

# Switching Devices —Low Voltage

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### Switching Devices—Low Voltage

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### Specifications

See Eaton's *Product Specification Guide*, available on CD or on the Web.

|                                                   |                       |                            |
|---------------------------------------------------|-----------------------|----------------------------|
| CSI Format: .....                                 | 1995                  | 2010                       |
| Safety Switches .....                             | <b>Section 16441A</b> | <b>Section 26 28 16.16</b> |
| Auxiliary Power Heavy-Duty<br>Safety Switch ..... | <b>Section 16441B</b> | <b>Section 26 28 16.23</b> |
| Elevator Control Switch .....                     | <b>Section 16445</b>  | <b>Section 26 28 16.17</b> |
| Quick-Connect Double-Throw .....                  | <b>Section 16441C</b> | <b>Section 26 28 16.26</b> |



*Quick-Connect Double-Throw Safety Switches*

**General Description**
**Safety Switches**


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. The Application Guide **Table 28.0-1**, below, summarizes major differences and similarities between the heavy-duty and general-duty type of Eaton's safety switches.

Individual catalog pages and selection tables provide more specific information as to number of poles, voltage, specifications and horsepower ratings.

**K-Series Switch Design**

**Note:** K-Series design available where the letter K appears in the catalog number.

The efficient K-Series design uses double-break, rotary blade action for high performance and reliability. Here are some of the characteristics of the K-Series type of switch:

- High visibility handle and nameplate for indication of switch position—ON or OFF
- Clear line terminal shields—on heavy-duty switches only
- Unique Control Pole option—allows the addition of a late-make/early-break, 15A switched pole for disconnecting control power circuits

- Generous wiring room—meeting or exceeding NEC® wire bending space
- Built-in fuse pullers in NEMA® 4X and 12 enclosed switches through 200A
- Side-hinged NEMA 3R enclosure doors
- Tangential knockouts in heavy-duty NEMA 1 and 3R enclosures through 200A
- Type 304 or 316 stainless steel enclosures for UL® NEMA 4X applications—dust-tight, watertight and corrosion-resistant
- NEMA 12 enclosures for 30–800A switches also rated for NEMA 3R use when a factory provided drain hole is opened
- Rated for 60°C/75°C wire connection

**Table 28.0-1. Safety Switch Application Guide—See Catalog Selection Tables for Specific Ratings**

| Application/<br>Features                      | General-Duty<br>Safety Switches                                                               | Heavy-Duty<br>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<br>800–1200A switches with Class L fusing—200,000 rms                                                                                                                                                      |
| Short-circuit rating with fuse options        | Class R fuse adaptation and 400–600A switches with T or J fuse adaptation—100,000 rms amperes | Switches with Class R or Class J fusing and 200–800A switches with Class T fuse adaptation—200,000A at 480V and 100,000 rms symmetrical amperes at 600V                                                                                                        |
| 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 240V, 500 hp at 480 and 600 Vac                                                                                                                                                                                                                      |
| UL (NEMA) enclosure types                     | Type 1—general purpose indoor use<br>Type 3R—rainproof and sleet-resistant                    | Type 1 indoor, 3R outdoor<br>Type 4 watertight and dust-tight<br>Type 4X watertight, dust-tight and corrosion-resistant<br>Type 12 indoor falling dust, dirt and liquids<br>Type 12/3R convertible to outdoor use<br>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, 200–600A sizes                                                           | Field- or factory-installed for all sizes                                                                                                                                                                                                                      |
| Control pole interlock                        | Field-installed kit, 400–600A sizes                                                           | Field-installed for K-Series switches                                                                                                                                                                                                                          |
| Fuse pullers                                  | Not available                                                                                 | Standard in Type 4X and 12 enclosed switches through 200A<br>field-installed for all other 30–200A switches                                                                                                                                                    |

## General-Duty



General-Duty (Plug Fuse)



General-Duty (Cartridge Fuse)

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

- 240 Vac
- 30–600A
- For short-circuit ratings, see Technical Data
- 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
- 200–600A 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 100,000A rms symmetrical

**Note:** Plug fuse switches are not service entrance rated.

## Heavy-Duty



Heavy-Duty

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

- 600 Vac, 600 Vdc maximum
- 30–1200A
- For short-circuit ratings, see Technical Data
- 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

## Heavy-Duty—Solar Photovoltaic Switch



Heavy-Duty—Solar Photovoltaic Switch

**Marked as suitable for NEC 690 PV applications up to 600 Vdc.**

- UL 98 listed
- All switches are single-pole and suitable for switching one circuit
- Clear polycarbonate deadfront to guard against accidental contact with live parts
- Suitable for positive and negative grounded systems—100% load break rated with current flowing in either direction
- NEC 690.17—compliant labeling warning that the switch terminals may be energized in the open position
- NEC 690.14.(C) two required “PV System Disconnect” labels included
- Isolated ground terminals (neutral) for grounded conductors
- Ground lug for equipment grounding conductor
- NEMA 3R, 12 and 4X stainless enclosures
- Fusible and non-fusible configurations—Class R fuse clips standard
- Fuse clips are located on the center pole to ensure that both fuse clips are de-energized—meets NEC Article 690.16, which requires isolation of the fuse from all potential supply sources

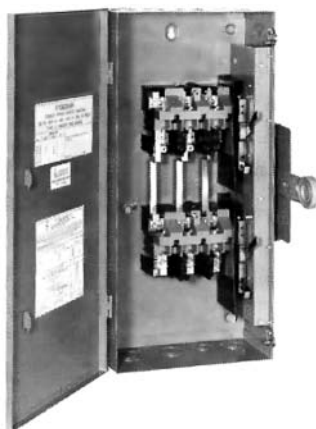
## Six-Pole Motor Circuit

*Six-Pole Motor Circuit*

**A compact safety switch that's ideal for use in heavy industry...when an "in sight" disconnecting means is required for two-speed motors that are remote from their motor control devices.**

- 600 Vac, 250 Vdc maximum
- 30–200A
- Fusible or non-fusible
- Trunk-type latches keep the cover tightly closed and a neoprene gasket seals out moisture and dust from the switch assembly
- 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
- Clear line shield protection
- Built-in fuse pullers
- Clearly visible handle
- Triple padlocking capability. Cabinet door can be further padlocked at the top and bottom
- De-ionizing arc chutes. Arc chutes confine and suppress the arcs produced by contacts under load

## 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 Technical Data
- 30–1200A 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 for fusible double-throw switches up through 600A are wired from factory for 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 power source
- 800A fusible double-throw switches must be ordered from the factory for either two-source or two-load configuration
- 1200A fusible double-throw switches are available only for two-source connections
- 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 28.0-14**

## Quick-Connect Switches

*Quick-Connect Double-Throw*

**Provides a safe and quick means of connecting portable generators to facilities, transferring the building to backup power, or providing for temporary connection of portable loads.**

- Single-throw and double-throw designs
- Safety interlocks prevent access to the receptacle compartment unless the lower switch is in the “open” position. This prevents against accidentally unplugging a circuit under load
- For short-circuit ratings, see Technical Data
- 30–800A switches
- 600 Vac, 600 Vdc maximum
- Fusible or non-fusible
- Fusible and non-fusible switches are 100% load break and load make rated
- Cam-Lok® or Posi-Lok® receptacle options
- NEMA 1 or NEMA 3R enclosure ratings
- Switching neutral option

## Enclosed Rotary

*Enclosed Rotary*

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

- UL listed
- Meets NEC Article 430 requirements for a separate disconnect means within sight of all motor loads
- Padlockable in the OFF position (up to three padlocks) to meet OSHA lockout requirements
- Available 16–80A ratings
- 600 Vac, three- and four-pole non-fusible device
- Rated at highest available hp rating (at 480 Vac, 16A–10 hp, 25A–15 hp, 30A–15 hp, 40A–20 hp, 60A–30 hp, 80A–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

## EnviroLine

*Stainless Steel Switch*

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

- **EnviroLine Stainless Steel Switch:** Primarily for use in the meatpacking and food processing industries, or any application where water is frequently used to hose down equipment. In addition to the stainless steel NEMA 4X enclosure, the interior mechanism, back pan and springs are all stainless steel. Ratings for these heavy-duty switches are 30–400A, 240–600 Vac, available as fusible and non-fusible switches

*Window Switches*

- **Window Switches:** These switches are available with either an upper window over the switch contacts or a lower window over the fuse block. The upper window provides visual verification of ON/OFF status. The lower window switch allows for visual verification of fuse status if used in conjunction with fuses with blown fuse indicator. Ratings are 30–800A and 200–1200A, 240–600 Vac, fusible and non-fusible. Available in NEMA 12/3R, 4X stainless steel enclosures



Receptacle Switches



Non-Metallic Switches

NEMA 7/9—Hazardous Location  
Disconnect Switch



DS361UX

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■ **Receptacle Switches:** These heavy-duty switches are pre-wired and interlocked to polarized receptacles for three-phase, three-wire, grounded type power plugs. These are 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 30–100A, 600 Vac, NEMA 12, 4X stainless steel enclosures

■ **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 30–200A, 240–600 Vac, fusible and non-fusible. Enclosure is NEMA 4X rated



Non-Metallic Halyester Switch

- **Non-Metallic Halyester® Switch:** A strong, yet lightweight heavy-duty, corrosion-resistant, NEMA 4X enclosed switch that withstands salt environments and general outdoor conditions better than standard 304-grade stainless steel at a more competitive price point than other non-metallic enclosures
- **316 Grade Stainless Steel Switches:** This option replaces the 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

■ The cast aluminum enclosure is ideally suited for harsh industrial applications including petrochemical facilities, mining operations, pharmaceutical plants and wastewater treatment facilities. Eaton’s Type DS switch is used as the switching device. Ratings are 30–100A, 600 Vac, fusible and non-fusible

Table 28.0-2. EnviroLine Standards Compliances

| UL Classified—<br>Standard 886<br>File No. E84577 | CSA® Certified—<br>Standard C22.2<br>File No. LR 42131-6 |
|---------------------------------------------------|----------------------------------------------------------|
| Class I, division 1 & 2,<br>groups B, C and D     | Class I, division 1 & 2,<br>groups B, C and D            |
| Class II, division 1 & 2,<br>groups E, F and G    | Class II, division 1 & 2,<br>groups E, F and G           |
| Class III, division 1 & 2                         | Class III, division 1 & 2                                |
| NEMA Types 7 and 9                                | NEMA Types 7 and 9                                       |
| Zone 1, IIB + H <sub>2</sub>                      | Zone 1, IIB + H <sub>2</sub>                             |

Seismic Qualification



Refer to **Tab 1** for information on seismic qualification for this and other Eaton products.

## Auxiliary Power Heavy-Duty Safety Switch

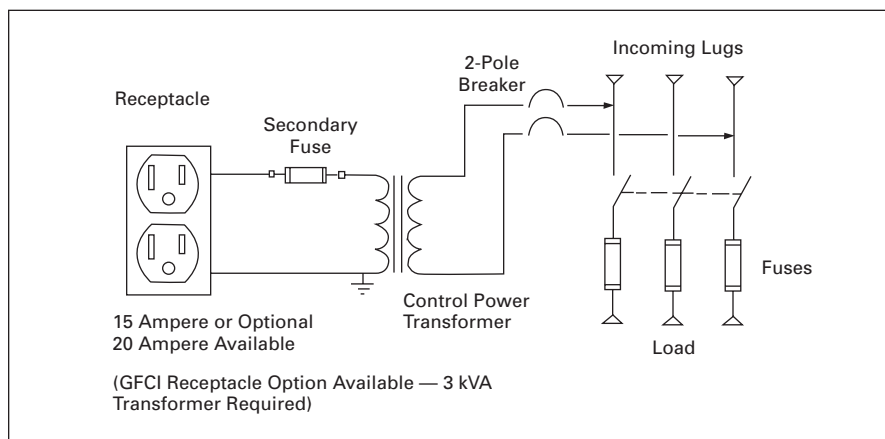


**Auxiliary Power Heavy-Duty Safety Switch**

NEC Section 210.63 for Heating, Air-Conditioning and Refrigeration Equipment requires a 125V, single-phase, 15A- or 20A-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 (7.5m) of the heating,

air-conditioning and refrigeration equipment. The receptacle outlet is not to be connected to the load side of the equipment disconnecting means.

The Auxiliary Power Heavy-Duty Safety Switch combines a safety switch, 2 kVA control transformer, and 15A GFI receptacle in a single product. Ratings are 30–200A, 240 or 600 Vac, NEMA 3R outdoor enclosures. The auxiliary circuit is tapped off of the line side of the safety switch and can be operated independently of the main switch circuit. Auxiliary circuit voltages are available at either 208, 240, 480 or 600V. In 480V and 600V applications, the auxiliary circuit disconnect and overcurrent protection are provided by a fusible deadfront disconnect switch with Class J fuses. The short-circuit rating is 200 kAIC. 208V and 240V applications have a molded-case breaker with a 100 kAIC rating as the auxiliary circuit disconnect. The use of the Auxiliary Power Heavy-Duty Safety Switch eliminates the need for running a separate 120V circuit common to rooftop air-conditioning applications.



**Figure 28.0-1. Auxiliary Power Heavy-Duty Safety Switch Circuit Diagram**

## Elevator Control Switch



**Elevator Control Switch**

The elevator control switch provides an all-in-one product solution and selective coordination for elevator circuits. The elevator control switch uses a shunt trip disconnect as standard with Class J time-delay current-limiting fuses for meeting several code and user requirements for such circuits. Ratings are 30–200A, 600 Vac, NEMA 1, 3R, 12 and 4 enclosures. The elevator control switch carries a 200 kAIC rms symmetrical short-circuit rating.

### Why do Buildings Require Eaton Elevator Disconnects?

Eaton's Elevator Disconnect is a simple, all-in-one solution that takes the mystery out of meeting the many codes associated with fire protection and safety in elevator shafts. The model national building codes that prescribe the requirements for sprinklers, elevators and electrical equipment, and how the various systems shall interact are:

- NFPA® 70 (National Electrical Code®)
- NFPA 72 (National Fire Alarm Code®)
- ANSI/ASME A17.1 (Safety Code for Elevators and Escalators)
- NFPA 13 (Installation of Sprinkler Systems)

In addition to these national codes, state and local jurisdictions or other agencies of the government (such as the Veteran's Administration) may edit or amend the codes, as they deem necessary for public safety.

## General Description

Eaton's Elevator Disconnect enables consultants, contractors and building owners to install a single device that meets the requirements of the various codes.

### Why is There a Need for the Eaton Elevator Disconnect?

1. According to 2010 NFPA 13, fire sprinkler protection is required (with some exceptions) at the top and bottom of elevator shafts. Additionally, NFPA 13 requires the installation of sprinklers in the elevator machine room. When sprinkler heads are installed in elevator shafts, or in elevator machine rooms, then they must also be installed according to the State-Adopted Elevator Code (in many cases, ANSI/ASME A17.1).
2. The ASME A17.1 Safety Code for Elevators and Escalators, Rule 102.2 (c) (3), requires the shutdown of power to the elevator **prior to the application of water** in the elevator machine room **or** hoistway.

Shutdown of power is usually accomplished with the use of a shunt trip device in the elevator circuit, and is done for two valid safety concerns.

The first of these is to minimize the potential for electric shock due to the release of water on energized electrical equipment. The second, and less obvious, is to reduce the possibility of elevator car slippage after the car has gone to the recall floor and the doors have opened. Slippage is possible when the hoisting equipment (cables, sheave, braking system, etc.) become wet from discharged water.

Eaton's Elevator Disconnect is a fusible switch that is equipped with a shunt trip mechanism. The shunt trip is operated by a control relay (called a Fire Safety Interface Relay) in the unit that is wired to a normally open contact in the remote Fire Alarm Control Panel (FACP).

