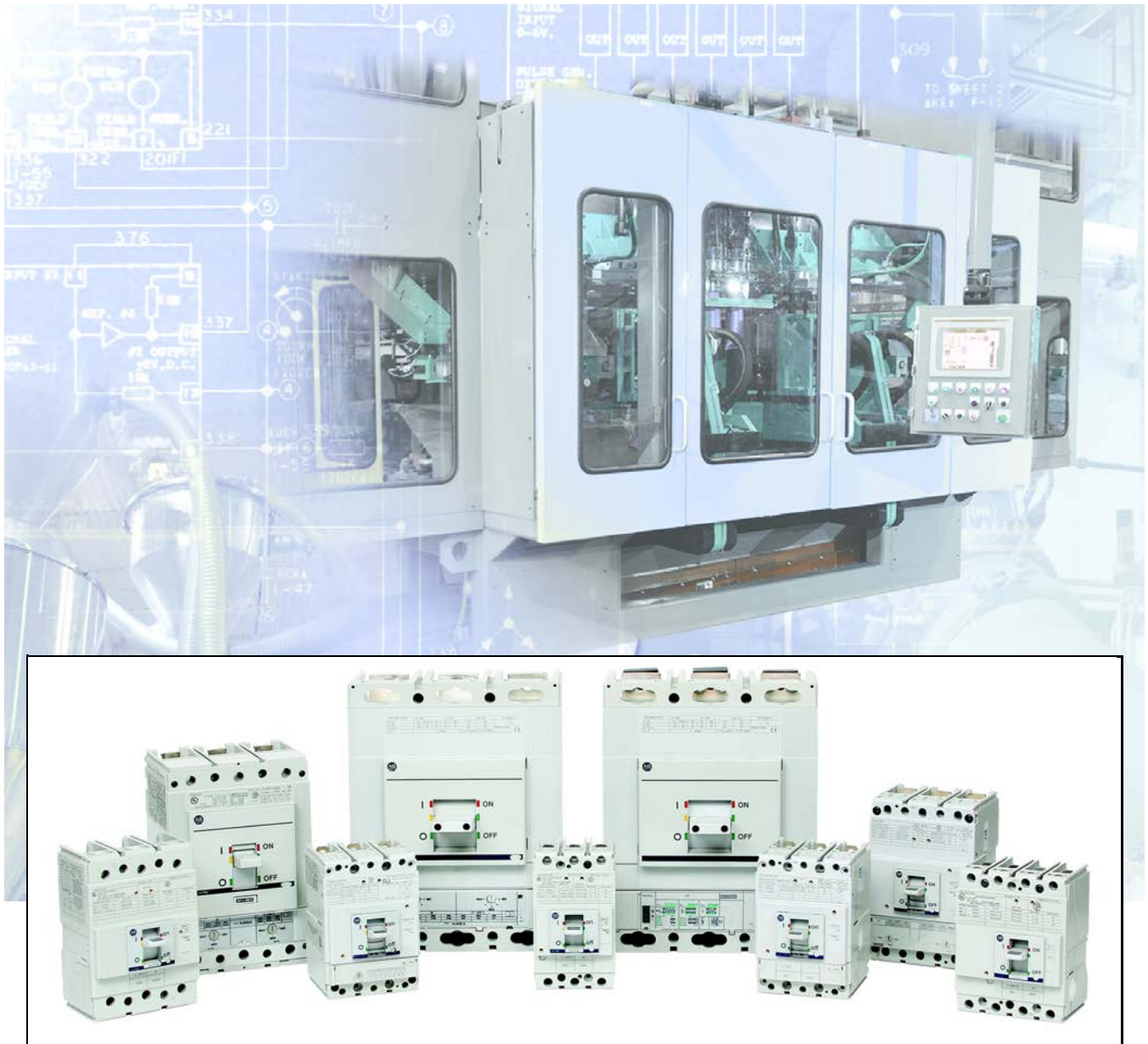


Molded Case Circuit Breakers

Bulletin Numbers 140G, 140MG



LISTEN.
THINK.
SOLVE.

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Summary of Changes

This publication reflects additions and corrections of product information throughout. It incorporates content from previous technical data publications (140G-TD100 and 140G-TD047), and contains new information for current-limiting molded case circuit breakers.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Circuit Breaker Protection for Automation Systems, publication 140G-BR001	Overview of full line of Allen-Bradley circuit breaker offerings.
Circuit Breaker Selectivity Guide, publication 140G-TD050	Aids in selecting circuit breaker pairs for line and load side protection.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

What is a Circuit Breaker?

What is a circuit breaker? This is the first question to answer in understanding Molded Case Circuit Breakers. The definition of a circuit breaker varies between the standards organizations, but the most commonly used definitions are:

The National Electrical Manufacturers Association (NEMA) defines circuit breakers as “devices designed to open and close a circuit by non-automatic means, and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.”

The International Electrotechnical Commission (IEC) Standard IEC 60947-2 defines a circuit breaker as “a mechanical switching device, capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specified time and breaking currents under specified abnormal circuit conditions such as those of short-circuit.”

There are also similar definitions, that further identify circuit breakers by type of construction and functionality. Within the IEC specification for circuit breakers, there are several distinctions of types of circuit breakers by classification:

Utilization Category

Interrupting medium

- Air break
- Vacuum break
- Gas break

Design

- Open case
- Moulded (molded) case

Method of controlling the operating mechanism

- Dependent manual operation
- Independent manual operation
- Dependent power operation
- Independent power operation
- Stored energy operation

Type of overcurrent release

- Instantaneous
- Definite time delay
- Inverse time delay

In reviewing the attributes just listed, it is understandable that many people are confused about which type of circuit breaker to use, where to use it, and how to select it properly. In this section, we will focus on the definition, application and selection of Molded Case Circuit Breakers (MCCBs) with an inverse time delay as applied to industrial control panels.

This publication focuses on the application and selection of MCCBs, Motor Protection Circuit Breakers (MPCBs) and Motor Circuit Protectors (MCPs). The primary focus will be on products that are packaged in a molded case design, but much of the information can be applied to other circuit breakers that are commonly found in control panels.

Definitions

Each of the product categories we mentioned earlier is packaged in a molded case and confusion develops because of the physical similarity of the products.

The Molded Case Circuit Breaker is a specific type of circuit breaker. NEMA defines circuit breakers as devices designed to open or close a circuit by nonautomatic means, and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating. The term “molded case” simply refers to the construction of the circuit breaker and refers to the fact that the circuit breaker is an assembled unit in a supporting housing of an insulating material.

Within the realm of MCCBs, three distinct product variations exist, each with specific protection properties and uses within the industrial control panel. The main categories are:

Molded Case Circuit Breakers or Feeder Breakers

MCCBs are intended to provide overcurrent protection for conductors and equipment by opening automatically before the current reaches a value and duration that will cause an excessive or dangerous temperature in conductors or conductor insulation. Additionally, these devices can serve as the main disconnecting means for a control panel. This protection pertains to low level overcurrent, and short-circuit current. Traditionally these types of circuit breakers are generically described as thermal magnetic devices, though an increasing number of these devices are also electronic circuit breakers which provide the same type of protection, with the exception that the electronics allow the protection curves to be customized to the specific application. In the United States, the National Electrical Code (NEC) defines how

this protection is selected in Sections 240-2, 240-3 and 240-4. In Canada there are similar references in the Canadian Electric Code, C22.1-12. For IEC applications, IEC 60204-1 provides guidance for the construction of industrial control panels.

Motor Protection Circuit Breakers

As application-specific variations of the MCCB, motor protection circuit breakers (MPCBs) combine the short-circuit and isolation functionality of the MCCB with the motor overcurrent protection of a traditional overload relay. These devices are traditionally used in two-component starter applications, with a contactor to control a motor load. MPCBs are UL 489 Listed as circuit breakers and verified as motor overload relays. Allen-Bradley MPCBs are UL Listed as 100% breakers, allowing utilization of the full range of motor protection provided. Note: most circuit breakers applied in North America are 80% rated, meaning they can only be used continuously at 80% of their thermal rating. Allen-Bradley MPCBs are 100% rated, which allows full use of the circuit breakers' thermal capacity in motor protection applications.

Motor Circuit Protectors

Another application-specific version of the MCCB, the motor circuit protector (MCP) is a magnetic trip only version of the MCCB. These circuit breakers provide no overload protection and, as a result, when applied in motor circuit need to be applied with a controller in order to provide short-circuit and overcurrent protection. In the United States, the MCP is UL Listed with a controller and together they form a combination starter. The advantage of this combination is the choice in overload protection that can be applied to the starter. Listed combinations can include thermal as well as electronic overload relays, providing users with protection that is customized for their application. The MCP can also be

provided in several variations, including high magnetic trip versions that allow them to be used with high-efficiency motors, reducing the chance of nuisance tripping due to the characteristic high inrush currents associated with these motors.

Where are each of these breakers used? [Figure 1](#) represents a typical multi-starter control panel. Note that the main disconnecting means is an MCCB, which is acting as both the main disconnect and feeder protection. There are several branches within this control panel. Both MCPs and MPCBs are being used to provide the branch a circuit breaker as a device in the case of the MCP, and branch short-circuit protection as well as overload protection in the case of the MPCB.

Molded Case Switch

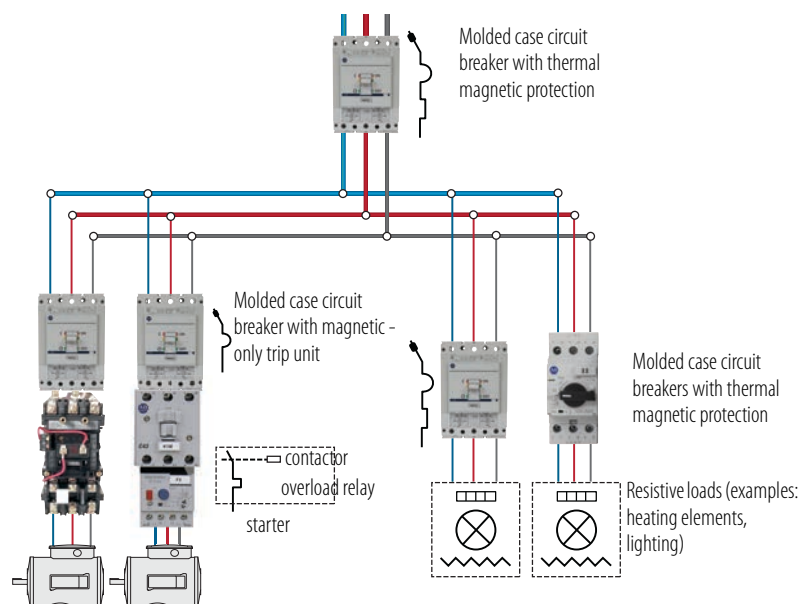
The function of a Molded Case Switch is to disconnect the downstream circuit in which it is installed. In the OFF position, the switch ensures sufficient electrical isolation to the circuit. Its mechanical function is the same as that of a circuit breaker with both an ON and OFF feature controlled with a toggle switch. It features the same overall dimensions and can accept the same electrical and mechanical accessories as an MCCB.

Typical applications include the following:

- Local isolation at a motor installation
- Disconnect to isolate a single/group of machines
- Bus-tie isolation

Molded case switches are not designed to automatically break under short circuit or overload conditions. For this reason, you must protect the line side with a coordinated device that protects against short circuits.

Figure 1 - Typical Multi-starter Control Panel



Breaker Theory and Construction

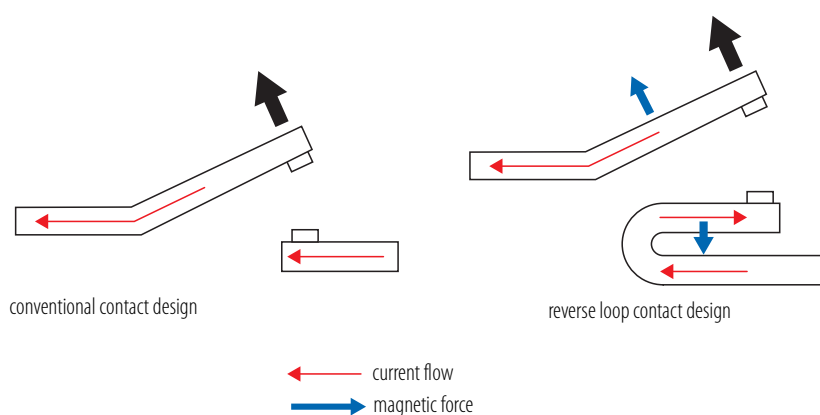
When used in an industrial control panel application, the purpose of the MCCB is to provide overcurrent protection.

This definition can be divided into short-circuit protection and thermal overcurrent protection. A short circuit can range from hundreds of amps to over 100,000 A, depending upon the power source and where the short circuit would occur in the circuit.

An arc chamber is integral to all MCCBs. This arc chamber is similar in all forms of the circuit breakers and performs several

important functions in providing short-circuit protection. This chamber surrounds the switching contacts within the circuit breaker and the contacts open during a short circuit. The opening of these contacts generates an arc. The arc chamber and its components, the arc chutes and splitter plates, draw the arc away from the contacts, dividing and cooling the arc. Ultimately, this leads to the extinguishing of the arc and the circuit opening and current flow stopping. One of the remarkable elements is that this entire operation occurs in milliseconds, with short-circuit currents that can be 100,000 A or greater, depending upon the available current in the circuit.

Figure 2 - Conventional Contact Design Compared to Reverse Loop Contact Design.

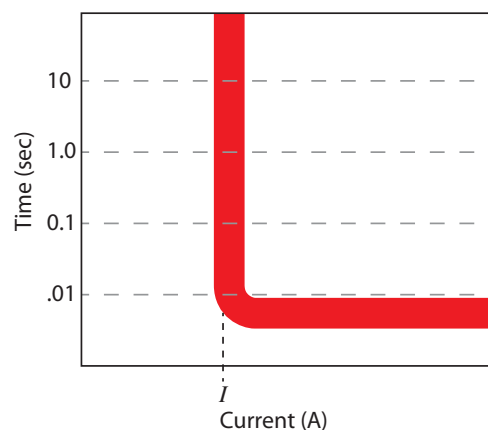


Depending upon the design of the circuit breaker and intended short-circuit interruption capability, there are differences in the construction of the contact assemblies. [Figure 2](#) shows the most commonly used contact assemblies.

Modern circuit breakers use the reverse loop design because it uses the magnetic forces created by current flowing in opposite direction to assist in the opening of the contacts under short-circuit conditions. Additionally, the amount of repulsive force generated is proportional to the value of the short-circuit current being experienced by the circuit breaker. This allows faster interruption time as the short-circuit currents increase.

Using these magnetic trip units, we are able to provide short-circuit protection that can be represented in a curve as shown in [Figure 3](#).

Figure 3 - Example of Magnetic Time vs. Current Curve



This document is not designed to be a reference to circuit breaker design. However, we are discussing the construction of the arc chamber because it is important to understand that MCCBs with a 25 kA interrupting rating will require fewer arc splitters and smaller arc chutes to interrupt a short circuit than will a comparable device rated for 100 kA of interruption.

Therefore, when selecting an MCCB for a specific application, it is very important to take into consideration the amount of

short-circuit current available and then select the circuit breaker with an interrupting rating sufficient to meet the requirements of the application.

The MCCB also provides thermal protection for the control panel and, as we will see later, the branch circuit. This thermal protection can be provided either through the use of bimetallic heater elements similar to those found in overload relays or through the use of electronics, which simulate the operation of heater element and can provide adjustable overcurrent protection for the application.

Reverse-Fed Circuit Breaker

Due to physical equipment arrangements in panelboards, switchboards, and industrial control panels, it is often desirable to reverse feed a molded case circuit breaker. For this application, the circuit breaker must be tested and listed accordingly.

All Bulletin 140G circuit breakers may be reverse fed. When reverse feeding these devices, the line and load side terminals need to be identified properly.

Figure 4 - Reverse Feed Configuration

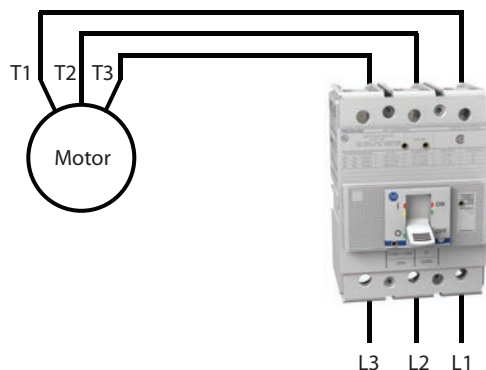


Table 1 - Maximum Voltage for Reverse-fed Circuit Breakers

Bulletin 140G, 140MG Frame Size	Maximum Voltage [V AC] ⁽¹⁾	
	UL/CSA	IEC
G	600Y/347	690
H	480	480
I	600Y/347	690
J	600	600
K	600	690
M	600	690
N, NS	600	690
R	600	690

- (1) NEC Article 404.7 states "Where these switch or circuit breaker handles are operated vertically rather than rotationally or horizontally, the up position of the handle shall be the (on) position." Refer to applicable codes and standards for specific application requirements

Interrupting Ratings

The maximum amount of fault current supplied by a system can be calculated at any point in that system. One rule must be followed for applying the correct circuit breaker. The interrupting rating of the breaker must be equal to or greater than the amount of fault current that can be delivered at that point in the system where the breaker is applied. The interrupting rating of the breaker is the maximum amount of fault current it can safely interrupt without damaging itself. A breaker's interrupting rating always decreases as the voltage increases. Interrupting rating is one of the most critical factors in the breaker selection process. [Figure 5](#) shows a closeup of this rating information.

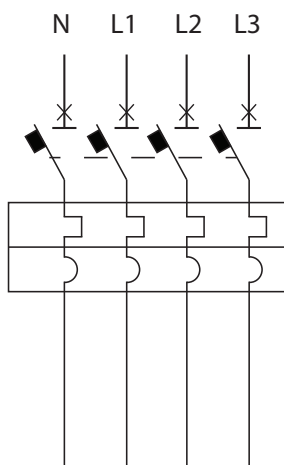
Figure 5 - Interrupting Rating Nameplate Information



Neutral Pole Ratings

When applying 4 pole MCCBs, the neutral pole is rated at 100% for thermal magnetics, and adjustable 100%, 50% or 0% for electronics.

Figure 6 - Neutral Pole Configuration



For all 4 pole 140G MCCB and Molded Case Switches, the neutral is the left outside pole

Certifications

To provide customers with third-party assurance that Rockwell Automation MCCBs meet industry standards, our circuit breakers comply with various global standards. The Bulletin 140G MCCB and 140MG MCP and MPCBs comply with UL, CSA and IEC standards and as such, are UL Listed, CSA Certified, and CCC Certified.

Other certifications exist for the family of MCCBs. The certification of these products is an ongoing process and additional ratings and certifications are continually being pursued. For information about compliance with a particular standard, contact your local Rockwell Automation sales office or Allen-Bradley distributor.

In each of the product sections, the latest certifications at the time of publication are listed for the specific product type.

Molded Case Circuit Breaker Thermal Protection

MCCBs provide thermal overcurrent protection and short-circuit protection. These devices provide this protection by using mechanical means with heater elements, or by using electronics to detect current flow and model the associated heat generated by the current.

When electronic MCCBs are applied, the ability to adjust the thermal trip rating to shape the trip curve is available and the result is that there are fewer trip units required to cover a wider range of current. Note: while a trip unit may have the capability of protecting the current range, in many cases a rating plug is used to limit the range of adjustability.

[Table 2](#) and [Table 3](#) illustrate the available thermal magnetic and electronic trip units and adjustment ranges available with the 140G family of MCCBs.

Table 2 - Trip Units and Adjustment Ranges for 140G Molded Case Circuit Breakers, 10...225 A

Frame Size	Type	Rated Current [A] ⁽²⁾																																			
		10	15	16	20	24	25	30	32	35	40	45	50	56	60	63	64	70	77	80	87	90	100	105	110	112	120	122	125	140	150	157	160	175	200	210	225
G	T-M	X	X	X			X	X	X	X	X	X		X	X		X		X		X	X		X					X				X ⁽⁴⁾				
H	T-M	X	X	X			X	X	X	X	X		X		X	X		X																			
	E																																				
I	T-M														X	X		X		X		X	X		X				X		X		X	X	X		X
J	T-M						X	X		X	X	X	X		X	X		X																			
	E																																				
K	T-M																																				
	E																																				
M	T-M																																				
	E																																				
N/NS	E																																				
R	E																																				

(1) T-M = Thermal Magnetic; E = Electronic

(2) X = Denotes fixed thermal and Fixed Magnetic; 0 = denotes adjustable thermal and adjustable magnetic

(3) IEC only.

(4) IEC only. G-Frame is Adjustable Thermal.

Table 3 - Trip Units and Adjustment Ranges for 140G Molded Case Circuit Breakers, 240...3000 A

[illegible]

(1) T-M = Thermal Magnetic; E = Electronic

(2) X = Denotes fixed thermal and Fixed Magnetic; O = denotes adjustable thermal and adjustable magnetic

Applying Molded Case Circuit Breakers to North American Guidelines

The MCCB is most commonly used as either a feeder breaker or a single circuit breaker where disconnecting, short-circuit, and thermal protection functionality is required. When selecting an MCCB, you need to consider the following items.

- Application voltage
- Available short-circuit current
- Amperage of the load or wiring to be protected

Additionally, local code requirements will also need to be taken into consideration and these requirements may ultimately affect the type and functionality of the MCCB selected.

Molded Case Circuit Breakers

- Magnetic and thermal trip currents may be fixed or adjustable
- Must be sized per NEC/CEC rules
- May be used for motor circuits, but 140MG (MCP) is first choice
- Motor Current (thermal rating)
 - $\leq 250\%$ motor full load amperes (FLA)
 - $\leq 300\%$ for motors ≤ 100 A if the circuit trips on start
 - $\leq 400\%$ for motors ≥ 100 A if the circuit breaker trips on start
- Magnetic trip current is generally set at 1000% (10x) of circuit breaker thermal ratings
- May be UL Listed as part of UL 508/UL 60947-4-1
- May also be used for motor control-circuit transformers, but Bulletin 1489 miniature circuit breakers (MCBs) are a more appropriate choice

Motor Protection Circuit Breakers

Motor Protection Circuit Breakers are relatively new to the North American market. These devices are considered motor protection circuit breakers (MPCBs) outside of North America. Within North America they are defined as manual Type E self-protecting combination motor controllers.

- Sized at 100% of the motor full-load current (FLA)
- Motor current setting is adjustable (thermal rating)
- IEC & UL/CSA calibration requirements require overload to trip at 120 & 125% FLA
- Motor is able to run into the Service Factor when set at 100% of the motor current
- Magnetic Trip Current setting is adjustable (magnetic rating)
- Adjustable at 1300% (13x) highest motor current setting on circuit breaker
- Higher Magnetic Trip Current settings are available if circuit breaker trips on start (140M-C2T-***)
- Example of an MPCB using 140M-C2E-C10:
 - Motor Current is adjustable from 6.3...10 A
 - Set at 100% FLA for proper motor protection
 - Magnetic Trip Current is fixed at 130 A
 - This is where circuit breaker begins to trip in a “short-circuit” condition
- NEC/CEC (Canadian Electrical Code) do not specifically recognize this classification of circuit breaker and, therefore, do not describe how to size them (for example, 100% FLA sizing)

Motor Circuit Protectors

Motor circuit protectors (MCPs) are the most popular choice for motor circuits in the North American market. They have been used in combination starters and Motor Control Center unit inserts (buckets) for many years.

- Motor current setting (thermal) is not specified by NEC/CEC
- MCPs are magnetic only
- Thermal capability should be greater than or equal to motor FLA and less than or equal to overload relay setting
- Motor overload protection must be provided separately
- MCPs are UL Recognized
- Must be tested and listed with specific contactors and overloads
- UL Listing is obtained as part of UL 508/UL 60947-4-1
- Magnetic trip current is adjustable
- Adjustability is required by UL489 standard
- Must be sized per NEC/CEC rules
 - $\leq 800\%$ motor FLA for standard efficiency motors
 - $\leq 1300\%$ motor FLA allowed if motor will not start
 - $\leq 1100\%$ motor FLA for high efficiency motors
 - $\leq 1700\%$ motor FLA allowed if motor will not start
- Provide choice in overload protection

Selecting a Circuit Breaker, When Application is to Follow U.S. Guidelines

The next step is selecting a breaker for use in an industrial control panel. In the following section we will focus on the MCCB for use as a feeder and as a branch circuit protective device.

Selecting The MCCB for Use as The Main Disconnect or Feeder

A typical industrial control panel is a feeder circuit as defined by the NEC, where a feeder is composed of the wires between the service entrance of the panel or line side of the MCCB and the line side of the branch protective devices.

In many industrial control applications, motor control is involved. In that case, the application must then follow Article 430 of the NEC, which states that breakers for feeders having mixed loads, e.g. heating (lighting and heat appliances) and motors should have ratings suitable for carrying the heating loads, plus the capacity required by the motor loads.

For motor loads, NEC Article 430 states that breakers for motor feeders shall have a rating not greater than the sum of the highest breaker rating of any of its branches and the full-load currents of all other motors served by the feeder.

Feeder Breaker Thermal Rating Selection Example

This assumes that the circuit breaker selected has a voltage rating equal or greater than the application and that the interrupting rating is equal or greater to the available short-circuit current. The panel contains a main feeder breaker supply with three motor branch circuits.

In our application, the feeder is supplying a 3-motor system at a voltage of 480V.

- Motor 1 is 10 Hp. Current value from Table 430.250 of the NEC is 14 A.
- Motor 2 is 5 Hp. Current value from Table 430.250 of the NEC is 7.6 A.
- Motor 3 is 5 Hp. Current value from Table 430.250 of the NEC is 7.6 A.

Calculation of panel wiring includes:

- **For single motors:** Per [430.22], size motor branch circuit conductors no smaller than 125 percent of the motor FLC rating listed in Table 430.147 or 430.148 (Figure 430-4). Size the branch circuit short-circuit and ground-fault protection device per 240.6(A) and 430.52(C)(1) Ex. 1.

- **For multiple motors.** Per [430.24], size multiple motor conductors as follows. First, multiply the full-load current rating of the highest-load motor by 1.25. Then, add up the full-load current ratings of all the other motors in the group. Add these two numbers. That's your motor load for calculating ampacity. Add any other loads on that conductor, to calculate total conductor ampacity.

Current Calculation is:

Motor 1 (14 A* 1.25)	17.5 A
Motor 2	7.6 A
Motor 3	7.6 A
Total	32.7 A

Since the total load comes to 32.7 A and there is not a commercially available breaker available for 32.7 A, the NEC allows the next largest standard-sized breaker to be used. Therefore, a 35 A MCCB could be selected to protect this control panel. Note: each motor branch also needs protection.

Thermal Magnetic Circuit Breakers Used as Branch Short-circuit Devices

It is also possible to use an MCCB as a branch protective device for a motor load, and while we will show the calculation for applying an MCCB in this manner, there are other circuit breakers, such as the MCP and MPCB, that are better suited for this application. After the calculation for sizing is completed, it should be apparent that even though this is technically correct, in some cases, the motor protection and wire protection can be less than ideal.

Per NEC Article 430.52(B), the motor branch circuit short-circuit and ground fault device shall be capable of carrying the starting current of the motor. Further, 430.52(C) indicates that the protective device that has a rating or setting not exceeding the value calculated according to the values given in Table 430.52 shall be used. In the case of an inverse time MCCB, such as the 140G, the calculation for the maximum setting or rating of the protective device is 250% of the motor being protected. [Figure 1 on page 4](#) shows an example of this type of configuration.

Example

An MCCB is being used to protect a branch motor circuit with a 10 Hp 460V motor. Using Table 430.250 of the NEC, a value of FLC of 14 A is supplied for this motor.

Calculating the maximum branch circuit protective device rating or setting is:

$$14 \text{ A} * 250\% = 35 \text{ A}$$

Therefore, the maximum size MCCB that could be used in this example is 35 A. This is the maximum rating and therefore smaller devices could be selected for this application. A point to consider is that generally MCCBs have a magnetic trip of approximately 10X the rating of the MCCB. When starting, motors usually exhibit an inrush characteristic of 6 to 10 times the full load rating of the motor, depending on the type of motor being used. In this case, the circuit breaker trip point is approximately 350 A and the motor starting current of locked rotor current is approximately 140 A if a 10x ratio of running to starting current is assumed. A smaller breaker could be selected without concern for nuisance tripping. In that case, there may be more concern about the thermal protection provided by the circuit breaker being based on a 35 A breaker with only a 14 A load. The motor and the wiring may not be adequately protected if larger wire isn't selected or if a motor overload relay is not used.

MCCB Application and Sizing

The Bulletin 140G MCCBs are traditionally used for protection of branch and feeder circuit in an industrial control application. In the role of a feeder circuit breaker, the MCCB provides isolation and short-circuit protection for the panel and thermal protection for the feeder wires and as a branch circuit breaker provides the same protection for the branch wires in the panel. For illustrative purposes, the feeder will be shown at the wiring from the load side of the main or feeder MCCB to the line connection of the branch short-circuit protective devices to which the feeder is supplying power.

The following example is a generic interpretation of the US National Electrical Code (NEC), and should be used only as a reference for applying the MCCB. Final authority regarding the sizing and components used is governed by local and/or

national electrical standards and the Jurisdiction Having Authority. Consult these standards before installing or designing any electrical system using short-circuit protective devices (SCPDs).

While this discussion is not intended to be a comprehensive guidebook to designing industrial control panels, we will present several categories of typical applications where a feeder SCPD device will be applied:

- A panel where only motor loads are being fed by the breaker
- A panel where fixed loads are being fed by the breaker
- A panel where mixed loads are being protected by the feeder breaker

In all cases, the examples given here are for reference and users should reference their local electrical code requirements, as they may vary from location to location. The applier should verify that their selection and installation complies with local codes, regulations, and/or standards.

A feeder is composed of the conductors of a wiring system between the service equipment or the generator switchboard of an isolated plant and the branch circuit overcurrent device.

NEC Article 220 states:

Where a feeder supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than the noncontinuous load plus 125% of the continuous load. Exception: Where the assembly including the overcurrent devices protecting the feeder(s) are listed for operation at 100% of their rating, neither the ampere rating of the overcurrent device nor the ampacity of the feeder conductors shall be less than the sum of the continuous load plus the noncontinuous load. Only breakers listed for 100% application, and so labeled can be applied under the exception (for example N Frame and R Frame 140G devices that are specifically marked and rated 100%). Breakers without a 100% application listing and label are applied at 80% of rating.

NEC Article 430 states:

Breakers for feeders having mixed loads; e.g., heating (lighting and heat appliances) and motors, should have ratings suitable for carrying the heating loads plus the capacity required by the motor loads... breakers for motor feeders shall have a rating not greater than the sum of the highest breaker rating of any of its branches and the full load currents of all other motors served by the feeder.

A molded case circuit breaker is rated in rms amperes at a specific ambient temperature. This ampere rating is the maximum continuous current it may carry in the ambient temperature for which it is calibrated. To minimize the need for derating, Allen-Bradley thermal magnetic breakers are calibrated for an ambient temperature of 40 °C (104 °F), which is the average temperature within an enclosure. If the enclosure ambient temperature is known to exceed 40 °C, the breaker used should either be specially calibrated for that temperature, or be derated accordingly.

80% Continuous Rated

All 140G Molded Case Circuit Breakers are rated for 80% continuous load unless marked for 100% loads. The NEC requires that only 100% rated continuous load be marked special with the load designation. In all general applications the unmarked circuit breaker is to be applied at no more than 80% continuous load of its rated current (I_n). Typically 100% rated current MCCBs are devices with electronic trip units. The 140G product line has 100% rated electronic trip MCCBs. Visit www.rockwellautomation.com for specific devices.

Cable Selection

UL Listed circuit breakers rated 125 A or less shall be marked as being suitable for 60 °C (140 °F), 75 °C (167 °F) only or 60/75 °C (140/167 °F) wire. All Allen-Bradley breakers rated 125 A or less are marked for 60/75 °C wire. All UL Listed circuit breakers rated over 125 A are suitable for 75 °C conductors. Conductors rated for higher temperatures may be used, but must not be loaded to carry more current than the 75 °C ampacity of that size conductor for equipment marked or rated 75 °C, or the 60 °C ampacity of that size conductor for equipment marked or rated 60 °C. However, the full 90 °C (194 °F) ampacity may be used when applying derating factors, so long as the actual load does not exceed the lower of the derated ampacity or the 75 °C or 60 °C ampacity that applies.

Unusual Operating Conditions

Operation below 0 °C

Bulletin 140G MCCBs may be applied in ambient temperatures (near the MCCB within an enclosure) below 0 °C. Applications below 0 °C must consider the possibility of ice forming within or on the MCCB and interfering with the internal or external operating mechanisms. All ratings below 0 °C are based on the absence of freezing water or other elements.

Trip Unit Temperatures

Thermal magnetic circuit breakers are temperature sensitive. At ambient temperatures below 40 °C (104 °F), circuit breakers may carry more current than their continuous current rating. Nuisance tripping is not a problem under these lower temperature conditions, although consideration should be given to closer protection coordination to compensate for the additional current-carrying capability. In addition, the actual mechanical operation of the breaker could be affected if the ambient temperature is significantly below the 40 °C standard.

For ambient temperatures above 40 °C, breakers should carry less current than their continuous current rating. Under this condition, the circuit breaker should be derated for the higher ambient temperature.

Electronic trip units are insensitive to ambient temperatures within a certain temperature range. The temperature range for most electronic trip units is -25 °C...+70 °C (-13 °F...+158 °F). Allen-Bradley MCCBs are designed to include temperature protective circuits that initiate a tripping operation and provide self-protection, should the internal temperature rise to an unsafe level.

Circuit Breaker Temperatures

The temperature of the air immediately surrounding a circuit breaker is the ambient temperature. All Allen-Bradley standard breakers are calibrated to a 40 °C ambient temperature. For any ambient temperature application significantly above or below 40 °C, it is recommended that rerating of the circuit breaker be considered or Rockwell Automation be consulted about any possible re-rating.

Altitude

Low voltage circuit breakers must be derated for voltage and interrupting rating at altitudes above 2000 m (6560 ft) above sea level. The thinner air at higher altitudes reduces cooling and dielectric characteristics compared to the denser air found at lower altitudes.

Use the following [Table 4](#) and [Table 5](#) to derate as appropriate.

Table 4 - Voltage Rating

Voltage Rating Operational Voltage U_e [V]				
Altitude	2000 m (6560 ft)	3000 m (9840 ft)	4000 m (13,120 ft)	5000 m (16,400 ft)
All Frames	100%	90%	79%	67%

Table 5 - Current Rating

Current Rating Rated Uninterrupted Current I_u [A]				
Altitude	2000 m (6560 ft)	3000 m (9840 ft)	4000 m (13,120 ft)	5000 m (16,400 ft)
All Frames	100%	98%	93%	90%

Unusual Mounting Configurations

Generally, circuit breakers may be mounted in any position, up or down, horizontal or vertical, without affecting the tripping characteristics or interrupting rating. However, mounting circuit breakers in a vertical position with the ON position other than UP will be in violation of Article 240-81 of the NEC.

Tropicalization

The 140G/MG Circuit breakers are tested in compliance with IEC Standards, making these devices suitable for hot-humid conditions defined in IEC 60721-2-1, climatograph 8. These devices include:

- Moldings of glass fiber reinforced synthetic resins
- Metallic parts treated for anti-corrosion
- Zinc plating protected by a conversion layer (hexavalent-chromium free)
- Electronic circuits protected for anti-condensation

Electromagnetic Compatibility

The 140G/MG Circuit Breakers electronic trip units and electronic residual current releases are in compliance with EN 60947-2 Appendix B and Appendix F and European Directive No. 2004/108/EC regarding EMC – electromagnetic compatibility.

Maintenance Mode (MM)

Maintenance Mode (MM) offers a preset set of protection parameters. MM allows systems testing when the molded case circuit breaker is energized or ON. This feature is a manual adjustment on the molded case circuit breaker, via a DIP switch. Preset values for Maintenance Mode are indicated in the selection guide for each frame size.

Shock and Vibration

Allen-Bradley Molded Case Circuit Breakers are shock tested to conform with IEC 60068-2-27, and vibration tested to IEC 60068-2-6.

Table 6 - MCCB Shock and Vibration Test Values

Bul. 140G MCCB Frame Size	Vibration	Shock (peak acceleration)
G	2 ... 13.2 Hz ± 1 mm; 13.2 ... 100 Hz ± 0.7 g	150m/s ² peak; pulse duration 11 ms
H		
I		
J		
K		120m/s ² peak; pulse duration 11 ms
M		—
N/NS	—	—
R		—

Allen-Bradley Molded Case Circuit Breakers

The Bulletin 140G family of Molded Case Circuit Breakers (MCCBs) offers a wide range of features include thermal/magnetic and electronic protection devices, high interrupting/breaking capacities and complete line of factory and field installed accessories. The Bulletin 140G MCCBs are ideal for use in line protection of control panels.

Molded case circuit breakers have the following features:

- 10...3000 A current range
- 3- and 4-pole devices
- Space-saving dimensions
- End cap/bolt-on terminals are standard
- Thermal/Magnetic protection: 15...800 A
- Electronic protection: 10...3000 A
- Approved for global application: UL, CSA, CCC, and IEC performance interrupting/breaking capacity
- Wide range of mounting options
- Extensive range of factory- or field-installed accessories

Standards Compliance and Certifications

Standards Compliance	Certifications
IEC 60947-2	CE Marked
UL489	CCC
CSA22.2, No. 5	CSA Certified
	UL Listed
	HACR Type



Product Overview

Frame Size	G-Frame	H-Frame	I-Frame	J-Frame	K-Frame	M-Frame	N-Frame	NS-Frame	R-Frame
									
Rated Current I_n	125 A (160 A – IEC)	125 A (160 A – IEC)	225 A	250 A	400 A	800 A	1200 A	1200...1250 A	2000...3000 A
No. of Poles	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
Dimensions [mm (in.)]									
Height	130 (5.19)	130 (5.19)	150 (5.90)	160 (6.23)	205 (8.07)	268 (10.55)	268 (10.55)	268 (10.55)	382 (15.04)
Width, 3-Pole	76.2 (3)	90 (3.54)	105 (4.13)	105 (4.13)	139.5 (5.49)	210 (8.27)	210 (8.27)	210 (8.27)	428 (16.85)
Width, 4-Pole	101.2 (3.98)	120 (4.72)	140 (5.51)	140 (5.51)	186 (7.32)	280 (11.02)	280 (11.02)	280 (11.02)	554 (21.81)
Depth	70 (2.75)	82.5 (3.25)	70 (2.75)	82.5 (3.25)	103.5 (4.07)	103.5 (4.07)	125 (4.92)	125 (4.92)	231 (9.09)
Interrupting Rating [kA]									
240V	50 65 100	65 100 150 200 200	50 65	65 100 150 200	100 150 200 200	100 200 200	65 100 150	65 100 150	125
480V	25 35 65	25 35 65 100 150	25 35	25 35 65 100	35 65 100 150	50 65 100	50 65 100	50 65 100	125
600V	—	14 18 25 35 42	—	14 18 25 35	25 35 65 100	25 35 42	25 50 65	25 50 65	100
600Y/347V	10 14 25	—	10 10	—	—	—	—	—	—
Breaking Capacity I_{cu} [kA]									
220...240V	65 85 100	65 85 100 150 200	65 85	65 85 100 150	85 100 150 200	70 100 200	85 100 200	85 100 200	130
415V	36 50 70	36 50 70 120 150	36 50	36 50 70 120	50 70 120 150	36 70 100	50 70 120	50 70 120	80
440V	30 36 50	36 50 65 100 150	36 40	36 50 65 100	40 65 100 180	35 50 65	50 65 100	50 65 100	80
690V	6 8 10	10 12 15 18 20	36 50	10 12 15 18	25 40 70 80	20 25 30	30 42 50	30 42 50	40
250V DC	36 50 10	36 50 70 85 100	36 50	36 50 70 85	—	—	—	—	—
500V DC	36 50 70	36 50 70 85 100	36 50	36 50 70 85	36 50 70 100	—	—	—	—
750V DC	—	—	—	—	25 36 70 70	16 36 50	—	—	—
Protection Type:									
Thermal Magnetic	✓	✓	✓	✓	✓	✓	—	—	—
Electronic (LSI,LSIG)	—	✓	—	✓	✓	✓	✓	✓	✓
Molded Case Switch	✓	✓	✓	✓	✓	✓	✓	—	✓
MCP	✓	✓	✓	✓	✓	✓	✓	—	—
MPCB	—	✓	—	✓	—	—	—	—	—
Internal Accessories									
Auxiliary Contact	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alarm Contact	✓	✓	✓	✓	✓	✓	✓	✓	—
AX/AL Combo	✓	✓	✓	✓	✓	✓	✓	✓	—
Trip Unit Contact	—	✓	—	✓	—	—	✓	✓	✓
Shunt Trip	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shunt Close	—	—	—	—	—	—	—	✓	✓
UV Relay	✓	✓	✓	✓	✓	✓	✓	✓	✓
Field Installable	✓	✓	✓	✓	✓	✓	✓	✓	✓

Frame Size	G-Frame	H-Frame	I-Frame	J-Frame	K-Frame	M-Frame	N-Frame	NS-Frame	R-Frame
									
External Accessories									
End Cap (Bolt-on) Terminals	standard	standard	standard	standard	standard	standard	standard	standard	
Terminal Lugs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Multi-cable Terminal Lugs	✓	✓	✓	✓	✓	—	—	—	—
Extended Terminal	✓	✓	✓	✓	✓	✓	✓	✓	—
Spreader Terminal	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rear Terminal	—	—	—	—	—	—	✓	✓	✓
25 mm Phase barriers	standard	standard	standard	standard	standard	—	—	—	—
Extended Phase barriers	✓	✓	✓	✓	✓	✓	✓	✓	✓
Back Plates	standard	standard	standard	standard	standard	standard	—	—	—
DIN Mounting	✓	✓	✓	✓	—	—	—	—	—
Padlock	✓	✓	✓	✓	✓	✓	✓	✓	✓
Terminal Cover	✓	✓	✓	✓	✓	✓	✓	✓	—
Direct Rotary	✓	✓	✓	✓	✓	✓	✓	—	—
Variable Depth (Door)	✓	✓	✓	✓	✓	✓	✓	—	—
Internal NFPA 79	✓	✓	✓	✓	✓	✓	✓	—	—
Flange Operator	✓	✓	✓	✓	✓	✓	✓	—	—
Flange Cable	✓	✓	✓	✓	✓	✓	✓	—	—
Motor Operator	✓	✓	✓	✓	✓	✓	—	✓	✓
Residual Current	✓	✓	✓	✓	✓	—	—	—	—
Neutral Current	—	—	—	—	✓	✓	✓	✓	✓
Field Installable	✓	✓	✓	✓	✓	✓	✓	✓	✓

Molded Case Circuit Breakers Product Selection

125 A, G-Frame Molded Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies with Factory-Installed Options

Examples given in this section are not intended to be used for product selection. Use ProposalWorks™ to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table g to add on to the molded case circuit breaker catalog number selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G – G 6 C 4 – C70 – SD – KA
a b c d e f g

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
G	125 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
2	25 kA
3	35 kA
6	65 kA

d	
Protection Type	
Code	Description
C	Fixed thermal/fixed magnetic
E	Adjust thermal/fixed magnetic
S	Molded case switch (Isolator)

e	
No. of Poles	
Code	Description
3	3 poles
4	4 poles

f	
Current Range	
Code	Description
C	e.g., C30 = 30 A
D	e.g., D16 = 160 A

g			
Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
Code	Description	Code	Description
SJ	Shunt Trip, 24 . . . 30V AC/DC	KA	1 Aux. Contact, 250V
SK	Shunt Trip, 48 . . . 60V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110 . . . 127V AC; 110 . . . 125V DC	BA	2 Aux., 1 Alarm Contact, 250V
SA	Shunt Trip, 220 . . . 240V AC; 220 . . . 250V DC	KJ	1 Aux. Contact, 24V
SB	Shunt Trip, 380 . . . 440V AC	AJ	1 Aux., 1 Alarm Contact, 24V
SC	Shunt Trip, 480 . . . 525V AC		
UJ	Undervoltage Release, 24 . . . 30V AC/DC		
UR	Undervoltage Release, 48V AC/DC		
UD	Undervoltage Release, 110 . . . 127V AC; 110 . . . 125V DC		
UA	Undervoltage Release, 220 . . . 240V AC; 220 . . . 250V DC		
UB	Undervoltage Release, 380 . . . 440V AC		
UC	Undervoltage Release, 480 . . . 525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Assembled Molded Case Circuit Breakers—125 A, G-Frame


Table 7 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA C22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2 I_{cu} [kA]// I_{cs} %								Breaking Capacity (DC), IEC 60947-2				Interrupting Code ⁽¹⁾
240V	480V	600V/347V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2- pole in series)		500V DC (3- pole in series)		
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
50	25	10	65	75	36	100	36	50	6	75	36	100	36	100	G2
65	35	14	85	75	50	75	50	50	8	50	50	100	50	100	G3
100	65	25	100	75	70	50	65	50	10	50	70	75	70	75	G6

(1) See [Table 8](#) for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 8 - Thermal-Magnetic, Fixed Thermal-Fixed Magnetic

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip [A] I_m	Interrupting Code G2		Interrupting Code G3		Interrupting Code G6	
			Cat. No.		Cat. No.		Cat. No.	
			3 Poles	4 Poles	3 Poles	4 Poles	3 Poles	4 Poles
15	15	500	140G-G2C3-C15	140G-G2C4-C15	140G-G3C3-C15	140G-G3C4-C15	140G-G6C3-C15	140G-G6C4-C15
16	16	500	140G-G2C3-C16	140G-G2C4-C16	140G-G3C3-C16	140G-G3C4-C16	140G-G6C3-C16	140G-G6C4-C16
20	20	500	140G-G2C3-C20	140G-G2C4-C20	140G-G3C3-C20	140G-G3C4-C20	140G-G6C3-C20	140G-G6C4-C20
25	25	500	140G-G2C3-C25	140G-G2C4-C25	140G-G3C3-C25	140G-G3C4-C25	140G-G6C3-C25	140G-G6C4-C25
30	30	500	140G-G2C3-C30	140G-G2C4-C30	140G-G3C3-C30	140G-G3C4-C30	140G-G6C3-C30	140G-G6C4-C30
32	32	500	140G-G2C3-C32	140G-G2C4-C32	140G-G3C3-C32	140G-G3C4-C32	140G-G6C3-C32	140G-G6C4-C32
35	35	500	140G-G2C3-C35	140G-G2C4-C35	140G-G3C3-C35	140G-G3C4-C35	140G-G6C3-C35	140G-G6C4-C35
40	40	500	140G-G2C3-C40	140G-G2C4-C40	140G-G3C3-C40	140G-G3C4-C40	140G-G6C3-C40	140G-G6C4-C40
45	45	500	140G-G2C3-C45	140G-G2C4-C45	140G-G3C3-C45	140G-G3C4-C45	140G-G6C3-C45	140G-G6C4-C45
50	50	500	140G-G2C3-C50	140G-G2C4-C50	140G-G3C3-C50	140G-G3C4-C50	140G-G6C3-C50	140G-G6C4-C50
60	60	600	140G-G2C3-C60	140G-G2C4-C60	140G-G3C3-C60	140G-G3C4-C60	140G-G6C3-C60	140G-G6C4-C60
63	63	630	140G-G2C3-C63	140G-G2C4-C63	140G-G3C3-C63	140G-G3C4-C63	140G-G6C3-C63	140G-G6C4-C63
70	70	700	140G-G2C3-C70	140G-G2C4-C70	140G-G3C3-C70	140G-G3C4-C70	140G-G6C3-C70	140G-G6C4-C70
80	80	800	140G-G2C3-C80	140G-G2C4-C80	140G-G3C3-C80	140G-G3C4-C80	140G-G6C3-C80	140G-G6C4-C80
90	90	900	140G-G2C3-C90	140G-G2C4-C90	140G-G3C3-C90	140G-G3C4-C90	140G-G6C3-C90	140G-G6C4-C90
100	100	1000	140G-G2C3-D10	140G-G2C4-D10	140G-G3C3-D10	140G-G3C4-D10	140G-G6C3-D10	140G-G6C4-D10
110	110	1100	140G-G2C3-D11	140G-G2C4-D11	140G-G3C3-D11	140G-G3C4-D11	140G-G6C3-D11	140G-G6C4-D11
125	125	1250	140G-G2C3-D12	140G-G2C4-D12	140G-G3C3-D12	140G-G3C4-D12	140G-G6C3-D12	140G-G6C4-D12
160 ⁽¹⁾	⁽²⁾	1600	140G-G2E3-D16	140G-G2E4-D16	140G-G3E3-D16	140G-G3E4-D16	140G-G6E3-D16	140G-G6E4-D16

(1) IEC only.

(2) Adjustable thermal trip. 112 A min., 136 A med., 160 A max.

125 A, H-Frame Molded Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies — 125 A, H-Frame

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, trip units, and alarm contacts. Use the codes from Table [g](#) to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G — H 3 C 3 — C60 — SD — AA
a b c d e f g g

a		b		c		d	
Bulletin Number		Frame/Rating		Interrupting Rating/Breaking Capacity (based on I_c at 480V)		Protection Type	
Code	Description	Code	Description	Code	Description	Code	Description
140G	Global Molded Case Circuit Breaker	H	125 A	2	25 kA	C	Fixed thermal/fixed magnetic
				3	35 kA	F	Adjust thermal/ adjust magnetic
				6	65 kA	H	Electronic LSI- long, short, instant
				0	100 kA	I	Electronic LSIG -Long, short instant, and ground fault
				15	150 kA	X	Breaker frame
				T	Trip unit	S	Molded case switch (isolator)

e		f		g	
No. of Poles		Current Range		Factory-Installed Internal Options ⁽¹⁾	
Code	Description	Code	Description	Shunt Trip and Undervoltage Release Units	Auxiliary and Alarm Contacts, Trip Units
3	3 poles	C	e.g., C30 = 30 A	Code	Description
4	4 poles	D	e.g., D16 = 160 A	SJ	Shunt Trip, 24...30V AC/DC
		Blank	Frame only	SK	Shunt Trip, 48...60V AC/DC
				SD	Shunt Trip, 110...127V AC; 110...125V DC
				SA	Shunt Trip, 220...240V AC; 220...250V DC
				SB	Shunt Trip, 380...440V AC
				SC	Shunt Trip, 480...525V AC
				UJ	Undervoltage Release, 24...30V AC/DC
				UR	Undervoltage Release, 48V AC/DC
				UD	Undervoltage Release, 110...127V AC; 110...125V DC
				UA	Undervoltage Release, 220...240V AC; 220...250V DC
				UB	Undervoltage Release, 380...440V AC
				UC	Undervoltage Release, 480...525V AC
				No Digit	No Selection

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Breaker Frames and Trip Units

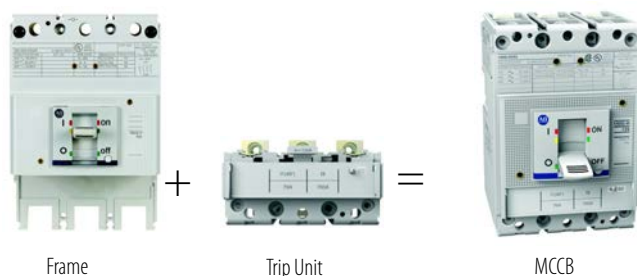


Table 9 - Breaker Frames, 125 A Rated Current

Interrupting Rating (50/60 Hz, UL 489/CSA 22.2, No. 5 [kA]) ⁽¹⁾			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾				Cat. No.	
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2- pole in series)		500V DC (3 Poles in series)		3 Poles	4 Poles
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]		
65	25	14	65	100	36	100	36	100	10	100	36	100	36	100	140G-H2X3	140G-H2X4
100	35	18	85	100	50	100	50	100	12	100	50	100	50	100	140G-H3X3	140G-H3X4
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	140G-H6X3	140G-H6X4
200	100	35	150	100	120	100	100	100	18	75	85	100	85	100	140G-H0X3	140G-H0X4
200	150	42	200	100	150	100	150	100	20	75	100	100	100	100	140G-H15X3	140G-H15X4

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 10 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.	
				3 Poles	4 Poles
50	50	500	C (Fixed)	140G-HTC3-C50	140G-HTC4-C50
60	60	600	C (Fixed)	140G-HTC3-C60	140G-HTC4-C60
63	63	630	C (Fixed)	140G-HTC3-C63	140G-HTC4-C63
70	70	700	C (Fixed)	140G-HTC3-C70	140G-HTC4-C70
80	56...80	400...800	F (Adjustable)	140G-HTF3-C80	140G-HTF4-C80
90	63...90	450...900	F (Adjustable)	140G-HTF3-C90	140G-HTF4-C90
100	70...100	500...1000	F (Adjustable)	140G-HTF3-D10	140G-HTF4-D10
110	77...110	550...1100	F (Adjustable)	140G-HTF3-D11	140G-HTF4-D11
125	87...125	625...1250	F (Adjustable)	140G-HTF3-D12	140G-HTF4-D12

Table 11 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.	
	L		S		I	3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=1...10 \times I_n$	$t_2=sec.$	$I_3=1...10 \times I_n$		
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-HTH3-C60	140G-HTH4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-HTH3-D10	140G-HTH4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	140G-HTH3-D12	140G-HTH4-D12

Table 12 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.	
	L		S		I	G		3 Poles	4 Poles
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$		
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-HTI3-C60	140G-HTI4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-HTI3-D10	140G-HTI4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	25...125	0.1, 0.2, 0.4, 0.8	140G-HTI3-D12	140G-HTI4-D12

Assembled Molded Case Circuit Breakers — 125 A, H-Frame

Table 13 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

InterruptingRating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2				Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2 Poles in series)		500V DC (3 Poles in series)		
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
65	25	14	65	100	36	100	36	100	10	100	36	100	36	100	H2
100	35	18	85	100	50	100	50	100	12	100	50	100	50	100	H3
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	H6
200	100	35	150	100	120	100	100	100	18	75	85	100	85	100	H0
200	150	42	200	100	150	100	150	100	20	75	100	100	100	100	H15

(1) See Table 14 and Table 15 for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 14 - Thermal-Magnetic, Fixed and Adjustable

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Interrupting Code H2		Interrupting Code H3		Interrupting Code H6	
			Cat. No.		Cat. No.		Cat. No.	
			3 Poles	4 Poles	3 Poles	4 Poles	3 Poles	4 Poles
15	15	400	140G-H2C3-C15	140G-H2C4-C15	140G-H3C3-C15	140G-H3C4-C15	140G-H6C3-C15	140G-H6C4-C15
16	16	400	140G-H2C3-C16	140G-H2C4-C16	140G-H3C3-C16	140G-H3C4-C16	140G-H6C3-C16	140G-H6C4-C16
20	20	400	140G-H2C3-C20	140G-H2C4-C20	140G-H3C3-C20	140G-H3C4-C20	140G-H6C3-C20	140G-H6C4-C20
25	25	400	140G-H2C3-C25	140G-H2C4-C25	140G-H3C3-C25	140G-H3C4-C25	140G-H6C3-C25	140G-H6C4-C25
30	30	400	140G-H2C3-C30	140G-H2C4-C30	140G-H3C3-C30	140G-H3C4-C30	140G-H6C3-C30	140G-H6C4-C30
32	32	400	140G-H2C3-C32	140G-H2C4-C32	140G-H3C3-C32	140G-H3C4-C32	140G-H6C3-C32	140G-H6C4-C32
35	35	400	140G-H2C3-C35	140G-H2C4-C35	140G-H3C3-C35	140G-H3C4-C35	140G-H6C3-C35	140G-H6C4-C35
40	40	400	140G-H2C3-C40	140G-H2C4-C40	140G-H3C3-C40	140G-H3C4-C40	140G-H6C3-C40	140G-H6C4-C40
50	50	500	140G-H2C3-C50	140G-H2C4-C50	140G-H3C3-C50	140G-H3C4-C50	140G-H6C3-C50	140G-H6C4-C50
60	60	600	140G-H2C3-C60	140G-H2C4-C60	140G-H3C3-C60	140G-H3C4-C60	140G-H6C3-C60	140G-H6C4-C60
63	63	630	140G-H2C3-C63	140G-H2C4-C63	140G-H3C3-C63	140G-H3C4-C63	140G-H6C3-C63	140G-H6C4-C63
70	70	700	140G-H2C3-C70	140G-H2C4-C70	140G-H3C3-C70	140G-H3C4-C70	140G-H6C3-C70	140G-H6C4-C70
80	56...80	400...800	140G-H2F3-C80	140G-H2F4-C80	140G-H3F3-C80	140G-H3F4-C80	140G-H6F3-C80	140G-H6F4-C80
90	63...90	450...900	140G-H2F3-C90	140G-H2F4-C90	140G-H3F3-C90	140G-H3F4-C90	140G-H6F3-C90	140G-H6F4-C90
100	70...100	500...1000	140G-H2F3-D10	140G-H2F4-D10	140G-H3F3-D10	140G-H3F4-D10	140G-H6F3-D10	140G-H6F4-D10
110	77...110	550...1100	140G-H2F3-D11	140G-H2F4-D11	140G-H3F3-D11	140G-H3F4-D11	140G-H6F3-D11	140G-H6F4-D11
125	87...125	625...1250	140G-H2F3-D12	140G-H2F4-D12	140G-H3F3-D12	140G-H3F4-D12	140G-H6F3-D12	140G-H6F4-D12
160 ⁽¹⁾	112...160	800...1600	140G-H2F3-D16	140G-H2F4-D16	140G-H3F3-D16	140G-H3F4-D16	140G-H6F3-D16	140G-H6F4-D16

(1) IEC only.

Table 15 - Thermal-Magnetic, Fixed and Adjustable

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Interrupting Code H0		Interrupting Code H15	
			Cat. No.		Cat. No.	
			3 Poles	4 Poles	3 Poles	4 Poles
15	15	400	140G-H0C3-C15	140G-H0C4-C15	140G-H15C3-C15	140G-H15C4-C15
16	16	400	140G-H0C3-C16	140G-H0C4-C16	140G-H15C3-C16	140G-H15C4-C16
20	20	400	140G-H0C3-C20	140G-H0C4-C20	140G-H15C3-C20	140G-H15C4-C20
25	25	400	140G-H0C3-C25	140G-H0C4-C25	140G-H15C3-C25	140G-H15C4-C25
30	30	400	140G-H0C3-C30	140G-H0C4-C30	140G-H15C3-C30	140G-H15C4-C30
32	32	400	140G-H0C3-C32	140G-H0C4-C32	140G-H15C3-C32	140G-H15C4-C32
35	35	400	140G-H0C3-C35	140G-H0C4-C35	140G-H15C3-C35	140G-H15C4-C35
40	40	400	140G-H0C3-C40	140G-H0C4-C40	140G-H15C3-C40	140G-H15C4-C40
50	50	500	140G-H0C3-C50	140G-H0C4-C50	140G-H15C3-C50	140G-H15C4-C50
60	60	600	140G-H0C3-C60	140G-H0C4-C60	140G-H15C3-C60	140G-H15C4-C60
63	63	630	140G-H0C3-C63	140G-H0C4-C63	140G-H15C3-C63	140G-H15C4-C63
70	70	700	140G-H0C3-C70	140G-H0C4-C70	140G-H15C3-C70	140G-H15C4-C70
80	56...80	400...800	140G-H0F3-C80	140G-H0F4-C80	140G-H15F3-C80	140G-H15F4-C80
90	63...90	450...900	140G-H0F3-C90	140G-H0F4-C90	140G-H15F3-C90	140G-H15F4-C90
100	70...100	500...1000	140G-H0F3-D10	140G-H0F4-D10	140G-H15F3-D10	140G-H15F4-D10
110	77...110	550...1100	140G-H0F3-D11	140G-H0F4-D11	140G-H15F3-D11	140G-H15F4-D11
125	84...120	625...1250	140G-H0F3-D12	140G-H0F4-D12	140G-H15F3-D12	140G-H15F4-D12
160 ⁽¹⁾	112...160	800...1600	140G-H0F3-D16	140G-H0F4-D16	140G-H15F3-D16	140G-H15F4-D16

(1) IEC only.

Table 16 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
65	25	14	65	100	36	100	36	100	10	100	H2
100	35	18	85	100	50	100	50	100	12	100	H3
150	65	25	100	100	70	100	65	100	15	100	H6
200	100	35	150	100	120	100	100	100	18	100	H0
200	150	42	200	100	150	100	150	100	20	75	H15

(1) See Table 17 through Table 20 for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 17 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code H2		Interrupting Code H3	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4...1 \times I_n$	$t_1=\text{sec.}$	$I_2=1...10 \times I_n$	$t_2=\text{sec.}$	$I_3=1...10 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	140G-H2H3-C25	140G-H2H4-C25	140G-H3H3-C25	140G-H3H4-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-H2H3-C60	140G-H2H4-C60	140G-H3H3-C60	140G-H3H4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-H2H3-D10	140G-H2H4-D10	140G-H3H3-D10	140G-H3H4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	140G-H2H3-D12	140G-H2H4-D12	140G-H3H3-D12	140G-H3H4-D12
160 ⁽¹⁾	64...160	3, 12, 36, 60	160...1600	0.05, 0.1, 0.2, 0.4	160...1600	140G-H2H3-D16	140G-H2H4-D16	140G-H3H3-D16	140G-H3H4-D16

(1) IEC only.

Table 18 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code H6	
	L		S		I	Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	3 Poles	4 Poles
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	140G-H6H3-C25	140G-H6H4-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-H6H3-C60	140G-H6H4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-H6H3-D10	140G-H6H4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	140G-H6H3-D12	140G-H6H4-D12
160 ⁽¹⁾	64...160	3, 12, 36, 60	160...1600	0.05, 0.1, 0.2, 0.4	160...1600	140G-H6H3-D16	140G-H6H4-D16

(1) IEC only.

Rated Current I_n [A]	Protection Type					Interrupting Code H0		Interrupting Code H15	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	140G-H0H3-C25	140G-H0H4-C25	140G-H15H3-C25	140G-H15H4-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-H0H3-C60	140G-H0H4-C60	140G-H15H3-C60	140G-H15H4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-H0H3-D10	140G-H0H4-D10	140G-H15H3-D10	140G-H15H4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	140G-H0H3-D12	140G-H0H4-D12	140G-H15H3-D12	140G-H15H4-D12
160 ⁽¹⁾	64...160	3, 12, 36, 60	160...1600	0.05, 0.1, 0.2, 0.4	160...1600	140G-H0H3-D16	140G-H0H4-D16	140G-H15H3-D16	140G-H15H4-D16

(1) IEC only.

Table 19 - Electronic LSI (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code H2		Interrupting Code H3	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	5...25	0.1, 0.2, 0.4, 0.8	140G-H2I3-C25	140G-H2I4-C25	140G-H3I3-C25	140G-H3I4-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-H2I3-C60	140G-H2I4-C60	140G-H3I3-C60	140G-H3I4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-H2I3-D10	140G-H2I4-D10	140G-H3I3-D10	140G-H3I4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	25...125	0.1, 0.2, 0.4, 0.8	140G-H2I3-D12	140G-H2I4-D12	140G-H3I3-D12	140G-H3I4-D12
160 ⁽¹⁾	64...160	3, 12, 36, 60	160...1600	0.05, 0.1, 0.2, 0.4	160...1600	32...160	0.1, 0.2, 0.4, 0.8	140G-H2I3-D16	140G-H2I4-D16	140G-H3I3-D16	140G-H3I4-D16

(1) IEC only.

Rated Current I_n [A]	Protection Type							Interrupting Code H6	
	L		S		I	G		Cat. No.	Cat. No.
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	5...25	0.1, 0.2, 0.4, 0.8	140G-H6I3-C25	140G-H6I4-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-H6I3-C60	140G-H6I4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-H6I3-D10	140G-H6I4-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	25...125	0.1, 0.2, 0.4, 0.8	140G-H6I3-D12	140G-H6I4-D12
160 ⁽¹⁾	64...160	3, 12, 36, 60	160...1600	0.05, 0.1, 0.2, 0.4	160...1600	32...160	0.1, 0.2, 0.4, 0.8	140G-H6I3-D16	140G-H6I4-D16

(1) IEC only.

Table 20 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type								Interrupting Code H0		Interrupting Code H15	
	L		S		I	G		Cat. No.	3 Poles	4 Poles	3 Poles	4 Poles
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$					
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	5...25	0.1, 0.2, 0.4, 0.8	140G-H0I3-C25	140G-H0I4-C25	140G-H15I3-C25	140G-H15I4-C25	
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-H0I3-C60	140G-H0I4-C60	140G-H15I3-C60	140G-H15I4-C60	
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-H0I3-D10	140G-H0I4-D10	140G-H15I3-D10	140G-H15I4-D10	
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	25...125	0.1, 0.2, 0.4, 0.8	140G-H0I3-D12	140G-H0I4-D12	140G-H15I3-D12	140G-H15I4-D12	
160 ⁽¹⁾	64...160	3, 12, 36, 60	160...1600	0.05, 0.1, 0.2, 0.4	160...1600	32...160	0.1, 0.2, 0.4, 0.8	140G-H0I3-D16	140G-H0I4-D16	140G-H15I3-D16	140G-H15I4-D16	

(1) IEC only.

225 A I-Frame Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies — 225 A, I-Frame

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table g to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G – I 3 C 3 – C60 – SA – KA
a b c d e f g g

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
I	225 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
2	25 kA
3	35 kA

d	
Protection Type	
Code	Description
C	Fixed thermal/fixed magnetic
S	Molded case switch (Isolator)

e	
No. of Poles	
Code	Description
3	3 poles
4	4 poles

f	
Current Range	
Code	Description
C	e.g., C30 = 30 A
D	e.g., D16 = 160 A

g			
Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
Code	Description	Code	Description
SJ	Shunt Trip, 24...30V AC/DC	KA	1 Aux. Contact, 250V
SK	Shunt Trip, 48...60V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110...127V AC; 110...125V DC	BA	2 Aux., 1 Alarm Contact, 250V
SA	Shunt Trip, 220...240V AC; 220...250V DC	KJ	1 Aux. Contact, 24V
SB	Shunt Trip, 380...440V AC	AJ	1 Aux., 1 Alarm Contact, 24V
SG	Shunt Trip, 480...525V AC		
UJ	Undervoltage Release, 24...30V AC/DC		
UR	Undervoltage Release, 48V AC/DC		
UD	Undervoltage Release, 110...127V AC; 110...125V DC		
UA	Undervoltage Release, 220...240V AC; 220...250V DC		
UB	Undervoltage Release, 380...440V AC		
UC	Undervoltage Release, 480...525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Assembled Molded Case Circuit Breakers — 225 A I-Frame



Table 21 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2				Interrupting Code ⁽¹⁾
240V	480V	600V/ 347V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2 Poles in series)		500V DC (3 Poles in series)		
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
50	25	10	50	75	36	75	25	75	5	50	36	100	36	100	
65	35	10	85	50	50	50	40	50	6	50	50	75	50	75	I3

(1) See [Table 22](#) for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 22 - Thermal-Magnetic, Fixed

Rated Current I_n [A]	Thermal Trip [A] $I_r = I_n$ (Fixed)	Magnetic Trip [A] I_m	Interrupting Code I2		Interrupting Code I3	
			Cat. No.		Cat. No.	
			3 Poles	4 Poles	3 Poles	4 Poles
60	60	600	140G-I2C3-C60	140G-I2C4-C60	140G-I3C3-C60	140G-I3C4-C60
63	63	630	140G-I2C3-C63	140G-I2C4-C63	140G-I3C3-C63	140G-I3C4-C63
70	70	700	140G-I2C3-C70	140G-I2C4-C70	140G-I3C3-C70	140G-I3C4-C70
80	80	800	140G-I2C3-C80	140G-I2C4-C80	140G-I3C3-C80	140G-I3C4-C80
90	90	900	140G-I2C3-C90	140G-I2C4-C90	140G-I3C3-C90	140G-I3C4-C90
100	100	1000	140G-I2C3-D10	140G-I2C4-D10	140G-I3C3-D10	140G-I3C4-D10
110	110	1100	140G-I2C3-D11	140G-I2C4-D11	140G-I3C3-D11	140G-I3C4-D11
125	125	1250	140G-I2C3-D12	140G-I2C4-D12	140G-I3C3-D12	140G-I3C4-D12
150	150	1500	140G-I2C3-D15	140G-I2C4-D15	140G-I3C3-D15	140G-I3C4-D15
160	160	1600	140G-I2C3-D16	140G-I2C4-D16	140G-I3C3-D16	140G-I3C4-D16
175	175	1750	140G-I2C3-D17	140G-I2C4-D17	140G-I3C3-D17	140G-I3C4-D17
200	200	2000	140G-I2C3-D20	140G-I2C4-D20	140G-I3C3-D20	140G-I3C4-D20
225	225	2250	140G-I2C3-D22	140G-I2C4-D22	140G-I3C3-D22	140G-I3C4-D22

250 A, J-Frame Molded Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies — 250 A, J-Frame

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, trip units, and alarm contacts. Use the codes from Table g to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G – J 3 C 3 – C60 – SD – AA
a b c d e f g g

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
J	250 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
2	25 kA
3	35 kA
6	65 kA
0	100 kA
T	Trip unit

d	
Protection Type	
Code	Description
C	Fixed thermal/ fixed magnetic
E	Adjust thermal/ fixed magnetic
F	Adjust thermal/ adjust magnetic
H	Electronic LSI-long, short, instant
I	Electronic LSI-long, short, instant, and ground fault
X	Breaker frame
S	Molded case switch (isolator)

e	
No. of Poles	
Code	Description
3	3 poles
4	4 poles

f	
Current Range	
Code	Description
C	e.g., C30 = 30 A
D	e.g., D16 = 160 A
Blank	Frame only

g	
Factory-Installed Internal Options ⁽¹⁾	
Shunt Trip and Undervoltage Release Units	
Code	Description
SJ	Shunt Trip, 24...30V AC/DC
SK	Shunt Trip, 48...60V AC/DC
SD	Shunt Trip, 110...127V AC; 110...125V DC
SA	Shunt Trip, 220...240V AC; 220...250V DC
SB	Shunt Trip, 380...440V AC
SC	Shunt Trip, 480...525V AC
UJ	Undervoltage Release, 24...30V AC/DC
UR	Undervoltage Release, 48V AC/DC
UD	Undervoltage Release, 110...127V AC; 110...125V DC
UA	Undervoltage Release, 220...240V AC; 220...250V DC
UB	Undervoltage Release, 380...440V AC
UC	Undervoltage Release, 480...525V AC
No Digit	No Selection
Auxiliary and Alarm Contacts, Trip Units	
Code	Description
KA	1 Aux. Contact, 250V
AA	1 Aux., 1 Alarm Contact, 250V
BA	2 Aux., 1 Alarm Contact, 250V
DA	1 Trip Unit Alarm Contact, 250V
FB	2 Aux. Contacts, 400V
AB	1 Aux., 1 Alarm Contact, 400V
KJ	1 Aux. Contact, 24V
AJ	1 Aux., 1 Alarm Contact, 24V
DJ	1 Trip Unit Alarm Contact, 24V

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Breaker Frames and Trip Units

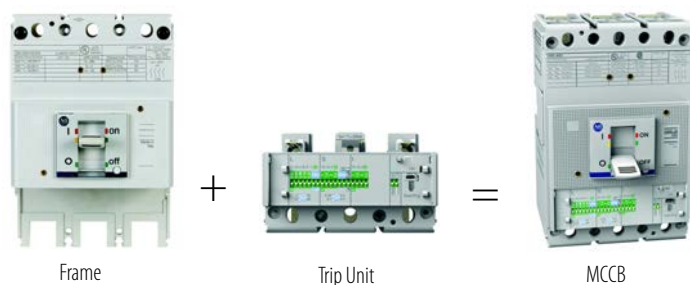


Table 23 - Breaker Frames, 250 A Rated Current

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾				Cat. No.	
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2 Poles in series)		500V DC (3 Poles in series)			
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	3 Poles	4 Poles
65	25	14	65	100	36	100	36	100	10	100	36	100	36	100	140G-J2X3	140G-J2X4
100	35	18	85	100	50	100	50	100	12	100	50	100	50	100	140G-J3X3	140G-J3X4
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	140G-J6X3	140G-J6X4
200	100	35	150	100	120	100	100	100	20	100	85	100	85	100	140G-J0X3	140G-J0X4

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 24 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.	
				3 Poles	4 Poles
25	25	400	C (Fixed)	140G-JTC3-C25	140G-JTC4-C25
30	30	400	C (Fixed)	140G-JTC3-C30	140G-JTC4-C30
32	32	400	C (Fixed)	140G-JTC3-C32	140G-JTC4-C32
35	35	400	C (Fixed)	140G-JTC3-C35	140G-JTC4-C35
40	40	400	C (Fixed)	140G-JTC3-C40	140G-JTC4-C40
50	50	500	C (Fixed)	140G-JTC3-C50	140G-JTC4-C50
60	60	600	C (Fixed)	140G-JTC3-C60	140G-JTC4-C60
63	63	630	C (Fixed)	140G-JTC3-C63	140G-JTC4-C63
70	70	700	C (Fixed)	140G-JTC3-C70	140G-JTC4-C70
80	56...80	400...800	F (Adjustable)	140G-JTF3-C80	140G-JTF4-C80
90	63...90	450...900	F (Adjustable)	140G-JTF3-C90	140G-JTF4-C90
100	70...100	500...1000	F (Adjustable)	140G-JTF3-D10	140G-JTF4-D10
110	77...110	550...1100	F (Adjustable)	140G-JTF3-D11	140G-JTF4-D11
125	87.5...125	625...1250	F (Adjustable)	140G-JTF3-D12	140G-JTF4-D12
150	105...150	750...1500	F (Adjustable)	140G-JTF3-D15	140G-JTF4-D15
160	112...160	800...1600	F (Adjustable)	140G-JTF3-D16	140G-JTF4-D16
175	122.5...175	875...1750	F (Adjustable)	140G-JTF3-D17	140G-JTF4-D17
200	140...200	1000...2000	F (Adjustable)	140G-JTF3-D20	140G-JTF4-D20
225	157.5...225	1125...2250	F (Adjustable)	140G-JTF3-D22	140G-JTF4-D22
250	175...250	1250...2500	F (Adjustable)	140G-JTF3-D25	140G-JTF4-D25

Table 25 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.	Cat. No.
	L		S		I	3 Poles	4 Poles
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$		
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	140G-JTH3-C40	140G-JTH4-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-JTH3-C60	140G-JTH4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-JTH3-D10	140G-JTH4-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	140G-JTH3-D15	140G-JTH4-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	140G-JTH3-D25	140G-JTH4-D25

Table 26 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.	Cat. No.
	L		S		I	G		3 Poles	4 Poles
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$		
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	8...40	0.1, 0.2, 0.4, 0.8	140G-JT13-C40	140G-JT14-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-JT13-C60	140G-JT14-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-JT13-D10	140G-JT14-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	30...150	0.1, 0.2, 0.4, 0.8	140G-JT13-D15	140G-JT14-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	50...250	0.1, 0.2, 0.4, 0.8	140G-JT13-D25	140G-JT14-D25

Assembled Molded Case Circuit Breakers — 250 A J-Frame

Table 27 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾				Interrupting Code ⁽²⁾
240V	480V	600V	220V ⁽³⁾		415V		440V ⁽³⁾		690V		250V DC (2- pole in series)		500V DC (3 Poles in series)		
			I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	
65	25	14	65	100	36	100	36	100	10	100	36	100	36	100	J2
100	35	18	85	100	50	100	50	100	12	100	50	100	50	100	J3
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	J6
200	100	35	150	100	120	100	100	100	20	100	85	100	85	100	J0

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) See Table 28 for Cat. No. selection.

(3) These ratings have not been tested for the CCC listing.

Table 28 - Thermal-Magnetic, Fixed and Adjustable

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Interrupting Code J2		Interrupting Code J3	
			Cat. No.		Cat. No.	
			3 Poles	4 Poles	3 Poles	4 Poles
25	25	400	140G-J2C3-C25	140G-J2C4-C25	140G-J3C3-C25	140G-J3C4-C25
30	30	400	140G-J2C3-C30	140G-J2C4-C30	140G-J3C3-C30	140G-J3C4-C30
32	32	400	140G-J2C3-C32	140G-J2C4-C32	140G-J3C3-C32	140G-J3C4-C32
35	35	400	140G-J2C3-C35	140G-J2C4-C35	140G-J3C3-C35	140G-J3C4-C35
40	40	400	140G-J2C3-C40	140G-J2C4-C40	140G-J3C3-C40	140G-J3C4-C40
50	50	500	140G-J2C3-C50	140G-J2C4-C50	140G-J3C3-C50	140G-J3C4-C50
60	60	600	140G-J2C3-C60	140G-J2C4-C60	140G-J3C3-C60	140G-J3C4-C60
63	63	630	140G-J2C3-C63	140G-J2C4-C63	140G-J3C3-C63	140G-J3C4-C63
70	70	700	140G-J2C3-C70	140G-J2C4-C70	140G-J3C3-C70	140G-J3C4-C70
80	56...80	400...800	140G-J2F3-C80	140G-J2F4-C80	140G-J3F3-C80	140G-J3F4-C80
90	63...90	450...900	140G-J2F3-C90	140G-J2F4-C90	140G-J3F3-C90	140G-J3F4-C90
100	70...100	500...1000	140G-J2F3-D10	140G-J2F4-D10	140G-J3F3-D10	140G-J3F4-D10
110	77...110	550...1100	140G-J2F3-D11	140G-J2F4-D11	140G-J3F3-D11	140G-J3F4-D11
125	87.5...125	625...1250	140G-J2F3-D12	140G-J2F4-D12	140G-J3F3-D12	140G-J3F4-D12
150	105...150	750...1500	140G-J2F3-D15	140G-J2F4-D15	140G-J3F3-D15	140G-J3F4-D15
160	112...160	800...1600	140G-J2F3-D16	140G-J2F4-D16	140G-J3F3-D16	140G-J3F4-D16
175	122.5...175	875...1750	140G-J2F3-D17	140G-J2F4-D17	140G-J3F3-D17	140G-J3F4-D17
200	140...200	1000...2000	140G-J2F3-D20	140G-J2F4-D20	140G-J3F3-D20	140G-J3F4-D20
225	157.5...225	1125...2250	140G-J2F3-D22	140G-J2F4-D22	140G-J3F3-D22	140G-J3F4-D22
250	175...250	1250...2500	140G-J2F3-D25	140G-J2F4-D25	140G-J3F3-D25	140G-J3F4-D25

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Interrupting Code J6		Interrupting Code J0	
			Cat. No.		Cat. No.	
			3 Poles	4 Poles	3 Poles	4 Poles
25	25	400	140G-J6C3-C25	140G-J6C4-C25	140G-J0C3-C25	140G-J0C4-C25
30	30	400	140G-J6C3-C30	140G-J6C4-C30	140G-J0C3-C30	140G-J0C4-C30
32	32	400	140G-J6C3-C32	140G-J6C4-C32	140G-J0C3-C32	140G-J0C4-C32
35	35	400	140G-J6C3-C35	140G-J6C4-C35	140G-J0C3-C35	140G-J0C4-C35
40	40	400	140G-J6C3-C40	140G-J6C4-C40	140G-J0C3-C40	140G-J0C4-C40
50	50	500	140G-J6C3-C50	140G-J6C4-C50	140G-J0C3-C50	140G-J0C4-C50
60	60	600	140G-J6C3-C60	140G-J6C4-C60	140G-J0C3-C60	140G-J0C4-C60
63	63	630	140G-J6C3-C63	140G-J6C4-C63	140G-J0C3-C63	140G-J0C4-C63
70	70	700	140G-J6C3-C70	140G-J6C4-C70	140G-J0C3-C70	140G-J0C4-C70
80	56...80	400...800	140G-J6F3-C80	140G-J6F4-C80	140G-J0F3-C80	140G-J0F4-C80
90	63...90	450...900	140G-J6F3-C90	140G-J6F4-C90	140G-J0F3-C90	140G-J0F4-C90
100	70...100	500...1000	140G-J6F3-D10	140G-J6F4-D10	140G-J0F3-D10	140G-J0F4-D10
110	77...110	550...1100	140G-J6F3-D11	140G-J6F4-D11	140G-J0F3-D11	140G-J0F4-D11
125	87.5...125	625...1250	140G-J6F3-D12	140G-J6F4-D12	140G-J0F3-D12	140G-J0F4-D12
150	105...150	750...1500	140G-J6F3-D15	140G-J6F4-D15	140G-J0F3-D15	140G-J0F4-D15
160	112...160	800...1600	140G-J6F3-D16	140G-J6F4-D16	140G-J0F3-D16	140G-J0F4-D16
175	122.5...175	875...1750	140G-J6F3-D17	140G-J6F4-D17	140G-J0F3-D17	140G-J0F4-D17
200	140...200	1000...2000	140G-J6F3-D20	140G-J6F4-D20	140G-J0F3-D20	140G-J0F4-D20
225	157.5...225	1125...2250	140G-J6F3-D22	140G-J6F4-D22	140G-J0F3-D22	140G-J0F4-D22
250	175...250	1250...2500	140G-J6F3-D25	140G-J6F4-D25	140G-J0F3-D25	140G-J0F4-D25

Table 29 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA C22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
65	25	14	65	100	36	100	36	100	10	100	J2
100	35	18	85	100	50	100	50	100	12	100	J3
150	65	25	100	100	70	100	65	100	15	100	J6
200	100	35	150	100	120	100	100	100	20	100	J0

(1) See Table 30 through Table 32 for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 30 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code J2		Interrupting Code J3	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	140G-J2H3-C40	140G-J2H4-C40	140G-J3H3-C40	140G-J3H4-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-J2H3-C60	140G-J2H4-C60	140G-J3H3-C60	140G-J3H4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-J2H3-D10	140G-J2H4-D10	140G-J3H3-D10	140G-J3H4-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	140G-J2H3-D15	140G-J2H4-D15	140G-J3H3-D15	140G-J3H4-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	140G-J2H3-D25	140G-J2H4-D25	140G-J3H3-D25	140G-J3H4-D25

Rated Current I_n [A]	Protection Type					Interrupting Code J6		Interrupting Code J0	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	140G-J6H3-C40	140G-J6H4-C40	140G-J0H3-C40	140G-J0H4-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-J6H3-C60	140G-J6H4-C60	140G-J0H3-C60	140G-J0H4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-J6H3-D10	140G-J6H4-D10	140G-J0H3-D10	140G-J0H4-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	140G-J6H3-D15	140G-J6H4-D15	140G-J0H3-D15	140G-J0H4-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	140G-J6H3-D25	140G-J6H4-D25	140G-J0H3-D25	140G-J0H4-D25

Table 31 - Electronic LSI (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code J2		Interrupting Code J3	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	8...40	0.1, 0.2, 0.4, 0.8	140G-J2I3-C40	140G-J2I4-C40	140G-J3I3-C40	140G-J3I4-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-J2I3-C60	140G-J2I4-C60	140G-J3I3-C60	140G-J3I4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-J2I3-D10	140G-J2I4-D10	140G-J3I3-D10	140G-J3I4-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	30...150	0.1, 0.2, 0.4, 0.8	140G-J2I3-D15	140G-J2I4-D15	140G-J3I3-D15	140G-J3I4-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	50...250	0.1, 0.2, 0.4, 0.8	140G-J2I3-D25	140G-J2I4-D25	140G-J3I3-D25	140G-J3I4-D25

Table 32 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code J6		Interrupting Code J0	
	L		S		I	G		Cat. No.	Cat. No.	Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	8...40	0.1, 0.2, 0.4, 0.8	140G-J6I3-C40	140G-J6I4-C40	140G-J0I3-C40	140G-J0I4-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-J6I3-C60	140G-J6I4-C60	140G-J0I3-C60	140G-J0I4-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-J6I3-D10	140G-J6I4-D10	140G-J0I3-D10	140G-J0I4-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	30...150	0.1, 0.2, 0.4, 0.8	140G-J6I3-D15	140G-J6I4-D15	140G-J0I3-D15	140G-J0I4-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	50...250	0.1, 0.2, 0.4, 0.8	140G-J6I3-D25	140G-J6I4-D25	140G-J0I3-D25	140G-J0I4-D25

400 A, K-Frame Molded Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies — 400 A, K-Frame

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table g to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G – K 3 F 3 – D30 – SD – AA
a b c d e f g

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
K	400 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
3	35 kA
6	65 kA
0	100 kA
15	150 kA
T	Trip unit

d	
Protection Type	
Code	Description
F	Adjust thermal/ adjust magnetic
H	Electronic LSI –long, short, instant
I	Electronic LSI –long, short instant, and ground fault
K	Electronic LSI –MM –long, short, instant, ground fault, and MM
S	Molded case switch (isolator)
X	Breaker Frame

e	
No. of Poles	
Code	Description
3	3 poles
4	4 poles

f	
Current Range	
Code	Description
D30	e.g., 300 A
D40	e.g., 400 A
Blank	Frame only

g	
Factory-Installed Internal Options ⁽¹⁾	
Shunt Trip and Undervoltage Release Units	
Code	Description
SJ	Shunt Trip, 24...30V AC/DC
SK	Shunt Trip, 48...60V AC/DC
SD	Shunt Trip, 110...127V AC; 110...125V DC
SA	Shunt Trip, 220...240V AC; 220...250V DC
SB	Shunt Trip, 380...440V AC
SC	Shunt Trip, 480...525V AC
UJ	Undervoltage Release, 24...30V AC/DC
UR	Undervoltage Release, 48V AC/DC
UD	Undervoltage Release, 110...127V AC; 110...125V DC
UA	Undervoltage Release, 220...240V AC; 220...250V DC
UB	Undervoltage Release, 380...440V AC
UC	Undervoltage Release, 480...525V AC
No Digit	No Selection

Auxiliary and Alarm Contacts,	
Code	Description
AA	1 Aux., 1 Alarm Contact, 250V
CA	3 Aux., 1 Alarm Contact, 250V
AB	1 Aux., 1 Alarm Contact, 400V
FB	2 Aux. Contacts, 400V
CJ	3 Aux., 1 Alarm Contact, 24V

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Breaker Frames and Trip Units



Table 33 - Breaker Frames, 400 A Rated Current

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]					Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾		Cat. No.	
240V	480V	600V	2 Poles in series	3 Poles in series	220V ⁽²⁾		415V		440V ⁽²⁾		690V		500V DC (3 Poles in series)			
			500V DC ⁽¹⁾	600V DC ⁽¹⁾	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	3 Poles	4 Poles
100	35	25	35	25	85	100	50	100	40	100	25	100	36	100	140G-K3X3	140G-K3X4
150	65	35	50	35	100	100	70	100	65	100	40	100	50	100	140G-K6X3	140G-K6X4
200	100	65	65	50	200	100	120	100	100	100	70	100	70	100	140G-K0X3	140G-K0X4
200	150	100	100	65	200	100	200	100	180	100	80	100	100	100	140G-K15X3	140G-K15X4

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 34 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.	
				3 Poles	4 Poles
300	210...300	1500...3000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-KTF3-D30	140G-KTF4-D30
400	280...400	2000...4000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-KTF3-D40	140G-KTF4-D40

Table 35 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.	
	L		S		I	3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=1...10 \times I_n$	$t_2=sec.$	$I_3=1...10 \times I_n$		
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	140G-KTH3-D30	140G-KTH4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	140G-KTH3-D40	140G-KTH4-D40

Table 36 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.	Cat. No.
	L		S		I	G		3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=1...10 \times I_n$	$t_2=sec.$	$I_3=1...10 \times I_n$	$I_4=0.2...1 \times I_n$	$t_4=sec.$		
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300	0.1, 0.2, 0.4, 0.8	140G-KTI3-D30	140G-KTI4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400	0.1, 0.2, 0.4, 0.8	140G-KTI3-D40	140G-KTI4-D40

Table 37 - Trip Units, Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)⁽¹⁾

Rated Current I_n [A]	Protection Type							Cat. No.	
	L		S		I	G		3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3=1.5...12 \times I_n$	$I_4=0.2...1 \times I_n$	$t_4=sec.$		
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300	0.1, 0.2, 0.4, 0.8	140G-KTK3-D30	140G-KTK4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400	0.1, 0.2, 0.4, 0.8	140G-KTK3-D40	140G-KTK4-D40

(1) See [page 39](#) for a list of the preset values for Maintenance Mode.

Assembled Molded Case Circuit Breakers — 400 A K-Frame



Table 38 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]					Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾		Interrupting Code ⁽²⁾
240V	480V	600V	2 Poles in series	3 Poles in series	220V ⁽³⁾		415V		440V ⁽³⁾		690V		500V DC (3 Poles in series)		
			500V DC	600V DC	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
100	35	25	35	25	85	100	50	100	40	100	25	100	36	100	K3
150	65	35	50	35	100	100	70	100	65	100	40	100	50	100	K6
200	100	65	65	50	200	100	120	100	100	100	70	100	70	100	K0
200	150	100	100	65	200	100	200	100	180	100	80	100	100	100	K15

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) See [Table 39](#) for Cat. No. selection.

(3) These ratings have not been tested for the CCC listing.

