Low-voltage power distribution and control systems > Switches and disconnects >

Safety switches

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Note: For customized safety switches see, Safety Switches—Customized Solutions (DG008002EN).



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Product Description

Safety Switches


General-Duty


Heavy-Duty


Heavy-Duty Safety Switch with Surge Protection


Double-Throw


Shunt Trip Safety Switch


Auxiliary Power Switch


Enclosed Rotary

Safety switches have a number of applications from service entrance to branch circuit protection. They are also horsepower rated for use as motor circuit switches. **Table 28.1-1** summarizes major differences and similarities between the heavy-duty and general-duty type of Eaton's safety switches. In addition to heavy-duty and general-duty applications, we have seen many industry trends that have created needs for specialized versions of safety switches:

- Eaton's EnviroLine line of switches come with options for stainless steel enclosures, mechanisms and springs, various types of interlocked receptacles, viewing windows and also non-metallic enclosures for use in abnormal environments. Solar switches made to meet specific requirements and demands of the solar industry
- Shunt trippable switches for a quick and safe means to remotely open a switch in an emergency situation. Service Entrance capability at 480 Vac, 1200 A with integrated ground fault relay and/or arc reduction relay
- Auxiliary power switches for providing control power for HVAC and other applications that may require disconnect and receptacle to meet NEC requirements
- Rotary switches for OEM and compact applications where space is limited

If you don't see your specific application listed above, make sure to call your local Eaton salesperson to discuss the capabilities of our Flex Center that will provide custom switches to meet many industry needs.

The following pages give more details on the many types of switching devices Eaton can provide to meet your every need.

Table 28.1-1. Safety Switch Application Guide—See Catalog Selection Tables for Specific Ratings

Application/ Features	General-Duty Safety Switches	Heavy-Duty Safety Switches
Type of facility	Residential, commercial, light industrial	Commercial, institutional, industrial
Maximum voltages	240 Vac—250 Vdc in larger sizes	600 Vac—250 Vdc and 600 Vdc
Short-circuit rating for non-fused switches	10,000 rms symmetrical amperes	10,000 rms symmetrical amperes. Higher combination ratings available with upstream Eaton molded case circuit breakers and fuses.
Short-circuit rating with standard fuse clips	With Class H fuse clips—10,000 rms symmetrical amperes	Switches with Class H fuse clips—10,000 rms amperes 800–1200 A switches with Class L fusing—200,000 rms
Short-circuit rating with fuse options	Class R fuse adaptation and 400–600 A switches with T or J fuse adaptation—100,000 rms amperes	Switches with Class R or Class J fusing and 200–800 A switches with Class T fuse adaptation—200,000 A at 480 V and 100,000 rms symmetrical amperes at 600 V
Ampere sizes	30, 60, 100, 200, 400, 600	30, 60, 100, 200, 400, 600, 800, 1200
Maximum horsepower ratings	200 hp at 240 Vac	250 hp at 240 V, 500 hp at 480 and 600 Vac
UL (NEMA) enclosure types	Type 1—general purpose indoor use Type 3R—rainproof and sleet-resistant	Type 1 indoor, 3R outdoor Type 4 watertight and dust-tight Type 4X watertight, dust-tight and corrosion-resistant Type 12 indoor falling dust, dirt and liquids Type 12/3R convertible to outdoor use Type 7/9 hazardous (classified) locations
Terminals	Box lug (screw pressure) for Al/Cu wire	Box lug (screw pressure) for Al/Cu wire
Electrical interlock—snap-switch type	Field-installed kit, 200–600 A sizes	Field- or factory-installed for all sizes
Control pole interlock	Field-installed kit, 400–600 A sizes	Field- or factory-installed for K-Series switches
Fuse pullers	Not available	Standard in Type 4X and 12 enclosed switches through 200 A field- or factory-installed for all other 30–200 A switches

Safety Switch Selection Guide

Table 28.1-2. Safety Switch Selection Guide

Type		Fuse Type		Fuse Class	Ampere Rating	Number of Poles	Enclosure Types							
							NEMA 1	NEMA 3R	NEMA 12	NEMA 4 Painted Steel	NEMA 4X Stainless Steel	NEMA 4X Non-Metallic	NEMA 4X 316 Grade Stainless Steel	NEMA 7/9
General-duty	Single-throw max. 240 Vac horsepower rated	Fusible	Plug	—	30	1 and 2	Yes	Yes	—	—	—	—	—	—
			Cartridge	H ①	30–600	2 and 3	Yes	Yes	—	—	—	—	—	—
		Non-fusible	—	—	30–600	2 and 3	Yes	Yes	—	—	—	—	—	—
Heavy-duty ②	Single-throw max. 600 Vac horsepower rated	Fusible	Cartridge	H ① L	30–600 800–1200	2, 3 and 4	Yes up to 1200 A	Yes up to 1200 A	Yes ③ up to 1200 A	Yes 400–1200 A	Yes up to 1200 A	Yes up to 200 A	Yes up to 1200 A	Yes ④ up to 100 A
		Non-fusible	—	—	30–1200	2, 3 and 4	Yes	Yes	Yes ③ up to 1200 A	Yes 400–1200 A	Yes up to 1200 A	Yes up to 200 A	Yes up to 1200 A	Yes up to 100 A
Double-throw	Max. 600 Vac horsepower rated	Fusible	Cartridge	H ① T (600 V) J L	30–400 400 600 800–1200	2 and 3	Yes	Yes	Yes up to 600 A ③	—	Yes up to 400 A	—	Yes up to 400 A	—
		Non-fusible	—	—	30–1200	2, 3, 4 and 6	Yes	Yes	Yes up to 800 A ③	—	Yes up to 600 A	—	Yes up to 600 A	—
Shunt trip	Single-throw max. 600 Vac horsepower rated	Fusible	Cartridge	H ① L	30–600 800–1200	2, 3 and 4	—	—	Yes ③	Yes	Yes	—	Yes	—
		Non-fusible	—	—	30–1200	2, 3 and 4	—	—	Yes ③	Yes	Yes	—	Yes	—
Auxiliary power heavy-duty	Max. 600 Vac horsepower rated	Fusible	Cartridge	H ①	30–200	3	—	Yes	—	—	—	—	—	—
		Non-fusible	—	—	30–200	3	—	Yes	—	—	—	—	—	—
Rotary switches	Max. 600 Vac	Non-fusible	—	—	16–100	3, 4	Yes	Yes	Yes	—	Yes	Yes	Yes	—

① Class J, R andT available in many instances with the use of adapter kits listed on **Page 28.1-8**.
② Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.
③ NEMA Type 12 enclosures (30–1200 A) can be field modified to meet NEMA 3R rainproof requirements when a factory provided drain screw is removed.
④ Class J clips provided.

Table 28.1-3. EnviroLine Safety Switch Selection Guide

EnviroLine	Fuse Type		Fuse Class	Ampere Rating	Number of Poles	Enclosure Types					
						NEMA 1	NEMA 3R	NEMA 12	NEMA 4 Painted Steel	NEMA 4X Stainless Steel	NEMA 4X Non-Metallic
Stainless enclosure with stainless mechanism	Fusible	Cartridge	H ⑤	30–400	2 and 3	—	—	—	—	Yes	—
	Non-fusible	—	—	30–400	3	—	—	—	—	Yes	—
Viewing window	Fusible	Cartridge	H ⑤ L	30–600 800–1200	2, 3, 4 and 6	—	—	Yes ⑥	Yes	Yes	—
	Non-fusible	—	—	30–1200	2, 3, 4 and 6	—	—	Yes ⑥	Yes	Yes	—
Welding receptacle	Fusible	Cartridge	H ⑤	30–100	3	—	—	Yes ⑥	—	Yes	—
	Non-fusible	—	—	30–100	3	—	—	Yes ⑥	—	Yes	—
Non-metallic	Fusible	Cartridge	H ⑤	30–200	3	—	—	—	—	—	Yes
	Non-fusible	—	—	30–200	3	—	—	—	—	—	Yes

⑤ Class J, R andT available in many instances with the use of adapter kits listed on **Page 28.1-8**.
⑥ NEMA Type 12 enclosures (30–1200 A) can be field modified to meet NEMA 3R rainproof requirements when a factory provided drain screw is removed.

General-Duty



General-Duty (Cartridge Fuse)

For residential and commercial applications. Suitable for light-duty motor circuits and service entrance.

- 240 Vac
- 30–600 A
- For short-circuit ratings, see **Table 28.1-42**
- Suitable for service entrance applications unless otherwise noted
- Fusible and non-fusible switches are 100% load break and load make rated
- The continuous load current of fusible switches is not to exceed 80% of the rating of fuses employed in other than motor circuits. Non-fusible switches are 100% fully rated
- 200–600 A features K-Series design
- Horsepower rated
- Ample wire bending space provides for easier installation
- With Class R fuses, switches may be used on systems capable of delivering 100,000 A rms symmetrical

Note: Plug fuse switches are not service entrance rated.

Heavy-Duty



Heavy-Duty

For heavy-duty commercial and industrial applications where reliable performance and service continuity are critical.

- 600 Vac, 600 Vdc maximum
- 30–1200 A
- For short-circuit ratings, see **Table 28.1-43**
- Horsepower rated
- Fusible and non-fusible switches are 100% load break and load make rated
- The continuous load current of fusible switches is not to exceed 80% of the rating of fuses employed in other than motor circuits. Non-fusible switches are 100% fully rated
- Suitable for service entrance applications unless otherwise noted
- Visible double break rotary blade mechanism. Two points of contact provide a positive open and close, easier operation, and also help to prevent contact burning for longer contact life
- Triple padlocking capability. Personnel safety feature because the large hasp can accommodate up to three 3/8-inch (9.5 mm) shank locks. Cabinet door can be further padlocked at the top and bottom
- Interlocking mechanism. Door cannot be opened when the handle is in the ON position. Built-in defeater mechanism provides for user access when necessary
- De-ionizing arc chutes. Arc chutes confine and suppress the arcs produced by contacts under load

Enhanced Visible Blade



Enhanced Visible Blade

- Heavy-duty safety switches with enhanced visible blade provide a highly visible means of disconnect to help improve personnel safety and equipment protection
- Enhanced visible means of disconnect allows personnel to clearly see that blades are disengaged from stationary contacts when the switch handle is in the OFF position
- New visible blade design provides increased visibility over each pole, allowing users to clearly see the trailing edge of the blade
- Material color update from red to yellow creates greater contrast between blades and arc shield
- Available in 30–1200 A ratings
- Fusible and non-fusible configurations in two-, three-, four- and six-pole
- NEMA 1, 3R, 12, 4 and 4X enclosures for robust environmental protection
- Modifications available such as auxiliary contacts, pilot lights and more, contact the Flex Center via email FlexSwitches@eaton.com
- To order safety switches with enhanced visible blade features and no viewing window, the standard heavy-duty catalog number should be used with the addition of a 'V' suffix

Note: 30–100 A have enhanced visible blade as a standard feature (no 'V' suffix needed).

Window Switch



Window Switch

These switches incorporate a new external viewing window to replace the internal design.The new design instills confidence by allowing users to easily view the trailing edge of the blade to confirm disconnect is open while the switch handle is in the OFF position.

- All Eaton safety switches featuring a viewing window incorporates enhanced visible blade components as standard
- Viewing window provides clear path to view switch interior
- Window material is high-quality laminated safety glass
- External viewing window design is field replaceable—kits available for switches 30–1200 A
- 30 A and 60 A heavy-duty safety switches feature a vertical viewing window
- 100–1200 A heavy-duty safety switches feature a horizontal viewing window(s)
- Ratings are 30–1200 A, 240–600 Vac, fusible and non-fusible. Available in NEMA 12/3R, 4X stainless steel enclosures

Heavy-Duty Surge Switch



Heavy-Duty Surge Switch

Eaton's Switching Device product line combined heavy-duty safety switches and Eaton's SP1 and CVX series surge protective devices (SPDs) to provide reliable, cost-effective surge protection. Integral to the switch, an SPD provides significantly better performance compared to a device that is externally mounted, resulting in better protection for connected equipment. Eaton's new packaged solution provides contractors and end users a UL listed product by connecting the SPD to the safety switch at the factory.

- 30–1200 A
- NEMA 12/3R or 4X 304-grade stainless steel enclosures
- External window over switching base standard
- Window to view LEDs of SPD for quick status view
- Enhanced visible blades included
- Eaton Type SP1 and CVX surge protective devices available

EnviroLine



Stainless Steel Switch

Eaton offers a line of safety switches designed for your special application and/or extreme environmental conditions.

The EnviroLine stainless steel switch is primarily used in the meatpacking and food processing industries, or any application where water is frequently used to hose down equipment.

- Stainless steel NEMA 4X enclosure
- Stainless steel interior mechanism, back pan and springs
- Available in 30–400 A ratings, 240–600 Vac
- Fusible and non-fusible configurations
- 316 grade stainless steel option replaces standard 304 grade stainless steel and hardware with 316 stainless. 316 stainless holds up better in high salt environments found in coastal areas, and in water/wastewater applications

EnviroLine



Receptacle Switch

Receptacle Switch

These heavy-duty switches are pre-wired and interlocked to polarized receptacles for three-phase, three-wire, grounded type power plugs.

- Used for portable power applications such as welders, infrared ovens, batch feeders, conveyors, and truck and marine docks
- Receptacles are interlocked to handle mechanisms so that power plugs may not be inserted or removed when the switch is in the ON position unless noted otherwise
- Ratings are 30–100 A, 600 Vac
- Available in NEMA 12 and 4X stainless steel enclosures



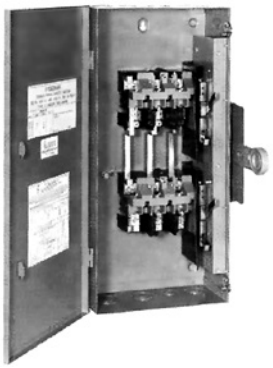
Non-Metallic Switch

Non-Metallic Switch

This switch has a KRYDON™ enclosure. This is a compression molded fiberglass reinforced polyester enclosure, which is capable of withstanding almost any corrosive environment.

- Ratings are 30–200 A, 240–600 Vac, fusible and non-fusible
- Enclosure is NEMA 4X rated

Heavy-Duty Double-Throw



Heavy-Duty Double-Throw

Used to transfer service from a normal power source to an alternate source, or to switch from one load circuit to another.

- For short-circuit ratings, see **Table 28.1-44**
- 30–1200 A switches are horsepower rated
- 600 Vac, 250 Vdc maximum
- Fusible or non-fusible
- Fusible and non-fusible switches are 100% load break and load make rated
- The continuous load current of fusible switches is not to exceed 80% of the rating of fuses employed in other than motor circuits. Non-fusible switches are 100% fully rated
- Suitable for service entrance applications unless otherwise noted
- Wiring configuration from factory allows a single load to be supplied by a normal or alternate source. Can be field modified to allow two loads to be alternately supplied by a single source
- Ample wire bending space provides for easier installation
- Visible double-break rotary blade mechanism. Two points of contact provide a positive open and close, easier operation, and also help to prevent contact burning for longer contact life
- Triple padlocking capability. Personnel safety feature because the large hasp can accommodate up to three 3/8-inch (9.5 mm) shank locks
- Clearly visible handle. The position (ON or OFF) can be clearly seen from a distance
- Additional locking capability. Cabinet door can be further padlocked at the top and bottom
- Clear line shield protects against accidental contact with energized parts. Probe holes enable the user to test if the line side is energized without removing the shield
- De-ionizing arc chutes. Arc chutes confine and suppress the arcs produced by contacts under load
- UL listed switching neutral capability is available on three-pole and four-pole non-fusible double-throw switches with the installation of the proper bonding kit shown on **Page 28.1-3**
- 600–1200 A fusible utilizes a common set of fuses; two source, one load applications

Shunt Trip Safety Switch



Shunt Trip Safety Switch

Integrates shunt trip technology, enhancing safety by providing a means to remotely open a safety switch electrically.

- Heavy-duty safety switch design with integrated shunt trip module
- Visible means of disconnect—visible blade
- 30–1200 A (240–600 Vac)
- Integral arc energy reduction system available (NEC® 240.67)
- NEMA® Type 12/3R, 4 (painted steel) and 4X (stainless steel) enclosures
- Horsepower ratings same as standard safety switches
- Passes Class 1 ground fault testing (1200% opening)
- Maximum response time of 50 ms
- Integral ground fault available for 480 Vac service entrance applications (NEC 230.95)
- Switch arcing time less than 10 ms (AC)
- Class H fuse clips supplied as standard on fusible devices 30–600 A, Class L for 800 A; Class R, J, T fuse clips available

Modifications available, such as viewing windows, pilot lights, and more. Call the Flex Center at 888-329-9272 for more information.

Auxiliary Power Heavy-Duty Safety Switch



Auxiliary Power Heavy-Duty Safety Switch

NEC Article 210.63 requires that a 125 V, single-phase, 15 or 20 A rated receptacle outlet be installed at an accessible location for the servicing of heating, air-conditioning and refrigeration equipment. The receptacle must be located on the same level and within 25 ft (7.5 m) of the heating, air-conditioning and refrigeration equipment. Eaton's heavy-duty safety switch is an ideal solution for these applications, including elimination of the need for running a separate 120 V circuit to the rooftop.