When the FACP receives a signal from the fire alarm system that there is going to be a sprinkler release in an elevator shaft, a normally open contact in the FACP closes, energizing the Fire Safety Interface Relay and completing a circuit to initiate a trip.

The Fire Safety Interface Relay is available with a 120 Vac or 24 Vdc coil. The 120 Vac coil should be selected when powered by the Elevator Disconnect control circuit, and the 24 Vdc relay should be selected when the power is supplied from the fire alarm system.

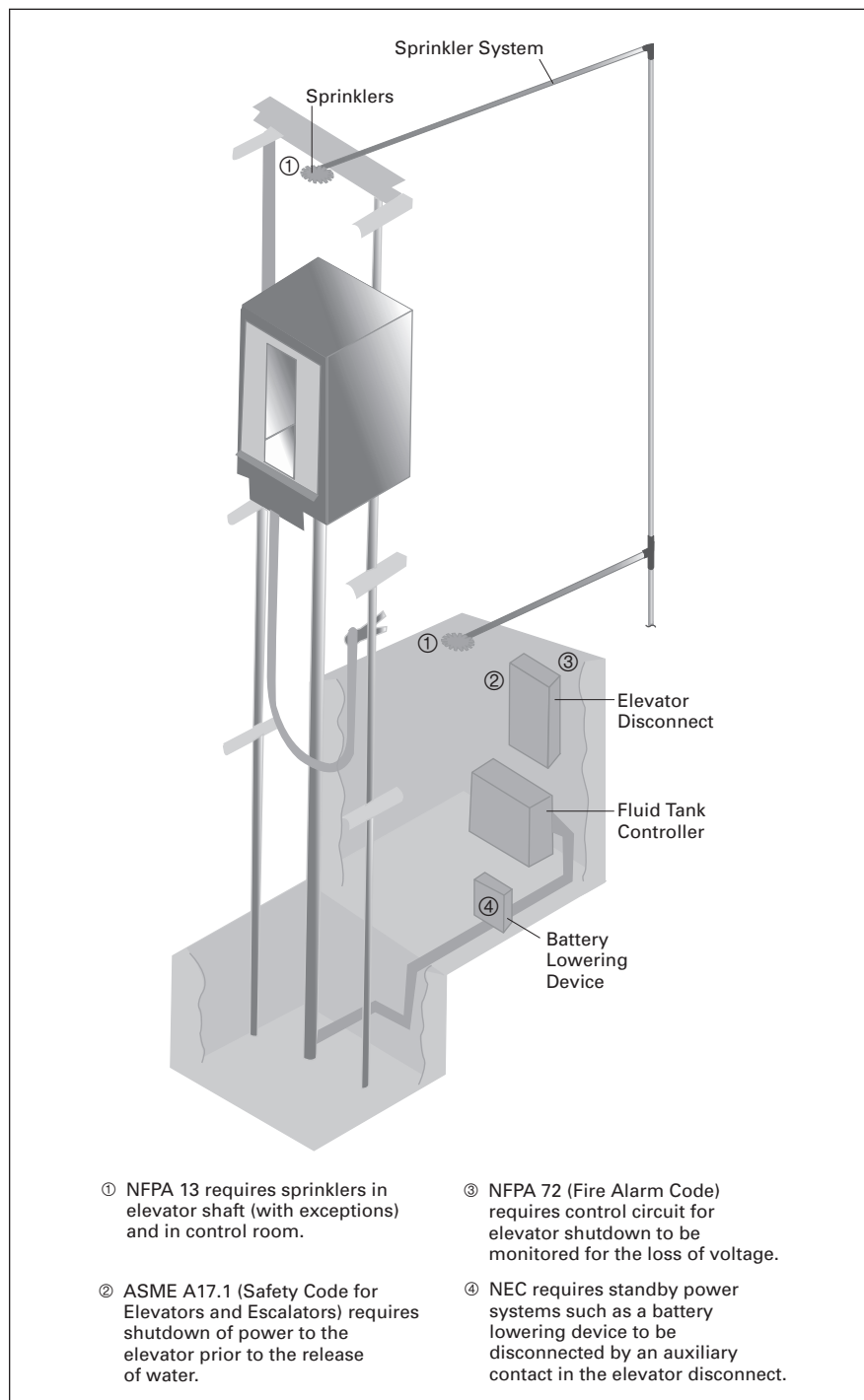


Figure 28.0-2. Typical Hydraulic Elevator Components and Requirements

## General Description

- In addition to turning off power, the model codes require other functions that are satisfied by the Eaton Elevator Disconnect. One of these requirements is that the shunt trip control circuit requires monitoring. The NFPA 72 (Fire Alarm Code) requires:

Control circuits to shut down elevator power shall be monitored for the presence of operating voltage. Loss of voltage to the control circuit for the disconnecting means shall cause a supervisory signal to be indicated at the control unit and required remote annunciation.

Thus, there is a requirement to monitor and to annunciate the presence of shunt trip control power. This is accomplished in the Eaton Elevator Disconnect by the Fire Alarm Voltage Monitoring Relay option. This relay is either a SPDT or a 3PDT relay. When control power is present, the closed relay contacts complete a circuit to the FACP that indicate the presence of control voltage. If control voltage is lost, the contact opens, signaling an alarm at the FACP and/or monitoring and annunciating a single elevator; all that is required is the single-pole relay. When wiring multiple switches (for multiple elevators), the three-pole relay option should be chosen. However, if there is a doubt, selecting the three-pole relay will provide all the functionality that is needed.

### Additional Requirements and Concerns

Many elevators are equipped with backup power supplies to allow the elevator to be lowered if power is lost. For example, many hydraulic elevators are equipped with a battery system that opens a solenoid to lower the elevator, and then provides power to open the elevator doors.

This battery-lowering device is viewed by the NEC as an "emergency or standby power system," and is governed by Article 620.91.

- Paragraph (C) requires that the main disconnect be provided with an auxiliary contact that disconnects the additional power source from the load when the disconnecting means is in the open position. The purpose of this auxiliary contact is to disconnect the backup power system when the elevator switch is opened

to prevent the elevator from automatically lowering while being maintained—which would endanger maintenance personnel.

Eaton's Elevator Disconnect is supplied with a standard set of 1NO and 1NC auxiliary contacts that are wired to the terminal blocks for this feature. Other manufacturers offer this as an option.

An additional concern that is not code related is accidental signaling of a loss of voltage if a switch is turned off for maintenance or testing. For example, if an Eaton Elevator Disconnect is turned off to perform routine maintenance, the control voltage will be disconnected and it will send a signal

to the FACP—which may alert the local fire department and initiate a fire call.

To solve this problem, an optional micro switch mounted on the main switch can be supplied and field-wired in parallel with the alarm contact on the Voltage Monitoring relay. Wiring in this fashion would prevent an alarm signal from being sent when the Eaton Elevator Disconnect is turned off for routine maintenance.

An additional standard feature on the Eaton Elevator Disconnect is a Key-To-Test switch to perform a functional test of the operation of the shunt trip. A pilot light signaling that the switch is ON and a neutral lug are the only other available options.

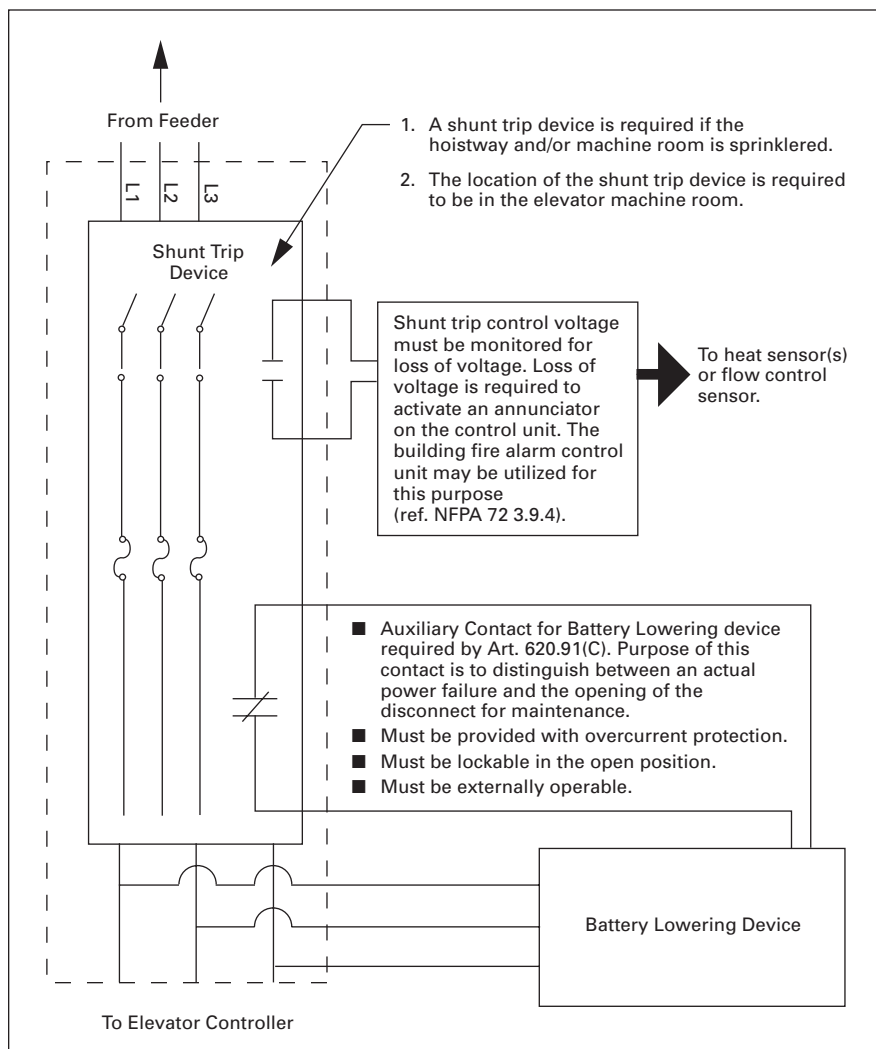


Figure 28.0-3. Shunt Trip Device Wiring Diagram

## General Description—Selection Guide

### Safety Switch Selection Guide

**Table 28.0-3. 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                           | 30–600                           | 2 and 3         | Yes             | Yes             | —                 | —                    | —                       | —                    | —                                 |                  |
|                            |                                            | Non-fusible | —         | —                           | 30–600                           | 2 and 3         | Yes             | Yes             | —                 | —                    | —                       | —                    | —                                 |                  |
| Heavy-duty                 | Single-throw max. 600 Vac horsepower rated | Fusible     | Cartridge | H L                         | 30–600<br>800–1200               | 2, 3 and 4      | Yes up to 1200A | Yes up to 1200A | Yes ① up to 1200A | Yes 400–1200A        | Yes up to 1200A         | Yes up to 200A       | Yes up to 1200A                   | Yes ② up to 100A |
|                            |                                            | Non-fusible | —         | —                           | 30–1200                          | 2, 3 and 4      | Yes             | Yes             | Yes ① up to 1200A | Yes 400–1200A        | Yes up to 1200A         | Yes up to 200A       | Yes up to 1200A                   | Yes up to 100A   |
| Six-pole motor circuit     | Single-throw max. 600 Vac                  | Fusible     | Cartridge | H                           | 30–200                           | 6               | —               | Yes             | Yes ①             | —                    | Yes                     | —                    | Yes                               | —                |
|                            |                                            | Non-fusible | —         | —                           | 30–200                           | 6               | —               | Yes             | Yes ①             | —                    | Yes                     | —                    | —                                 | —                |
| Double-throw               | Max. 600 Vac horsepower rated              | Fusible     | Cartridge | H T (600V)<br>T (240V)<br>L | 30–200<br>400<br>600<br>800–1200 | 2 and 3         | Yes up to 600A  | Yes up to 400A  | —                 | —                    | —                       | —                    | —                                 | —                |
|                            |                                            | Non-fusible | —         | —                           | 30–1200                          | 2, 3, 4 and 6   | Yes             | Yes             | Yes up to 400A    | —                    | Yes up to 400A          | —                    | —                                 | —                |
| Rotary switches            | Max. 600 Vac                               | Non-fusible | —         | —                           | 16–125                           | 3, 4            | Yes             | Yes ①           | Yes ①             | —                    | Yes                     | Yes                  | —                                 | —                |
| Auxiliary power heavy-duty | Max. 600 Vac horsepower rated              | Fusible     | Cartridge | H                           | 30–200                           | 3               | —               | Yes             | —                 | —                    | —                       | —                    | —                                 | —                |
|                            |                                            | Non-fusible | —         | —                           | 30–200                           | 3               | —               | Yes             | —                 | —                    | —                       | —                    | —                                 | —                |
| Elevator control switch    | Max. 600 Vac horsepower rated              | Fusible     | Cartridge | J                           | 30–200                           | 3               | Yes             | Yes             | Yes               | Yes                  | —                       | —                    | —                                 | —                |

<sup>①</sup> NEMA Type 12 enclosures (30–800A) can be field modified to meet NEMA 3R rainproof requirements when a factory provided drain screw is removed.

<sup>②</sup> Class J clips provided.

**Table 28.0-4. 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          | 30–400        | 2 and 3         | —               | —       | —       | —                    | Yes                     | —                    |
|                                              | Non-fusible | —         | —          | 30–400        | 3               | —               | —       | —       | —                    | Yes                     | —                    |
| Viewing window upper or lower ③④             | Fusible     | Cartridge | H L        | 30–600 800    | 3               | —               | —       | Yes ⑤   | Yes                  | Yes                     | —                    |
|                                              | Non-fusible | —         | —          | 30–800        | 3               | —               | —       | Yes ⑤   | Yes                  | Yes                     | —                    |
| Welding receptacle                           | Fusible     | Cartridge | H          | 30–100        | 3               | —               | —       | Yes     | —                    | Yes                     | —                    |
|                                              | Non-fusible | —         | —          | 60            | 3               | —               | —       | Yes     | —                    | Yes                     | —                    |
| Non-metallic                                 | Fusible     | Cartridge | H          | 30–200        | 3               | —               | —       | —       | —                    | —                       | Yes                  |
|                                              | Non-fusible | —         | —          | 30–200        | 3               | —               | —       | —       | —                    | —                       | Yes                  |

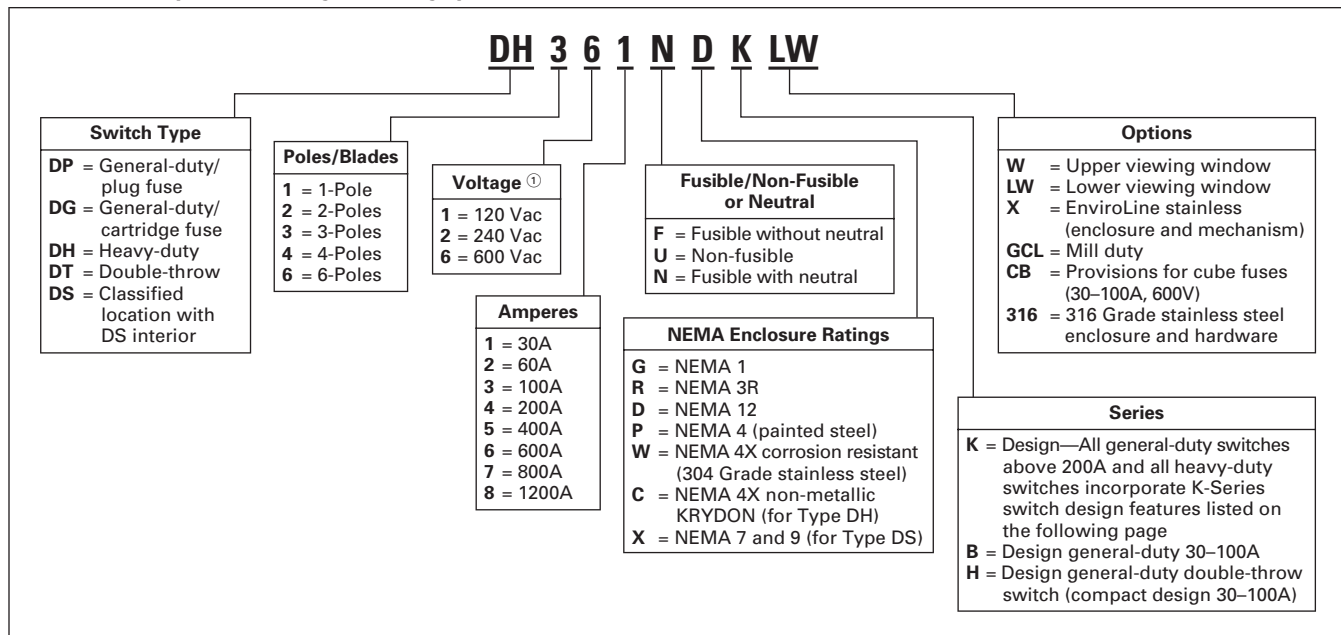
<sup>③</sup> 800A upper window switches are not UL listed.