Table 39 - Thermal-Magnetic, Adjustable and Adjustable

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Interrupting Code K3		Interrupting Code K6	
				Cat. No.		Cat. No.	
				3 Poles	4 Poles	3 Poles	4 Poles
300	210...300	1500...3000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-K3F3-D30	140G-K3F4-D30	140G-K6F3-D30	140G-K6F4-D30
400	280...400	2000...4000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-K3F3-D40	140G-K3F4-D40	140G-K6F3-D40	140G-K6F4-D40

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Interrupting Code K0		Interrupting Code K15	
				Cat. No.		Cat. No.	
				3 Poles	4 Poles	3 Poles	4 Poles
300	210...300	1500...3000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-K0F3-D30	140G-K0F4-D30	140G-K15F3-D30	140G-K15F4-D30
400	280...400	2000...4000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-K0F3-D40	140G-K0F4-D40	140G-K15F3-D40	140G-K15F4-D40

Table 40 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

InterruptingRating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽³⁾		690V		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
100	35	25	85	100	50	100	40	100	25	100	K3
150	65	35	100	100	70	100	65	100	40	100	K6
200	100	65	200	100	120	100	100	100	70	100	K0
200	150	100	200	100	200	100	180	100	80	100	K15

(1) See [Table 41](#) through [Table 43](#) for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 41 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code K3		Interrupting Code K6	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	140G-K3H3-D30	140G-K3H4-D30	140G-K6H3-D30	140G-K6H4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	140G-K3H3-D40	140G-K3H4-D40	140G-K6H3-D40	140G-K6H4-D40

Rated Current I_n [A]	Protection Type					Interrupting Code K0		Interrupting Code K15	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	140G-K0H3-D30	140G-K0H4-D30	140G-K15H3-D30	140G-K15H4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	140G-K0H3-D40	140G-K0H4-D40	140G-K15H3-D40	140G-K15H4-D40

Table 42 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type						Interrupting Code K3		Interrupting Code K6	
	L		S		I	G	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$ $t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300 0.1, 0.2, 0.4, 0.8	140G-K3I3-D30	140G-K3I4-D30	140G-K6I3-D30	140G-K6I4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400 0.1, 0.2, 0.4, 0.8	140G-K3I3-D40	140G-K3I4-D40	140G-K6I3-D40	140G-K6I4-D40

Rated Current I_n [A]	Protection Type						Interrupting Code K0		Interrupting Code K15	
	L		S		I	G	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$ $t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300 0.1, 0.2, 0.4, 0.8	140G-K0I3-D30	140G-K0I4-D30	140G-K15I3-D30	140G-K15I4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400 0.1, 0.2, 0.4, 0.8	140G-K0I3-D40	140G-K0I4-D40	140G-K15I3-D40	140G-K15I4-D40

Table 43 - Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)

Rated Current I_n [A]	Protection Type						Interrupting Code K3		Interrupting Code K6	
	L		S		I	G	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$ $t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300 0.1, 0.2, 0.4, 0.8	140G-K3K3-D30	140G-K3K4-D30	140G-K6K3-D30	140G-K6K4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400 0.1, 0.2, 0.4, 0.8	140G-K3K3-D40	140G-K3K4-D40	140G-K6K3-D40	140G-K6K4-D40

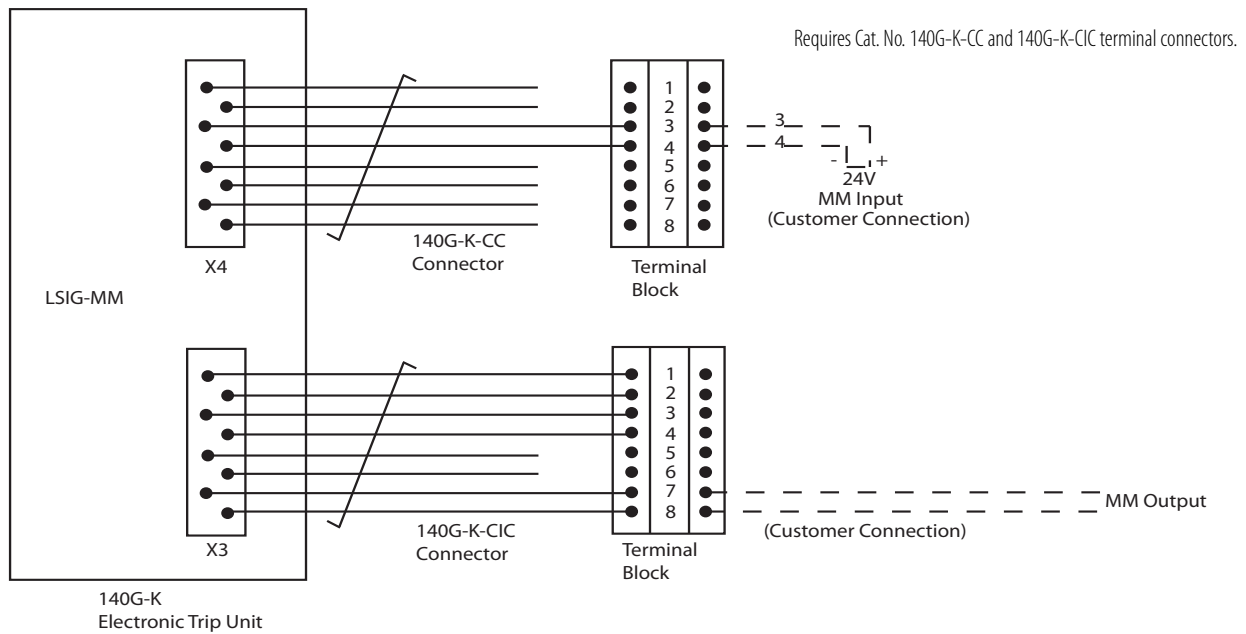
Rated Current I_n [A]	Protection Type						Interrupting Code K0		Interrupting Code K15	
	L		S		I	G	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$ $t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
300	120...300	3, 6, 9, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300 0.1, 0.2, 0.4, 0.8	140G-K0K3-D30	140G-K0K4-D30	140G-K15K3-D30	140G-K15K4-D30
400	160...400	3, 6, 9, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400 0.1, 0.2, 0.4, 0.8	140G-K0K3-D40	140G-K0K4-D40	140G-K15K3-D40	140G-K15K4-D40

Maintenance Mode (MM)

Maintenance Mode (MM) offers a preset set of protection parameters. MM allows systems testing when the molded case circuit breaker is energized or ON. The following table lists the preset values for Maintenance Mode.

Rated Current I_n [A]	L		S		I	G		MM
	$I_1=1 \times I_n$	$t_1=\text{MAX sec.}$	$I_2=\text{OFF}$	$t_2=\text{OFF sec.}$	$I_3=4 \times I_n$	$I_4=\text{OFF}$	$t_4=\text{OFF sec.}$	$I_5=2.5 \times I_n$
300	300	18	—	—	1200	—	—	750
400	400	18	—	—	1600	—	—	1000

Figure 7 - Maintenance Mode Basic Wiring Diagram



Complete Circuit Breaker Assemblies — 800 A, M-Frame

140G	–	M	6	K	3	–	D60	–	SD	–	AA
a		b	c	d	e		f		g		g

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
M	800 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
5	50 kA
6	65 kA
0	100 kA
T	Trip unit

d	
Protection Type	
Code	Description
F	Adjust thermal/ adjust magnetic
H	Electronic LSI -long, short, instant
I	Electronic LSIG -long, short, instant, and ground fault
K	Electronic LSIG-MM -long, short, instant, ground fault, and MM
X	Breaker frame
S	Molded case switch (isolator)

e	
No. of Poles	
Code	Description
3	3 poles
4	4 poles

f	
Current Range	
Code	Description
D60	e.g., 600 A
D63	e.g., 630 A
D80	e.g., 800 A
Blank	Frame only

g	
Factory-Installed Internal Options ⁽¹⁾	
Shunt Trip and Undervoltage Release Units	
Code	Description
SJ	Shunt Trip, 24...30V AC/DC
SK	Shunt Trip, 48...60V AC/DC
SD	Shunt Trip, 110...127V AC; 110...125V DC
SA	Shunt Trip, 220...240V AC; 220...250V DC
SB	Shunt Trip, 380...440V AC
SC	Shunt Trip, 480...525V AC
UJ	Undervoltage Release, 24...30V AC/DC
UR	Undervoltage Release, 48V AC/DC
UY	Undervoltage Release, 60V AC/DC
UD	Undervoltage Release, 110...127V AC; 110...125V DC
UA	Undervoltage Release, 220...240V AC; 220...250V DC
UB	Undervoltage Release, 380...440V AC
UC	Undervoltage Release, 480...525V AC
No Digit	No Selection

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Breaker Frames and Trip Units



Table 44 - Breaker Frames, 800 A Rated Current

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5[kA]				Breaking Capacity (50/60 Hz), IEC 60947-2						Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾		Cat. No.	
240V	480V	600V	3 Poles in series	220V ⁽²⁾		415V		690V		750V DC (3 Poles in series)			
			600V DC ⁽¹⁾	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	3 Poles	4 Poles
100	50	25	20	85	100	50	100	22	75	16	75	140G-M5X3	140G-M5X4
200	65	35	35	100	100	70	100	25	75	36	75	140G-M6X3	140G-M6X4
200	100	42	50	200	75	100	75	30	75	50	75	140G-M0X3	140G-M0X4

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 45 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.	
				3 Poles	4 Poles
600	420...600	3000...6000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-MTF3-D60	140G-MTF3-D60
800	560...800	4000...8000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-MTF3-D80	140G-MTF4-D80

Table 46 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.	
	L		S		I	3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3^{(1)}$		
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	140G-MTH3-D60	140G-MTH4-D60
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	140G-MTH3-D80	140G-MTH4-D80

(1) 600 A I_3 max = 12 I_n ; 800 A I_3 max = 10.5 I_n

Table 47 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.	
	L		S		I	G		3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3^{(1)}$	$I_4=0.2...1 \times I_n$	$t_4=sec.$		
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	120...600	0.1, 0.2, 0.4, 0.8	140G-MTI3-D60	140G-MTI4-D60
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	160...800	0.1, 0.2, 0.4, 0.8	140G-MTI3-D80	140G-MTI4-D80

(1) 600 A I_3 max = 12 I_n ; 800 A I_3 max = 10.5 I_n

Table 48 - Trip Units, Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode⁽¹⁾)

Rated Current I_n [A]	Protection Type							Cat. No.	
	L		S		I	G		3 Poles	4 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3^{(2)}$	$I_4=0.2...1 \times I_n$	$t_4=sec.$		
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	120...600	0.1, 0.2, 0.4, 0.8	140G-MTK3-D60	140G-MTK4-D60
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	160...800	0.1, 0.2, 0.4, 0.8	140G-MTK3-D80	140G-MTK4-D80

(1) See [page 44](#) for a list of the preset values for Maintenance Mode.

(2) 600 A I_3 max = 12 I_n ; 800 A I_3 max = 10.5 I_n

Assembled Molded Case Circuit Breakers — 800 A, M-Frame


Table 49 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic and Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]				Breaking Capacity (50/60 Hz), IEC 60947-2						Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾		Interrupting Code ⁽²⁾
240V	480V	600V	3 Poles in series	220V ⁽³⁾		415V		690V		750V DC (3 Poles in series)		
			600V DC ⁽¹⁾	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	
100	50	25	20	85	100	50	100	22	75	16	75	M5
200	65	35	35	100	100	70	100	25	75	36	75	M6
200	100	42	50	200	75	100	75	30	75	50	75	M0

(1) DC ratings applicable to thermal magnetic trip unit only.

(2) See [Table 50](#) through [Table 54](#) for Cat. No. selection

(3) These ratings have not been tested for the CCC listing.

Table 50 - Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Interrupting Code M5		Interrupting Code M6		Interrupting Code M0	
				Cat. No.		Cat. No.		Cat. No.	
				3 Poles	4 Poles	3 Poles	4 Poles	3 Poles	4 Poles
600	420...600	3000...6000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-M5F3-D60	140G-M5F4-D60	140G-M6F3-D60	140G-M6F4-D60	140G-M0F3-D60	140G-M0F4-D60
630 ⁽¹⁾	441...630	3150...6300		140G-M5F3-D63	140G-M5F4-D63	140G-M6F3-D63	140G-M6F4-D63	140G-M0F3-D63	140G-M0F4-D63
800	560...800	4000...8000		140G-M5F3-D80	140G-M5F4-D80	140G-M6F3-D80	140G-M6F4-D80	140G-M0F3-D80	140G-M0F4-D80

(1) IEC only.

Table 51 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code M5		Interrupting Code M6	
	L		S		I	Cat. No.		Cat. No.	Cat. No.
	$I_1=0.4...1 \times I_n$	$t_1=\text{sec.}$	$I_2=0.6...10 \times I_n$	$t_2=\text{sec.}$	$I_3=\text{sec.}$ ⁽¹⁾	3 Poles	4 Poles	3 Poles	4 Poles
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	140G-M5H3-D60	140G-M5H4-D60	140G-M6H3-D60	140G-M6H4-D60
630 ⁽²⁾	252...630	3, 6, 12, 18	378...6300	0.05, 0.1, 0.25, 0.5	945...7560	140G-M5H3-D63	140G-M5H4-D63	140G-M6H3-D63	140G-M6H4-D63
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	140G-M5H3-D80	140G-M5H4-D80	140G-M6H3-D80	140G-M6H4-D80

(1) 600 A, 630 A $I_3 \text{ max} = 12 I_n$; 800 A $I_3 \text{ max} = 10.5 I_n$

(2) IEC only.

Rated Current I_n [A]	Protection Type					Interrupting Code M0	
	L		S		I	Cat. No.	
	$I_1=0.4...1 \times I_n$	$t_1=\text{sec.}$	$I_2=0.6...10 \times I_n$	$t_2=\text{sec.}$	$I_3=\text{sec.}$ ⁽¹⁾	3 Poles	4 Poles
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	140G-M0H3-D60	140G-M0H4-D60
630 ⁽²⁾	252...630	3, 6, 12, 18	378...6300	0.05, 0.1, 0.25, 0.5	945...7560	140G-M0H3-D63	140G-M0H4-D63
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	140G-M0H3-D80	140G-M0H4-D80

(1) 600 A, 630 A $I_3 \text{ max} = 12 I_n$; 800 A $I_3 \text{ max} = 10.5 I_n$

(2) IEC only.

Table 52 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code M5		Interrupting Code M6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=0.6 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3^{(1)}$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	120...600	0.1, 0.2, 0.4, 0.8	140G-M5I3-D60	140G-M5I4-D60	140G-M6I3-D60	140G-M6I4-D60
630 ⁽²⁾	252...630	3, 6, 12, 18	378...6300	0.05, 0.1, 0.25, 0.5	945...7560	126...630	0.1, 0.2, 0.4, 0.8	140G-M5I3-D63	140G-M5I4-D63	140G-M6I3-D63	140G-M6I4-D63
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	160...800	0.1, 0.2, 0.4, 0.8	140G-M5I3-D80	140G-M5I4-D80	140G-M6I3-D80	140G-M6I4-D80

(1) 600 A, 630 A $I_3 \text{ max} = 12 I_n$, 800 A $I_3 \text{ max} = 10.5 I_n$

(2) IEC only.

Rated Current I_n [A]	Protection Type							Interrupting Code M0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=0.6 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n^{(1)}$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	120...600	0.1, 0.2, 0.4, 0.8	140G-M0I3-D60	140G-M0I4-D60
630 ⁽²⁾	252...630	3, 6, 12, 18	378...6300	0.05, 0.1, 0.25, 0.5	945...7560	126...630	0.1, 0.2, 0.4, 0.8	140G-M0I3-D63	140G-M0I4-D63
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	160...800	0.1, 0.2, 0.4, 0.8	140G-M0I3-D80	140G-M0I4-D80

(1) 600 A, 630 A $I_3 \text{ max} = 12 I_n$, 800 A $I_3 \text{ max} = 10.5 I_n$

(2) IEC only.

Table 53 - Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)

Rated Current I_n [A]	Protection Type							Interrupting Code M5		Interrupting Code M6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=0.6 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n^{(1)}$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles	3 Poles	4 Poles
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	120...600	0.1, 0.2, 0.4, 0.8	140G-M5K3-D60	140G-M5K4-D60	140G-M6K3-D60	140G-M6K4-D60
630 ⁽²⁾	252...630	3, 6, 12, 18	378...6300	0.05, 0.1, 0.25, 0.5	945...7560	126...630	0.1, 0.2, 0.4, 0.8	140G-M5K3-D63	140G-M5K4-D63	140G-M6K3-D63	140G-M6K4-D63
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	160...800	0.1, 0.2, 0.4, 0.8	140G-M5K3-D80	140G-M5K4-D80	140G-M6K3-D80	140G-M6K4-D80

(1) 600 A, 630 A $I_3 \text{ max} = 12 I_n$, 800 A $I_3 \text{ max} = 10.5 I_n$

(2) IEC only.

Table 54 - Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)

Rated Current I_n [A]	Protection Type							Interrupting Code M0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=0.6 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n^{(1)}$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	3 Poles	4 Poles
600	240...600	3, 6, 12, 18	360...6000	0.05, 0.1, 0.25, 0.5	900...7200	120...600	0.1, 0.2, 0.4, 0.8	140G-M0K3-D60	140G-M0K4-D60
630 ⁽²⁾	252...630	3, 6, 12, 18	378...6300	0.05, 0.1, 0.25, 0.5	945...7560	126...630	0.1, 0.2, 0.4, 0.8	140G-M0K3-D63	140G-M0K4-D63
800	320...800	3, 6, 9, 18	480...8000	0.05, 0.1, 0.25, 0.5	1200...8400	160...800	0.1, 0.2, 0.4, 0.8	140G-M0K3-D80	140G-M0K4-D80

(1) 600 A, 630 A $I_3 \text{ max} = 12 I_n$, 800 A $I_3 \text{ max} = 10.5 I_n$

(2) IEC only.

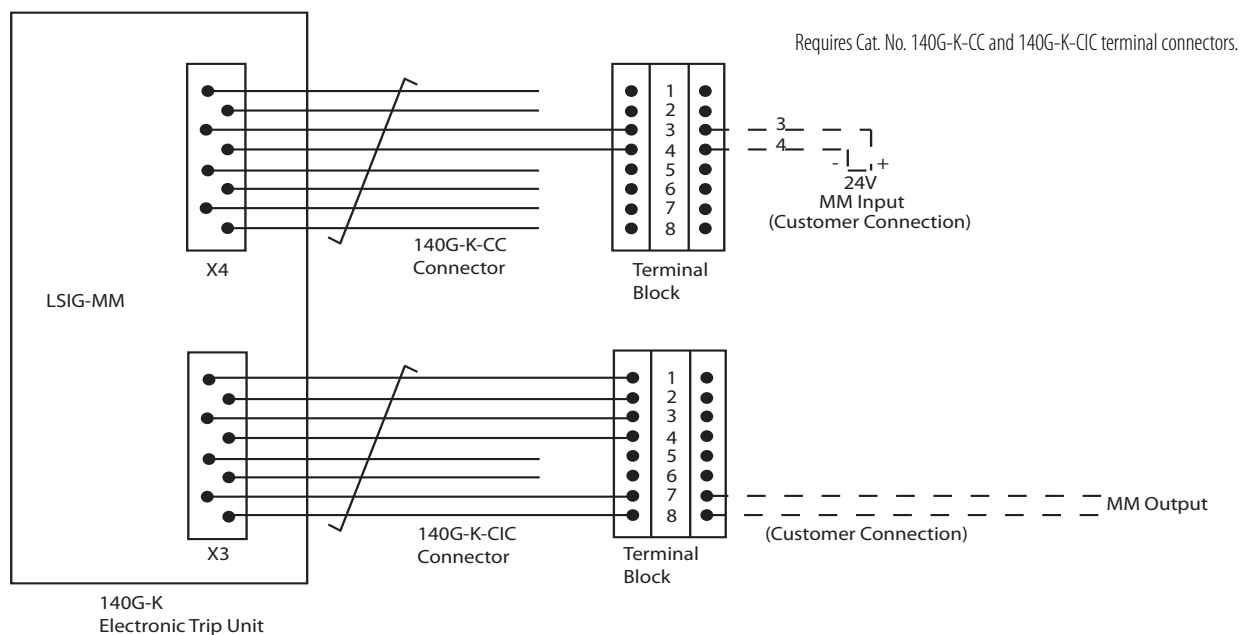
Maintenance Mode (MM)

Maintenance Mode (MM) offers a preset set of protection parameters. MM allows systems testing when the molded case circuit breaker is energized or ON. The following table lists the preset values for Maintenance Mode.

Rated Current I_n [A]	L		S		I	G		MM
	$I_1=1 \times I_n$	$t_1=\text{MAX sec.}$	$I_2=\text{OFF}$	$t_2=\text{OFF sec.}$	$I_3=4 \times I_n$	$I_4=\text{OFF}$	$t_4=\text{OFF sec.}$	$I_5=2.5 \times I_n$
600	600	18	—	—	2400	—	—	1500
630 ⁽¹⁾	630	18	—	—	2520	—	—	1575
800	800	18	—	—	3200	—	—	2000

(1) IEC only.

Figure 8 - Maintenance Mode Basic Wiring Diagram



1200 A, N-Frame Molded Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies — 1200 A, N-Frame

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table [h](#) to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G
-
N
5
H
3
-
E12
-

-
SD
-
AB

a
b
c
d
e
f
g
h

a		b		c		d	
Bulletin Number		Frame/Rating		Interrupting Rating/Breaking Capacity (based on I_c at 480V)		Protection Type	
Code	Description	Code	Description	Code	Description	Code	Description
140G	Global Molded Case Circuit Breaker	N	1200 A	5	50 kA	H	Electronic LSI-long, short, and instant
				6	65 kA	I	Electronic LSIG-long, short, instant, and ground fault
				0	100 kA	K	Electronic LSIG-MM-long, short, instant, ground fault, and MM
				T	Trip unit	S	Molded case switch (isolator)

e		f		g		h	
Poles		Current Range		Rating ⁽¹⁾		Factory-Installed Internal Options ⁽²⁾	
Code	Description	Code	Description	Code	Description	Shunt Trip and Undervoltage Release Units	
3	3 poles	E12	1200 A rating plug, standard	No Digit	80% Rated	Code	Description
4	4 poles			Z1	100% Rated	SJ	Shunt Trip, 24V AC/DC
						SK	Shunt Trip, 48V AC/DC
						SD	Shunt Trip, 110...120V AC/DC
						SA	Shunt Trip, 220...240V AC/DC
						SB	Shunt Trip, 380V AC
						SC	Shunt Trip, 415...440V AC
						UJ	Undervoltage Release, 24V AC/DC
						UD	Undervoltage Release, 110...120V AC/DC
						UA	Undervoltage Release, 220...240V AC/DC
						UB	Undervoltage Release, 380...400V AC
						UC	Undervoltage Release, 415...440V AC
						No Digit	No Selection
						Auxiliary and Alarm Contacts	
						Code	Description
						AJ	1 Aux., 1 Alarm Contact, 24V
						FJ	2 Aux. Contacts, 24V
						AB	1 Aux., 1 Alarm Contact, 400V
						FB	2 Aux. Contacts, 400V

(1) For more information about 80% and 100% ratings, please see [page 13](#).

(2) Select up to two internal options: 1 for lower right side mounting (shunt trip or undervoltage release), 1 for upper right (auxiliary or alarm contact).

Assembled Molded Case Circuit Breakers — 1200 A, N-Frame


Table 55 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2										Interrupting Code ⁽¹⁾
240V	480V	600V	220V		415V		440V		500V		690V		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	
65	50	25	85	85	50	50	50	50	40	40	30	30	N5
100	65	50	100	100	70	70	65	65	50	50	42	32	N6
150	100	65	200	200	120	120	100	100	85	64	50	38	N0

(1) See [Table 56](#) through [Table 61](#) for Cat. No. selection

Table 56 - Electronic LSI (Long, Short, Instantaneous) - 80% Rated⁽¹⁾

Rated Current I_n [A]	Protection Type ⁽²⁾					Interrupting Code N5		Interrupting Code N6	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 6 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 12 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
1200	480 ... 1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...14400	140G-N5H3-E12	140G-N5H4-E12	140G-N6H3-E12	140G-N6H4-E12

(1) For more information about 80% and 100% ratings, please see [page 13](#).

(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A rating plug value.

Rated Current I_n [A]	Protection Type ⁽¹⁾					Interrupting Code N0	
	L		S		I	Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 6 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 12 \times I_n$	3 Poles	4 Poles
1200	480 ... 1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...14400	140G-N0H3-E12	140G-N0H4-E12

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A rating plug value.

Table 57 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault) - 80% Rated⁽¹⁾

Rated Current I_n [A]	Protection Type ⁽²⁾							Interrupting Code N5		Interrupting Code N6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles	3 Poles	4 Poles
1200	480 ... 1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240 ... 1200	0.1, 0.2, 0.4, 0.8	140G-N5I3-E12	140G-N5I4-E12	140G-N6I3-E12	140G-N6I4-E12

(1) For more information about 80% and 100% ratings, please see [page 13](#).

(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A rating plug value.

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code N0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
1200	480 ... 1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800 ... 18000	OFF, 240 ... 1200	0.1, 0.2, 0.4, 0.8	140G-N0I3-E12	140G-N0I4-E12

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A rating plug value.

Table 58 - Electronic LSI-G-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode) - 80% Rated^{(1) (2)}

Rated Current I_n [A]	Protection Type ⁽³⁾							Interrupting Code N5		Interrupting Code N6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles	3 Poles	4 Poles
1200	480...1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-N5K3-E12	140G-N5K4-E12	140G-N6K3-E12	140G-N6K4-E12

(1) See [page 48](#) for maintenance mode adjustment.(2) For more information about 80% and 100% ratings, please see [page 13](#).(3) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A rating plug value.

Rated Current I_n [A] ⁽¹⁾	Protection Type ⁽²⁾							Interrupting Code N0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
1200	480...1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-N0K3-E12	140G-N0K4-E12

(1) See [page 48](#) for maintenance mode adjustment.(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.**Table 59 - Electronic LSI (Long, Short, Instantaneous) - 100% Rated⁽¹⁾**

Rated Current I_n [A]	Protection Type ⁽²⁾					Interrupting Code N5		Interrupting Code N6	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 6 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 12 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
1200	480...1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...14400	140G-N5H3-E12-Z1	140G-N5H4-E12-Z1	140G-N6H3-E12-Z1	140G-N6H4-E12-Z1

(1) For more information about 80% and 100% ratings, please see [page 13](#).(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

Rated Current I_n [A]	Protection Type ⁽¹⁾					Interrupting Code N0	
	L		S		I	Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 6 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 12 \times I_n$	3 Poles	4 Poles
1200	480...1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...14400	140G-N0H3-E12-Z1	140G-N0H4-E12-Z1

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.**Table 60 - Electronic LSI-G (Long, Short, Instantaneous, Ground Fault) - 100% Rated⁽¹⁾**

Rated Current I_n [A]	Protection Type ⁽²⁾							Interrupting Code N5		Interrupting Code N6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=1 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles	3 Poles	4 Poles
1200	480...1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-N5I3-E12-Z1	140G-N5I4-E12-Z1	140G-N6I3-E12-Z1	140G-N6I4-E12-Z1

(1) For more information about 80% and 100% ratings, please see [page 13](#).(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code N0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=1 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
1200	480...1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720... 12000	0.1, 0.25, 0.5, 0.8	OFF, 1800... 18000	OFF, 240... 1200	0.1, 0.2, 0.4, 0.8	140G-N0I3-E12-Z1	140G-N0I4-E12-Z1

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

Table 61 - Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode) - 100% Rated⁽¹⁾

Rated Current I_n [A]	Protection Type ⁽²⁾							Interrupting Code N5		Interrupting Code N6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=1 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles	3 Poles	4 Poles
1200	480... 1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720... 12000	0.1, 0.25, 0.5, 0.8	OFF, 1800... 18000	OFF, 240... 1200	0.1, 0.2, 0.4, 0.8	140G-N5K3-E12-Z1	140G-N5K4-E12-Z1	140G-N6K3-E12-Z1	140G-N6K4-E12-Z1

(1) For more information about 80% and 100% ratings, please see [page 13](#).

(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code N0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=1 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_n$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
1200	480... 1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720... 12000	0.1, 0.25, 0.5, 0.8	OFF, 1800... 18000	OFF, 240... 1200	0.1, 0.2, 0.4, 0.8	140G-N0K3-E12-Z1	140G-N0K4-E12-Z1

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

Maintenance Mode (MM)

Maintenance Mode (MM) offers a preset set of protection parameters. MM allows systems testing when the molded case circuit breaker is energized or ON. The following table lists the preset values for Maintenance Mode.

Rated Current I_n [A]	L		S		I	G		MM
	$I_1=1 \times I_n$	$t_1=MAX \text{ sec.}$	$I_2=OFF$	$t_2=OFF \text{ sec.}$	$I_3=4 \times I_n$	$I_4=OFF$	$t_4=OFF \text{ sec.}$	$I_5=2.5 \times I_n$
1200	480... 1200	3... 144	—	—	—	—	—	3000

Trip Units, Electronic LSI (Long, Short, Instantaneous), LSIG (Long, Short, Instantaneous, Ground Fault), LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)

	Rated Current I_n [A]	Protection Type	Cat. No. ⁽¹⁾
	1200	H (LSI)	140G-NTH-E12
	1200	I (LSIG)	140G-NTI-E12
	1200	K (LSIG-MM)	140G-NTK-E12

(1) Supplied installed with each MCCB. The Cat. Nos. listed are replacement parts.

Table 62 - Rating Plugs⁽¹⁾

Rated Current I_n [A]	Cat. No.	Rated Current I_n [A]	Cat. No.	Rated Current I_n [A]	Cat. No.
400	140G-NRP-D40	800	140G-NRP-D80	1200	140G-NRP-E12
600	140G-NRP-D60	1000	140G-NRP-E10	1250 (IEC only)	140G-NRP-E125

(1) 1200 A rating plug is supplied installed from the factory for all N frame MCCBs. For all other rating currents, the rating plug must be ordered separately for field installation.

Assembled Molded Case Circuit Breakers — 1200 A, NS-Frame



Table 63 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/CSA C22.2, No. 5[kA]			Breaking Capacity (50/60 Hz), IEC 60947-2										Interrupting Code ⁽¹⁾
240V	480V	600V	220V		415V		440V		500V		690V		
			<i>I</i> _{CU} [kA]	<i>I</i> _{CS} [kA]	<i>I</i> _{CU} [kA]	<i>I</i> _{CS} [kA]	<i>I</i> _{CU} [kA]	<i>I</i> _{CS} [kA]	<i>I</i> _{CU} [kA]	<i>I</i> _{CS} [kA]	<i>I</i> _{CU} [kA]	<i>I</i> _{CS} [kA]	
65	50	25	85	85	50	50	50	50	40	40	30	30	NS5
100	65	50	100	100	70	70	65	65	50	50	42	32	NS6
150	100	65	200	200	120	120	100	100	85	64	50	38	NS0

(1) See table below for Cat. No. selection

Table 64 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type ⁽¹⁾					Interrupting Code NS5		Interrupting Code NS6	
	L		S		I	Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 6 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=sec.$	$I_3=1.5 \dots 12 \times I_n$	3 Poles	4 Poles	3 Poles	4 Poles
1200 ⁽²⁾	480...1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...14400	140G-NS5H3-E12	140G-NS5H4-E12	140G-NS6H3-E12	140G-NS6H4-E12

(1) Listed I_1, I_2, I_3 values are based on a 1200 A Rating plug value.

(2) Rated current = 1200 A for UL Ratings.

Rated Current I_n [A]	Protection Type ⁽¹⁾					Interrupting Code NS0	
	L		S		I	Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 6 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_1$	$I_3=1.5 \dots 12 \times I_n$	3 Poles	4 Poles
1200 ⁽²⁾	480...1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...14400	140G-NS0H3-E12	140G-NS0H4-E12

(1) Listed I_1, I_2, I_3 values are based on a 1200 A Rating plug value.

(2) Rated current = 1200 A for UL Ratings; 1250 A for IEC.

Table 65 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code NS5		Interrupting Code NS6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_1$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles	3 Poles	4 Poles
1200 ⁽²⁾	480...1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-NS5I3-E12	140G-NS5I4-E12	140G-NS6I3-E12	140G-NS6I4-E12

(1) Listed I_1, I_2, I_3 , and I_4 values are based on a 1200 A Rating plug value.

(2) Rated current = 1200 A for UL Ratings.

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code NS0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_1$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
1200 ⁽²⁾	480...1200	3, 6, 12, 18	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-NS0I3-E12	140G-NS0I4-E12

(1) Listed I_1, I_2, I_3 , and I_4 values are based on a 1200 A Rating plug value.

(2) Rated current = 1200 A for UL Ratings; 1250 A for IEC.

Table 66 - Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code NS5		Interrupting Code NS6	
	L		S		I	G		Cat. No.		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_1$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles	3 Poles	4 Poles
1200 ⁽²⁾	480...1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-NS5K3-E12	140G-NS5K4-E12	140G-NS6K3-E12	140G-NS6K4-E12

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

(2) Rated current = 1200 A for UL Ratings.

Rated Current I_n [A]	Protection Type ⁽¹⁾							Interrupting Code NS0	
	L		S		I	G		Cat. No.	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=[t_{sec.}] @ 3 \times I_1$	$I_2=0.6 \dots 10 \times I_n$	$t_2=[t_{sec.}] @ 10 \times I_1$	$I_3=1.5 \dots 15 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
1200 ⁽²⁾	480...1200	3, 12, 24, 36, 48, 72, 108, 144	OFF, 720...12000	0.1, 0.25, 0.5, 0.8	OFF, 1800...18000	OFF, 240...1200	0.1, 0.2, 0.4, 0.8	140G-NS0K3-E12	140G-NS0K4-E12

(1) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

(2) Rated current = 1200 A for UL Ratings; 1250 A for IEC.

Maintenance Mode (MM)

Maintenance Mode (MM) offers a preset set of protection parameters. MM allows systems testing when the molded case circuit breaker is energized or ON. The following table lists the preset values for Maintenance Mode.

Rated Current I_n [A]	L		S		I	G		MM
	$I_1=1 \times I_n$	$t_1=MAX \text{ sec.}$	$I_2=OFF$	$t_2=OFF \text{ sec.}$	$I_3=4 \times I_n$	$I_4=OFF$	$t_4=OFF \text{ sec.}$	$I_5=2.5 \times I_n$
1200	480...1200	3...144	—	—	—	—	—	3000

Table 67 - Trip Units, Electronic LSI (Long, Short, Instantaneous), LSIG (Long, Short, Instantaneous, Ground Fault), LSIG-MM (Long, Short, Instantaneous, Ground Fault -Maintenance Mode)⁽¹⁾

	Rated Current I_n [A]	Protection Type	Cat. No.
	1200	H (LSI)	140G-NTH-E12
	1200	I (LSIG)	140G-NTI-E12
	1200	K (LSIG-MM)	140G-NTK-E12

(1) Supplied installed with each MCCB. The Cat. Nos. listed are replacement parts.

Table 68 - Rating Plugs⁽¹⁾

Rated Current I_n [A]	Cat. No.	Rated Current I_n [A]	Cat. No.
400	140G-NRP-D40	1000	140G-NRP-E10
600	140G-NRP-D60	1200	140G-NRP-E12
800	140G-NRP-D80	1250 ⁽²⁾	140G-NRP-E125

(1) 1200 A rating plug is supplied installed from the factory for all NS-Frame MCCBs. For all other rating currents, the rating plug must be ordered separately for field installation.

(2) IEC only.

2500...3000 A, R-Frame Molded Case Circuit Breakers

Catalog Number Explanation

Complete Circuit Breaker Assemblies — 2000...3000 A, R-Frame

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for spring charging motor with shunt trip and close [for remote control], or separate installation of shunt trip and undervoltage release units. Use the codes from Tables [h](#) and [i](#) to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>.



140G – R 12 I 3 – E25 – Z1 – MD – RD – SB

a b c d e f g h i

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
R	2500...3000 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
12	125 kA

d	
Protection Type	
Code	Description
I	Electronic LSIG -Long, short, instant, and ground fault
S	Molded case switch (isolator)

e	
Poles	
Code	Description
3	3 poles
4	4 poles

f	
Current Range	
Code	Description
E20	2000 A rating plug, installed
E25	2500 A rating plug, installed
E30	3000 A rating plug, installed

g	
Rating ⁽¹⁾	
Code	Description
No Digit	80% Rated
Z1	100% Rated

(1) For more information about 80% and 100% ratings, please see [page 13](#).

h	
Remote MCCB Operation	
Spring Charge Motor	
Code	Description
MJ	Spring Charge Motor, 24...30V AC/DC
MK	Spring Charge Motor, 48...60V AC/DC
MD	Spring Charge Motor, 110...130V AC/DC
MA	Spring Charge Motor, 220...250V AC/DC
MC	Spring Charge Motor, 380...415V AC

h, cont'd.	
Remote MCCB Operation	
Shunt Trip and Shunt Close Units	
Code	Description
RJ	Shunt Trip and Shunt Close, 24V AC/DC
RK	Shunt Trip and Shunt Close, 48V AC/DC
RD	Shunt Trip and Shunt Close, 110...120V AC/DC
RA	Shunt Trip and Shunt Close, 220...240V AC/DC
RB	Shunt Trip and Shunt Close, 380...400V AC
RC	Shunt Trip and Shunt Close, 415...440V AC
No Digit	No Selection

i	
Factory-Installed Internal Options ⁽¹⁾	
Shunt Trip and Undervoltage Release Units	
Code	Description
SJ	Shunt Trip, 24V AC/DC
SK	Shunt Trip, 48V AC/DC
SD	Shunt Trip, 110...120V AC/DC
SA	Shunt Trip, 220...240V AC/DC
SB	Shunt Trip, 380...400V AC
SC	Shunt Trip, 415...440V AC
UJ	Undervoltage Release, 24V AC/DC
UD	Undervoltage Release, 110...120V AC/DC
UA	Undervoltage Release, 220...240V AC/DC
UB	Undervoltage Release, 380...400V AC
UC	Undervoltage Release, 415...440V AC
No Digit	No Selection

(1) Select one internal option for inner right mounting (shunt trip or undervoltage release). For remote control MCCB operation, select the spring charging motor and operating voltage for shunt trip and shunt close coils from table [i](#). Consult your local Rockwell automation sales office or Allen-Bradley distributor.

Assembled Molded Case Circuit Breakers — 2000...3000 A, R-Frame



Table 69 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA C22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2										Interrupting Code ⁽¹⁾
240V	480V	600V	220V		415V		440V		500V		690V		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [kA]	
125	125	100	130	97.5	80	60	80	60	40	40	40	40	R12

(1) See tables on the following pages for Cat. No. selection.

Table 70 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault) - 80% Rated⁽¹⁾

Rated Current I_n [A]	Protection Type ⁽²⁾							Interrupting Code R12	
	L		S		I	G		Cat. No.	
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3=1.5...12 \times I_n$	$I_4=0.2...1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
2000	800...2000	3, 6, 12, 18	OFF, 1200...20000	0.1, 0.25, 0.5, 0.8	OFF, 3000...24000	OFF, 400...2000	0.1, 0.2, 0.4, 0.8	140G-R12I3-E20	140G-R12I4-E20
2500 ⁽²⁾	1000...2500	3, 6, 12, 18	OFF, 1500...25000	0.1, 0.25, 0.5, 0.8	OFF, 3750...30000	OFF, 500...2500	0.1, 0.2, 0.4, 0.8	140G-R12I3-E25	140G-R12I4-E25
3000	1200...3000	3, 6, 12, 18	OFF, 1800...30000	0.1, 0.25, 0.5, 0.8	OFF, 4500...30000	OFF, 600...3000	0.1, 0.2, 0.4, 0.8	140G-R12I3-E30	140G-R12I4-E30

(1) For more information about 80% and 100% ratings, please see [page 13](#).

(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 1200 A Rating plug value.

Table 71 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault) - 100% Rated⁽¹⁾

Rated Current I_n [A]	Protection Type							Interrupting Code R12	
	L		S		I	G		Cat. No.	
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3=1.5...12 \times I_n$	$I_4=0.2...1 \times I_n$	$t_4=sec.$	3 Poles	4 Poles
2000 ⁽²⁾	800...2000	3, 6, 12, 18	OFF...20000	0.1, 0.25, 0.5, 0.8	OFF, 3000...24000	OFF, 400...2000	0.1, 0.2, 0.4, 0.8	140G-R12I3-E20-Z1	140G-R12I4-E20-Z1
2500 ⁽²⁾	1000...2500	3, 6, 12, 18	OFF, 1500...25000	0.1, 0.25, 0.5, 0.8	OFF, 3750...30000	OFF, 500...2500	0.1, 0.2, 0.4, 0.8	140G-R12I3-E25-Z1	140G-R12I4-E25-Z1
3000 ⁽²⁾	1200...3000	3, 6, 12, 18	OFF, 1800...30000	0.1, 0.25, 0.5, 0.8	OFF, 4500...30000	OFF, 600...3000	0.1, 0.2, 0.4, 0.8	140G-R12I3-E30-Z1	140G-R12I4-E30-Z1

(1) For more information about 80% and 100% ratings, please see [page 13](#).

(2) Listed I_1 , I_2 , I_3 , and I_4 values are based on a 2000, 2500, and 3000 A rating plug value, respectively.

Table 72 - Rating Plugs⁽¹⁾

Rated Current I_n [A]	Cat. No.	Rated Current I_n [A]	Cat. No.
1000	140G-NRP-E10	2000	140G-RRP-E20
1200	140G-NRP-E12	2500	140G-RRP-E25
1600	140G-RRP-E16	3000	140G-RRP-E30

(1) A 2000 A, 2500 A, or 3000 A rating plug is supplied installed from the factory for all R-Frame MCCBs. For all other rating currents, the rating plug must be ordered separately for field installation.

Notes:

Current-limiting Molded Case Circuit Breakers

Product Selection

Catalog Number Explanation

Complete Circuit Breaker Assemblies— 125 A H-Frame, 250 A J-Frame, and 400 A K-Frame Devices

Examples given in this section are not intended to be used for product selection. Use ProposalWorks to configure the molded case circuit breaker. These configurations are for selection of all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, trip units, and alarm contacts. Use the codes from Table [g](#) to add on to the molded case circuit breaker cat. no. selected on the following pages to form a complete cat. no. with factory-installed options. ProposalWorks is available from <http://www.rockwellautomation.com/global/e-tools/overview.page>. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140G – **HC** **6** **C** **3** – **C60** – **SD** – **AA**
 a b c d e f g g

a	
Bulletin Number	
Code	Description
140G	Global Molded Case Circuit Breaker

b	
Frame/Rating	
Code	Description
HC	125 A
JC	250 A
KC	400 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
6	65 kA
0	100 kA
T	Trip unit

d	
Protection Type	
Code	Description
C	Fixed thermal/fixed magnetic
F	Adjust thermal/ adjust magnetic
H	Electronic LSI- long, short, instant
I	Electronic LSIG -Long, short instant, and ground fault
K	Electronic LSIG -MM Long, short instant, ground fault, and maintenance mode (K-Frame only)
X	Breaker frame

e		f	
No. of Poles		Current Range	
Code	Description	H- and J-Frame MCCBs	
3	3 poles	Code	Description
		C	e.g., C30 = 30 A
		D	e.g., D16 = 160 A
		Blank	Frame only
		K-Frame MCCBs	
Code	Description	Code	Description
		D30	e.g., 300 A
		D40	e.g., 400 A
		Blank	Frame only

g			
H- and J-Frame Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts, Trip Units	
Code	Description	Code	Description
SJ	Shunt Trip, 24...30V AC/DC	KA	1 Aux. Contact, 250V
SK	Shunt Trip, 48...60V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110...127V AC; 110...125V DC	BA	2 Aux., 1 Alarm Contact, 250V
SA	Shunt Trip, 220...240V AC; 220...250V DC	DA	1 Trip Unit Alarm Contact, 250V
SB	Shunt Trip, 380...440V AC	FB	2 Aux. Contacts, 400V
SC	Shunt Trip, 480...525V AC	AB	1 Aux., 1 Alarm Contact, 400V
UJ	Undervoltage Release, 24...30V AC/DC	KJ	1 Aux. Contact, 24V
UR	Undervoltage Release, 48V AC/DC	AJ	1 Aux., 1 Alarm Contact, 24V
UD	Undervoltage Release, 110...127V AC; 110...125V DC	DJ	1 Trip Unit Alarm Contact, 24V
UA	Undervoltage Release, 220...240V AC; 220...250V DC		
UB	Undervoltage Release, 380...440V AC		
UC	Undervoltage Release, 480...525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

g			
K-Frame Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
Code	Description	Code	Description
SJ	Shunt Trip, 24...30V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SK	Shunt Trip, 48...60V AC/DC	CA	3 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110...127V AC; 110...125V DC	AB	1 Aux., 1 Alarm Contact, 400V
SA	Shunt Trip, 220...240V AC; 220...250V DC	FB	2 Aux. Contacts, 400V
SB	Shunt Trip, 380...440V AC	CJ	3 Aux., 1 Alarm Contact, 24V
SC	Shunt Trip, 480...525V AC		
UJ	Undervoltage Release, 24...30V AC/DC		
UR	Undervoltage Release, 48V AC/DC		
UD	Undervoltage Release, 110...127V AC; 110...125V DC		
UA	Undervoltage Release, 220...240V AC; 220...250V DC		
UB	Undervoltage Release, 380...440V AC		
UC	Undervoltage Release, 480...525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

H-Frame Current-limiting MCCBs

Breaker Frames and Trip Units

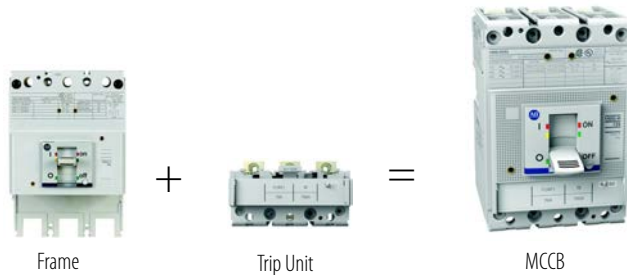


Table 73 - Current-limiting Breaker Frames, 125 A Rated Current

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA] ⁽¹⁾			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾				Cat. No.
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2- pole in series)		500V DC (3 Poles in series)		
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	140G-HC6X3
200	100	35	150	100	120	100	100	100	18	75	85	100	85	100	140G-HC0X3

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 74 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.
50	50	500	C (Fixed)	140G-HTC3-C50
60	60	600	C (Fixed)	140G-HTC3-C60
63	63	630	C (Fixed)	140G-HTC3-C63
70	70	700	C (Fixed)	140G-HTC3-C70
80	56...80	400...800	F (Adjustable)	140G-HTF3-C80
90	63...90	450...900	F (Adjustable)	140G-HTF3-C90
100	70...100	500...1000	F (Adjustable)	140G-HTF3-D10
110	77...110	550...1100	F (Adjustable)	140G-HTF3-D11
125	87...125	625...1250	F (Adjustable)	140G-HTF3-D12

Table 75 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.
	L		S		I	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-HTH3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-HTH3-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	140G-HTH3-D12

Table 76 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.
	L		S		I	G		
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$	
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-HTI3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-HTI3-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	25...125	0.1, 0.2, 0.4, 0.8	140G-HTI3-D12

Assembled Current-limiting Molded Case Circuit Breakers — 125 A, H-Frame

Table 77 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2				Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2 Poles in series)		500V DC (3 Poles in series)		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	HC6
200	100	35	150	100	120	100	100	100	18	75	85	100	85	100	HCO

(1) See [Table 78](#) for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 78 - Thermal-Magnetic, Fixed and Adjustable

Rated Current I_n [A]	Thermal Trip [A]	Magnetic Trip [A]	Interrupting Code HC6		Interrupting Code HCO	
	I_r	I_m	Cat. No.		Cat. No.	
15	15	400	140G-HC6C3-C15		140G-HCO3-C15	
16	16	400	140G-HC6C3-C16		140G-HCO3-C16	
20	20	400	140G-HC6C3-C20		140G-HCO3-C20	
25	25	400	140G-HC6C3-C25		140G-HCO3-C25	
30	30	400	140G-HC6C3-C30		140G-HCO3-C30	
32	32	400	140G-HC6C3-C32		140G-HCO3-C32	
35	35	400	140G-HC6C3-C35		140G-HCO3-C35	
40	40	400	140G-HC6C3-C40		140G-HCO3-C40	
50	50	500	140G-HC6C3-C50		140G-HCO3-C50	
60	60	600	140G-HC6C3-C60		140G-HCO3-C60	
63	63	630	140G-HC6C3-C63		140G-HCO3-C63	
70	70	700	140G-HC6C3-C70		140G-HCO3-C70	
80	56...80	400...800	140G-HC6F3-C80		140G-HCOF3-C80	
90	63...90	450...900	140G-HC6F3-C90		140G-HCOF3-C90	
100	70...100	500...1000	140G-HC6F3-D10		140G-HCOF3-D10	
110	77...110	550...1100	140G-HC6F3-D11		140G-HCOF3-D11	
125	87...125	625...1250	140G-HC6F3-D12		140G-HCOF3-D12	

Table 79 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
150	65	25	100	100	70	100	65	100	15	100	HC6
200	100	35	150	100	120	100	100	100	18	75	HCO

(1) See [Table 80](#) and [Table 81](#) for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 80 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code HC6	Interrupting Code HCO
	L		S		I	Cat. No.	Cat. No.
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$		
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	140G-HC6H3-C25	140G-HCOH3-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-HC6H3-C60	140G-HCOH3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-HC6H3-D10	140G-HCOH3-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	140G-HC6H3-D12	140G-HCOH3-D12

Table 81 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code HC6	Interrupting Code HCO
	L		S		I	G		Cat. No.	Cat. No.
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$		
25	10...25	3, 12, 36, 60	25...250	0.05, 0.1, 0.2, 0.4	25...250	5...25	0.1, 0.2, 0.4, 0.8	140G-HC6I3-C25	140G-HCOI3-C25
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-HC6I3-C60	140G-HCOI3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-HC6I3-D10	140G-HCOI3-D10
125	50...125	3, 12, 36, 60	125...1250	0.05, 0.1, 0.2, 0.4	125...1250	25...125	0.1, 0.2, 0.4, 0.8	140G-HC6I3-D12	140G-HCOI3-D12

J-Frame Current-limiting MCCBs

Breaker Frames and Trip Units



Table 82 - Current-limiting Breaker Frames, 250 A Rated Current

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾				Cat. No.
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		250V DC (2 Poles in series)		500V DC (3 Poles in series)		
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	140G-JC6X3
200	100	35	150	100	120	100	100	100	20	100	85	100	85	100	140G-JC0X3

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 83 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.
25	25	400	C (Fixed)	140G-JTC3-C25
30	30	400	C (Fixed)	140G-JTC3-C30
32	32	400	C (Fixed)	140G-JTC3-C32
35	35	400	C (Fixed)	140G-JTC3-C35
40	40	400	C (Fixed)	140G-JTC3-C40
50	50	500	C (Fixed)	140G-JTC3-C50
60	60	600	C (Fixed)	140G-JTC3-C60
63	63	630	C (Fixed)	140G-JTC3-C63
70	70	700	C (Fixed)	140G-JTC3-C70
80	56...80	400...800	F (Adjustable)	140G-JTF3-C80
90	63...90	450...900	F (Adjustable)	140G-JTF3-C90
100	70...100	500...1000	F (Adjustable)	140G-JTF3-D10
110	77...110	550...1100	F (Adjustable)	140G-JTF3-D11
125	87.5...125	625...1250	F (Adjustable)	140G-JTF3-D12
150	105...150	750...1500	F (Adjustable)	140G-JTF3-D15
160	112...160	800...1600	F (Adjustable)	140G-JTF3-D16
175	122.5...175	875...1750	F (Adjustable)	140G-JTF3-D17
200	140...200	1000...2000	F (Adjustable)	140G-JTF3-D20
225	157.5...225	1125...2250	F (Adjustable)	140G-JTF3-D22
250	175...250	1250...2500	F (Adjustable)	140G-JTF3-D25

Table 84 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.
	L		S		I	
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	140G-JTH3-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-JTH3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-JTH3-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	140G-JTH3-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	140G-JTH3-D25

Table 85 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.
	L		S		I	G		
	$I_1=0.4\dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1\dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1\dots 10 \times I_n$	$I_4=0.2\dots 1 \times I_n$	$t_4=\text{sec.}$	
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	8...40	0.1, 0.2, 0.4, 0.8	140G-JTI3-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-JTI3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-JTI3-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	30...150	0.1, 0.2, 0.4, 0.8	140G-JTI3-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	50...250	0.1, 0.2, 0.4, 0.8	140G-JTI3-D25

Assembled Current-limiting Molded Case Circuit Breakers — 250 A J-Frame

Table 86 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾				Interrupting Code ⁽²⁾
240V	480V	600V	220V ⁽³⁾		415V		440V ⁽³⁾		690V		250V DC (2- pole in series)		500V DC (3 Poles in series)		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
150	65	25	100	100	70	100	65	100	15	100	70	100	70	100	JC6
200	100	35	150	100	120	100	100	100	20	100	85	100	85	100	JC0

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) See [Table 87](#) for Cat. No. selection.

(3) These ratings have not been tested for the CCC listing.

Table 87 - Thermal-Magnetic, Fixed and Adjustable

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Interrupting Code JC6	Interrupting Code JCO
			Cat. No.	Cat. No.
25	25	400	140G-JC6C3-C25	140G-JCO3-C25
30	30	400	140G-JC6C3-C30	140G-JCO3-C30
32	32	400	140G-JC6C3-C32	140G-JCO3-C32
35	35	400	140G-JC6C3-C35	140G-JCO3-C35
40	40	400	140G-JC6C3-C40	140G-JCO3-C40
50	50	500	140G-JC6C3-C50	140G-JCO3-C50
60	60	600	140G-JC6C3-C60	140G-JCO3-C60
63	63	630	140G-JC6C3-C63	140G-JCO3-C63
70	70	700	140G-JC6C3-C70	140G-JCO3-C70
80	56...80	400...800	140G-JC6F3-C80	140G-JCO3-C80
90	63...90	450...900	140G-JC6F3-C90	140G-JCO3-C90
100	70...100	500...1000	140G-JC6F3-D10	140G-JCO3-D10
110	77...110	550...1100	140G-JC6F3-D11	140G-JCO3-D11
125	87.5...125	625...1250	140G-JC6F3-D12	140G-JCO3-D12
150	105...150	750...1500	140G-JC6F3-D15	140G-JCO3-D15
160	112...160	800...1600	140G-JC6F3-D16	140G-JCO3-D16
175	122.5...175	875...1750	140G-JC6F3-D17	140G-JCO3-D17
200	140...200	1000...2000	140G-JC6F3-D20	140G-JCO3-D20
225	157.5...225	1125...2250	140G-JC6F3-D22	140G-JCO3-D22
250	175...250	1250...2500	140G-JC6F3-D25	140G-JCO3-D25

Table 88 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/ CSA C22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽²⁾		690V		
			I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	I _{cu} [kA]	I _{cs} [%I _{cu}]	
150	65	25	100	100	70	100	65	100	15	100	JC6
200	100	35	150	100	120	100	100	100	20	100	JC0

(1) See Table 89 and Table 90 for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 89 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code JC6	Interrupting Code JCO
	L		S		I	Cat. No.	Cat. No.
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=1...10 \times I_n$	$t_2=sec.$	$I_3=1...10 \times I_n$		
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	140G-JC6H3-C40	140G-JCOH3-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	140G-JC6H3-C60	140G-JCOH3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	140G-JC6H3-D10	140G-JCOH3-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	140G-JC6H3-D15	140G-JCOH3-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	140G-JC6H3-D25	140G-JCOH3-D25

Table 90 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code JC6	Interrupting Code JC0
	L		S		I	G		Cat. No.	Cat. No.
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$		
40	16...40	3, 12, 36, 60	40...400	0.05, 0.1, 0.2, 0.4	40...400	8...40	0.1, 0.2, 0.4, 0.8	140G-JC6I3-C40	140G-JC0I3-C40
60	24...60	3, 12, 36, 60	60...600	0.05, 0.1, 0.2, 0.4	60...600	12...60	0.1, 0.2, 0.4, 0.8	140G-JC6I3-C60	140G-JC0I3-C60
100	40...100	3, 12, 36, 60	100...1000	0.05, 0.1, 0.2, 0.4	100...1000	20...100	0.1, 0.2, 0.4, 0.8	140G-JC6I3-D10	140G-JC0I3-D10
150	60...150	3, 12, 36, 60	150...1500	0.05, 0.1, 0.2, 0.4	150...1500	30...150	0.1, 0.2, 0.4, 0.8	140G-JC6I3-D15	140G-JC0I3-D15
250	100...250	3, 12, 36, 60	250...2500	0.05, 0.1, 0.2, 0.4	250...2500	50...250	0.1, 0.2, 0.4, 0.8	140G-JC6I3-D25	140G-JC0I3-D25

K-Frame Current-limiting MCCBs

Breaker Frames and Trip Units



Table 91 - Current-limiting Breaker Frames, 400 A Rated Current

Interrupting Rating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]					Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾		Cat. No.
240V	480V	600V	2 Poles in series	3 Poles in series	220V ⁽²⁾		415V		440V ⁽²⁾		690V		500V DC (3 Poles in series)		
			500V DC ⁽¹⁾	600V DC ⁽¹⁾	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
150	65	35	50	35	100	100	70	100	65	100	40	100	50	100	140G-KC6X3
200	100	65	65	50	200	100	120	100	100	100	70	100	70	100	140G-KC0X3

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) These ratings have not been tested for the CCC listing.

Table 92 - Trip Units, Thermal-Magnetic

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Cat. No.
300	210...300	1500...3000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-KTF3-D30
400	280...400	2000...4000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-KTF3-D40

Table 93 - Trip Units, Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Cat. No.
	L		S		I	
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=1...10 \times I_n$	$t_2=sec.$	$I_3=1...10 \times I_n$	
300	120...300	3, 6, 12, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	140G-KTH3-D30
400	160...400	3, 6, 12, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	140G-KTH3-D40

Table 94 - Trip Units, Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Cat. No.
	L		S		I	G		
	$I_1=0.4 \dots 1 \times I_n$	$t_1=sec.$	$I_2=1 \dots 10 \times I_n$	$t_2=sec.$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=sec.$	
300	120...300	3, 6, 12, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300	0.1, 0.2, 0.4, 0.8	140G-KT13-D30
400	160...400	3, 6, 12, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400	0.1, 0.2, 0.4, 0.8	140G-KT13-D40

Table 95 - Trip Units, Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)⁽¹⁾

Rated Current I_n [A]	Protection Type							Cat. No.
	L		S		I	G		3 Poles
	$I_1=0.4...1 \times I_n$	$t_1=sec.$	$I_2=0.6...10 \times I_n$	$t_2=sec.$	$I_3=1.5...12 \times I_n$	$I_4=0.2...1 \times I_n$	$t_4=sec.$	
300	120...300	3, 6, 12, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300	0.1, 0.2, 0.4, 0.8	140G-KTK3-D30
400	160...400	3, 6, 12, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400	0.1, 0.2, 0.4, 0.8	140G-KTK3-D40

(1) See [page 66](#) for a list of the preset values for Maintenance Mode.

Assembled Current-limiting Molded Case Circuit Breakers — 400 A K-Frame



Table 96 - Interrupting Rating/Breaking Capacity — Thermal-Magnetic Circuit Breakers

Interrupting Rating (50/60 Hz), UL 489/CSA 22.2, No. 5 [kA]					Breaking Capacity (50/60 Hz), IEC 60947-2								Breaking Capacity (DC), IEC 60947-2 ⁽¹⁾		Interrupting Code ⁽²⁾
240V	480V	600V	2 Poles in series	3 Poles in series	220V ⁽³⁾		415V		440V ⁽³⁾		690V		500V DC (3 Poles in series)		
			500V DC	600V DC	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	
150	65	35	50	35	100	100	70	100	65	100	40	100	50	100	KC6
200	100	65	65	50	200	100	120	100	100	100	70	100	70	100	KC0

(1) DC rating is applicable for thermal-magnetic trip unit only.

(2) See [Table 97](#) for Cat. No. selection.

(3) These ratings have not been tested for the CCC listing.

Table 97 - Thermal-Magnetic, Adjustable and Adjustable

Rated Current I_n [A]	Thermal Trip [A] I_r	Magnetic Trip [A] I_m	Protection Type	Interrupting Code KC6	Interrupting Code KC0
				Cat. No.	Cat. No.
300	210...300	1500...3000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-KC6F3-D30	140G-KC0F3-D30
400	280...400	2000...4000	F (Adjustable Thermal/ Adjustable Magnetic)	140G-KC6F3-D40	140G-KC0F3-D40

Table 98 - Interrupting Rating/Breaking Capacity — Electronic Circuit Breakers

InterruptingRating (50/60 Hz), UL 489/ CSA 22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2								Interrupting Code ⁽¹⁾
240V	480V	600V	220V ⁽²⁾		415V		440V ⁽³⁾		690V		
			<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	<i>I</i> _{cu} [kA]	<i>I</i> _{cs} [% <i>I</i> _{cu}]	
150	65	35	100	100	70	100	65	100	40	100	KC6
200	100	65	200	100	120	100	100	100	70	100	KC0

(1) See [Table 99](#) through [Table 101](#) on the following pages for Cat. No. selection.

(2) These ratings have not been tested for the CCC listing.

Table 99 - Electronic LSI (Long, Short, Instantaneous)

Rated Current I_n [A]	Protection Type					Interrupting Code KC6	Interrupting Code KC0
	L		S		I	Cat. No.	Cat. No.
	$I_1=0.4...1 \times I_n$	$t_1=\text{sec.}$	$I_2=1...10 \times I_n$	$t_2=\text{sec.}$	$I_3=1...10 \times I_n$		
300	120...300	3, 6, 12, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	140G-KC6H3-D30	140G-KC0H3-D30
400	160...400	3, 6, 12, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	140G-KC6H3-D40	140G-KC0H3-D40

Table 100 - Electronic LSIG (Long, Short, Instantaneous, Ground Fault)

Rated Current I_n [A]	Protection Type							Interrupting Code KC6	Interrupting Code KC0
	L		S		I	G		Cat. No.	Cat. No.
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$		
300	120...300	3, 6, 12, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300	0.1, 0.2, 0.4, 0.8	140G-K6I3-D30	140G-K0I3-D30
400	160...400	3, 6, 12, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400	0.1, 0.2, 0.4, 0.8	140G-K6I3-D40	140G-K0I3-D40

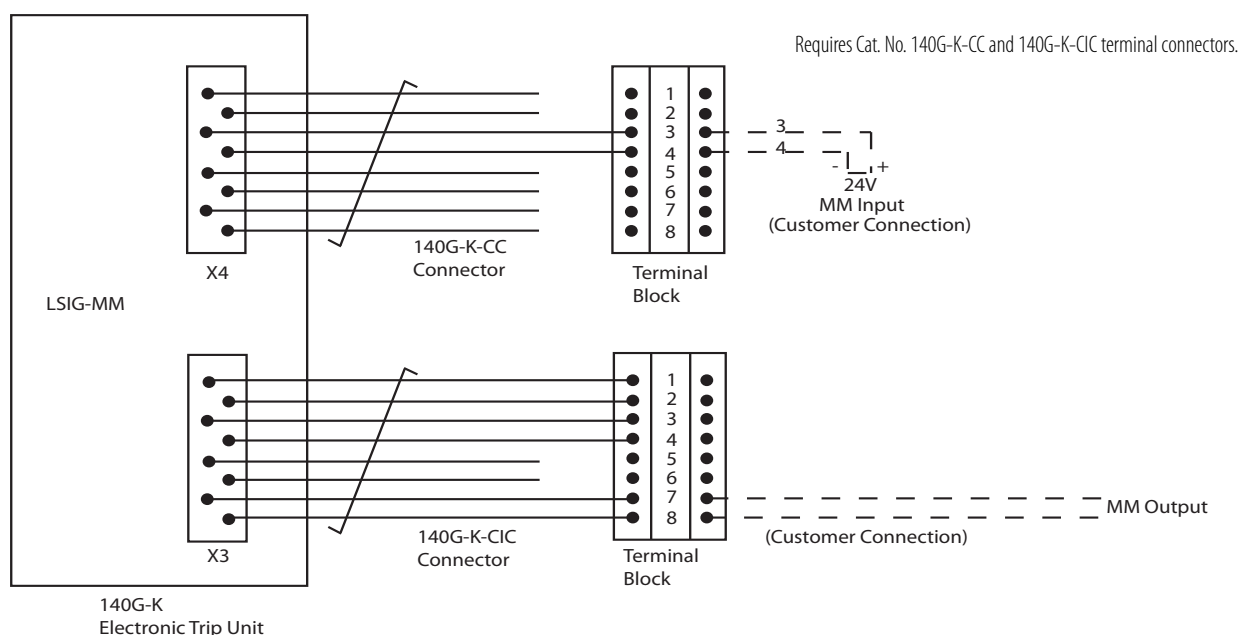
Table 101 - Electronic LSIG-MM (Long, Short, Instantaneous, Ground Fault - Maintenance Mode)

Rated Current I_n [A]	Protection Type							Interrupting Code KC6	Interrupting Code KC0
	L		S		I	G		Cat. No.	Cat. No.
	$I_1=0.4 \dots 1 \times I_n$	$t_1=\text{sec.}$	$I_2=1 \dots 10 \times I_n$	$t_2=\text{sec.}$	$I_3=1 \dots 10 \times I_n$	$I_4=0.2 \dots 1 \times I_n$	$t_4=\text{sec.}$		
300	120...300	3, 6, 12, 18	180...3000	0.05, 0.1, 0.25, 0.5	450...3600	60...300	0.1, 0.2, 0.4, 0.8	140G-K6K3-D30	140G-K0K3-D30
400	160...400	3, 6, 12, 18	240...4000	0.05, 0.1, 0.25, 0.5	600...4800	80...400	0.1, 0.2, 0.4, 0.8	140G-K6K3-D40	140G-K0K3-D40

Maintenance Mode (MM)

Maintenance Mode (MM) offers a preset set of protection parameters. MM allows systems testing when the molded case circuit breaker is energized or ON. The following table lists the preset values for Maintenance Mode.

Rated Current I_n [A]	L		S		I	G		MM
	$I_1=1 \times I_n$	$t_1=\text{MAX sec.}$	$I_2=\text{OFF}$	$t_2=\text{OFF sec.}$	$I_3=4 \times I_n$	$I_4=\text{OFF}$	$t_4=\text{OFF sec.}$	$I_5=2.5 \times I_n$
300	300	18	—	—	1200	—	—	750
400	400	18	—	—	1600	—	—	1000

Figure 9 - Maintenance Mode Basic Wiring Diagram

Motor Circuit Protectors Product Selection

Motor Circuit Protectors



- Current range 0.16...1200 A
- End cap/bolt-on terminals are standard
- UL Listed/Recognized for motor loads
 - Short-circuit protection - magnetic trip
 - Overload protection must be provided separately
- Visible trip indication
- High current limiting
- High switching capacity

The Bulletin 140MG Motor Circuit Protectors provide short-circuit protection for individual motor loads. Factory-installed internal accessories make installation and wiring easy.

General Information

Motor Circuit Protectors may provide the following protective and control functions.

- Disconnect for motor branch circuit
- Branch-Circuit, short-circuit protection (magnetic protection)
- Switching (manual)

In North America, electrical codes require that an individual Motor Branch Circuit be protected by a UL/CSA Listed fuse, circuit breaker or self-protected combination motor controller.

140MG-G, H, I, J, K, M and N Frames

The 140MG-G, H, I, J, K, M and N-Frame motor circuit protectors are UL/CSA Recognized as circuit breakers. They are UL/CSA Recognized, rather than UL/CSA Listed, since they only provide short-circuit protection and not thermal overload protection for the motor.

Standards Compliance and Certifications

Standards Compliance	Certifications
IEC 60947-2	CE Marked
UL489	CSA Certified (File No. LR1234)
CSA22.2, No. 5	UR Recognized (File No. E224135)
	CCC

Catalog Number Explanation— 125 A, G-Frame and 150 A, I-Frame

Examples given in this section are not intended to be used for product selection. Use these configurations only to select all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table f to add on to the motor circuit protector cat. no. selected on the previous pages to form a complete cat. no. for a complete assembly with factory-installed options. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140MG – I 8 P – C70 – SD – KA
a b c d e f f

a	
Bulletin Number	
Code	Description
140MG	Global Motor Circuit Protector

b	
Frame/Rating	
Code	Description
G	125 A
I	150 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
8	High break

d	
Protection Type	
Code	Description
P	Adjustable magnetic only (less than $13 \times I_n$)

e	
Current Range	
Code	Description
B	e.g., D30 = 3 A
C	e.g., C30 = 30 A
D	e.g., D12 = 120 A

f			
Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
Code	Description	Code	Description
SJ	Shunt Trip, 24...30V AC/DC	KA	1 Aux. Contact, 250V
SK	Shunt Trip, 48...60V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110...127V AC; 110...125V DC	BA	2 Aux., 1 Alarm Contact, 250V
SA	Shunt Trip, 220...240V AC; 220...250V DC	KJ	1 Aux. Contact, 24V
SB	Shunt Trip, 380...440V AC	AJ	1 Aux., 1 Alarm Contact, 24V
SC	Shunt Trip, 480...525V AC		
UJ	Undervoltage Release, 24...30V AC/DC		
UR	Undervoltage Release, 48V AC/DC		
UD	Undervoltage Release, 110...127V AC; 110...125V DC		
UA	Undervoltage Release, 220...240V AC; 220...250V DC		
UB	Undervoltage Release, 380...440V AC		
UC	Undervoltage Release, 480...525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Catalog Number Explanation — 125 A, H-Frame and 250 A, J-Frame

Complete Motor Circuit Protector Assemblies with Factory-Installed Options

Examples given in this section are not intended to be used for product selection. Use these configurations only to select all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table f to add on to the motor circuit protector cat. no. selected on the previous pages to form a complete cat. no. for a complete assembly with factory-installed options. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140MG — J 8 P — D15 — SD — AA
a b c d e f f

a	
Bulletin Number	
Code	Description
140MG	Global Motor Circuit Protector

b	
Frame/Rating	
Code	Description
H	125 A
J	250 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
8	High break

d	
Protection Type	
Code	Description
P	Adjustable magnetic only (less than $13 \times I_n$)

e	
Current Range	
Code	Description
B	e.g., B30 = 3 A
C	e.g., C30 = 30 A
D	e.g., D20 = 200 A

f			
Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
Code	Description	Code	Description
SJ	Shunt Trip, 24...30V AC/DC	KA	1 Aux. Contact, 250V
SK	Shunt Trip, 48...60V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110...127V AC; 110...125V DC	BA	2 Aux., 1 Alarm Contact, 250V
SA	Shunt Trip, 220...240V AC; 220...250V DC	DA	1 Trip Unit Alarm Contact, 250V
SB	Shunt Trip, 380...440V AC	FB	2 Aux. Contacts, 400V
SC	Shunt Trip, 480...525V AC	AB	1 Aux., 1 Alarm Contact, 400V
UJ	Undervoltage Release, 24...30V AC/DC	KJ	1 Aux. Contact, 24V
UR	Undervoltage Release, 48V AC/DC	AJ	1 Aux., 1 Alarm Contact, 24V
UD	Undervoltage Release, 110...127V AC; 110...125V DC	DJ	1 Trip Unit Alarm Contact, 24V
UA	Undervoltage Release, 220...240V AC; 220...250V DC		
UB	Undervoltage Release, 380...440V AC		
UC	Undervoltage Release, 480...525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Catalog Number Explanation — 1200 A, N-Frame

Examples given in this section are not intended to be used for product selection. Use these configurations only to select all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table f to add on to the motor circuit protector cat. no. selected on the previous pages to form a complete cat. no. for a complete assembly with factory-installed options. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140MG – N 8 P – E12 – SD – AB
a b c d e f f

a		b		c		d	
Bulletin Number		Frame/Rating		Interrupting Rating/Breaking Capacity (based on I_c at 480V)		Protection Type	
Code	Description	Code	Description	Code	Description	Code	Description
140MG	Global Motor Circuit Protector	N	1200 A	8	High break	P	Adjustable magnetic only (less than $13 \times I_n$)

e		f			
Current Range		Factory-Installed Internal Options ⁽¹⁾			
Code	Description	Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
E12	1200 A	Code	Description	Code	Description
		SJ	Shunt Trip, 24V AC/DC	AJ	1 Aux., 1 Alarm Contact, 24V
		SK	Shunt Trip, 48V AC/DC	AB	1 Aux., 1 Alarm Contact, 400V
		SD	Shunt Trip, 110...120V AC/DC	FB	2 Aux., 400V
		SA	Shunt Trip, 220...240V AC/DC		
		SB	Shunt Trip, 380V AC		
		SC	Shunt Trip, 415...440V AC		
		UJ	Undervoltage Release, 24V AC/DC		
		UD	Undervoltage Release, 110...120V AC/DC		
		UA	Undervoltage Release, 220...240V AC/DC		
		UB	Undervoltage Release, 380...400V AC		
		UC	Undervoltage Release, 415...440V AC		
		No Digit	No Selection		

(1) Select one internal option for inner right mounting (shunt trip or undervoltage release). For remote control MCCB operation, select the spring charging motor and operating voltage for shunt trip and shunt close coils from table f.

Motor Circuit Protectors

Rated Operational Current I_e [A]	Magnetic Trip Current [A]									3-phase Hp Ratings ⁽¹⁾				Max. kW, 3-Phase — AC-3 ⁽¹⁾				Cat. No. ⁽²⁾
	Cam Setting									200V	230V	460V	575V	230V	400/415V	500V	690V	
	A	B	C	D	E	F	G	H	I									
G-Frame																		
3	12	15	17	20	23	25	28	30	33	0.5	0.5	1.5	1	0.6	0.75	1.1	1.5	140MG-G8P-B30
7	28	34	40	46	53	59	65	71	77	0.75	1	2	3	1.1	2.2	3	4	140MG-G8P-B70
15	45	60	75	90	105	120	135	150	165	2	2	5	5	3	5.5	7.5	11	140MG-G8P-C15
30	90	120	150	180	210	240	270	300	330	3	5	10	10	5.5	11	15	22	140MG-G8P-C30
50	150	200	250	300	350	400	450	500	550	10	10	25	25	11	22	22	37	140MG-G8P-C50
70	210	280	350	420	490	560	630	700	770	15	15	40	40	15	30	37	55	140MG-G8P-C70
80	240	320	400	480	560	640	720	800	880	20	20	50	60	22	45	55	75	140MG-G8P-C80
100	300	400	500	600	700	800	900	1000	1100	25	25	60	75	30	55	75	100	140MG-G8P-D10
125	375	500	625	750	875	1000	1125	1250	1375	30	30	75	100	37	55	75	110	140MG-G8P-D12
H-Frame																		
3	12	15	17	20	23	25	28	30	33	0.5	0.5	1.5	1	0.6	0.75	1.1	1.5	140MG-H8P-B30
7	28	34	40	46	53	59	65	71	77	0.75	1	2	3	1.1	2.2	3	4	140MG-H8P-B70
15	45	60	75	90	105	120	135	150	165	2	2	5	5	3	5.5	7.5	11	140MG-H8P-C15
30	90	120	150	180	210	240	270	300	330	3	5	10	10	5.5	11	15	22	140MG-H8P-C30
50	150	200	250	300	350	400	450	500	550	10	10	25	25	11	22	22	37	140MG-H8P-C50
70	210	280	350	420	490	560	630	700	770	15	15	40	40	15	30	37	55	140MG-H8P-C70
80	240	320	400	480	560	640	720	800	880	20	20	50	60	22	45	55	75	140MG-H8P-C80
100	300	400	500	600	700	800	900	1000	1100	25	25	60	75	30	55	75	100	140MG-H8P-D10
125	625	703	781	859	938	1016	1094	1172	1250	30	30	75	100	37	55	75	110	140MG-H8P-D12
I-Frame																		
100	600	675	750	825	900	975	1050	1125	1200	25	25	60	75	30	55	75	100	140MG-I8P-D10
110	660	743	825	908	990	1073	1150	1238	1320	25	30	60	75	30	55	75	100	140MG-I8P-D11
125	750	844	938	1031	1125	1219	1313	1406	1500	30	30	75	100	37	55	75	110	140MG-I8P-D12
150	900	1013	1125	1238	1350	1463	1575	1688	1800	30	40	75	100	45	75	90	132	140MG-I8P-D15
J-Frame																		
150	750	844	938	1031	1125	1219	1313	1406	1500	30	40	75	100	45	75	90	132	140MG-J8P-D15
175	875	984	1094	1203	1313	1422	1531	1641	1750	40	40	100	125	55	90	110	160	140MG-J8P-D17
200	1000	1125	1250	1375	1500	1625	1750	1875	2000	50	50	125	150	55	110	132	160	140MG-J8P-D20
225	1125	1266	1406	1547	1688	1828	1969	2109	2250	50	60	125	150	90	110	160	200	140MG-J8P-D22
250	1250	1406	1563	1719	1875	2031	2188	2344	2500	60	75	150	200	132	132	160	250	140MG-J8P-D25
Rated Operational Current I_e [A]		Magnetic Trip Current [A]							3-phase Hp Ratings ⁽¹⁾				Max. kW, 3-Phase — AC-3 ⁽¹⁾				Cat. No. ⁽²⁾	
		I_3 (adjustable) [A]							200V	230V	460V	575V	230V	400/415V	500V	690V		
K-Frame																		
300		300...3000							75	75	150	200	55	110	160	200	140MG-K8P-D30	
400		400...4000							100	100	200	250	90	160	200	250	140MG-K8P-D40	
M-Frame																		
600		600...6000							125	150	300	400	110	200	250	355	140MG-M8P-D60	
800		800...8000							150	200	400	500	160	250	355	500	140MG-M8P-D80	
N-Frame																		
1200 ⁽³⁾		1200...12000							250	300	600	700	200	250	500	710	140MG-N8P-E12	

(1) The Hp and kW ratings shown are for reference only. The final selection of the MCP should be made based on motor full load current and the requirements of local electrical codes.

(2) The interrupting rating for MCPs is dependent upon the controller used. Please see the global short-circuit ratings tables at <http://www.rockwellautomation.com/global/support/global-sccr.page>, or contact your local Rockwell Automation sales office or Allen-Bradley distributor.

(3) I_3 is adjustable between 1...10x motor FLA. Values based on 1200 A rating plug.

Motor Protection Circuit Breakers Product Selection

Motor Protection Circuit Breakers



Cat. No. 140MG-H...



Cat. No. 140MG-J...

Motor Protection Circuit Breakers have the following features:

- 10...150 A current range
- UL Listed for motor loads
- Adjustment features
 - Rated motor current adjustable from $0.4...1 \times I_n$
 - Overload protection [L] Class 3E, 5E, 10E, and 20E
 - Unbalance L1, L2, L3 detection [U] adjustable either ON or OFF, alarm at 10% unbalance, trip at 50% unbalance, $T=2$ seconds
 - Short-circuit protection [I], electronic magnetic trip adjustable from $6...13 \times I_n$
- LED visible warnings and trip indication
- Manual settings using DIP switches
- End cap/bolt-on terminals are standard

Standards Compliance and Certifications

Standards Compliance	Certifications
IEC 60947-2	CE Marked
UL489	CCC
CSA22.2, No. 5	CSA Certified (File No. LR1234)
UL 60947-4-1A	UL Listed
	HACR type E197878

Catalog Number Explanation

Complete Motor Protection Circuit Breaker Assemblies with Factory-Installed Options

Examples given in this section are not intended to be used for product selection. Use these configurations only to select all factory-installed options for shunt trips, undervoltage release units, auxiliary contacts, and alarm contacts. Use the codes from Table f to add on to the motor protection circuit breaker cat. no. selected on the previous pages to form a complete cat. no. for a complete assembly with factory-installed options. Note: Terminal lugs are not supplied and can be ordered separately. See [page 85](#) for available lugs.



140MG **–** **J** **8** **E** **–** **D15** **–** **SD** **–** **AA**
 a b c d e f f

a	
Bulletin Number	
Code	Description
140MG	Motor Protection Circuit Breaker

b	
Frame/Rating	
Code	Description
H	100 A
J	150 A

c	
Interrupting Rating/Breaking Capacity (based on I_c at 480V)	
Code	Description
8	High break

d	
Protection Type	
Code	Description
E	LUI

e	
Current Range	
Code	Description
C	e.g., C25 = 25 A
D	e.g., D15 = 150 A

f			
Factory-Installed Internal Options ⁽¹⁾			
Shunt Trip and Undervoltage Release Units		Auxiliary and Alarm Contacts	
Code	Description	Code	Description
SJ	Shunt Trip, 24...30V AC/DC	KA	1 Aux. Contact, 250V
SK	Shunt Trip, 48...60V AC/DC	AA	1 Aux., 1 Alarm Contact, 250V
SD	Shunt Trip, 110...127V AC; 110...125V DC	BA	2 Aux., 1 Alarm Contact, 250V
SA	Shunt Trip, 220...240V AC; 220...250V DC	DA	1 Trip Unit Alarm Contact, 250V
SB	Shunt Trip, 380...440V AC	FB	2 Aux. Contacts, 400V
SC	Shunt Trip, 480...525V AC	AB	1 Aux., 1 Alarm Contact, 400V
UJ	Undervoltage Release, 24...30V AC/DC	KJ	1 Aux. Contact, 24V
UR	Undervoltage Release, 48V AC/DC	AJ	1 Aux., 1 Alarm Contact, 24V
UD	Undervoltage Release, 110...127V AC; 110...125V DC	DJ	1 Trip Unit Alarm Contact, 24V
UA	Undervoltage Release, 220...240V AC; 220...250V DC		
UB	Undervoltage Release, 380...440V AC		
UC	Undervoltage Release, 480...525V AC		
No Digit	No Selection		

(1) Select up to two internal options: 1 for left side mounting (shunt trip or undervoltage release), 1 for right (auxiliary or alarm contact).

Table 102 - Interrupting Rating/Breaking Capacity

Interrupting Rating (50/60 Hz), UL 489/CSA C22.2, No. 5 [kA]			Breaking Capacity (50/60 Hz), IEC 60947-2							
240V	480V	600V	220V ⁽¹⁾		415V		440V ⁽¹⁾		690V	
			I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]	I_{cu} [kA]	I_{cs} [% I_{cu}]
150	65	25	100	100	70	100	65	100	15	100

(1) These ratings have not been tested for the CCC listing.

Max. Rated Motor Current I_n [A]	L (Motor FLC)		U	I	Cat. No. ⁽¹⁾
	$I_1 = 0.4 \dots 1 \times I_n$	Trip Class	50% of I_1	I_n = Instantaneous	
H-Frame					
25	10...25	3E, 5E, 10E, 20E (approx. 2...20 s)	ON or OFF	Adjustable from 6...13 x I_n	140MG-H8E-C25
60	24...60				140MG-H8E-C60
100	40...100				140MG-H8E-D10
J-Frame					
40	16...40	3E, 5E, 10E, 20E (approx. 2...20 s)	ON or OFF	Adjustable from 6...13 x I_n	140MG-J8E-C40
60	24...60				140MG-J8E-C60
100	40...100				140MG-J8E-D10
150	60...150				140MG-J8E-D15

(1) Select the Motor Protection Circuit Breaker based on the motor FLC.

Molded Case Switches



- 125...2500 A current range
- 3- and 4-pole devices
- End cap/bolt-on terminals are standard
- These switches are like an MCCB, but they are not supplied with thermal overload protection
- Self Protecting, supplied with instantaneous magnetic trip override
- Suitable for use as Motor Branch Circuit and Motor Disconnect
- Must be protected on the supply side of the switch against short-circuits.

Standards Compliance and Certifications

Standards Compliance	Certifications
IEC 60947-1, -2	CE Marked
UL489	UL Listed
CSA22.2, No. 5	CSA Certified (File No. LR 1234)
HACR [G,H,I and J Frame]	HACR Type E118548

UL 489, CSA C22.2, No. 5				IEC 60947-3							Cat. No.	
Rated Current I_n [A]	Magnetic Override ⁽¹⁾ [A]	Rated Voltage		Rated Service Voltage U_e [V]			Rated Service Current AC23	Rated Service Current DC23	Rated insulation voltage	Rated impulse withstand	3 Poles	4 Poles
		AC (50/60 Hz) [V]	DC [V]	AC (50/60 Hz)	DC	Poles in series	I_e [A]	I_e [A]	U_i [V]	U_{imp} [kV]		
125	1500	600Y/347	500	690	500	4 ⁽²⁾	125	125	800	8	140G-G6S3-D12	140G-G6S4-D12
125	1500	600	500	690	500	3	125	125	1000	8	140G-H6S3-D12	140G-H6S4-D12
225	2700	600Y/347	500	690	500	3	200	200	800	8	140G-I3S3-D22	140G-I3S4-D22
250	3000	600	600	690	500	2	200	200	1000	8	140G-J0S3-D25	140G-J0S4-D25
400	5000	600	600	690	750	3	400	400	1000	8	140G-K1S53-D40	140G-K1S54-D40
800	10000	600	600	690	750	3	800	—	1000	8	140G-M6S3-D80	140G-M6S4-D80
1200	20000	600	—	—	—	—	—	—	—	—	140G-N6S3-E12	140G-N6S4-E12
2500	40000	600	—	—	—	—	—	—	—	—	140G-R12S3-E25	140G-R12S4-E25

(1) Does not provide overcurrent protection; may open above this current value

(2) 50V DC with 3 poles in series.

Mounting System Adapters Product Selection

Mounting System Adapters

Catalog Number Explanation

Complete MCCB/MCP/MPCB Assemblies with Factory-installed Options

Examples given in this section are not intended to be used for product selection. Use these configurations only to select the busbar adapter to be used with an MCCB or MCP. Use the codes from Table 4 to add on to the MCCB or MCP cat. no. selected previously to form a complete cat. no. for a complete assembly with busbar adapter.



140G – G 6 F 3 – C10 – KA – MT

a b c

a		b		c	
Bulletin Number		Frame/Rating, Protection Type, Poles, Current Range, Factory-installed Options		Busbar Adapter Options	
Code	Description	Configured from MCCB /MCP/MPCB selection tables		Code	Description
140G	Global Molded Case Circuit Breaker			MT	Top feed (branch) connection for G- and H-Frame, supplied with factory-installed line- and load-side lugs
140MG	Motor Circuit Protector			MB	Bottom feed (main) connection for G- and H-Frame, supplied with factory-installed line- and load-side lugs
				MU	Universal (top or bottom) connection for J- and K-Frame, supplied unassembled. If required, order terminal lugs separately (1 set only)

Mounting Adapters for Bul. 140G MCCBs and 140MG MCPs—ordered separately for field assembly

- Adapters clamp or plug directly on to the busbar
- For 5 mm or 10mm thick busbar

Description		For Use With	Thermal Current I_{th} [A]	Width [mm]	Cat. No.
Busbar adapter with flexible connection	top feed	140G/MG G- and H-Frame devices	125	90	141A-GHT
	bottom feed	140G/MG G- and H-Frame devices		90	141A-GHB
Busbar adapter with rear connecting studs	top or bottom feed	140G/MG J-Frame devices	250	105	141A-GJU
Busbar adapter with rear connecting studs	top or bottom feed	140G/MG K-Frame devices	400	140	141A-GKU

Description		Frame Size	For Use With	Pkg. Qty	Cat. No.
	Cu wire, two required per busbar adapter (1) 14...1/0 AWG or 2.5...70 mm ²	G	MCCB only	3	140G-G-TLC13
	Cu wire, two required per busbar adapter (1) 14...1/0 AWG or 1.5...70 mm ²		MCP only		140G-G-TLC13A
	Cu wire, two required per busbar adapter (1) 14...1/0 AWG or 2.5...95 mm ²	H	All		140G-H-TLC13
	Al or Cu/Cu wire, one required per busbar adapter—multiple options available	J, K	All		See page 85

Notes:

Internal Electrical Accessories

Photos in this section are representative. Appearance of actual accessory may differ from the photo shown.

Auxiliary/Alarm Contact (AX/AL)

Functionality

[Figure 10](#) through [Figure 13](#) show the position of contacts at various points in the circuit breaker operation.

[Figure 10](#) shows the position of the auxiliary contacts (AX), alarm contacts (AL), or thermal trip (TU) AL contacts when they are installed and the circuit breaker is ON or the AX contact not installed.

