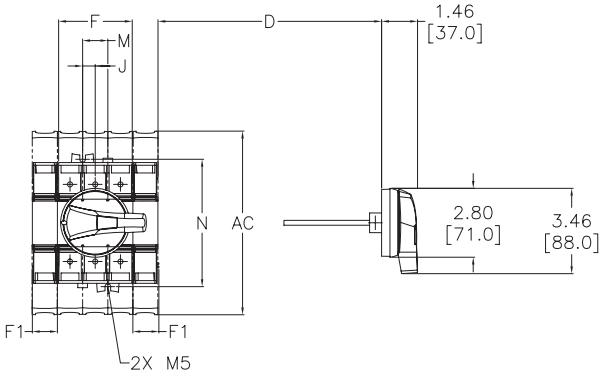
1. Location for: 1 switched fourth pole module (1 per device max), or 1 unswitched neutral pole module, or 1 auxillary contact module
2. Position for auxillary contact module

NOTE: MAX OF 2 ADDITIONAL BLOCK MODULES

External front operation



External side operation



Dimensions													
Switch Body Rating (A) / Frame Size	Units	Overall Dimensions				Terminal Shrouds AC	Switch Body				Switch Mounting		Connection
		D min	D Max	E min	E max		F	F1	G	J	M	N	T
100 / M3	in	1.18	7.87	3.94	14.65	7.44	3.07	1.02	4.91	0.51	1.02	5.17	1.02
	mm	30	201	100	372	189	78	26	124.6	13	26	131.4	26

Please see our website www.AutomationDirect.com for complete engineering drawings.

SIRCO UL 98 Non-Fusible Disconnect Switches

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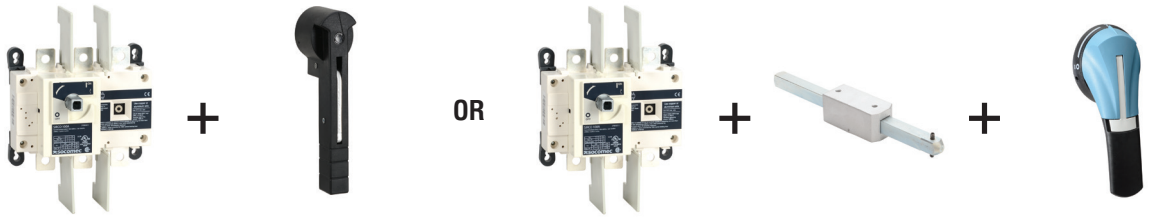
To assemble a switch, please select:

Direct Operation ***External Operation***



Switch Body + Direct Handle OR Switch Body + Shaft + External Handle

UL 98 Non-Fusible Disconnect Switches				
Part Number	***Description***	***Amp Rating***	***# of Poles***	***Price***
27003011	Non-fusible 600VAC rotary disconnect switch, 200kA	100	3	$134.00
27004011			4	$157.00
27003021		200	3	$209.00
27004021			4	$232.00
27003041		400	3	$501.00
27003060		600	3	$866.00

Handles – Defeatable and Lockable						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA/UL Type***	***Price***
26995052	Mounts directly on switch, no shaft required*	100-400	Black	–	–	$14.00
37996012		600	Black	–	–	$28.50
142F2111	External front handles, shaft required	100-400	Black/Blue	S2	1, 3R, 12	$34.50
142G2111			Red/Yellow			$34.50
142D2111			Black/Blue		4, 4X	$48.00
142E2111			Red/Yellow			$48.00
143D3111		600	Black/Bue	S3		$57.00
143E3111			Red/Yellow			$57.00
143F3111			Black/Blue		1, 3R, 12	$44.50
143G3111			Red/Yellow			$44.50
142D2911	External heavy duty front handles, shaft required**	100-400	Black/Blue	S2	4, 4X	$60.00
142E2911			Red/Yellow			$60.00
143D3911		600	Black/Blue	S3		$79.00
143E3911			Red/Yellow			$79.00

Direct Handle 26995052

S2 Type Heavy Duty 142E2911

S2 Type 142F2111

Direct Handle 37996012

S3 Type 143D3111

**** Not defeatable.***

***** Heavy duty handles have larger metal hasp to accommodate multiple locking devices.***

Shafts for External Handles					
Part Number	***Switch Body Rating (A)***	***Handle Type***	***Length (in)***	***Length (mm)***	***Price***
14001020	100-400	S1, S2	7.9	200	$9.25
14001032			12.6	320	$10.00
14001040			15.7	400	$11.50
14011520	600	S3	7.9	200	$12.50
14011532			12.6	320	$16.50
14011540			15.7	400	$18.00

14001020

14011520

SIRCO UL 98 Non-Fusible Disconnect Switches

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Shaft Guide for External Handle

Part Number	Description	Fits Handle Type	Price
14290000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length over 300mm. Included with longer shafts	S01, S1, S2, S3	$5.00

14290000

Auxiliary Contacts

Part Number	Description	Switch Body Rating (A)	Type	Contacts	Price
27990021	Auxiliary Contact Block: 1 Form C, 10A @ 125 VAC	100-600	C Type standard level	1 NO / 1 NC	$10.00
27990022	Auxiliary Contact Block: 1 Form C, 10A @ 125 VAC, 2/pk			1 NO / 1 NC	$14.00
27990121	Auxiliary Contact Block: 1 Form C, 1A @ 125 VAC, low impedance		C Type low impedance	1 NO / 1 NC	$12.00
27990122	Auxiliary Contact Block: 1 Form C, 1A @ 125 VAC, low impedance, 2/pk			1 NO / 1 NC	$19.00

27990021

Terminal Screens

Part Number	Description	Switch Body Rating (A)	No. of Poles	Position	Price
27983021	Terminal screens provide line or load protection against direct contact with terminals or connection parts.	100-250	3	Line	$16.50
27988021				Load	$16.50
27984021			4	Line or load	$19.00
27983041		400	3	Line	$24.50
27988041				Load	$24.50
27983060*		600		Load	$55.00

** Load side screen, the line side is included with the switch.*

27983021

Terminal Lugs

Part Number	Description	Switch Body Rating (A)	Wire Range	Lugs per kit	No cables per lug	Price
39542020	Terminal lug kits allow for the connection of bare copper cables on to the terminals (no spade lugs). Cable type Cu/Al.	100-250	#6 - 300MCM	2	1	$14.00
39543020				3		$20.50
39544020				4		$27.00
39543040		400	#4 - 600MCM	3		$53.00
39543041			2x (#6 - 350MCM)		2	$71.00
39543060		600	2x (#2 - 600MCM)			$108.00

39542020

SIRCO UL 98 Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 98 / CSA 22.2#4				
	27003011 27004011	***27003021 27004021***	***27003041***	***27003060***
General use rating (A)	100	200	400	600
Short-circuit rating at 600VAC (kA)	200	200	200	200
Type of fuse	J	J	J	J
Max fuse rating (A)	100	200	400	600
Max. motor hp / FLA 3-phase motor max.				
220-240 VAC	30 / 80	75 / 192	125 / 312	200 / 480
440-480 VAC	75 / 96	150 / 180	250 / 302	400 / 477
600VAC	100 / 99	200 / 192	350 / 336	350 / 336
Max. motor hp / FLA 1-phase motor max.				
240VAC	10 / 50	10 / 50	–	–
Max. motor hp / DC FLA motor max.				
120VDC[1]	10 / 76	15 / 112	20 / 148	20 / 148
250VDC[2]	15 / 55	15 / 55	50 / 173	50 / 173
Wire type/temperature	Cu / 75°C (167°F)			
Product weight – lb (kg)				
3-pole	4.2 (1.91)	4.2 (1.91)	10.0 (4.6)	18.1 (8.2)
4-pole	5.0 (2.3)	5.0 (2.3)	12.3 (5.6)	23.9 (10.9)
Wire range				
Stranded (AWG)	#6-300MCM	#6-300MCM	#4-600MM	(2) #2-600MCM
Torque – lb·in (N·m)	275 (31)	275 (31)	550 (62)	375 (42.4)
Stranded (AWG)	–	–	(2) 1/0-250MCM	–
Torque – lb·in (N·m)	–	–	550 (62)	–
Stranded (AWG)	–	–	(2) #6-2	–
Torque – lb·in (N·m)	–	–	200 (22.6)	–
Stranded (AWG)	–	–	(2) #1-350MCM	–
Torque – lb·in (N·m)	–	–	375 (42.4)	–
Environmental – switch body				
Operating temperature[3]	-20°C to 70°C (-4°F to +158°F)			
Flammability rating	UL 94-V0			
Mechanical characteristics				
Endurance (number of operating cycles)	10,000	8,000	6,000	6,000
Operating torque (lb·in / N·m)	88.5 / 10	88.5 / 10	128.3 / 14.5	327.5 / 37
Mounting	Panel mount			
Auxiliary contacts				
Electrical characteristics	A300	A300	A300	A600
Approvals				
UL file # E201138 (UL 98), CSA file # 112964 (C22.2 NO. 4)				

[1] 2 pole in series
[2] 3 pole in series
[3] Temperatures above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A

***Note:** Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.*

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

SIRCO UL 98 Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to IEC 60647-3				
	27003011 27004011	***27003021 27004021***	***27003041***	***27003060***
Thermal current I_{th} at 40°C (A)	100	200	400	600
Rated insulation voltage U_i (V)	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp} (kV)	12	12	12	12
Rated operational currents I_e				
400VAC / AC-22A utilization category (A)[1]	100	200	400	630
400VAC / AC-23A utilization category (A)[1]	100	200	400	630
690VAC / AC-22A utilization category (A)[1]	100	200	400	500
Connection				
Min. Cu cable cross section (mm^2)	35	70	185	2 x 150
Min. Cu busbar (mm^2)	–	–	–	2 x 30 x 5
690VAC / AC-23A utilization category (A)[1]	100	200	315	200
Operational power in AC-23 (kW)[2/3]				
@ 400VAC without prebreak AC in AC-23	51	100	220	355
@ 500VAC without prebreak AC in AC-23	63	140	280	450
@ 690VAC without prebreak AC in AC-23	90	185	185	185
Overload capacity (U_e 415VAC)				
Rated short-circuit making capacity I_{cm} (kA peak)[4]	17.6	32	48	48

[1]Category with index A = frequent operation.
[2]A/B: Category with index A = frequent operation - Category with index B = infrequent operation.
[3]The power value is given for information only, the current values vary from one manufacturer to another.
[4]For a rated operating voltage Ue = 400VAC

SIRCO UL 98 Non-Fusible Disconnect Switches

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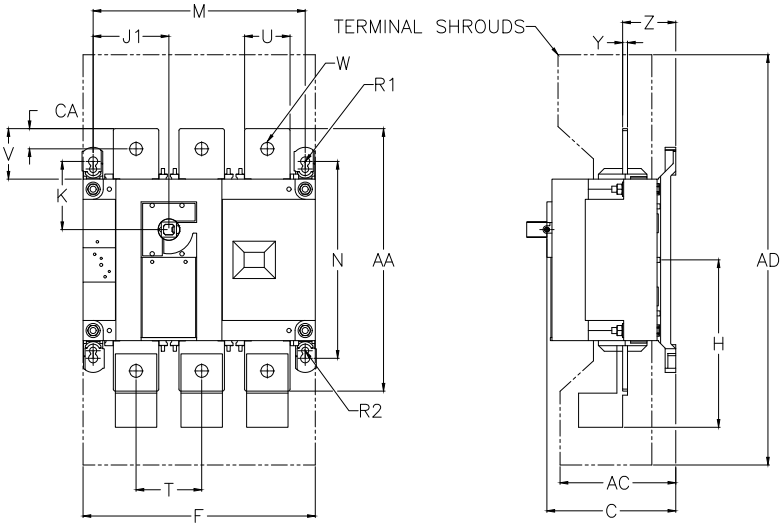
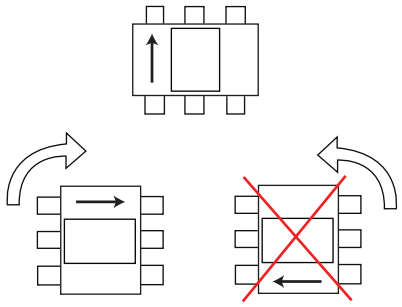
Dimensions [inches/mm]

27003011, 27004011, 27003021, 27004021, 27003041



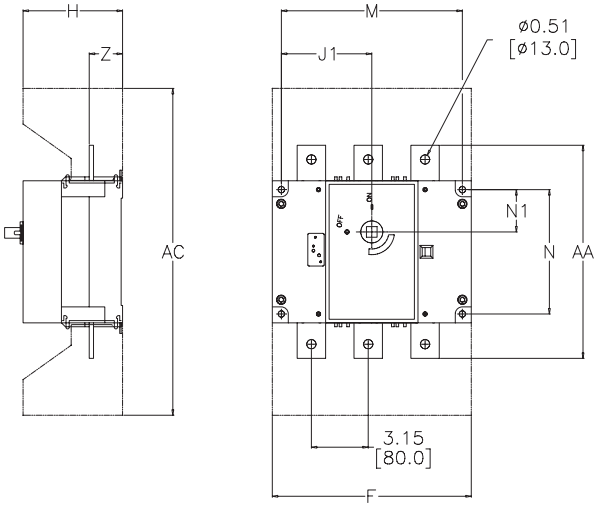
Mounting Orientation



Note: The switch will operate correctly when rotated clockwise 90 degrees.
The switch will not operate correctly when rotated counterclockwise 90 degrees.

Dimensions																							
Switch Body Rating (A)	Unit	Overall Dims	Terminal Shrouds		Switch Body						Switch Mounting					Connection							
		C	AC	AD	F 3p	F 4p	H	J1 3p	J1 4p	K	M 3p	M 4p	N	R1	R2	T	U	V	W	Y	Z	AA	CA
100	in	3.72	3.05	10.1	7.09	9.06	4.22	2.17	4.13	1.8	6.3	8.27	5.31	0.35	0.27	1.97	0.98	1.18	0.43	0.14	1.35	6.3	0.6
	mm	94.6	77.5	256	180	230	107	55	105	45.6	160	210	135	9	7	50	25	30	11	3.5	34.4	160	15
200	in	3.72	3.05	10.1	7.09	9.06	4.22	2.17	4.13	1.8	6.3	8.27	5.31	0.35	0.27	1.97	0.98	1.18	0.43	0.14	1.35	6.3	0.6
	mm	94.6	77.5	256	180	230	107	55	105	45.6	160	210	135	9	7	50	25	30	11	3.5	34.4	160	15
400	in	4.92	4.15	16	9.05	–	6.53	2.95	–	2.65	8.26	–	7.67	0.35	0.27	2.56	1.77	1.97	0.43	0.2	2.08	10.2	0.8
	mm	128	115	406	230	–	166	75	–	67.5	210	–	195	9	7	65	45	50	13	5	53	260	20

27003060



Dimensions													
Switch Body Rating (A)	Unit	Terminal Shrouds	Switch Body					Switch Mounting				Connection	
		AC	F 3p	F 4p	H	J1 3p	J1 4p	M 3p	M 4p	N	N1	AA	Z
600	in	18.12	11	–	5.5	5	–	10.03	–	6.88	2.34	12.6	1.85
	mm	460	280	–	140	127.5	–	255	–	175	59.5	320	47

Please see our website www.AutomationDirect.com for complete engineering drawings.

SIRCO M UL 508 Non-Fusible Disconnect Switches

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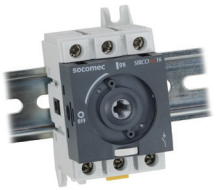
To assemble a switch, please select:

Direct Operation



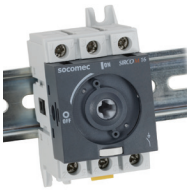
Switch Body

+

Direct Handle

OR

External Operation



Switch Body

+

Shaft

+

External Handle

UL 508 Non-Fusible Disconnect Switches				
Part Number	***Description***	***Switch Body Rating (A)***	***# of Poles***	***Price***
22003000-UL	Non-fusible UL 508 disconnect rotary 600VAC disconnect switch	16	3	$20.50
22003001-UL		20	3	$21.50
22003002-UL		25	3	$23.00
22003003-UL		32	3	$23.50
22003004-UL		40	3	$24.50
22003006-UL		63	3	$32.50
22003008-UL		80	3	$36.50
22003009		100	3	$43.50

Handles – Defeatable and Lockable						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA/ UL Type***	***Price***
22995012	Direct operation handle, shaft not required*	16 - 100	Blue	M00	–	$2.00
14731111	Front and right side handles I - 0, shaft required		Black/Blue	S00	1, 3R, 12	$10.50
14741111			Red/Yellow			$10.50
147D1111			Black/Blue		4, 4X	$16.50
147E1111			Red/Yellow			$16.50
14831111			Black/Blue	S0	1, 3R, 12	$18.50
14841111			Red/Yellow			$18.50
148D1111			Black/Blue		4, 4X	$29.50
148E1111			Red/Yellow			$29.50
140F2111			Black/Blue	S01	1, 3R, 12	$24.50
140G2111			Red/Yellow			$24.50
140D2111			Black/Blue		4, 4X	$36.00
140E2111			Red/Yellow			$36.00

****Not defeatable***

M00 Handle 22995012

S0 Handle 14831111

S00 Handle 147D1111

S01 Handle 140D2111

Shafts for External Handles						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Type***	***Length***		***Price***
				in	***mm***	
14070515	For 3/4-pole switches: shafts are for external front and side handle	16 - 100	S00, S0	5.9	150	$3.25
14070520				7.9	200	$4.25
14070532				12.6	320	$5.75
14040520	For 3/4-pole switches: shafts are for external front and side handle.		S01	7.9	200	$8.25
14040532				12.6	320	$9.75
14040540				15.7	400	$17.00

14070515

SIRCO M UL 508 Non-Fusible Disconnect Switches

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Shaft Guide for External Handle

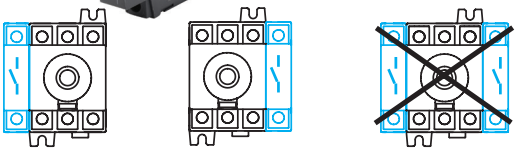
Part Number	Description	Fits Handle Type	Price
14190000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length over 300mm. Included with longer shafts.	S0, S00	$1.75
14290000		S01, S1, S2, S3	$5.00

14190000

Additional Poles

Part Number	Description	Switch Body Rating (A)	No. of Poles	Use	Price
22001000-UL	Module switched 4th pole	16	1	Transforms a 3-pole switch into a 4-pole	$11.00
22001001-UL		20			$12.50
22001002-UL		25			$12.50
22001003-UL		32			$13.50
22001004-UL		40			$15.00

22001000-UL



4th Pole Configurations

Terminal Shrouds

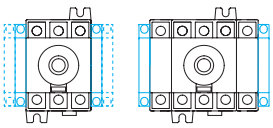
Part Number	Description	Switch Body Rating (A)	No. of Poles	Price
22941005	Terminal shroud line/load mount, 2 per pack, offers additional protection against direct contact with the terminals.	16-40	1	$2.25
22943005			3	$3.25
22941009		63-100	1	$2.75
22943009			3	$4.25

22941005

Auxiliary Contacts

Part Number	Description	Switch Body Rating (A)	Contacts	Price
22990001-UL	Auxiliary contact block module, 10A @ 240VAC, can be mounted on left or right side of switch, maximum 4 auxiliary contacts can be used (requires 2 modules).	16 - 100	1 NO / 1 NC	$15.50
22990011-UL		16 - 100	2 NO	$16.50

22990001-UL



Auxiliary Contact Configurations

Conversion Kit

Part Number	Description	Switch Body Rating (A)	Price
22096009	Front mount transfer switch (2/4 pole) conversion kit. Open center transition (I-O-II).	16 - 100	$23.50
22696009	Front mount multi-pole (6/8 pole) conversion kit.	16 - 100	$19.00

22096009

Door Mounting Kit

Part Number	Description	Switch Body Rating (A)	No. of Poles	Price
22993409	This kit enables direct mounting of the switch on the panel door or on the right or left side of the panel. For use with S0 and S00 handles only.	16-100	3/4	$4.25

22993409

SIRCO M UL 508 Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 508 / CSA 22.2#4								
	22003000-UL	**22003001-UL**	**22003002-UL**	**22003003-UL**	**22003004-UL**	**22003006-UL**	**22003008-UL**	**22003009**
General use rating (A)	16	20	25	32	40	63	80	100
Short-circuit rating at 600VAC (kA)	65	65	65	65	10 / 65	50 / 65	50 / 65	50 / 65
Type of fuse	J	J	J	J	J	J	J	J
Max fuse rating (A)	30	30	30	30	60 / 30	100 / 60	100 / 60	100 / 60
Max. motor hp / FLA 3-phase motor max.								
208VAC	3 / 10.6	5 / 16.7	7.5 / 24.2	7.5 / 24.2	7.5 / 24.2	15 / 46.2	15 / 46.2	15 / 46,2
220-240 VAC	5 / 15.2	5 / 15.2	7.5 / 22	7.5 / 22	7.5 / 22	20 / 54	20 / 54	20 / 54
440-480 VAC	10 / 14	10 / 14	15 / 21	20 / 27	20 / 27	40 / 52	40 / 52	40 / 52
600VAC	10 / 11	15 / 17	20 / 22	25 / 27	25 / 27	40 / 41	40 / 41	40 / 41
Wire type / temperature	Cu / 167°F (75°C)							
Product weight – lb (kg)	0.5 (0.2)					0.7 (0.32)		
Wire range								
Solid (AWG) - 1 wire	#14-10	#14-10	#14-10	#14-10	#14-10	#14-10	#14-10	#14-10
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	39.8 (4.5)	39.8 (4.5)	
Solid (AWG) - 2 wire	(2) #12	(2) #12	(2) #12	(2) #12	(2) #12	(2) #12	(2) #12	(2) #12
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	39.8 (4.5)	39.8 (4.5)	
Stranded (AWG) - 1 wire	#14-4	#14-4	#14-4	#14-4	#14-4	#14-1	#14-1	#14-1
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	39.8 (4.5)	39.8 (4.5)	
Stranded (AWG) - 2 wire	(2) #14-12	(2) #14-13	(2) #14-14	(2) #14-15	(2) #14-16	(2) #10-6	(2) #10-6	(2) #10-6
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	26.5 (3)	39.8 (4.5)	39.8 (4.5)	
Environmental – switch body								
Operating temperature[1]	-20°C to 70°C (-4°F to +158°F)							
Flammability rating	UL 94-V0							
Mechanical characteristics								
Endurance (# of operating cycles)	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Operating torque (lb·in / N·m)	7 / 0.8	7 / 0.8	7 / 0.8	7 / 0.8	7 / 0.8	8.9 / 1	8.9 / 1	8.9 / 1
Mounting	DIN rail or panel mount							
Auxiliary contacts								
Electrical characteristics	A300	A300	A300	A300	A300	A300	A300	A300
Agency approvals								
UL file # E173959 (UL 508, C22.2 NO. 14) Manual motor controller "suitable as motor disconnect" CE2011/65/EU								

[1] Temperatures above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A

Note: Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

SIRCO M UL 508 Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to IEC 60647-3									
		22003000-UL	22003001-UL	22003002-UL	22003003-UL	22003004-UL	22003006-UL	22003008-UL	22003009
General use rating (A)		16	20	25	32	40	63	80	100
Thermal current I_{th} at 40°C (A)		16	20	25	32	40	63	80	100
Rated insulation voltage U_i (V)		800	800	800	800	800	800	800	800
Rated impulse withstand voltage U_{imp} (kV)		8	8	8	8	8	8	8	8
Rated operational currents I_e									
415VAC	**AC-23A / AC-23B utilization category (A/B)[1]**	16 / 16	20 / 20	25 / 25	32 / 32	40 / 40	63 / 63	80 / 80	80 / 80
500VAC	**AC-22A / AC-22B utilization category (A/B)[1]**	16 / 16	20 / 20	25 / 25	32 / 32	40 / 40	63 / 63	80 / 80	-
500VAC	**AC-23A / AC-23B utilization category (A/B)[1]**	16 / 16	20 / 20	25 / 25	25 / 25	25 / 25	63 / 63	63 / 63	-
690VAC	**AC-21A / AC-21B utilization category (A/B)[1]**	16 / 16	20 / 20	25 / 25	32 / 32	40 / 40	63 / 63	80 / 80	100 / 100
690VAC	**AC-22A / AC-22B utilization category (A/B)[1]**	16 / 16	20 / 20	25 / 25	32 / 32	32 / 40	40 / 63	63 / 80	-
690VAC	**AC-23A / AC-23B utilization category (A/B)[1]**	16 / 16	20 / 20	25 / 25	25 / 25	25 / 25	40 / 40	40 / 40	-
Operational power in AC-23 (kW)									
@ 400VAC without prebreak AC in AC-23[1/2]		7.5	9	11	15	18.5	30	37	-
@ 500VAC without prebreak AC in AC-23[1/2]		7.5	9	11	15	15	30	37	-
@ 690VAC without prebreak AC in AC-23[1/2]		7.5	11	15	18.5	18.5	30	37	-
Fuse protected short-circuit withstand (kA rms prospective)									
Prospective short-circuit current (kA rms)[3]		50	50	50	50	50	50	50	25
Associated fuse rating (A)[3]		16	20	25	32	40	63	80	100
Overload capacity (U_e 415VAC)									
Rated short-time withstand current 0.3 s. I_{cw} (kA rms)[3]		2.5	2.5	2.5	2.5	2.5	3	3	1.5
Rated short-circuit making capacity I_{cm} (kA peak)[3]		6	6	6	6	6	9	9	2.1
Connection									
Minimum Cu cable cross section (mm^2)		1.5	1.5	1.5	1.5	1.5	2.5	2.5	2.5
Maximum Cu cable cross section (mm^2)		16	16	16	16	16	35	35	35
Tightening torque min/max (N·m)		2 / 2.2	2 / 2.2	2 / 2.2	2 / 2.2	2 / 2.2	3.5 / 3.85	3.5 / 3.85	3.5 / 3.85

[1]A/B: Category with index A = frequent operation - Category with index B = infrequent operation.

[2]The power value is given for information only, the current values vary from one manufacturer to another.

[3]For a rated operating voltage Ue = 400VAC

SIRCO M UL 508 Non-Fusible Disconnect Switches

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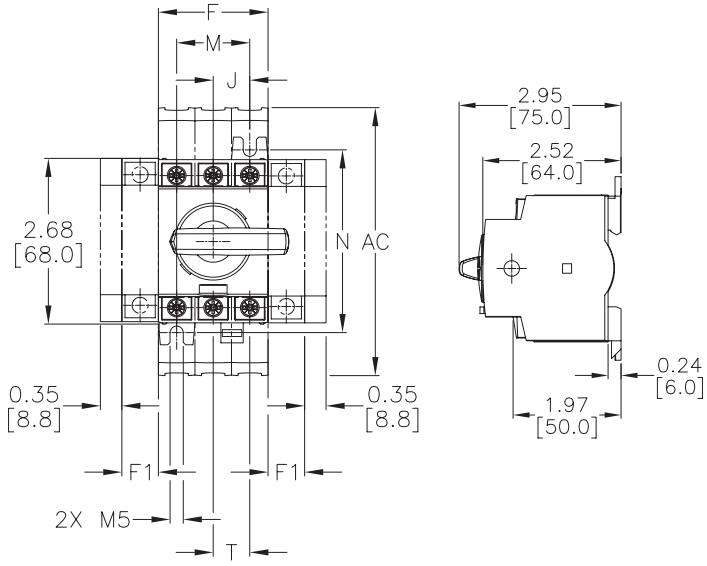
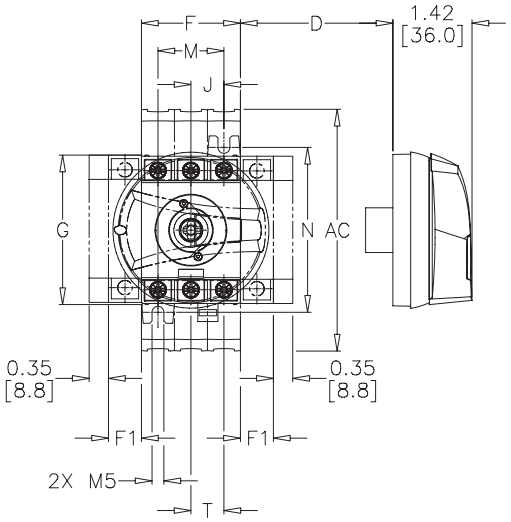
Dimensions

Inches [mm]

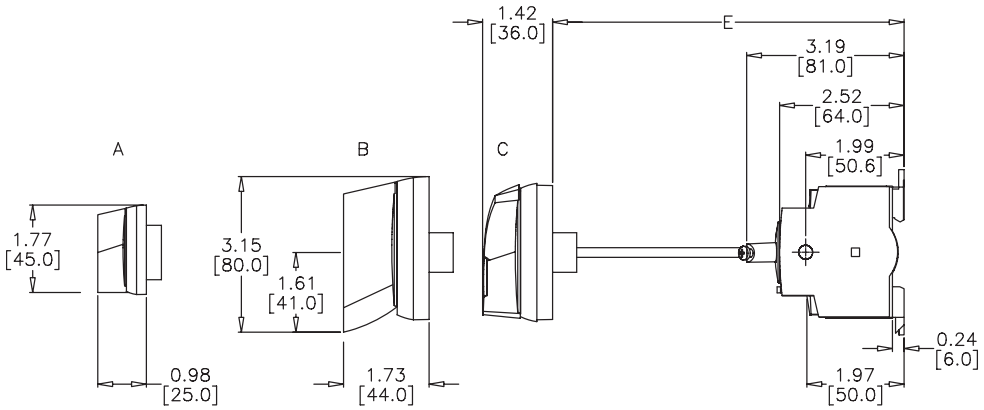
Switch with direct handle



Switch with external handle side operation



Switch with external handle front operation



Dimensions													
Switch Body Rating (A)	Units	Overall Dimensions				Terminal Shrouds AC	Switch Body				Switch Mounting		Connection
		D min	D max	E min	E max		F	F1	G	J	M	N	T
16 - 40	in	1.18	9.25	3.94	14.64	4.33	1.77	0.59	2.67	0.59	1.18	2.95	0.59
	mm	30	235	100	372	110	45	15	68	15	30	75	15
63 - 100	in	1.18	9.25	3.94	14.64	4.33	2.06	0.69	2.99	0.69	1.38	3.35	0.69
	mm	30	235	100	372	110	52.5	17.5	76	17.5	35	85	17.5

Please see our website www.AutomationDirect.com for complete engineering drawings.

SIRCO M UL 508 Enclosed Non-Fusible Disconnect Switches

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Our enclosed UL 508 switches allow for the safe control and disconnection of any motor application.

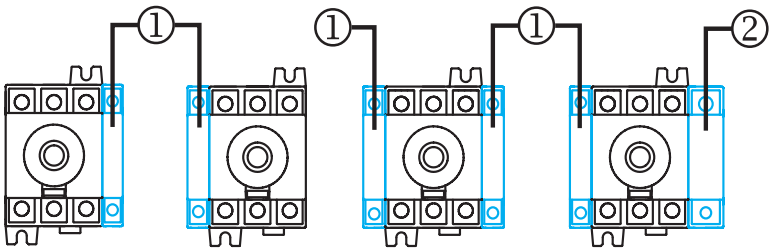
General characteristics

- Gray enclosure with red handle
- Equipped with a 3-pole SIRCO M
- 1 removable ground terminal
- Possibility of adding 1 power pole and 1 auxiliary contact
- Operating temperature -4° to +158°F (-20° to +70°C)
- Polycarbonate plastic
- Flammability rating UL94-5VA
- NEMA/UL Type 1, 3R, 4, 4X, 12

UL 508 Enclosed Non-Fusible Disconnect Switches						Accessories		
Part Number	Enclosure Rating (A)	No. of Poles	Enclosure Size	Weight lb (kg)	Price	Switched 4th Pole Module	Auxiliary Contacts	Terminal Shrouds (Line & Load)
22143503	30	3	1	1.25 (0.56)	$71.00	1P 22001003-UL $13.50	1 NO / 1 NC 22990001-UL $15.50	1P 22941005 $2.25
22243503			2	1.60 (0.72)	$82.00			3P 22943005 $3.25
22243506	60	3	2	1.80 (0.82)	$98.00	–	2 NO 22990011-UL $16.50	1P 22941009 $2.75
								3P 22943009 $4.25

Note: 2294100x fits 4th pole module only.

Configuration of the Auxiliary Contacts



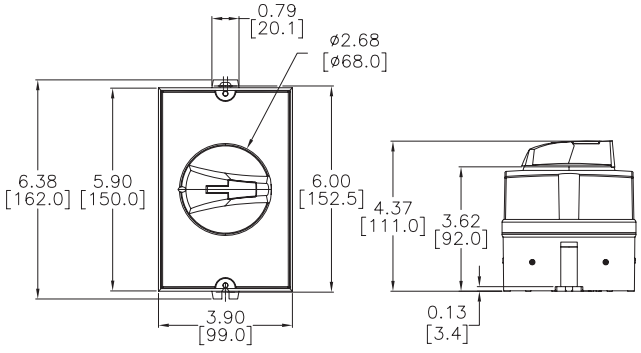
1. M Type auxiliary contacts
2. Additional 4th pole

See switch body drawings for dimensions

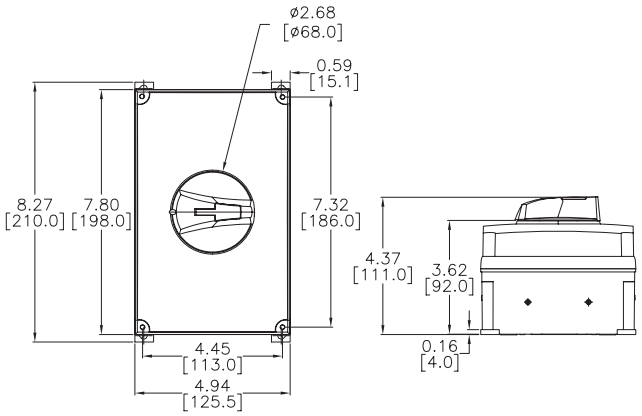
Dimensions

Inches [mm]

Size 1



Size 2



Please see our website www.AutomationDirect.com for complete engineering drawings.

SIRCO M UL 508 Enclosed Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 508 / CSA 22.2#4			
	22143503	**22243503**	**22243506**
General use rating (A)	30A	30A	60A
Max volts (VAC)		600VAC	
Short circuit rating at 600VAC (kA)	65kA	65kA	50kA
Type of fuse		J	
Max fuse rating (A)	30	100	100
Max. motor 3-ph HP			
240VAC	7.5	7.5	20
480VAC	20	20	40
600VAC	25	25	40
Wire type/temperature		Cu / 75°C (167°F)	
Product weight – lb (kg)	1.5 lb (0.68 kg)	1.9 lb (0.86 kg)	2.1 lb (0.95 kg)
Wire range			
Solid (AWG) - 1 wire	#14-10	#14-10	#14-10
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	38.9 (4.5)
Solid (AWG) - 2 wire	(2) #12	(2) #12	(2) #12
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	38.9 (4.5)
Stranded (AWG) - 1 wire	#14-4	#14-4	#14-1
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	38.9 (4.5)
Stranded (AWG) - 2 wire	(2) #14-12	(2) #14-12	(2) #10-6
Torque - lb·in (N·m)	26.5 (3)	26.5 (3)	38.9 (4.5)
Environmental			
Operating temperature[1]	-20°C to 70°C (-4°F to +158°F)		
Flammability rating	UL94-5VA		
Enclosure Material	Polycarbonate		
Enclosure NEMA/UL type	1, 3R, 12, 4, 4X		
Mounting	Wall		
Auxiliary contacts	A300		
Agency approvals			
UL file # E173959 (UL 508, C22.2 NO. 14) Manual motor controller "suitable as motor disconnect" CE 2011/65/EU, 2014/35/EU LVD and 2014/30/EU EMC			

[1] Temperatures above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A

Note: Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

SIRCO UL 98B DC Non-Fusible Disconnect Switches

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To assemble a switch, please select:

Direct Operation ***External Operation***

Switch Body **Direct Handle** **OR** **Switch Body** **Shaft** **External Handle**

UL 98B Non-Fusible Disconnect Switches					
Part Number	***Description***	***Switch Body Rating (A)***	***Voltage Rating***	***# of Poles***	***Price***
27DC3011	Non-fusible UL 98B rotary disconnect switch	100	600VDC	3	$233.00
27DC4011			1000VDC	4	$262.00
27DC3021		250	600VDC	3	$284.00
27DC4021			1000VDC	4	$314.00

Handles – Defeatable and Lockable						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA/UL Type***	***Price***
26995052	Mounts directly on switch, no shaft required*	100-400	Black	–	–	$14.00
142F2111	External front handles, shaft required	100-400	Black/Blue	S2	1, 3R, 12	$34.50
142G2111			Red/Yellow			$34.50
142D2111			Black/Blue		4, 4X	$48.00
142E2111			Red/Yellow			$48.00
142D2911	External heavy duty front handles, shaft required**	100-400	Black/Blue	S2		$60.00
142E2911			Red/Yellow			$60.00

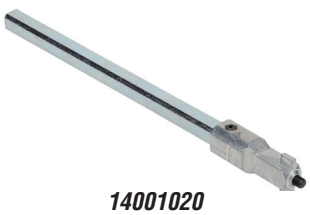
**** Not defeatable***
***** Heavy duty handles have larger metal hasp to accommodate multiple locking devices.***

Direct Handle 26995052

S2 Type 142F2111

S2 Type Heavy Duty 142E2911

Shafts for External Handles					
Part Number	***Switch Body Rating (A)***	***Handle Type***	***Length (in)***	***Length (mm)***	***Price***
14001020	100-400	S1, S2	7.9	200	$9.25
14001032			12.6	320	$10.00
14001040			15.7	400	$11.50



14001020

SIRCO UL 98B DC Non-Fusible Disconnect Switches

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Shaft Guide for External Handle			
Part Number	**Description**	**Fits Handle Type**	**Price**
14290000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length over 300mm. Included with longer shafts.	S01, S1, S2, S3	$5.00

14290000

Auxiliary Contacts					
Part Number	**Description**	**Switch Body Rating (A)**	**Type**	**Contacts**	**Price**
27990021	Auxiliary contact block: 1 Form C, 10A @ 125VAC	100-600	C Type standard level	1 NO / 1 NC	$10.00
27990022	Auxiliary contact block: 1 Form C, 10A @ 125VAC, 2/pk			1 NO / 1 NC	$14.00
27990121	Auxiliary contact block: 1 Form C, 1A @ 125VAC, low impedance		C Type low impedance	1 NO / 1 NC	$12.00
27990122	Auxiliary contact block: 1 Form C, 1A @ 125VAC, low impedance, 2/PK			1 NO / 1 NC	$19.00

27990021

Terminal Screens					
Part Number	**Description**	**Switch Body Rating (A)**	**No. of Poles**	**Position**	**Price**
27983021	Terminal screens provide line or load protection against direct contact with terminals or connection parts.	100-250	3	Line	$16.50
27988021				Load	$16.50
27984021			4	Line or load	$19.00

27983021

Terminal Lugs						
Part Number	**Description**	**Switch Body Rating (A)**	**Wire Range**	**Lugs per kit**	**No cables per lug**	**Price**
39542020	Terminal lug kits allow for the connection of bare copper cables on to the terminals (no spade lugs). Cable type Cu/Al.	100-250	#6 - 300MCM	2	1	$14.00

39542020

SIRCO UL 98B DC Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 98 / CSA 22.2#4 and UL 98B		
	27DC3011, 27DC4011	***27DC3021, 27DC4021***
General use rating (A)	100	250
600VDC / 3P in series (A)	100	250
1000VDC / 4P in series (A)	100	250
Short-circuit capacity at 600VDC		
Prospective short-circuit current (kA rms)[1]	20	20
Type of fuse	Mersen A70P100	Mersen A70P100
Associated fuse rating (A)	200	200
Short-circuit capacity at 1000VDC (any breaker)		
Prospective short-circuit current (kA rms)[1]	10	10
Wire type/temperature	Cu/Al / 75°C (167°F)	
Product weight – lb (kg)		
3-pole	4.2 (1.91)	
4-pole	5.0 (2.3)	
Wire range		
Stranded (AWG)	#6-300MCM	#6-300MCM
Torque - lb·in (N·m)	275 (31)	275 (31)
Environmental – switch body		
Operating temperature[1]	-20°C to 70°C (-4°F to +158°F)	
Flammability rating	UL 94-V0	
Mechanical characteristics		
Endurance (number of operating cycles)	10,000	10,000
Operating torque (lb·in / N·m)	88.5 / 10	88.5 / 10
Mounting	Panel mount	
Auxiliary contact		
Electrical characteristics	A300	A300
Agency approvals		
UL file # E201138 (UL 98), E346418 (UL 98B) CSA file # 112964 (22.2 No. 4)		

[1] Temperatures above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A

Note: Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Characteristics According to IEC 60647-3		
	27DC3011 27DC4011	***27DC3021 27DC4021***
Thermal current I_{th} at 40°C (A)	160	250
Rated insulation voltage U_i (V)	1,200	1,200
Rated impulse withstand voltage U_{imp} (kV)	12	12
Rated operational currents I_e, DC-22B		
750VDC / 3P in series (A)	160	250
1000VDC / 4P in series (A)	160	250

SIRCO UL 98B DC Non-Fusible Disconnect Switches

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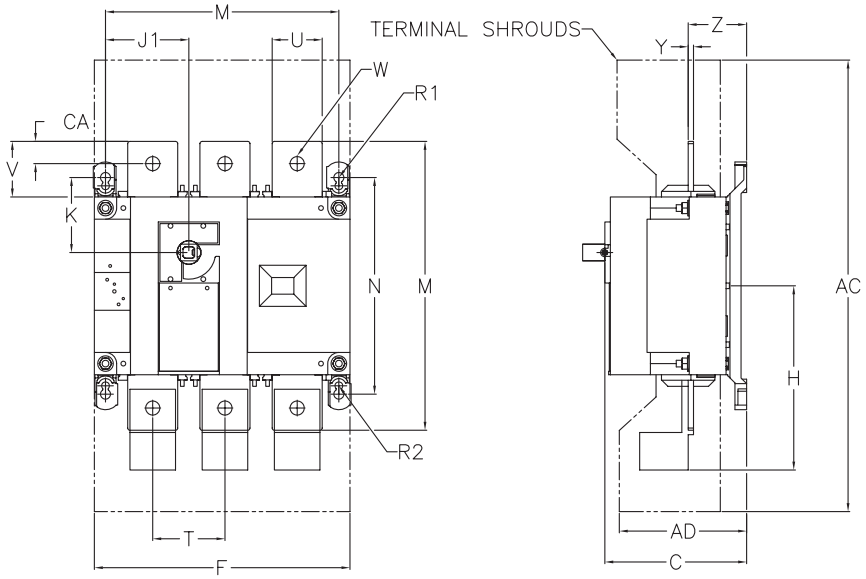
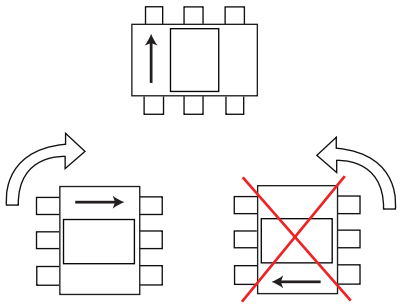
Dimensions [inches/mm]



Dimensions																							
Switch Body Rating (A)	Unit	Overall Dims	Terminal Shrouds		Switch Body						Switch Mounting					Connection							
		C	AC	AD	F 3p	F 4p	H	J1 3p	J1 4p	K	M 3p	M 4p	N	R1	R2	T	U	V	W	Y	Z	AA	CA
100-250	in	3.72	10.1	3.05	7.09	9.06	4.22	2.17	4.13	1.8	6.3	8.27	5.31	0.35	0.27	1.97	0.98	1.18	0.43	0.14	1.35	6.3	0.6
	mm	94.6	256	77.5	180	230	107	55	105	45.6	160	210	135	9	7	50	25	30	11	3.5	34.4	160	15

Please see our website www.AutomationDirect.com for complete engineering drawings.

Mounting Orientation



Note: The switch will operate correctly when rotated clockwise 90 degrees.
The switch will not operate correctly when rotated counterclockwise 90 degrees.

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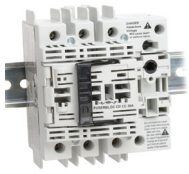
FUSERBLOC UL 489 Compact Fusible Disconnect Switches

To assemble a switch, please select:

Direct Operation



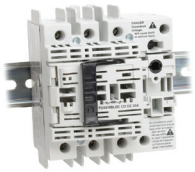
Switch Body

+

Direct Handle

OR

External Operation



Switch Body

+

Shaft

+

External Handle

UL 498 Compact Fusible Disconnect Switches				
Part Number	***Description***	***Frame Size***	***Fuse Type***	***Price***
37103003	Compact UL 489 fusible front operated switch, 30A, 600VAC, 3-pole	1	Class CC	$94.00
37104003	Compact UL 489 fusible front operated switch, 30A, 600VAC, 3-pole with switched neutral			$120.00
37105003	Compact UL 489 fusible front operated switch, 30A, 600VAC, 3-pole with unswitched neutral			$114.00
37103004	Compact UL 489 fusible front operated switch, 30A, 600VAC, 3-pole	2	Class J	$94.00
37104004	Compact UL 489 fusible front operated switch, 30A, 600VAC, 3-pole with switched neutral			$120.00
37105004	Compact UL 489 fusible front operated switch, 30A, 600VAC, 3-pole with unswitched neutral			$115.00

Handles							
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA/ UL Type***	***Test***	***Price***
37294012	Direct handle for class CC disconnect switches*	30	Black	–	–	–	$17.00
37294014	Direct handle for class J disconnect switches*	30	Black	–	–	–	$17.00
14930111	Front operation handle for compact UL 489 fusible disconnect switches, defeatable and lockable	30	Black/Blue	S0	1, 3R, 12	I - O	$18.50
14940111		30	Red/Yellow	S0		I - O	$18.50
149D0111		30	Black/Blue	S0	4, 4X	I - O	$21.00
149E0111		30	Red/Yellow	S0		I - O	$21.00
141F2111		30	Black/Blue	S1	1, 3R, 12	I - O	$24.00
141G2111		30	Red/Yellow	S1		I - O	$24.00
141D2111		30	Black/Blue	S1	4, 4X	I - O	$30.00
141E2111		30	Red/Yellow	S1		I - O	$30.00
141D2115		30	Black/Blue	S1		I - O - Test	$31.50
141E2115		30	Red/Yellow	S1		I - O - Test	$31.50
141D2911	External heavy duty front handles, shaft required**	30	Black/Blue	S1	4, 4X	I - O	$35.00
141E2911		30	Red/Yellow	S1		I - O	$35.00

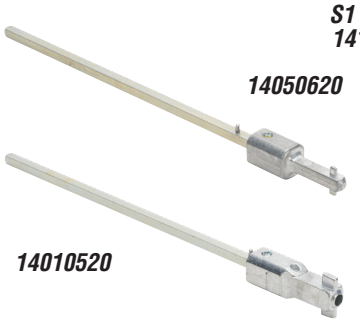
Direct Handle 37294012

S0 Handle 149D0111

S1 Handle 141F2111

**** Defeatable***
*****Heavy duty handles have larger metal hasp to accommodate multiple locking devices.***

Shafts for External Handles					
Part Number	***Switch Body Rating (A)***	***Handle Type***	***Length***		***Price***
			in	***mm***	
14050620	30	S0	7.9	200	$8.25
14050632			12.6	320	$9.75
14050640			15.7	400	$10.00
14010520		S1	7.9	200	$7.50
14010532			12.6	320	$9.00
14010540			15.7	400	$10.00



14050620

14010520

FUSERBLOC UL 489 Compact Fusible Disconnect Switches

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Shaft Guide for External Handle

Part Number	Description	Fits Handle Type	Price
14290000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length longer than 300mm. Included with longer shafts.	S01, S1, S2, S3	$5.00
14190000		S00, S0	$1.75

14290000

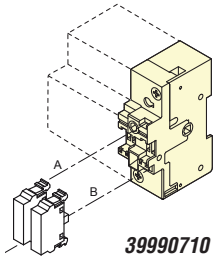
Auxiliary Contacts

Part Number	Description	Switch Body Rating (A)	Contacts	Price
39990701	Front mount auxiliary contacts can be configured to be operated on standard and TEST position switches. Each slot can accommodate up to 2 interlocked auxiliary contacts. 3A @ 240VAC. For 30 to 200A/J, maximum of 4 auxiliary contacts.	30 - 600	1 NO	$7.25
39990702			1 NC	$7.25

39990701

Contact Holder for Additional Auxiliary Contacts

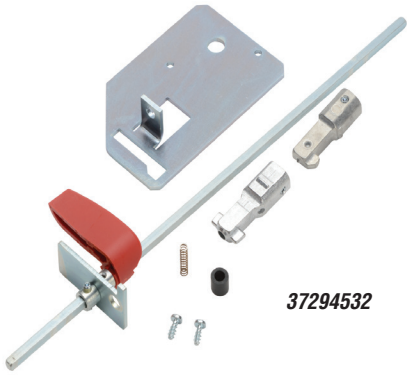
Part Number	Description	Switch Body Rating (A)	Fuse Types	Price
39990710	Additional auxiliary contact holder, side mount. For use with Class CC and J FUSERBLOC compact 30A fused switch bodies. Holds a maximum of 4 (2 wide x 2 high).	30	Class CC / J	$12.00



39990710

NFPA 79 "Through the Door" Kit

Part Number	Description	Switch Body Rating (A)	Frame Size	Price
37294532	Allows retrofit of installations for 30A ratings. Meets both UL 508A and NFPA 79 requirements. Order an S1-type external handle separately.	30	1, 2	$35.50



37294532

FUSERBLOC UL 489 Compact Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 489 / CSA 22.2#5		
	37103003, 37104003 37105003	***37103004, 37104004 37105004***
General use rating (A)	30	30
Short circuit rating at 600VAC (kA)	100	100
Type of fuse	CC	J
Maximum fuse rating (A)	30	30
Operational power (hp) / current max operation 3-phase (A)		
220-240 VAC	7.5 / 22	7.5 / 22
440-480 VAC	15 / 21	15 / 21
600VAC	20 / 22	20 / 22
125VDC[1]	3 / 25	3 / 25
250VDC[2]	5 / 20	5 / 20
Product weight – lb (kg)	1.3 (0.6)	1.4 (0.6)
Environmental – switch body		
Operating temperature[3]	-20°C to 70°C (-4°F to +158°F)	
Flammability rating	UL 94-V0	
Mechanical endurance		
Endurance (number of operating cycles)	10,000	10,000
Operating torque – lb·in (N·m)	3.5 (0.4)	3.5 (0.4)
Mounting	35mm DIN rail or panel mount	
Connection		
Min. connection cross-section (AWG)[2]	#14	#14
Max. connection cross-section (AWG)[2]	#10	#10
Torque – lb·in (N·m)	27 (3)	27 (3)
Agency Approvals		
UL file # E255272 (UL 489, C22.2 No.5) Accessories UL file # 201138, CSA 112964		

[1] 2 poles in series
[2] 3 poles in series
[3] Temperatures above 40°C, the current rating of the switch has to be derated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A

***Note:** Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.*

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

FUSERBLOC UL 489 Compact Fusible Disconnect Switches

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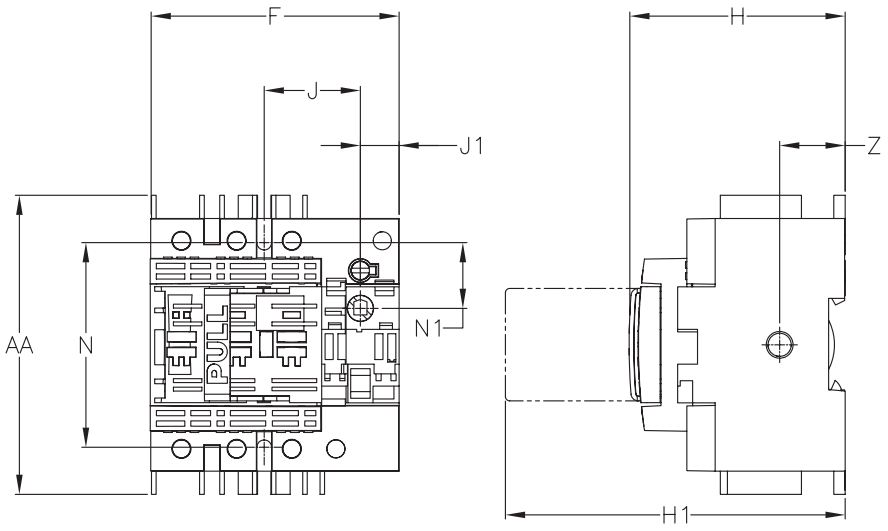
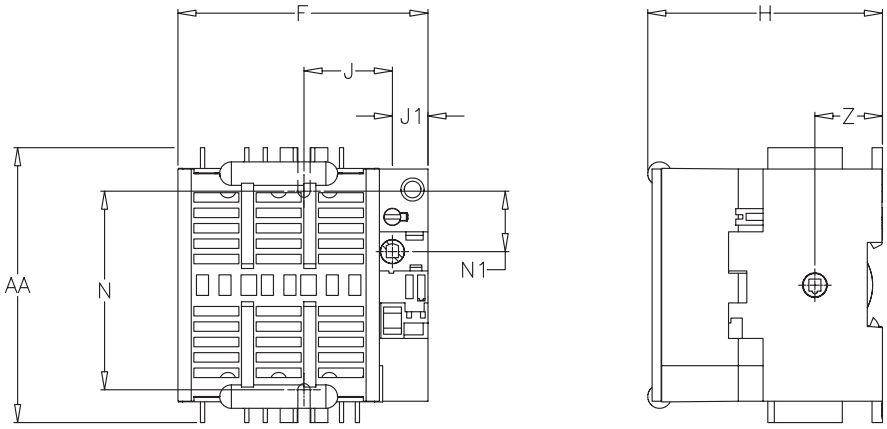
Dimensions [inches/mm]

Class CC



Class J



Dimensions										
Switch Body Rating (A)	Unit	Switch Body					Switch Mounting		Connection	
		F	H	H1	J	J1	N	N1	AA	Z
30 Class CC	in	3.78	3.28	5.19	1.47	0.59	3.13	1	4.56	1.12
	mm	96	83.5	132	37.5	15	79.5	25.5	116	28.5
30 Class J	in	4.13	3.89	–	1.47	0.59	3.30	1	4.56	1.12
	mm	105	99	–	37.5	15	84	25.5	116	28.5

Please see our website www.AutomationDirect.com for complete engineering drawings.

FUSERBLOC UL 489 Compact Fusible Disconnect Switches

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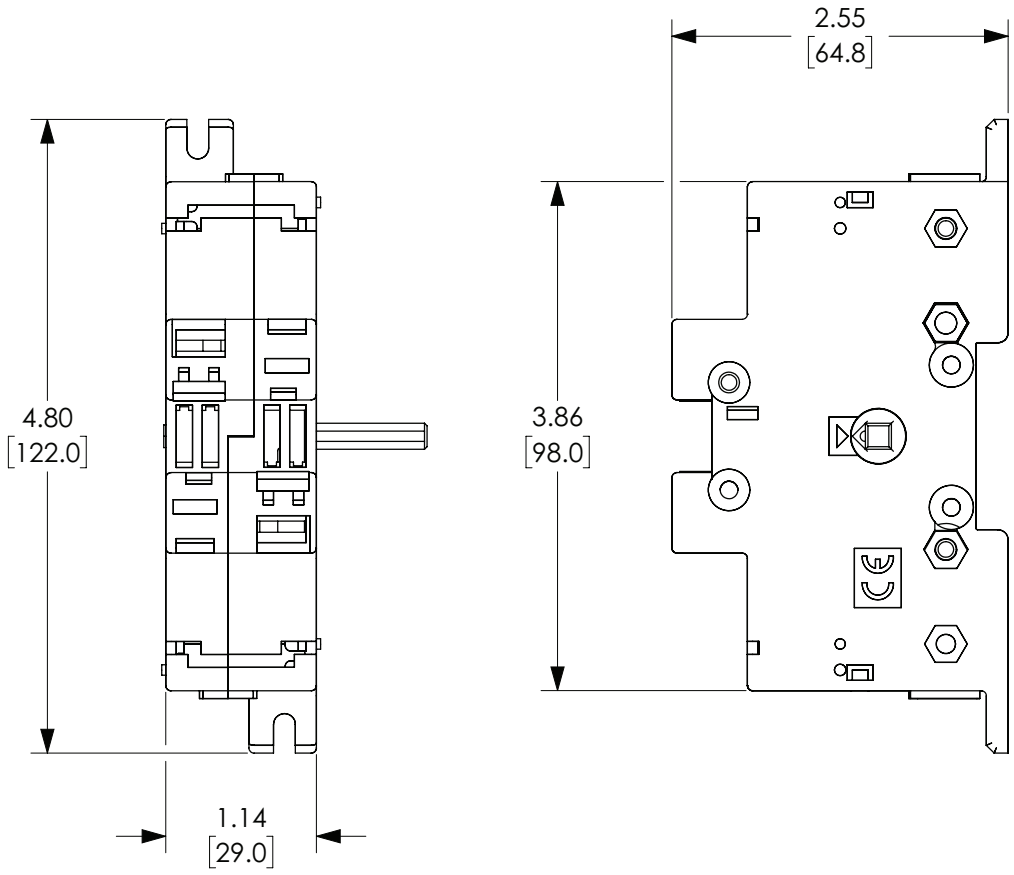
39990710 Contact Holder for Additional Auxiliary Contacts

Dimensions in inches [mm]



Please see our website www.AutomationDirect.com for complete engineering drawings.

FUSERBLOC UL 98 Fusible Disconnect Switches

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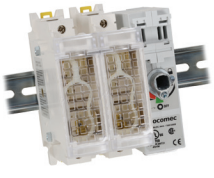
To assemble a switch, please select:

Direct Operation



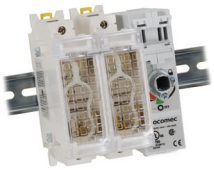
Switch Body

+

Direct Handle

OR

External Operation



Switch Body

+

Shaft

+

External Handle

UL 98 Fusible Disconnect Switches					
Part Number	***Description***	***Switch Body Rating (A)***	***Frame Size***	***Number of Poles***	***Price***
38612004	Front or side operated UL 98 Class J fusible switch, 600VAC, 250VDC	30	4	2	$88.00
38613004				3	$112.00
38616004				4	$132.00
38612005		60		2	$113.00
38613005				3	$140.00
38616005				4	$175.00
38612010		100	5	2	$151.00
38613010				3	$189.00
38616010				4	$241.00
38612020		200	6	2	$416.00
38613020				3	$512.00
38616020				4	$647.00
38513038		400	7	3	$704.00
38503060		600	8	3	$1,226.00

Direct Handle 36297910

Front Operation Handles								
Part Number	***Description***	***Switch Body Rating (A)***	***Fits Frame***	***Handle Color***	***Handle Type***	***NEMA/ UL Type***	***Test***	***Price***
36297910	Direct mount handle	30-400	4 - 7	Black	–	–	–	$21.50
38596011		600	8	Black	–	–	–	$38.50
141F2111	Front operation handle for UL 98 fusible disconnect switches	30-60	4	Black/Blue	S1	1, 3R, 12	I - 0	$24.00
141G2111				Red/Yellow				$24.00
141D2111				Black/Blue	S1	4, 4X	I - 0	$30.00
141E2111				Red/Yellow				$30.00
141D2115				Black/Blue	S1		I - 0 - Test	$31.50
141E2115				Red/Yellow				$31.50
142D2115		100-200	5, 6	Black/Blue	S2	4, 4X	I - 0 - Test	$60.00
142E2115				Red/Yellow				$60.00
142F2111		100-400	5, 6, 7	Black/Blue	S2	1, 3R, 12	I - 0	$34.50
142G2111				Red/Yellow				$34.50
142D2111				Black/Blue		4, 4X	I - 0	$48.00
142E2111				Red/Yellow				$48.00
143F3111		600	8	Black/Blue	S3	1, 3R, 12	I - 0	$44.50
143G3111				Red/Yellow				$44.50
143D3111				Black/Blue		4, 4X	I - 0	$57.00
143E3111				Red/Yellow				$57.00
141D2911	Heavy duty front operation handle for UL 98 fusible disconnect switches	30-60	4	Black/Blue	S1	4, 4X	I - 0	$35.00
141E2911				Red/Yellow				$35.00
142D2911		100-400	5, 6, 7	Black/Blue	S2	4, 4X	I - 0	$60.00
142E2911				Red/Yellow				$60.00
143D3911		600	8	Black/Blue	S3	4, 4X	I - 0	$79.00
143E3911				Red/Yellow				$79.00

S1 Handle 142F2111

S2 Handle 142G2111

S3 Handle 143D3111

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Right Side Operation Handles (No door interlocking)								
Part Number	Description	Switch Body Rating (A)	Fits Frame	Handle Color	Handle Type	NEMA/ UL Type	Test	Price
141H6111	Side operation handle for UL 98 fusible disconnect switches	30-60	4	Black/Blue	S1	4, 4X	I - O	$30.50
141I6111				Red/Yellow				$30.50
142H6111		100-400	5, 6, 7	Black/Blue	S2			$44.50
142I6111				Red/Yellow				$44.50
141H6911	Heavy duty side operation handle for UL 98 fusible disconnect switches*	30-60	4	Black/Blue	S1			$61.00
141I6911				Red/Yellow				$61.00
142H6911		100-400	5, 6, 7	Black/Blue	S2			$74.00
142I6911				Red/Yellow				$74.00

** Heavy duty handles have larger metal hasp to accommodate multiple locking devices.*

141H6111

Shafts for External Handles					
Part Number	Switch Body Rating (A)	Handle Type	Length		Price
			in	mm	
14001020	30-400	S1, S2	7.9	200	$9.25
14001032			12.6	320	$10.00
14001040			15.7	400	$11.50
14001220	600	S3	7.9	200	$12.50
14001232			12.6	320	$15.00
14001240			15.7	400	$17.00

14001020

14001220

Shaft Guide for External Handle			
Part Number	Description	Fits Handle Type	Price
14290000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length longer than 300mm. Included with longer shafts.	S1, S2, S3	$5.00

14290000

Auxiliary Contacts				
Part Number	Description	Body Switch Rating (A)	Contacts	Price
39990701	Front mount auxiliary contacts can be configured to be operated on standard and TEST position switches. Each slot can accomodate up to 2 interlocked auxiliary contacts. 3A @ 240VAC. For 30 to 200A/J, maximum of 4 auxiliary contacts	30 - 600	1 NO	$7.25
39990702			1 NC	$7.25
3999U041	Side operated auxiliary contacts for frame sizes 3 to 8 UL 98 fusible disconnect switches, position OFF and ON signalled by 1 to 4 NO + NC auxiliary contacts. 10A @ 600 VAC/DC. 2/pk	30-200	1 NO	$21.50
3999U042		30-200	1NO / 1NC	$42.00

39990701

3999U041

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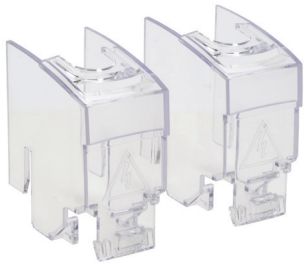
Terminal Shrouds				
Part Number	Description	Switch Body Rating (A)	Pcs/pk	Price
38982020	Line or load protection against direct contact with terminals or connection parts, 1 pole	200	2	$14.50
38983020		200	3	$20.50
38984020		200	4	$26.50
38983040		400	3	$26.00
38983080		600	3	$45.50



38982020

Terminal Lugs					
Part Number	Switch Body Rating (A)	Wire Range	Wires per lug	Lugs per Kit	Price
39542020	200	#6 - 300MCM	1	2	$14.00
39543020				3	$20.50
39544020				4	$27.00
39543040	400	#2 - 600MCM	1	3	$53.00
39543041		2 x (#6 - 350MCM)	2	3	$71.00
39543060	600	2 x (#2 - 600MCM)	2	3	$108.00

Note: Accept either copper or aluminum wires

39542020

NFPA 79 Accessories

Requires flange handle, cable operator and cable.

Flange Handles						
Part Number	Description	Switch Body Rating (A)	Handle Color	Handle Type	NEMA/ UL Type	Price
37299002	Flange handle, meets UL 508A and NFPA 79 requirements. The handle will operate the switch by cable.	30-200	Gray	Standard	1, 3, 3R, 4, 12	$100.00
37299003		30-200	–	Chrome plated	1, 3, 3R, 4, 4X, 12	$269.00

37299002

37299003

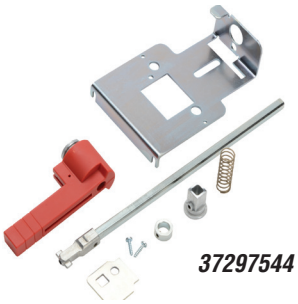
Cable Operator			
Part Number	Description	Switch Body Rating (A)	Price
37299903	Cable flange mechanism links to flange handle and side-operated switches. Must also order flange handle.	30-200	$103.00
Cables			
Part Number	Cable Length (feet)	Cable Length (m)	Price
37299992	3	1	$121.00
37299993	5	1.5	$141.00

37299992

+

37299903

NFPA 79 "Through the Door" Kit					
Part Number	Description	Min Enclosure Depth	Switch Body Rating (A)	Fits Frame Size	Price
37297540	Meets both UL 508A and NFPA 79 requirements. Order an S-type external handle separately (not S0).	11.14 in (238mm)	30-200	3, 4, 5, 6	$45.00
37297544		11.81 in (300mm)	400	7	$65.00
37297552		14.96 in (380mm)	600	8	$137.00



37297544

FUSERBLOC UL 98 Fusible Disconnect Switches

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Blown Fuse Monitors

These fuse monitors detect fuse opening using a bistable (latching) relay and a signaling LED. They can be mounted on a 35mm DIN rail, a back plate, next to the disconnect switch or on the door, or can be mounted directly on the side of Fuserbloc (3861xxx) series switches.

Blown Fuse Monitors for UL 98 Fusible Disconnect Switches						
Part Number	Model	# of LEDs	Auxiliary Contacts	Operating Voltage	Weight lb (kg)	Price
38991120	FMD10	1	1 NO / 1 NC 3A @ 230VAC/30VDC	120 - 260 VAC	0.35 (0.16)	$111.00
38991380				380 - 690 VAC		$124.00
38993120	FMD30	3		120 - 260 VAC		$138.00
38993380				380 - 690 VAC		$151.00

38991120

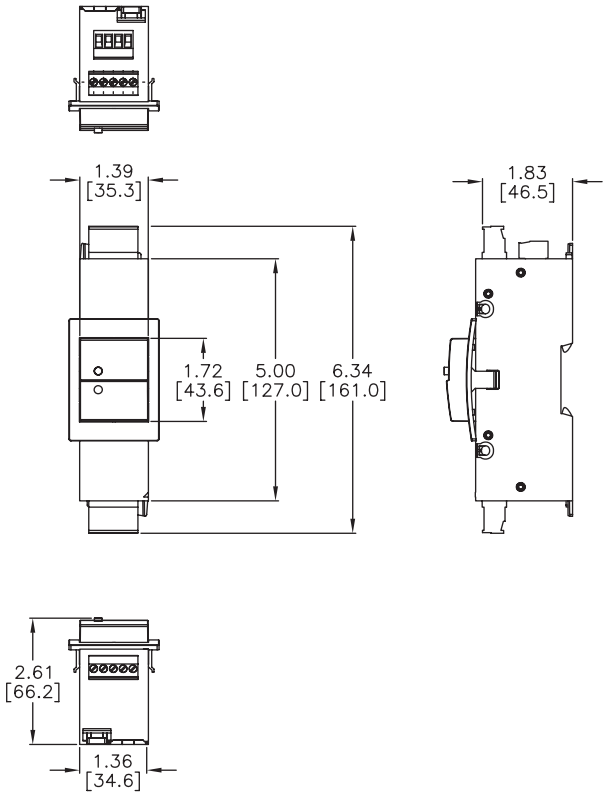
38993120

Fuse Monitors Accessories			
Part Number	Description	Mounting	Price
38199120	Blown fuse monitor connection hardware	Standard	$24.50
38299120	Blown fuse monitor door mounting and connection hardware	Door mounted	$45.50

38199120

38299120

Dimensions [inches/mm]



Please see our website www.AutomationDirect.com for complete engineering drawings.