<sup>④</sup> Lower window switches are available through 600A.

<sup>⑤</sup> NEMA Type 12 enclosures (30–800A) can be field modified to meet NEMA 3R rainproof requirements when a factory provided drain screw is removed.

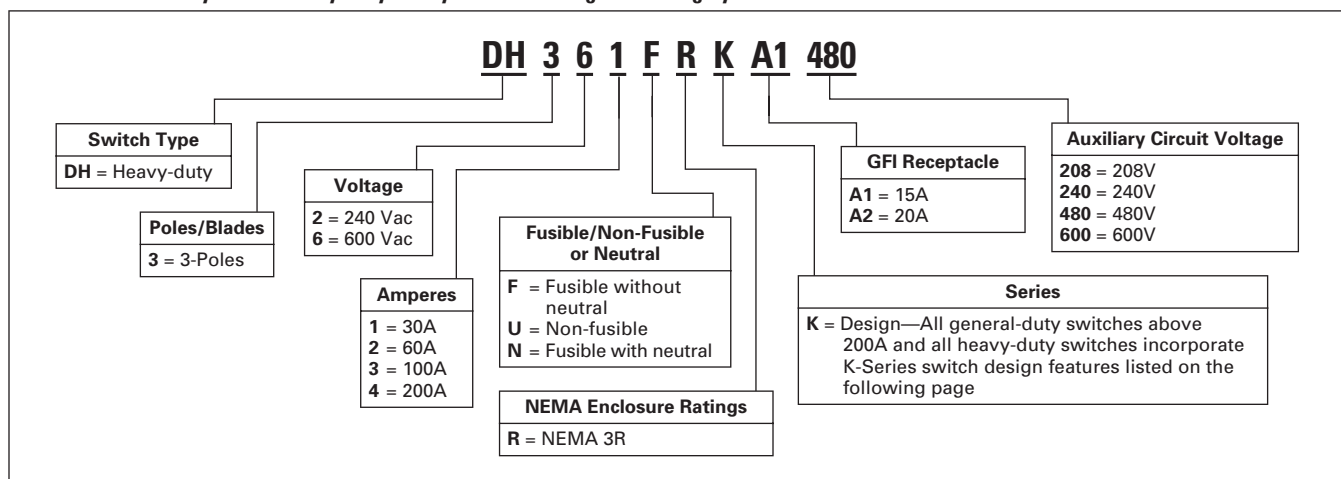
## Catalog Numbering System

Table 28.0-5. Safety Switch Catalog Numbering System



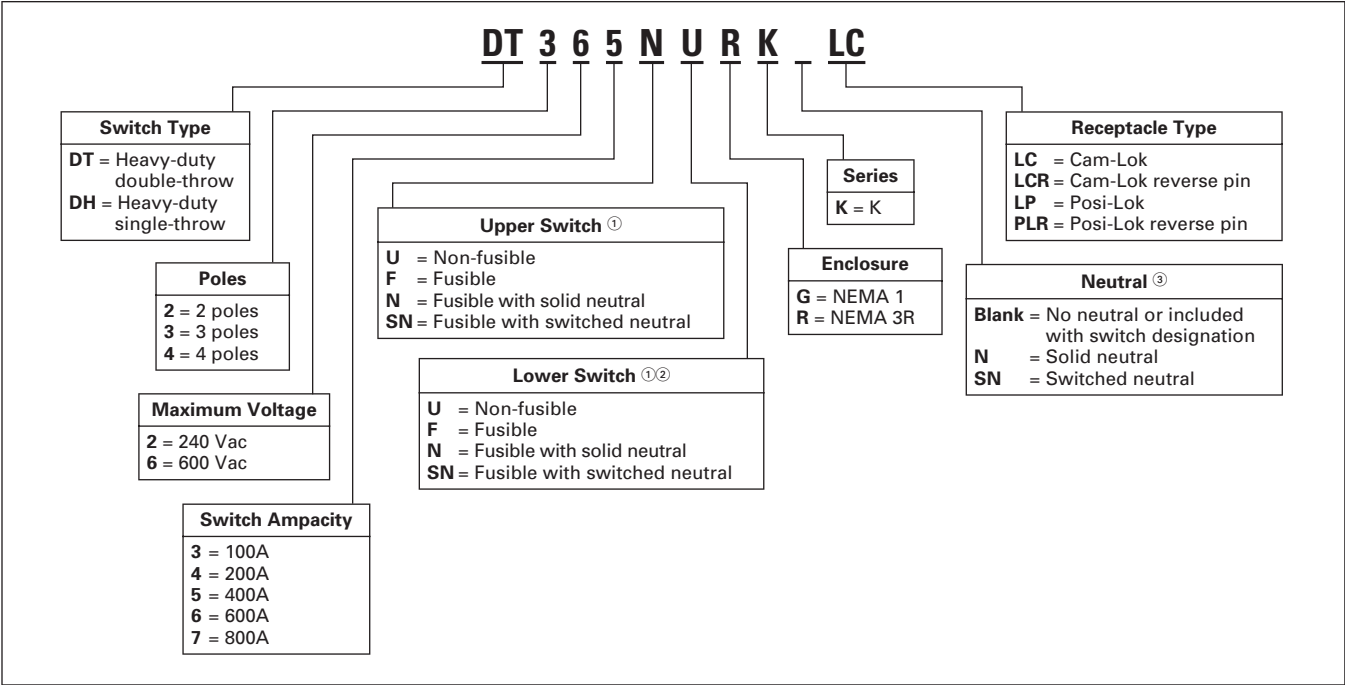
① For DC ratings, check individual switch ratings.

Table 28.0-6. Auxiliary Power Heavy-Duty Safety Switch Catalog Numbering System



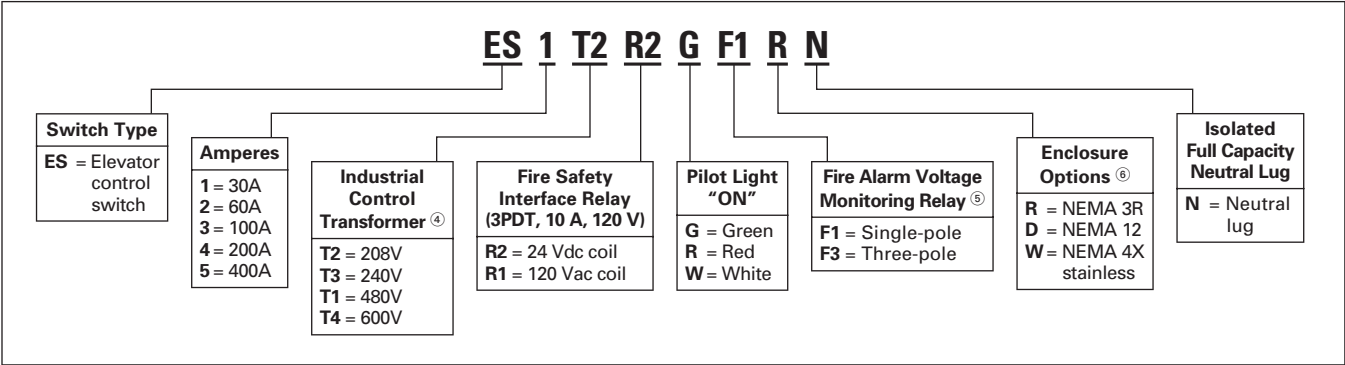
General Description—Catalog Numbering System

Table 28.0-7. Quick-Connect Safety Switch Catalog Numbering System

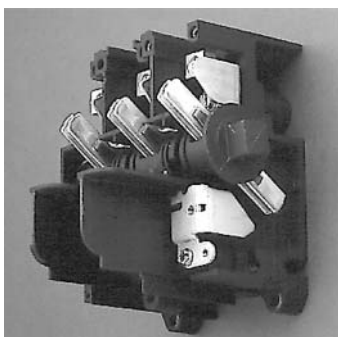


- ① When upper and lower switches are the same, the switch configuration is consolidated in one letter (e.g., "U" not "UU"). Also, a switch with a neutral will have either a solid neutral or a switched neutral, not both. Lastly, a switched neutral pole is never fused.
- ② Heavy-duty single-throw switches will not have a lower switch option.
- ③ This field is only used when a switch is completely non-fused.

Table 28.0-8. Elevator Control Switch Catalog Numbering System



- ④ 100 VA with primary and secondary fusing (120V secondary).
- ⑤ To monitor shunt trip voltage.
- ⑥ NEMA 1 standard with no suffix designation required.
- Note:** All modules are three-pole, 600V and contain a key to test switch and mechanically interlocked auxiliary contact as standard.

**All General-Duty Switches Above 100A and All Heavy-Duty Switches  
 Incorporate These K-Series Switch Design Features**

**Visible Double Break Rotary Blade Mechanism**

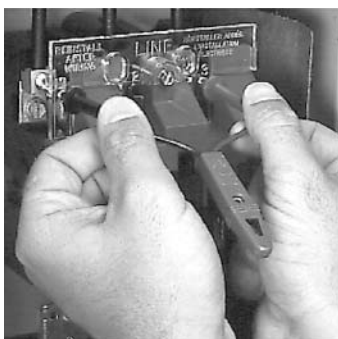
Two points of contact provide a positive open and close, easier operation, and also help prevent contact burning for longer contact life.


**Clearly Visible Handle**

The position (ON or OFF) can be clearly seen from a distance and the length provides for easy operation.


**Interlocking Mechanism**

Door cannot be opened when the handle is in the ON position. Front side operable defeater mechanism provides for user access when necessary.


**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. **Not provided on general-duty switches.**


**Triple Padlocking Capability**

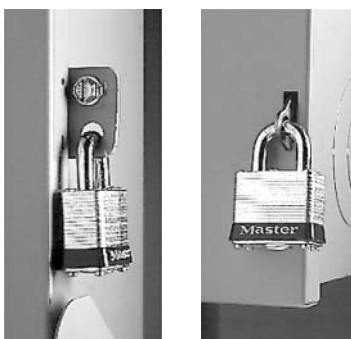
Personnel safety feature because the large hasp can accommodate up to three 3/8-inch (9.5 mm) shank locks.


**Tangential Knockouts**

An ample number are provided on the top, bottom and sides of both NEMA Types 1 and 3R enclosures through 200A.

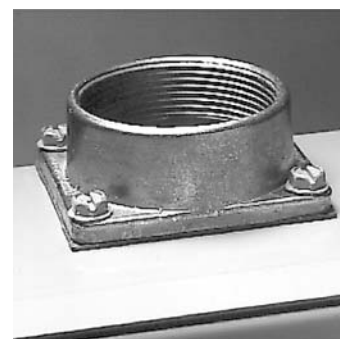

**Built-in Fuse Pullers (NEMA 12 and 4X 30-200A Only)**

Provide easy removal of fuses.


**Additional Locking Capability**

Cabinet door can be further padlocked at the top and bottom as applicable.

**Note:** Size of hasp in inches (mm):  
 30-100A—0.344 (8.7) 0.250 shank  
 200-1200A—0.50 (12.7) 0.375 shank


**Bolt-On Hub Kits**

For switches in a NEMA Type 3R, 12, 4 or 4X enclosure.

## Accessories, Hubs, Lug Data



DH030NK



DS16CP



DS200EK1



DS200GK



DS22JK



DS36CL



DS56CK



DS30FP



DS12FK



DS426TK

Table 28.0-9. Safety Switches—Accessories

| Description                                                                                                                                                                                                                                                                                                                 | Catalog Number                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Neutral Kits/Ground Kits</b><br>30A DG<br>60–100A DG<br>200A DG, DH (NEMA 1, 3R enclosures)<br>30–60A DH<br>100A DH<br>200A DH (NEMA 4X, 12 enclosures)<br>400A DG, DH<br>600A DG, DH<br>400–600A Fusible DT, 800–1200A DH<br>30–100A DT<br>200A DT<br>400A Non-fusible DT<br>600A Non-fusible DT<br>800A DT<br>1200A DT | DG030NB<br>DG100NB<br>DG200NK<br>DH030NK<br>DH100NK<br>DH200NK<br>DS400NK<br>DS600NK<br>DS800NK<br>DT100NK<br>DT200NK<br>DT400NK<br>DT600NK<br>DT800NK<br>DT1200NK |
| <b>Ground Lug Kits</b><br>30–100A DG<br>30–100A DH, DT ①<br>200A DG, DH, DT<br>400–600A DG, 400–1200A DH, 400–1200A DT                                                                                                                                                                                                      | DG030GB<br>DS100GK<br>DS200GK<br>DS468GK                                                                                                                           |
| <b>Switching Neutral Bonding Kits</b><br>30–100A DT, three-pole, four-pole<br>200A DT, three-pole, four-pole<br>400A DT, three-pole, four-pole<br>600A DT, three-pole, four-pole<br>800A DT, three-pole, four-pole                                                                                                          | DT100BK<br>DT200BK<br>DT400BK<br>DT600BK<br>DT800BK                                                                                                                |
| <b>Control Pole Kit</b><br>400–600A DG, 30–1200A DH, 30–800A DT                                                                                                                                                                                                                                                             | DS16CP                                                                                                                                                             |
| <b>Auxiliary Contact Kits</b><br>All switches (except 30–100A DG) 1NO/1NC<br>All switches (except 30–100A DG) 2NO/2NC                                                                                                                                                                                                       | DS200EK1<br>DS200EK2                                                                                                                                               |
| <b>Copper Lug Kits</b><br>30A DH, DT ②<br>60A DH, DT ②<br>100A DH, DT ②<br>200A DH ②<br>400A DH (NEMA 4, 4X, 12 enclosures) ③<br>600–800A DH (NEMA 4, 4X, 12 enclosures) ③                                                                                                                                                  | DS16CL<br>DS26CL<br>DS36CL<br>DS46CL<br>DS56CL<br>DS66CL                                                                                                           |
| <b>Crimp Lug Pad Kit (NEMA 4, 4X, 12 Enclosures)</b><br>400–600A DH ②<br>800A DH ③<br>400–800A neutral DH ④                                                                                                                                                                                                                 | DS56CK<br>DS76CK<br>DS800CNK                                                                                                                                       |

① Ground bar kit is not listed on device publications.

② Order one kit for three poles.

③ Order one kit for each pole.

④ Order one kit per switch.