Figure 10 - Auxiliary, Alarm, or Trip Unit Alarm Contact Position—Circuit Breaker ON

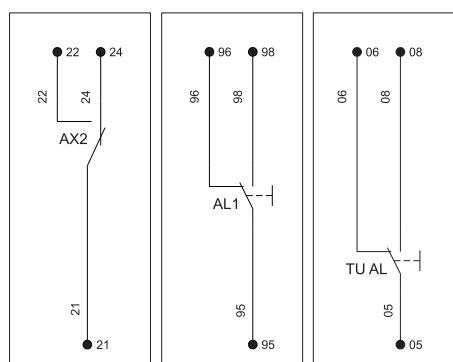
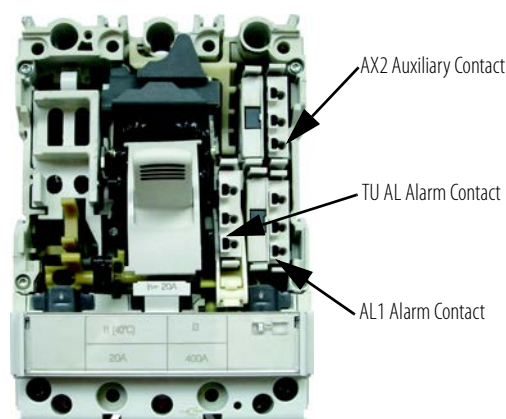


Diagram in bold indicates contact position when installed in the ON position



[Figure 11](#) shows the position of the contacts when the circuit breaker is OFF

Figure 11 - Auxiliary, Alarm, or Trip Unit Alarm Contact Position—Circuit Breaker OFF

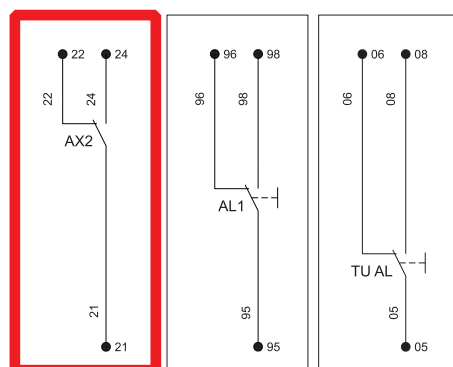
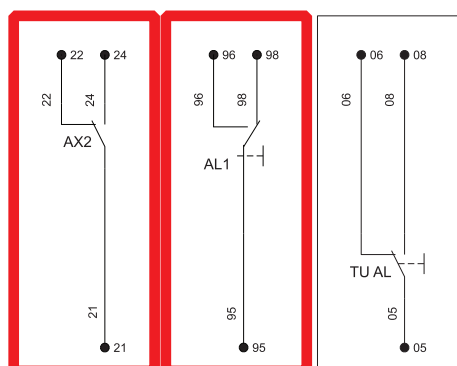


Diagram in bold indicates contact position when installed in the OFF position

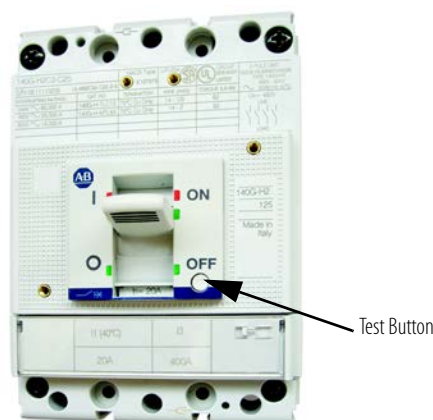


[Figure 12](#) shows the position of the contacts when the circuit breaker is TRIPPED via the TEST Button on the face of the circuit breaker or shunt trip or undervoltage release

Figure 12 - Auxiliary, Alarm, or Trip Unit Alarm Contact Position—Tripped via TEST Button

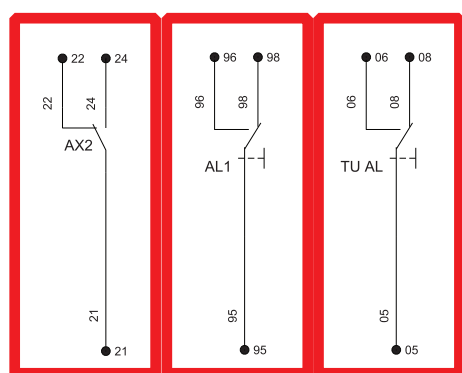


Diagrams in bold indicate contact position when the circuit breaker is tripped via the test button

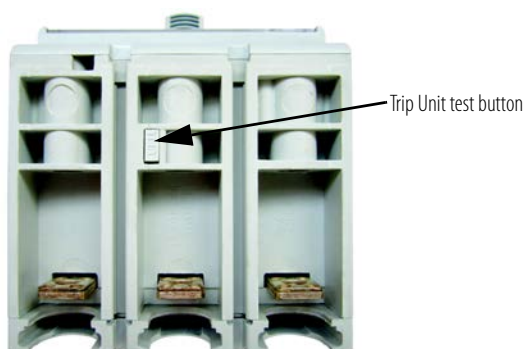


[Figure 13](#) shows the position of the contacts when the circuit breaker trip unit has TRIPPED. This can occur from fault current of thermal overload or via the Test button on the center pole of thermal-magnetic trip units.

Figure 13 - Auxiliary, Alarm, or Trip Unit Alarm Contact Position—Circuit Breaker Tripped



Diagrams outlined in bold indicate contact position when the circuit breaker has tripped



Auxiliary/Alarm Contact Features

Auxiliary and alarm contacts are supplied in multiple variations for customer application.

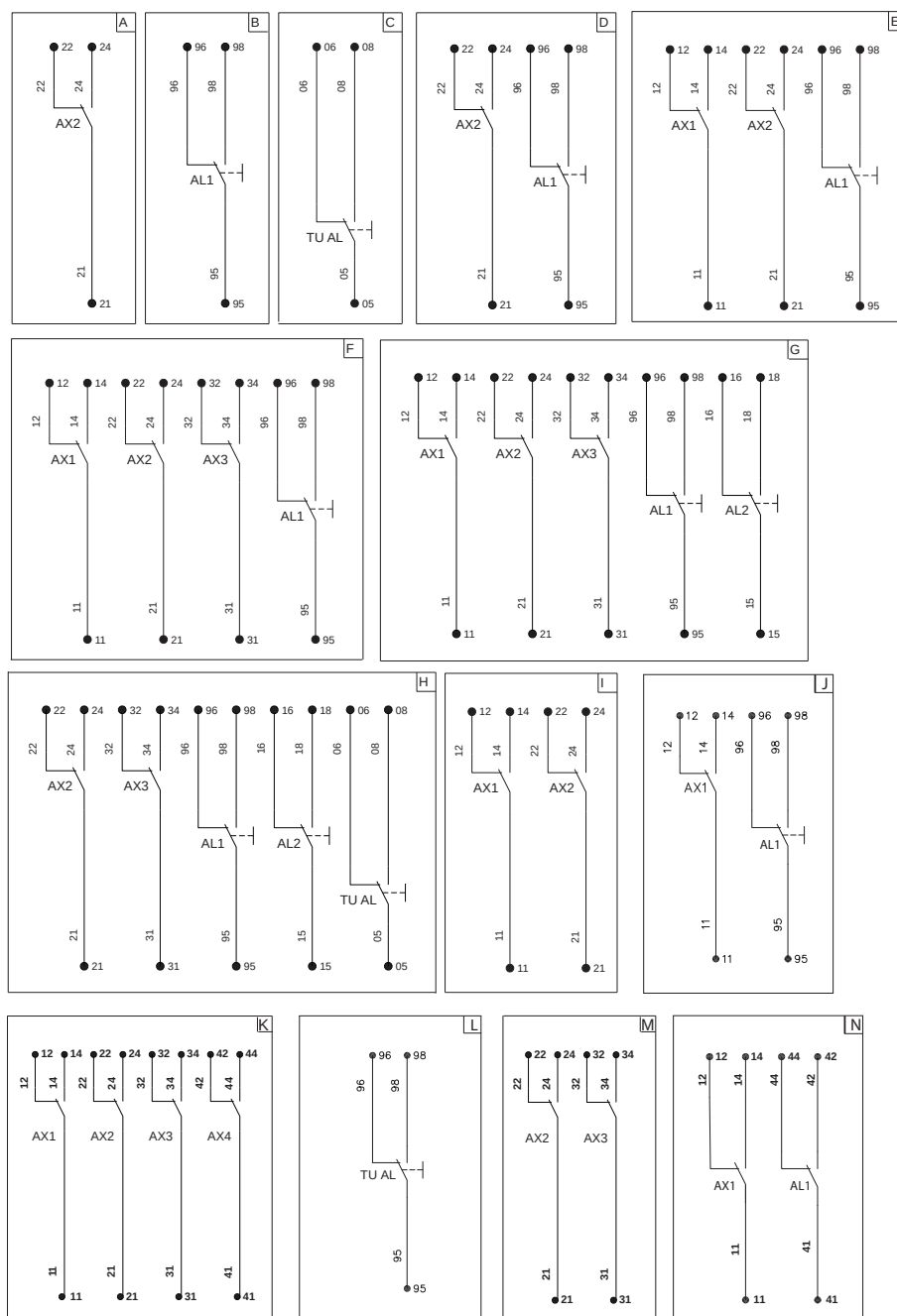
- Auxiliary Contacts (AX) : Indicate ON/OFF status of the MCCB.
- Alarm Contacts (AL): Indicate trip status of the MCCB. Alarm trip can be initiated by pressing the test button on the molded case circuit breaker, a trip due to overcurrent, short circuit; or trip due to residual current, shunt, or undervoltage release signals.
- Thermal Trip Contacts (TU): Trips only when the MCCB has detected an overcurrent, short-circuit, or protection trip. H- and J-Frame MCCBs have a button to test this feature. Available only for H, J, N, and NS frames.

These contacts are installed by removing the MCCB cover and accessing right-side pockets within the breaker with snap-in mounting provisions. Frames G...M are supplied with 1 meter (39 in.) pig tail wiring, with each terminal wire marked. Frames N and NS are wired internal to the breaker and are terminated for connection using a 3-pin quick connector.

	Description	Auxiliary Contact	Alarm Contact	Trip Unit Alarm Contact	Designation	Diagram	Frame Size	Cat. No.
250V AC								
	1 Auxiliary contact	1	—	—	AX2	A	G, H, I, J	140G-G-EA1A
	1 Auxiliary or 1 alarm contact	1 or 1		—	AX2	A	G, H, I, J	140G-G-EA1AU ⁽¹⁾
				—	AL1	B		
	1 Auxiliary and 1 alarm contact	1	1	—	AX2/AL1	D	G, H, I, J	140G-G-EA1R1A
	2 Auxiliary and 1 alarm contact	2	1	—	AX1/AX2/AL1	E	G, H, I, J	140G-G-EA2R1A
	3 Auxiliary and 1 alarm contact	3	1	—	AX1/AX2/AX3/AL1	F	H, I, J	140G-H-EA3R1A
	1 Trip unit alarm contact	—	—	1	TU AL	C	H, J	140G-H-EA1TA
	3 Auxiliary and 2 alarm contacts	3	2	—	AX1/AX2/AX3/AL1/AL2	G	H, J	140G-H-EA3R2A
	2 Auxiliary, 2 alarm, and 1 trip unit alarm contacts	2	2	1	AX2/AX3/AL1/AL2/TU AL	H	H, J	140G-H-EA2R2TA
	1 Auxiliary and 1 alarm contact	1	1	—	AX1/AL1	J	K, M	140G-K-EA1R1A
	3 Auxiliary and 1 alarm contact	3	1	—	AX1/AX2/AX3/AL1	F	K, M	140G-K-EA3R1A
	1 Trip unit alarm contact	—	—	1	TU AL	L	N, NS	140G-N-EA1TA
	1 Trip unit alarm contact	—	—	1	TU AL	L	R	140G-R-EA1TA
24V DC, PLC								
	1 Auxiliary contact	1	—	—	AX2	A	G, H, I, J	140G-G-EA1J
	1 Auxiliary and 1 alarm contact	1	1	—	AX2/AL1	D	G, H, I, J	140G-G-EA1R1J
	1 Trip unit alarm contact	—	—	1	TU AL	C	H, J	140G-H-EA1TJ
	3 Auxiliary and 1 alarm contact	3	1	—	AX1/AX2/AX3/AL1	F	H, I, J	140G-H-EA3R1J
	3 Auxiliary and 1 alarm contact	3	1	—	AX1/AX2/AX3/AL1	F	K, M	140G-K-EA3R1J
	1 Auxiliary and 1 alarm contact	1	1	—	AX1/AL1	N	N	140G-N-EA1R1J
	2 Auxiliary contacts	2	—	—	AX2/AX3	M	N, NS	140G-N-EA2J
400V AC								
	1 Auxiliary and 1 alarm contact	1	1	—	AX2/AL1	D	H, J	140G-H-EA1R1B
	2 Auxiliary contacts	2	—	—	AX1/AX2	I	H, J	140G-H-EA2B
	1 Auxiliary and 1 alarm contact	1	1	—	AX1/AL1	J	K, M	140G-K-EA1R1B
	2 Auxiliary contacts	2	—	—	AX1/AX2	I	K, M	140G-K-EA2B
	1 Auxiliary and 1 alarm contact	1	1	—	AX1/AL1	N	N	140G-N-EA1R1B
	2 Auxiliary contacts	2	—	—	AX2/AX3	M	N, NS	140G-N-EA2B

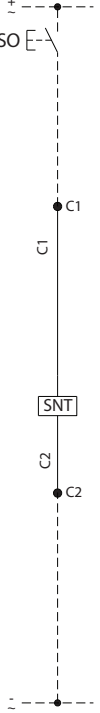
(1) This contact is supplied with unmarked wires. The contact can function as either an auxiliary or alarm contact, depending on connection method.

Figure 14 - Auxiliary/Alarm Contact Diagrams



Shunt Trip (SNT)

- Allows remote tripping of the MCCB by applying control voltage to the shunt trip coil.
- Frames G, H, I, J, K, and M are supplied with 1 meter (39 in.) pig-tail wiring (each terminal wire is marked).
- Frames N and NS are wired internal to the breaker and terminated for connection using a 3-pin quick connector.

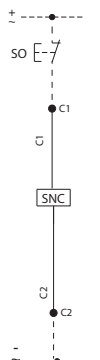
Description		Diagram ⁽¹⁾	Frame Size	Cat. No.
	12V DC		G, H, I, J	140G-G-SNR
	24...30V AC/DC			140G-G-SNJ
	48...60V AC/DC			140G-G-SNKY
	110...127V AC/110...125V DC			140G-G-SND
	220...240V AC/220...250V DC			140G-G-SNA
	380...440V AC			140G-G-SNB
	480...525V AC			140G-G-SNC
	12V DC		K, M	140G-K-SNR
	24...30V AC/DC			140G-K-SNJ
	48...60V AC/DC			140G-K-SNKY
	110...127V AC/110...125V DC			140G-K-SND
	220...240V AC/220...250V DC			140G-K-SNA
	380...440V AC			140G-K-SNB
	480...525V AC			140G-K-SNC
	24V AC/DC		N, NS	140G-N-SNJ
	48V AC/DC			140G-N-SNKY
	110...120V AC/DC			140G-N-SND
	220...240V AC/DC			140G-N-SNA
	380...400V AC			140G-N-SNB

(1) For N- and NS-Frame devices, terminals C1 and C2 are designated C11 and C12.

Shunt Close (SNC)

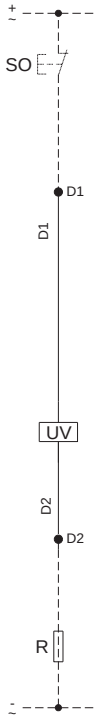
- For use with motorized versions of the NS-Frame MCCB.
- Allows remote closing of the MCCB when the spring motor is charged.

The shunt close unit is wired internal to the MCCB and terminated for connection using a 3-pin quick connect.

Description		Diagram	Frame Size	Cat. No.
	24V AC/DC		NS	140G-NS-SNCJ
	48V AC/DC			140G-NS-SNCKY
	110...120V AC/DC			140G-NS-SNCD
	220...240V AC/DC			140G-NS-SNCA
	380...400V AC			140G-NS-SNCB

Undervoltage Release (UVR)

- Opens the MCCB when supply voltage drops below 0.7 of the UV relay, with a trip rating from 0.7...0.35.
- The MCCB can be reset when the supply voltage is higher than 0.85 of the relay rating.
- When the UV is de-energized it is not possible to close the main contacts on the MCCB.
- R Resistor is supplied with the MCCB when reset is required.
- Frames G,H,I,J,K, and M are supplied with 1 meter (39 in.) pig-tail wiring (each terminal wire is marked).
- Frames N and NS are internally wired to the breaker and terminated for connection using a 3-pin quick connector.

Description		Diagram	Frame Size	Cat. No.
	24...30V AC/DC		G, H, I, J	140G-G-UVJ
	48V AC/DC			140G-G-UVKY
	60V AC/DC			140G-G-UVY
	110...127V AC/110...125V DC			140G-G-UVD
	220...240V AC/220...250V DC			140G-G-UVA
	380...440 V AC			140G-G-UVB
	480...525 V AC			140G-G-UVC
	24...30V AC/DC		K, M	140G-K-UVJ
	48V AC/DC			140G-K-UVKY
	60V AC/DC			140G-K-UVY
	110...127V AC/110...125V DC			140G-K-UVD
	220...240V AC/220...250V DC			140G-K-UVA
	380...440 V AC			140G-K-UVB
	480...525 V AC			140G-K-UVC
	24V AC/DC		N, NS	140G-N-UVJ
	60V AC/DC			140G-N-UVKY
	110...120V AC/DC			140G-N-UVD
	220...240V AC/DC			140G-N-UVA
	380...400V AC			140G-N-UVB
	415...440V AC			140G-N-UVC

Residual Current Release Module (IEC Only)

The residual current release module provides protection against low levels of earth (ground) fault currents. It continuously monitors the insulation. Compliant with IEC 60947-2 annex B, IEC 61000 for protection against unwarranted tripping.

	Description	Frame Size	3-Pole Cat. No.	4-Pole Cat. No.
	• Alarm & Trip indication • 0.03 A with 0.0 s override • Current adjustment: 0.5...10 A • Time adjustment: 0.0...3 s • Test	G	140G-G-ELP1603	140G-G-ELP1604
		H	—	140G-H-ELP1604
		I	140G-I-ELP2503	140G-I-ELP2504
		J	—	140G-J-EP2504
		K	—	140G-K-ELP

Current Transformer for Neutral Current

	Rated Current [A]	Frame Size	Cat. No.
	300	K ⁽¹⁾	140G-K-NCTD30
	400	K ⁽¹⁾	140G-K-NCTD40
	600	M ⁽¹⁾	140G-M-NCTD60
	800	M ⁽¹⁾	140G-M-NCTD80
	400...1600	N, NS	140G-N-NCTE16
	1000...3200	R	140G-R-NCTE30

(1) Order with connector (Cat. No. 140G-K-CC).

Mechanical Accessories

Terminal Lugs

You can use mechanical terminal lugs to terminate line and load wiring to the MCCB. The 140G product line includes, as standard, the capability to terminate wiring using customer furnished “crimp-on” ring lug (ring tongue) or forked lug termination.

For customers who prefer terminating wiring to Mechanical Terminal Lugs, the 140G line offers a variety of mechanical terminals lugs to match the frame and application wiring.

Multiple tap terminal lugs are available for those customers terminating multiple wires to a MCCB pole, either to line or load connection. Use of a multi-tap connection can save on panel space, making wiring easier due to using (multiple) smaller diameter wire. For applications following the UL guidelines for panel short-circuit current rating (SCCR), the use of multiple wire termination on the load size permits the termination to be rated at the SCCR level of the circuit breaker, which may allow a higher SCCR than may be available using a separate power distribution block.

Description	Conductor Type	No. of Conductors	Wire Size		Frame Size	Cat. No. (Pkg. Qty. 3)	Cat. No. (Pkg. Qty. 4)
			[mm ²]	[AWG]			
	Cu wire	1	2.5...70	14...1/0	G	140G-G-TLC13 ⁽¹⁾	140G-G-TLC14
	Cu wire	1	15...70	14...1/0		140G-G-TLC13A ⁽²⁾	—
	Multiple cable - Cu wire	6	2.5...35	14...2		140G-G-MTL63 ⁽³⁾	140G-G-MTL64 ⁽³⁾
	Cu wire	1	2.5...95	14...1/0	H	140G-H-TLC13	140G-H-TLC14
	Multiple cable - Cu wire	6	2.5...35	14...2		140G-H-MTL63 ⁽³⁾	140G-H-MTL64 ⁽³⁾
	Al or Cu wire	1	2.5...50	14...1/0	I	140G-I-TLA13	140G-I-TLA14
	Al or Cu wire	1	25...150	4...300 MCM		140G-I-TLA1A3	140G-I-TLA1A4
	Cu wire	1	6...185	10...250 MCM		140G-I-TLC13	140G-I-TLC14
	Multiple cable - Cu wire	6	2.5...35	12...2		140G-I-MTL63 ⁽³⁾⁽⁴⁾	140G-I-MTL64 ⁽³⁾⁽⁴⁾
	Al or Cu wire	1	2.5...50	14...1/0	J	140G-J-TLA13	140G-J-TLA14
	Al or Cu wire	1	25...150	4...300 MCM		140G-J-TLA1A3	140G-J-TLA1A4
	Cu wire	1	6...185	10...250 MCM		140G-J-TLC13	140G-J-TLC14
	Cu wire	1	120...185	250...350 MCM		140G-J-TLC1A3	140G-J-TLC1A4
	Multiple cable - Cu wire	6	2.5...35	12...2		140G-J-MTL63 ⁽³⁾⁽⁴⁾	140G-J-MTL64 ⁽³⁾⁽⁴⁾
	Al or Cu wire	1	120...240	250...500 MCM	K	140G-K-TLA13	140G-K-TLA14
	Al or Cu wire	2	95...120	2/0...250 MCM		140G-K-TLA23 ⁽³⁾	140G-K-TLA24 ⁽³⁾
	Al or Cu wire	2	95...240	3/0...500 MCM		140G-K-TLA2A3	—
	Cu wire	1	120...240	250...500 MCM		140G-K-TLC13 ⁽⁴⁾	140G-K-TLC14 ⁽⁴⁾
	Cu wire	2	95...120	2/0...250 MCM		140G-K-TLC23 ⁽³⁾⁽⁴⁾	140G-K-TLC24 ⁽³⁾⁽⁴⁾
	Multiple cable - Cu wire	6	16...50	6...1/0		140G-K-MTL63 ⁽³⁾	140G-K-MTL64 ⁽³⁾
	Al or Cu wire	2	120...240	250...500 MCM	M	140G-M-TLA23	140G-M-TLA24
	Al or Cu wire	3	70...185	2/0...400 MCM		140G-M-TLA33 ⁽³⁾	140G-M-TLA34 ⁽³⁾
	Cu wire	2	85...185	3/0...350 MCM		140G-M-TLC23 ⁽⁴⁾	140G-M-TLC24 ⁽⁴⁾
	Cu wire	3	70...185	2/0...350 MCM		140G-M-TLC33 ⁽³⁾⁽⁴⁾	140G-M-TLC34 ⁽³⁾⁽⁴⁾
	Al or Cu wire	4	120...240	4/0...500 MCM	N, NS	140G-N-TLA43 ⁽³⁾	140G-N-TLA44 ⁽³⁾
	Cu wire	4	120...240	4/0...500 MCM		140G-N-TLC43 ⁽³⁾	140G-N-TLC44 ⁽³⁾
	Al or Cu wire	6	50...400	1/0...750 MCM	R	140G-R-TLA63	—
	Cu wire	6	50...400	1/0...750 MCM		140G-R-TLC63	—

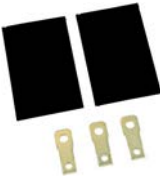
(1) Molded case circuit breaker only

(2) Motor circuit protector only.

(3) Includes the High Terminal cover. Multiple cable logs for use with load side connectors only.

(4) Includes screw for customer supplied connection for voltage tap.

Extended Terminals

	Description	Frame Size	3-Pole Cat. No. (Pkg. Qty. 3)	4-Pole Cat. No. (Pkg. Qty. 4)
 Extended Terminals for busbar or ring type connection - G- & I-frame supplied with 100 mm phase barrier - H- & J-frame supplied with insulator, 100 mm phase barrier, and terminal cover - K- & N-/NS-frame supplied with insulator and 100 mm phase barrier - M-frame terminals only		G	140G-G-EXT3	140G-G-EXT4
		H	140G-H-EXT3	140G-H-EXT4
		I	140G-I-EXT3	140G-I-EXT4
		J	140G-J-EXT3	140G-J-EXT4
		K	140G-K-EXT3 ⁽¹⁾	140G-K-EXT4 ⁽¹⁾
		M	140G-M-EXT3 ⁽¹⁾	140G-M-EXT4 ⁽¹⁾
		N, NS	140G-N-EXT3 ⁽¹⁾	140G-N-EXT4 ⁽¹⁾

(1) IEC only.

Spreader Terminals

	Description	Frame Size	3-Pole Cat. No. (Pkg. Qty. 3)	4-Pole Cat. No. (Pkg. Qty. 4)
 Spreader Terminals for busbar or ring type connection - G- & I-frame supplied with 200 mm phase barrier - H- & J-frame supplied with insulator, 200 mm phase barrier - K- & N-/NS-frame supplied with insulator and 200 mm phase barrier - M- & R-frame terminals only		G	140G-G-EXS3	140G-G-EXS4
		H	140G-H-EXS3	140G-H-EXS4
		I	140G-I-EXS3	140G-I-EXS4
		J	140G-J-EXS3	140G-J-EXS4
		K	140G-K-EXS3 ⁽¹⁾	140G-K-EXS4 ⁽¹⁾
		M	—	140G-M-EXS4 ⁽¹⁾
		N, NS	—	140G-N-EXS4 ⁽¹⁾
 Top Spreader Terminals for busbar or ring type connection - M-frame terminals only - N-/NS-frame supplied with insulator and 100 mm phase barrier Bottom Spreader Terminals for busbar or ring type connection - M-frame terminals only - N-/NS-frame supplied with insulator and 100 mm phase barrier		R	140G-R-EXS3 ⁽¹⁾	140G-R-EXS4 ⁽¹⁾
		M	140G-M-EXSLI3 ⁽¹⁾	—
		N, NS	140G-N-EXSLI3 ⁽¹⁾	—
		M	140G-M-EXSLO3 ⁽¹⁾	—
		N, NS	140G-N-EXSLO3 ⁽¹⁾	—

(1) IEC only

Rear Terminals (IEC only)

	Description	Frame Size	3-Pole Cat. No. (Pkg. Qty. 3)	4-Pole Cat. No. (Pkg. Qty. 4)
	Rear flat horizontal terminals	N, NS	140G-N-TLH3	140G-N-TLH4
	Rear flat vertical terminals	N, NS	140G-N-TLV3	140G-N-TLV4
		R ⁽¹⁾	140G-R-TLV3	140G-R-TLV4

(1) 2000 A (80/100%) and 2500 A (80%) MCCBs only.

Phase Barriers

Phase barriers allow you to increase the insulation characteristics between the phases at the connections. Phase barriers provide additional electrical clearance between each phase when special connections extend past the circuit breaker housing. They are mounted from the front, even with the circuit breaker already installed.

	Description	Frame Size	Length	3-Pole Cat. No. (Pkg. Qty. 4)	4-Pole Cat. No. (Pkg. Qty. 6)
	- Provides additional clearance when special connections that extend beyond the frame of the MCCB are used. - Frames G, H, I, J, and K are supplied with 25 mm barriers as standard.	G, I	1 in. (25 mm)	140G-G-PB3M	140G-G-PB4M
			4 in. (100 mm)	140G-G-PB3L	140G-G-PB4L
			8 in. (200 mm)	140G-G-PB3H	140G-G-PB4H
		H, J	1 in. (25 mm)	140G-H-PB3M	140G-H-PB4M
			4 in. (100 mm)	140G-H-PB3L	140G-H-PB4L
			8 in. (200 mm)	140G-H-PB3H	140G-H-PB4H
		K, N, NS	4 in. (100 mm)	140G-K-PB3L	140G-K-PB4L
			8 in. (200 mm)	140G-K-PB3H	140G-K-PB4H
		M	4 in. (100 mm)	140G-M-PB3L	140G-M-PB4L
		R	4 in. (100 mm)	140G-R-PB3L ⁽¹⁾	140G-R-PB4L ⁽²⁾
			8 in. (200 mm)	140G-R-PB3H ⁽¹⁾	140G-R-PB4H ⁽²⁾

(1) Package Qty 2. Supplied for the line side only.

(2) Package Qty 3. Supplied for the line side only.

Terminal Covers

The terminal shield prevents accidental contact with live parts, they also provide phase-to-phase insulation.

	Description	Frame Size	Height	3-Pole Cat. No. (Pkg. Qty. 2)	4-Pole Cat. No. (Pkg. Qty. 2)
	- Provide IP40 finger protection against accidental contact with live parts. - Terminal covers are pre-punched to ease installation. - Supplied as standard with the selection of multiple cable terminal lugs.	G	2 in. (50 mm)	140G-G-TC3H	140G-G-TC4H
		H	2 in. (50 mm)	140G-H-TC3H	140G-H-TC4H
		I	2.36 in. (60 mm)	140G-I-TC3H	140G-I-TC4H
		J	2.36 in. (60 mm)	140G-J-TC3H	140G-J-TC4H
		K	2.36 in. (60 mm)	140G-K-TC3H	140G-K-TC4H
		M	2.36 in. (60 mm)	140G-M-TC3H	140G-M-TC4H
		N, NS	2.76 in. (70 mm)	140G-N-TC3H	140G-N-TC4H

	Description	Frame Size	Cat. No. (Pkg. Qty. 2)
	- Terminal Cover seal kit provides protection against tampering with installed terminal cover. - Supplied with two (2) screws and two (2) seals. - Sealing wire and lead to be supplied by the customer. - Quantity one required for Line cover, one required for Load cover.	G, H, I, J	140G-G-TS
		K	140G-K-TS
		M, N, NS	140G-M-TS

Ingress Protection

The table indicates the degrees of protection against intrusion and accidental contact according to IEC 60529.

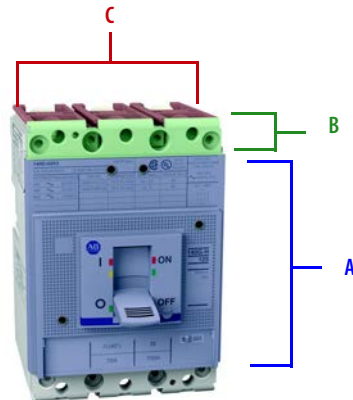
Location	Without Terminal Covers	With High Terminal Covers ⁽¹⁾
A	IP40 ⁽²⁾	—
B	IP20 ⁽³⁾	IP40 ⁽²⁾
C	—	IP40 ⁽⁴⁾

(1) High terminal covers have a height of 60 mm and are designated with a suffix "H" in the catalog number (140G-G-TC3H).

(2) Also with direct or variable depth rotary operator.

(3) G through M frames.

(4) After installation.



Variable Depth Rotary Operating Kits

When you install MCCBs as the main or feeder circuit breaker in an industrial control panel and you use a non-flanged enclosure, a common method of operating the circuit breaker using a rotary operator mechanism. The use of a rotary operator converts a rotary motion to a vertical motion that “toggles” the MCCB. In this situation, the rotary operator kit consists of:

- External operating handle
- Operating shaft
- Circuit breaker-mounted rotary operating mechanism

Using these kits allows external operation of the circuit breaker with the capability of turning the circuit breaker on/off, or resetting it without having to open the enclosure. Traditionally, these kits are sold with an operating shaft that allows you to use the kit with enclosures of various depths. The operating handles will also provide status indication when the circuit breakers trip.

NFPA 79 Operators

A NFPA 79-compliant Internal Rotary Operating Handle Kit for Bulletin 140G MCCBs, and Bulletin 140MG MCPs and MPCBs is available to address current requirements of the NFPA 79 standard. The NFPA 79 kits are available for G-, H-, I-, J-, K-, M-, and N-Frame Circuit Breaker product lines.

Compliance with the current NFPA 79 standard enables you to maintain control of the main disconnecting means when the door is open; an issue for rotary-operated through-the-door disconnect switches and circuit breakers.

This standard requires that the rotary main disconnecting means be operable without the use of accessory tools or devices (independent of door position) and restates the requirement for an interlocking provision to prevent the closing of the disconnecting means while the enclosure door is open, unless the interlock is operated by a deliberate action. Without this requirement, rotary-operated devices may have a shaft protruding from the panel when the door is open. If the panel is powered and it is necessary to turn power off, it is difficult to de-energize the panel with the operating shaft alone. This standard is to reduce the possibility of personnel not being able to turn an energized panel off with the door opened.

Why is This Relatively Simple Product Important to You?

The trend in the market is moving toward building smaller and less-expensive control panels. To achieve this, many panel builders and OEMs have started using rotary operators because they are easier to install and the non-flanged enclosure is

significantly less expensive. With the introduction of this internal handle, customers can now comply with the NFPA 79 requirement and use the less-expensive, non-flanged enclosure with circuit breakers.

Applications Where NFPA 79 Compliance is Required as an Upgrade

From an installation perspective, the internal handle replaces the existing operating shaft. Externally, the same 140G handle is used. In the case of an existing 140G installation, installing the kit can be as simple as removing the existing operating shaft, measuring it, and then cutting the new internal operating handle shaft to the same length. It is then installed in place of the existing operating shaft.

Easy to Use, No-Tools-Required Internal Handle Operation

When the door is open, the kit provides an internal handle with a positive grip, allowing users to operate the breaker. If the enclosure were opened using the defeater on the external handle with the circuit breaker on, the user could then turn the breaker off using the internal handle, rather than using a tool to rotate the operating shaft.

Compliance with “Deliberate Action Required”

Finally, the handle complies with the NFPA 79 requirement to: “Prevent closing of the disconnecting means while the enclosure door is open, unless an interlock is operated by deliberate action.” The internal handle must be pulled out before it can be turned, otherwise the handle itself will just ratchet on the shaft.

Rotary Variable Depth Operators

	Description	Frame Size	Handle Color	Shaft Length	Cat. No.
	- Supplied with external handle, operating shaft, and MCCB mounted operating mechanism. - See page 90 to select as components. - Frames G, H, I, and J use a Bul. 140U P-style handle. - Frames K, M, and N use a Bul. 140U medium style handle.	G, I	Black	12 in. (305 mm)	140G-G-RVM12B
			Red/Yellow		140G-G-RVM12R
			Black	21 in. (533 mm)	140G-G-RVM21B
			Red/yellow		140G-G-RVM21R
		H, J	Black	12 in. (305 mm)	140G-H-RVM12B
			Red/yellow		140G-H-RVM12R
			Black	21 in. (533 mm)	140G-H-RVM21B
			Red/yellow		140G-H-RVM21R
		K	Black	12 in. (305 mm)	140G-K-RVM12B
			Red/yellow		140G-K-RVM12R
			Black	22 in. (559 mm)	140G-K-RVM21B
			Red/yellow		140G-K-RVM21R
		M	Black	12 in. (305 mm)	140G-M-RVM12B
			Red/yellow		140G-M-RVM12R
			Black	22 in. (559 mm)	140G-M-RVM21B
			Red/yellow		140G-M-RVM21R
		N	Black	12 in. (305 mm)	140G-N-RVM12B
			Red/yellow		140G-N-RVM12R
			Black	22 in. (559 mm)	140G-N-RVM21B
			Red/yellow		140G-N-RVM21R

Rotary Variable Depth Operators with Internal NFPA 79 Operating Handle

	Description	Frame Size	Handle Color	Shaft Length	Cat. No.
	- Supplied with external handle, NFPA handle with operating shaft, support bracket, and MCCB mounted operating mechanism. - See page 90 to select as individual components. - Frames G, H, I, and J use a Bul. 140U P-style handle. - Frames K, M, and N use a Bul. 140U medium style handle.	G, I	Black	12 in. (305 mm)	140G-G-NVM12B
			Red/yellow		140G-G-NVM12R
			Black	21 in. (533 mm)	140G-G-NVM21B
			Red/yellow		140G-G-NVM21R
		H, J	Black	12 in. (305 mm)	140G-H-NVM12B
			Red/yellow		140G-H-NVM12R
			Black	21 in. (533 mm)	140G-H-NVM21B
			Red/yellow		140G-H-NVM21R
		K	Black	12 in. (305 mm)	140G-K-NVM12B
			Red/yellow		140G-K-NVM12R
			Black	22 in. (559 mm)	140G-K-NVM21B
			Red/yellow		140G-K-NVM21R
		M	Black	12 in. (305 mm)	140G-M-NVM12B
			Red/yellow		140G-M-NVM12R
			Black	22 in. (559 mm)	140G-M-NVM21B
			Red/yellow		140G-M-NVM21R
		N	Black	12 in. (305 mm)	140G-N-NVM12B
			Red/yellow		140G-N-NVM12R
			Black	22 in. (559 mm)	140G-N-NVM21B
			Red/yellow		140G-N-NVM21R

Variable Depth Rotary Components

	Description - P-style handle for G, H, I, and J frames - Medium handles for K, M, and N frames - Rated 3/3R/4/4X/12 - Accepts 3 padlocks	Handle Color - Black/Grey - Red/Yellow - Black/Grey - Red/Yellow	Frame Size - G, H, I, J - K, M, N	Cat. No. 140U-PB 140U-PY 140U-HM4 140U-HM4E
	Description Extension Shaft	Shaft Length 12 in. (305 mm) 21 in. (533 mm) 12 in. (305 mm) 22 in. (305 mm)	Frame Size - G, H, I, J - K, M, N	Cat. No. 194R-S1 194R-S2 194R-R7 194R-R8
	Description NFPA 79 internal operating handle with shaft Internal handle permits operation of the molded case circuit breaker when the door is open in compliance with NFPA 79.	Shaft Length 12 in. (305 mm) 21 in. (533 mm) 12 in. (305 mm) 22 in. (305 mm)	Frame Size - G, H, I, J - K, M, N	Cat. No. 140G-N1 140G-N2 140G-N7 140G-N8
	Description Rotary Variable Depth Operating Mechanism - Direct molded case circuit breaker mount - G, H, I, and J frame use 194R-S1 or 194R-S2 shafts (140G-N1 or 140G-N2 NFPA) - K, M, and N frames use 194R-R7 or 194R-R8 shafts (140G-R7 or 140G-R8 NFPA) - Shaft secured with set screw or cotter pin	Frame Size - G, I - H, J - K - M - N	Cat. No. 140G-G-RMX 140G-H-RMX 140G-K-RMX 140G-M-RMX 140G-N-RMX	
	Description Support Bracket Supplied as standard with NFPA variable depth operator kits	Frame Size - G, H, I, J - K - M - N	Cat. No. 140G-G-OSB 140G-K-OSB 140G-M-OSB 140G-N-OSB	

Direct Rotary Operators

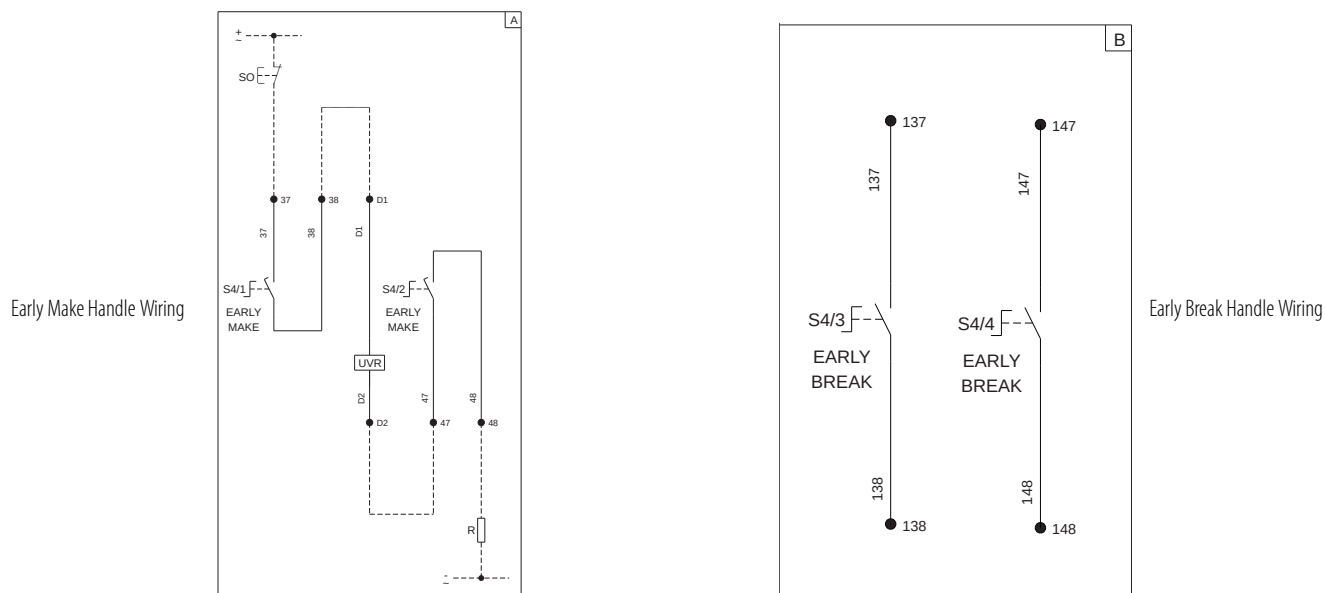
	Description	Frame Size	Handle Color	Cat. No.
	- Mount with direct handle operation of the MCCB. - Lockable in OFF position (three padlocks max.).	G, I	Black	140G-G-RMB
			Red/yellow	140G-G-RMY
H, J		Black	140G-H-RMB	
		Red/yellow	140G-H-RMY	
K		Black	140G-K-RMB	
		Red/yellow	140G-K-RMY	
M		Black	140G-M-RMB	
		Red/yellow	140G-M-RMY	
N		Black	140G-N-RMB	
		Red/yellow	140G-N-RMY	
				

Auxiliary Contacts for Handle Mechanism Mounting

- Early make contacts are (typically) used with an undervoltage release. The contacts close before the main contacts in the MCCB. The early make contacts supply power the undervoltage release, which prevents nuisance tripping of the relay.
- Early break contacts are used to remove system voltage from electronics that could be damaged by transient voltage caused by the opening of the main contacts in the MCCB.
- Mounted inside rotary mechanism or direct handle, supplied with 1 meter (39 in.) pig-tail wiring (each terminal wire is marked)

	Description	Diagram (see Figure 15)	For Use With	Frame Size	Pkg. Qty	Cat. No.
	Early Make Handle Auxiliary Contact; Open 400V	A	140G-G-RMB, -RMY, RMX 140G-H-RMB, -RMY, RMX	G, H, I, J	2	140G-G-EAM1B
	Early Break Handle Auxiliary Contact; Close 400V	B			2	140G-G-EAB1B
	Early Make Handle Auxiliary Contact; Close 250V	A	140G-K-RMB, -RMY, RMX	K	2	140G-K-EAM1A
		A	140G-M-RMB, -RMY, RMX	M		140G-M-EAM1A

Figure 15 - Auxiliary Contact Wiring Diagrams



Motor Operators

The operating mechanism enables remote opening and closing of the circuit breaker and is particularly suitable for use in power supply network supervisory control systems. It comes complete with a padlock device.

The motor operating mechanism is fitted on the front of the circuit breaker as an alternative to the front flange or rotary operating mechanism. Motor-operated circuit breakers are normally used in applications where switching is done infrequently and generally are not used to replace contactors that are applied in series with the circuit breaker.

Description			Frame Size	Cat. No.
	- Remotely opens, closes, and resets the MCCB. - Supplied with auto/manual selector, test feature, and special tool for local operation of the MCCB.	24V DC	G, I	140G-G-EOPJ
		48...60V DC		140G-G-EOPKY
		110...125V AC/DC		140G-G-EOPD
		220...250V AC/DC		140G-G-EOPA
		380...440V AC		140G-G-EOPB
		480...525V AC		140G-G-EOPC
	Remotely opens, closes, and resets the MCCB.	24V DC	H, J	140G-H-EOPJ
		48...60V DC		140G-H-EOPKY
		110...125V AC/DC		140G-H-EOPD
		220...250V AC/DC		140G-H-EOPA
		380...440V AC		140G-H-EOPB
		480...525V AC		140G-H-EOPC
	- Remotely opens, closes, and resets the MCCB. - Uses a stored energy motor for local control of the motor without the use of special tools and include auto/manual/lock selection, lever to recharge the motor, and open & close push button operation.	24V DC	K	140G-K-EOPJ
		48...60V DC		140G-K-EOPKY
		110...125V AC/DC		140G-K-EOPD
		220...250V AC/DC		140G-K-EOPA
		380V AC		140G-K-EOPB
		M	24V DC	140G-M-EOPJ
			48...60V DC	140G-M-EOPKY
			110...125V AC/DC	140G-M-EOPD
			220...250V AC/DC	140G-M-EOPA
			380V AC	140G-M-EOPB

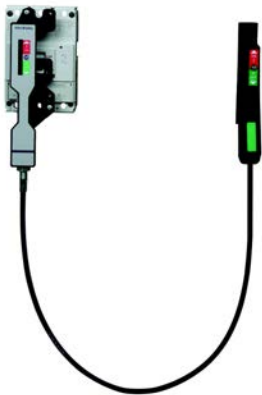
Description			Frame Size	Cat. No.
	Spring Charging Motor	24...30V AC/DC	NS	140G-NS-SCMJ
		48...60V AC/DC		140G-NS-SCMKY
		100...130V AC/DC		140G-NS-SCMD
		220...250V AC/DC		140G-NS-SCMA
		380...415V AC		140G-NS-SCMB

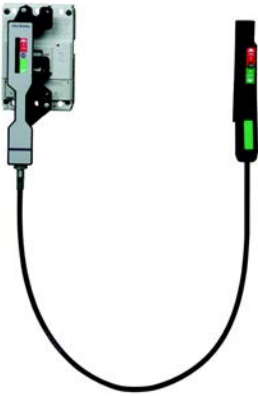
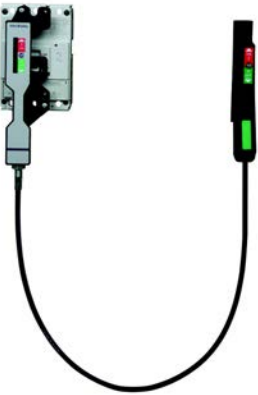
Flange-mounted Cable Operators—3-Pole Only

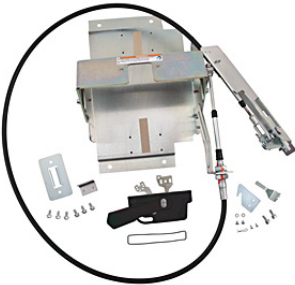
Flexible Cable Operators are useful accessories when you are installing a circuit breaker in a flanged enclosure and you need to control the MCCB externally. Traditionally in North America, flange operators that consist of operating rods or special mounting plates for the breakers have been used. In each case, the circuit breaker must be mounted directly or nearly directly behind the external handle, which is located on the flange. This type of installation is reliable; however, the positioning of the circuit breaker is less than ideal in terms of working room, especially in small enclosures.

The Flexible Cable Operator uses a similar flange-mounted operating handle to control the MCCB; however, rather than operating rods, the breaker is operated by a flexible cable, which provides flexibility in the circuit breaker placement. In many industrial control panels, incoming power to the panel may actually be on the hinged side of the panel and when using traditional flange-mounted operators, you need to route the main feeder wires across the panel to the line side of the MCCB. Using a flexible cable-operated MCCB allows you to install the MCCB closer to the incoming feeder wires.

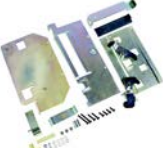
Another application where Flexible Cable Operators are used is in conjunction with busbar mounting systems installed within an industrial control panel. When an MCCB is being used on the busbar system as the main disconnect or feeder protector, the location of the feeder breaker isn't restricted to the area behind the flange.

	Description	Frame Size	Handle Type	Cable Length	Cat. No.
	- For use with NEMA-style flange enclosures. - Includes handle, MCCB operator, cable, and necessary hardware. - Pre-assembled for ease of installation. - Replacement Hardware is listed on page 100	G	Non-metallic Handle, Type 1/3/12/4/4X	3 ft. (0.91 m)	140G-G-FCX03
				4 ft. (1.3 m)	140G-G-FCX04
				6 ft. (1.9 m)	140G-G-FCX06
				10 ft. (3.0 m)	140G-G-FCX10
			Stainless Steel Handle, Type 4/4X	3 ft. (0.91 m)	140G-G-FCS03
				4 ft. (1.3 m)	140G-G-FCS04
				6 ft. (1.9 m)	140G-G-FCS06
				10 ft. (3.0 m)	140G-G-FCS10
		H	Painted Metal Handle, Type 1/12	3 ft. (0.91 m)	140G-G-FMX03
				4 ft. (1.3 m)	140G-G-FMX04
				6 ft. (1.9 m)	140G-G-FMX06
				10 ft. (3.0 m)	140G-G-FMX10
			Non-metallic Handle, Type 1/3/12/4/4X	3 ft. (0.91 m)	140G-H-FCX03
				4 ft. (1.3 m)	140G-H-FCX04
				6 ft. (1.9 m)	140G-H-FCX06
				10 ft. (3.0 m)	140G-H-FCX10
			Stainless Steel Handle, Type 4/4X	3 ft. (0.91 m)	140G-H-FCS03
				4 ft. (1.3 m)	140G-H-FCS04
				6 ft. (1.9 m)	140G-H-FCS06
				10 ft. (3.0 m)	140G-H-FCS10
			Painted Metal Handle, Type 1/12	3 ft. (0.91 m)	140G-H-FMX03
				4 ft. (1.3 m)	140G-H-FMX04
				6 ft. (1.9 m)	140G-H-FMX06
				10 ft. (3.0 m)	140G-H-FMX10

	Description	Frame Size	Handle Type	Cable Length	Cat. No.
	- For use with NEMA-style flange enclosures. - Includes handle, MCCB operator, cable, and necessary hardware. - Pre-assembled for ease of installation. - Replacement Hardware is listed on page 100	I	Non-metallic Handle, Type 1/3/12/4/4X	3 ft. (0.91 m)	140G-I-FCX03
				4 ft. (1.3 m)	140G-I-FCX04
				6 ft. (1.9 m)	140G-I-FCX06
				10 ft. (3.0 m)	140G-I-FCX10
			Stainless Steel Handle, Type 4/4X	3 ft. (0.91 m)	140G-I-FCS03
				4 ft. (1.3 m)	140G-I-FCS04
				6 ft. (1.9 m)	140G-I-FCS06
				10 ft. (3.0 m)	140G-I-FCS10
			Painted Metal Handle, Type 1/12	3 ft. (0.91 m)	140G-I-FMX03
				4 ft. (1.3 m)	140G-I-FMX04
				6 ft. (1.9 m)	140G-I-FMX06
				10 ft. (3.0 m)	140G-I-FMX10
	- For use with NEMA-style flange enclosures. - Includes handle, MCCB operator, cable, and necessary hardware. - Pre-assembled for ease of installation. - Replacement Hardware is listed on page 100	J	Non-metallic Handle, Type 1/3/12/4/4X	3 ft. (0.91 m)	140G-J-FCX03
				4 ft. (1.3 m)	140G-J-FCX04
				6 ft. (1.9 m)	140G-J-FCX06
				10 ft. (3.0 m)	140G-J-FCX10
			Stainless Steel Handle, Type 4/4X	3 ft. (0.91 m)	140G-J-FCS03
				4 ft. (1.3 m)	140G-J-FCS04
				6 ft. (1.9 m)	140G-J-FCS06
				10 ft. (3.0 m)	140G-J-FCS10
			Painted Metal Handle, Type 1/12	3 ft. (0.91 m)	140G-J-FMX03
				4 ft. (1.3 m)	140G-J-FMX04
				6 ft. (1.9 m)	140G-J-FMX06
				10 ft. (3.0 m)	140G-J-FMX10
		K	Non-metallic Handle, Type 1/3/12/4/4X	3 ft. (0.91 m)	140G-K-FCX03
				4 ft. (1.3 m)	140G-K-FCX04
				6 ft. (1.9 m)	140G-K-FCX06
				10 ft. (3.0 m)	140G-K-FCX10
			Stainless Steel Handle, Type 4/4X	3 ft. (0.91 m)	140G-K-FCS03
				4 ft. (1.3 m)	140G-K-FCS04
				6 ft. (1.9 m)	140G-K-FCS06
				10 ft. (3.0 m)	140G-K-FCS10
			Painted Metal Handle, Type 1/12	3 ft. (0.91 m)	140G-K-FMX03
				4 ft. (1.3 m)	140G-K-FMX04
				6 ft. (1.9 m)	140G-K-FMX06
				10 ft. (3.0 m)	140G-K-FMX10

	Description	Frame Size	Handle Type	Cable Length	Cat. No.
	- For use with NEMA-style flange enclosures. - Includes handle, MCCB operator, cable, and necessary hardware. - Pre-assembled for ease of installation. - Replacement Hardware is listed on page 100	M	Non-metallic Handle, Type 1/3/12/4/4X	4 ft (1.3 m)	140G-M-FCX04
				6 ft (1.9 m)	140G-M-FCX06
				10 ft (3.0 m)	140G-M-FCX10
			Stainless Steel Handle, Type 4/4X	4 ft (1.3 m)	140G-M-FCS04
				6 ft (1.9 m)	140G-M-FCS06
				10 ft (3.0 m)	140G-M-FCS10
			Painted Metal Handle, Type 1/12	4 ft (1.3 m)	140G-M-FMX04
				6 ft (1.9 m)	140G-M-FMX06
				10 ft (3.0 m)	140G-M-FMX10
	Left-hand flange-mount bracket - relocates cable to left side - ideal for enclosures less than 15 in. (38.1 cm) deep	M	—	—	140G-BML
				—	140G-BNL
				—	140G-BNL

Additional Accessories

	Description	Frame Size	Cat. No.
	Trip Test Battery	H, J, K, M (LSI, LSIG, MM) N/NS (LSI)	140G-ELTT
	Battery Unit Used to interrogate the last trip of the MCCB when supplemental control power is not present or is lost. Use with LSIG and LSIG-MM breakers	N, NS	140G-ELBU
	Padlockable Handle Block Padlocking Hasp Lock-OFF only	G, I	140G-G-PL
		H, J	140G-H-PL
		N	140G-N-PL
		NS	140G-NS-PL
		R	140G-R-PL
	Padlocking Flange Supplied with toggle extension and escutcheon. Lock-OFF only	K	140G-K-TPA
		M	140G-M-TPA
	Direct Mechanical Lock to Door	N	140G-N-SINT

	Description	Frame Size	3-Pole Cat. No.	4-Pole Cat. No.
	DIN Rail Adapter Adapts to 35 mm DIN Rail	G	140G-G-DRA	140G-G-DRA4
		H, J	140G-H-DRA	140G-H-DRA
		I	140G-I-DRA	140G-I-DRA4
	Escutcheon Plates Finish Frame with Marking provision window. For flush mounted (to door) MCCB applications.	G	140G-G-EP3	140G-G-EP4
		H	140G-H-EP3	140G-H-EP4
		I	140G-I-EP3	140G-I-EP4
		J	140G-J-EP3	140G-J-EP4
		K	140G-K-EP	
		M	140G-M-EP	
		N, NS	140G-N-EP	
	IP54 Door protection Transparent plastic cover flush mounted to the enclosure door. Mounted on hinges and provided with a keyed lock.	R	140G-R-EP	
		N, NS	140G-N-BC12	
		R	140G-R-BC12	

	Description	For Use With	Cat. No.
	Adapter Plate for replacement of 140U/140M, Frames G, H, and J	140U-G to 140G-G	140G-G-PRA
		140U-H to 140G-G	
		140U-H to 140G-H	140G-J-PRA
		140U-J to 140G-J	
	Panel Mount Terminal for customer wiring connection of maintenance mode MCCBs	K, M	140G-K-CC
			140G-K-CIC
	Connector to mount shunt release in 3rd pole pocket for a 4-pole MCCB	K, M (4-pole only)	140G-K-CC2

	Description		For Use With	Cat. No.
	MCCB Ready-to-Close Auxiliary Contact Signals that the MCCB is ready to accept closing command if: • MCCB open • spring charging motor is fully charged • a shunt trip is de-energized • an undervoltage release is energized • an opening solenoid is armed	Form C, 24V PLC	NS	140G-NS-RTCJ
		Form C, 250V		140G-NS-RTCA
	Spring Charging Motor (Charged) Auxiliary contact signals that the motor is charged	Form C, 24V PLC	NS	140G-NS-SCJ
		Form C, 250V		140G-NS-SCA
	Trip Reset Auxiliary contact allows remote reset of MCCB following an overcurrent trip	Form C, 24...30V AC/DC, PLC	NS	140G-NS-RRJ
		Form C, 110...130V AC/DC		140G-NS-RRD
		Form C, 200...230V AC/DC		140G-NS-RRR
	Mechanical Counter Indicates number of times the MCCB has been toggled from ON to OFF.		NS	140G-N-MOC
			R	140G-R-MOC

Bulletin 1494V Variable Depth Flange-Mounted Circuit Breaker Operating Mechanism



Components

Circuit Breaker Operating Mechanism

The mechanism listed must be combined with a connecting rod, operating handle, and a circuit breaker (supplied by customer) to obtain a functional device.

	3-Pole Circuit Breaker ⁽¹⁾		Operating Mechanism
	Frame Size [A]	Frame Size	Cat. No.
	125, 225, 250	G, H, I, J	1494V-M70
	400	K	1494V-M71
	800, 1200	M, N	1494V-M72

(1) Circuit breakers to be provided by customer.

Connecting Rods

	Circuit Breaker Frame Size [A]	Enclosure Working Depth [in. (mm)]		Cat. No.
		Minimum	Maximum	
	125, 150, 225, 250	6-3/4 (172)	21-5/8 (549)	1494V-RA4
	400	8-1/2 (216)	21-5/8 (549)	1494V-RA4
	800, 1200	9-1/2 (241)	23 (584)	1494V-RB4

Operating Handle

	Handle Type	Description	Circuit Breaker Frame Size [A]	Operating Handle Cat. No.
	Type 1, 3R, 4, 4X, 12	Nonmetallic	125, 150, 250, 400	1494F-P1
	Type 1, 3R, 4, 12	Painted Metal	125, 150, 250, 400	1494F-M1
	Type 4, 4X	Stainless Steel	125, 150, 250, 400	1494F-S1
	Type 1, 3R, 4, 12	Painted Metal	800, 1200	1494F-M2
	Type 4, 4X	Stainless Steel	800, 1200	1494F-S2

Auxiliary Contacts

	Description	For Use With	Contact Type	Cat. No.
	Auxiliary Contact Kit for Circuit Breakers (includes contacts and adapter)	125...1200 A Allen-Bradley Bul. 140G Circuit Breakers	1 N.O.	1495-N85
			1 N.C.	1495-N86

	Description	For Use With	Cat No.
	Insulation Kit	140G-G, 140MG-G 140G-H, 140MG-H 140G-I, 140MG-I 140G-J, 140MG-J	1495-N87

Photos in this section are representative. Appearance of actual product may differ from the photo shown.

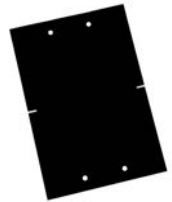
Replacement Parts, G...NS Frames

End Cap Kits

All 140G MCCBs are furnished with end caps mounted on the circuit breaker as standard. Replacement end cap kits are available.

Many customers prefer to use a “crimp-on” ring lug (ring tongue terminal) or forked terminal as the wire termination method to the MCCB. Others prefer wire connection to a terminal lug. A broad selection of terminal lugs are available to meet specific application requirements.

The replacement end cap kit consists of a captive nut and bolt or termination screw, which allows you to terminate wires without the need to use terminal lugs.

	Description	Frame Size	3-Pole Cat. No.	4-Pole Cat. No.
 - End Caps are supplied as standard for G, H, I, J, K, M, N & NS frames. Provide connections for ring type or bolt-on terminals. - Pkg qty. 3 or 4	Replacement End Cap Kits	G	140G-G-ECM	140G-G-ECM4
		G (MCP)	140MG-G-ECM	—
		H	140G-H-ECM	140G-H-ECM4
		I	140G-I-ECM	140G-I-ECM4
		J	140G-J-ECM	140G-J-ECM4
		K	140G-K-ECM	140G-K-ECM4
		M	140G-M-ECM	140G-M-ECM4
	Insulators Supplied as standard for G, H, I, J, K, and M frames. Provide insulating barrier for MCCB applications, required for all applications with a $U_e > 440V$. Pkg Qty 10.	G	140G-G-BP3	140G-G-BP4
		H	140G-H-BP3	140G-H-BP4
		I	140G-I-BP3	140G-I-BP4
		J	140G-J-BP3	140G-J-BP4
		K	140G-K-BP3	140G-K-BP4
		M	140G-M-BP3	140G-M-BP4
	Replacement Mounting Hardware Metric threads	G, I	140G-G-MH3 ⁽¹⁾	140G-G-MH4 ⁽²⁾
		H, J	140G-H-MH4 ⁽¹⁾	140G-H-MH4 ⁽¹⁾
		K	140G-K-MH4 ⁽³⁾	140G-K-MH4 ⁽³⁾
		M	140G-M-MH4 ⁽³⁾	140G-M-MH4 ⁽³⁾
		N, NS	140G-N-MH4 ⁽³⁾	140G-N-MH4 ⁽³⁾

(1) Pkg. Qty. 2

(2) Pkg. Qty. 3

(3) Pkg. Qty. 4

Replacement Parts for Flex Cable Operator

Description	Frame Size	Cat. No.
Non-metallic Flange Handle with mounting hardware	G, H, I, K, M	140G-P1
Stainless Steel Flange Handle with mounting hardware		140G-S1
Painted Metal Flange Handle with mounting hardware		140G-M1
Long non-metallic Flange Handle with mounting hardware	N	140G-P2
Flange Handle hardware	G, H, I, K	140G-FH1
Actuator mounting hardware	G, I	140G-BH1
	H, J	140G-BH2
	K	140G-BH3

Replacement Parts, R Frame

Internal Electrical Accessories

Auxiliary/Trip Unit Contact (AX1/AX2/AX3/AX4)

- Auxiliary Contacts (AX) : Indicate ON/OFF status of the MCCB.
- AX are Form C-style switches for internal MCCB wiring and are terminated with a 3-pin quick connector.

	Description	Designation	Diagram (page 82)	Frame Size	Cat. No.
	(3) Auxiliary contacts, 400V, (1) auxiliary contact, 24V	AX1/AX2/AX3/AX4	K	R	140G-R-EA3A1J

Shunt Trip (SNT)

- Allows remote tripping of the MCCB by applying control voltage to the shunt trip coil.
- Wired internal to the breaker and terminated with a 3-pin quick connector.

Description	Diagram	Frame Size	Cat. No.
	See page 82	R	140G-R-SNJ
24V DC			140G-R-SNXY
48V AC/DC			140G-R-SND
110...120V AC/DC			140G-R-SNA
220...240V AC/DC			140G-R-SNB
380...400V AC			

Shunt Close (SNC)

- Allows remote closing of the MCCB when the spring motor is charged.

The shunt close unit is wired internal to the MCCB and terminated with a 3-pin quick connect.

Description		Diagram	Frame Size	Cat. No.
	24V AC/DC	See page 82	R	140G-R-SNCJ
	48V AC/DC			140G-R-SNCKY
	110...120V AC/DC			140G-R-SNCD
	220...240V AC/DC			140G-R-SNCA
	380...400V AC			140G-R-SNCB

Undervoltage Release (UVR)

- Opens the MCCB when supply voltage drops below 0.7 of the UV relay, with a trip rating from 0.7...0.35.
- The MCCB can be reset when the supply voltage is higher than 0.85 of the relay rating.
- When the UV is de-energized it is not possible to close the main contacts on the MCCB.
- R Resistor is supplied with the MCCB when reset is required.

Description		Diagram	Frame Size	Cat. No.
	24V AC/DC	See page 91	R	140G-R-UVJ
	60V AC/DC			140G-R-UVKY
	110...120V AC/DC			140G-R-UVD
	220...240V AC/DC			140G-R-UVA
	380...400V AC			140G-R-UVB
	415...440V AC			140G-R-UVC

Additional Replacement Parts

Description			Frame Size	Cat. No.
	Spring Charging Motor	220...250V DC	R	140G-R-SCMA
		110...130V AC/DC		140G-R-SCMD
		24...30V DC		140G-R-SCMJ
		48...60V AC/DC		140G-R-SCMKY
	Trip Reset Auxiliary contact allows remote reset of MCCB following an overcurrent trip	Form C, 24...30V AC/DC, PLC	R	140G-R-RRJ
		Form C, 110...130V AC/DC		140G-R-RRD
		Form C, 200...240V AC/DC		140G-R-RRA
	Battery Unit Used to interrogate the last trip of the MCCB when supplemental control power is not present or is lost.		R	140G-ELBU

Notes:

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Bulletin 140G MCCB Specifications

Performance Characteristics

		G-Frame			H-Frame					I-Frame	
Max. Rated Current	[A]	125 / 160 (IEC version with a 160 A I_{cu} rating)			125 / 160 (IEC version with a 160 A I_{cu} rating)					225	
Rated insulation voltage, U_r , IEC	[V]	800			1000					800	
Rated impulse withstand voltage, U_{imp}	[kV]	8			8					8	
NEMA, UL, CSA Ratings											
Interrupting Rating Code ⁽¹⁾		G2	G3	G6	H2	H3	H6	H0	H15	I2	I3
240V AC, 50/60 Hz	[kA]	50	65	100	65	100	150	200	200	50	65
480V AC, 50/60 Hz	[kA]	25	35	65	25	35	65	100	150	25	35
600Y/347V AC, 50/60 Hz	[kA]	10	14	25	—	—	—	—	—	10	10
600V AC, 50/60 Hz	[kA]	—	—	—	14	18	25	35	42	25	35
IEC 60947-2 Ratings											
Rated ultimate short-circuit breaking capacity, I_{cu}											
220...230V AC, 50/60 Hz	[kA]	65	85	100	65	85	100	150	200	50	85
380V AC, 50/60 Hz	[kA]	36	50	70	36	50	70	120	150	30	50
400...415V AC, 50/60 Hz	[kA]	36	50	70	36	50	70	120	150	36	50
440V AC, 50/60 Hz	[kA]	36	50	65	36	50	65	100	150	25	40
500V AC, 50/60 Hz	[kA]	30	36	50	30	35	50	60	70	20	30
525V AC, 50/60 Hz	[kA]	22	35	35	20	25	30	36	50	13	20
690V AC, 50/60 Hz	[kA]	6	8	10	10	12	15	18	20	5	6
250V DC- 2 poles in series, thermal-mag trip units only	[kA]	36	50	70	36	50	70	85	100	36	50
500V DC- 3 poles in series, thermal-mag trip units only	[kA]	36 (4 p in series)	50 (4 p in series)	70 (4 p in series)	36	50	70	85	100	36	50
Rated service short-circuit breaking capacity, I_{cs}											
220...230V AC, 50/60 Hz	% I_{cu}	75% (50)	75%	75%	100%	100%	100%	100%	100%	75%	50%
380V AC, 50/60 Hz	% I_{cu}	100%	100%	75%	100%	100%	100%	100%	100%	75%	50% (27)
400...415V AC, 50/60 Hz	% I_{cu}	100%	100%	50% ⁽²⁾	100%	100%	100%	100%	100%	75%	50% (27)
440V AC, 50/60 Hz	% I_{cu}	50%	50%	50%	100%	100%	100%	100%	100%	75%	50%
500V AC, 50/60 Hz	% I_{cu}	50%	50%	50%	100%	100%	100%	100%	100%	75%	50%
525V AC, 50/60 Hz	% I_{cu}	50%	50%	50%	100%	100%	100%	100%	100%	75%	50%
690V AC, 50/60 Hz	% I_{cu}	75%	50%	50% ⁽²⁾	100%	100%	100%	100%	75%	50%	50%
250V DC- 2 poles in series, thermal-mag trip units only	% I_{cu}	100%	100%	75% ⁽²⁾	100%	100%	100%	100%	100%	100%	75%
500V DC- 3 poles in series, thermal-mag trip units only	% I_{cu}	100%	100%	75% ⁽²⁾	100%	100%	100%	100%	100%	100%	75%

(1) Explanation of Interrupting Code. Example: code G2, G=G-Frame; 2= 25 kA@480V. See product selection for complete ratings

(2) See [Table 103](#).

Table 103 - I_{cs} Ratings for 15, 16, and 20 A G-Frame Devices

	400...415V	690V	250V DC	500V DC
I_{cs}	100%	75%	100%	100%

		G-Frame	H-Frame	I-Frame
Mechanical Life	[No. of Operations]	25000	25000	25000
	[Operations/hour]	240	240	240
Electrical Life @ 415V (AC)	[No. of Operations]	8000	8000	8000
	[Operations/hour]	120	120	120
Wire Temperature Rating ⁽¹⁾		Cu 75°C	Cu 75°C	Al or Cu 75°C
Ambient Temperature w/out derating		104°F [40°C]	104°F [40°C]	104°F [40°C]
Storage Temperature		-40...176°F [-40...+80°C]	-40...176°F [-40...+80°C]	-40...176°F [-40...+80°C]
Dimensions Width/Depth/Height	3-pole [mm]	76.2 x 70 x 130	90 x 82.5 x 130	105 x 70 x 150
	4-pole [mm]	101.6 x 70 x 130	120 x 82.5 x 130	140 x 70 x 150
Weight	3-pole [lb. (kg)]	2.42 (1.1)	2.65 (1.2)	3.75 (1.7)
	4-pole [lb. (kg)]	3.08 (1.4)	3.53 (1.6)	5.73 (2.1)

(1) Wire Temperature Rating is determined by testing the circuit breaker under full load current with the conductors sized for 75°C

		J-Frame	K-Frame	M-Frame
Max. Rated Current	[A]	250	400	800
Rated insulation voltage, U_i , IEC	[V]	1000	1000	1000
Rated impulse withstand voltage, U_{imp}	[kV]	8	8	8

NEMA, UL, CSA Ratings

Interrupting Rating Code ⁽¹⁾		J2	J3	J6	J0	K3	K6	K0	K15	M5	M6	M0
240V AC, 50/60 Hz	[kA]	65	100	150	200	100	150	200	200	100	200	200
480V AC, 50/60 Hz	[kA]	25	35	65	100	35	65	100	150	50	65	100
600V AC, 50/60 Hz	[kA]	14	18	25	35	25	35	65	100	25	35	42
500V DC - 2 poles in series ⁽²⁾	[kA]	—	—	—	—	35	50	65	100	—	—	—
600V DC - 3 poles in series ⁽²⁾	[kA]	—	—	—	—	25	35	50	65	20	35	50

IEC 60947-2 Ratings

Rated ultimate short-circuit breaking capacity, I_{cu}												
220...230V AC, 50/60 Hz	[kA]	65	85	100	150	85	100	200	200	85	100	200
380V AC, 50/60 Hz (AC)	[kA]	36	50	70	120	50	70	120	200	50	70	100
400...415V AC, 50/60 Hz	[kA]	36	50	70	120	50	70	120	200	50	70	100
440V AC, 50/60 Hz	[kA]	36	50	65	100	40	65	100	180	45	50	80
500V AC, 50/60 Hz	[kA]	30	36	50	60	30	50	85	150	35	50	65
525V AC, 50/60 Hz	[kA]	20	25	45	50	25	40	70	100	25	35	42
690V AC, 50/60 Hz	[kA]	10	12	15	20	25	40	70	100	22	25	30
250V DC - 2 poles in series ⁽²⁾	[kA]	36	50	70	85	50	70	100	150	50	70	100
500V DC - 2 poles in series ⁽²⁾	[kA]	36	50	70	85	36	50	70	100	35	50	65
500V DC - 3 poles in series ⁽²⁾	[kA]	36	50	70	85	—	—	—	—	—	—	—
750V DC - 3 poles in series ⁽²⁾	[kA]	—	—	—	—	25	36	50	70	20	36	50

Rated service short-circuit breaking capacity, I_{cs}												
220...230V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
380V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
400...415V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
440V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
500V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
525V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	75%(80kA)	75% (18kA)	50% (19kA)	50% (22.5kA)
690V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%
250V DC - 2 poles in series ⁽²⁾	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%
500V DC - 2 poles in series ⁽²⁾	% I_{cu}	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%
500V DC - 3 poles in series ⁽²⁾	% I_{cu}	100%	100%	100%	100%	—	—	—	—	—	—	—
750V DC - 3 poles in series ⁽²⁾	% I_{cu}	—	—	—	—	100%	100%	100%	100%	75%	75%	75%

(1) Explanation of Interrupting Code. Example: code G2, G=G-Frame; 2= 25 kA@480V. See product selection for complete ratings

(2) DC rating is applicable for thermal-magnetic trip units only

		J-Frame	K-Frame	M-Frame
Mechanical Life	[No. of Operations]	25000	20000	20000
	[Operations/hour]	240	120	120
Electrical Life @ 415V (AC)	[No. of Operations]	8000	7000 (400 A)/5000 (600 A)	7000 (600...630 A)/5000 (800 A)
	[Operations/hour]	120	60	60
Wire Temperature Rating ⁽¹⁾		Al or Cu 75°C	Al or Cu 75°C	Al or Cu 75°C
Ambient Temperature w/out derating		104°F [40°C]	104°F [40°C]	104°F [40°C]
Storage Temperature		-40...176°F [-40...+80°C]	-40...176°F [-40...+80°C]	-40...176°F [-40...+80°C]
Dimensions	3-pole [mm]	105 x 82.5 x 160	140 x 108.5 x 205	210 x 103.5 x 268
Width/Depth/Height	4-pole [mm]	140 x 82.5 x 160	185 x 103.5 x 205	280 x 103.5 x 268
Weight	3-pole [lb. (kg.)]	5.51 (2.5)	7.17 (3.25)	26.68 (12.1)
	4-pole [lb. (kg.)]	7.72 (3.5)	9.15 (4.15)	33.29 (15.1)

(1) Wire Temperature Rating is determined by testing the circuit breaker under full load current with the conductors sized for 75°C

Specifications

		N, NS-Frame	R-Frame
Max. Rated Current	[A]	1200	2000/2500/3000
Rated insulation voltage, U_i , IEC	[V]	1000	1000
Rated impulse withstand voltage, U_{imp}	[kV]	8	12

NEMA, UL, CSA Ratings

Interrupting Rating Code ⁽¹⁾		N5	N6	N0	R12
240V AC, 50/60 Hz	[kA]	65	100	150	125
480V AC, 50/60 Hz	[kA]	50	65	100	125
600V AC, 50/60 Hz	[kA]	25	50	65	100

IEC 60947-2 Ratings

Rated ultimate short-circuit breaking capacity, I_{cu}					
220...230V AC, 50/60 Hz	[kA]	85	100	200	130
380V AC, 50/60 Hz	[kA]	50	70	120	80
400...415V AC, 50/60 Hz	[kA]	50	70	120	80
440V AC, 50/60 Hz	[kA]	50	65	100	80
500V AC, 50/60 Hz	[kA]	40	50	85	40
525V AC, 50/60 Hz	[kA]	30	50	65	—
690V AC, 50/60 Hz	[kA]	30	42	50	40

Rated service short-circuit breaking capacity, I_{cs}					
220...230V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%
380V AC, 50/60 Hz (AC)	% I_{cu}	100%	100%	100%	—
400...415V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%
440V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%
500V AC, 50/60 Hz	% I_{cu}	100%	100%	75%	100%
525V AC, 50/60 Hz	% I_{cu}	75% (30 kA)	50% (31.5 kA)	50% (37.5 kA)	—
690V AC, 50/60 Hz	% I_{cu}	100%	75%	75%	100%

(1) Explanation of Interrupting Code. Example: code G2, G=G-Frame; 2= 25 kA@480V. See product selection for complete ratings

		N-Frame	NS-Frame	R-Frame
Mechanical Life	[No. of Operations]	10000		15000
	[Operations/hour]	60		60
Electrical Life @ 415V (AC)	[No. of Operations]	2000		4500 (2000 A) / 4000 (2500 A) / 3000 (3200 A)
	[Operations/hour]	60		60
Wire Temperature Rating ⁽¹⁾		Al or Cu 75°C		Al or Cu 75°C
Ambient Temperature w/out derating		104°F [40°C]		104°F [40°C]
Storage Temperature		-40...176°F [-40...+80°C]		-40...176°F [-40...+80°C]
Dimensions	3-pole [mm]	210 x 154 x 268	210 x 178 x 268	427 x 282 x 382
Width/Depth/Height	4-pole [mm]	280 x 154 x 268	280 x 178 x 268	553 x 282 x 382
Weight	3-pole [lb. (kg)]	21.39 (9.7)	24.25 (11)	175 (79)
	4-pole [lb. (kg)]	27.56 (12.5)	30.86 (14)	—

(1) Wire Temperature Rating is determined by testing the circuit breaker under full load current with the conductors sized for 75°C

Bulletin 140G Current-limiting MCCB Specifications

Performance Characteristics

		HC-Frame	JC-Frame	KC-Frame
Max. Rated Current	[A]	125 / 160 (IEC version with a 160 A I_{cu} rating)	250	400
Rated insulation voltage, U_r , IEC	[V]	1000	1000	1000
Rated impulse withstand voltage, U_{imp}	[kV]	8	8	8

NEMA, UL, CSA Ratings

Interrupting Rating Code ⁽¹⁾		HC6	HC0	JC6	JC0	KC6	KC0
240V AC, 50/60 Hz	[kA]	150	200	150	200	150	200
480V AC, 50/60 Hz	[kA]	65	100	65	100	65	100
600V AC, 50/60 Hz	[kA]	—	—	25	35	35	65
500V DC - 2 poles in series ⁽²⁾	[kA]	25	35	—	—	50	65
600V DC - 3 poles in series ⁽²⁾	[kA]	—	—	—	—	35	50

IEC 60947-2 Ratings

Rated ultimate short-circuit breaking capacity, I_{cu}

220...230V AC, 50/60 Hz	[kA]	100	150	100	150	100	200
380V AC, 50/60 Hz (AC)	[kA]	70	120	70	120	70	120
400...415V AC, 50/60 Hz	[kA]	70	120	70	120	70	120
440V AC, 50/60 Hz	[kA]	65	100	65	100	65	100
500V AC, 50/60 Hz	[kA]	50	60	50	60	50	85
525V AC, 50/60 Hz	[kA]	30	36	45	50	40	70
690V AC, 50/60 Hz	[kA]	15	18	15	20	40	70
250V DC - 2 poles in series ⁽²⁾	[kA]	70	85	70	85	70	100
500V DC - 2 poles in series ⁽²⁾	[kA]	70	85	70	85	50	70
500V DC - 3 poles in series ⁽²⁾	[kA]	—	—	70	85	—	—
750V DC - 3 poles in series ⁽²⁾	[kA]	—	—	—	—	36	50

Rated service short-circuit breaking capacity, I_{cs}

220...230V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
380V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
400...415V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
440V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
500V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
525V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
690V AC, 50/60 Hz	% I_{cu}	100%	100%	100%	100%	100%	100%
250V DC - 2 poles in series ⁽²⁾	% I_{cu}	100%	100%	100%	100%	100%	100%
500V DC - 2 poles in series ⁽²⁾	% I_{cu}	100%	100%	100%	100%	100%	100%
500V DC - 3 poles in series ⁽²⁾	% I_{cu}	—	—	100%	100%	—	—
750V DC - 3 poles in series ⁽²⁾	% I_{cu}	—	—	—	—	100%	100%

(1) Explanation of Interrupting Code. Example: code HC6, HC = Current-limiting H-Frame; 6 = 65 kA@480V. See product selection for complete ratings

(2) DC rating is applicable for thermal-magnetic trip units only

		HC-Frame	JC-Frame	KC-Frame
Mechanical Life	[No. of Operations]	25000	25000	20000
	[Operations/hour]	240	240	120
Electrical Life @ 415V (AC)	[No. of Operations]	8000	8000	7000 (400 A)/5000 (600 A)
	[Operations/hour]	120	120	60
Wire Temperature Rating ⁽¹⁾		Cu 75°C	Al or Cu 75°C	Al or Cu 75°C
Ambient Temperature w/out derating		104°F [40°C]	104°F [40°C]	104°F [40°C]
Storage Temperature		-40...176°F [-40...+80°C]	-40...176°F [-40...+80°C]	-40...176°F [-40...+80°C]
Dimensions (Width/Depth/Height)	3-pole [mm]	90 x 82.5 x 130	105 x 82.5 x 160	140 x 108.5 x 205
Weight	3-pole [lb (kg)]	2.65 (1.2)	5.51 (2.5)	7.17 (3.25)

(1) Wire Temperature Rating is determined by testing the circuit breaker under full load current with the conductors sized for 75°C

Let-through Current Tables

See [page 171](#) for let-through energy curves.

Table 104 - 140G-HC Frame Let-through Current

Frame Size	Rated Current I_n [A]	Rated voltage [V AC]	Threshold Current			Intermediate Point			Interrupting Rating		
			I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]	I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]	I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]
140G-HC6	up to 125 A	480	6	10	266	30	19	480	65	23.2	512
		600	6	10	301	14	14.1	472	25	18	655
140G-HC0	up to 125 A	480	6	10	266	50	21	486	100	31.1	704
		600	6	10	301	22	18	655	35	20	650

Table 105 - 140G-JC Frame Let-through Current

Frame Size	Rated Current I_n [A]	Rated voltage [V AC]	Threshold Current			Intermediate Point			Interrupting Rating		
			I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]	I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]	I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]
140G-JC6	up to 250 A	480	10	14.4	499	42	26.4	853	65	30	980
		600	10	13.7	582	18	91.1	791	25	22.3	990
140G-JC0	up to 250 A	480	10	14.4	499	50	26.4	853	100	44.5	1142
		600	10	13.7	582	30	24.2	1058	50	30.4	1162

Table 106 - 140G-KC Frame Let-through Current

Frame Size	Rated Current I_n [A]	Rated voltage [V AC]	Threshold Current			Intermediate Point			Interrupting Rating		
			I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]	I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]	I_{rms} [kA]	I_p [kA]	I^2t [$\times 10^3$]
140G-KC6	up to 400 A	480	10	20	1.4	65	43.9	2.8	100	47.3	3
		600	10	21	1.5	30	36	2.6	65	44	3
140G-KC0	up to 400 A	480	10	20	1.4	30	35	2.4	65	43.9	2.8
		600	10	21	1.5	22	31	2.2	35	38	2.8

Definitions

Threshold current: the rms symmetrical prospective at the highest interrupting capacity of the current limiting range, where:

- the peak current let-through in each phase is less than the peak of that symmetrical prospective current, and
- the I^2t in each phase is less than the I^2t of a 1/2 cycle wave of the symmetrical current

Interrupting rating: the highest current at rated voltage that a device is intended to interrupt under standard test conditions

I^2t (Amperes squared seconds): an expression related to the energy that is let through for a specific short circuit event. With respect to circuit breakers, the I^2t [A^2s] is expressed for the current flow between the initiation of the fault current and the clearing of the circuit.

I_p peak current: the maximum (or peak) instantaneous current that is allowed to pass during a specific short-circuit event. The value is determined from either a table as shown above or evaluated from a SCCR table based upon the available short circuit current at a specific voltage.

I_{rms} short-circuit current rating: the maximum rms prospective (available) current to which a device can interrupt. The rating is expressed in Amperes and volts.

MCP Performance Characteristics

		G-Frame	H-Frame	I-Frame	J-Frame	K-Frame	M-Frame	N-Frame
Frame Size	[A]	125	125	225	250	400	800	1200
Poles		3	3	3	3	3	3	3
Instantaneous Trip Settings	[A]	3...125	3...125	100...150	150...250	300 & 400	600 & 800	1200 ⁽¹⁾
Rated insulation voltage, U_i IEC	[V]	800	1000	800	1000	1000	1000	1000
Rated impulse withstand voltage, U_{imp}	[kV]	8	8	8	8	8	8	8
NEMA, UL, CSA Ratings — UL 489 Instantaneous Trip Circuit Breaker (Magnetic Only) Max SCCR. Combination Controller Rating⁽²⁾								
480V AC	[kA]	65	65	35	65	65	65	—
600V/347V AC	[kA]	25	—	10	—	—	—	—
600V AC	[kA]	—	25	—	25	35	35	—
IEC 60947-2 GB14048.2 Ratings								
Rated ultimate short-circuit breaking capacity, I_{cu} ⁽³⁾								
220-230V AC	[kA]	65 ⁽⁴⁾	65 ⁽⁴⁾	85	100	100	100	100
380V AC	[kA]	36 ⁽⁴⁾	36 ⁽⁴⁾	50	70	70	70	70
400-415V AC	[kA]	36 ⁽⁴⁾	36 ⁽⁴⁾	50	70	70	70	70
440V AC	[kA]	36 ⁽⁴⁾	36 ⁽⁴⁾	40	65	65	50	65
500V AC	[kA]	30 ⁽⁴⁾	30 ⁽⁴⁾	30	50	50	50	50
525V AC	[kA]	22 ⁽⁴⁾	20 ⁽⁴⁾	20	45	40	25	42
690V AC	[kA]	6 ⁽⁴⁾	10 ⁽⁴⁾	6	15	40	25	42
(DC) 250V - 2 poles in series	[kA]	—	—	50	70	—	—	—
(DC) 500V - 3 poles in series	[kA]	—	—	50	70	—	—	—
Rated service short-circuit breaking capacity, I_{cs} ⁽³⁾								
220-230V AC	% I_{cu}	75% ⁽⁴⁾	100% ⁽⁴⁾	50%	100%	100%	100%	100%
380V AC	% I_{cu}	100% ⁽⁴⁾	100% ⁽⁴⁾	50% (27)	100%	100%	100%	100%
400-415V AC	% I_{cu}	100% ⁽⁴⁾	100% ⁽⁴⁾	50% (27)	100%	100%	100%	100%
440V AC	% I_{cu}	50% ⁽⁴⁾	100% ⁽⁴⁾	50% (27)	100%	100%	100%	100%
500V AC	% I_{cu}	50% ⁽⁴⁾	100% ⁽⁴⁾	50%	100%	100%	100%	100%
525V AC	% I_{cu}	50% ⁽⁴⁾	100% ⁽⁴⁾	50%	100%	100%	75%	75%
690V AC	% I_{cu}	75% ⁽⁴⁾	100% ⁽⁴⁾	50%	100%	100%	75%	75%
(DC) 250V - 2 poles in series	% I_{cu}	—	—	75%	100%	—	—	—
(DC) 500V - 3 poles in series	% I_{cu}	—	—	75%	100%	—	—	—
Mechanical Life	[No. of Ops]	25000	25000	25000	25000	20000	20000	10000
	[Ops/Hour]	240	240	240	240	120	120	60
Electrical Life @ 415V (AC)	[No. of Ops]	8000	8000	8000	8000	7000	5000	2000
	[Ops/Hour]	120	120	120	120	60	60	60
Wire Temperature Rating ⁽⁵⁾		Cu 75°C	Al or Cu 75°C	Al or Cu 75°C	Al or Cu 75°C	Al or Cu 75°C	Al or Cu 75°C	Al or Cu 75°C
Ambient Temperature w/out derating		104°F (40°C)	104°F (40°C)	104°F (40°C)	104°F (40°C)	104°F (40°C)	104°F (40°C)	104°F (40°C)
Operating Temperature		-13...+158°F (-25...+70°C)	-13...+158°F (-25...+70°C)	-13...+158°F (-25...+70°C)	-13...+158°F (-25...+70°C)	-13...+158°F (-25...+70°C)	-13...+158°F (-25...+70°C)	-13...+158°F (-25...+70°C)
Storage Temperature		-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)
Dimensions [Width/Depth/Height]	[mm]	76.2 x 70 x 130	90 x 82.5 x 130	105 x 70 x 150	105 x 82.5 x 160	140 x 108.5 x 205	210 x 103.5 x 268	210 x 154 x 268
	[inches]	3 x 2.76 x 5.12	3.54 x 3.25 x 5.12	4.13 x 2.76 x 5.9	4.13 x 3.25 x 6.3	5.51 x 4.27 x 8.07	8.27 x 4.07 x 10.55	8.27 x 6.06 x 10.55
Weight (approx.)	[lb. (kg)]	2.4 (1.1)	2.6 (1.2)	3.7 (1.7)	5.5 (2.5)	7.2 (3.25)	21 (9.5)	21.4 (9.7)

(1) Adjustable between 1...10x motor FLA. Value based on 1200 A rating plug.

(2) The Short Circuit value is based on a combined of MCP, motor contactor and overload relay as a UL60497-4-1 Type D Combination Motor Controller, consult the [Global SCCR tool from Rockwell Automation](#).

(3) These ratings represent the standalone values for the MCP. For Type 2 coordinations values (per IEC60947-4) with Allen-Bradley contactors and overload relays, see the combination ratings in [Table 108](#). Consult the [Global SCCR tool from Rockwell Automation](#) for specific product catalog numbers.

(4) See [Table 107](#).

(5) Wire Temperature Rating is determined by testing the circuit breaker under full load current with the conductors sized for 40°C

Table 107 - I_{cs}/I_{cu} Ratings, 3...7 A, G- and H-Frame

	230V	415V	440V	500V-525V	690V	250V DC	500V DC (H-Frame only)
I_{cu}	5	5	3	3	3	5	5
I_{cs} %	100	100	100	100	100	100	100

Type D Combination Ratings

The short-circuit value is based on a combination of MCP, motor contactor, and overload relay, rated as a UL 60947-4-1 Type D Combination Motor Controller. Values in [Table 108](#) are for Type 2 coordination with Allen-Bradley contactors and overload relays.