FUSERBLOC UL 98 Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 98 / CSA 22.2 #4						
	38612004 38613004 38616004	***38612005 38613005 38616005***	***38612010 38613010 38616010***	***38612020 38613020 38616020***	***38513038***	***38503060***
General use rating (A)	30	60	100	200	400	600
Short circuit rating at 600VAC (kA)	200	100	200	200	200	200
Type of fuse	J	J	J	J	J	J
Max. fuse rating (A)	30	60	100	200	400	600
Operational power (hp) / current max operation 3-phase (A)						
220-240 VAC	7.5 / 22	15 / 42	30 / 80	60 / 154	125 / 312	200 / 480
440-480 VAC	15 / 21	30 / 40	60 / 77	125 / 156	250 / 302	500 / 590
600VAC	20 / 22	50 / 52	75 / 77	150 / 144	350 / 336	500 / 475
125VDC[1]	3 / 25	5 / 40	7.5 / 58	15 / 112	20 / 148	–
250VDC[2]	5 / 20	10 / 38	20 / 72	40 / 140	50 / 173	–
Mechanical endurance						
Endurance (number of operating cycles)	10,000	10,000	10,000	8,000	6,000	5,000
Operating torque (lb·in / N·m)	4.1	8.7	9.7	10.2	17	66.2
Wire type/temperature	Cu / 75°C (167°F)			Cu/Al / 75°C (167°F)		
Product weight – lb (kg)						
2-pole	3.0 (1.3)	3.1 (1.4)	4.07 (1.8)	5.7 (2.6)	–	–
3-pole	3.8 (1.7)	4.1 (1.8)	5.3 (2.4)	7.8 (3.5)	16.6 (7.6)	44.2 (20.1)
4-pole	4.7 (2.1)	4.8 (2.2)	6.49 (2.9)	10.8 (4.9)	–	–
Wire range						
Solid (AWG)	#14-10	#14-10	#12-10	–	–	–
Torque – lb·in (N·m)	27 (3.1)	31 (3.5)	35.4 (4)	–	–	–
Stranded (AWG)	#14-6	#14-6	#12-1	#6-300MCM	#4-600MCM	(2) #2-600MCM
Torque – lb·in (N·m)	31 (3.5)	31 (3.5)	35.4 (4)	275 (31)	550 (62)	375 (42.4)
Stranded (AWG)	–	–	–	–	(2) 1/0-250MCM	–
Torque – lb·in (N·m)	–	–	–	–	550 (62)	–
Environmental – switch body						
Operating temperature[3]	-20°C to 70°C (-4°F to +158°F)					
Flammability rating	UL 94-V0					
Mounting	35mm DIN rail or panel mount		panel mount			
Agency Approvals						
UL file # E201138 (UL 98), CSA file # 112964 (C22.2 No. 4)						

[1] 2 poles in series
[2] 3 poles in series
[3] Temperatures above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

FUSERBLOC UL 98 Fusible Disconnect Switches

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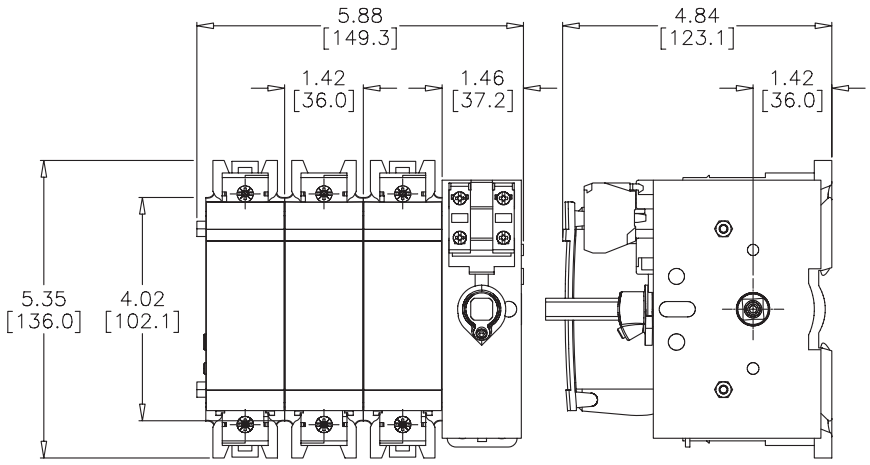
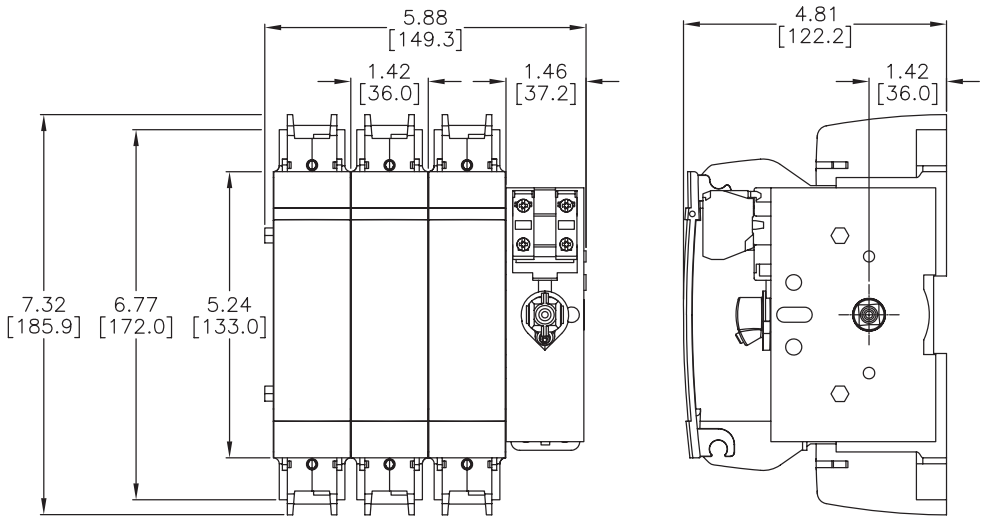
Dimensions [inches/mm]

30A to 60A - Frame Size 4



Note: For 2-pole and 4-pole devices decrease overall width by 1.41"/36mm

100A - Frame Size 5



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FUSERBLOC UL 98 Fusible Disconnect Switches

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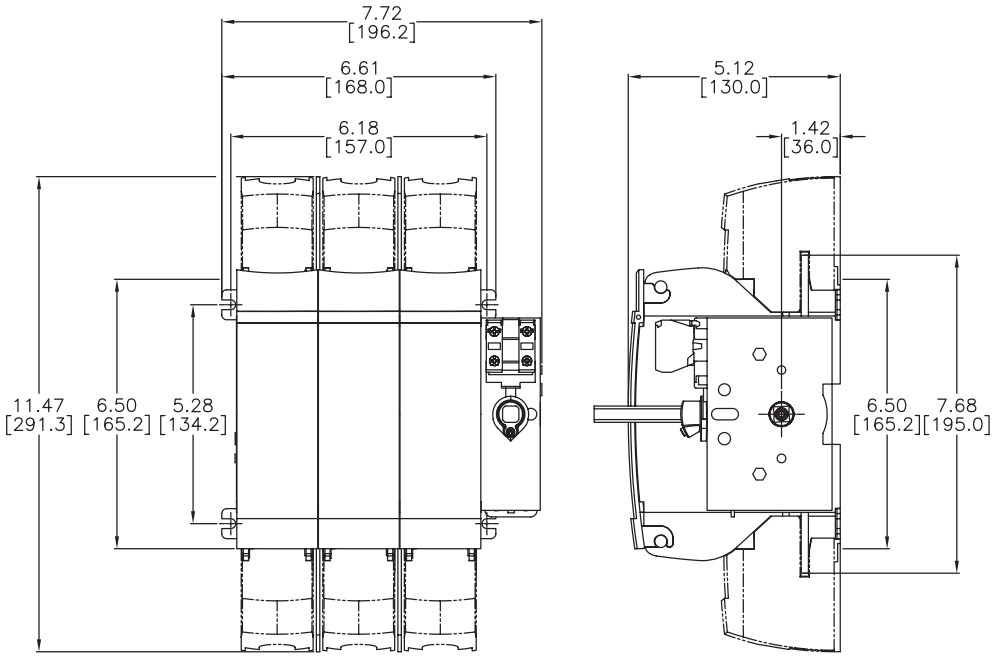
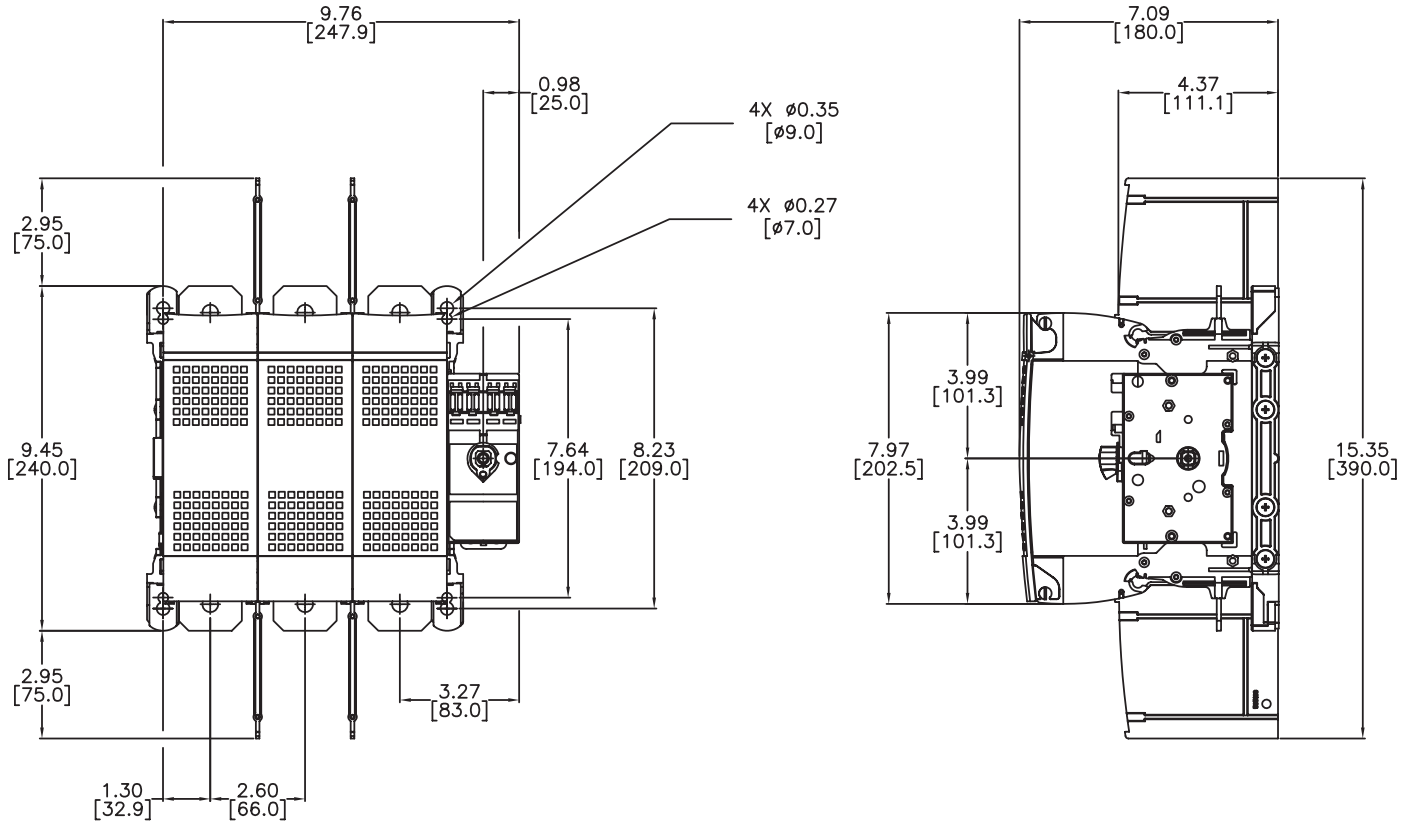
Dimensions [inches/mm]

200A - Frame Size 6



Note: For 2-pole and 4-pole devices decrease overall width by 1.96"/50mm

400A - Frame Size 7



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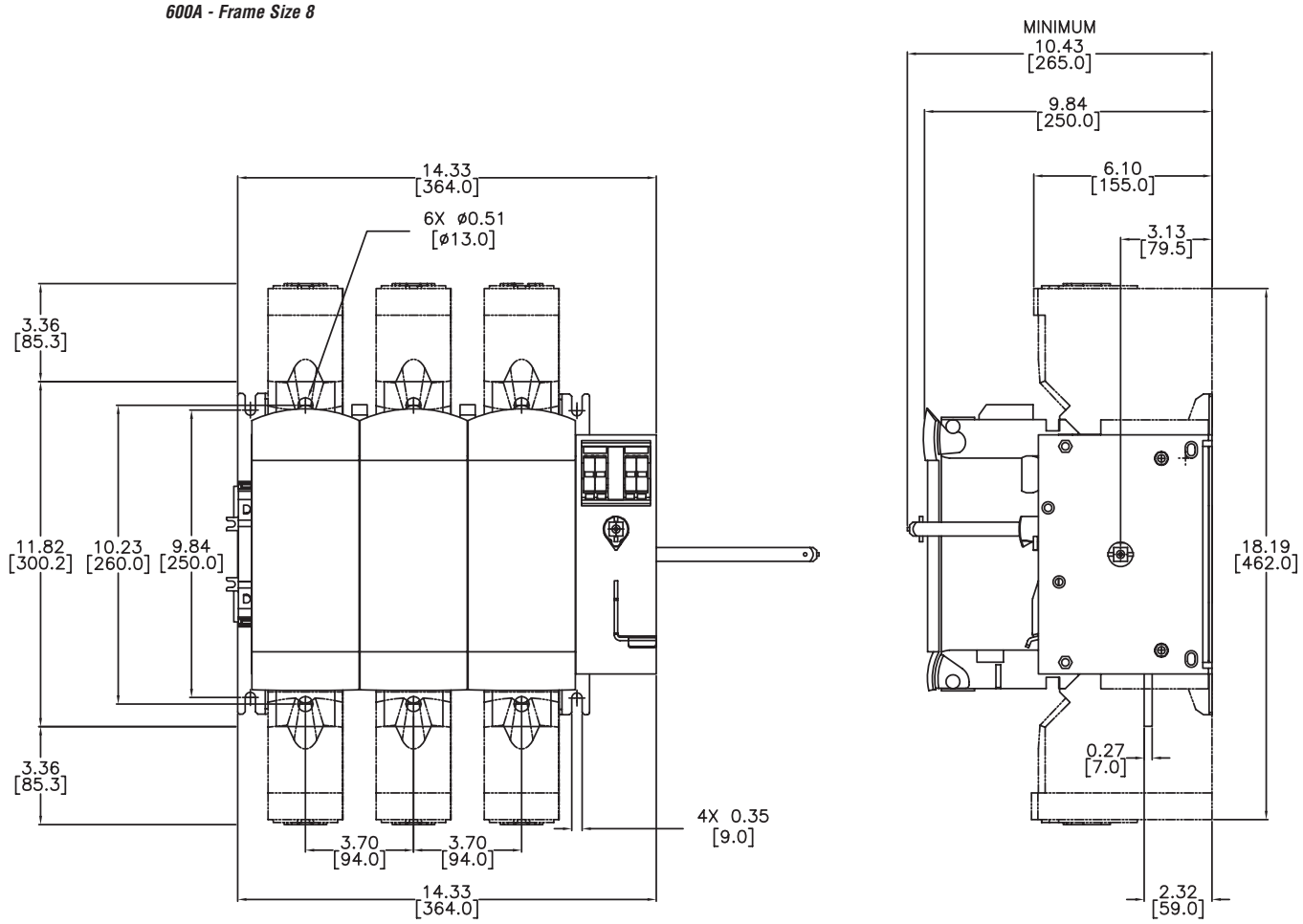
Dimensions [inches/mm]

600A - Frame Size 8



Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

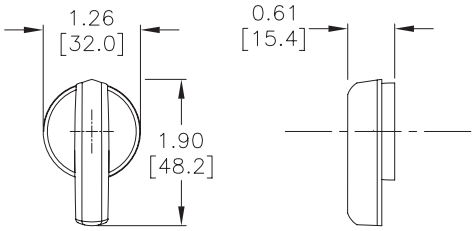
Handles

[inches/mm]

Direct Handle for UL 98 Compact Non-Fusible Disconnect Switches

22995032

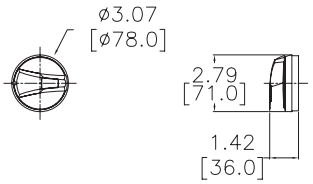
Handle Dimensions



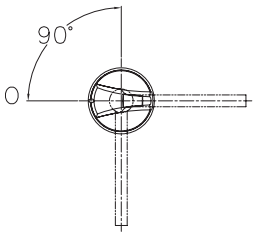
External Handles for UL 98 Compact Non-Fusible Disconnect Switches

S00 Type

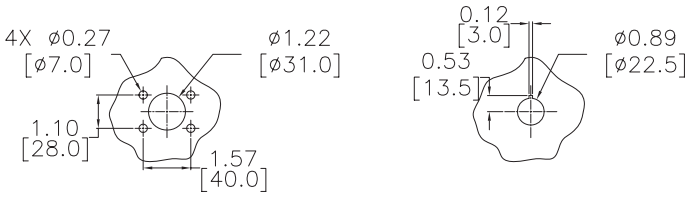
Handle Dimensions



Direction of Operation

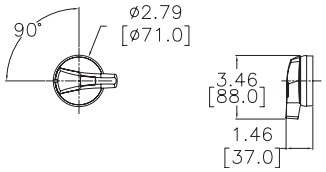


Door Drilling

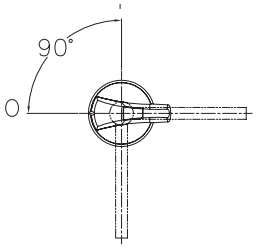


S0 Type

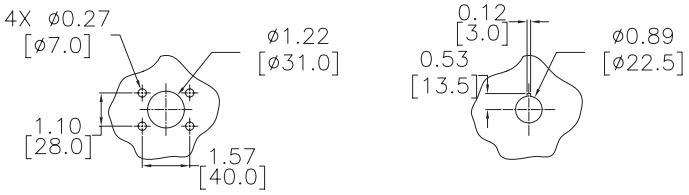
Handle Dimensions



Direction of Operation

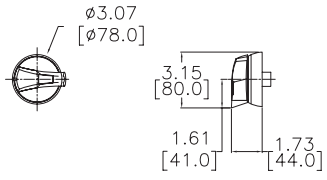


Door Drilling

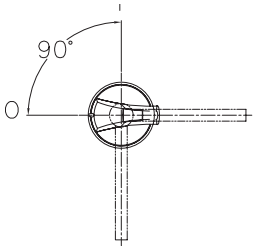


S01 Type

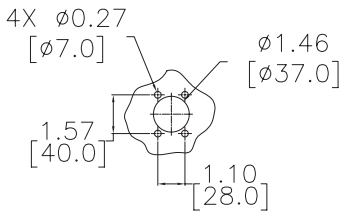
Handle Dimensions



Direction of Operation



Door Drilling



Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

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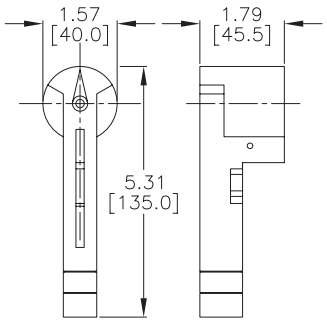
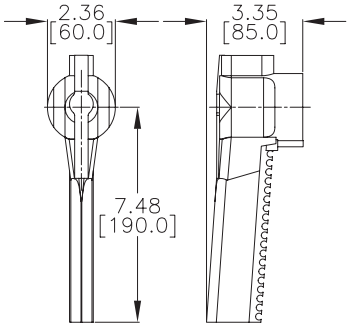
Handles

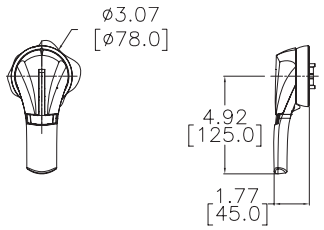
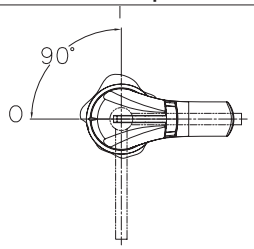
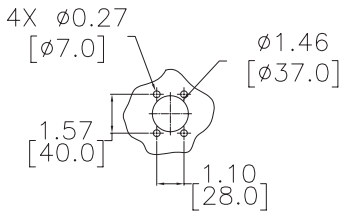
[inches/mm]

Direct Handles for UL 98 Non-Fusible Disconnect Switches

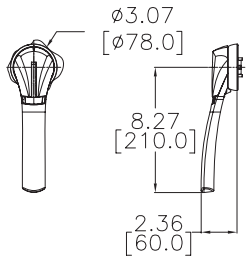
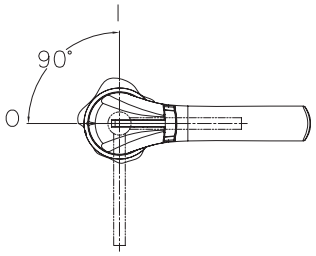
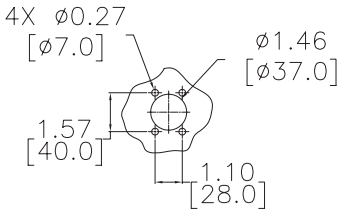
26995052	*37996012*
Handle Dimensions	**Handle Dimensions**
	

External Handles for UL 98 Non-Fusible Disconnect Switches

S2 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

S3 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

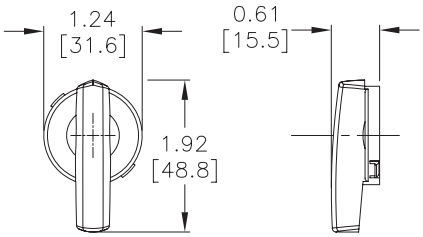
Handles

[inches/mm]

Direct Handle for UL 508 Non-Fusible Disconnect Switches

22995012

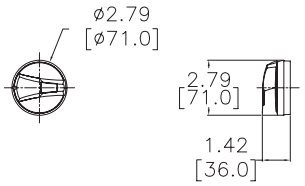
Handle Dimensions



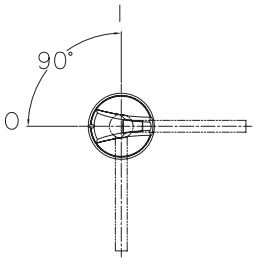
External Handles for UL 508 Non-Fusible Disconnect Switches

S00 Type

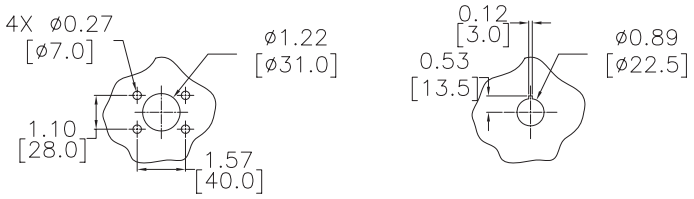
Handle Dimensions



Direction of Operation

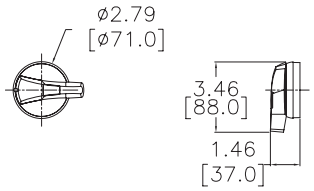


Door Drilling

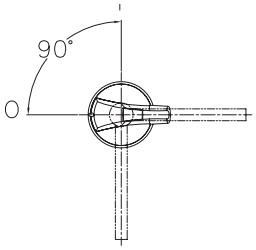


S0 Type

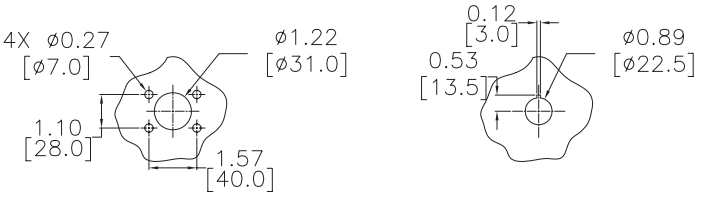
Handle Dimensions



Direction of Operation

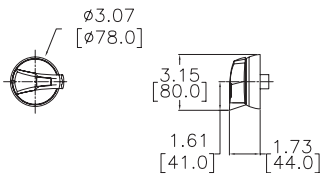


Door Drilling

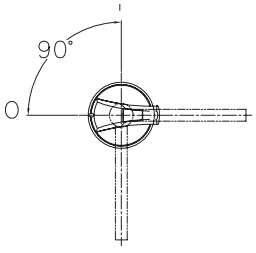


S01 Type

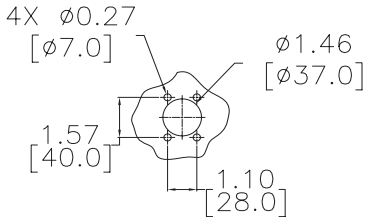
Handle Dimensions



Direction of Operation



Door Drilling



Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

socomec
Innovative Power Solutions

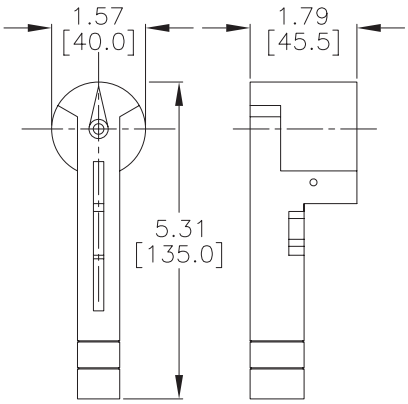
Handles

[inches/mm]

Direct Handle for UL 98B DC Non-Fusible Disconnect Switches

26995052

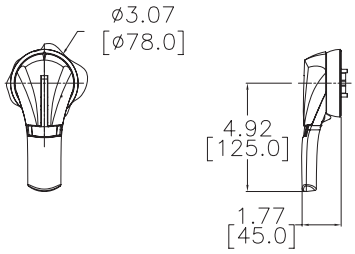
Handle Dimensions



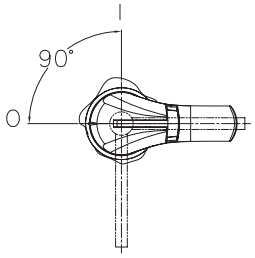
External Handles for UL 98B DC Non-Fusible Disconnect Switches

S2 Type

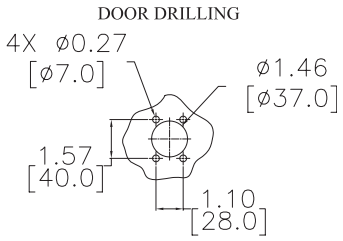
Handle Dimensions



Direction of Operation



Door Drilling



Please see our website www.AutomationDirect.com for complete engineering drawings.

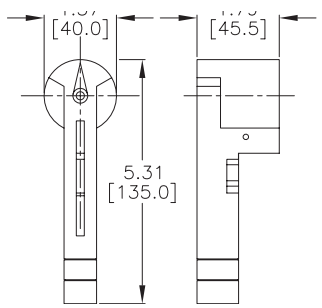
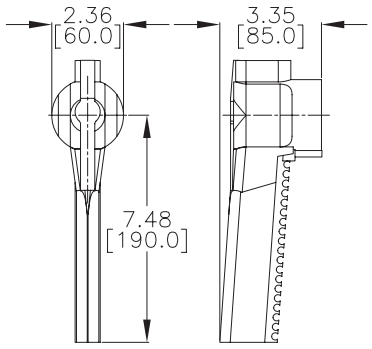
Accessories Dimensions

socomec
Innovative Power Solutions

Handles

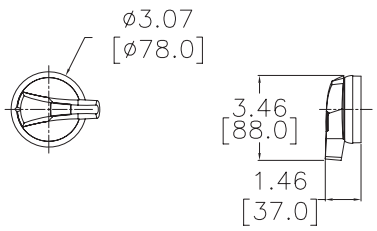
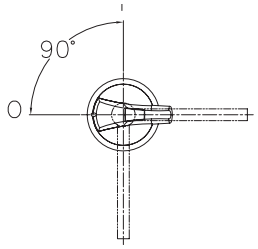
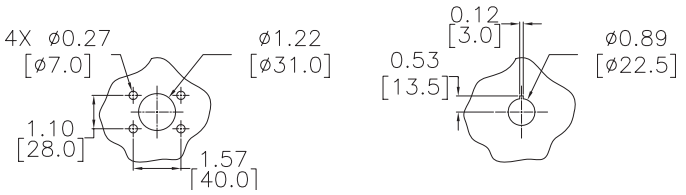
[inches/mm]

Direct Handles for UL 489 Compact Fusible Disconnect Switches

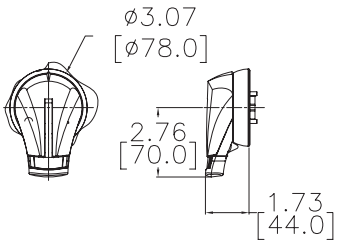
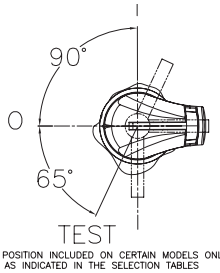
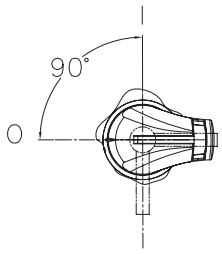
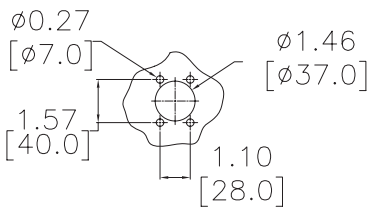
26995052	*37996012*
Handle Dimensions	**Handle Dimensions**
	

External Handles for UL 489 Compact Fusible Disconnect Switches

S0 Type

Handle Dimensions	**Direction of Operation**	**Door Drilling**
		

S1 Type

Handle Dimensions	**Direction of Operation**		**Door Drilling**
			

Note: Test position included on certain models only as indicated in the selection tables.

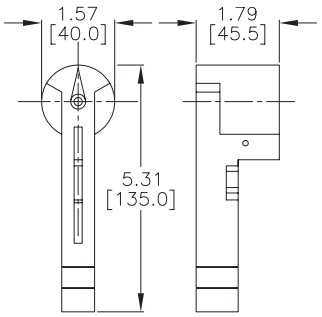
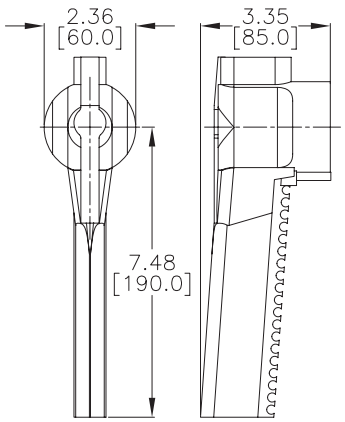
Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

socomec
Innovative Power Solutions

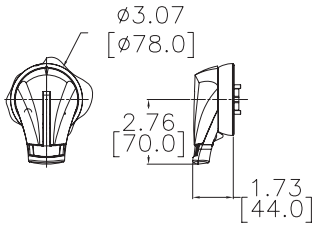
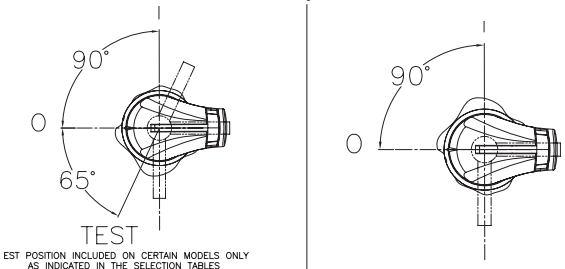
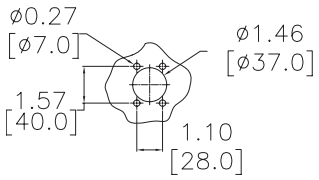
Handles
[inches/mm]

Direct Handles for UL 98 Fusible Disconnect Switches

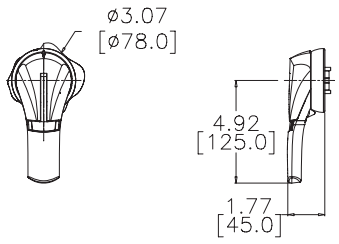
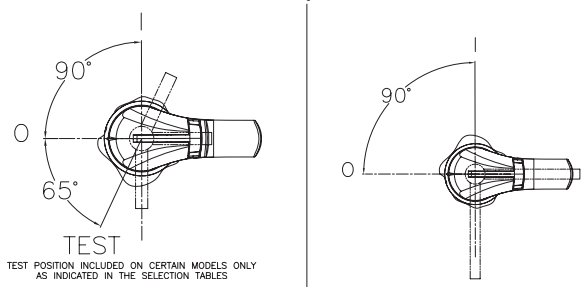
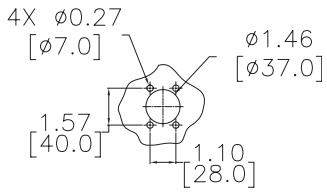
36297910	*38596011*
Handle Dimensions	**Handle Dimensions**
	

External Handles for UL 98 Fusible Disconnect Switches

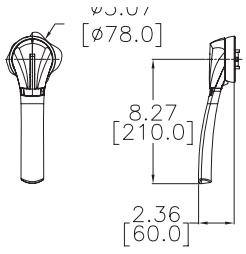
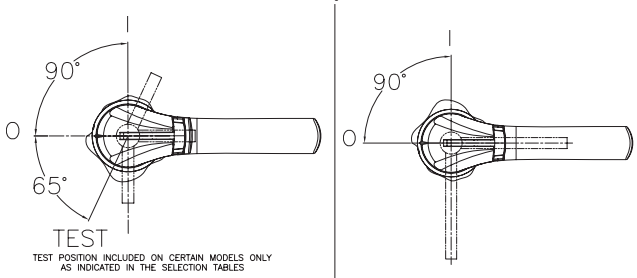
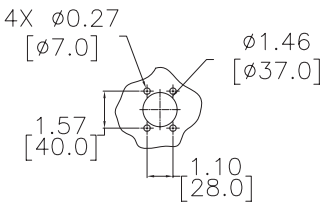
S1 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

S2 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

S3 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

Note: Test position included on certain models only as indicated in the selection tables.
Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

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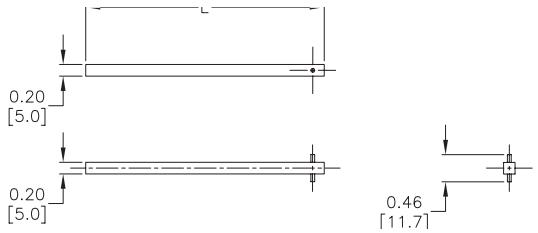
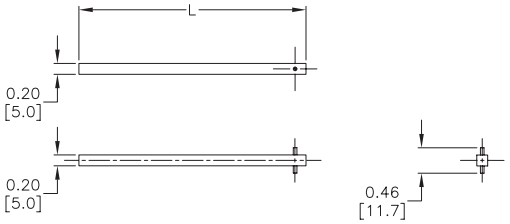
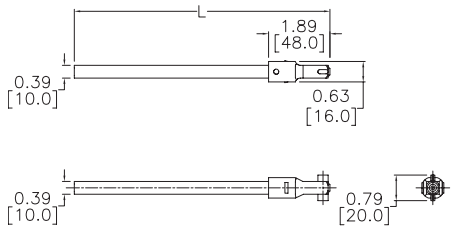
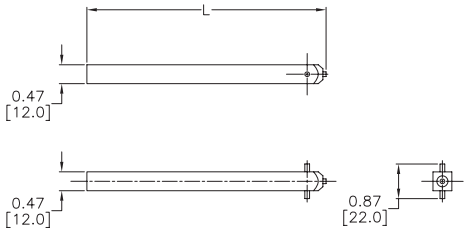
Shafts for Non-Fusible Disconnect Switches

[inches/mm]

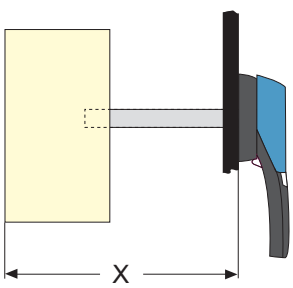
Shafts for Non-Fusible Disconnect Switches				
Shafts for S00, S0 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14070515**	16 - 100	5.9	150
	14070520		7.9	200
	14070532		12.6	320
Shafts for S01 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14040520**	16 - 100	7.9	200
	14040532		12.6	320
	14040540		15.7	400
Shafts for S1, S2 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14001020**	100 - 400	7.9	200
	14001032		12.6	320
	14001040		15.7	400
Shafts for S3 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14011520**	600	7.9	200
	14011532		12.6	320
	14011540		15.7	400

Please see our website www.AutomationDirect.com for complete engineering drawings.

Shaft Length Minimum Dimensions

Use standard lengths:
– 7.9 in / 200mm
– 12.6 in / 320mm
– 15.7 in / 400mm

Switch Body Rating (A)	*Dimension X*		*Handle Type*	*Length*		*Part Number*
	in	*mm*		*in*	*mm*	
100 - 400	5.31 - 10.43	135 - 265	S2	7.9	200	**14001020**
100 - 400	5.31 - 15.16	135 - 385	S2	12.6	320	**14001032**
100 - 400	5.31 - 18.31	135 - 465	S2	15.7	400	**14001040**
600	8.70 - 13.50	221 - 343	S3	7.9	200	**14011520**
600	8.70 - 18.23	221 - 463	S3	12.6	320	**14011532**
600	8.70 - 21.38	221 - 543	S3	15.7	400	**14011540**



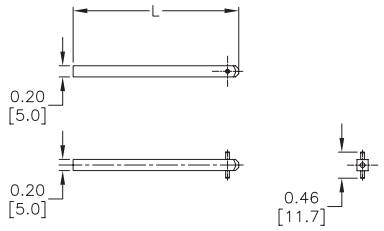
Accessories Dimensions

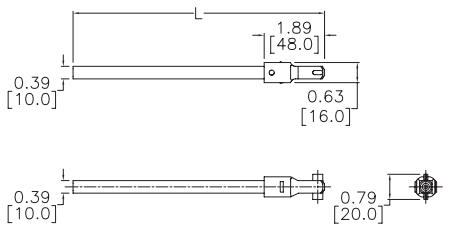
socomec
Innovative Power Solutions

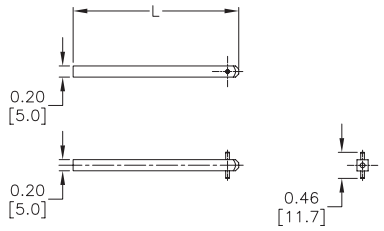
Shafts for Fusible Disconnect Switches

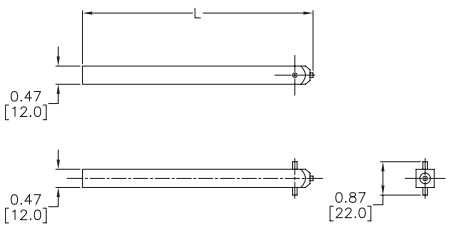
[inches/mm]

Shafts for Fusible Disconnect Switches

Shafts for S0 Handle Type	Part Number	Body Switch Rating	Length in	Length mm
	14050620	30A	7.9	200
	14050632		12.6	320
	14050640		15.7	400

Shafts for S2 Handle Type	Part Number	Body Switch Rating	Length in	Length mm
	14001020	30A to 400A	7.9	200
	14001032	30A to 200A	12.6	320
	14001040	30A to 400A	15.7	400

Shafts for S1 Handle Type	Part Number	Switch Body Rating	Length in	Length mm
	14010520	30A	7.9	200
	14010532		12.6	320
	14010540		15.7	400

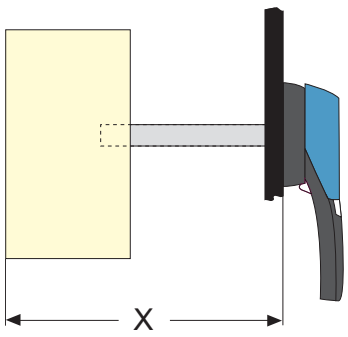
Shafts for S3 Handle Type	Part Number	Switch Body Rating	Length in	Length mm
	14001220	600A	7.9	200
	14001232		12.6	320
	14001240		15.7	400

Please see our website www.AutomationDirect.com for complete engineering drawings.

Shaft Length Minimum Dimensions

Use standard lengths:
– 7.9 in / 200mm – 12.6 in / 320mm – 15.7 in / 400mm

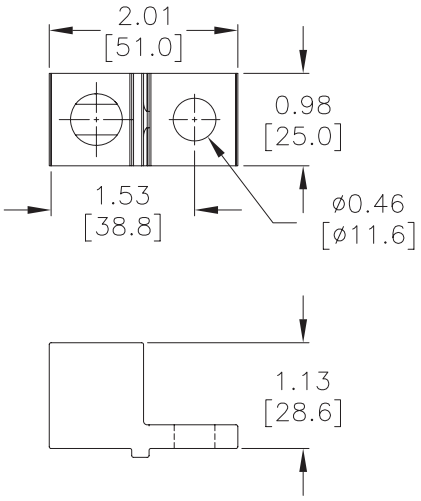
Switch Body Rating (A)	*Dimension X*		*Handle Type*	*Length*		*Part Number*
	in	*mm*		*in*	*mm*	
30	4.02 - 9.65	102 - 245	S0	7.9	200	**14050620**
30	4.02 - 14.37	102 - 365	S0	12.6	320	**14050632**
30	4.02 - 17.52	102 - 445	S0	15.7	400	**14050640**
30	4.02 - 9.65	102 - 245	S1	7.9	200	**14010520**
30	4.02 - 14.37	102 - 365	S1	12.6	320	**14010532**
30	4.02 - 17.52	102 - 445	S1	15.7	400	**14010540**
30 - 100	5.3 - 9.06	135 - 230	S2	7.9	200	**14001020**
200	5.7 - 9.06	145 - 230	S2	7.9	200	**14001020**
400	7.87 - 10.24	200 - 260	S2	7.9	200	**14001020**
30 - 100	5.3 - 13.78	135 - 350	S1, S2	12.6	320	**14001032**
200	5.7 - 13.78	145 - 350	S2	12.6	320	**14001032**
400	7.87 - 14.96	200 - 380	S2	12.6	320	**14001032**
30 - 100	5.3 - 16.93	135 - 430	S1, S2	15.7	400	**14001040**
200	5.7 - 16.93	145 - 430	S2	15.7	400	**14001040**
400	7.87 - 18.1	200 - 460	S2	15.7	400	**14001040**
600 - 800	10.63 - 11.97	270 - 304	S3	7.9	200	**14001220**
600 - 800	10.63 - 16.69	270 - 424	S3	12.6	320	**14001232**
600 - 800	10.63 - 19.84	270 - 504	S3	15.7	400	**14001240**



Accessories Dimensions

Lugs

[inches/mm]



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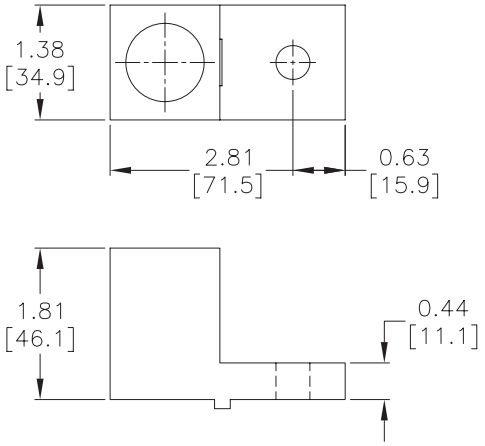

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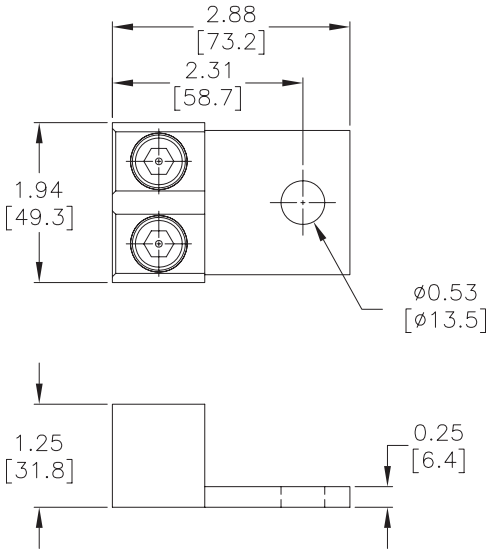

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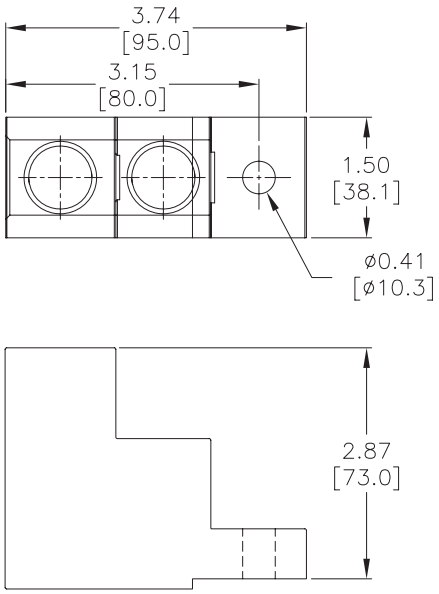

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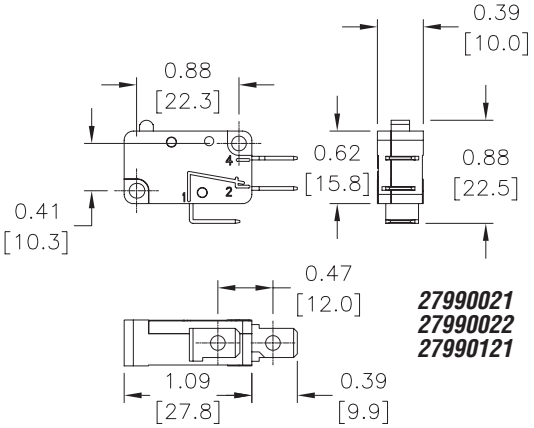
Please see our website www.AutomationDirect.com for complete engineering drawings.

Accessories Dimensions

socomec
Innovative Power Solutions

Auxiliary Contacts and Additional Poles

[inches/mm]



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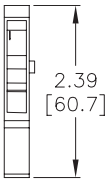

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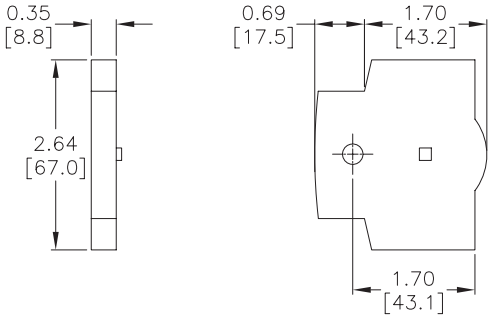

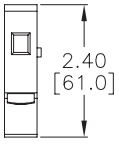

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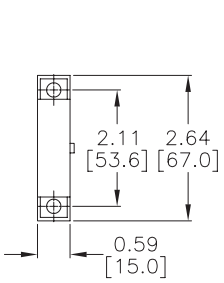

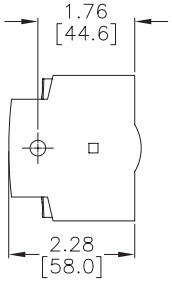

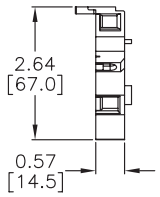

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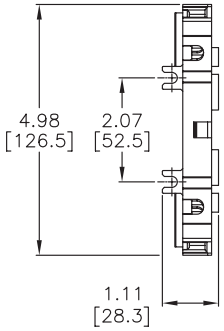

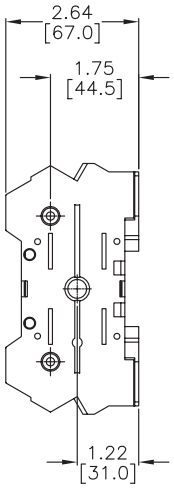

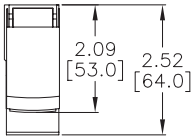

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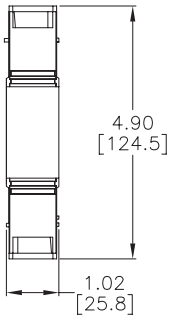

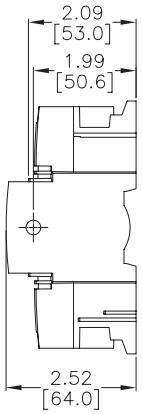

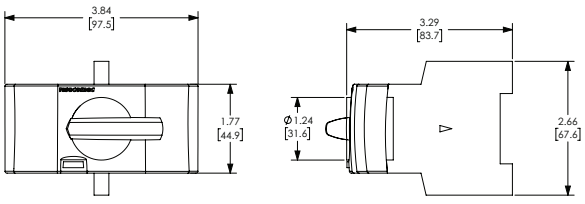

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Please see our website www.AutomationDirect.com for complete engineering drawings.

Get Your Fuses From Us!

AutomationDirect has teamed up with Edison Fuse, a subsidiary of Cooper Industries, the worldwide leader in circuit protection, to offer the Edison line of fuses and fuse holders. Cooper Industries is a $4.1B corporation with seven electrical products divisions, including two fuse brands. The Edison Fuse products are industry-standard fuses that are designed using the highest quality materials and manufacturing methods. All Edison fuses can be directly cross referenced and used as replacements for other name-brand fuses such as Littelfuse, Mersen, Siemens, and many more. Our fuse manufacturer cross reference list is at the end of this section.

AutomationDirect carries a wide range of fuses in convenient package sizes. Just about every electrical system requires some sort of circuit protection, so while you're ordering your other components from us, don't forget the fuses!

Fuses

Fuse Holders

Fuse Blocks

Where to Use a Fuse

Fuses can be used for a variety of overcurrent and overload applications. They can be used to protect transformers, motors, DC power supplies, lighting circuits, contactors, relays and other industrial and commercial electrical equipment and conductors.

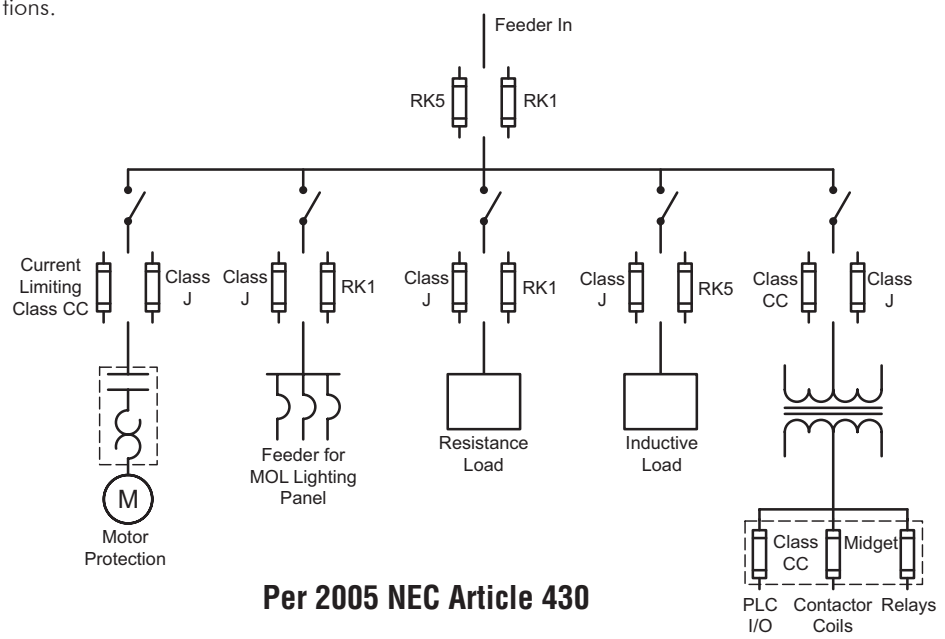
AutomationDirect now carries a vast assortment of fuse types. General purpose Midget Class fuses are typically used as supplemental protection for control loads. IWhere adherence to extensive current limiting codes is not required, the Class M Midget fuses are a great low-cost solution for both time-delay and fast-acting protection.

Current limiting fuses, frequently used in applications for motor branch circuit protection, are available in both time-delay and fast-acting models.

In addition, the current limiting line is recognized for NEC branch circuit protection and Type 2 coordinated applications for IEC or NEMA starters/contactors.

Small dimension fuses are perfect in size and ratings for protection in electronic applications.

And, we've not forgotten the accessories you need: fuse holders and fuse blocks are available in a variety of 1, 2, and 3-pole form factors.



Per 2005 NEC Article 430

10 Great Reasons to Use a Fuse...

Why use a fuse?

Fuses offer a safe and economical solution for overcurrent protection of both conductors and components. Fuses can help make your control systems meet the UL and NEC codes.

1 Safety

Overcurrent protective devices that have tripped are often reset without first investigating the cause of the fault. Electromechanical devices may not have the reserve capacity to open safely when a second or third fault occurs. When a fuse opens it is replaced with a new fuse, so the protection level is not degraded by previous faults. Our current limiting fuses meet the UL and NEC codes.

2 Cost effective

Fuses typically are the most cost effective means of providing overcurrent protection. This is especially true where high fault currents exist or where small components such as Control Transformers or DC power supplies need protection.

3 High interrupting rating

With most low voltage current limiting fuses ($\leq$ 600 volts) having a 200,000 amp interrupting rating, you are not paying a high premium for a high interrupting capacity. Our current limiting fuses meet the UL and NEC codes.

4 Reliability

Fuses have no moving parts to wear out or become contaminated by dust or oil.

5 North American standards

Tri-National Standards specify fuse performance and maximum allowable fuse I^p and I^2t let-thru values.

6 Component protection

The high current limiting action of a fuse minimizes or eliminates component damage.

7 Extended protection

Devices with low interrupting ratings are often rendered obsolete by service upgrades or increases in available fault current. Updated NEC and UL standards are causing the need for potentially expensive system upgrades to non-fused systems.

8 Selectivity

Fuses can be easily coordinated to provide selectivity under both overload and short circuit conditions.

9 Minimal maintenance

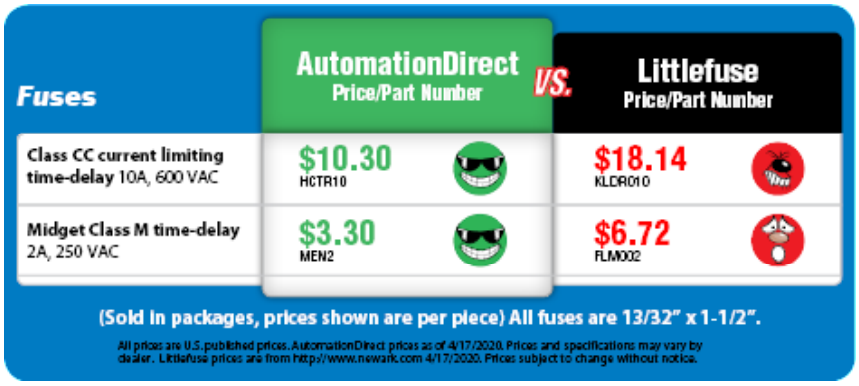
Fuses do not require periodic recalibration as do some electromechanical overcurrent protective devices.

10 Long life

As a fuse ages, the speed of response will not slow down or change. A fuse's ability to provide protection will not be adversely affected by the passing of time.

...plus the best reason of all - our prices!

AutomationDirect has secured great pricing for our fuses, fuse holders and fuse blocks, and can pass those savings on to you. Many items are priced well below industry list prices, making fuse protection a beneficial and affordable option for almost every electrical device.



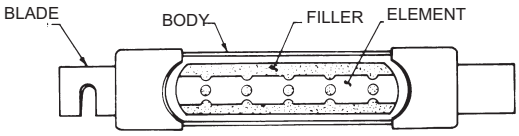
Fuse Construction and Operation

The typical fuse consists of an element which is surrounded by a filler and enclosed by the fuse body. The element is welded or soldered to the fuse contacts (blades or ferrules).

The element is a calibrated conductor. Its configuration, mass and the materials employed are selected to achieve the desired electrical and thermal characteristics. The element provides the current path through the fuse. It generates heat at a rate dependent on its resistance and the load current.

The heat generated by the element is absorbed by the filler and passed through the fuse body to the surrounding air. The filler material, such as quartz sand, provides effective heat transfer and allows for the small element cross-section typical in modern fuses. The effective heat transfer allows the fuse to carry harmless overloads. The small element cross section melts quickly under short-circuit conditions. The filler also aids fuse performance by absorbing arc energy when the fuse clears an overload or short circuit.

When a sustained overload occurs, the element will generate heat at a faster rate than the heat can be passed to the filler. If the overload persists, the element will reach its melting point and open. Increasing the applied current will heat the element faster and cause the fuse to open sooner. Thus, fuses have an inverse time current characteristic:



that is, the greater the overcurrent, the less time required for the fuse to open the circuit.

This characteristic is desirable because it parallels the characteristics of conductors, motors, transformers, and other electrical apparatus. These components can carry low-level overloads for relatively long periods without damage. However, under high-current conditions, damage can occur quickly. Because of its inverse time current characteristic, a properly applied fuse can provide effective protection over a broad current range, from low-level overloads to high-level short circuits.

How to Talk Fuses

Commonly used terms

I^2t (Ampere Squared seconds): A measure of the thermal energy associated with current-flow. I^2t is equal to $(I_{RMS})^2 \times t$, where t is the duration of current flow in seconds.

Clearing I^2t: The total I^2t passed by a fuse as the fuse clears a fault, with t being equal to the time elapsed from the initiation of the fault to the instant the fault has been cleared.

Melting I^2t: The minimum I^2t required to melt the fuse element.

Ampere Rating: The continuous current carrying capability of a fuse under defined laboratory conditions. The ampere rating is marked on each fuse.

Available Fault Current: The maximum short-circuit current that can flow in an unprotected circuit

Coordination: The use of overcurrent protective devices that will isolate only that portion of an electrical system that has been overloaded or faulted.

Current-Limiting Range: The available fault currents a fuse will clear in less than ½ cycle, thus limiting the actual magnitude of current flow.

Element: A calibrated conductor inside a fuse that melts when subjected to excessive current. The element is enclosed by the fuse body and may be surrounded by an arc-quenching medium such as silica sand. The element is sometimes referred to as a link.

Fast-Acting Fuse: This is a fuse with no intentional time-delay designed into the overload range. It is sometimes referred to as a "single-element fuse" or "non-delay fuse."

Fault Current: Short-circuit current that flows partially or entirely outside the intended normal load current path of a circuit component. Values may be from hundreds to many thousands of amperes.

Ferrule: The cylindrical brass, bronze or copper mounting terminals of fuses with amp ratings up to 60 amperes. The cylindrical terminals at each end of a fuse fit into fuse clips.

Current-limiting Fuse: A fuse that meets the following three conditions:

1. **Interrupts all available overcurrents within its interrupt rating.**
2. **Within its current limiting range, limits the clearing time at rated voltage to an interval equal to, or less than, the first major or symmetrical current loop duration.**
3. **Limits peak let-through current to a value less than the available peak current.**

Interrupting Rating: The maximum level of fault current that the fuse has been tested to safely interrupt.

Our Fuses at a Glance

Fuse

Fuse Holders

Fuse Block

Fuse Series	Class	Amperage Range	Description	Application
JDL	J	1A to 600A	Most popular current limiting dual element time delay fuses available. Small physical size and high preformance characteristics makes the class J ideal for any space limited applications	All general purpose circuits with high inrush inductive loads including motor branch circuits and transformers. Also suited for lighting loads. Recommended for type 2 (no damage) protection of IEC style motors, starters, and contactors.
JHL			JHL Class J fuses combine the performance of high-speed semiconductor fuses and the convenience of Class J branch-circuit fuses in one small package. Ideal for AC and DC drives and controllers.	AC and DC drives, electronic motor controllers, power semiconductor devices that utilize diodes, GTOs, SCRs, or SSRs.
ECNR	RK5	1A to 600A	The dual element time delay characteristics of these fuses typically allows them to be sized closer to the running ampacity of inductive loads to reduce cost and improve over current protection.	Use in AC power distribution system mains, feeders, and branch circuits. Recommended for high inrush inductive loads, like motors and transformers, and non inductive loads like lighting, and heating loads.
ECSR		3A to 600A		
LENRK	RK1	10A to 600A	These dual element time delay fuses have up to 40% more current limitation and up to 350% more I2t limitation under fault conditions than the ECNR and ECSR fuses, reducing the potential for damage.	Use in AC power distribution system mains, feeders, and branch circuits. Recommended for high inrush inductive loads, like motors and transformers, and non inductive loads like lighting, and heating loads.
LESRK		5A to 600A		
TJN	T	1A to 600A	These fuses are extremely fast-acting fuses in a compact, space-saving size.	These fuses are ideal as the main fuse protection for panel boards, load centers, meter stacks, and AC drives.
TJS				
HCLR	CC	0.5A to 30A	Fast acting characteristics with 200kA Interrupting Rating, and compact design are an excellent choice for inductive loads as well as resistive loads	Recommended for branch circuit protection, resistive heating loads, and lighting loads
HCTR	CC	0.25A to 30A	Time delay characteristics with 200kA Interrupting Rating, and compact design are an excellent choice for high inductive loads. Meets the requirements of the NEC® 430.72 and UL508	Recommended for Motor Branch protection, short circuit protection required by NEC® 430.52 and for Primary protection for control transformer loads.
EDCC	CC	0.5A to 30A	Low peak design was developed specifically for motor protection, Provides excellent current limiting capabilities up to 200KA 600VAC	Recommended for small horsepower motor circuits. Can provide Type 2 coordinated protection for IEC or NEMA starters/contactors
MCL	Midget	0.5A to 50A	Provides supplemental protection to end-use equipment with a 100KA interruption rating, 600VAC. Fast acting design responds quickly to both overloads and short-circuit protection	Recommended for control circuits, street lighting, HID lighting, and electronic equipment protection
MOL	Midget	0.5A to 30A	Provides supplemental protection to end-use equipment with a 10,000A interruption rating, economical laminated paper tube	Recommended to use as supplemental protection for non inductive control loads and lighting circuits
MEQ	Midget	0.25 to 30A	Provides supplemental protection to high inrush loads. has a 10,000A interruption rating, 500VAC. Fiber tube construction.	Recommended to use as supplemental protection for inductive control loads such as transformers and solenoids.
MEN	Midget	0.5A to 30A	Provides supplemental protection to high inrush loads. has a 10,000A interruption rating, fiber tube construction. Dual element allows harmless inductive surges to pass without opening.	Recommended to use as supplemental protection for inductive control loads such as transformers and solenoids, and other high inrush electronics circuits.
ABC	1 1/4" x 1/4" Ceramic	0.5A to 30A	Fast acting 1/4" x 1-1/4" ceramic tube construction. Small dimension electronic fuses.	Recommended as supplemental protection for electronic applications
AGC	1 1/4" x 1/4" Glass	0.5A to 30A	Fast acting 1/4" x 1-1/4" glass tube construction. Small dimension electronic fuses.	Recommended as supplemental protection for electronic applications
GMA	5mm x 20mm Glass	0.063A to 15A	Fast acting 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
GMC	5mm x 20mm Glass	0.5A to 10A	Medium Time Delay 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
MDA	1 1/4" x 1/4" Ceramic	0.5A to 20A	Time Delay 1/4" x 1-1/4" ceramic tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
MDL	1 1/4" x 1/4" Glass	0.0625A to 20A	Time Delay 1/4" x 1-1/4" glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
S500	5mm x 20mm Glass	0.032A to 10A	Fast acting 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
S506	5mm x 20mm Glass	0.25A to 6.3 A	Time Delay 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
LCU	L	601-1200 A	Fast acting current limiting for non-inductive applications.	Suited for protection of low interrupting circuit breakers and non-inductive loads.

Edison Selection Guide

Line Overview

The Edison family of fuses, fuse blocks and fuse holders is divided into two classes:

1. Current Limiting: Class CC, Class J, Class L, Class RK, Class T
2. General Purpose: Class M Midget and Small Dimension

The fuse selection guide below is a general summary of the specifications included for each fuse type. This selection guide does not include the many variables that can exist for specific situations such as local codes, unusual temperature, or other operating conditions. When selecting fuses, be sure to comply with any applicable PUBLIC SAFETY standards that apply to Overcurrent Protection Devices (OPD).

Edison Fuses Selection Guide and General Specifications

Description	Current Limiting											
	Class J		Class RK5		Class RK1		Class T		Class L	Class CC		
Fuse Type	Fast-Acting	Time-Delay	Time-Delay				Extremely Fast-Acting		Fast-Acting	Fast-Acting	Time-Delay	
Part Number	JHL	JDL	ECNR	ECSR	LENRK	LESRK	TJN	TJS	LCU	HCLR	HCTR	EDCC
Voltage Rating	600VAC 450VDC	600VAC 300VDC*	250VAC 125 VDC* (1-200A) 250VDC* (201-600A)	600VAC 300VDC*	250VAC 125VDC* (10-60A) 250VDC* (70-600A)	600VAC 300VDC*	300VAC 160 VDC (15-600A)	600VAC	600V	600VAC 300VDC (15-20A)	600VAC	600VAC 300VDC (0.5-2.25A) (20–30A)
Amp Rating	1 - 600		1 - 600	3 - 600	10 - 600	5 - 600	1 - 600		601 - 1200	0.5 - 30	0.25 - 30	0.5 - 30
Interrupting Rating	200,000 RMS Symmetrical Amps											
Current Limiting	Class J		Class RK5		Class RK1		Class T		Class L	Class CC		
Agency Approvals	UL Listed Class J Guide JDDZ File E162363 CSA Certified HRCI-J per C22.2, No. 248.8 File 700489 RoHS compliant	UL Listed Class J Guide JDDZ File E162363 CSA Certified HRCI-J per C22.2, No. 248.8 File 700489	UL Listed, Class RK, Guide JDDZ, File E162363 CSA Certified HRCI-R per C22.2, No. 248.12, File 700489 (LENRK CSA File 053787)				UL Listed, Class T, Guide JDDZ, File E162363 CSA Certified HRCI-T per C22.2, No. 248.12, File 53787, Class 1422-02 & 1422-82		UL Listed, Std. 248-10 CSA Certified, HRC-L C22.2 No. 248.10, Class 1422-02, File 53787	UL Listed to 248.4, Class CC, Guide JDDZ, File E162363, CSA certified HRCI-MISC per C22.2 No. 248.4, File 700489		
Dimensions	See product specification pages.									ferrule (in): 13/32, length (in): 1-1/2		

** Self-certified DC ratings*

Edison Fuses Selection Guide and General Specifications

Description	General Purpose – Midget				General Purpose – Small Dimension Electronic							
Fuse Type	Fast-Acting		Time-Delay		Fast-Acting Ceramic	Fast-Acting Glass		Medium Time-Delay Glass	Time-Delay Ceramic	Time-Delay Glass	Fast-Acting Glass	Time-Delay Glass
Part Number	MCL	MOL	MEQ	MEN	ABC	AGC	GMA	GMC	MDA	MDL	S500	S506
Voltage Rating	600 VAC	250 VAC	500 VAC	250 VAC	250 VAC (0.5 to 30A) 125VDC: (0.5 to 30A)	250VAC: (0.1 to 10A) 32VAC: (15 to 30A)	250VAC (0.063 - 3A) 125VAC (4 - 15A)	250VAC (0.5 - 3A) 125VAC (4 - 10A)	250VAC 125VDC (20A)	250VAC: (0.0625 to 8A) 32VAC: (10 to 20A)	250VAC	250VAC
Amp Rating	0.5 to 50	0.5 to 30	0.25 to 30	0.5 to 30	0.5 to 30	0.10 to 30	0.063 to 15	0.5 to 10	0.5 to 20	0.0625 to 20	0.032 to 10	0.25 to 6.3
Interrupting Rating	100,000 RMS Amps	10,000 RMS Amps			See specifications table on product pages							
Current Limiting	N/A				N/A							
Agency Approvals	UL Listed to 248.14, File E162443 CSA Cert. C22.2 Part 59.2, LR 700489				UL Listed standard 248-14 UL Listed Guide and File nos. (ABC 0.25-20 A): (AGC 1/100-10 A) JDYX and E19180 UL Recognition Guide and File nos. (ABC 20-30A):(AGC 11-30) JDYX2 and E19180 CSA Certification Record No: 053787 C 000 and Class No: 1422 01 and 1422 30		Designed to UL/CSA 248-14 UL Listed, Guide JDYX, File E19180 63mA-6A UL Recognition, Guide JDYX2, File E19180, 7A-15A CSA Certified, File 053787_C_000, 63mA-6A Class 1422-01		UL Listed standard 248-14 UL Listed Card: MDA 2/10-20A , MDL 1/16-8A (Guide JDYX, File E19180 UL Recognized Card: MDA 25-30A MDL 9-30A (Guide JDYX2, File E19180) CSA Certification Card: MDA 2/10-15A (Class No. 1422-01)		UL Recognized Guide JDYX2, File E19180 Semko Approval VDE Approval BSI Approval IMQ Approval RoHS compliant	
					RoHS							
Dimensions	ferrule (in): 13/32 length (in): 1-1/2				1/4" x 1-1/4", (6.3mm x 32mm)		0.197" x 0.788" (5mm x 20mm)		1/4" x 1-1/4", (6.3mm x 32mm)		0.197" x 0.788" (5mm x 20mm)	

Cross Reference Guide

CROSS REFERENCE GUIDE By manufacturers type reference or series number. Ampere ratings must be added for ordering purposes.								
FUSE TYPE		***VOLT***	***EDISON***	***BRUSH/ DORMAN***	***BUSSMANN***	***MERSEN / GOULD***	***GEC/CEFCO***	***LITTELFUSE***
UL CLASS CURRENT LIMITING FUSES (CSA CLASS)								
CC (HRCI-CC)	Time-Delay	600	EDCC	–	LP-CC	ATDR	–	CCMR
	Time-Delay	600	HCTR	–	FNQ-R	ATQR	–	KLDR
	Fast-Acting	600	HCLR	HCLR	KTK-R	ATMR	CTK-R	KLKR
RK1	Time-Delay Dual Element	250	LENRK	–	LPN-RK-SP	A2DR	–	LLNRK
		600	LESRK	–	LPS-RK-SP	A6DR	–	LLSRK
RK5	Time-Delay Dual Element	250	ECNR	–	FRN-R	TR	–	FLNR
		600	ECSR	–	FRS-R	TRS	–	FLSR
J	Time-Delay Dual Element	600	JDL	–	LPJ	AJT	–	JTD
	High-Speed AC Drive	600	JHL	–	DFJ	HSJ	–	–
T	Extremely Fast-Acting	300	TJN	–	JJN	A3T	–	JLLN
		600	TJS	–	JJS	A6T	–	JLLS
L	Fast-Acting	600	LCU	LCU	KTU	A4BY	CL, CLU	LDC
UL CLASS GENERAL PURPOSE FUSES								
Midget	Fast-Acting	600	MCL	MCL	KTK	ATM	CTK	KLK
		250	MOL	MOL	BAF/BAN	OTM	–	BLF
	Time-Delay	500	MEQ	MEQ	FNQ	ATQ	–	FLQ
		250	MEN	MEN	FNM	TRM	–	FLM
1/4"x1/4" Ceramic	Fast-Acting	250/125	ABC	ABC	ABC	GAB	–	314
1/4"x1/4"Glass		250/32	AGC	AGC	AGC	GGC	–	312
1/4"x1/4" Ceramic	Time-Delay	250	MDA	MDA	MDA	–	–	326
1/4"x1/4"Glass		250/32	MDL	MDL	MDL	GDL	–	313
5x20 mm Glass	Fast-Acting	250/125	GMA	GMA	GMA	GGM	–	235
	Medium Time-Delay	250/125	GMC	GMC	GMC	GSC	–	–
5x20 mm Glass	Fast-Acting	250	S500	BDB	GDB	GSB	–	217
	Time-Delay	250	S506	BDC	GDC	GDG	–	218
Fuse Puller								
Fuse Puller FP-2		–	old - 38072 new - FP-2	–	FP-2	–	–	–

Dual Element Time-Delay Class J Fuses

JDL5

JDL40

JDL150

EDISON JDL Class J fuses are among the most popular current limiting time-delay fuses available. Their small physical size and high performance characteristics make Class J fuses ideal for any space-limited application.