**Note:** Accessories are not applicable to NEMA 7/9 switches.

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                 | Catalog Number                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Fuse Puller Kits</b><br>30–60A DH ②<br>30–60A DH ⑤<br>100A DH ②<br>200A DH ②                                                                                                                                                                                                                                                                                                                                                             | DS30FP<br>DS60FP<br>DS100FP<br>DS200FP                                                   |
| <b>“J” Fuse Adapter Kits</b><br>60A 240V DH ②<br>60A DT and receptacle switches ②<br>400A 600V DT ⑥<br>600A 240–600V DH only ③                                                                                                                                                                                                                                                                                                              | DS22JK<br>DS26JK<br>DT400JK<br>DS600JK                                                   |
| <b>“R” Fuse Adapter Kits ②</b><br>30A DG<br>100A DG<br>30A 240V DH, DT<br>30A 600V DH, DT, 60A 240V DH, DT, 60A DG<br>60A 600V DH, DT<br>100A 240–600V DH, DT<br>200A 240–600V DH, DT, 200A DG<br>400A 240–600V DH, 240V DT, 400A DG<br>600A 240–600V DH, 600A DG                                                                                                                                                                           | DG030RB<br>DG100RB<br>DS12FK<br>DS16FK<br>DS26FK<br>DS36FK<br>DS46FK<br>DS56FK<br>DS66FK |
| <b>“T” Fuse Adapter Kits</b><br>200A 240V DH ②<br>200A 600V DH ②<br>400A 240V DG, DH ③<br>400A 600V DH ③<br>600A 240V DG, DH ③<br>600A 600V DH ③<br>800A 240V DH ③<br>800A 600V DH ③<br>800–1200A 600V DH DT                                                                                                                                                                                                                                | DS426TK<br>DS466TK<br>DS526TK<br>DS566TK<br>DS626TK<br>DS666TK<br>DS726TK<br>DS766TK     |
| Hookstick handle                                                                                                                                                                                                                                                                                                                                                                                                                            | DH800HSH                                                                                 |
| Lubricating grease for safety switch blades and contacts (Each kit contains three 30 cc tubes of lubricating grease.)                                                                                                                                                                                                                                                                                                                       | DSLUBEKIT                                                                                |
| <b>Auxiliary Contacts for:</b><br>16–25A three-, four-pole rotary switches, includes holder and contact (1NO/1NC)<br>30–40A three-pole rotary switches, includes holder and contact (1NO)<br>60–125A three-pole rotary switches, includes holder and contact (1NO)<br>30–40A four-pole rotary switches, includes holder and contact (1NO)<br>30–125A three-, four-pole, contact only (1NC)<br>30–125A three-, four-pole, contact only (1NO) | CMAC<br>CRAC3 ⑦<br>CWAC3 ⑦<br>CRAC4 ⑦<br>CRAA ⑦<br>CRAB ⑦                                |

⑤ Receptacle switches.

⑥ Order one kit for six poles.

⑦ The mechanism is reversed on these contacts.

## Hubs



DS075H1

Table 28.0-10. Plate Type Hubs  
for NEMA Type 3R Enclosures (Up to 200A)

| Group 1<br>General-Duty, Heavy-Duty,<br>Double-Throw Through 100A |      |                   | Group 2<br>General-Duty, Heavy-Duty,<br>Double-Throw—200A |      |                   |
|-------------------------------------------------------------------|------|-------------------|-----------------------------------------------------------|------|-------------------|
| Conduit Size                                                      |      | Catalog<br>Number | Conduit Size                                              |      | Catalog<br>Number |
| Inches                                                            | mm   |                   | Inches                                                    | mm   |                   |
| 3/4                                                               | 19.1 | DS075H1           | 2                                                         | 50.8 | DS200H2           |
| 1                                                                 | 25.4 | DS100H1           | 2-1/2                                                     | 63.5 | DS250H2           |
| 1-1/4                                                             | 31.8 | DS125H1           | 3                                                         | 76.2 | DS300H2           |
| 1-1/2                                                             | 38.1 | DS150H1           | —                                                         | —    | —                 |
| 2                                                                 | 50.8 | DS200H1           | —                                                         | —    | —                 |

**Note:** Catalog Number **DS900AK** Adapter Kit—Permits Installation of Group 1 Hubs on 200A Type General-Duty, Heavy-Duty and Double-Throw Switches.

Table 28.0-11. Myers Type Hubs  
NEMA Type 3R (400A and Above)  
NEMA Types 4, 4X (Stainless Steel), 12

| Conduit Size |       | Catalog<br>Number |
|--------------|-------|-------------------|
| Inches       | mm    |                   |
| 1/2          | 12.7  | DS050MH           |
| 3/4          | 19.1  | DS075MH           |
| 1            | 25.4  | DS100MH           |
| 1-1/4        | 31.8  | DS125MH           |
| 1-1/2        | 38.1  | DS150MH           |
| 2            | 50.8  | DS200MH           |
| 2-1/2        | 63.5  | DS250MH           |
| 3            | 76.2  | DS300MH           |
| 3-1/2        | 88.9  | DS350MH           |
| 4            | 101.6 | DS400MH           |
| 5            | 127.0 | DS500MH           |

**Note:** Contact the Flex Center at 1-888-329-9272 for information on hubs for non-metallic NEMA 4X switches.

Table 28.0-12. Standard Lug Capacities

| Ampere<br>Rating      | Minimum<br>Wire Size | Maximum<br>Wire Size           | Wire<br>Type     |
|-----------------------|----------------------|--------------------------------|------------------|
| 30A DP                | #14                  | #10                            | Cu <b>OR</b>     |
| 30A DG                | #12                  | #10                            | Al               |
| 30A DH, DT            | #14                  | #6                             | Cu/Al            |
| 60A DG                | #14                  | #2                             | Cu/Al            |
| 60A DH, DT            | #14                  | #1/0                           | Cu/Al            |
| 100A DG ①             | #14                  | #1/0                           | Cu/Al            |
| 100A DH, DT           | #14                  | #1/0                           | Cu/Al            |
| 200A DG, DT           | #6                   | 250 kcmil                      | Cu/Al            |
| 200A DH Type 1 and 3R | #6                   | 250 kcmil                      | Cu/Al            |
| 200A DH Type 4 and 12 | #6                   | 300 kcmil                      | Cu/Al            |
| 400A DG, DH, DT       | (2) #1/0<br>(1) #1/0 | (2) 300 kcmil<br>(1) 750 kcmil | Cu/Al <b>OR</b>  |
| 600A DG               | (1) #2               | (1) 600 kcmil                  | Cu/Al <b>AND</b> |
| 600A DH               | (1) #1/0             | (1) 750 kcmil                  | Cu/Al            |
| 600A DT (Fusible)     |                      |                                |                  |
| 600A DT (Non-fusible) | (2) #250             | (2) 500 kcmil                  | Cu/Al            |
| 800A DH               | (4) #1/0             | (4) 750 kcmil                  | Cu/Al            |
| 800A DT               | (3) #250             | (3) 500 kcmil                  | Cu/Al            |
| 1200A DH, DT          | (4) #1/0             | (4) 750 kcmil                  | Cu/Al            |

## Copper-Bodied Lugs

|         |          |               |    |
|---------|----------|---------------|----|
| 30A Cu  | #14      | #6            | Cu |
| 60A Cu  | #14      | #4            | Cu |
| 100A Cu | #6       | #1/0          | Cu |
| 200A Cu | #6       | 250 kcmil     | Cu |
| 400A Cu | #1/0     | 500 kcmil     | Cu |
| 600A Cu | (2) #1/0 | (2) 500 kcmil | Cu |

① The maximum size aluminum or copper-clad aluminum wire allowable for applications where the conductor enters or leaves the enclosure through the wall opposite its terminal is #1 gauge.

**Note:** Although certain lug capacities are larger than required, only minimum wire bending space is provided per the requirements noted in NEC Tables 373.6 (a) and (b) for respective ampere ratings.

## General Description—Lug Data, Connection Plugs

**Table 28.0-13. Available Lug Capacities of the Double-Throw Switch Assembly with Cam-Lok or Posi-Lok Receptacles**

| Double Throw Switch Size—Cam-Lok or Posi-Lok Receptacles | Service Terminal Openings                    | Load Terminal Openings                       | Switched Neutral Pole Load Terminal Openings | Solid Neutral Terminal Openings                         | Ground Terminal Openings  | Receptacle Bypass Terminal              |
|----------------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|---------------------------------------------------------|---------------------------|-----------------------------------------|
| 100                                                      | (1) 1/0–14 AWG Cu/Al                         | (1) 1/0–14 AWG Cu/Al                         | (1) 1/0–14 AWG Cu/Al                         | (2) 1/0–14 AWG, (1) 2–14 AWG Cu/Al                      | (3) 2–14 AWG Cu/Al        | (1) 10–32 Screw mounting                |
| 200                                                      | (1) 300 kcmil–6 AWG Cu/Al                    | (1) 250 kcmil–6 AWG Cu/Al                    | (1) 250 kcmil–6 AWG Cu/Al                    | (2) 250 kcmil–6 AWG, (1) 1/0–14 AWG, (1) 2–14 AWG Cu/Al | (3) 2–14 AWG Cu/Al        | (2) 1/4 Studs, 1.75-inch spacing        |
| 400                                                      | (1) 750 kcmil–1/0 or (2) 300 kcmil–1/0 Cu/Al | (1) 750 kcmil–1/0 or (2) 300 kcmil–1/0 Cu/Al | (1) 750 kcmil–1/0 or (2) 300 kcmil–1/0 Cu/Al | (6) 500 kcmil, (6) 250 kcmil–6 AWG Cu/Al                | (4) 250 kcmil–6 AWG Cu/Al | (2) 1/2–13 UNC studs, 1.75-inch spacing |
| 600                                                      | (4) 750 kcmil–3/0 Cu/Al                      | (4) 500–250 kcmil Cu/Al                      | (4) 500–250 kcmil Cu/Al                      | (6) 500–250 kcmil, (4) 250 kcmil–6 AWG Cu/Al            | (4) 250 kcmil–6 AWG Cu/Al | (2) 1/2–13 UNC studs, 1.75-inch spacing |
| 800                                                      | (4) 750 kcmil–3/0 Cu/Al                      | (4) 500–250 kcmil Cu/Al                      | (4) 500–250 kcmil Cu/Al                      | (6) 500–250 kcmil, (4) 250 kcmil–6 AWG Cu/Al            | (4) 250 kcmil–6 AWG Cu/Al | (2) 1/2–13 UNC studs, 1.75-inch spacing |

**Table 28.0-14. Quick-Connect Double-Throw Standard Receptacles and Corresponding Connection Plugs (Part Numbers are Cooper Crouse-Hinds)**

| Double Throw Switch Size—Cam-Lok or Posi-Lok Receptacles |                                                                                         | Cam-Lok Connectors                                                                          |                                                                                                  | Posi-Lok Connectors                                                                                                                                                                                                                                                                                                                                        |                                                                                   |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                                          |                                                                                         | Receptacle                                                                                  | Plug                                                                                             | Receptacle Panel                                                                                                                                                                                                                                                                                                                                           | Plug                                                                              |
| 100                                                      | Ground (green)<br>Neutral (white)<br>A Phase (black)<br>B Phase (red)<br>C Phase (blue) | E1016-1635S<br>E1016-1636S<br>E1016-1600S<br>E1016-1602S<br>E1016-1612S                     | E-Z1016-8366<br>E-Z1016-8367<br>E-Z1016-8387<br>E-Z1016-8389<br>E-Z1016-8393                     | Two-pole, three-wire with solid neutral or three-pole, three-wire with switched neutral pole (two-phase and single neutral pole): E0200-1696 / three-pole, three-wire (no neutral): E0200-1686 / three-pole, four-wire with solid neutral or four-pole, four-wire with switched neutral pole (three-phase and single neutral pole): E0200-1687             | E0200-281<br>E0200-282<br>E0200-283<br>E0200-284<br>E0200-285                     |
| 200                                                      | Ground (green)<br>Neutral (white)<br>A Phase (black)<br>B Phase (red)<br>C Phase (blue) | E1016-1635S<br>E1016-1636S<br>E1016-1600S<br>E1016-1602S<br>E1016-1612S                     | E-Z1016-8366<br>E-Z1016-8367<br>E-Z1016-8387<br>E-Z1016-8389<br>E-Z1016-8393                     | Two-pole, three-wire with solid neutral or three-pole, three-wire with switched neutral pole (two-phase and single neutral pole): E0200-1696 / three-pole, three-wire (no neutral): E0200-1686 / three-pole, four-wire with solid neutral or four-pole, four-wire with switched neutral pole (three-phase and single neutral pole): E0200-1687             | E0200-281<br>E0200-282<br>E0200-283<br>E0200-284<br>E0200-285                     |
| 400                                                      | Ground (green)<br>Neutral (white)<br>A Phase (black)<br>B Phase (red)<br>C Phase (blue) | E1016-1635S<br>E1016-1636S<br>E1016-1600S<br>E1016-1602S<br>E1016-1612S                     | E-Z1016-8366<br>E-Z1016-8367<br>E-Z1016-8387<br>E-Z1016-8389<br>E-Z1016-8393                     | Two-pole, three-wire with solid neutral or three-pole, three-wire with switched neutral pole (two-phase and single neutral pole): E0400-1696 / three-pole, three-wire (no neutral): E0400-1686 / three-pole, four-wire with solid neutral or four-pole, four-wire with switched neutral pole (three-phase and single neutral pole): E0400-1687             | E0400-281<br>E0400-282<br>E0400-283<br>E0400-284<br>E0400-285                     |
| 600                                                      | Ground (green)<br>Neutral (white)<br>A Phase (black)<br>B Phase (red)<br>C Phase (blue) | (2) E1016-1635S<br>(2) E1016-1636S<br>(2) E1016-1600S<br>(2) E1016-1602S<br>(2) E1016-1612S | (2) E-Z1016-8366<br>(2) E-Z1016-8367<br>(2) E-Z1016-8387<br>(2) E-Z1016-8389<br>(2) E-Z1016-8393 | Two-pole, three-wire with solid neutral or three-pole, three-wire with switched neutral pole (two-phase and single neutral pole): (2) E0400-1696 / three-pole, three-wire (no neutral): (2) E0400-1686 / three-pole, four-wire with solid neutral or four-pole, four-wire with switched neutral pole (three-phase and single neutral pole): (2) E0400-1687 | (2) E0400-281<br>(2) E0400-282<br>(2) E0400-283<br>(2) E0400-284<br>(2) E0400-285 |
| 800                                                      | Ground (green)<br>Neutral (white)<br>A Phase (black)<br>B Phase (red)<br>C Phase (blue) | (2) E1016-1635S<br>(2) E1016-1636S<br>(2) E1016-1600S<br>(2) E1016-1602S<br>(2) E1016-1612S | (2) E-Z1016-8366<br>(2) E-Z1016-8367<br>(2) E-Z1016-8387<br>(2) E-Z1016-8389<br>(2) E-Z1016-8393 | Two-pole, three-wire with solid neutral or three-pole, three-wire with switched neutral pole (two-phase and single neutral pole): (2) E0400-1696 / three-pole, three-wire (no neutral): (2) E0400-1686 / three-pole, four-wire with solid neutral or four-pole, four-wire with switched neutral pole (three-phase and single neutral pole): (2) E0200-1687 | (2) E0400-281<br>(2) E0400-282<br>(2) E0400-283<br>(2) E0400-284<br>(2) E0400-285 |

**Note:** Switches are not supplied with the mating plugs. Eaton will supply the plug if cord sets are ordered.

## Dimensions

Table 28.0-15. General-Duty, Non-Fusible, 240V, Three-Pole, Single-Throw

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

Table 28.0-16. General-Duty, Fusible, 240V, Three-Pole, Solid Neutral, Single-Throw

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

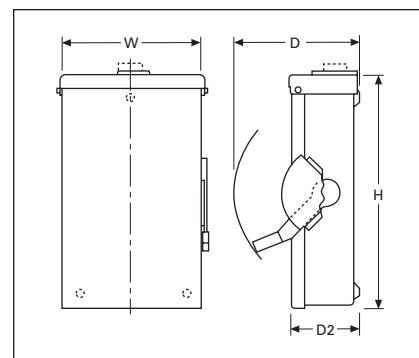
**Note:** Not applicable to plug fuse.