Combination motor controller components:

- Circuit breaker—Bul. 140MG MCP, G-, H-, J-, K-, M-Frame
- Contactor—Bul. 100-C, 100S-C, 100-D, 100S-D
- Overload relay—Bul 193/592 E1 Plus™, E3™, E3 Plus, E300™

Table 108 - Type D Combination Ratings per IEC 60947-2/GB 14048.2

Attribute		Bul 140MG MCP				
		G	H	J	K	M
Rated ultimate short-circuit breaking capacity, I_{CU}						
220-230V AC	[kA]	100	100	100	65	65
380V AC	[kA]	100	100	100	65	65
400-415V AC	[kA]	100	100	100	65	65
440V AC	[kA]	65	65	65	65	65
500V AC	[kA]	50	50	50	50	50
525V AC	[kA]	50	50	50	50	50
690V AC	[kA]	—	50	50	25	25
Rated service short-circuit breaking capacity, $I_{CS}^{(3)}$						
220-230V AC	% I_{CU}	100%	100%	100%	100%	100%
380V AC	% I_{CU}	100%	100%	100%	100%	100%
400-415V AC	% I_{CU}	100%	100%	100%	100%	100%
440V AC	% I_{CU}	100%	100%	100%	100%	100%
500V AC	% I_{CU}	100%	100%	100%	100%	100%
525V AC	% I_{CU}	100%	100%	100%	100%	100%
690V AC	% I_{CU}	100%	100%	100%	100%	100%

MPCB Performance Characteristics

		H-Frame	J-Frame
Max. Rated Current	[A]	100	150
Rated insulation voltage, U_i , IEC	[V]	1000	1000
Rated impulse withstand voltage, U_{imp}	[kV]	8	8
NEMA, UL, CSA Ratings			
Interrupting Rating Code ⁽¹⁾		H8	J8
240V AC, 50/60 Hz	[kA]	150	150
480V AC, 50/60 Hz	[kA]	65	65
600V AC, 50/60 Hz	[kA]	25	25
IEC 60947-2 Ratings			
Rated ultimate short-circuit breaking capacity, I_{cu}			
220...230V AC, 50/60 Hz	[kA]	100	100
380V AC, 50/60 Hz	[kA]	70	70
400...415V AC, 50/60 Hz	[kA]	70	70
440V AC, 50/60 Hz	[kA]	65	65
525V AC, 50/60 Hz	[kA]	15	45
550V AC, 50/60 Hz	[kA]	15	45
690V AC, 50/60 Hz	[kA]	15	15
250V DC- 2 poles in series	[kA]	70	70
500V DC- 3 poles in series	[kA]	70	70
Rated service short-circuit breaking capacity, I_{cs}			
220...230V AC, 50/60 Hz	% I_{cu}	100%	100%
380V AC, 50/60 Hz	% I_{cu}	100%	100%
400...415V AC, 50/60 Hz	% I_{cu}	100%	100%
440V AC, 50/60 Hz	% I_{cu}	100%	100%
525V AC, 50/60 Hz	% I_{cu}	100%	100%
550V AC, 50/60 Hz	% I_{cu}	100%	100%
690V AC, 50/60 Hz	% I_{cu}	100%	100%
250V DC- 2 poles in series	% I_{cu}	100%	100%
500V DC- 3 poles in series	% I_{cu}	100%	100%
Mechanical Life	[No. of Operations]	25000	25000
	[Operations/hour]	240	240
Electrical Life @ 415V (AC)	[No. of Operations]	8000	8000
	[Operations/hour]	120	120
Wire Temperature Rating ⁽²⁾		Cu 75°C	Al or Cu 75°C
Ambient Temperature w/out derating		104°F (40°C)	104°F (40°C)
Operational Temperature		-13...158°F (-25...+70°C)	-13...158°F (-25...+70°C)
Storage Temperature		-40...158°F (-40...+70°C)	-40...158°F (-40...+70°C)
Dimensions	[mm]	90 x 82.5 x 130	105 x 82.5 x 160
Width/Depth/Height	[in.]	3.54 x 3.25 x 5.12	4.13 x 3.25 x 6.3
Weight (approx.)	[lb. (kg)]	2.6 (1.2)	5.5 (2.5)

(1) Explanation of Interrupting Code. Example: code H8, H=H-Frame; 8= 65 kA@480V. See product selection for complete ratings

(2) Wire Temperature Rating is determined by testing the circuit breaker under full load current with the conductors sized for 75°C

Bulletin 140G/MG MCCB Specifications

Temperature Performance

140G G-Frame Thermal Magnetic Circuit Breakers

The G frame thermal magnetic circuit breaker is calibrated at 40 °C (104 °F). For applications at other temperatures there is a variation in the thermal tripping as shown in [Table 109](#).

Table 109 - 140G G-Frame Temperature/Thermal Trip Ratings

Rated Current I_n [A]	Ambient Temperature			
	40 °C	50 °C	60 °C	70 °C
	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]
15	15	14	13	12
16	16	15	14	13
20	20	19	18	16
25	25	23	22	20
30	30	28	26	24
32	32	30	28	26
40	40	38	35	33
45	45	42	40	37
50	50	47	44	41
60	60	56	52	49
63	63	59	55	51
70	70	66	61	57
80	80	75	70	65
90	90	85	79	73
100	100	94	88	81
110	110	103	96	90
125	125	117	109	102
160 ⁽¹⁾	160 ⁽¹⁾	150 ⁽¹⁾	140 ⁽¹⁾	130 ⁽¹⁾

(1) IEC only.

Molded Case Switches and Motor Circuit Protectors

Molded case switches and motor circuit protectors do not undergo tripping variations because of ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

[Table 110](#) shows the maximum current to prevent terminal overheating.

Table 110 - Maximum Operating Current above 40 °C (104 °F)—G-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	3	3	3	3	I_n [A]	3	3	3	3
	7	7	7	7		7	7	7	7
	15	15	15	15		15	15	15	15
	30	30	30	30		30	30	30	30
	50	50	50	50		50	50	50	50
	70	70	70	70		70	70	70	70
	80	80	79	79		80	80	80	80
	100	93	84	79		100	100	100	100
	125 ⁽¹⁾	112 ⁽¹⁾	97 ⁽¹⁾	79 ⁽¹⁾		125	125	125	125
						160 ⁽¹⁾	160 ⁽¹⁾	125 ⁽¹⁾	136 ⁽¹⁾

(1) Molded case switch rated current

140G H-Frame Thermal Magnetic Circuit Breakers

The H frame thermal magnetic circuit breaker is calibrated at 40 °C (104 °F). For applications at other temperatures there is a variation in the thermal tripping as shown in [Table 111](#).

Table 111 - 140G H-Frame Temperature/Thermal Trip Ratings

Rated Current I_n [A]	Ambient Temperature			
	40 °C	50 °C	60 °C	70 °C
	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]
15	15	14	13	12
16	16	15	14	13
20	20	19	17	16
25	25	23	22	20
30	30	28	26	24
32	32	30	28	26
40	40	37	35	32
50	50	47	43	40
60	60	56	52	49
63	63	59	55	51
70	70	66	61	57
80	80	75	70	65
90	90	86	78	73
100	100	93	87	81
110	110	103	96	89
125	125	117	109	101
160*	160*	150*	139*	129*

Electronic Trip Circuit Breakers, Molded Case Switches, and Motor Circuit Protectors

The electronic trip circuit breakers do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

The same considerations are appropriate for molded case switches and motor circuit protectors.

[Table 112](#) shows the maximum current to prevent terminal overheating.

Table 112 - Maximum Operating Current above 40 °C (104 °F)—H-Frame Devices

North American (UL) Ratings					IEC Ratings				
I_n [A]	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)	I_n [A]	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
	3	3	3	3		3	3	3	3
	7	7	7	7		7	7	7	7
	15	15	15	15		15	15	15	15
	30	30	30	30		30	30	30	30
	50	50	50	50		50	50	50	50
	70	70	70	70		70	70	70	70
	80	80	79	79		80	80	80	80
	100	93	84	79		100	100	100	100
	125 ⁽¹⁾	112 ⁽¹⁾	97 ⁽¹⁾	79 ⁽¹⁾		125	125	125	125
						160 ⁽¹⁾	160 ⁽¹⁾	146 ⁽¹⁾	131 ⁽¹⁾

(1) Molded case switch rated current

140G I-Frame Thermal Magnetic Circuit Breakers

The I frame thermal magnetic circuit breaker is calibrated at 40 °C (104 °F). For applications at other temperatures there is a variation in the thermal tripping as shown in [Table 113](#).

Table 113 - 140G I-Frame Temperature/Thermal Trip Ratings

Rated Current I_n [A]	Ambient Temperature			
	40 °C	50 °C	60 °C	70 °C
	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]
60	60	56	52	49
63	63	59	55	51
70	70	66	60	56
80	80	75	69	64
90	90	84	78	72
100	100	93	87	80
110	110	102	95	88
125	125	116	108	100
150	150	140	130	121
160	160	149	139	129
200	200	186	173	161
225	225	210	196	181

Molded Case Switches and Motor Circuit Protectors

Molded case switches and motor circuit protectors do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

[Table 114](#) shows the maximum current to prevent terminal overheating.

Table 114 - Maximum Operating Current above 40 °C (104 °F)—I-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	100	100	100	100	I_n [A]	100	100	100	100
	110	110	110	110		110	110	110	110
	125	125	125	125		125	125	125	125
	150	148	153	142		150	150	150	150
	200	181	161	142		200	200	200	200
	225 ⁽¹⁾	199 ⁽¹⁾	175 ⁽¹⁾	142 ⁽¹⁾		225 ⁽¹⁾	225 ⁽¹⁾	214 ⁽¹⁾	204 ⁽¹⁾

(1) Molded case switch rated current

140G J-Frame Thermal Magnetic Circuit Breakers

The J frame thermal magnetic circuit breaker is calibrated at 40 °C (104 °F). For applications at other temperatures there is a variation in the thermal tripping as shown in [Table 115](#).

Table 115 - 140G J-Frame Temperature/Thermal Trip Ratings

Rated Current I_n [A]	Ambient Temperature			
	40 °C	50 °C	60 °C	70 °C
	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]
25	25	23	21	19
30	30	25	23	20
32	32	27	24	21
35	35	32	30	26
40	40	37	34	30
50	50	46	42	39
60	60	56	51	45
63	63	58	53	48
70	70	65	58	51
80	80	74	66	58
90	90	86	77	68
100	100	95	85	75
110	110	101	92	84
125	125	115	105	95
160	160	150	137	140
175	175	166	153	142
200	200	190	175	160
225	225	208	190	170
250	250	240	230	220

Electronic Trip Circuit Breakers, Molded Case Switches, and Motor Circuit Protectors

The electronic trip circuit breakers do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

The same considerations are appropriate for molded case switches and motor circuit protectors.

[Table 116](#) shows the maximum current to prevent terminal overheating.

Table 116 - Maximum Operating Current above 40 °C (104 °F)—J-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	150	150	150	150	I_n [A]	150	150	150	150
	175	175	164	158		175	175	175	175
	200	200	172	158		200	200	200	200
	225	225	180	158		225	225	221	213
	250 ⁽¹⁾	250 ⁽¹⁾	222 ⁽¹⁾	158 ⁽¹⁾		250 ⁽¹⁾	250 ⁽¹⁾	238 ⁽¹⁾	213 ⁽¹⁾

(1) Molded case switch rated current

140G K-Frame Thermal Magnetic Circuit Breakers

The K frame thermal magnetic circuit breaker is calibrated at 40 °C (104 °F). For applications at other temperatures there is a variation in the thermal tripping as shown in [Table 117](#).

Table 117 - 140G K-Frame Temperature/Thermal Trip Ratings

Rated Current I_n [A]	Ambient Temperature			
	40 °C	50 °C	60 °C	70 °C
	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]
300	300	286	267	247
320	320	305	285	263
400	400	380	355	325

Electronic Trip Circuit Breakers, Molded Case Switches, and Motor Circuit Protectors

The electronic trip circuit breakers do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

The same considerations are appropriate for molded case switches and motor circuit protectors.

[Table 118](#) shows the maximum current to prevent terminal overheating.

Table 118 - Maximum Operating Current above 40 °C (104 °F)—K-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	300	264	228	189	I_n [A]	320	320	320	320
	400 ⁽¹⁾	352 ⁽¹⁾	304 ⁽¹⁾	252 ⁽¹⁾		400 ⁽¹⁾	400 ⁽¹⁾	400 ⁽¹⁾	352 ⁽¹⁾

(1) Molded case switch rated current

140G M-Frame Thermal Magnetic Circuit Breakers

The M frame thermal magnetic circuit breaker is calibrated at 40 °C (104 °F). For applications at other temperatures there is a variation in the thermal tripping as shown in [Table 119](#).

Table 119 - 140G M-Frame Temperature/Thermal Trip Ratings

Rated Current I_n [A]	Ambient Temperature			
	40 °C	50 °C	60 °C	70 °C
	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]	Max. Thermal Trip [A]
600	600	552	514	476
630 ⁽¹⁾	630	580	540	500
800	800	740	670	610

(1) IEC only.

Electronic Trip Circuit Breakers, Molded Case Switches, and Motor Circuit Protectors

The electronic trip circuit breakers do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

The same considerations are appropriate for molded case switches and motor circuit protectors.

[Table 120](#) shows the maximum current to prevent terminal overheating.

Table 120 - Maximum Operating Current above 40 °C (104 °F)—M-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	600	528	456	378	I_n [A]	630	630	598.5	567
	800 ⁽¹⁾	704 ⁽¹⁾	608 ⁽¹⁾	504 ⁽¹⁾		800 ⁽¹⁾	800 ⁽¹⁾	760 ⁽¹⁾	720 ⁽¹⁾

(1) Molded case switch rated current

140G N/NS-Frame Electronic Trip Circuit Breakers, Molded Case Switches, and Motor Circuit Protectors

The N/NS frame electronic trip circuit breakers do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum current to prevent terminal overheating.

The same considerations are appropriate for molded case switches and motor circuit protectors.

[Table 121](#) shows the maximum current to prevent terminal overheating.

Table 121 - Maximum Operating Current above 40 °C (104 °F)—N/NS-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	1200 ⁽¹⁾	1056 ⁽¹⁾	815 ⁽¹⁾	756 ⁽¹⁾	I_n [A]	1250 ⁽¹⁾	1250 ⁽¹⁾	1118 ⁽¹⁾	980 ⁽¹⁾

(1) Molded case switch rated current

140G R-Frame Electronic Trip Circuit Breakers and Molded Case Switches

The R frame electronic trip circuit breakers do not undergo tripping variations based on ambient temperature. However, even though ambient temperature does not affect the tripping characteristic, for temperatures exceeding +40 °C it is advisable to reduce the maximum setting for external thermal protection against overloads per the following.

The same considerations are appropriate for molded case switches, except instead of a current adjustment, the table should be used to reflect the maximum current at the specific temperature.

[Table 122](#) shows the maximum adjustment at which the threshold I_1 of the overcurrent protection (L) must be set according to the ambient temperature.

Table 122 - Maximum Operating Current above 40 °C (104 °F)—R-Frame Devices

North American (UL) Ratings					IEC Ratings				
	40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)		40 °C (104 °F)	50 °C (122 °F)	60 °C (140 °F)	70 °C (158 °F)
I_n [A]	2000	1760	1520	1260	I_n [A]	2000	2000	1826	1633
	2500 ⁽¹⁾	2200 ⁽¹⁾	1900 ⁽¹⁾	1575 ⁽¹⁾		2500 ⁽¹⁾	2500 ⁽¹⁾	2283 ⁽¹⁾	2042 ⁽¹⁾
	3000	2640	2280	1890					

(1) Molded case switch rated current

Watt Loss

140G G-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Thermal Magnetic	15	4.0	5.3
		16	4.5	
		20	5.4	
		25	6.0	
		30	5.5	
		32	6.3	
		35	6.0	
		40	7.8	
		45	9.0	
		50	11.1	
		60	11.7	
		63	12.9	
		70	11.0	
		80	14.4	
		90	17.0	
		100	21.0	
		110	24.9	
		125	32.1	
		160 ⁽¹⁾	45.0	
	Molded Case Switch	25	1.2	
		50	4.9	
		75	11.1	
		100	19.8	
		125	30.9	

(1) IEC only

140MG G-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	3	4.2
	7	9.9
	15	3.3
	30	6.9
	50	9.3
	70	15.9
	80	15.9
	100	19.8
	125	30.9

140G H-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Thermal Magnetic	15	3.4	4.6
		16	3.9	5.2
		20	4.8	6.4
		25	5.4	7.2
		30	6.9	9.1
		32	7.8	10.4
		35	8.5	11.3
		40	11.1	14.8
		50	12.3	16.4
		60	13.3	17.4
		63	14.4	19.2
		70	13.3	17.8
		80	17.4	23.2
		90	19.7	26.2
		100	24.3	32.4
		110	26.5	35.3
		125	34.2	45.6
		160 ⁽¹⁾	48.5	64.6
	Electronic	10	0.3	0.4
		25	2.4	3.2
		60	4.5	6.0
		100	12.6	16.8
		125	19.8	26.4
	Molded Case Switch	25	0.8	1.1
		50	3.2	4.2
		75	7.1	9.5
		100	12.7	16.9
		125	19.8	26.4

(1) IEC only

140MG H-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	3	11.1
	7	27.9
	15	19.2
	30	11.4
	50	15
	70	16.5
	80	20.4
	100	24.3
	125	42

140G I-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Thermal Magnetic	60	11.7	15.6
		63	12.9	17.2
		70	11.0	14.7
		80	14.4	19.2
		90	13.6	18.1
		100	16.8	22.4
		110	17.4	23.2
		125	19.8	26.4
		150	20.8	27.8
		160	23.7	31.6
		175	30.3	40.4
		200	39.6	52.8
		225	43.2	57.6
	Molded Case Switch	25	0.5	0.7
		50	2.1	2.8
		75	4.8	6.4
		100	8.5	11.4
		125	13.3	17.8
		150	19.2	25.6
		175	26.1	34.8
		200	34.1	45.5
		225	43.2	57.6

140MG I-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	100	13.5
	110	9.9
	125	12.3
	150	19.5

140G J-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Thermal Magnetic	25	8.1	10.7
		30	11.6	15.5
		32	13.2	17.6
		35	13.2	17.6
		40	13.5	18.0
		50	14.1	18.8
		60	14.4	19.2
		63	15.9	21.2
		70	16.2	21.6
		80	16.5	22.0
		90	18.0	24.0
		100	18.6	24.8
		110	20.1	26.8
		125	22.2	29.6
		150	23.5	31.3
		160	26.7	35.6
		175	27.3	36.4
		200	35.7	47.6
		225	39.9	53.1
		250	49.2	65.6
	Electronic	40	1.8	2.4
		60	3.8	5.1
		63	4.2	5.6
		100	10.5	14.0
		150	23.5	31.4
	Molded Case Switch	225	53.0	70.6
		250	65.4	87.2
		25	0.7	0.9
		50	2.6	3.5
		75	5.9	7.8
		100	10.5	14.0
		125	16.4	21.8
		150	23.5	31.4
		175	32.0	42.7
		200	41.9	55.8
		225	53.0	70.6
		250	65.4	87.2

140MG J-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	150	23.4
	175	27.3
	200	35.7
	225	39.9
	250	49.2

140G K-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Thermal Magnetic	300	40.8	54.4
		400	58.5	78.0
	Molded Case Switch	300	31.8	42.4
		400	49.5	66.0

140MG K-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	300	31.8
	400	49.5

140G M-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Thermal Magnetic	600	90.0	120.0
		630 ⁽¹⁾	91.8	122.4
		800	93.0	124.0
	Molded Case Switch	600	86.4	115.2
		630 ⁽¹⁾	90.0	120.0
		800	96.0	128.0

(1) IEC only

140MG M-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	600	86.4
	800	96.0

140G N/NS-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Electronic	1200	252.0	336.0
	Molded Case Switch	1200	252.0	336.0

140MG N-Frame Motor Circuit Protectors

	Rated Current I_n [A]	Watt Loss
	1200	252.0

140G R-Frame Circuit Breakers

	Type	Rated Current I_n [A]	Watt Loss	
			3 Poles	4 Poles
	Electronic	2000	138	184
		2500	219	292
		3000	351	468
	Molded Case Switch	2000	138	184
		2500	219	292
		3000	351	468

Accessory Specifications

Auxiliary Contacts

Application Ratings									Electrical Operating Ratings (Nominal Values)								
Order Code	Catalog Number	140G Family							Description	Electrical Specifications ⁽¹⁾							
		Frame								Rated Voltage U _e [V]	Wire Size		Wire Length	IEC Rating		UL Rating	
		G	H	I	J	K	M	N, NS			R	AWG		mm ²	Rated Operational Current (AC)		Rated Operational Current (DC)
AA	140G-G-EA1R1A	X	X	X	X	O	O	O	O	(1) Aux - Form C (1) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250 V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC	
	140G-K-EA1R1A	O	O	O	O	X	X	O	O	(1) Aux - Form C (1) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 6 A @ 250V AC	
AB	140G-H-EA1R1ZB	O	X	O	X	O	O	O	O	(1) Aux - Form C (1) AL - Form C	400V	17	1	1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	10 A @ 125V AC 10 A @ 250V AC
	140G-K-EA1R1B	O	O	O	O	X	X	O	O	(1) Aux - Form C (1) AL - Form C	400V	17	1	1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	12 A @ 125V AC 12 A @ 250V AC
	140G-N-EA1R1B	O	O	O	O	O	O	X (N only)	O	(1) Aux - Form C (1) AL - Form C	400V	17	1	1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	12 A @ 125V AC 12 A @ 250V AC
AJ	140G-G-EA1R1J	X	X	X	X	O	O	O	O	(1) Aux - Form C (1) AL - Form C	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
	140G-N-EA1R1J	O	O	O	O	O	O	X (N only)	O	(1) Aux - Form C (1) AL - Form C	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
BA	140G-G-EA2R1A	X	X	X	X	O	O	O	O	(2) Aux - Form C (1) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC	
CA	140G-H-EA3R1A	O	X	X	X	O	O	O	O	(3) Aux - Form C (1) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC	
	140G-K-EA3R1A	O	O	O	O	X	X	O	O	(3) Aux - Form C (1) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 6 A @ 250V AC	
CJ	140G-H-EA3R1J	O	X	X	X	O	O	O	O	(3) Aux - Form C (1) AL - Form C	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
	140G-K-EA3R1J	O	O	O	O	X	X	O	O	(3) Aux - Form C (1) AL - Form C	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
DA	140G-H-EA1TA	O	X	O	X	O	O	O	O	(1) TU AL - Form C (Thermal)	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC	
DJ	140G-H-EA1TJ	O	X	O	X	O	O	O	O	(1) TU AL - Form C (Thermal)	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
FB	140G-H-EA2B	O	X	O	X	O	O	O	O	(2) Aux - Form C	400V	17	1	1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	12 A @ 125V AC 12 A @ 250V AC
	140G-K-EA2B	O	O	O	O	X	X	O	O	(2) Aux - Form C	400V	17	1	1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	10 A @ 125V AC 10 A @ 250V AC
KA	140G-G-EA1A	X	X	X	X	O	O	O	O	(1) Aux - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC	
TA	140G-G-EA1AU	X	X	X	X	O	O	O	O	(1) Aux - Form C or (1) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾ 0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	—	
—	140G-G-EA1J	X	X	X	X	O	O	O	O	(1) Aux - Form C or (1) AL - Form C	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes

(1) Contacts are wired with 600 V (UL/CSA) insulated wire. No voltage derating of circuit breaker required.

(2) See [Table 123 on page 123](#) for expanded description of the voltage ratings.

Application Ratings										Electrical Operating Ratings (Nominal Values)							
Order Code	Catalog Number	140G Family								Description	Rated Voltage U _e [V]	Electrical Specifications ⁽¹⁾					
		Frame										Wire Size		Wire Length	IEC Rating		UL Rating
		G	H	I	J	K	M	N, NS	R			AWG	mm ²		Rated Operational Current (AC)	Rated Operational Current (DC)	
—	140G-H-EA2R2TA	0	X	0	X	0	0	0	0	(2) Aux - Form C (2) AL - Form C (Thermal)	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾	0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC
—	140G-H-EA3R2A	0	X	0	X	0	0	0	0	(3) Aux - Form C (2) AL - Form C	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾	0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	5 A @ 125V AC 3 A @ 250V AC
—	140G-N-EA1TA	0	0	0	0	0	0	X	0	(1) AL - Form C (Thermal)	250V	20	0.5	1 m (39 in.)	6 A @ 250V AC ⁽²⁾	0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	—
—	140G-N-EA2B	0	0	0	0	0	0	X	0	(2) Aux - Form C	400V	17	1	1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	12 A @ 125V AC 12 A @ 250V AC
—	140G-N-EA2J	0	0	0	0	0	0	X	0	(2) Aux - Form C	24V	20	0.5	1 m (39 in.)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
—	140G-R-EA1TA	0	0	0	0	0	0	0	X	(1) AL - Form C (Thermal)	250V	(3)	(3)	(3)	6 A @ 250V AC ⁽²⁾	0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	—
—	140G-R-EA4A	0	0	0	0	0	0	0	X	(4) Aux - Form C	400V	(3)	(3)	(3)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	15 A @ 125V AC 15 A @ 250V AC
—	140G-R-EA4J	0	0	0	0	0	0	0	X	(4) Aux - Form C	24V	(3)	(3)	(3)	—	Max. — 0.1 A @ 24V DC Min. — 0.01 A @ 5V DC min.	Yes
—	140G-G-EAB1B	X	X	X	X	0	0	0	0	Quantity 2 Each (1) N.C. Early Break	400 V	17	1	1 m (39 in.) 1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	12 A @ 125V AC 12 A @ 250V AC
—	140G-G-EAM1B	X	X	X	X	0	0	0	0	Quantity 2 Each (1) N.O. Early Make	400 V	17	1	1 m (39 in.) 1 m (39 in.)	12 A @ 250V AC 3 A @ 400V AC	0.5 A @ 125V DC 0.3 A @ 250V DC	12 A @ 125V AC 12 A @ 250V AC
—	140G-K-EAM1A	—				X	0	0	0	Quantity 2 Each (1) N.O. Early Make	250V	20	0.5	1 m (39 in.) 1 m (39 in.)	6 A @ 250V AC ⁽²⁾	0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	—
—	140G-M-EAM1A	—				0	X	0	0	Quantity 2 Each (1) N.O. Early Make	250V	20	0.5	1 m (39 in.) 1 m (39 in.)	6 A @ 250V AC ⁽²⁾	0.5 A @ 110V DC 0.3 A @ 250V DC (min. 0.03 A DC)	—

(1) Contacts are wired with 600 V (UL/CSA) insulated wire. No voltage derating of circuit breaker required.

(2) See [Table 123 on page 123](#) for expanded description of the voltage ratings

(3) Contact your local Rockwell Automation sales office or Allen-Bradley distributor.

(4) For use with 140G-G-RMB, -RMY, -RMX 140G-H-RMB, -RMY, RMX handle mechanisms.

(5) For use with 140G-K-RMB, -RMY, -RMX handle mechanisms.

Table 123 - 250 V AC/DC Expanded Description

250 V AC/DC Expanded Description			
Voltage	Class of use	AC	DC
110V DC	DC-12	—	0.5 A
	DC-14	—	0.05 A
125V AC/DC	AC-12, AC-13, AC-14	6 A	—
250V AC/DC	AC-15	5 A	—
	AC-12 and DC-12	6 A	0.3 A
	AC-13	6 A	—
	AC-14, DC-14	5 A	0.03 A
	AC-15	4 A	—

Shunt Trip Devices

All shunt trip devices are wired with 600V (UL/CSA) insulated wire. No voltage derating is required.

Application Ratings				Electrical Operating Ratings (Nominal Values)						
140G Frames G, H, I, J										
Order Code	Catalog Number	Rated Voltage U _e [V]	Wire Length (Size)	Shunt Open Release	Operation Voltage [V]		Inrush Power Consumption		Opening Time [ms]	
					Min.	Max.	AC [VA]	DC [W]		
—	140G-G-SNR	12V DC	1 m (0.5 mm ² /20 AWG)		8.4	13.2	—	50	≤ 15	
SJ	140G-G-SNJ	24...30V AC/DC	1 m (0.5 mm ² /20 AWG)		16.8	33	50	50		
SK	140G-G-SNKY	48...60V AC/DC	1 m (0.5 mm ² /20 AWG)		33.6	66	60	60		
SD	140G-G-SND	110...127V AC 110...125V DC	1 m (0.5 mm ² /20 AWG)		77	139 AC 137 DC	50	50		
SA	140G-G-SNA	220...240V AC 220...250V DC	1 m (0.5 mm ² /20 AWG)		154	278 AC 274 DC	50	50		
SB	140G-G-SNB	380...440V AC	1 m (1 mm ² /17 AWG)		266	484	55	—		
SC	140G-G-SNC	480...525V AC	1 m (1 mm ² /17 AWG)		336	577	55	—		
140G Frames K, M										
—	140G-K-SNR	12V DC	1 m (0.5 mm ² /20 AWG)	Shunt Open Release	8.4	13.2	—	50	≤ 15	
SJ	140G-K-SNJ	24...30V AC/DC	1 m (0.5 mm ² /20 AWG)		16.8	33	50	50		
SK	140G-K-SNKY	48...60V AC/DC	1 m (0.5 mm ² /20 AWG)		33.6	66	60	60		
SD	140G-K-SND	110...127V AC 110...125V DC	1 m (0.5 mm ² /20 AWG)		77	139 AC 137 DC	50	50		
SA	140G-K-SNA	220...240V AC 220...250V DC	1 m (0.5 mm ² /20 AWG)		154	278 AC 274 DC	50	50		
SB	140G-K-SNB	380...440V AC	1 m (1 mm ² /17 AWG)		266	484	55	—		
SC	140G-K-SNC	480...525V AC	1 m (1 mm ² /17 AWG)		336	577	55	—		
Application Ratings				Electrical Operating Ratings (Nominal Values)						
140G Frames N, NS										
Order Code	Catalog Number	Rated Voltage U _e [V]	Wire Length (Size)	Shunt Open Release	Operation Voltage [V]		Inrush Power Consumption		Opening Time [ms]	
					Min.	Max.	AC [VA]	DC [W]		
SJ	140G-N-SNJ	24V AC/DC	1 m (0.5 mm ² /20 AWG)		16.8	26.4	—	300	≤ 20	
SK	140G-N-SNKY	48V AC/DC	1 m (0.5 mm ² /20 AWG)		33.6	52.8	300	300		
SD	140G-N-SND	110...120V AC/DC	1 m (0.5 mm ² /20 AWG)		77	132	300	300		
SA	140G-N-SNA	220...240V AC/DC	1 m (0.5 mm ² /20 AWG)		154	264	300	300		
SB	140G-N-SNB	380...400V AC	1 m (1 mm ² /17 AWG)		266	440	300	—		
RJ	140G-NS-SNCJ	24V AC/DC	1 m (0.5 mm ² /20 AWG)		Shunt Close Release	20.4	26.4	300	300	≤ 80
RK	140G-NS-SNCKY	48V AC/DC	1 m (0.5 mm ² /20 AWG)			40.8	52.8	300	300	
RD	140G-NS-SNCD	110...120V AC/DC	1 m (0.5 mm ² /20 AWG)	93.5		126.5	300	300		
RA	140G-NS-SNCA	220...240V AC/DC	1 m (0.5 mm ² /20 AWG)	187		196.5	300	300		
RB	140G-NS-SNCB	380...400V AC	1 m (1 mm ² /17 AWG)	323		440	300	—		
140G Frame R										
SJ	140G-R-SNJ	24V AC/DC	1 m (0.5 mm ² /20 AWG)	Shunt Open Release	16.8	26.4	—	200	≤ 60	
SK	140G-R-SNKY	48V AC/DC	1 m (0.5 mm ² /20 AWG)		33.6	52.8	200	200		
SD	140G-R-SND	110...120V AC/DC	1 m (0.5 mm ² /20 AWG)		77	132	200	200		
SA	140G-R-SNA	220...240V AC/DC	1 m (0.5 mm ² /20 AWG)		154	264	200	200		
SB	140G-R-SNB	380...400V AC/DC	1 m (1 mm ² /17 AWG)		266	440	200	—		
RJ	140G-R-SNCJ	24V AC/DC	1 m (0.5 mm ² /20 AWG)	Shunt Close Release	20.4	26.4	—	200	≤ 80	
RK	140G-R-SNCKY	48V AC/DC	1 m (0.5 mm ² /20 AWG)		40.8	52.8	200	200		
RD	140G-R-SNCD	110...120V AC/DC	1 m (0.5 mm ² /20 AWG)		93.5	126.5	200	200		
RA	140G-R-SNCA	220...240V AC/DC	1 m (0.5 mm ² /20 AWG)		187	196.5	200	200		
RB	140G-R-SNCB	380...400V AC/DC	1 m (1 mm ² /17 AWG)		323	440	200	—		

Undervoltage Release Devices

All undervoltage release devices are wired with 600V (UL/CSA) insulated wire. No voltage derating is required.

Application Ratings				Electrical Operating Ratings (Nominal Values)					
140G Frames G, H, I, J									
Order Code	Catalog Number	Rated Voltage U _e [V]	Wire Length (Size)	Electrical Specifications					Opening Time [ms]
				Dropout Voltage [V]		Pickup Voltage Max. [V]	UVR Power Absorbed During Normal Operation		
				Min.	Max.		AC [VA]	DC [W]	
UJ	140G-G-UVJ	24...30V AC/DC	1 m (0.5 mm ² /20 AWG)	8.4	21	25.5	1.5	1.5	≤ 15
UR	140G-G-UVR	48V AC/DC	1 m (0.5 mm ² /20 AWG)	16.8	33.6	40.8	1	1	
—	140G-G-UVKY	60V AC/DC	1 m (0.5 mm ² /20 AWG)	21	42	51	1	1	
UD	140G-G-UVD	110...127V AC 110...125V DC	1 m (0.5 mm ² /20 AWG)	38.5	88.9 AC 87.5 DC	108 AC 106 DC	2	2	
UA	140G-G-UVA	220...240V AC 220...250V DC	1 m (0.5 mm ² /20 AWG)	77	154 AC 175 DC	208 AC 212.5 DC	2.5	2.5	
UB	140G-G-UVB	380...440V AC	1 m (1 mm ² /17 AWG)	133	308	374	3	—	
UC	140G-G-UVC	480...525V AC	1 m (1 mm ² /17 AWG)	168	367.5	446	4	—	
140G Frames K, M									
UJ	140G-K-UVJ	24...30V AC/DC	1 m (0.5 mm ² /20 AWG)	8.4	21	25.5	1.5	1.5	≤ 25
UR	140G-K-UVR	48V AC/DC	1 m (0.5 mm ² /20 AWG)	16.8	33.6	40.8	1	1	
—	140G-K-UVKY	60V AC/DC	1 m (0.5 mm ² /20 AWG)	21	42	51	1	1	
UD	140G-K-UVD	110...127V AC 110...125V DC	1 m (0.5 mm ² /20 AWG)	38.5	88.9 AC 87.5 DC	108 AC 106 DC	2	2	
UA	140G-K-UVA	220...240V AC 220...250V DC	1 m (0.5 mm ² /20 AWG)	77	154 AC 175 DC	208 AC 212.5 DC	2.5	2.5	
UB	140G-K-UVB	380...440V AC	1 m (1 mm ² /17 AWG)	133	308	374	3	—	
UC	140G-K-UVC	480...525V AC	1 m (1 mm ² /17 AWG)	168	367.5	446	4	—	
Application Ratings				Electrical Operating Ratings (Nominal Values)					
140G Frames N, NS									
Order Code	Catalog Number	Rated Voltage U _e [V]	Wire Length (Size)	Electrical Specifications					Opening Time [ms]
				Dropout Voltage [V]		Pickup Voltage Max. [V]	UVR Power Absorbed During Normal Operation		
				Min.	Max.		AC [VA]	DC [W]	
UJ	140G-N-UVJ	24V AC/DC	1 m (0.5 mm ² /20 AWG)	8.4	21	25.5	—	5	≤ 20
—	140G-N-UVKY	60V AC/DC	1 m (0.5 mm ² /20 AWG)	21	42	51	5	5	
UD	140G-N-UVD	110...120V AC/DC	1 m (0.5 mm ² /20 AWG)	38.5	88.9 AC 87.5 DC	108 AC 106 DC	5	5	
UA	140G-N-UVA	220...240V AC/DC	1 m (0.5 mm ² /20 AWG)	77	154 AC 175 DC	208 AC 212.5 DC	5	5	
UB	140G-N-UVB	380...400V AC	1 m (1 mm ² /17 AWG)	133	308	374	5	—	
UC	140G-N-UVC	415...440V AC	1 m (1 mm ² /17 AWG)	168	367.5	446	5	—	
140G Frame R									
UJ	140G-R-UVJ	24V AC/DC	1 m (0.5 mm ² /20 AWG)	8.4	21	25.5	—	5	≤ 30
—	140G-R-UVKY	60V AC/DC	1 m (0.5 mm ² /20 AWG)	21	42	51	5	5	
UD	140G-R-UVD	110...120V AC/DC	1 m (0.5 mm ² /20 AWG)	38.5	88.9 AC 87.5 DC	108 AC 106 DC	5	5	
UA	140G-R-UVA	220...240V AC/DC	1 m (0.5 mm ² /20 AWG)	77	154 AC 175 DC	208 AC 212.5 DC	5	5	
UB	140G-R-UVB	380...400V AC	1 m (1 mm ² /17 AWG)	133	308	374	5	—	
UC	140G-R-UVC	415...440V AC	1 m (0.5 mm ² /20 AWG)	168	367.5	446	5	—	

Motor Operators

All motor operators are wired with 600V (UL/CSA) insulated wire. No voltage derating is required.

Application Ratings						Application Specifications, Electrical Operating Ratings (Nominal Values)										
Catalog Number	Rated Voltage U _e [V]	140G Frame				Wire Length (Size)	Operating Voltage		Opening Time [s]	Closing Time [s]	Resetting Time [s]	Min. Control Impulse Time (opening and closing) [ms]	Inrush Power		UVR Power Absorbed During Normal Operation	
		G	H	I	J		Min. [V]	Max. [V]					AC [VA]	DC [W]	AC [VA]	DC [W]
140G-G-EOPJ	24 V DC	X	O	X	O	1 m (0.5 mm ² /20 AWG)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	—	(1)
140G-H-EOPJ		O	X	O	X		20.4	26.4	0.1	0.1	(1)	≥ 150	—	500	—	350
140G-G-EOPKY	48 . . . 60 V DC	X	O	X	O	1 m (0.5 mm ² /20 AWG)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	—	350
140G-H-EOPKY		O	X	O	X		40.8	66	0.1	0.1	(1)	≥ 150	—	500	—	350
140G-G-EOPD	110 . . . 125 V AC/DC	X	O	X	O	1 m (0.5 mm ² /20 AWG)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
140G-H-EOPD		O	X	O	X		106.3	137	0.1	0.1	(1)	≥ 150	500	500	350	350
140G-G-EOPA	220 . . . 250 V AC/DC	X	O	X	O	1 m (0.5 mm ² /20 AWG)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
140G-H-EOPA		O	X	O	X		212.6	275	0.1	0.1	(1)	≥ 150	500	500	350	350
140G-G-EOPB	380 . . . 440 V AC	X	O	X	O	1 m (1 mm ² /17 AWG)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	—	(1)	—
140G-H-EOPB		O	X	O	X		374	484	0.1	0.1	(1)	≥ 150	500	—	350	—
140G-G-EOPC	480 . . . 525 V AC	X	O	X	O	1 m (1 mm ² /17 AWG)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	—	(1)	—
140G-H-EOPC		O	X	O	X		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

(1) Contact your local Rockwell Automation sales office or Allen-Bradley distributor.

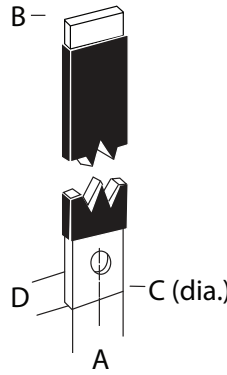
Application Ratings					Application Specifications, Electrical Operating Ratings (Nominal Values)									
Catalog Number	Rated Voltage U _e [V]	140G Frame		Wire Length (Size)	Operating Voltage		Opening Time [s]	Closing Time [s]	Resetting Time [s]	Min. Control Impulse Time (opening and closing) [ms]	Inrush Power		UVR Power Absorbed During Normal Operation	
		K	M		Min. [V]	Max. [V]					AC [VA]	DC [W]	AC [VA]	DC [W]
140G-K-EOPJ	24 V DC	X	O	1 m (0.5 mm ² /20 AWG)	20.4	26.4	1.5	< 0.1	3	≥ 100	—	300	—	150
140G-M-EOPJ		O	X	1 m (0.5 mm ² /20 AWG)	20.4	26.4	3	< 0.1	5	≥ 100	—	300	—	150
140G-K-EOPKY	48...60 V DC	X	O	1 m (0.5 mm ² /20 AWG)	40.8	66	1.5	< 0.1	3	≥ 100	—	300	—	150
140G-M-EOPKY		O	X	1 m (0.5 mm ² /20 AWG)	40.8	66	3	< 0.1	5	≥ 100	—	300	—	150
140G-K-EOPD	110...125 V AC/DC	X	O	1 m (0.5 mm ² /20 AWG)	106.3	137	1.5	< 0.1	3	≥ 100	300	300	150	150
140G-M-EOPD		O	X	1 m (0.5 mm ² /20 AWG)	106.3	137	3	< 0.1	5	≥ 100	300	300	150	150
140G-K-EOPA	220...250 V AC/DC	X	O	1 m (0.5 mm ² /20 AWG)	212.6	275	1.5	< 0.1	3	≥ 100	300	300	150	150
140G-M-EOPA		O	X	1 m (0.5 mm ² /20 AWG)	212.6	275	3	< 0.1	5	≥ 100	300	300	150	150
140G-K-EOPB	380 V AC	X	O	1 m (1 mm ² /17 AWG)	374	484	1.5	< 0.1	3	≥ 100	300	—	150	—
140G-M-EOPB		O	X	1 m (1 mm ² /17 AWG)	374	484	3	< 0.1	5	≥ 100	300	—	150	—

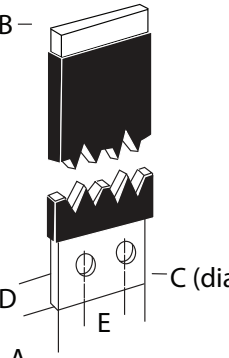
Application Ratings					Application Specifications, Electrical Operating Ratings (Nominal Values)				
Cat. No. Spring Charging Motor	Rated Voltage U _e [V]	140G Frame		Wire Length (Size)	Operating Voltage		Charging Time [s]	Inrush Power	
		N	NS		Min. [V]	Max. [V]		AC [VA]	DC [W]
140G-NS-SCMJ	24...30 V AC/DC	O	X	1 m (0.5 mm ² /20 AWG)	20.4	33	8 - 10	—	≤ 400
140G-NS-SCMKY	48...60 V AC/DC	O	X	1 m (0.5 mm ² /20 AWG)	40.8	66	8 - 10	≤ 400	≤ 400
140G-NS-SCMD	100...130 V AC/DC	O	X	1 m (0.5 mm ² /20 AWG)	106.3	143	8 - 10	≤ 400	≤ 400
140G-NS-SCMA	220...250 V AC/DC	O	X	1 m (0.5 mm ² /20 AWG)	212.6	275	8 - 10	—	≤ 400
140G-NS-SCMB	380...415 V AC	O	X	1 m (1 mm ² /17 AWG)	323	456	8 - 10	≤ 400	—

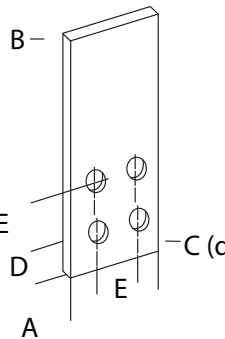
Application Ratings				Application Specifications, Electrical Operating Ratings (Nominal Values)					
Cat. No. Spring Charging Motor	Rated Voltage U _e [V]	140G Frame	Wire Length (Size)	Operating Voltage		Inrush Time [s]	Charging Time [s]	Inrush Power	
		R		Min. [V]	Max. [V]			AC [VA]	DC [W]
140G-R-SCMJ	24...30 V AC/DC	X	1 m (0.5 mm ² /20 AWG)	20.4	33	0.2	4 - 5	500	500
140G-R-SCMKY	48...60 V AC/DC	X		40.8	66	0.2	4 - 5	500	500
140G-R-SCMD	100...130 V AC/DC	X	1 m (0.5 mm ² /20 AWG)	106.3	143	0.2	4 - 5	500	500
140G-R-SCMA	220...250 V AC/DC	X		212.6	275	0.2	4 - 5	500	500

Busbar and Terminals

Busbar

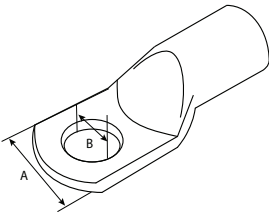
	140G Frame Size		Busbar Dimensions						Terminal Torque			Hex Tool Size
			Width (A)		Thickness (B)		Terminal Hole Diameter (C)	Hole Center (D)	Fastener	[lb·in.]	[N·m]	
			Min.	Max.	Min.	Max.						
G	[in.]	0.512	0.630	0.138	0.197	0.138	0.63	M6	53	6	M5	
	[mm]	13	16	3.5	5	6.5	7.5					
H	[in.]	0.512	0.787	0.098	0.197	0.138	0.63	M6	53	6	M5	
	[mm]	13	20	2.5	5	6.5	7.5					
I	[in.]	0.669	0.984	0.197	0.315	0.335	0.374	M8	71	8	M6	
	[mm]	17	25	5	8	8.5	9.5					
J	[in.]	0.669	0.984	0.197	0.315	0.335	0.3974	M8	71	8	M6	
	[mm]	17	25	5	8	8.5	9.5					
K	[in.]	1.38	1.38	0.19	5	0.41	0.43	M8	248	28	M8	
	[mm]	35	35	0.39	10	10.5	0.11					

	140G Frame Size		Busbar Dimensions						Terminal Torque			Hex Tool Size	
			Width (A)		Thickness (B)		Terminal Holes (two) Diameter (C)	Hole Center (D)	Distance Between Terminal Holes (E)	Fastener	[lb·in.]		[N·m]
			Min.	Min.	Max.								
	M	[in.]	1.57	0.19	0.39	0.25 (each)	0.47	0.88	(2) M6	80	9	M5	
		[mm]	50	5	10	6.5 (each)	12	22.5					
	N	[in.]	1.96	0.4	0.78	0.433	0.55	0.984	(2) M10	161	18	M5	
[mm]		50	10	20	11 (each)	14	25						

	140G-RFrame Size	Qty. Required		Busbar Dimensions					Terminal Torque			Wrench Size
				Width (A)	Thickness (B)	Terminal Holes (four) Diameter (C)	Hole Center (D)	Distance Between Terminal Holes (E)	Fastener	[lb·in.]	[N·m]	
	Front Busbar											
	2000 A	2	[in.]	4	0.25	0.59	0.79	1.57	Fasteners supplied by customer			
			[mm]	102	6.4	15	20	40				
	2500 A, 80%	2	[in.]	4	0.25	0.59	0.79	1.57				
			[mm]	102	6.4	15	20	40				
	Rear Busbar ⁽¹⁾											
	2000 A	2	[in.]	4	0.25	0.59	4.5	1.57	Fasteners supplied by customer			
			[mm]	102	6.4	15	114	40				
2500 A, 80%	2	[in.]	4	0.25	0.59	4.5	1.57					
		[mm]	102	6.4	15	114	40					
2500 A, 100%	4	[in.]	4	0.25	0.512	3.87	1.75	M12 Stud	615	70	19 mm	
		[mm]	102	6.4	13	98	44.45					
3000 A, 80%	4	[in.]	4	0.25	0.512	3.87	1.75	M12 Stud	615	70	19 mm	
		[mm]	102	6.4	13	98	44.45					
3000 A, 100%	4	[in.]	4	0.25	0.512	3.87	1.75	M12 Stud	615	70	19 mm	
		[mm]	102	6.4	13	98	44.45					

(1) Always use two wrenches (to avoid straining the insulating parts of the breaker), and apply the tightening torque of the terminals using high-strength fasteners. Check tightness after 24 hours.

Cable (Ring) Terminals

	140G Frame Size		Cable (Ring) Terminal Dimensions		No. of Cables	Cable (Ring) Terminal Torque			Fastener Terminal Tool				
			Width (A)	Terminal Hole Diameter (B)		Fastener	[lb-in.]	[N-m]					
	G	[in.]	0.630	0.25	1	M6	53	6	CH5				
		[mm]	16	6.5									
	H	[in.]	0.787	0.25	1					M8	71	8	CH6
		[mm]	20	6.5									
	I	[in.]	0.984	0.335	1	M8	71	8	CH6				
		[mm]	25	8.5									
	J	[in.]	0.984	0.335	1					M8	71	8	CH6
		[mm]	25	8.5									
	K	[in.]	1.38	0.41	1	M8	248	28	CH8				
		[mm]	35	10.5									
	M	[in.]	See Extender/Spreader table										
		[mm]											
	N	[in.]											
		[mm]											

Trip and Let-through Current Curves

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Using Trip Curves

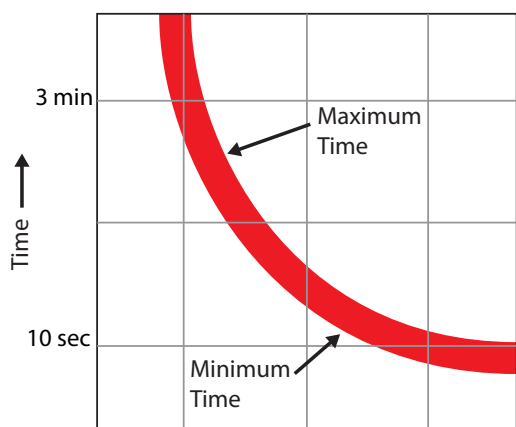
One of the most common questions asked after, “How is an MCCB properly sized?” is, “How do I interpret the trip curves?”

A logical starting point is to explain what the curve actually is. The curve is a representation of how the circuit breaker will react to overcurrents and short-circuit currents. The curve is determined by a specific set of test conditions, and as such, you should use the curve as a guideline; real-world deviations from the test criteria may alter the individual results as compared to the curve.

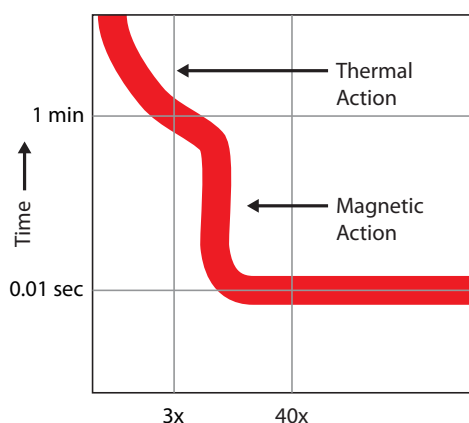
Trip Curve for a Thermal-Magnetic MCCB

The most commonly selected form of thermal protection is the bimetallic version. This works similarly to a traditional overload relay in which a bimetallic element is heated, causing a deflection, which then exerts pressure on a trip bar and causes the circuit breaker to trip.

Figure 16 - Example Bimetallic Trip Curve



Using the bimetallic model, we can provide a thermal protection curve as shown here

Figure 17 - Example Thermal-magnetic MCCB Trip Curve

Combining the short-circuit and overcurrent protection provides us with a protection curve that looks like this.

Trip Curve for an Electronic MCCB

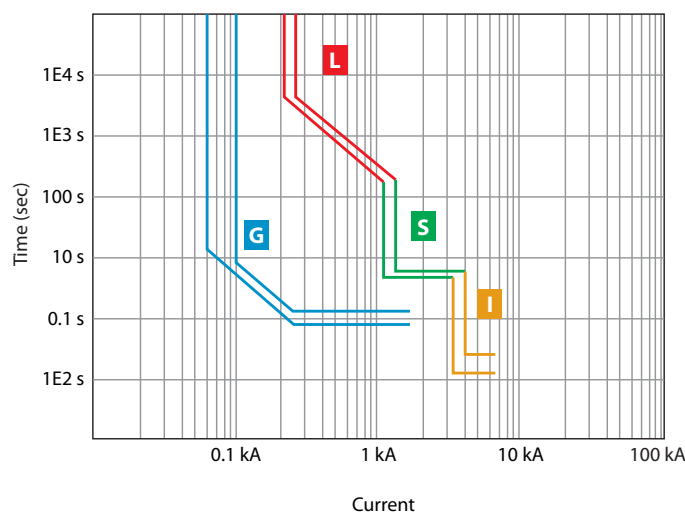
An alternative to using fixed-thermal protection is to use electronic overcurrent protection, which electronically replicates the function of the mechanical overcurrent device.

One of the benefits of using electronic trip units is their ability to tailor the tripping characteristics of the circuit breaker for the application.

The electronic trip unit has the ability to provide advanced protection in the form of additional trip functionality such as adjustable:

- Long Time – Allows the long time between 1.05 and $\sim 1.3 \times$ the thermal rating to be delayed, similar to how an adjustable relay changes classes
- Short Time – Adjustable short time between thermal and short-circuit
- Instantaneous Trip – Adjustable instantaneous short-circuit trip time
- Ground Fault – Adjustable time and value of ground fault tripping

[Figure 18](#) shows an example trip curve for electronic MCCBs.

Figure 18 - Example Electronic MCCB Trip Curve

L – Overcurrent protection long time delay
S – Short-circuit protection short time delay
I – Short-circuit protection instantaneous trip
G – Ground fault protection

Electronic trip units are available in a variety of trip settings. The most common combinations are LSI, LSIG and M-LIV trip settings; therefore a wide variety of options exist for customizing the protection the circuit breaker provides within the control panel.

Bulletin 140G Thermal-magnetic Molded Case Circuit Breakers

Time-Current Curves

Figure 19 - 140G-G Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 15...30 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

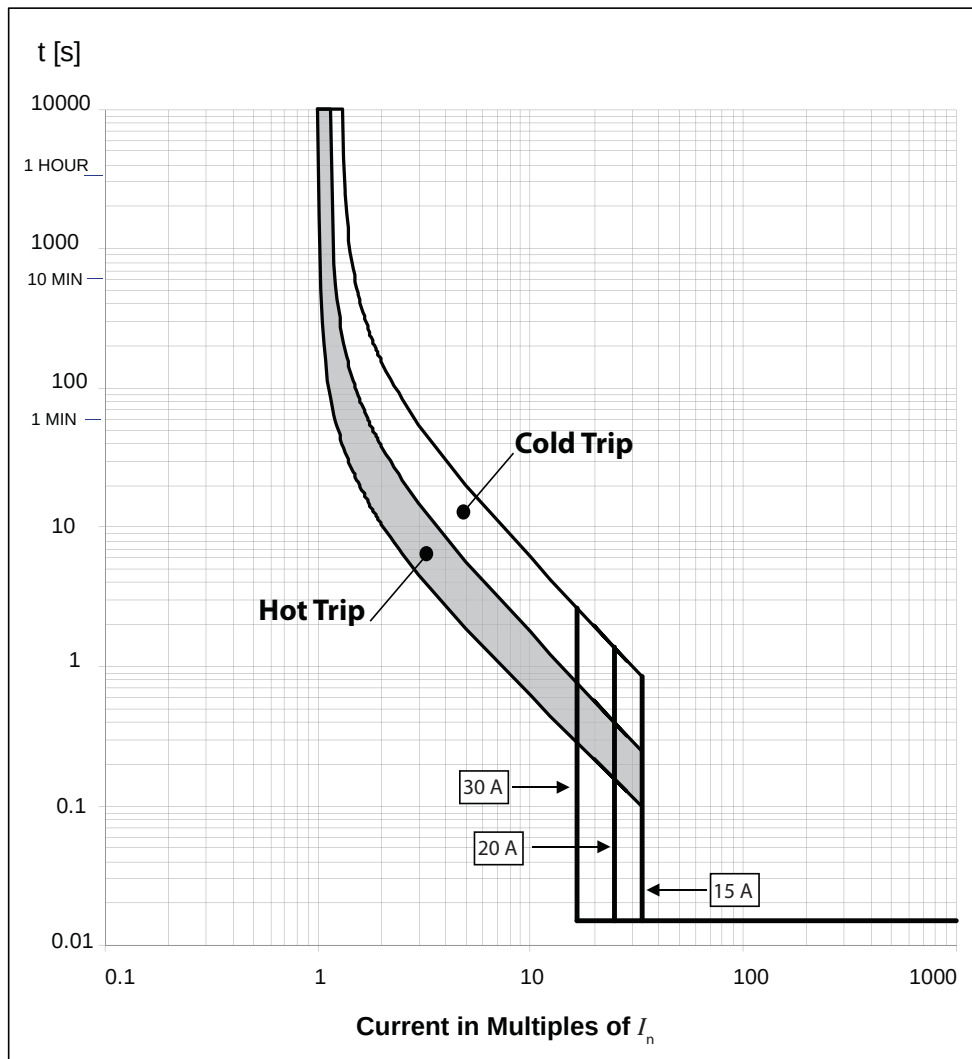


Table 124 - Current Ratings

Rated Current I_n [A]	Magnetic Trip I_m [A]
15...30	500

Figure 20 - 140G-G Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 32 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

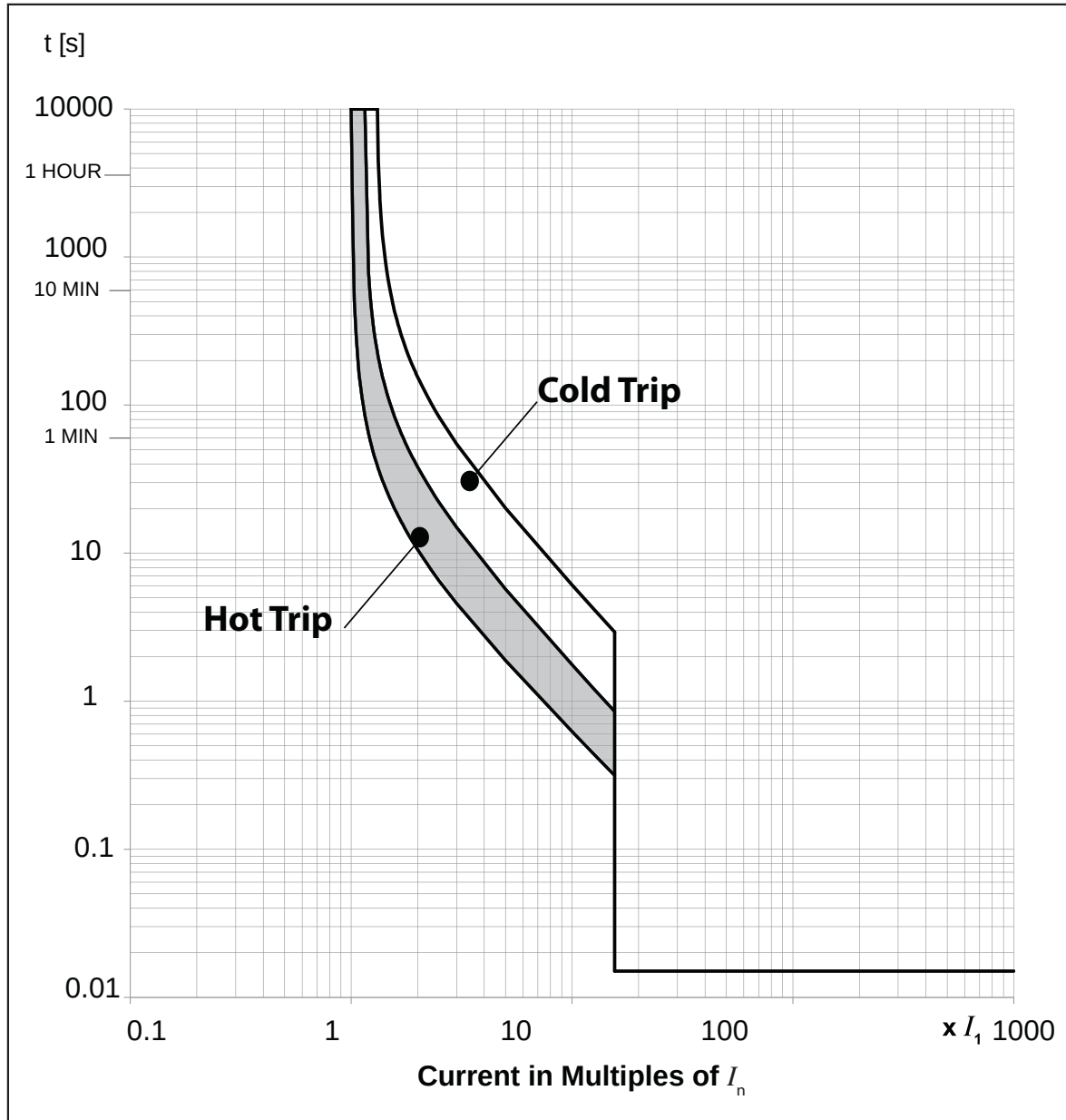
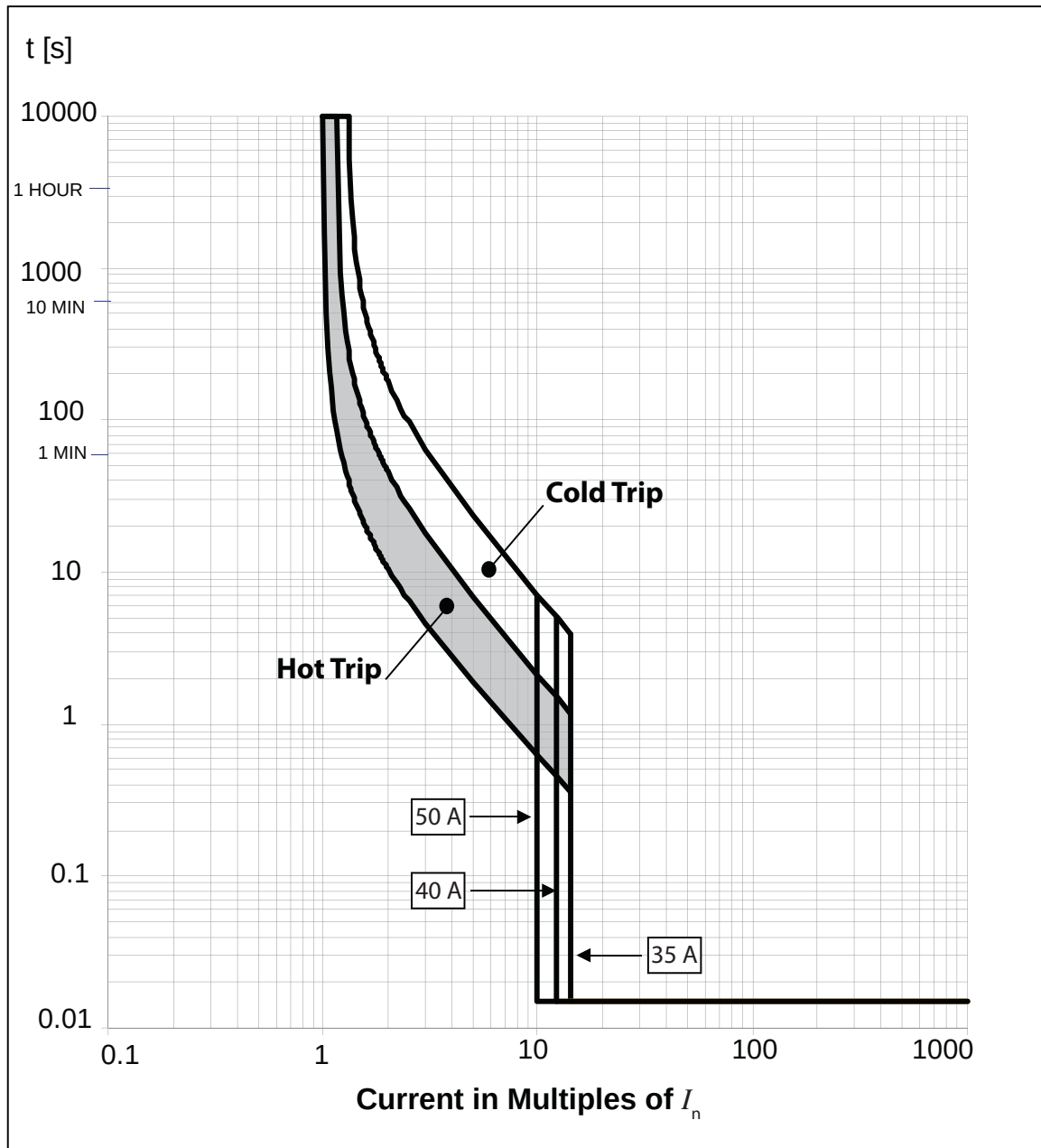


Figure 21 - 140G-G Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 35...50 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

**Table 125 - Current Ratings**

Rated Current I_n [A]	Magnetic Trip I_m [A]
35...50	500

Figure 22 - 140G-G Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 60...100 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

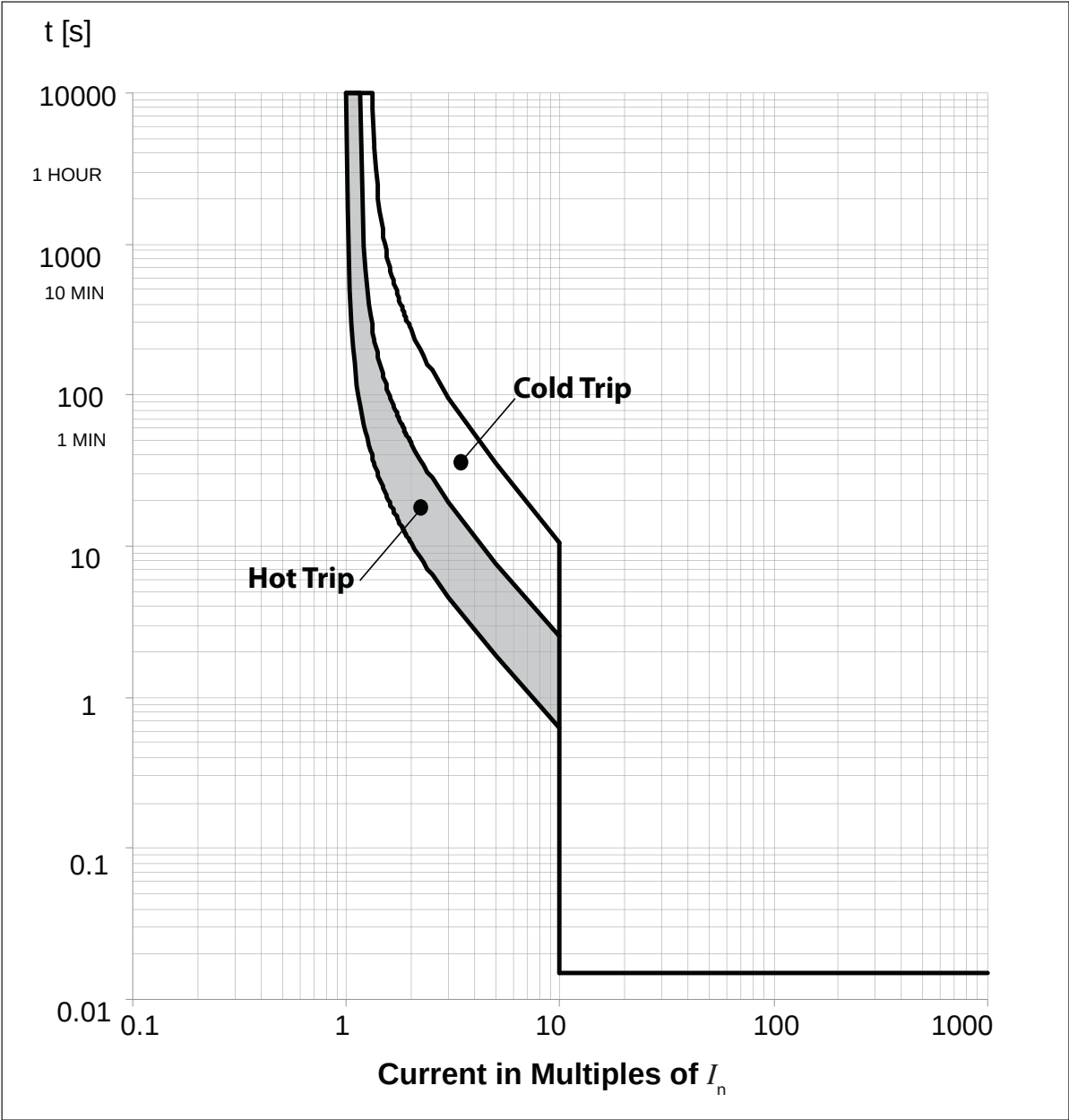


Table 126 - Current Ratings

Rated Current I_n [A]	Magnetic Trip I_m [A]
60	600
63	630
70	700
80	800
90	900
100	1000

Figure 23 - 140G-G Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 125 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

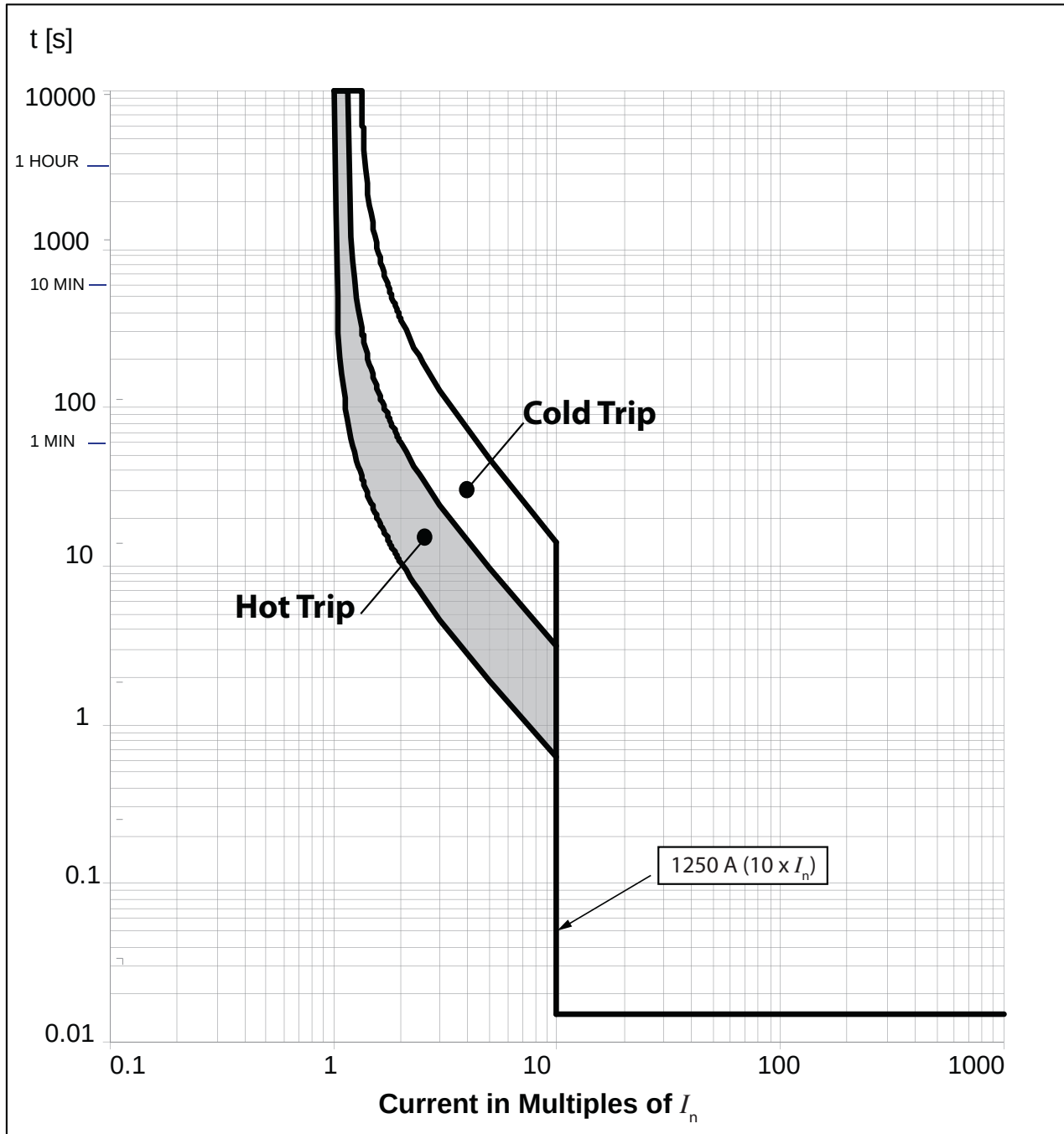


Figure 24 - 140G-G Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 160 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

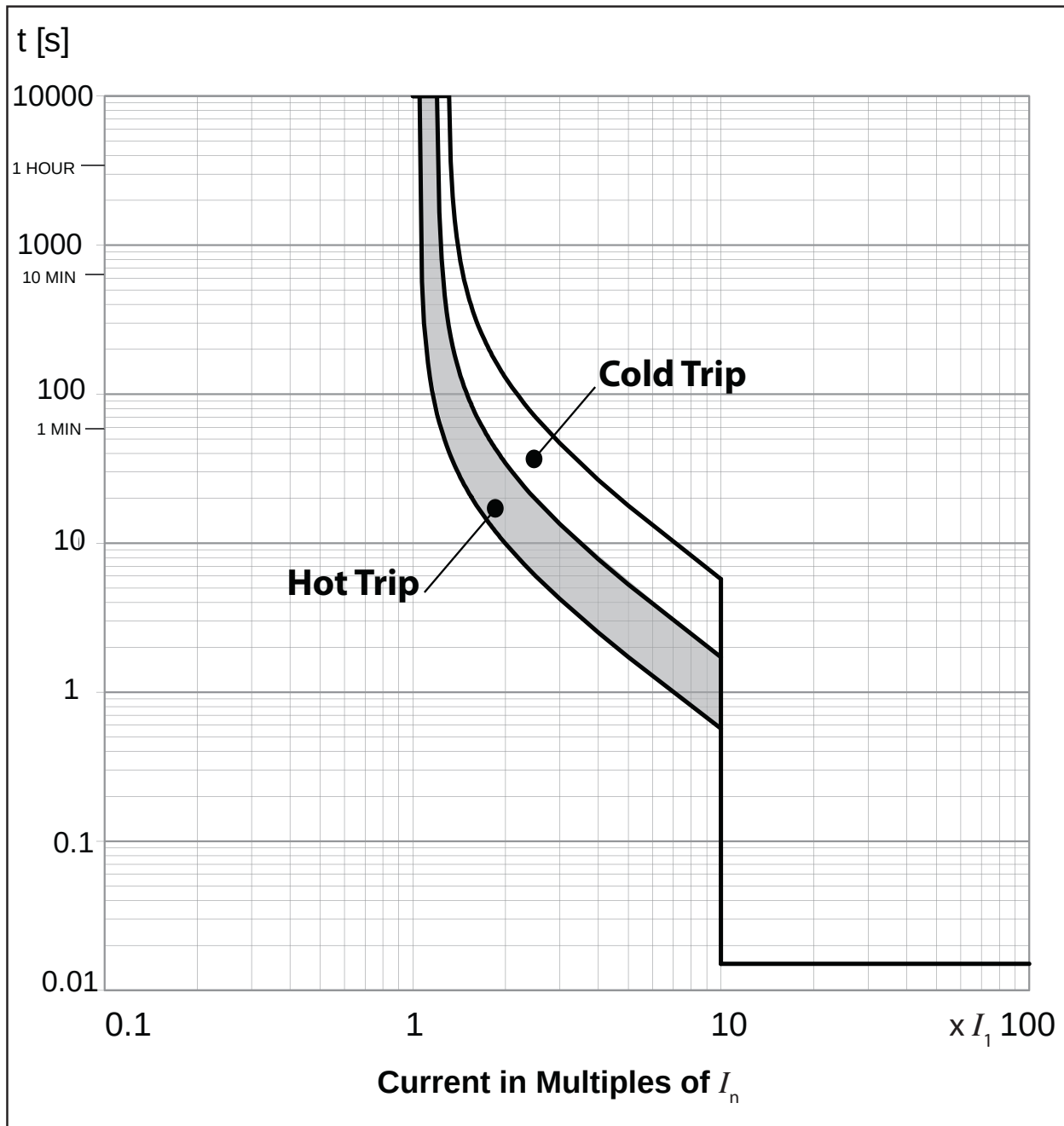
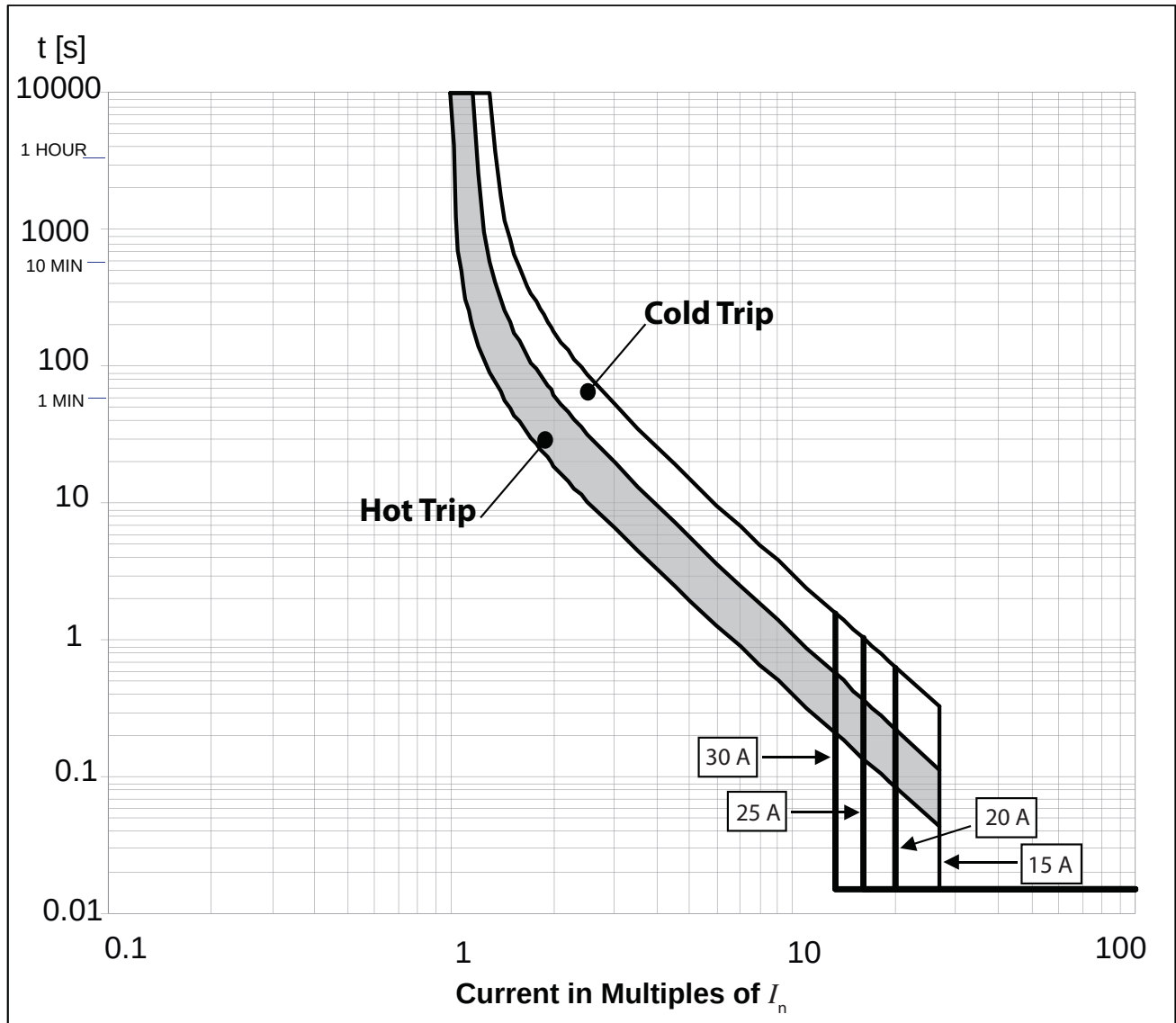


Figure 25 - 140G-H Time-Current Curve

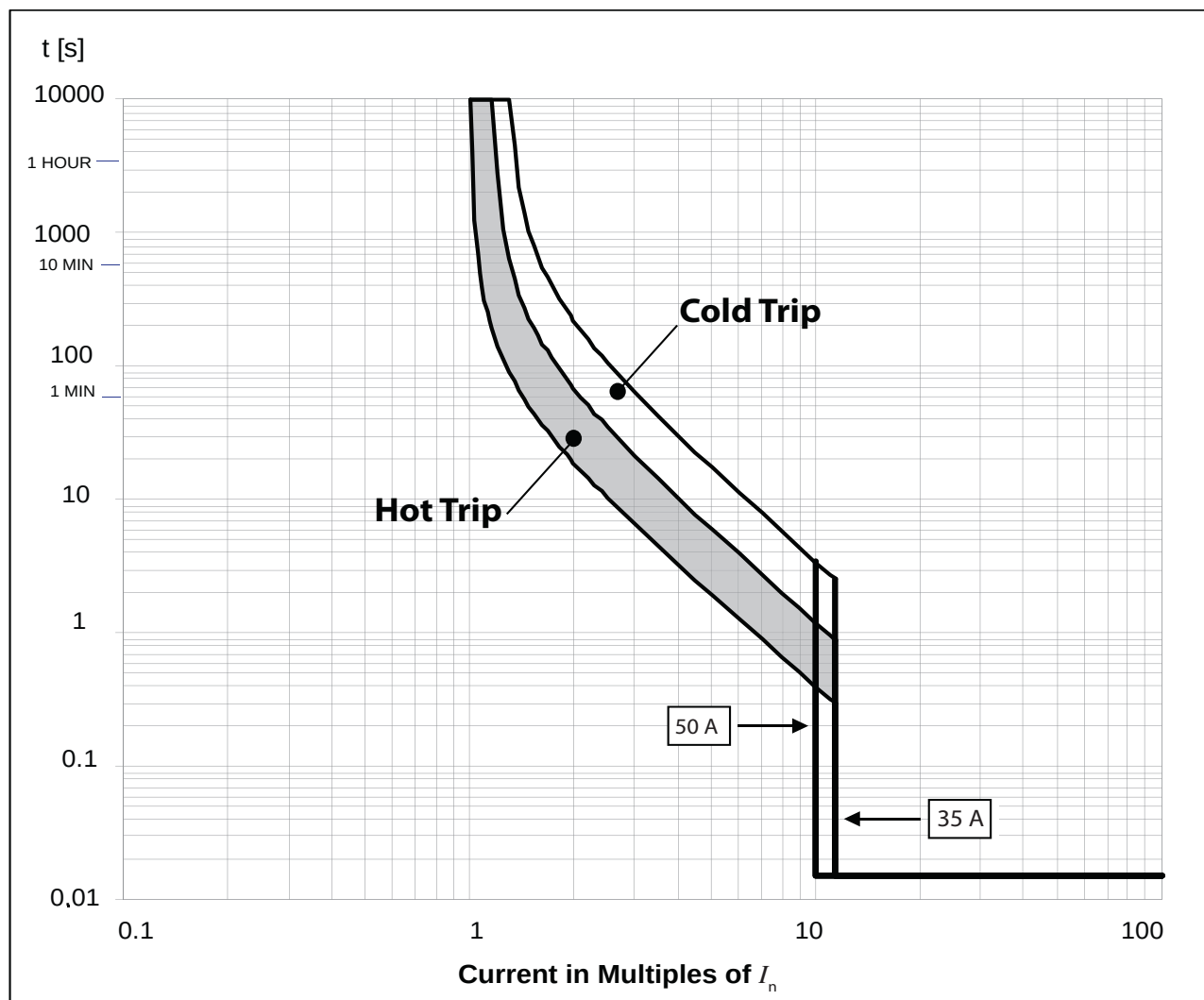
- Maximum voltage: 600V AC
- Maximum current: 15...30 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

**Table 127 - Current Ratings**

Rated Current I_n [A]	Magnetic Trip I_m [A]
15...30	400

Figure 26 - 140G-H Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 35...50 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

**Table 128 - Current Ratings**

Rated Current I_n [A]	Magnetic Trip I_m [A]
35	400
40	400
50	500

Figure 27 - 140G-H Time-Current Curve

- Maximum current: 32 A
- Instantaneous (magnetic) trip: 400 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

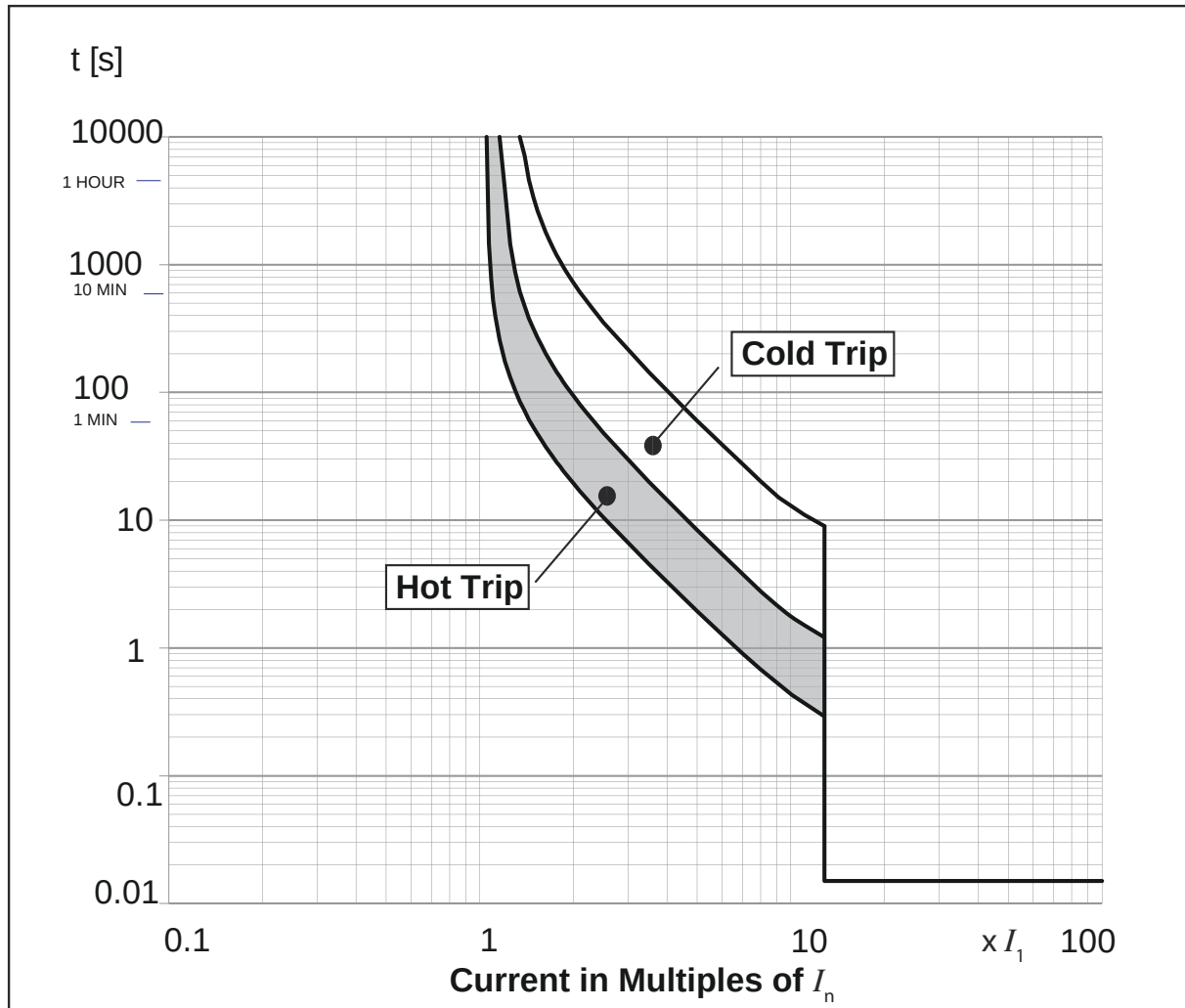
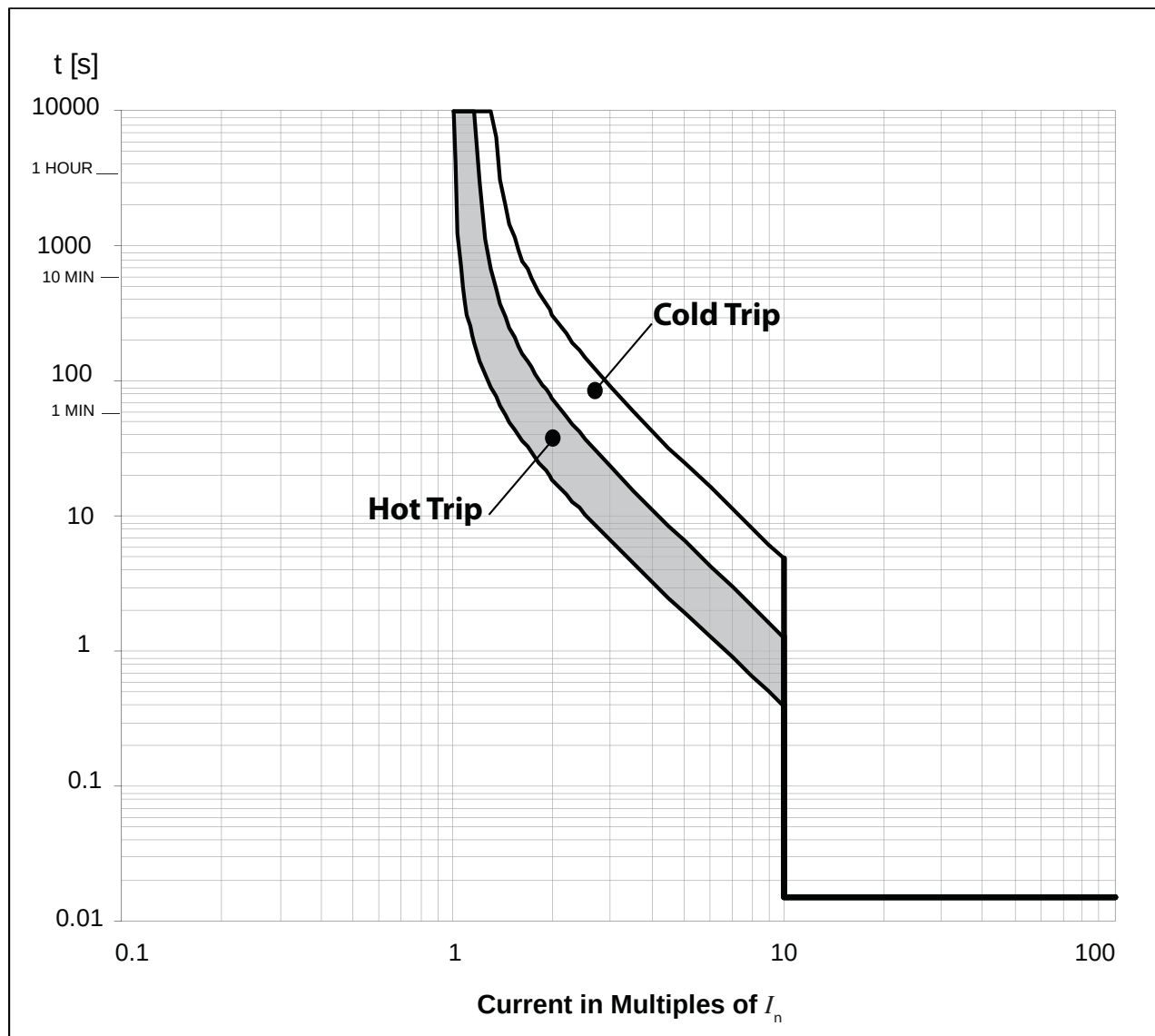