JDL Features

- Space saving dimensions compared to Class R
- Dual-Element construction provides superior time-delay to pass harmless motor or transformer surges
- High performance with fatigue-free cycling capabilities
- Extremely current limiting

Applications

- Recommended for Type 2 (no damage) protection of IEC style motor starters and contactors.
- Use to protect lower interrupting rated circuit breakers.
- All general purpose circuits with inductive (high inrush) loads, including motor and motor branch circuits, and transformer circuits. Also suitable for lighting loads.

Voltage Rating: **JDL - 600 VAC**

Ampere Rating: **1–600 Amps**

Interrupting Rating:
200,000 RMS Symmetrical Amps

Self-Certified Interruptin Rating:
300,000 RMS Symmetrical Amps

Self-Certified DC Ratings:
Voltage Rating: JDL - 300 VDC

Interrupting Rating: JDL - 20,000 Amperes DC

Current Limiting:
Class J Fuse

Agency Approvals

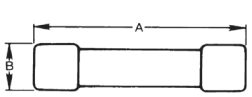
- UL Listed, Class J, Guide JDDZ, File E162363
- CSA Certified HRCI-J per C22.2, No. 248.8

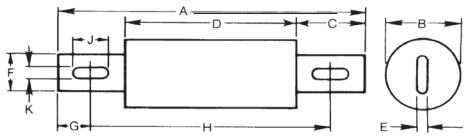
JDL Series Dual-element Time-delay Fuses					
Part Number	AMP Rating	Rated Voltage AC Max	Pcs/ Pkg	Package Weight	Price
JDL1	1	600V	10	1.00 lb.	$149.00
JDL2	2				$149.00
JDL3	3				$149.00
JDL4	4				$156.00
JDL5	5				$149.00
JDL6	6				$149.00
JDL8	8				$156.00
JDL10	10				$149.00
JDL12	12				$156.00
JDL15	15				$149.00
JDL17-5	17.5				$156.00
JDL20	20				$149.00
JDL25	25				$149.00
JDL30	30				$149.00
JDL35	35				$253.00
JDL40	40			2.00 lb	$253.00
JDL45	45				$253.00
JDL50	50				$253.00
JDL60	60				$253.00
JDL70	70		5	1.70 lb	$259.00
JDL80	80				$259.00
JDL90	90				$273.00
JDL100	100				$259.00
JDL110	110		1	4.25 lb	$105.00
JDL125	125				$105.00
JDL150	150				$105.00
JDL175	175				$105.00
JDL200	200				$105.00
JDL225	225			1.70 lb	$166.00
JDL250	250				$160.00
JDL300	300				$194.00
JDL350	350				$195.00
JDL400	400				$177.00
JDL450	450			2.80 lb	$296.00
JDL500	500				$298.00
JDL600	600				$284.00

CROSS REFERENCE				
VOLTS	EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
600	JDL	LPJ	AJT	JTD

Specifications

JDL Dimensions inches (mm)





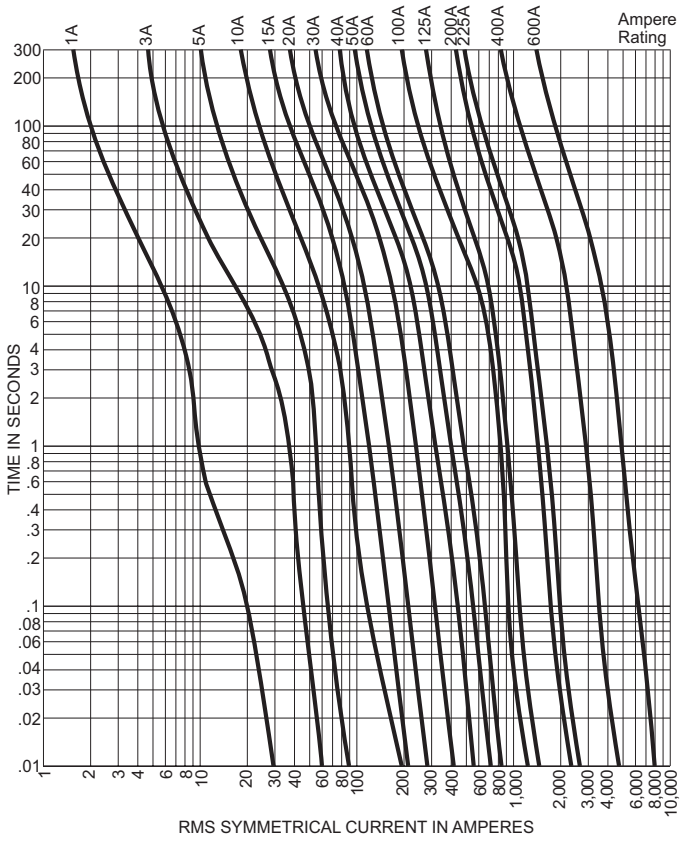
JDL Series Dimensions - Inches [mm]										
Ampere Rating	Overall Length	Max. Dia.	Blade Length	Barrel Length	Blade Thickness	Blade Width	Mounting Hole Spacing			
Range	A	B	C	D	E	F	G	H	J	K
1-30	2.25 [57.15]	0.81 [20.6]	–	–	–	–	–	–	–	–
35-60	2.38 [60.5]	1.06 [26.92]	–	–	–	–	–	–	–	–
70-100	4.63 [117.5]	1.13 [28.6]	1 [25.4]	2.63 [66.7]	0.13 [3.2]	0.75 [19.1]	0.5 [12.7]	3.63 [92.1]	0.38 [9.5]	0.28 [7.1]
110-200	5.75 [146.1]	1.63 [41.3]	1.38 [34.9]	3 [76.2]	0.19 [4.8]	1.13 [28.6]	0.69 [17.5]	4.38 [111.1]	0.38 [9.5]	0.28 [7.1]
225-400	7.13 [181]	2.13 [54]	1.88 [47.8]	3.38 [85.8]	0.25 [6.35]	1.63 [41.3]	0.94 [23.8]	5.25 [133.4]	0.56 [14.3]	0.41 [10.3]
450-600	8 [203.2]	2.5 [63.5]	2.13 [54]	3..75 [95.3]	0.38 [9.5]	2 [50.8]	1 [25.4]	6 [152.4]	0.75 [19.1]	0.53 [13.5]

Dual Element Time-Delay Class J Fuses

Current Curves

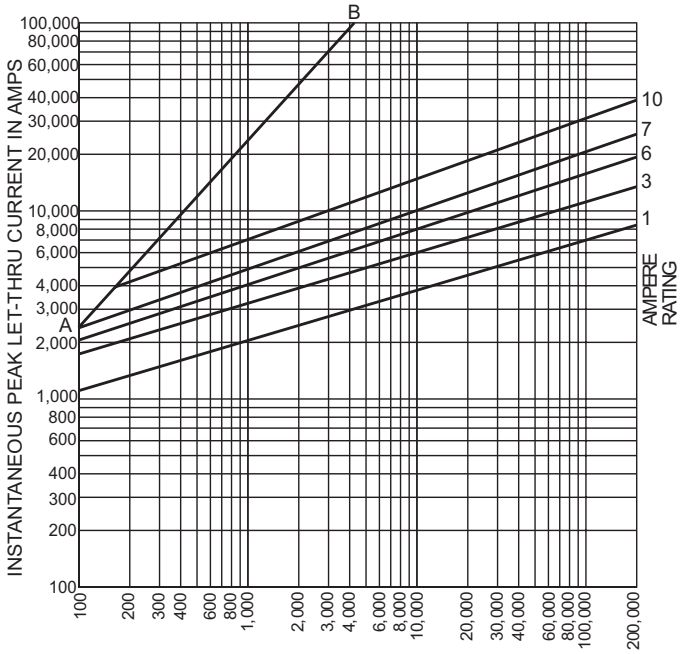
AVERAGE TIME/CURRENT CURVE

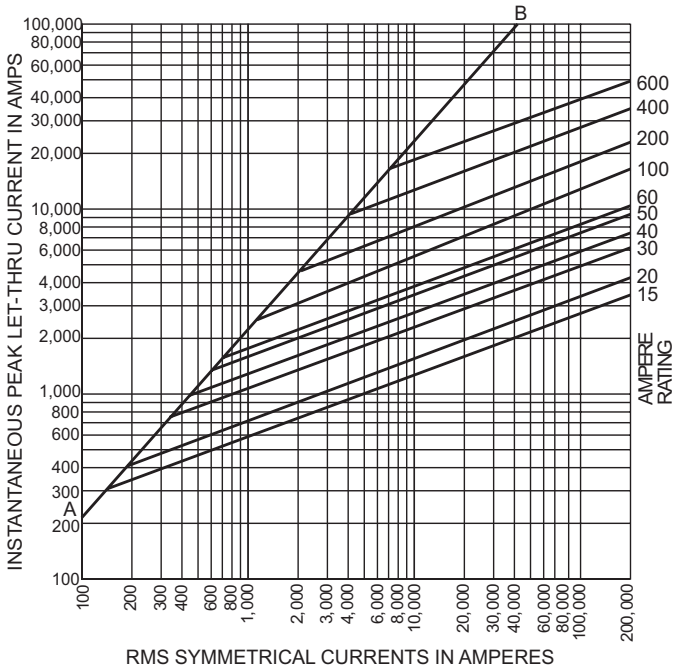
Cat. No. JDL (Amp) 600V



PEAK LET-THROUGH CURRENT CURVES

Cat. No. JDL (Amp) 600V





Current-Limiting Effects

*Prosp. S.C.C.	Let-Thru Current (Apparent RMS Symmetrical) JDL (600V) Fuse Ratings						
	15A	30A	60A	100A	200A	400A	600A
1,000	270	470	750	—	—	—	—±
3,000	370	670	1,130	1,640	2,360	—	—
5,000	450	800	1,420	1,910	2,760	4,400	—
10,000	550	1,000	1,730	2,450	3,520	5,540	8,000
15,000	625	1,220	1,890	2,850	4,000	6,420	9,000
20,000	700	1,330	2,120	3,090	4,400	7,000	10,000
25,000	750	1,440	2,250	3,400	5,000	7,500	11,100
30,000	800	1,530	2,370	3,650	5,140	8,000	11,800
35,000	820	1,600	2,580	3,780	5,430	8,330	12,500
40,000	900	1,640	2,670	4,000	5,640	9,000	13,270
50,000	925	1,760	2,790	4,470	6,000	9,380	13,820
60,000	1,000	1,850	3,000	4,670	6,420	10,000	15,000
80,000	1,160	2,000	3,220	5,000	7,400	11,270	16,000
100,000	1,220	2,150	3,520	5,360	7,950	12,180	17,270
150,000	1,400	2,460	4,000	6,170	9,000	14,360	19,270
200,000	1,560	2,640	4,450	7,000	10,000	15,820	20,600

*RMS Symmetrical Amperes Short-Circuit Current.

NOTEData derived from Current Limiting Curves.

Class J High-Speed Drive Fuses

1 – 60 A

70 – 600 A

EDISON JHL Class J fuses combine the performance of high-speed semiconductor fuses and the convenience of Class J branch-circuit fuses in one small package, allowing maximum protection for AC and DC drives* and controllers.

Note: JHL fuses can be used with GS and DURAPULSE drives in non-UL applications. Fuse the drive according to NEC guidelines (NEC Article 430). For UL applications, GS and DURAPULSE drives require Class T fuses (refer to the drive's user manual for details).

Applications

- AC and DC drives
- Electronic motor controllers
- Power semiconductor devices that utilize diodes, GTOs, SCRs, or SSRs

JHL Features

- Space saving Class J dimensions allow the use of readily available Class J fuse blocks, holders, and switches
- Allows the lowest I^2t let-through energy of any branch-circuit overcurrent protective device
- Works with existing and new variable speed drives and electronic motor controllers
- Meets UL, CSA, and NEC requirements for branch circuit protection devices

Specifications

Voltage Rating: 600 VAC; 450 VDC

Ampere Rating: 1 – 600 Amps

Interrupting Rating:
200,000 RMS Symmetrical Amps;
100,000 DC Amps

Current Limiting: Class J Fuse

Agency Approvals

- UL, std 248-8, Class J, Guide JDDZ, File E162363
- CSA Certified, C22.2 # 248.8, Class 1422-02, File 700489
- RoHS compliant

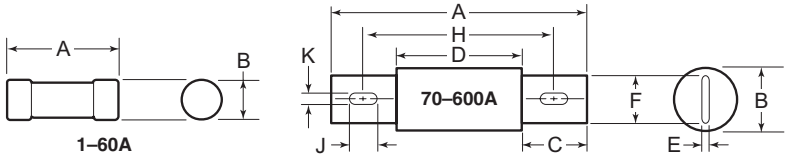
JHL Series Class J High-Speed Drive Fuses

Part Number	AMP Rating	Rated Voltage (max)	Pcs/ Pkg	Pkg Weight (lb[kg])	Price	Part Number	Pcs/ Pkg	Pkg Weight (lb[kg])	Price
JHL1	1	600 VAC 450 VDC	10	1.0 [0.45]	$138.00	JHL1-1	1	0.10 [0.05]	$19.00
JHL2	2				$150.00	JHL2-1			$19.00
JHL3	3				$138.00	JHL3-1			$19.00
JHL4	4				$156.00	JHL4-1			$20.00
JHL5	5				$150.00	JHL5-1			$19.00
JHL6	6				$150.00	JHL6-1			$19.00
JHL8	8				$157.00	JHL8-1			$20.00
JHL10	10				$150.00	JHL10-1			$19.00
JHL12	12				$157.00	JHL12-1			$20.00
JHL15	15				$151.00	JHL15-1			$19.00
JHL17P5	17.5				$153.00	JHL17P5-1			$18.00
JHL20	20				$151.00	JHL20-1			$19.00
JHL25	25				$151.00	JHL25-1			$19.00
JHL30	30				$151.00	JHL30-1			$19.00
JHL35	35			1.5 [0.68]	$256.00	JHL35-1		0.16 [0.07]	$30.00
JHL40	40				$256.00	JHL40-1			$30.00
JHL45	45				$256.00	JHL45-1			$30.00
JHL50	50				$256.00	JHL50-1			$30.00
JHL60	60				$256.00	JHL60-1			$29.00
JHL70	70		1	0.30 [0.14]	$52.00				
JHL80	80				$52.00				
JHL90	90				$55.00				
JHL100	100				$52.00				
JHL110	110			0.70 [0.32]	$100.00				
JHL125	125			0.8 [0.36]	$106.00				
JHL150	150				$106.00				
JHL175	175				$103.00				
JHL200	200				$106.00				
JHL225	225			1.6 [0.73]	$180.00				
JHL250	250				$162.00				
JHL300	300				$162.00				
JHL350	350				$168.00				
JHL400	400				$162.00				
JHL450	450			2.6 [1.18]	$245.00				
JHL500	500				$253.00				
JHL600	600				$248.00				

CROSS REFERENCE

VOLTS	EDISON	COOPER / BUSSMANN	FERRAZ / MERSEN	LITTELFUSE
600	JHL	DFJ	HSJ	–

JHL Dimensions



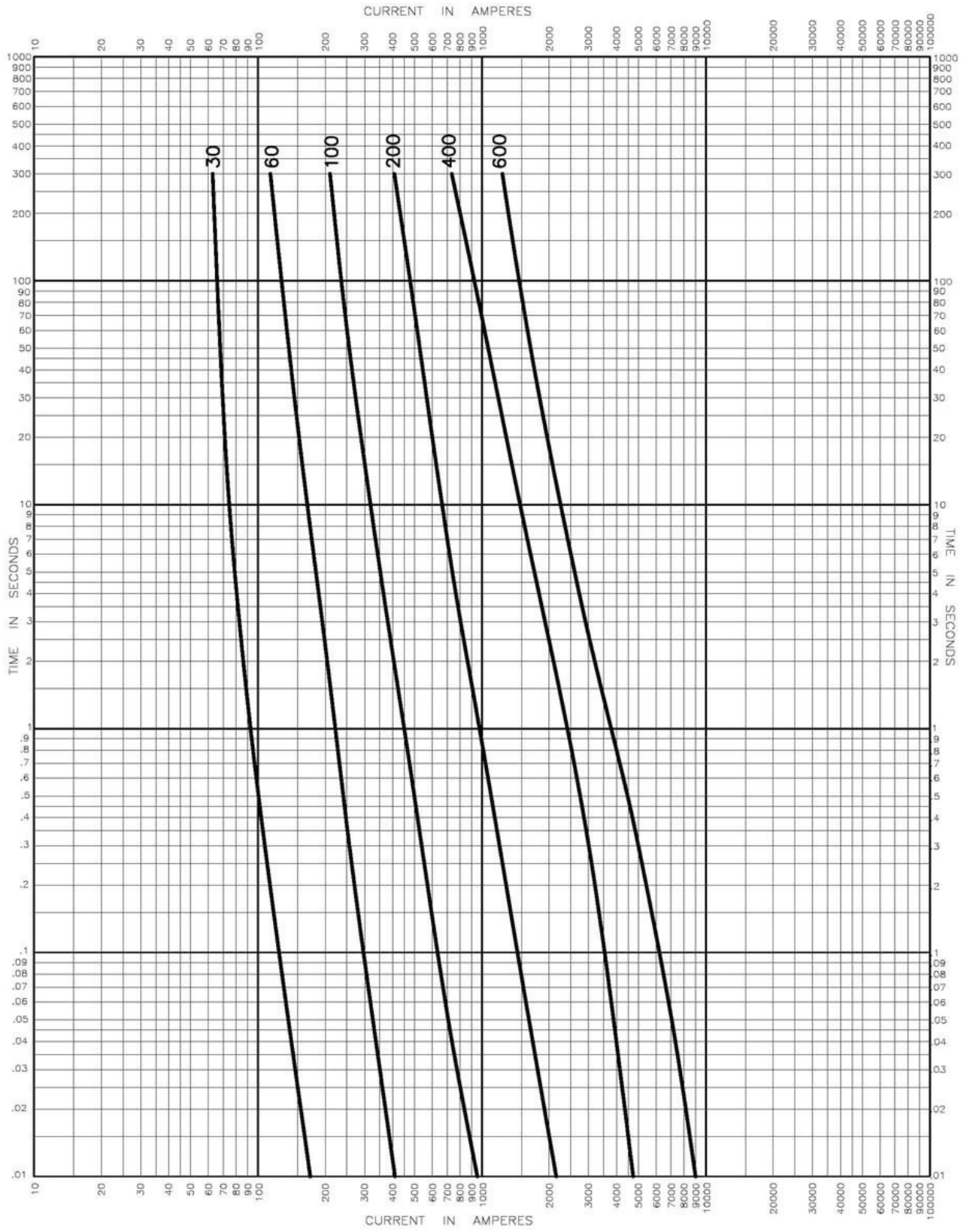
JHL Series Dimensions - Inches [mm]

Range	A	B	C	D	E	F	H	J	K
1-30	2.25 [57.2]	0.81 [20.6]	–	–	–	–	–	–	–
35-60	2.38 [60.5]	1.06 [26.9]	–	–	–	–	–	–	–
70-100	4.63 [117.6]	1.13 [28.7]	1.00 [25.4]	2.63 [66.8]	0.13 [3.3]	0.75 [19.1]	3.63 [92.2]	0.43 [10.9]	0.28 [7.1]
110-200	5.75 [146.1]	1.63 [41.4]	1.38 [35.1]	3.00 [76.2]	0.19 [4.8]	1.13 [28.7]	4.38 [111.3]	0.43 [10.9]	0.28 [7.1]
225-400	7.13 [181.1]	2.11 [53.6]	1.88 [47.8]	3.38 [85.9]	0.25 [6.4]	1.63 [41.4]	5.25 [133.4]	0.58 [14.7]	0.41 [10.4]
450-600	8.00 [203.2]	2.50 [63.5]	2.13 [54.1]	3.75 [95.3]	0.38 [9.7]	2.00 [50.8]	6.00 [152.4]	0.74 [18.8]	0.53 [13.5]

Class J High-Speed Drive Fuses

Time-current characteristic curves

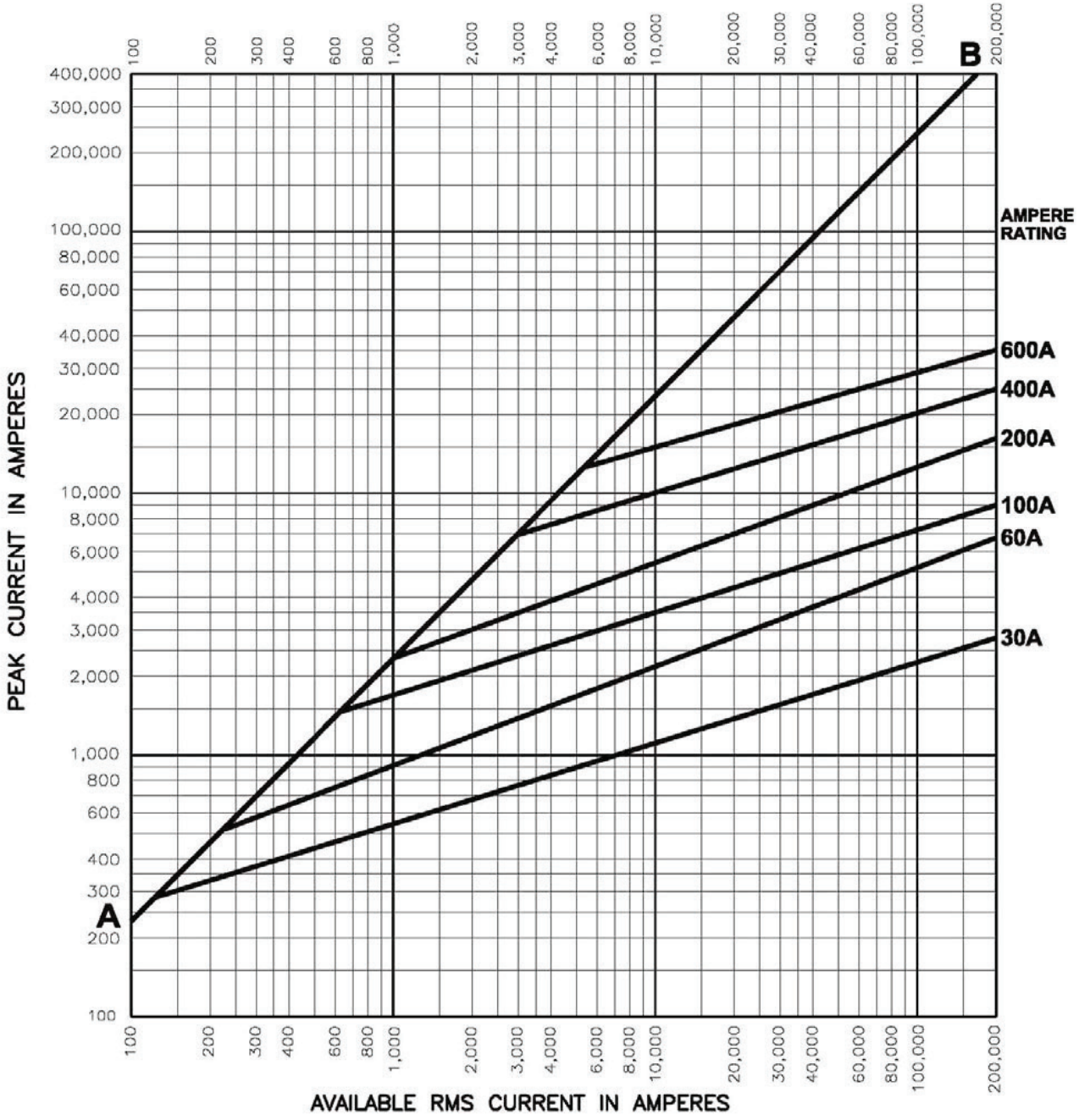
Time-Current Characteristic Curves – Average Melt – JHL Fuses



Class J High-Speed Drive Fuses

Current Limitation Curves

Current Limitation Curves – JHL Fuses



Dual Element Time-Delay Class RK5 Fuses

ECNR40

ECNR70

ECNR150

ECSR5

These fuses are recommended for AC power distribution system mains, feeders and branch circuits having inductive loads (motors, transformers) or non-inductive loads (lighting, heating) where the available short-circuit current does not exceed 200,000 RMS symmetrical amperes. These dual element, time-delay fuses have minimum industry standard time-delay of 10 seconds at 5 times the fuse rating (8 sec. minimum for 250V, 30A and less). The time-delay characteristics of these fuses typically allows them to be sized closer to the running ampacity of inductive loads to reduce cost and provide improved overcurrent protection. These fuses will override normal equipment current surges to reduce unnecessary fuse openings. They are the most popular fuses used in the industry and the most economical for most applications, especially motors and transformers. They have moderate current limitation.

ECSR100

ECSR200

ECNR/ECSR

Features

- True dual - element construction allows sizing of 125% FLA for motor backup protection
- Superior overload and cycling capabilities
- Current limiting; provides component short circuit protection

Applications

- Recommended for AC power distribution system mains, feeders, and branch circuits
- Protection of motors and motor branch circuits
- Protection of transformers and other inductive loads
- All general-purpose applications including lighting, heating and other non-inductive loads

ECNR/ECSR Specifications

Voltage Rating:

ECNR: 250 VAC
ECSR: 600 VAC

Ampere Rating:

ECNR: 1–600 Amps
ECSR: 3–600 Amps

Interrupting Rating:

200,000 RMS Symmetrical Amps

Self-Certified DC Ratings:

- Voltage Rating:
  ECNR (1–200): 125 VDC
  ECNR (201–600): 250 VDC
  ECSR (3–600): 300 VDC
- Self-Certified Interrupting Rating:
  ECNR/ECSR 20,000 Amperes DC

Current Limiting: RK5 Fuse

Agency Approvals

- UL Listed, Class RK5, Guide JDDZ, File E162363
- CSA Certified HRCI-R per C22.2, No. 248.12

CROSS REFERENCE

VOLTS	EDISON	BUSSMANN	MERS-EN GOULD	LITTELFUSE
250	ECNR	FRN-R	TR	FLNR
600	ECSR	FRS-R	TRS	FLSR

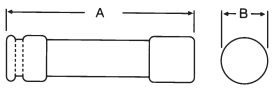
Dual Element Time-Delay Class RK5 Fuses

ECNR Series 250V Dual-element Time-delay Fuses					
Part Number	AMP Rating	Rated Voltage AC Max	Pcs/Pkg	Package Weight	Price
ECNR1	1	250V	10	0.30 lb	$66.00
ECNR2	2				$63.00
ECNR3	3				$61.00
ECNR5	5			0.50 lb	$59.00
ECNR8	8				$61.00
ECNR10	10				$59.00
ECNR15	15				$48.50
ECNR20	20				$48.50
ECNR25	25				$48.50
ECNR30	30				$48.50
ECNR35	35			1.00 lb	$87.00
ECNR40	40				$87.00
ECNR45	45				$87.00
ECNR50	50				$87.00
ECNR60	60				$87.00
ECNR70	70		5	1.50 lb	$97.00
ECNR80	80				$97.00
ECNR90	90				$103.00
ECNR100	100				$97.00
ECNR125	125		1	0.77 lb	$43.50
ECNR150	150				$43.50
ECNR175	175			1.10 lb	$43.50
ECNR200	200			1.52 lb	$43.50
ECNR225	225				$61.00
ECNR250	250				$61.00
ECNR300	300				$61.00
ECNR350	350				$62.00
ECNR400	400				$59.00
ECNR450	450			3.00 lb	$101.00
ECNR500	500				$101.00
ECNR600	600				$101.00

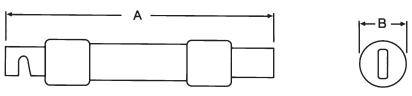
ECSR Series 600V Dual-element Time-delay Fuses					
Part Number	AMP Rating	Rated Voltage AC Max	Pcs/Pkg	Package Weight	Price
ECSR3	3	600V	10	1.7 lb	$118.00
ECSR4	4				$118.00
ECSR5	5				$118.00
ECSR6	6				$118.00
ECSR6-25	6.25				$123.00
ECSR7	7				$125.00
ECSR8	8				$118.00
ECSR10	10				$118.00
ECSR12	12				$118.00
ECSR15	15				$105.00
ECSR17-5	17.5				$105.00
ECSR20	20				$105.00
ECSR25	25				$105.00
ECSR30	30				$105.00
ECSR35	35			3.00 lb	$182.00
ECSR40	40				$182.00
ECSR45	45				$182.00
ECSR50	50				$182.00
ECSR60	60				$182.00
ECSR70	70		5	50.54 lb	$216.00
ECSR80	80				$216.00
ECSR90	90				$216.00
ECSR100	100				$216.00
ECSR110	110		1	1.00 lb	$74.00
ECSR125	125			1.22 lb	$74.00
ECSR150	150				$74.00
ECSR175	175				$74.00
ECSR200	200				$74.00
ECSR225	225			3.00 lb	$114.00
ECSR250	250				$114.00
ECSR300	300				$123.00
ECSR350	350				$114.00
ECSR400	400				$114.00
ECSR450	450			5.00 lb	$166.00
ECSR500	500				$166.00
ECSR600	600				$166.00

ECNR/ECSR Dimensions

Ferrule Design – 1 through 60 Amperes



Knife Blade – 70 through 600 Amperes

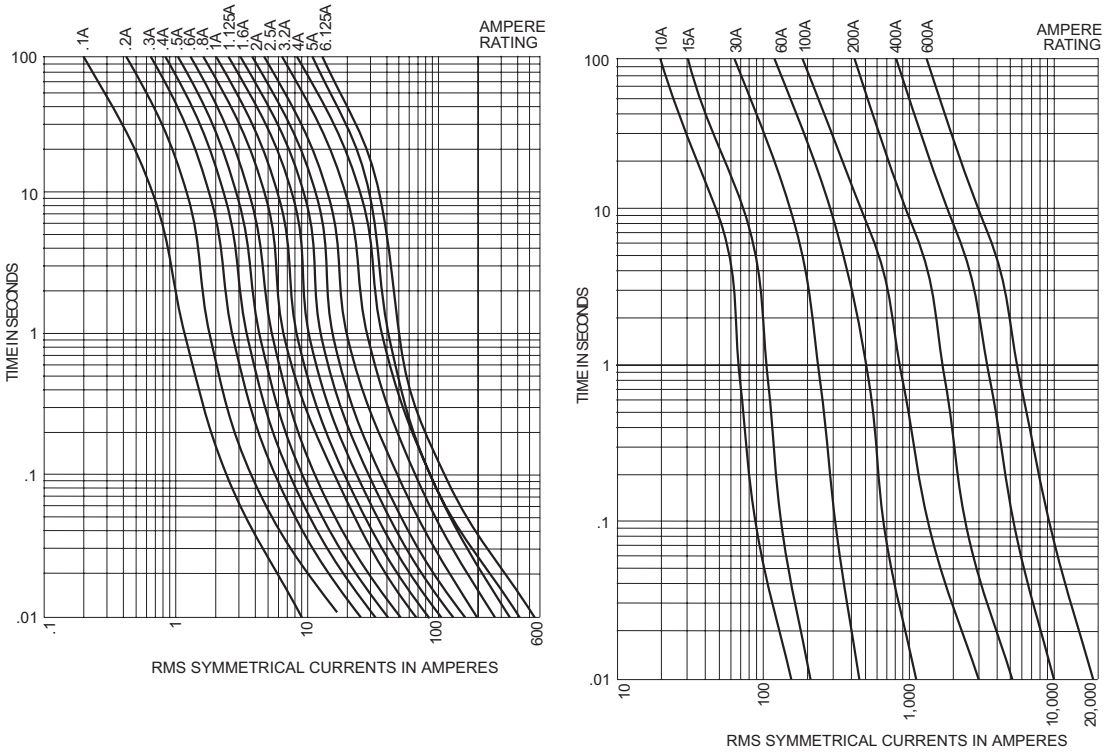


Dimensions inches (mm)							
Part Number	Amps	Overall Length A	Max Diameter B	Part Number	Amps	Overall Length A	Max Diameter B
ECNR 250V	1-30	2 (50.8)	0.56 (14.2)	ECSR 600V	3-30	5 (127)	0.81 (20.6)
	35-60	3 (76.2)	0.81 (20.6)		35-60	5.5 (139.7)	1.06 (26.9)
	70-100	5.88 (149.4)	1.06 (26.9)		70-100	7.88 (200.2)	1.11 (28.2)
	110-200	7.13 (181.1)	1.56 (39.6)		110-200	9.63 (244.6)	1.61 (40.9)
	225-400	8.63 (219.2)	2.06 (52.3)		225-400	11.63 (295.4)	2.34 (59.4)
	450-600	10.38 (263.7)	2.59 (65.8)		450-600	13.38 (339.9)	2.88 (73.2)

Dual Element Time-Delay Class RK5 Fuses

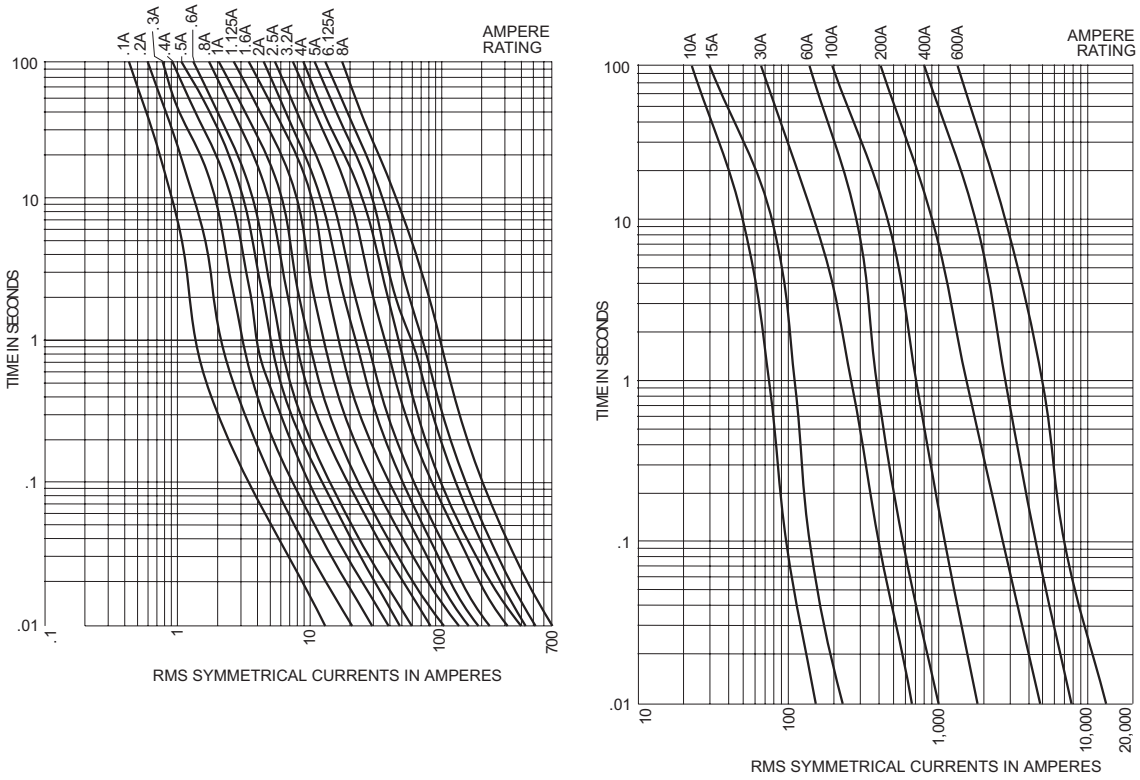
ECNR Curves

AVERAGE TIME/CURRENT CURVES
Cat No. ECNR (AMP) 250 VAC



ECSR Curves

AVERAGE TIME/CURRENT CURVES
Cat No. ECSR (AMP) 600 VAC

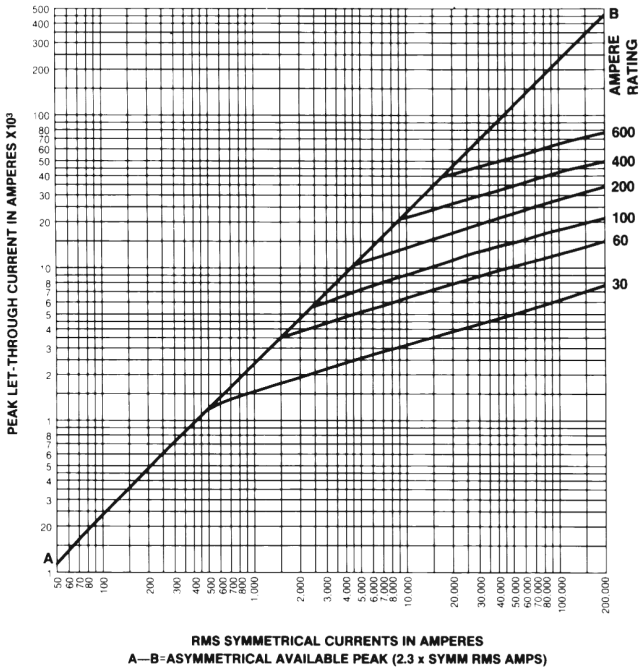


Dual Element Time-Delay Class RK5 Fuses

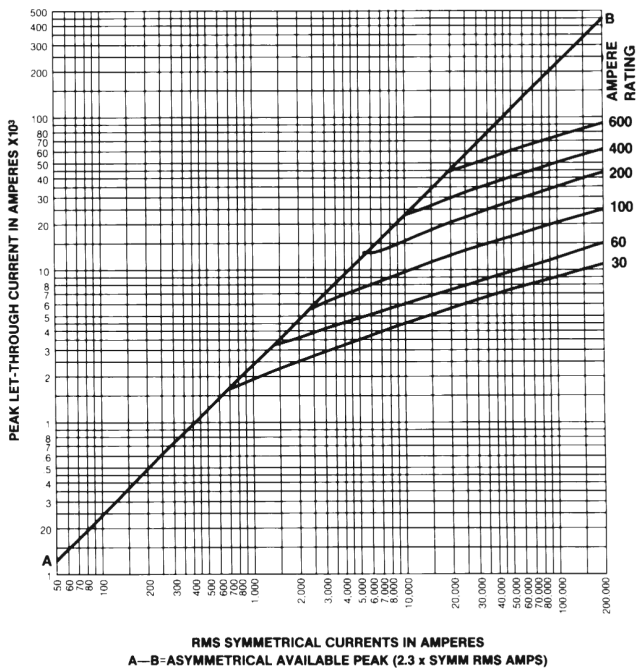
ECNR/ECSR Curves

PEAK LET-THROUGH CURRENT CURVES*

ECNR (250V)



ECSR (600V)



CURRENT LIMITATION TABLES

ECNR (250V)*

Available Fault Current	Apparent Effective Let-Thru Amperes Fuse Ampere Ratings					
RMS Amps	30A	60A	100A	200A	400A	600A
5,000	1,050	2,070	2,820	4,300	5,000	5,000
10,000	1,310	2,570	3,630	5,400	8,700	10,000
15,000	1,490	2,920	4,140	6,200	9,900	15,000
20,000	1,630	3,200	4,500	6,800	10,700	16,100
25,000	1,720	3,420	4,800	7,200	11,400	17,200
30,000	1,840	3,630	5,100	7,700	12,100	18,300
35,000	1,920	3,810	5,400	8,100	12,600	19,200
40,000	2,000	3,980	5,600	8,500	13,100	19,900
50,000	2,140	4,200	6,000	9,100	14,000	21,400
60,000	2,260	4,500	6,400	9,600	14,900	22,600
80,000	2,450	4,900	7,000	10,600	16,000	24,600
100,000	2,620	5,200	7,500	11,400	17,100	26,200
150,000	2,920	5,800	8,300	13,000	19,200	29,200
200,000	3,140	6,200	8,900	14,300	20,800	31,700

ECSR (600V)*

Available Fault Current	Apparent Effective Let-Thru Amperes Fuse Ampere Ratings					
RMS Amps	30A	60A	100A	200A	400A	600A
5,000	1,290	2,070	2,980	5,000	5,000	5,000
10,000	1,640	2,590	3,810	6,500	8,800	10,000
15,000	1,890	2,940	4,400	7,500	10,200	15,000
20,000	2,110	3,250	4,800	8,300	11,400	18,200
25,000	2,260	3,470	5,200	8,900	12,400	19,600
30,000	2,420	3,660	5,500	9,600	13,200	21,100
35,000	2,570	3,850	5,800	10,100	14,100	22,400
40,000	2,670	4,030	6,000	10,500	14,700	23,400
50,000	2,890	4,300	6,500	11,400	16,000	25,300
60,000	3,060	4,500	6,900	12,100	17,200	27,000
80,000	3,360	4,900	7,600	13,400	19,100	29,500
100,000	3,630	5,200	8,200	14,400	20,700	31,700
150,000	4,100	5,800	9,300	16,500	23,900	36,300
200,000	4,400	6,100	10,400	18,300	26,700	39,500

*"Apparent Let-Thru Amperes" values are read from "Peak Let-Through Current Curves" and the peak current value divided by 2.3 Asymmetry Factor.

Dual Element Time-Delay Class RK1 Fuses

LENRK20 LENRK100 LESRK5 LESRK100

LENRK/LESRK Features

- True dual - element spring - trigger construction allows sizing of 125% FLA for motor backup protection
- Superior overload and cycling capabilities
- Extremely current limiting; provides superior short circuit component protection

Applications

- Recommended for AC power distribution system mains, feeders, and branch circuits
- Protection of motors and motor branch circuits
- Type 2 protection for IEC components
- All general-purpose applications including lighting, heating and other non-inductive loads

LENRK/LESRK series fuses have up to 40% more current limitation and up to 350% more Amps-Squared-Second (I2t) limitation under fault conditions than ECNR/ECSR series fuses, reducing the potential for damage. They also offer a better selection for electrical power system designers and superior short circuit protection for breakers having inadequate interrupting ratings. ECNR/ECSR and LENRK/LESRK fuse lines are physically interchangeable (and electrically interchangeable per U.L. equipment listing conditions). We recommend them as a practical, economical way to upgrade systems in many situations.

Specifications

Voltage Rating:

LENRK: 250 VAC
LESRK: 600 VAC

Ampere Rating:

LENRK: 10–600A
LESRK: 5–600A

Interrupting Rating:

200,000 RMS Symmetrical Amps

Self-Certified Interrupting Rating:

300,000 RMS Symmetrical Amps

Self-Certified DC Ratings:

Voltage Rating:
LENRK (10–60A) 125 VDC
LENRK (70–600A) 250 VDC
LESRK 300 VDC
Interrupting Rating: LENRK/LESRK 20,000 Amperes DC

Current Limiting: RK1 Fuse

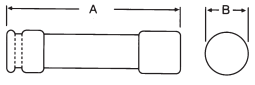
Agency Approvals:

- UL Listed, Class RK1, Guide JDDZ, File E162363
- CSA Certified HRCI-R per C22.2, No. 248.12

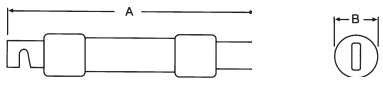
LENRK/LESRK Dimensions

Dimensions inches (mm)			
Catalog Number	Amps	Overall Length A	Max Diameter B
LENRK series 250V	10-30	2 (50.8)	0.56 (14.2)
	35-60	3 (76.2)	0.81 (20.6)
	70-100	5.88 (149.4)	1.10 (27.9)
	110-200	7.13 (181.1)	1.61 (40.9)
	225-400	8.63 (219.2)	2.36 (59.9)
	450-600	10.38 (263.7)	2.88 (73.2)
LESRK series 600V	5-30	5 (127)	0.81 (20.6)
	35-60	5.5 (139.7)	1.06 (26.9)
	70-100	7.88 (200.2)	1.11 (28.2)
	110-200	9.63 (244.6)	1.61 (40.9)
	225-400	11.63 (295.4)	2.36 (59.9)
	450-600	13.38 (339.9)	2.88 (73.2)

Ferrule Design – 5 through 60 Amperes



Knife Blade – 70 through 600 Amperes



CROSS REFERENCE				
VOLTS	EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
250	LENRK	LPN-RK-SP	A2DR	LLNRK
600	LESRK	LPS-RK-SP	A6DR*	LLSRK
*Not dual element 110–600 Amp				

LENRK Series Dual-element Time-delay Fuses					
Part Number	AMP Rating	Rated Voltage AC Max	Pcs/Pkg	Package Weight	Price
LENRK10	10	250V	10	0.50 lb	$86.00
LENRK15	15				$67.00
LENRK20	20				$67.00
LENRK30	30				$67.00
LENRK60	60			1.24 lb	$126.00
LENRK100	100		5	1.90 lb	$142.00
LENRK200	200		1	0.90 lb	$62.00
LENRK300	300			2.00 lb	$88.00
LENRK400	400				$86.00
LENRK500	500			3.00 lb	$150.00
LENRK600	600				$141.00

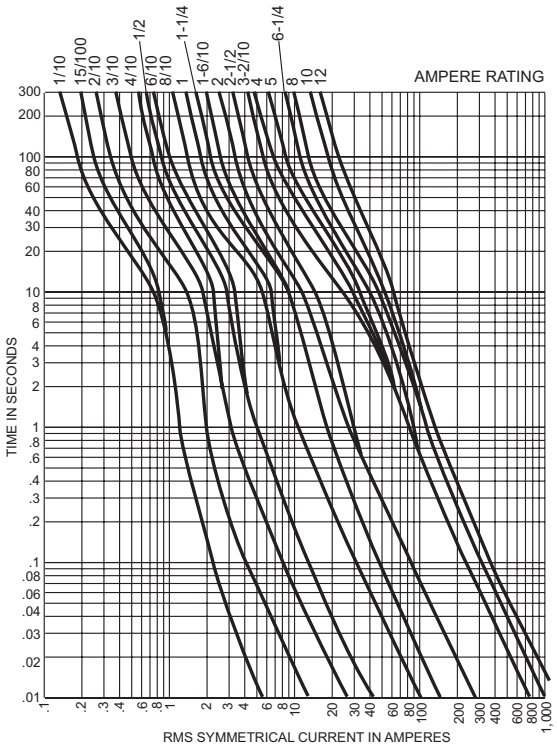
LESRK Series Dual-element Time-delay Fuses					
Part Number	AMP Rating	Rated Voltage AC Max	Pcs/Pkg	Package Weight	Price
LESRK5	5	600V	10	1.60 lb	$169.00
LESRK10	10				$169.00
LESRK15	15				$151.00
LESRK20	20				$151.00
LESRK25	25				$151.00
LESRK30	30				$151.00
LESRK40	40			3.05 lb	$259.00
LESRK50	50			3.10 lb	$259.00
LESRK60	60				$259.00
LESRK100	100		5	1.50 lb	$270.00
LESRK200	200		1	1.10 lb	$107.00
LESRK300	300			2.40 lb	$163.00
LESRK400	400				$163.00
LESRK500	500			3.40 lb	$234.00
LESRK600	600				$232.00

Dual Element Time-Delay Class RK1 Fuses

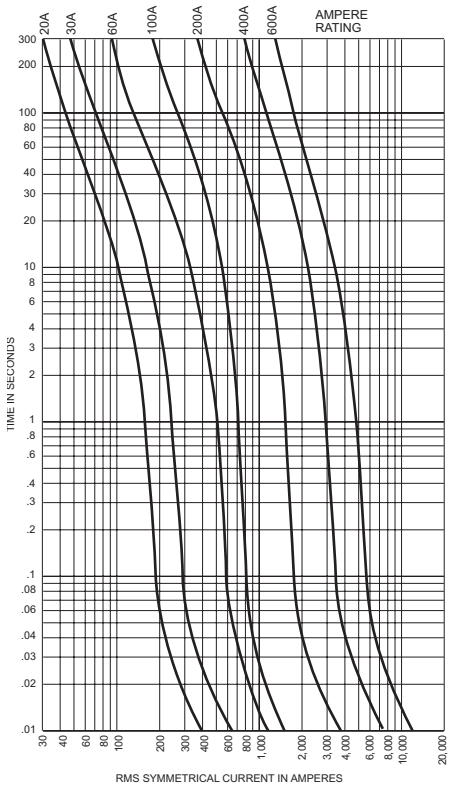
LENRK/LESRK

Average Time/ Current Curves

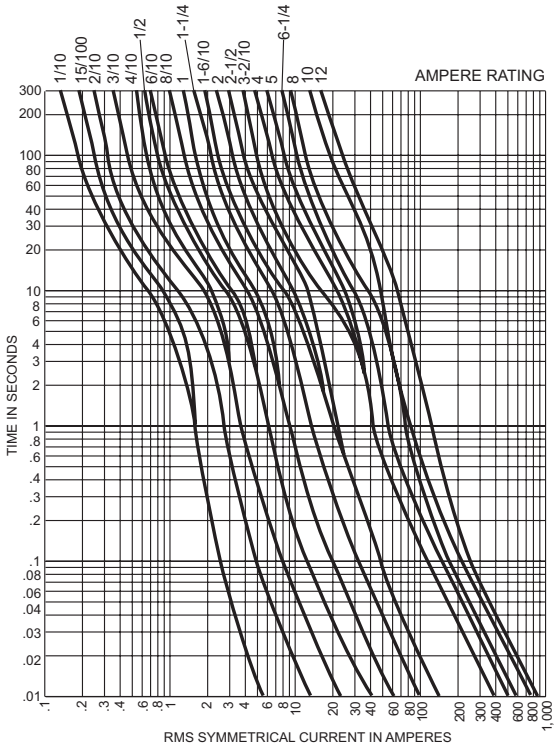
LENRK (AMP) 250 VAC



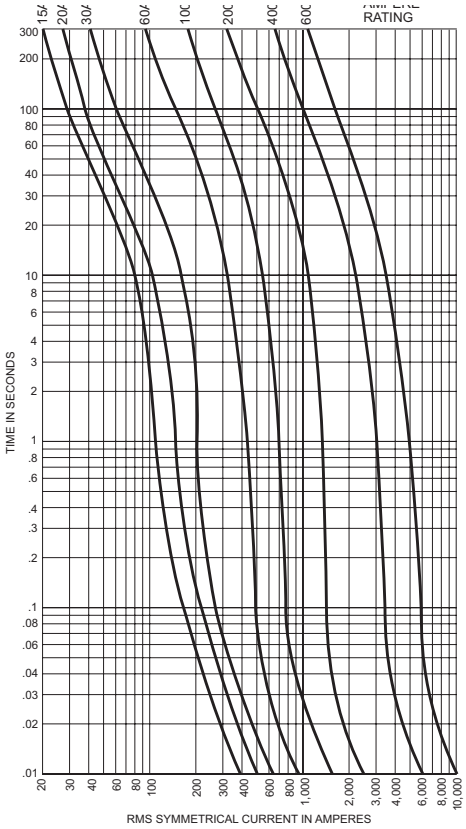
LENRK (250 VAC)



LESRK (AMP) 600VAC



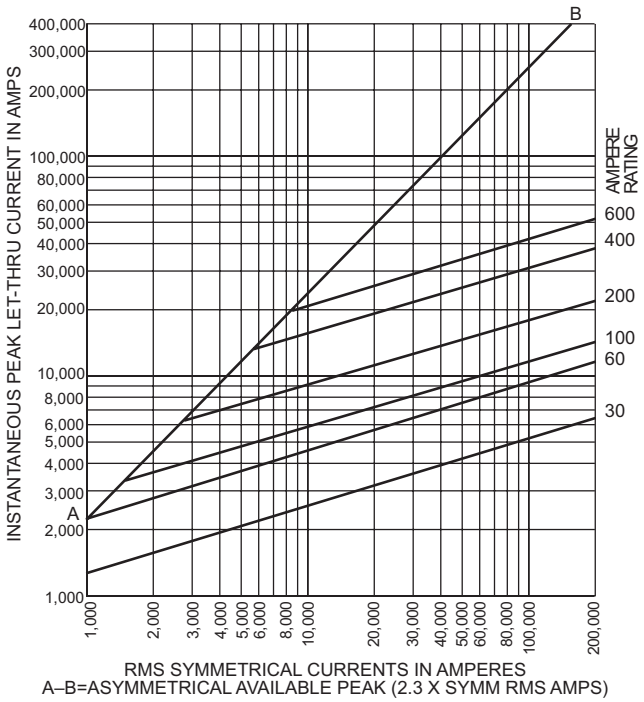
LESRK (600VAC)



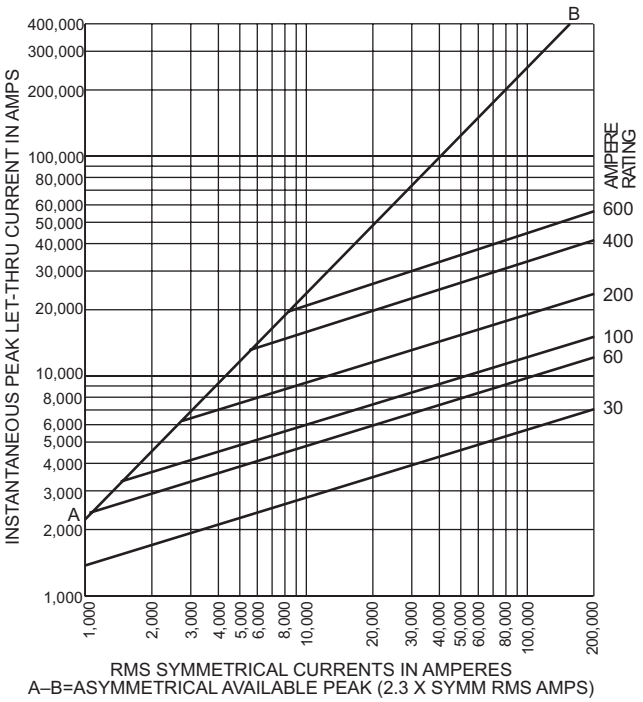
Dual Element Time-Delay Class RK1 Fuses

PEAK LET-THROUGH CURRENT CURVES*

LENRK (250V)



LESRK (600V)



*Curves test data obtained at 15% short-circuit power factor when possible.

CURRENT LIMITATION TABLES

LENRK (250V)* RMS & Peak Let-Thru Currents (kA)

Available Fault current	Apparent Effective Let-Thru Amperes (kA)											
	30		60		100		200		400		600	
RMS Amps	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p
1,000	1	1	1	2	1	2	1	2	1	2	1	2
2,000	1	2	1	3	2	4	2	5	2	5	2	5
3,000	1	2	1	3	2	4	3	6	3	7	3	7
5,000	1	2	2	4	2	5	3	7	5	12	5	12
10,000	1	3	2	4	2	6	4	9	7	15	9	21
15,000	1	3	2	5	3	6	4	10	7	17	10	23
20,000	1	3	2	6	3	7	5	11	8	19	11	25
25,000	1	3	3	6	3	7	5	12	9	20	12	27
30,000	2	3	3	6	3	8	5	12	9	21	13	29
35,000	2	4	3	7	4	8	6	13	10	22	13	30
40,000	2	4	3	7	4	9	6	13	10	23	13	31
50,000	2	4	3	7	4	9	6	14	10	24	14	33
60,000	2	4	3	8	4	10	7	15	11	26	15	35
70,000	2	4	3	8	4	10	7	16	12	27	16	36
80,000	2	5	4	8	5	11	7	16	12	28	17	38
90,000	2	5	4	9	5	11	7	17	13	29	17	39
100,000	2	5	4	9	5	11	8	18	13	30	17	40
150,000	2	6	4	10	5	13	8	19	16	36	20	46
200,000	3	6	5	11	6	14	9	21	18	42	22	50

LESRK (600V)* RMS & Peak Let-Thru Currents (kA)

Available Fault current	Apparent Effective Let-Thru Amperes (kA)											
	30		60		100		200		400		600	
RMS Amps	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p	I_{RMS}	I_p
1,000	1	1	1	2	1	2	1	2	1	2	1	2
2,000	1	2	1	3	2	4	2	4	2	4	2	4
3,000	1	2	1	3	2	4	3	6	3	7	3	7
5,000	1	2	2	4	2	5	3	7	5	12	5	12
10,000	1	3	2	5	3	6	4	9	7	16	9	21
15,000	1	3	2	5	3	7	5	11	8	18	10	24
20,000	1	3	3	6	3	7	5	12	8	19	11	26
25,000	2	4	3	6	3	8	5	12	9	21	12	28
30,000	2	4	3	6	4	8	6	13	10	22	13	30
35,000	2	4	3	7	4	9	6	14	10	23	13	31
40,000	2	4	3	7	4	9	6	14	10	24	14	32
50,000	2	5	3	8	4	10	7	15	11	26	15	35
60,000	2	5	3	8	4	10	7	16	12	28	16	37
70,000	2	5	4	8	5	11	7	17	13	29	17	39
80,000	2	5	4	9	5	11	8	18	13	30	17	40
90,000	2	5	4	9	5	12	8	18	13	31	18	42
100,000	2	6	4	9	5	12	8	19	14	32	19	44
150,000	3	6	5	11	6	14	9	21	16	36	22	50
200,000	3	7	5	12	7	15	10	23	17	40	23	54

*"Apparent Let-Thru Amperes" values are read from "Peak Let-Through Current Curves" and the peak current value divided by 2.3 Asymmetry Factor.

Extremely Fast-Acting Class T Fuses

EDISON TJN and TJS Class T fuses are extremely fast-acting fuses in a compact, space-saving size. These fuses are ideal as the main fuse protection for panel boards, load centers, meter stacks, and AC drives.

TJN/S Features

- Extremely current limiting
- No intentional time delay; opens quickly on overload
- Silver link construction provides superior component protection against fault currents
- Space saving dimensions

Applications

- Recommended for protection of non-inductive loads such as lighting and resistance-heating circuits
- Use to protect lower interrupting-rated circuit breakers when series rated with Class T fuses
- For motor protection, size at 300% FLC; provides short-circuit protection only
- Use for short-circuit protection of AC drives

Specifications

Voltage Rating:

TJN: 300 VAC
TJS: 600 VAC

Ampere Ratings:

1–600 Amps

Interrupting Rating:

200,000 RMS Symmetrical Amps

Self-Certified Voltage Ratings (DC)
(15–600): 160 VDC
TJS (15–400): 300 VDC

Self-Certified Interrupting Ratings (DC):
TJN (15–600): 20,000 Amps DC
TJS (15–400): 10,000 Amps DC

Current Limiting: Class T Fuse

Agency Approvals

- UL Listed, Class T, Guide JDDZ, File E162363
- CSA Certified HRCI-T per C22.2, No. 248.12

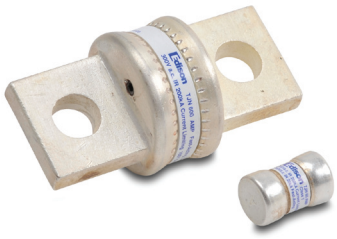
T Series 300VAC Extremely Fast-Acting Fuses

Part Number	AMP Rating	Rated Voltage	Pcs/ Pkg	Package Weight	Price
TJN1	1	300 VAC	10	0.12 lb	$95.00
TJN1-1			1	0.02 lb	$12.00
TJN3	3		10	0.12 lb	$95.00
TJN3-1			1	0.02 lb	$12.00
TJN6	6		10	0.12 lb	$95.00
TJN6-1			1	0.02 lb	$12.00
TJN10	10		10	0.12 lb	$115.00
TJN10-1			1	0.02 lb	$14.50
TJN15	15		10	0.12 lb	$126.00
TJN15-1			1	0.02 lb	$16.00
TJN20	20		10	0.12 lb	$126.00
TJN20-1			1	0.02 lb	$15.50
TJN25	25		10	0.12 lb	$121.00
TJN25-1			1	0.02 lb	$15.50
TJN30	30		10	0.12 lb	$126.00
TJN30-1			1	0.02 lb	$16.00
TJN35	35		10	0.23 lb	$131.00
TJN35-1			1	0.03 lb	$16.00
TJN40	40		10	0.23 lb	$131.00
TJN40-1			1	0.03 lb	$16.00
TJN45	45		10	0.23 lb	$131.00
TJN45-1			1	0.03 lb	$16.00
TJN50	50		10	0.23 lb	$131.00
TJN50-1			1	0.03 lb	$16.00
TJN60	60		10	0.23 lb	$126.00
TJN60-1			1	0.03 lb	$16.00
TJN70	70		5	0.36 lb	$74.00
TJN70-1			1	0.11 lb	$17.50
TJN80	80		5	0.36 lb	$78.00
TJN80-1			1	0.11 lb	$19.50
TJN90	90		5	0.36 lb	$78.00
TJN90-1			1	0.11 lb	$19.50
TJN100	100		5	0.36 lb	$73.00
TJN100-1			1	0.11 lb	$17.50
TJN110	110		1	0.14 lb	$22.00
TJN125	125		1		$22.00
TJN150	150		1		$24.50
TJN175	175		1		$24.50
TJN200	200		1		$24.50
TJN225	225		1	0.25 lb	$56.00
TJN250	250		1		$56.00
TJN300	300		1		$56.00
TJN350	350		1		$49.50
TJN400	400		1		$44.50
TJN450	450		1	0.44 lb	$65.00
TJN500	500		1		$72.00
TJN600	600		1		$72.00

T Series 600VAC Extremely Fast-Acting Fuses

Part Number	AMP Rating	Rated Voltage	Pcs /Pkg	Package Weight	Price
TJS1	1	600 VAC	10	0.33 lb	$95.00
TJS1-1			1	0.02 lb	$10.50
TJS3	3		10	0.33 lb	$95.00
TJS3-1			1	0.02 lb	$10.50
TJS6	6		10	0.33 lb	$95.00
TJS6-1			1	0.02 lb	$10.50
TJS10	10		10	0.33 lb	$109.00
TJS10-1			1	0.02 lb	$13.00
TJS15	15		10	0.33 lb	$109.00
TJS15-1			1	0.02 lb	$13.00
TJS20	20		10	0.33 lb	$109.00
TJS20-1			1	0.02 lb	$13.00
TJS25	25		10	0.33 lb	$109.00
TJS25-1			1	0.02 lb	$13.00
TJS30	30		10	0.33 lb	$102.00
TJS30-1			1	0.02 lb	$12.00
TJS35	35		10	0.82 lb	$152.00
TJS35-1			1	0.03 lb	$17.00
TJS40	40		10	0.82 lb	$167.00
TJS40-1			1	0.03 lb	$18.50
TJS45	45		10	0.82 lb	$176.00
TJS45-1			1	0.03 lb	$20.50
TJS50	50		10	0.82 lb	$154.00
TJS50-1			1	0.03 lb	$17.50
TJS60	60		10	0.82 lb	$152.00
TJS60-1			1	0.03 lb	$16.50
TJS70	70		5	0.51 lb	$111.00
TJS70-1			1	0.11 lb	$25.50
TJS80	80		5	0.51 lb	$126.00
TJS80-1			1	0.11 lb	$29.00
TJS90	90		5	0.51 lb	$141.00
TJS90-1			1	0.11 lb	$31.50
TJS100	100		5	0.51 lb	$126.00
TJS100-1			1	0.11 lb	$29.00
TJS110	110		1	0.19 lb	$30.00
TJS125	125		1		$30.00
TJS150	150		1		$30.00
TJS175	175		1		$31.00
TJS200	200		1		$31.00
TJS225	225		1	0.46 lb	$74.00
TJS250	250		1		$74.00
TJS300	300		1		$84.00
TJS350	350		1		$86.00
TJS400	400		1		$89.00
TJS450	450		1	0.85 lb	$175.00
TJS500	500		1		$180.00
TJS600	600		1		$195.00

Extremely Fast-Acting Class T Fuses

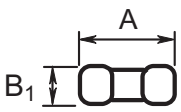


300V TJN Fuses

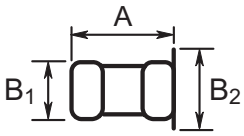
600V TJS Fuses

CROSS REFERENCE				
VOLTS	EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
300	TJN	JJN	A3T	JLLN
600	TJS	JJS	A6T	JLLS

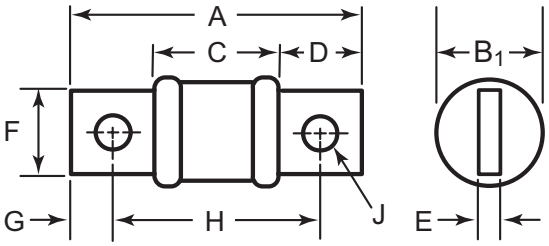
TJN & TJS Fuse Dimensions



1A to 60A TJN
1A to 30A TJS



35A to 60A TJS



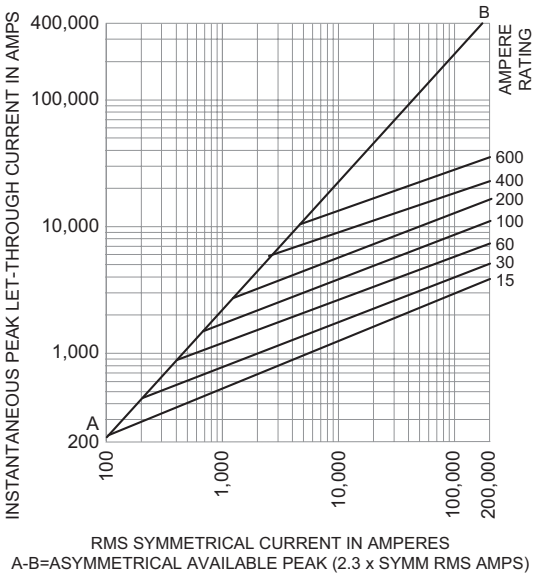
70A to 600A

Fuse Type	Current Rating	Overall Length	Maximum Diameter		Barrel Length	Blade Length	Blade Thickness	Blade Width	Mounting Hole Spacing		
	Range	A	B_1	B_2	C	D	E	F	G	H	J
	(A)	(in [mm])									
TJN (300 VAC)	1-30	0.88 [22.4]	0.41 [10.4]	n/a	n/a (no blades)						
	35-60		0.56 [14.2]								
	70-100	2.16 [54.9]	0.82 [20.8]		0.84 [21.3]	0.66 [16.8]	0.125 [3.18]	0.75 [19.1]	0.27 [6.86]	1.56 [39.6]	0.284 [7.21]
	110-200	2.44 [62.0]	1.06 [26.9]			0.80 [20.3]	0.19 [4.83]	0.88 [22.4]	0.34 [8.64]	1.69 [42.9]	0.344 [8.74]
	225-400	2.75 [69.9]	1.33 [33.8]		0.86 [21.8]	0.95 [24.1]	0.25 [6.35]	1.00 [25.4]	0.42 [10.7]	1.84 [46.7]	0.406 [10.3]
	450-600	3.06 [77.7]	1.60 [40.6]		0.88 [22.4]	1.08 [27.4]	0.31 [7.87]	1.25 [31.8]	0.48 [12.2]	2.03 [51.6]	0.484 [12.3]
TJS (600 VAC)	1-30	1.50 [38.1]	0.56 [14.2]		n/a (no blades)						
	35-60	1.56 [39.6]	0.81 [20.6]	1.00 [25.4]							
	70-100	2.95 [74.9]	0.82 [20.8]	n/a	1.64 [41.7]	0.66 [16.8]	0.125 [3.18]	0.75 [19.1]	0.27 [6.86]	2.36 [59.9]	0.281 [7.14]
	110-200	3.25 [82.6]	1.07 [27.2]		1.66 [42.2]	0.80 [20.3]	0.19 [4.83]	0.88 [22.4]	0.34 [8.64]	2.50 [63.5]	0.344 [8.74]
	225-400	3.63 [92.2]	1.60 [40.6]		1.73 [43.9]	0.95 [24.1]	0.25 [6.35]	1.00 [25.4]	0.42 [10.7]	2.72 [69.1]	0.406 [10.3]
	450-600	3.98 [101]	2.08 [52.8]		1.78 [45.2]	1.08 [27.4]	0.31 [7.87]	1.25 [31.8]	0.48 [12.2]	2.95 [74.9]	0.484 [12.3]

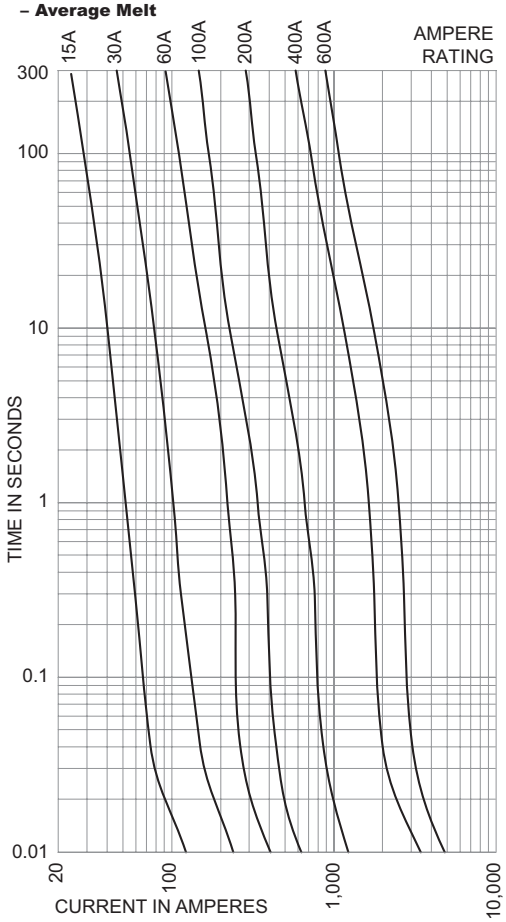
Extremely Fast-Acting Class T Fuses

TJN (300 VAC)Trip Curves

Current Limitation Curves

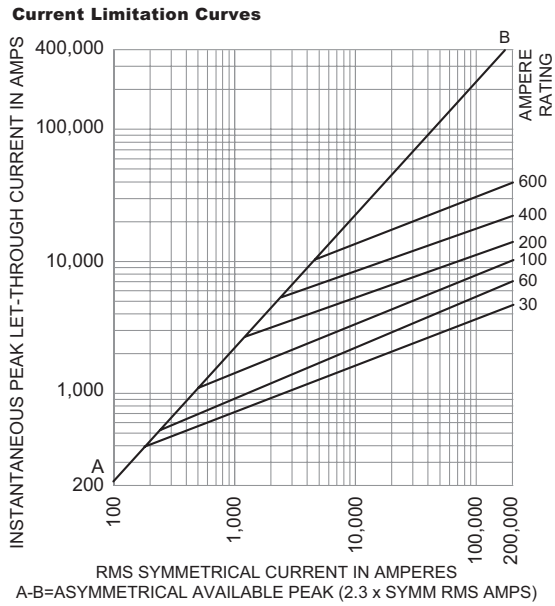


TJS Time-Current Characteristic Curves – Average Melt

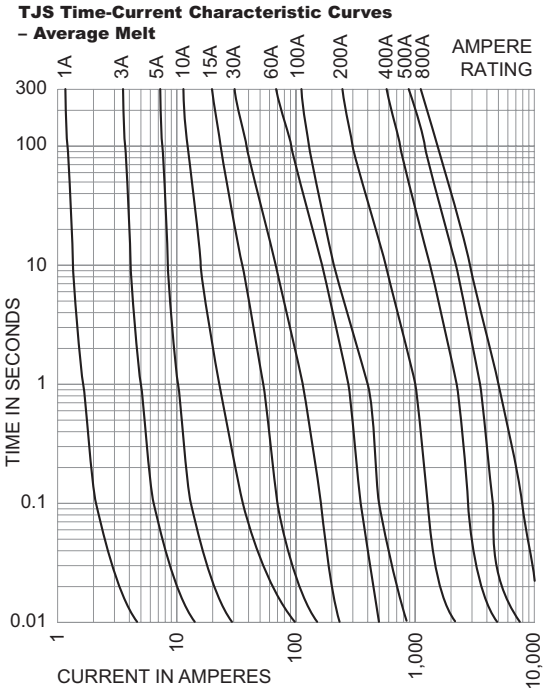


TJS (600 VAC)Trip Curves

Current Limitation Curves



TJS Time-Current Characteristic Curves – Average Melt



Class L Fast-Acting Current Limiting Fuses

LCU601

LCU1200

Edison LCU UL Class L fuses are particularly suited for protection of circuit breakers with lower interrupting ratings and non-inductive loads such as lighting and heating circuits. 99% pure silver links provide low watt loss and low operating temperature at normal current levels.