- 30–200 A
- Horsepower rated
- NEMA 3R outdoor enclosure standard
- 15 A and 20 A ground fault receptacles standard

Enclosed Rotary



Enclosed Rotary

Provides users with the ability to lock directly wired motor loads in the OFF position to comply with new OSHA lockout/tagout regulations. Also for machine applications that require compact, economical disconnect switches.

- Padlockable in the OFF position (up to three padlocks) to meet OSHA lockout requirements
- Available 16–80 A ratings
- 600 Vac, three- and four-pole non-fusible device
- Rated at highest available hp rating (at 480 Vac, 16 A–10 hp, 25 A–15 hp, 30 A–15 hp, 40 A–20 hp, 60 A–30 hp, 80 A–40 hp)
- Rated for making and breaking loads
- Accepts auxiliary contacts
- Capability to signal PLC controllers
- Ground lug connection provided
- Can be rated up to 65 kAIC, when protected by applicable upstream fusing

Accessories and Field Kits

For General-Duty, Heavy-Duty and Double-Throw Safety Switches

Table 28.1-4. Safety Switches—Accessories

Description	Catalog Number
Neutral Kits ①	
DH030NK 	
30 A DG	**DG030NB**
60–100 A DG	**DG100NB**
200 A DG, DH (NEMA 1, 3R enclosures)	**DG200NK**
30–60 A DH	**DH030NK**
100 A DH	**DH100NK**
200 A DH (NEMA 4X, 12 enclosures)	**DH200NK**
400 A DG, DH	**DS400NK**
600 A DG, DH	**DS600NK**
400 A fusible DT, 800–1200 A DH	**DS800NK**
30–100 A DT	**DT100NK**
200 A DT	**DT200NK**
400 A non-fusible DT	**DT400NK**
600 A non-fusible DT	**DT600NK**
600 A fusible DT, 800 A DT	**DT800NK**
1200 A DT	**DT1200NK**
Ground Lug Kits Factory-installed ground lug is supplied in all safety switches	
DS200GK 	
30–100 A DG	**DG030GB**
30–100 A DH, DT ②	**DS100GK**
200 A DG, DH, DT	**DS200GK**
400–600 A DG, 400–1200 A DH, 400–1200 A DT	**DS468GK**
Switching Neutral Bonding Kits ③	
DT100BK 	
30–100 A DT, 3P, 4P non-fusible	**DT100BK**
200 A DT, 3P, 4P non-fusible	**DT200BK**
400 A DT, 3P, 4P non-fusible	**DT400BK**
600 A DT, 3P, 4P non-fusible	**DT600BK**
800–1200 A DT, 3P, 4P non-fusible	**DT800BK**
Control Pole Kit (For 2P, 3P Switches)	
DS16CP 	
400–600 A DG, 30–1200 A DH, 30–1200 A DT Multiple key options are included with the control pole kit. Standard keys provide late-make, early-break functionality. Flanged key provides same make, same break functionality.	**DS16CP**
Auxiliary Contact Kits Auxiliary contact kits are not field installable on shunt trip safety switches	
DS200EK1 	
All switches (except 30–100 A DG) 1NO/1NC	**DS200EK1** ④
All switches (except 30–100 A DG) 2NO/2NC	**DS200EK2** ④
NEMA 7/9 switches (30–100 A) 1NO/1NC	**178C265G05**
NEMA 7/9 switches (30–100 A) 2NO/2NC	**178C265G06**
Copper Lug Kits	
DS36CL 	
30 A DH, DT ⑤	**DS16CL**
60 A DH, DT ⑤	**DS26CL**
100 A DH, DT ⑤	**DS36CL**
200 A DH ⑤	**DS46CL**
400 A DH (NEMA 4, 4X, 12 enclosures) ⑥	**DS56CL**
600–800 A DH (NEMA 4, 4X, 12 enclosures) ⑥	**DS66CL**

Description	Catalog Number
Crimp Lug Pad Kits (NEMA 4, 4X, 12 Enclosures Only)	
DS56CK 	
400–600 A DH ⑤	**DS56CK**
800 A DH ⑥	**DS76CK**
400–800 A neutral DH ③	**DS800CNK**
Fuse Puller Kits	
DS60FP 	
30 A DH ⑤	**DS30FP**
60 A DH ⑤	**DS60FP**
100 A DH ⑤	**DS100FP**
200 A DH ⑤	**DS200FP**
"J" Fuse Adapter Kits ⑦⑧	
DS22JK 	
60 A 240 V DH ⑤	**DS22JK**
60 A DH, DT and receptacle switches ⑤	**DS26JK**
400 A 600 V DT ⑨	**DT400JK**
600 A 240–600 V DH, 600 A DG ⑥	**DS600JK**
"R" Fuse Adapter Kits ⑤⑩	
DS12FK 	
30 A DG	**DG030RB**
100 A DG	**DG100RB**
30 A 240 V DH, DT	**DS12FK**
30 A 600 V DH, DT, 60 A 240 V DH, DT, 60 A DG	**DS16FK**
60 A 600 V DH, DT	**DS26FK**
100 A 240–600 V DH, DT	**DS36FK**
200 A 240–600 V DH, DT, 200 A DG	**DS46FK**
400 A 240–600 V DH, 240 V DT, 400 A DG	**DS56FK**
600 A 240–600 V DH, DT, 600 A DG	**DS66FK**
"T" Fuse Adapter Kits	
DS426TK 	
200 A 240 V DH ⑤	**DS426TK**
200 A 600 V DH ⑤	**DS466TK**
400 A 240 V DG, DH, DT ⑥	**DS526TK**
400 A 600 V DH ⑥	**DS566TK**
600 A 240 V DG, DH ⑥	**DS626TK**
600 A 600 V DH ⑥	**DS666TK**
600 A 240 V DT ⑥	**DT626TK**
600 A 600 V DT ⑥	**DT666TK**
800 A 240 V DH ⑥	**DS726TK**
800 A 600 V DH, DT ⑥	**DS766TK**
Miscellaneous Kits	
Hookstick handle	**DH800HSH**
Lubricating grease for safety switch blades and contacts (each kit contains three 30 cc tubes of lubricating grease)	**DSLUBEKIT**

① Service entrance bonding kit and sticker are included with the neutral kit.
② Ground bar kit is not listed on device publications.
③ Order one kit per switch.
④ For duty ratings, see table on following page.
⑤ Order one kit for three poles.
⑥ Order one kit for each pole.
⑦ 30 A Class J available as factory option only.
⑧ If Class J fuse kit is not listed, then switch will accept Class J fusing by repositioning either fuse base or fuse clips. No drilling required.
⑨ Order one kit for six poles.
⑩ Class R fuse kits are used to reject Class H fuses, and allow only Class R fuses to be installed.

Note: Accessories are not applicable to NEMA 7/9 switches unless indicated otherwise.

Auxiliary Contact Rating

Table 28.1-5. AC Pilot Duty Ratings

Description	Volts	Break (Amperes)	Make (Amperes)	Catalog Number
1NO-1NC	110	15.0	40.0	**DS200EK1**
1NO-1NC	220	10.0	20.0	**DS200EK1**
1NO-1NC	440	6.0	10.0	**DS200EK1**
1NO-1NC	600	5.0	8.0	**DS200EK1**
2NO/2NC	110	3.0	30.0	**DS200EK2**
2NO/2NC	220	1.5	15.0	**DS200EK2**
2NO/2NC	440	1.0	8.0	**DS200EK2**
2NO/2NC	600	0.8	6.0	**DS200EK2**

Table 28.1-6. DC Pilot Duty Ratings

Description	Volts	Single Throw (Amperes)	Double Throw (Amperes)	Catalog Number
1NO-1NC	115	2.0	0.5	**DS200EK1**
1NO-1NC	230	0.5	0.2	**DS200EK1**
1NO-1NC	600	0.1	0.02	**DS200EK1**
2NO/2NC	115	1.0	0.2	**DS200EK2**
2NO/2NC	230	0.3	0.1	**DS200EK2**
2NO/2NC	600	0.1	—	**DS200EK2**

Table 28.1-7. Myers Type Hubs—Dimensions in Inches (mm)

NEMA 3R (400 A and above)
NEMA 4, 4X (stainless steel), 12

	Conduit Size	Catalog Number
DS050MH 	0.50 (12.7)	**DS050MH**
	0.75 (19.1)	**DS075MH**
	1.00 (25.4)	**DS100MH**
	1.25 (31.8)	**DS125MH**
	1.50 (38.1)	**DS150MH**
	2.00 (50.8)	**DS200MH**
	2.50 (63.5)	**DS250MH**
	3.00 (76.2)	**DS300MH**
	3.50 (88.9)	**DS350MH**
	4.00 (101.6)	**DS400MH**
	5.00 (127.0)	**DS500MH**

Table 28.1-8. Plate Type Hubs—Dimensions in Inches (mm)

For NEMA 3R enclosures (up to 200 A)

	Group 1 General-Duty, Heavy-Duty, Double-Throw Through 100 A		Group 2 General-Duty, Heavy-Duty, Double-Throw Through 200 A	
	Conduit Size	Catalog Number	Conduit Size	Catalog Number
DS075H1 	0.75 (19.1)	**DS075H1**	2.00 (50.8)	**DS200H2**
	1.00 (25.4)	**DS100H1**	2.50 (63.5)	**DS250H2**
	1.25 (31.8)	**DS125H1**	3.00 (76.2)	**DS300H2**
	1.50 (38.1)	**DS150H1**	—	—
	2.00 (50.8)	**DS200H1**	—	—

Note: Catalog number DS900AP adapter kit permits installation of Group 1 hubs on 200 A type general-duty, heavy-duty and double-throw switches.

Flex Center

Introduction

The Switching Device Flex Center is a special facility at the site of Eaton's Cleveland, Tennessee plant that is dedicated to providing customized safety switches and enclosed breakers that meet customer's challenging applications.

Table 28.1-9. Common Flex Center Design Offerings

Modification	Catalog Suffix	Description
Custom paint	(varies)	Special paint colors are available such as red, orange, yellow, green, black, white. Other colors may be available upon request. Custom color is applied over the standard ANSI-61 gray finish.
Nameplates	-00NP	Plastic or phenolic nameplates are available. Up to three lines of text, 25 characters per line. Standard offering is white with black letters. Custom colors and sizes available upon request. Specify text at order entry.
Lock on provisions	-00LO	Available on heavy-duty and double-throw safety switches. Provision will accept a single lock.
Trapped key interlock	-00TK	Available on heavy-duty and double-throw safety switches. Trapped key systems are used on safety switches to prevent unauthorized operations or to predetermine a series of power transfers by an authorized operator.
Upper viewing window	W	An upper viewing window is centered over the switching contacts to provide visual verification of ON/OFF status. Available on NEMA 12/3R and NEMA 4X stainless steel heavy-duty and double-throw safety switches. **Note:** 30–100 A switches are now provided with a full view cover window for both blade and blown fuse viewing.
Lower viewing window	LW	A lower viewing window is centered over the fuses and provides visual verification of blown fuse indicators. Available on 200–1200 A NEMA 12/3R and NEMA 4X stainless steel heavy-duty and double-throw safety switches. Available for fusible switches only. **Note:** 30–100 A switches are now provided with a full view cover window for both blade and blown fuse viewing.
Neutral assemblies	N	Factory-installed field neutral accessory kits. Add Suffix N on non-fusible switches, or replace the 6th character "F" with "N" on fusible switches.
Class "R" fuse clips	5 or 6	Factory-installed Class R fuse clips/provisions. Add Suffix 5 for 240 V switches, and Suffix 6 for 600 V switches. Available on 30–600 A safety switches.
Class "T" fuse clips	T	Factory-installed ClassT fuse clips/provisions. Available on 200–1200 A safety switches.
Class "J" fuse clips	J	Factory-installed Class J fuse clips/provisions. Available on 30–600 A safety switches. **Note:** Field modification kits are not available for 30 A heavy-duty safety switches. 30 A switches requiring Class J fusing must be ordered factory installed with J suffix.
Fungus proofing	-00FP	All non-metallic components of the switch are coated with a moisture and fungus-resistant varnish. The inhibitor used meets military specification: MIL-V-173C for MOISTURE AND FUNGUS-RESISTANTTREATMENT. The treated switch meets military specification MIL-T-152E for MOISTURE AND FUNGUS-RESISTANTTREATMENT OF COMMUNICATIONS, ELECTRONICS, AND ASSOCIATED EQUIPMENT. Not UL Listed.
Fuse pullers	FE	Factory-installed fuse pullers. **Note:** Standard NEMA 12/3R and 4X switches 30–200 A are supplied with fuse pullers from the factory.
Crimp lug pads	-00CK	Factory-installed crimp lug pad kits. Available on 400–800 A safety switches. Crimp lugs are not included. **Note:** Standard heavy-dutyType DH switches 30–200 A are adaptable to crimp lugs; simply remove the box lugs.
Copper lugs	-00CL	Factory-installed copper lug kits. Available on 30–800 A safety switches.
Ground lug kits factory installed	G	Factory-installed ground lug kits. Provides additional ground lug capacity when compared to ground lugs that come with standard safety switches. Available on 30–1200 A safety switches.
Custom lugs	-000L	Customer-specified lug arrangements are available on heavy-duty and double-throw safety switches.
Auxiliary contacts	2 or 3	Factory-installed auxiliary contact kits (DS200EK1 or DS200EK2). Auxiliary contacts are Early-Make/Early-Break operation. To specify 1NO/1NC contact, add Suffix 2. To specify 2NO/2NC contacts, add Suffix 3.
Control pole	-00CP	The K-Series control pole provides one NO contact. It mounts in the exact location as the neutral block using the same pre-drilled holes. This is directly connected to the power pole operating shaft. Direct connection and visible blades provide more secure electrical interlocking than handle linkage operation of a snap/switch type interlock. This reliability meets the requirements of many specifications for four-pole switches when the fourth pole is required for secure electrical interlocking. This control pole provides Same-Make/Same-Break operation.
Control pole with offset	-0CP2	Same as above except this control pole provides Late-Make/Early-Break operation. Both Control Pole options are provided when you purchase the DS16CP field kit.
Switching neutral double throws	SN	UL Listed for three-pole and four-pole non-fusible double-throw safety switches. Switching neutrals are required for separately derived systems when bonding the neutral of the generator to a grounding system at the generator.
Surge protection	(varies)	Factory-installed EatonType 1 (SP1 series) orType 2 (CVX series) surge protective device products. SPD installed and wired to load side of disconnect.

Additional Flex Center Design Offerings

- Left-hand design (30–200 A)
- Cover controls
- 200% neutrals
- Seam-welded stainless steel
- Quick Connect products with Cam-Lok™ and Posi-Lok™ receptacles
- Custom enclosures
- 316 grade stainless steel
- Mill-duty switches
- Irrigation switches
- Fuses installed
- Hook stick handles (heavy-duty switches only)
- Custom labels
- Custom mounting
- Pad-mount designs
- Non-standard receptacles
- Enhanced visible blade
- Voltage indicators

Contact

For more information on these or any other modifications, please contact the Switching Device Flex Center at 1-888-329-9272, FlexSwitches@eaton.com or visit Eaton.com/FlexCenter.