Figure 28.0-4. NEMA 1-3R 30-100A

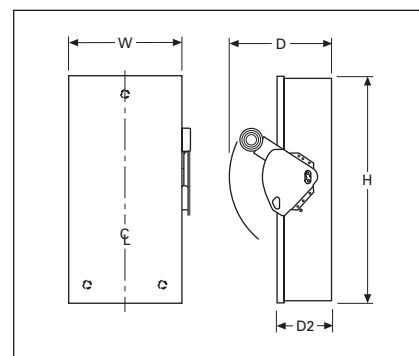


Figure 28.0-5. NEMA 1-3R 200-600A

*Dimensions are for estimating purposes only.*

## Dimensions (Continued)

Table 28.0-17. Heavy-Duty, Non-Fusible, 600V, Three-Pole, Single-Throw

| Ampere Rating | NEMA 1, 3R                |                |               |               |                 | NEMA 12, 4X Stainless Steel, 4 |                |               |               |                 |
|---------------|---------------------------|----------------|---------------|---------------|-----------------|--------------------------------|----------------|---------------|---------------|-----------------|
|               | Dimensions in Inches (mm) |                |               |               | Weight Lbs (kg) | Dimensions in Inches (mm)      |                |               |               | Weight Lbs (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)    |

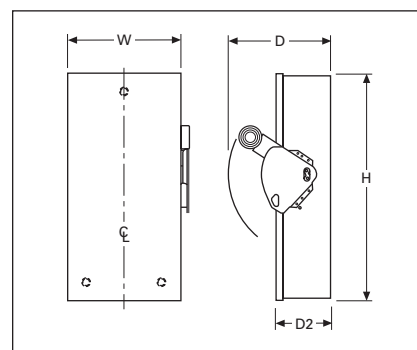


Figure 28.0-6. NEMA 1, 3R 30-1200A

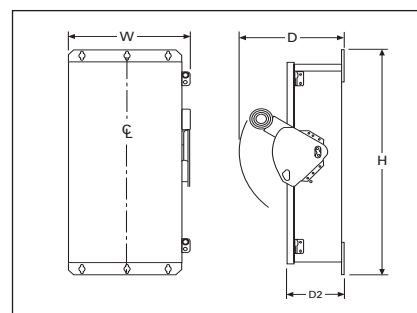


Figure 28.0-7. NEMA 4/4X and 12 30-800A

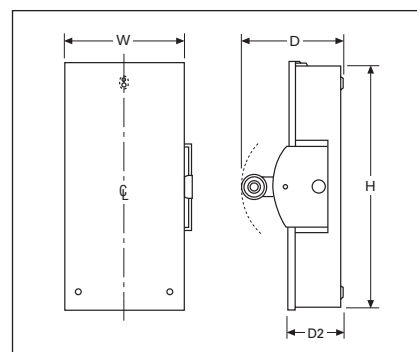


Figure 28.0-8. NEMA 1, 3R 30-800A

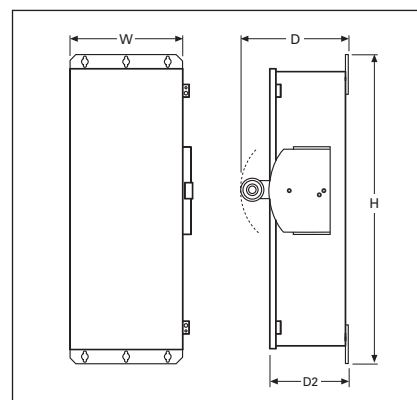


Figure 28.0-9. NEMA 12, 4X 30-400A

Table 28.0-18. Heavy-Duty, Fusible, 240 and 600V, Three-Pole Solid Neutral, Single-Throw

| Ampere Rating | NEMA 1, 3R                |                |               |               |                 | NEMA 12, 4X Stainless Steel, 4 |                |               |               |                 |
|---------------|---------------------------|----------------|---------------|---------------|-----------------|--------------------------------|----------------|---------------|---------------|-----------------|
|               | Dimensions in Inches (mm) |                |               |               | Weight Lbs (kg) | Dimensions in Inches (mm)      |                |               |               | Weight Lbs (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)    |

## Dimensions (Continued)

Table 28.0-19. Heavy-Duty, Non-Fusible, 240 and 600V, Three-Pole, Double-Throw

| Ampere Rating | NEMA 1, 3R                |                |               |               |                 | NEMA 12, 4X Stainless Steel |                |               |              |                 |
|---------------|---------------------------|----------------|---------------|---------------|-----------------|-----------------------------|----------------|---------------|--------------|-----------------|
|               | Dimensions in Inches (mm) |                |               |               | Weight Lbs (kg) | Dimensions in Inches (mm)   |                |               |              | Weight Lbs (kg) |
|               | Width (W)                 | Height (H)     | Depth (D)     | Depth (D2)    |                 | Width (W)                   | Height (H)     | Depth (D)     | Depth (D2)   |                 |
| 30            | 11.94 (303.3)             | 24.63 (625.6)  | 9.88 (251.0)  | 5.38 (136.7)  | 34 (15.436)     | 12.00 (304.8)               | 25.88 (657.4)  | 10.25 (260.4) | 5.50 (139.7) | 60 (27.24)      |
| 60            | 11.94 (303.3)             | 24.63 (625.6)  | 9.88 (251.0)  | 5.38 (136.7)  | 34 (15.436)     | 12.00 (304.8)               | 25.88 (657.4)  | 10.25 (260.4) | 5.50 (139.7) | 60 (27.24)      |
| 100           | 11.94 (303.3)             | 24.63 (625.6)  | 9.88 (251.0)  | 5.38 (136.7)  | 34 (15.436)     | 12.00 (304.8)               | 25.88 (657.4)  | 10.25 (260.4) | 5.50 (139.7) | 60 (27.24)      |
| 200           | 19.56 (496.8)             | 37.38 (949.5)  | 11.25 (285.8) | 6.10 (154.9)  | 80 (36.32)      | 19.50 (495.3)               | 41.00 (1041.4) | 11.63 (295.4) | 6.48 (164.6) | 105 (47.67)     |
| 400           | 23.13 (587.5)             | 53.81 (1366.8) | 12.50 (317.5) | 7.25 (184.2)  | 140 (63.56)     | 23.00 (584.2)               | 57.50 (1460.5) | 12.50 (317.5) | 7.25 (184.2) | 185 (83.99)     |
| 600           | 24.13 (612.9)             | 63.31 (1608.1) | 14.13 (358.9) | 8.88 (225.6)  | 175 (79.45)     | —                           | —              | —             | —            | —               |
| 800           | 24.13 (612.9)             | 63.31 (1608.1) | 14.13 (358.9) | 8.88 (225.6)  | 175 (79.45)     | —                           | —              | —             | —            | —               |
| 1200          | 42.15 (1070.6)            | 78.11 (1984.0) | 25.62 (650.7) | 20.47 (519.9) | 509 (231.09)    | —                           | —              | —             | —            | —               |

Table 28.0-20. Heavy-Duty, Fusible, 240 and 600V, Three-Pole, Double-Throw

| Ampere Rating | NEMA 1, 3R                |                |               |               |                 | NEMA 12, 4X Stainless Steel |                |               |              |                 |
|---------------|---------------------------|----------------|---------------|---------------|-----------------|-----------------------------|----------------|---------------|--------------|-----------------|
|               | Dimensions in Inches (mm) |                |               |               | Weight Lbs (kg) | Dimensions in Inches (mm)   |                |               |              | Weight Lbs (kg) |
|               | Width (W)                 | Height (H)     | Depth (D)     | Depth (D2)    |                 | Width (W)                   | Height (H)     | Depth (D)     | Depth (D2)   |                 |
| 30            | 11.94 (303.3)             | 36.63 (930.4)  | 9.88 (251.0)  | 5.38 (136.7)  | 44 (19.976)     | 12.00 (304.8)               | 39.81 (1011.2) | 10.25 (260.4) | 5.50 (139.7) | 45 (20.43)      |
| 60            | 11.94 (303.3)             | 36.63 (930.4)  | 9.88 (251.0)  | 5.38 (136.7)  | 44 (19.976)     | 12.00 (304.8)               | 39.81 (1011.2) | 10.25 (260.4) | 5.50 (139.7) | 45 (20.43)      |
| 100           | 11.94 (303.3)             | 36.63 (930.4)  | 9.88 (251.0)  | 5.38 (136.7)  | 44 (19.976)     | 12.00 (304.8)               | 39.81 (1011.2) | 10.25 (260.4) | 5.50 (139.7) | 45 (20.43)      |
| 200           | 19.56 (496.8)             | 50.88 (1292.4) | 11.25 (285.8) | 6.10 (154.9)  | 95 (43.13)      | 19.56 (496.8)               | 55.63 (1413.0) | 11.63 (295.4) | 6.46 (164.1) | 100 (45.4)      |
| 400           | 25.38 (644.7)             | 74.75 (1898.7) | 14.13 (358.9) | 8.88 (225.6)  | 230 (104.42)    | 25.38 (644.7)               | 74.75 (1898.7) | 14.13 (358.9) | 8.92 (226.6) | 260 (118.04)    |
| 600           | 27.44 (697.0)             | 86.13 (2187.7) | 14.13 (358.9) | 8.88 (225.6)  | 320 (145.28)    | —                           | —              | —             | —            | —               |
| 800           | 28.12 (714.2)             | 58.86 (1495.0) | 25.62 (650.7) | 20.47 (519.9) | 282 (128.03)    | —                           | —              | —             | —            | —               |
| 1200          | 42.15 (1070.6)            | 78.11 (1984.0) | 25.62 (650.7) | 20.47 (519.9) | 509 (231.09)    | —                           | —              | —             | —            | —               |

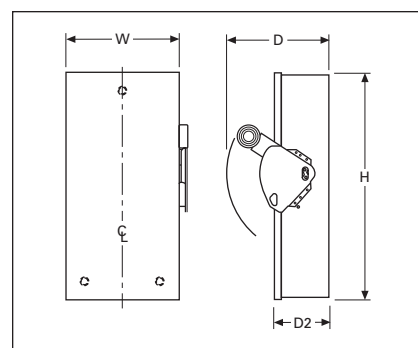


Figure 28.0-10. NEMA 1, 3R 30-1200A

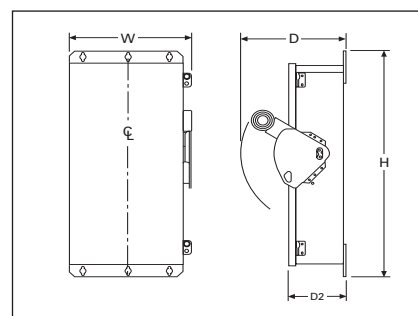


Figure 28.0-11. NEMA 4/4X and 12 30-800A

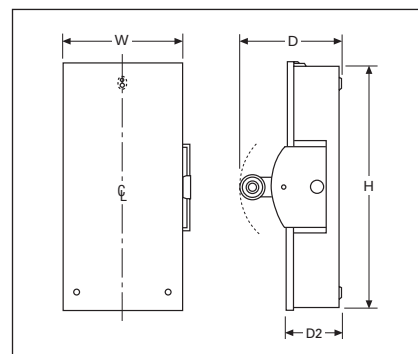


Figure 28.0-12. NEMA 1, 3R 30-800A

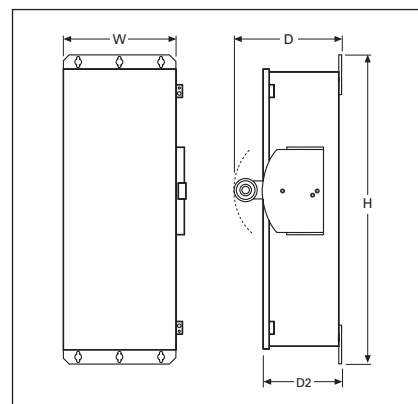


Figure 28.0-13. NEMA 12, 4X 30-400A

## Dimensions (Continued)

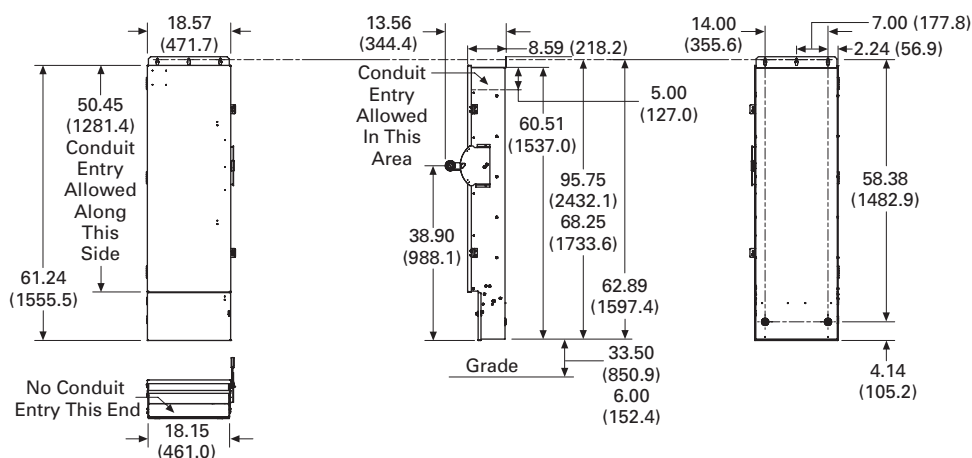


Figure 28.0-14. Quick-Connect Double-Throw 30/200A—Dimensions in Inches (mm)

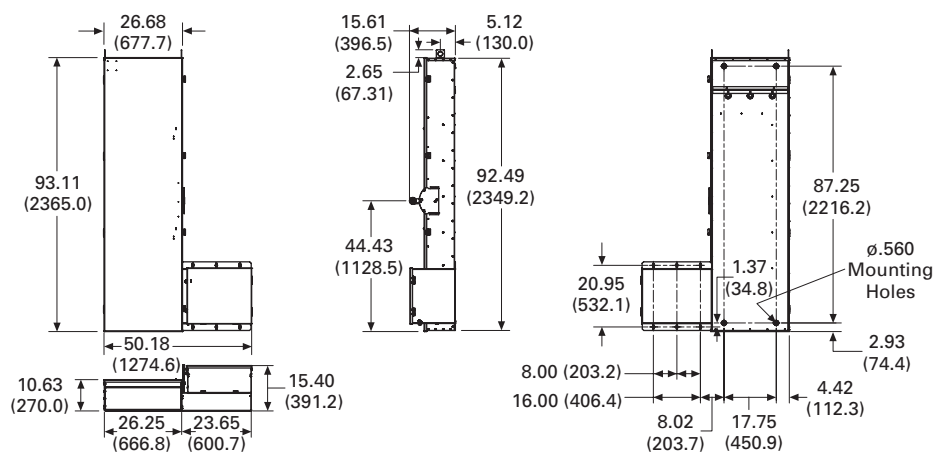


Figure 28.0-15. Quick-Connect Double-Throw 400A—Dimensions in Inches (mm)