Figure 28 - 140G-H Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 60...70 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

**Table 129 - Current Ratings**

Rated Current I_n [A]	Magnetic Trip I_m [A]
60	600
63	630
70	700

Figure 29 - 140G-H Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 80...100 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

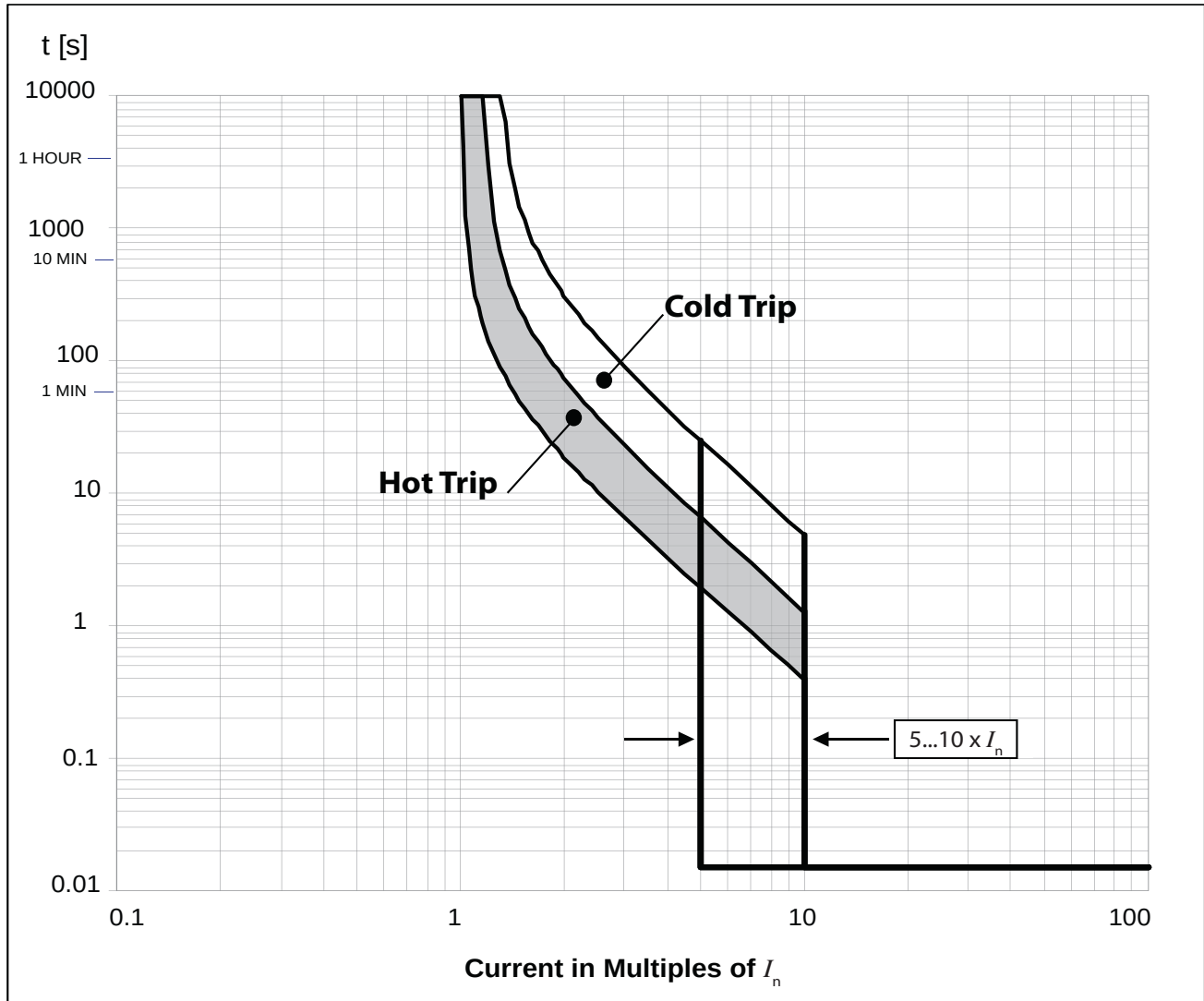


Figure 30 - 140G-H Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 110...125 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

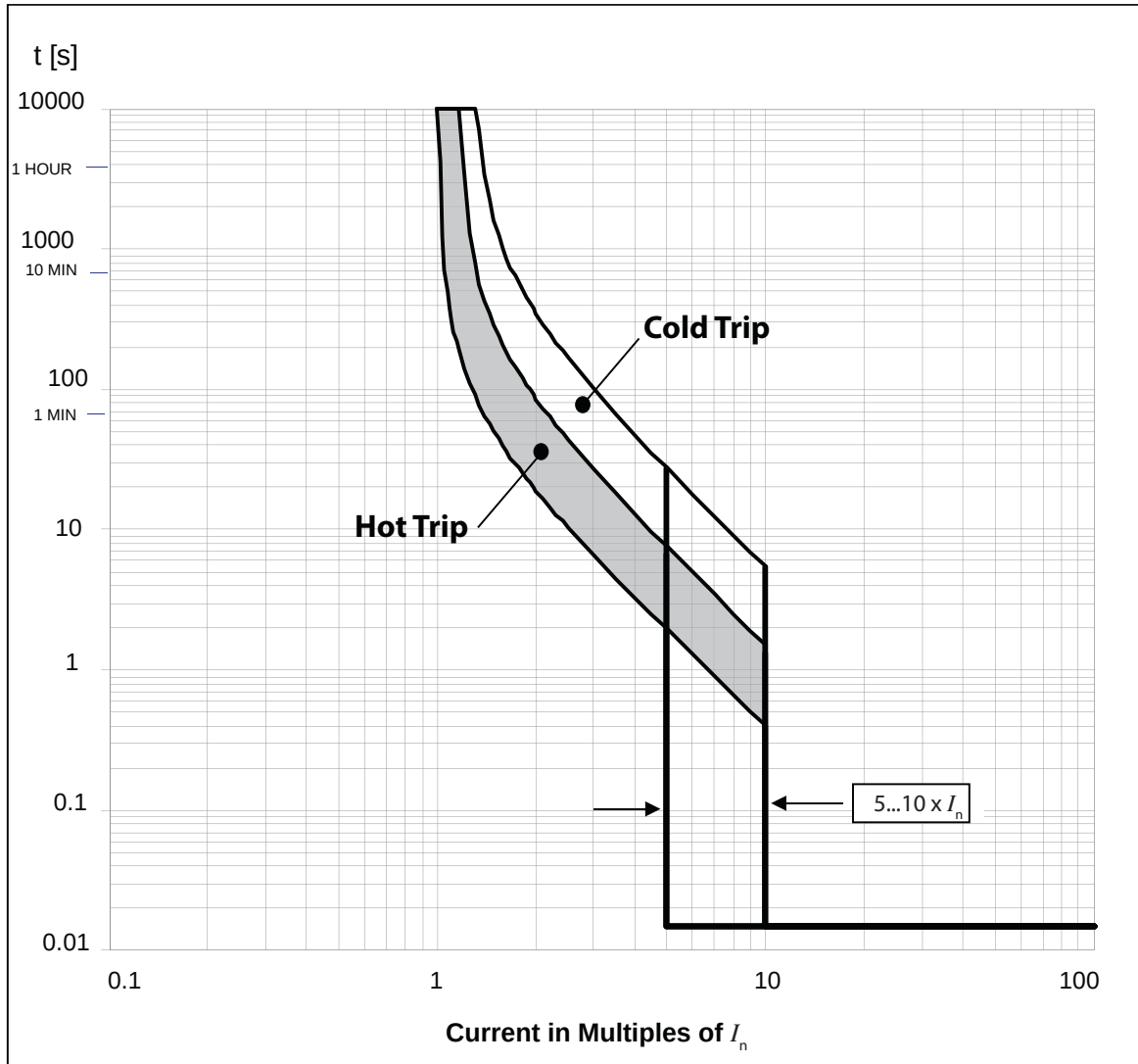


Figure 31 - 140G-H Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 160 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

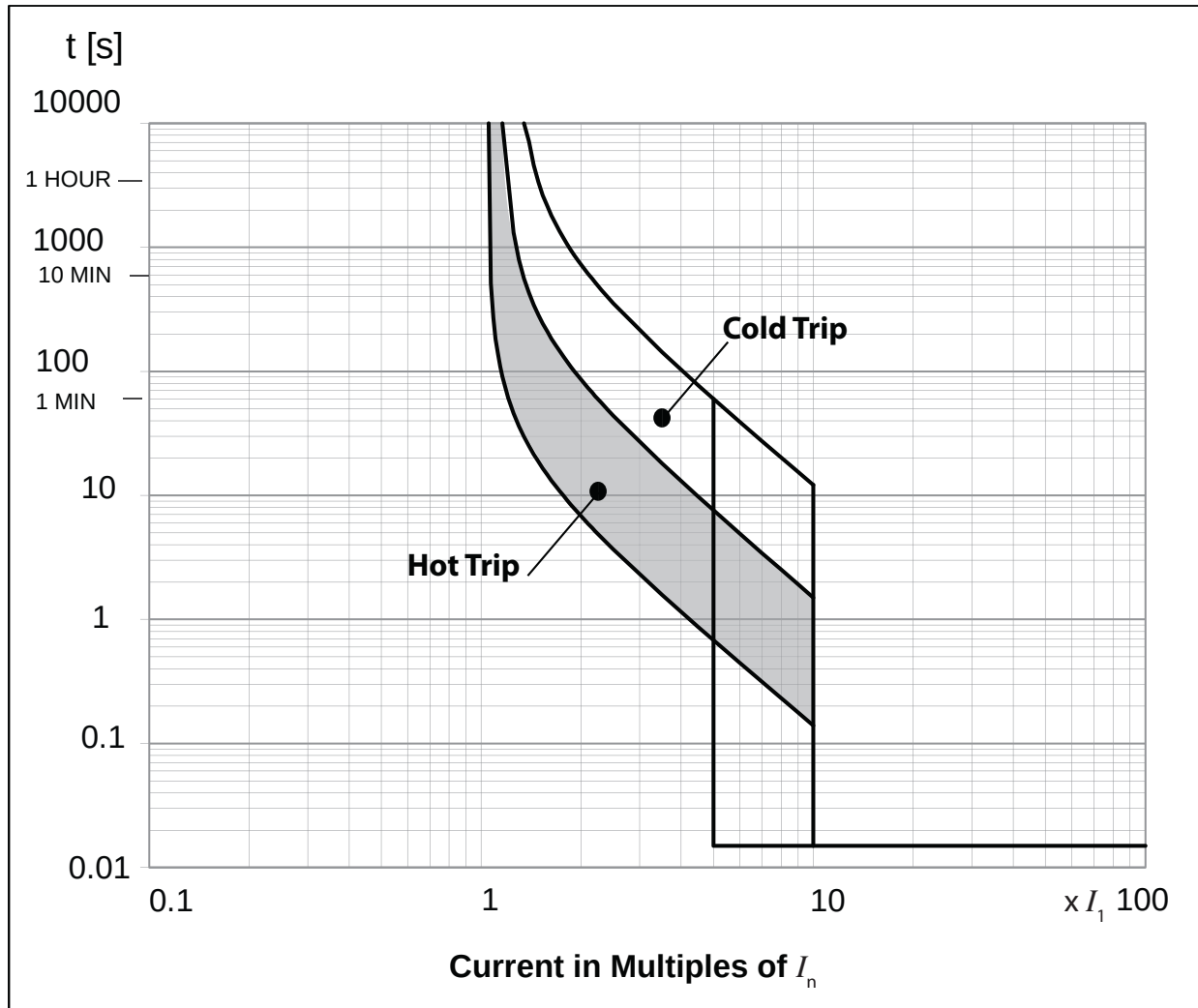


Figure 32 - 140G-I Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 60...100 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

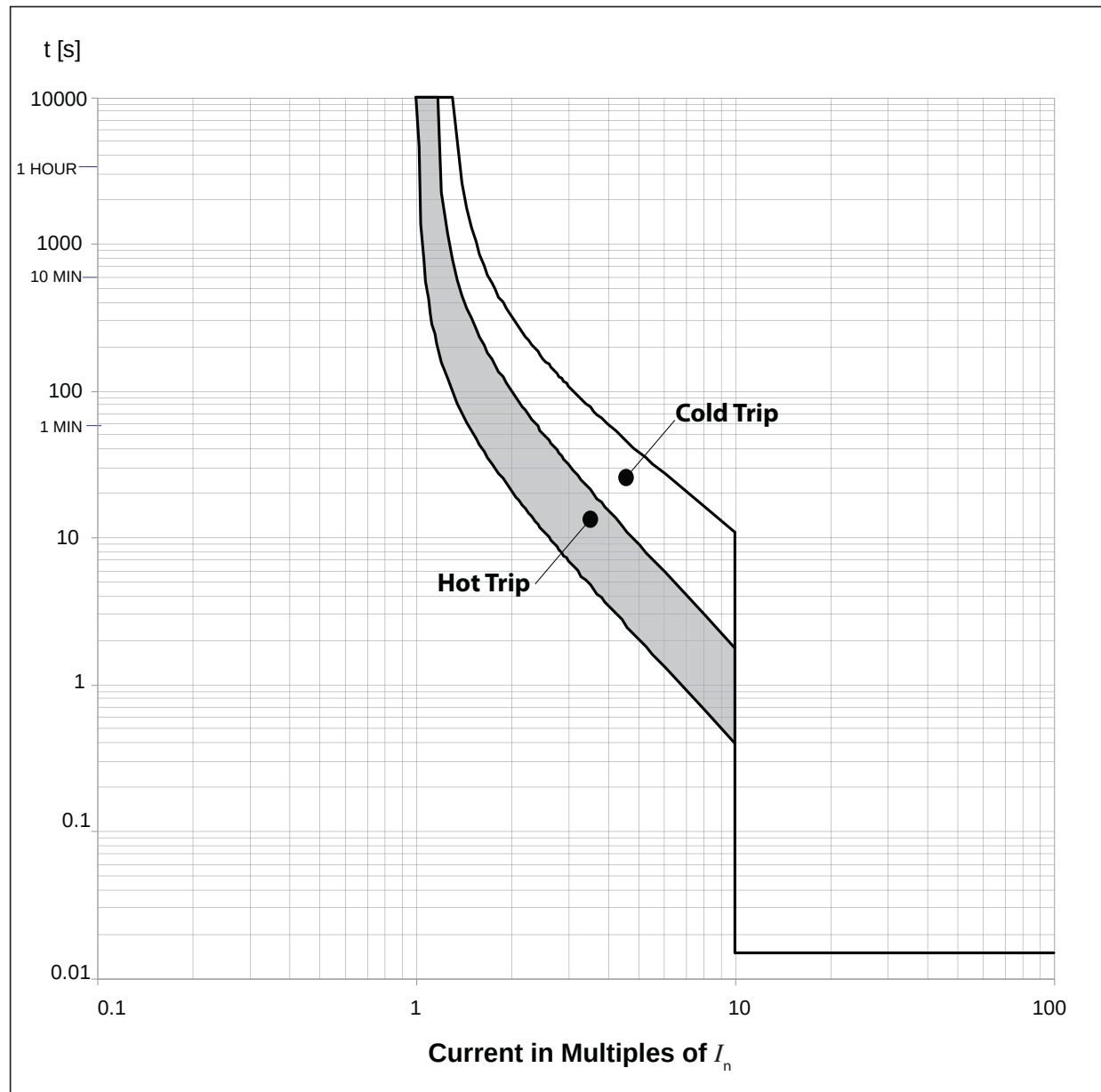


Figure 33 - 140G-I Time-Current Curve

- Maximum voltage: 600Y/347V AC
- Maximum current: 110...150 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

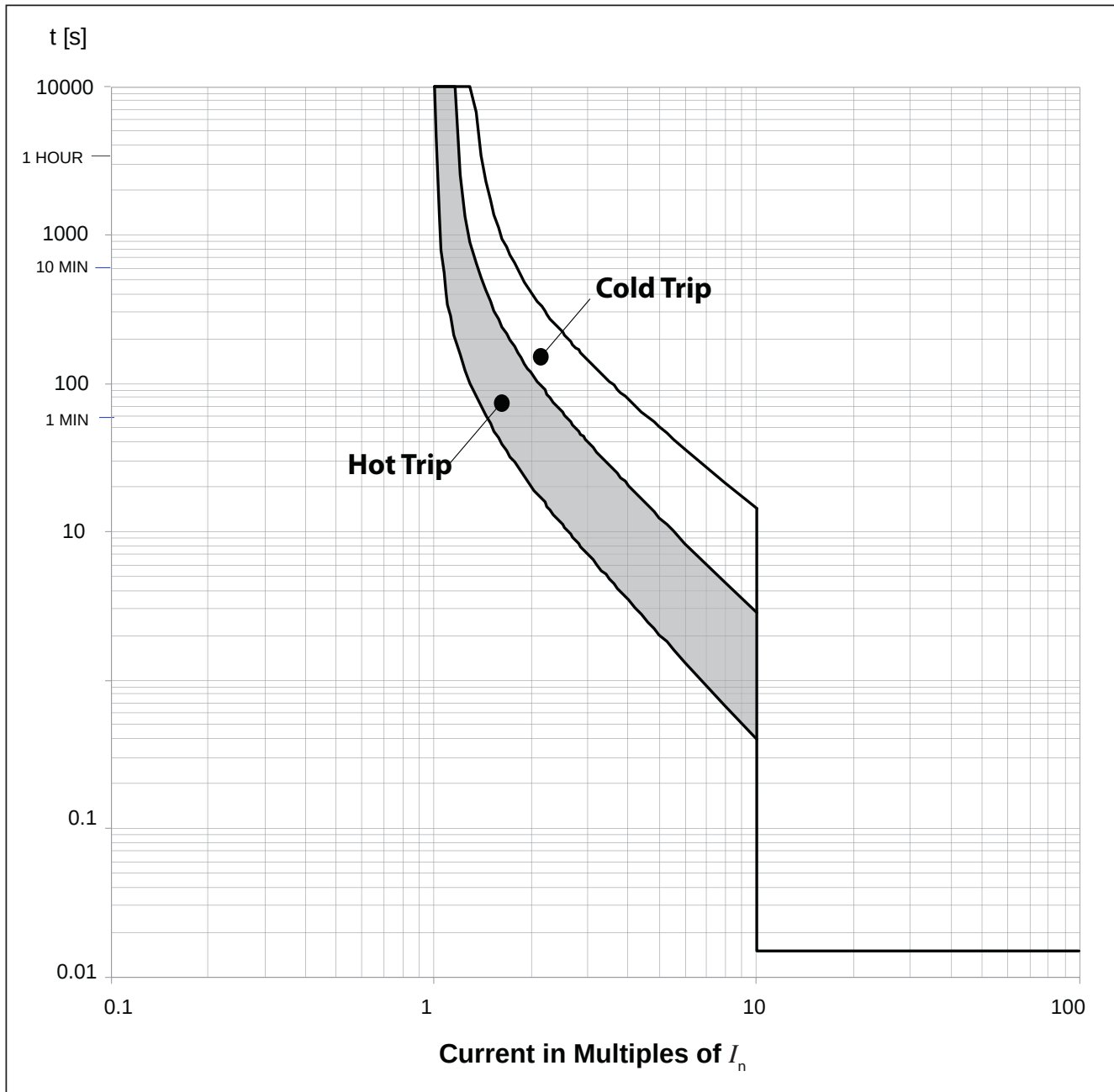


Figure 34 - 140G-I Time-Current Curve

- Maximum voltage: 600Y/347V AC, 480V AC
- Maximum current: 160...225 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

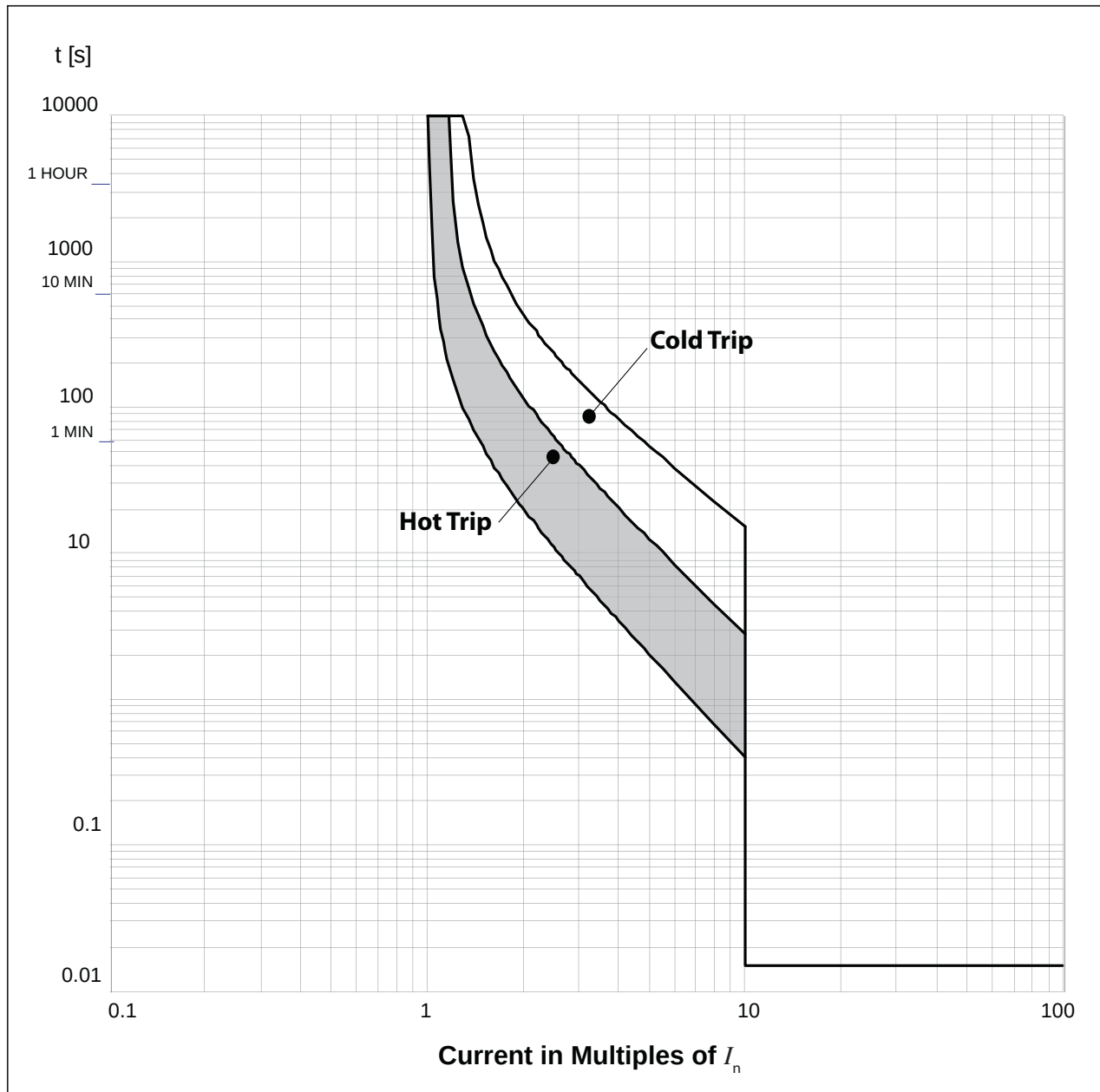
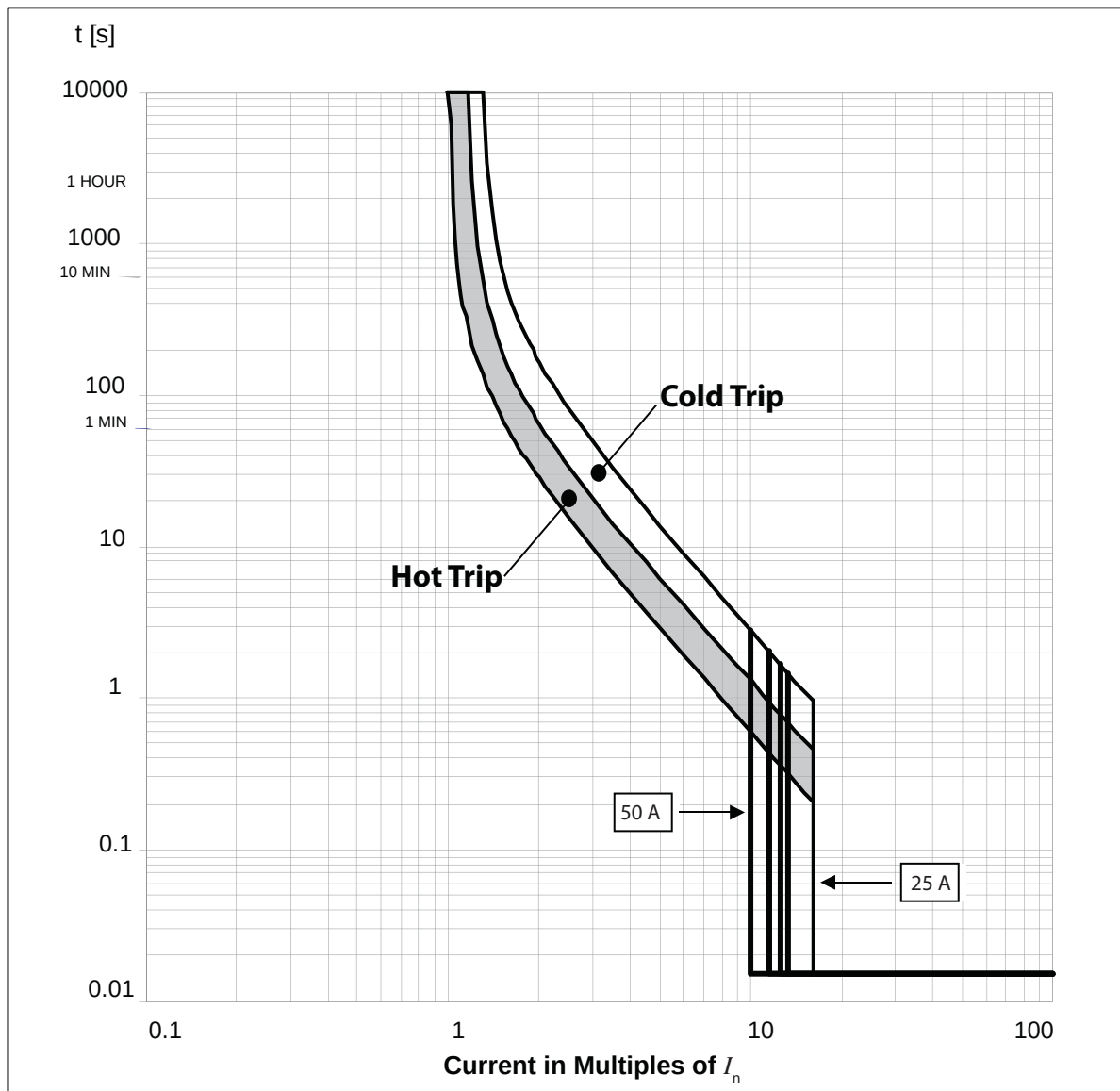


Figure 35 - 140G-J Time-Current Curve

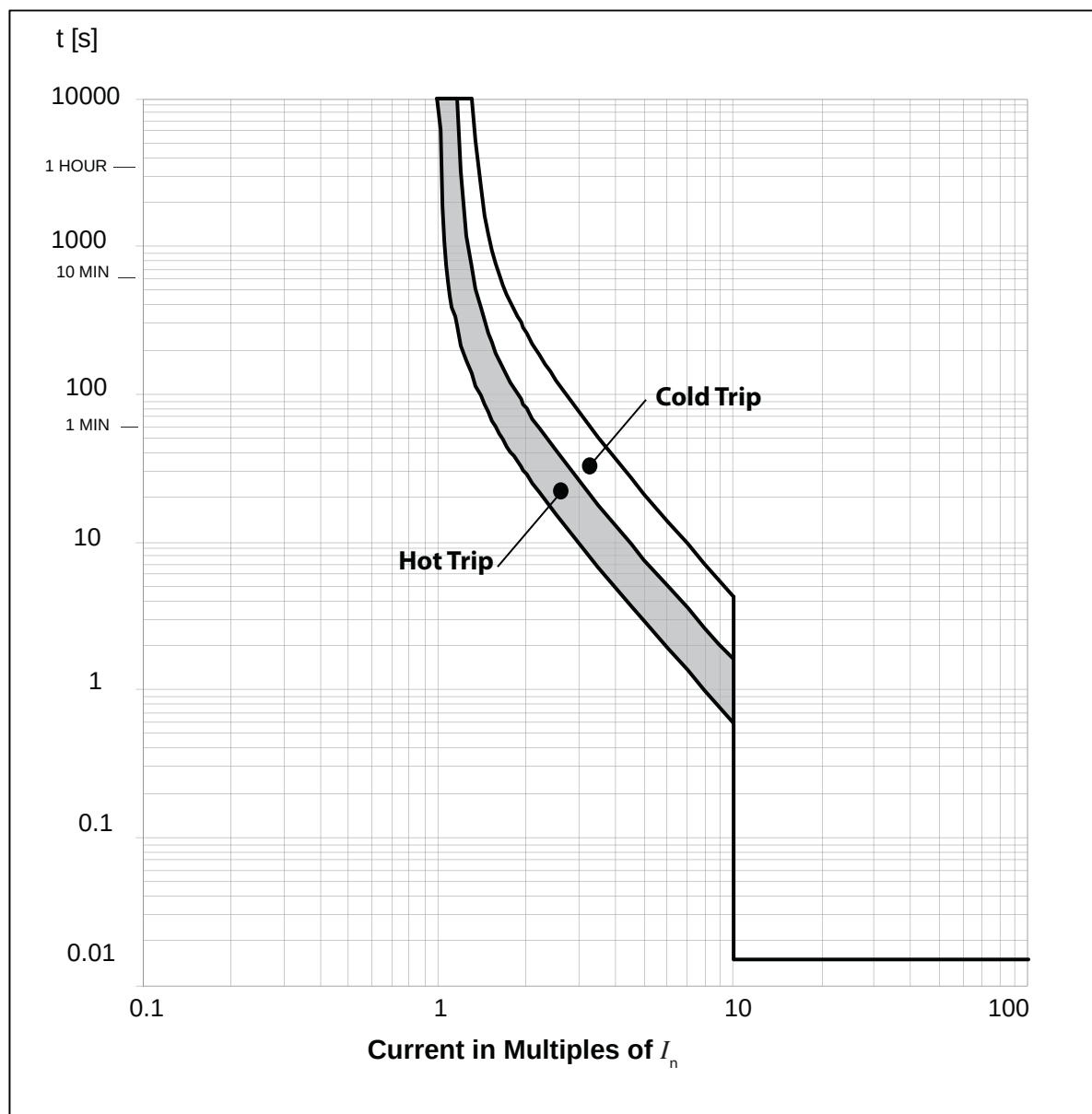
- Maximum voltage: 600V AC
- Maximum current: 25...50 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

**Table 130 - Current Ratings**

Rated Current I_n [A]	Magnetic Trip I_m [A]
25...40	400
50	500

Figure 36 - 140G-J Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 60...70 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

**Table 131 - Current Ratings**

Rated Current I_n [A]	Magnetic Trip I_m [A]
60	600
63	630
70	700

Figure 37 - 140G-J Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 80...100 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

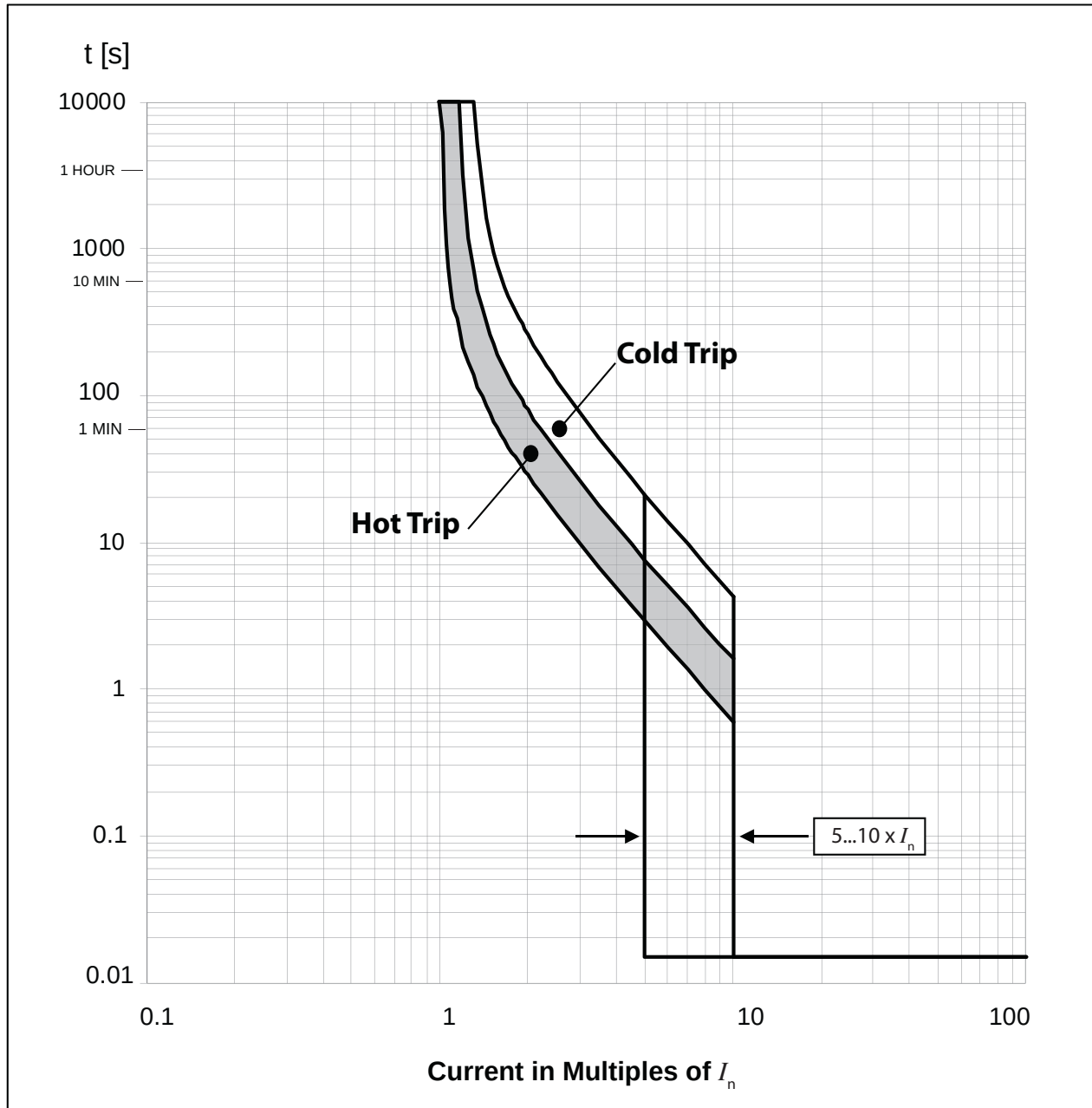


Figure 38 - 140G-J Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 110...150 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

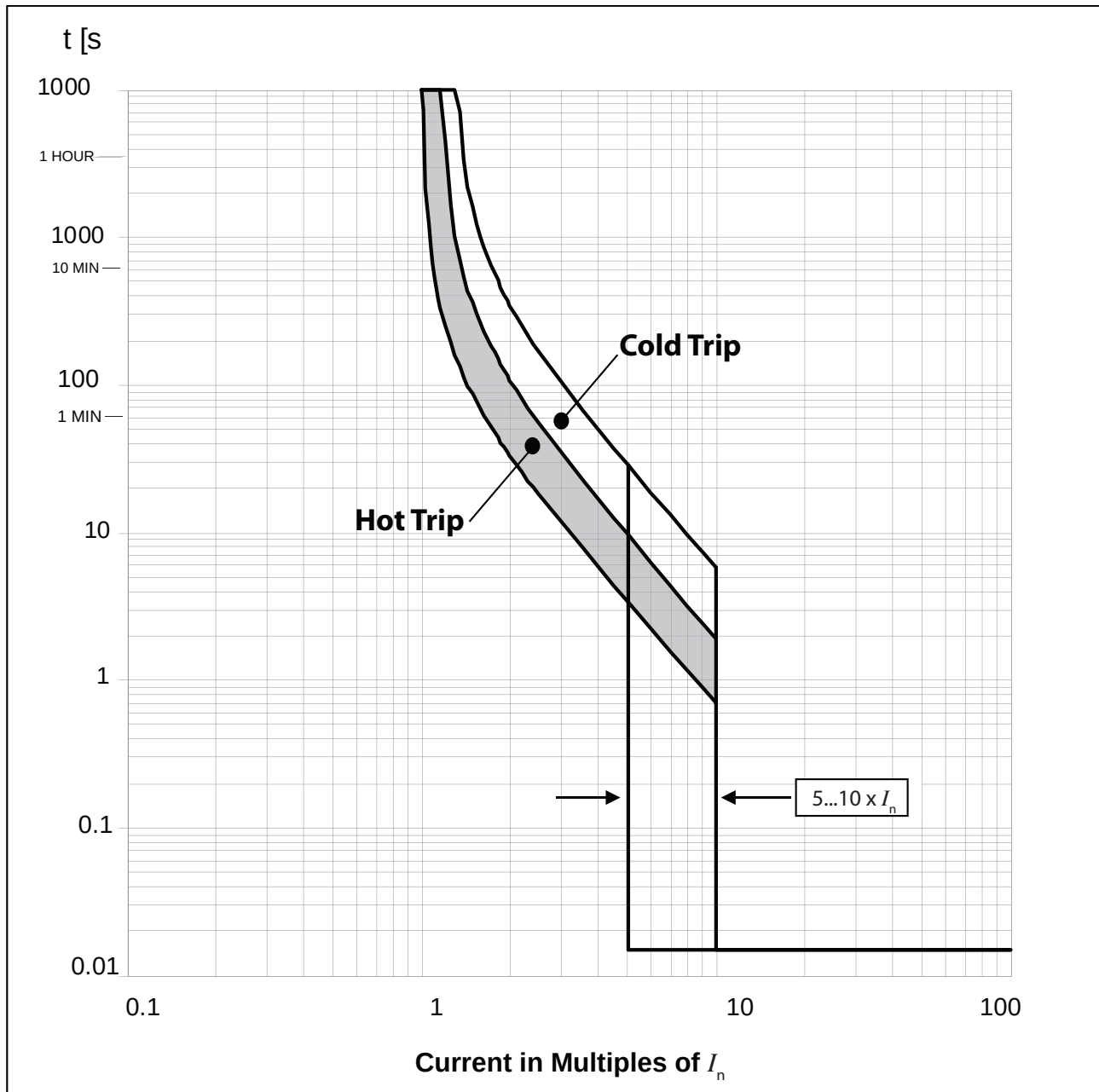


Figure 39 - 140G-J Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 160...225 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

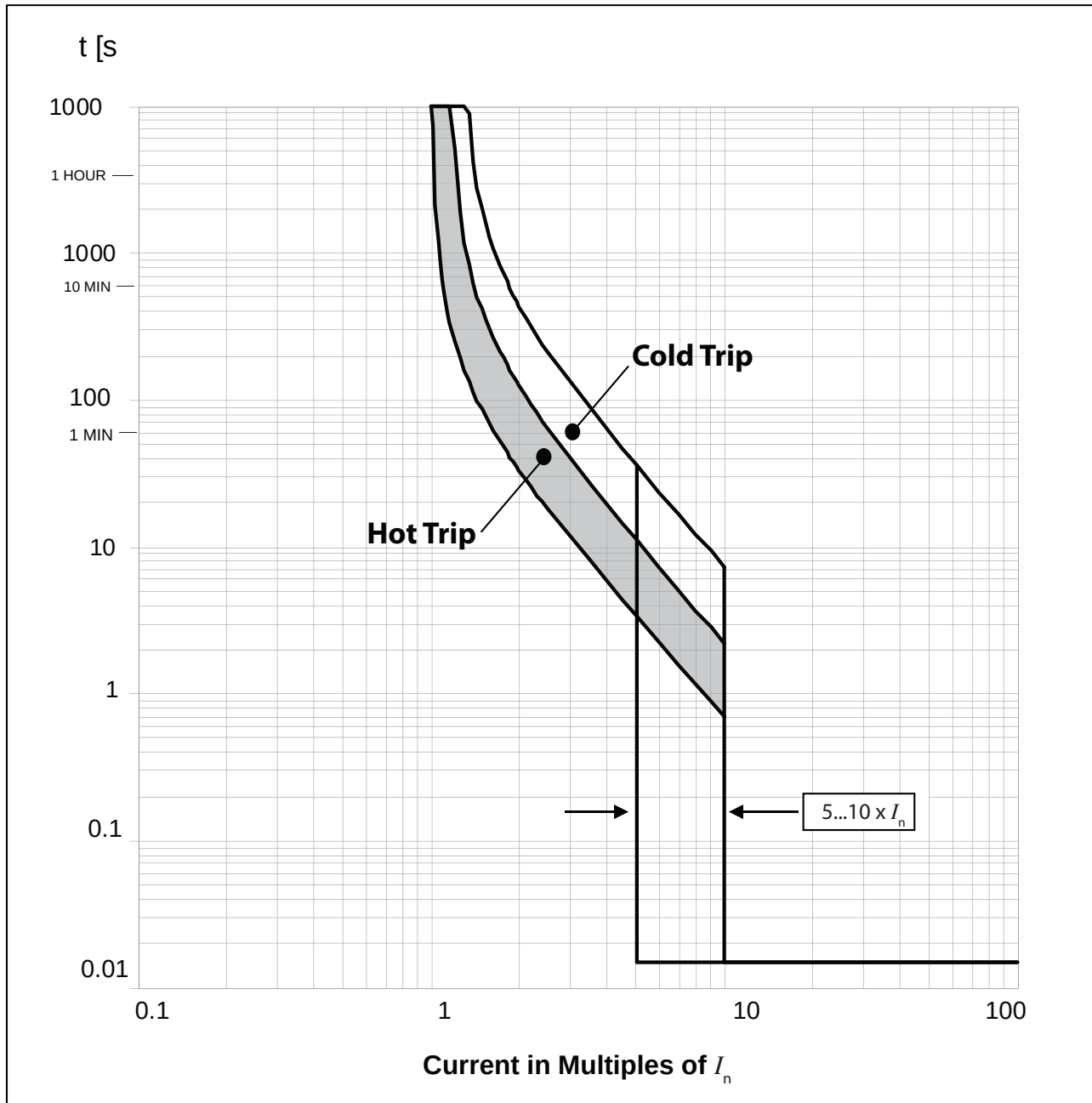


Figure 40 - 140G-J Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 250 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

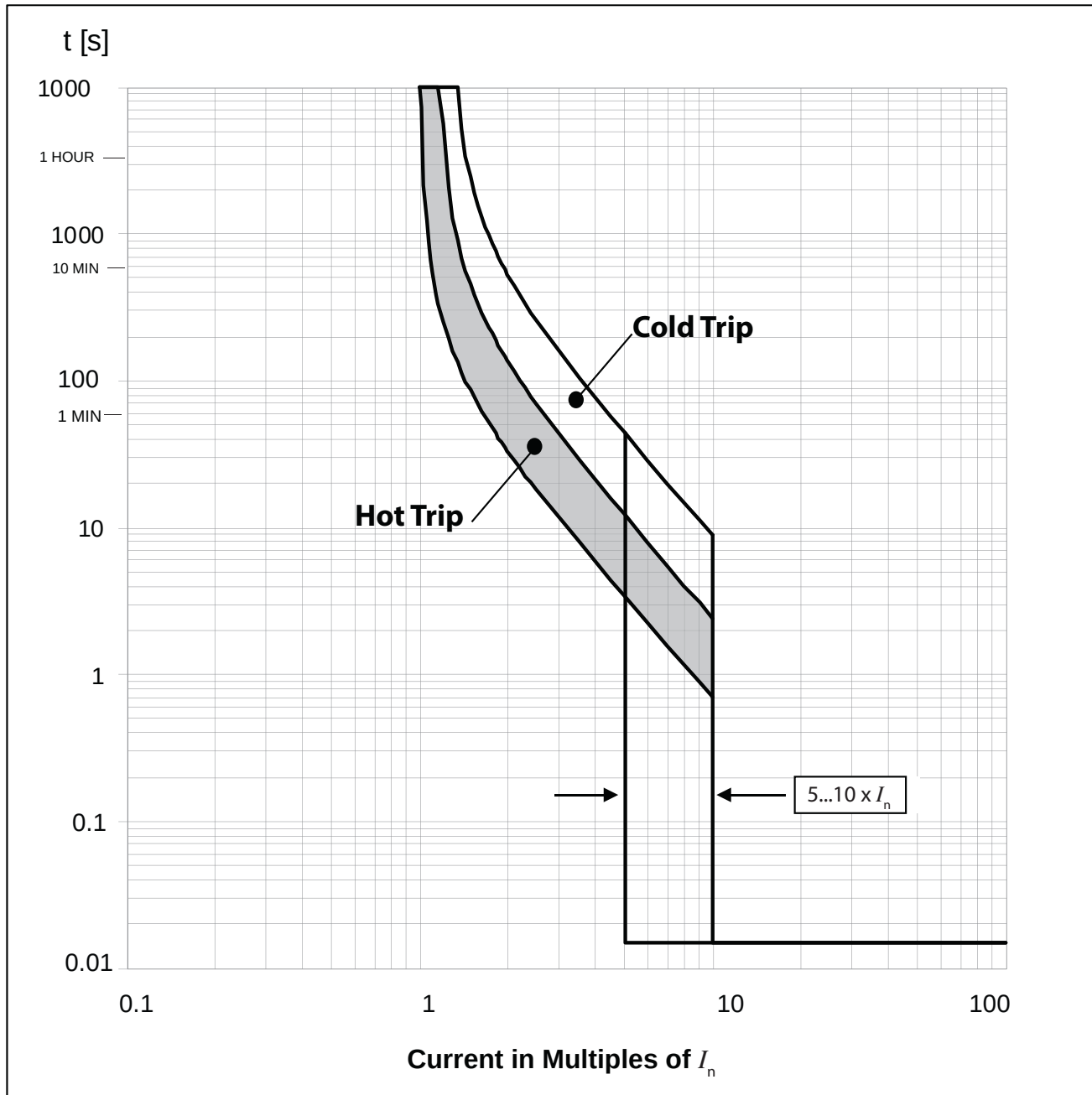


Figure 41 - 140G-K Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 300, 400 A
- Adjustable thermal/ adjustable magnetic release
- Instantaneous (magnetic) trip tolerance: -20% / +30%

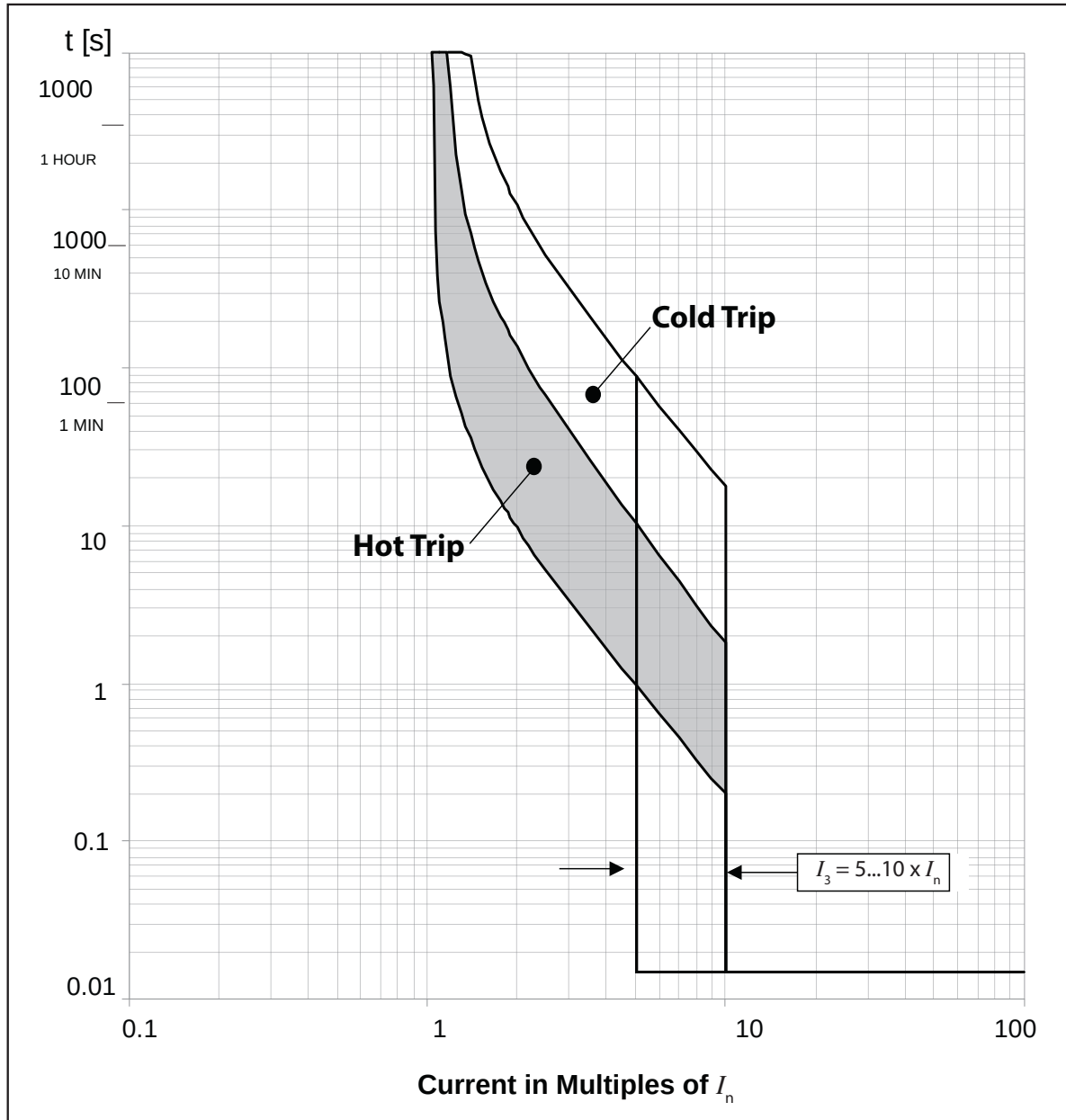


Figure 42 - 140G-M Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 600 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

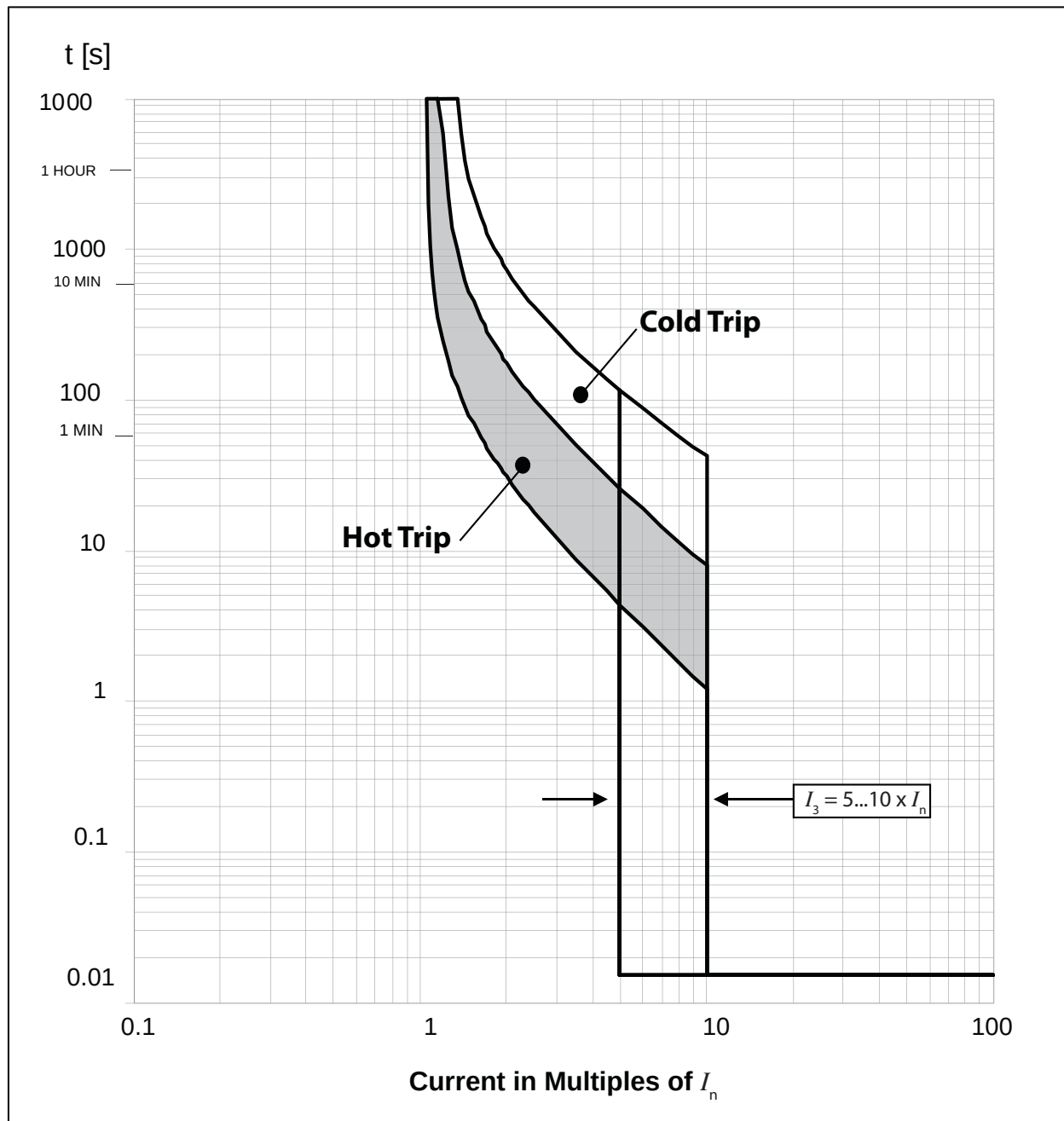


Figure 43 - 140G-M Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 630 A
- Instantaneous (magnetic) trip tolerance: -20% / +30%

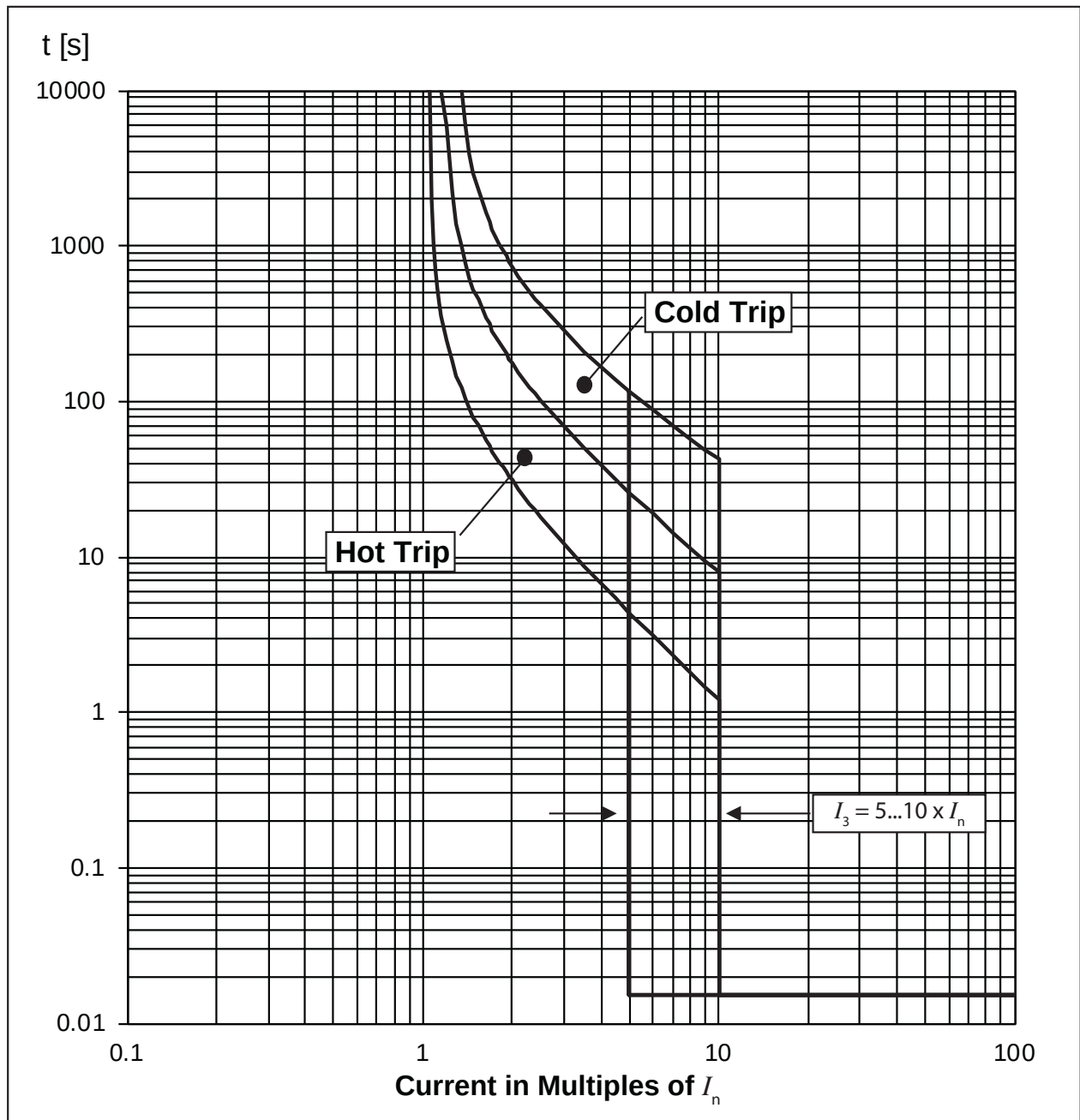
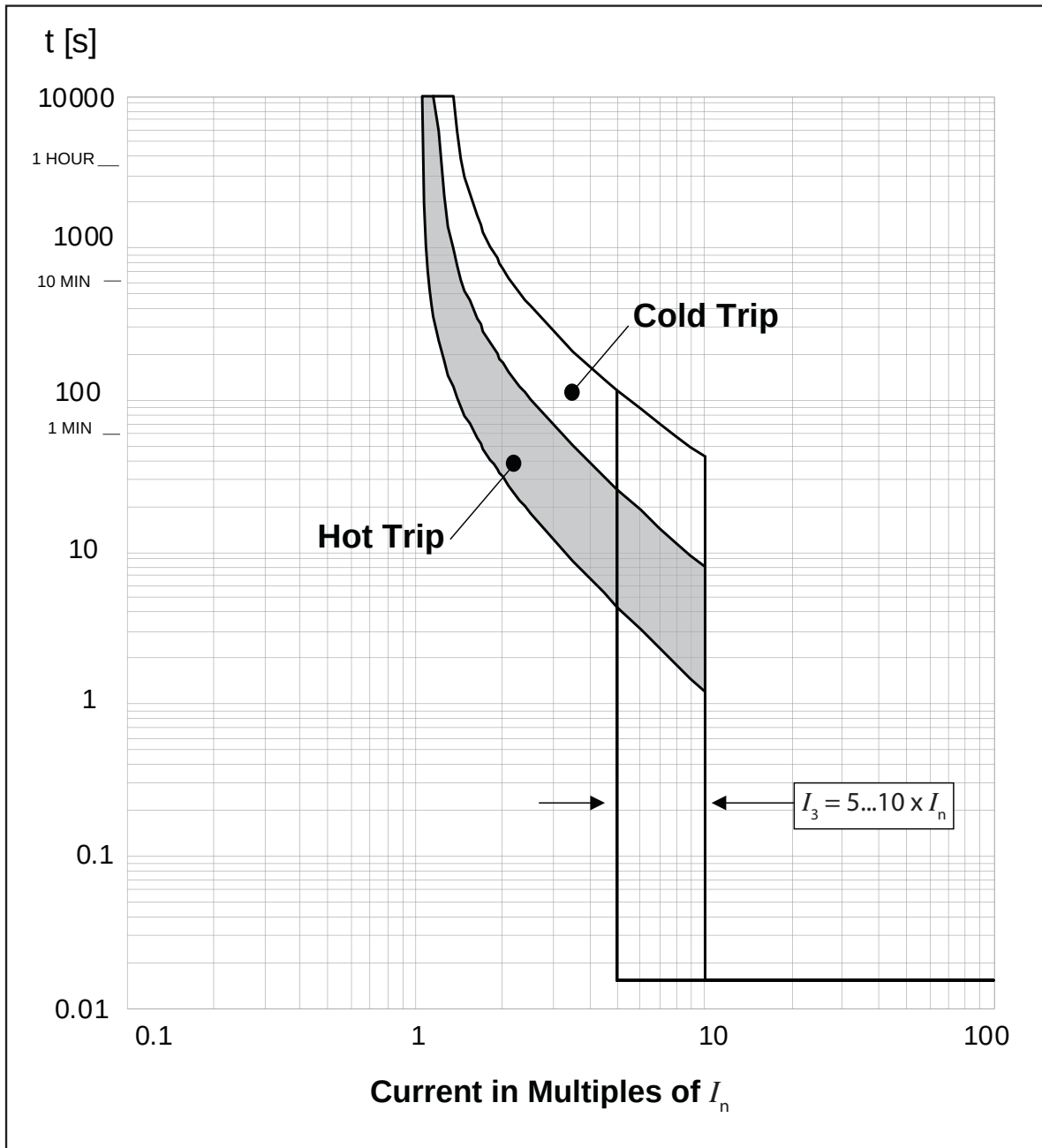


Figure 44 - 140G-M Time-Current Curve

- Maximum voltage: 600V AC
- Maximum current: 800 A
- Adjustable thermal/ adjustable magnetic release
- Instantaneous (magnetic) trip tolerance: -20% / +30%



Bulletin 140G Electronic Molded Case Circuit Breakers

Figure 45 - 140G-H Time-Current Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 40 A, 60 A, 100 A, 150 A, 250 A
- Electronic trip unit. Long delay response, short delay with I^2t response, and instantaneous curve

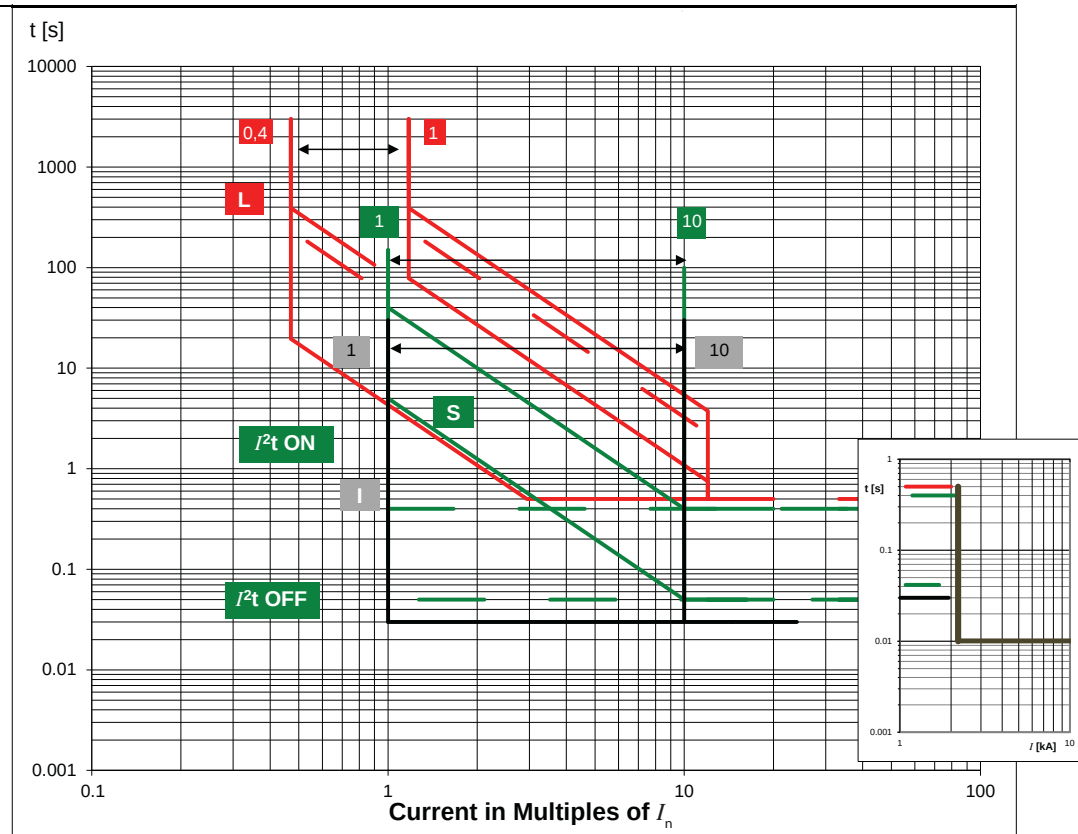
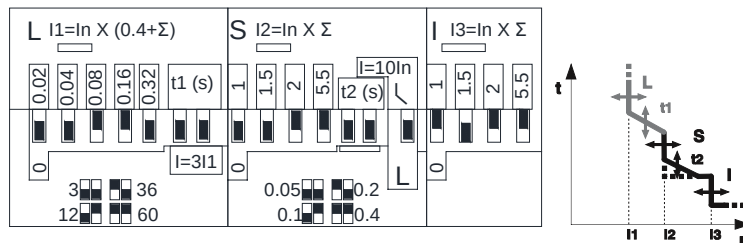


Table 132 - Tolerance Values

Protection	Trip Threshold	Trip Time
L	$1.05 \leq x I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60 \text{ ms}$
Others	$\pm 20\%$	



Notes:

1. Curve accuracy applies from -20°C to $+55^\circ \text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
2. The right portion of the curve is determined by the interrupting rating of the circuit breaker.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. For high fault current levels an additional fixed instantaneous hardware override is provided at $10.5 \times I_n$.

Figure 46 - 140G-H Ground Fault Protection Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 25 A, 60 A, 100 A, 125 A

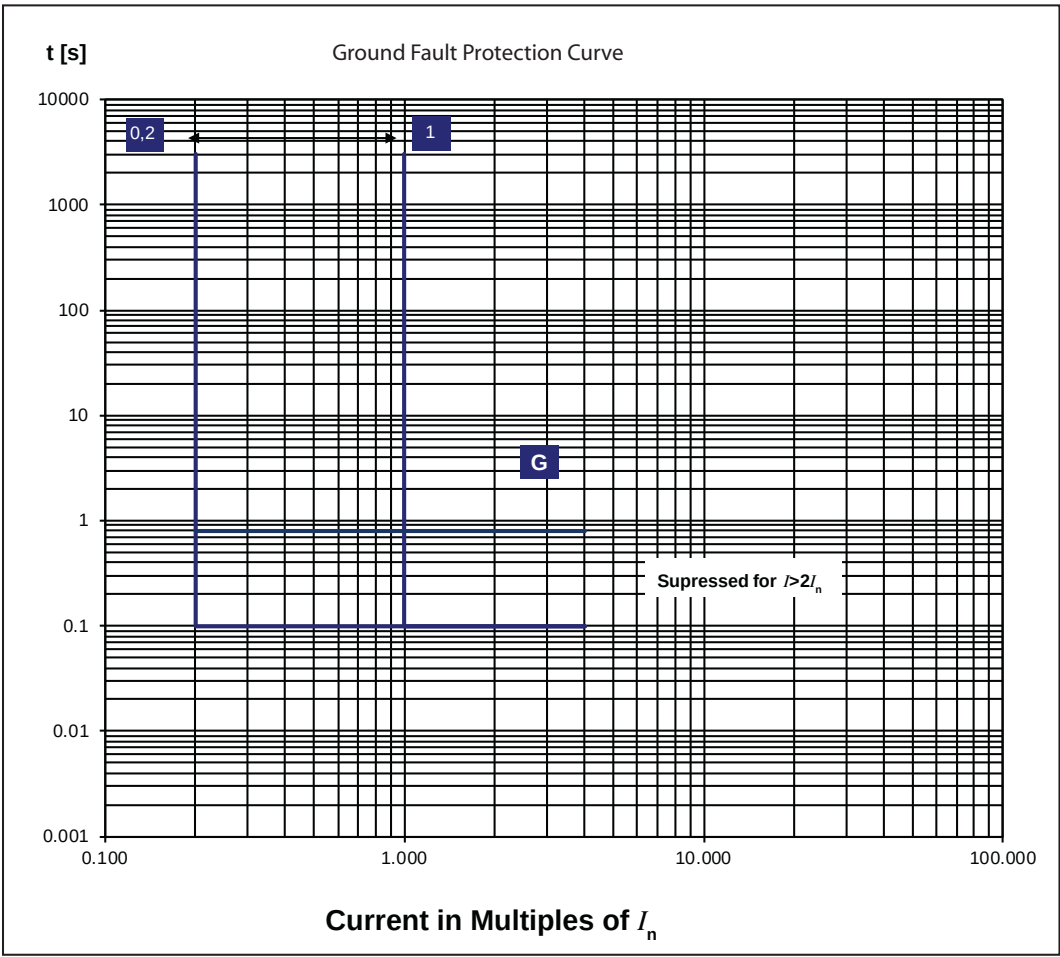


Table 133 - Tolerance Values

Protection	Trip Threshold	Trip Time
G	$\pm 10\%$	$\pm 20\%$

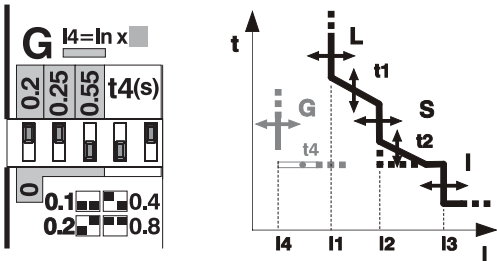


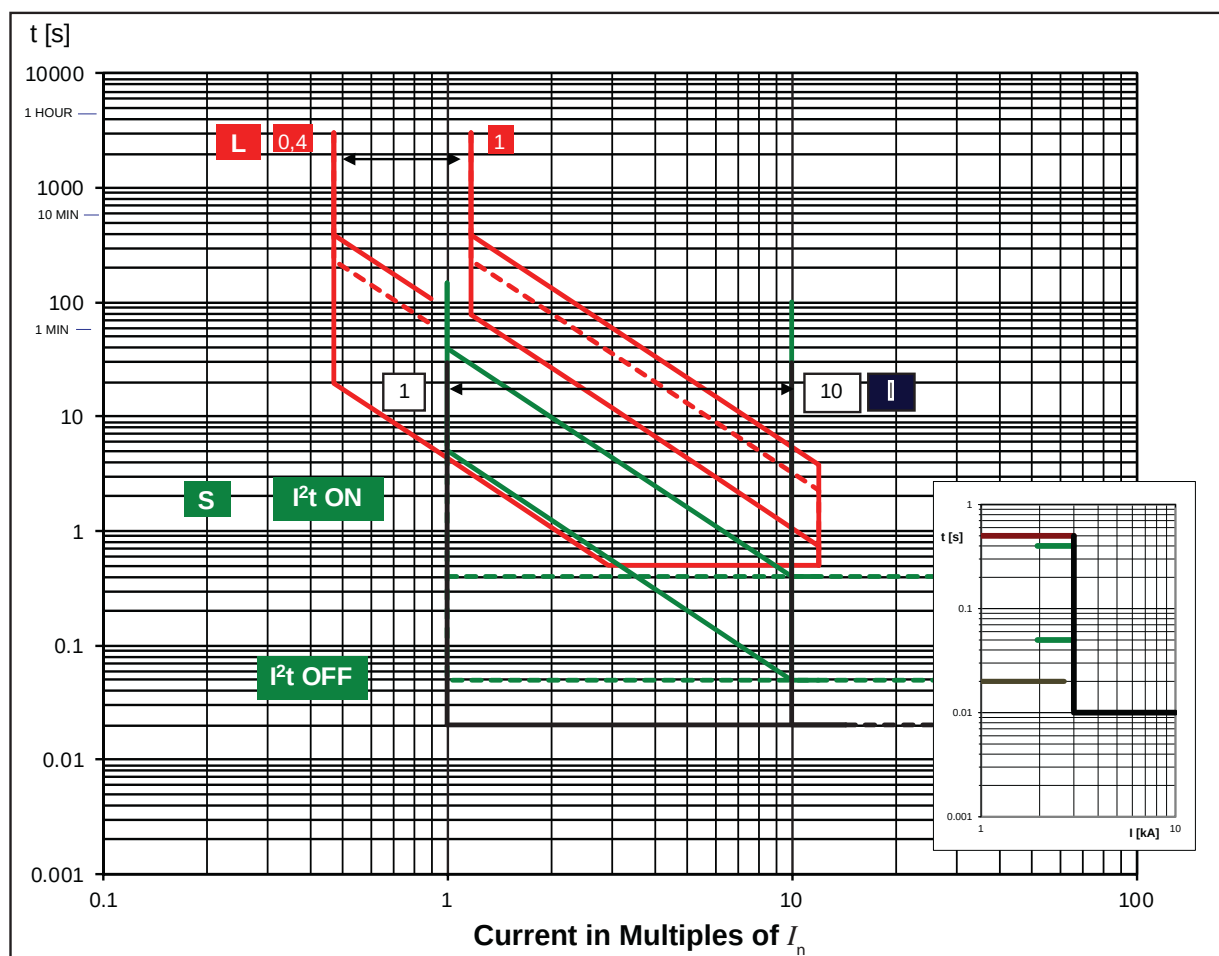
Table 134 - Ground Fault Current Ratings

$I_n [A]$	$I_4 [I_n]$						
	0.2	0.25	0.45	0.55	0.75	0.8	1
25	5	6.25	11.3	13.8	18.8	20	25
60	12	15	27	33	45	48	60
100	20	25	45	55	75	80	100
125	25	31.3	56.3	68.8	93.8	100	125
160 ⁽¹⁾	32	40	75	88	120	128	160

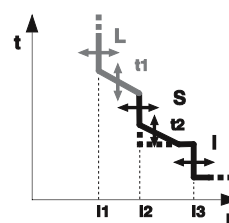
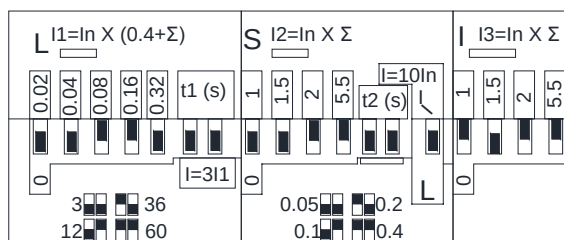
(1) IEC only.

Figure 47 - 140G-J Time-Current Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 40 A; 60 A; 100 A; 150 A; 250 A
- Electronic trip unit. Long delay response, short delay with I^2t response, and instantaneous curve

**Table 135 - Tolerance Values**

Protection	Trip Threshold	Trip Time
L	$1.05 \leq x I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60 \text{ ms}$
Others	$\pm 20\%$	

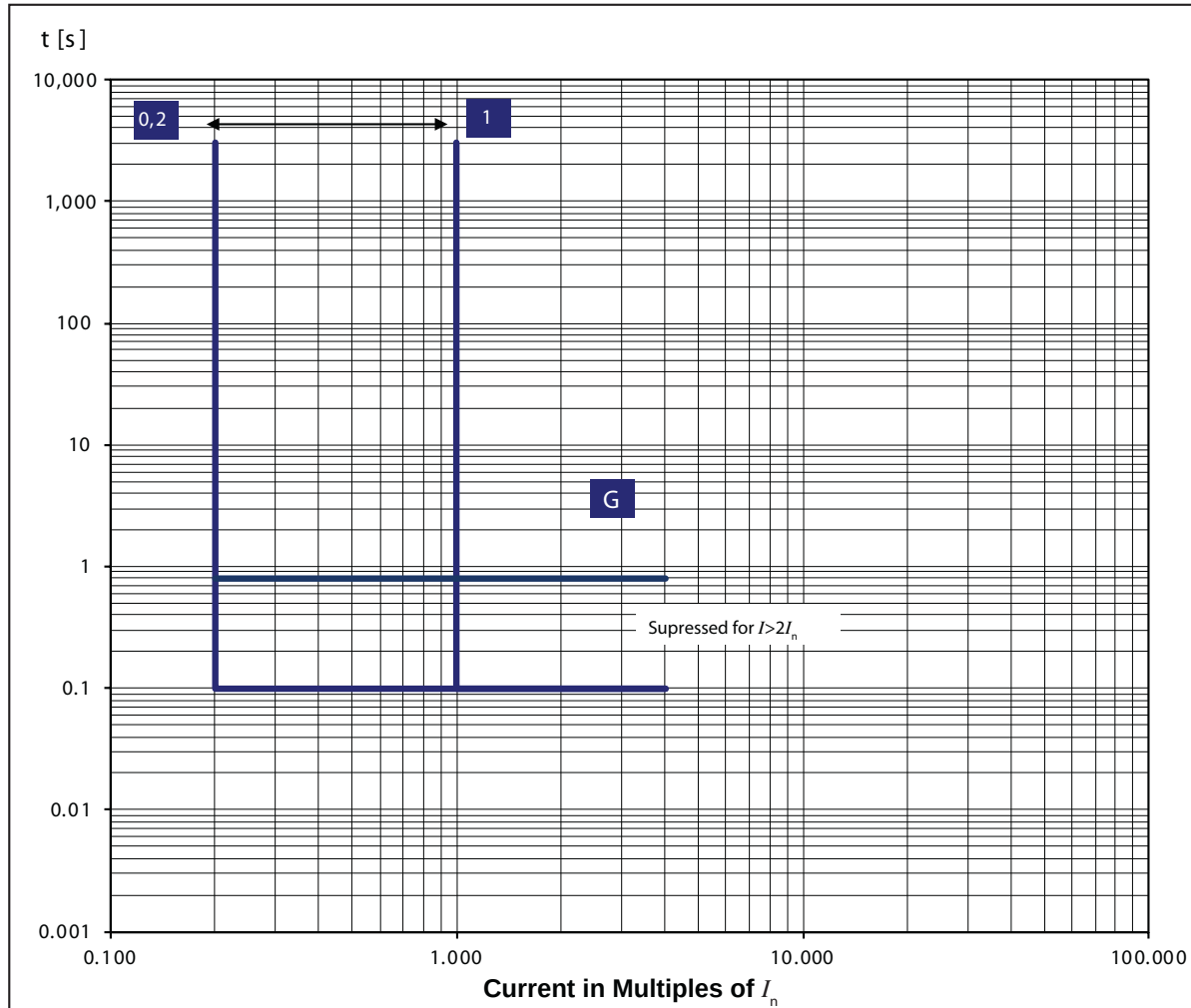


Notes:

- Curve accuracy applies from -20°C to $+55^\circ\text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
- The right portion of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- For high fault current levels an additional fixed instantaneous hardware override is provided at $10.5 \times I_n$.

Figure 48 - 140G-J Ground Fault Protection Curve for LSIg MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 40 A, 60 A, 100 A, 150 A, 250 A



Example:

- $I_n = 100 \text{ A}$
- $I_4 = 100 \times (0.2 + 0.25) = 45 \text{ A}$
- $t_4 = 0.2 \text{ s @ } I > I_4$

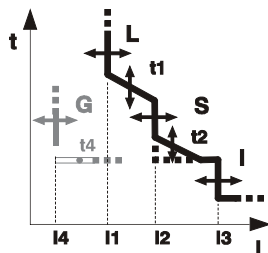
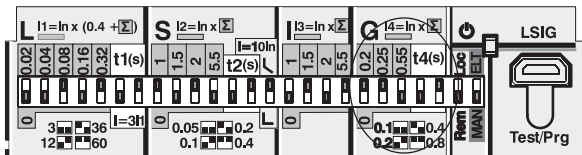


Table 136 - Ground Fault Current Ratings

	$I_4 [I_n]$						
$I_n [A]$	0.2	0.25	0.45	0.55	0.75	0.8	1
25	8	10	18	22	30	32	40
60	12	15	27	33	45	48	60
100	20	25	45	55	75	80	100
150	30	37.5	67.5	82.5	113	120	150
250	50	62.5	113	138	188	200	250

Figure 49 - 140G-K Time-Current Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 300 A; 400 A
- Electronic trip unit. Long delay response, short delay with I^2t response, and instantaneous curve

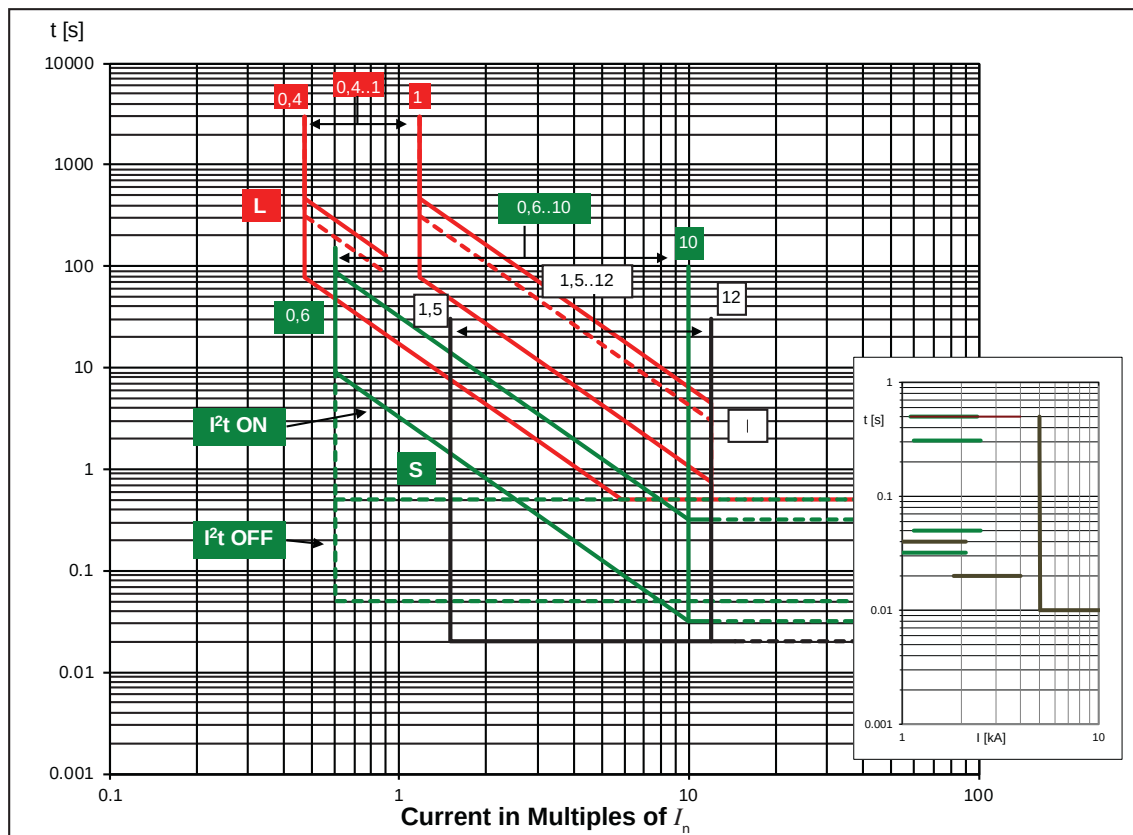


Table 137 - Tolerance Values

Protection	Trip Threshold	Trip Time
L	$1.05 \leq x I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	≤ 60 ms
Others	$\pm 20\%$	—

Notes:

- Curve accuracy applies from -20°C to $+55^\circ\text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
- The right portion of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- For high fault current levels an additional fixed instantaneous hardware override is provided at $10.5 \times I_n$.