General-Duty

Table 28.1-10. General-Duty, Non-Fusible, 240 V, Three-Pole, Single-Throw

Ampere Rating	NEMA 1					NEMA 3R				
	Dimensions in Inches (mm)				Weight Lb (kg)	Dimensions in Inches (mm)				Weight Lb (kg)
	Width (W)	Height (H)	Depth (D)	Depth (D2)		Width (W)	Height (H)	Depth (D)	Depth (D2)	
30	6.38 (162.1)	10.69 (271.5)	6.88 (174.8)	3.75 (95.2)	6 (2.724)	6.38 (162.1)	10.81 (274.6)	6.88 (174.8)	3.75 (95.2)	6 (2.724)
60	8.69 (220.7)	14.19 (360.4)	7.38 (187.5)	4.21 (106.9)	9 (4.086)	8.69 (220.7)	14.38 (365.3)	7.38 (187.5)	4.21 (106.9)	9 (4.086)
100	9.13 (231.9)	18.81 (477.8)	7.38 (187.5)	4.23 (107.4)	12 (5.448)	9.13 (231.9)	19.25 (489.0)	7.38 (187.5)	4.23 (107.4)	12 (5.448)
200	16.00 (406.4)	25.25 (641.4)	11.25 (285.8)	6.14 (156.0)	48 (21.792)	16.00 (406.4)	25.50 (647.7)	11.25 (285.8)	6.14 (156.0)	55 (24.97)
400	23.00 (584.2)	44.75 (1136.7)	12.63 (320.8)	7.27 (184.7)	100 (45.4)	23.00 (584.2)	45.19 (1147.8)	12.63 (320.8)	7.27 (184.7)	105 (47.67)
600	24.00 (609.6)	52.25 (1327.2)	14.25 (362.0)	8.95 (227.3)	130 (59.02)	24.00 (609.6)	52.70 (1338.6)	14.25 (362.0)	8.95 (227.3)	135 (61.29)

Table 28.1-11. General-Duty, Fusible, 240 V, Three-Pole, Solid Neutral, Single-Throw

Ampere Rating	NEMA 1					NEMA 3R				
	Dimensions in Inches (mm)				Weight Lb (kg)	Dimensions in Inches (mm)				Weight Lb (kg)
	Width (W)	Height (H)	Depth (D)	Depth (D2)		Width (W)	Height (H)	Depth (D)	Depth (D2)	
30	6.38 (162.1)	10.69 (271.5)	6.88 (174.8)	3.75 (95.2)	6 (2.724)	6.38 (162.1)	10.81 (274.6)	6.88 (174.8)	3.75 (95.2)	6 (2.724)
60	8.68 (220.7)	14.19 (360.4)	7.38 (187.5)	4.21 (106.9)	10 (4.54)	8.69 (220.7)	14.38 (365.3)	7.38 (187.5)	4.21 (106.9)	10 (4.54)
100	9.13 (231.9)	18.81 (477.8)	7.38 (187.5)	4.23 (107.4)	14 (6.356)	9.13 (231.9)	19.25 (489.0)	7.38 (187.5)	4.23 (107.4)	14 (6.356)
200	16.00 (406.4)	24.75 (628.7)	11.25 (285.8)	6.14 (156.0)	48 (21.792)	16.00 (406.4)	25.50 (647.7)	11.25 (285.8)	6.14 (156.0)	55 (24.97)
400	23.00 (584.2)	44.75 (1136.7)	12.63 (320.8)	7.27 (184.7)	110 (49.94)	23.00 (584.2)	45.19 (1147.8)	12.63 (320.8)	7.27 (184.7)	115 (52.21)
600	24.00 (609.6)	52.25 (1327.2)	14.25 (362.0)	8.95 (227.3)	145 (65.83)	24.00 (609.6)	52.70 (1338.6)	14.25 (362.0)	8.95 (227.3)	150 (68.1)

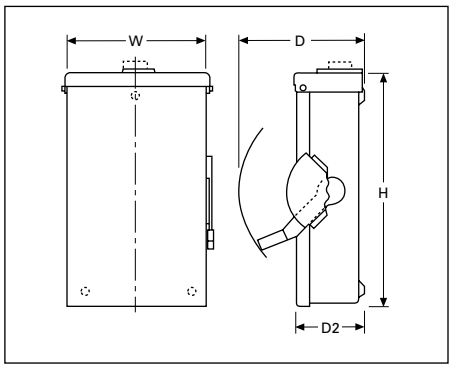


Figure 28.1-1. NEMA 1-3R 30–100 A

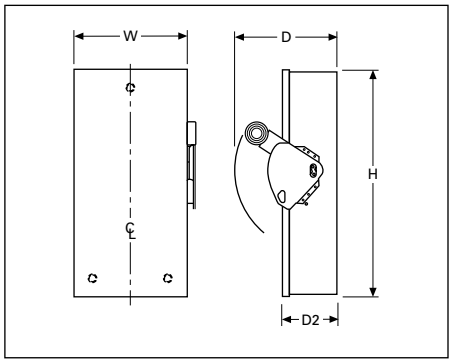


Figure 28.1-2. NEMA 1-3R 200–600 A

Heavy-Duty

Approximate Dimensions in Inches (mm)

Table 28.1-12. Heavy-Duty, Non-Fusible, 600 V, Three-Pole, Single-Throw ①

Ampere Rating	NEMA 1, 3R					NEMA 12, 4X Stainless Steel, 4				
	Dimensions in Inches (mm)				Weight Lb (kg)	Dimensions in Inches (mm)				Weight Lb (kg)
	Width (W)	Height (H)	Depth (D)	Depth (D2)		Width (W)	Height (H)	Depth (D)	Depth (D2)	
30	8.13 (206.5)	15.88 (403.4)	10.00 (254.0)	5.25 (133.3)	16 (7.264)	8.13 (206.5)	12.13 (308.1)	10.00 (254.0)	5.50 (139.7)	17 (7.718)
60	8.13 (206.5)	15.88 (403.4)	10.00 (254.0)	5.25 (133.3)	16 (7.264)	8.13 (206.5)	12.13 (308.1)	10.00 (254.0)	5.50 (139.7)	17 (7.718)
100	11.13 (282.7)	21.69 (550.9)	10.00 (254.0)	5.25 (133.3)	22 (9.988)	11.13 (282.7)	24.00 (609.6)	10.25 (260.4)	5.50 (139.7)	28 (12.712)
200	16.00 (406.4)	27.63 (701.8)	11.25 (285.8)	6.14 (156.0)	46 (20.884)	16.00 (406.4)	34.38 (873.3)	11.50 (292.1)	6.44 (163.6)	55 (24.97)
400	23.00 (584.2)	45.19 (1147.8)	12.63 (320.8)	7.27 (184.7)	110 (49.94)	23.00 (584.2)	57.63 (1463.8)	12.63 (320.8)	7.19 (182.6)	125 (56.75)
600	24.00 (609.6)	52.70 (1338.6)	14.25 (362.0)	8.95 (227.3)	135 (61.29)	24.00 (609.6)	63.00 (1600.2)	14.25 (362.0)	8.88 (225.6)	167 (75.818)
800	25.38 (644.7)	56.69 (1439.9)	14.25 (362.0)	8.95 (227.3)	158 (71.732)	25.38 (644.7)	71.75 (1822.5)	14.25 (362.0)	8.88 (225.6)	175 (79.45)
1200	41.47 (1053.3)	70.31 (1785.9)	19.94 (506.5)	12.44 (316.0)	430 (195.22)	41.47 (1053.3)	70.31 (1785.9)	19.94 (506.5)	13.51 (343.2)	475 (215.65)

① Data applicable to heavy-duty and enhanced visible blade switches.

Table 28.1-13. Heavy-Duty, Fusible, 240 and 600 V, Three-Pole Solid Neutral, Single-Throw ②

Ampere Rating	NEMA 1, 3R					NEMA 12, 4X Stainless Steel, 4				
	Dimensions in Inches (mm)				Weight Lb (kg)	Dimensions in Inches (mm)				Weight Lb (kg)
	Width (W)	Height (H)	Depth (D)	Depth (D2)		Width (W)	Height (H)	Depth (D)	Depth (D2)	
30	8.13 (206.5)	15.88 (403.4)	10.00 (254.0)	5.25 (133.3)	20 (9.08)	8.13 (206.5)	17.88 (454.2)	10.00 (254.0)	5.50 (139.7)	22 (9.988)
60	8.13 (206.5)	15.88 (403.4)	10.00 (254.0)	5.25 (133.3)	20 (9.08)	8.13 (206.5)	17.88 (454.2)	10.00 (254.0)	5.50 (139.7)	22 (9.988)
100	11.13 (282.7)	21.69 (550.9)	10.00 (254.0)	5.25 (133.3)	27 (12.258)	11.13 (282.7)	24.00 (609.6)	10.25 (260.4)	5.50 (139.7)	30 (13.62)
200	16.00 (406.4)	27.63 (701.8)	11.25 (285.8)	6.14 (156.0)	52 (23.608)	16.00 (406.4)	34.38 (873.3)	11.50 (292.1)	6.44 (163.6)	61 (27.694)
400	23.00 (584.2)	45.19 (1147.8)	12.63 (320.8)	7.27 (184.7)	120 (54.48)	23.00 (584.2)	57.63 (1463.8)	12.63 (320.8)	7.19 (182.6)	135 (61.29)
600	24.00 (609.6)	52.70 (1338.6)	14.25 (362.0)	8.95 (227.3)	153 (69.462)	24.00 (609.6)	63.00 (1600.2)	14.25 (362.0)	8.88 (225.6)	203 (92.162)
800	25.38 (644.7)	56.69 (1439.9)	14.25 (362.0)	8.95 (227.3)	168 (76.272)	25.38 (644.7)	71.75 (1822.5)	14.25 (362.0)	8.88 (225.6)	213 (96.702)
1200	41.47 (1053.3)	70.31 (1785.9)	19.94 (506.5)	12.44 (316.0)	465 (211.11)	41.47 (1053.3)	70.31 (1785.9)	19.94 (506.5)	13.51 (343.2)	510 (231.54)

② Data applicable to heavy-duty and enhanced visible blade switches.

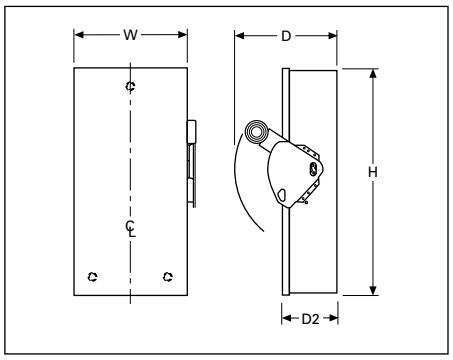


Figure 28.1-3. NEMA 1, 3R 30–1200 A

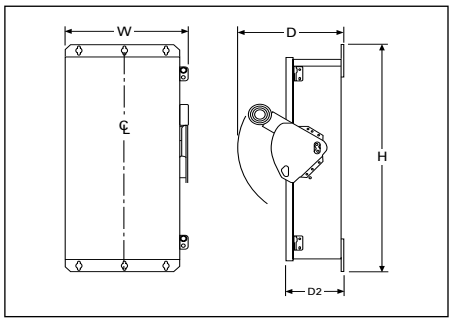


Figure 28.1-4. NEMA 4/4X and 12 30–1200 A

Heavy-Duty Safety Switches with Surge Protection

Approximate Dimensions in Inches (mm)

Table 28.1-14. Heavy-Duty Safety Switches with Surge Protection

Ampere rating	Height (H)	Width (W)	Depth (D1)	Depth (D2)
30	25.02 (635.5)	15.00 (381.0)	10.31 (261.9)	5.62 (142.7)
60	25.02 (635.5)	15.00 (381.0)	10.31 (261.9)	5.62 (142.7)
100	25.02 (635.5)	15.00 (381.0)	10.31 (261.9)	5.62 (142.7)
200	35.37 (898.4)	20.44 (519.2)	11.66 (296.2)	6.48 (164.6)
400	57.47 (1459.7)	23.30 (591.8)	12.45 (316.2)	7.36 (186.9)
600	62.97 (1599.4)	24.30 (617.2)	14.08 (357.6)	8.98 (228.1)
800	71.72 (1821.7)	25.55 (649.0)	14.08 (357.6)	8.98 (228.1)
1200 ①	73.77 (1873.8)	43.12 (1095.0)	19.20 (487.7)	12.46 (316.5)

① Available with SP1 type surge protective device only.

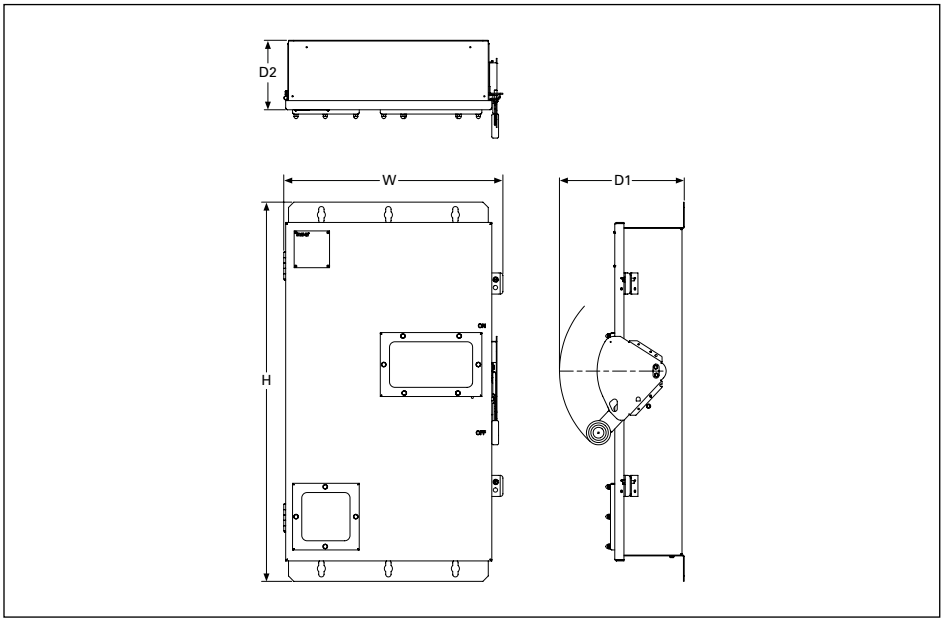


Figure 28.1-5. Heavy-Duty Safety Switch with Surge Protection

EnviroLine

Approximate Dimensions in Inches (mm)

Table 28.1-16. Heavy-Duty, Non-Fusible, 600 V, Three-Pole, Single-Throw

Ampere Rating	Width (W)	Height (H)	Depth (D)	Depth (D2)	Weight Lb (kg)
4X Stainless Steel					
30 60 100	8.13 (206.5) 8.13 (206.5) 11.13 (282.7)	12.13 (308.1) 12.13 (308.1) 24.00 (609.6)	10.00 (254.0) 10.00 (254.0) 10.25 (260.4)	5.50 (139.7) 5.50 (139.7) 5.50 (139.7)	17 (7.718) 17 (7.718) 28 (12.712)
200 400	16.00 (406.4) 23.00 (584.2)	34.38 (873.3) 57.63 (1463.8)	11.50 (292.1) 12.63 (320.8)	6.44 (163.6) 7.19 (182.6)	55 (24.97) 125 (56.75)

Table 28.1-17. Heavy-Duty, Fusible, 240 V and 600 V, Three-Pole, Solid Neutral, Single-Throw

Ampere Rating	Width (W)	Height (H)	Depth (D)	Depth (D2)	Weight Lb (kg)
4X Stainless Steel					
30 60 100	8.13 (206.5) 8.13 (206.5) 11.13 (282.7)	17.88 (454.2) 17.88 (454.2) 24.00 (609.6)	10.00 (254.0) 10.00 (254.0) 10.25 (260.4)	5.50 (139.7) 5.50 (139.7) 5.50 (139.7)	22 (9.988) 22 (9.988) 30 (13.62)
200 400	16.00 (406.4) 23.00 (584.2)	34.38 (873.3) 57.63 (1463.8)	11.50 (292.1) 12.63 (320.8)	6.44 (163.6) 7.19 (182.6)	61 (27.694) 135 (61.29)

Table 28.1-18. Heavy-Duty, Non-Fusible, 600 V, Three-Pole, Single-Throw

Ampere Rating	Width (W)	Height (H)	Depth (D)	Depth (D2)	Weight Lb (kg)
NEMA 12/3R, 4, 4X Stainless Steel					
30 60 100	8.76 (222.5) 8.76 (222.5) 11.79 (299.5)	19.08 (484.6) 19.08 (484.6) 24.95 (633.7)	10.22 (259.6) 10.22 (259.6) 10.22 (259.6)	5.50 (139.7) 5.50 (139.7) 5.50 (139.7)	22 (9.988) 22 (9.988) 30 (13.62)
200 400 600	16.95 (430.5) 24.12 (612.6) 25.01 (635.3)	35.38 (898.7) 57.47 (1459.7) 62.97 (1599.4)	11.63 (295.4) 12.43 (315.7) 12.79 (324.9)	6.44 (163.6) 7.19 (182.6) 8.95 (227.3)	61 (27.694) 135 (61.29) 203 (92.162)
800 1200	26.35 (669.3) 43.11 (1095.0)	71.72 (1821.7) 73.77 (1873.8)	12.79 (324.9) 17.15 (435.6)	8.95 (227.3) 12.45 (316.2)	213 (96.702) 510 (231.54)

Approximate Dimensions in Inches (non-window version)
Dimensions are for estimating purposes only

Table 28.1-19. Heavy-Duty Safety Switches with Weld Receptacle, Fusible and Non-Fusible

Ampere Rating	Width			Height		Depth		Receptacle Brand
	(W1)	(W2)	(W3)	(H1)	(H2)	(D1)	(D2)	
NEMA Type 12/3R, 4X Stainless Steel								
30	8.05	6.75	7.73	19.09	6.67	5.50	10.22	Crouse-Hinds
60	8.05	6.75	7.73	19.09	6.67	5.50	10.22	Crouse-Hinds
100	11.08	9.75	10.76	24.95	7.48	5.50	10.22	Crouse-Hinds