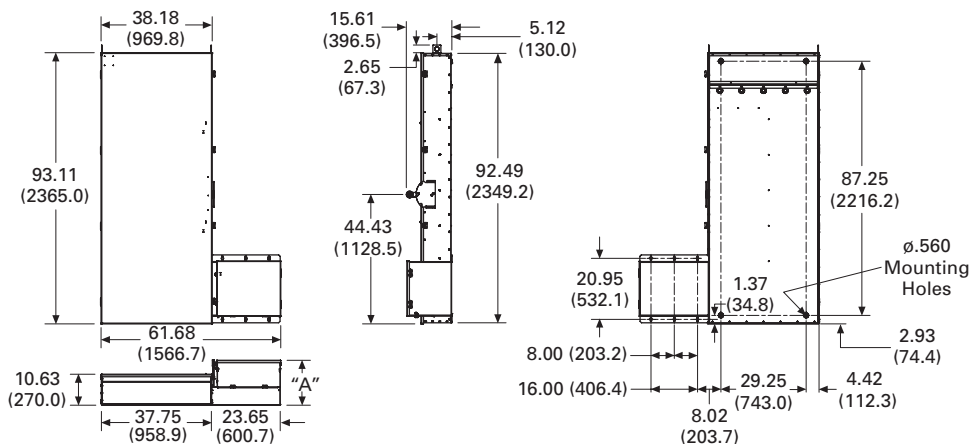
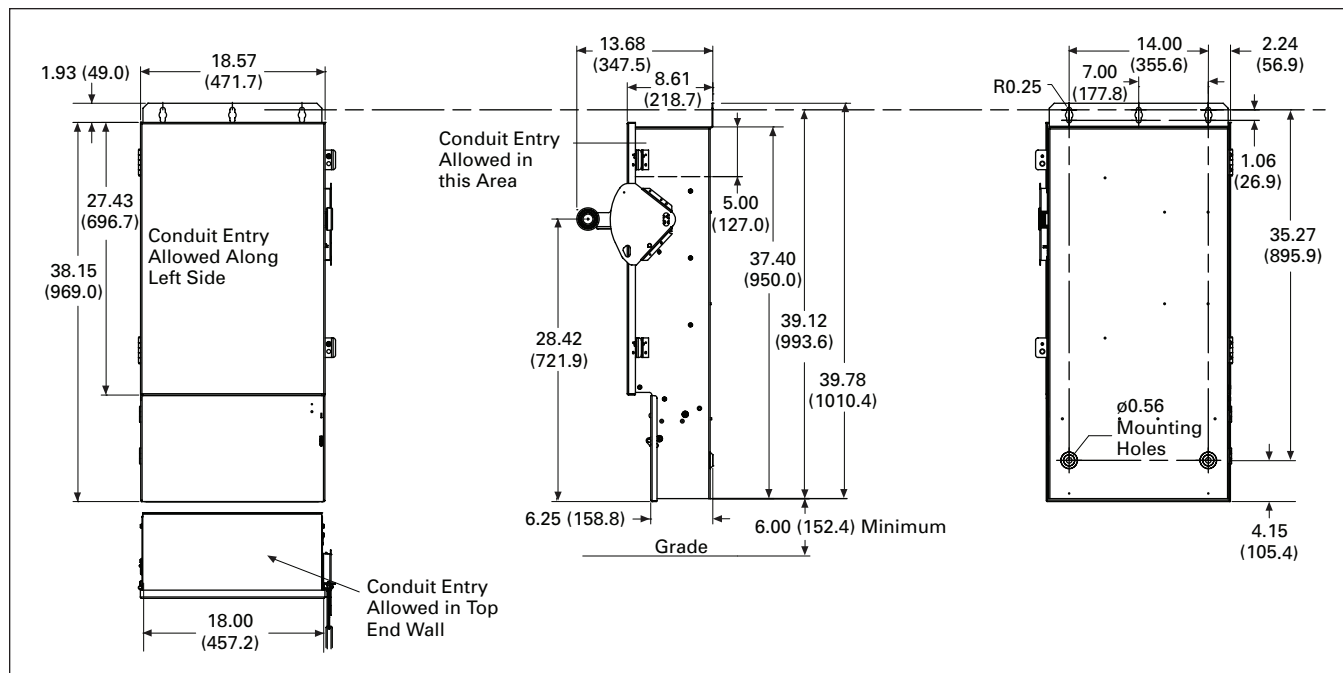
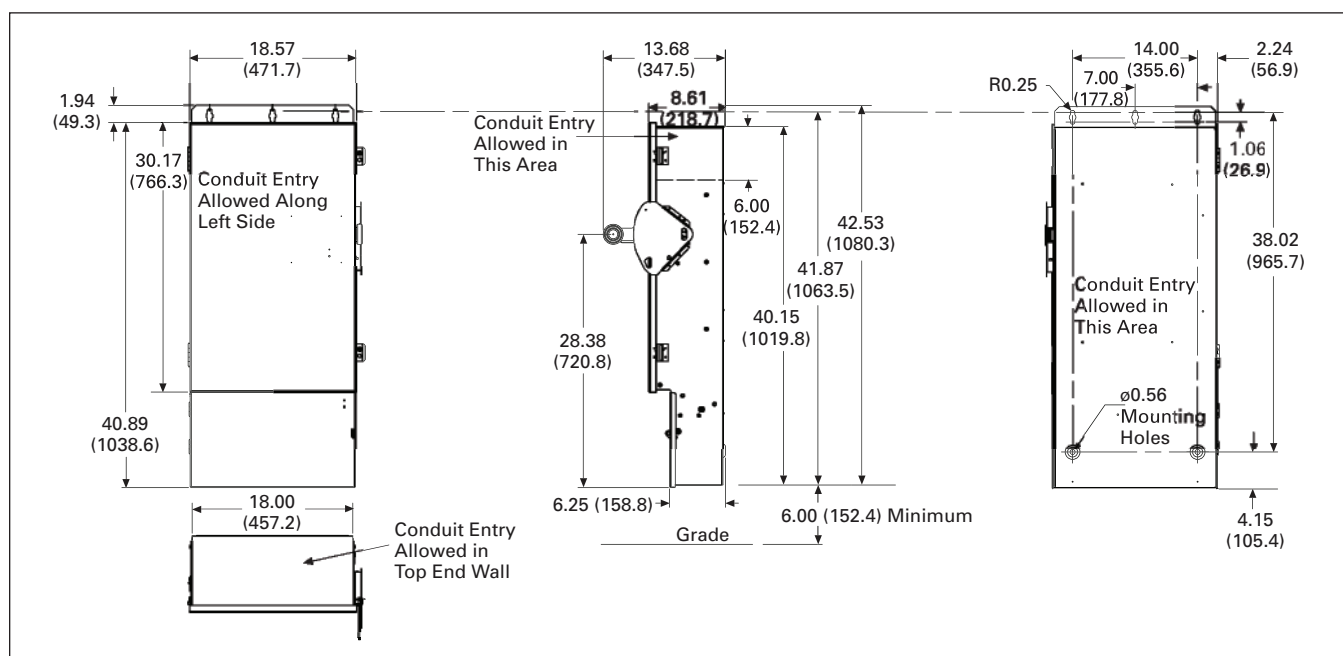


Figure 28.0-16. Quick-Connect Double-Throw 600–800A—Dimensions in Inches (mm)

**Dimensions (Continued)**



**Figure 28.0-17. Quick-Connect Single-Throw 100A—Dimensions in Inches (mm)**



**Figure 28.0-18. Quick-Connect Single-Throw 200A—Dimensions in Inches (mm)**

## Dimensions (Continued)

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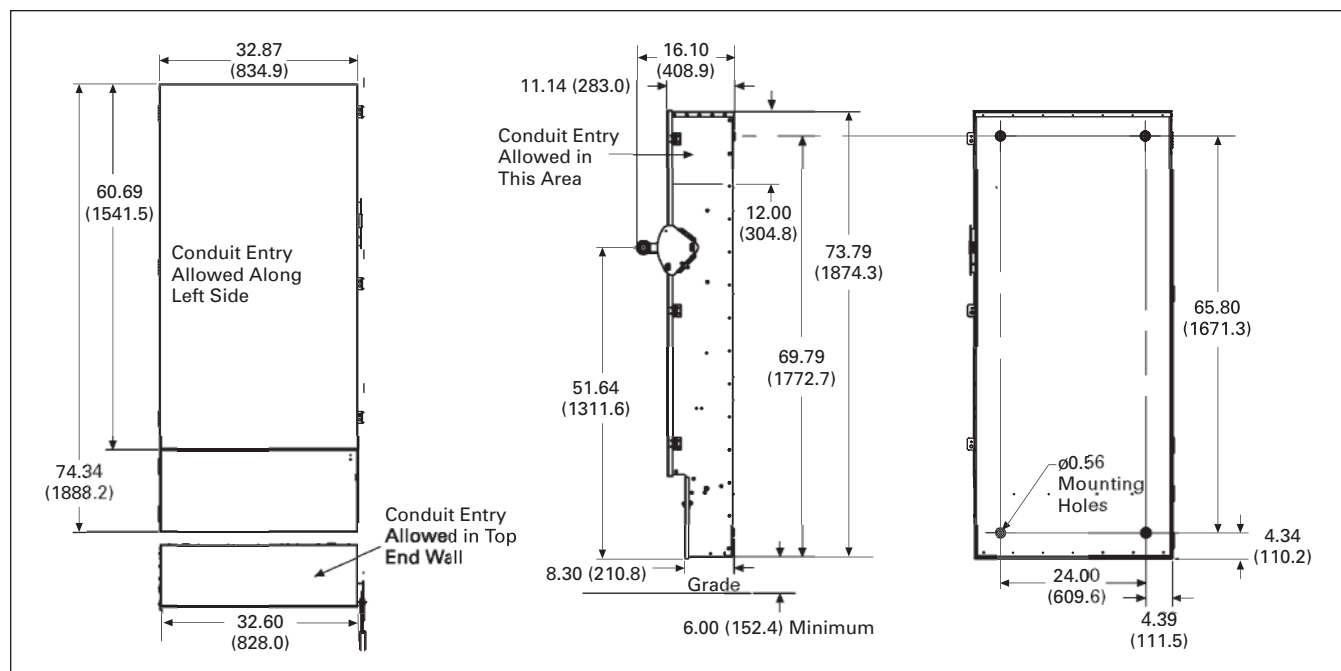


Figure 28.0-19. Quick-Connect Single-Throw 400-600A—Dimensions in Inches (mm)

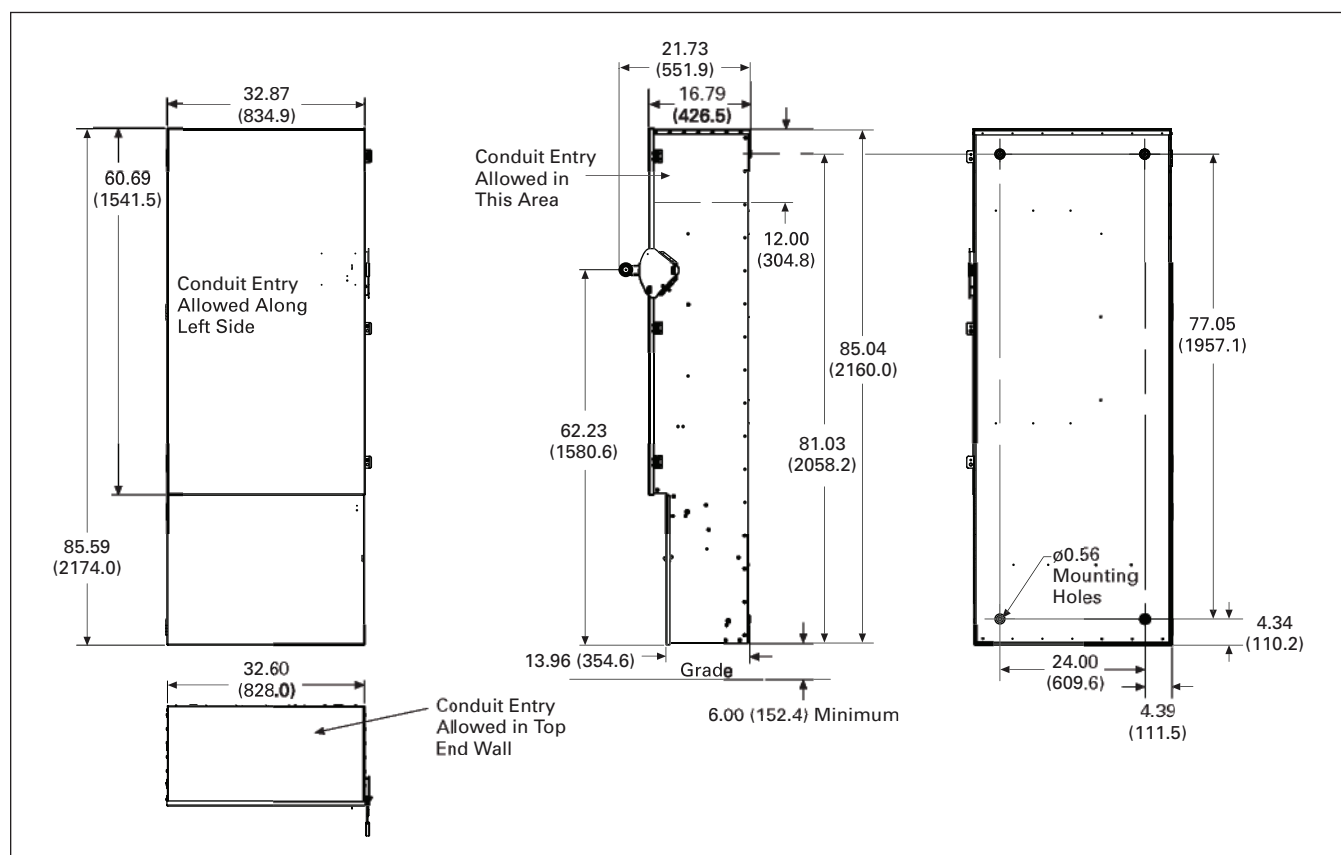


Figure 28.0-20. Quick-Connect Single-Throw 800A—Dimensions in Inches (mm)

## Dimensions (Continued)

Table 28.0-21. Auxiliary Power Heavy-Duty Safety Switch

| Ampere Rating | NEMA 3R                   |                  |                  |                  |                 |
|---------------|---------------------------|------------------|------------------|------------------|-----------------|
|               | Dimensions in Inches (mm) |                  |                  |                  | Weight Lbs (kg) |
|               | Width (W)                 | Height (H)       | Depth (D)        | Depth (D2)       |                 |
| 30            | 26.58<br>(675.1)          | 24.93<br>(633.2) | 16.00<br>(406.4) | 11.29<br>(286.8) | ①               |
| 60            | 26.58<br>(675.1)          | 24.93<br>(633.2) | 16.00<br>(406.4) | 11.29<br>(286.8) | ①               |
| 100           | 26.58<br>(675.1)          | 24.93<br>(633.2) | 16.00<br>(406.4) | 11.29<br>(286.8) | ①               |

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

Table 28.0-22. Elevator Control Switch

| Ampere Rating | Dimensions in Inches (mm) |                   |                  |
|---------------|---------------------------|-------------------|------------------|
|               | Width (W)                 | Height (H)        | Depth (D)        |
| <b>NEMA 1</b> |                           |                   |                  |
| 30            | 16.00<br>(406.4)          | 20.00<br>(508.0)  | 8.63<br>(219.2)  |
| 60            | 16.00<br>(406.4)          | 20.00<br>(508.0)  | 8.63<br>(219.2)  |
| 100           | 16.00<br>(406.4)          | 20.00<br>(508.0)  | 8.63<br>(219.2)  |
| 200           | 20.00<br>(508.0)          | 30.00<br>(762.0)  | 8.63<br>(219.2)  |
| 400           | 25.21<br>(640.3)          | 53.25<br>(1352.6) | 12.69<br>(322.3) |