Applications

- Circuit breakers
- Drive protection
- Meets UL, NEC and CSA requirements for branch and feeder protection

Class L Features

- Fast-acting, short circuit protection
- Allows low I^2t let-through energy of any branch circuit overcurrent protective device
- High grade silica-sand filler accelerates response of fuse to short circuits by having a quenching effect upon the fuse arc.
- O-ring seals maximize pressure build-up during current limiting actions and ensure filler retention.
- Silver-plated micro-peened terminals provide high electrical conductivity, minimize heat generation, and keep fuses and switches cool.
- Selective coordination (blackout prevention)
- Glass melamine tube
- Silver-plated end bells
- No fuse reducers required.

Specifications

Voltage Rating: 600 VAC (or less)

Ampere Rating: 601-1200 Amps

Interrupting Rating:
200,000 RMS Symmetrical Amps;

Current Limiting: Class L Fuse

Mounting: Bolt mount

Note: Fuse blocks not sold by AutomationDirect.com

Agency Approvals

- UL Listed, Std. 248-10, E162363, JDDZ
- CSA Certified, HRC-L C22.2 No. 248.10, Class 1422-02, File 53787
- RoHS compliant, CE, Reach

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

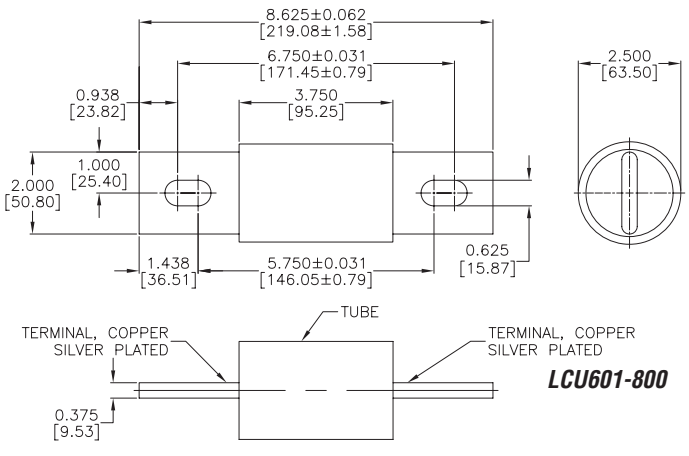
Cross Reference			
Edison	***Bussmann***	***Mersen***	***Littelfuse***
LCU	KTU	A4BY	LDC

LCU Series Class L Fast-Acting Fuses

Part Number	*AMP Rating*	*Rated Voltage (max)*	*Pcs/ Pkg*	*Weight lb [kg]*	*Price*
LCU601	601	600VAC	1	3.64 [1.65]	$375.00
LCU650	650				$443.00
LCU700	700				$375.00
LCU800	800				$354.00
LCU1000	1000			4.04 [1.82]	$354.00
LCU1200	1200				$354.00

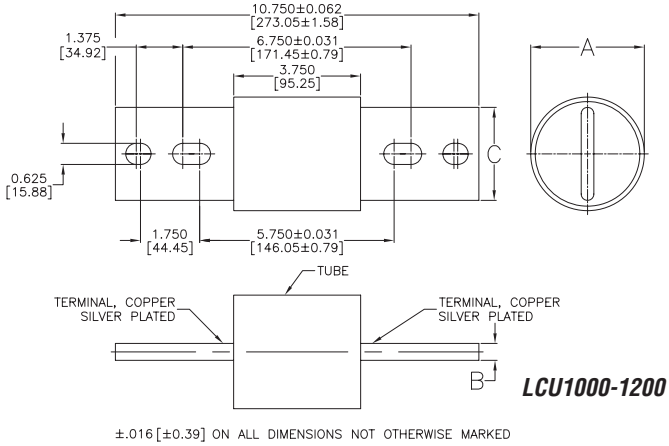
Dimensions

in [mm]



LCU601-800

±.016 [±0.39] ON ALL DIMENSIONS NOT OTHERWISE MARKED



LCU1000-1200

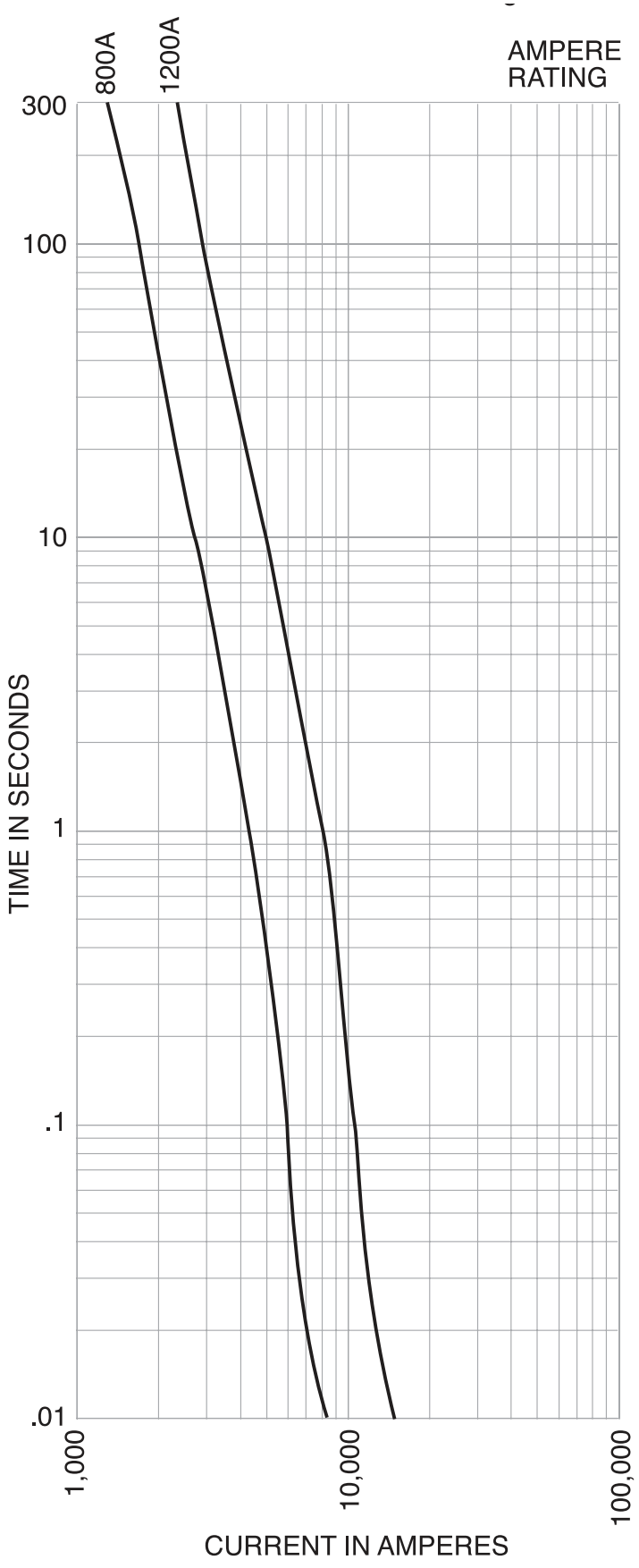
±.016 [±0.39] ON ALL DIMENSIONS NOT OTHERWISE MARKED

Dimensions			
Amp	***A***	***B***	***C***
1000-1200	2-25/64	3/8	2

Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Class L Fast-Acting Fuses

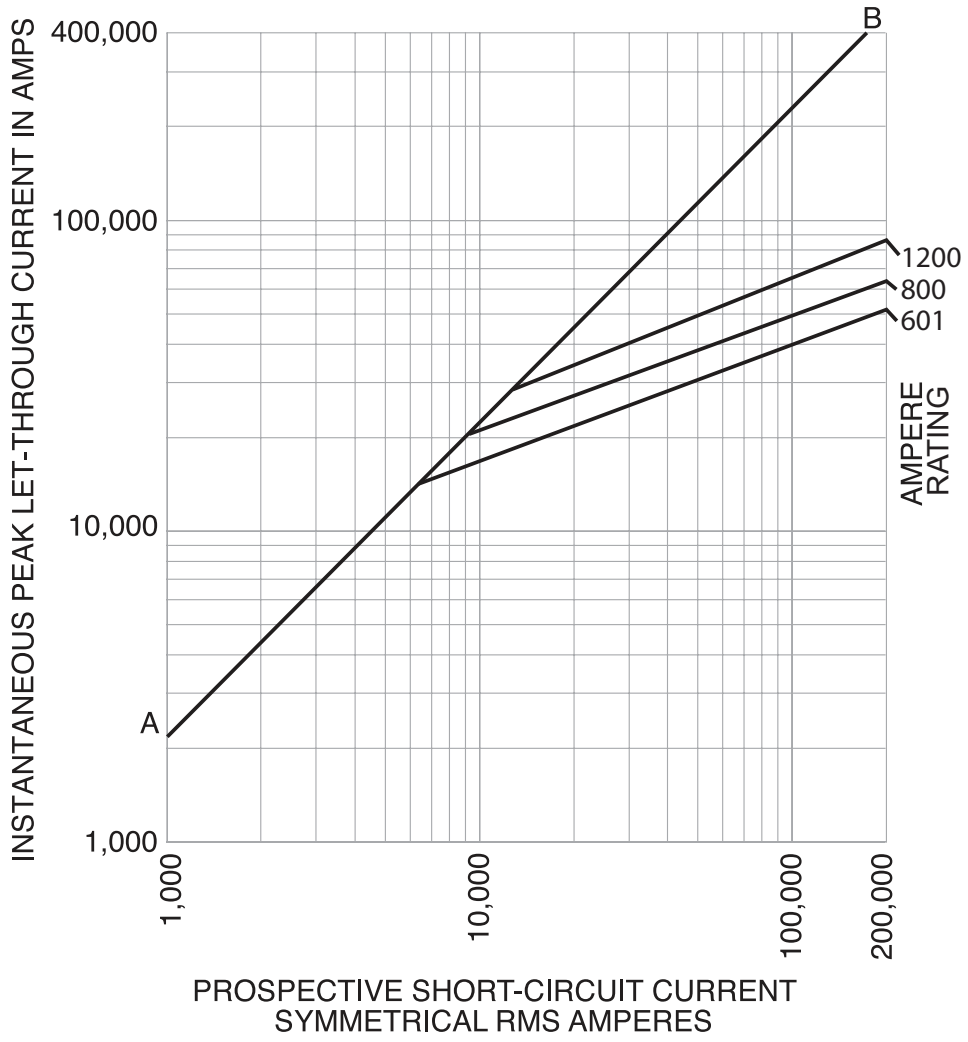
Time-current characteristic curves



***Note:** See website for interpolation method document to address the correct method in which to interpolate the fuse curve that does not appear on the chart (601, 650, 700).*

Class L Fast-Acting Fuses

Current Limitation Curves



How to Use the Let-Through Charts

Using the example given, one can determine the pertinent let-through data for the LCU800 amp fuse. The Let-Through Chart pertaining to the 800A fuse is illustrated.

Determine the PEAK let-through CURRENT.

Step 1. Enter the chart on the Prospective Short-Circuit current scale at 100,000 amps and proceed vertically until the 800A fuse curve is intersected.
Step 2. Follow horizontally until the Instantaneous Peak Let-Through Current scale is intersected.
Step 3. Read the PEAK let-through CURRENT as 50,000A. (If a fuse had not been used, the peak current would have been 200,000A.)

UL Class L bolt-on fuses rated 601 to 1200A: Mounting

To mount UL Class L fuse, use stainless steel bolts of correct number, diameter and length, stainless steel spring washers on each side of the bolt and stainless steel nuts. The nuts shall be tightened to the torque recommended by ASTM Standards for the bolt size used. The bolts shall have the largest diameter that will fit the bolt holes and length to allow full nut thread engagement. Bolts shall be installed in each fuse mounting hole or slot.

HCLR Current Limiting Class CC Fuses

Features

- Branch circuit rated for 600 VAC
- Compact dimensions
- Fast-acting design responds quickly to both overload and short-circuit current

Applications

- Lighting
- Resistive heating loads

HCLR Specifications

Fast-Acting

Voltage Rating: HCLR:
600 VAC
300 VDC (15–20A)

Ampere Rating: 0.5–30 Amps

Interrupting Rating:
200,000 RMS Symmetrical Amps

Current Limiting: Class CC Fuse

Agency Approvals

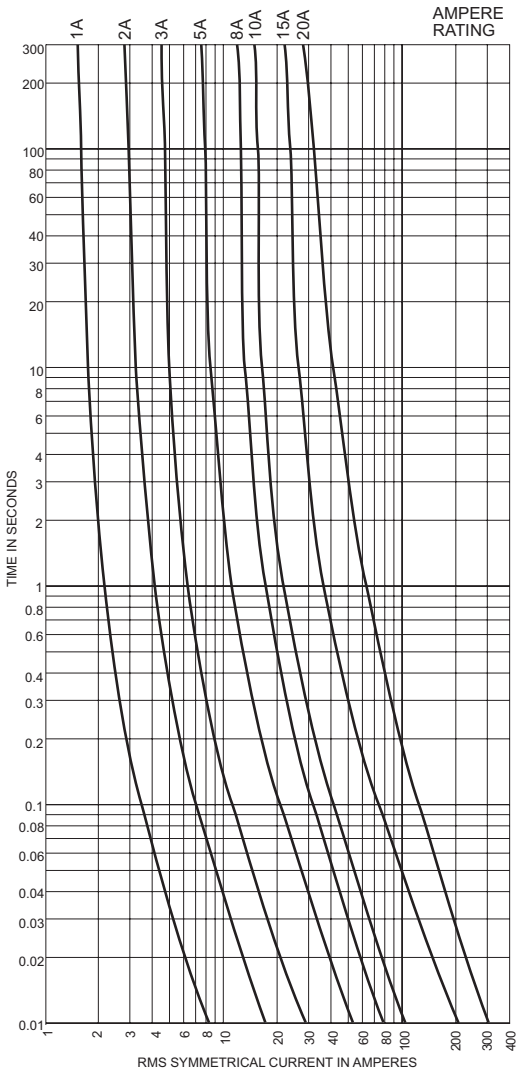
- UL Listed, Class CC, Guide JDDZ, File E162363
- CSA Certified HRCI-MISC per C22.2, No. 248.4
- CE Compliant

HCLR Current Limiting Class CC Fuses				
Part Number	AMP Rating	Pcs/Pkg	Package Weight	Price
HCLR-5	0.5	10	0.2 lb	$89.00
HCLR-75	0.75			$97.00
HCLR1	1			$85.00
HCLR1-5	1.5			$85.00
HCLR2	2			$85.00
HCLR2-5	2.5			$108.00
HCLR3	3			$85.00
HCLR3-5	3.5			$113.00
HCLR4	4			$90.00
HCLR5	5			$85.00
HCLR6	6			$88.00
HCLR7	7			$103.00
HCLR8	8			$90.00
HCLR9	9			$113.00
HCLR10	10			$85.00
HCLR12	12			$86.00
HCLR15	15			$85.00
HCLR20	20			$85.00
HCLR25	25			$90.00
HCLR30	30			$85.00

DIMENSIONS		
Amps	Ferrule (in)	Length (in)
0.5 - 30	13/32	1-1/2

CROSS REFERENCE			
EDISON	BUSSMANN	GOULD	LITTELFUSE
HCLR	KTK-R	ATMR	KLKR

Characteristic Curves



HCTR Current Limiting Class CC Fuses

Features

- Branch circuit rated for 600 VAC
- Compact dimensions
- Time-delay design allows closer sizing for inductive loads such as control transformers and solenoids

Applications

- Primary protection for our PH series of control power transformers. See our complete selection listed at the end of this catalog section.

HCTR Specifications

Time-Delay

Voltage Rating: **HCTR - 600 VAC**

Ampere Rating: **0.25 - 30 Amps**

Interrupting Rating:
200,000 RMS Symmetrical Amps

Current Limiting: **Class CC Fuse**

Agency Approvals

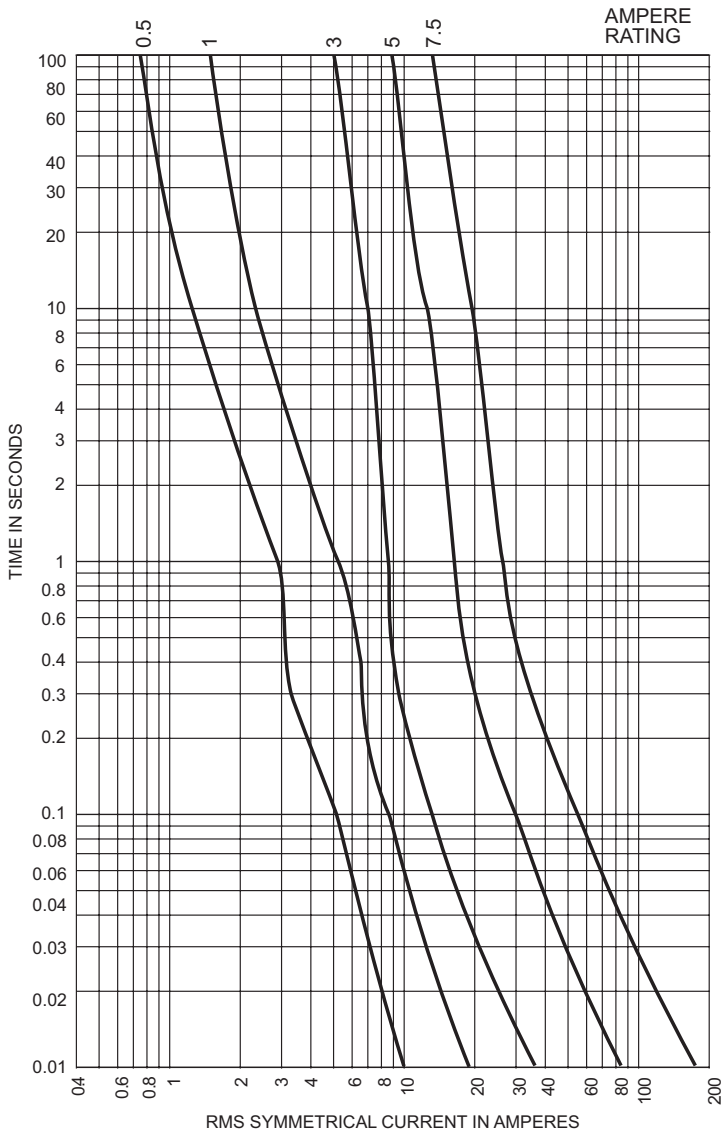
- UL Listed, Class CC, Guide JDDZ, File E162363
- CSA Certified HRCI-MISC per C22.2, No. 248.4
- CE Compliant

HCTR Current Limiting Class CC Fuses				
Part Number	**AMP Rating**	**Pcs/Pkg**	**Package Weight**	**Price**
HCTR-25	0.25	10	0.2 lb	$111.00
HCTR-5	0.5			$99.00
HCTR-75	0.75			$124.00
HCTR1	1			$99.00
HCTR1-25	1.25			$124.00
HCTR1-5	1.5			$100.00
HCTR2	2			$100.00
HCTR2-5	2.5			$111.00
HCTR3	3			$99.00
HCTR3-5	3.5			$124.00
HCTR4	4			$108.00
HCTR5	5			$100.00
HCTR6	6			$111.00
HCTR7-5	7.5			$120.00
HCTR8	8			$111.00
HCTR10	10			$108.00
HCTR15	15			$102.00
HCTR20	20			$106.00
HCTR25	25			$106.00
HCTR30	30			$106.00

DIMENSIONS		
Amps	**Ferrule (in)**	**Length (in)**
0.25 - 30	13/32	1-1/2

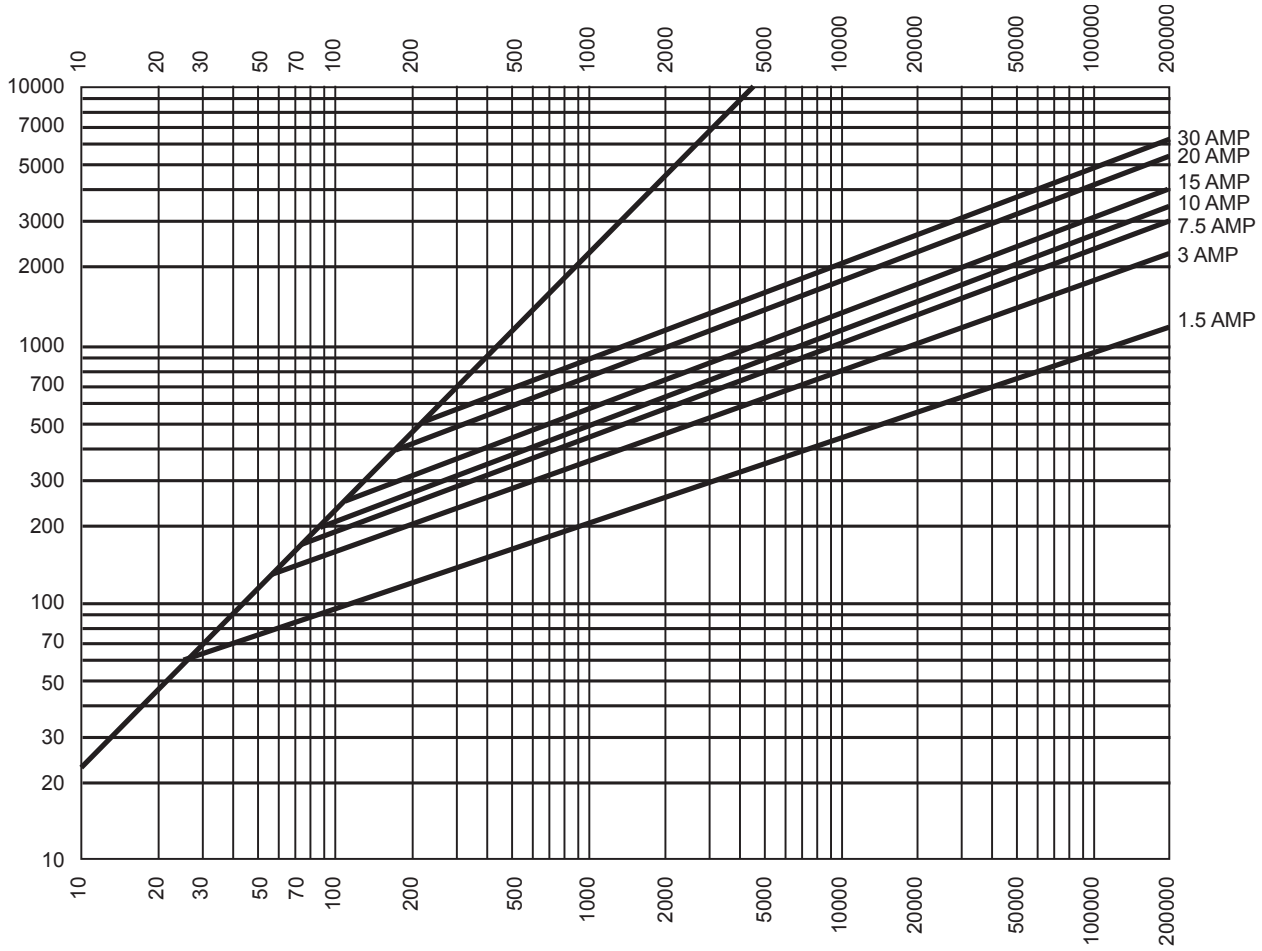
CROSS REFERENCE			
EDISON	**BUSSMANN**	**GOULD**	**LITTELFUSE**
HCTR	FNQ-R	ATQR	KLDR

Time-Current Characteristic Curves - Total Clearing



HCTR Current Limiting Class CC Fuses

Instantaneous Peak Let-Thru Current



EDCC Current Limiting Class CC Fuses

EDCC Current Limiting Class CC Fuses				
Part Number	AMP Rating	Pcs/Pkg	Package Weight	Price
EDCC-5	0.5	10	0.2 lb	$91.00
EDCC1	1			$91.00
EDCC1-5	1.5			$97.00
EDCC2	2			$91.00
EDCC2-5	2.5			$91.00
EDCC3	3			$91.00
EDCC3-5	3.5			$91.00
EDCC4	4			$91.00
EDCC5	5			$91.00
EDCC5-6	5.6			$97.00
EDCC6	6			$97.00
EDCC7	7			$97.00
EDCC8	8			$97.00
EDCC9	9			$97.00
EDCC10	10			$91.00
EDCC12	12			$97.00
EDCC15	15			$91.00
EDCC20	20			$91.00
EDCC25	25			$97.00
EDCC30	30			$91.00

Current-Limiting Effects EDCC (600V) Fuse Rating						
Let-Thru Current (Apparent RMS Symmetrical) Versus Fuse Ratings						
Prospective Short- Circuit Current*	1.25A	2.8A	15A	20A	25A	30A
1000	100	135	240	305	380	435
3000	140	210	350	440	575	580
5000	165	255	420	570	690	710
10,000	210	340	540	700	870	1,000
20,000	260	435	680	870	1,090	1,305
30,000	290	525	800	1,030	1,300	1,520
40,000	315	610	870	1,150	1,390	1,700
50,000	340	650	915	1,215	1,520	1,820
60,000	350	735	1,050	1,300	1,650	1,980
80,000	390	785	1,130	1,500	1,780	2,180
100,000	420	830	1,210	1,600	2,000	2,400
200,000	525	1,100	1,600	2,000	2,520	3,050

Note:RMS Symmetrical Amperes
Short-circuit Current
Ipeak = IRMS x 2.3

DIMENSIONS		
Amps	Ferrule (in)	Length (in)
0.5 - 30	13/32	1-1/2

CROSS REFERENCE			
EDISON	BUSSMANN	GOULD	LITTELFUSE
EDCC	LP-CC	ATDR	CCMR

Features

- Branch circuit rated for 600 VAC
- Time-delay for motor branch circuit protection
- Excellent current-limiting performance
- Upgrade for standard "midget" fuses

Applications

- Use for protection of small horsepower motor circuits or other circuits requiring small dimension, time-delay fuses
- Can provide Type "2" coordinated protection for IEC or NEMA starters/ contactors
- For control transformer applications, refer to HCTR fuses

Agency Approvals

- UL Listed, Class CC, Guide JDDZ, File E162363
- CSA Certified HRCI-MISC per C22.2, No. 248.4
- CE Compliant

EDCC Specifications

Time-Delay

Voltage Rating: EDCC
600 VAC; 300 VDC (0.5–2.25A, 20–30A)

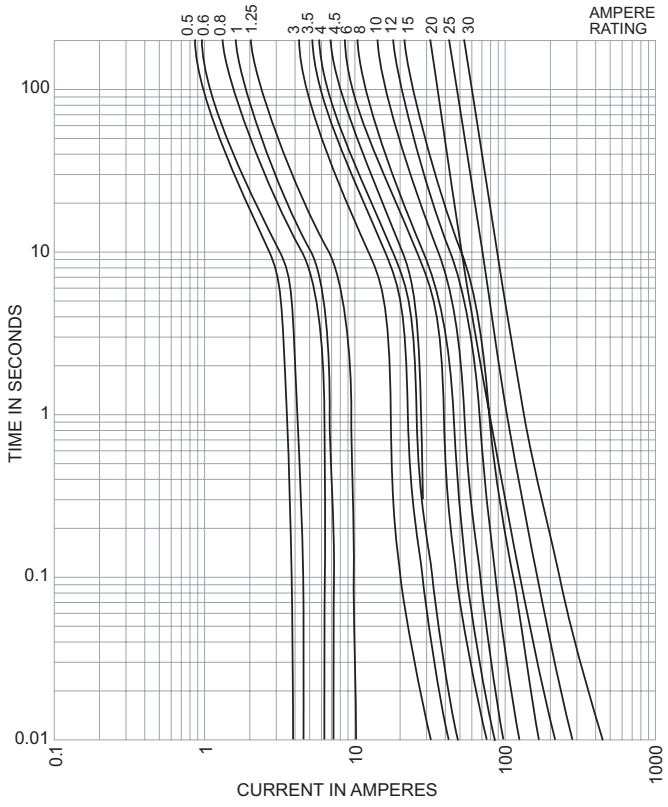
Ampere Rating: 0.5–30 Amps

Interrupting Rating:
200,000 RMS Symmetrical Amps
20,000 Amps DC

Current Limiting: Class CC Fuse

UL Listed DC Ratings (per 198L)

Characteristic Curves



****RMS Symmetrical Amperes Short-Circuit Current.***
NOTE: To calculate Ip (Ipeak) multiply IRMS value x 2.3.

General Purpose Midget Class MCL Fuses

Features

- Provide supplemental protection to end-use equipment
- Compact dimensions
- High interrupting rating
- Fast-acting design responds quickly to both overloads and short-circuit current

Applications

- Control circuits, electronic equipment protection, street lighting holders, and HID lighting

MCL Specifications

Fast-Acting

Voltage Rating: MCL - 600 VAC

Ampere Rating: 0.5 - 50 Amps

Interrupting Rating: 100,000 RMS Amps

Agency Approvals

- (0.5 - 30) UL Listed, File E162443
- (0.5 - 30) CSA Certified C22.2, Part 59.2, LR700489
- CE Compliant

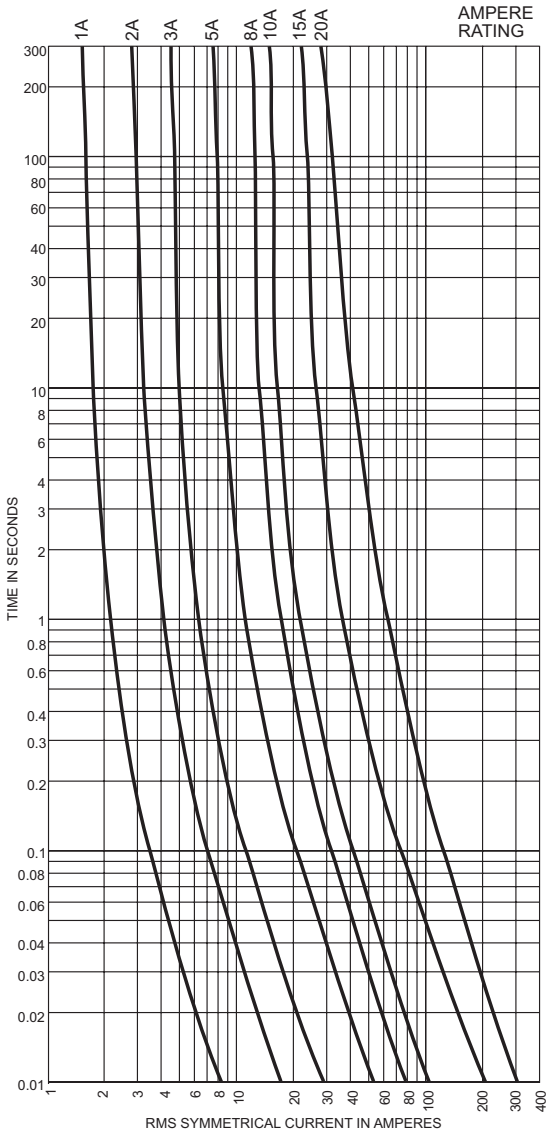
MCL General Purpose Midget Class Fuses				
Part Number	AMP Rating	Pcs/Pkg	Package Weight	Price
MCL-5	0.5	10	0.2 lb	$89.00
MCL1	1			$82.00
MCL1-5	1.5			$90.00
MCL2	2			$82.00
MCL2-5	2.5			$104.00
MCL3	3			$82.00
MCL3-5	3.5			$107.00
MCL4	4			$85.00
MCL5	5			$82.00
MCL6	6			$81.00
MCL8	8			$85.00
MCL10	10			$82.00
MCL12	12			$98.00
MCL15	15			$82.00
MCL20	20			$82.00
MCL25	25			$82.00
MCL30	30			$82.00
MCL35*	35			$107.00
MCL40*	40			$96.00
MCL50	50			$109.00

*Note: Max continuous load 25A. Not UL.

DIMENSIONS		
Amps	Ferrule (in)	Length (in)
0.5 - 50	13/32	1-1/2

CROSS REFERENCE			
EDISON	BUSSMANN	GOULD	LITTELFUSE
MCL	KTK	ATM	KLK

Characteristic Curves



General Purpose Midget Class MOL Fuses

Features

- Provide supplemental protection to end-use equipment
- Compact dimensions
- Economical laminated paper tube design

Applications

- Supplemental protection for non-inductive control and lighting circuits

MOL Specifications

Fast-Acting

Voltage Rating: MOL:
0.5 to 15 Amps - 250 VAC
20 to 30 Amps - 125 VAC

Ampere Rating: 0.5 - 30 Amps

Interrupting Rating: 10,000 RMS Amps

Agency Approvals

- (0.5 - 30) UL Listed to 198G, File E162443
- (0.5 - 30) CSA Certified C22.2, Part 59.2, LR700489
- CE Compliant

MOL General Purpose Midget Class Fuses

Part Number	AMP Rating	Pcs/Pkg	Package Weight	Price
MOL-5	0.5	10	0.2 lb	$22.00
MOL1	1			$17.00
MOL1-5	1.5			$22.00
MOL2	2			$17.00
MOL2-5	2.5			$22.00
MOL3	3			$17.00
MOL4	4			$22.00
MOL5	5			$17.00
MOL6	6			$17.00
MOL8	8			$18.50
MOL10	10			$13.50
MOL15	15			$16.00
MOL20	20			$21.00
MOL25	25			$21.50
MOL30	30			$19.50

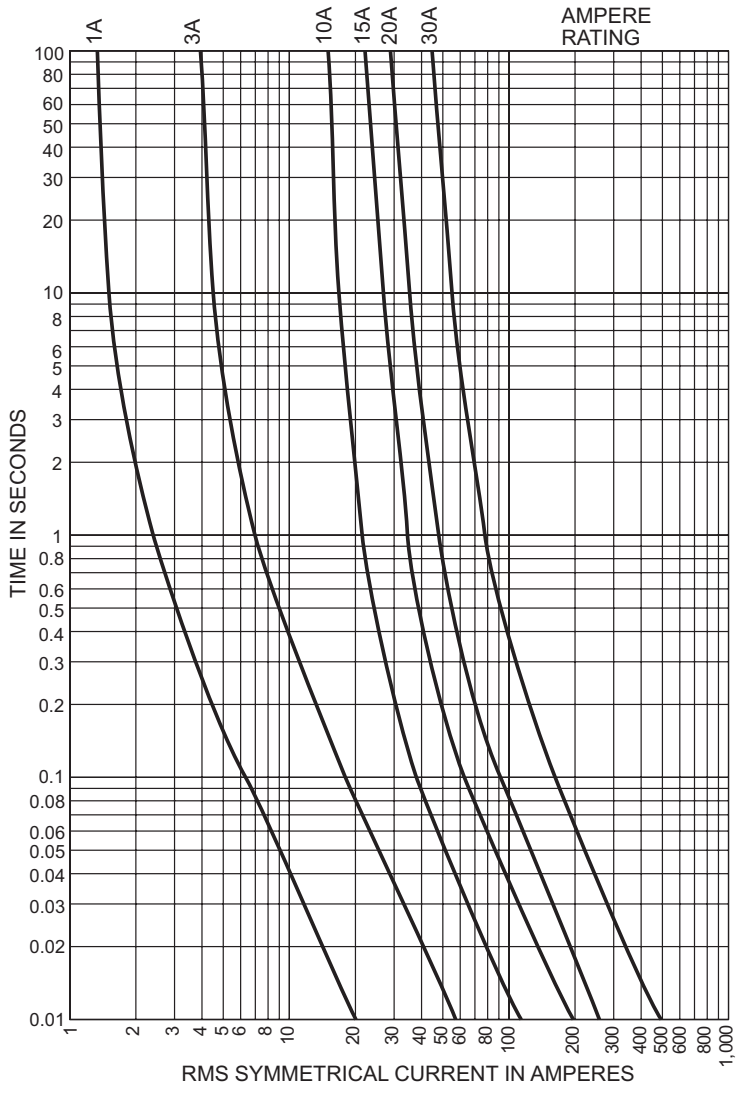
DIMENSIONS

Amps	Ferrule (in)	Length (in)
0.5 - 30	13/32	1-1/2

CROSS REFERENCE

EDISON	BUSSMANN	GOULD	LITTELFUSE
MOL	BAF/BAN	OTM	BLF

Characteristic Curves



General Purpose Midget Class MEQ Fuses

Features

- Compact dimensions
- Fiber tube construction
- Time-delay allows harmless inductive surges to pass without needless fuse opening

Applications

- Supplemental protection of transformers, solenoids, and other high- inrush circuits
- For motor branch circuit applications, refer to EDCC fuses

MEQ Specifications

Time-Delay

Voltage Rating: MEQ - 500 VAC
Ampere Rating: 0.25 - 30 Amps
Interrupting Rating: 10,000 RMS Amps

Agency Approvals

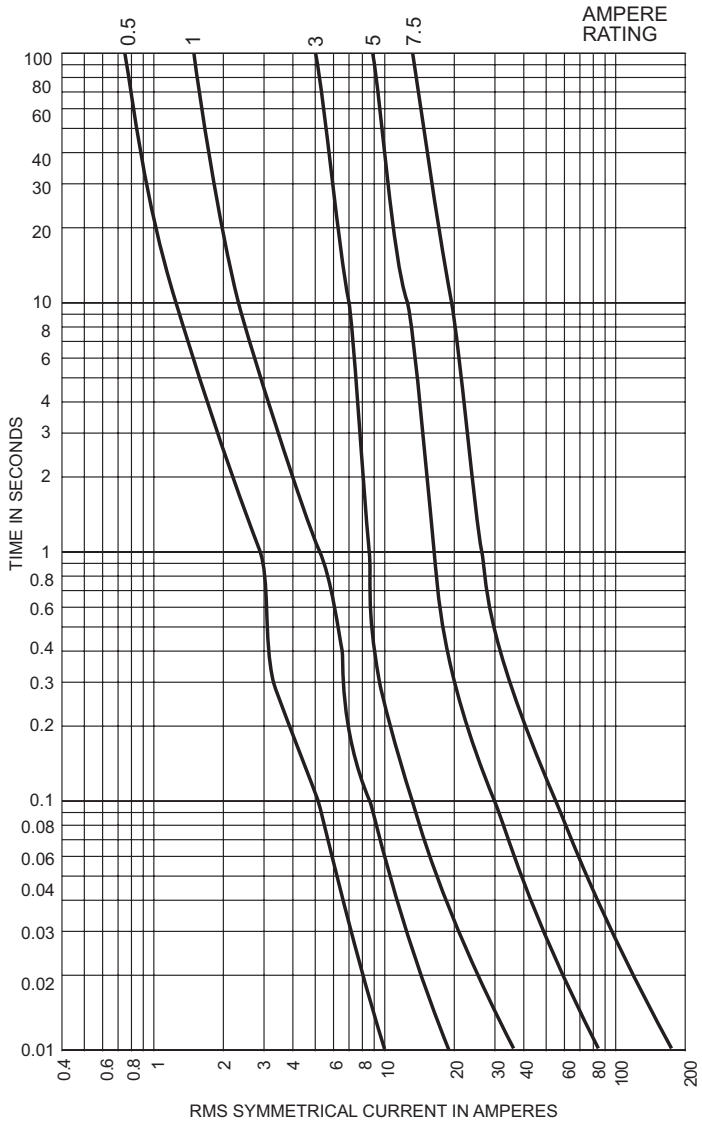
- (0.25 - 30) UL Listed, File E162443
- (0.25 - 30) CSA Certified C22.2, Part 59.2, LR700489
- CE Compliant

MEQ General Purpose Midget Class Fuses				
Part Number	AMP Rating	Pcs/Pkg	Package Weight	Price
MEQ-25	0.25	10	0.2 lb	$93.00
MEQ-5	0.5			$87.00
MEQ1	1			$84.00
MEQ1-5	1.5			$87.00
MEQ2	2			$84.00
MEQ2-5	2.5			$87.00
MEQ3	3			$84.00
MEQ3-5	3.5			$93.00
MEQ4	4			$84.00
MEQ4-5	4.5			$101.00
MEQ5	5			$84.00
MEQ6	6			$84.00
MEQ7	7			$87.00
MEQ8	8			$84.00
MEQ10	10			$84.00
MEQ12	12			$84.00
MEQ15	15			$84.00
MEQ20	20			$84.00
MEQ25	25			$84.00
MEQ30	30			$84.00

DIMENSIONS		
Amps	Ferrule (in)	Length (in)
0.25 - 30	13/32	1-1/2

CROSS REFERENCE			
EDISON	BUSSMANN	GOULD	LITTELFUSE
MEQ	FNQ	ATQ	FLQ

Characteristic Curves



General Purpose Midget Class MEN Fuses

Features

- Compact dimensions
- Fiber tube construction
- Dual-element construction allows harmless inductive surges to pass without opening

Applications

- Supplemental protection of small motors, transformers, solenoids, and other high-inrush power electronic circuits
- For motor branch circuit applications, refer to EDCC fuses

Time-Delay

Voltage Rating: MEN - 250 VAC
Ampere Rating: 0.5 - 30 Amps
Interrupting Rating: 10,000 RMS Amps @ 125V

Agency Approvals

- UL Listed, File E162443
- CSA Certified C22.2, Part 59.2, LR700489
- CE Compliant

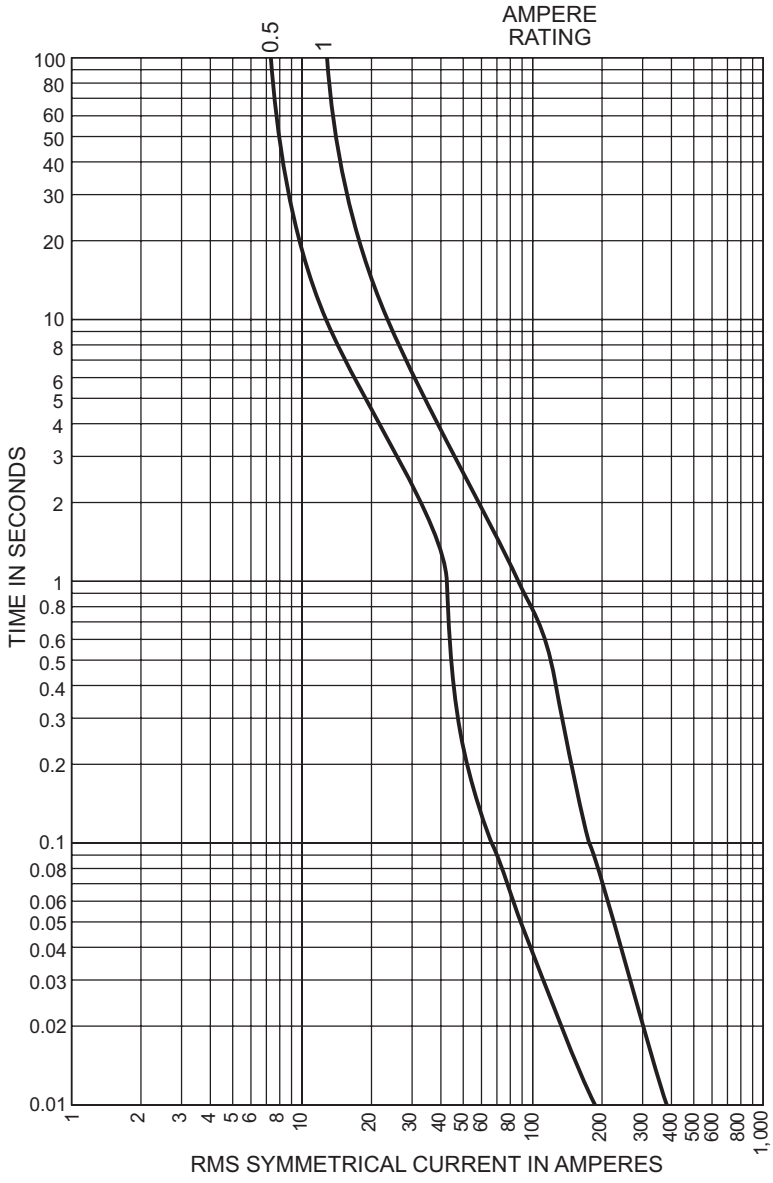
MEN Specifications

MEN General Purpose Midget Class Fuses				
Part Number	AMP Rating	Pcs/Pkg	Package Weight	Price
MEN-5	0.5	10	0.2 lb	$41.00
MEN-6	0.6			$41.00
MEN1	1			$38.50
MEN1-4	1.4			$50.00
MEN1-5	1.5			$43.00
MEN2	2			$34.50
MEN2-5	2.5			$39.50
MEN3	3			$36.50
MEN3-5	3.5			$37.50
MEN4	4			$36.50
MEN5	5			$34.50
MEN6	6			$39.50
MEN7	7			$37.50
MEN8	8			$36.50
MEN10	10			$34.50
MEN12	12			$40.50
MEN15	15			$36.50
MEN20	20			$37.00
MEN25	25			$43.00
MEN30	30			$37.00

DIMENSIONS		
Amps	Ferrule (in)	Length (in)
0.5 - 30	13/32	1-1/2

CROSS REFERENCE			
EDISON	BUSSMANN	GOULD	LITTELFUSE
MEN	FNM	TRM	FLM

Characteristic Curves



Small Dimension Fast-Acting ABC Fuses

Features

- Compact dimensions 1/4" x 1-1/4", (6.3 mm x 32 mm)
- Ceramic tube construction
- Fast-acting
- Fit on our DN-F6 fuse terminal blocks sold in Wiring Solutions section of this catalog
- RoHS Compliant

Applications

- Supplemental protection for electronic applications

ABC Specifications

Voltage Rating: ABC - See table below

Ampere Rating: 0.5 - 30 Amps

Interrupting Rating: See table below

Environmental Data

- Shock: 0.5A - MIL-STD-202, Method 213, Test Condition I;
  1A thru 30A - MIL-STD-202, Method 207, (HI Shock)
- Vibration: 0.5A thru 30A - MIL-STD-202, Method 204, Test Condition C (except 5g, 500 HZ)

Agency Approvals

- UL Listed product meets standard 248-14
- UL Listed Guide and File numbers (ABC 0.5-15A): JDYX and E19180
- UL Recognition Guide and File numbers (ABC 20-30A): JDYX2 and E19180
- CSA Certification Record No: 053787, Class No: 1422 01 and 1422 30
- RoHS

ABC Small Dimension Fast-Acting Fuses

Part Number	AMP Rating	Rated Voltage		AC Interrupting Rating*		DC Interrupting Rating*		Melting I^2t**	Voltage Drop***	Pcs/Pkg	Package Weight (lb)	Price
		AC Max	DC Max	250V	125V	125V	75V					
ABC-5	0.5	250V	125V	35A	10000A	10000A	–	0.19	0.51	5	0.045	$6.25
ABC-75	0.75							0.8	0.42			$6.25
ABC1	1							1.4	0.35			$6.00
ABC2	2			100A				4.2	0.35			$6.00
ABC3	3							19.5	0.25			$6.00
ABC4	4			200A				29.1	0.25			$6.00
ABC5	5							16.4	0.23			$5.75
ABC6	6							31.6	0.24			$5.75
ABC7	7							109.3	0.17			$5.75
ABC8	8							111.9	0.17			$5.75
ABC10	10							215.6	0.15			$5.75
ABC12	12			750A				129.6	0.11			$5.75
ABC15	15							200.2	0.12			$5.75
ABC20	20			400A	1000A			550.8	0.13			$8.50
ABC25	25			200A		400A	1000A	839.3	0.12			$8.50
ABC30	30							1429	0.14			$8.50

** Interrupting ratings were measured at 70% – 80% power factor on AC, and at a time constant described in UL 198L.*
*** Typical Melting I^2t (A^2sec) – measured at listed interrupting rating and rated voltage (at 70% to 80% power factor on AC).*
**** Typical Voltage Drop – measured at 25°C ± 3°C ambient temperature at rated current.*

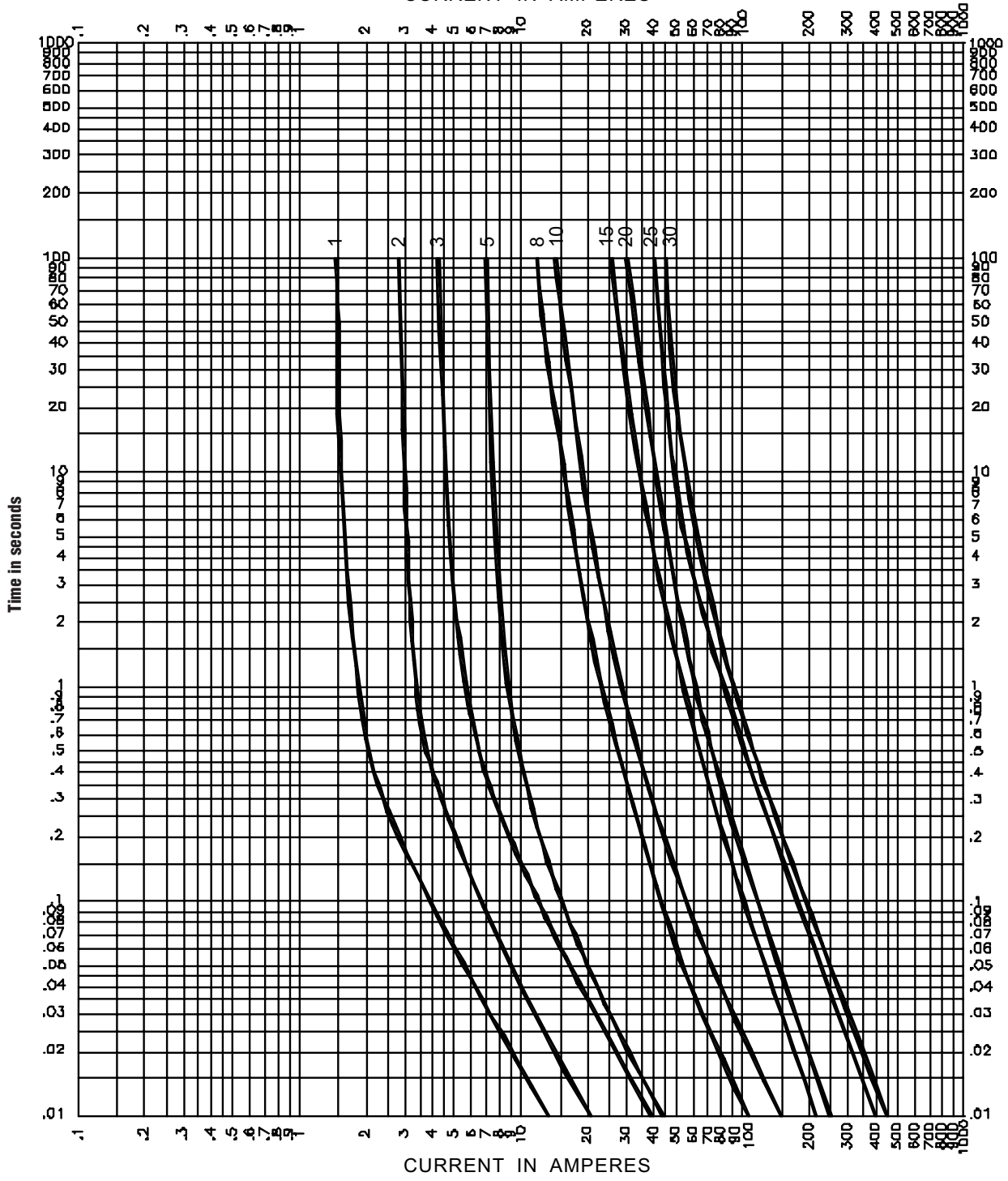
For mounting and wiring ABC fuses, see our DN-F6 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE

OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
BBC	ABC	GAB	314

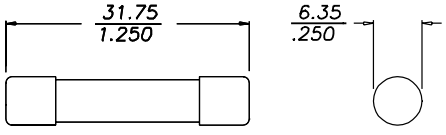
Small Dimension Fast-Acting ABC Fuses

TIME CURRENT CURVE



Dimensions

(mm/inches)



ABC Electrical Characteristics		
Rated Current	*% of Amp Rating*	*Opening Time*
0.5 to 30 Amps	100	4 hours minimum
	135	60 minutes maximum
	200	120 seconds maximum

Small Dimension Fast-Acting AGC Fuses

Features

- Compact dimensions 1/4" x 1-1/4", (6.3 mm x 32 mm)
- Glass tube construction, with nickel plated brass endcaps
- Fast-acting
- RoHS Compliant

Applications

- Supplemental protection for electronic applications

AGC Specifications

Voltage Rating: AGC - See table below

Ampere Rating: 0.10 - 30 Amps

Interrupting Rating: See table below

Environmental Data

Shock: 0.1A thru 0.75A - MIL-STD-202, Method 213, Test Condition I;
1A thru 30A - MIL-STD-202, Method 207, (HI shock)

Vibration: 0.1A thru 30A - MIL-STD-202, Method 204, Test condition A (except 5g, 500 HZ)

Agency Approvals

- UL Listed product meets standard 248-14
- UL Listed Card: (0.1-10A): JDYX E19180
- UL Recognition Card: (15-30A): JDYX2 E19180
- CSA Certification 053787 (Class No. 1422 01 and 1422 30
- RoHS

AGC Small Dimension Fast-Acting Fuses

Part Number	AMP Rating	Rated Voltage	AC Interrupting Rating*			Melting I^2t**	Voltage Drop mv***	Pcs/Pkg	Package Weight (lb.)	Price
		AC Max	250V	125V	32V					
AGC-1	0.10	250V	35A	10000A	—	0.000787	6.00	5	0.035	$8.00
AGC-125	0.125					0.00131	4.67			$8.00
AGC-25	0.25					0.0148	0.89			$4.75
AGC-5	0.5					0.269	0.59			$3.00
AGC-75	0.75					0.815	0.37			$3.00
AGC1	1					1.615	0.31			$2.00
AGC1-5	1.5		100A			0.0149	0.27			$2.00
AGC2	2					0.00509	0.28			$2.00
AGC2-5	2.5					0.00879	0.31			$2.00
AGC3	3					0.0167	0.025			$2.00
AGC4	4		200A			0.0305	0.22			$2.50
AGC5	5					0.045	0.23			$3.00
AGC6	6					0.071	0.23			$3.25
AGC7	7					0.105	0.23			$3.25
AGC7-5	7.5					–	–			$2.75
AGC8	8					0.152	0.19			$2.75
AGC10	10					0.492	0.20			$2.75
AGC15	15	32V	—	—	1000A	0.566	0.14			$2.50
AGC20	20					1.438	0.12			$2.50
AGC25	25					2.109	0.11			$2.50
AGC30	30					3.807	0.12			$2.50

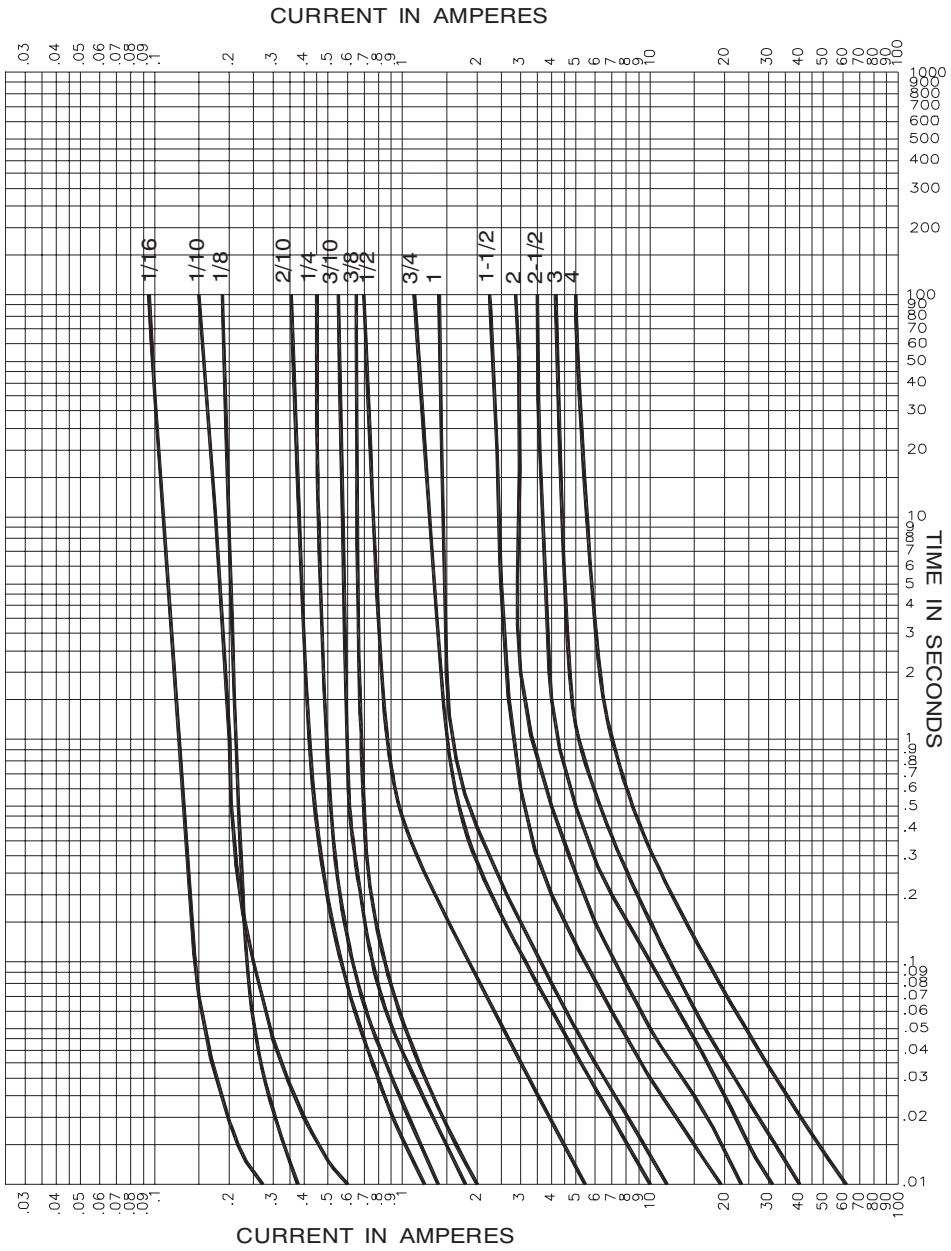
*Note: Interrupting ratings were measured at 70% - 80% power factor on AC, and at a time constant described in UL 198L.
** Typical Melting I^2t (A^2Sec) - measured at listed interrupting rating and rated voltage (at 70% to 80% power factor on AC)
*** Typical Voltage Drop - measured at 25°C ± 3°C ambient temperature at rated current.

For mounting and wiring AGC fuses, see our DN-F6 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE			
OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
BGC	AGC	GGC	312

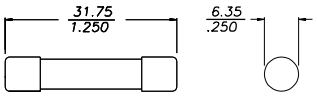
Small Dimension Fast-Acting AGC Fuses

TIME CURRENT CURVES



Dimensions

(mm/inches)



AGC Electrical Characteristics		
Rated Current	*% of Amp Rating*	*Opening Time*
0.1 to 30 Amps	100	None
	135	60 minutes maximum
	200	120 seconds maximum

5x20mm Glass Fast-Acting GMA Fuses

Features

- Compact dimensions, 0.197" x 0.788" (5mm x 20mm)
- Glass tube construction with nickel-plated brass end caps
- Fast-acting, low breaking capacity
- RoHS Complian

Applications

- Supplemental protection for electronic applications

Voltage Rating: GMA - See table below

Ampere Rating: 0.063 - 15 Amps

Interrupting Rating: See table below

Agency Approvals

- Designed to UL/CSA 248-14
- UL Listed, Guide JDYX, File E19180 63 mA-6A
- UL Recognition, Guide JDYX2, File E19180, 7A-15A
- CSA Certified, Class 1422-01, File 053787, 63 mA-6A
- RoHS

GMA Specifications

GMA Series 5x20mm Glass, Fast-acting Fuses									
Part Number	AMP Rating	Rated Voltage	AC Interrupting Rating*		Typical Pre-Arc I^2t AC**	Voltage Drop mv***	Pcs/Pkg	Package Weight (lb.)	Price
		AC Max	250V	125V					
GMA-063	0.063	250V	35A	10000A	0.00024	4700	5	0.1	$6.50
GMA-1	0.10				0.0001	4300			$6.25
GMA-25	0.25				0.018	2200			$4.75
GMA-5	0.5				0.15	230			$4.00
GMA1	1				0.48	300			$4.00
GMA1-5	1.5		100A		1.6	270			$4.00
GMA1-6	1.6				2.0	260			$4.00
GMA2	2				3.1	250			$4.00
GMA2-5	2.5				4.9	240			$4.00
GMA3	3				8.8	215			$4.00
GMA4	4	125V	—		19	205			$4.00
GMA5	5				29	200			$4.00
GMA6	6				45	180			$4.00
GMA7	7			200A	150	110			$4.00
GMA8	8				280	110			$4.00
GMA10	10				280	110			$4.00
GMA15	15			150A	950	100			$4.00

*Note: Interrupting ratings for 63 mA - 6A were measured at 70% - 80% power factor on AC; interrupting ratings for 7A - 15A were measured at 100% power factor on AC.

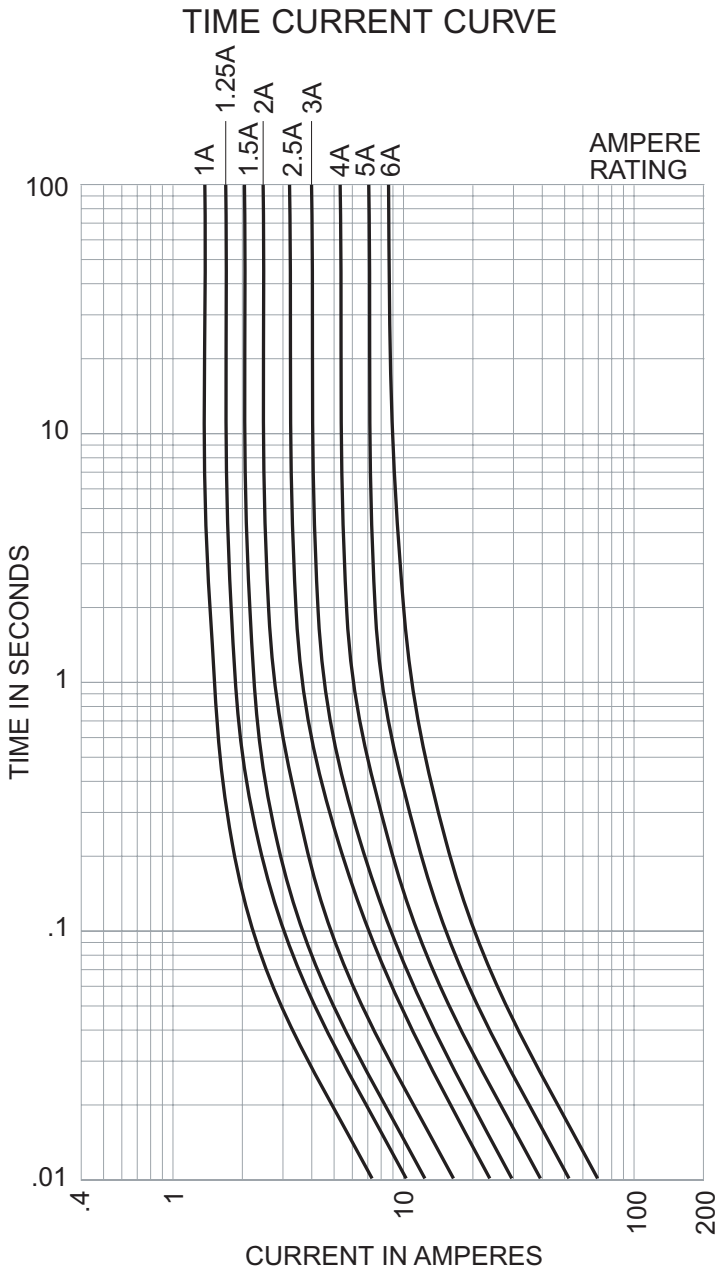
** Typical pre-arcing I^2t (A^2Sec) - measured at listed interrupting rating and rated voltage (at 70% to 80% power factor on AC)

*** Typical Voltage Drop - measured at 20°C ambient temperature at rated current.

For mounting and wiring GMA fuses, see our DN-F10 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

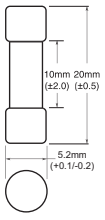
CROSS REFERENCE			
OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
BMA	GMA	GGM	235

5x20mm Glass Fast-Acting GMA Fuses



Dimensions

(mm)



GMA Electrical Characteristics		
Rated Current	***% of Amp Rating***	***Opening Time***
63 mA to 10 Amps	100	None
	135	60 minutes maximum
	200	2 minutes maximum

5x20mm Glass Medium Time-Delay GMC Fuses

Features

- Compact dimensions, 0.197" x 0.788" (5 mm x 20 mm)
- Glass tube construction with nickel-plated brass end caps
- Medium time-delay, low breaking capacity
- RoHS

Applications

- Supplemental protection for electronic applications

GMC Specifications

Voltage Rating: GMC - See table below
Ampere Rating: 0.5 - 10 Amps
Interrupting Rating: See table below

Agency Approvals

- Designed to UL/CSA 248-14
- UL Listed, Guide JDYX, File E19180, 0.5A - 5A
- UL Recognition, Guide JDYX2, File E19180, 10A
- CSA Certified, Class 1422-01, File 053787, 0.5A - 5A
- RoHS

GMC Series 5x20mm Glass, Medium Time-Delay Fuses

Part Number	AMP Rating	Rated Voltage	AC Interrupting Rating*		Typical Pre-Arc I^2t AC**	Voltage Drop mv***	Pcs/Pkg	Package Weight (lb.)	Price
		AC Max	250V	125V					
GMC-5	0.5	250V	35A	10000A	0.41	370	5	0.025	$6.50
GMC1	1				1.8	250			$6.50
GMC2	2		100A		8.9	130			$6.50
GMC3	3				19	130			$6.50
GMC4	4	125V	–		36	120			$6.50
GMC5	5				58	120			$6.50
GMC10	10			200A	300	110			$6.50

*Note: Interrupting ratings for 63 mA - 6A were measured at 70% - 80% power factor on AC; rnterrupting ratings for 7A - 15 A were measured at 100% power factor on AC.