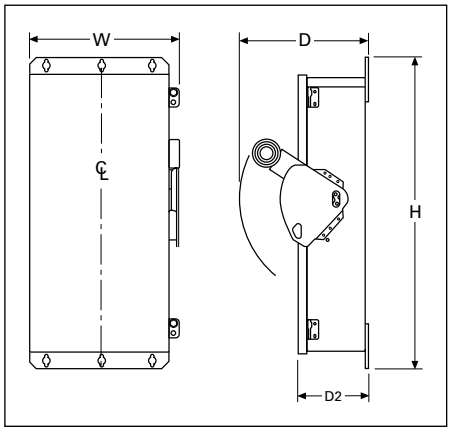


Figure 28.1-6. NEMA 4X Heavy-Duty 30–400 A

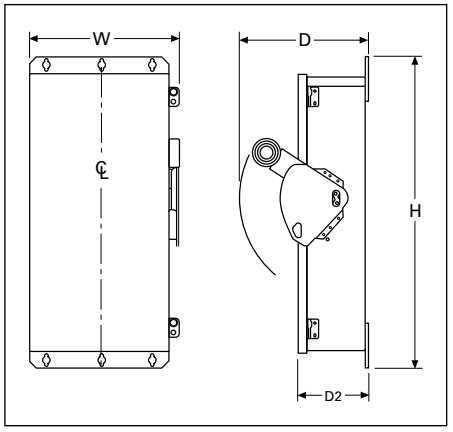


Figure 28.1-7. NEMA 12/3R, 4, 4X Heavy-Duty 30–1200 A

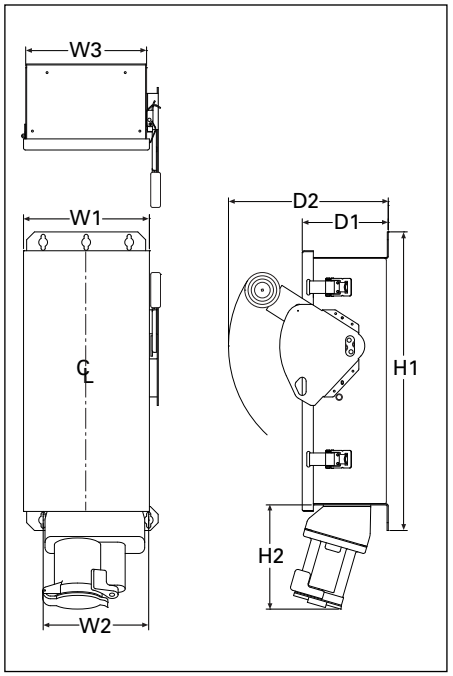


Figure 28.1-8. Receptacle Switches

Table 28.1-20. Non-Metallic NEMA 4X Rated Safety Switches, Fusible and Non-Fusible

Ampere Rating	Height	Width	Depth		Weight Lb (kg)
	Height (H)	Width (W)	Depth (D1)	Depth (D2)	
30 60	19.25 (489.0) 19.25 (489.0)	11.30 (287.0) 11.30 (287.0)	15.46 (392.7) 15.46 (392.7)	8.63 (219.2) 8.63 (219.2)	32 (14.5) 32 (14.5)
100 200	27.25 (692.2) 27.25 (692.2)	15.30 (388.6) 25.30 (642.6)	16.46 (418.1) 16.46 (418.1)	9.70 (246.4) 9.70 (246.4)	45 (20.4) 77 (35.0)

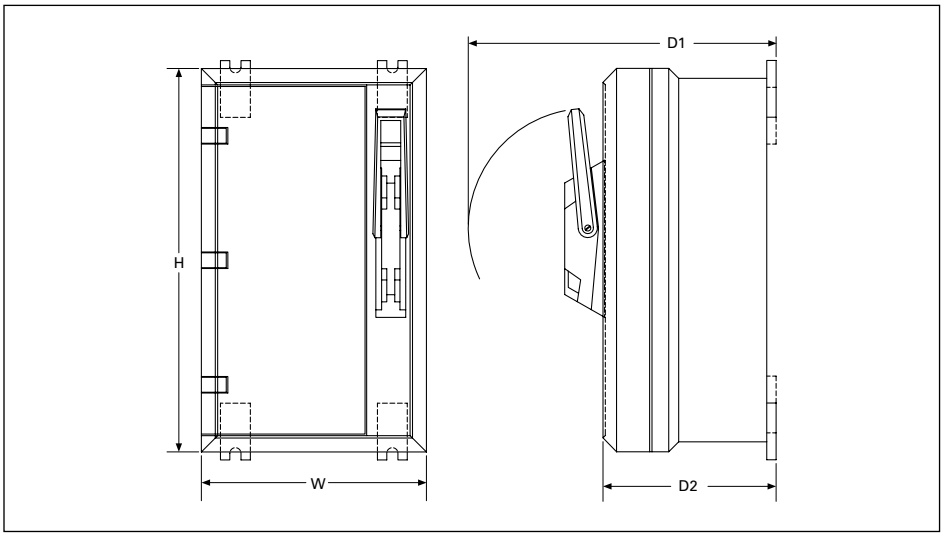


Figure 28.1-9. 240 Vac and 600 Vac Heavy-Duty Non-Metallic

Heavy-Duty Double-Throw

Approximate Dimensions in Inches (mm)

Table 28.1-21. Heavy-Duty, Non-Fusible, 240 V and 600 V, Three-Pole, Double-Throw

Ampere Rating	Width (W)	Height (H)	Depth (D)	Depth (D2)	Weight Lb (kg)
NEMA 1, 3R					
30 60 100	11.94 (303.3) 11.94 (303.3) 11.94 (303.3)	24.63 (625.6) 24.63 (625.6) 24.63 (625.6)	9.88 (251.0) 9.88 (251.0) 9.88 (251.0)	5.38 (136.7) 5.38 (136.7) 5.38 (136.7)	34 (15.436) 34 (15.436) 34 (15.436)
200 400 600	19.56 (496.8) 23.13 (587.5) 27.44 (697.0)	37.38 (949.5) 53.81 (1366.8) 63.31 (1608.1)	11.25 (285.8) 12.50 (317.5) 14.13 (358.9)	6.10 (154.9) 7.25 (184.2) 8.88 (225.6)	80 (36.32) 140 (63.56) 175 (79.45)
800 1200	27.44 (697.0) 42.62 (1082.5)	63.31 (1608.1) 78.11 (1984.0)	14.13 (358.9) 29.62 (752.3)	8.88 (225.6) 20.47 (519.9)	175 (79.45) 473 (214.6)
NEMA 12, 4X Stainless Steel					
30 60 100	12.00 (304.8) 12.00 (304.8) 12.00 (304.8)	25.88 (657.4) 25.88 (657.4) 25.88 (657.4)	10.25 (260.4) 10.25 (260.4) 10.25 (260.4)	5.50 (139.7) 5.50 (139.7) 5.50 (139.7)	60 (27.24) 60 (27.24) 60 (27.24)
200 400	19.50 (495.3) 23.00 (584.2)	41.00 (1041.4) 57.50 (1460.5)	11.63 (295.4) 12.50 (317.5)	6.48 (164.6) 7.25 (184.2)	105 (47.67) 185 (83.99)

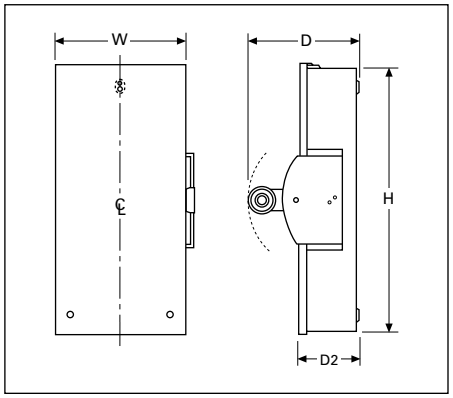


Figure 28.1-10. NEMA 1, 3R Double-Throw 30–1200 A

Table 28.1-22. Heavy-Duty, Fusible, 240 V and 600 V, Three-Pole, Double-Throw

Ampere Rating	Width (W)	Height (H)	Depth (D)	Depth (D2)	Weight Lb (kg)
NEMA 1, 3R					
30 60 100	11.94 (303.3) 11.94 (303.3) 11.94 (303.3)	36.63 (930.4) 36.63 (930.4) 36.63 (930.4)	9.88 (251.0) 9.88 (251.0) 9.88 (251.0)	5.38 (136.7) 5.38 (136.7) 5.38 (136.7)	44 (19.976) 44 (19.976) 44 (19.976)
200 400 600	19.56 (496.8) 25.38 (644.7) 28.12 (714.3)	50.88 (1292.4) 74.75 (1898.7) 58.86 (1495.0)	11.25 (285.8) 14.13 (358.9) 25.62 (650.7)	6.10 (154.9) 8.88 (225.6) 20.47 (520.0)	95 (43.13) 230 (104.42) 282 (127.9)
800 1200	28.12 (714.2) 42.62 (1082.5)	58.86 (1495.0) 78.11 (1984.0)	25.62 (650.7) 29.62 (752.3)	20.47 (519.9) 20.47 (519.9)	282 (127.9) 509 (230.9)
NEMA 12, 4X Stainless Steel					
30 60 100	12.00 (304.8) 12.00 (304.8) 12.00 (304.8)	39.81 (1011.2) 39.81 (1011.2) 39.81 (1011.2)	10.25 (260.4) 10.25 (260.4) 10.25 (260.4)	5.50 (139.7) 5.50 (139.7) 5.50 (139.7)	45 (20.43) 45 (20.43) 45 (20.43)
200 400	19.56 (496.8) 25.38 (644.7)	55.63 (1413.0) 74.75 (1898.7)	11.63 (295.4) 14.13 (358.9)	6.46 (164.1) 8.92 (226.6)	100 (45.4) 260 (118.04)

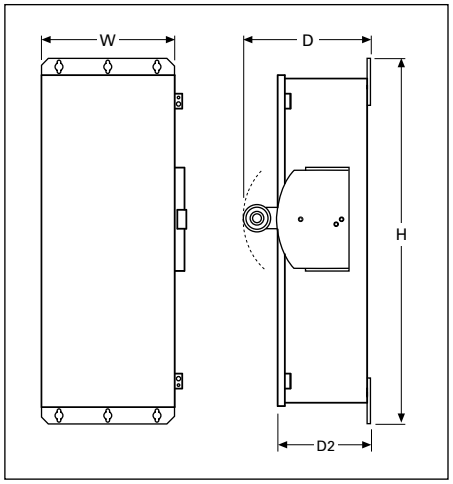


Figure 28.1-11. NEMA 12, 4X Double-Throw 30–400 A

Shunt Trip Safety Switch

Approximate Dimensions in Inches (mm)

Table 28.1-23. Shunt Trip Safety Switch, 240 Vac and 600 Vac

Ampere Rating	Fuse Class ①	Number of Poles	Enclosure Dimensions ②, Exterior in Inches (mm)			
			Height (H)	Width (W)	Depth (D1)	Depth (D2)
Fusible						
30	H	2, 3 or 4 ③	21.58 (548.1)	11.58 (294.1)	11.43 (290.3)	5.58 (141.7)
60	H	2, 3 or 4 ③	21.58 (548.1)	11.58 (294.1)	11.43 (290.3)	5.58 (141.7)
100	H	2, 3 or 4 ③	24.95 (633.7)	14.89 (378.2)	11.51 (282.4)	5.58 (141.7)
200	H	2, 3 or 4	35.38 (898.7)	20.11 (510.8)	11.61 (294.9)	6.45 (163.8)
400	H	2, 3 or 4	57.47 (1459.7)	27.29 (693.2)	12.43 (315.7)	7.42 (188.5)
600	H	2, 3 or 4	62.97 (1599.4)	28.29 (718.6)	12.43 (315.7)	7.42 (188.5)
800	L	2, 3	71.72 (1821.7)	29.54 (750.3)	12.43 (315.7)	7.42 (188.5)
1200	L	2, 3	72.50 (1841.5)	47.23 (1199.6)	23.15 (588.0)	12.46 (316.5)
Non-Fusible						
30	—	2, 3 or 4 ③	21.58 (548.1)	11.58 (294.1)	11.43 (290.3)	5.58 (141.7)
60	—	2, 3 or 4 ③	21.58 (548.1)	11.58 (294.1)	11.43 (290.3)	5.58 (141.7)
100	—	2, 3 or 4 ③	24.95 (633.7)	14.89 (378.2)	11.51 (282.4)	5.58 (141.7)
200		2, 3 or 4	35.38 (898.7)	20.11 (510.8)	11.61 (294.9)	6.45 (163.8)
400	—	2, 3 or 4	57.47 (1459.7)	27.29 (693.2)	12.43 (315.7)	7.42 (188.5)
600	—	2, 3	62.97 (1599.4)	28.29 (718.6)	12.43 (315.7)	7.42 (188.5)
800	—	2, 3	71.72 (1821.7)	29.54 (750.3)	12.43 (315.7)	7.42 (188.5)
1200	—	2, 3	72.50 (1841.5)	47.23 (1199.6)	23.15 (588.0)	12.46 (316.5)

① Class H fuse clips supplied as standard on fusible devices 30–600 A, Class L for 800 A; Class R, J,T fuse clips available.
② Accurate for all enclosure NEMA type ratings—12/3R, 4, 4X stainless steel.
③ Four-pole devices are wider than dimension for 30, 60 and 100 A devices. Consult factory for details.

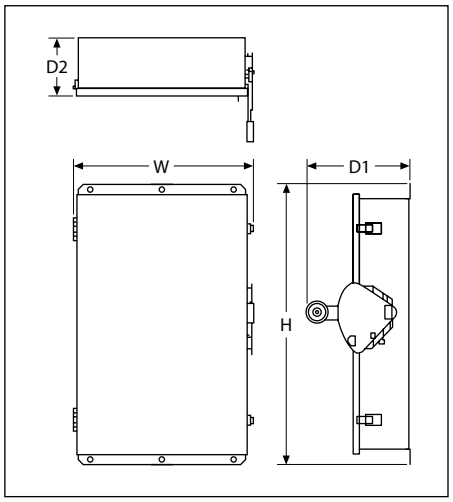


Figure 28.1-12. Shunt Trip Safety Switch, 240 Vac and 600 Vac

Auxiliary Power Heavy-Duty Safety Switch

Approximate Dimensions in Inches (mm)

Table 28.1-24. Auxiliary Power Heavy-Duty Safety Switch

Ampere Rating	NEMA 3R				Weight Lb (kg)
	Width (W)	Height (H)	Depth (D1)	Depth (D2)	
30	26.58 (675.1)	24.93 (633.2)	16.00 (406.4)	11.29 (286.8)	④
60	26.58 (675.1)	24.93 (633.2)	16.00 (406.4)	11.29 (286.8)	④
100	26.58 (675.1)	24.93 (633.2)	16.00 (406.4)	11.29 (286.8)	④

④ 108 lb (49 kg) with a 15 A GFI receptacle; 130 lb (59 kg) with a 20 A GFI receptacle.

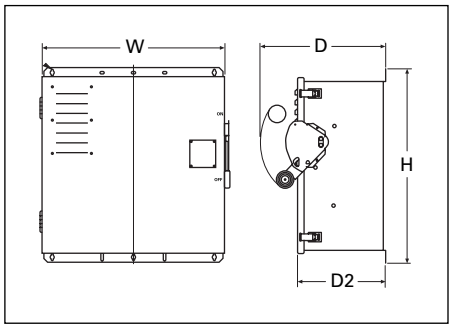
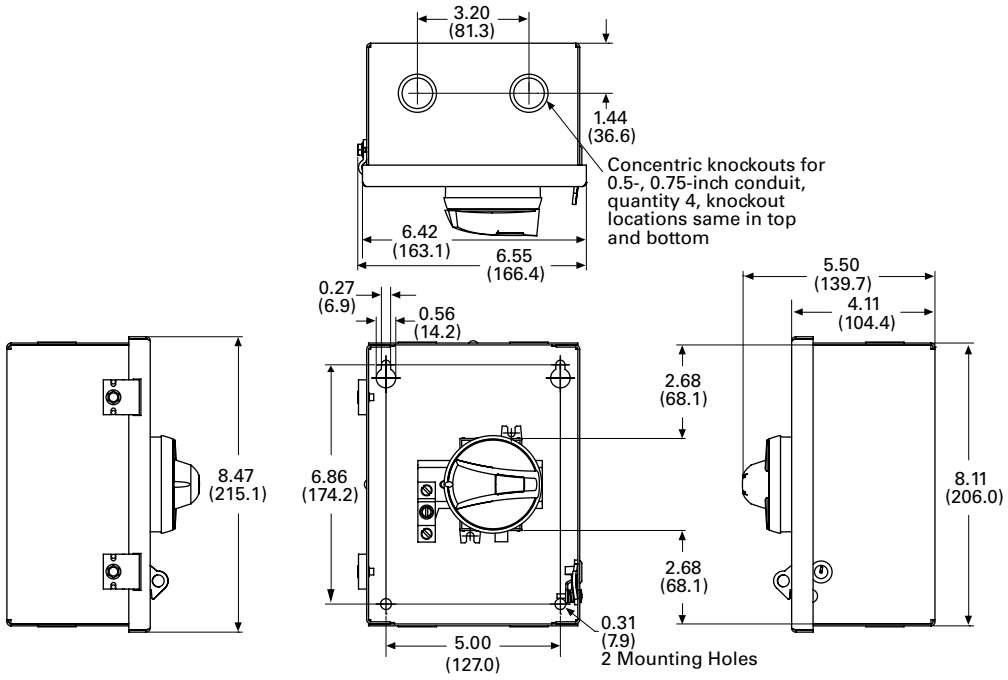


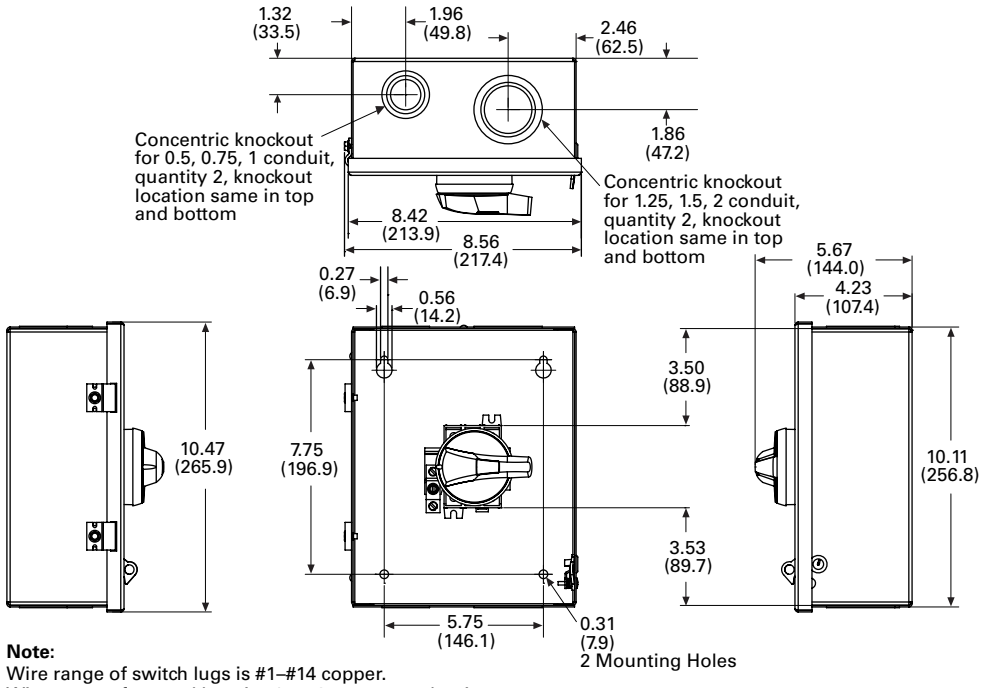
Figure 28.1-13. Auxiliary Power Heavy-Duty Safety Switch

Enclosed Rotary



Note:
Wire range of switch lugs for 16–25 A is #6–#10 copper, and for 30–40 A is #8–#14.
Wire range of ground lugs is #2–#14 copper or aluminum.