**NEMA 3R or 12**

|     |                  |                   |                  |
|-----|------------------|-------------------|------------------|
| 30  | 20.00<br>(508.0) | 20.00<br>(508.0)  | 8.00<br>(203.2)  |
| 60  | 20.00<br>(508.0) | 20.00<br>(508.0)  | 8.00<br>(203.2)  |
| 100 | 20.00<br>(508.0) | 20.00<br>(508.0)  | 8.00<br>(203.2)  |
| 200 | 24.00<br>(609.6) | 30.00<br>(762.0)  | 8.00<br>(203.2)  |
| 400 | 25.21<br>(640.3) | 53.25<br>(1352.6) | 12.69<br>(322.3) |

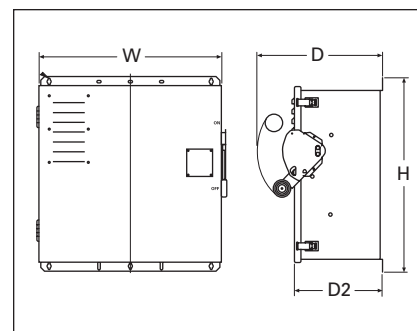


Figure 28.0-21. Auxiliary Power Heavy-Duty Switch Diagram

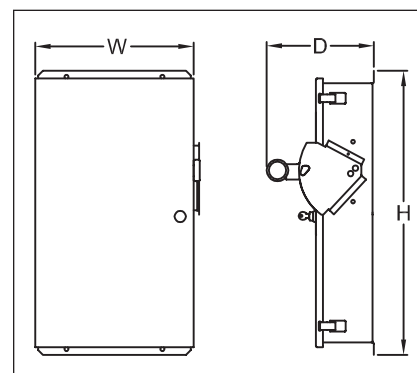


Figure 28.0-22. Elevator Control Switch Diagram

Dimensions (Continued)

Table 28.0-23. NEMA 7/9 Enclosure Sizes

| Ampere Rating | Catalog Number | Type                                 | Poles | Voltage                | Standard Conduit Size in Inches (mm) | Enclosure Number |
|---------------|----------------|--------------------------------------|-------|------------------------|--------------------------------------|------------------|
| 30            | DS361FX        | Fusible<br>(Class J fuse provisions) | 3     | 600 Vac<br>125/250 Vdc | 1.50 (38.1)                          | 1                |
| 60            | DS362FX        |                                      |       |                        | 2.00 (50.8)                          | 2                |
| 100           | DS363FX        |                                      |       |                        | 2.50 (63.5)                          | 3                |
| 30            | DS361UX        | Non-fusible                          | 3     | 600 Vac<br>125/250 Vdc | 1.50 (38.1)                          | 1                |
| 60            | DS362UX        |                                      |       |                        | 1.50 (38.1)                          | 1                |
| 100           | DS363UX        |                                      |       |                        | 2.00 (50.8)                          | 2                |

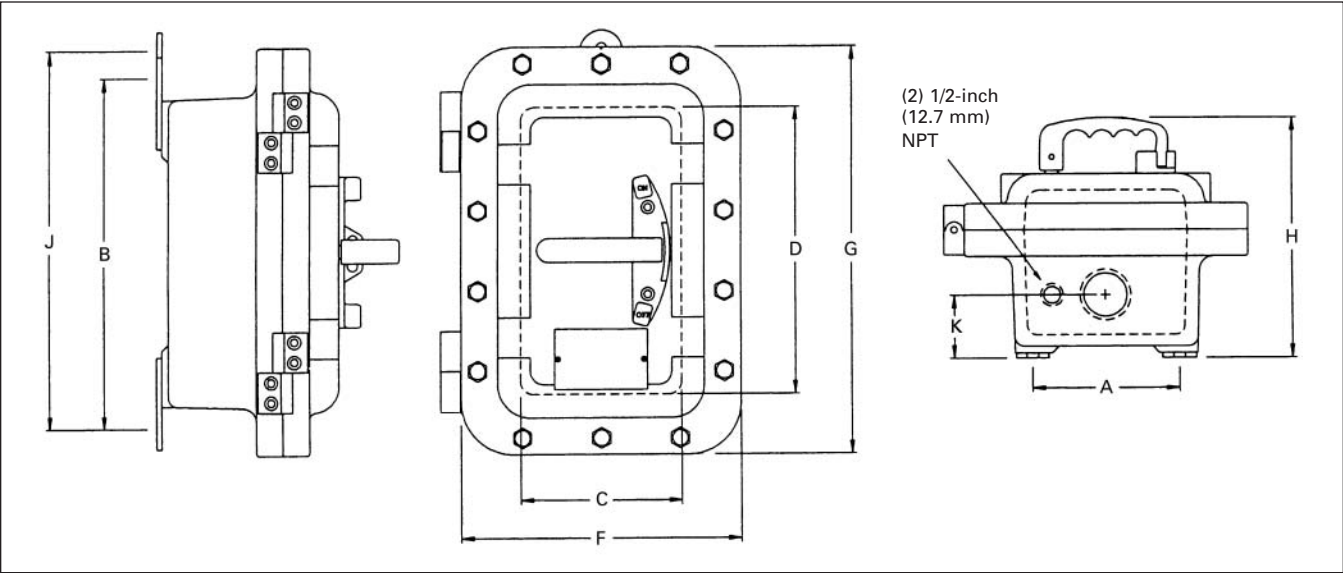


Figure 28.0-23. NEMA 7/9—30–100A—Dual 3 and 4 Point Mounting Available as Standard on Enclosures 1 and 2

Table 28.0-24. NEMA 7/9—Dimensions in Inches (mm)

| Enclosure Number | Mounting Dimensions |                  |                  | Inside Dimensions |                  | Outside Dimensions |                  |                 | Number of Conduits | K Dimensions   | Approximate Weight Lbs (kg) |
|------------------|---------------------|------------------|------------------|-------------------|------------------|--------------------|------------------|-----------------|--------------------|----------------|-----------------------------|
|                  | A                   | B                | J                | C                 | D                | F                  | G                | H               |                    |                |                             |
| 1                | 5.50<br>(139.7)     | 13.13<br>(333.5) | 14.13<br>(358.9) | 5.94<br>(150.9)   | 10.75<br>(273.1) | 10.63<br>(270.0)   | 15.25<br>(387.4) | 8.84<br>(224.5) | 2 ①                | 2.00<br>(50.8) | 38<br>(17)                  |
| 2                | 6.00<br>(152.4)     | 18.00<br>(457.2) | 19.00<br>(482.6) | 6.50<br>(165.1)   | 16.00<br>(406.4) | 11.00<br>(279.4)   | 20.50<br>(520.7) | 8.97<br>(227.8) | 2 ①                | 2.31<br>(58.6) | 57<br>(26)                  |
| 3                | 10.25<br>(260.4)    | 22.63<br>(574.8) | —                | 11.75<br>(298.4)  | 20.00<br>(508.0) | 16.38<br>(416.1)   | 25.13<br>(638.3) | 9.59<br>(243.6) | 2 ①                | 3.50<br>(88.9) | 104<br>(47)                 |

① See Table 28.0-23 for threaded conduit sizes, one at top and one at bottom.

**Note:** Accessories and modifications shown on Pages 28.0-14, 28.0-15, 28.0-30 and 28.0-31 are not applicable to NEMA 7/9 disconnect switches.

Dimensions are for estimating purposes only.

## Maximum Horsepower Ratings

Table 28.0-25. General-Duty, Fusible and Non-Fusible, 120V with Time Delay Fuses

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

Table 28.0-26. General-Duty, Fusible and Non-Fusible, 240V 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 28.0-27. Heavy-Duty, Non-Fusible, 120V

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

Table 28.0-28. Heavy-Duty, Fusible, 240V 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            |
| 800           | —               | 250            |

Table 28.0-29. Heavy-Duty, Fusible, 480V 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            |
| 600           | —               | 400            |
| 800           | —               | 500            |

Table 28.0-30. Heavy-Duty, Fusible, 600V 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            |
| 600           | —               | 500            |
| 800           | —               | 500            |

Table 28.0-31. Heavy-Duty, Non-Fusible, 240V

| 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           | —               | —              |

Table 28.0-32. Heavy-Duty, Non-Fusible, 480V

| 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            |

Table 28.0-33. Heavy-Duty, Non-Fusible, 600V

| 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            |

Table 28.0-34. Double Throw, Fusible, 240V 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 ①         | —               | 50             |

① Only available for use with fast acting fuses. Standard hp rating is shown.

Table 28.0-35. Double Throw, Fusible, 480V 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.

## Technical Data

## Maximum Horsepower Ratings

Table 28.0-36. Double-Throw, Fusible, 600V 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 28.0-37. Double-Throw, Non-Fusible, 120V

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

Table 28.0-38. Double-Throw, Non-Fusible, 240V

| 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 28.0-39. Double-Throw, Non-Fusible, 480V

| 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 28.0-40. Double-Throw, Non-Fusible, 600V

| 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 28.0-41. Heavy-Duty, Non-Fusible, 480V, 600V Types 7 and 9

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

Table 28.0-42. Heavy-Duty, Fusible, 480V, 600V Types 7 and 9 with Time Delay Fuses

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

Note: Ratings are based on three-pole designs.

## General-Duty

Table 28.0-43. Short-Circuit Ratings Using Class “R,” “J” or “T” Fusing where Applicable

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

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

## Heavy-Duty

Table 28.0-44. 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            | 200k at 600V                    | 200k at 600V                 | 200k at 600V                 | 200k at 600V                 |
| 60            | 200k at 600V                    | 200k at 600V                 | 200k at 600V                 | 200k at 600V                 |
| 100           | 200k at 480V<br>100k at 600V    | 200k at 480V<br>100k at 600V | 200k at 600V                 | 200k at 600V                 |
| 200           | 200k at 600V                    | 200k at 600V                 | 200k at 600V                 | 200k at 600V                 |
| 400           | 200k at 480V<br>100k at 600V    | 200k at 480V<br>100k at 600V | 200k at 480V<br>100k at 600V | 200k at 480V<br>100k at 600V |
| 600           | 200k at 480V<br>100k at 600V    | 200k at 480V<br>100k at 600V | 200k at 480V<br>100k at 600V | 200k at 480V<br>100k at 600V |
| 800 ①         | 200k at 480V<br>100k at 600V    | 200k at 480V<br>100k at 600V | 200k at 480V<br>100k at 600V | 200k at 480V<br>100k at 600V |
| 1200 ①        | 200k at 600V                    | 200k at 600V                 | 200k at 600V                 | 200k at 600V                 |

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

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

## Double Throw

Table 28.0-45. Short-Circuit Ratings Using Class “R,” “J” or “T” Fusing where Applicable

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

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

**Note:** Class “L” fuse connectors supplied as standard for 800A and 1200A.

**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 28.0-45 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.

## 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 28.0-46. 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)                       |
|-----------------------------|---------------------------|----------------------------------------------------------------|------------------------------------------------|
| 30 and 60                   | 600                       | 25,000<br>18,000<br>14,000                                     | FDC, HFD, HFDE, EGH<br>FD, EGE<br>FDB          |
| 100                         | 600                       | 25,000<br>18,000<br>14,000                                     | FDC, HFD, HFDE, EGH<br>FD, EGE<br>FDB          |
|                             | 480                       | 35,000                                                         | EGH, EGS                                       |
| 200                         | 600                       | 25,000<br>18,000<br>14,000                                     | FDC, HFD, HFDE, HJD, JGH<br>FD, JD, JGE<br>FDB |
|                             | 480                       | 65,000                                                         | HFD, HFDE, HJD, JGH                            |

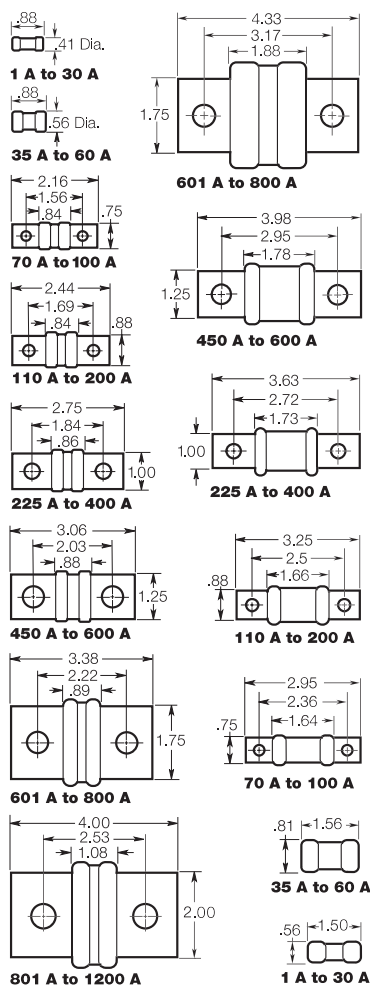
## Typical Fuse Dimensions

### Class T

#### T-Tron™ Fuses

JJN (300V)

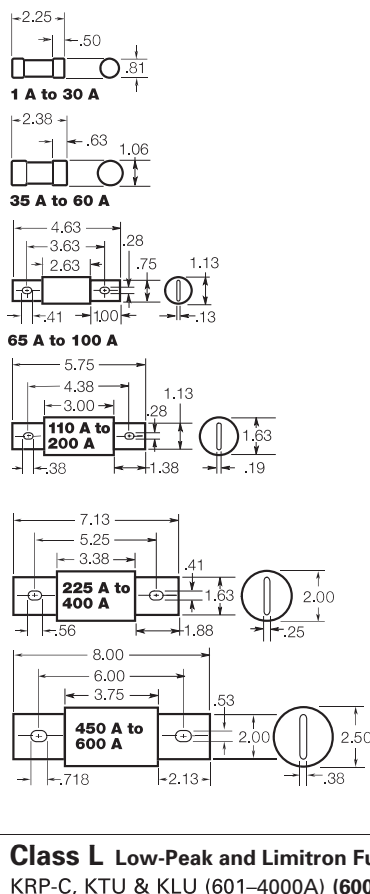
JJS (600V)



### Class J

#### Low-Peak® and Limitron® Fuses

LPJ & JKS (600V)



### Class RK5 and RK1

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

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.

| Ampere  | 250V |      | 600V |      |
|---------|------|------|------|------|
|         | 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

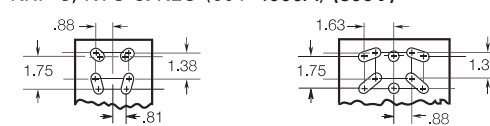
| Ampere  | 250V  |      | 600V  |      |
|---------|-------|------|-------|------|
|         | A     | B    | A     | B    |
| 70-100  | 5.88  | 1.06 | 7.88  | 1.34 |
| 110-200 | 7.13  | 1.56 | 9.63  | 1.84 |
| 225-400 | 8.63  | 2.06 | 11.63 | 2.59 |
| 450-600 | 10.38 | 2.59 | 13.38 | 3.13 |

#### Low-Peak

| Ampere  | 250V  |      | 600V  |      |
|---------|-------|------|-------|------|
|         | 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 (601-4000A) (600V)



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

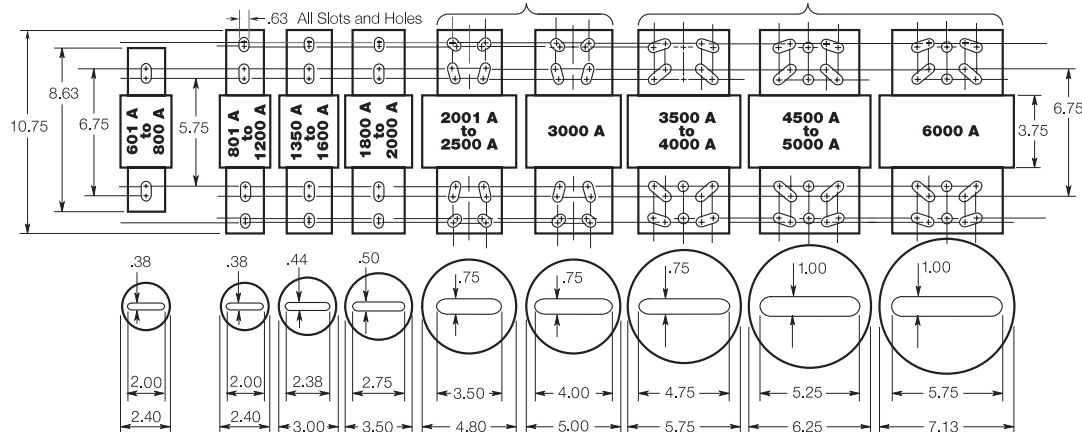


Figure 28.0-24. Typical Fuse Dimensions in Inches

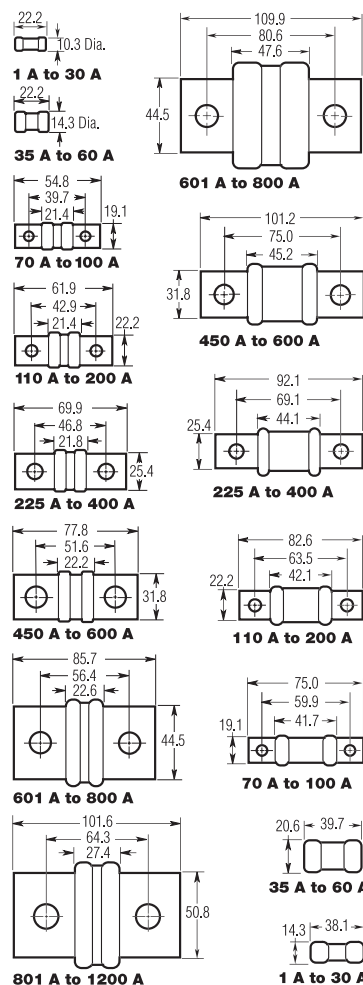
**Note:** For typical fuse dimensions in millimeters, see Figure 28.0-25 on Page 28.0-29.