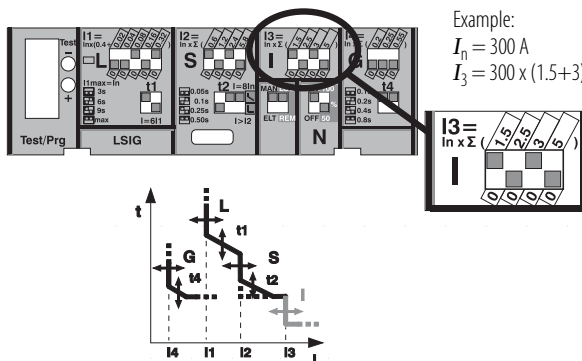


Table 138 - Current Ratings

	$I_3(I_n)$														
I_n [A]	1.5	2.5	3	4	4.5	5	5.5	6.5	7	7.5	8	9	9.5	10.5	12
300	450	750	900	1200	1350	1500	1650	1950	2100	2250	2400	2700	2850	3150	3600
400	600	1000	1200	1600	1800	2000	2200	2600	2800	3000	3200	3600	3800	4200	4800

Figure 50 - 140G-K Ground Fault Protection Curve for LSIG MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 300 A, 400 A

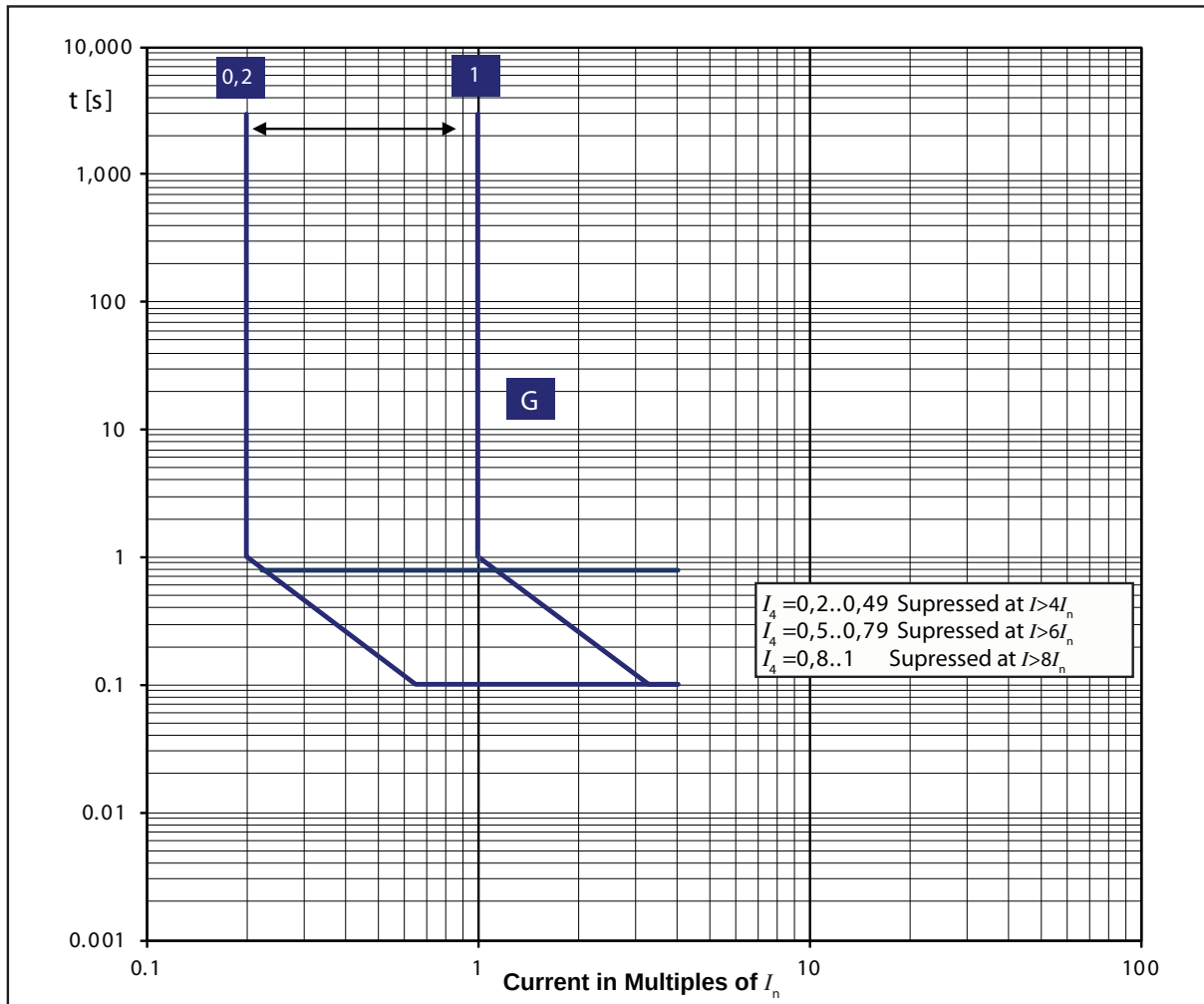


Table 139 - Ground Fault Current Ratings

	$I_4 [I_n]$						
$I_n [A]$	0.2	0.25	0.45	0.55	0.75	0.8	1
300	60	75	135	165	225	240	300
400	80	100	180	220	300	320	400

Example:

- $I_n = 300$ A
- $I_4 = 300 \times (0.2 + 0.25) = 135$ A
- $t_4 = 0.2$ s @ $I > I_4$

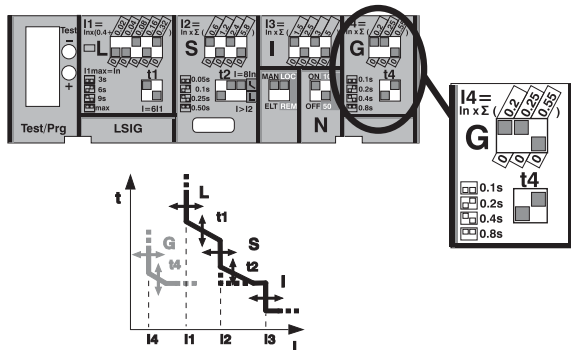


Figure 51 - 140G-M Time-Current Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 600 A
- Electronic trip unit. Long delay response, short delay with I^2t response, and instantaneous curve

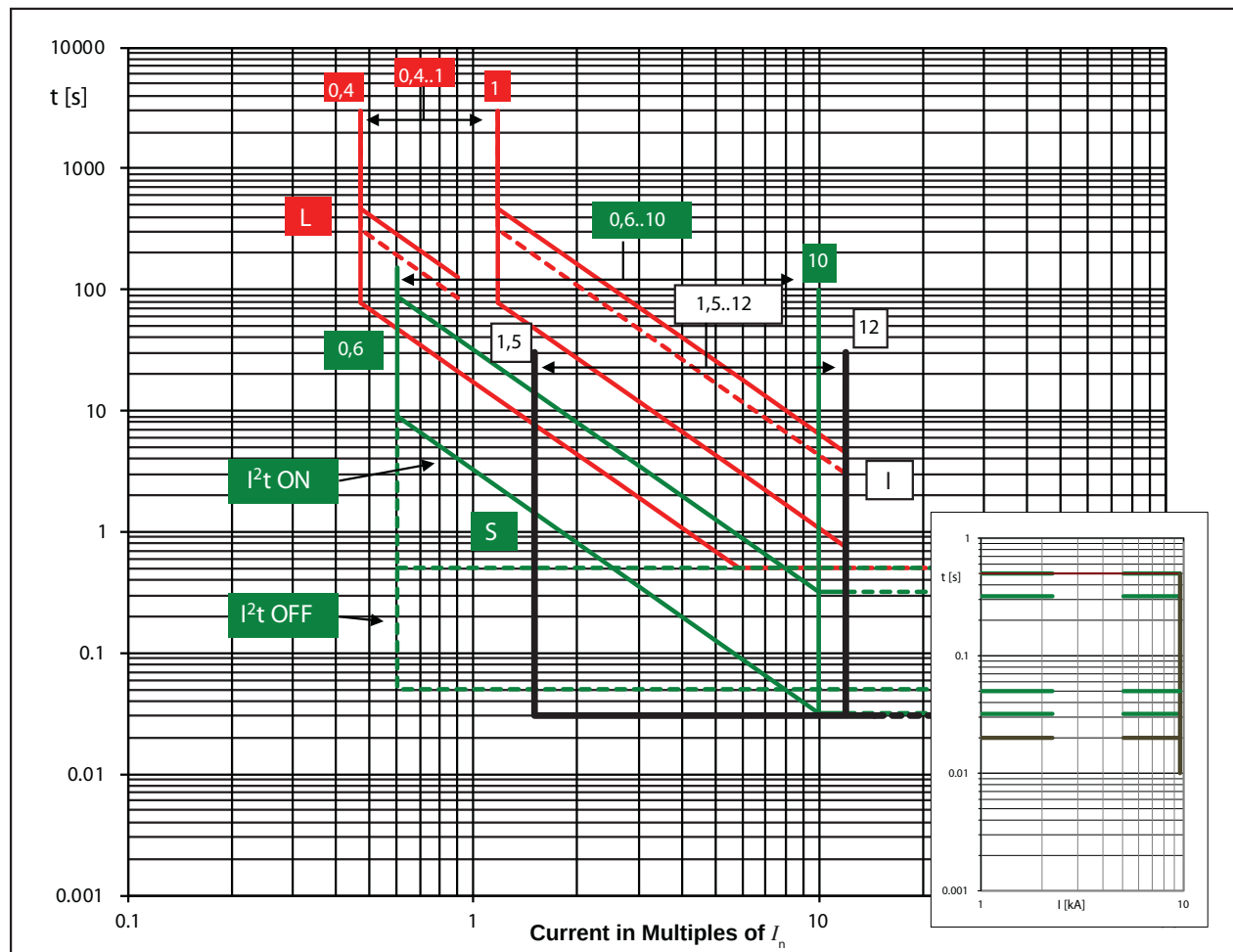


Table 140 - Tolerance Values

Protection	Trip Threshold	Trip Time
L	$1.05 \leq x I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	≤ 60 ms
Others	$\pm 20\%$	—

Notes:

- Curve accuracy applies from -20°C to $+55^\circ\text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
- The right portion of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- For high fault current levels an additional fixed instantaneous hardware override is provided at $10.5 \times I_n$.

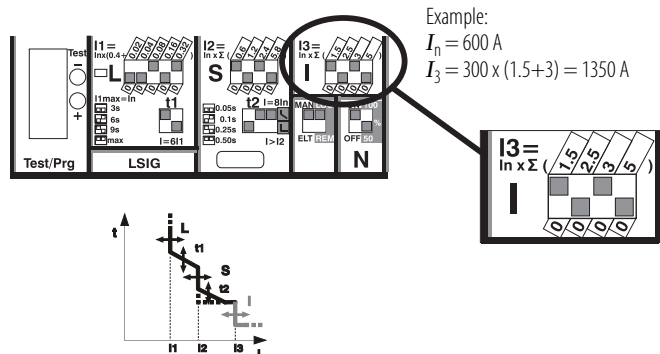
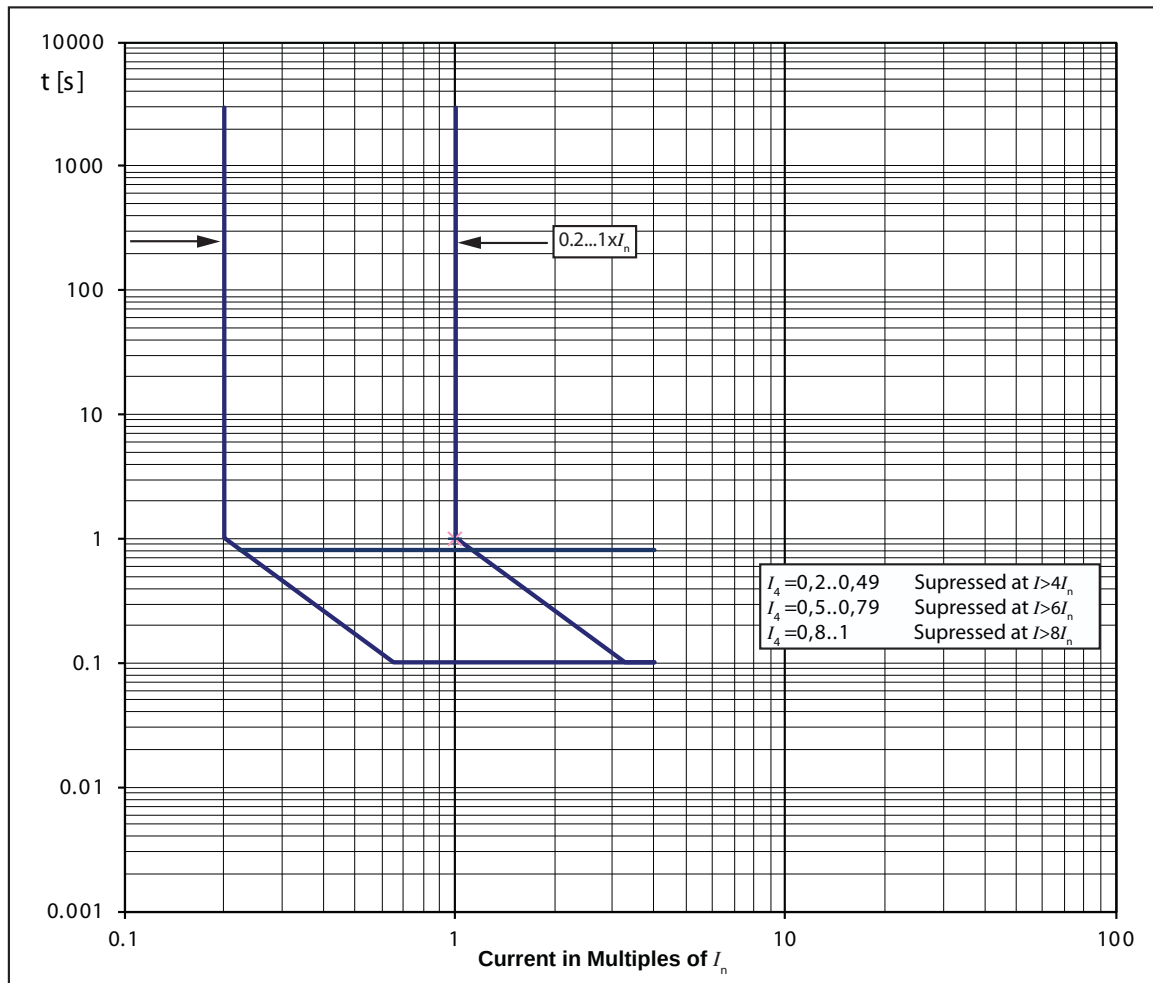


Figure 52 - 140G-M Ground Fault Protection Curve for LSIG MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 600 A, 800 A



Example:

- $I_n = 100$ A
- $I_4 = 100 \times (0.2 + 0.25) = 45$ A
- $t_4 = 0.2$ s @ $I > I_4$

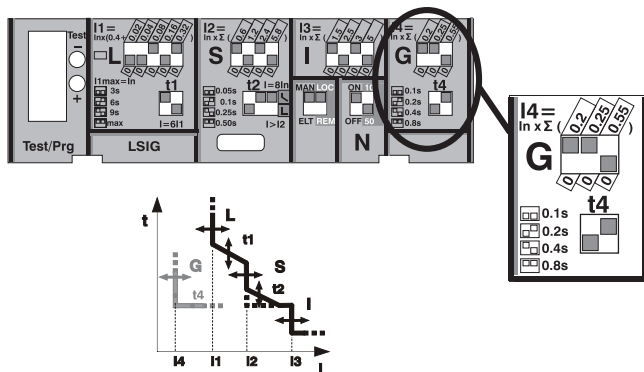
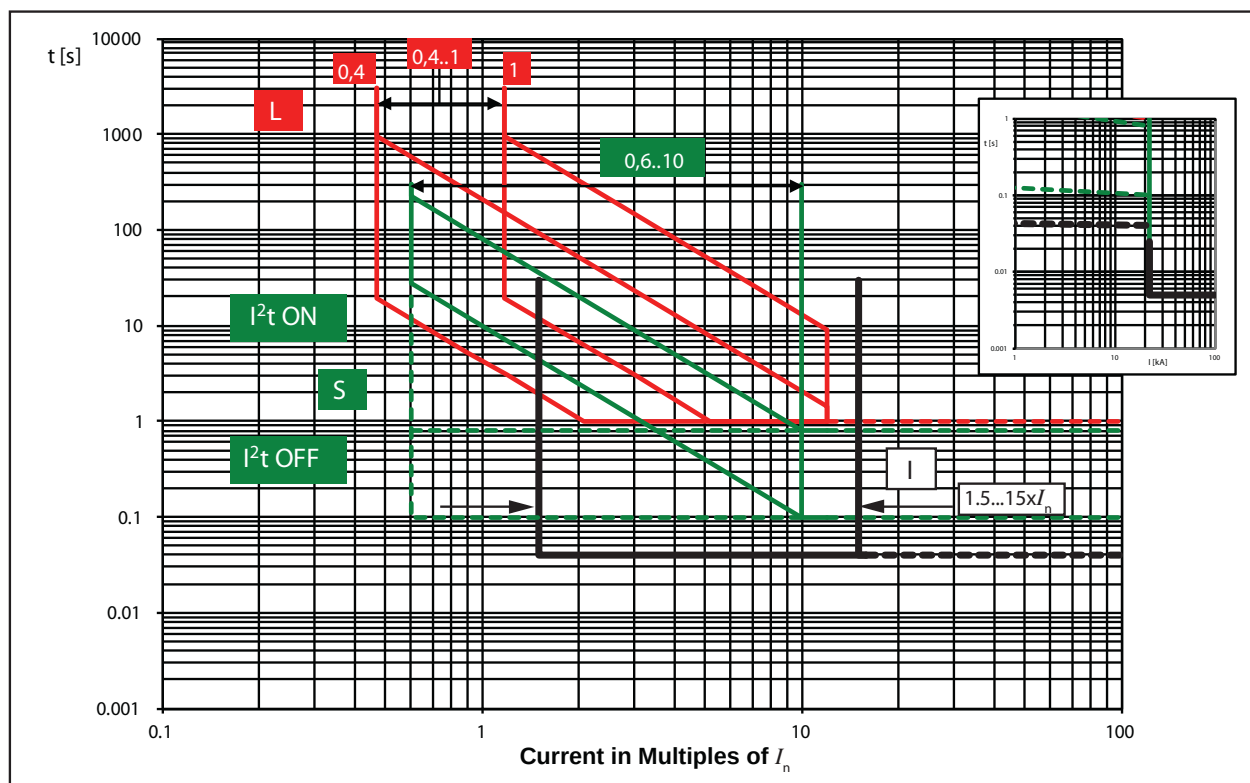


Figure 53 - 140G-N, 140G-NS Time-Current Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 1200 A
- Electronic trip unit. Long delay response, short delay with I^2t response, and instantaneous curve

**Table 141 - Trip Threshold Tolerance Values**

Protection	Disable	Trip Threshold	Trip Time	Trip Threshold Tolerance	Trip Time Tolerance
L ($t = k/I^2$)		$I_1 = 0.4-0.425-0.45-0.475-0.5-1 \times I_n$	$t_1 = 3-12-24-36-48-72-108-144 \text{ s}^{(1)} @ 3I_1$	Release between 1.05 and $1.2 I_1$	$\pm 10\% I_g \leq 6 \times I_n$
S ($t = k$)	✓	$I_2 = 0.6-0.8-1.2-1.8-2.4-3-3.36-4.2-5-5.8-6.6-7.4-8.2-9-10 \times I_n$	with $I > I_2$ $t_2 = 0.1-0.2-0.3-0.4-0.5-0.6-0.7-0.8 \text{ s}$	$\pm 7\% I_g \leq 6 \times I_n$; $\pm 10\% I_g > 6 \times I_n$	The best of $\pm 10\%$ or $\pm 40 \text{ ms}$
S ($t = k/I^2$)	✓	$I_2 = 0.6-0.8-1.2-1.8-2.4-3-3.36-4.2-5-5.8-6.6-7.4-8.2-9-10 \times I_n$	$t_2 = 0.1-0.2-0.3-0.4-0.5-0.6-0.7-0.8 \text{ s} @ 10 I_n$	$\pm 7\% I_g \leq 6 \times I_n$; $\pm 10\% I_g > 6 \times I_n$	$\pm 15\% I_g \leq 6 \times I_n$; $\pm 20\% I_g > 6 \times I_n$
I ($t = k$)	✓	$I_3 = 1.5-2-3-4-5-6-7-8-9-10-11-12-13-14-15 \times I_n$	$\leq 30 \text{ ms}$	$\pm 10\%$	—

For all cases not covered by [Table 141](#), the tolerance values in [Table 142](#) apply.

Table 142 - Tolerance Values

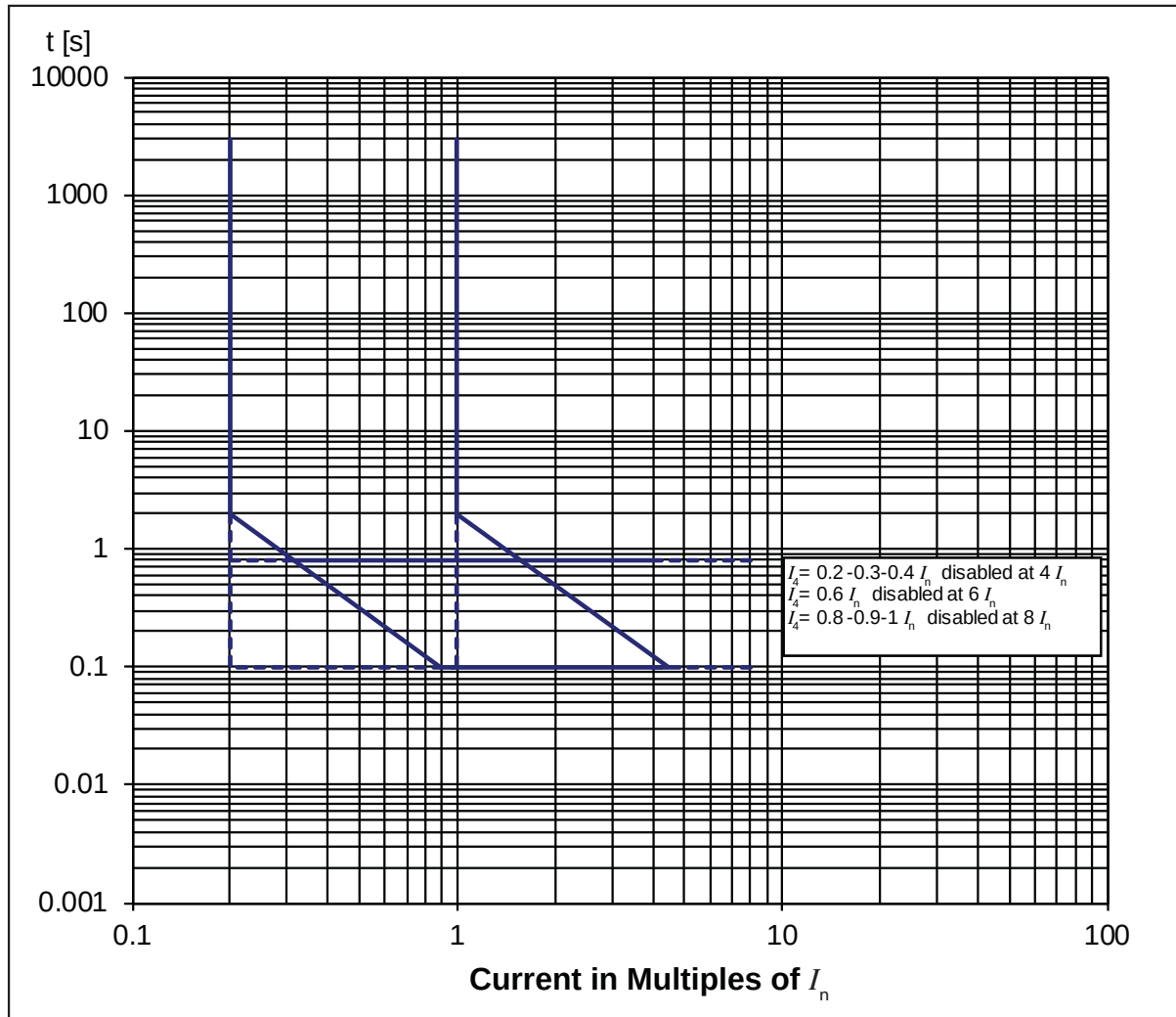
Protection	Trip Threshold	Trip Time
L	$1.05 \leq x I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60 \text{ ms}$
Others	$\pm 20\%$	—

Notes:

- The minimum value of this trip is 1 s regardless of curve type (self-protection)
- These tolerances apply under the following conditions:
 - self-powered relay at full power (without start-up)
 - presence of auxiliary power supply
 - two-phase or three-phase power supply
 - preset trip time $\geq 100 \text{ ms}$
- The value of this trip is ensured between 40 and 500 ms from circuit breaker closing; this setting must be done by the customer
- Curve accuracy applies from -20°C to $+55^\circ \text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
- The right portion of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- For high fault current levels an additional fixed instantaneous hardware override is provided at 18 kA.

Figure 54 - 140G-N, 140G-NS Ground Fault Protection Curve for LSIG MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 1200 A

**Table 143 - Trip Threshold Tolerance Values**

Protection	Disable	Trip Threshold	Trip Time	Trip Threshold Tolerance	Trip Time Tolerance
G ($t = k$)	✓	$I_4 = 0.2-0.3-0.4-0.6-0.8-0.9-1 \times I_n$	with $I > I_4$ $t_4 = 0.1-0.2-0.4$ s	$\pm 7\%$	The best of $\pm 10\%$ or ± 40 ms
G ($t = k/I^2$)	✓	$I_4 = 0.2-0.3-0.4-0.6-0.8-0.9-1 \times I_n$	$t_4 = 0.1$ @ $4.47 I_4$ $t_4 = 0.2$ @ $3.16 I_4$ $t_4 = 0.4$ @ $2.24 I_4$ $t_4 = 0.8$ @ $1.58 I_4$	$\pm 7\%$	$\pm 15\%$

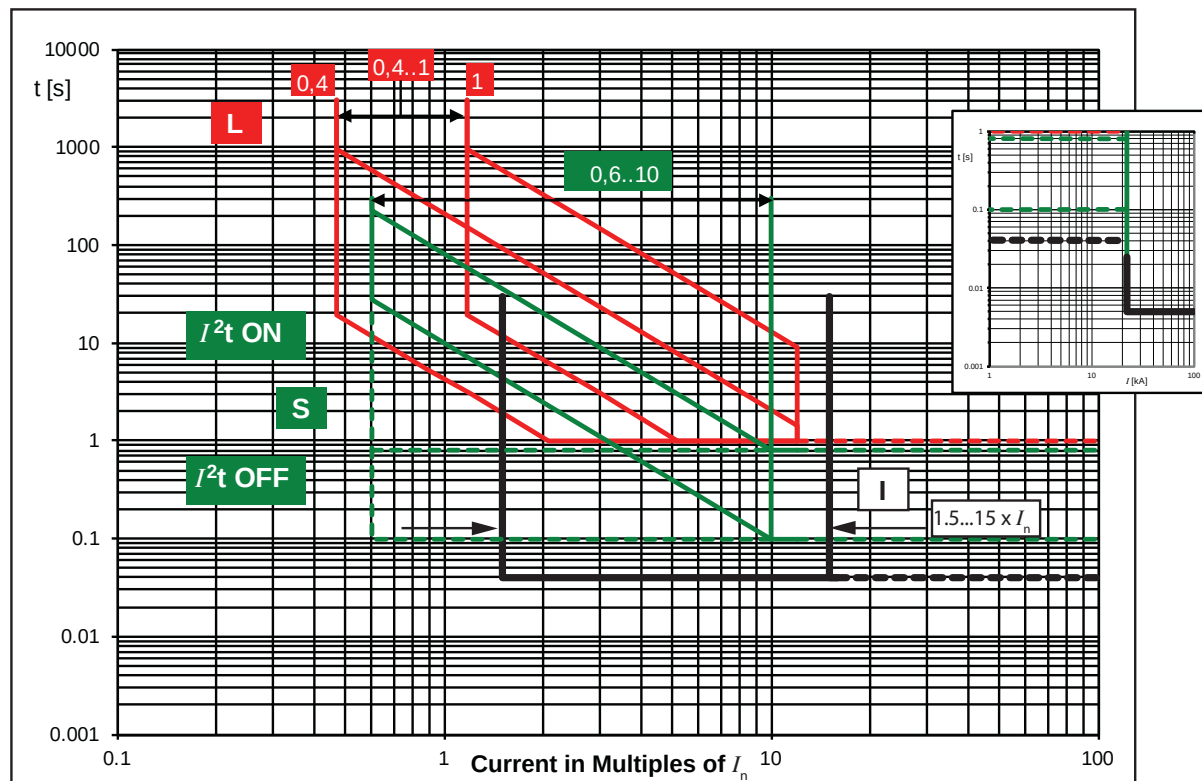
For all cases not covered by [Table 143](#), the tolerance values in [Table 144](#) apply.

Table 144 - Tolerance Values

Protection	Trip Threshold	Trip Time
G	$\pm 10\%$	$\pm 20\%$
Others	$\pm 20\%$	—

Figure 55 - 140G-N, 140G-NS Time-Current Curve for LSIG-MM MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 400 A, 600 A, 800 A, 1000 A, 1200 A, 1250 A (IEC)

**Table 145 - Trip Threshold Tolerance Values**

Protection	Disable	Trip Threshold	Trip Time	Trip Threshold Tolerance	Trip Time Tolerance
$L (t = k/I^2)$		$0.4 \times I_n \leq I_1 \leq 1 \times I_n$	$3 \text{ s} \leq t_1 \leq 144 \text{ s}^{(1)}$, step 3 s $t_1 @ 3 \times I_1$	Release between 1.05 and 1.2 I_1	$\pm 10\% I_g \leq 6 \times I_n$
$S (t = k)$	✓	$0.6 \times I_n \leq I_2 \leq 10 \times I_n$ $0.6 \times I_n \leq I_2 \text{ startup} \leq 10 \times I_n$ step 0.1 $\times I_n$	Min. 0.05 s $\leq t_2 \leq 0.8 \text{ s}$, step 0.01 s 0.10 s $\leq t_2 \text{ startup} < 30 \text{ s}$, step 0.01 s 0.04 s $\leq t_2 \text{ sel} \leq 0.20 \text{ s}$, step 0.01 s	$\pm 7\% I_g \leq 6 \times I_n$; $\pm 10\% I_g > 6 \times I_n$	The best of $\pm 10\%$ or $\pm 40 \text{ ms}$
$S (t = k/I^2)$	✓	$0.6 \times I_n \leq I_2 \leq 10 \times I_n$; step 0.1 $\times I_n$	0.05 s $\leq t_2 \leq 0.8 \text{ s}$, step 0.01 @ 10 $\times I_n$	$\pm 7\% I_g \leq 6 \times I_n$; $\pm 10\% I_g > 6 \times I_n$	$\pm 15\% I_g \leq 6 \times I_n$; $\pm 20\% I_g > 6 \times I_n$
$I (t = k)$	✓	$1.5 \times I_n \leq I_3 \leq 15 \times I_n$; step 0.1 $\times I_n$	$\leq 30 \text{ ms}$	$\pm 10\%$	—

For all cases not covered by [Table 145](#), the tolerance values in [Table 146](#) apply.

Table 146 - Tolerance Values

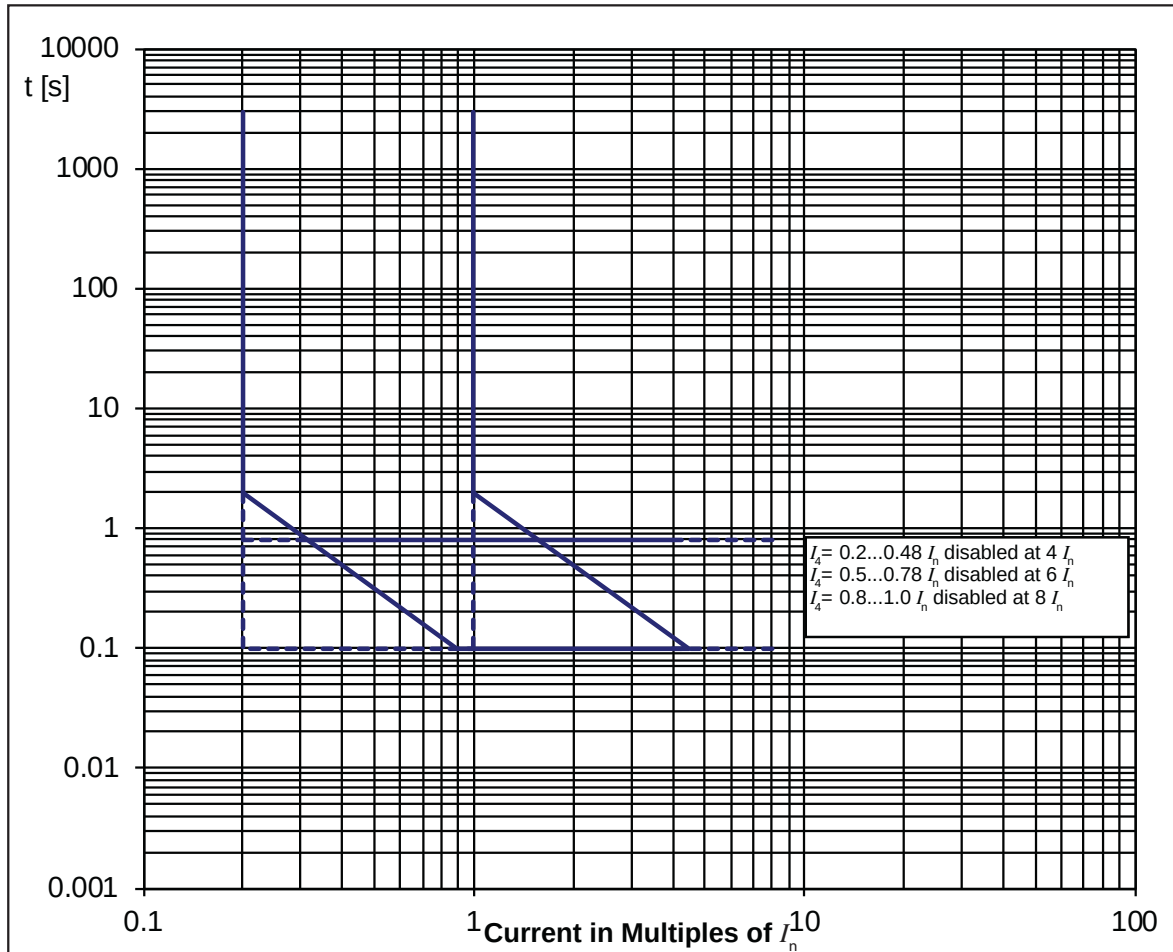
Protection	Trip Threshold	Trip Time
L	$1.05 \leq I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60 \text{ ms}$
Others	$\pm 20\%$	—

Notes:

- The minimum value of this trip is 1 s regardless of curve type (self-protection)
- These tolerances apply under the following conditions:
 - self-powered relay at full power (without start-up)
 - presence of auxiliary power supply
 - two-phase or three-phase power supply
 - preset trip time $\geq 100 \text{ ms}$
- The value of this trip is ensured between 40 and 500 ms from circuit breaker closing; this setting must be done by the customer
- Curve accuracy applies from -20°C to $+55^\circ \text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
- The right portion of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- For high fault current levels an additional fixed instantaneous hardware override is provided at 18 kA.

Figure 56 - 140G-N, 140G-NS Ground Fault Protection Curve for LSIG-MM MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 400 A, 600 A, 800 A, 1000 A, 1200 A, 1250 A (IEC)

**Table 147 - Trip Threshold Tolerance Values**

Protection	Disable	Trip Threshold	Trip Time	Trip Threshold Tolerance	Trip Time Tolerance
G ($t = k$)	✓	$0.2 \times I_n \leq I_4 \leq 1 \times I_n$ step $0.02 \times I_n$ when $I > I_4$	$0.1 \text{ s} \leq t_4 \leq 1 \text{ s}$, step 0.05 s $0.10 \text{ s} \leq t_{4 \text{ startup}} \leq 1 \text{ s}$, step 0.02 s $0.04 \text{ s} \leq t_{4 \text{ sel}} \leq 0.20 \text{ s}$, step 0.01 s	$\pm 7\%$	The best of $\pm 10\%$ or $\pm 40 \text{ ms}$
G ($t = k/I^2$)	✓	$0.2 \times I_n \leq I_4 \leq 1 \times I_n$ step $0.02 \times I_n$	$0.1 \text{ s} \leq t_4 \leq 1 \text{ s}$, step 0.05 @ $I_g > 4 \times I_n$	$\pm 7\%$	$\pm 15\%$

For all cases not covered by [Table 147](#), the tolerance values in [Table 148](#) apply.

Table 148 - Tolerance Values

Protection	Trip Threshold	Trip Time
G	$\pm 10\%$	$\pm 20\%$
Others	$\pm 20\%$	—

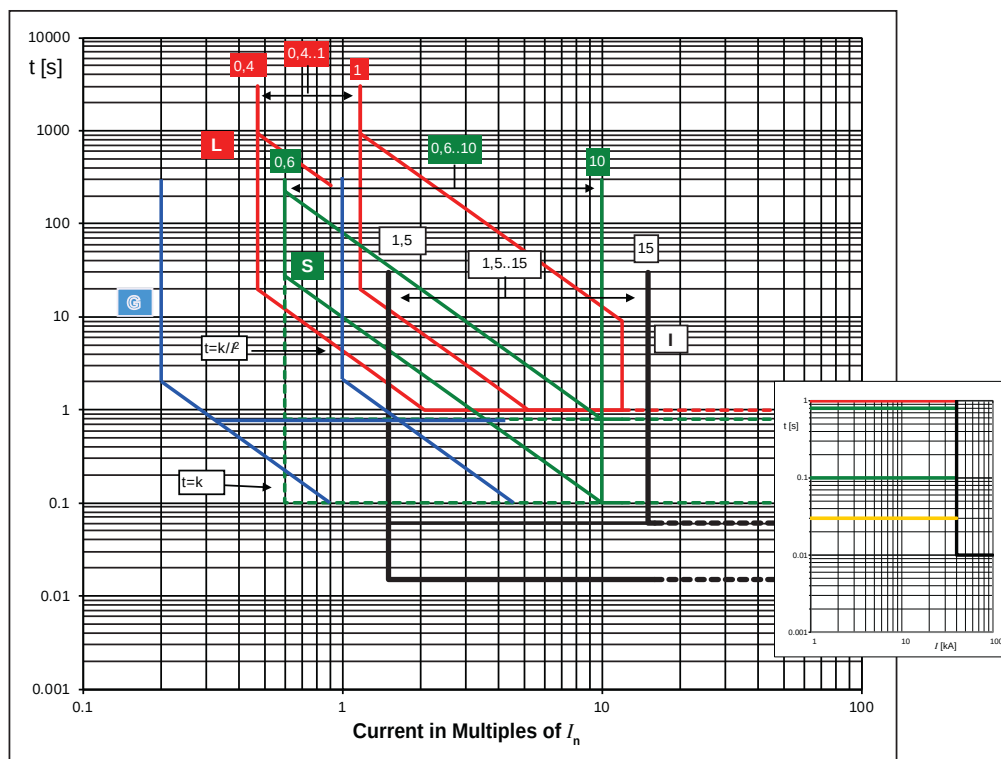
Note:

Protection G is disabled for current values:

- greater than $4 \times I_n$, where $I_4 < 0.4 \times I_n$
- greater than $6 \times I_n$, where $0.5 I_n \leq I_4 < 0.8 I_n$
- greater than $8 \times I_n$, where $I_4 \geq 0.8 \times I_n$

Figure 57 - 140G-R Time-Current Curve for LSIG MCCBs

- Maximum voltage: 600V AC, 50/60 Hz
- Available sensors (I_n): 2000 A, 2500 A, 3000 A
- Electronic trip unit. Long delay response, short delay with I^2t available sensors

**Table 149 - Trip Threshold Tolerance Values**

Protection	Disable	Trip Threshold	Trip Time	Trip Threshold Tolerance	Trip Time Tolerance
L ($t = k/I^2$)		$I_1 = 0.4-0.425-0.45-0.475-0.5 \dots 1 \times I_n$	$t_1 = 3-12-24-36-48-72-108-144 \text{ s}^{(1)}$ @ $3 \times I_1$	Release between 1.05 and $1.2 I_1$	$\pm 10\% I_g \leq 6 \times I_n$
S ($t = k$)	✓	$I_2 = 0.6-0.8-1.2-1.8-2.4-3-3.6-4.2-5-5.8-6.6-7.4-8.2-9-10 \times I_n$	with $I > I_2$ $t_2 = 0.1-0.2-0.3-0.4-0.5-0.6-0.7-0.8 \text{ s}$	$\pm 7\% I_g \leq 6 \times I_n$; $\pm 10\% I_g > 6 \times I_n$	The best of $\pm 10\%$ or $\pm 40 \text{ ms}$
S ($t = k/I^2$)	✓	$I_2 = 0.6-0.8-1.2-1.8-2.4-3-3.6-4.2-5-5.8-6.6-7.4-8.2-9-10 \times I_n$	$t_2 = 0.1-0.2-0.3-0.4-0.5-0.6-0.7-0.8 \text{ s}$ @ $10 \times I_n$	$\pm 7\% I_g \leq 6 \times I_n$; $\pm 10\% I_g > 6 \times I_n$	$\pm 15\% I_g \leq 6 \times I_n$; $\pm 20\% I_g > 6 \times I_n$
I ($t = k$)	✓	$I_3 = 1.5-2-3-4-5-6-7-8-9-10-11-12-13-14-15 \times I_n$	$\leq 30 \text{ ms}$	$\pm 10\%$	—
G ($t = k$)	✓	$I_4 = 0.2-0.3-0.4-0.6-0.8-0.9-1 \times I_n$	with $I > I_4$; $t_4 = 0.1-0.2-0.4-0.8 \text{ s}$	$\pm 7\%$	The best of $\pm 10\%$ or $\pm 40 \text{ ms}$
G ($t = k/I^2$)	✓	$I_4 = 0.2-0.3-0.4-0.6-0.8-0.9-1 \times I_n$	$t_4 = 0.1$ @ $4.47 I_4$; $t_4 = 0.2$ @ $3.16 I_4$ $t_4 = 0.4$ @ $2.24 I_4$; $t_4 = 0.8$ @ $1.58 I_4$	$\pm 7\%$	$\pm 15\%$

For all cases not covered by [Table 149](#), the tolerance values in [Table 150](#) apply.

Table 150 - Tolerance Values

Protection	Trip Threshold	Trip Time
L	$1.05 \leq I_1 \leq 1.25$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60 \text{ ms}$
G	$\pm 10\%$	$\pm 20\%$
Others	$\pm 20\%$	—

Notes:

- The minimum value of this trip is 1 s regardless of curve type (self-protection)

- These tolerances apply under the following conditions:
 - self-powered relay at full power (without start-up)
 - presence of auxiliary power supply
 - two-phase or three-phase power supply
 - preset trip time $\geq 100 \text{ ms}$
- The value of this trip is ensured between 40 and 500 ms from circuit breaker closing; this setting must be done by the customer
- Curve accuracy applies from -20°C to $+55^\circ\text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , consult Rockwell Automation.
- The right portion of the curve is determined by the interrupting rating of the circuit breaker.
- Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
- For high fault current levels an additional fixed instantaneous hardware override is provided at 18 kA.

Let-through Current Curves

Figure 58 - Let-through Current Curve for MCCBs, 240V

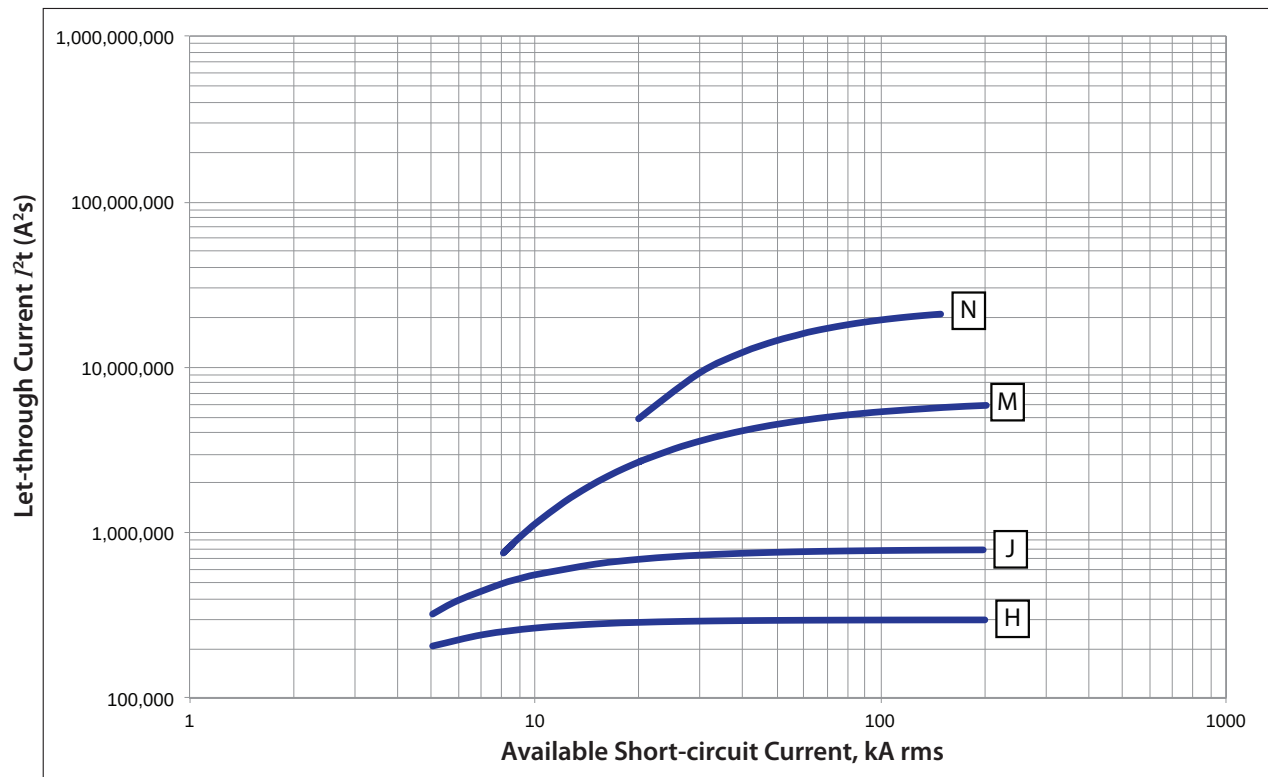


Figure 59 - Peak Let-through Current Curve for MCCBs, 240V

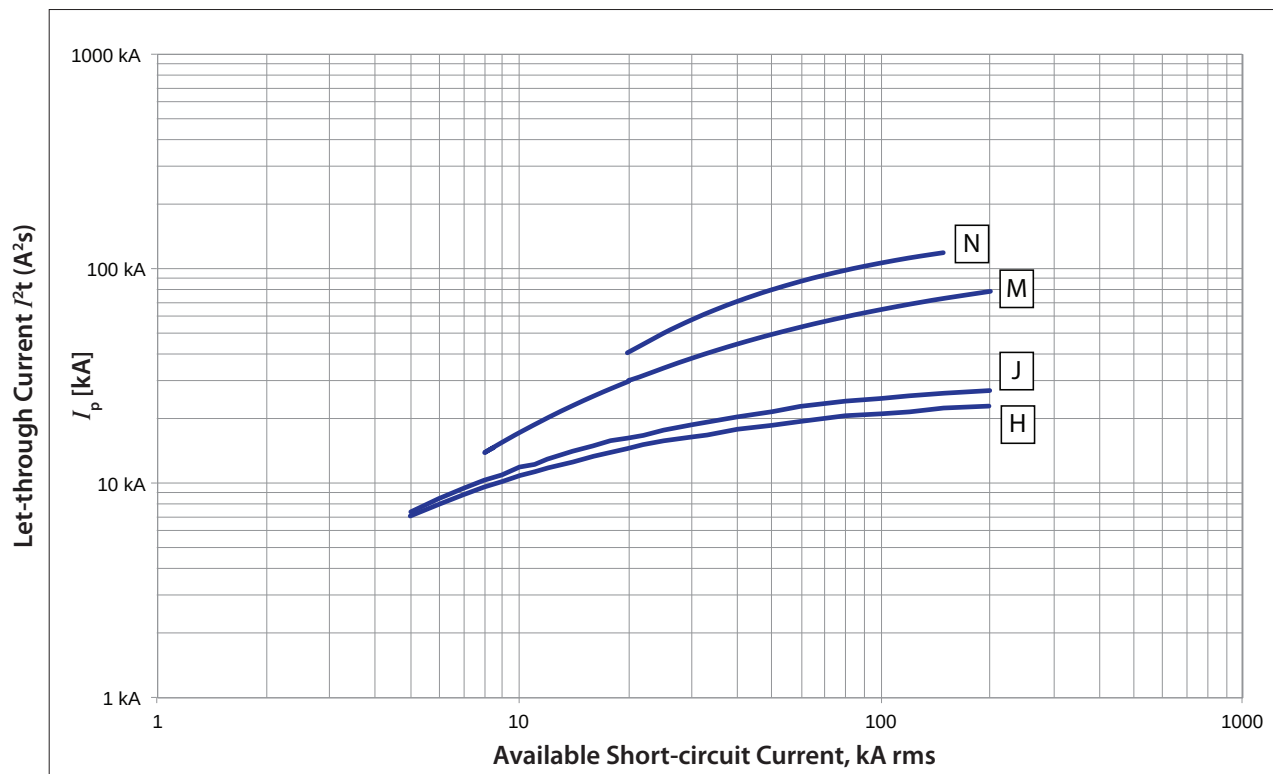


Figure 60 - Let-through Current Curve for MCCBs, 480V

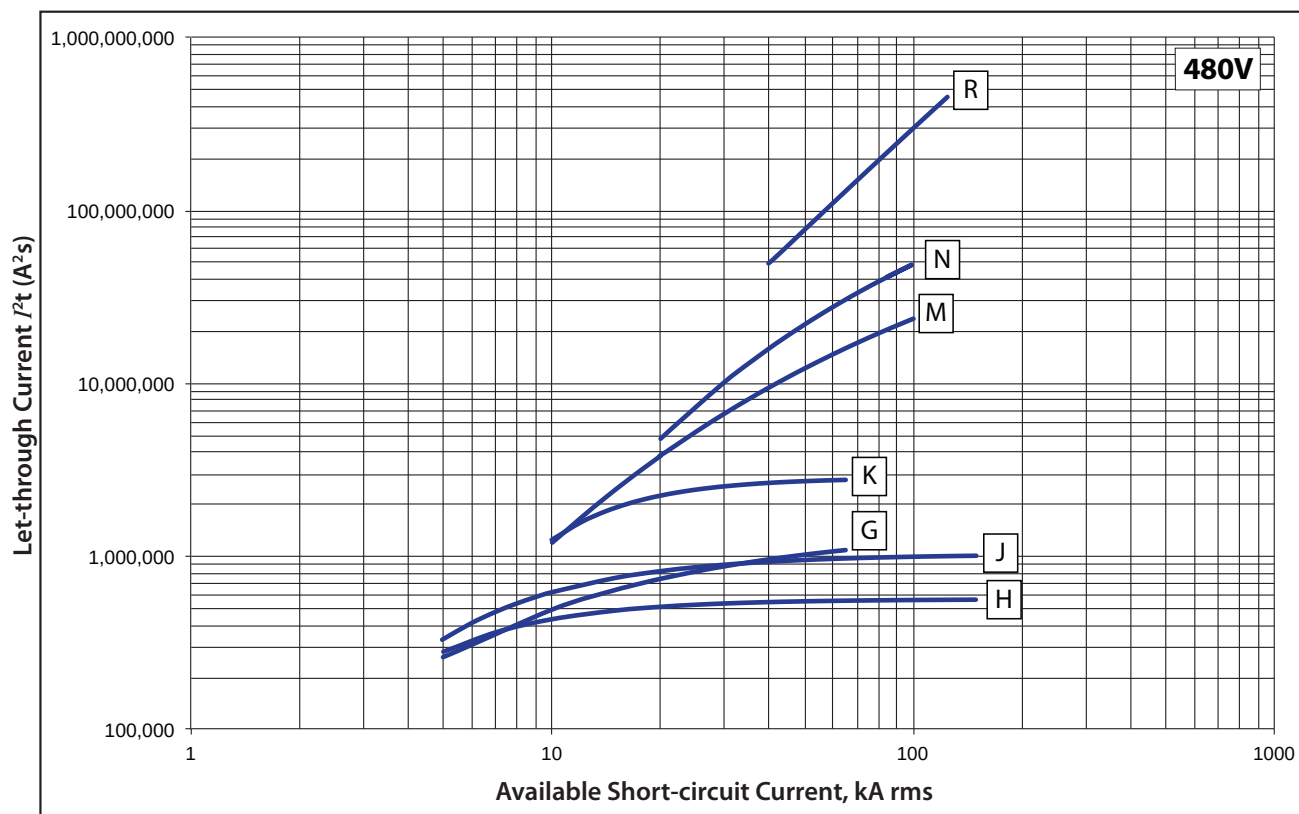


Figure 61 - Peak Let-through Current Curve for MCCBs, 480V

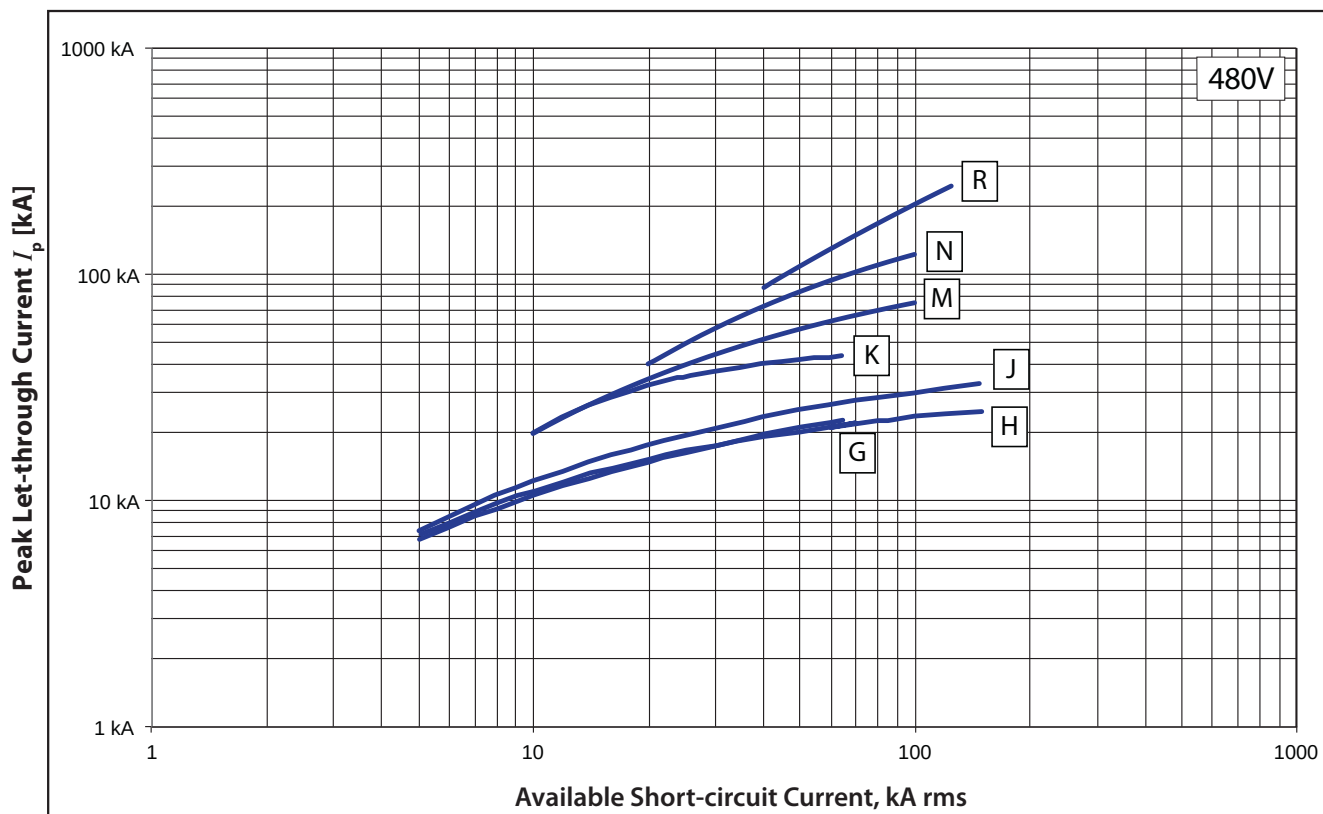


Figure 62 - Let-through Current Curve for MCCBs, 600V

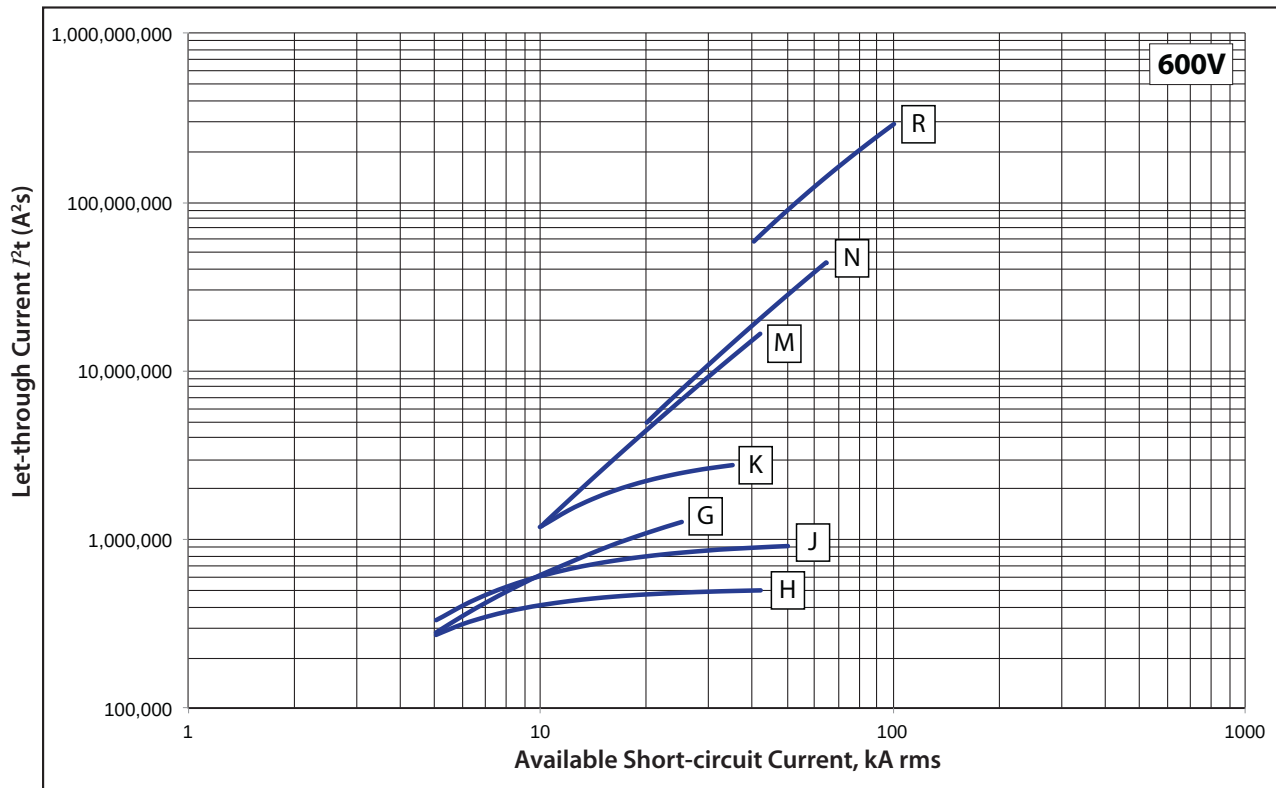
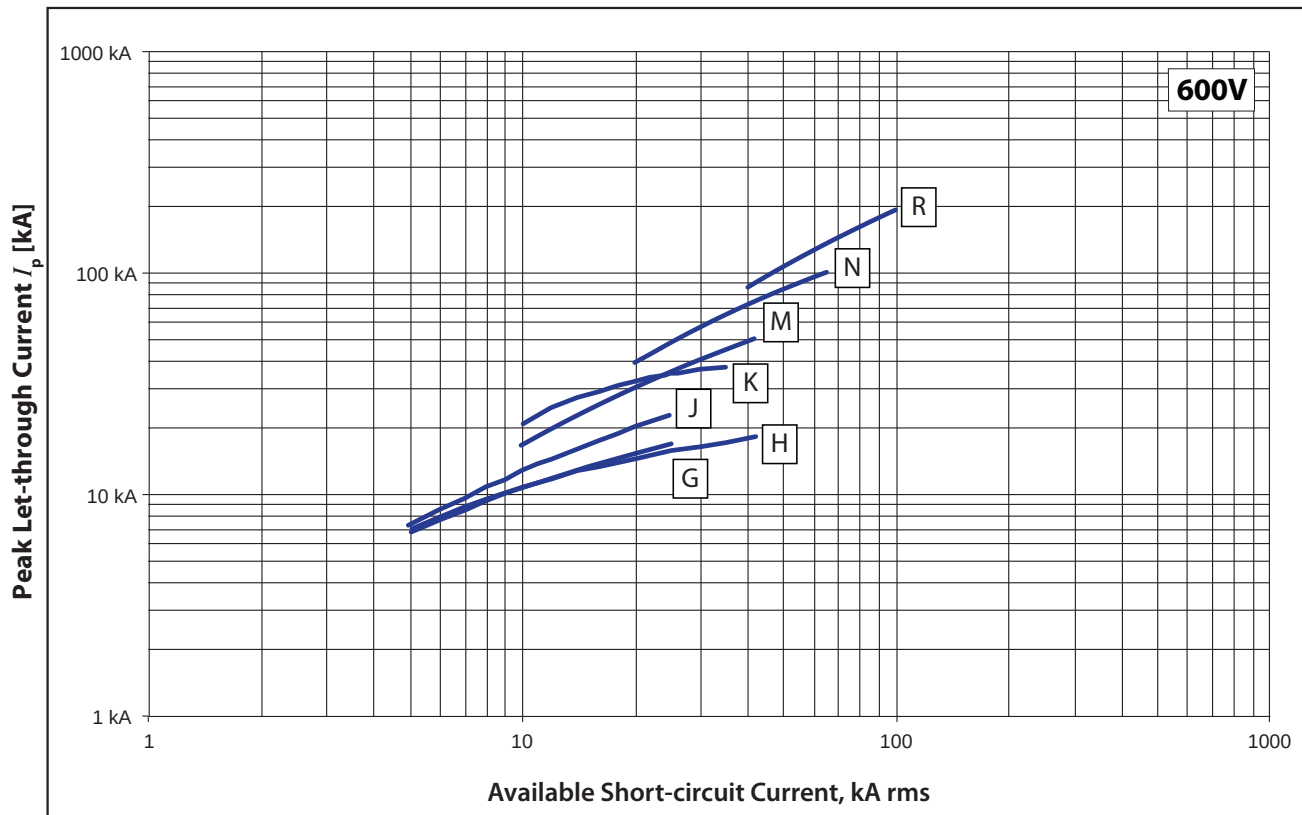


Figure 63 - Peak Let-through Current Curve for MCCBs, 600V



Bulletin 140G Current-limiting Molded Case Circuit Breakers

Let-through Current Curves

Figure 64 - Peak Let-through Current Curve for 65 kA Current-limiting MCCBs, 480V

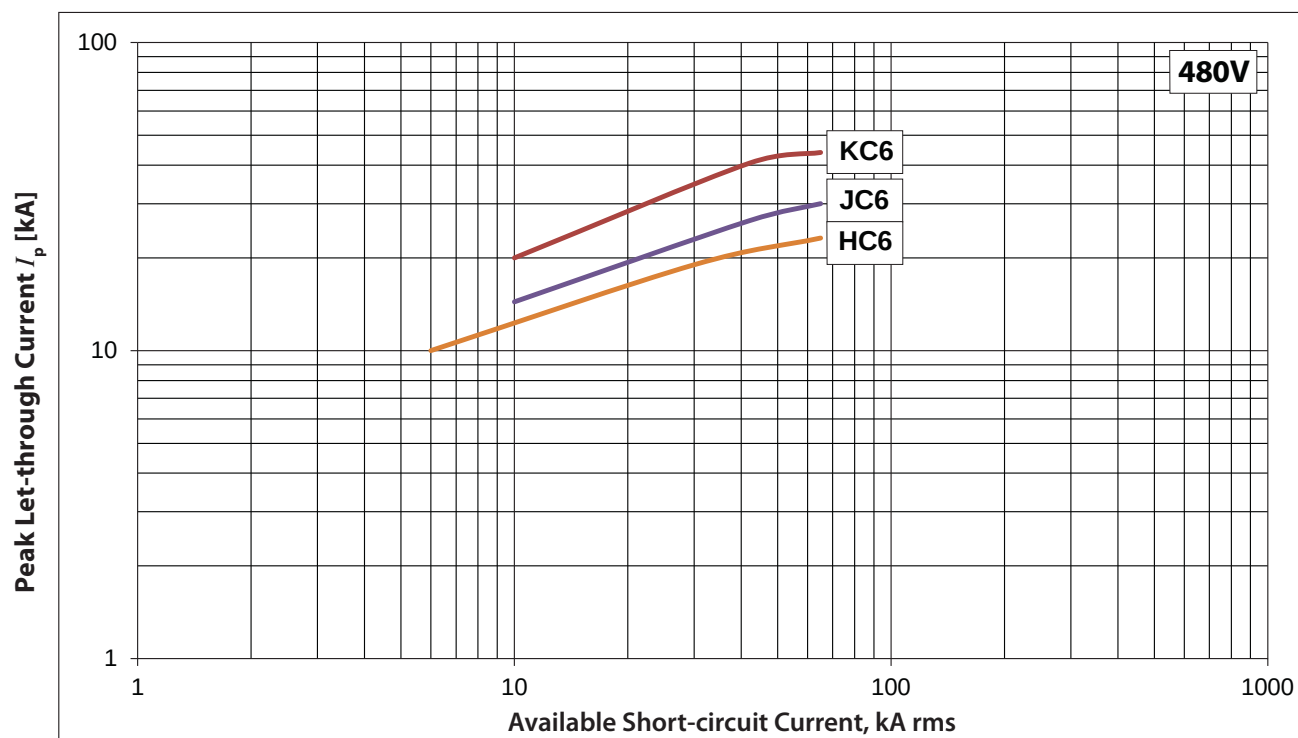


Figure 65 - Peak Let-through Current Curve for 100 kA Current-limiting MCCBs, 480V

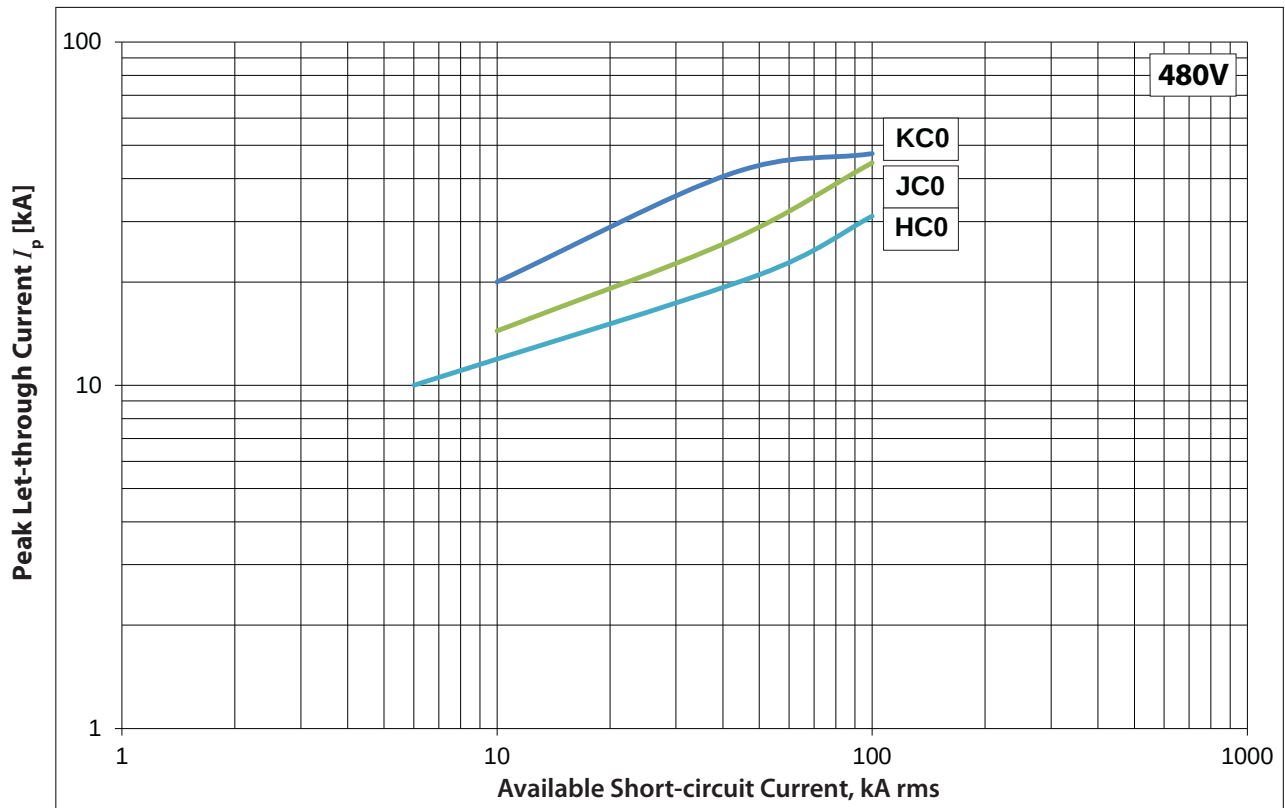


Figure 66 - Peak Let-through Current Curve for 65 kA Current-limiting MCCBs, 600V

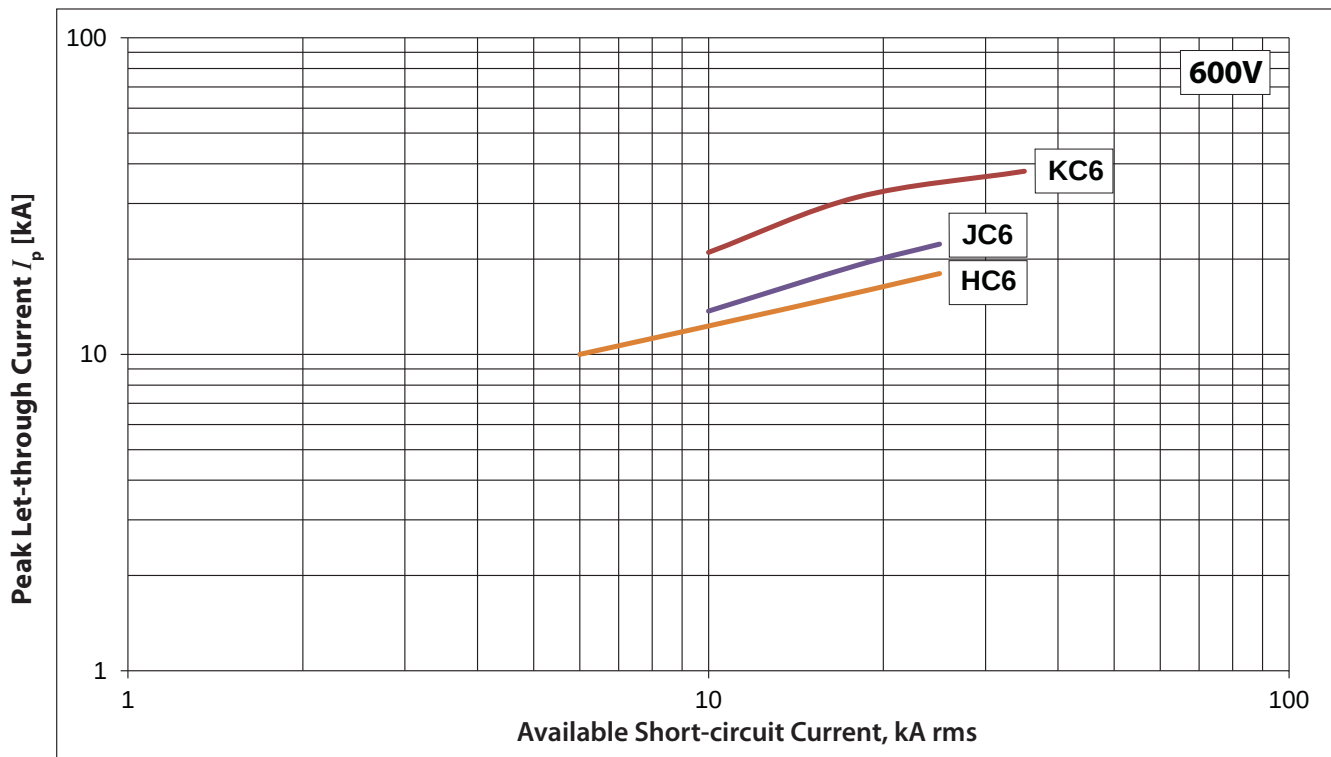


Figure 67 - Peak Let-through Current Curve for 100 kA Current-limiting MCCBs, 600V

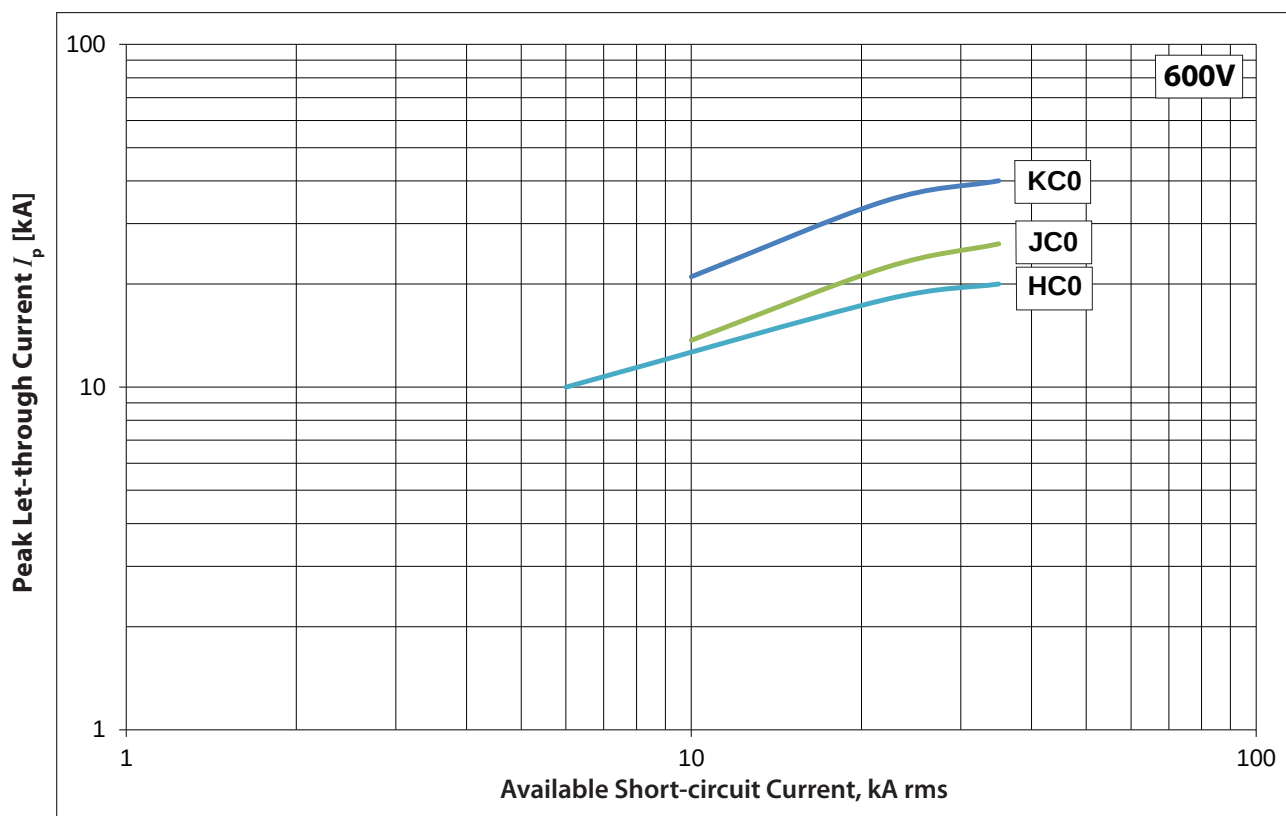


Figure 68 - Let-through Current Curve for 65 kA Current-limiting MCCBs, 480V

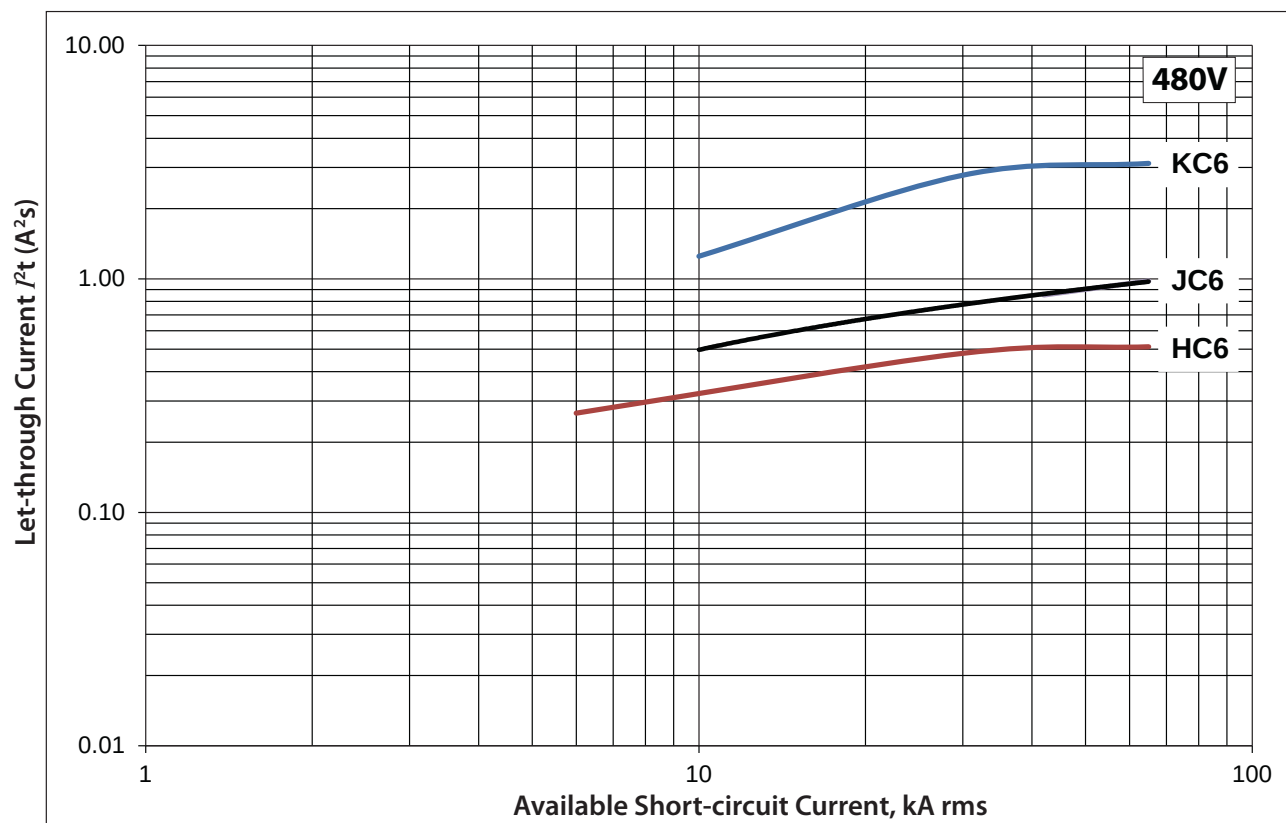


Figure 69 - Let-through Current Curve for 100 kA Current-limiting MCCBs, 480V

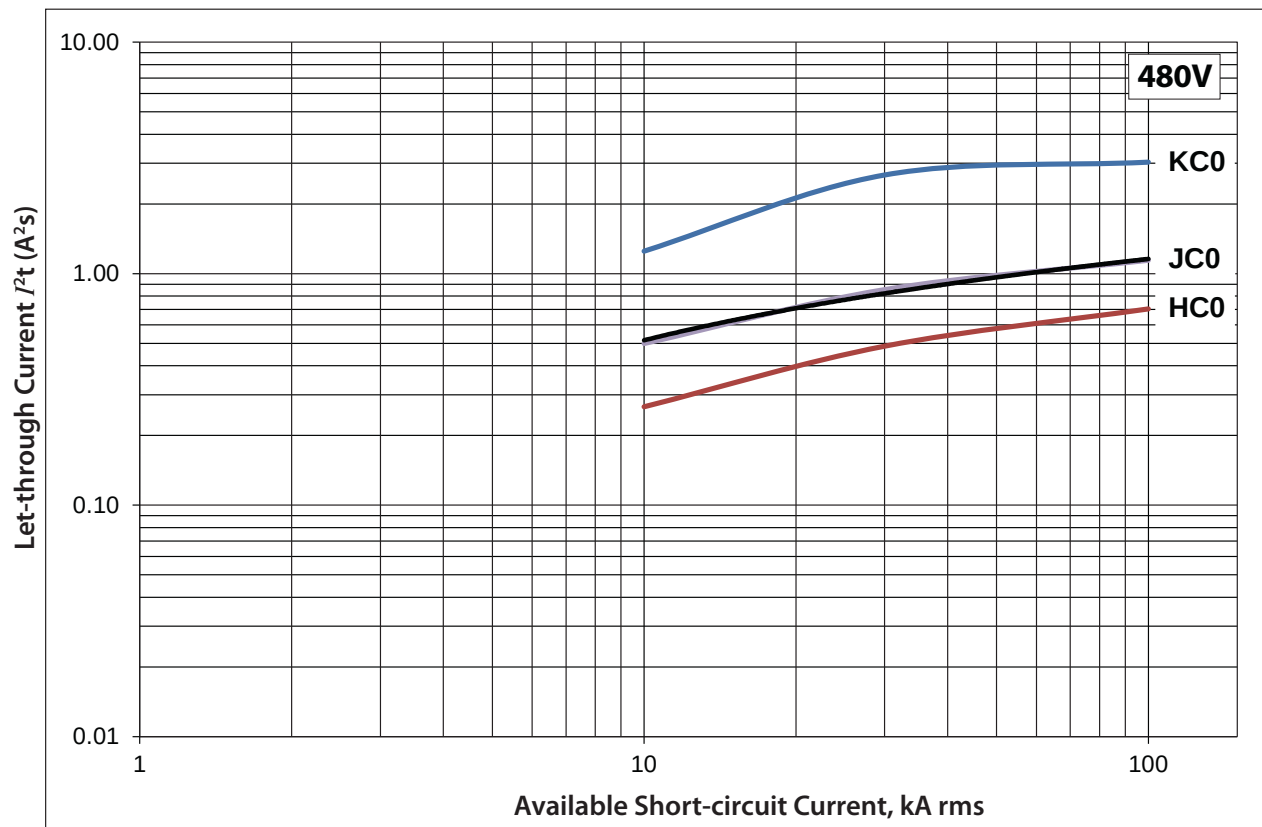


Figure 70 - Let-through Current Curve for 65 kA Current-limiting MCCBs, 600V

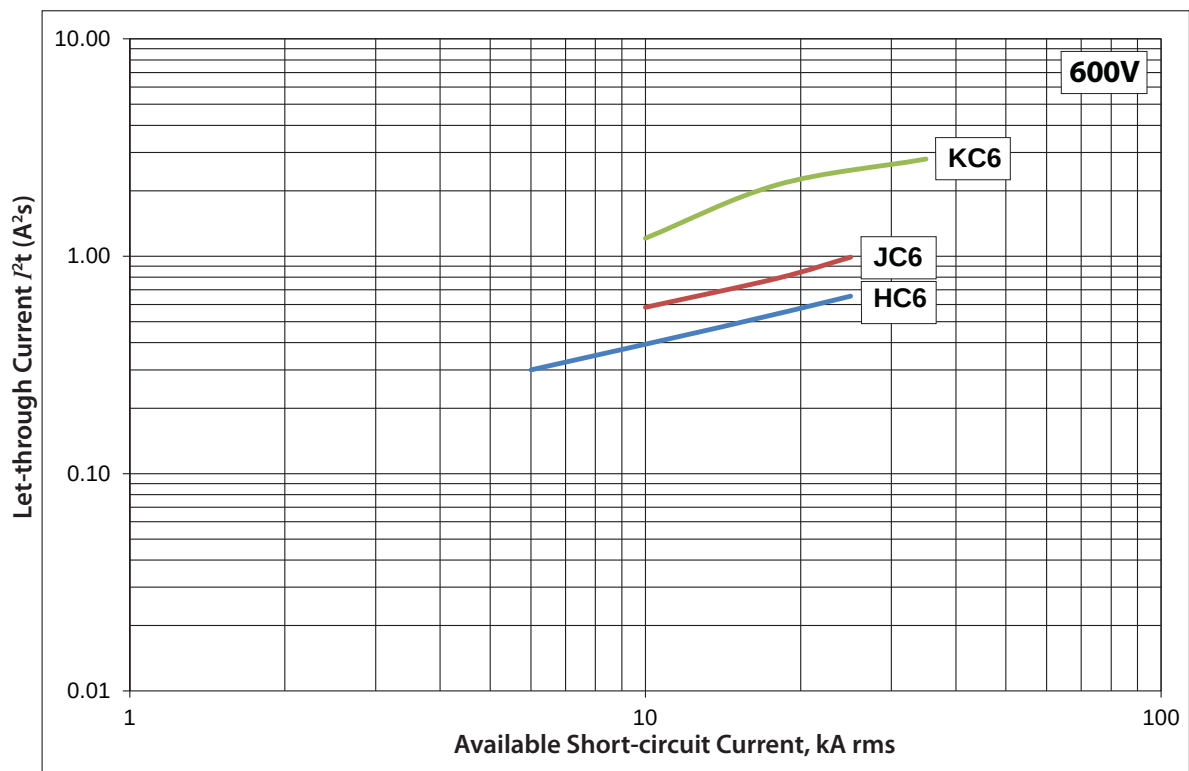
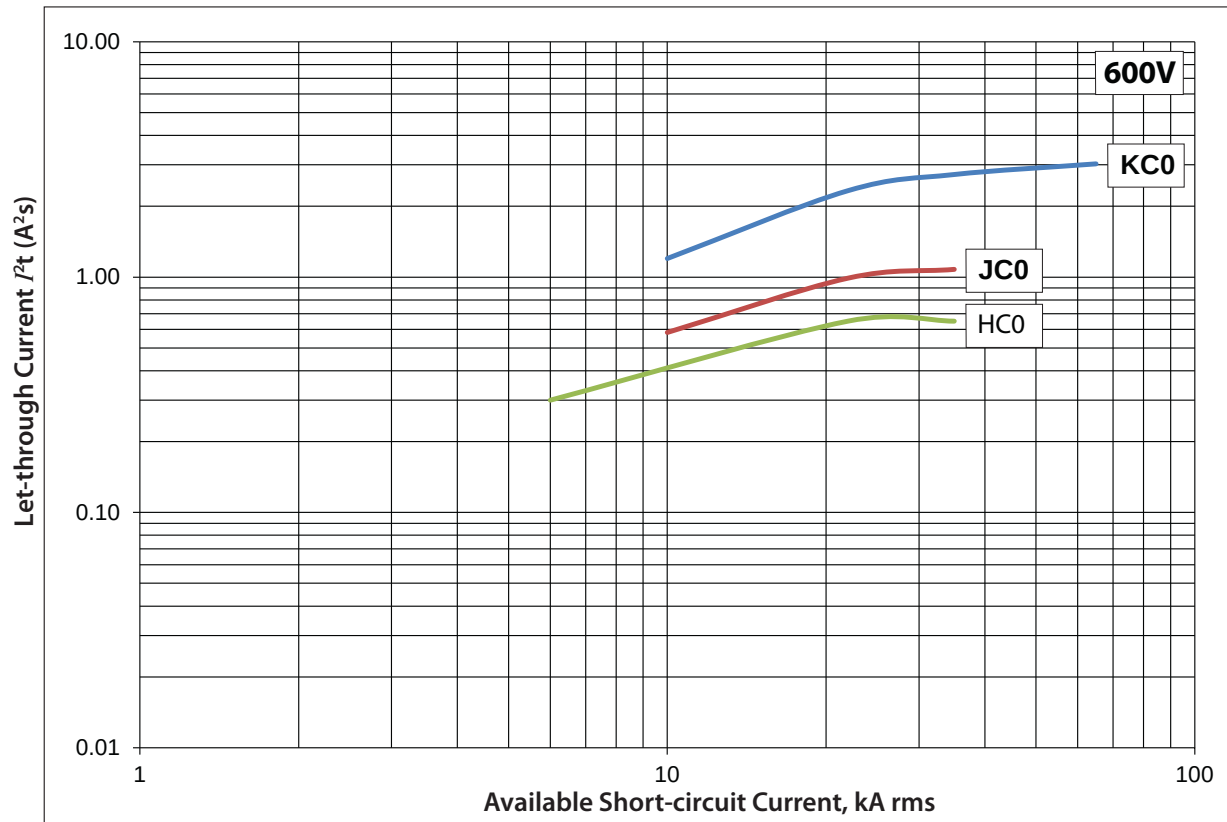


Figure 71 - Let-through Current Curve for 100 kA Current-limiting MCCBs, 600V



Bulletin 140MG Motor Circuit Protectors

Time-Current Curves

Note: Motor circuit protectors are for use only in combination controllers. For DC applications, pick-up settings are approximately 40% higher.

Figure 72 - 140MG-G Time-Current Curve

- Maximum voltage: 600Y/347V AC, (50/60 Hz)
- Maximum current: 3...125 A

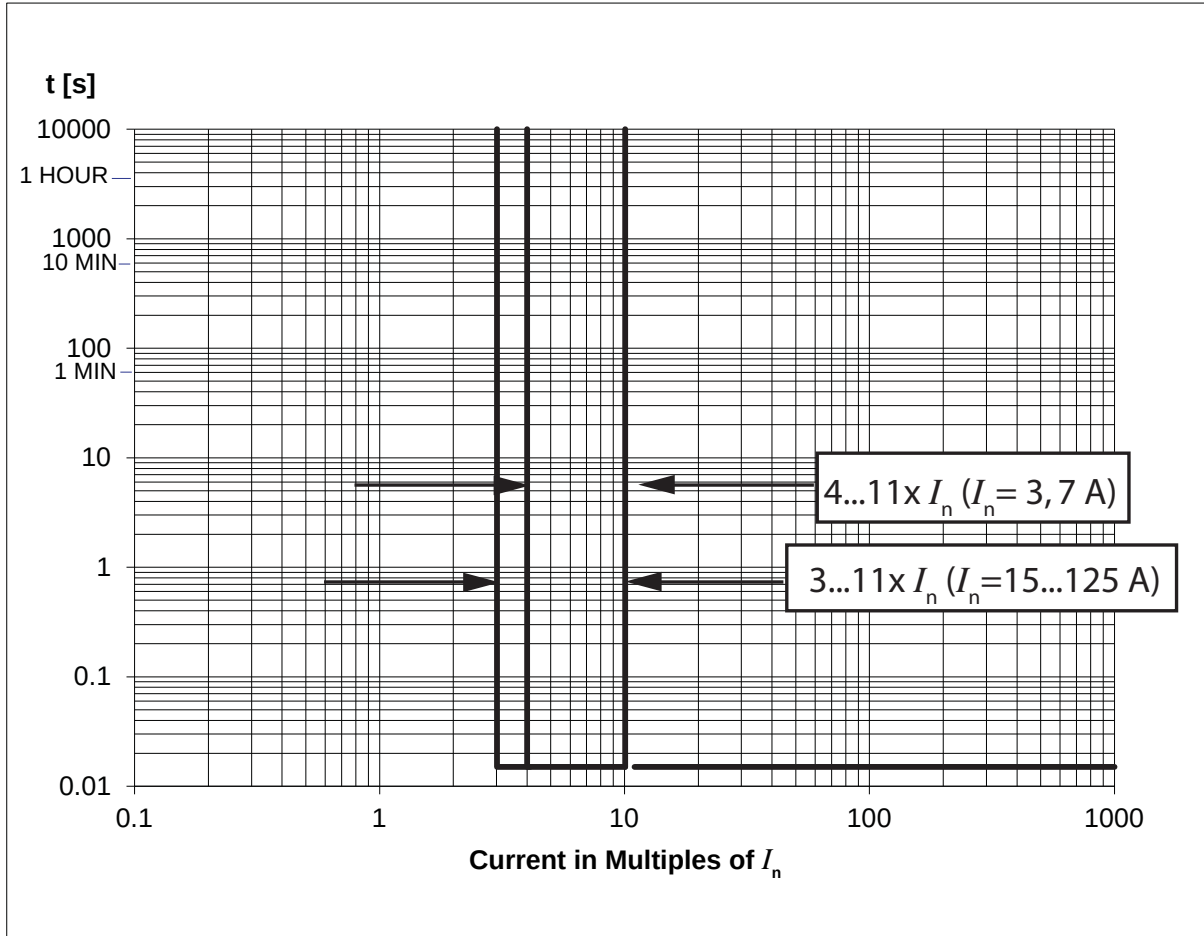


Table 151 - Instantaneous Pick-up Setting (Amperes)

Catalog Number	A	B	C	D	E	F	G	H	I
140MG-G8P-B30	9	12	15	18	21	24	27	30	33
140MG-G8P-B70	21	28	35	42	49	56	63	70	77
140MG-G8P-C15	45	60	75	90	105	120	135	150	165
140MG-G8P-C30	90	120	150	180	210	240	270	300	330
140MG-G8P-C50	150	200	250	300	350	400	450	500	550
140MG-G8P-C70	210	280	350	420	490	560	630	700	770
140MG-G8P-C80	240	320	400	480	560	640	720	800	880
140MG-G8P-D10	300	400	500	600	700	800	900	1000	1100
140MG-G8P-D12	375	500	625	750	875	1000	1125	1250	1375



Table 152 - Typical Trip Unit Nameplate

I_3 [A]								
A	B	C	D	E	F	G	H	I
300	400	500	600	700	800	900	1000	1100

See [Table 151](#) for trip setting values.