Figure 28.1-14. NEMA Type 1 (16–40 A)



Note:
Wire range of switch lugs is #1–#14 copper.
Wire range of ground lugs is #2–#14 copper or aluminum.

Figure 28.1-15. NEMA Type 1 (60–80 A)

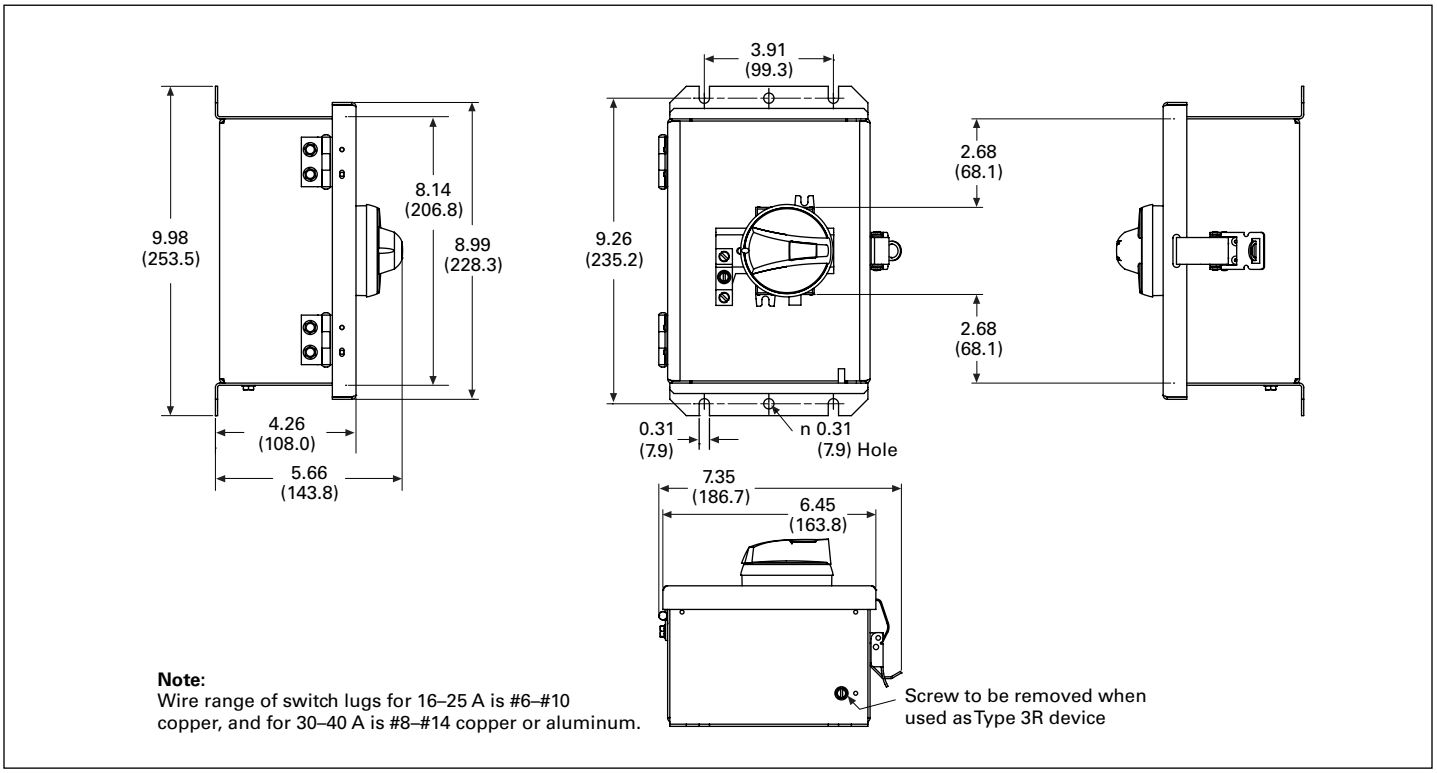


Figure 28.1-16. NEMA Type 12/3R (16–40 A)

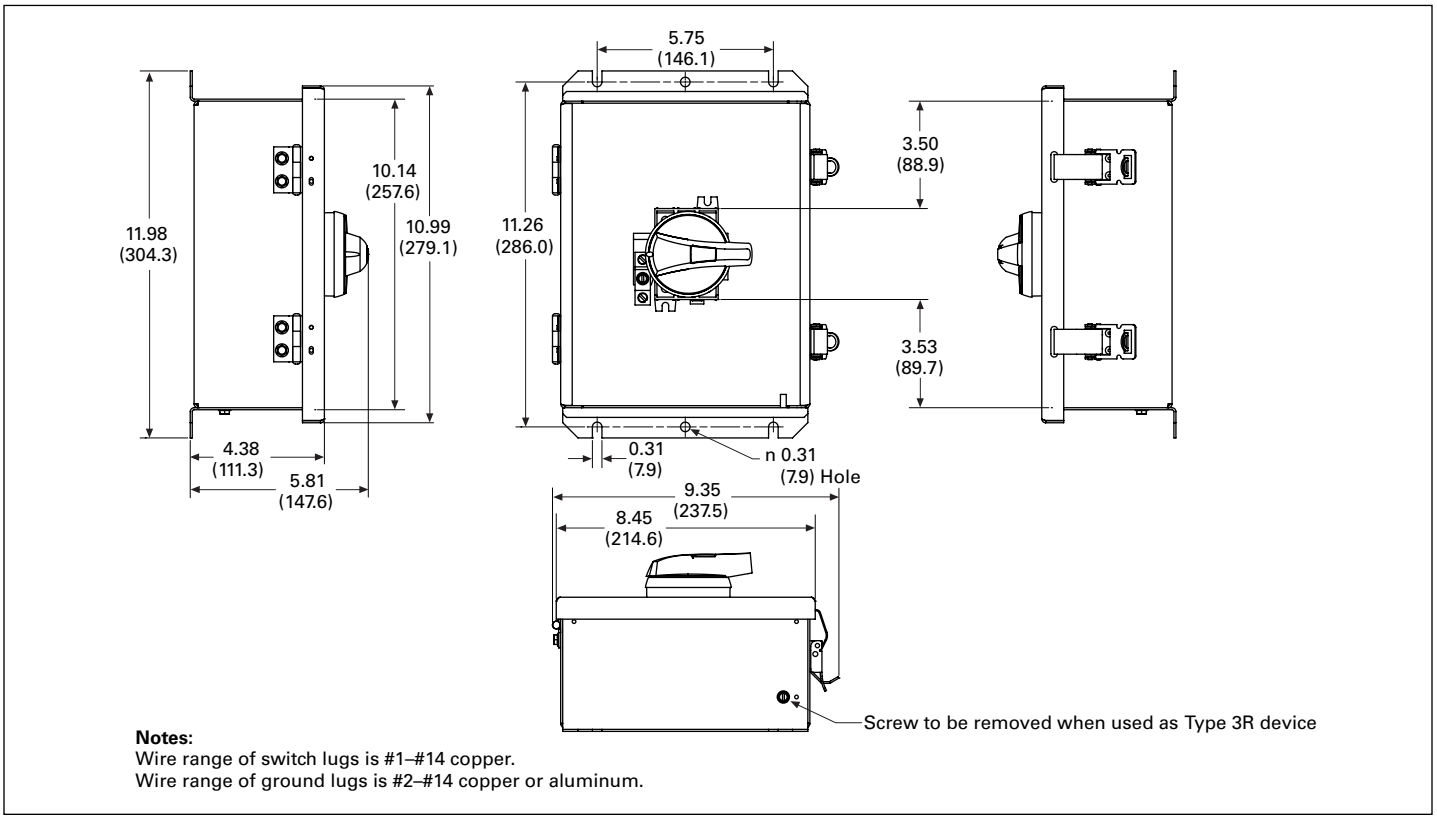


Figure 28.1-17. NEMA Type 12/3R (60–80 A)

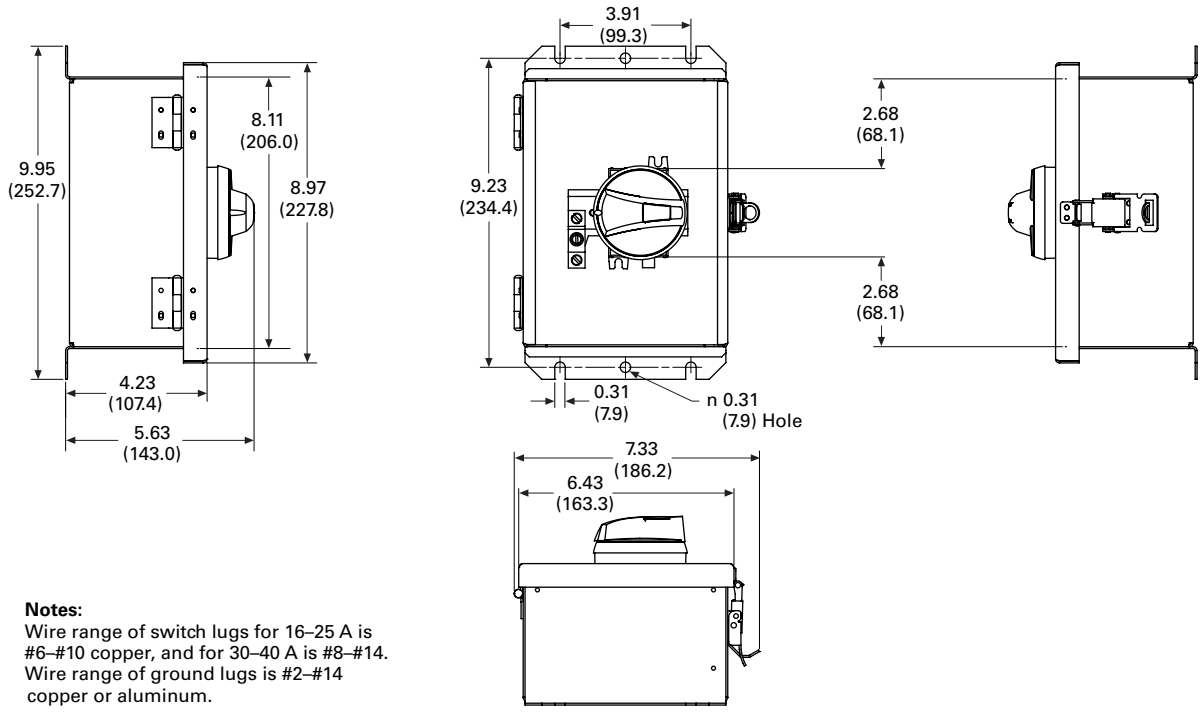


Figure 28.1-18. NEMA Type 4X Stainless (16–40 A)