** Typical pre-arcing I^2t (A^2Sec) - measured at listed interrupting rating and rated voltage.

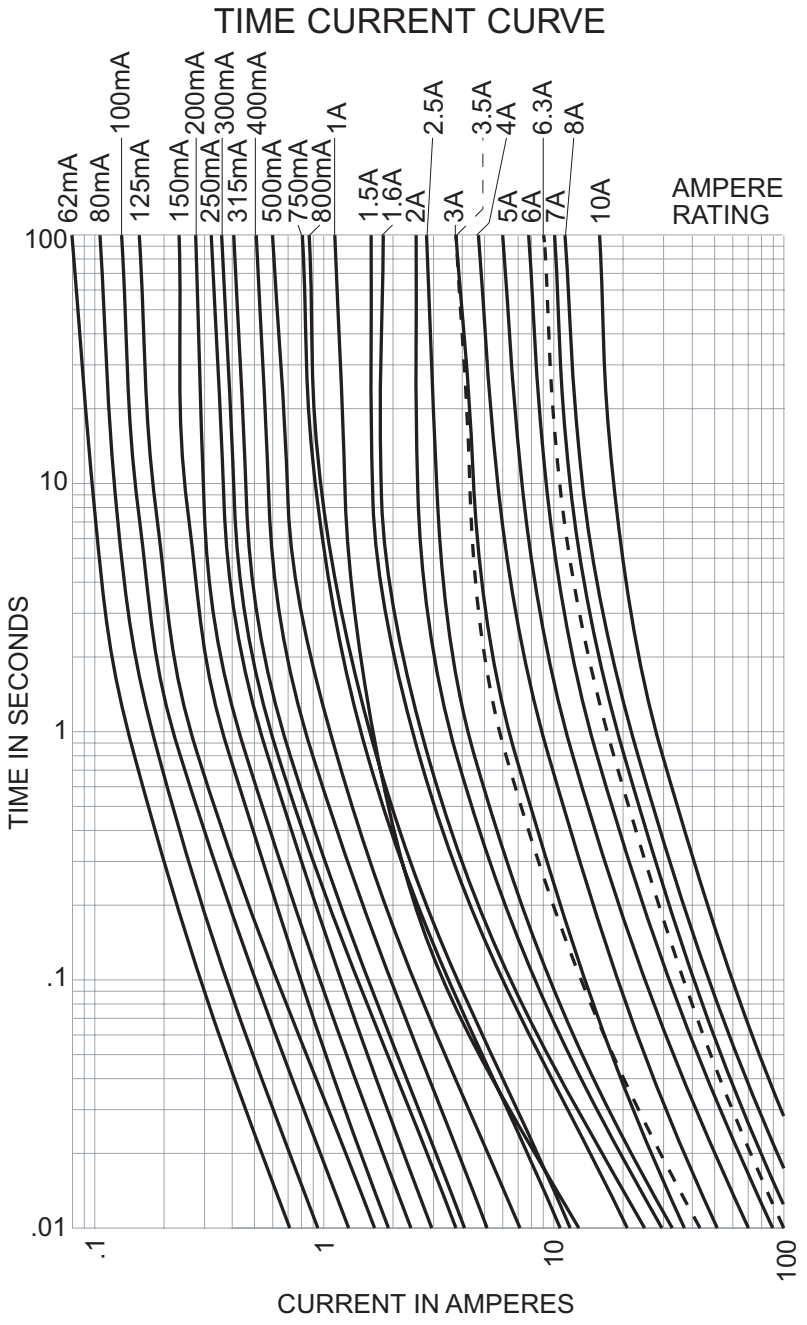
*** Typical Voltage Drop - measured at 20°C ambient temperature at rated current.

For mounting and wiring GMC fuses, see our DN-F10 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE

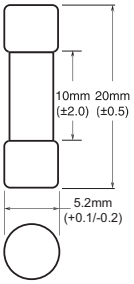
OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
none	GMC	GSC	none

5x20mm Glass Medium Time-Delay GMC Fuses



Dimensions

(mm)



GMC Electrical Characteristics		
Rated Current	***% of Amp Rating***	***Opening Time***
0.5A to 10 Amps	100	None
	135	60 minutes maximum
	200	2 minutes maximum

Small Dimension Time-Delay MDA Fuses

Features

- Compact dimensions 1/4" x 1-1/4", (6.3 mm x 32 mm)
- Ceramic tube construction with nickel-plated brass end caps
- Time-delay
- RoHS

Applications

- Supplemental protection for electronic applications

MDA Specifications

Voltage Rating: MDA - See table below

Ampere Rating: 0.5 - 20 Amps

Interrupting Rating: See table below

Environmental Data

Shock: 0.5A : MIL-STD-202, Method 213, Test Condition I;

1A thru 20A: MIL-STD-202, Method 207, (HI shock)

Vibration: 0.5A: MIL-STD-202, Method 201;

0.5A thru 20A: MIL-STD-202, Method 204, Test condition C (except 5g, 500 HZ)

Agency Approvals

- UL Listed product meets standard 248-14
- UL Listed Card: MDA 0.5-20A (Guide JDYX, File E19180
- CSA Certification File 053787: MDA 0.5-15 (Class No. 1422-01)
- RoHS

MDA Small Dimension Time-Delay Fuses

Part Number	AMP Rating	Rated Voltage		AC Interrupting Rating*		DC Interrupting Rating	Melting I^2t**	Voltage Drop mv***	Pcs/Pkg	Package Weight (lb.)	Price
		AC Max	DC Max	250V	125V	125V					
MDA-5	0.5	250V	—	35A	10000A	—	2.3	1.42	5	0.0425 lb	$16.50
MDA1	1						11.1	1.03			$16.50
MDA2	2			100A			64.0	0.623			$16.50
MDA3	3			200A			40.9	0.182			$11.00
MDA4	4						134.0	0.162			$11.00
MDA5	5						345.9	0.145			$11.00
MDA8	8						944.0	0.134			$11.00
MDA10	10						1491.3	n/a			$11.00
MDA12	12			750A			113.8	0.114			$11.00
MDA15	15						206.2	0.107			$11.00
MDA20	20		125V	1500A		10000A	439.5	0.095			$11.00

*Note: Interrupting ratings were measured at 70% - 80% power factor on AC, and at a time constant described in UL 198L.

** Typical Melting I^2t (A^2Sec) - measured at listed interrupting rating and rated voltage (at 70% to 80% power factor on AC)

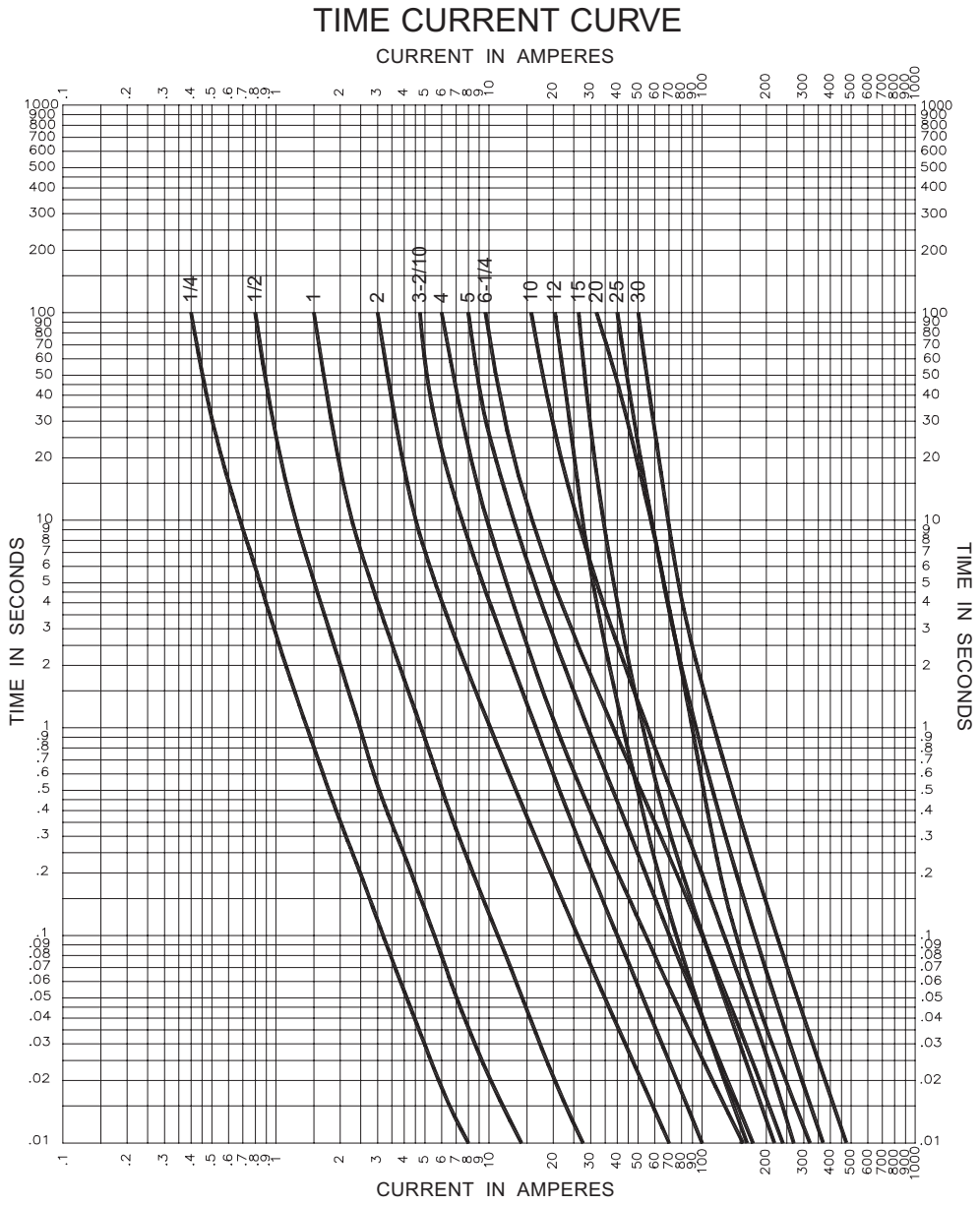
*** Typical Voltage Drop - measured at 25°C ± 3°C ambient temperature at rated current.

For mounting and wiring MDA fuses, see our DN-F6 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE

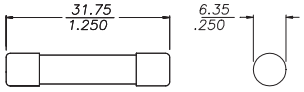
OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
BDA	MDA	None	326

Small Dimension Time-Delay MDA Fuses



Dimensions

(mm/inches)



MDA Electrical Characteristics		
Rated Current	***% of Amp Rating***	***Opening Time***
0.5 to 20 Amps	100	None
	135	60 minutes maximum
	200	120 seconds maximum

Small Dimension Time-Delay MDL Fuses

Features

- Compact dimensions 1/4" x 1-1/4", (6.3mm x 32mm)
- Glass tube construction with nickel-plated brass end caps
- Time-delay
- RoHS Compliant

Applications

- Supplemental protection for electronic applications

MDL Specifications

Voltage Rating: MDL - See table below

Ampere Rating: 0.0625 - 20 Amps

Interrupting Rating: See table below

Environmental Data

Shock: 0.0625A
MIL-STD-202, Method 213, Test Condition I;
1A thru 20A: MIL-STD-202, Method 207, (HI shock)

Vibration: 0.0625A: MIL-STD-202, Method 201;
0.25A thru 20A: MIL-STD-202, Method 204, Test condition C (except 5g, 500 HZ)

Agency Approvals

- UL Listed product meets standard 248-14
- UL Listed Card: MDL 0.0625-8A (Guide JDYX, File E19180)
- UL Recognized Card: MDL 9-20A (Guide JDYX2, File E19180)
- CSA Certification File 053787: MDA 0.25-15A (Class No. 1422-01)
- RoHS

MDL Small Dimension Time-Delay Fuses

Part Number	AMP Rating	Rated Voltage	AC Interrupting Rating*			Melting I^2t**	Voltage Drop mv***	Pcs/Pkg	Package Weight (lb.)	Price
		AC Max	250V	125V	32V					
MDL-0625	0.0625	250V	35A	10000A	—	0.0046	2.79	5	0.1	$16.00
MDL-25	0.25					0.447	0.965			$9.75
MDL-5	0.5					1.656	1.27			$8.25
MDL1	1					11.498	0.995			$9.00
MDL1-5	1.5		100A			22.7	0.721			$7.00
MDL2	2					62.3	0.644			$7.00
MDL2-5	2.5					63.1	0.410			$7.50
MDL3	3					67.5	0.345			$7.00
MDL4	4		200A			19.3	0.187			$7.00
MDL5	5					32.0	0.160			$7.00
MDL6	6					37.4	0.155			$7.00
MDL6-25	6.25					38.7	0.152			$7.50
MDL7	7					42.7	0.140			$7.50
MDL8	8					47.8	0.119			$7.00
MDL10	10	32V	—	—	1000A	64.4	0.114			$9.00
MDL15	15					354.0	0.130			$10.00
MDL20	20					2914.0	0.530			$9.75

*Note: Interrupting ratings were measured at 70% - 80% power factor on AC, and at a time constant described in UL 198L.
** Typical Melting I^2t (A^2Sec) - measured at listed interrupting rating and rated voltage (at 70% to 80% power factor on AC)
*** Typical Voltage Drop - measured at 25°C ± 3°C ambient temperature at rated current.

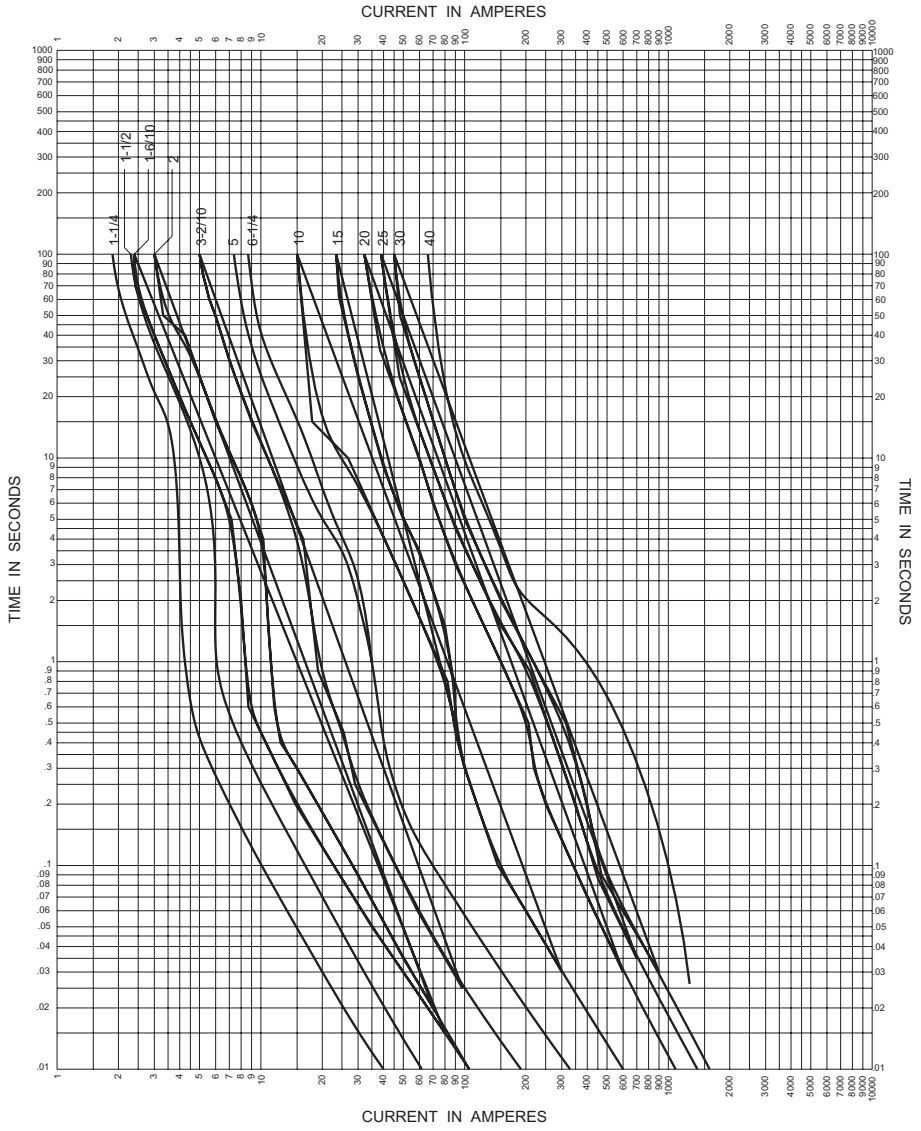
For mounting and wiring MDL fuses, see our DN-F6 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE

OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
BDL	MDL	GDL	313

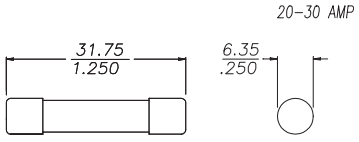
Small Dimension Time-Delay MDL Fuses

TIME CURRENT CURVE



Dimensions

(mm/inches)



MDL Electrical Characteristics		
Rated Current	***% of Amp Rating***	***Opening Time***
0.0625 to 20 Amps	100	None
	135	60 minutes maximum
	200	120 seconds maximum
0.0625 to 3 Amps	200	5 seconds minimum
4 to 8 Amps	200	12 seconds minimum

5x20mm Fast-Acting S500 Series Fuses

Features

- Compact dimensions, 0.197" x 0.788" (5 mm x 20 mm)
- Glass tube construction with nickel-plated brass end caps
- Fast-acting, low breaking capacity
- Designed to IEC 60127-2 (32mA-6.3A)
- RoHS Compliant

Applications

- Supplemental protection for electronic applications

Agency Approvals

- UL Recognized Card: (0.5A-10A) Guide JDYX2, File E19180
- CSA Component Acceptance File 53787
- Semko Approval 160 mA-400 mA and 800 mA-10A
- VDE Approval 0.32A-10A
- BSI Approval 0.32A-10A
- IMQ Approval 0.32A-10A
- RoHS

S500 Specifications

Voltage Rating: See table below

Ampere Rating: 0.32 - 10 Amps

Interrupting Rating: See table below

S500 Series 5x20 mm Glass Fast-acting Fuses								
Part Number	AMP Rating	Rated Voltage AC Max	AC Interrupting Rating at Rated Voltage (50Hz)	Typical Melting I^2t AC*	Voltage Drop mv**	Pcs/Pkg	Package Weight (lb.)	Price
S500-32-R	0.032	250V	35A	0.000047	3200	5	0.025	$11.00
S500-5-R	0.5			0.18	220			$8.00
S5001-R	1			0.60	200			$8.00
S5001-6-R	1.6			1.6	190			$8.00
S5002-R	2			4.2	150			$8.00
S5003-15-R	3.15			13	130			$8.00
S5004-R	4		40A	22	130			$8.00
S5005-R	5		50A	42	120			$8.00
S5006-3-R	6.3		63A	69	120			$8.00
S5008-R	8		80A	–	–			$8.50
S50010-R	10		100A	–	–			$8.50

*Note: Typical Melting I^2t (A^2Sec) - measured at listed interrupting rating and rated voltage.
** Typical Voltage Drop - measured at 20°C ambient temperature at rated current.

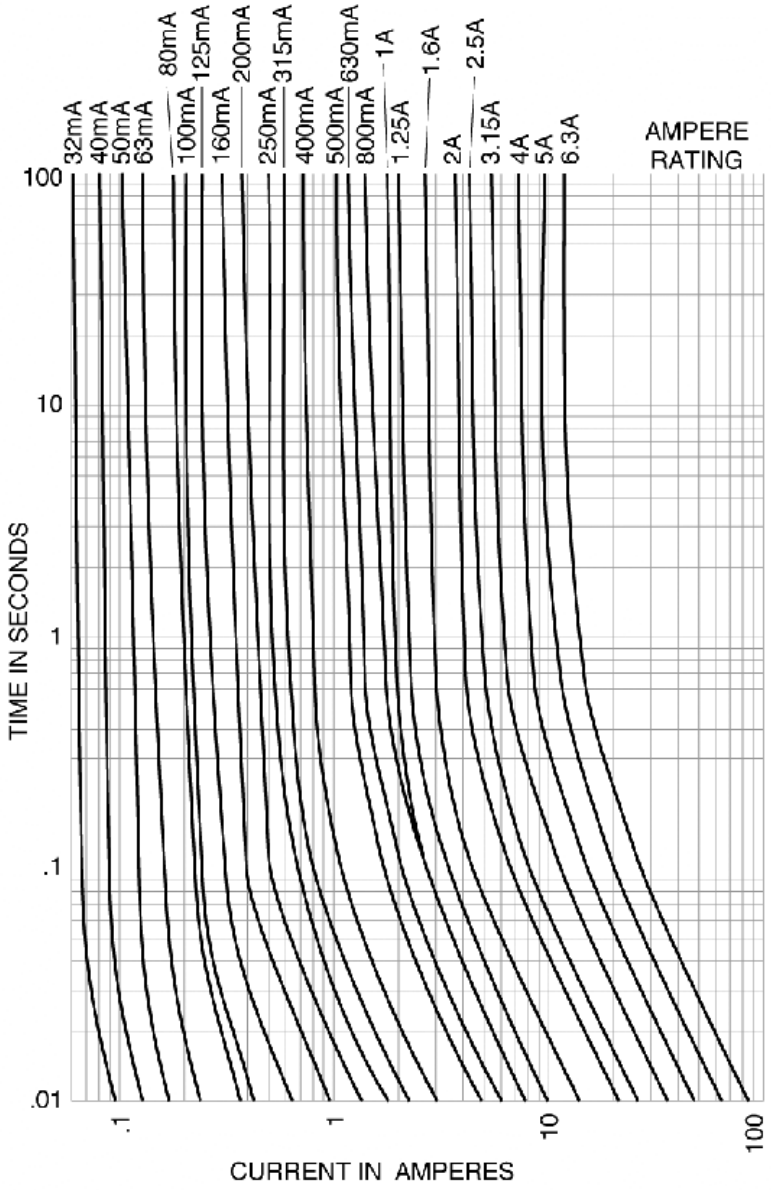
For mounting and wiring S500 fuses, see our DN-F10 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE			
OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
GDB/BDB	GDB	GSB	217

5x20 mm Fast-Acting S500 Series Fuses

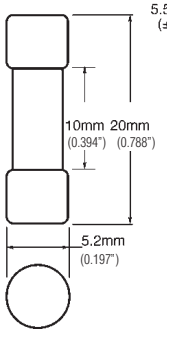
TIME CURRENT CURVE

Time-Current Characteristic Curves–Average Melt



Dimensions

mm (inches)



S500 Electrical Characteristics							
IN	***1.5 In min***	***2.1 In max***	***2.75 In min***	***2.75 In max***	***4 In min***	***4 In max***	***10 In max***
0.32A to 6.3A	60 min	30 min	50 ms	2 sec	10 ms	300 ms	20 ms

5x20 mm Time-Delay S506 Series Fuses

Features

- Compact dimensions, 0.197" x 0.788" (5 mm x 20 mm)
- Glass tube construction with nickel-plated brass end caps
- Time-delay, low breaking capacity
- Designed to IEC 60127-2 (32 mA-10A)
- RoHS Compliant

Applications

- Supplemental protection for electronic applications

S506 Specifications

Voltage Rating: See table below

Ampere Rating: 0.25 - 6.3 Amps

Interrupting Rating: See table below

Agency Approvals:

- UL Recognized Card: (0.25A-10A) Guide JDYX2, File E19180
- CSA Component Acceptance File 053787
- Semko Approval 0.25-10A
- VDE Approval 0.25-10A
- BSI Approval 0.25-10A
- IMQ Approval 0.25-10A
- MITI Approval, 0.25-10A
- RoHS

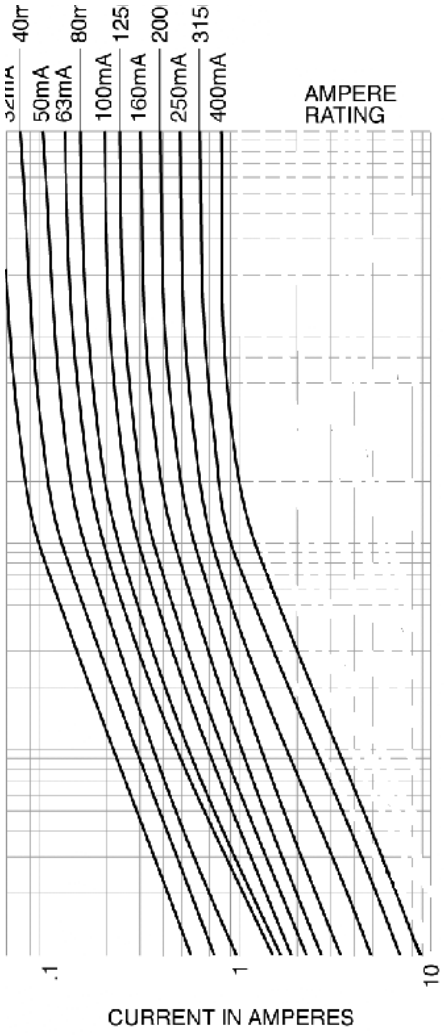
S506 Series 5x20 mm Glass Time-delay Fuses								
Part Number	AMP Rating	Rated Voltage AC Max	AC Interrupting Rating at Rated Voltage (50Hz)	Typical Melting I^2t AC*	Voltage Drop mv**	Pcs/Pkg	Package Weight (lb.)	Price
S506-25-R	0.25	250V	35A	0.17	270	5/1	0.025	$9.75
S506-5-R	0.5			0.67	140			$9.75
S5061-R	1			2.7	80			$9.75
S5061-6-R	1.6			9.7	70			$9.75
S5062-R	2			15	68			$9.75
S5062-5-R	2.5			25	68			$9.75
S5063-15-R	3.15			51	66			$9.75
S5064-R	4		40A	88	66			$9.75
S5065-R	5		50A	150	66			$9.75
S5066-3-R	6.3		63A	214	75			$11.00

*Note: Typical Melting I^2t (A^2Sec) - measured at 10 In and rated voltage.
** Typical Voltage Drop - measured at 20°C ambient temperature at rated current.

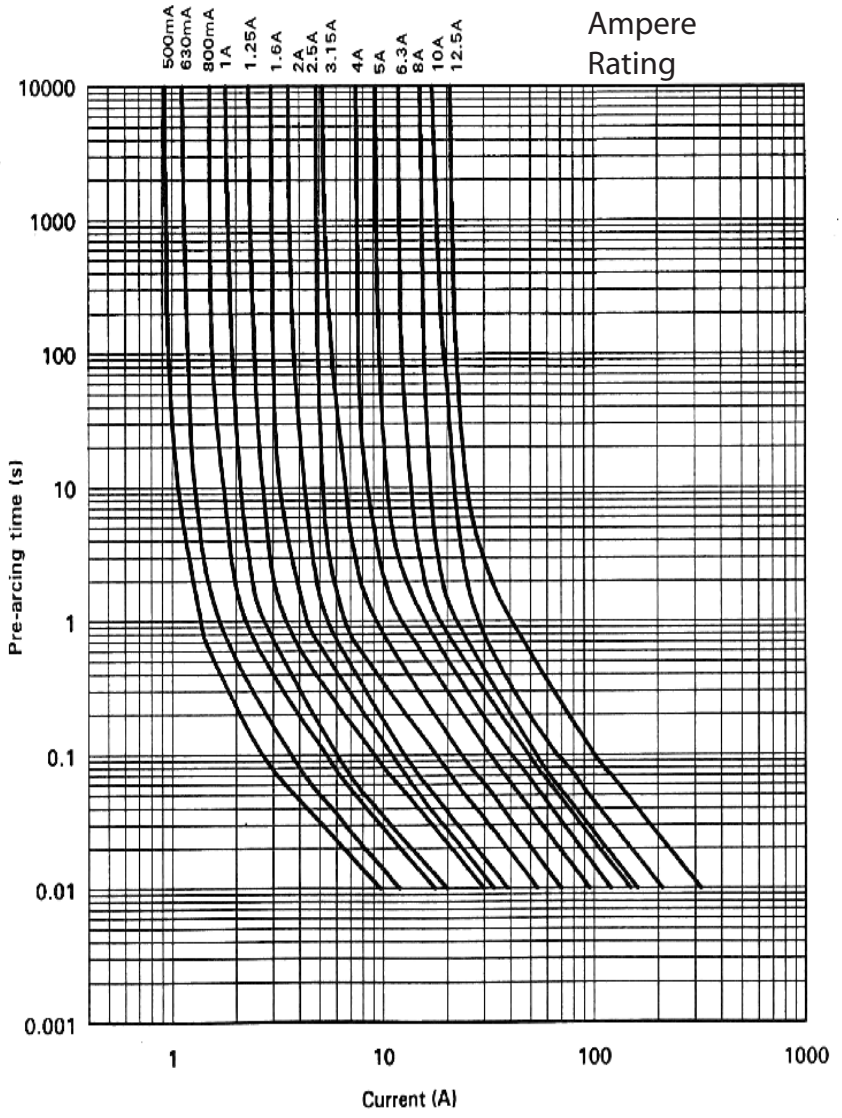
For mounting and wiring S506 fuses, see our DN-F10 Series fuse blocks in the Terminal Blocks and Wiring Solutions section.

CROSS REFERENCE			
OLD EDISON	BUSSMANN	MERSEN GOULD	LITTELFUSE
GDC/BDC	GDC	GDG	218

5x20 mm Time-Delay S506 Series Fuses

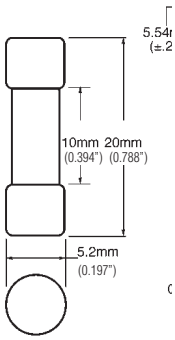


TIME CURRENT CURVE



Dimensions

mm (inches)



S506 Electrical Characteristics							
IN	*2.1 In max*	*2.75 In min*	*2.75 In max*	*4 In min*	*4 In max*	*10 In min*	*10 In max*
0.25A - 6.3A	2 min	600 ms	10 sec	150 ms	3 sec	20 ms	300 ms

Modular Ferrule Fuse Blocks for Class R Fuses

Description

RM Series for use with Class R fuses LENRK, LESRK, ECNR & ECSR

Mounting

35mm DIN rail or panel mount

Specifications

Materials:
Base – Thermoplastic
Terminals – Tin-plated copper brass
Covers – Thermoplastic
Screws – Zinc-plated steel
SCCR: 200kA
Flammability rating:
Blocks – UL 94V0, self-extinguishing
Covers – UL 94HB, self-extinguishing
Operating and storage temp range:
Blocks – -40° to 120°C [-40° to 248°F]
Covers – indicating -20° to 90°C [-4° to 194°F]
non-indicating -40° to 120°C [-40° to 248°F]
Wire:
Cu – 75°/90°C [167°/194°F]
Al – 75°C [167°F]
Ring or Fork terminal to fit a #10-32 screw

Agency Approvals

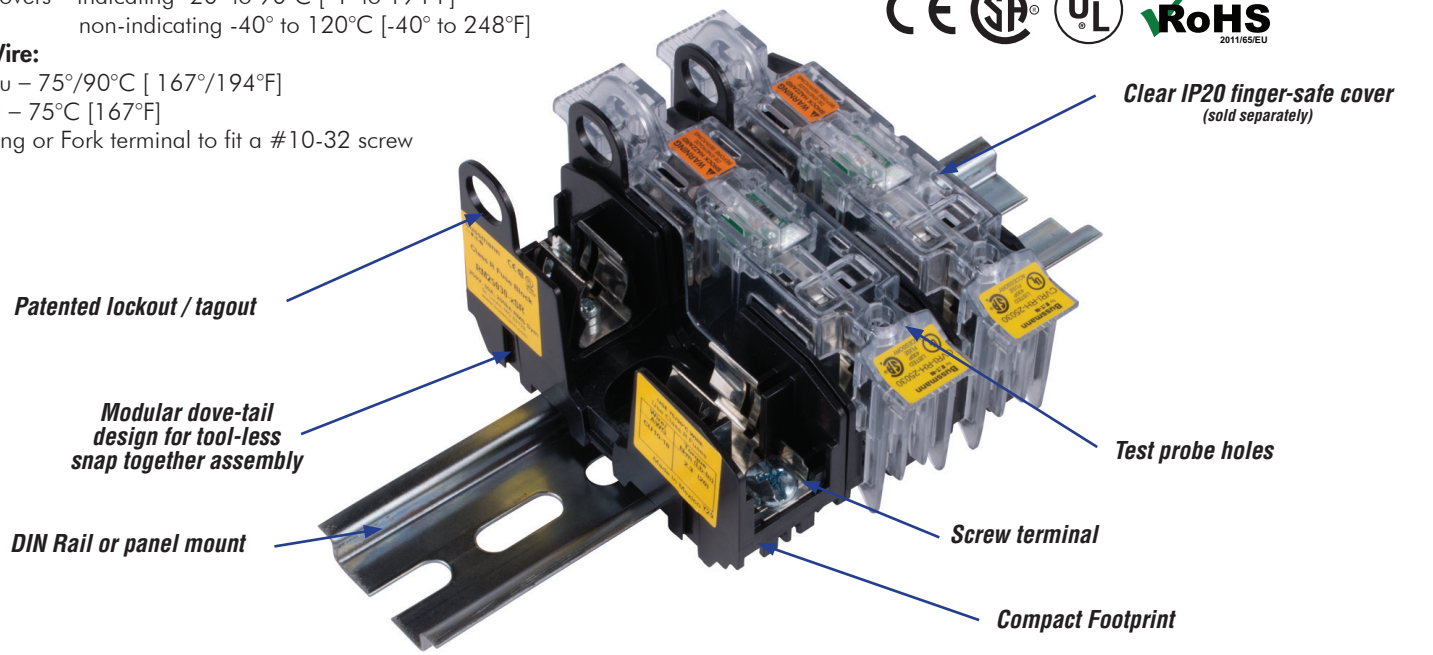
Fuse Blocks

- UL® Listed E14853 - IZLT
- CSA® Certified 47235-6225-01
- CE
- RoHS Compliant
- Conflict mineral free
- REACH Compliant

Covers

- Covers are included in the overall UL Listing/Recognition and CSA Certification
- IP20 finger-safe
- RoHS compliant
- REACH Compliant

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.



Modular Ferrule Fuse Blocks for Class R Fuses

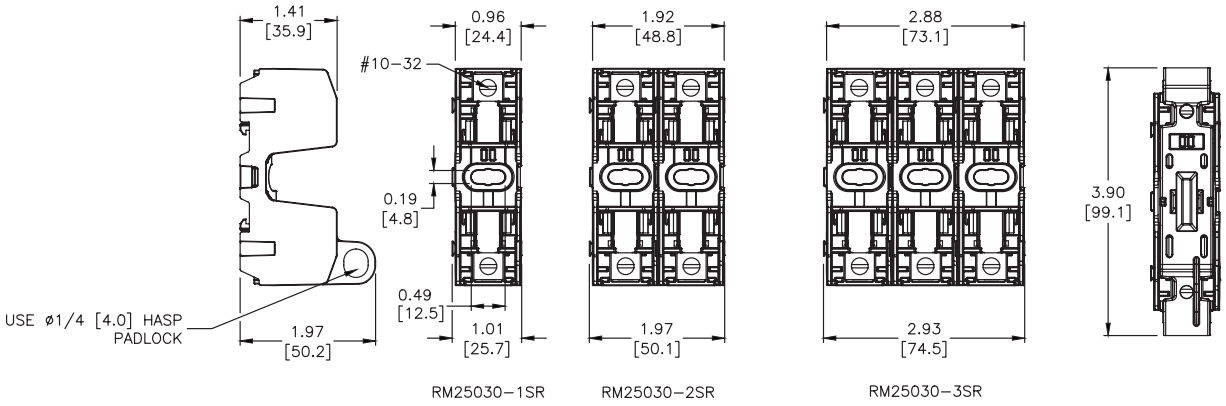
Type	Part Number	Pc/ pkg	Price	Volts	Amps	Poles	Wire Range: solid and stranded	Wire Range: fine stranded (Cu)	Torque: lb·in [N·m]	Wt.: lb [kg]	Covers (sold separately): w/o Indication	Covers (sold separately): w/ Indication[1]	Pc/ pkg
Screw	RM25030-1SR	1	$9.75	250V AC/DC	30	1	18-10 AWG (Cu)	18-10 AWG	20 [2.3]	0.10 [0.04]	CVR-RH-25030 $6.25	CVRI-RH-25030 $8.00	1
	RM25030-2SR	1	$15.00			2				0.15 [0.07]			
	RM25030-3SR	1	$22.50			3				0.25 [0.12]			
Box Lug	RM25060-1CR	1	$17.50		60	1	14-2 AWG (Cu) 8-2 AWG (Al)	3-2 AWG 6-4 AWG 8 AWG 14-10 AWG	50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.15 [0.07]	CVR-RH-25060 $7.50	CVRI-RH-25060 $8.50	1
	RM25060-2CR	1	$31.50			2				0.30 [0.14]			
	RM25060-3CR	1	$43.00			3				0.45 [0.22]			
Screw	RM60030-1SR	1	$20.00	600V AC/DC	30	1	18-10 AWG (Cu)	18-10 AWG	20 [2.3]	0.15 [0.07]	CVR-RH-60030 $6.25	CVRI-RH-60030 $8.00	1
	RM60030-2SR	1	$31.00			2				0.30 [0.14]			
	RM60030-3SR	1	$37.50			3				0.45 [0.22]			
Box Lug	RM60060-1CR	1	$25.00		60	1	14-2 AWG (Cu) 8-2 AWG (Al)	3-2 AWG 6-4 AWG 8 AWG 14-10 AWG	50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.25 [0.12]	CVR-RH-60060 $7.50	CVRI-RH-60060 $8.50	1
	RM60060-2CR	1	$42.00			2				0.45 [0.22]			
	RM60060-3CR	1	$53.00			3				0.70 [0.30]			

[1] Open fuse indication requires 90V minimum and closed circuit to operate.

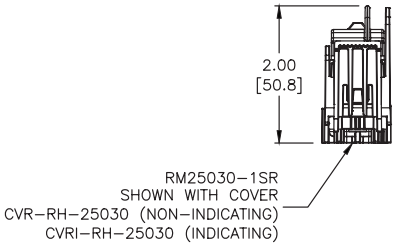
Modular Ferrule Fuse Blocks for Class R Fuses

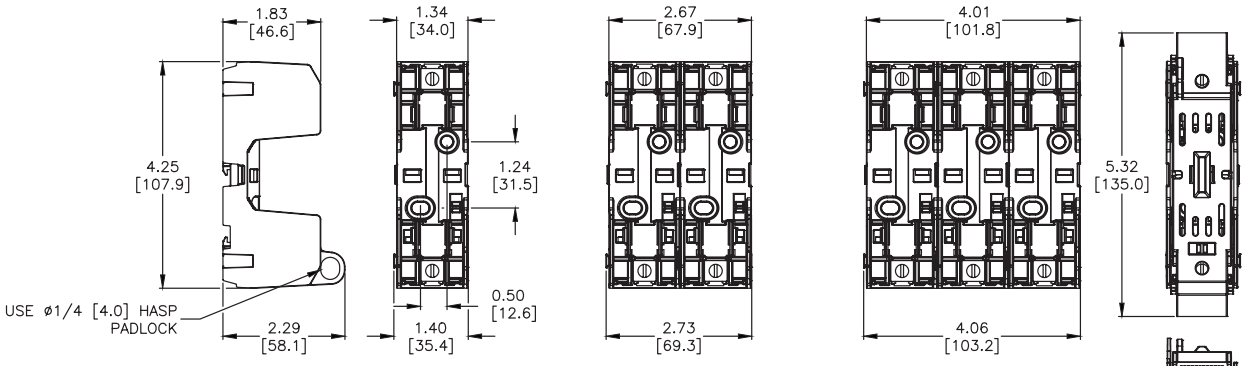
Dimensions

in [mm]

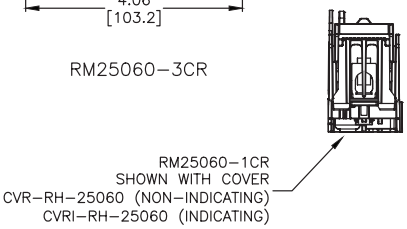


RM25030





RM25060

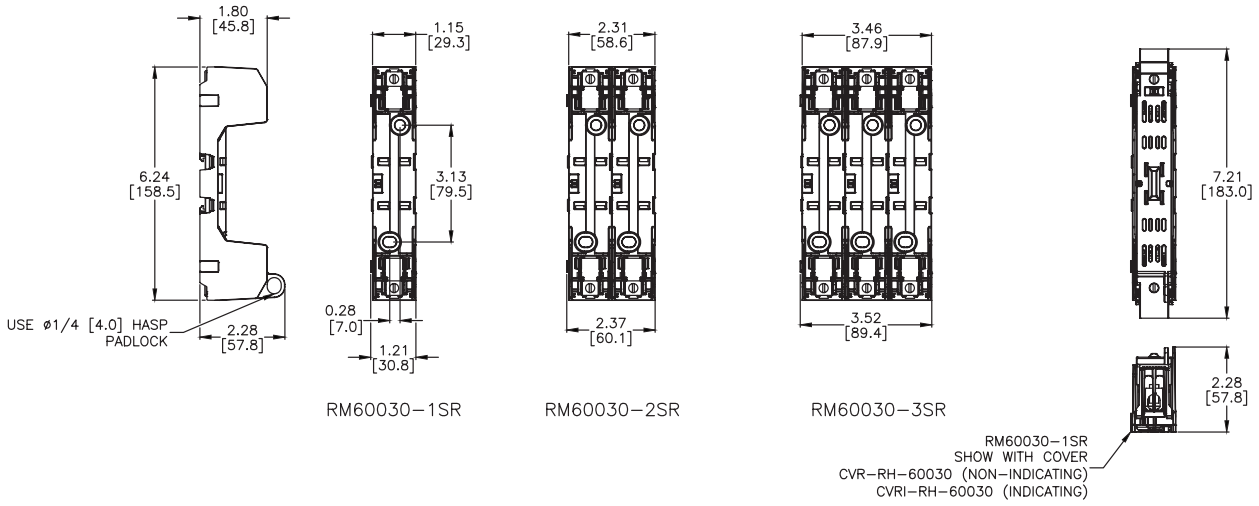


Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

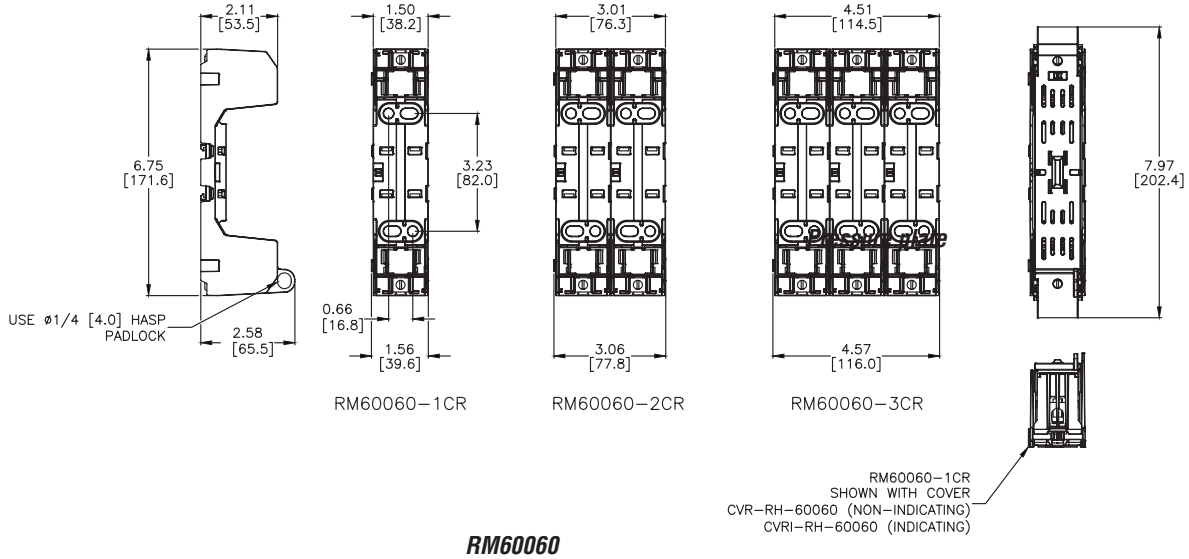
Modular Ferrule Fuse Blocks for Class R Fuses

Dimensions

Dimensions **in [mm]**



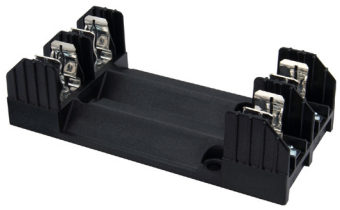
RM60030



RM60060

Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Fuse Blocks for Class RK Fuses



R60030-2SR

R60600-3CR

Description

For use with Edison LESRK and ECSR, R600, Class R fuses

Terminal type :

- SR = Screw type, clip with re-inforced spring.
- CR = Box lug type, clip with reinforced spring

Agency Approvals

- UL Listed, UL 512, Guide IZLT, File E14853
- CSA, Certified, C22.2 No.39 Class 6225-01, File 47235

Specifications

Construction: **Thermoplastic**
UL Flammability: **94V-0**

Voltage Ratings:
R600: 600 Volts AC

Ampere Ratings: **0.10 - 600 Amps**

Short-circuit current Rating: **200,000 RMS Symmetrical Amps**

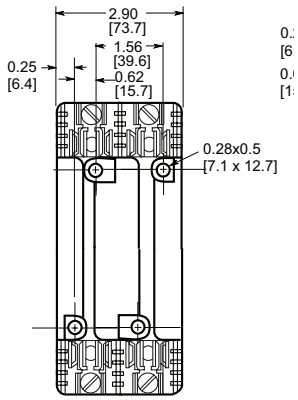
R600 Series Fuse Blocks (600V)						
Part Number	***Amps***	***Poles***	***Maximum Wire Size***	***Pcs/Pkg***	***Wt. (lbs.)***	***Price***
R60030-2SR	0.1 to 30	2	#10-18 Cu only	1	0.44	$28.50
R60600-3CR*	401 to 600	3	(2) 500MCM-4/0 Cu-Al		17.30	Retired

**** Not UL***

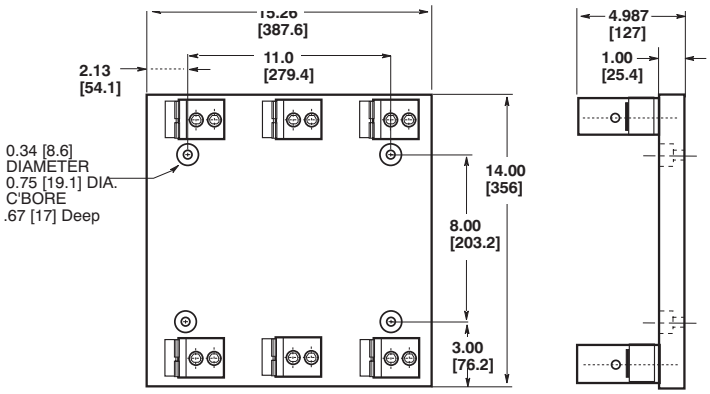
Dimensions

inches (mm)

R60030-2SR



R60600-3CR



T300 & T600 Fuse Blocks for Class T Fuses

Description

For use with Class T fuses

T300 series: for use with 300V Class T fuses (TJN)

T600 series: for use with 600V Class T fuses (TJS)

Terminal type:

- SR = Screw type; clip with re-inforcing spring
- CR = Box lug type; clip with reinforcing spring
- C = Box lug type; clip with reinforcing spring standard on FB rated 100A; spring not required above 100A for bolt-on fuses

Specifications

Construction: Glass Polyester; Phenolic on 600V

UL Flammability: 94V-O

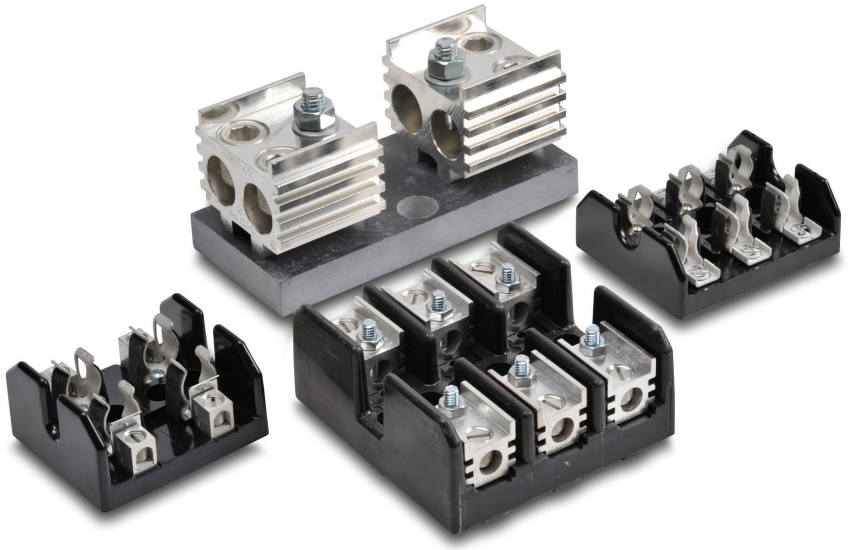
Ratings:
T300: 300 VAC; 30–600A
T600: 600 VAC; 30–600A

Short-circuit Current Rating:
200,000 RMS Symmetrical Amps

Agency Approvals

- UL Listed, Guide IZLT, File E14853
- CSA, Class 6225-01, File 47235
- CE
- REACH
- RoHS

Edison Class T Fuse Blocks



Class T Fuse Blocks

Part Number	Volts	Amps	Poles	Terminal Type	Wire Range (AWG)	Fig #	Wt. (lb)	Pcs /Pkg	Price
T30030-2SR	300	0.5 to 30	2	screw	10–18 Cu (only)	1	0.3	1	$21.00
T30030-3SR			3				0.4		$21.00
T30060-2CR		31 to 60	2	box lug	2–14 Cu/Al		0.4		$26.00
T30060-3CR			3				0.5		$40.00
T30100-1CR		61 to 100	1		1/0–8 Cu/Al	4	0.6		$33.00
T30100-3CR			3				1.5		$114.00
T30200-1C		101 to 200	1		250 kcmil – 6 Cu/Al	5a	1.0		$89.00
T30200-3C			3			5b	1.9		$240.00
T30400-1C		201 to 400	1		600 kcmil – 2/0 Cu/Al	6	1.3		$131.00
T30600-1C		401 to 600	1		(2) 600 kcmil – 4/0 Cu/Al	7	2.4		$201.00
T60030-1SR	600	0.5 to 30	1	screw	10–18 Cu (only)	2	0.2	1	$13.00
T60030-2SR			2				0.3		$23.00
T60030-3SR			3				0.5		$20.00
T60060-1CR		31 to 60	1	box lug	2–14 Cu/Al	3	0.3		$14.50
T60060-2CR			2				0.4		$29.50
T60060-3CR			3				0.6		$37.50
T60100-1C		61 to 100	1		2/0–14 Cu/Al	4	1.0		$45.50
T60100-3C			3				1.5		$118.00
T60200-1C		101 to 200	1		250 kcmil – 6 Cu/Al	5a	1.0		$60.00
T60400-1C		201 to 400	1		600 kcmil – 2/0 Cu/Al	6	1.3		$138.00
T60600-1C		401 to 600	1		(2) 600 kcmil – 4/0 Cu/Al	7	2.6		$234.00

T300 & T600 Fuse Blocks for Class T Fuses

Fuse Block Terminal Torque Specifications

Terminal Tightening Torque Specs – Class T Fuse Blocks							
Part Number	***Amps***	***Volts***	***Poles***	***Terminal Type***	***Wire Range (AWG)***	***Wire Torque (lb·in)***	***Fuse Torque (lb·in)***
Tx0030-xSR	30	300, 600	1,2,3	screw	10–18 Cu (only)	20	n/a
Tx0060-xCR	60	300, 600	1,2,3	box lug	2–3	50	n/a
					4–6	45	
					8	40	
					10–14	35	
T30100-xCR	100	300	1,3		1/0–8 Cu/Al	100	n/a
T60100-xC	100	600	1,3		2/0–3	50	70
					4–6	45	
					8	40	
					10–14	35	
Tx0200-1C	200	300, 600	1		250 kcmil – 6 Cu/Al	375	132
T30200-3C	200	300	3		250 kcmil – 6 Cu/Al	275	132
Tx0400-1C	400	300, 600	1		600 kcmil – 2/0 Cu/Al	500	192
Tx0600-1C	600	300, 600	1		(2) 600 kcmil – 4/0 Cu/Al	450	380

Fuse Block Dimensions

Fig.1: 300V; 0.5–60A

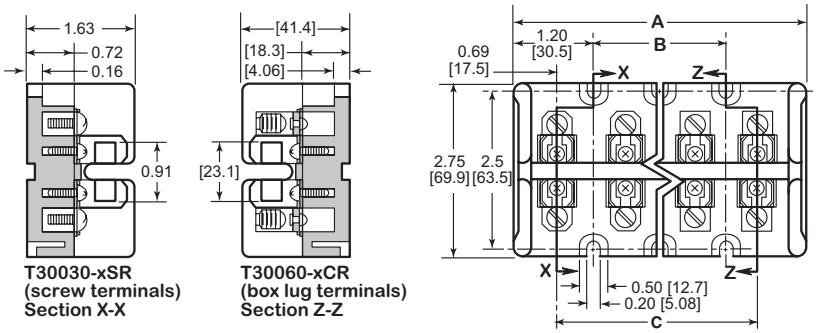


Figure 1: 300V 1/2A to 60A

Terminal Type	Dimensions (in [mm])		
	A	B	C
T30030-2SR T30060-2CR	2.41 [61.2]	–	1.03 [26.2]
T30030-3SR T30060-3CR	3.44 [87.4]	1.03 [26.2]	2.06 [52.3]

Fig.2: 600V; 0.5–30A

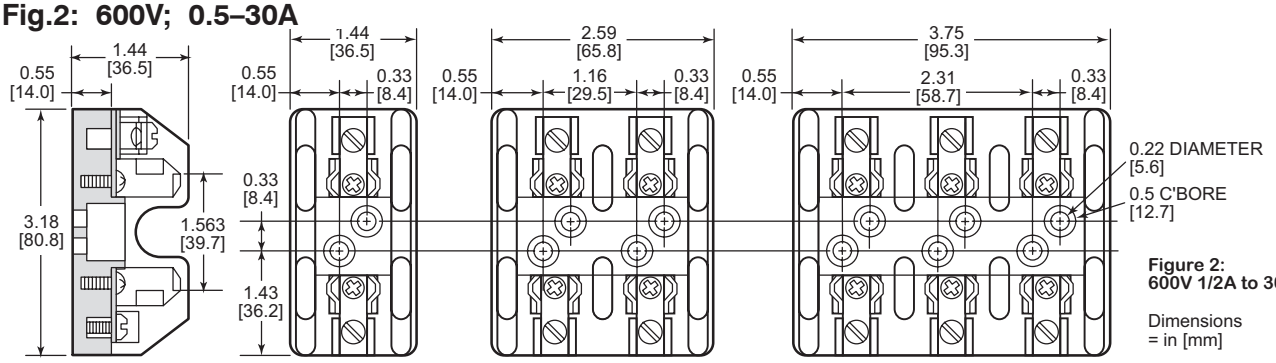


Figure 2:
600V 1/2A to 30A

Dimensions
= in [mm]

Fig.3: 600V; 31–60A

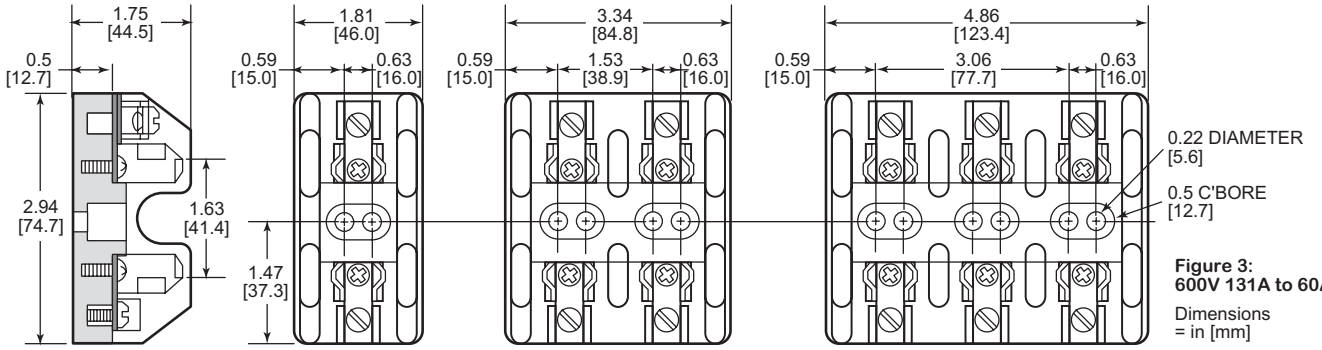


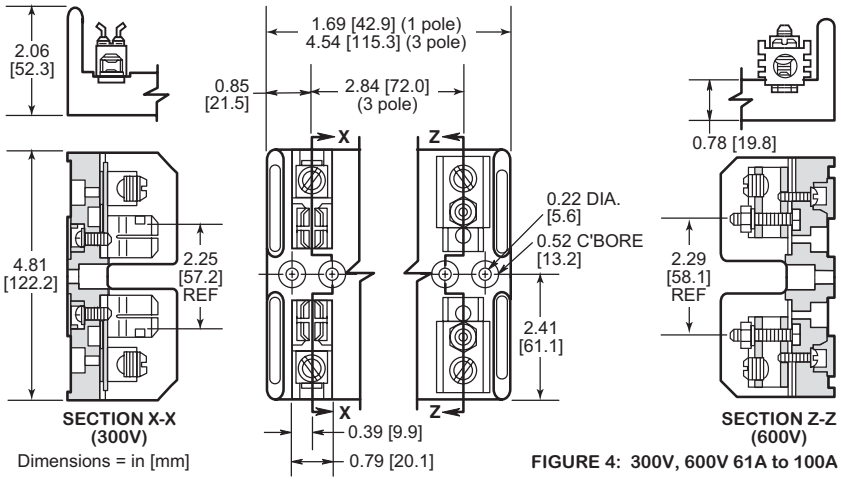
Figure 3:
600V 131A to 60A

Dimensions
= in [mm]

T300 & T600 Fuse Blocks for Class T Fuses

Fuse Block Dimensions

Fig.4: 300V, 600V; 61–100A



Dimensions = in [mm]

FIGURE 4: 300V, 600V 61A to 100A

Fig.5a: 300V, 600V; 101–200A

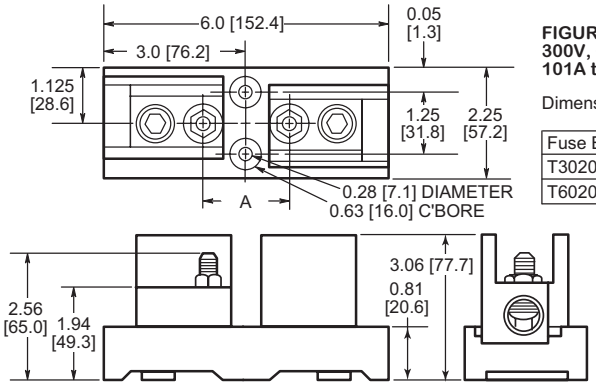


FIGURE 5a:
300V, 600V
101A to 200A

Dimensions = in [mm]

Fuse Block	Dimension A
T30200-1C	1.69 [42.9]
T60200-1C	2.50 [63.5]

Fig.5b: 300V; 101–200A

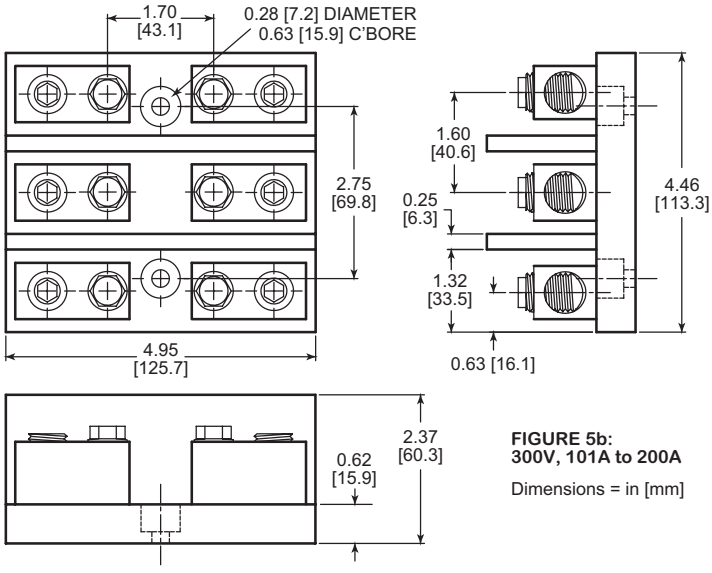


FIGURE 5b:
300V, 101A to 200A

Dimensions = in [mm]

T300 & T600 Fuse Blocks for Class T Fuses

Fuse Block Dimensions

Fig.6: 300V, 600V; 201–400A

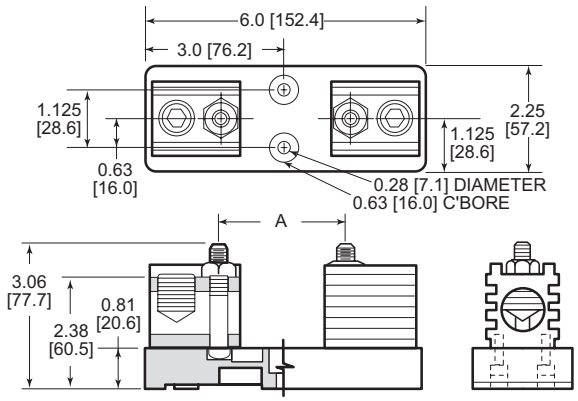
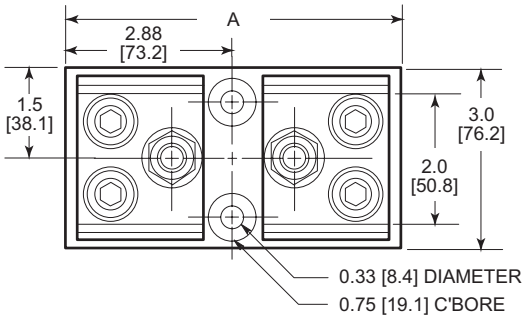


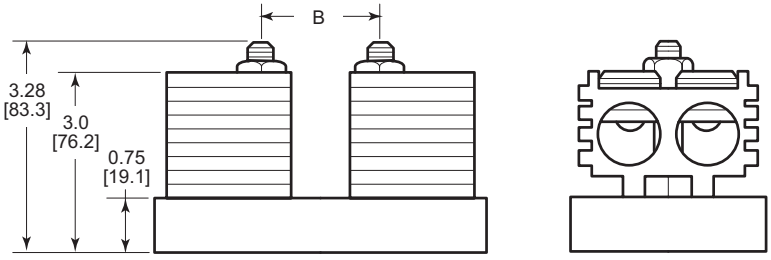
FIGURE 6:
300V, 600V
201A to 400A

Dimensions = in [mm]

Fuse Block	Dimension A
T30400-1C	1.84 [46.7]
T60400-1C	2.72 [69.1]

Fig.7: 300V, 600V; 401–600A





Dimensions = in [mm]

FIGURE 7: 300V, 600V 401A to 600A

Fuse Block	Dimensions (in [mm])	
	A	B
T30600-1C	5.75 [146]	2.03 [51.6]
T60600-1C	6.75 [171.4]	2.95 [74.9]

Modular Ferrule Fuse Blocks for Class J Fuses

Description

JM Series for use with Class J fuses JHL & JDL

Mounting

35mm DIN rail or panel mount

Specifications

Materials:
Base – Thermoplastic
Terminals – Tin-plated copper brass
Covers – Thermoplastic
Screws and pressure plates – Zinc-plated steel
SCCR: 200kA
Flammability rating:
Blocks – UL 94V0, self-extinguishing
Covers – UL 94HB, self-extinguishing
Operating and storage temp range:
Blocks – -40° to 120°C [-40° to 248°F]
Covers – indicating -20° to 90°C [-4° to 194°F]
non-indicating -40° to 120°C [-40° to 248°F]
Wire:
Cu – 75°/90°C [167°/194°F]
Al – 75°C [167°F]
Ring or Fork terminal to fit a #10-32 screw

Agency Approvals

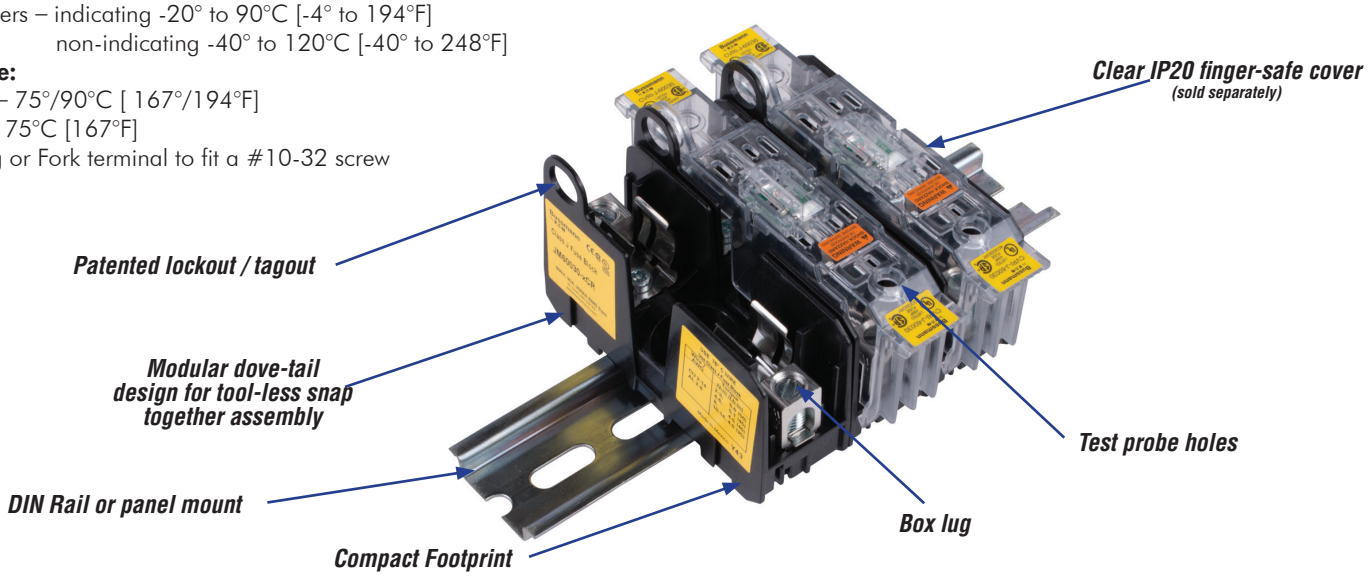
Fuse Blocks

- UL® Listed E14853 - IZLT
- CSA® Certified 47235-6225-01
- CE
- RoHS Compliant
- Conflict mineral free
- REACH Compliant

Covers

- Covers are included in the overall UL Listing/Recognition and CSA Certification
- IP20 finger-safe
- RoHS compliant
- REACH Compliant

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.



Modular Ferrule Fuse Blocks for Class J Fuses

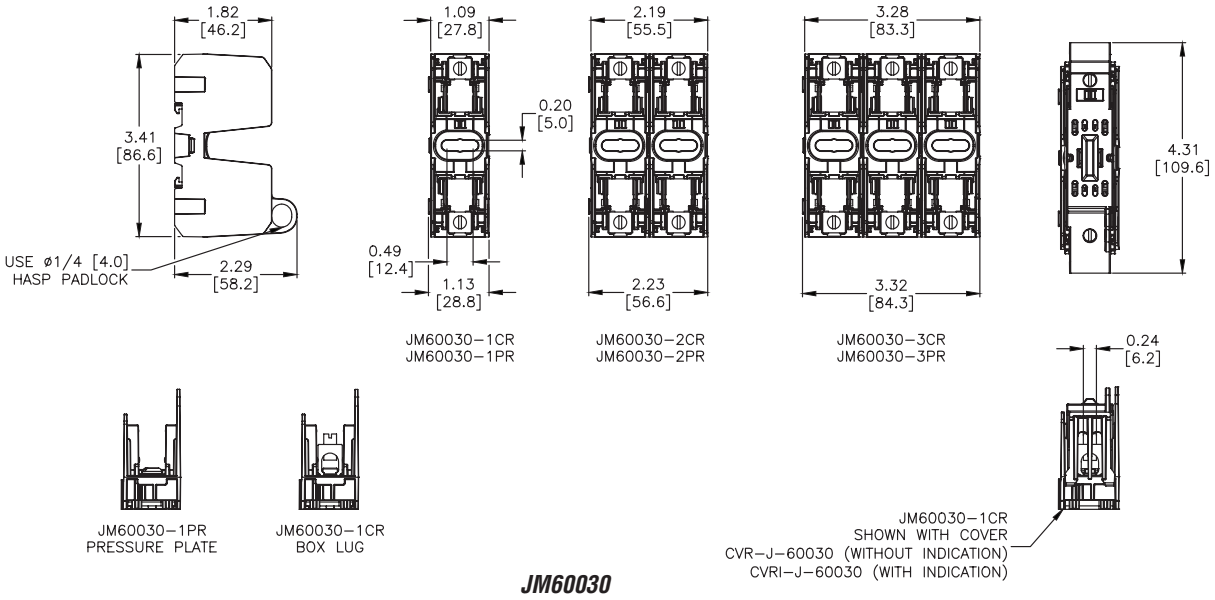
Type	Part Number	Pc/ pkg	Price	Volts	Amps	Poles	Wire Range: solid and stranded	Wire Range: fine stranded (Cu)	Torque: lb-in [N-m]	Wt.: lb [kg]	Covers (sold separately): w/o Indication	Covers (sold separately): w/ Indication[1]	Covers (sold separately): Pc/ pkg
Box lug	JM60030-1CR	1	$19.00	600V AC/DC	30	1	14-2 AWG (Cu) 8-2 AWG (Al)	3-2 AWG 6-4 AWG 8AWG 14-10 AWG	50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.15 [0.08]	CVR-J-60030 $6.25	CVRI-J-60030 $8.00	1
Box lug	JM60030-2CR	1	$37.00			2				0.25 [0.12]			
Box lug	JM60030-3CR	1	$54.00			3				0.40 [0.18]			
Pressure Plate	JM60030-1PR	1	$18.50			1	18-10 AWG (Cu)	18-10 AWG	20 [2.3]	0.15 [0.08]			
Pressure Plate	JM60030-2PR	1	$36.00			2				0.25 [0.12]			
Pressure Plate	JM60030-3PR	1	$55.00			3				0.40 [0.18]			
Box lug	JM60060-1CR	1	$22.50		60	1	14-2 AWG (Cu) 8-2 AWG (Al)	3-2 AWG 6-4 AWG 8AWG 14-10 AWG	50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.20 [0.10]	CVR-J-60060 $7.50	CVRI-J-60060 $8.50	1
Box lug	JM60060-2CR	1	$43.00			2				0.35 [0.16]			
Box lug	JM60060-3CR	1	$55.00			3				0.55 [0.26]			

[1] Open fuse indication requires 90V minimum and closed circuit to operate.