Figure 73 - 140MG-H Time-Current Curve

- Maximum voltage: 600V AC, (50/60 Hz)
- Maximum current: 3...100 A

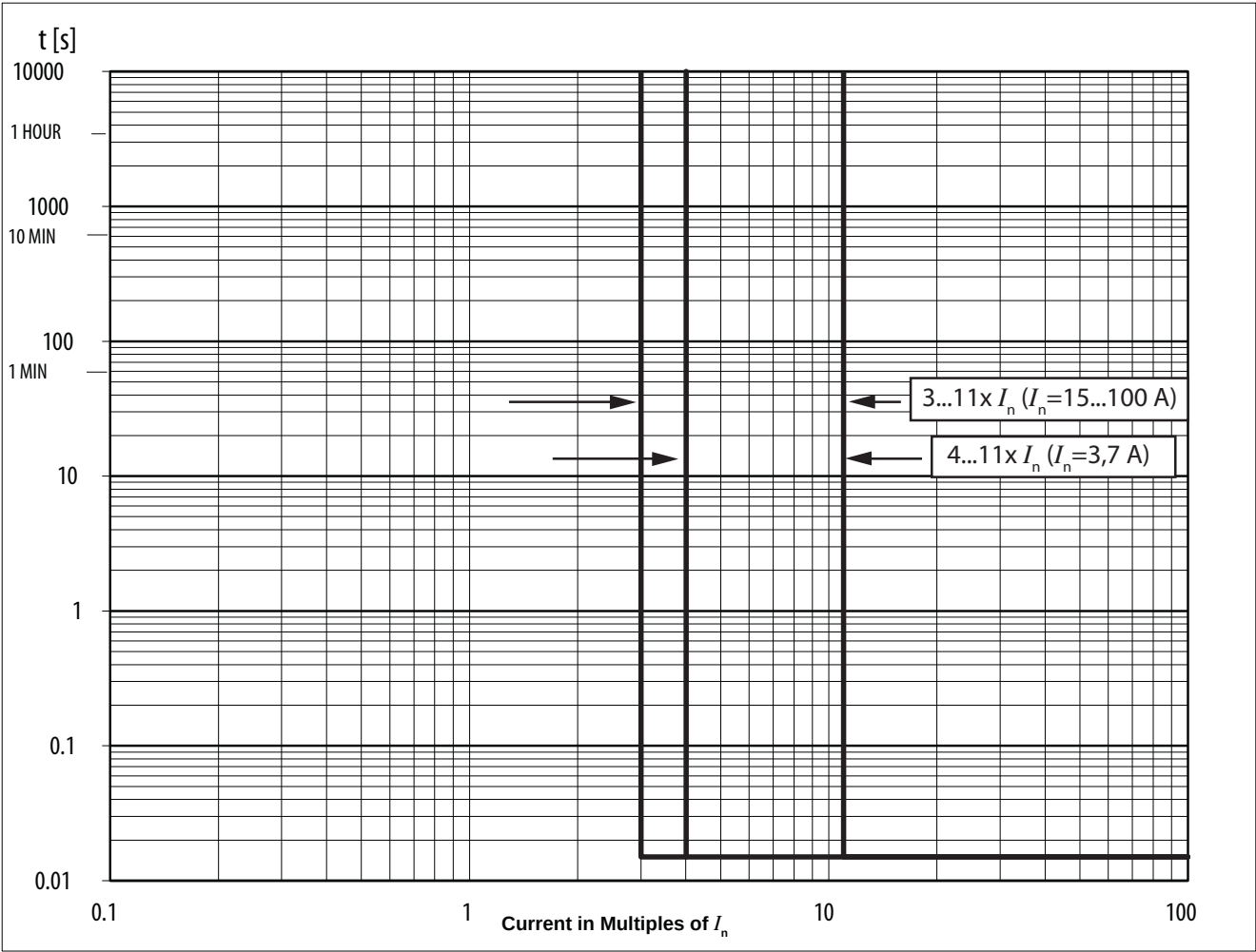


Table 153 - Instantaneous Pick-up Setting (Amperes)

Catalog Number	A	B	C	D	E	F	G	H	I
140MG-H8P-B30	9	12	15	18	21	24	27	30	33
140MG-H8P-B70	21	28	35	42	49	56	63	70	77
140MG-H8P-C15	45	60	75	90	105	120	135	150	165
140MG-H8P-C30	90	120	150	180	210	240	270	300	330
140MG-H8P-C50	150	200	250	300	350	400	450	500	550
140MG-H8P-C70	210	280	350	420	490	560	630	700	770
140MG-H8P-C80	240	320	400	480	560	640	720	800	880
140MG-H8P-D10	300	400	500	600	700	800	900	1000	1100



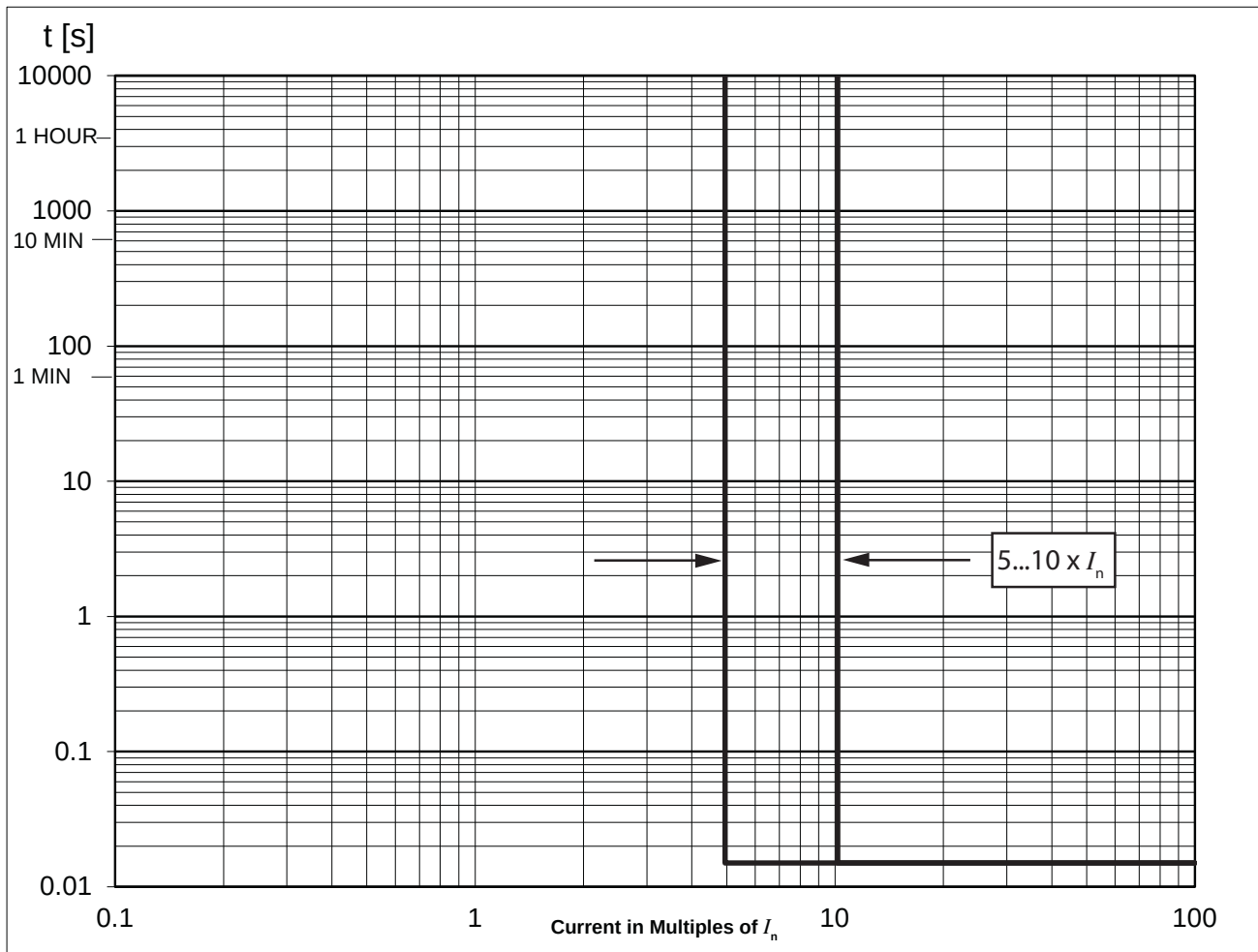
Table 154 - Typical Trip Unit Nameplate

I_3 [A]								
A	B	C	D	E	F	G	H	I
300	400	500	600	700	800	900	1000	1100

See [Table 153](#) for trip setting values.

Figure 74 - 140MG-H Time-Current Curve

- Maximum voltage: 600V AC, (50/60 Hz)
- Maximum current: 125 A

**Table 155 - Typical Trip Unit Nameplate**

I_3 [A]								
A	B	C	D	E	F	G	H	I
625	703	781	859	938	1016	1094	1172	1250

Figure 75 - 140MG-I Time-Current Curve

- Maximum voltage: 600Y/347V AC, (50/60 Hz)
- Maximum current: 100...150 A

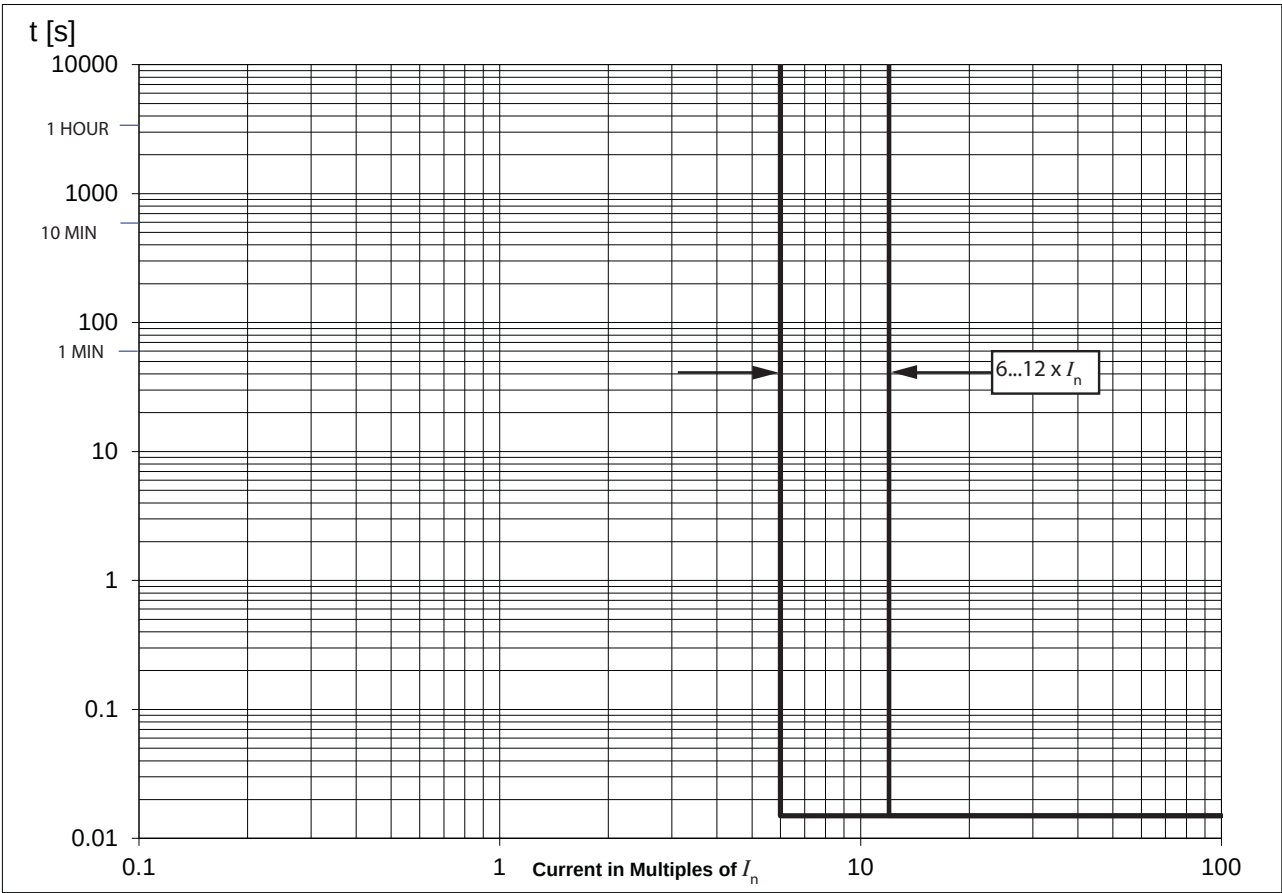


Table 156 - Instantaneous Pick-up Setting (Amperes)

Catalog Number	A	B	C	D	E	F	G	H	I
140MG-I8P-D10	600	675	750	825	900	975	1050	1125	1200
140MG-I8P-D11	660	743	825	908	990	1073	1155	1238	1320
140MG-I8P-D12	750	844	938	1031	1125	1219	1313	1406	1500
140MG-I8P-D15	900	1013	1125	1238	1350	1463	1575	1688	1800



Table 157 - Typical Trip Unit Nameplate

I_3 [A]								
A	B	C	D	E	F	G	H	I
600	675	750	825	900	975	1050	1125	1200

See [Table 156](#) for trip setting values.

Figure 76 - 140MG-J Time-Current Curve

- Maximum voltage: 600V AC, (50/60 Hz)
- Maximum current: 150...200 A

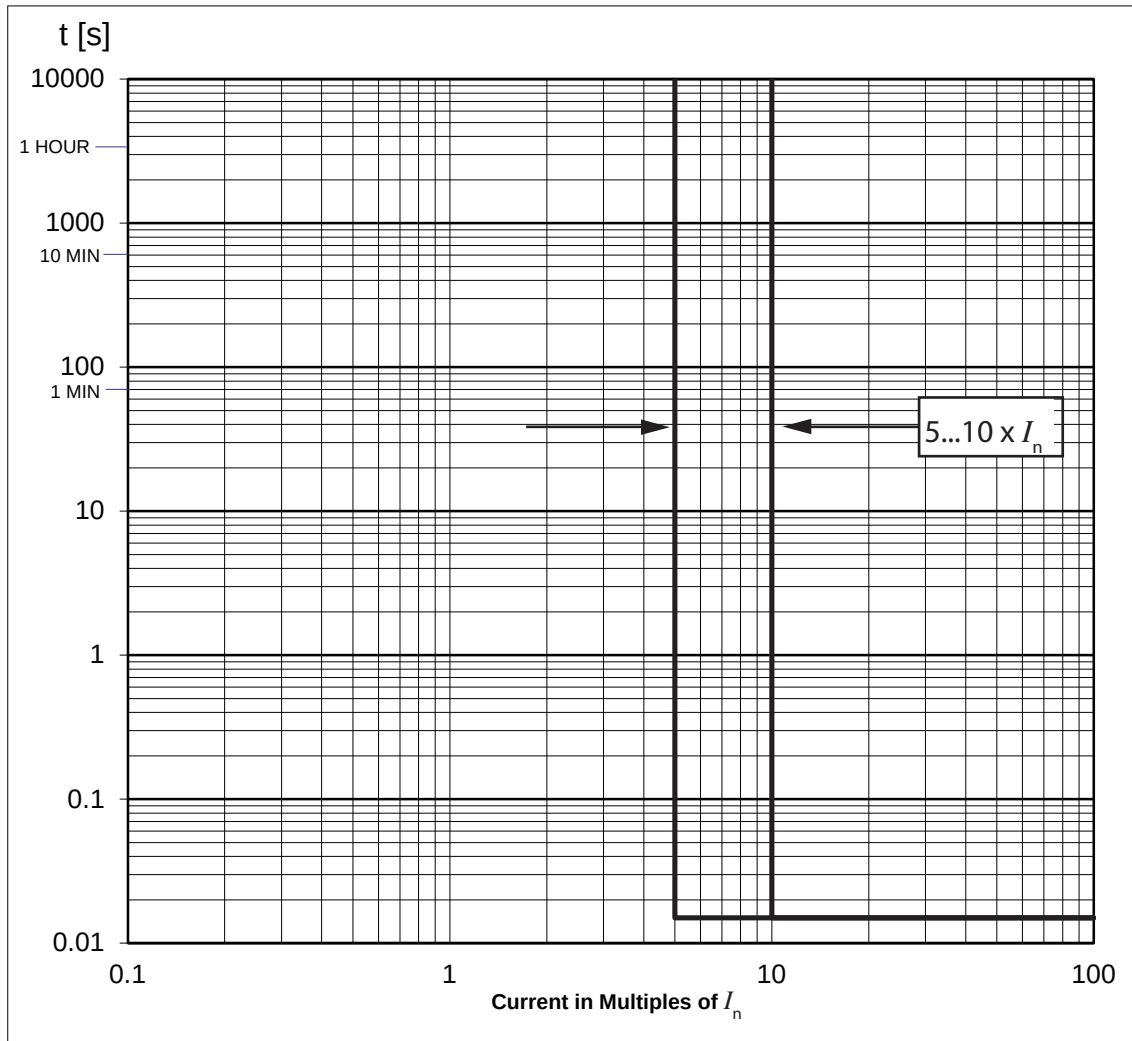


Table 158 - Instantaneous Pick-up Setting (Amperes)

Catalog Number	A	B	C	D	E	F	G	H	I
140MG-J8P-D15	750	844	938	1031	1125	1219	1313	1406	1500
140MG-J8P-D17	875	984	1094	1203	1313	1422	1531	1641	1750
140MG-J8P-D20	1000	1125	1250	1375	1500	1625	1750	1875	2000
140MG-J8P-D22	1125	1266	1406	1547	1688	1828	1969	2109	2250
140MG-J8P-D25	1250	1406	1563	1719	1875	2031	2188	2344	2500



Table 159 - Typical Trip Unit Nameplate

I_3 [A]								
A	B	C	D	E	F	G	H	I
750	844	938	1031	1125	1219	1313	1406	1500

See [Table 158](#) for trip setting values.

Figure 77 - 140MG-K Time-Current Curve

- Maximum voltage: 600V AC, (50/60 Hz)
- Maximum current: 300, 400 A

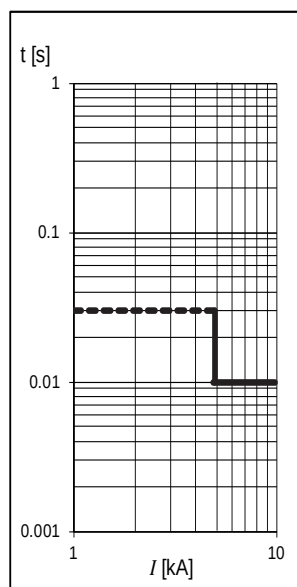
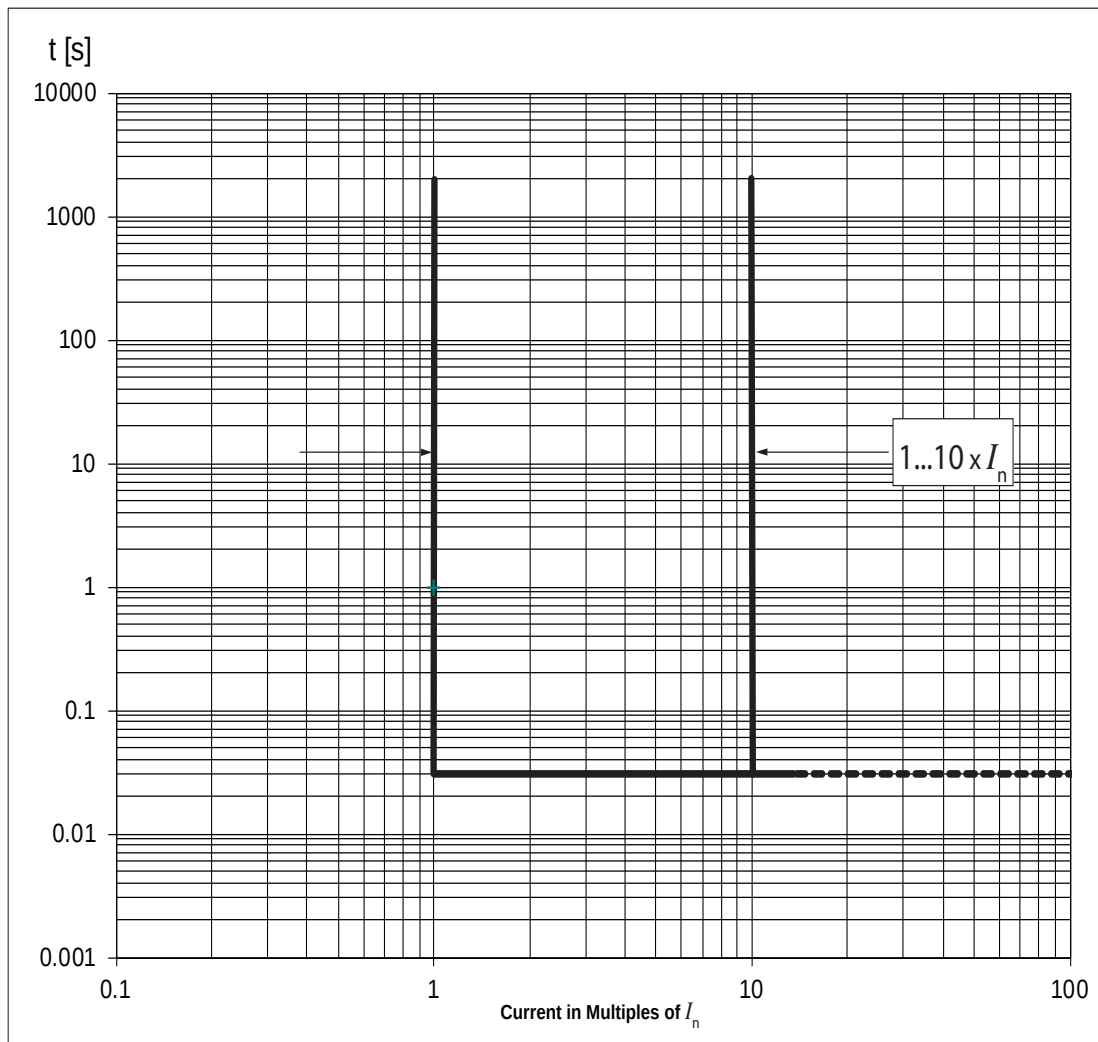


Figure 78 - 140MG-M Time-Current Curve

- Maximum voltage: 600V AC, (50/60 Hz)
- Maximum current: 600, 800 A

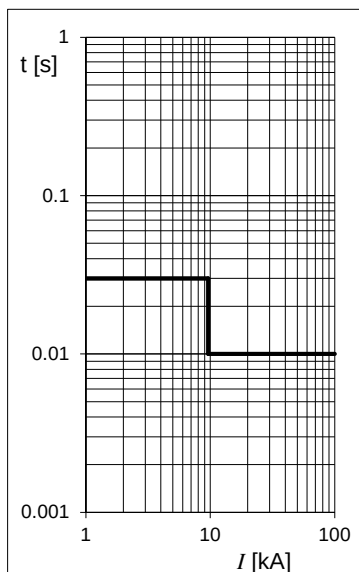
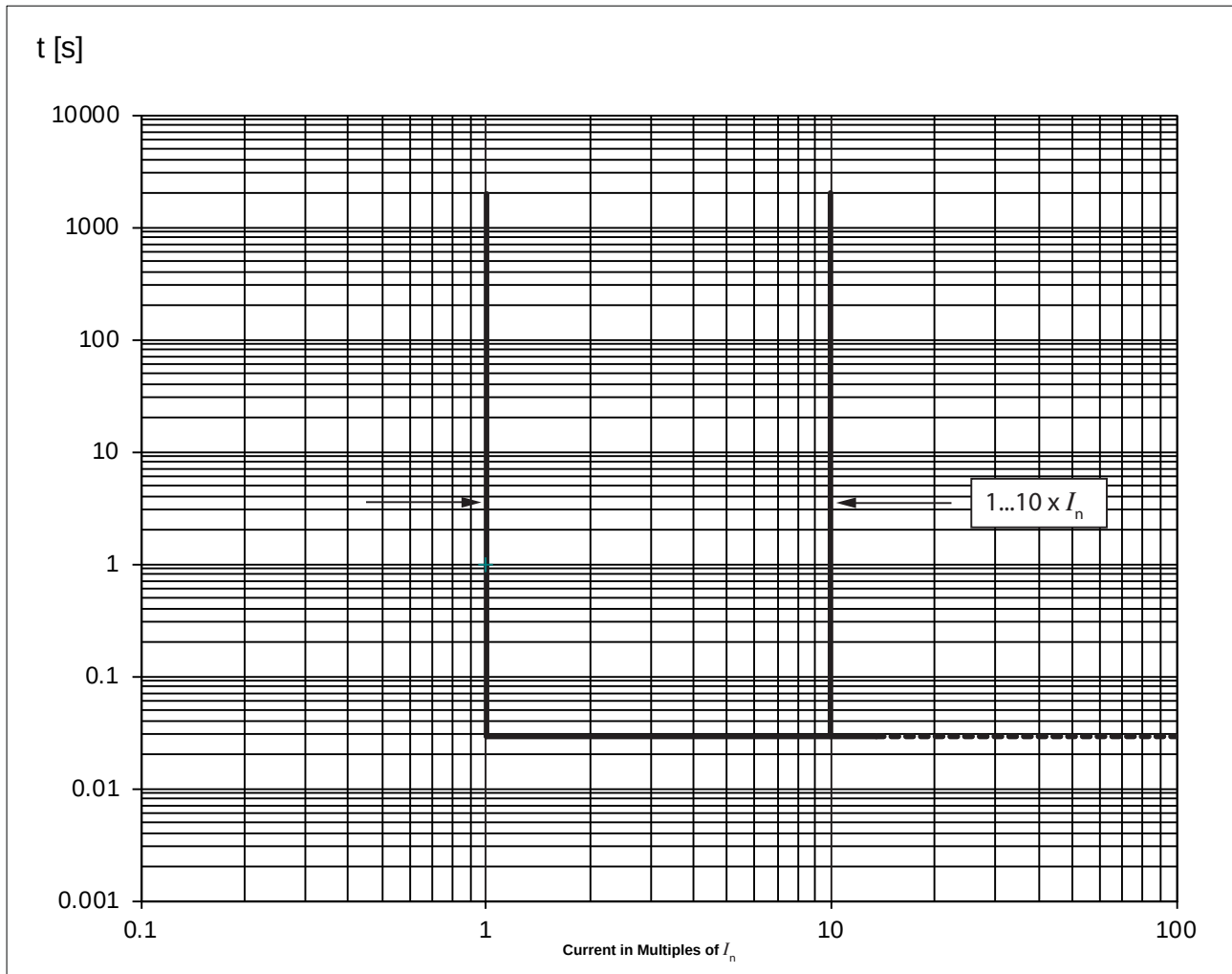
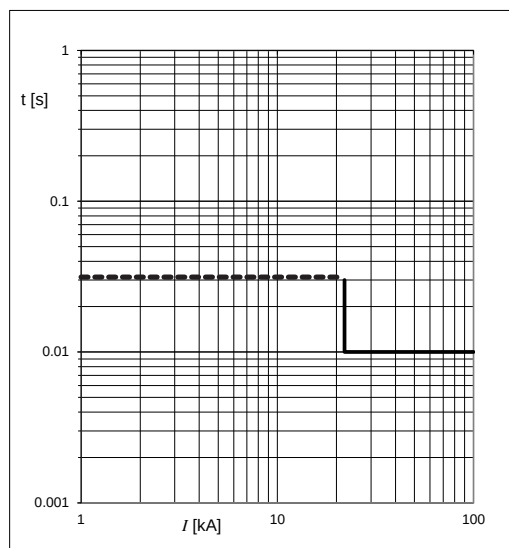
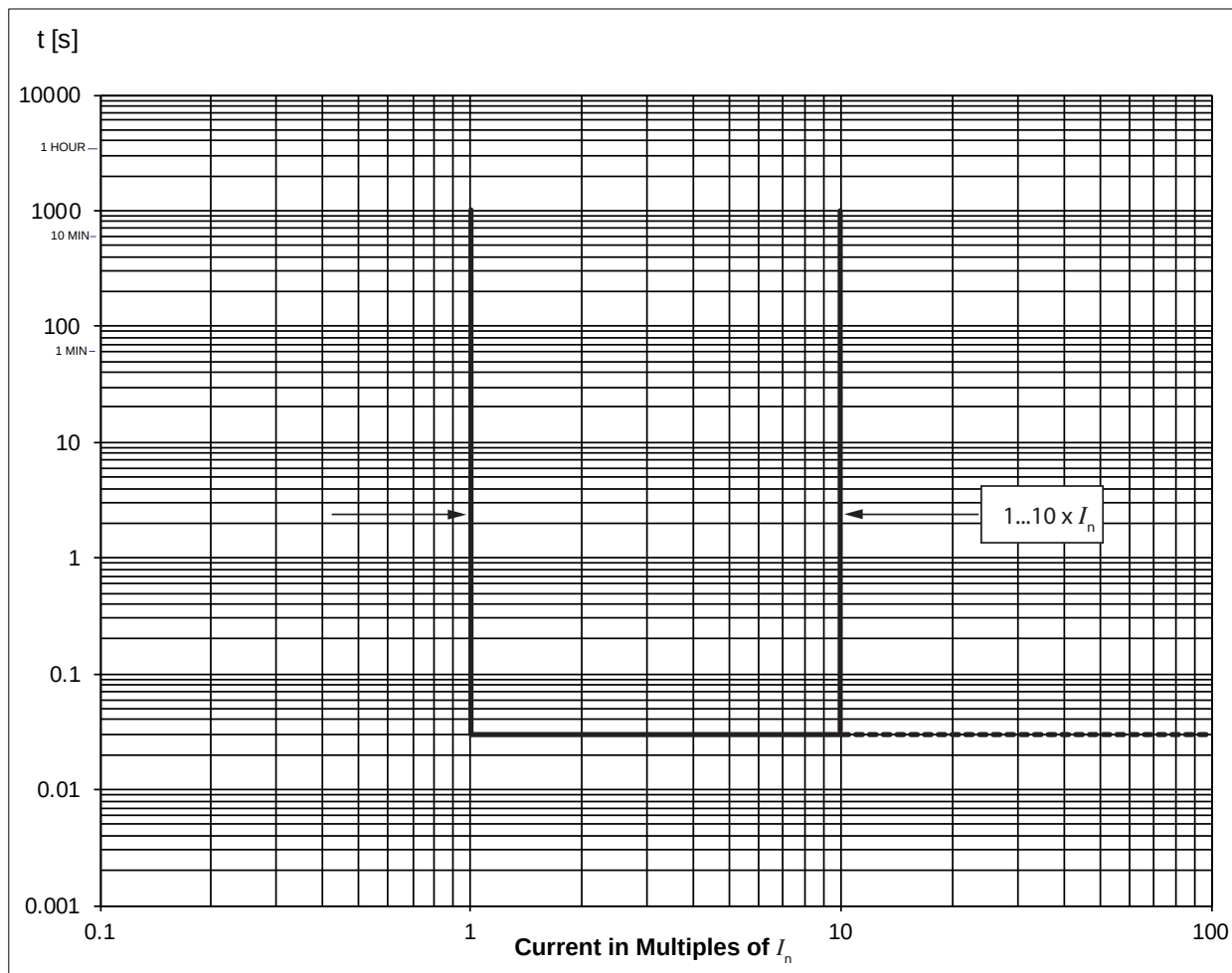


Figure 79 - 140MG-N Time-Current Curve

- Maximum voltage: 600V AC, (50/60 Hz)
- Maximum current: 1200 A

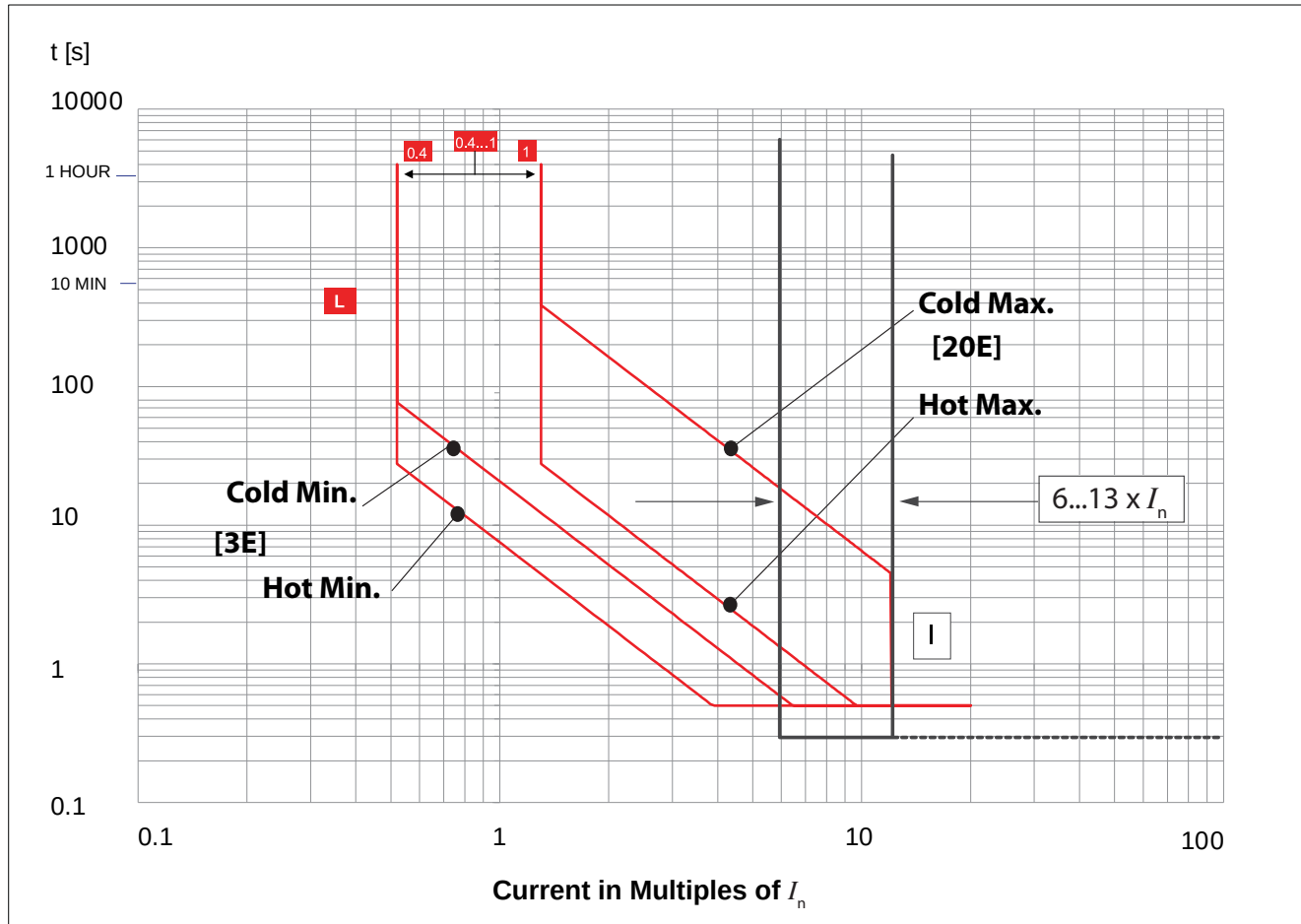


Bulletin 140MG Motor Protection Circuit Breakers

Time-Current Curves

Figure 80 - 140MG-H Time-Current Curve

- Maximum voltage: 600V AC, 50/60 Hz
- Available Current Sensors: 25 A, 60 A, 100 A



Notes:

1. Curve accuracy applies from -20° C to +55° C ambient. For possible continuous ampere derating for ambient above 40° C, consult Rockwell Automation.
2. Set L function value equal to the motor FLA.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. For high fault current levels an additional fixed instantaneous hardware override is provided at 2.2 kA.

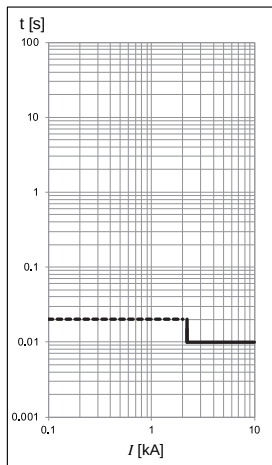
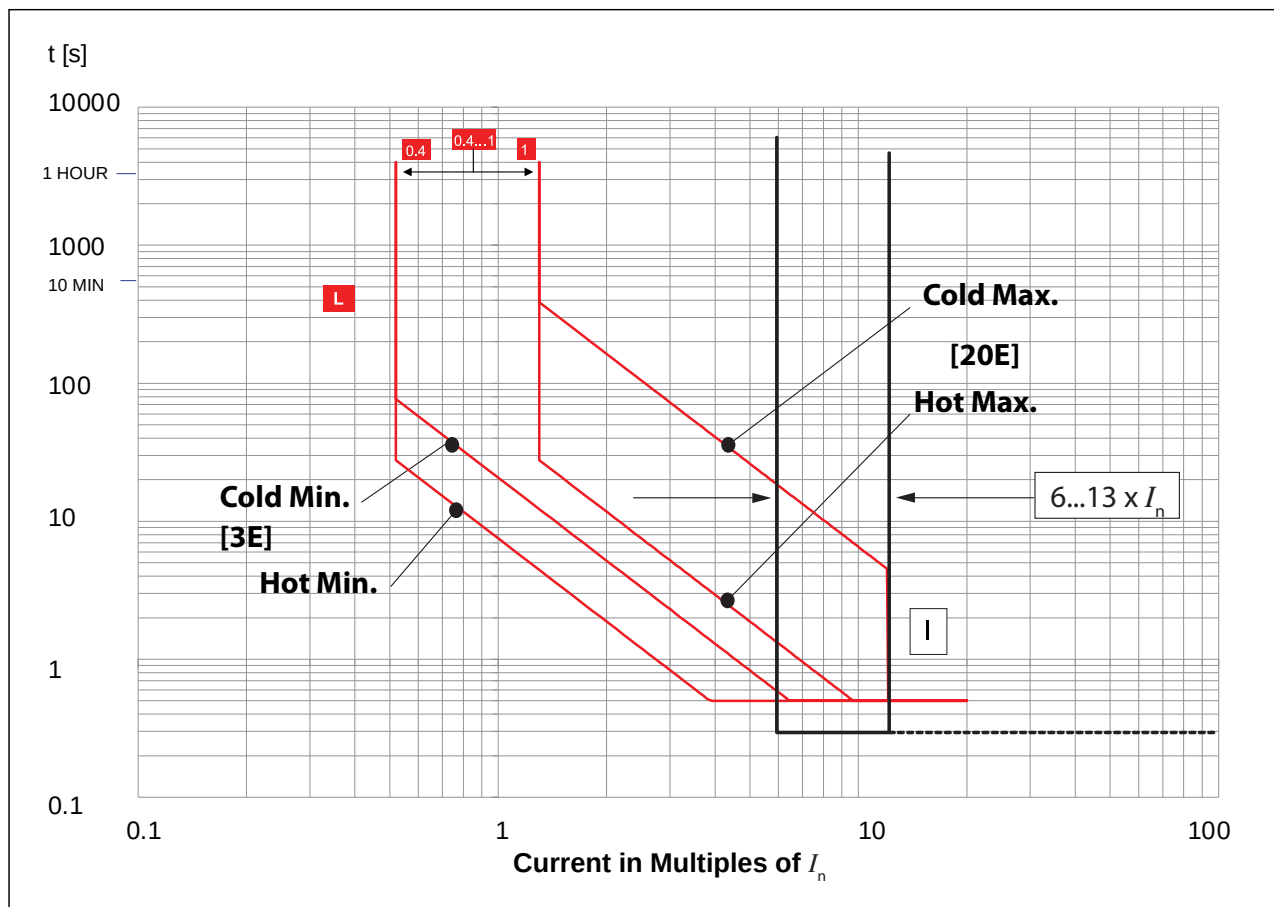


Figure 81 - 140MG-J Time-Current Curve

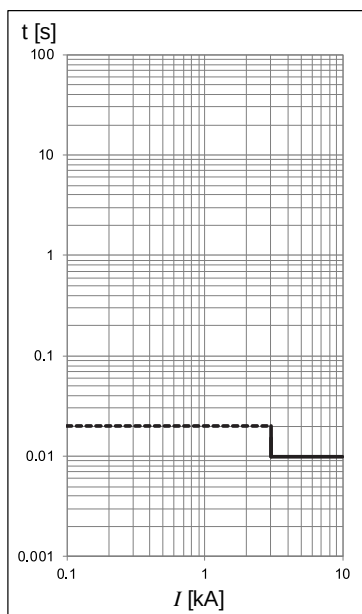
- Maximum voltage: 600V AC, 50/60 Hz

- Available Current Sensors: 40 A, 60 A, 100 A, 150 A



Notes:

1. Curve accuracy applies from -20° C to +55° C ambient. For possible continuous ampere derating for ambient above 40° C, consult Rockwell Automation.
2. Set L function value equal to the motor FLA.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. For high fault current levels an additional fixed instantaneous hardware override is provided at 3 kA.



Bulletin 140G/MG G-Frame

Dimensions are in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Figure 82 - Panel Mounted Molded Case Circuit Breaker

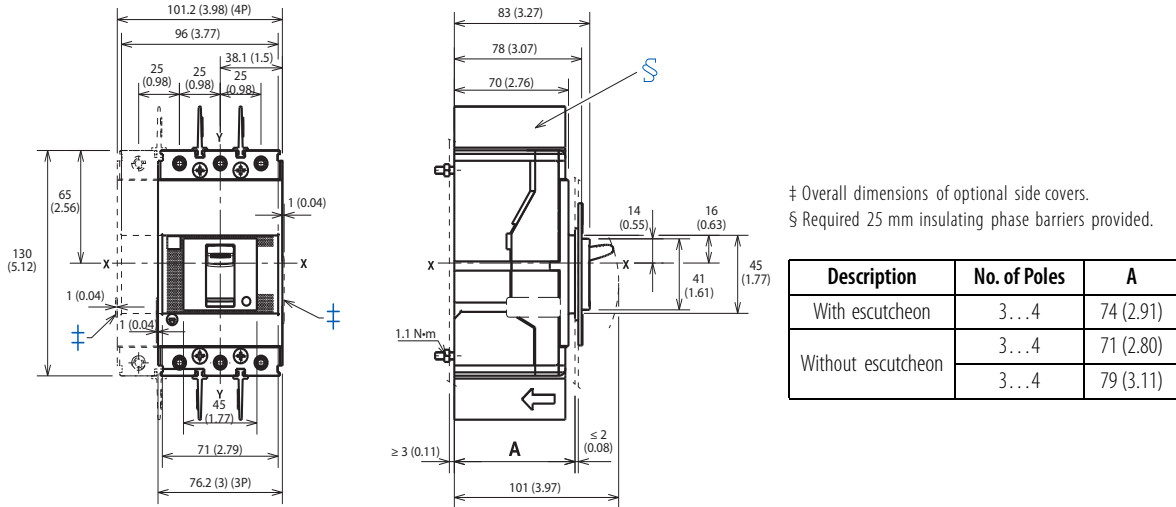


Figure 83 - DIN Rail Mounted Molded Case Circuit Breaker

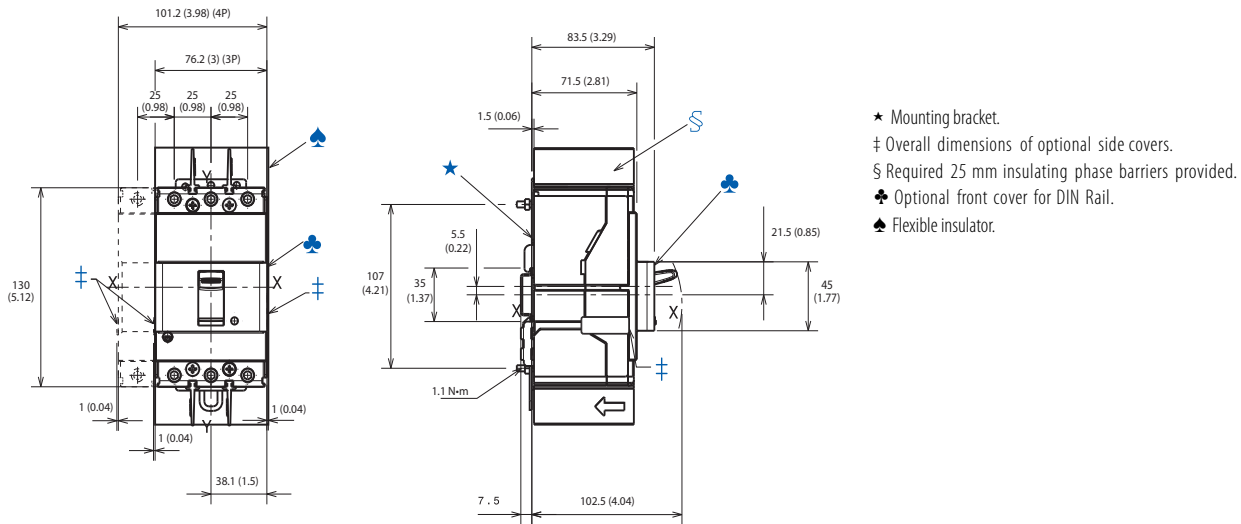


Figure 84 - Drilling Template for Molded Case Circuit Breaker Mounting

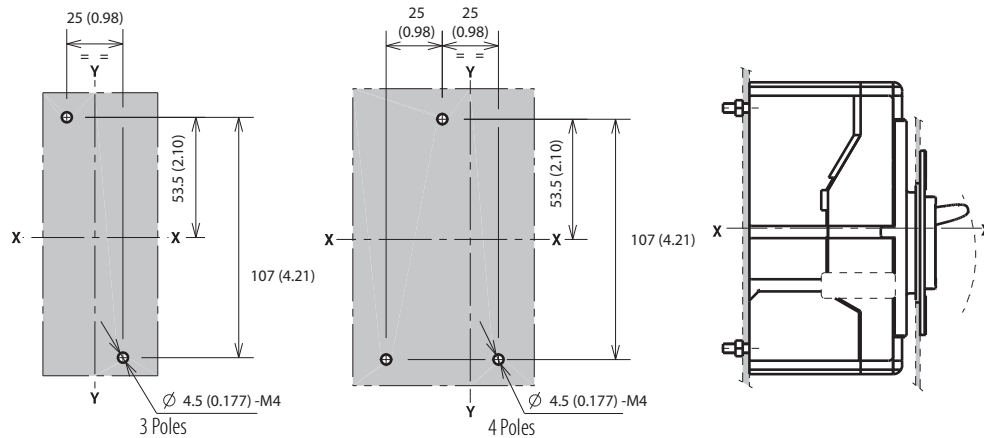


Figure 85 - Cat. Nos. 140G-G-ECM, -ECM4 Terminals

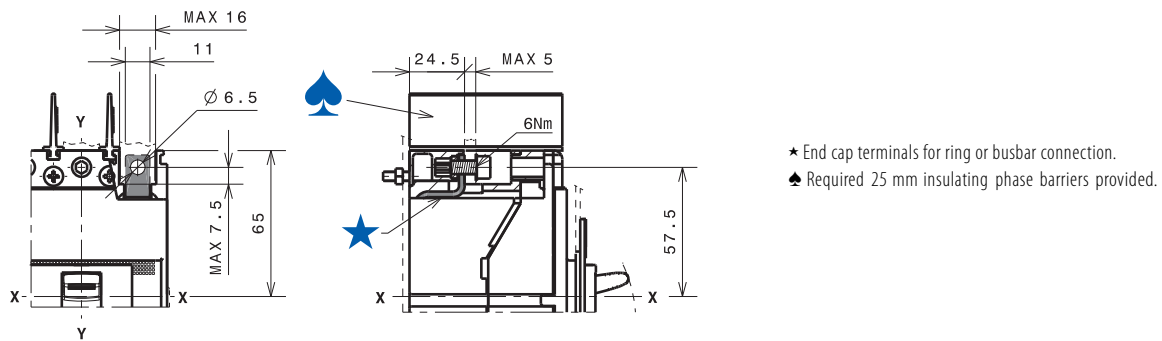


Figure 86 - Cat. Nos. 140G-G-EXT3, -EXT4 Extended Terminals

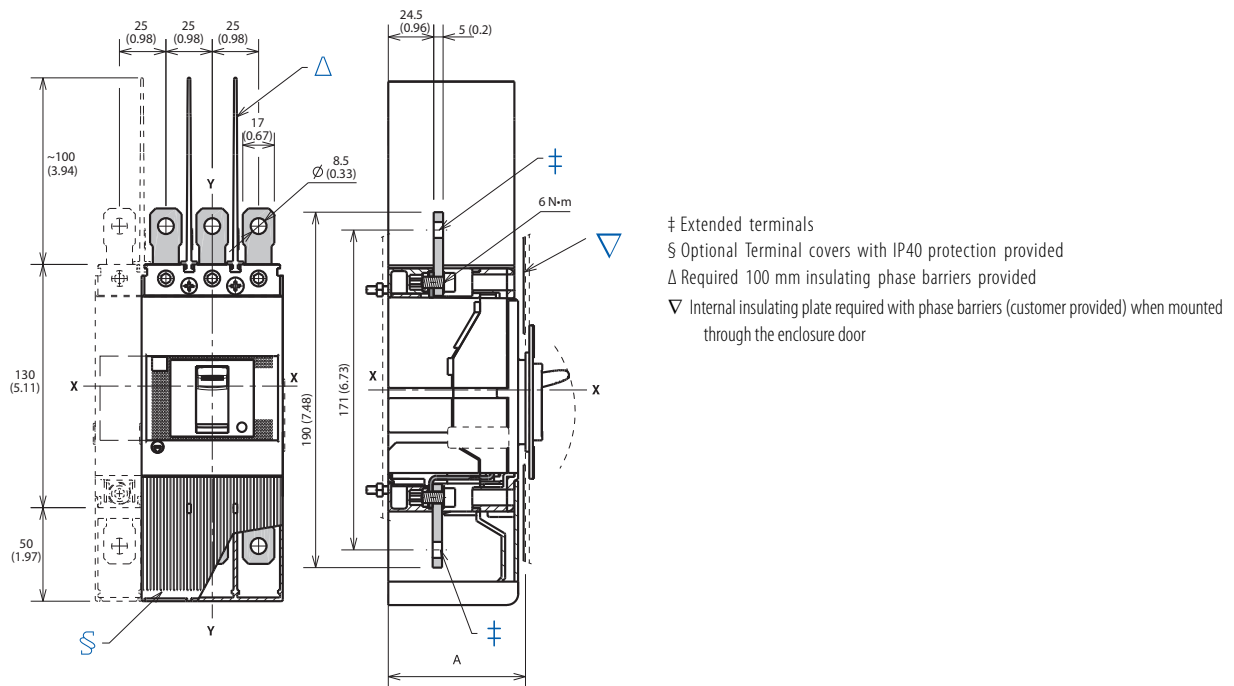


Figure 87 - Cat. Nos. 140G-G-EXS3, -EXS4 Spreader Terminals

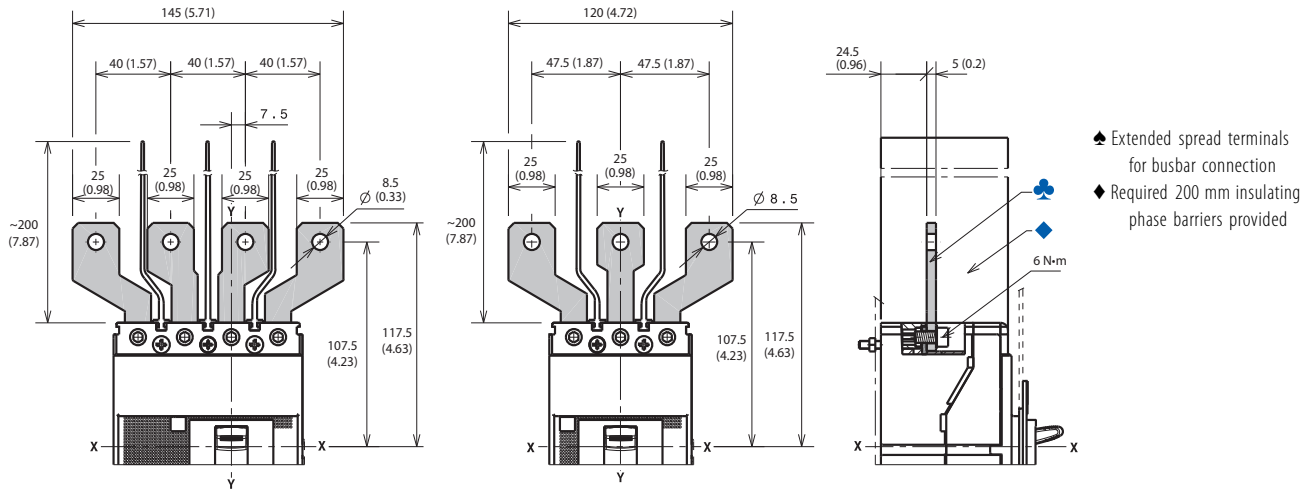


Figure 88 - Cat. Nos. 140G-G-TLC13, 140G-G-TLC14 Terminals (Copper Only Lug)

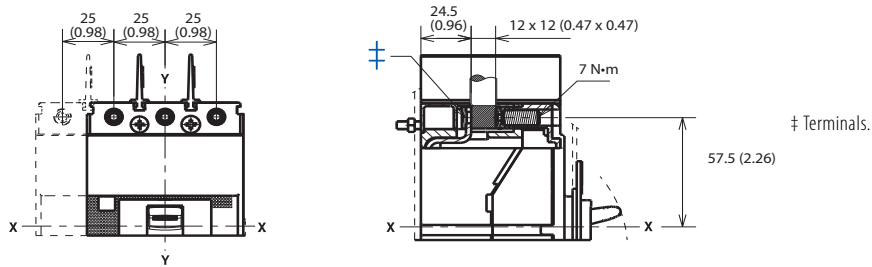


Figure 89 - Cat. No. 140G-G-MTL63, -MTL64 Terminal (Multi-Cable Terminal Lug)

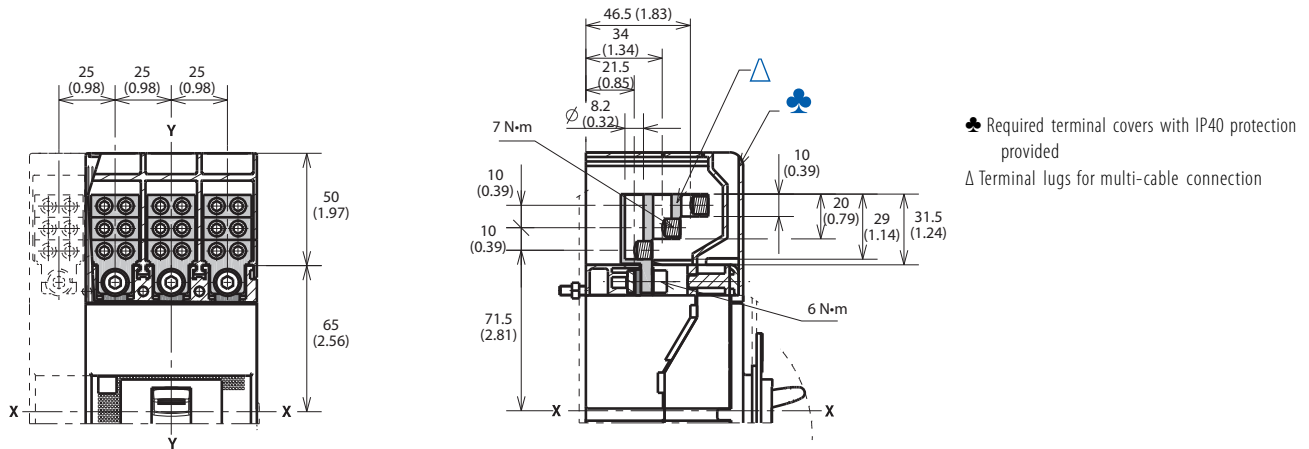
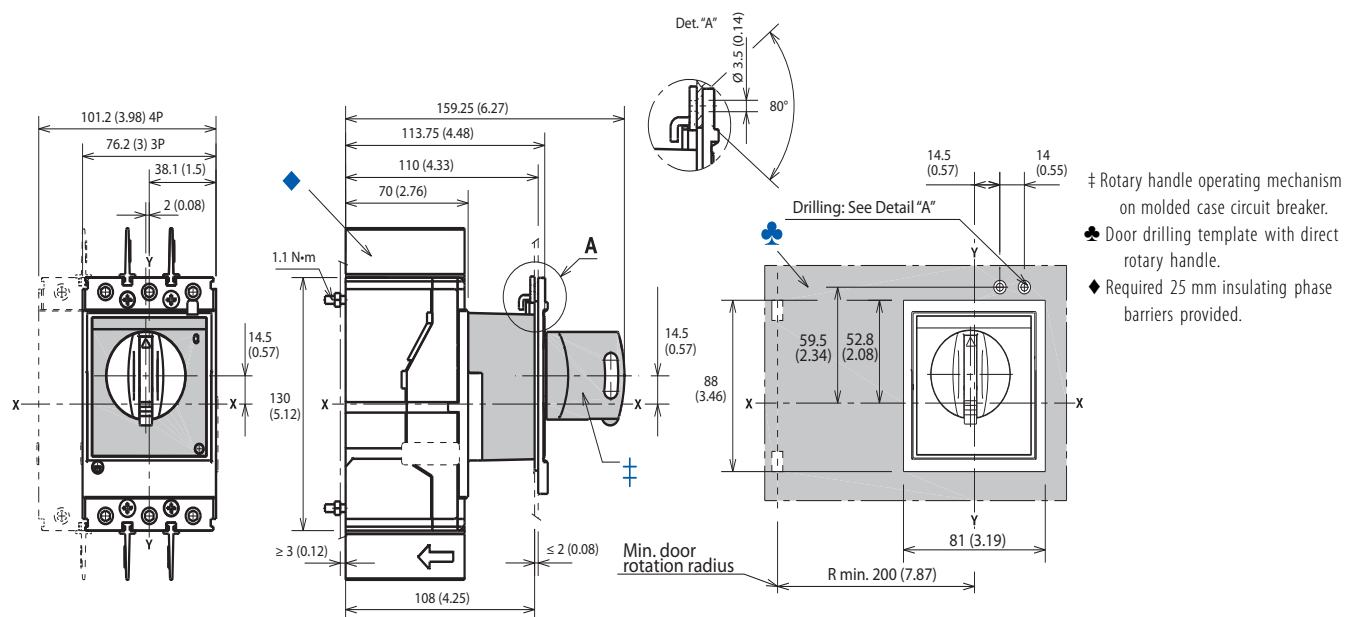
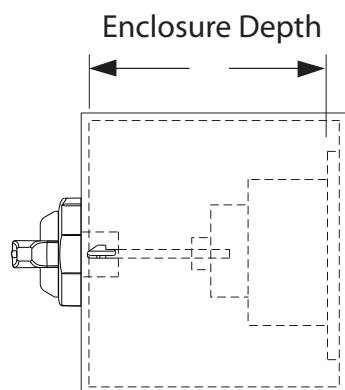
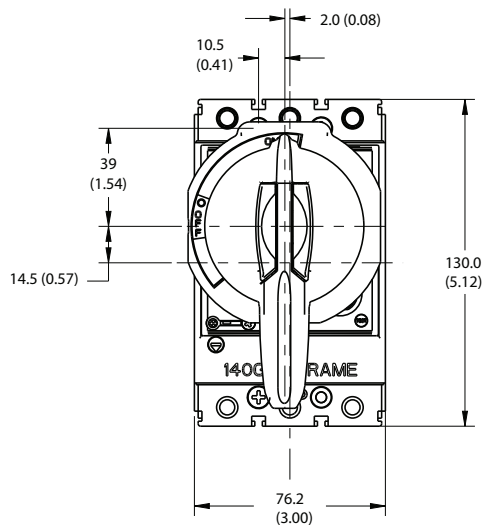
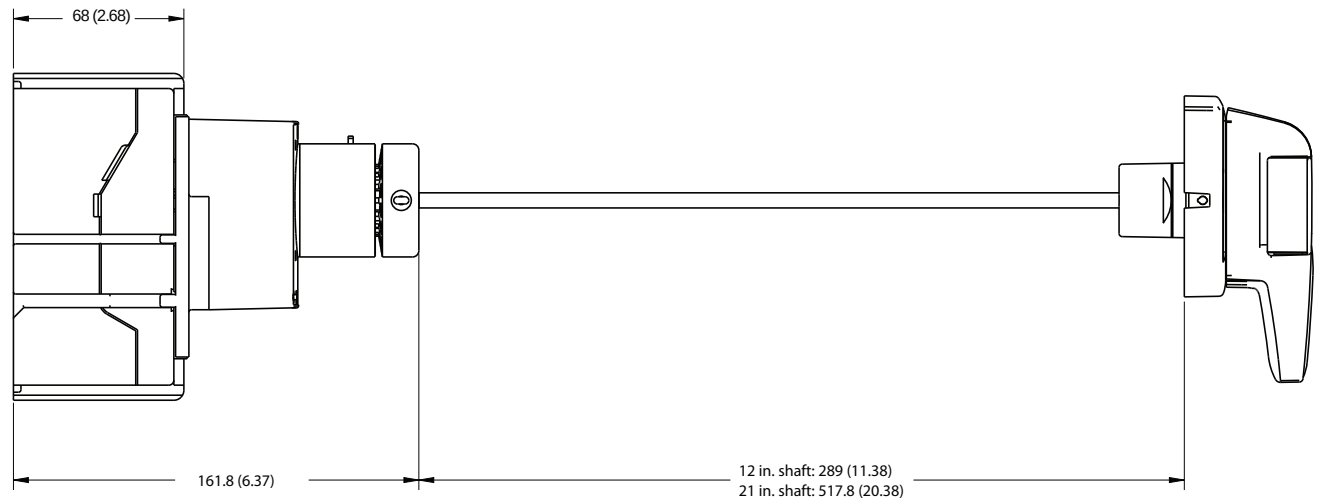


Figure 90 - Cat. No. 140G-G-RMB or 140G-G-RMY Direct Rotary Operating Handle**Figure 91 - 140G-H-RVM... Minimum/Maximum Enclosure Depth**

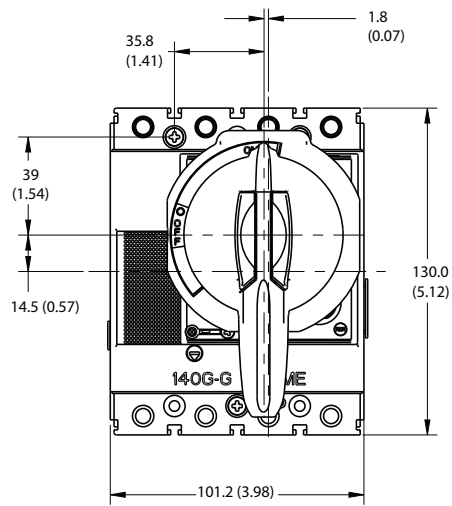
	Minimum	Maximum
12 in. Shaft	7.25 in. (191 mm)	17.75 in. (451 mm)
21 in. Shaft		26.75 in. (679 mm)
12 in. Shaft w/NFPA	9 in. (229 mm)	17.75 in. (451 mm)
21 in. Shaft w/NFPA		26.75 in. (679 mm)

Note: this figure depicts the minimum and maximum enclosure sizes that will accommodate the MCCB, operator, and handle. See [Figure 92](#) for overall assembly dimension and handle cutout.

Figure 92 - Cat. No. 140G-G-RVM... Variable Depth Rotary Mechanism



3-Pole



4-Pole

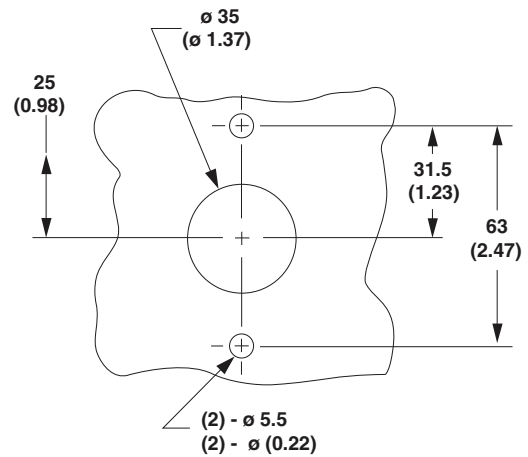
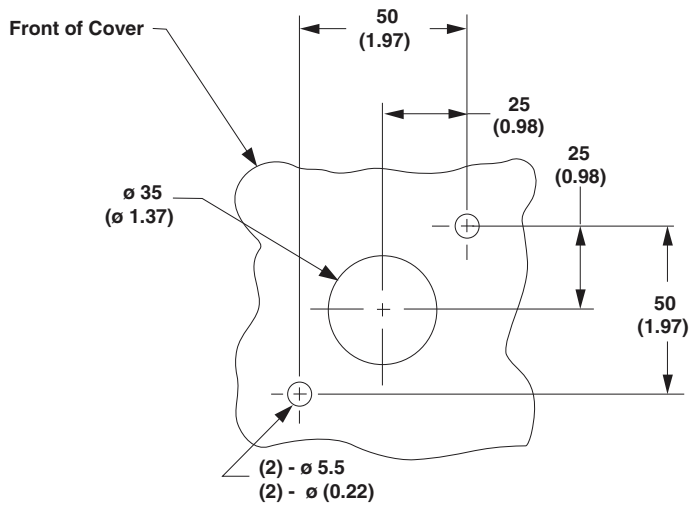


Figure 93 - Cat. No. 140G-G-EOP... Motor Operator

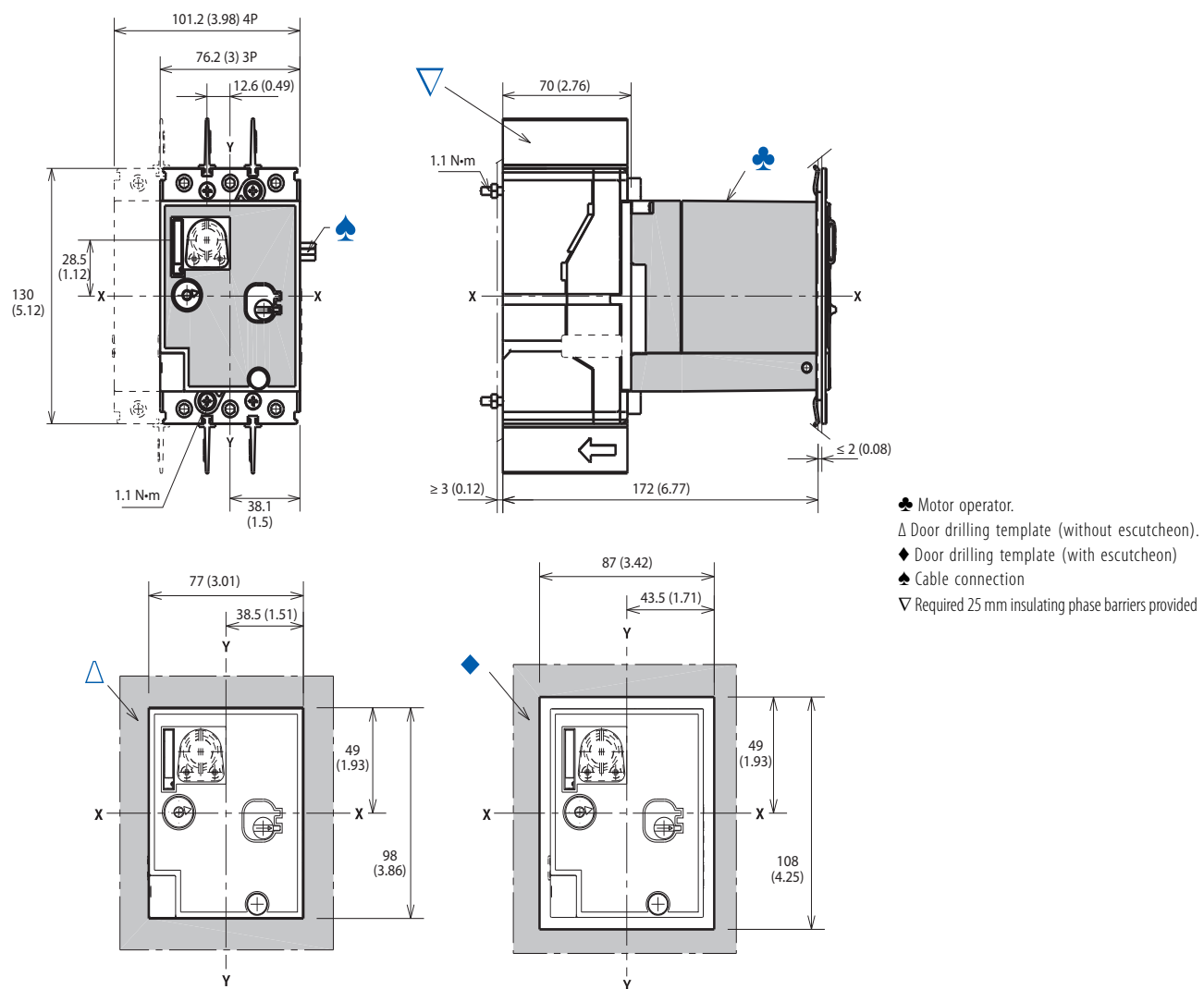
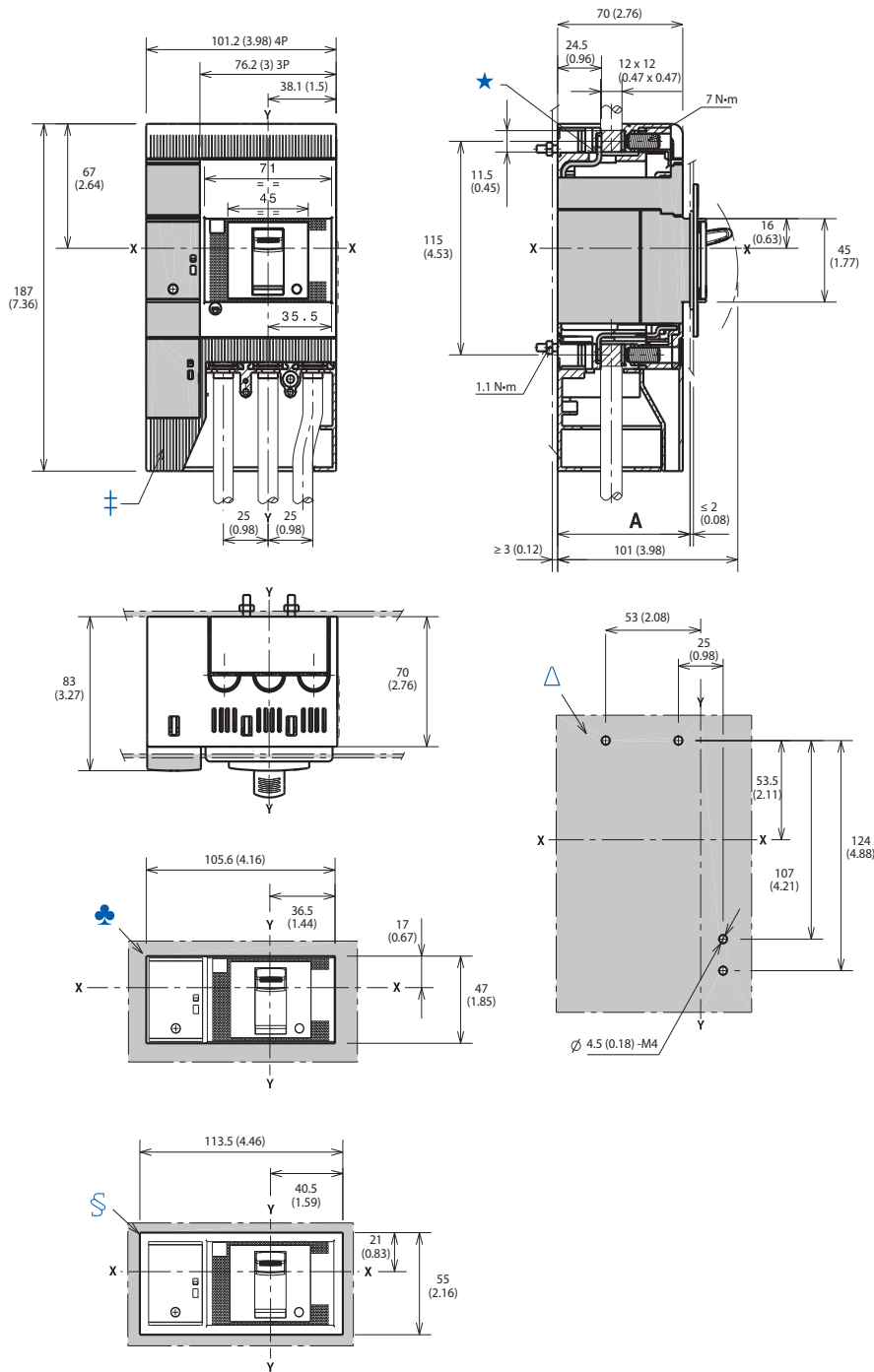


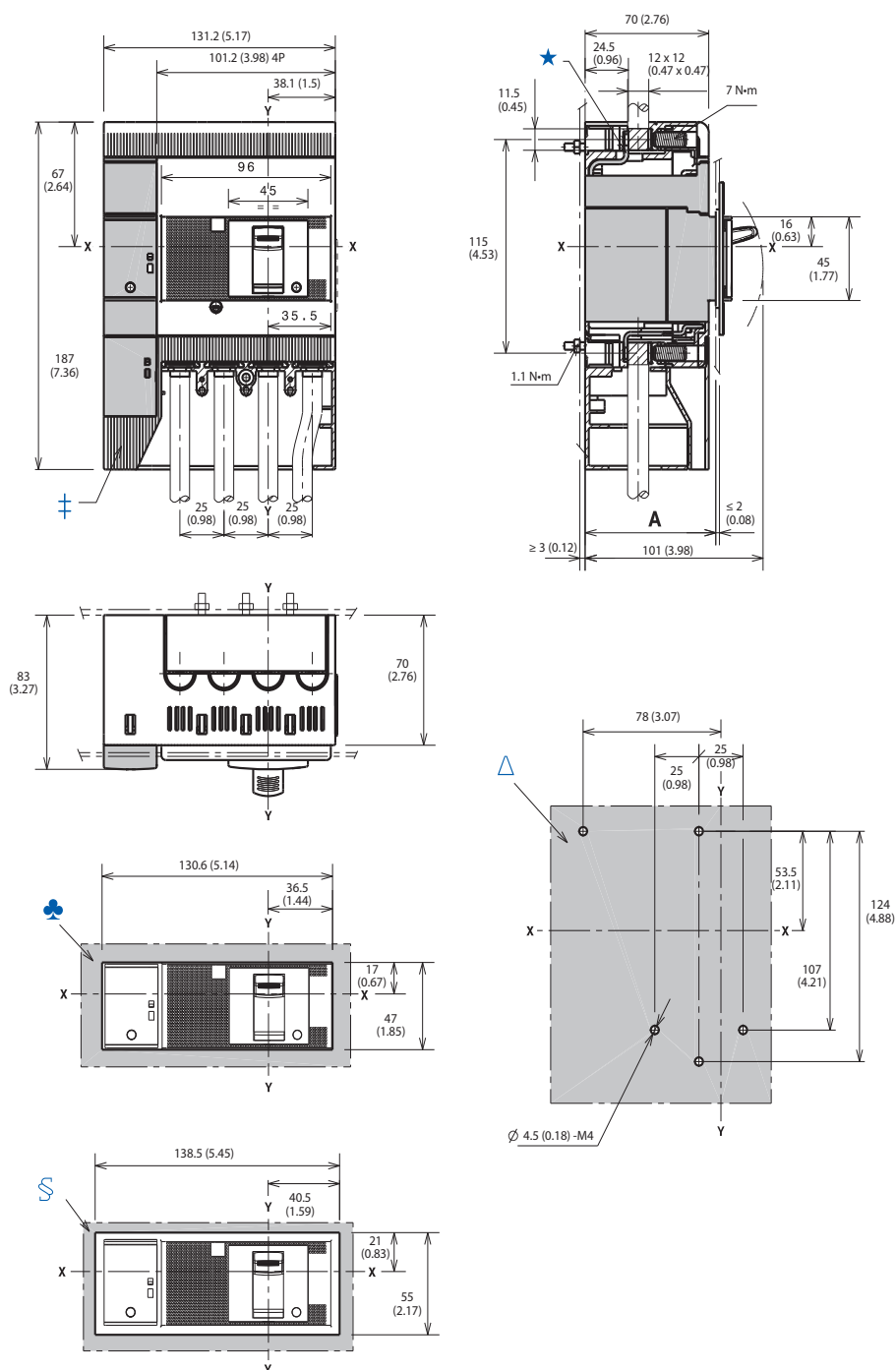
Figure 94 - Cat. No. 140G-G-ELP1603 Residual Current Release Module for 3-Pole Molded Case Circuit Breakers



Description	No. of Poles	A
With escutcheon	3	74 (2.91)
Without escutcheon	3	71 (2.80)

- ★ Terminals for ring or busbar connection.
- ‡ IP40 terminal covers.
- § Drilling template — door with direct rotary mechanism and escutcheon.
- ♣ Drilling template — door with direct rotary mechanism, without escutcheon.
- Δ Drilling template — molded case circuit breaker mounting on mounting plate.

Figure 95 - Cat. No. 140G-G-ELP1604 Residual Current Release Module for 4-Pole Molded Case Circuit Breakers



Description	No. of Poles	A
With escutcheon	4	74 (2.91)
Without escutcheon	4	71 (2.80)

★ End cap terminals for ring or busbar connection.

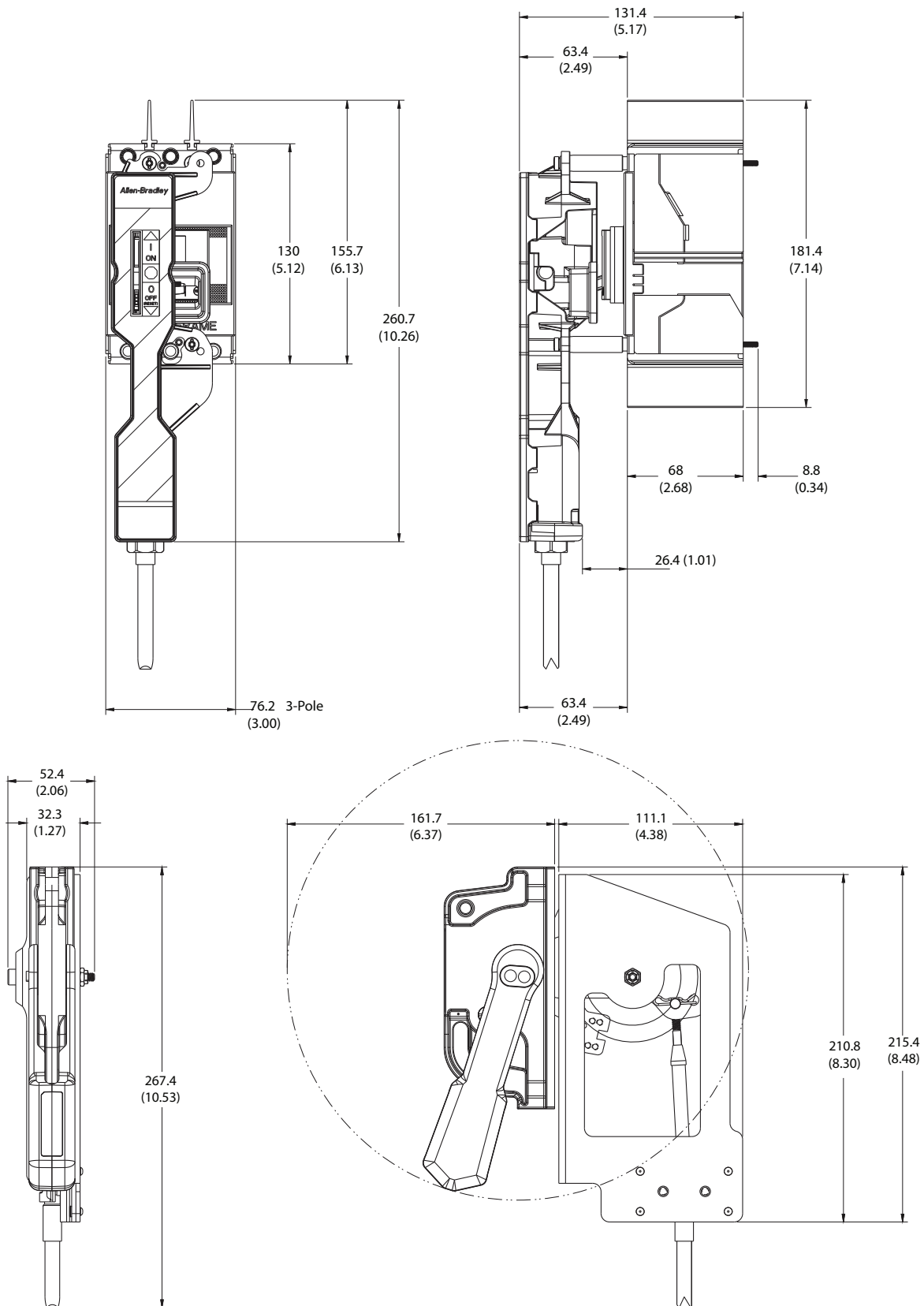
‡ IP40 terminal covers.

§ Drilling template — door with direct rotary mechanism and escutcheon.

♣ Drilling template — door with direct rotary mechanism, without escutcheon.

Δ Drilling template — molded case circuit breaker mounting on mounting plate.

Figure 96 - G-Frame Flex Cable Operator and Actuator



Bulletin 140G/MG H-Frame

Figure 97 - Panel Mounted Molded Case Circuit Breaker

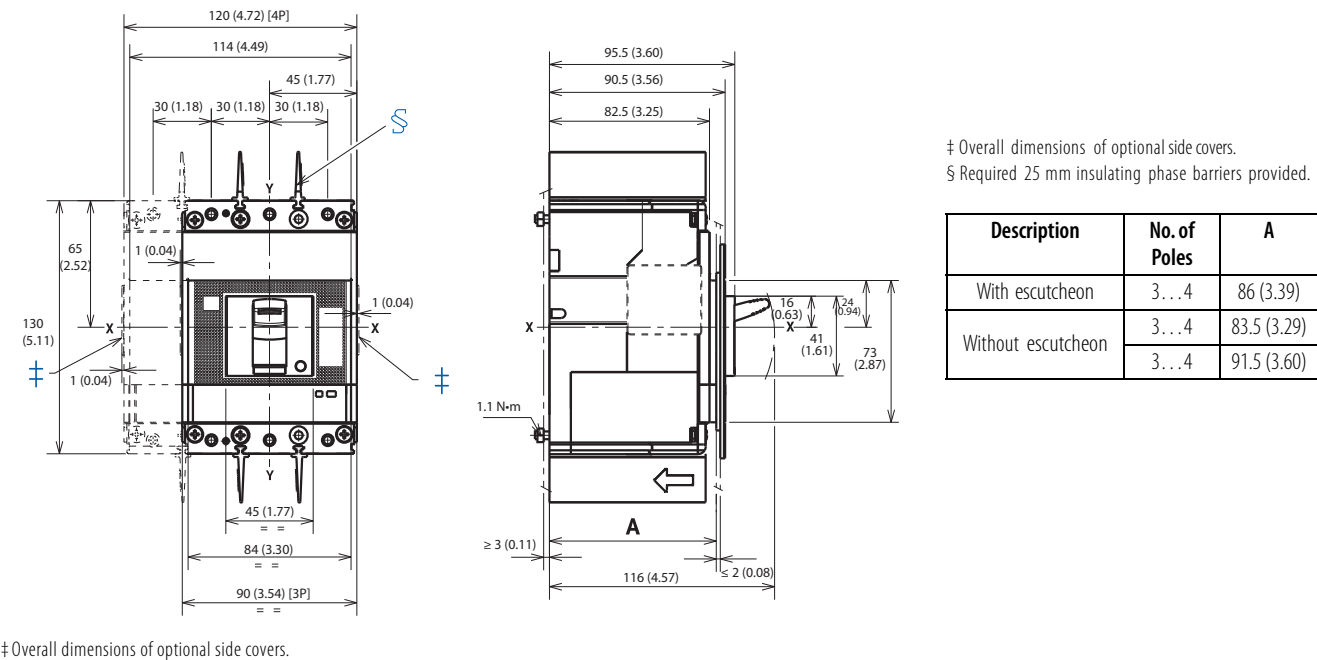


Figure 98 - DIN Rail Mounted Molded Case Circuit Breaker

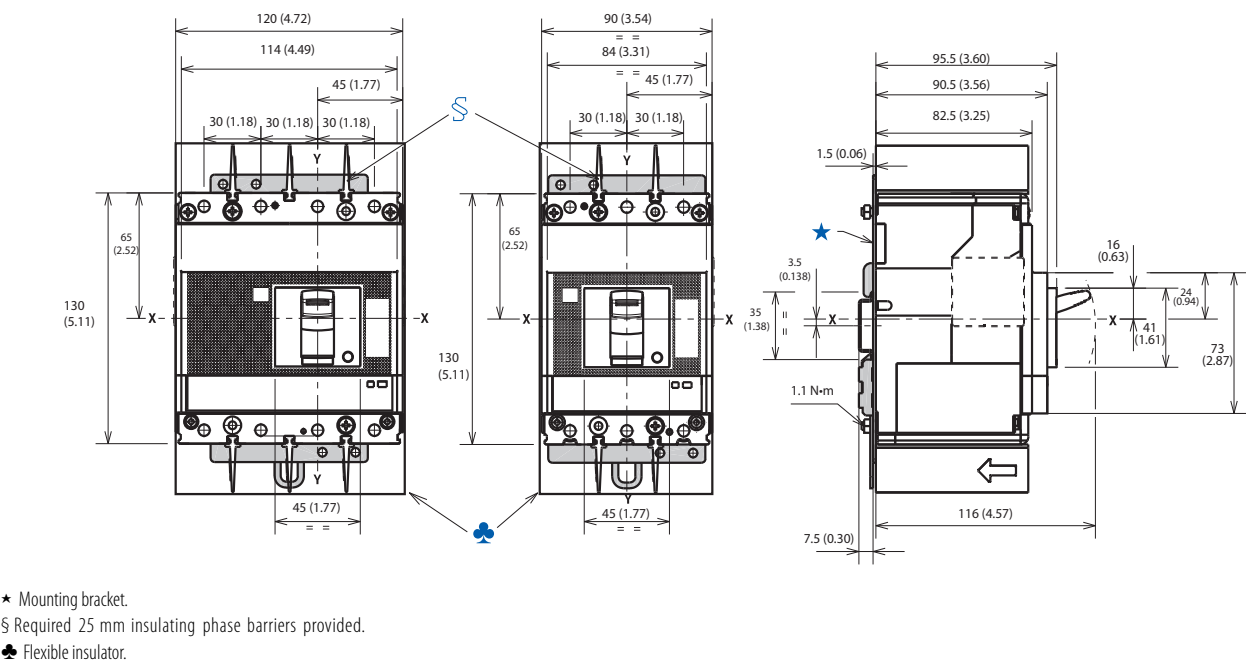


Figure 99 - Drilling Template for Molded Case Circuit Breaker Mounting

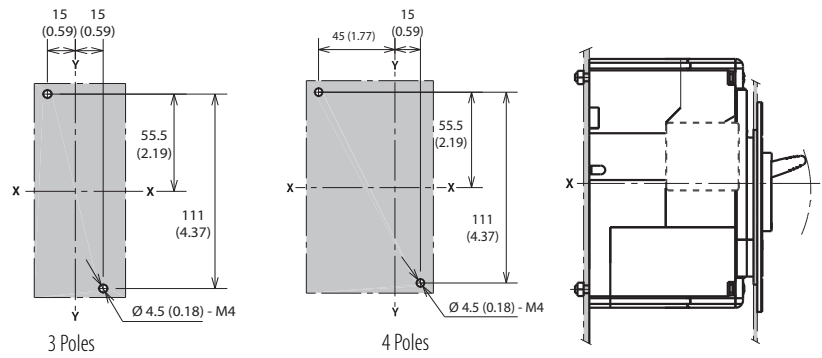
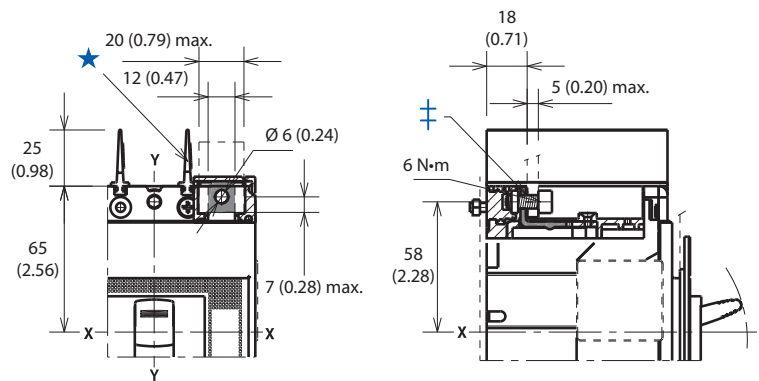


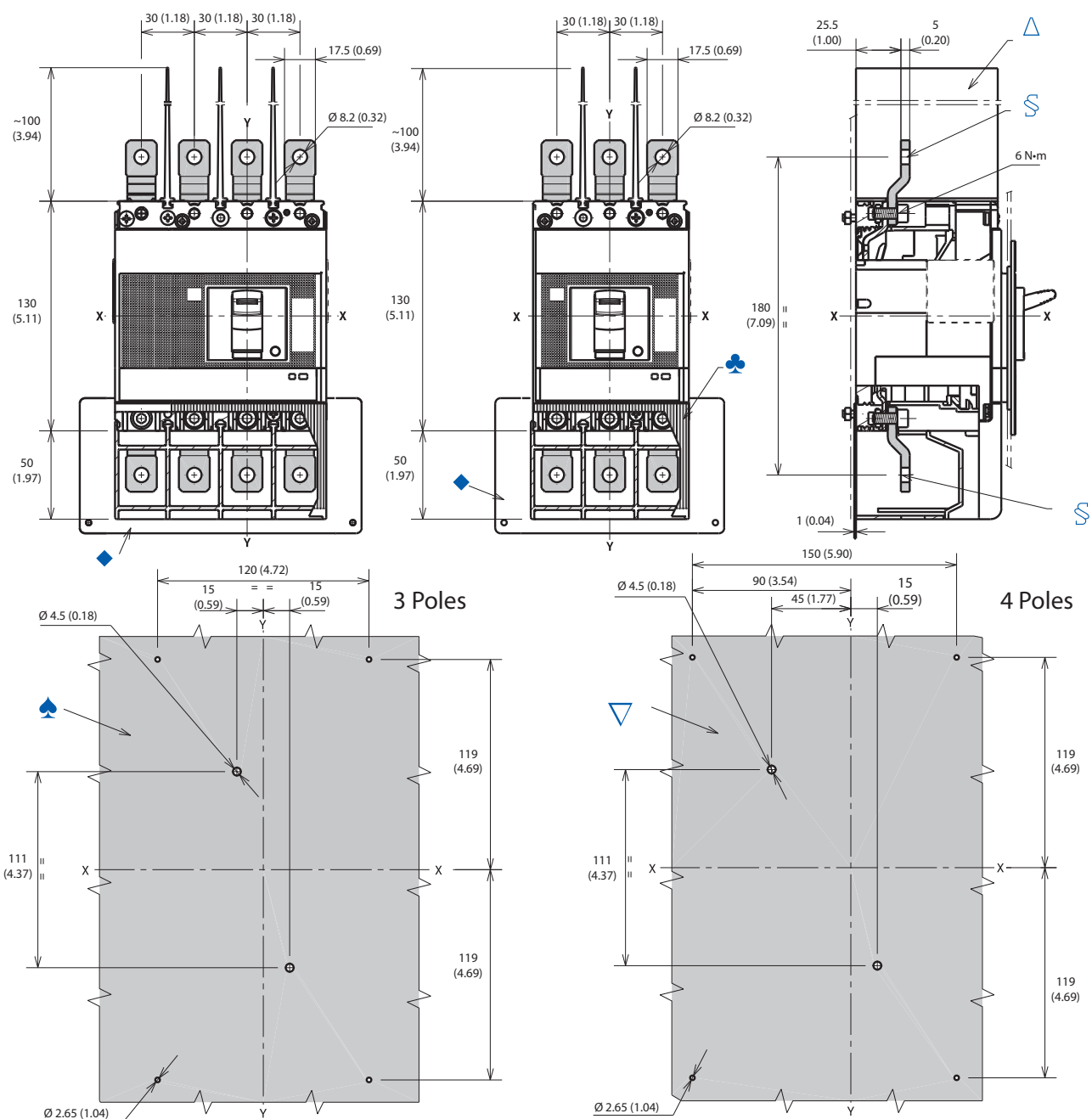
Figure 100 - Cat. Nos. 140G-H-ECM, -ECM4 Terminals



★ Required 25 mm insulating phase barriers provided.