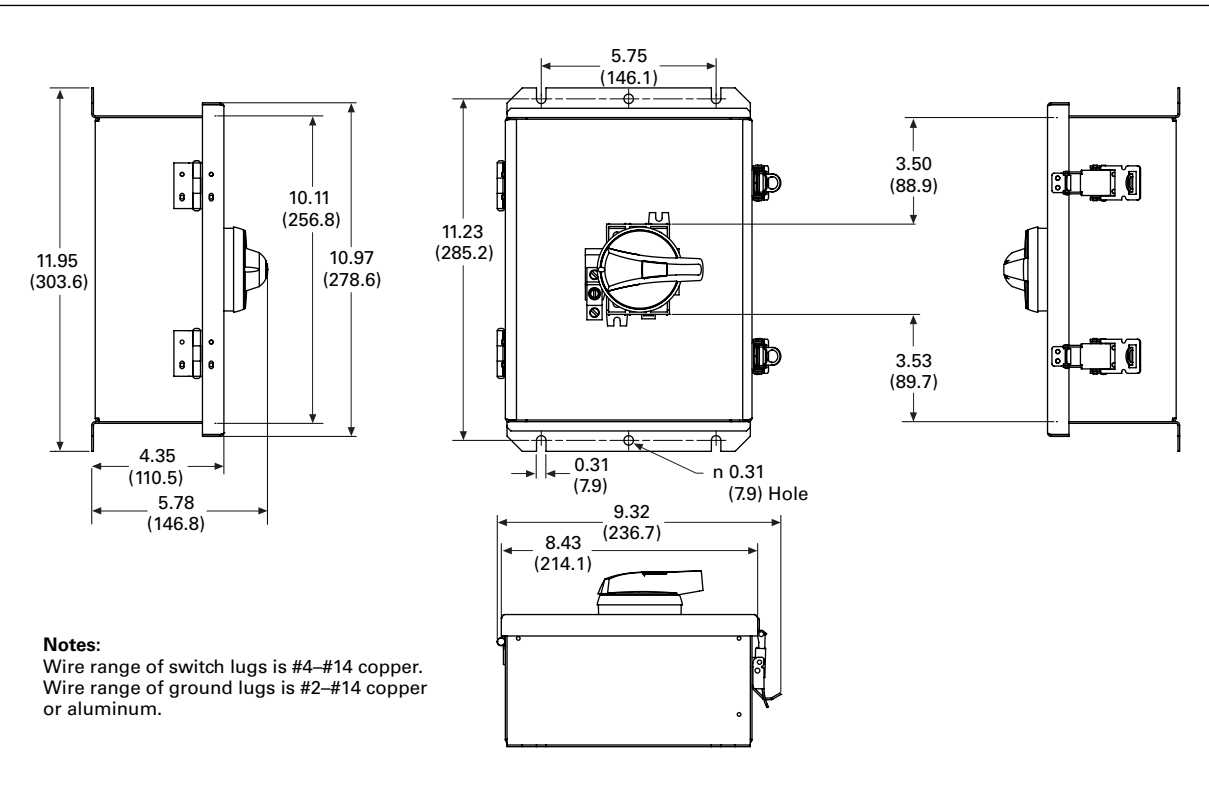
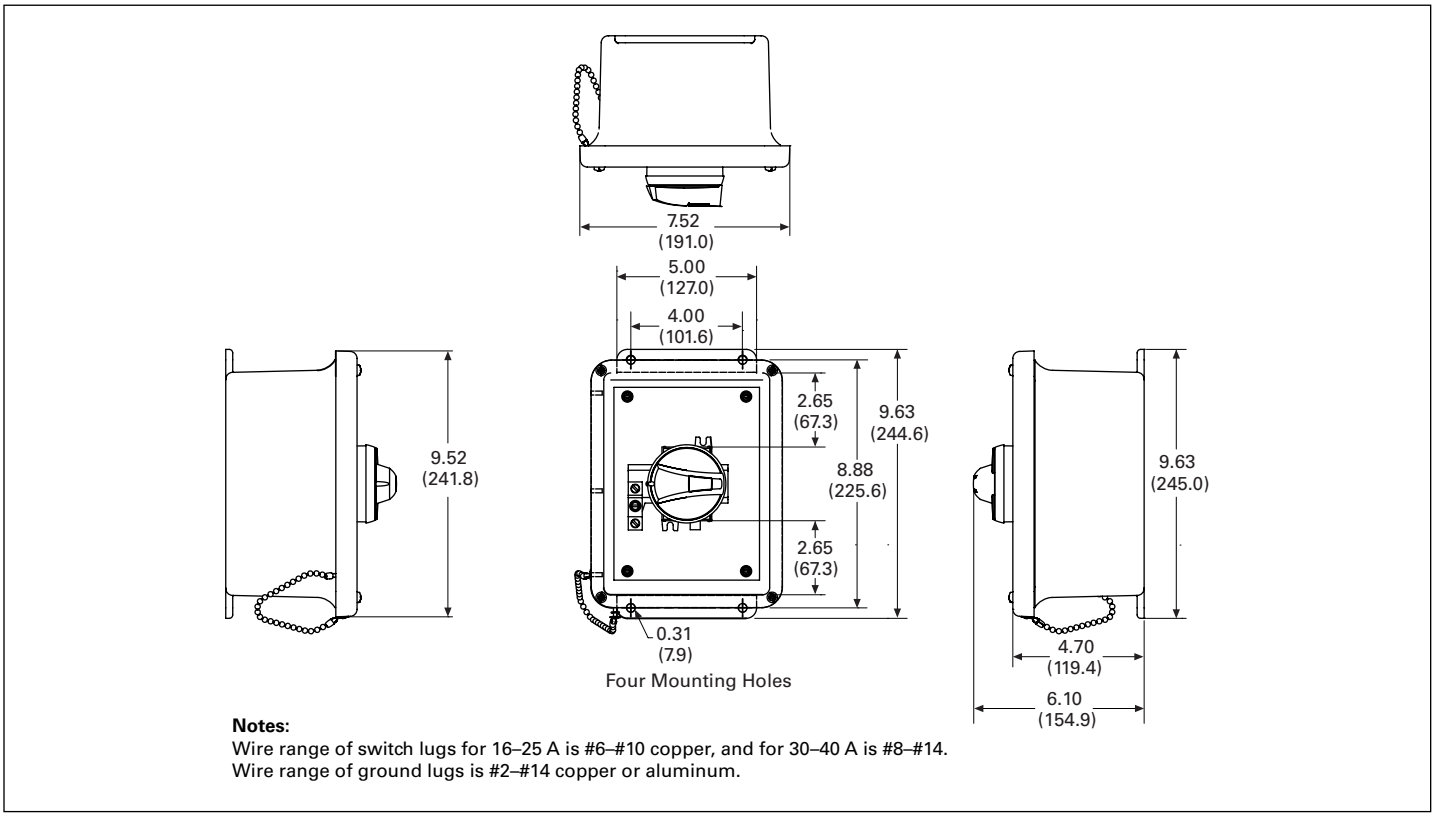
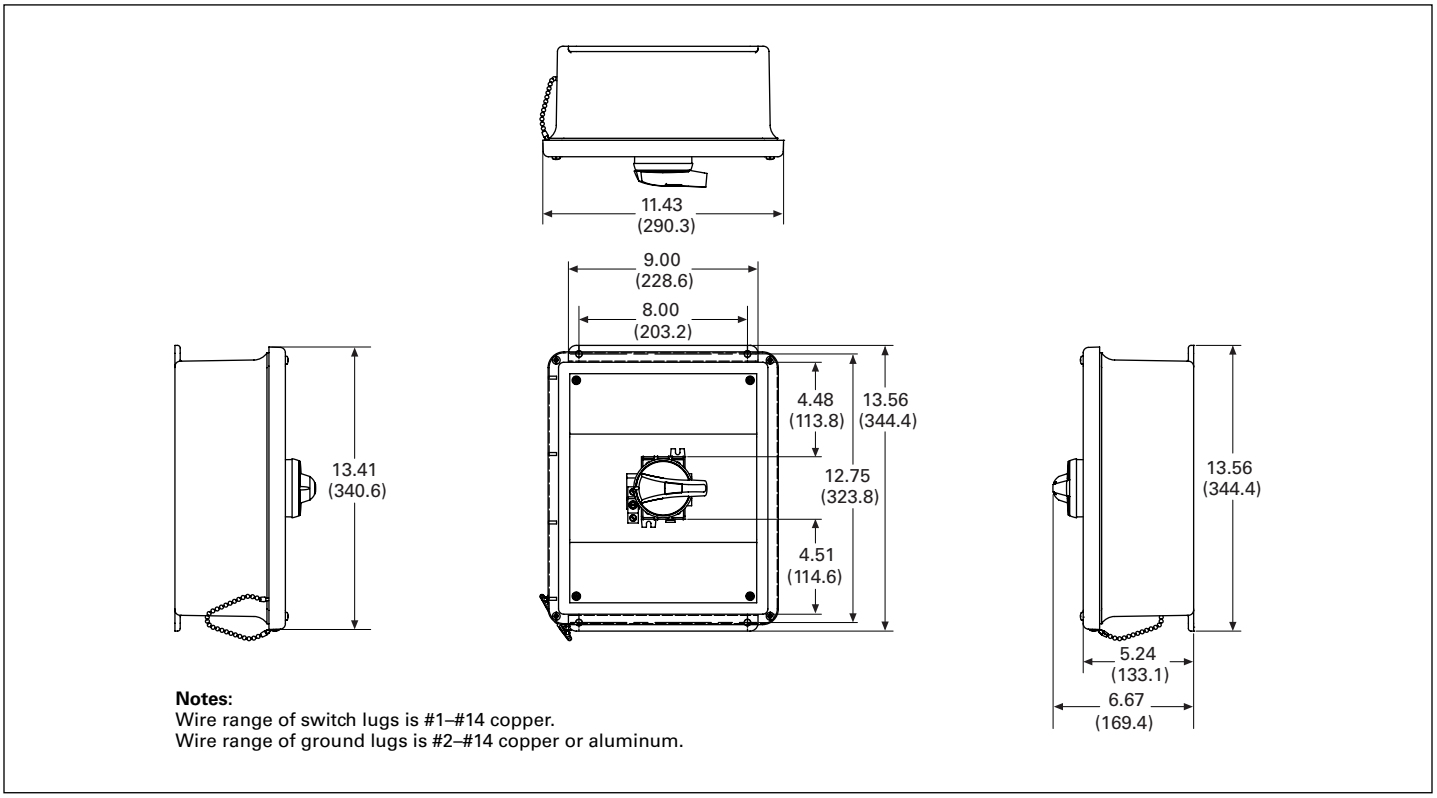


Figure 28.1-19. NEMA Type 4X Stainless (60–80 A)



Notes:
Wire range of switch lugs for 16–25 A is #6–#10 copper, and for 30–40 A is #8–#14.
Wire range of ground lugs is #2–#14 copper or aluminum.

Figure 28.1-20. NEMA Type 4X Thermoset Polyester (16–40 A)



Notes:
Wire range of switch lugs is #1–#14 copper.
Wire range of ground lugs is #2–#14 copper or aluminum.

Figure 28.1-21. NEMA Type 4X Thermoset Polyester (60–80 A)

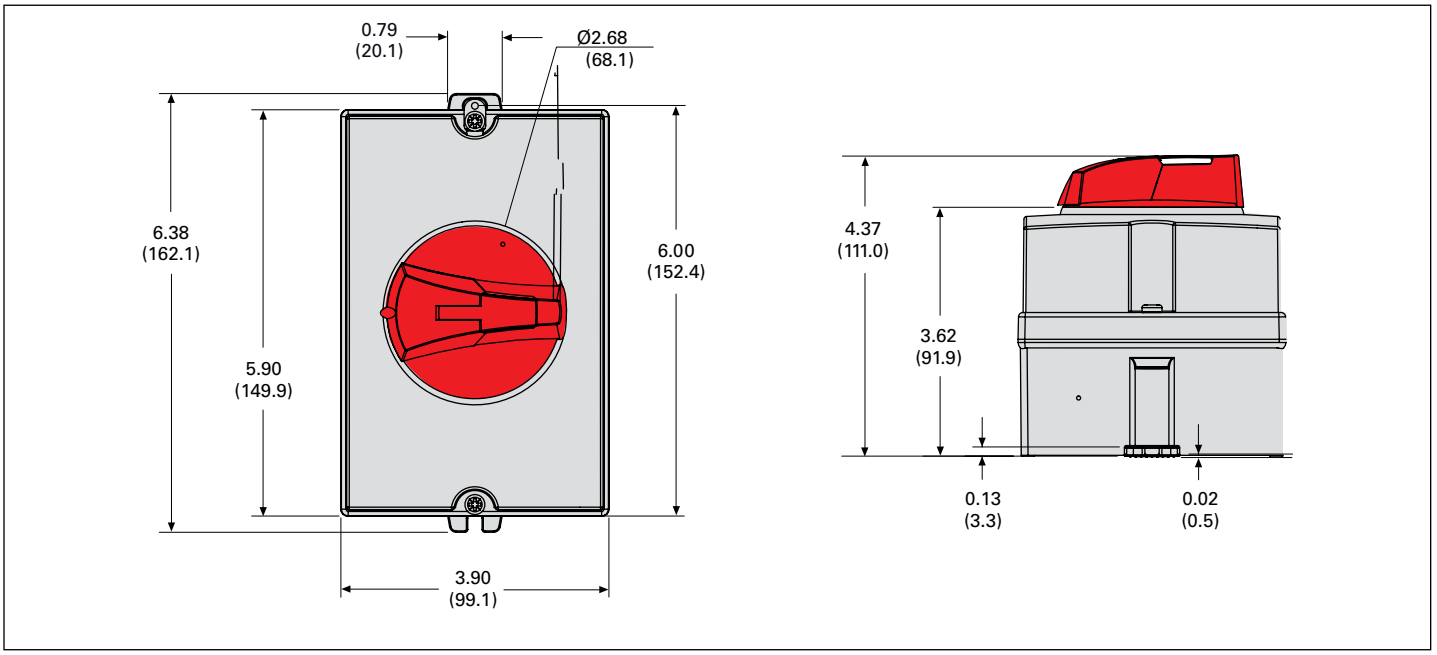


Figure 28.1-22. NEMA Type 4X—Polycarbonate (30 A)

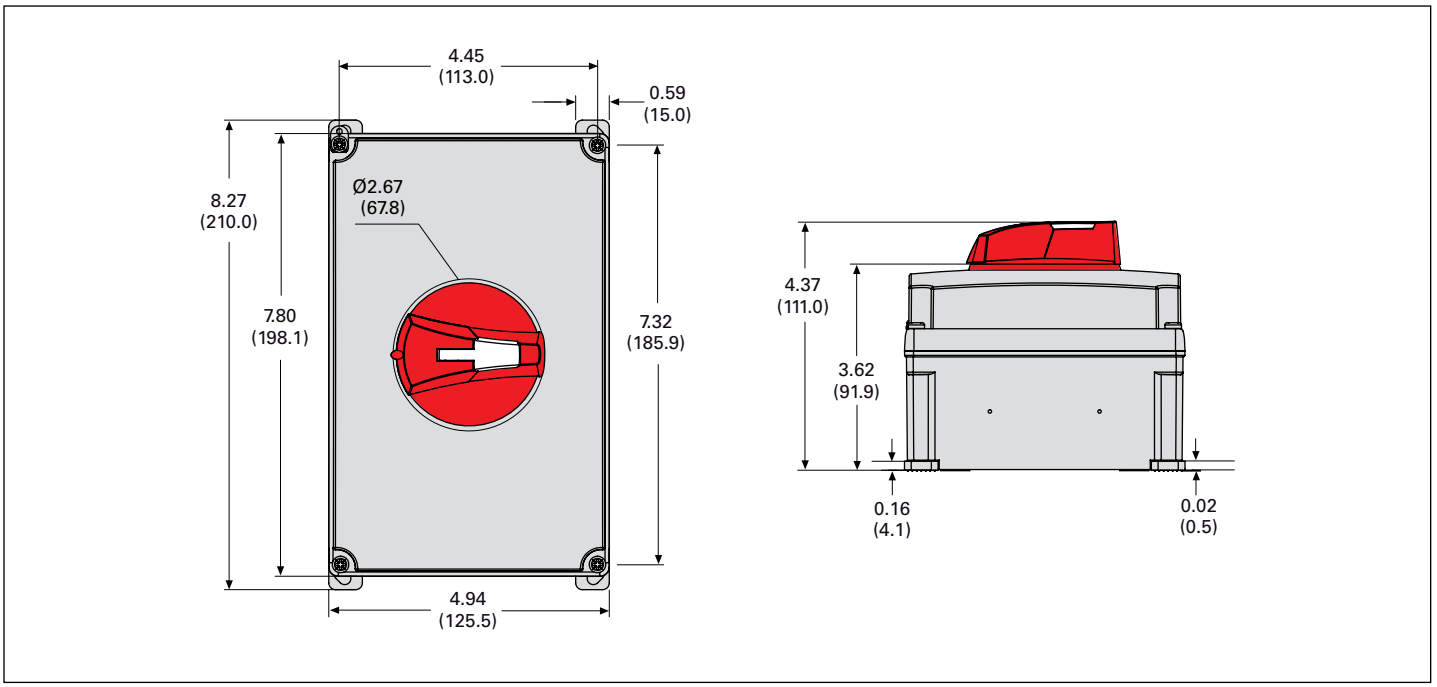


Figure 28.1-23. NEMA Type 4X—Polycarbonate (60 A)

Maximum Horsepower Ratings

Table 28.1-25. General-Duty, Fusible and Non-Fusible, 120 V with Time Delay Fuses

Ampere Rating	Single-Phase AC	Three-Phase AC
30	2	3
60	3	7-1/2

Table 28.1-26. General-Duty, Fusible and Non-Fusible, 240 V with Time Delay Fuses

Ampere Rating	Single-Phase AC	Three-Phase AC
30	3	7-1/2
60	10	15
100	15	30
200	15	60
400	—	125
600	—	200

Table 28.1-27. Heavy-Duty, Non-Fusible, 120 V

Ampere Rating	Single-Phase AC	Three-Phase AC
30	2	5
60	3	10

Table 28.1-28. Heavy-Duty, Fusible, 240 V with Time Delay Fuses ①

Ampere Rating	Single-Phase AC	Three-Phase AC
30	3	7-1/2
60	10	15
100	15	30
200	15	60
400	—	125
600	—	200
800	—	250

① Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.

Table 28.1-29. Heavy-Duty, Fusible, 480 V with Time Delay Fuses ②

Ampere Rating	Single-Phase AC	Three-Phase AC
30	7-1/2	15
60	20	30
100	30	60
200	50	125
400	—	250
600	—	400
800	—	500

② Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.

Table 28.1-30. Heavy-Duty, Fusible, 600 V with Time Delay Fuses ③

Ampere Rating	Single-Phase AC	Three-Phase AC
30	10	20
60	25	50
100	40	75
200	50	150
400	—	350
600	—	500
800	—	500

③ Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.

Table 28.1-31. Heavy-Duty, Non-Fusible, 240 V ④

Ampere Rating	Single-Phase AC	Three-Phase AC
30	3	10
60	10	20
100	20	40
200	15	60
400	—	125
600	—	200
800	—	—

④ Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.

Table 28.1-32. Heavy-Duty, Non-Fusible, 480 V ⑤

Ampere Rating	Single-Phase AC	Three-Phase AC
30	7-1/2	20
60	20	50
100	40	75
200	50	125
400	—	250
600	—	400
800	—	500

⑤ Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.

Table 28.1-33. Heavy-Duty, Non-Fusible, 600 V ⑥

Ampere Rating	Single-Phase AC	Three-Phase AC
30	10	30
60	25	60
100	50	100
200	50	150
400	—	350
600	—	500
800	—	500

⑥ Data applicable to heavy-duty, enhanced visible blade and heavy-duty surge switches.

Table 28.1-34. Double-Throw, Fusible, 240 V with Time Delay Fuses

Ampere Rating	Single-Phase AC	Three-Phase AC
30	3	7-1/2
60	10	15
100	15	30
200	15	60
400	—	125
600 ⑦	—	50

⑦ Only available for use with fast acting fuses. Standard hp rating is shown.

Table 28.1-35. Double-Throw, Fusible, 480 V with Time Delay Fuses

Ampere Rating	Single-Phase AC	Three-Phase AC
30	7-1/2	15
60	20	30
100	30	60
200	50	125
400	—	250

Note: Ratings are based on three-pole designs.