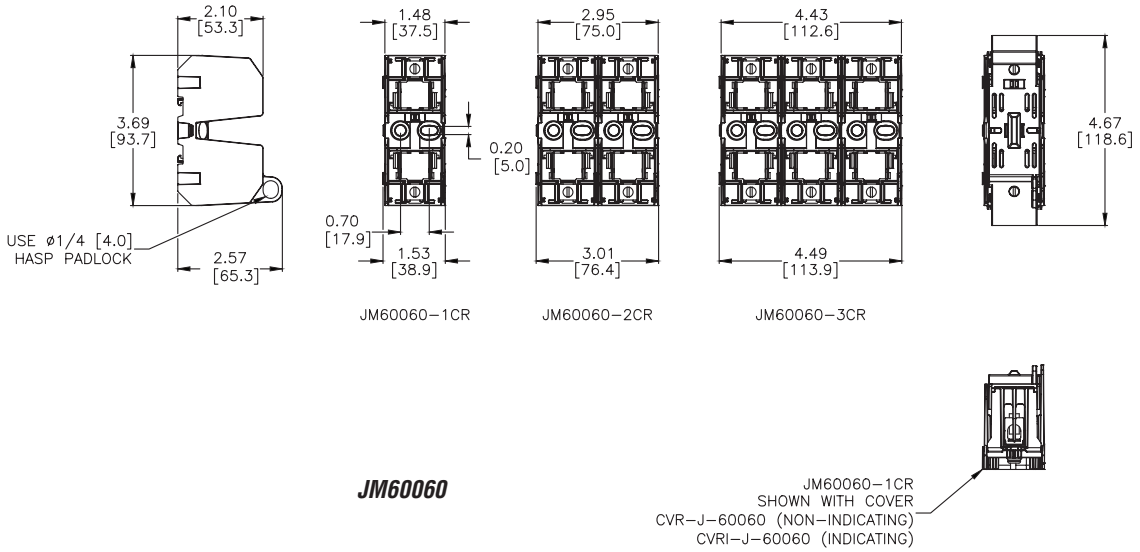
Modular Ferrule Fuse Blocks for Class J Fuses

Dimensions

in [mm]



JM60030



JM60060

Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Modular Fuse Holders for Class J Fuses

CH30J1

CH30J2I

CH30J3

Description

- Choice of LED indicator or non-indicating fuse holder
- Comes in standard 1-, 2- and 3-Pole ganged assemblies where all fuses are extracted simultaneously
- Meets requirements of IEC 60529 for IP-20 finger safe rating
- 35 mm DIN rail and chassis (6-32 UNC Pan Head recommended) mounting features
- Fuseholder wire ports dual wire rated from 18 to 3 AWG

Specifications

Construction: Thermoplastic, with tin-plated copper clip
UL Flammability: 94V-0

Voltage Ratings: 600 Volts AC/DC (or less)

Ampere Ratings: 1 - 60 Amps

Interrupting Rating: 200,000 RMS Symmetrical Amps

Minimum Indicating Voltage (neon lamp): 90 Volts

Nominal Operating Current (neon lamp): 34 mA (460 VAC)

Agency Approvals

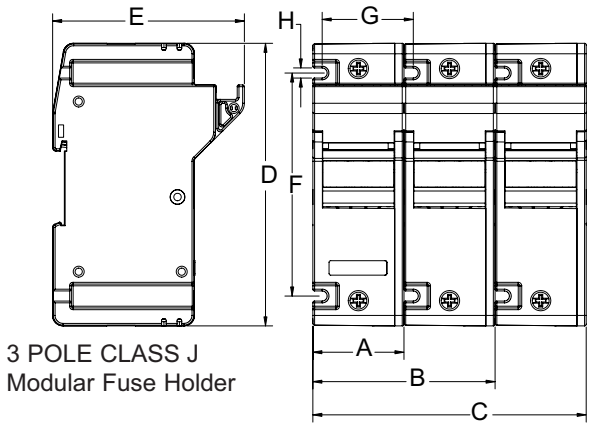
- Listed UL 512, Guide IZLT, File E14853
- CSA Certified per C22.2 Nos. 39 Class 6225-01, File LR47235
- CE compliance for the European Union Low Voltage Directive

CH Series Modular Fuse Holders for Class J Fuses

Amp Rating	Part Number	Amps	Type	Poles	Maximum Wire Size	Pcs/Pkg	Weight (lbs.)	Price
30A	CH30J1	0.5 to 30	Easy ID window	1	18 -1 AWG Single 18 -3 AWG Dual 75°C	6	2.8	$145.00
	CH30J2		Easy ID window	2		3		$203.00
	CH30J3		Easy ID window	3		2		$200.00
	CH30J1I		Neon indicator	1		6		$169.00
	CH30J2I		Neon indicator	2		3		$231.00
	CH30J3I		Neon indicator	3		2		$220.00
60A	CH60J1	31 to 60	Easy ID window	1		6	3.4	$194.00
	CH60J2		Easy ID window	2		3		$227.00
	CH60J3		Easy ID window	3		2		$231.00
	CH60J1I		Neon indicator	1		6		$218.00
	CH60J2I		Neon indicator	2		3		$271.00
	CH60J3I		Neon indicator	3		2		$248.00

Dimensions

Dimension	CH30J in (mm)	CH60J in (mm)
A	1.28 (32.5)	1.58 (40.0)
B	2.56 (65.0)	3.16 (80.0)
C	3.84 (97.5)	4.72 (120.0)
D	4.59 (116.6)	4.88 (124.0)
E	2.83 (71.8)	3.31 (84.1)
F	3.56 (90.4)	3.85 (97.9)
G	1.28 (32.5)	1.58 (40.0)
H	0.18 (4.44)	0.18 (4.44)



3 POLE CLASS J
Modular Fuse Holder

Modular Fuse Blocks for Class J Fuses

Description

For use with Edison JHL, JDL, Class J fuses

Specifications

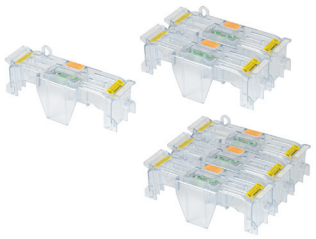
Materials:
Base – thermoplastic
Box lug terminals – tin-plated aluminum
SCCR: 200kA
Flammability rating:
Blocks – UL 94V0, self-extinguishing
Covers – UL 94HB, self-extinguishing
Operating and storage temp range:
Blocks – -40° to 120°C [-40° to 248°F]
Covers – indicating -20° to 90°C [-4° to 194°F]
non-indicating -40° to 120°C [-40° to 248°F]
Wire:
Cu/Al – 75°/90°C [167°/194°F](100-200 A)
Cu/Al – 75°C [167°F] only (400-600 A)*
Note: Higher temperature rated wire can be used with appropriate derating.
* 400A Class J double box lug rated for 75°/90°C Cu/Al.

Agency Approvals

- Blocks - UL - Listed cULus E14853 – IZLT & IZLT7
- CSA - Certified 47235 – 6225-01
- Covers - UL - Listed UL E58836 – JDVS
- CE, RoHS, Reach compliant

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Class J Fuse Blocks



Class J Fuse Block Covers

JM Series Modular Fuse Blocks

Part Number (1 pc/pkg)	Volts	Amps	Poles	Wire Range: solid and stranded***	Wire Range: fine stranded (Cu)	Torque: lb-in [N-m]	Wt.: lb [kg]	Covers**: w/o Indication	Covers**: w/ Indication	Pcs/ Pkg
JM60100-1CR-1 $28.00	600	100	1	–	3-1 AWG	55 [6.2]	0.32 [0.14]	CVR-J-60100-M-1 $8.00	CVRI-J-60100-M-1 $14.50	1
JM60100-1CR-2 $56.00			2	3-1/0 AWG; (2) Cu 6-4 AWG 6-4 AWG; (2) Cu 8AWG 8AWG ; (2) Cu 14-10 AWG Cu 14-10 AWG; Al 12-10 AWG	6-4 AWG 8AWG – –	50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.64 [0.28]	CVR-J-60100-M-2 $16.00	CVRI-J-60100-M-2 $28.00	2
JM60100-1CR-3 $85.00			3				0.96 [0.42]	CVR-J-60100-M-3 $24.00	CVRI-J-60100-M-3 $41.00	3
JM60200-1CR-1 $119.00	600	200	1	1AWG - 250MCM	1-3/0 AWG	375 [42]	0.82 [0.37]	CVR-J-60200-M-1 $9.75	CVRI-J-60200-M-1 $16.00	1
JM60200-1CR-2 $237.00			2	6-2 AWG; (2) Cu 6-2 AWG	6-2 AWG	275 [31]	1.64 [0.74]	CVR-J-60200-M-2 $20.00	CVRI-J-60200-M-2 $31.00	2
JM60200-1CR-3 $358.00			3				2.46 [1.11]	CVR-J-60200-M-3 $26.50	CVRI-J-60200-M-3 $47.50	3
JM60400-1CR-1 $213.00	600	400	1	600MCM 500MCM (2) Cu 4-3/0 AWG (2) Al 4-3/0 AWG	N/A	500 [57] 450 [51]	2.16 [0.98]	CVR-J-60400-M-1 $17.50	CVRI-J-60400-M-1 $25.50	1
JM60400-1CR-3 $638.00			3			500 [57] 300 [34]	6.48 [2.94]	CVR-J-60400-M-3 $52.00	CVRI-J-60400-M-3 $73.00	3
JM60400-1MW22-1* $257.00	600	400	1	(2) 1AWG - 350MCM	NA	375 [42]	2.58 [1.17]	CVR-J-60400-M-1 $17.50	CVRI-J-60400-M-1 $25.50	1
JM60400-1MW22-3* $735.00			3	(2) 6-2 AWG		275 [51]	7.74 [3.51]	CVR-J-60400-M-3 $52.00	CVRI-J-60400-M-3 $73.00	3
JM60600-1CR-1* $351.00	600	600	1	(2) 4AWG - 500MCM	N/A	450 [51]	3.92 [1.78]	CVR-J-60600-1 $29.00	CVRI-J-60600-1 $36.50	1
JM60600-1CR-3* $1,049.00			3				11.76 [5.34]	CVR-J-60600-3 $89.00	CVRI-J-60600-3 $111.00	3

**** Modular double box lug fuse block***
***** Covers sold separately. Blown fuse indication requires 90V minimum and closed circuit to operate.***
****** Ratings are for copper and aluminum wire except where otherwise noted.***

Double Box Lug Configurations

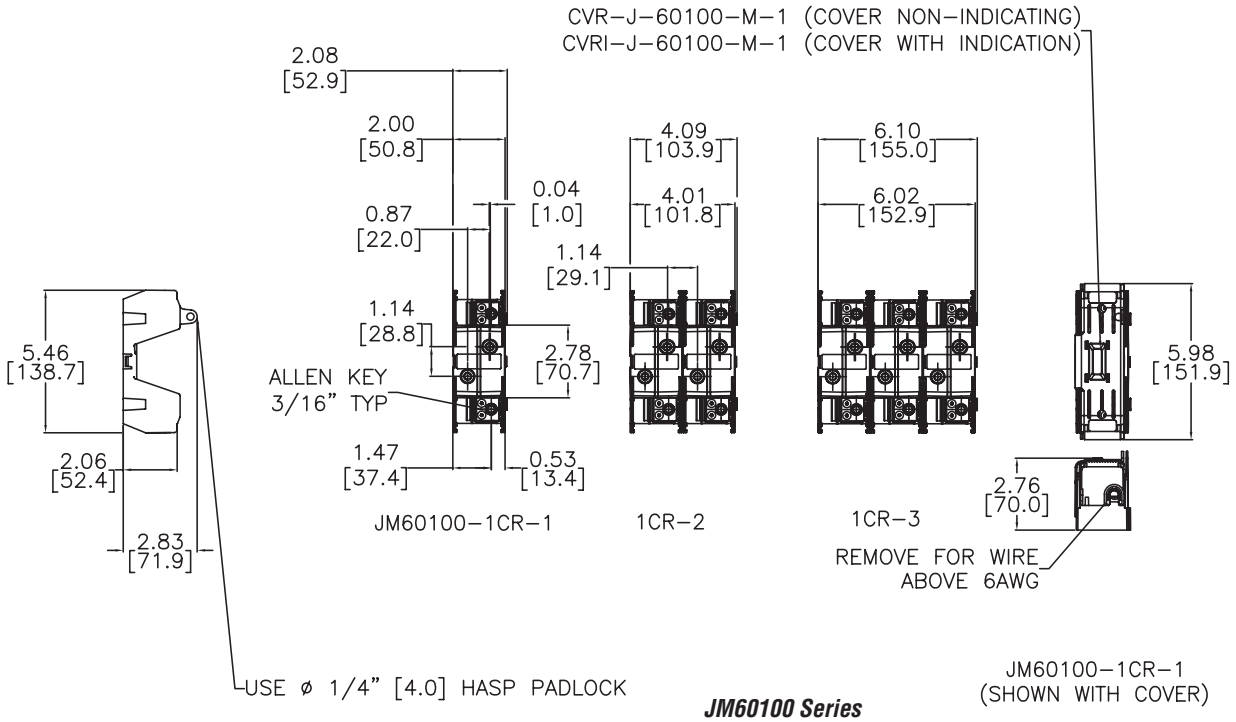
- Allows for ease of installation with smaller, more flexible wire
- Capable of achieving maximum current rating with parallel copper or aluminum wires
- Standard on all 600A blocks
- Optional on 400A blocks
- Compatible with IP20 finger-safe covers (for 400A double box lug configuration, optional cover provides IP20 finger-safe protection for dual 1AWG - 350MCM wires or one single 6AWG - 350MCM)

JM60400-1MW22

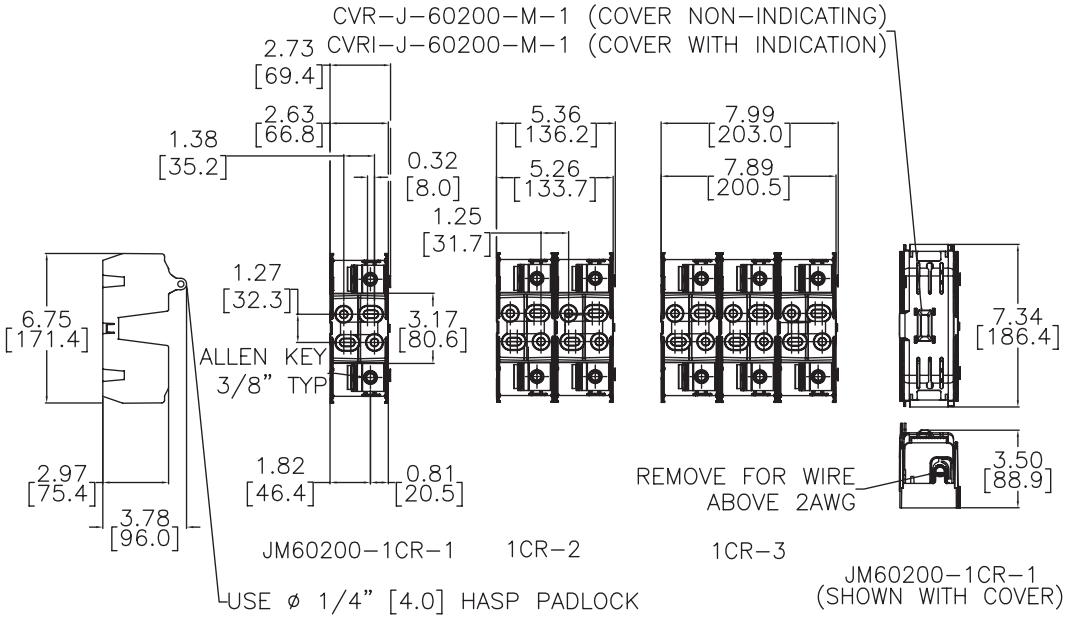
Fuse Blocks for Class J Fuses

Dimensions

in [mm]



JM60100 Series



JM60200 Series

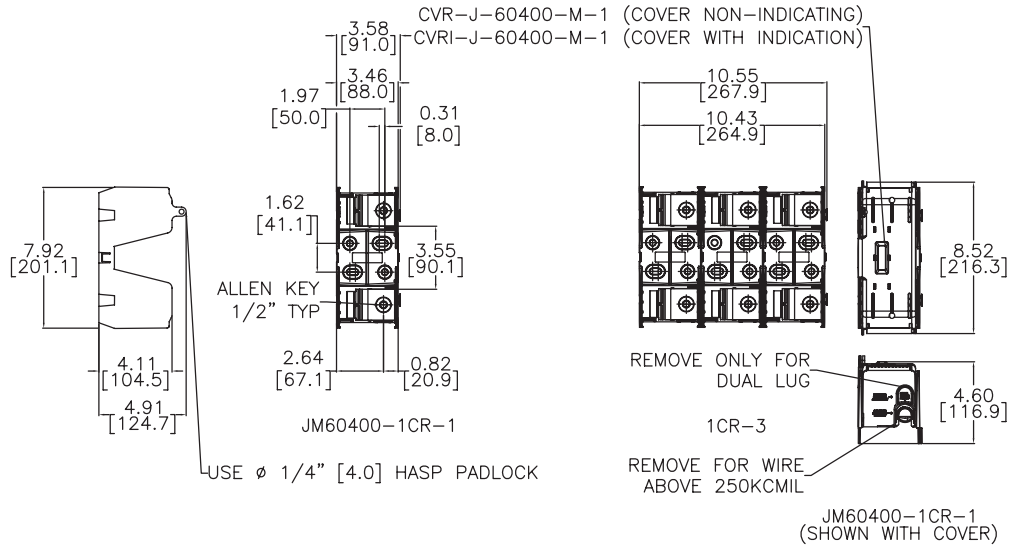
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Fuse Blocks for Class J Fuses

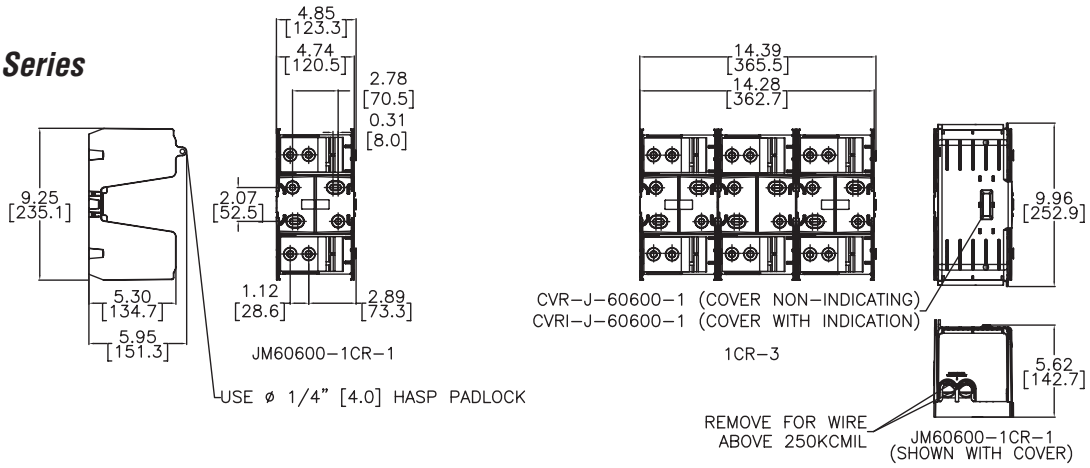
Dimensions

in [mm]

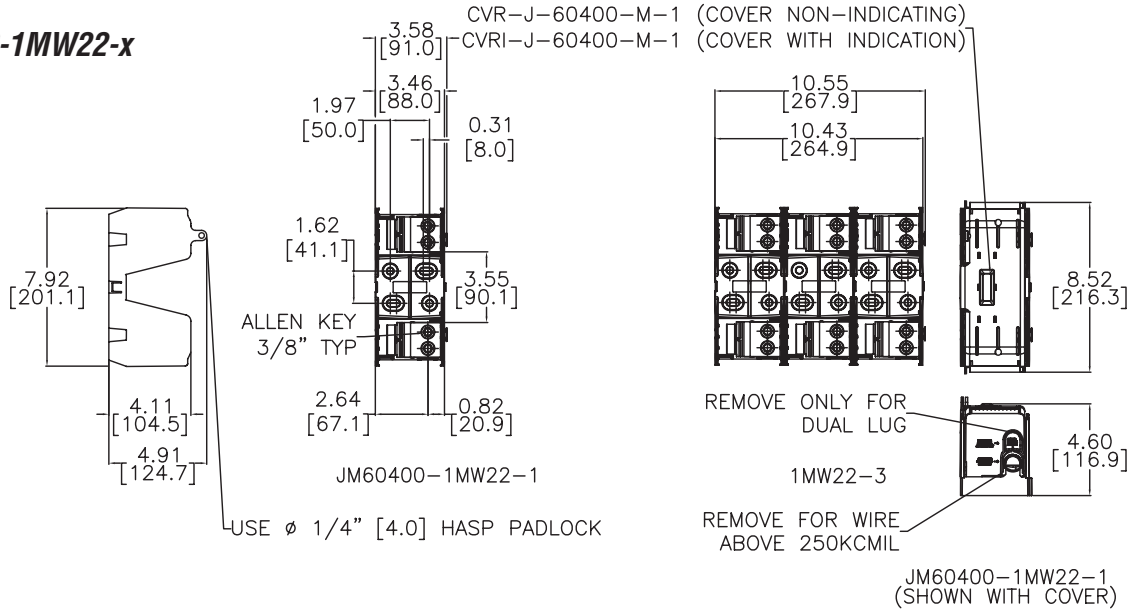
JM60400 Series



JM60600 Series



JM60400-1MW22-x



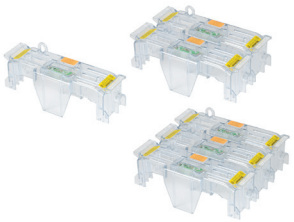
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Modular Power Distribution Multi-Wire Fuse Blocks for Class J Fuses

Features

- Combination power distribution block and fuse block reduces wire connections and total panel components, using 50% less panel space and reducing installation time and labor by 33%.
- A 200kA withstand rating helps achieve a higher assembly short circuit current rating (SCCR) for compliance with NEC® sections 110.10, 409.110(4), 409.22, 440.4(B), 670.3(A)(4) and 670.5.
- Optional see-through cover enhances safety with IP20 finger-safe protection, lockout/tagout capability and open circuit indication.

Class J Power Distribution Blocks



Covers for Class J Power Distribution Blocks

Specifications

Materials:
Base – thermoplastic
Box lug terminals – tin-plated aluminum
SCCR: 200kA
Flammability rating:
Blocks – UL 94V0, self-extinguishing
Covers – UL 94HB, self-extinguishing
Operating and storage temp range:
Blocks – -40° to 120°C [-40° to 248°F]
Covers – indicating -20° to 90°C [-4° to 194°F]
non-indicating -40° to 120°C [-40° to 248°F]
Wire:
Cu/Al – 75°C [167°F]*
* Conductors with higher temperature rating may be used, but at their 75°C ampacity.

Agency Approvals

- Blocks - UL - UR recognized E14853 – IZLT2
- CSA - Certified 47235 – 6225-01
- Covers - UL - Listed UL E58836 – JDVS
- CE, RoHS, Reach Compliant

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

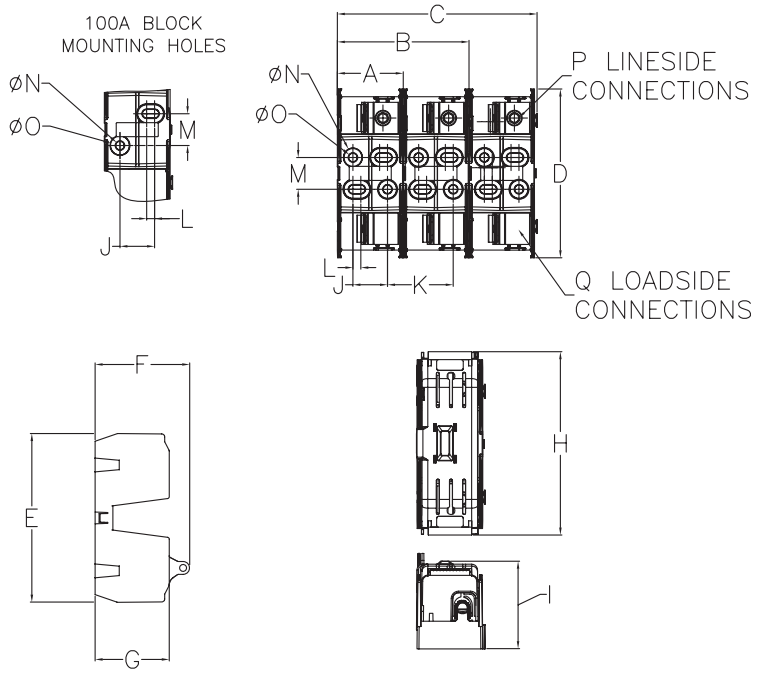
JM Series Modular Power Distribution Multi-Wire Fuse Blocks

Part Number (1 pc/pkg)	Volts	Amps	Poles	Lineside		Loadside		Wt.	Covers***		
				Wire range (AWG)	Torque N·m [lb·in]	Wire range (AWG)	Torque N·m [lb·in]	lb [kg]	w/o Indication	w/ Indication	Pcs/ Pkg
JM60100-1MW14-1 $32.50	600	100	1	(1) 14 - 1/0 Cu/Al	1-1/0; 5.6 [50] 6-4; 5.0 [45] 8; 4.5 [40] 14-10; 4.0 [35]	(4) 14-4 Cu, 8-4 Al (8)** 14-10 Cu	6-4; 4.0 [35] 8; 2.8 [25] 14-10; 2.3 [20]† (2) 14-10; 3.4 [30]†	0.32 [0.15]	CVR-J-60100-M-1 $8.00	CVRI-J-60100-M-1 $14.50	1
JM60100-1MW14-2 $62.00			2					0.64 [0.3]	CVR-J-60100-M-2 $16.00	CVRI-J-60100-M-2 $28.00	2
JM60100-1MW14-3 $96.00			3					0.96 [0.45]	CVR-J-60100-M-3 $24.00	CVRI-J-60100-M-3 $41.00	3
JM60200-1MW16-1 $125.00		200	1	(1) 6 - 250MCM Cu/Al	1 - 250MCM; 42 [375] (2) 6-2; 31 [275]	(6) 14-4 Cu, 8-4 Al (12)** 14-10 Cu	6-4; 4.0 [35] 8; 2.8 [25] 14-10; 2.3 [20]† (2) 14-10; 3.4 [30]†	0.84 [0.39]	CVR-J-60200-M-1 $9.75	CVRI-J-60200-M-1 $16.00	1
JM60200-1MW16-2 $241.00			2					1.68 [0.78]	CVR-J-60200-M-2 $20.00	CVRI-J-60200-M-2 $31.00	2
JM60200-1MW16-3 $363.00			3					2.52 [1.17]	CVR-J-60200-M-3 $29.00	CVRI-J-60200-M-3 $47.50	3
JM60400-1MW16-1 $223.00		400	1	(1) 4 - 600MCM Cu/Al	4 - 600MCM; 57 [500] 500MCM; 51 [450] (2) 4-3/0; 57 [500] Cu 34 [300] Al	(6) 14-2 Cu, 8-2 Al (12)** 14-8 Cu, 8 Al	3-2; 5.6 [50] 6-4; 5.0 [45] 8; 4.5 [40] (2) 8; 4.5 [40]†† 14-10; 4.0 [35]† (2) 14-10; 4.5 [40]†	2.24 [1.02]	CVR-J-60400-M-1 $17.50	CVRI-J-60400-M-1 $25.50	1
JM60400-1MW16-3 $640.00			3					6.72 [3.06]	CVR-J-60400-M-3 $52.00	CVRI-J-60400-M-3 $73.00	3
JM60400-1MW26-1* $280.00			1	(2) 6 - 350MCM Cu/Al	(2) 1 - 350MCM; 42 [375] (2) 6-2; 31 [275]	(6) 14-2 Cu, 8-2 Al (12)** 14-8 Cu, 8 Al	3-2; 5.6 [50] 6-4; 5.0 [45] 8; 4.5 [40] (2) 8; 4.5 [40]†† 14-10; 4.0 [35]† (2) 14-10; 4.5 [40]†	2.44 [1.1]	CVR-J-60400-M-1 $17.50	CVRI-J-60400-M-1 $25.50	1
JM60400-1MW26-3* $802.00			3					7.32 [3.3]	CVR-J-60400-M-3 $52.00	CVRI-J-60400-M-3 $73.00	3

** Lineside dual box lug*
*** Dual wire rated lugs with same wire size*
**** Covers sold separately. Blown fuse indication requires 90V minimum and closed circuit to operate.*
† Copper conductor only.
†† Dual wire not for CSA installations

Power Distribution Blocks for Class J Fuses

Dimensions



Dimensions																Connections	
Block Size		A	B	C	D	E	F	G	H	I	J	K	L	M	øN	øO	Lineside (P)	Loadside (Q)
100A	in	2.0	4.0	6.0	5.5	5.5	2.8	2.2	6.0	2.8	0.9	2.0	0.4	1.1	0.4	0.5	1	4
	mm	51	102	153	139	139	72	55	152	72	22	51	10	29	9	13		
200A	in	2.6	5.3	8.0	6.8	6.8	3.8	3.0	7.3	3.8	1.4	2.6	0.3	1.3	0.4	0.7	1	6
	mm	67	134	203	172	172	97	75	186	97	35	34	8	32	9	19		
400A	in	3.5	7.0	10.6	8.0	8.0	4.8	4.1	8.7	4.8	2.0	3.5	0.3	1.6	0.4	0.7	2 (1)*	6
	mm	88	177	268	202	202	121	105	220	121	50	88	8	41	9	19		

***JM60400-1MW16-X**

Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Modular Fuse Blocks for Class R Fuses

Description

For use with Edison ECNR, ECSR, LENRK, LESRK, Class R fuses

Specifications

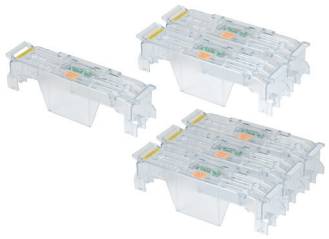
Materials:
Base – thermoplastic
Box lug terminals – tin-plated aluminum
SCCR: 200kA sym RMS
Flammability rating:
Blocks – UL 94V0, self-extinguishing
Covers – UL 94HB, self-extinguishing
Operating and storage temp range:
Blocks – -40° to 120°C [-40° to 248°F]
Covers – indicating -20° to 90°C [-4° to 194°F]
non-indicating -40° to 120°C [-40° to 248°F]
Wire:
Cu/Al – 75°/90°C [167°/194°F](100-200 A)
Cu/Al – 75°C [167°F] only (400-600 A)
Note: Higher temperature rated wire can be used with appropriate derating.

Agency Approvals

- Blocks - UL - Listed cULus E14853 – IZLT & IZLT7
- CSA - Certified 47235 – 6225-01
- Covers - UL - Listed UL E58836 – JDVS
- CE, RoHS, Reach Compliant

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Class R Fuse Blocks



Class R Fuse Block Covers

RM Series Modular Fuse Blocks

Part Number (1 pc/pkg)	Volts	Amps	Poles	Wire Range		Torque	Wt.	Covers*		
				solid and stranded**	fine stranded (Cu)	lb·in [N·m]	lb [kg]	w/o Indication	w/ Indication	Pcs/Pkg
RM25100-1CR-1 $25.50	250	100	1	– 3-1/0 AWG; (2) Cu 6-4 AWG 6-4 AWG; (2) Cu 8AWG 8AWG ; (2) Cu 14-10 AWG Cu 14-10 AWG; Al 12-10 AWG	3-1 AWG 6-4 AWG 8AWG – –	55 [6.2] 50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.86 [0.39]	CVR-RH-25100-1 $9.25	CVRI-RH-25100-1 $15.50	1
RM25100-1CR-2 $50.00			2				1.72 [0.78]	CVR-RH-25100-2 $19.00	CVRI-RH-25100-2 $30.00	2
RM25100-1CR-3 $75.00			3				2.58 [1.17]	CVR-RH-25100-3 $28.00	CVRI-RH-25100-3 $45.50	3
RM25200-1CR-1 $86.00	250	200	1	1AWG - 250MCM 6-2 AWG; (2) Cu 6-2 AWG	1-3/0 AWG 6-2 AWG	375 [42] 275 [31]	0.88 [0.4]	CVR-RH-25200-1 $13.00	CVRI-RH-25200-1 $20.00	1
RM25200-1CR-2 $170.00			2				1.76 [0.8]	CVR-RH-25200-2 $26.50	CVRI-RH-25200-2 $40.00	2
RM25200-1CR-3 $257.00			3				2.64 [1.2]	CVR-RH-25200-3 $38.00	CVRI-RH-25200-3 $59.00	3
RM25400-1CR-1 $276.00	250	400	1	600MCM 500MCM - 4AWG (2) Cu 4-3/0 AWG (2) Al 4-3/0 AWG	N/A	500 [57] 450 [51] 500 [57] 300 [34]	2.24 [1.02]	CVR-RH-25400-1 $21.00	CVRI-RH-25400-1 $28.50	1
RM25400-1CR-3 $831.00			3				6.72 [3.06]	CVR-RH-25400-3 $61.00	CVRI-RH-25400-3 **$88.00**	3
RM25600-1CR-1 $362.00	250	600	1	(2) 4AWG - 500 MCM	N/A	450 [51]	4.04 [1.83]	CVR-RH-25600-1 $37.50	CVRI-RH-25600-1 $45.50	1
RM25600-1CR-3 $1,083.00			3				12.12 [5.49]	CVR-RH-25600-3 $114.00	CVRI-RH-25600-3 $139.00	3
RM60100-1CR-1 $31.00	600	100	1	– 3-1/0 AWG; (2) Cu 6-4 AWG 6-4 AWG; (2) Cu 8AWG 8AWG; (2) Cu 14-10 AWG Cu 14-10 AWG; Al 12-10 AWG	3-1 AWG 6-4 AWG 8AWG – –	55 [6.2] 50 [5.6] 45 [5.1] 40 [4.5] 35 [4.0]	0.34 [0.16]	CVR-RH-60100-1 $12.00	CVRI-RH-60100-1 $19.00	1
RM60100-1CR-2 $63.00			2				0.68 [0.32]	CVR-RH-60100-2 $23.00	CVRI-RH-60100-2 $37.00	2
RM60100-1CR-3 $94.00			3				1.02 [0.48]	CVR-RH-60100-3 $33.00	CVRI-RH-60100-3 $55.00	3
RM60200-1CR-1 $82.00	600	200	1	1AWG - 250MCM 6-2 AWG; (2) Cu 6-2 AWG	1-3/0 AWG 6-2 AWG	375 [42] 275 [31]	0.92 [0.42]	CVR-RH-60200-1 $15.50	CVRI-RH-60200-1 $23.00	1
RM60200-1CR-2 $163.00			2				1.84 [0.84]	CVR-RH-60200-2 $29.00	CVRI-RH-60200-2 $45.50	2
RM60200-1CR-3 $244.00			3				5.52 [2.52]	CVR-RH-60200-3 $44.50	CVRI-RH-60200-3 $69.00	3
RM60400-1CR-1 $225.00	600	400	1	600MCM 4AWG - 500MCM (2) Cu 4-3/0 AWG (2) Al 4-3/0 AWG	N/A	500 [57] 450 [51] 500 [57] 300 [34]	2.32 [1.05]	CVR-RH-60400-1 $27.00	CVRI-RH-60400-1 $36.00	1
RM60400-1CR-3 $676.00			3				6.96 [3.15]	CVR-RH-60400-3 $80.00	CVRI-RH-60400-3 $110.00	3
RM60600-1CR-1 $362.00	600	600	1	(2) 4AWG - 500MCM	N/A	450 [51]	4.16 [1.88]	CVR-RH-60600-1 $47.00	CVRI-RH-60600-1 $56.00	1
RM60600-1CR-3 $1,084.00			3				12.48 [5.64]	CVR-RH-60600-3 $142.00	CVRI-RH-60600-3 $170.00	3

** Covers sold separately. Blown fuse indication requires 90V minimum and closed circuit to operate.*
*** Ratings are for copper and aluminum wire except where otherwise noted.*

Modular Fuse Holders for Class CC & Midget Class Fuses

Features

- EHCC Series: High SCCR rated, UL Listed CC holder with indicator option for 600VAC/DC
- EHM Series: UL Recognized midget holders
- Minimum 90VAC/DC required for illumination
- Rated for use with 75˚C or 90˚C wire, fine stranded wire, spade terminals and comb-bus bars. Use any higher temperature rated wire with appropriate derating.
- Complete range of UL Listed and high SCCR rated 1-phase and 3-phase finger-safe comb-bus bars and power feed lugs
- Polyester material is UL 94V0 rated, self extinguishing
- Multi-phase connections available for ganging up to 4 poles*
- Mounts on 35 mm DIN rail
- IP20 rated
- Spade terminals are accepted (Max width-10mm, Min ID of slot 4mm Max ID of slot 5mm)
- Wire ferrules may not be used.

Application

- EHM: Edison MCL, MOL, MEQ, MEN, or midget fuses
- EHCC: Edison HCLR, HCTR, EDCC fuses, or class CC fuses

Agency Approvals/ Standards Class CC

- UL File E300536 Guide IZLT Listed
- CSA File 47235, Class 6225-01
- CE Compliant
- RoHS, Reach

Agency Approvals/ Standards Midget

- UL File E300536 IZLT2 Recognized
- CSA File 47235, Class 6225-30
- IEC 60269-2
- CE Compliant
- RoHS, Reach

Modular Fuse Holder Selection Table

Series Size	Max Voltage & Current	IEC	UL	Phase Configuration	Fuse Holder Without Indication	Box Qty.	Pkg. Wt. (lb.)	Price	Fuse Holder with NEON Indication	Product Weight (lb.)	Box Qty.	Price
EHM Midget Class	UL 600V/30A IEC 690V/32A	•	•	1 pole	EHM1DU	1	0.12	$9.50	EHM1DIU	0.12	1	$12.50
					EHM1DU-12	12	1.42	$97.00	EHM1DIU-12	1.42	12	$129.00
		•	•	2 pole	EHM2DU	1	0.24	$19.50	EHM2DIU	0.24	1	$25.50
					EHM2DU-6	6	1.42	$101.00	EHM2DIU-6	1.42	6	$132.00
		•	•	3 pole	EHM3DU	1	0..36	$30.00	EHM3DIU	0.36	1	$40.50
					EHM3DU-4	4	1.42	$102.00	EHM3DIU-4	1.42	4	$136.00
EHCC Class CC	UL 600V/30A		••	1 pole	EHCC1DU	1	0.12	$11.00	EHCC1DIU	0.12	1	$14.50
					EHCC1DU-12	12	1.42	$114.00	EHCC1DIU-12	1.42	12	$148.00
			••	2 pole	EHCC2DU	1	0.24	$23.00	EHCC2DIU	0.24	1	$30.00
					EHCC2DU-6	6	1.42	$117.00	EHCC2DIU-6	1.42	6	$152.00
			••	3 pole	EHCC3DU	1	0.36	$34.50	EHCC3DIU	0.36	1	$45.50
					EHCC3DU-4	4	1.42	$118.00	EHCC3DIU-4	1.42	4	$153.00

** To add additional poles, see multi-pole connection kit JV-L in accessories. One JV-L kit is sufficient to gang up to 4 poles.*

• UL Recognized, CSA

•• UL Listed, CSA

Modular Fuse Holders for Class CC & Midget Class Fuses

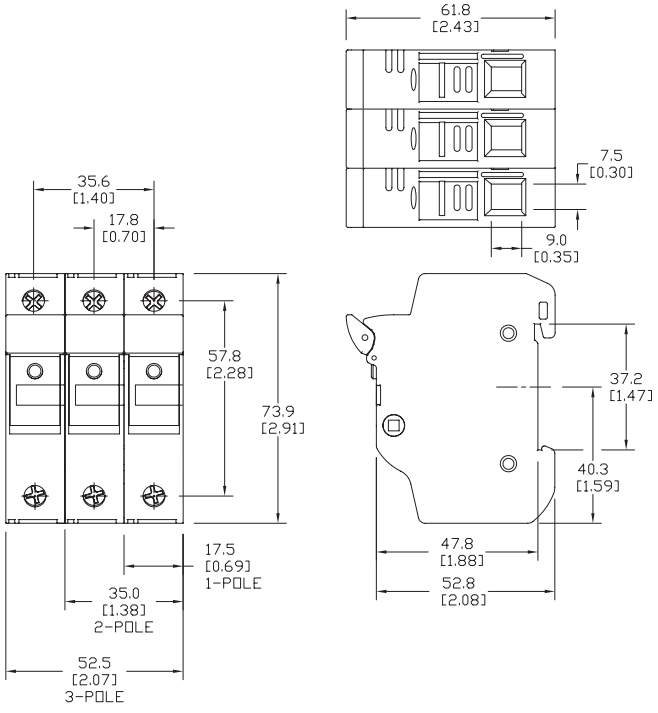
Modular Fuse Holder Specifications										
Part Number w/o Indication	Part Number w/ Indication	Holder Size	Max Voltage & Current	Number of poles	Wire Range	Maximum Torque	Operating Temperature	SCCR Rating	Terminal Rating	Flammability Rating
EHM1DU	EHM1DIU	EHM Midget Class and 10x38	UL/CSA 600V/30A IEC 690V/32A	1	18-4 AWG (0.8-21 mm²)	30 lb-in (3.4 N•m) maximum	-20˚C to +90˚C -4˚F to 194˚F (indicating) -20˚C to +120˚C -4˚F to 248˚F (non-indicating)	100kA rms sym	Solid, Stranded, Fine stranded, Spade lug, Comb-bus bar; Single and dual wire; 75˚C and 90˚C Cu wire	UL 94V0 self-extinguishing
EHM1DU-12	EHM1DIU-12									
EHM2DU	EHM2DIU			2						
EHM2DU-6	EHM2DIU-6									
EHM3DU	EHM3DIU			3						
EHM3DU-4	EHM3DIU-4									
EHCC1DU	EHCC1DIU	EHCC Class CC	UL/CSA 600V/30A	1				200kA rms sym		
EHCC1DU-12	EHCC1DIU-12									
EHCC2DU	EHCC2DIU			2						
EHCC2DU-6	EHCC2DIU-6									
EHCC3DU	EHCC3DIU			3						
EHCC3DU-4	EHCC3DIU-4									

CHCC and EHM Wire Range, Type and Torque			
Wire Range	Conductor Type	Number of Conductors	Torque
18-14 AWG (0.8-2.0 mm²)	Solid, Stranded	Single	20 lb-in (2.3 N•m)
18-16 AWG (0.8-1.3 mm²)		Dual	25 lb-in (2.8 N•m)
14-10 AWG (2.0-5.2 mm²)			30 lb-in (3.4 N•m)
12-10 AWG (3.3-5.2 mm²)		Single	
8-4 AWG (8.3-21.1 mm²)	Stranded, Fine Stranded		
18-14 AWG (0.8-2.0 mm²)	Spade Terminal		
N/A	Comb Bus		

Fuse Holder Dimensions

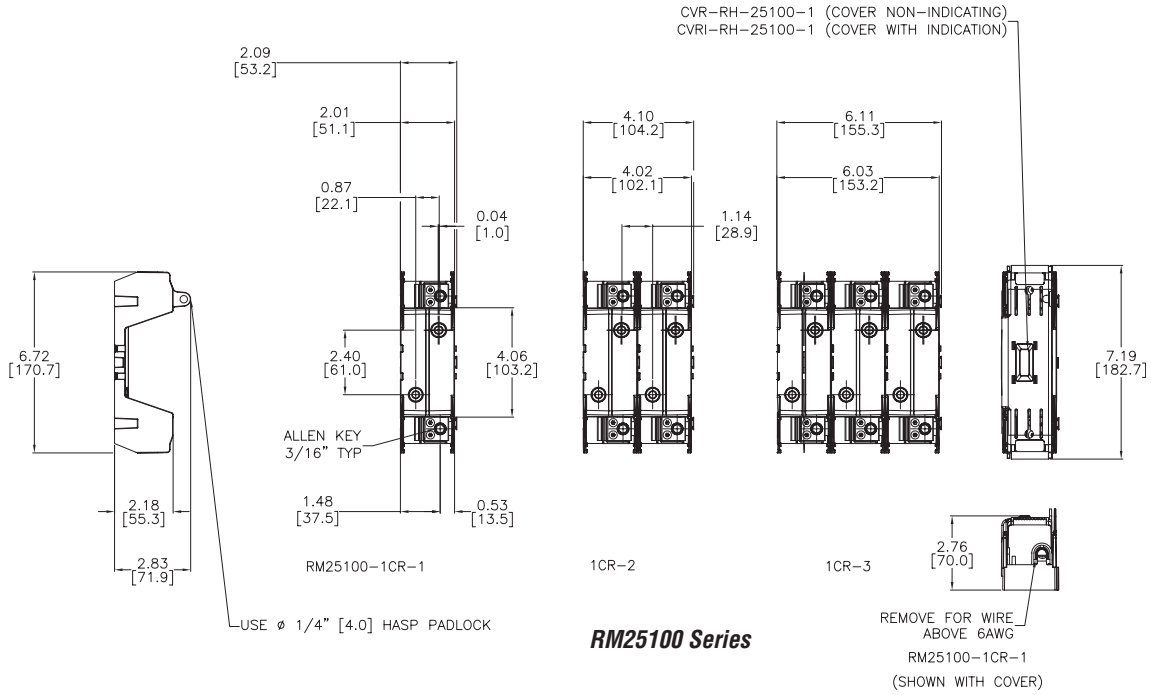
mm [inches]

EHM Midget Class / EHCC Class CC

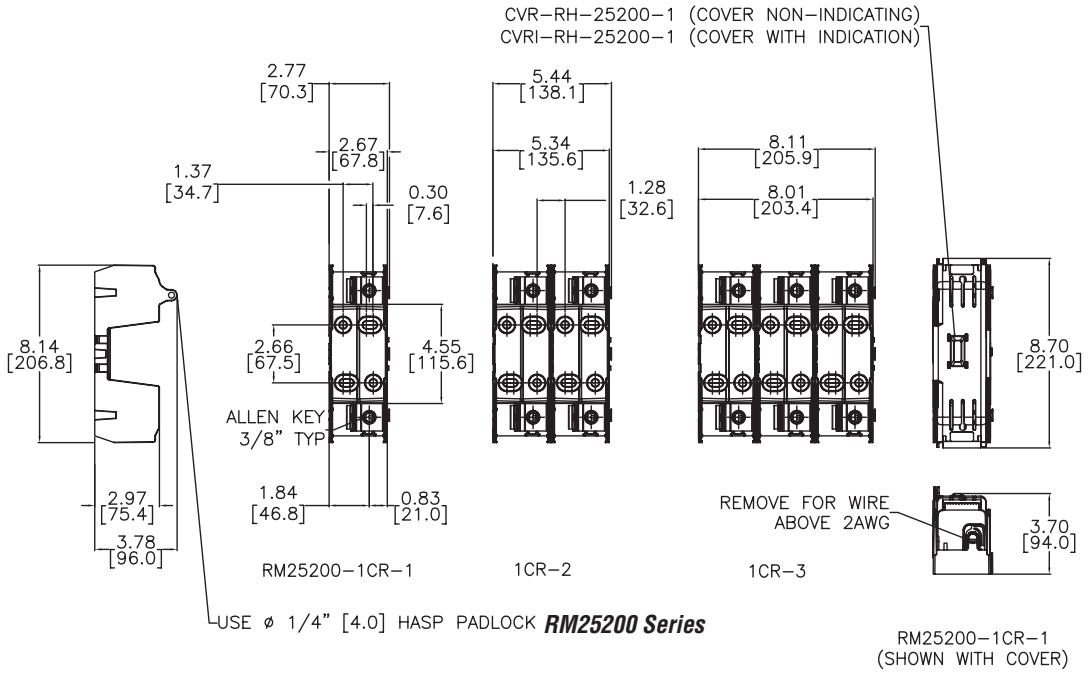


Fuse Blocks for Class R Fuses

Dimensions in [mm]



RM25100 Series

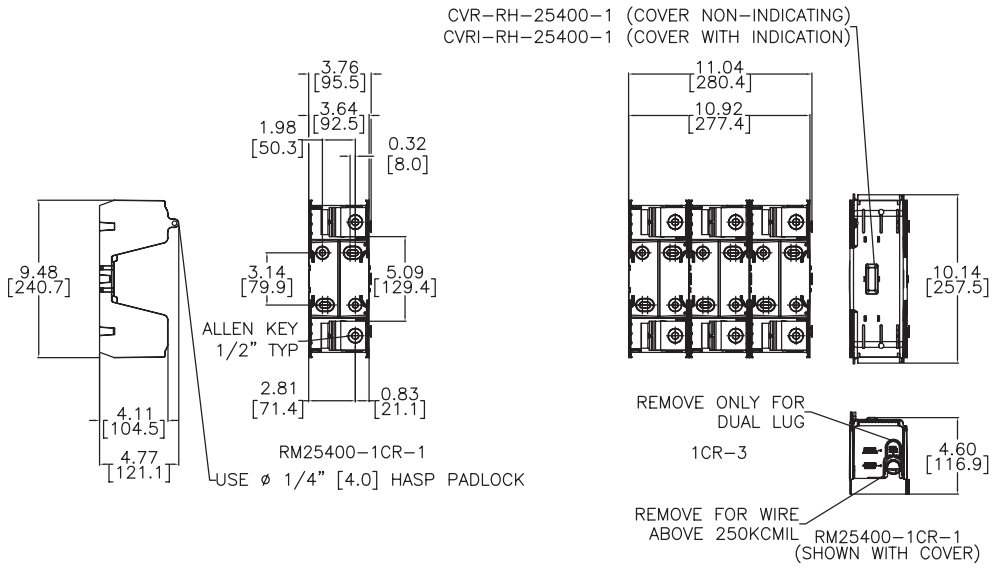


RM25200 Series

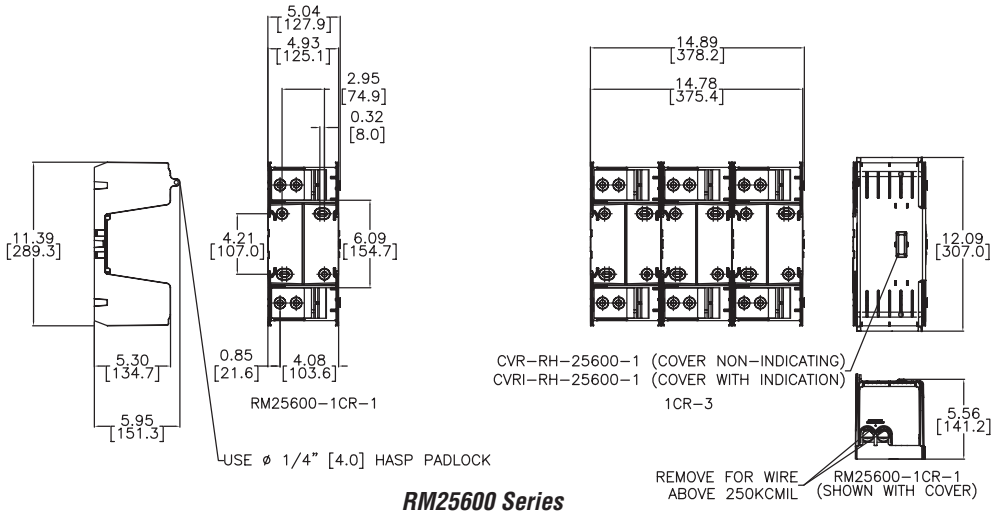
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Fuse Blocks for Class R Fuses

Dimensions in [mm]



RM25400 Series



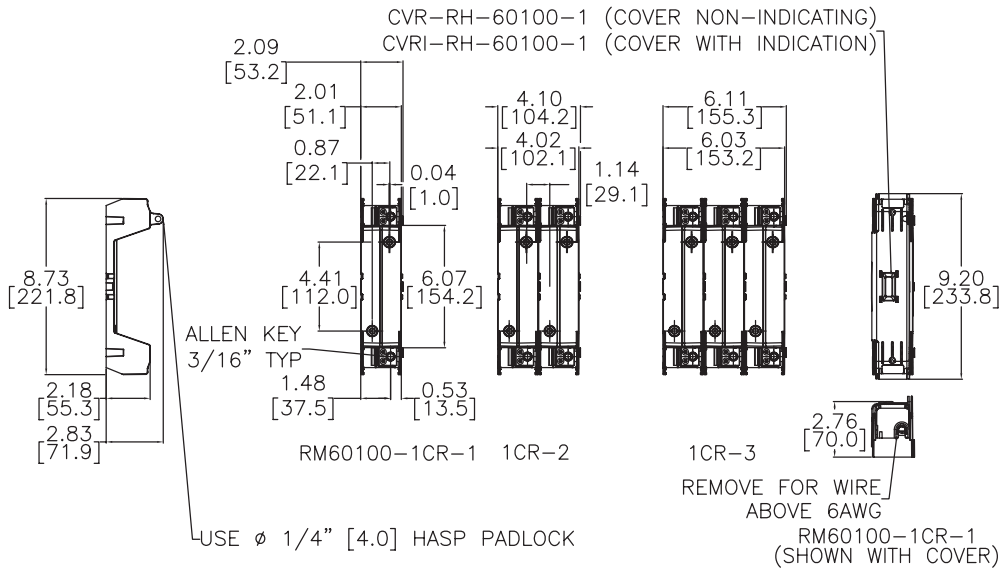
RM25600 Series

Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

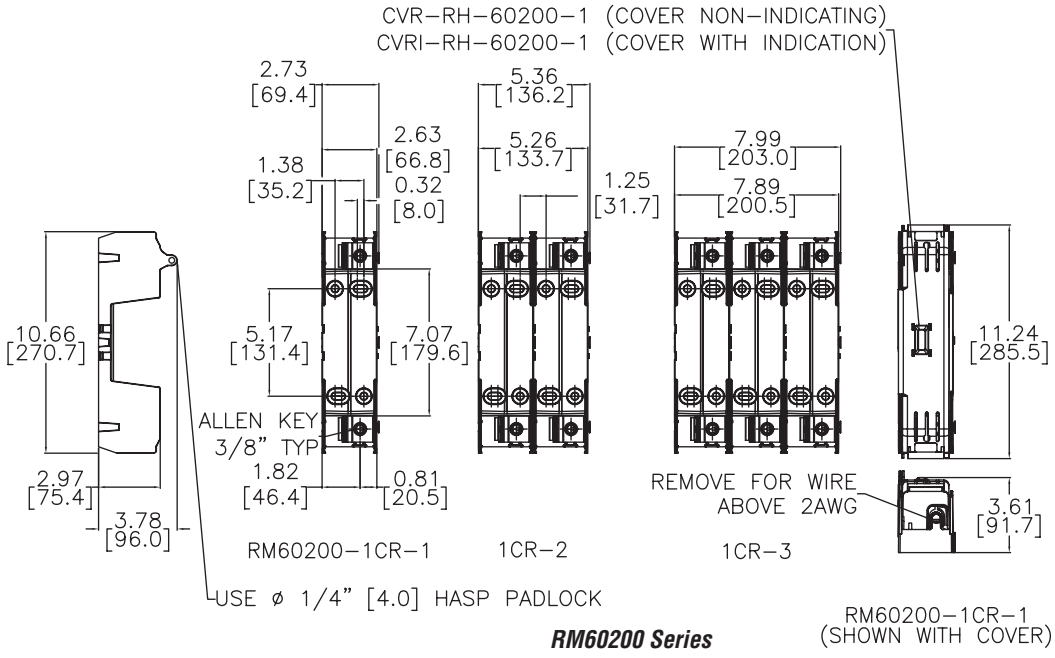
Fuse Blocks for Class R Fuses

Dimensions

in [mm]



RM60100 Series

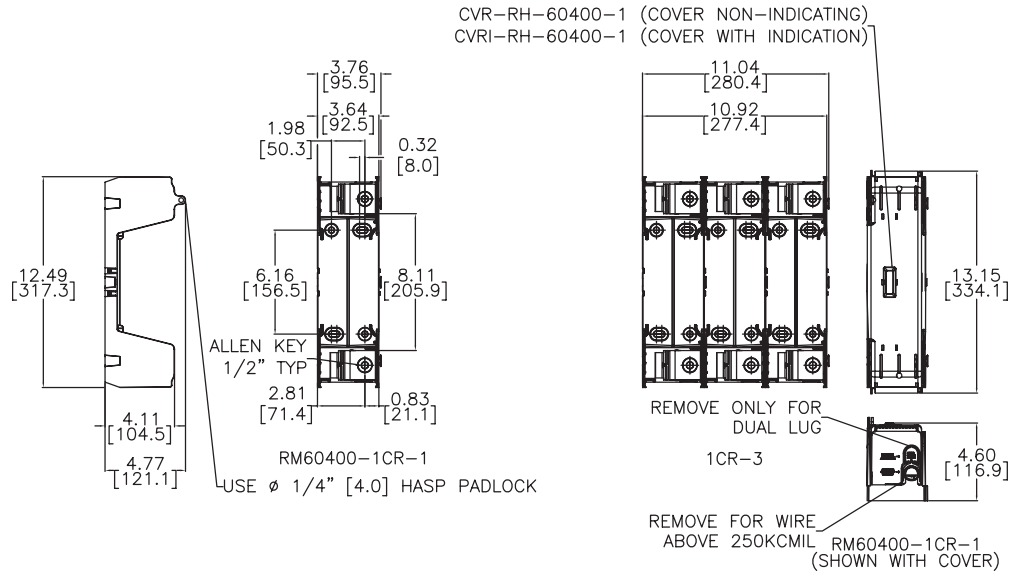


RM60200 Series

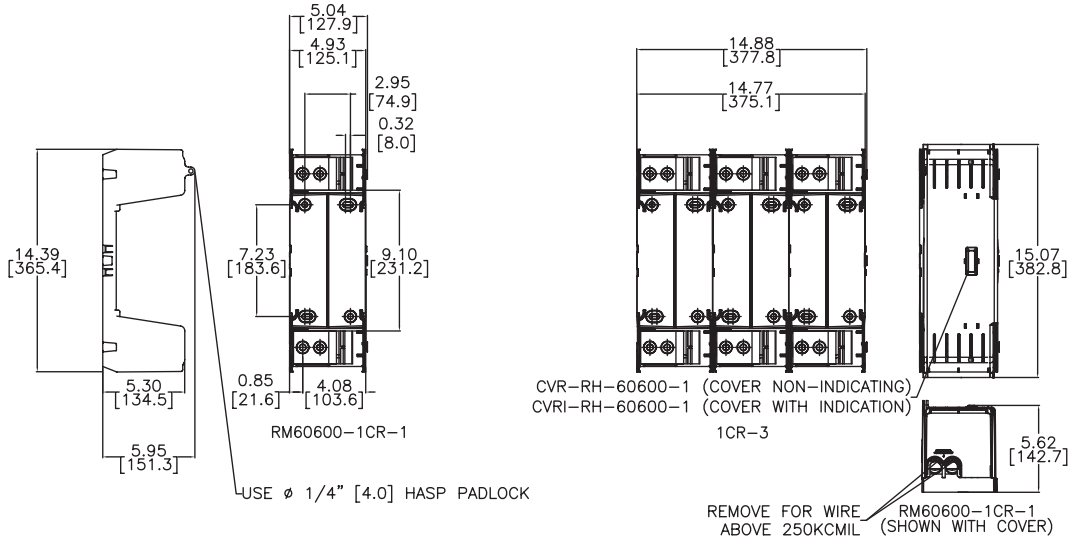
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Fuse Blocks for Class R Fuses

Dimensions in [mm]



RM60400 Series



RM60600 Series

Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Modular Ferrule Fuse Blocks for Midget Class and CC Fuses

Description

BCM Series for use with Class CC fuses EDCC, HCTR and HCLR
BMM Series for use with Midget Class Midget fuses
MCL, MEQ, MEN & MOL

Mounting

35mm DIN rail or panel mount

Specifications

Materials:
Base – Thermoplastic
Terminals – Tin-plated bimetallic copper
Covers – Thermoplastic
Screws and pressure plates – Zinc-plated steel
SCCR: 200kA
Flammability rating:
Blocks – UL 94V0, self-extinguishing
Covers – UL 94HB, self-extinguishing
Operating and storage temp range:
Blocks – -40° to 120°C [-40° to 248°F]
Covers – indicating -20° to 90°C [-4° to 194°F]
non-indicating -40° to 120°C [-40° to 248°F]
Wire:
Cu – 75°/90°C [167°/194°F]
Ring or Fork terminal to fit a #10-32 screw

Agency Approvals

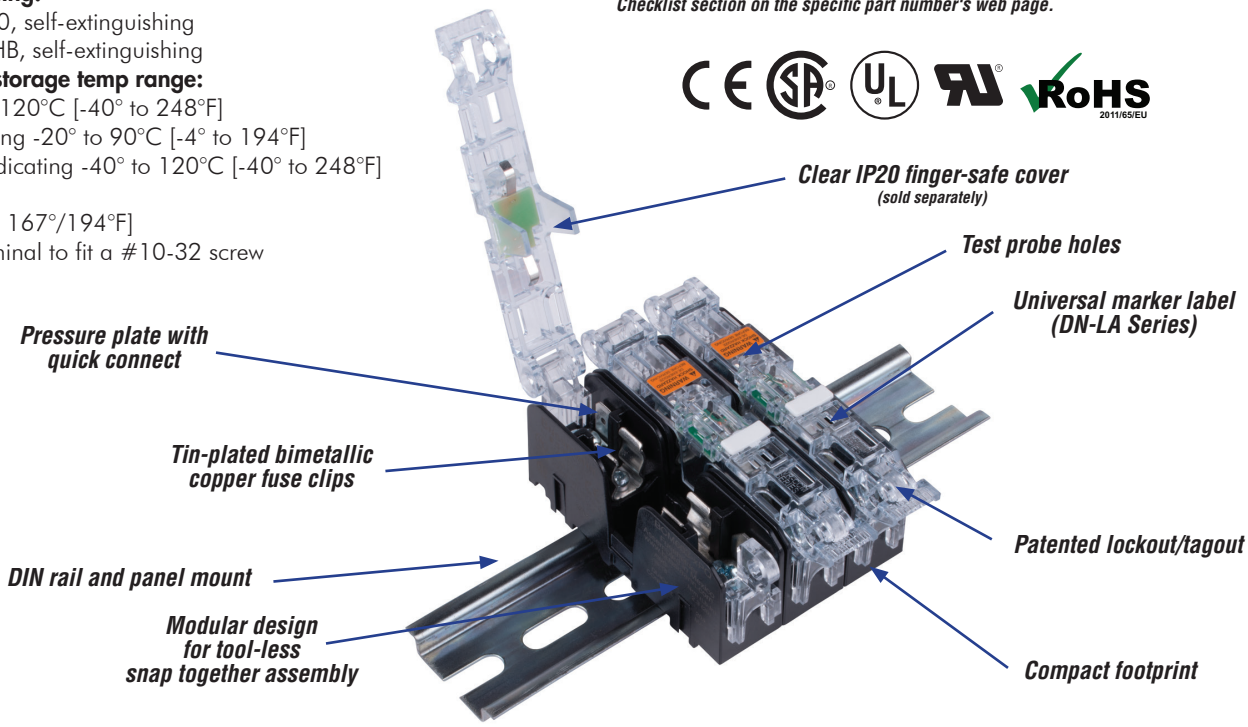
Fuse Blocks

- BCM – UL® Listed E14853 - IZLT
  BMM and BCCM UL Recognized E14853-IZLT2
- CSA® Certified 47235-6225-01
- CE
- RoHS Compliant
- Conflict mineral free
- REACH Compliant

Covers

- Covers are included in the overall UL Listing/Recognition and CSA Certification
- IP20 finger-safe
- RoHS compliant
- REACH Compliant

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.