## Typical Fuse Dimensions (Continued)

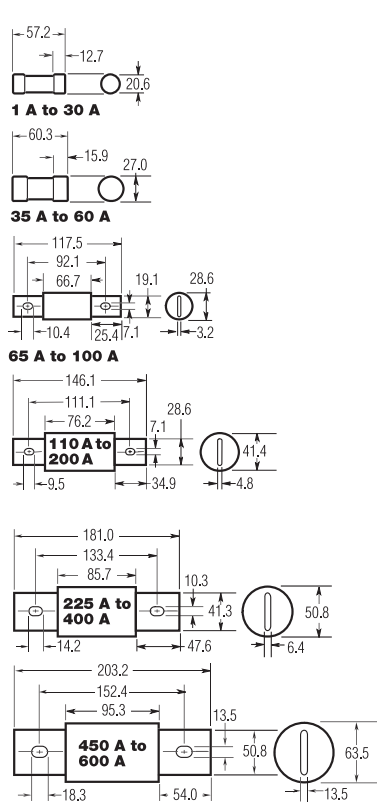
## Class T

T-Tron Fuses  
JJN (300V)

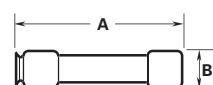
JJS (600V)



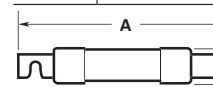
## Class J

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

## Class RK5 and RK1

Fusetron, Low-Peak and  
Limitron Fuses (250 and 600V)  
FRN-R and FRS-R; LPN-RKand 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.


| Ampere  | 250V |      | 600V  |      |
|---------|------|------|-------|------|
|         | 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 |



| Ampere  | 250V  |      | 600V  |      |
|---------|-------|------|-------|------|
|         | 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

| Ampere  | 250V  |      | 600V  |      |
|---------|-------|------|-------|------|
|         | 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 (601-4000A) (600V)

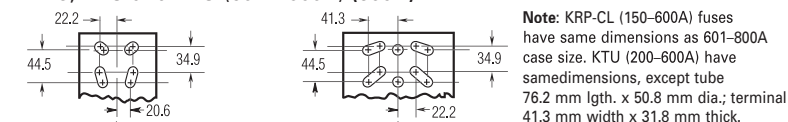
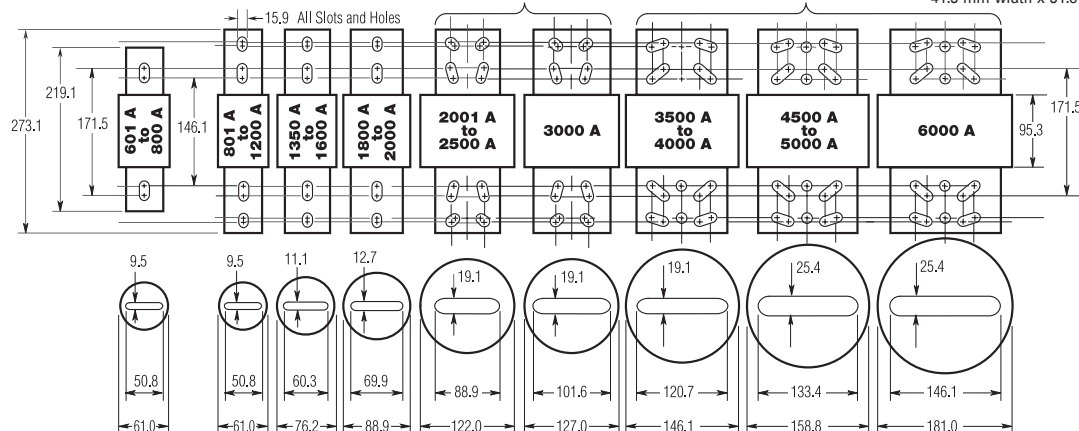
**Note:** KRP-CL (150-600A) fuses  
have same dimensions as 601-800A  
case size. KTU (200-600A) have  
same dimensions, except tube  
76.2 mm lgth. x 50.8 mm dia.; terminal  
41.3 mm width x 31.8 mm thick.

Figure 28.0-25. Typical Fuse Dimensions in Millimeters

**Note:** For typical fuse dimensions in inches, see Figure 28.0-24 on Page 28.0-28.

## Flex Center

### Introduction

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

Eaton's Safety Switch Flex Center is a solutions center that provides real value:

- A dedicated and knowledgeable engineering/manufacturing/customer service team to meet your needs
- A production facility stocked with a full array of equipment to get the job done
- The industry's shortest lead time
- Easy ordering through our distributors

| Description (Suffix)                                                                             | Item |
|--------------------------------------------------------------------------------------------------|------|
| Phenolic Nameplates (NP) . . . . .                                                               | 1    |
| Fungus Proofing (FP) . . . . .                                                                   | 2    |
| Special Paint . . . . .                                                                          | 3    |
| Lock-On Provisions on Heavy-Duty Safety Switches for Most Enclosure Types (LO) . . . . .         | 4    |
| Trapped Key Interlock Systems (TK) . . . . .                                                     | 5    |
| Upper Cover Viewing Window (W) . .                                                               | 6    |
| Lower Cover Viewing Window (LW) . .                                                              | 7    |
| Neutral Assemblies Factory Installed for Double-Throw Safety Switches (N) . . . . .              | 8    |
| Class "R" Fuse Clips Factory Installed for Heavy-Duty Switches (5 or 6) . . . . .                | 9    |
| Class "T" Fuse Clips Factory Installed for Heavy-Duty Switches (T) . . . . .                     | 10   |
| Class "J" Fuse Clips Factory Installed for Heavy-Duty and Double-Throw Safety Switches (J) . .   | 11   |
| Fuse Pullers Factory Installed (FE) . .                                                          | 12   |
| Special Crimp Lug Pads Factory Installed for General-Duty and Heavy-Duty Switches (CK) . . . . . | 13   |
| Copper Lugs Factory Installed (CL) . . . . .                                                     | 14   |
| Equipment Ground Lugs Factory Installed (G) . . . . .                                            | 15   |
| Custom Lug Configurations (L) . . .                                                              | 16   |
| Auxiliary Contacts Factory Installed (2 or 3) . . . . .                                          | 17   |
| Control Pole Factory Installed (CP) . .                                                          | 18   |

Switching Neutral Double-Throw (SN) . . . . . 19

Neutral Assemblies Factory Installed for Single-Throw Non-Fusible Safety Switches (N) . . . 20

### 1. Nameplates

Price covers up to three lines of text with a maximum of 25 characters per line. Standard nameplates are laser-engraved plastic and have black letters on a white background. Rotary-engraved phenolic nameplates are also available at a premium. Additional color combinations and larger nameplates are available. Customer must specify the text when placing an order.

### 2. Fungus Proofing

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-RESISTANT TREATMENT. The treated switch meets military specification: MIL-T-152E for MOISTURE AND FUNGUS-RESISTANT TREATMENT OF COMMUNICATIONS, ELECTRONICS AND ASSOCIATED EQUIPMENT. Not UL listed.

To specify, add Suffix FP to standard safety switch catalog number.

Example: DH363FGKFP.

### 3. Special Paint

Special paint colors are available for order quantities of five or more switches. Colors available are red, orange, yellow, green, black and white. Custom color is applied over the standard ANSI-61 gray finish.

Minimum quantity of five of the same color is required. To specify, add Suffix LO to the standard catalog number.

For quantities less than five, higher ampere ratings, or other color request, contact the Safety Switch Flex Center.

### 4. Lock-on Provisions on Heavy-Duty Safety Switches for Most Enclosure Types

Available on 30–800A Heavy-Duty and Double-Throw Safety Switches. Provision will accept a single lock. To specify, add Suffix LO to the standard catalog number.

### 5. Trapped Key Interlock Systems

Available only 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.

Before system construction can begin, the following information must be provided to the Flex Center:

1. User—name, address and telephone number.
2. Complete coordination (lock scheme) required with order.

To specify, add Suffix TK to the standard catalog number.

### 6. Upper Cover Viewing Window

Upper Viewing Window is Centered over the switching contacts to provide visual verification of ON/OFF status. Available on most Heavy-Duty NEMA 4X Stainless Steel and NEMA 12 Double-Throw enclosures. Not available on nonmetallic enclosures. To specify, add Suffix W to the standard catalog number.

**Note:** 30–100A switches are now provided with a full view cover window for blade verification and blown fuse indication.

### 7. Lower Cover Viewing Window

Lower Viewing Window is positioned over fuses and provides visual verification of Blown Fuse Indicators. Available in 30–600A, two- and three-pole Heavy-Duty NEMA 12, NEMA 3R and NEMA 4X Stainless Steel Safety Switches. Not available on nonmetallic enclosures. To specify, add Suffix LW to standard catalog number.

**Note:** 30–100A switches are now provided with a full view cover window for blade verification and blown fuse indication.

### 8. Neutral Assemblies Factory Installed for Double-Throw Safety Switches

To specify, add Suffix N to the standard safety switch catalog number.

Example: DT361URKN

### 9. Class "R" Fuse Clips Factory Installed for Heavy-Duty Switches

To specify, add Suffix 5 to the standard catalog number for 240V application. Add Suffix 6 to standard catalog number for 600V application.

Example: DH324FRK5

### 10. Class "T" Fuse Clips Factory Installed for Heavy-Duty Switches

To specify, add Suffix T to the standard catalog number (catalog number identifies voltage).

Example: DH364FGKT

**11. Class "J" Fuse Clips Factory Installed for Heavy-Duty and Double-Throw Safety Switches**

To specify by description. A table of common 30A heavy-duty switches with "J" fuse clips factory installed is shown below (**field modification kits are not available for 30A Heavy-Duty Switches**).

**Table 28.0-47. Common 30A Heavy-Duty Switches with "J" Fuse Clips Factory Installed**

| Voltage | Switch Type<br>Three-Pole               | Catalog<br>Number                                |
|---------|-----------------------------------------|--------------------------------------------------|
| 240     | NEMA 1<br>NEMA 3R<br>NEMA 12<br>NEMA 4X | DH321FGKJ<br>DH321FRKJ<br>DH321FDKJ<br>DH321FWKJ |
| 600     | NEMA 1<br>NEMA 3R<br>NEMA 12<br>NEMA 4X | DH361FGKJ<br>DH361FRKJ<br>DH361FDKJ<br>DH361FWKJ |

To specify, add Suffix J to the standard catalog number (catalog number identifies voltage).

*Example: DH363FGKJ*

**12. Fuse Pullers Factory Installed**

To specify, add Suffix FE to the standard catalog number.

*Example: DH361FRKFE.*

**Note:** Standard NEMA 12/3R, 4 and 4X switches through 200A are supplied with fuse pullers from the factory.

**13. Special Crimp Lug Pads Factory Installed for General-Duty and Heavy-Duty Switches (Crimp Lugs are Not Included)**

To specify add Suffix CK to the standard safety switch catalog number.

Heavy-Duty Type DH Switches, 30–200A, are adaptable to crimp lugs; simply remove the box lugs.

**14. Copper Lugs Factory Installed**

To specify, add Suffix CL to the standard safety switch catalog number.

*Example: DH221FGKCL*

**15. Equipment Ground Lugs Factory Installed for General-Duty and Heavy-Duty Switches**

To specify, add Suffix G to the standard safety switch catalog number.

**16. Custom Lug Configurations**

Customer-specified lug arrangements are available on heavy-duty and double-throw safety switches. Contact the Safety Switch Flex Center for price and lead time.

**17. Auxiliary Contacts Factory Installed Provide Early-Make/Early-Break Operation**

To specify 1NO/1NC contacts, add Suffix 2 to the standard safety switch catalog number.

To specify 2NO/2NC contacts, add Suffix 3 to the standard safety switch catalog number.

*Example: DH423FGK2*

*Example: DT324FGK22*

**18. Control Pole Factory Installed Provides Late-Make/Early-Break Operation**

The K-Series Control Pole provides one Normally Open contact, late-make, early-break operation. 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.

To specify, add Suffix CP to the standard Safety Switch catalog number.

*Example: DH267FGKCP*

**19. Switching Neutral Double-Throw**

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.

To specify, add Suffix SN to the standard safety switch catalog number.

*Example: DT324URKSN*

**20. Neutral Assemblies Factory Installed for Single-Throw Non-Fusible Safety Switches**

Available on 200–600A General-Duty Safety Switches and 30–1200A Heavy-Duty Safety Switches.

To specify, add Suffix N to the standard Safety Switch Catalog Number.

*Example: DH364UWKN*

For application, availability or pricing questions, contact Eaton.

**Additional Safety Switch Flex Center Design Offerings**

- Left-hand design (30–200A)
- Cover-mounted status lights and selector switches
- Integrated:
  - Surge protection devices (SPDs)
  - Current transformers
- Double-throw receptacle switches
- 200% neutrals
- 1200A NEMA 4X stainless steel
- Seam-welded stainless steel
- Gang-operated kits:
  - Mechanically interlocks two or three separate switches
- Cam-Lok receptacles
- Reverse feed
- Integrated wattmeter
- Custom enclosures
- Double-throw switches with windows
- 316 Grade stainless steel
- Mill duty

**Literature**

The Safety Switch Flex Center's innovative approach to flexible engineering, manufacturing and customer service provides the shortest production, design and delivery cycle in the industry. Find out more about how the Safety Switch Flex Center can give you the safety switch solutions you need...when you need them.

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