Table 28.1-36. Double-Throw, Fusible, 600 V with Time Delay Fuses

Ampere Rating	Single-Phase AC	Three-Phase AC
30	10	20
60	25	50
100	40	75
200	50	150
400	—	350

Table 28.1-37. Double-Throw, Non-Fusible, 240 V

Ampere Rating	Single-Phase AC	Three-Phase AC
30	3	10
60	10	20
100	20	40
200	15	60
400	—	125
600	—	125
800	—	125

Table 28.1-38. Double-Throw, Non-Fusible, 480 V

Ampere Rating	Single-Phase AC	Three-Phase AC
30	7-1/2	20
60	20	50
100	40	75
200	50	125
400	—	250
600	—	250
800	—	250

Table 28.1-39. Double-Throw, Non-Fusible, 600 V

Ampere Rating	Single-Phase AC	Three-Phase AC
30	10	30
60	25	60
100	50	100
200	50	150
400	—	350
600	—	350
800	—	350

Table 28.1-40. Heavy-Duty, Non-Fusible, 480 V, 600 V Types 7 and 9

Ampere Rating	Three-Phase, 480 V AC	Three-Phase, 600 V AC
30	20	20
60	40	50
100	75	75
200	125	150

Table 28.1-41. Heavy-Duty, Fusible, 480 V, 600 V Types 7 and 9 with Time Delay Fuses

Ampere Rating	Three-Phase, 480 V AC	Three-Phase, 600 V AC
30	15	20
60	30	50
100	60	75
200	125	150

Note: Ratings are based on three-pole designs.

Short-Circuit Ratings

General-Duty

Table 28.1-42. Short-Circuit Ratings Using Class "R," "J" or "T" Fusing where Applicable

Ampere Rating	Short-Circuit Ratings (Amperes)	
	Type 1	Type 3R
30 60 100	100 k at 240 V 100 k at 240 V 100 k at 240 V	100 k at 240 V 100 k at 240 V 100 k at 240 V
200 400 600	100 k at 240 V 100 k at 250 V 100 k at 250 V	100 k at 240 V 100 k at 250 V 100 k at 250 V

Note: Class "H" fuse clips supplied as standard for 30–600 A. Rated at 10,000 rms symmetrical when using Class "H" fuses.

Heavy-Duty

Table 28.1-43. Short-Circuit Ratings Using Class "R," "J" or "T" Fusing where Applicable

Ampere Rating	Short-Circuit Ratings (Amperes)			
	Type 1	Type 3R	Type 12	Type 4 and 4X
30	200 k at 600 V	200 k at 600 V	200 k at 600 V	200 k at 600 V
60	200 k at 600 V	200 k at 600 V	200 k at 600 V	200 k at 600 V
100	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 600 V	200 k at 600 V
200	200 k at 600 V	200 k at 600 V	200 k at 600 V	200 k at 600 V
400	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V
600	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V
800 ①	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V	200 k at 480 V 100 k at 600 V
1200 ①	200 k at 600 V	200 k at 600 V	200 k at 600 V	200 k at 600 V

① Class "L" fuse connectors supplied as standard for 800 A and 1200 A.

Note: Class "H" fuse clips supplied as standard for 30–600 A. Rated at 10,000 A rms symmetrical when using Class "H" fuses.

Double-Throw

Table 28.1-44. Short-Circuit Ratings Using Class "R," "J" or "T" Fusing where Applicable

Ampere Rating	Short-Circuit Ratings (Amperes) (600 V)			
	Type 1	Type 3R	Type 12	Type 4 and 4X
30 60 100 200	100 k 100 k 100 k 100 k	100 k 100 k 100 k 100 k	100 k 100 k 100 k 100 k	100 k 100 k 100 k 100 k
400 600 800 1200	100 k 100 k 100 k 100 k	100 k 100 k 100 k 100 k	100 k 100 k — —	100 k 100 k — —

Note: Class "H" fuse clips supplied as standard for 30–600 A, except Class "T" for 400 A at 600 V and 600 A at 240 V. Rated at 10,000 A rms symmetrical when using Class "H" fuses.

Note: Class "L" fuse connectors supplied as standard for 800 A and 1200 A.

Note: Safety switch short-circuit ratings are applicable to AC only.

Note: Safety switch I^2t and I_p values are identical to UL maximum acceptable I^2t and I_p values for the corresponding class fuse.

Note: Table 28.1-44 is not applicable to the compact design shown in Eaton's Volume 2—Commercial Distribution, CA08100003E, Tab 8, Section 8.1. The compact design is suitable for use on a circuit capable of delivering not more than 10,000 rms symmetrical amperes.

Shunt Trip Safety Switch

Table 28.1-45. Short-Circuit Ratings Using Class "R," "J/L" or "T" Fusing ②

Ampere Rating	480 V	600 V
30 60 100 200	200 kAIC 200 kAIC 200 kAIC 200 kAIC	200 kAIC 200 kAIC 200 kAIC 100 kAIC
400 600 800	200 kAIC 200 kAIC 200 kAIC	100 kAIC 100 kAIC 200 kAIC

② Non-fusible values are based on combination rating with upstream device (see TD00801005E).

Short-Circuit Ratings of Non-Fusible Switches

The UL listed short-circuit ratings for Eaton's non-fusible switches are based on the switches being properly protected by overcurrent protective devices. For applications that require a UL listed short-circuit rating of 10,000 rms symmetrical amperes or less, an Eaton non-fusible switch must be properly protected by any overcurrent protective device rated no greater than the ampere rating of the switch. For applications that require a UL listed short-circuit rating of greater than 10,000 rms symmetrical amperes, an Eaton non-fusible switch must be properly protected by the appropriate class and size fusing noted. Otherwise, this non-fusible switch must be replaced with an Eaton fusible switch that uses the appropriate fusing required. Molded case circuit breaker protection of non-fusible Eaton switches for applications that require a short-circuit rating of greater than 10,000 rms symmetrical amperes has been evaluated and is summarized below. Refer to the reference tables for typical Eaton fusible switch UL listed short-circuit ratings.

Table 28.1-46. UL Recognized Safety Switch/Circuit Breaker Series-Connected Ratings

Safety Switch Ampere Rating	Maximum System Voltage AC	Circuit Breaker Maximum Short Circuit Rating (rms Symmetrical)	Circuit Breaker Frame(s)	Power Defense
30 and 60	600	25,000 18,000 14,000	FDC, HFD, HFDE, EGH FD, EGE FDB	PDG1xM, PDG2xM, PDG2xP PDG1xF, PDG2xG PDG2xF
100	600	25,000 18,000 14,000	FDC, HFD, HFDE, EGH FD, EGE FDB	PDG1xM, PDG2xM, PDG2xP PDG1xF, PDG2xG PDG2xF
	480	35,000	EGH, EGS	PDG1xP, PDG1xM
200	600	25,000 18,000 14,000	FDC, HFD, HFDE, HJD, JGH FD, JD, JGE FDB	PDG2xM, PDG2xP PDG2xG PDG2xF
	480	65,000	HFD, HFDE, HJD, JGH	PDG2xM

Product Enhancement

Eaton non-fusible safety switches now carry series combination short-circuit ratings when paired with the identified MCCB or fuse type. With this listed rating, the safety switch shown in **Figure 28.1-24**, can be correctly applied when the motor feeder Eaton HMCP circuit breaker is replaced with an Eaton molded case circuit breaker properly sized for the motor hp rating. This is a significant enhancement to the product's performance rating. To achieve these ratings, the switches have been tested in combination with all of the overcurrent devices shown. Furthermore, the applicable combination ratings are marked on the inside of the switch door, ensuring inspector approval.

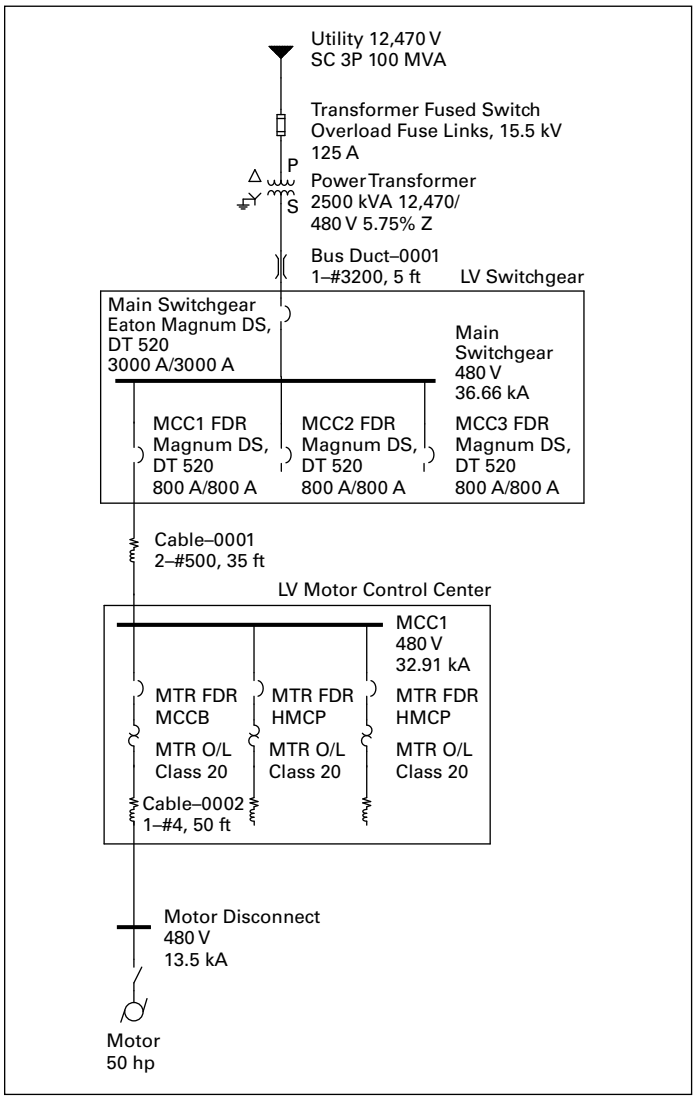


Figure 28.1-24. One-Line Diagram

Information and Application

The circuit breaker or fuse rating is not to exceed the ampere rating of the non-fusible switch. When used on systems with greater than 10 kA short-circuit rating available, the UL Listed short-circuit rating of the non-fusible switch is based upon the switch being used in combination with fuses or molded case circuit breakers identified in **Table 28.1-47**.

Table 28.1-47. Non-Fusible Safety Switches

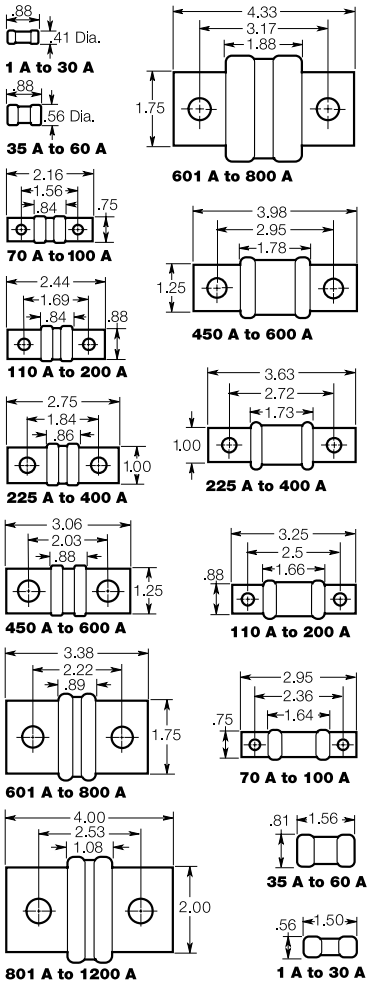
Eaton Non-Fusible Safety Switch Ampere Rating ①	Maximum System Voltage AC	Maximum Short-Circuit Rating	Upstream Device ②	
			Fuse Class	Breaker Frame
30 and 60	600	10,000	H, K	Any circuit breaker
		14,000		FDB
		18,000		FD, EGE
		25,000		FDC, HFD, HFDE, EGH
		200,000	R,T, J, L	
100	480	10,000	H, K	Any circuit breaker
		35,000		EGH, EGS
		200,000	R,T, J, L	
	600	10,000	H, K	Any circuit breaker
		14,000		FDB
		18,000		FD, EGE
		25,000		FDC, HFD, HFDE, EGH
		200,000 ③	R,T, J, L	
200	480	10,000	H, K	Any circuit breaker
		65,000		HFD, HFDE, HJD, JGH
		200,000	R,T, J, L	
	600	10,000	H, K	Any circuit breaker
		14,000		FDB
		18,000		FD, JD, JGE
		25,000		FDC, HFD, HFDE, HJD, JGH
		200,000	R,T, J, L	
400	480	200,000	R,T, J	
	600	10,000	H, K	Any circuit breaker
		100,000	R,T, J	
600	480	200,000	R,T, J	
	600	10,000	H, K	Any circuit breaker
		100,000	R,T, J	
800	480	200,000	L,T	
	600	10,000		Any circuit breaker
		100,000	L,T	
1200	480	200,000	L,T	
	600	10,000		Any circuit breaker
		100,000	L,T	

① For use on NEMA 1, 3R, 12/3R and 4X switches.
② Fuse or circuit breaker rating is not to exceed switch rating.
③ NEMA 12, 4/4X only. NEMA 1, 3R are 100 kAIC at 600 Vac.

Fuse Dimensions

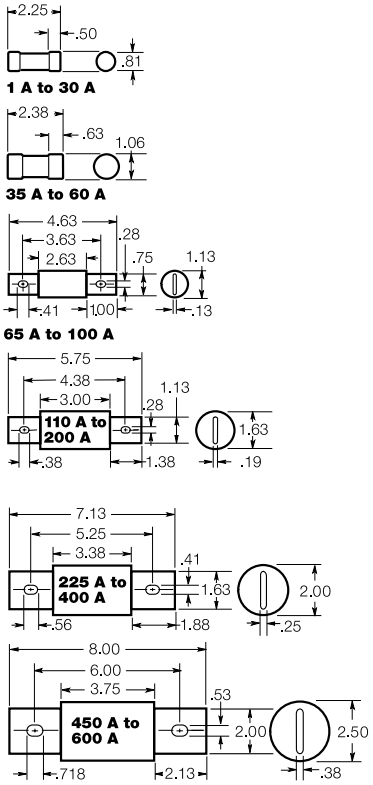
Class T

T-Tron™ Fuses
JJN **(300 V)** JJS **(600 V)**



Class J

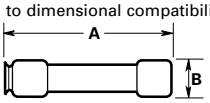
Low-Peak® and Limitron® Fuses
LPJ & JKS **(600 V)**



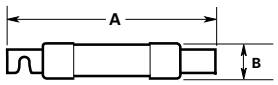
Class RK5 and RK1

Fusetron®, Low-Peak and Limitron Fuses (250 and 600 V)
FRN-R and FRS-R; LPN-RK and LPS-RK; KTN-R and KTS-R
Basic dimensions are same as Class H (formerly NEC) ONE-TIME (NON and NOS) and SUPERLAG Renewable RES and REN fuses.

Note: These fuses can be used to replace existing Class H, RK1 and RK5 fuses relating to dimensional compatibility.



	250 V		600 V	
Ampere	**A**	**B**	**A**	**B**
1/10–30	2.00	0.56	5.00	0.81
35–60	3.00	0.81	5.50	1.06



Fusetron and Limitron

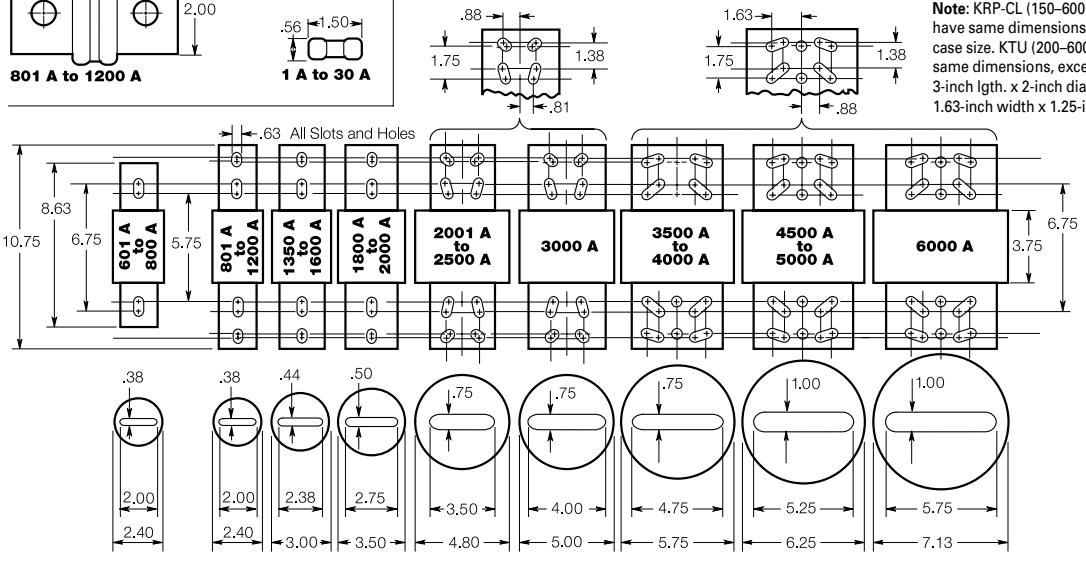
	250 V		600 V	
Ampere	**A**	**B**	**A**	**B**
70–100	5.88	1.06	7.88	1.34
110–200	7.13	1.56	9.63	1.84
225–400	8.63	2.06	11.63	2.59
450–600	10.38	2.59	13.38	3.13

Low-Peak

	250 V		600 V	
Ampere	**A**	**B**	**A**	**B**
70–100	5.88	1.16	7.88	1.16
110–200	7.13	1.66	9.63	1.66
225–400	8.63	2.38	11.63	2.38
450–600	10.38	2.88	13.38	2.88

Class L Low-Peak and Limitron Fuses

KRP-C, KTU & KLU (601–4000 A) **(600 V)**



Note: KRP-CL (150–600 A) fuses have same dimensions as 601–800 A case size. KTU (200–600 A) have same dimensions, except tube 3-inch lgth. x 2-inch dia.; terminal 1.63-inch width x 1.25-inch thick.