Pressure Plate (with Quick Connect) Modular Ferrule Fuse Blocks for Midget Class and CC Fuses**

Class	Part Number	Pc/ pkg	Price	Volts	Amps	Poles	Wire Range[1]		Torque	Wt.	Covers* (Sold Separately)		
							solid and stranded	fine stranded	lb·in [N·m]	lb [kg]	w/o Indication	w/ Indication[3]	Pc/ pkg
Midget	BMM603-1PQ	15	$79.00	600V AC/DC	30	1	18-10 AWG	18-10 AWG	20 [2.3]	0.05 [0.04]	CVR-CCM-QC $16.50	CVRI-CCM-QC $21.50	3
	BMM603-2PQ	5	$45.00			2				0.15 [0.06]			
	BMM603-3PQ	5	$57.00			3				0.20 [0.10]			
	BMM603-1PQ-1	1	$6.00			1				0.05 [0.04]			
CC	BCM603-1PQ	15	$109.00			1				0.05 [0.04]			
	BCM603-2PQ	5	$55.00			2				0.15 [0.06]			
	BCM603-3PQ	5	$71.00			3				0.20 [0.10]			
	BCM603-1PQ-1	1	$8.00			1				0.05 [0.04]			
Combo	BCCMM603-3PQ[2]	5	$76.00			3				0.20 [0.10]			

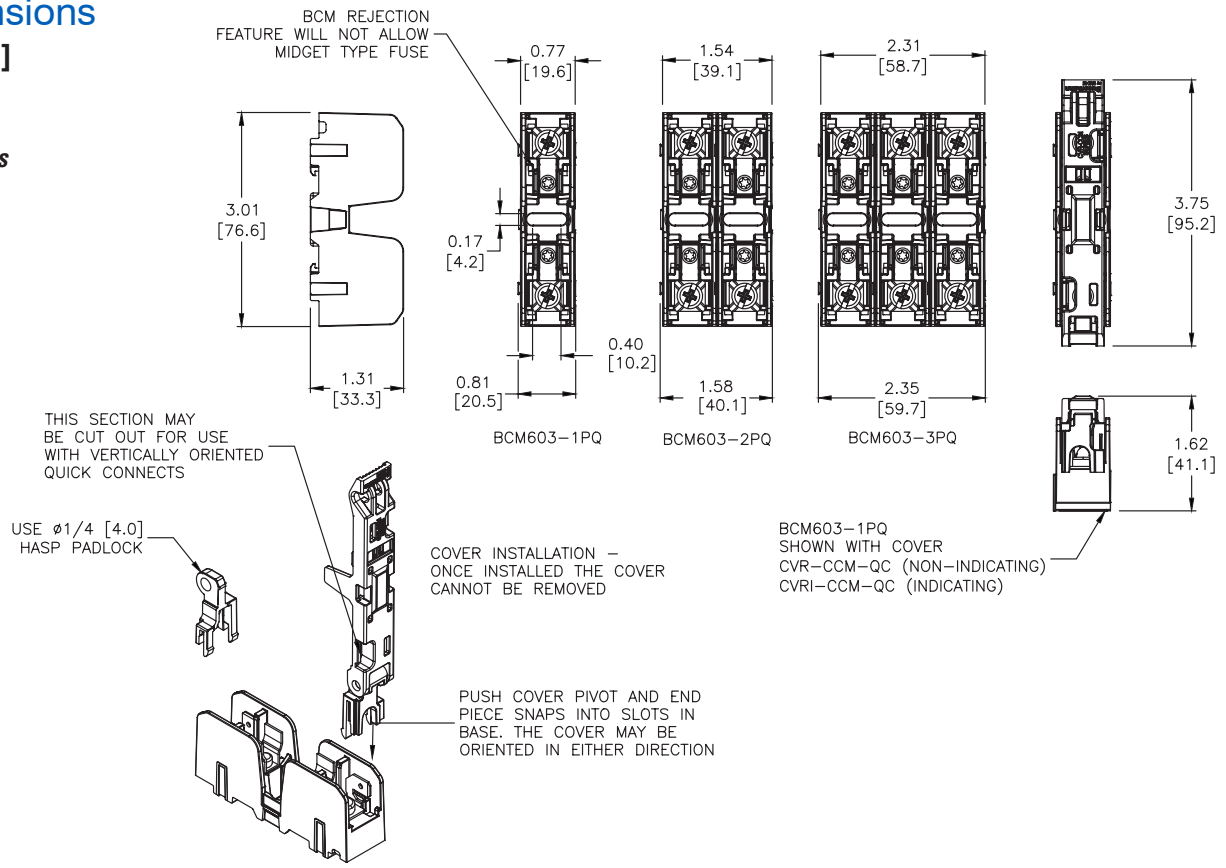
[1] *Ratings are for copper wire only.*
[2] *Combination modular fuse block for use with transformers. Accepts two (2) Class CC and one (1) Midget class fuse.*
[3] *Open fuse indication requires 90V minimum and closed circuit to operate.*
**Once installed, the cover cannot be removed.*
***Quick connect terminal rated for 20A maximum.*

Modular Ferrule Fuse Blocks for Midget Class and CC Fuses

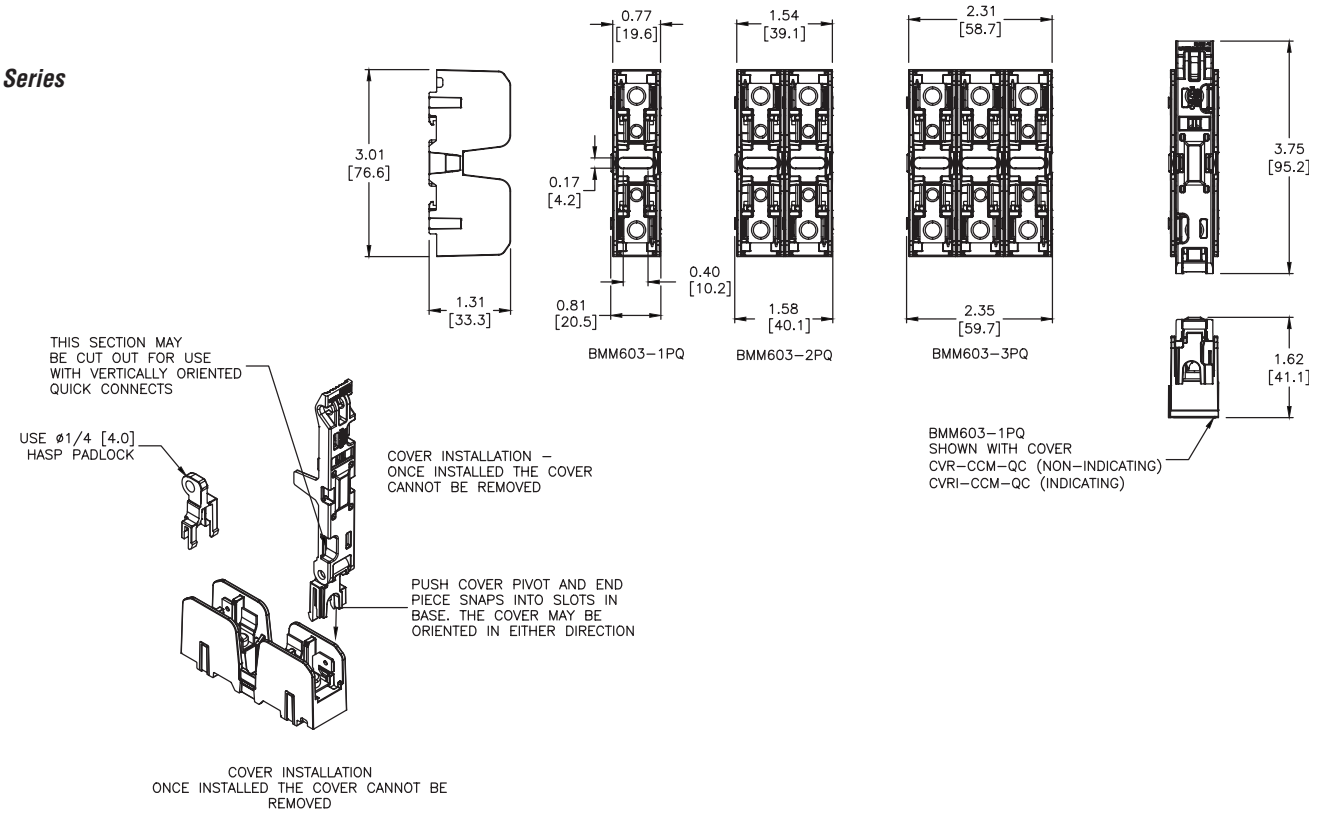
Dimensions

in [mm]

BCM Series



BMM Series



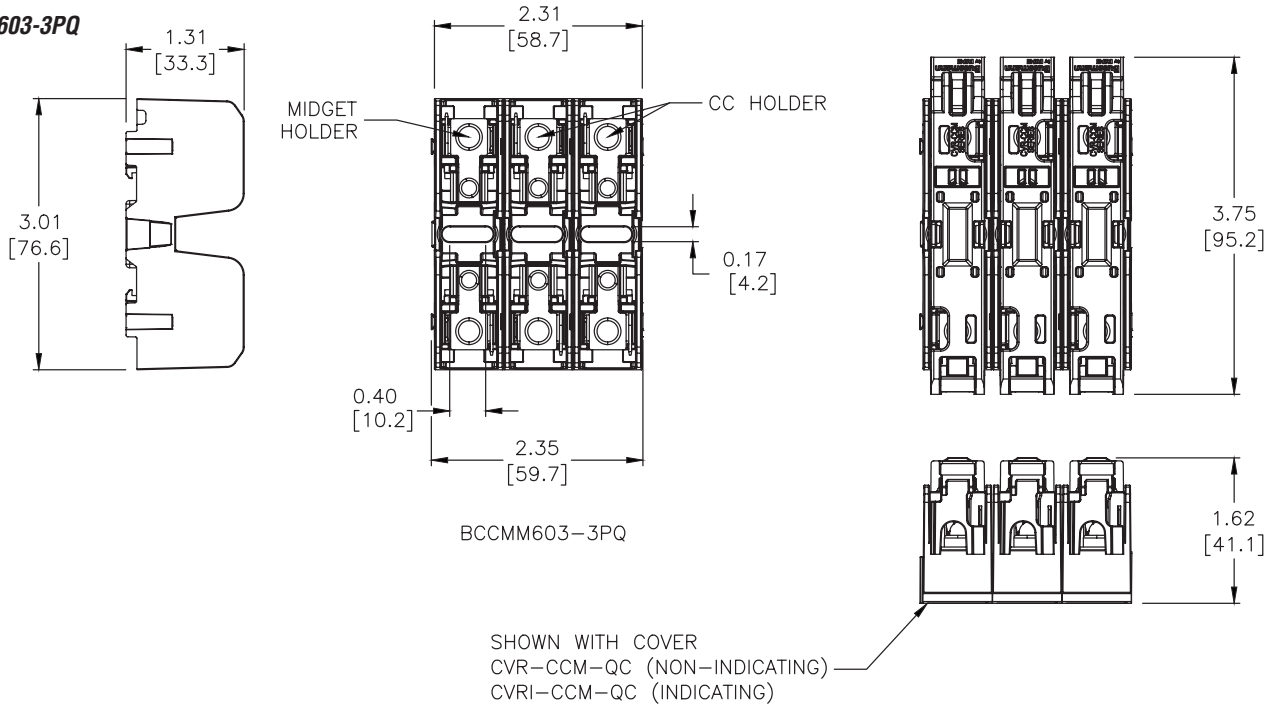
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Modular Ferrule Fuse Blocks for Midget Class and CC Fuses

Dimensions

in [mm]

BCCMM603-3PQ



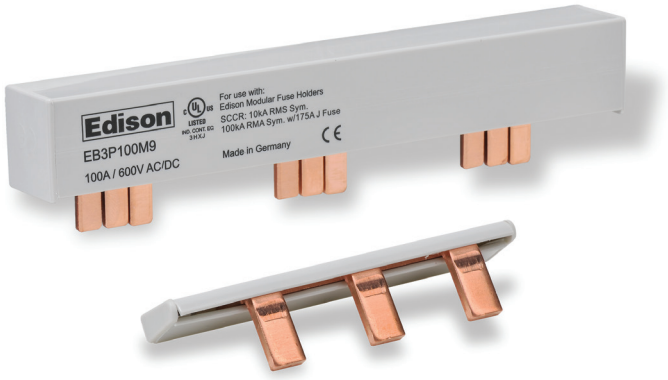
Please see our website www.AutomationDirect.com for complete engineering drawings. Dimensions are approximate. Not for construction purposes.

Edison Comb-Bus Bars

Features

- Easily distribute power in single-phase or three-phase configurations
- Flexible cut-to length solutions without compromising on the product's finger-safe features
- 10kA (default) SCCR
- 100kA SCCR (Short Circuit Current Rating) when protected by a 200A Class J fuse
- Single-phase bus bars rated to 1000VDC/600VAC and 100A configuration
- Three-phase bus bars rated to 600VAC/DC and 100A configuration
- Power feed terminals for single-phase and three-phase service

Note: Not to be used with older style CH series fuse holders.



Agency Approvals/Standards

- UL508, File E195399
- CE
- RoHS
- Reach

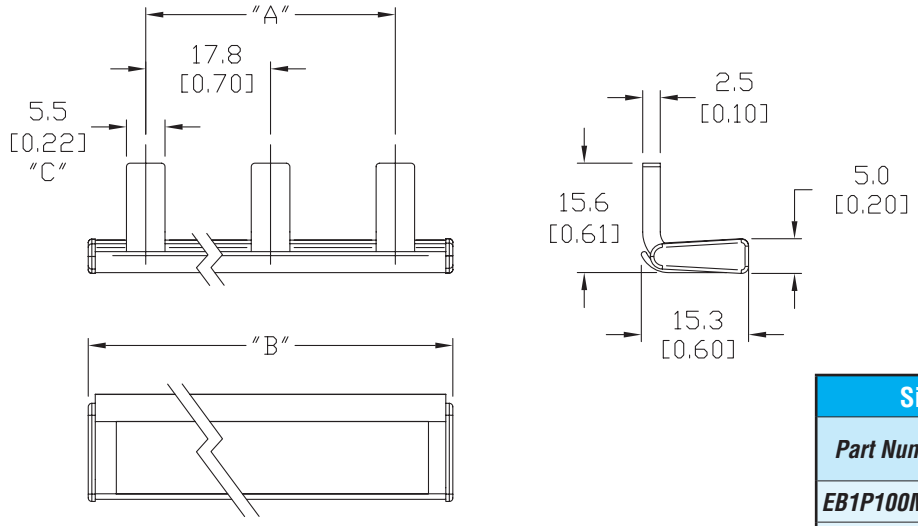
Comb-Bus Bar Selection Table

Part Number	Wiring Configuration	Maximum Voltage	Maximum Current	Endcap	# of Pins/ Connections	Product Weight (lbs.)	Box Qty.	Price
EB1P100M3	Single-phase	600VAC 1000VDC	100A	Ships w/2 Endcaps	3	1.84	1	$8.00
EB1P100M6					6	3.90		$11.50
EB1P100M9					9	5.38		$15.00
EB1P100M12					12	7.94		$18.50
EB1P100M15					15	10.00		$22.00
EB1P100M57				Sold separately (EECAP1P)	57	15.52	1	$67.00
EB3P100M6	Three-phase	600VAC/DC	100A	Ships w/2 Endcaps	6	1.84	1	$26.50
EB3P100M9					9	3.07		$33.50
EB3P100M12					12	4.28		$41.50
EB3P100M15					15	5.54		$55.00
EB3P100M57				Sold separately (EECAPMP)	57	44.67	1	$186.00

Comb-Bus Bars

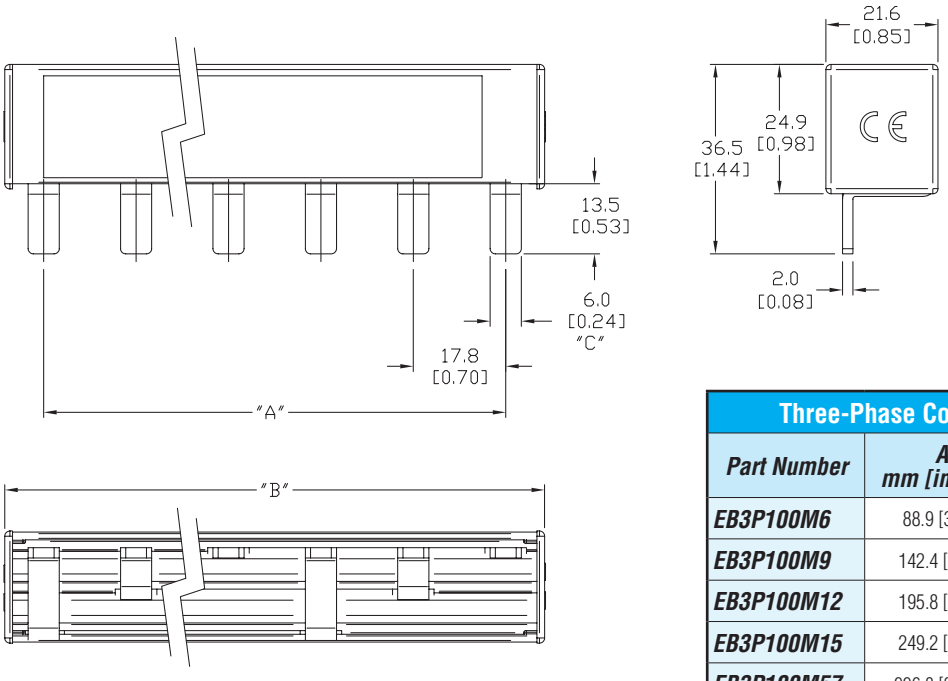
Typical Single-Phase Dimensional Data

mm [inches]



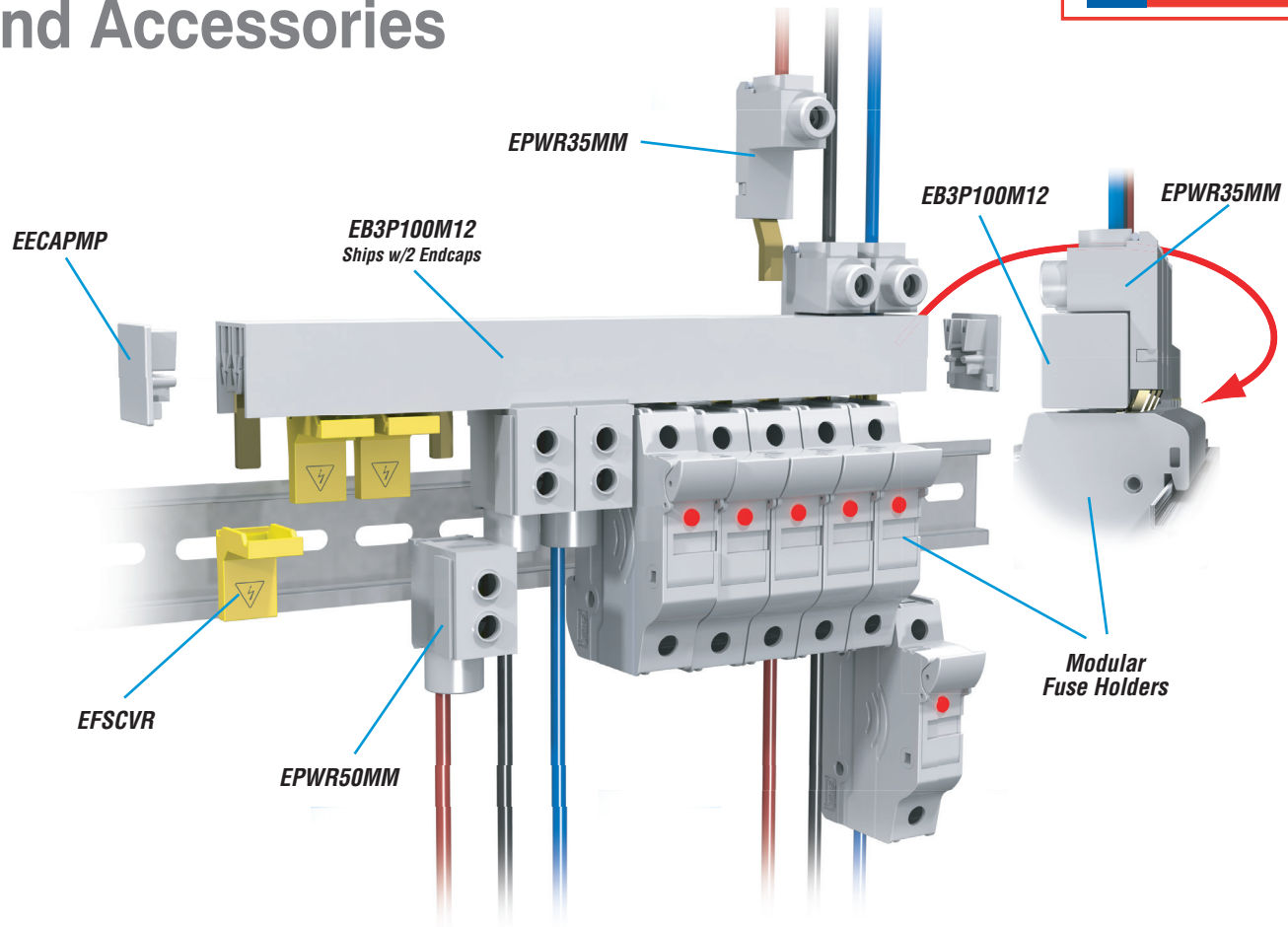
Single-Phase Comb-Bus Bar Dimensions			
Part Number	***A mm [inches]***	***B mm [inches]***	***C # of pins***
EB1P100M3	35.6 [1.40]	60.4 [2.38]	3
EB1P100M6	88.9 [3.50]	113.0 [4.45]	6
EB1P100M9	142.4 [5.61]	157.1 [6.19]	9
EB1P100M12	195.8 [7.71]	211.8 [8.33]	12
EB1P100M15	249.2 [9.81]	271.7 [10.70]	15
EB1P100M57	996.8 [39.24]	1011.2 [39.81]	57

Typical Three-Phase Dimensional Data



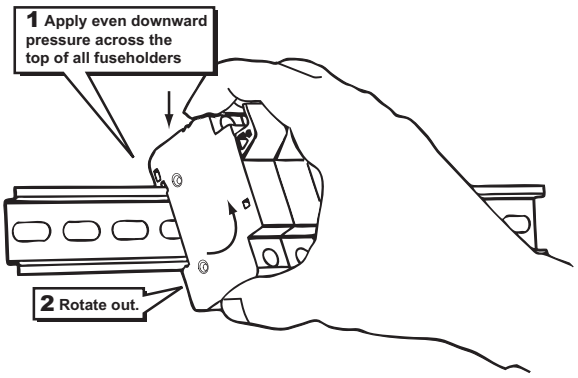
Three-Phase Comb-Bus Bar Dimensions			
Part Number	***A mm [inches]***	***B inches [mm]***	***C # of Pins***
EB3P100M6	88.9 [3.50]	103.7 [4.08]	6
EB3P100M9	142.4 [5.61]	158.4 [6.24]	9
EB3P100M12	195.8 [7.71]	213.3 [8.39]	12
EB3P100M15	249.2 [9.81]	265.0 [10.43]	15
EB3P100M57	996.8 [39.24]	1011.2 [39.81]	57

Comb-Bus Bar Installation and Accessories

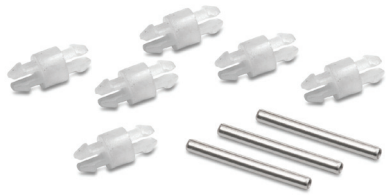


Comb-Bus Bar Accessories				
Part Number	Description	Product Weight (lbs)	Qty. Per Pack	Price
EECAP1P	Single-phase busbar endcap	0.02	50	$47.00
EECAP1P-10			10	$11.50
EECAPMP	Three-phase busbar endcap	0.22	50	$56.00
EECAPMP-10			10	$14.50
EPWR35MM	35mm² feeder terminal for three-phase busbar, wire range: 10-1/0 AWG CU, torque 50 lb-in, (115A, 1000VAC/DC)	0.68	10	$104.00
EPWR35MM-1			1	$13.00
EPWR50MM	50mm² direct feed terminal, wire range: 14-1 AWG CU, torque 35 lb-in, (115A, 1000VAC/DC)	0.61	10	$125.00
EPWR50MM-1			1	$16.00
EFSCVR	Spare contact safety protection covers	0.17	10	$46.00
EFSCVR-2			2	$12.00
EPWR1PLP	Single-phase low-profile feeder terminal, wire range: 10-1/0 AWG CU, torque 50 lb-in, (115A, 1000VAC/DC)	0.51	10	$114.00
EPWR1PLP-1			1	$15.00

DIN Rail Removal



Fuse Holder Accessories			
Part Number	Description	Qty. Per Pack	Price
JV-L(Not Field Installable)	Multi-pole connection kit to connect multiple Class CC and Midget Class fuse holders together.	6 connectors 3 handle pins	$8.25

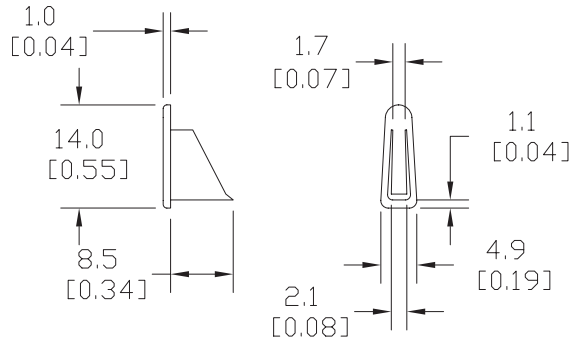


JV-L

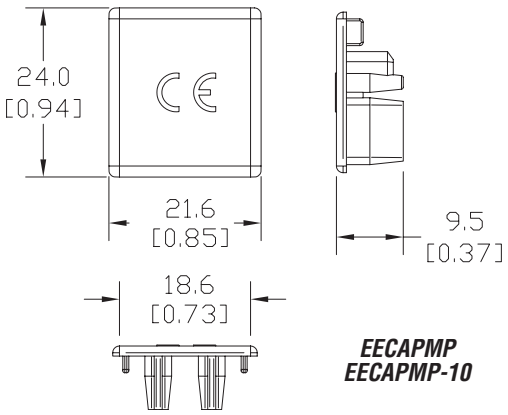
Comb-Bus Accessories

Dimensions

mm [inches]

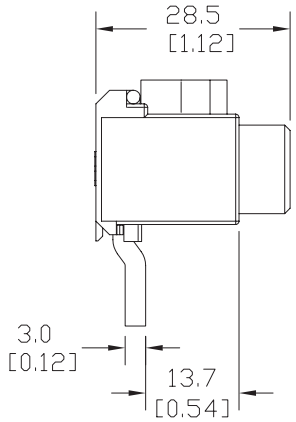


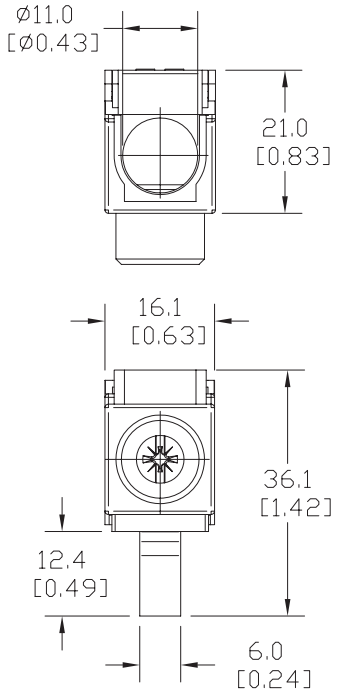
EECAP1P
EECAP1P-10

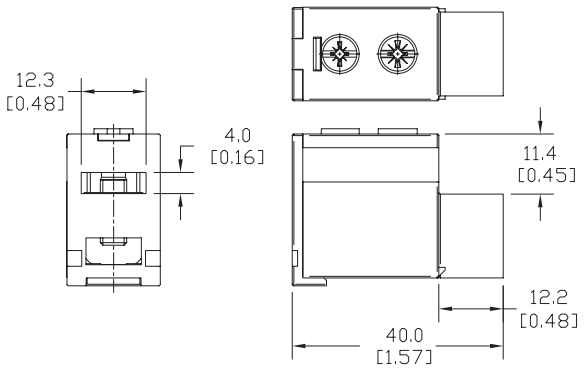


EECAPMP
EECAPMP-10

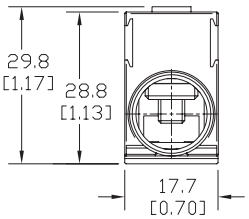
EPWR1PLP
EPWR1PLP-1







EPWR50MM
EPWR50MM-1

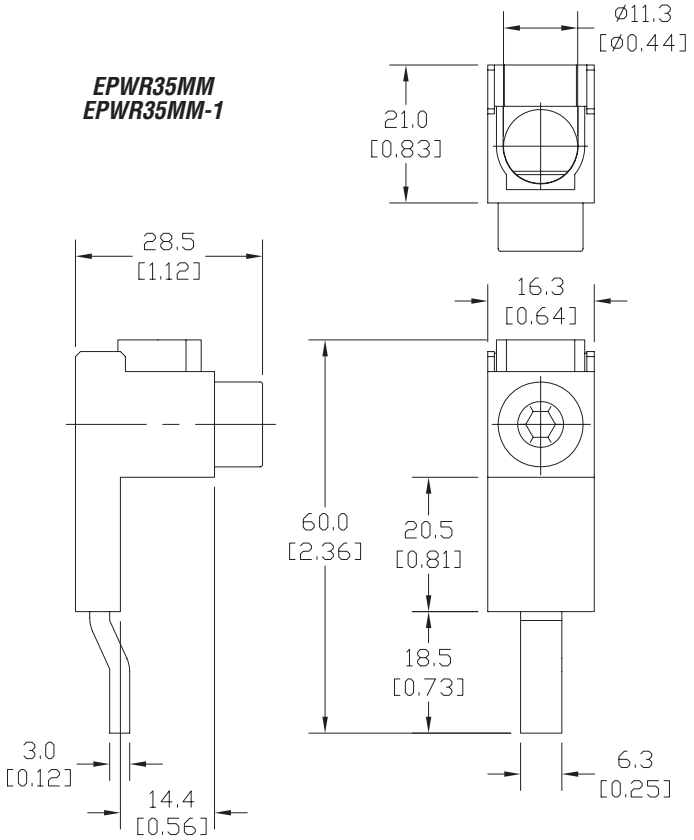


Comb-Bus Accessories

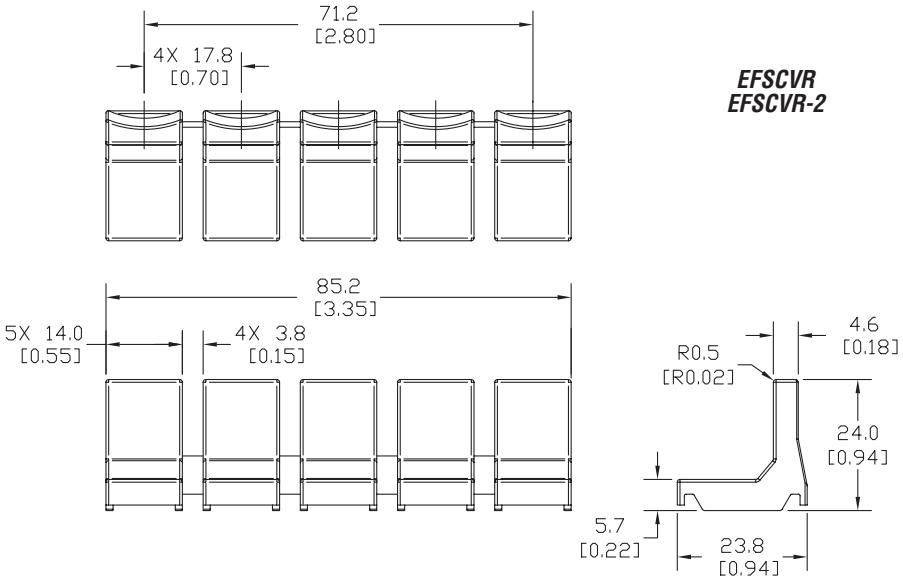
Dimensions

mm [inches]

EPWR35MM
EPWR35MM-1



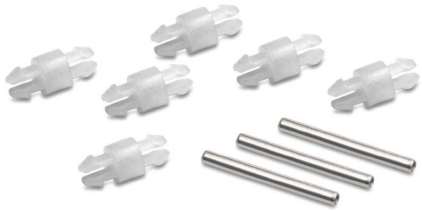
EFSCVR
EFSCVR-2



Accessories

Edison

FP2

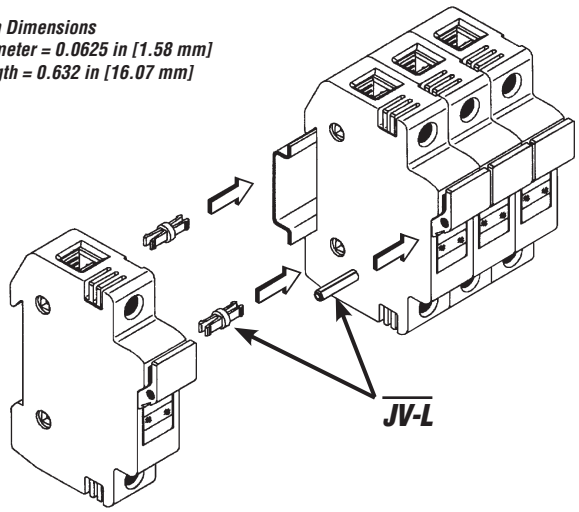


JV-L

Accessories			
Part Number	***Description***	***Pcs/Pkg***	***Price***
FP-2	Fuse puller for fuse dia. 13/32" - 13/16". Fuse type: 0-60A, 250V; 0-30A, 600V	1	$19.50
JV-L* (Not Field Installable)	Multi-pole connection kit to connect new design multiple Class CC and Midget Class fuse holders together. Kit consists of 6 connectors and 3 handle pins to connect up to 4 fuse holders.		$8.25

Note: Will not work with retired design fuse holders shipped before November 1, 2009.
****Roll pin punch or installation tool is required to install handle pins (Tool not sold by Automationdirect.com).***

Handle Pin Dimensions
Diameter = 0.0625 in [1.58 mm]
Length = 0.632 in [16.07 mm]



Cross Reference Guide

CROSS REFERENCE GUIDE By manufacturers type reference or series number. Ampere ratings must be added for ordering purposes.								
FUSE TYPE		**VOLT**	**EDISON**	**BRUSH/ DORMAN**	**BUSSMANN**	**MERSEN / GOULD**	**GEC/CEFCO**	**LITTELFUSE**
UL CLASS CURRENT LIMITING FUSES (CSA CLASS)								
CC (HRCI-CC)	Time-Delay	600	EDCC	–	LP-CC	ATDR	–	CCMR
	Time-Delay	600	HCTR	–	FNQ-R	ATQR	–	KLDR
	Fast-Acting	600	HCLR	HCLR	KTK-R	ATMR	CTK-R	KLKR
RK1	Time-Delay Dual Element	250	LENRK	–	LPN-RK-SP	A2DR	–	LLNRK
		600	LESRK	–	LPS-RK-SP	A6DR	–	LLSRK
RK5	Time-Delay Dual Element	250	ECNR	–	FRN-R	TR	–	FLNR
		600	ECSR	–	FRS-R	TRS	–	FLSR
J	Time-Delay Dual Element	600	JDL	–	LPJ	AJT	–	JTD
	High-Speed AC Drive	600	JHL	–	DFJ	HSJ	–	–
T	Extremely Fast-Acting	300	TJN	–	JJN	A3T	–	JLLN
		600	TJS	–	JJS	A6T	–	JLLS
UL CLASS GENERAL PURPOSE FUSES								
Midget	Fast-Acting	600	MCL	MCL	KTK	ATM	CTK	KLK
		250	MOL	MOL	BAF/BAN	OTM	–	BLF
	Time-Delay	500	MEQ	MEQ	FNQ	ATQ	–	FLQ
		250	MEN	MEN	FNM	TRM	–	FLM
1/4"x 1-1/4" Ceramic	Fast-Acting	250/125	ABC	ABC	ABC	GAB	–	314
1/4"x 1-1/4" Glass		250/32	AGC	AGC	AGC	GGC	–	312
1/4"x 1-1/4" Ceramic	Time-Delay	250	MDA	MDA	MDA	–	–	326
1/4"x 1-1/4" Glass		250/32	MDL	MDL	MDL	GDL	–	313
5x20 mm Glass	Fast-Acting	250/125	GMA	GMA	GMA	GGM	–	235
	Medium Time-Delay	250/125	GMC	GMC	GMC	GSC	–	–
5x20 mm Glass	Fast-Acting	250	S500	BDB	GDB	GSB	–	217
	Time-Delay	250	S506	BDC	GDC	GDG	–	218
Fuse Puller								
Fuse Puller FP-2		–	old - 38072 new - FP-2	–	FP-2	–	–	–

DINnectors Fuse Terminal Blocks

Fuse blocks are available for 1/4", 5mm, Class CC and midget size fuses, either with or without a blown fuse LED. LED fuse blocks are polarity sensitive and are 35mm DIN-rail mountable. The hinge side is positive.

DN-F6 Series: EURO S 10H/35 | DN-F6L Series: EURO S 10H/35 | DN-F10 Series: EURO S 4LH/35 | DN-F10L Series: EURO S 4LH/35

Ordering Information

	Part Number	Pcs/ Pkg	Price	Part Number	Pcs/ Pkg	Price	Part Number	Pcs/ Pkg	Price	Part Number	Pcs/ Pkg	Price
Gray Terminal Block	DN-F6	25	$105.00	–			DN-F10	50	$169.00	–		
	DN-F6MN	7	$23.00				DN-F10MN	10	$26.50			
12-24 VAC/DC*	–			DN-F6L24	10	$60.00	–			DN-F10L24	10	$59.00
110 VAC/DC*				DN-F6L110	10	$60.00				DN-F10L110	10	$59.00
220 VAC/DC*				DN-F6L220	10	$60.00				DN-F10L220	10	$59.00

Technical Specifications

Stripping Length	12mm [0.47 in]			12mm [0.47 in]			10mm [0.39 in]			10mm [0.39 in]		
Tightening Torque	0.8 N-m [10 lb-in]			0.8 N-m [10 lb-in]			0.6 N-m [5.3 lb-in]			0.6 N-m [5.3 lb-in]		
Density	100/m [30 pcs/ft]			100/m [30 pcs/ft]			100/m [30 pcs/ft]			100/m [30 pcs/ft]		
UL Approval**	600V	30A	20-6 AWG	600V	30A	20-6 AWG	300V	15A	24-10 AWG	300V	15A	24-10 AWG
CSA Approval	600V	30A	18-6 AWG	600V	30A	18-6 AWG	300V	8A	18-12 AWG	300V	8A	18-12 AWG
VDE Approval	750V	8A	–	750V	8A	–	500V	8A	4mm²	500V	8A	4mm²
Fuse Size (not supplied)	1 1/4" X 1/4"			1 1/4" X 1/4"			5x20mm-5x25mm			5x20mm-5x25mm		
Indicator Type	Non-Indicating			LED blown fuse indicator			Non-Indicating			LED blown fuse indicator		
Operating Temperature	Ambient air temperature: -20°C to 85°C [-4°F to 185°F] / Relative humidity: 50% max at 40°C [104°F]; 90% max at 20°C [68°F]											
SCCR Rating	10kA per Table SB4.1, 2009, UL 508A, Maximum short circuit current rating for unmarked components											
CE Conformity	CE (EN 60947-1 / 60947-7-3)											
Agency File #	UL E179129 / LR84816											

Note: To obtain the most current agency approval information, see the Agency Approval Checklists section on the specific part number's web page.

Accessories

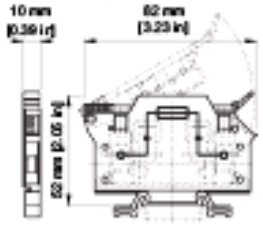
End Covers		Included			Included			Included			Included		
35mm DIN Rail	7.5mm high	DN-R35S1	10	$31.50	DN-R35S1	10	$31.50	DN-R35S1	10	$31.50	DN-R35S1	10	$31.50
		DN-R35S1-2	2	$10.00	DN-R35S1-2	2	$10.00	DN-R35S1-2	2	$10.00	DN-R35S1-2	2	$10.00
	15mm high	DN-R35HS1	10	$56.00	DN-R35HS1	10	$56.00	DN-R35HS1	10	$56.00	DN-R35HS1	10	$56.00
		DN-R35HS1-2	2	$14.50	DN-R35HS1-2	2	$14.50	DN-R35HS1-2	2	$14.50	DN-R35HS1-2	2	$14.50
End Brackets		DN-EB35	50	$45.00	DN-EB35	50	$45.00	DN-EB35	50	$45.00	DN-EB35	50	$45.00
		DN-EB35MN	20	$21.00	DN-EB35MN	20	$21.00	DN-EB35MN	20	$21.00	DN-EB35MN	20	$21.00
		DN-EB35-A	50	$32.00	DN-EB35-A	50	$32.00	DN-EB35-A	50	$32.00	DN-EB35-A	50	$32.00
		DN-EB35-A-10	10	$8.75	DN-EB35-A-10	10	$8.75	DN-EB35-A-10	10	$8.75	DN-EB35-A-10	10	$8.75
		DN-QEB35	50	$28.50	DN-QEB35	50	$28.50	DN-QEB35	50	$28.50	DN-QEB35	50	$28.50
		DN-QEB35-10	10	$8.75	DN-QEB35-10	10	$8.75	DN-QEB35-10	10	$8.75	DN-QEB35-10	10	$8.75
Angled Support Bracket		DN-ASB1	50	$56.00	DN-ASB1	50	$56.00	DN-ASB1	50	$56.00	DN-ASB1	50	$56.00
Marking Tags		DN-L*** or DN-LT****	500/ 100	various	DN-L*** or DN-LT****	500/ 100	various	DN-L*** or DN-LT****	500/ 100	various	DN-L*** or DN-LT****	500/ 100	various

*Working voltage **For copper wire only ***On lever arm ****On terminal body

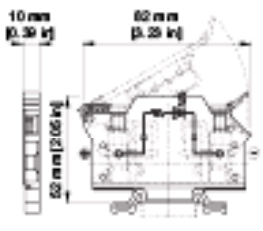
Note: DN-F6 series fuse holders will accommodate the following AutomationDirect fuses: ABC, AGC, MDA and MDL Series.
DN-F10 series fuse holders will accommodate the following AutomationDirect fuses: GMA, GMC, Sz00, and Sz06 Series.

For more information on accessories, see the DINnectors Accessories section of this chapter.

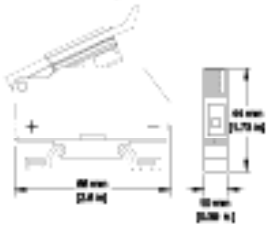
DN-F6 / DN-F6MN



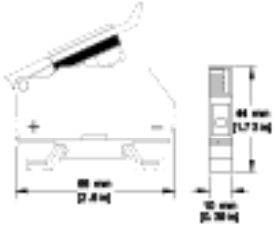
DN-F6L



DN-F10 / DN-F10MN



DN-F10L



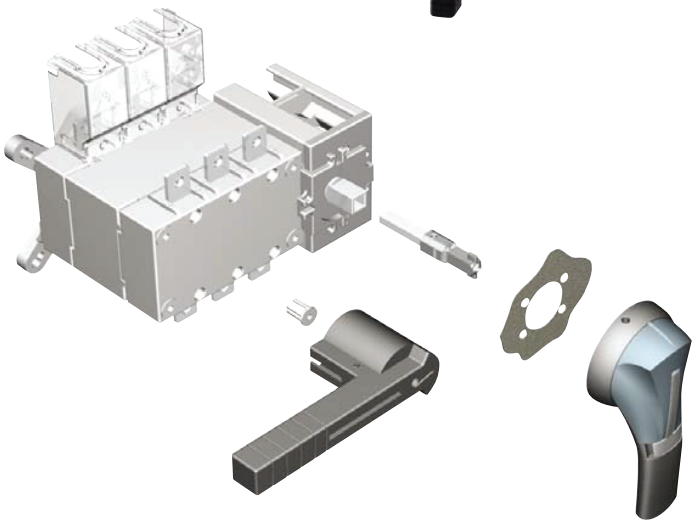
socomec
Innovative Power Solutions

SIRCOVER UL 1008
Manual Transfer Switching Equipment

The solution for manufacturing, power distribution and domestic applications

Functions

The Socomec SIRCOVER family of switches are manual transfer switches rated UL 1008. These switches are extremely durable and are tested and approved for use in the most demanding applications, such as resistive load or total system applications.



Applications

- Normal power supply to generator transfer
- Bypass operations
- Changing motor phase for rotation control or equipment grounding

Advantages

Stable positions

SIRCOVERs have three stable, completely isolated positions that are not affected by voltage drops or mechanical vibrations. This safety feature eliminates the risk of short-circuiting between two unsynchronized power supplies, even during transient events.

Compact design

The SIRCOVER is based on back-to-back switching technology, providing a compact solution.

Reliability

The SIRCOVER has double breaking per pole achieved through its sliding bar contacts system.

The quick opening and rapid closure provides simultaneous disconnecting or making of all power contacts.

Agency approvals: UL file # E173959, CSA 112964, CE 2011/65/EU, 2014/35/EU LVD and 2014/30/EU EMC

Sircover M UL 1008 Manual Transfer Switching Equipment

socomec
Innovative Power Solutions

To assemble a switch, please select:

Direct Operation ***External Operation***

Switch Body + Direct Handle OR Switch Body + Shaft + External Handle

UL 1008 Manual Transfer Switching Equipment				
Part Number	***Poles***	***Amp Rating***	***Max Operation Voltage (AC)***	***Price***
41502012	2	100	240VAC	$313.00
41503012	3		600VAC	$367.00
41504012	4			$468.00
41502026	2	260	240VAC	$604.00
41503026	3		600VAC	$739.00
41504026	4			$982.00
41503042	3	400		$864.00
41504042	4			$1,180.00

41503012

Note: Not to be used as motor disconnect. MTS meets the requirements of NEC section 702.2.

Direct Handle						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA / UL Type***	***Price***
41994012	B type handle for direct operation. Lockable in positions I and II.	100 - 400	Black	B3	–	$29.50

Direct Handle

41994012

External Handles						
Part Number	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA / UL Type***	***Lockable in 3 positions***	***Price***
142D2113	100 - 200	Black / Blue	S2	4, 4X	No	$48.00
142E2113		Red / Yellow				$48.00
142F2113		Black / Blue		1, 3R, 12		$44.50
142G2113		Red / Yellow				$44.50
142D2813		Black / Blue		4, 4X	Yes	$49.50
142E2813		Red / Yellow				$49.50
142F2813		Black / Blue		1, 3R, 12		$44.50
142G2813		Red / Yellow				$44.50
143D3113	260 - 600	Black / Blue	S3	4, 4X	No	$52.00
143E3113		Red / Yellow				$52.00
143F3113		Black / Blue		1, 3R, 12		$53.00
143G3113		Red / Yellow				$53.00
143D3813		Black / Blue		4, 4X	Yes	$52.00
143E3813		Red / Yellow				$52.00
143F3813		Black / Blue		1, 3R, 12		$52.00
143G3813		Red / Yellow				$52.00

S2 Type

142D2113

S3 Type

143D3113

Sircover UL 1008 Manual Transfer Switching Equipment

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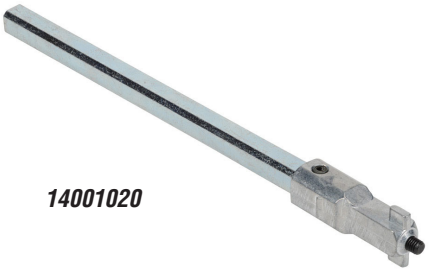
Shafts for External Handles				
Part Number	**Switch Body Rating (A)**	**Handle Type**	**Length (in / mm)**	**Price**
14001020	30-400	S1, S2	7.9 / 200	$9.25
14001032			12.6 / 320	$10.00
14001040			15.7 / 400	$11.50
14011520	600	S3	7.9 / 200	$12.50
14011532			12.6 / 320	$16.50
14011540			15.7 / 400	$18.00

Shaft for External Handle



14001020

Bridging Bars				
Part Number	**Description**	**Switch Body Rating (A)**	**QTY**	**Price**
41592021	Allows creation of a common point, above or below the switch, between positions I and II for line or load side connections.	100 - 200	2 bridging bars	$69.00
41593021			3 bridging bars	$94.00
41594021			4 bridging bars	$118.00
41592041		260 - 400	2 bridging bars	$73.00
41593041			3 bridging bars	$110.00
41594041			4 bridging bars	$160.00

Bridging Bars

41593021

Auxiliary Contacts				
Part Number	**Description**	**Switch Body Rating (A)**	**Contacts**	**Price**
41590021	Auxiliary contact, side mount, 10A @ 125VAC/250VAC. Package of 2.	100 - 400	NO/NC on position I and II	$12.00
41590022	Auxiliary contact, side mount, 1A @ 125VAC, low impedance. Package of 2.	100 - 400	Low level NO/NC on position I and II	$18.00

Auxiliary contacts

41590021

Terminal Protection Screens				
Part Number	**Description**	**Switch Body Rating (A)**	**Number of poles**	**Price**
41583021*	Use for top or bottom protection against direct contact with terminals or connecting parts.	100 - 200	2/3 P	$16.50
41584021*		100 - 200	4 P	$24.50
41583041		260 - 400	2/3 P	$22.50
41584041		260 - 400	4 P	$26.50

* Note: Screen covers line AND load terminals

Terminal Protection Screens

41583021

Terminal Lugs							
Part Number	**Description**	**Switch Body Rating (A)**	**Wires**	**Wires range**	**Lugs per kit**	**Wires per lug**	**Price**
39542020	Kit of terminal lugs for connection of bare copper cables onto the terminals (without lugs).	200	Cu/Al	#6 - 300MCM	2	1	$14.00
39542040		260-400		#4 - 600MCM	2		$44.00
39543020		200		#6 - 300MCM	3		$20.50
39543040		400		#2 - 600MCM	3		$53.00
39544020		200		#6 - 300MCM	4		$27.00
39544040		260-400		#4 - 600MCM	4		$86.00

39542040

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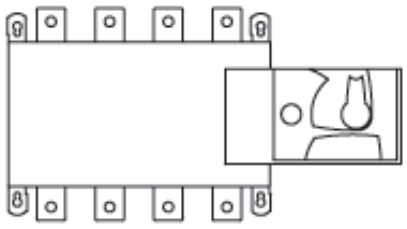
Technical Characteristics

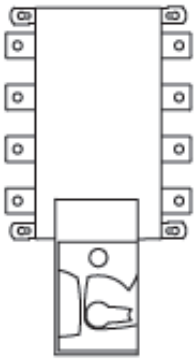
Characteristics According to UL 1008			
	41502012 41503012 41504012	***41502026 41503026 41504026***	***41503042 41504042***
General use rating	100A	260A	400A
Operation voltage 2 P / 3-4 P	240 / 600	240 / 600	240 / 600
Short-circuit rating with any breaker (kA) / Short-circuit capacity (ms)	10 / 25	14 / 50	14 / 50
Short-circuit rating at 600 VAC (kA)	100	65	65
Type of fuse	J	J	J
Max. fuse rating (A)	200	600	600
Short-circuit rating with specific breaker (kA)			
Square D JJ breaker 250 A 2 poles 240 VAC / 3-4 poles 480 VAC	65	-	-
Schneider Electric NSX-F 160 A 3-4 poles 480 VAC	35	-	-
Operational power / current max Operational 1 ph			
240 VAC total system (A)	100	260	400
240 VAC resistive load (A)	100	260	400
Operational power / current max Operational 3 ph			
240 VAC total system (A)	100	260	400
240 VAC resistive load (A)	100	260	400
480 VAC total system (A)	100	260	400
480 VAC resistive load (A)	100	260	400
600 VAC total system (A)	100	200	200
600 VAC resistive load (A)	100	260	400
Mechanical endurance			
Endurance (number of operating cycles)	6050	6050	4050
Connection terminals			
Min. connection section / AWG	#6	#4 / 2x1 / 0	#4 / 2x1 / 0
Max. connection section / AWG	300MCM	600MCM / 2 x 250MCM	600MCM / 2 x 250MCM
Agency approvals			
UL file # E173959, CSA file # 112964, CE 2011/65/EU, 2014/35/EU LVD, and 2014/30/EU EMC			

Mounting orientation (100 to 400 A)

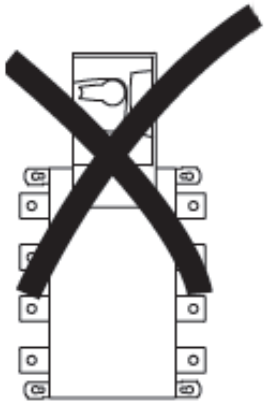
Ensure that the product is installed on a flat rigid surface

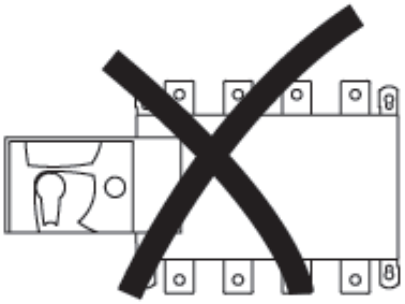


Recommended orientation



OK





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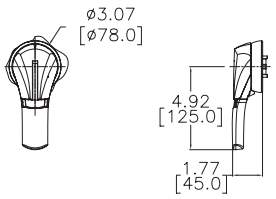
Dimensions

Inches [mm]

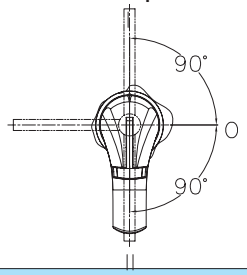
External Handles for UL 1008 Manual Transfer Switches

S2 Handle

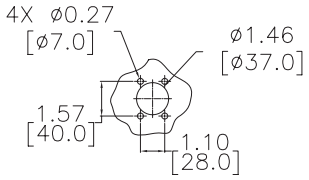
Handle Dimensions



Direction of Operation

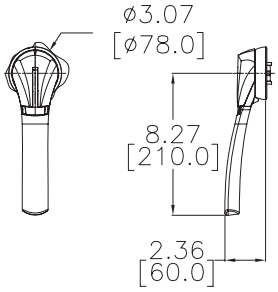


Door Drilling

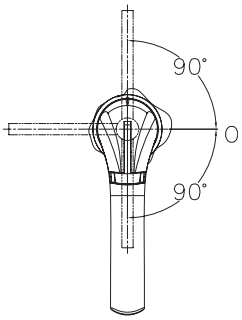


S3 Handle

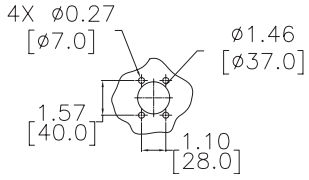
Handle Dimensions



Direction of Operation

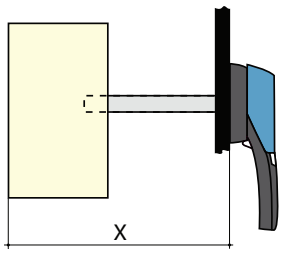


Door Drilling



Shaft Length Minimum Dimensions

Switch Body Rating (A)	Dimension X		Handle Type	Length		Part Number
	in	mm		in	mm	
100 - 200	10-14.3	254-362	S2	7.9	200	14001020
	10-19	254-482		12.6	320	14001032
	10-22.1	254-562		15.7	400	14001040
260-400	20-23.4	508-594	S3	7.9	200	14011520
	20-28.1	508-714		12.6	320	14011532
	20-31.3	508-794		15.7	400	14011540



Please see our website www.AutomationDirect.com for complete engineering drawings.

Sircover M UL 1008 Manual Transfer Switching Equipment

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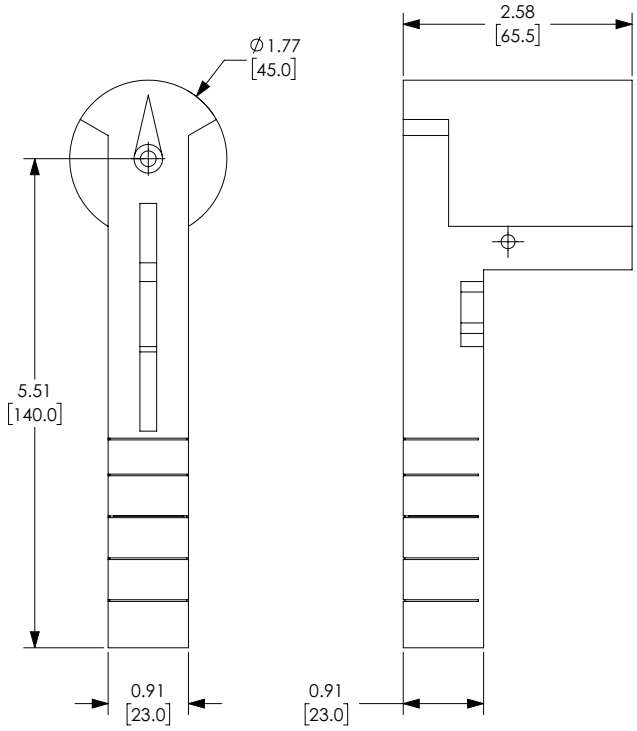
Dimensions

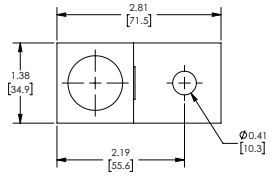
Inches [mm]

Direct Handle

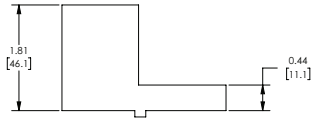
41994012

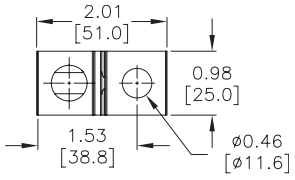


Terminal Lugs

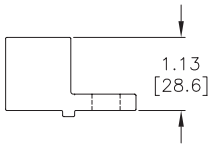


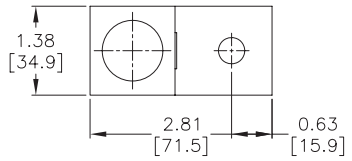
39542040





39542020
39543020
39544020





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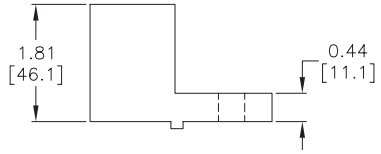
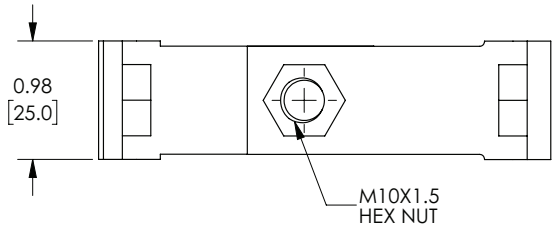
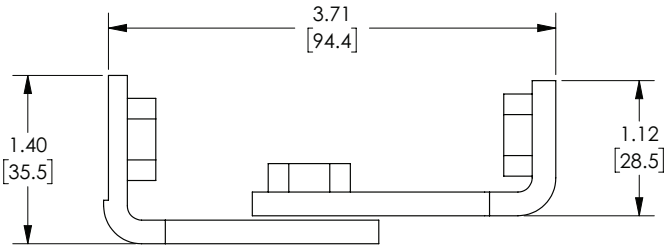


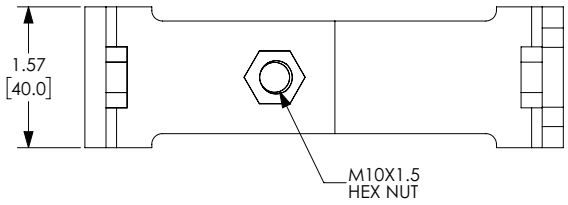
Bridging Bars

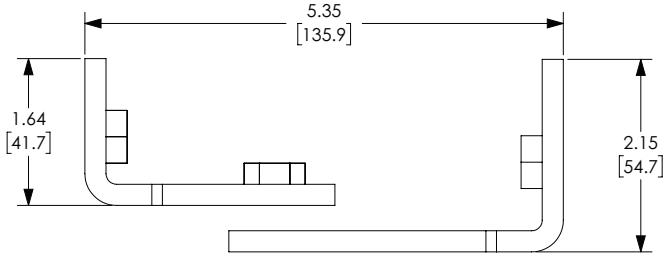
41592021 (100-200 A)





41592041 (260-400 A)





Please see our website www.AutomationDirect.com for complete engineering drawings.

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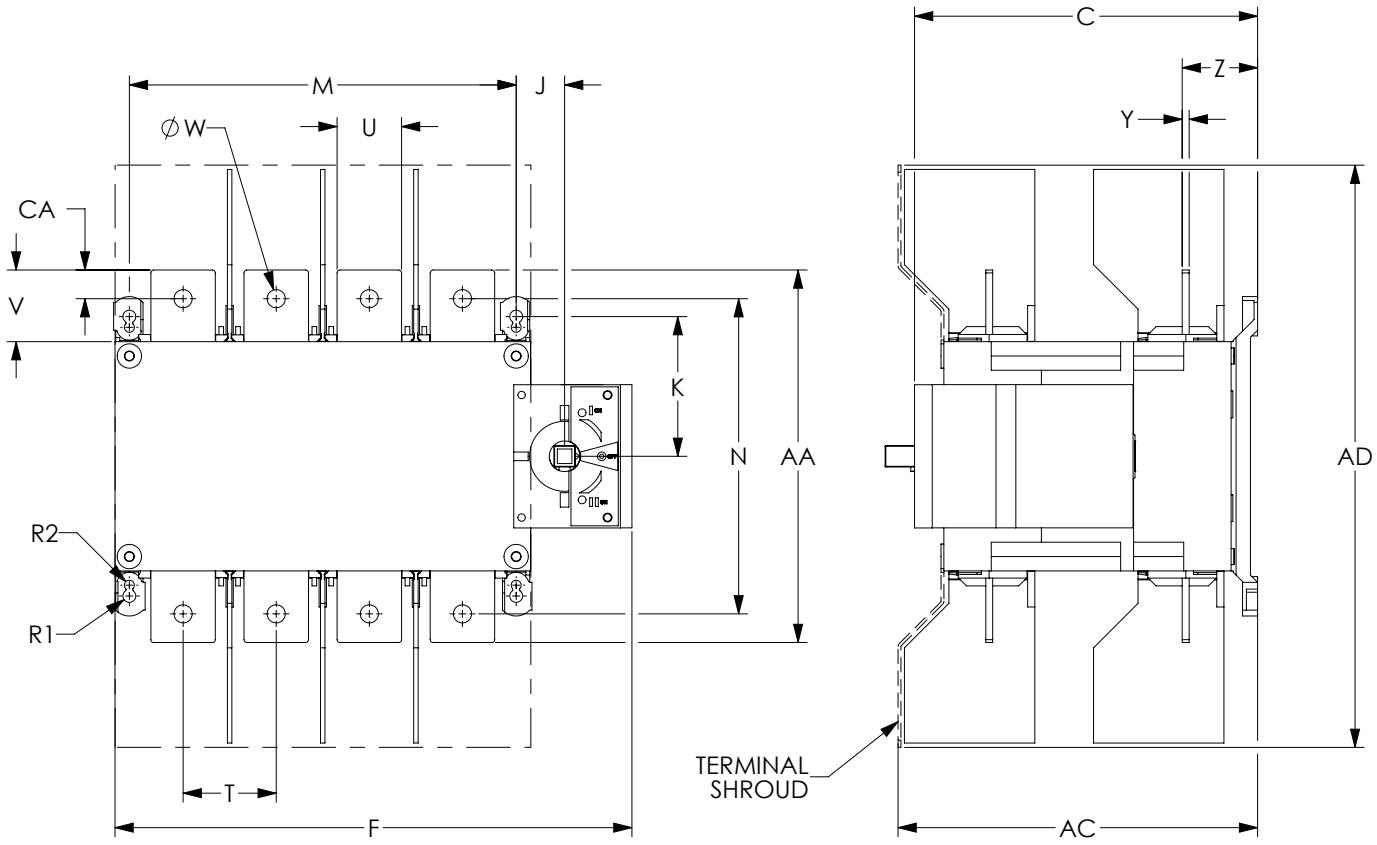
Dimensions (see table at bottom of page)



Dimensions Inches [mm]																							
Part Number	Body Rating	C	AC	AD	F 2p	F 3p	F 4p	J	K	M 2p	M 3p	M 4p	N	R1	R2	T	U	V	W	Y	Z	AA	CA
41502012	100A	6.42 [163]	6.93 [176]	10.43 [265]	9.61 [244]	9.61 [244]	11.57 [294]	1.38 [35]	3.84 [98]	6.30 [160]	6.30 [160]	8.27 [210]	7.68 [195]	0.18 [5]	0.14 [4]	1.97 [50]	0.98 [25]	1.18 [30]	0.43 [11]	0.14 [4]	1.55 [39]	6.30 [160]	0.56 [14]
41503012																							
41504012																							
41502026	260A	9.43 [240]	6.52 [166]	15.98 [406]	11.84 [301]	11.84 [301]	14.19 [360]	1.33 [34]	3.84 [98]	8.27 [210]	8.27 [210]	10.63 [270]	7.68 [195]	0.18 [5]	0.14 [4]	2.56 [65]	1.77 [45]	1.97 [50]	0.50 [13]	0.19 [5]	2.07 [53]	10.24 [260]	0.79 [20]
41503026																							
41504026																							
41503042	400A	9.43 [240]	6.52 [166]	15.98 [406]	–	11.84 [301]	14.19 [360]	1.33 [34]	3.84 [98]	–	8.27 [210]	10.63 [270]	7.68 [195]	0.18 [5]	0.14 [4]	2.56 [65]	1.77 [45]	1.97 [50]	0.50 [13]	0.19 [5]	2.07 [53]	10.24 [260]	0.79 [20]
41504042																							

Please see our website www.AutomationDirect.com for complete engineering drawings.

Gladiator® from AutomationDirect Miniature Circuit Breakers (UL 489)

Single-Pole

Two-Pole

Three-Pole

Overview

Gladiator miniature circuit breakers offer optimum and efficient protection for branch and control circuits up to 63 amps. The Gladiator series is available with B, C or D trip characteristics in accordance with UL 489. The Gladiator series units are DIN rail mountable and can be used in feeder and branch circuit applications.

Listings

- UL Listed under UL 489
  Category DIVQ E503708
  Category DIHS E509077
- CE LVD 2014/35/EU
- IEC/EN 60947-2

Features and Benefits

- Dual rated for AC or DC applications
- Complete range of UL 489 listed DIN rail mounted miniature circuit breakers up to 63 amp current rating
- Single-pole, two-pole and three-pole models
- Suitable for reverse feed applications
- Suitable for branch circuit device protection
- Thermal-magnetic overcurrent protection – three levels of short circuit protection, categorized by B, C and D curves

  B-curve magnetic trip point:
  3 to 5 times the rated current, typically used for resistive loads such as conductors or heaters.

  C-curve magnetic trip point:
  5 to 10 times the rated current, typically used for small transformers, pilot devices, etc.

  D-curve magnetic trip point:
  10 to 20 times the rated current, typically used for transformers or very high inductive loads.
- Trip-free design – breaker cannot be defeated by holding the handle in the “ON” position
- Captive screws cannot be lost
- Can also be used in applications for which UL 1077 or CSA C22.2 No.235 are also allowed
- Field installable shunt trip and auxiliary switches, side mountable
- Module width of only 18mm [0.71 in] (per pole)
- Contact position indicator (red / green)
- 35mm DIN rail mountable, utilizing spring clip

Full Line of Field Installable Accessories

- Auxiliary switch
- Alarm/auxiliary switch
- Shunt trip
- Padlock provision

Applications

Feeder and Branch Circuit Protection

- PLC I/O points
- Motor control circuits
- Control instrumentation
- Power supplies
- Relays
- Convenience receptacle circuits (internal / external)
- Load circuits leaving the equipment (external)
- Computers
- UPS
- HACR Equipment (Heating Air Conditioning, Refrigeration)
- Power conditioners

Gladiator from AutomationDirect Miniature Circuit Breakers

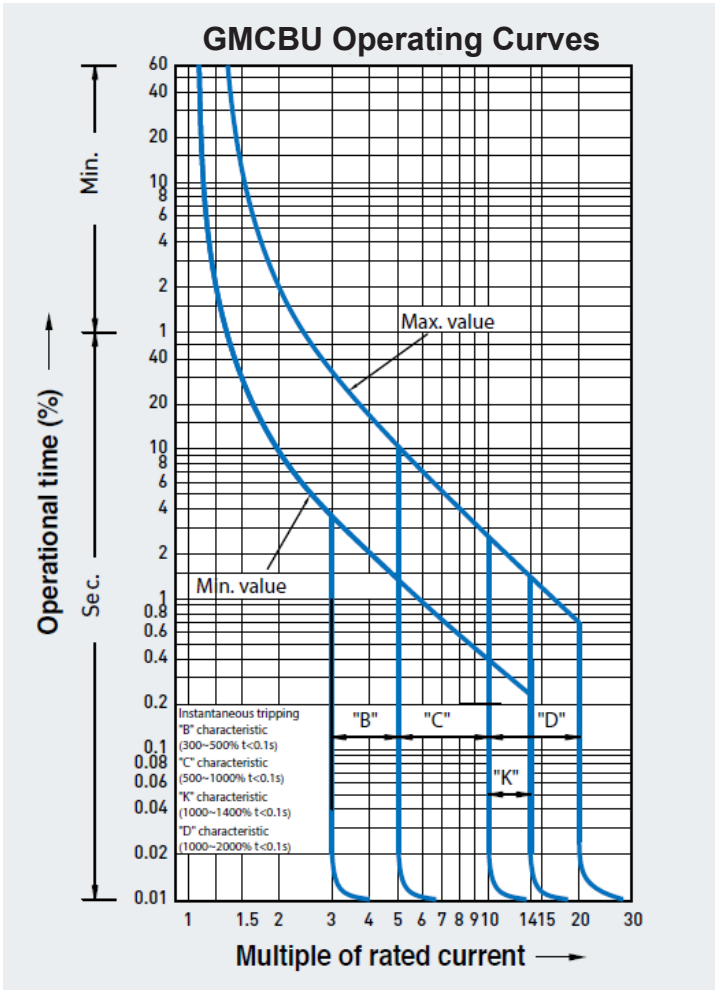
Tripping Characteristics

Gladiator miniature circuit breakers are available with "B" or "C" or "D" tripping characteristics.

Type B trip curve
(3 to 5 times I_n)
B-curve devices are suitable for resistive loads such as conductors or heaters.

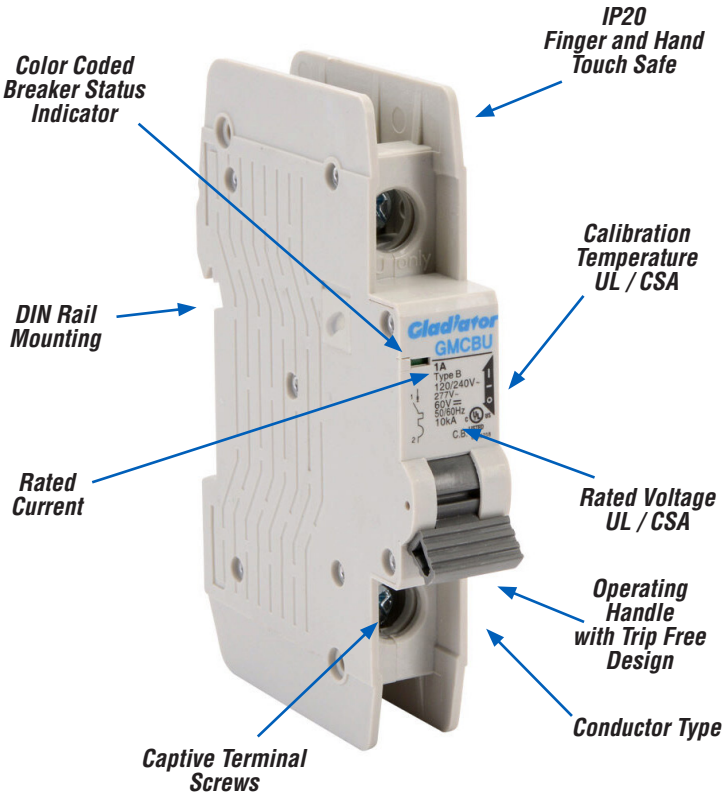
Type C trip curve
(5 to10 times I_n)
C-curve devices are suitable for applications where medium levels of inrush current are expected. Applications include small transformers, lighting, pilot devices, control circuits and coils. C-curve devices provide a medium magnetic trip point.

Type D trip curve
(10 to 20 times I_n)
D-curve devices are suitable for applications where high levels of inrush current are expected. The high magnetic trip point prevents nuisance tripping in high inductive applications such as motors, transformers and power supplies.



Labeling

The front of each Gladiator miniature circuit breaker is labeled for positive identification.



Gladiator from AutomationDirect

Miniature Supplementary Protectors (UL 1077)

Overview

Gladiator supplementary protectors are used to provide overcurrent protection where branch protection (for example, UL 489 MCCB) is already provided or not required. The units can be installed as a component within, or as a part of, an appliance or a piece of electrical equipment. Supplementary protectors are ideal replacements for fuses that are applied as a supplementary protector, i.e. in addition to branch protection (if required). They are 35mm DIN rail mountable, utilizing spring clips. These are standard protectors, recognized by UL and CSA under UL 1077 and CSA 22.2. They are CE marked in accordance with Low Voltage Directive (LVD) (73/23/EEC).

Single-Pole

Two-Pole

Three-Pole

Product Specification

Gladiator Supplementary Protectors are a dual-rated product for both AC and DC supplies, in accordance with UL 1077 and CSA 22.2 standards and is marked with CE in accordance with the Low Voltage Directive. You can include this dual-standard product in your design and know that in most cases wherever your equipment is used, the product will conform to the local UL, CSA or IEC (International) requirements.

The supplementary protector is designed to be applied in conjunction with a branch circuit protector (if branch protection is required) and can be a replacement for similarly applied fuses. Its advantage over fuses is that it is resettable and the device's status is easily and clearly identified by the position of the handle and the flag indicator.

In addition, you can select a device that provides maximum reliability and accuracy to fit various applications due to the availability of a wide range of current ratings from 1 to 63 amperes in three overcurrent characteristic curves, B, C and D.

Features and Benefits

- Dual rated for AC or DC applications
- Box terminals accept #14 to #4 wire
- Thermal magnetic overcurrent protection: three levels, categorized by B, C and D curves in direct relation to continuous rating of the device

  B-curve magnetic trip point:
  3 to 5 times the rated current, typically used for computers and electronic loads with very low inrush currents (PLC wiring).

  C-curve magnetic trip point:
  5 to 10 times the rated current, typically used for small transformers, pilot devices, etc.

  D-curve magnetic trip point:
  10 to 20 times the rated current, typically used for transformers or devices with very high inductive loads.
- Trip Free Design: Protector cannot be defeated by holding the handle in the "ON" position.
- Module width of only 18mm [0.71 in] per pole
- Color coded status indicator window (Red = ON or Green = OFF)
- IP20 finger protection
- 35mm DIN rail mountable, utilizing spring clip
- Captive screws cannot be lost
- Suitable for reverse feed applications

Listings

- UL recognized under UL 1077 Category QVNU2 File E508820
- CE File LVD
- IEC/EN 60947-2

Applications

Gladiator Supplementary Protectors are recognized per UL 1077 as a Supplementary Protector and can be fully utilized per the NEC and CEC Codes in that capacity. For international purposes, the entire Gladiator family is CE marked and in full conformity with the applicable IEC standards for miniature circuit breakers, EN/IEC 60898 and IEC/EN 60947-2.

Outside North America, they can be used in both residential and industrial applications as feeder and branch circuit protective devices. In North America, most European miniature circuit breakers are only UL recognized and CSA certified as "Supplementary Protectors," meaning they cannot be utilized as feeder or branch circuit protective devices per the local electrical codes (2008 NEC 240.10 and CEC Part 1 C22.1). This commonly restricts their use to applications where "closer" protection is desired than that offered by a branch circuit protection device.

Gladiator Supplementary Protectors are ideal for providing protection in many applications, including:

- Control power transformers (D curve)
- Relays
- Contactor coils
- PLC I/O points
- Lighting circuits
- Power supplies
- Computers
- Electronic equipment
- Control circuits

Gladiator® from AutomationDirect Miniature Circuit Breakers (UL 489)

Single-Pole

Gladiator UL 489 Single-Pole 277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
1	GMCBU-1B-1	$13.00	GMCBU-1C-1	$13.00	GMCBU-1D-1	$13.00
2	GMCBU-1B-2	$13.00	GMCBU-1C-2	$13.00	GMCBU-1D-2	$13.00
3	GMCBU-1B-3	$13.00	GMCBU-1C-3	$13.00	GMCBU-1D-3	$13.00
4	GMCBU-1B-4	$13.00	GMCBU-1C-4	$13.00	GMCBU-1D-4	$13.00
5	GMCBU-1B-5	$13.00	GMCBU-1C-5	$13.00	GMCBU-1D-5	$13.00
6	GMCBU-1B-6	$13.00	GMCBU-1C-6	$13.00	GMCBU-1D-6	$13.00
8	GMCBU-1B-8	$13.00	GMCBU-1C-8	$13.00	GMCBU-1D-8	$13.00
10	GMCBU-1B-10	$13.00	GMCBU-1C-10	$13.00	GMCBU-1D-10	$13.00
15	GMCBU-1B-15	$13.00	GMCBU-1C-15	$13.00	GMCBU-1D-15	$13.00
16	GMCBU-1B-16	$13.00	GMCBU-1C-16	$13.00	GMCBU-1D-16	$13.00
20	GMCBU-1B-20	$13.00	GMCBU-1C-20	$13.00	GMCBU-1D-20	$13.00
25	GMCBU-1B-25	$13.00	GMCBU-1C-25	$13.00	GMCBU-1D-25	$13.00
Gladiator UL 489 Single-Pole 120/240 VAC Selection Guide						
30	GMCBU-1B-30	$13.00	GMCBU-1C-30	$13.00	GMCBU-1D-30	$13.00
32	GMCBU-1B-32	$13.00	GMCBU-1C-32	$13.00	GMCBU-1D-32	$13.00
40	GMCBU-1B-40	$13.00	GMCBU-1C-40	$13.00	GMCBU-1D-40	$13.00
50	GMCBU-1B-50	$14.75	GMCBU-1C-50	$14.75	GMCBU-1D-50	$14.75
63	GMCBU-1B-63	$14.75	GMCBU-1C-63	$14.75	GMCBU-1D-63	$14.75

Two-Pole

Gladiator UL 489 Two-Pole 480Y/277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
1	GMCBU-2B-1	$26.00	GMCBU-2C-1	$26.00	GMCBU-2D-1	$26.00
2	GMCBU-2B-2	$26.00	GMCBU-2C-2	$26.00	GMCBU-2D-2	$26.00
3	GMCBU-2B-3	$26.00	GMCBU-2C-3	$26.00	GMCBU-2D-3	$26.00
4	GMCBU-2B-4	$26.00	GMCBU-2C-4	$26.00	GMCBU-2D-4	$26.00
5	GMCBU-2B-5	$26.00	GMCBU-2C-5	$26.00	GMCBU-2D-5	$26.00
6	GMCBU-2B-6	$26.00	GMCBU-2C-6	$26.00	GMCBU-2D-6	$26.00
8	GMCBU-2B-8	$26.00	GMCBU-2C-8	$26.00	GMCBU-2D-8	$26.00
10	GMCBU-2B-10	$26.00	GMCBU-2C-10	$26.00	GMCBU-2D-10	$26.00
15	GMCBU-2B-15	$26.00	GMCBU-2C-15	$26.00	GMCBU-2D-15	$26.00
16	GMCBU-2B-16	$26.00	GMCBU-2C-16	$26.00	GMCBU-2D-16	$26.00
20	GMCBU-2B-20	$26.00	GMCBU-2C-20	$26.00	GMCBU-2D-20	$26.00
25	GMCBU-2B-25	$26.00	GMCBU-2C-25	$26.00	GMCBU-2D-25	$26.00
Gladiator UL 489 Two-Pole 240VAC Selection Guide						
30	GMCBU-2B-30	$26.00	GMCBU-2C-30	$26.00	GMCBU-2D-30	$26.00
32	GMCBU-2B-32	$26.00	GMCBU-2C-32	$26.00	GMCBU-2D-32	$26.00
40	GMCBU-2B-40	$26.00	GMCBU-2C-40	$26.00	GMCBU-2D-40	$26.00
50	GMCBU-2B-50	$30.00	GMCBU-2C-50	$30.00	GMCBU-2D-50	$30.00
63	GMCBU-2B-63	$30.00	GMCBU-2C-63	$30.00	GMCBU-2D-63	$30.00

Gladiator® from AutomationDirect Miniature Circuit Breakers (UL 489)

Three-Pole

Gladiator UL 489 Three-Pole 480Y/277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
1	GMCBU-3B-1	$39.00	GMCBU-3C-1	$39.00	GMCBU-3D-1	$39.00
2	GMCBU-3B-2	$39.00	GMCBU-3C-2	$39.00	GMCBU-3D-2	$39.00
3	GMCBU-3B-3	$39.00	GMCBU-3C-3	$39.00	GMCBU-3D-3	$39.00
4	GMCBU-3B-4	$39.00	GMCBU-3C-4	$39.00	GMCBU-3D-4	$39.00
5	GMCBU-3B-5	$39.00	GMCBU-3C-5	$39.00	GMCBU-3D-5	$39.00
6	GMCBU-3B-6	$39.00	GMCBU-3C-6	$39.00	GMCBU-3D-6	$39.00
8	GMCBU-3B-8	$39.00	GMCBU-3C-8	$39.00	GMCBU-3D-8	$39.00
10	GMCBU-3B-10	$39.00	GMCBU-3C-10	$39.00	GMCBU-3D-10	$39.00
15	GMCBU-3B-15	$39.00	GMCBU-3C-15	$39.00	GMCBU-3D-15	$39.00
16	GMCBU-3B-16	$39.00	GMCBU-3C-16	$39.00	GMCBU-3D-16	$39.00
20	GMCBU-3B-20	$39.00	GMCBU-3C-20	$39.00	GMCBU-3D-20	$39.00
25	GMCBU-3B-25	$39.00	GMCBU-3C-25	$39.00	GMCBU-3D-25	$39.00
Gladiator UL 489 Three-Pole 240VAC Selection Guide						
30	GMCBU-3B-30	$39.00	GMCBU-3C-30	$39.00	GMCBU-3D-30	$39.00
32	GMCBU-3B-32	$39.00	GMCBU-3C-32	$39.00	GMCBU-3D-32	$39.00
40	GMCBU-3B-40	$39.00	GMCBU-3C-40	$39.00	GMCBU-3D-40	$39.00
50	GMCBU-3B-50	$44.75	GMCBU-3C-50	$44.75	GMCBU-3D-50	$44.75
63	GMCBU-3B-63	$44.75	GMCBU-3C-63	$44.75	GMCBU-3D-63	$44.75

Gladiator from AutomationDirect

Miniature Circuit Breakers (UL 489) Technical Specifications

Gladiator Miniature Circuit Breakers – UL 489				
		B-Curve	**C-Curve**	**D-Curve**
Short Circuit Trip Response		3-5 x In	5-10 x In	10-20 x In
Current Rating		1, 2, 3, 4, 5, 6, 8, 10 ,15, 16, 20 ,25, 30, 32, 40, 50, 63A		
Maximum Voltage Ratings UL / CSA	1-63 A, AC	1P: 120/240V 2P:240V 3P: 240V		
	1-25 A, AC	1P: 277V 2P:480Y/277V 3P: 480Y/277V		
	1-63 A, DC	1P: 60V 2P:125V 3P: 125V		
Thermal Tripping Characteristics (Temperature)	Single-pole	104°F [40°C]		
	Multi-pole			
Short Circuit Ratings (@ maximum voltage)	1-pole	***AC:*** *10kA @ 120/240VAC, 10kA @ 277VAC (1~25A),10kA @ 120/240VAC (30~63A)* ***DC:*** *10kA @ 60VDC*		
	2-pole	***AC:*** *10kA @ 240VAC, 480Y/277 VAC(1~25A), 10kA@240VAC (30~63A)* ***DC:*** *10kA @ 125VDC*		
	3-pole			
Rated Frequency		50/60 Hz		
Agency Approvals		UL, CB, ABS		

Notes: Line voltage connection suitable for reverse feed

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Gladiator Miniature Circuit Breaker - IEC				
		B-Curve	**C-Curve**	**D-Curve**
Short Circuit Trip Response		3-5 x In	5-10 x In	10-20 x In
Current Rating		1, 2, 3, 4, 5, 6, 8, 10 ,15, 16, 20 ,25, 30, 32, 40, 50, 63A		
Maximum Voltage Ratings - IEC/EN 60947-2	1-pole	500VAC		
	2-pole / 3-pole			
	2 poles in series			
Thermal Tripping Characteristics (Temperature)	Single-pole	104°F [40°C]		
	Multi-pole			
Interrupt Ratings (At Max Voltage) Uimp		6kV		
Rated Frequency		50/60 Hz		

General Specifications		
Lifespan / Endurance		6,000 operations electrical
Operating Temperature		23°F to 104°F [-5°C to 40°C]
Housing Material		Engineering plastic
Mounting Position		On 35mm DIN rail (vertical)
Weight	1-pole	0.28 lb [130g]
	2-pole	0.58 lb [260g]
	3-pole	0.86 lb [390g]

Wire Size	
Conductor Size Copper Only, 149°F [65°C]	Lug type 14-4 AWG

Tightening Torque	
Tightening Torque	35 lb•in [3.9 N•m]

Gladiator® from AutomationDirect Series Technical Data (UL 489)

Temperature Derating (UL 489)

Temperature Derating for UL 489 – Influence of Ambient Temperature T on Load Carrying Capacity (UL 489)												
Device Current Rating in Amps at 104°F [40°C]	*In (A) at Higher Ambient Temperature*											
	-40°F [-40°C]	-22°F [-30°C]	-4°F [-20°C]	14°F [-10°C]	32°F [0°C]	50°F [10°C]	68°f [20°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
1	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	0.9	0.8	0.8
2	3.0	2.8	2.7	2.6	2.4	2.3	2.2	2.1	2.0	1.8	1.7	1.5
3	4.4	4.2	4.0	3.8	3.6	3.5	3.3	3.2	3.0	2.8	2.5	2.3
4	5.9	5.6	5.4	5.1	4.9	4.6	4.4	4.2	4.0	3.7	3.4	3.1
5	7.4	7.0	6.7	6.4	6.1	5.8	5.5	5.3	5.0	4.6	4.2	3.9
6	8.9	8.4	8.0	7.7	7.3	6.9	6.6	6.3	6.0	5.5	5.0	4.6
8	11.8	11.3	10.7	10.2	9.7	9.3	8.8	8.4	8.0	7.3	6.7	6.2
10	14.8	14.1	13.4	12.8	12.2	11.6	11.0	10.5	10.0	9.2	8.4	7.7
15	22.2	21.1	20.1	19.1	18.2	17.4	16.5	15.8	15.0	13.8	12.6	11.6
16	23.6	22.5	21.4	20.4	19.4	18.5	17.6	16.8	16.0	14.7	13.5	12.3
20	29.5	28.1	26.8	25.5	24.3	23.2	22.1	21.0	20.0	18.3	16.8	15.4
25	36.9	35.2	33.5	31.9	30.4	28.9	27.6	26.3	25.0	22.9	21.0	19.3
30	44.3	42.2	40.2	38.3	36.5	34.7	33.1	31.5	30.0	27.5	25.2	23.1
32	47.3	45.0	42.9	40.8	38.9	37.0	35.3	33.6	32.0	29.3	26.9	24.7
40	59.1	56.3	53.6	51.1	48.6	46.3	44.1	42.0	40.0	36.7	33.6	30.8
50	73.9	70.4	67.0	63.8	60.8	57.9	55.1	52.5	50.0	45.9	42.0	38.6
63	93.1	88.6	84.4	80.4	76.6	72.9	69.5	66.2	63.0	57.8	53.0	48.6

Power Loss at I_n (UL 489)

Power Loss at *In* – *Characteristic B*			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.2	1.5	3.2
2	1.4	3.2	3.5
3	1.2	2.9	3.9
4	1.3	3.1	4.3
5	1.6	3.2	3.5
6	1.3	2.6	3.9
8	1.5	3.1	4.3
10	1.6	3.7	5.3
15	1.9	4.4	5.2
16	1.9	4.3	6.1
20	2.5	5.3	8.6
25	3.2	6.1	9.3
30	3.6	6.5	9.6
32	3.5	7.0	10.5
40	4.2	8.2	12.4
50	5.5	10.2	15.5
63	6.3	12.6	19.1

Power Loss at *In* – *Characteristic C*			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.1	1.8	3.2
2	1.3	2.2	4.2
3	1.1	2.1	3.7
4	1.2	2.8	4.0
5	1.5	3.0	3.7
6	1.2	2.3	3.5
8	1.4	3.1	4.2
10	1.5	2.8	4.3
15	1.8	3.3	4.8
16	1.8	3.6	5.4
20	2.7	4.8	8.2
25	3.1	5.9	9.1
30	3.3	6.4	9.5
32	3.7	7.1	10.7
40	4.0	7.9	12.3
50	4.8	9.7	15.1
63	6.1	12.1	18.5

Power Loss at *In* – *Characteristic D*			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.5	2.1	2.8
2	1.2	2.3	3.3
3	1.3	2.4	3.9
4	1.1	2.3	3.8
5	1.4	2.5	3.8
6	1.4	2.4	3.7
8	1.9	2.9	3.2
10	1.5	2.7	4.2
15	1.6	2.9	4.3
16	1.7	3.1	4.5
20	2.0	3.3	4.9
25	2.7	5.4	7.3
30	3.0	5.9	8.8
32	3.3	5.9	9.8
40	3.7	7.2	10.7
50	4.8	9.2	14.1
63	6.0	11.6	17.9

Gladiator® from AutomationDirect Miniature Circuit Breakers Accessories (UL 489)

Gladiator Miniature Circuit Breakers Accessories										
Part Number	**Price**	**Description**	**For Use With**	**Rating**	**Control Voltage (Ue)**	**Operation Voltage**	**Trip Voltage**	**VA/Watt**	**Operating Time**	**Dimensions in [mm]**
GMCBU-AUX11	$12.00	Auxiliary contact	UL 489 models	6A @ 240VAC 3A @ 415VAC 1A @ 110VDC 2A @ 48VDC	–	–	–	–	–	0.35x4.13x2.60 [9x105x66]
GMCBU-ALM11	$13.00	Alarm contact	UL 489 models							
GMCBU-SH110-380VAC	$19.00	Shunt trip	UL 489 models	–	110-380 VAC 60-220 VDC	80-110% Ue	–	70	300ms	0.71x4.13x2.60 [18x105x66]
GMCBU-UV110-120VAC	$23.00	Undervoltage trip	UL 489 models	–	110-120 VAC 220-240 VAC	–	35-70% Ue	1	2s	0.71x4.13x2.60 [18x105x66]
GMCBU-UV220-240VAC	$23.00	Undervoltage trip	UL 489 models	–				3.5	2s	

GMCBU-AUX11

GMCBU-ALM11

GMCBU-SH110-380VAC

GMCBU-UV110-120VAC
GMCBU-UV220-240VAC

Gladiator Miniature Circuit Breakers Locking Device						
Part Number	**Price**	**Description**	**For use with**	**Lock opening diameter**	**Weight**	**To operate**
GMCBU-LOCK	$5.50	Locking device	UL 489 and UL 1077 models	0.28 in [7.0]	Not less than 4.23 oz [120g	Press button and insert into the handle

Note: Do not overpull by 10kg F.

GMCBU-LOCK

Press button and insert into handle

Gladiator® from AutomationDirect Miniature Circuit Breakers Accessories (UL 489)

Contact Diagrams

GMCBU-AUX11

	OFF	TRIP	ON
MCB			
AUX	■	■	

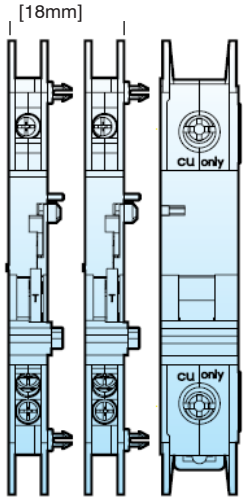
GMCBU-ALM11

	OFF	TRIP	ON
MCB			
ALM	■	■	

Connecting Accessories

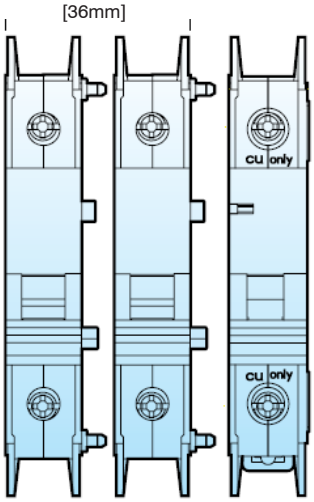
Auxiliary contacts

Up to 0.71 in [18mm]



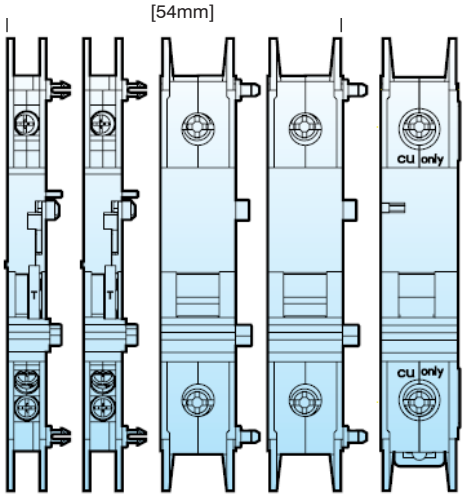
Tripping devices

Up to 1.42 in [36mm]



Both auxiliary contacts and tripping devices

Up to 2.13 in [54mm]



Gladiator® from AutomationDirect

Miniature Supplementary Protectors (UL 1077)

Single-Pole

Two-Pole

Three-Pole

Overview

Gladiator miniature supplemental protectors offer optimum and efficient protection for branch and control circuits up to 63 amps. The Gladiator series is available with B, C or D trip characteristics in accordance with UL 1077. The Gladiator series units are DIN rail mountable and can be used in feeder and branch circuit applications.

Listings

- UL Listed under UL 1077
  Category DIHS E509077
  Category NMTR E503708
- CE LVD 2014/35/EU
- IEC/EN 60947-2

Features and Benefits

- Dual rated for AC or DC applications
- Complete range of UL 1077 listed DIN rail mounted miniature supplemental protectors up to 63 amp current rating
- Single-pole, two-pole and three-pole models
- Suitable for reverse feed applications
- Thermal-magnetic overcurrent protection – three levels of short circuit protection, categorized by B, C and D curves

  B-curve magnetic trip point:
  3 to 5 times the rated current, typically used for resistive loads such as conductors or heaters.

  C-curve magnetic trip point:
  5 to 10 times the rated current, typically used for small transformers, pilot devices, etc.

  D-curve magnetic trip point:
  10 to 20 times the rated current, typically used for transformers or very high inductive loads.
- Trip-free design – breaker cannot be defeated by holding the handle in the “ON” position
- Captive screws cannot be lost
- Can also be used in applications for which UL 1077 or CSA C22.2 No.235 are also allowed
- Field installable shunt trip and auxiliary switches, side mountable
- Module width of only 18mm [0.71 in] (per pole)
- Contact position indicator (red / green)
- 35mm DIN rail mountable, utilizing spring clip

Applications

- Control power transformers (D curve)
- Relays
- Contactor coils
- PLC I/O points
- Lighting circuits
- Power supplies
- Computers
- Electronic equipment
- Control circuits

Gladiator from AutomationDirect

Miniature Supplementary Protectors (UL 1077)

1-, 2- and 3-pole models

Single-Pole

Two-Pole

Three-Pole

Third party certification and marking

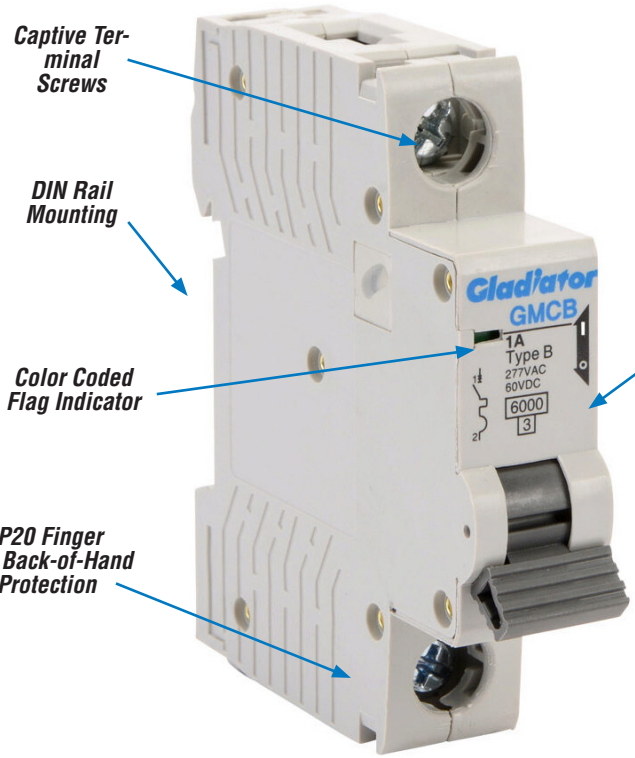
- UL recognized under UL 1077 Category QVNU2, File E508820
- CE File LVD 2014/35/EU
- IEC 60947-2

Full line of field installable accessories

- Auxiliary switch
- Alarm/Auxiliary Switch
- Shunt trip
- Padlock provision

Trip curves

- B [3-5 I_n]
- C [5-10 I_n]
- D [10-20 I_n]



Gladiator Series Supplementary Protectors

Gladiator Series Supplementary Protectors are UL 1077 recognized for applications where branch circuit protection is not required or is already provided. They are thermal magnetic and protect against short circuit (see ratings chart) and overload conditions.

These DIN rail mounted supplementary protectors come in 1-, 2- or 3-pole configurations and are available in three trip curves.

The B-curve magnetic trip point is 3 to 5 times the rated current and is typically used for computers and electronic loads with very low current loads.

The C-curve magnetic trip point is 5 to 10 times the rated current and is typically used for small transformers, pilot devices, etc.

The D-curve magnetic trip point is 10 to 20 times the rated current and is typically used for transformers or with very high inductive loads.

Shunt trips are available for remotely tripping the protector with an external voltage from a control system or alarm device.

A padlocking feature is also available for preventing unauthorized operation. Maintenance personnel can safely work on protected equipment without electrical safety concerns.

Gladiator from AutomationDirect

Miniature Supplementary Protectors (UL 1077)

Single-Pole

Gladiator UL 1077 Single-Pole 277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
1	GMCB-1B-1	$7.00	GMCB-1C-1	$7.00	GMCB-1D-1	$7.00
2	GMCB-1B-2	$7.00	GMCB-1C-2	$7.00	GMCB-1D-2	$7.00
3	GMCB-1B-3	$7.00	GMCB-1C-3	$7.00	GMCB-1D-3	$7.00
4	GMCB-1B-4	$7.00	GMCB-1C-4	$7.00	GMCB-1D-4	$7.00
5	GMCB-1B-5	$7.00	GMCB-1C-5	$7.00	GMCB-1D-5	$7.00
6	GMCB-1B-6	$7.00	GMCB-1C-6	$7.00	GMCB-1D-6	$7.00
8	GMCB-1B-8	$7.00	GMCB-1C-8	$7.00	GMCB-1D-8	$7.00
10	GMCB-1B-10	$7.00	GMCB-1C-10	$7.00	GMCB-1D-10	$7.00
15	GMCB-1B-15	$7.00	GMCB-1C-15	$7.00	GMCB-1D-15	$7.00
16	GMCB-1B-16	$7.00	GMCB-1C-16	$7.00	GMCB-1D-16	$7.00
20	GMCB-1B-20	$7.00	GMCB-1C-20	$7.00	GMCB-1D-20	$7.00
25	GMCB-1B-25	$7.00	GMCB-1C-25	$7.00	GMCB-1D-25	$7.00
30	GMCB-1B-30	$7.00	GMCB-1C-30	$7.00	GMCB-1D-30	$7.00
32	GMCB-1B-32	$7.00	GMCB-1C-32	$7.00	GMCB-1D-32	$7.00
40	GMCB-1B-40	$7.00	GMCB-1C-40	$7.00	GMCB-1D-40	$7.00
50	GMCB-1B-50	$7.25	GMCB-1C-50	$7.25	GMCB-1D-50	$7.25
63	GMCB-1B-63	$7.25	GMCB-1C-63	$7.25	GMCB-1D-63	$7.25

Two-Pole

Gladiator UL 1077 Two-Pole 480Y/277 VAC Selection Guide						
Ampere Rating	B-Curve Part Number	Price	C-Curve Part Number	Price	D-Curve Part Number	Price
1	GMCB-2B-1	$14.00	GMCB-2C-1	$14.00	GMCB-2D-1	$14.00
2	GMCB-2B-2	$14.00	GMCB-2C-2	$14.00	GMCB-2D-2	$14.00
3	GMCB-2B-3	$14.00	GMCB-2C-3	$14.00	GMCB-2D-3	$14.00
4	GMCB-2B-4	$14.00	GMCB-2C-4	$14.00	GMCB-2D-4	$14.00
5	GMCB-2B-5	$14.00	GMCB-2C-5	$14.00	GMCB-2D-5	$14.00
6	GMCB-2B-6	$14.00	GMCB-2C-6	$14.00	GMCB-2D-6	$14.00
8	GMCB-2B-8	$14.00	GMCB-2C-8	$14.00	GMCB-2D-8	$14.00
10	GMCB-2B-10	$14.00	GMCB-2C-10	$14.00	GMCB-2D-10	$14.00
15	GMCB-2B-15	$14.00	GMCB-2C-15	$14.00	GMCB-2D-15	$14.00
16	GMCB-2B-16	$14.00	GMCB-2C-16	$14.00	GMCB-2D-16	$14.00
20	GMCB-2B-20	$14.00	GMCB-2C-20	$14.00	GMCB-2D-20	$14.00
25	GMCB-2B-25	$14.00	GMCB-2C-25	$14.00	GMCB-2D-25	$14.00
30	GMCB-2B-30	$14.00	GMCB-2C-30	$14.00	GMCB-2D-30	$14.00
32	GMCB-2B-32	$14.00	GMCB-2C-32	$14.00	GMCB-2D-32	$14.00
40	GMCB-2B-40	$14.00	GMCB-2C-40	$14.00	GMCB-2D-40	$14.00
50	GMCB-2B-50	$14.25	GMCB-2C-50	$14.25	GMCB-2D-50	$14.25
63	GMCB-2B-63	$14.25	GMCB-2C-63	$14.25	GMCB-2D-63	$14.25

Gladiator from AutomationDirect

Miniature Supplementary Protectors (UL 1077)

Three-Pole

Gladiator UL 1077 Three-Pole 480Y/277 VAC Selection Guide						
Ampere Rating	*B-Curve Part Number*	*Price*	*C-Curve Part Number*	*Price*	*D-Curve Part Number*	*Price*
1	GMCB-3B-1	$21.00	GMCB-3C-1	$21.00	GMCB-3D-1	$21.00
2	GMCB-3B-2	$21.00	GMCB-3C-2	$21.00	GMCB-3D-2	$21.00
3	GMCB-3B-3	$21.00	GMCB-3C-3	$21.00	GMCB-3D-3	$21.00
4	GMCB-3B-4	$21.00	GMCB-3C-4	$21.00	GMCB-3D-4	$21.00
5	GMCB-3B-5	$21.00	GMCB-3C-5	$21.00	GMCB-3D-5	$21.00
6	GMCB-3B-6	$21.00	GMCB-3C-6	$21.00	GMCB-3D-6	$21.00
8	GMCB-3B-8	$21.00	GMCB-3C-8	$21.00	GMCB-3D-8	$21.00
10	GMCB-3B-10	$21.00	GMCB-3C-10	$21.00	GMCB-3D-10	$21.00
15	GMCB-3B-15	$21.00	GMCB-3C-15	$21.00	GMCB-3D-15	$21.00
16	GMCB-3B-16	$21.00	GMCB-3C-16	$21.00	GMCB-3D-16	$21.00
20	GMCB-3B-20	$21.00	GMCB-3C-20	$21.00	GMCB-3D-20	$21.00
25	GMCB-3B-25	$21.00	GMCB-3C-25	$21.00	GMCB-3D-25	$21.00
30	GMCB-3B-30	$21.00	GMCB-3C-30	$21.00	GMCB-3D-30	$21.00
32	GMCB-3B-32	$21.00	GMCB-3C-32	$21.00	GMCB-3D-32	$21.00
40	GMCB-3B-40	$21.00	GMCB-3C-40	$21.00	GMCB-3D-40	$21.00
50	GMCB-3B-50	$21.25	GMCB-3C-50	$21.25	GMCB-3D-50	$21.25
63	GMCB-3B-63	$21.25	GMCB-3C-63	$21.25	GMCB-3D-63	$21.25

Gladiator® from AutomationDirect

Miniature Supplementary Protectors Technical Specifications (UL 1077)

Gladiator Miniature Supplementary Protectors – UL 1077				
		B-Curve	***C-Curve***	***D-Curve***
Short Circuit Trip Response		3-5 x In	5-10 x In	10-20 x In
Current Rating		1, 2, 3, 4, 5, 6, 8, 10 ,15, 16, 20 ,25, 30, 32, 40, 50, 63A		
Maximum Voltage Ratings UL / CSA	1-63 A, AC	1P: 120/240V 2P:240V 3P: 240V		
	1-63 A, AC	1P: 277V 2P:480Y/277V 3P: 480Y/277V		
	1-63 A, DC	1P: 60V 2P:125V 3P: 125V		
Thermal Tripping Characteristics (Temperature)	Single-pole	104°F [40°C]		
	Multi-pole			
Short Circuit Ratings (@ maximum voltage)	1-pole	***AC:*** *10kA @ 120/240 VAC, 6kA @ 277VAC* ***DC:*** *10kA @ 60VDC*		
	2-pole	***AC:*** *10kA @ 120/240 VAC, 6kA @ 480Y/277VAC* ***DC:*** *10kA @ 125VDC*		
	3-pole			
Rated Frequency		50/60 Hz		
Agency Approvals		UL, CB, ABS		

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Gladiator Miniature Supplementary Protectors - IEC				
		B-Curve	***C-Curve***	***D-Curve***
Short Circuit Trip Response		3-5 x In	5-10 x In	10-20 x In
Current Rating		1, 2, 3, 4, 5, 6, 8, 10 ,15, 16, 20 ,25, 30, 32, 40, 50, 63A		
Maximum Voltage Ratings - IEC 60898-1	1-pole	240/415 VAC		
	2-pole / 3-pole	415VAC		
	2 poles in series			
Thermal Tripping Characteristics (Temperature)	Single-pole	104°F [40°C]		
	Multi-pole			
Interrupt Ratings (At Max Voltage)		6kV		
Rated Frequency		50/60 Hz		

General Specifications		
Lifespan / Endurance		6,000 operations electrical
Operating Temperature		23°F to 104°F [-5°C to 40°C]
Housing Material		Engineering plastic
Mounting Position		On 35mm DIN rail (vertical)
Weight	1 pole	0.26 lb [120g]
	2 pole	0.53 lb [240g]
	3 pole	0.79 lb [360g]

Wire Size	
Conductor Size Copper Only, 149°F [65°C]	Lug type 14-4 AWG

Tightening Torque	
Tightening Torque	17.5 lb•in [2 N•m]

Gladiator® from AutomationDirect Series Technical Data (UL 1077)

Temperature Derating (UL 1077)

Temperature Derating for UL 1077 – Influence of Ambient Temperature T on Load Carrying Capacity (UL 1077)													
Device Current Rating in Amps at 77°F [25°C]	*In (A) at Higher Ambient Temperature*												
	-40°F [-40°C]	-22°F [-30°C]	-4°F [-20°C]	14°F [-10°C]	32°F [0°C]	50°F [10°C]	68°F [20°C]	77°F [25°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
1	1.4	1.3	1.2	1.2	1.1	1.1	1.0	1.0	1.0	0.9	0.8	0.7	0.7
2	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.6	1.5	1.4
3	4.1	3.9	3.7	3.6	3.4	3.2	3.1	3.0	2.9	2.6	2.4	2.2	2.0
4	5.5	5.2	5.0	4.7	4.5	4.3	4.1	4.0	3.8	3.5	3.2	3.0	2.7
5	6.9	6.5	6.2	5.9	5.7	5.4	5.1	5.0	4.8	4.4	4.0	3.7	3.4
6	8.2	7.8	7.5	7.1	6.8	6.5	6.2	6.0	5.8	5.3	4.8	4.4	4.1
8	11.0	10.5	10.0	9.5	9.0	8.6	8.2	8.0	7.7	7.0	6.5	5.9	5.4
10	13.7	13.1	12.5	11.9	11.3	10.8	10.3	10.0	9.6	8.8	8.1	7.4	6.8
15	20.6	19.6	18.7	17.8	17.0	16.1	15.4	15.0	14.4	13.2	12.1	11.1	10.2
16	22.0	20.9	19.9	19.0	18.1	17.2	16.4	16.0	15.4	14.1	12.9	11.8	10.9
20	27.5	26.2	24.9	23.7	22.6	21.5	20.5	20.0	19.2	17.6	16.1	14.8	13.6
25	34.3	32.7	31.1	29.7	28.3	26.9	25.6	25.0	24.0	22.0	20.2	18.5	17.0
30	41.2	39.2	37.4	35.6	33.9	32.3	30.8	30.0	28.8	26.4	24.2	22.2	20.4
32	44.0	41.9	39.9	38.0	36.2	34.4	32.8	32.0	30.7	28.2	25.8	23.7	21.7
40	54.9	52.3	49.8	47.5	45.2	43.1	41.0	40.0	38.4	35.2	32.3	29.6	27.2
50	68.7	65.4	62.3	59.3	56.5	53.8	51.3	50.0	48.0	44.0	40.4	37.0	33.9
63	86.5	82.4	78.5	74.8	71.2	67.8	64.6	63.0	60.5	55.5	50.9	46.6	42.8

Power Loss at I_n (UL 1077)

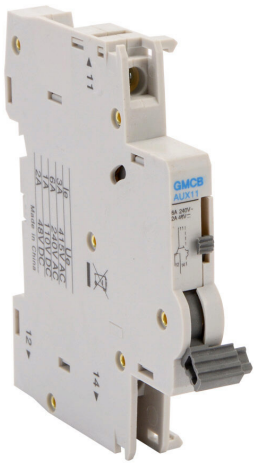
Power Loss at *In* – *Characteristic B*			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.6	2.2	4.2
2	1.5	2.9	4.4
3	1.3	2.7	4.2
4	1.3	2.9	4.6
5	1.5	3.5	4.3
6	1.9	2.9	4.3
8	1.5	3.1	4.5
10	1.7	3.5	5.5
15	1.9	3.5	6.2
16	2.1	3.4	6.3
20	3.1	4.3	8.6
25	3.1	5.6	10.1
30	3.3	6.6	10.2
32	3.4	6.8	11.5
40	4.2	8.6	13.2
50	5.3	11.1	15.5
63	6.2	12.9	19.6

Power Loss at *In* – *Characteristic C*			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.3	2.1	4.1
2	1.4	2.3	4.3
3	1.2	2.4	4.5
4	1.3	2.7	4.1
5	1.5	3.3	4.2
6	1.3	2.8	3.9
8	1.6	3.0	4.3
10	1.4	3.1	4.9
15	1.6	3.6	5.2
16	1.7	3.3	5.7
20	2.8	4.7	7.9
25	2.9	5.5	9.8
30	3.4	6.7	9.9
32	3.5	7.2	11.2
40	4.1	8.5	13.3
50	5.2	10.8	15.4
63	6.3	13.1	19.2

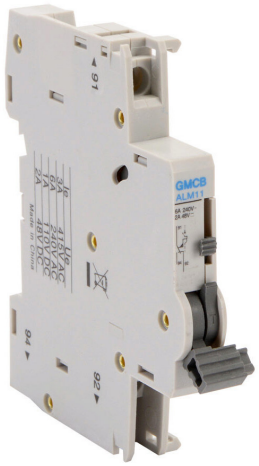
Power Loss at *In* – *Characteristic D*			
I_n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.3	2.5	2.9
2	1.5	2.4	3.1
3	1.3	2.1	3.5
4	1.4	2.4	3.9
5	1.4	2.8	3.7
6	1.4	2.4	3.8
8	1.2	2.7	3.8
10	1.5	2.8	4.1
15	1.4	2.7	4.2
16	1.5	3.1	4.5
20	2.1	3.5	4.7
25	2.4	5.2	7.1
30	2.8	5.6	8.5
32	3.1	5.9	9.5
40	4.1	7.9	11.5
50	5.0	9.8	14.7
63	6.1	12.3	18.5

Gladiator from AutomationDirect Miniature Supplementary Protectors Accessories (UL 1077)

Gladiator Miniature Supplementary Protectors Accessories										
Part Number	**Price**	**Description**	**For Use With**	**Rating**	**Control Voltage (Ue)**	**Operation Voltage**	**Trip Voltage**	**VA/Watt**	**Operating Time**	**Dimensions in [mm]**
GMCB-AUX11	$11.00	Auxiliary contact	UL 1077 models	6A @ 240VAC 3A @ 415VAC 1A @ 110VDC 2A @ 48VDC	–	–	–	–	–	0.35x3.19x2.60 [9x81x66]
GMCB-ALM11	$12.00	Alarm contact	UL 1077 models							
GMCB-SH110-380VAC	$17.00	Shunt trip	UL 1077 models	–	110-380 VAC 60-220 VDC	80-110% Ue	–	70	300ms	0.71x3.19x2.60 [18x81x66]



GMCB-AUX11



GMCB-ALM11

GMCB-SH110-380VAC

Gladiator Miniature Circuit Breakers Locking Device						
Part Number	**Price**	**Description**	**For use with**	**Lock opening diameter**	**Weight**	**To operate**
GMCBU-LOCK	$5.50	Locking device	UL 489 and UL 1077 models	0.28 in [7.0]	Not less than 4.23 oz [120g	Press button and insert into the handle

Note: Do not overpull by 10kg F.

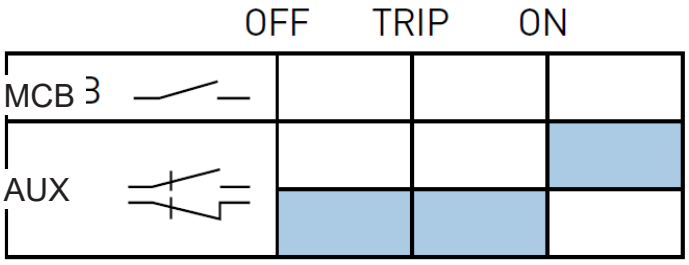
GMCBU-LOCK

Press button and insert into handle

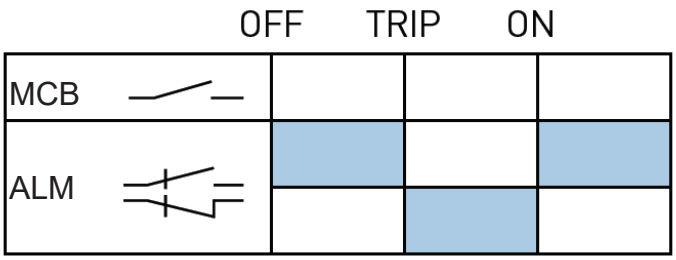
Gladiator® from AutomationDirect Miniature Supplementary Protectors Accessories (UL 1077)

Contact Diagrams

GMCB-AUX11



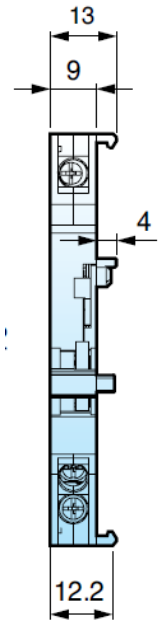
GMCB-ALM11



Connecting Accessories

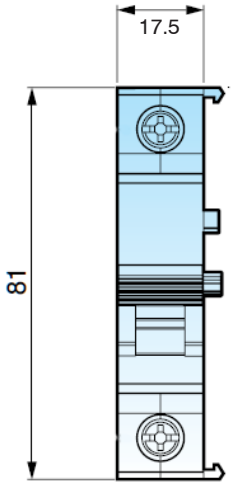
Auxiliary contacts

Up to 0.71 in
[18mm]



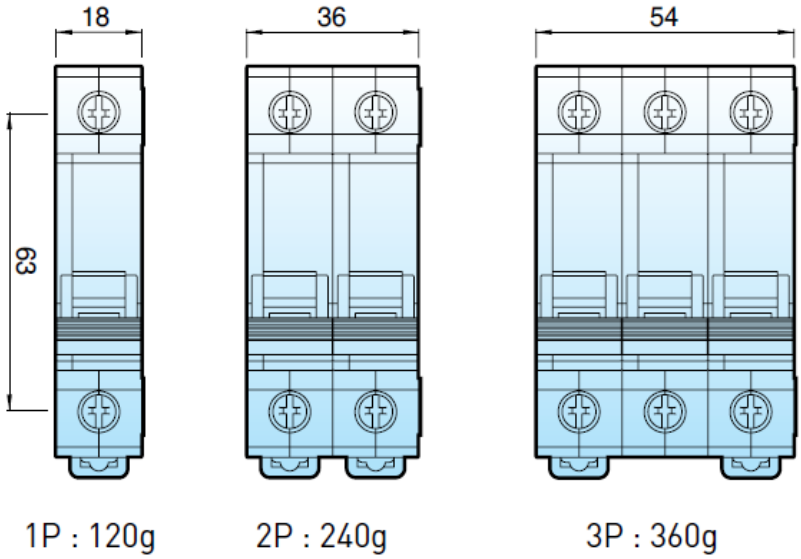
Tripping devices

Up to 1.42 in
[36mm]



Both auxiliary contacts and tripping devices

Up to 2.13 in
[54mm]

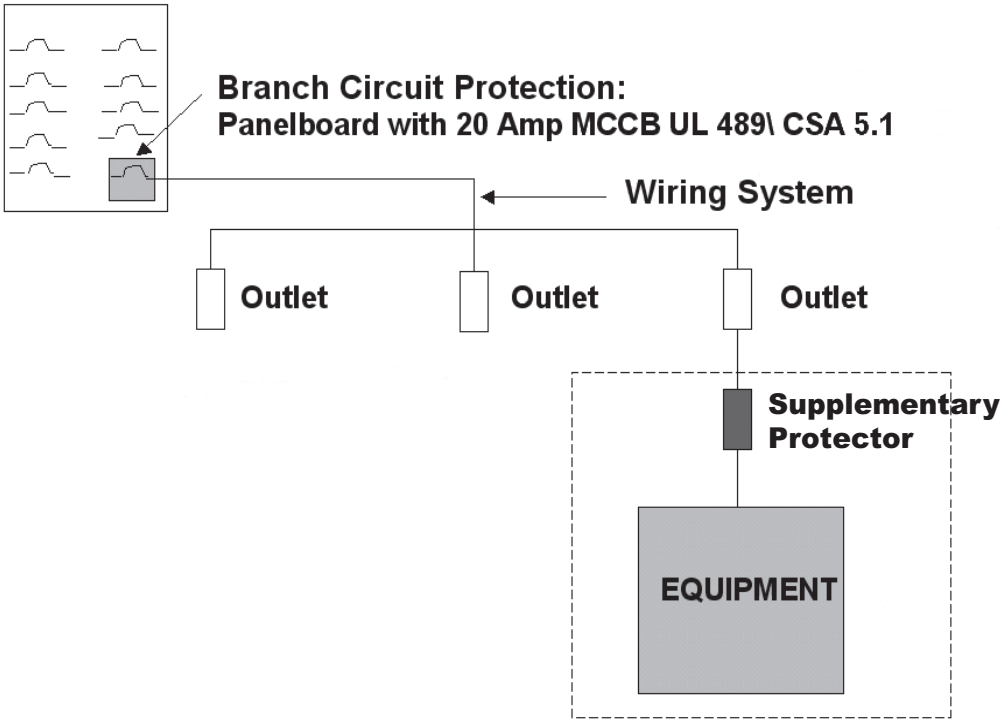


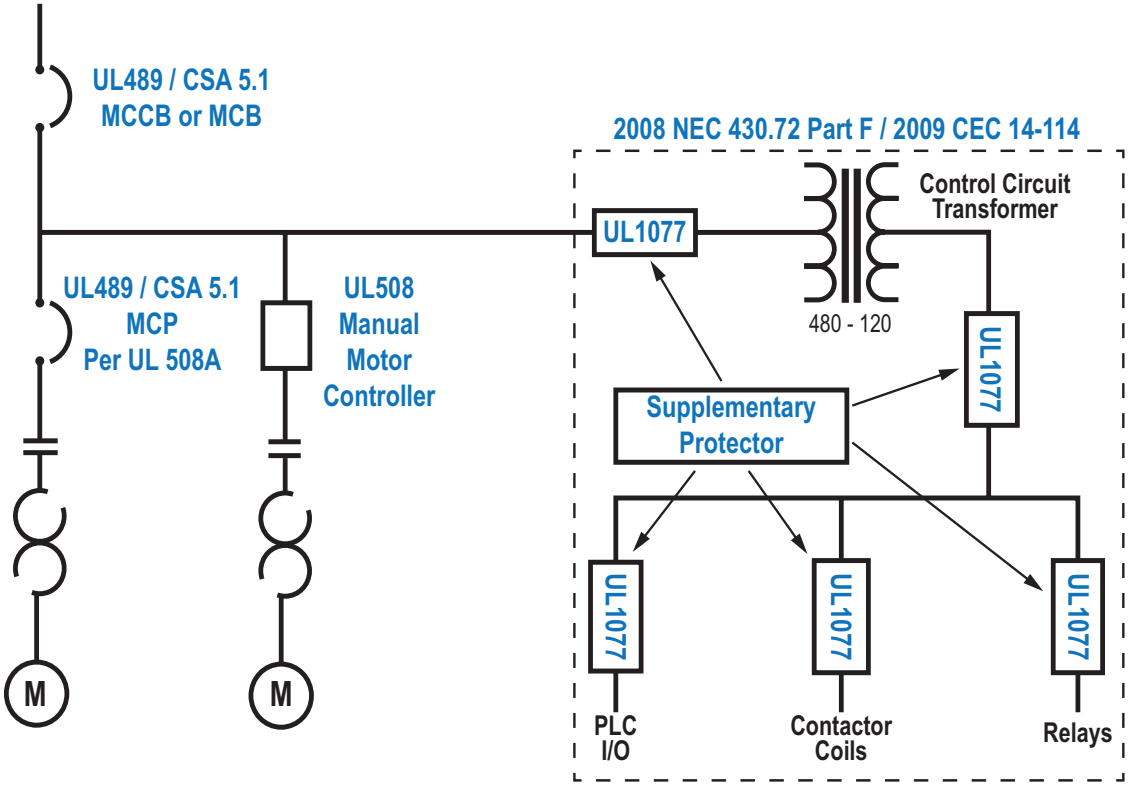
1P : 120g

2P : 240g

3P : 360g

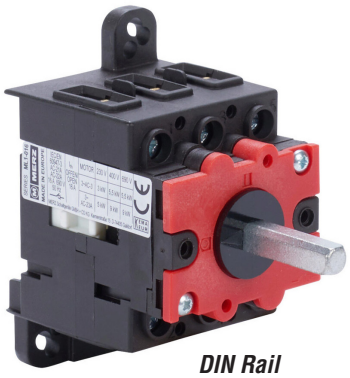
Supplementary Protectors Sample Applications





Supplementary protectors are not to be used in feeder circuits or motor circuits. Use them only in applications where branch protection is already provided or is not required.

Merz ML Series
Non-Fusible Disconnect Switches

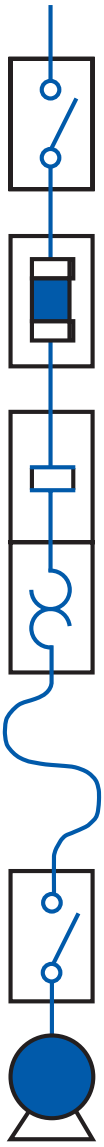


DIN Rail

Front Door

Enclosed

Typical Control Panel



UL 98 or UL 489
Non-fusible disconnect switches

or

Fusible disconnect switches

Compact Switches

UL 508/UL 60947 manual motor controllers have been additionally rated for use as motor disconnects. They are also known as compact switches in Europe.

The term "compact switch" is a common one in the industry and describes a particular approach to the design of disconnect switches – specifically, ON/OFF switches arranged for switchboard installation.

In the majority of cases the switches are designed for snap-on DIN rail mounting, base mounting or front mounting in a door. The terminal screws are all accessible from one side. ML1 Compact Switches are available for applications from 16A to 40A. For more demanding applications loads, the ML2 to ML3 series accommodates loads from 63A up to 125A.

Technical details for units in these series are covered in the following pages.

Agency Approvals

UL Listed File, E195426

Standards: UL 508, UL 60947-1 and UL 60947-4-1

Cam Switches CSA only file 025483_0_000

CE: 2014/35/EU LVD
2014/30/EU EMC
2011/65/EU RoHs

Merz UL 508 Non-Fusible Disconnect Switches DIN Rail Mount

To assemble a switch, please select:

Switch Body

+

External Handle

OR

Switch Body

+

Shaft

+

External Handle

Merz UL 508 Non-Fusible Manual Motor Controller Switches - DIN Rail Mount					
Part Number	***Price***	***Description***	***Switch Body Rating (A)***	***Poles***	***Drawing Link***
ML1-016-V-A01	$15.25	Non-fusible UL 508 / UL 60947 600VAC manual motor controller	16	3	PDF
ML1-025-V-A01	$15.75		25		PDF
ML1-032-V-A01	$17.00		32		PDF
ML1-040-V-A01	$18.25		40		PDF
ML2-063-V-A02	$25.50		63		PDF
ML2-080-V-A02	$28.50		80		PDF
ML3-125-V-A02	$35.25		125		PDF

Merz UL 508 Non-Fusible Disconnect Switches DIN Rail Mount - Accessories

Lockable Handles								
Part Number	Price	Description	Type	Color	Mounting	NEMA/UL Type	Use With	Drawing Link
H05R	$8.00	Two-position, lockable in OFF only	Round	Red/yellow	External front mount	NEMA 4/4X	Merz ML1 switch bodies in DIN rail applications with hinged doors.	PDF
H05B	$8.00	Two-position, lockable in OFF only	Round	Black/gray	External front mount	NEMA 4/4X	Merz ML1 switch bodies in DIN rail applications with hinged doors.	PDF
H06R	$10.00	Two-position, lockable in OFF only	Round	Red/yellow	External front mount	NEMA 4/4X	Merz ML2 and ML3 switch bodies in DIN rail applications with hinged doors.	PDF
H06B	$10.00	Two-position, lockable in OFF only	Round	Black/gray	External front mount	NEMA 4/4X	Merz ML2 and ML3 switch bodies in DIN rail applications with hinged doors.	PDF
H01R	$8.00	Two-position, lockable in OFF only	Round	Red/yellow	External front mount	NEMA 4/4X	Merz ML1 switch bodies in DIN rail applications with non-hinged doors.	PDF
H01B	$8.00	Two-position, lockable in OFF only	Round	Black/gray	External front mount	NEMA 4/4X	Merz ML1 switch bodies in DIN rail applications with non-hinged doors.	PDF
H02R	$10.00	Two-position, lockable in OFF only	Round	Red/yellow	External front mount	NEMA 4/4X	Merz ML2 and ML3 switch bodies in DIN rail applications with non-hinged doors.	PDF
H02B	$10.00	Two-position, lockable in OFF only	Round	Black/gray	External front mount	NEMA 4/4X	Merz ML2 and ML3 switch bodies in DIN rail applications with non-hinged doors.	PDF
H10B	$4.00	Two-position, lockable in OFF only	Pistol	Black/gray	Direct mount	NEMA 1	Merz ML1 switch bodies in DIN rail applications. On-off faceplate included.	PDF
H10R	$4.00	Two-position, lockable in OFF only	Pistol	Red/yellow	Direct mount	NEMA 1	Merz ML1 switch bodies in DIN rail applications. On-off faceplate included.	PDF
H11B	$5.00	Two-position, lockable in OFF only	Pistol	Black/gray	Direct mount	NEMA 1	Merz ML2 switch bodies in DIN rail applications. On-off faceplate included.	PDF
H11R	$5.00	Two-position, lockable in OFF only	Pistol	Red/yellow	Direct mount	NEMA 1	Merz ML2 switch bodies in DIN rail applications. On-off faceplate included.	PDF
H12B	$7.50	Two-position, lockable in OFF only	Pistol	Black/gray	Direct mount	NEMA 1	Merz ML3 switch bodies in DIN rail applications. On-off faceplate included.	PDF
H12R	$7.50	Two-position, lockable in OFF only	Pistol	Red/yellow	Direct mount	NEMA 1	Merz ML3 switch bodies in DIN rail applications. On-off faceplate included.	PDF

Adjustable Shafts for External Handles					
Part Number	Price	Description	Length (mm [in])	Use With	Drawing Link
AL-165	$3.00	6x6 mm [0.24 x 0.24 in] shaft	178-238 [7.01-9.37]	Merz handles -H01R(B), -H02R(B), -H05R(B), -H06R(B)	PDF
AL-265	$3.75	6x6 mm [0.24 x 0.24 in] shaft	278-338 [10.95-13.31]	Merz handles -H01R(B), -H02R(B), -H05R(B), -H06R(B)	PDF
AL-365	$4.25	6x6 mm [0.24 x 0.24 in] shaft	378-438 [14.88-17.24]	Merz handles -H01R(B), -H02R(B), -H05R(B), -H06R(B)	PDF
ASB-AL265-365	$7.50	Shaft support	–	Merz AL-265 and AL-365 shafts	PDF

NOTE: Shaft supports are necessary for extension of AL-265 and AL-365.

AL-165

Merz UL 508 Non-Fusible Disconnect Switches

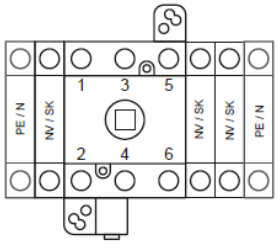
Accessories

Merz UL 508 Additional Pole Modules (For Use with Merz MLx Switch Bodies in DIN Rail Applications)					
Part Number	**Price**	**Description**	**Module Rating (A)**	**Use With**	**Drawing Link**
SK1-V	$6.00	Fourth pole module (load break capable)	40A	ML1 switch bodies	PDF
SK2-V	$12.00	Fourth pole module (load break capable)	80A	ML2 switch bodies	PDF
SK3-V	$14.00	Fourth pole module (load break capable)	125A	ML3 switch bodies	PDF
PE1-V	$4.50	Ground pole module	40A	ML1 switch bodies	PDF
PE2-V	$9.00	Ground pole module	80A	ML2 switch bodies	PDF
PE3-V	$10.50	Ground pole module	125A	ML3 switch bodies	PDF
N1-V	$4.50	Solid neutral pole module	40A	ML1 switch bodies	PDF
N2-V	$9.00	Solid neutral pole module	80A	ML2 switch bodies	PDF
N3-V	$10.50	Solid neutral pole module	125A	ML3 switch bodies	PDF

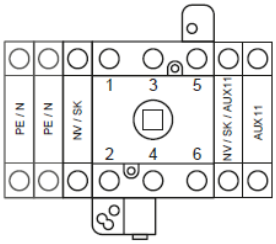
Merz UL 508 Auxiliary Contact				
Part Number	**Price**	**Description**	**Rating**	**Drawing Link**
AUX11-V	$7.00	1 NO / 1 NC auxiliary contacts, left or right side mount For use with Merz ML1, ML2 or ML3 DIN rail mount switch bodies -A01, -A02, -E01R, -E02R, E03R, -E04R, -E05R	10A @ 600VAC	PDF

Merz UL 508 Terminal				
Part Number	**Price**	**Description**	**Rating**	**Drawing Link**
2KL-V	$9.00	2-pole solid feed-through terminal, left or right side mount For use with Merz ML1, ML2 or ML3 DIN rail mount switch bodies -A01, -A02, -E01R, -E02R, E03R, -E04R, -E05R	10A @ 600VAC	PDF

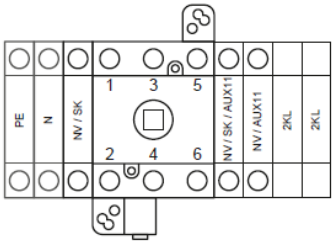
Optional contact, auxiliary contact, and terminal 2-pole



Optional contact/terminal
Max. 2NV/SK
In total max 3 contacts
+max 1 PE terminal
+max 1 N terminal



Optional contact/auxiliary contact/terminal
Max. 2NV/SK/AUX11
In total max 3 contacts
+max 1 PE terminal
+max 1 N terminal



Optional contact/auxiliary contact/terminal 2-pole/terminal
Max. 2NV/SK/AUX11
In total max 3 contacts
+max 2 2KL terminal 2-pole
+max 1 PE terminal
+max 1 N terminal

Merz UL 508 Non-Fusible Disconnect Switches With External Handle, Front Door Mount

Switch Body With Front External Handle

- Wire connections accessible from the rear

Merz UL 508 Non-Fusible Disconnect Switches - With External Handle, Front Mount						
Part Number	**Price**	**Description**	**Switch Body Rating (A)**	**Poles**	**Handle**	**Drawing Link**
ML1-016-E-H03R	$17.25	Non-fusible UL 508 / UL 60947 manual motor controller 600VAC "suitable as motor" disconnect switch	16	3	Red/yellow	PDF
ML1-016-E-H03B	$17.25		16		Black/gray	PDF
ML1-025-E-H03R	$18.50		25		Red/yellow	PDF
ML1-025-E-H03B	$18.50		25		Black/gray	PDF
ML1-032-E-H03R	$19.25		32		Red/yellow	PDF
ML1-032-E-H03B	$19.25		32		Black/gray	PDF
ML1-040-E-H03R	$20.25		40		Red/yellow	PDF
ML1-040-E-H03B	$20.25		40		Black/gray	PDF
ML2-063-E-H04R	$30.50		63		Red/yellow	PDF
ML2-063-E-H04B	$30.50		63		Black/gray	PDF

NOTE: Hardware for 4-hole door mounting and lockable handle for use with NEMA 4/4X enclosures included

Merz UL 508 Auxiliary Contact				
Part Number	**Price**	**Description**	**Rating**	**Drawing Link**
AUX11-E	$7.00	Auxiliary contact, left or right side mount, 1 NO / 1 NC contacts For use with Merz ML1, ML2 or ML3 door mount switch bodies -H03R(B), -H04R(B)	10A @ 600VAC	PDF

Merz UL 508 Terminal				
Part Number	**Price**	**Description**	**Rating**	**Drawing Link**
2KL-E	$9.00	2-pole solid feed-through terminal, left or right side mount For use with Merz ML1, ML2 or ML3 door mount switch bodies -H03R(B), -H04R(B)	10A @ 600VAC	PDF

Merz UL 508 Non-Fusible Disconnect Switches With Enclosure

Switch Body With Enclosure

General characteristics

- Gray enclosure with red handle
- Equipped with a 3-pole Merz ML1, ML2 or ML3 disconnect
- 1 removable ground terminal
- Possibility of adding 1 power pole and 1 auxiliary contact
- Operating temperature max 45°C or 55°C [113°F or 131°F]
- Operating temperature min -5°C [23°F]
- Polycarbonate plastic enclosure
- NEMA/UL Type 1, 3R, 4, 4X

Merz UL 508 Non-Fusible Disconnect Switches - With Enclosure

Part Number	Price	Description	Enclosure Rating (A)	Poles	Enclosure Size (in [mm])	Weight (lb [kg])	Included With PE/ Neutral Terminal	Included With Auxiliary Contacts	Drawing Link
ML1-025-V-E01R	$50.00	Non-fusible UL 508 / UL 60947 manual motor controller 600VAC "suitable as motor" disconnect switch	25	3	4.80 x 7.72 [122 x 120]	1.35 [0.61]	PE1-V	AUX11-V 1 NO / 1 NC	PDF
ML1-032-V-E01R	$53.00		32		4.80 x 7.72 [122 x 120]	1.35 [0.61]	PE1-V		PDF
ML1-040-V-E02R	$77.00		40		7.87 x 7.87 [200 x 200]	3.35 [1.52]	PE1-V		PDF
ML2-063-V-E03R	$70.00		63		7.87 x 7.87 [200 x 200]	3.85 [1.75]	PE2-V		PDF
ML2-080-V-E03R	$108.00		80		7.87 x 7.87 [200 x 200]	3.85 [1.75]	PE2-V		PDF
ML3-125-V-E03R	$121.00		125		7.87 x 7.87 [200 x 200]	4.05 [1.84]	PE3-V		PDF
ML1-040-V-E04R	$85.00		40		7.87 x 7.87 [200 x 200]	3.40 [1.54]	PE1-V + NV2-V		PDF
ML2-063-V-E05R	$76.00		63		7.87 x 7.87 [200 x 200]	4.05 [1.84]	PE2-V + NV2-V		PDF

Merz UL 508 Non-Fusible Disconnect Switches

Accessories

Terminal Shrouds					
Part Number	***Price***	***Description***	***Use With***	***Poles***	***Drawing Link***
HS1-ML1	$2.00	Terminal shroud, line or load side	Merz ML1 switch bodies	1	PDF
HS3-ML1	$6.00	Terminal shroud, line or load side	Merz ML1 switch bodies	3	PDF
HS1-ML2	$3.00	Terminal shroud, line or load side	Merz ML2 switch bodies	1	PDF
HS3-ML2	$9.00	Terminal shroud, line or load side	Merz ML2 switch bodies	3	PDF
HS1-ML3	$4.00	Terminal shroud, line or load side	Merz ML3 switch bodies	1	PDF
HS3-ML3	$12.00	Terminal shroud, line or load side	Merz ML3 switch bodies	3	PDF

HS1-ML1

Replacement Mounting Screws				
Part Number	***Price***	***Description***	***Use With***	***Drawing Link***
ML-SKT-1	$3.25	Cover mounting screws	Merz small size enclosed disconnects -E01R	PDF
ML-SKT-2	$4.00	Cover mounting screws	Merz large size enclosed disconnects -E02R, -E03R, -E04R, -E05R	PDF
ML-SKT-3	$3.00	Screw kit, mounting and hardware screws	Shafts AL-165, AL-265, AL-365 (Shaft support ASB-AL265-365 and terminal shrouds HS3-ML1, HS3-ML2, HS3-ML3 included)	PDF
ML-SKT-4	$4.75	Handle mounting screws	Merz handles -H01R(B), -H02R(B), -H03R(B), -H04R(B), -H05R(B), -H06R(B), -H08R(B), -H09R(B), -H010R(B), -H011R(B), -H012R(B)	PDF

ML-SKT-1

Merz UL 508 Non-Fusible Disconnect Switches

Technical Characteristics

Characteristics According to UL 508, UL 60947-4-1							
Type	**ML1-016**	**ML1-025**	**ML1-032**	**ML1-040**	**ML2-063-**	**ML2-080**	**ML3-125**
General use rating (A)	16	25	32	40	63	80	125
Short-circuit rating at 600VAC (kA)	5	5	5	5	5	5	5
Type of fuse	RK5	RK5	RK5	RK5	RK5	RK5	RK5
Max. fuse rating (A)	50	50	50	50	80	80	125

Max. Motor hp / Max. 3-Phase Motor FLA							
Type		**ML1-016**	**ML1-025**	**ML1-032**	**ML1-040**	**ML2-063**	**ML2-080**	**ML3-125**
General purpose 600VAC 3-phase [A]		16	25	32	40	63	80	125
Motor 3-phase	**240VAC (hp [FLA])**	7.5 [22]	7.5 [22]	10 [28]	10 [28]	15 [42]	20 [54]	25 [68]
	480VAC (hp [FLA])	10 [14]	10 [14]	20 [27]	20 [27]	30 [40]	40 [52]	50 [65]
	600VAC (hp [FLA])	10 [11]	10 [11]	20 [22]	20 [22]	30 [32]	40 [41]	50 [52]
Motor 1-phase	**120VAC (hp [FLA])**	1 [16]	1 [16]	1.5 [20]	1.5 [20]	3 [34]	5 [56]	7.5 [80]
	240VAC 2-Pole (hp [FLA])	2 [12]	2 [12]	3 [17]	3 [17]	7.5 [40]	10 [50]	15 [68]

Wire Type / Temperature – Use Copper (Cu) Wire Only, 75°C [167°F] or Higher					
Type	ML1	ML2	ML3	AUX11	2KL
Terminal cross section [AWG]	14-8	14-2	8-1/0	17-13	17-13
Single or multi-core [mm^2]	2.5-16	2.5-35	6-70	1-4	1-4
Stranded with sleeve [mm^2]	2.5-16	1.5-25	6-50	1-2.5	1-2.5
Stripping distance connector cable (mm [in])	10 [0.39]	13 [0.51]	16 [0.63]	10 [0.39]	10 [0.39]
Torque terminal screw (N•m [lb•ft])	1.2 [0.89]	2.5 [1.84]	3 [2.21]	0.6 [0.44]	0.6 [0.44]

Environmental – Switch Body							
Type	**ML1-016**	**ML1-025**	**ML1-032**	**ML1-040**	**ML2-063**	**ML2-080**	**ML3-125**
Max. surrounding air temperature (Open type) (C [F])	60 [140]	60 [140]	60 [140]	60 [140]	70 [158]	70 [158]	75 [167]
Max. ambient temperature (Enclosed type) (C [F])	45 [113]	45 [113]	45 [113]	45 [113]	50 [122]	50 [122]	55 [131]
Mounting	Horizontal on DIN rail or front door panel						

Auxiliary contacts	
Electrical characteristics	A600, thermal 10A @ 600VAC

Product Weight – lb (kg)							
Type	***ML1-016***	***ML1-025***	***ML1-032***	***ML1-040***	***ML2-063***	***ML2-080***	***ML3-125***
Open switches	0.40 [0.18]	0.40 [0.18]	0.40 [0.18]	0.40 [0.18]	0.75 [0.34]	0.75 [0.34]	0.95 [0.43]

Agency Approvals
UL file #E195426 (Manual Motor Controllers)

Note: Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Merz Non-UL Cam Changeover Switches 4 Hole Front Mount

Z251-2.H08B

W251-2.H08B

Merz Non-UL Cam Changeover Switches - 4 Hole Front Mount					
Part Number	***Price***	***Description***	***Rating (A)***	***Poles***	***Drawing Link***
Z251-2.H08B	$21.00	Non-UL changeover switches	25	2	PDF
Z251-3.H08B	$26.00		25	3	PDF
Z451-2.H08B	$29.50		32	2	PDF
Z451-3.H08B	$38.50		32	3	PDF
Z656-3.H09B	$69.00		80	3	PDF
W251-2.H08B	$21.75	Non-UL reversing switches	25	2	PDF
W251-3.H08B	$25.00		25	3	PDF
W451-2.H08B	$38.25		32	2	PDF
W451-3.H08B	$40.25		32	3	PDF

NOTE: Hardware for 4-hole door mounting and black operating handle included.

Merz Non-UL Cam Changeover Switches

Technical Characteristics

Characteristics According to CSA 22.2 No. 14-05				
Type		251	451	656
General Purpose 600VAC, 3-Phase		25A	32A	80A
Motor 3-Phase	**110/120 VAC**	3hp	7.5 hp	–
	220/240 VAC	7.5 hp	7.5 hp	25hp
	440/480 VAC	15hp	20hp	50hp
	550/600 VAC	20hp	20hp	50hp
Motor 1-Phase 2-pole	**110/120 VAC**	1.5 hp	–	7.5 hp
	220/240 VAC	3hp	3hp	15hp
	440/480 VAC	7.5 hp	10hp	15hp
	550/600 VAC	10hp	15hp	15hp
Short-Circuit Rating at 600VAC (kA)		5	5	5
Type of Fuse		RK5	RK5	RK5
Max. Fuse Rating (A)		60	60	60
Max. Surrounding Air Temperature (Open Type) (°C [°F])		40 [104]	40 [104]	40 [104]

Suitable for use on a circuit capable of delivering not more than 5kA rms symmetrical amperes, 600V maximum

Wire Type / Temperature – Use Copper (Cu) Wire Only, 75°C [167°F] or Higher			
Type	**251**	**451**	**656**
Terminal cross section [AWG]	14-8	14-6	14-4
Single or multi-core [mm^2]	1-6	1.5-10	1.5-25
Finely stranded with sleeve [mm^2]	1-4	1.5-6	1.5-16
Stripping distance connector cable (mm [in])	10 [0.39]	12 [0.47]	15 [0.59]
Terminal screw torque (N•m [lb•ft])	4.5 [40]	5.1 [45]	4.5 [40]

NOTE: Verify that all connections (including bridging link connections) are tightened to manufacturer's required torque before energization.

Agency Approvals
CSA file #025483_0_000

NOTE: The controllers are suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes at 600VAC max when protected by a 60A Class RK5 fuse.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.