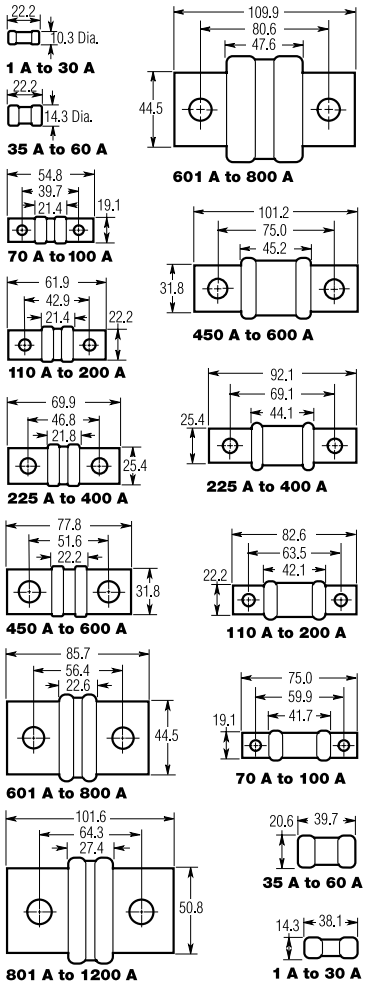
Figure 28.1-25. Typical Fuse Dimensions in Inches

Note: For typical fuse dimensions in millimeters, see **Figure 28.1-26 on Page 28.1-29**.

Class T

T-Tron Fuses

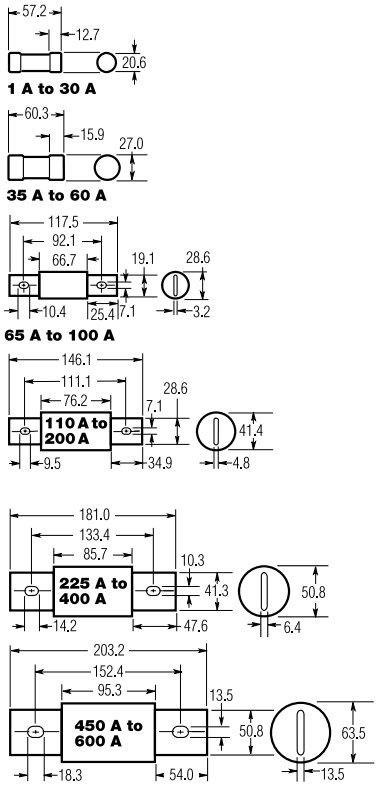
JJN **(300 V)** JJS **(600 V)**



Class J

Low-Peak and Limitron Fuses

LPJ and JKS **(600 V)**



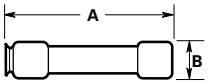
Class RK5 and RK1

Fusetron, Low-Peak and Limitron Fuses (250 and 600 V)

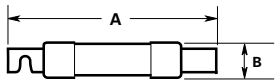
FRN-R and FRS-R; LPN-RK and LPS-RK; KTN-R and KTS-R

Basic dimensions are same as Class H (formerly NEC) ONE-TIME (NON and NOS) and SUPERLAG Renewable RES and REN fuses.

Note: These fuses can be used to replace existing Class H, RK1 and RK5 fuses relating to dimensional compatibility.



	250 V		600 V	
Ampere	**A**	**B**	**A**	**B**
1/10–30	50.8	14.3	127.0	20.6
35–60	76.2	20.6	139.7	27.0



Fusetron and Limitron

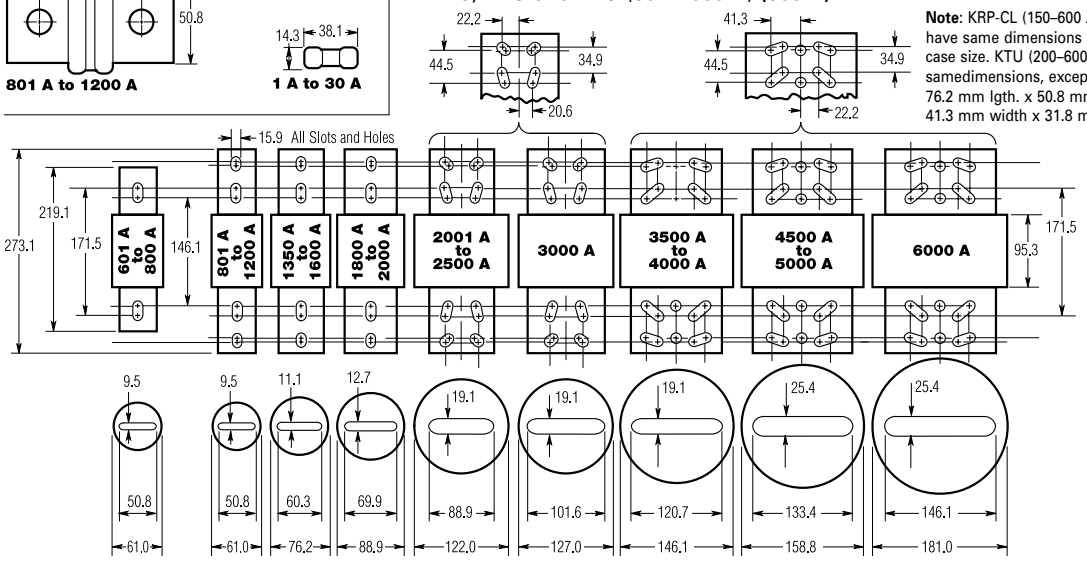
	250 V		600 V	
Ampere	**A**	**B**	**A**	**B**
70–100	149.2	26.9	200.0	34.0
110–200	181.0	39.6	244.5	46.7
225–400	219.1	52.3	295.3	65.8
450–600	263.5	65.8	339.7	79.5

Low-Peak

	250 V		600 V	
Ampere	**A**	**B**	**A**	**B**
70–100	149.2	29.5	200.0	29.5
110–200	181.0	42.2	244.5	42.2
225–400	219.1	60.5	295.3	60.5
450–600	263.5	73.2	339.7	73.2

Class L Low-Peak and Limitron Fuses

KRP-C, KTU and KLU (601–4000 A) **(600 V)**



Note: KRP-CL (150–600 A) fuses have same dimensions as 601–800 A case size. KTU (200–600 A) have samedimensions, except tube 76.2 mm lgth. x 50.8 mm dia.; terminal 41.3 mm width x 31.8 mm thick.

Figure 28.1-26. Typical Fuse Dimensions in Millimeters

Note: For typical fuse dimensions in inches, see **Figure 28.1-25 on Page 28.1-28**.

Table 28.1-48. Safety Switch Catalog Numbering System—General-Duty

DG 3 2 1 N G B

Switch Type	Voltage	Poles/Blades	Amperes	Protection	NEMA Enclosure Ratings	Series
DG = General-duty/cartridge fuse	**2** = 240 Vac	**1** = Single-pole **2** = Two-pole **3** = Three-pole	**1** = 30 A **2** = 60 A **3** = 100 A **4** = 200 A **5** = 400 A **6** = 600 A **7** = 800 A	**F** = Fusible without neutral **U** = Non-fusible **N** = Fusible with neutral	**G** = NEMA 1 **R** = NEMA 3R	**B** = Design general-duty 30–100 A **K** = Design for general-duty 200 A and higher

Table 28.1-49. Safety Switch Catalog Numbering System—Heavy-Duty

DH 3 6 4 U D K W

Switch Type	Voltage ①	Poles/Blades	Amperes	Protection	NEMA Enclosure Ratings	Options ③	Series
DH = Heavy-duty **DS** = Classified location with DS interior	**2** = 240 Vac **6** = 600 Vac	**1** = Single-pole **2** = Two-pole **3** = Three-pole **4** = Four-pole **6** = Six-pole	**1** = 30 A **2** = 60 A **3** = 100 A **4** = 200 A **5** = 400 A **6** = 600 A **7** = 800 A **8** = 1200 A	**F** = Fusible without neutral **U** = Non-fusible **N** = Fusible with neutral	**G** = NEMA 1 **R** = NEMA 3R **D** = NEMA 12 or 12/3R **P** = NEMA 4 ② **W** = NEMA 4X corrosion resistant (304 Grade stainless steel) **C** = NEMA 4X non-metallic (for Type DH) **X** = NEMA 7/9 (for Type DS)	**W** = Viewing window ④⑤ **V** = Enhanced visible blade **X** = Stainless steel mechanism **LW** = Lower viewing window ⑥ **GCL** = Mill duty rated	**K** = Design all general-duty

① For DC ratings, check individual switch ratings.
② Only available for 400 A and higher safety switches.
③ See Modifications-Flex Center for additional available options.
④ All window switches feature enhanced visible blade design as standard.
⑤ Only available in NEMA 12/3R and NEMA 4X enclosures.
⑥ Only available in 200 to 1200 A NEMA 12/3R and NEMA 4X enclosures.

Note: These tables are intended for use in breaking down existing catalog numbers. They are not intended for building new catalog numbers.
A factory-installed ground lug is supplied on all safety switches.

Table 28.1-50. Heavy-Duty Safety Switch with Surge Protection Catalog Numbering System

DH 3 6 3 N D K W – CVXE

Switch Type
DH = Heavy-duty single-throw

Poles/Blades
2 = Two-pole
3 = Three-pole

Voltage
2 = 240 Vac
4 = 600 Vac

Amperes
1 = 30 A
2 = 60 A
3 = 100 A
4 = 200 A
5 = 400 A
6 = 600 A
7 = 800 A
8 = 1200 A ①

NEMA Enclosure Ratings
D = NEMA 12/3R
W = NEMA 4X 304 stainless

Non-Fusible Neutral
Blank = Fusible, or non-fusible without neutral
N = Non-fusible with neutral

Series
K = K switch

Fusible/Non-Fusible or Neutral
F = Fusible without neutral
N = Fusible with neutral
U = Non-fusible without neutral

Window
W = Viewing windows

SP1 Type Surge Device
SP1A = SP1–240S (120/240 V single- or split-phase)
SP1B = SP1–208Y (208/120 V, 3 PH, 4 W)
SP1C = SP1–480Y (480/277 V, 3 PH, 4 W)
SP1D = SP1–600Y (600/347 V, 3 PH, 4 W)
SP1E = SP1–240D (240 V, 3 PH, 3 W Delta
SP1F = SP1–480D (480 V, 3 PH, 3 W Delta)
SP1G = SP1–600D (600 V, 3 PH, 3 W Delta)

CVX Type Surge Device
CVXA = CVX050–240S (120/240 V single- or split-phase)
CVXB = CVX100–240S (120/240 V single- or split-phase)
CVXC = CVX050–208Y (208/120 V, 3 PH, 4 W)
CVXD = CVX100–208Y (208/120 V, 3 PH, 4 W)
CVXE = CVX050–480Y (480/277 V, 3 PH, 4 W)
CVXF = CVX100–480Y (480/277 V, 3 PH, 4 W)
CVXG = CVX050–600Y (600/347 V, 3 PH, 4 W)
CVXH = CVX100–600Y (600/347 V, 3 PH, 4 W)
CVXI = CVX050–240D (240 V, 3 PH, 3 W)
CVXJ = CVX100–240D (240 V, 3 PH, 3 W)
CVXK = CVX050–480D (480 V, 3 PH, 3 W)
CVXL = CVX100–480D (480 V, 3 PH, 3 W)
CVXM = CVX050–600D (600 V, 3 PH, 3 W)
CVXN = CVX100–600D (600 V, 3 PH, 3 W)
CVXO = CVX050–240H (120/240 V, 3 PH high leg delta)
CVXP = CVX100–240H (120/240 V, 3 PH high leg delta)

① Available with SP1 type surge device only.

Note: This table is intended for use in breaking down existing catalog numbers. It is not intended for building new catalog numbers.

Table 28.1-51. Auxiliary Power Heavy-Duty Safety Switch Catalog Numbering System

DH 3 6 1 F R K A1 480

Switch Type
DH = Heavy-duty

Poles/Blades
3 = Three-pole

Voltage
2 = 240 Vac
6 = 600 Vac

Amperes
1 = 30 A
2 = 60 A
3 = 100 A
4 = 200 A

Fusible/Non-Fusible or Neutral
F = Fusible without neutral
U = Non-fusible
N = Fusible with neutral

NEMA Enclosure Ratings
R = NEMA 3R

Series
K = Design—All general-duty switches above 200 A and all heavy-duty switches incorporate K-Series switch design features listed on the following page

GFI Receptacle
A1 = 15 A
A2 = 20 A

Auxiliary Circuit Voltage
208 = 208 V
240 = 240 V
480 = 480 V
600 = 600 V

Table 28.1-52. Safety Switch Catalog Numbering System—Double-Throw

DT 3 6 5 N D K W

Switch Type
DT = Double-throw

Voltage ①
2 = 240 Vac
6 = 600 Vac

Poles/Blades
2 = Two-pole
3 = Three-pole
4 = Four-pole
6 = Six-pole

Amperes
1 = 30 A
2 = 60 A
3 = 100 A
4 = 200 A
5 = 400 A
6 = 600 A
7 = 800 A
8 = 1200 A

Protection
F = Fusible without neutral
U = Non-fusible
N = Fusible with neutral

NEMA Enclosure Ratings
G = NEMA 1
R = NEMA 3R
D = NEMA 12 or 12/3R
P = NEMA 4 ②
W = NEMA 4X corrosion resistant (304 Grade stainless steel)

Options ③
W = Viewing window ④⑤
V = Enhanced visible blade
X = Stainless steel mechanism

Series
K = Design all heavy-duty
H = General-duty double-throw switch (compact design 30–100 A)

① For DC ratings, check individual switch ratings.
② Only available for 400 A and higher safety switches.
③ See Modifications-Flex Center for additional available options.
④ All window switches feature enhanced visible blade design as standard.
⑤ Only available in NEMA 12/3R and NEMA 4X enclosures.

Note: These tables are intended for use in breaking down existing catalog numbers. They are not intended for building new catalog numbers. A factory-installed ground lug is supplied on all safety switches.

Table 28.1-53. Shunt Trip Safety Switch Catalog Numbering System

STS 3 6 8 N W 3 2 – 1 B 00

Switch Series
STS = Shunt trip switch (UL)

Number of Poles
2 = Two-pole
3 = Three-pole
4 = Four-pole

Maximum System Voltage
2 = 240 Vac
6 = 600 Vac

Ampere Rating	
1 = 30 A	**5** = 400 A
2 = 60 A	**6** = 600 A
3 = 100 A	**7** = 800 A
4 = 200 A	**8** = 1200 A

NEMA Type Enclosure Rating
D = NEMA 12/3R/1
P = NEMA 4 (painted steel)
W = NEMA 4X, stainless 304
X = NEMA 4X, stainless 316

Shunt Trip Coil Voltage ②
3 = 120 Vac
6 = 24 Vdc

Protection
F = Fusible without neutral
N = Fusible with neutral
U = Non-fusible ①

CPT Voltage
0 = No CPT
1 = 480 Vac ③
2 = 208 Vac
3 = 240 Vac
4 = 600 Vac ③

Type of Protective Relay ①④⑤⑥
0 = No relay
A = Arc energy reduction relay ⑦⑧
B = Ground fault relay ⑦
C = Arc energy reduction relay/ground fault relay ⑦⑧

Auxiliary Switch	
Blank	= No auxiliary switches
1	= 1NO/1NC alarm switch only
2	= 1NO/1NC auxiliary contact only
3	= 2NO/2NC auxiliary contacts only
4	= 1NO/1NC auxiliary contact and 1NO/1NC alarm switch
5	= 2NO/2NC auxiliary contacts and 1NO/1NC alarm switch

Additional Options/ Modifications	
00	= No accessories
CL	= Copper lugs
CP	= Control pole
0J	= Factory-converted provisions for Class J fusing
0N	= Factory-installed neutral for non-fused switch
0T	= Factory-converted provisions for Class T fusing
0W	= Viewing window over switch blades

① Relays can only be used with fusible switches.
② For alternate coil voltages, please contact the Flex Center.
③ Available for 600 Vac switches only.
④ Shunt trip safety switch with relay protection must use 120 Vac coils.
⑤ Only one relay option allowed.
⑥ Relay viewing window standard with relay option.
⑦ Available for 400–1200 A fusible switches only.
⑧ Options A and C are not available for a two-pole switch.

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