‡ End Cap terminals for ring or busbar connection.

Figure 101 - Cat. Nos. 140G-H-EXT3, -EXT4 Extended Terminals



§ Extended terminals.

♣ Optional terminal covers with IP40 protection provided.

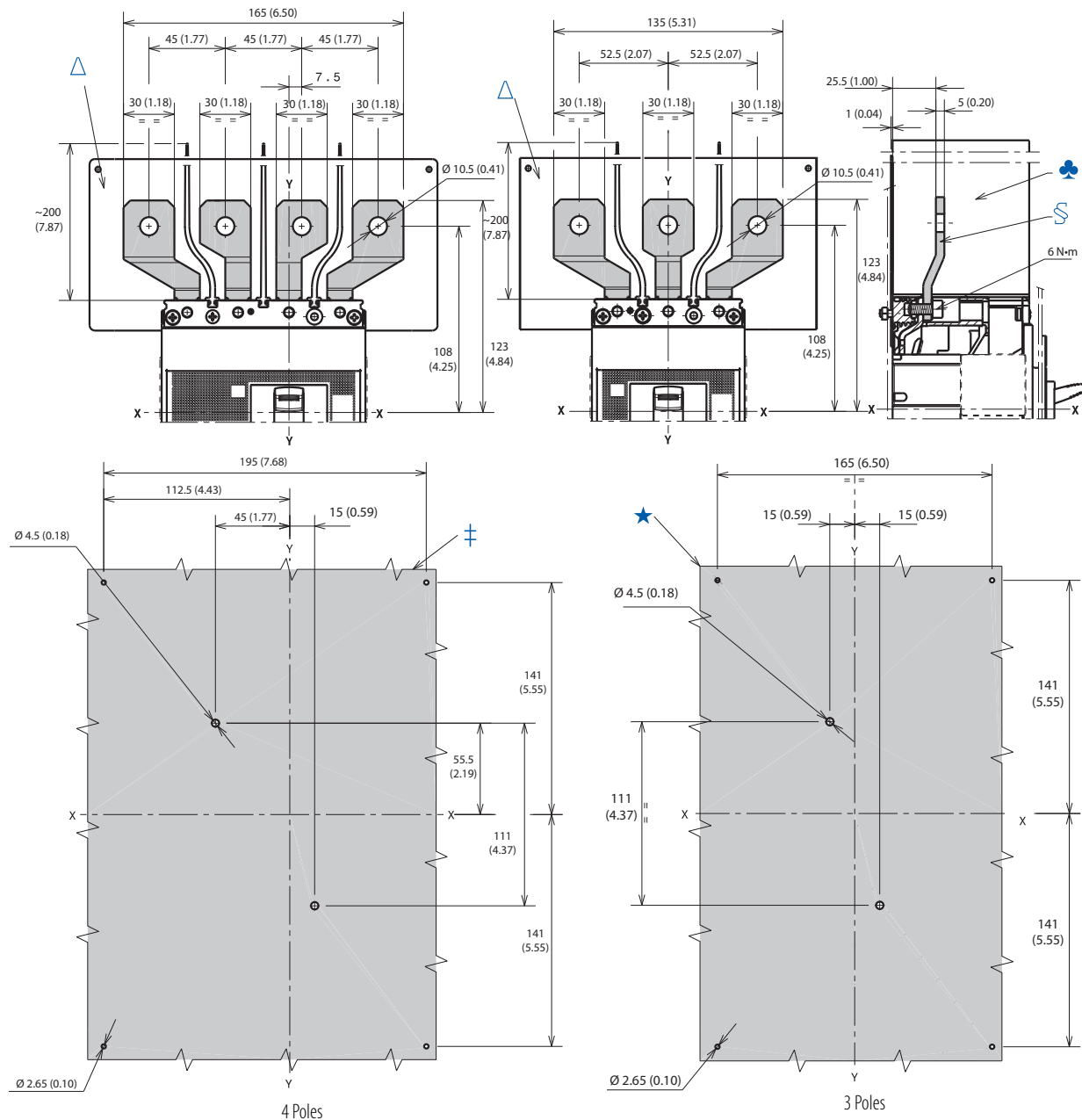
Δ Required 100 mm insulating phase barriers provided.

◆ Supplied insulator panel, required for $U_e > 440V$ applications.

♠ Drilling template for 3-pole molded case circuit breaker, $U_e > 440V$ (required).

▽ Drilling template for 4-pole molded case circuit breaker, $U_e > 440V$ (required).

Figure 102 - Cat. Nos. 140G-H-EXS3, -EXS4 Spreader Terminals



★ Drilling template for 3-pole molded case circuit breaker, $U_e > 440V$ (required).

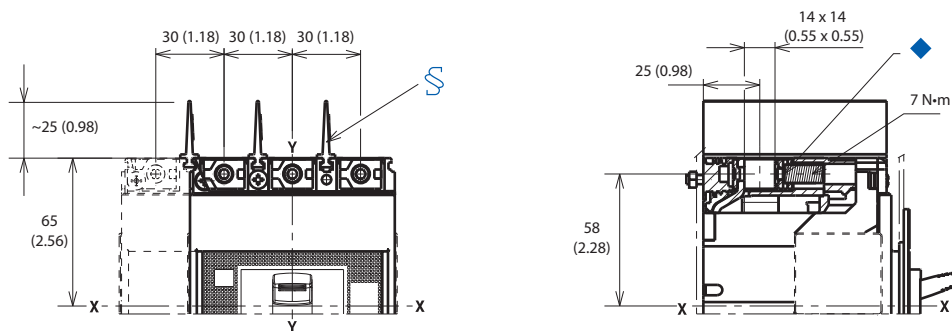
‡ Drilling template for 4-pole molded case circuit breaker, $U_e > 440V$ (required).

§ Extended spread terminals.

♣ Required 200 mm insulating phase barriers provided.

△ Supplied insulator panel, required for $U_e > 440V$ applications.

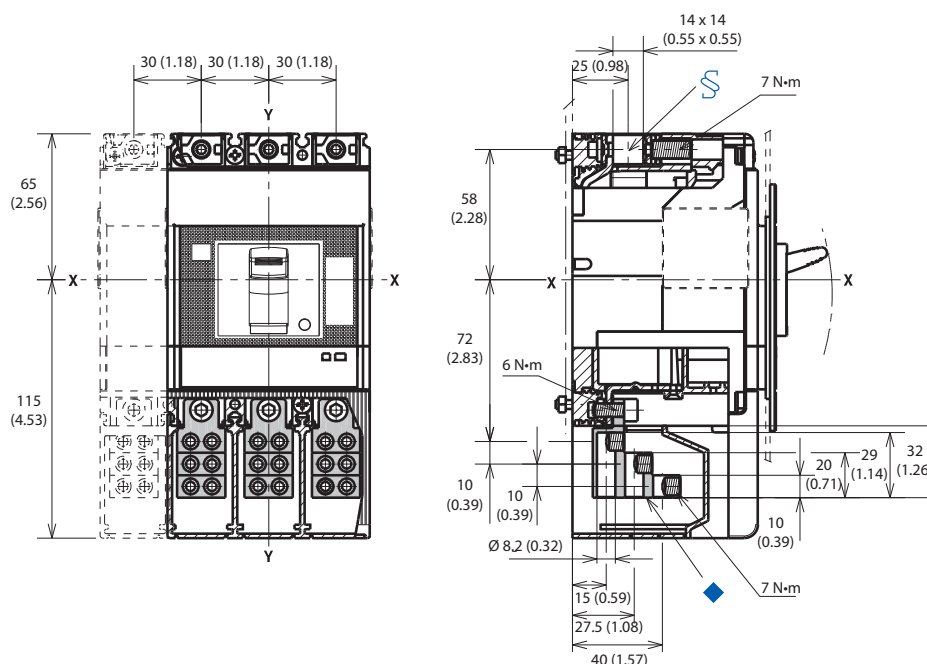
Figure 103 - Cat. Nos. 140G-H-TLC13, -TLC14 Terminals



§ Required 25 mm insulating phase barriers provided

◆ Copper terminals.

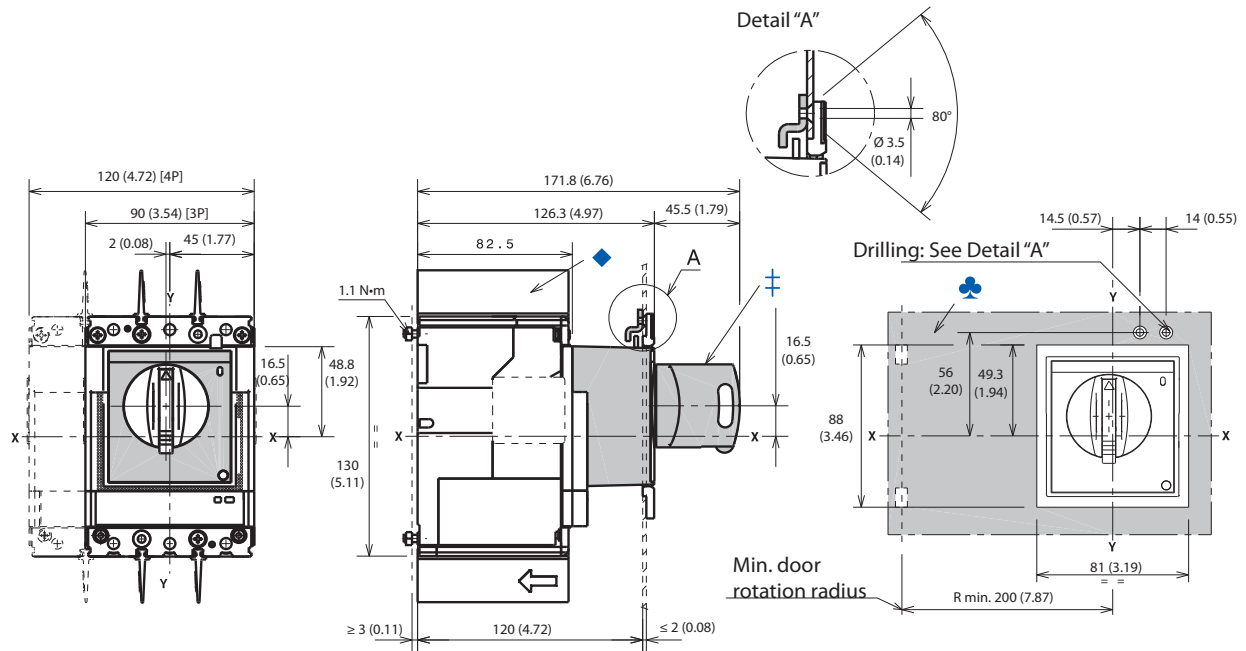
Figure 104 - Cat. Nos. 140G-H-MTL63, -MTL64 Terminals



§ Copper terminals

◆ Multi-cable terminals

Figure 105 - Cat. No. 140G-H-RMB, -RMY Direct Rotary Operating Handle



‡ Rotary handle operating mechanism on molded case circuit breaker

◆ Required 25 mm insulating phase barriers provided

Figure 106 - 140G-H-RVM... Minimum/Maximum Enclosure Depth

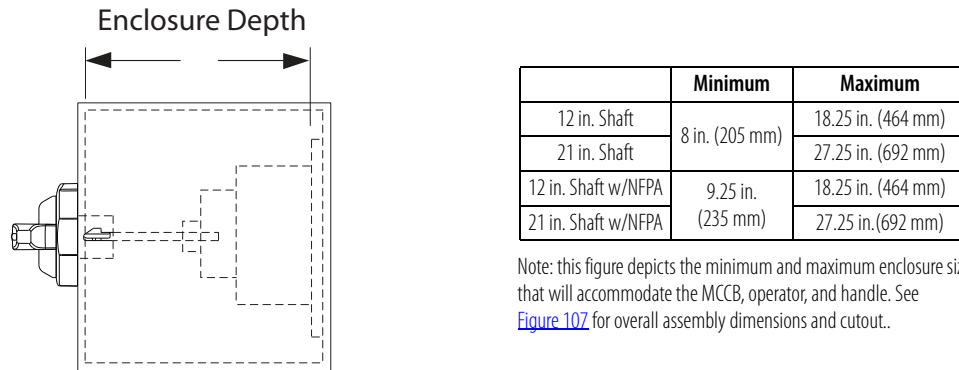


Figure 107 - Cat. No. 140G-H-RVM... Rotary Handle Operating Mechanism

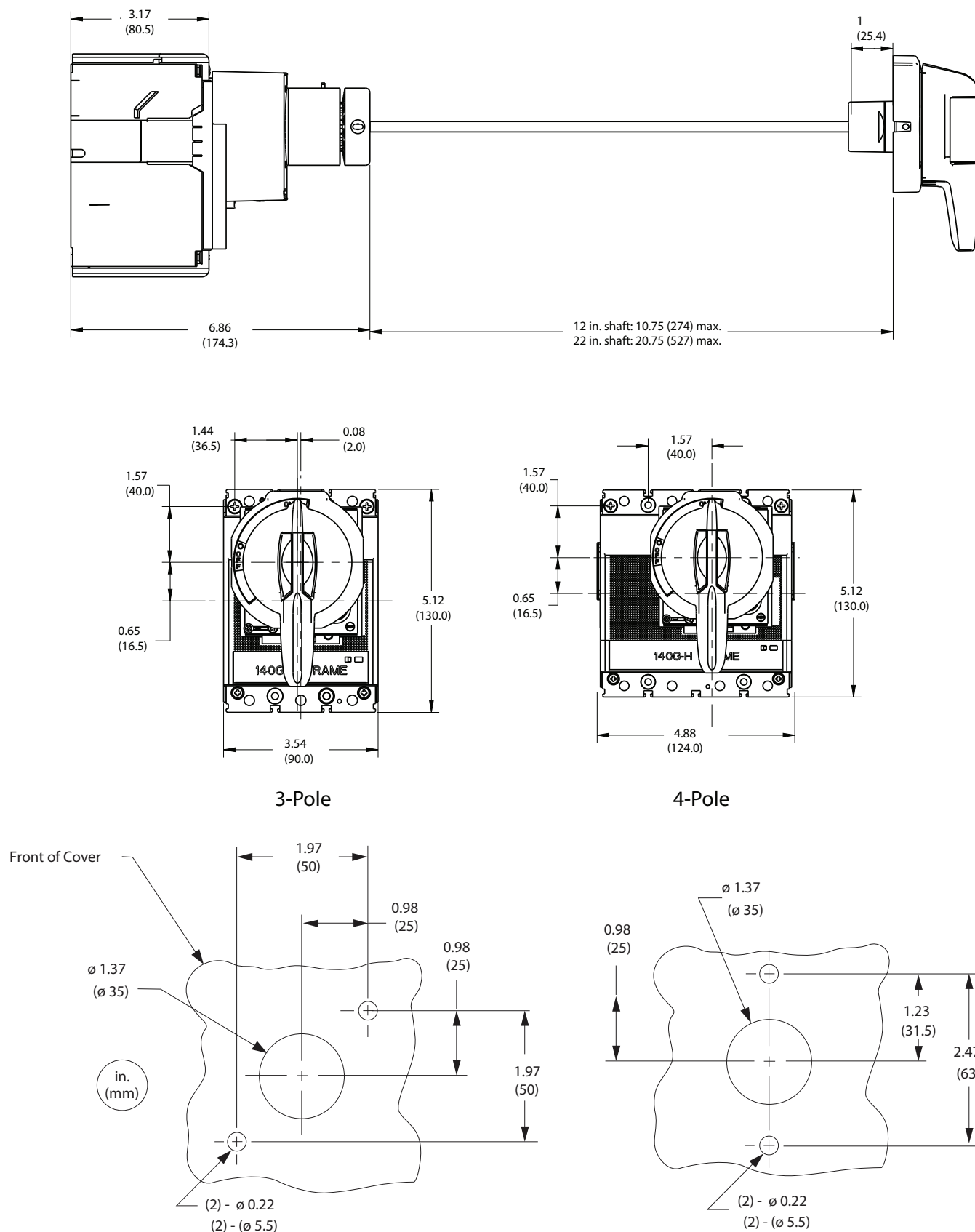
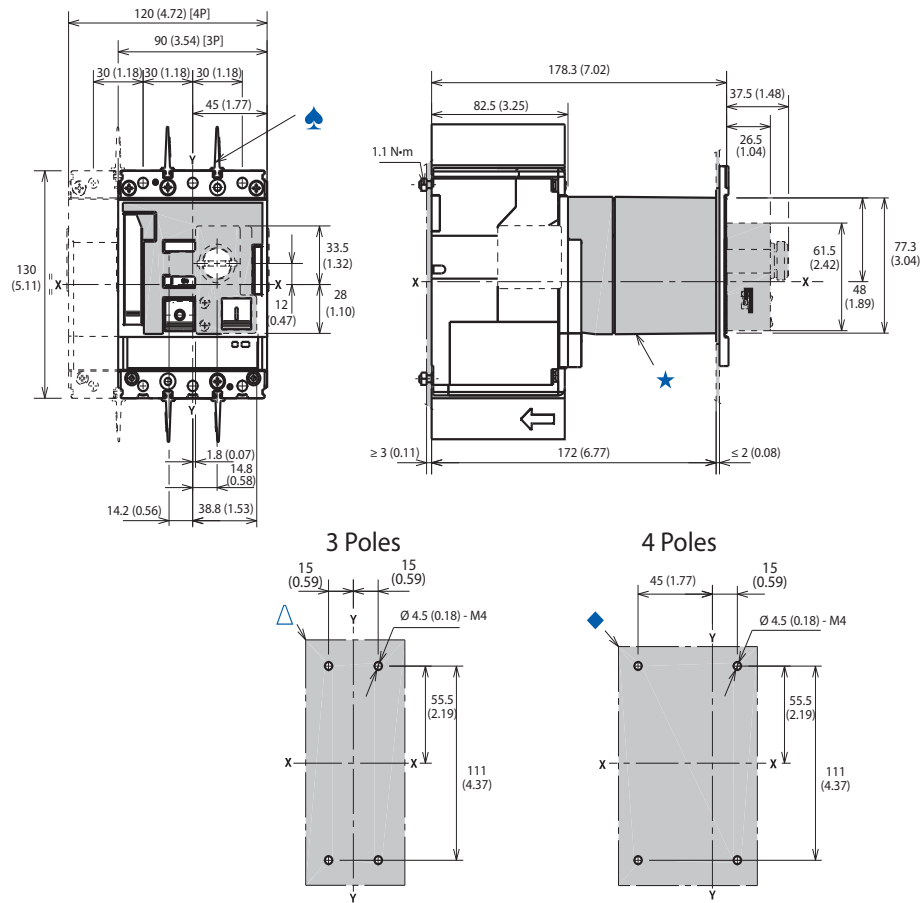


Figure 108 - Cat. No. 140G-H-EOP... Motor Operator



★ Motor operator

△ Drilling template for 3-pole molded case circuit breaker, mounted on mounting plate

◆ Drilling template for 4-pole molded case circuit breaker, mounted on mounting plate

♣ Required 25 mm insulating phase barriers provided

Figure 109 - Door Drilling Template

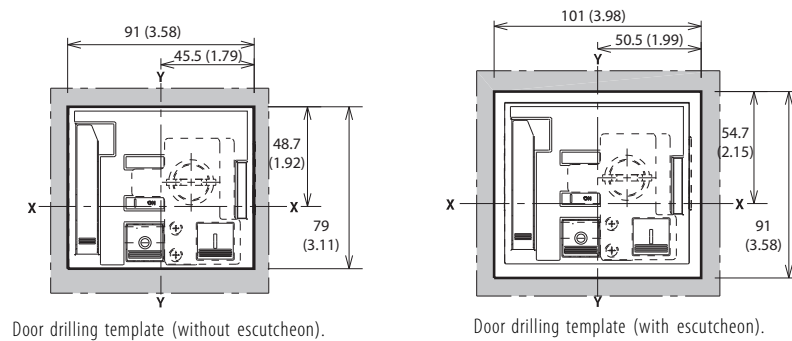


Figure 110 - H-Frame Flex Cable Operator and Actuator

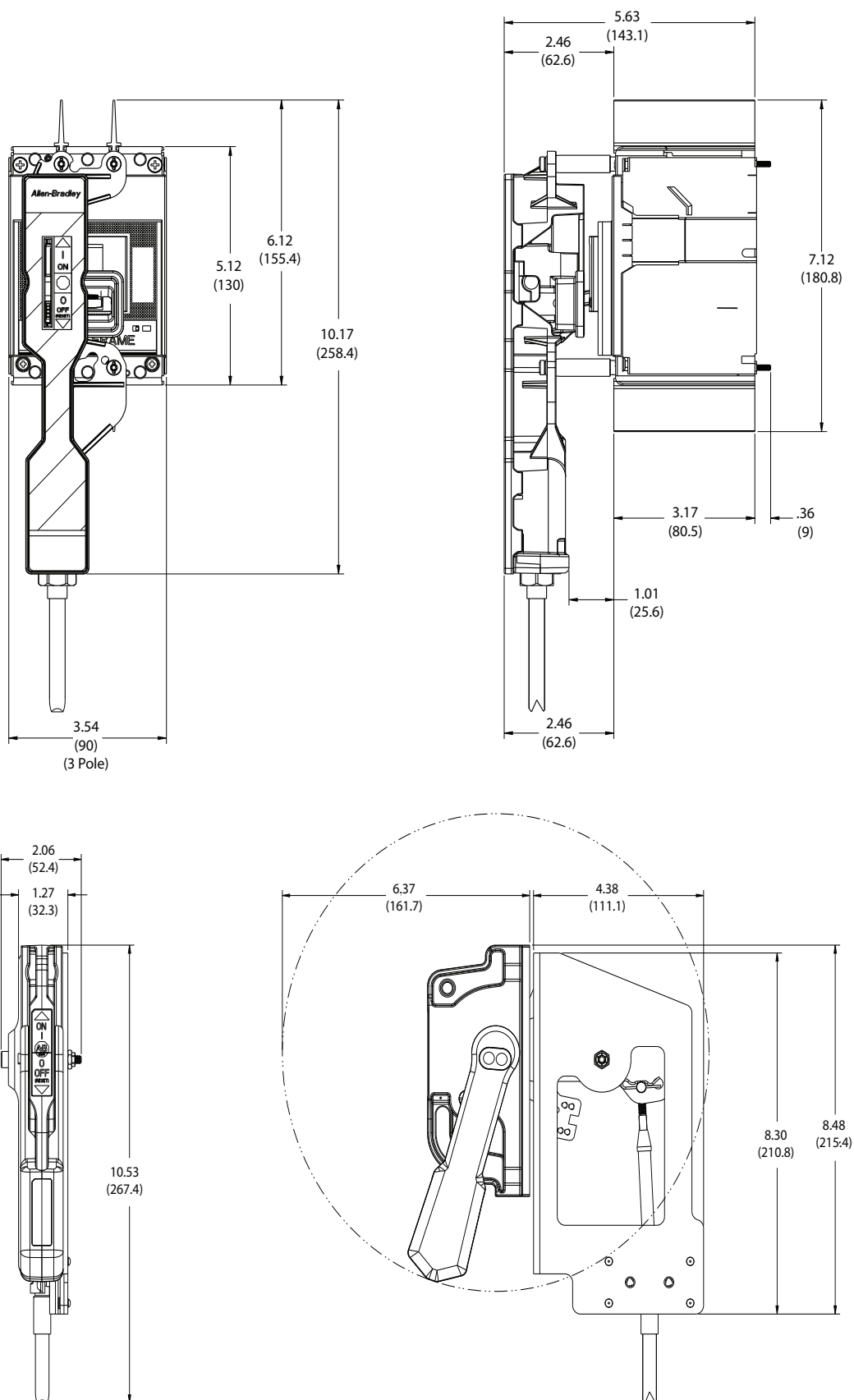
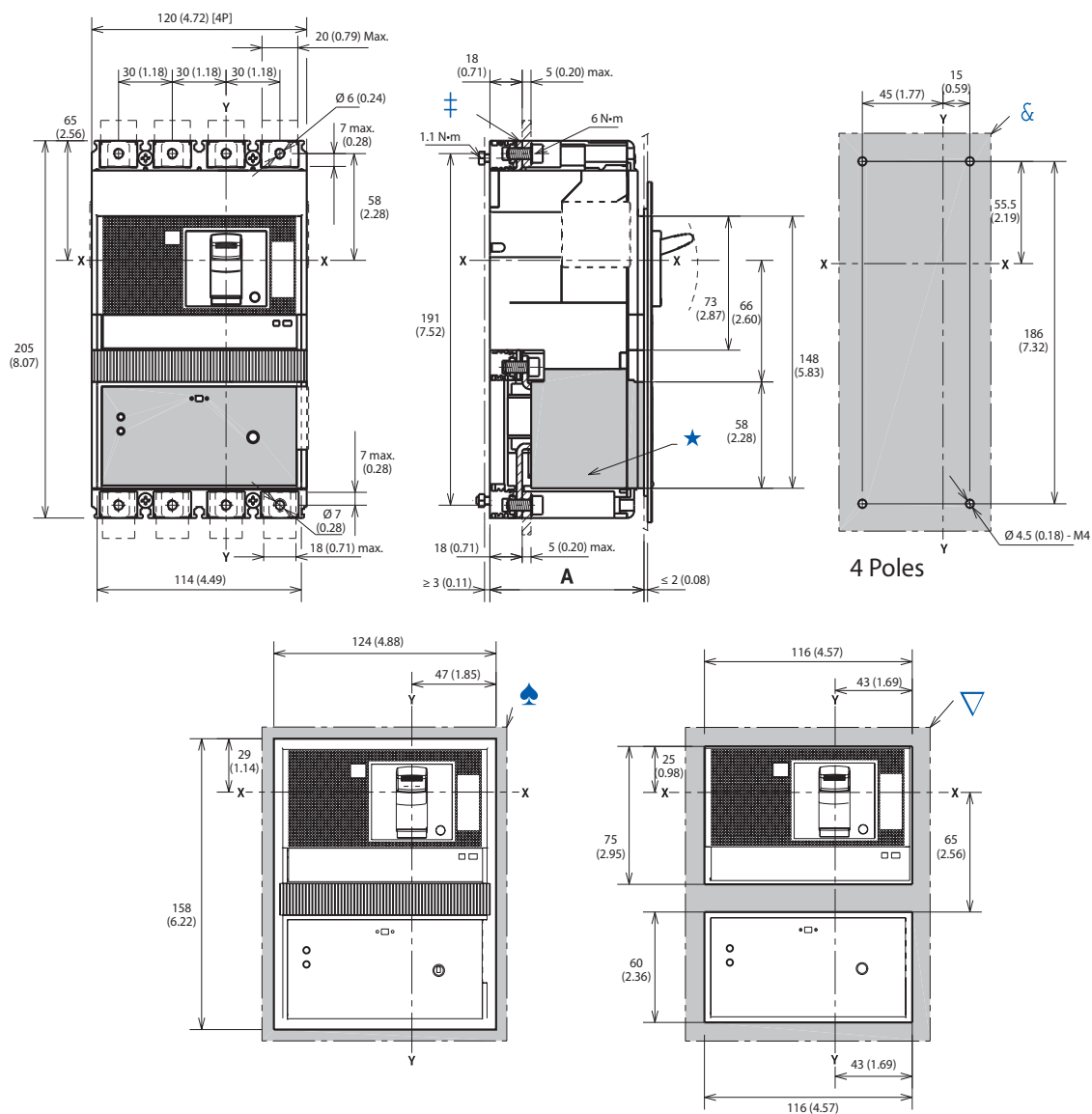


Figure 111 - Cat. No. 140G-H-ELP1604 Residual Current Release Module



Description	No. of Poles	A
With escutcheon	4	86 (3.39)
Without escutcheon	4	83.5 (3.25)

★ Residual current module.

‡ End cap terminals for ring or busbar connection.

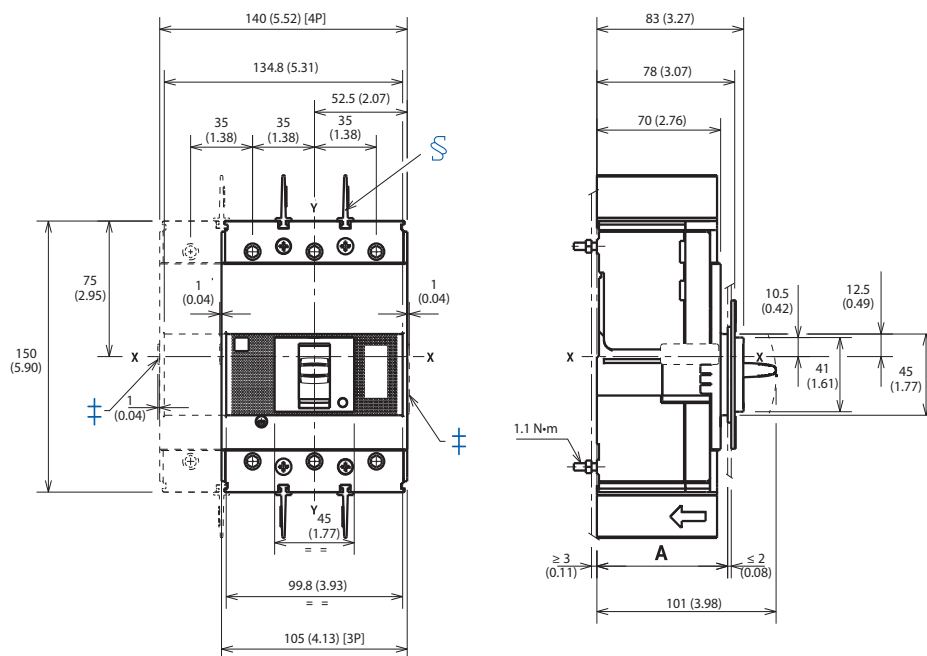
♠ Drilling template — door with direct rotary mechanism and escutcheon.

► Drilling template — door with direct rotary mechanism, without escutcheon.

& Drilling template — molded case circuit breaker mounting on mounting plate.

Bulletin 140G/MG I-Frame

Figure 112 - Panel Mounted Molded Case Circuit Breaker



‡ Overall dimensions of optional side covers.

§ Required 25 mm insulating phases barriers provided.

Description	No. of Poles	A
With escutcheon	3...4	74 (2.91)
Without escutcheon	3...4	71 (2.80)
	3...4	79 (3.11)

Figure 113 - DIN Rail Mounted Molded Case Circuit Breaker

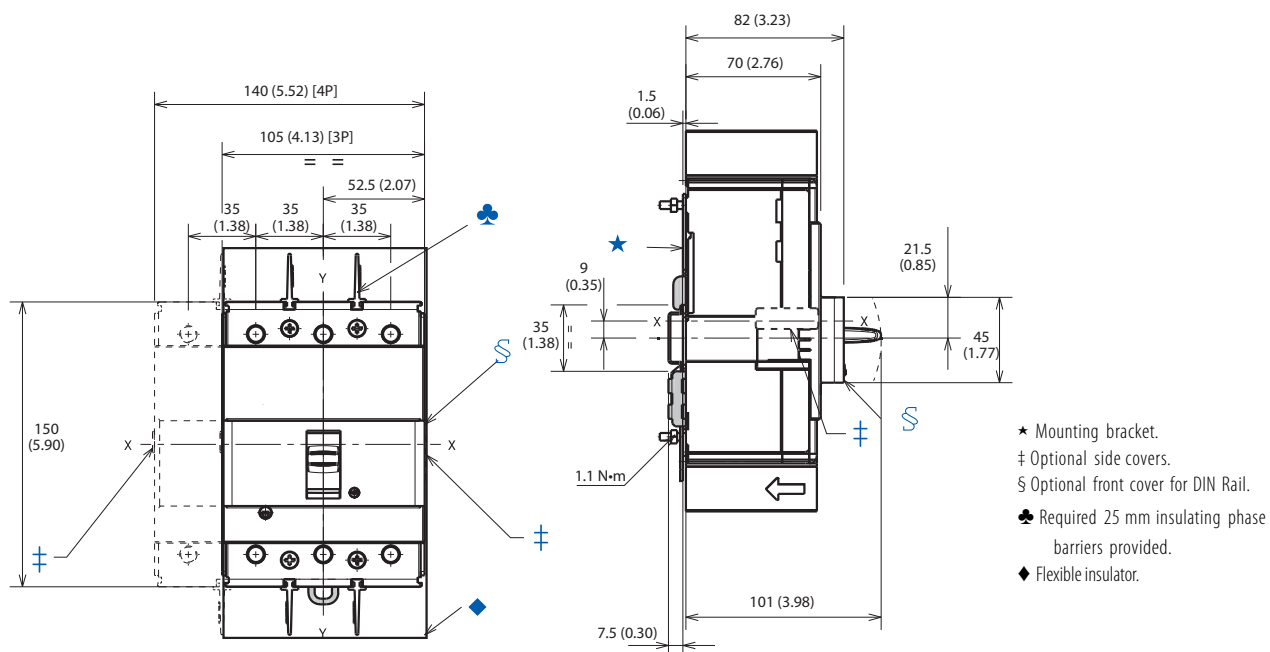


Figure 114 - Drilling Template for Molded Case Circuit Breaker Mounting

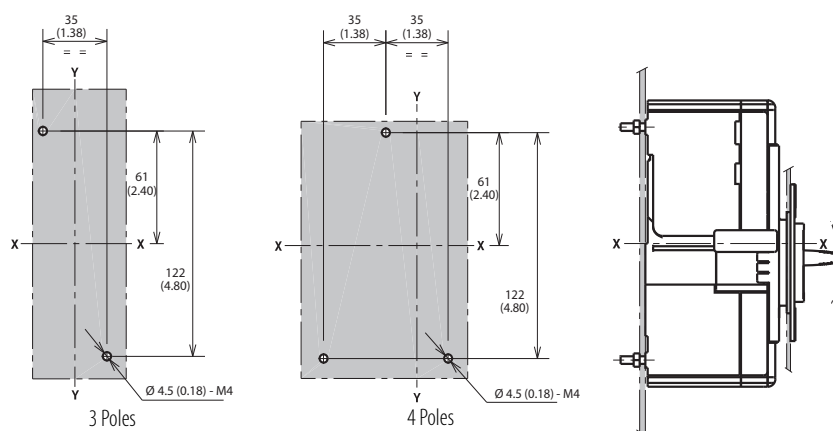
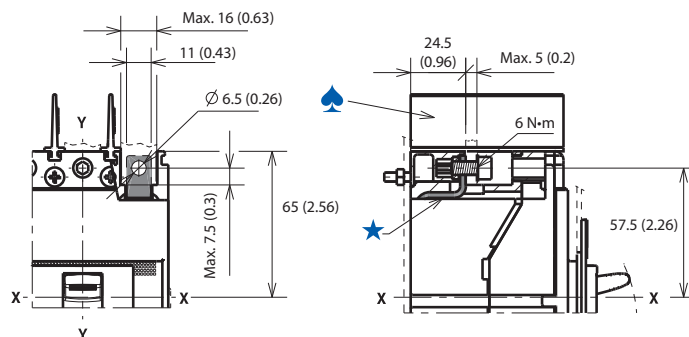


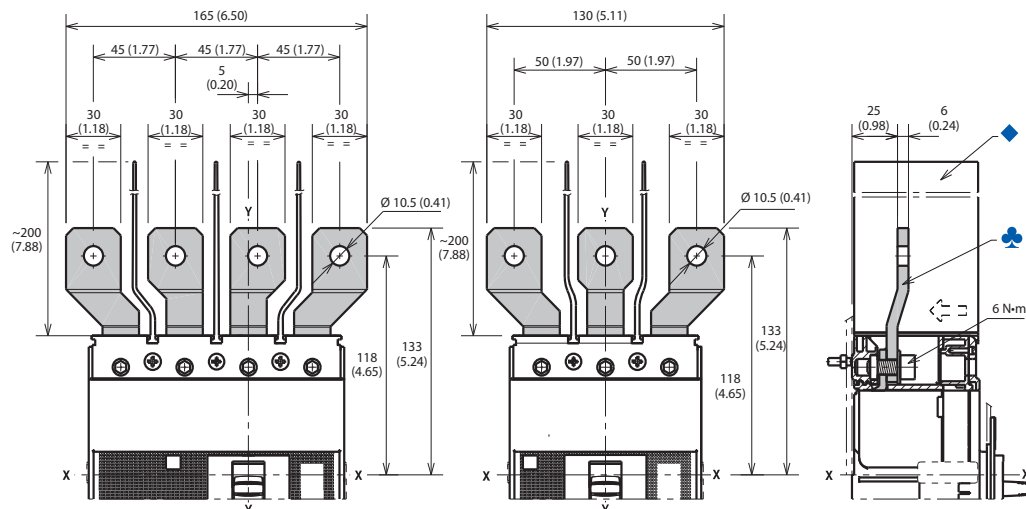
Figure 115 - Cat. Nos. 140G-I-ECM, -ECM4 Terminals



★ End cap terminals for ring or busbar connection.

♣ Required 25 mm insulating phase barriers provided.

Figure 116 - Cat. Nos. 140G-I-EXS3, -EXS4 Terminals ★

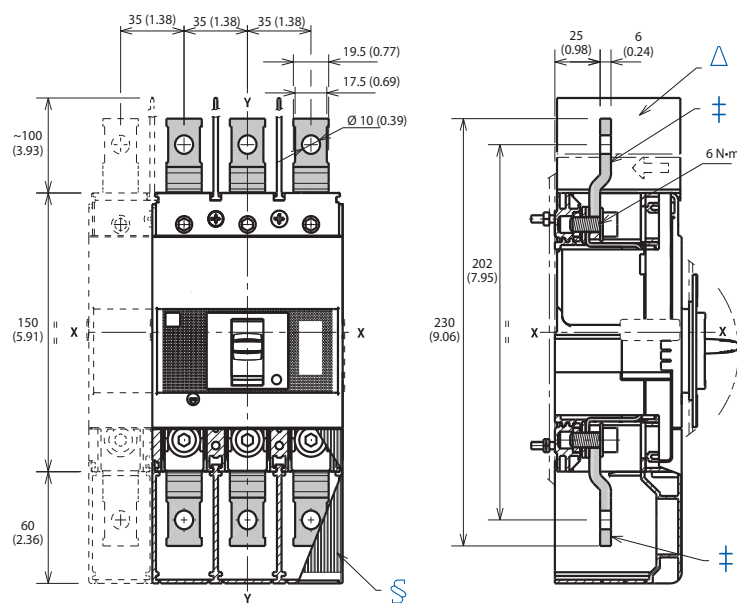


♣ Extended spread terminals.

◆ Required 200 mm insulating phase barriers provided.

★ $U_g > 440V$ requires supplied insulator panel (not shown in illustration).

Figure 117 - Cat. Nos. 140G-I-EXT3, -EXT4 Extended Terminals

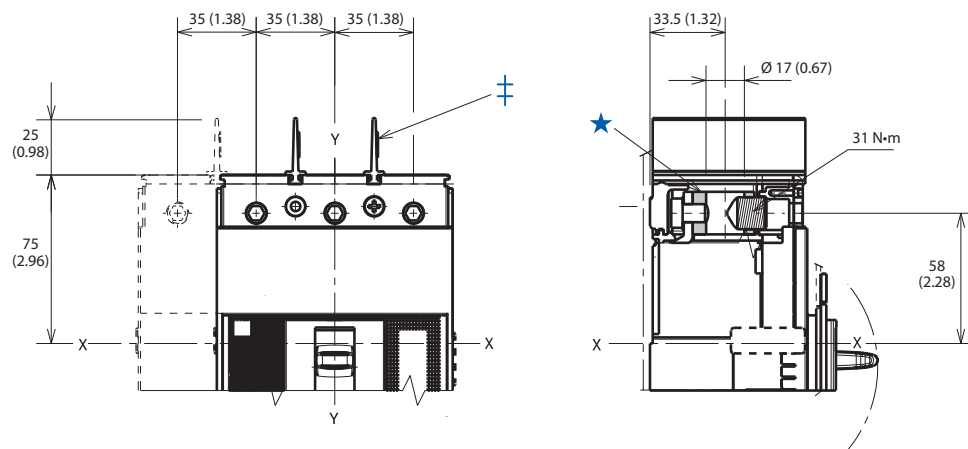


‡ Extended terminals

§ Optional terminal covers with IP40 protection provided

Δ Required 100 mm insulating phase barriers provided

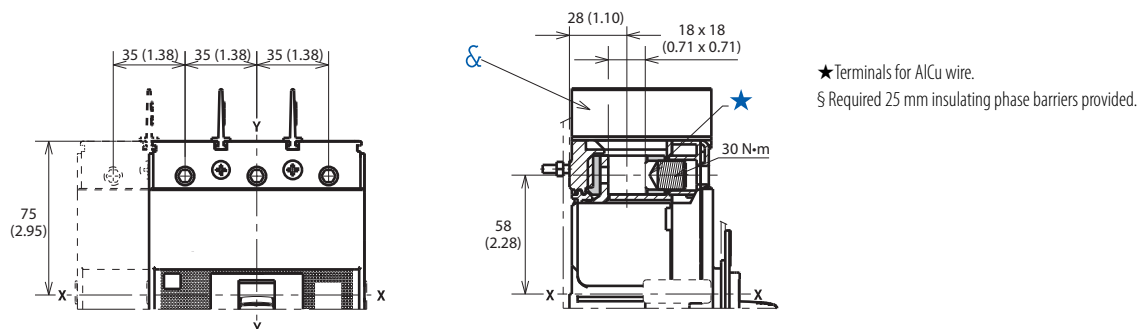
Figure 118 - Cat. Nos. 140G-I-TLA1A3, -TLA1A4 Terminals



★ 30...150 mm² terminals.

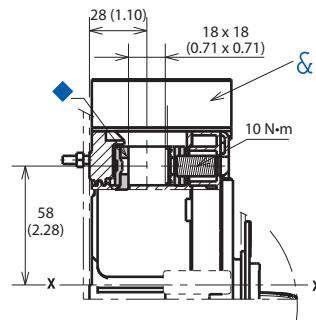
‡ Required 25 mm insulating phase barriers provided.

Figure 119 - Cat. Nos. 140G-I-TLA3, -TLA4 Terminals

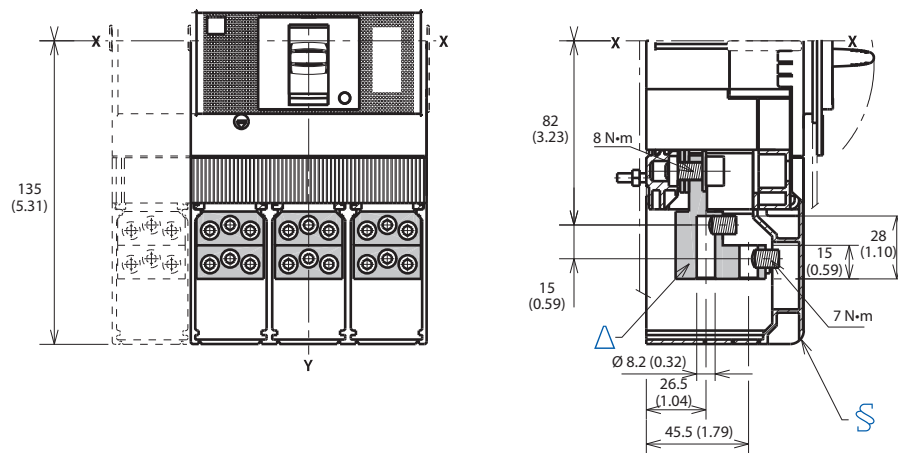


★ Terminals for AlCu wire.

§ Required 25 mm insulating phase barriers provided.

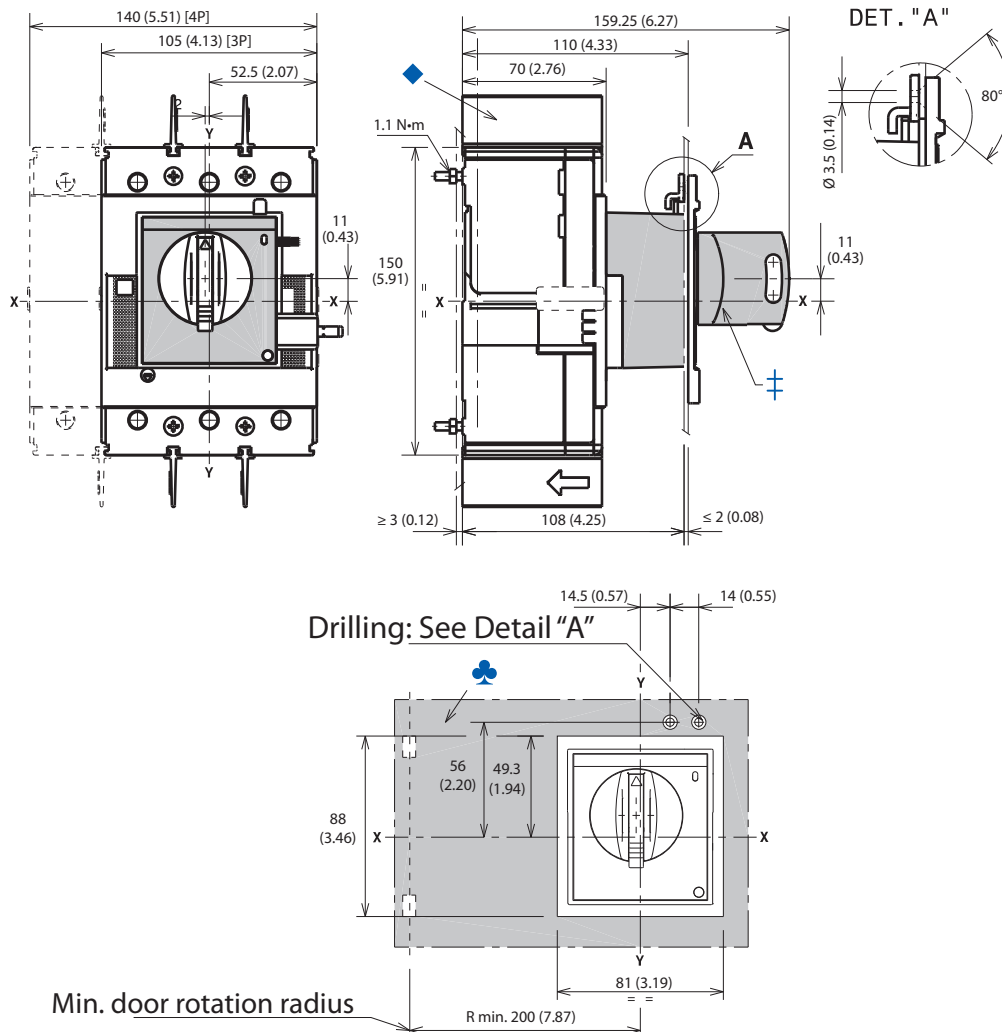
Figure 120 - Cat. Nos. 140G-I-TLC13, -TLC14 Terminals

◆ Terminals for copper wire.
 & Required 25 mm insulating phase barriers provided.

Figure 121 - Cat. Nos. 140G-I-MTL63, -MTL64 Terminals

△ Multi-cable terminal lugs.
 § Required 25 mm insulating phase barriers. Optional terminal covers with IP40 protection provided.

Figure 122 - Cat. No. 140G-G-RMB, -RMY Direct Rotary Operating Handle (For I- and G-Frame Molded Case Circuit Breaker)



‡ Rotary handle operating mechanism on molded case circuit breaker

♣ Door drilling template with direct rotary handle

◆ Required 25 mm insulating phase barriers provided

Figure 123 - 140G-G-RVM... Minimum/Maximum Enclosure Depth (for I-Frame Molded Case Circuit Breaker)

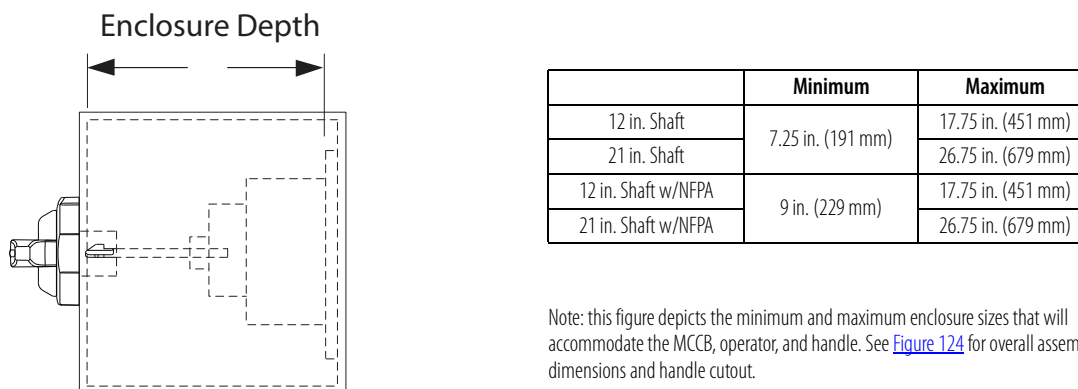


Figure 124 - Cat. No. 140G-G-RVM... Variable Depth Rotary Handle Operating Mechanism (For I-Frame Molded Case Circuit Breaker)

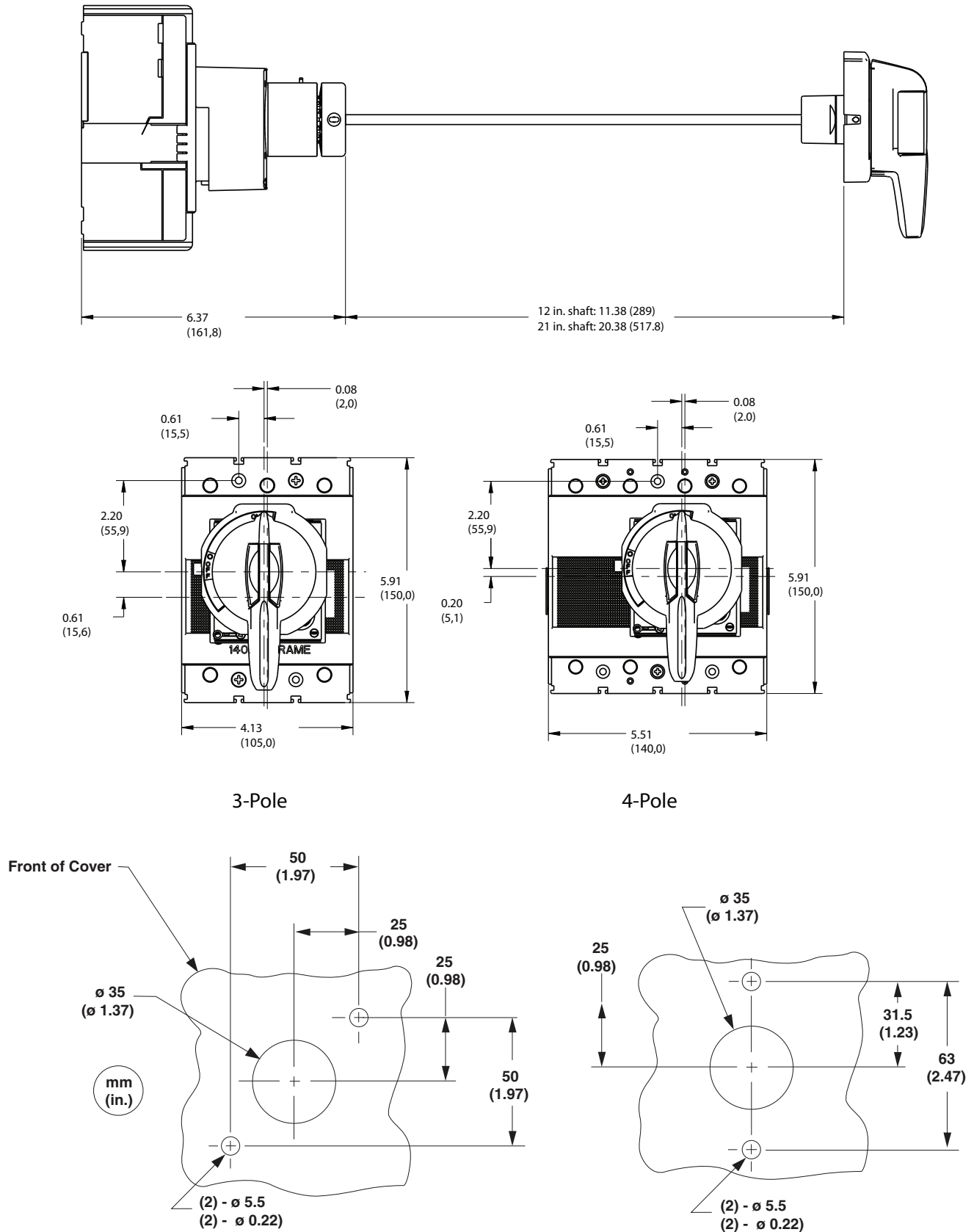
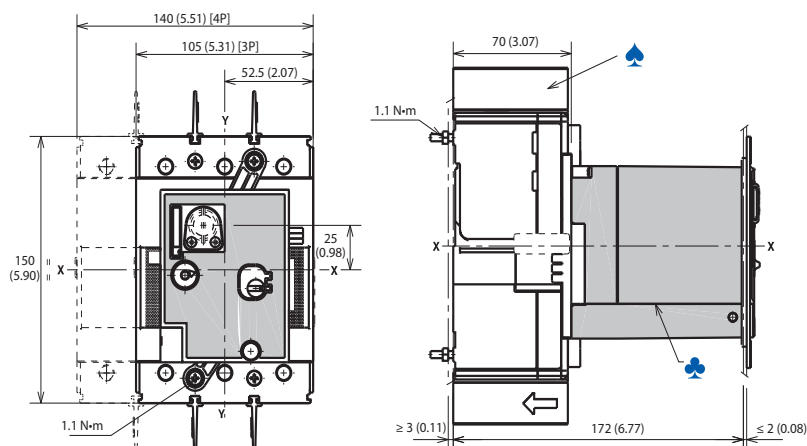


Figure 125 - Cat. No. 140G-G-EOP... Motor Operator (I-Frame)



- ♣ Motor operator
- ♠ Required 25 mm insulating phase barriers provided

Figure 126 - Door Drilling Template

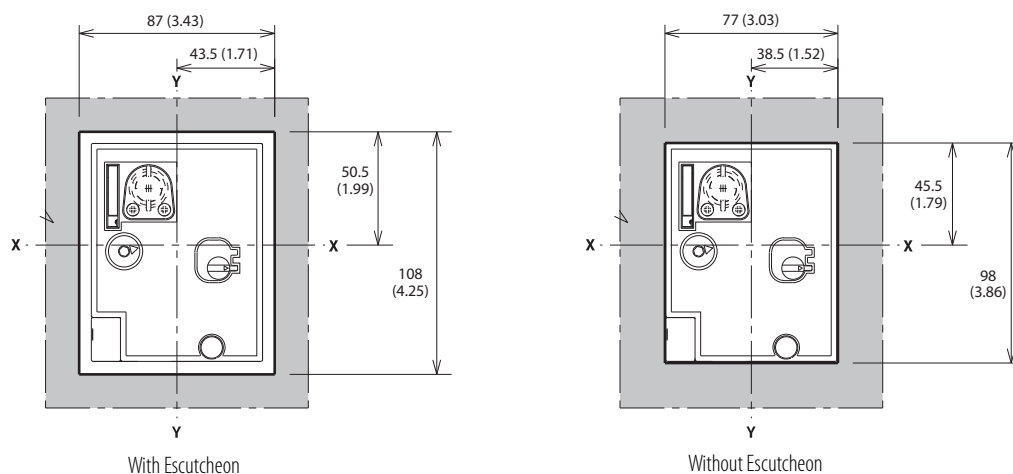
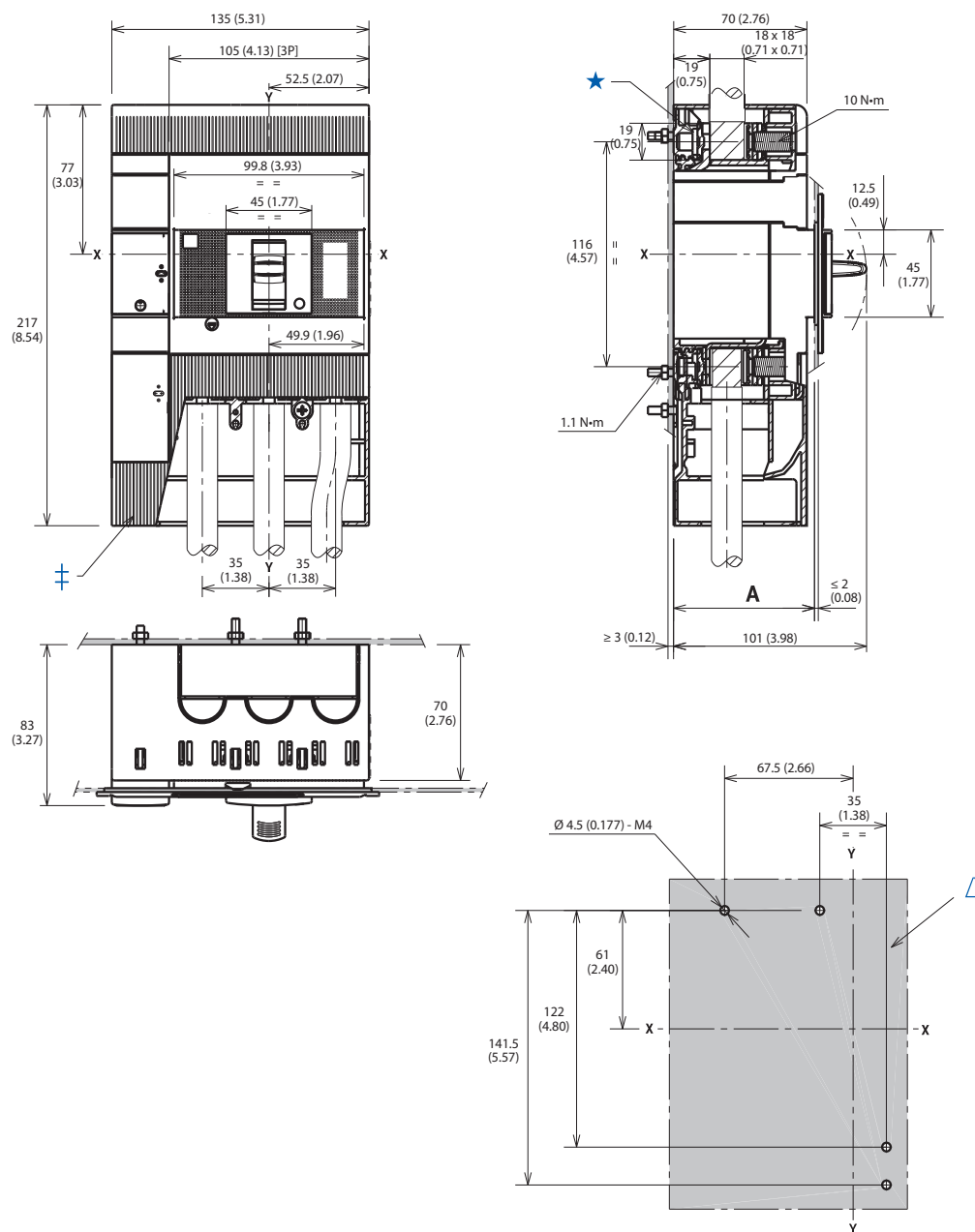


Figure 127 - Cat. No. 140G-I-ELP2503 Residual Current Release Module



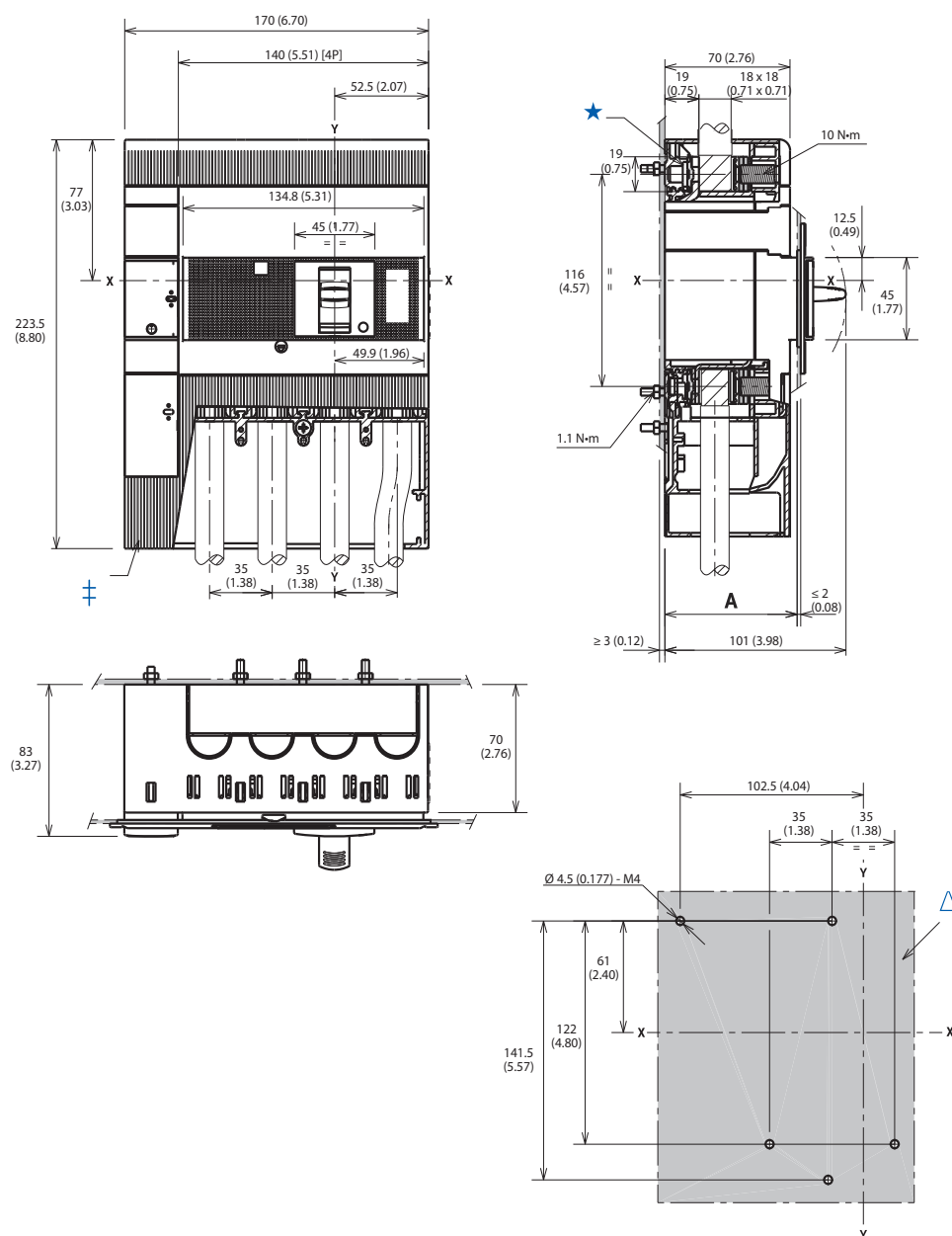
Description	No. of Poles	A
With escutcheon	3	74 (2.91)
Without escutcheon	3	71 (2.80)

★ Terminals for cable connection

‡ Terminal covers with IP40 protection

Δ Drilling template — molded case circuit breaker mounting on mounting plate

Figure 128 - Cat. No. 140G-I-ELP2504 Residual Current Release Module for 4-Pole Molded Case Circuit Breakers

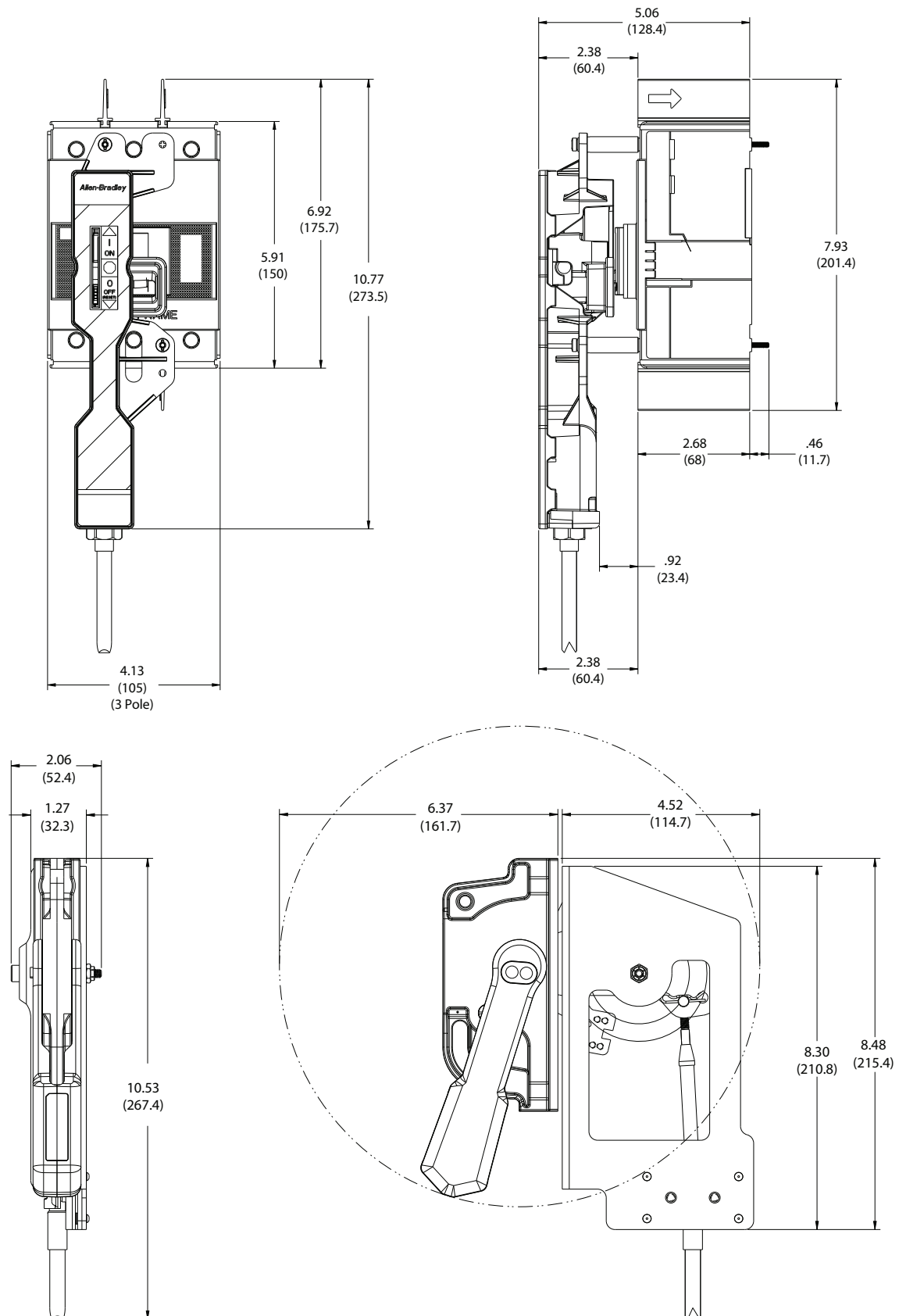


★ Terminals for cable connection.

‡ Terminal covers with IP40 protection.

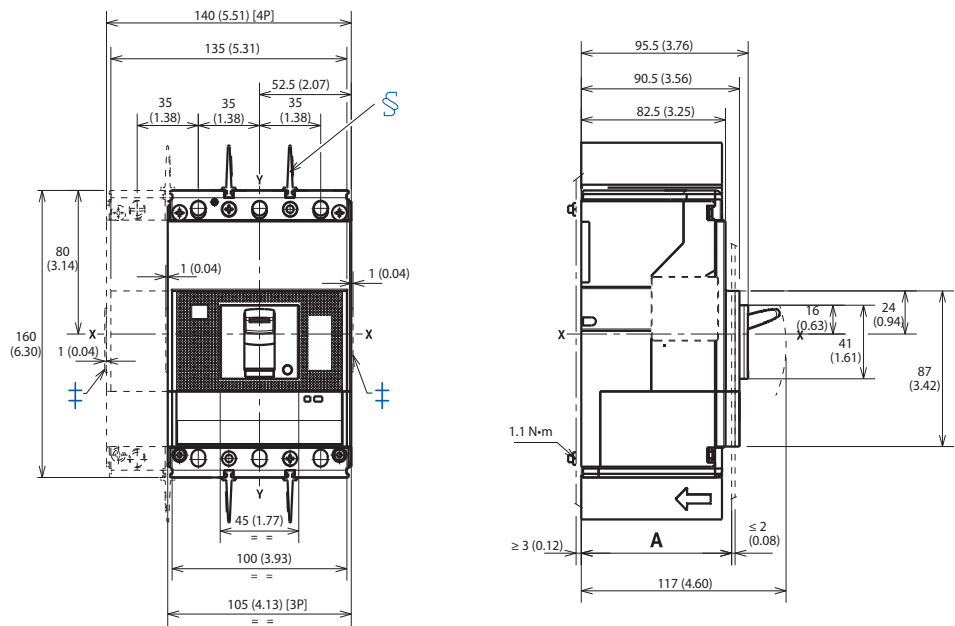
△ Drilling template — molded case circuit breaker mounting on mounting plate.

Figure 129 - I-Frame Flex Cable Operator and Actuator



Bulletin 140G/MG J-Frame

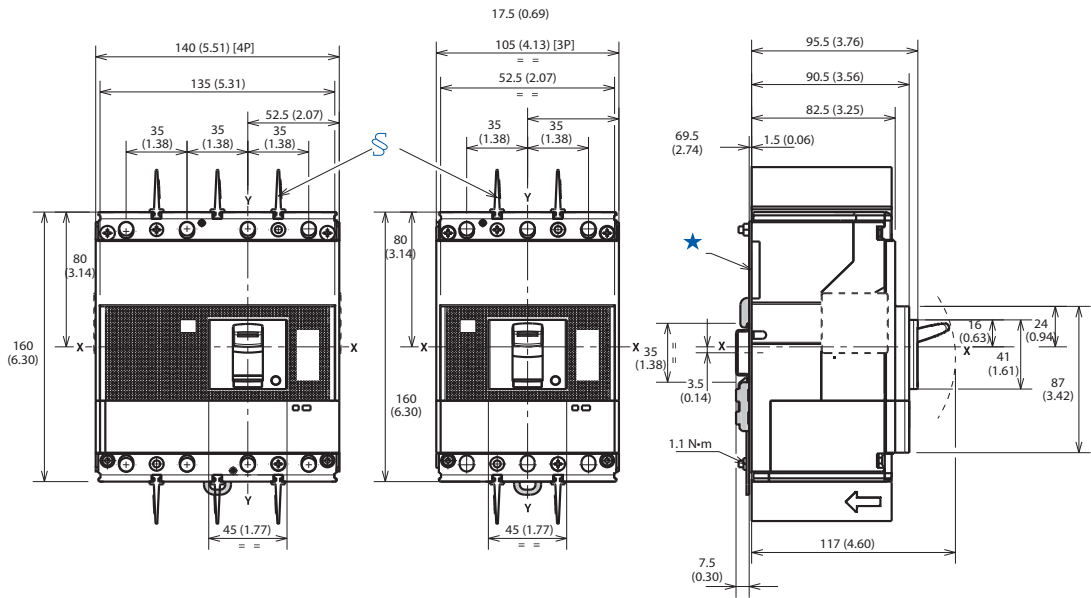
Figure 130 - Panel Mounted Molded Case Circuit Breaker



‡ Overall dimensions of optional wiring ducts.
§ Required 25 mm insulating phase barriers provided.

Description	No. of Poles	A
With escutcheon	3...4	86 (3.39)
Without escutcheon	3...4	83.5 (3.29)
	3...4	91.5 (3.60)

Figure 131 - DIN Rail Mounted Molded Case Circuit Breaker



★ Mounting bracket
§ Required 25 mm insulating phase barriers provided

Figure 132 - Drilling Template for Molded Case Circuit Breaker Mounting

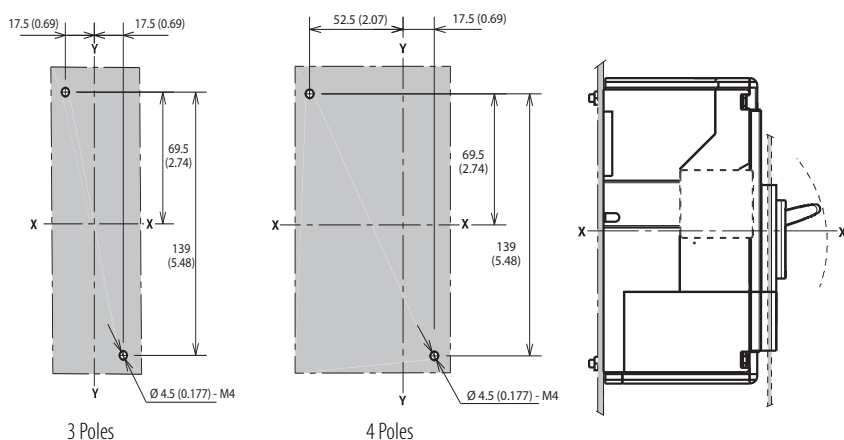


Figure 133 - Cat. Nos. 140G-J-ECM, -ECM4 Terminals

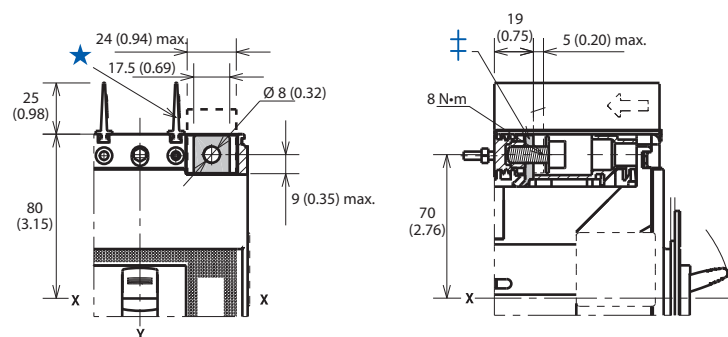
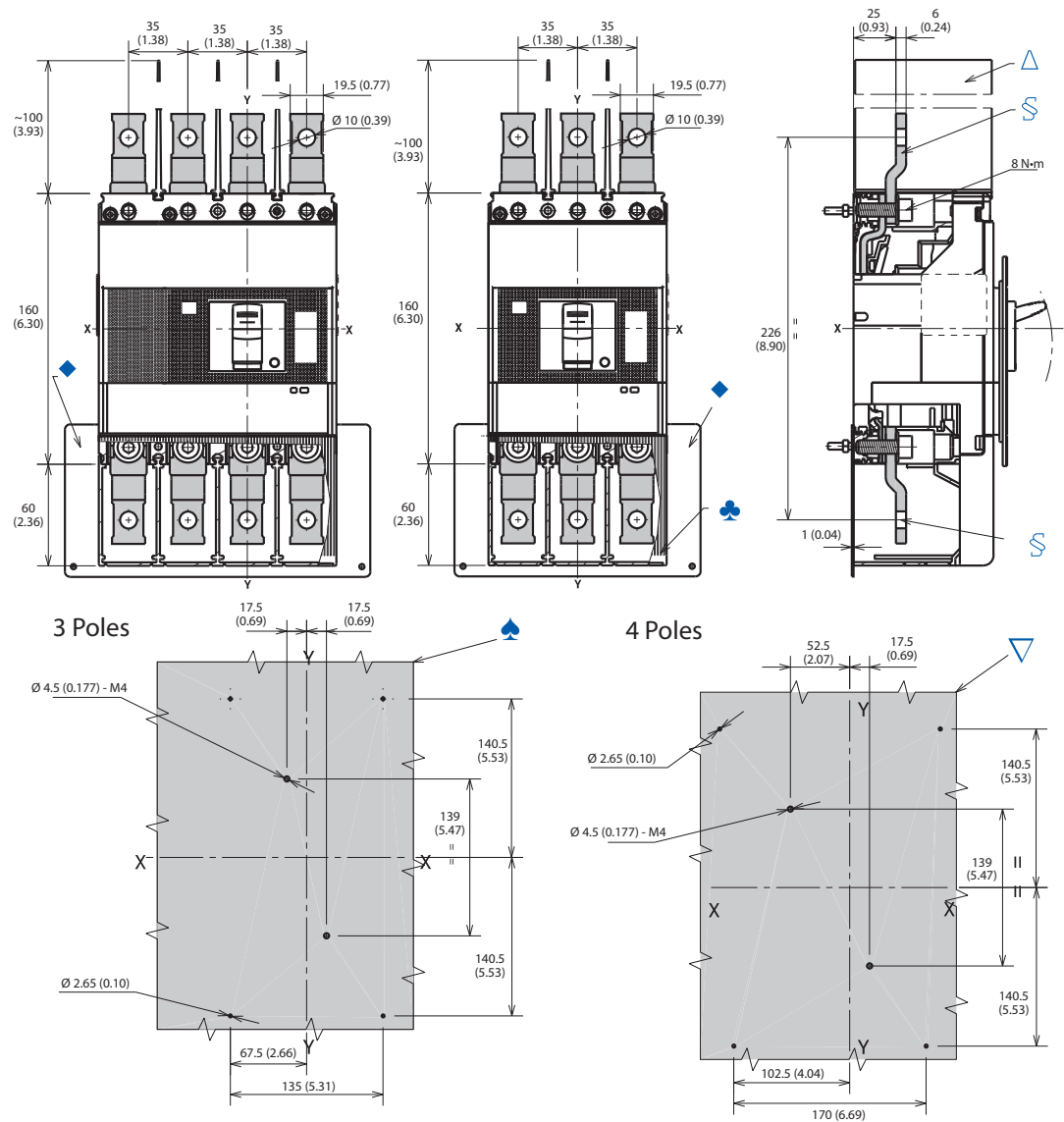


Figure 134 - Cat. Nos. 140G-J-EXT3, -EXT4 Extended Terminals



S Extended terminals.

♣ Optional terminal covers with IP40 protection provided.

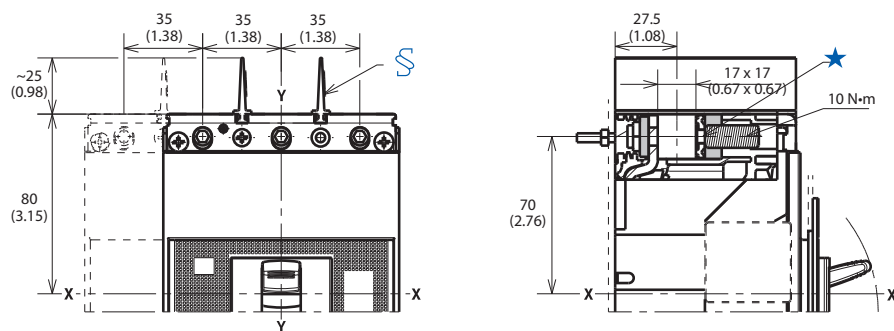
Δ Required 100 mm insulating phase barriers provided.

◆ Supplied insulator panel, required for $U_e > 440V$ applications.

♠ Drilling template for 3-pole molded case circuit breaker.

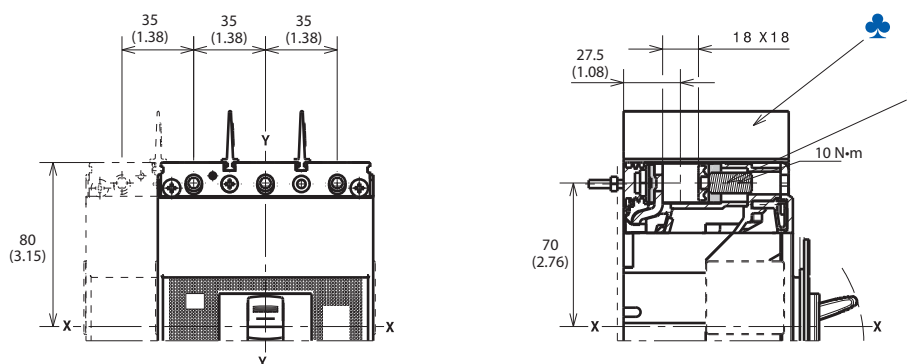
▽ Drilling template for 4-pole molded case circuit breaker.

Figure 136 - Cat. Nos. 140G-J-TLA13, -TLA14 Terminal Lugs



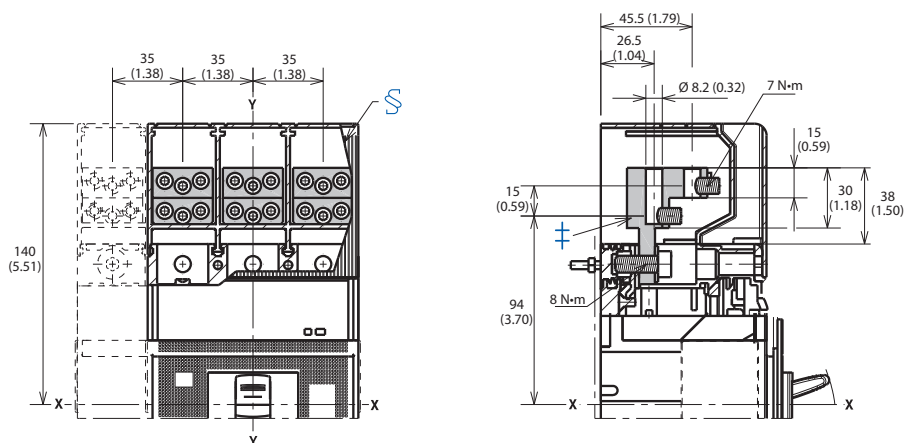
★ Terminals for aluminum or copper wire.
 § Required 25 mm insulating phase barriers provided.

Figure 137 - Cat. Nos. 140G-J-TLC13, -TLC14 Terminal Lugs



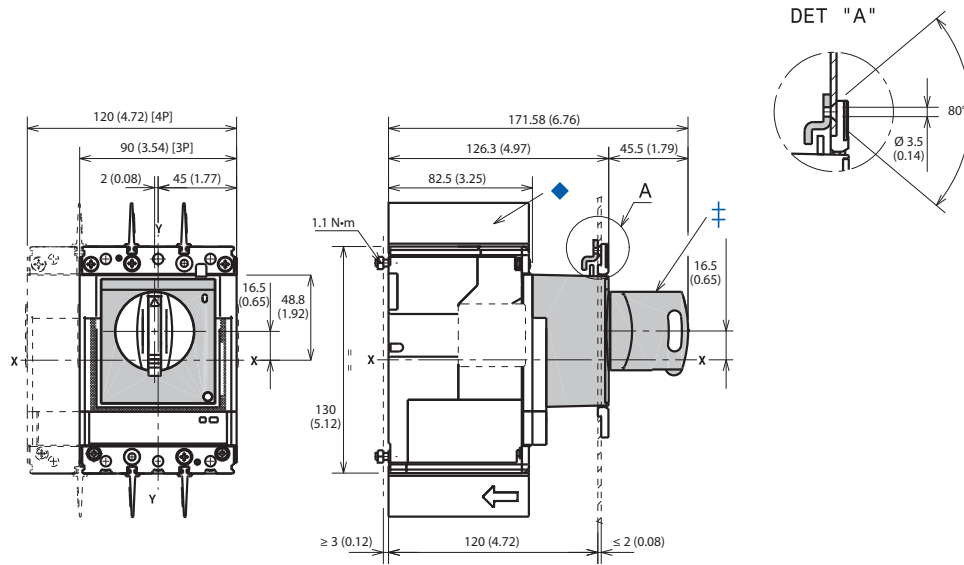
★ Terminals for copper wire.
 ♣ Required 25 mm insulating phase barriers provided.

Figure 138 - Cat. Nos. 140G-J-MTL63, -MTL64 Terminals



‡ Multi-cable terminal lugs.
 § Required 25 mm insulating phase barriers. Optional terminal covers with IP40 protection provided.

Figure 139 - Cat. No. 140G-H-RMB, -RMY Direct Rotary Operating Handle (For H- and J-Frame Molded Case Circuit Breaker)



‡ Rotary handle operating mechanism on molded case circuit breaker.

◆ Required 25 mm insulating phase barriers provided.

Figure 140 - Escutcheon Mount Drill Template.

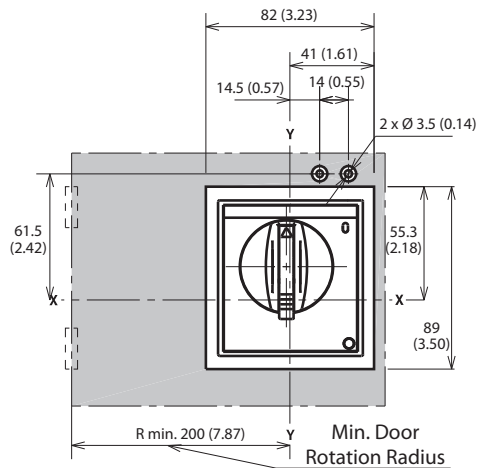
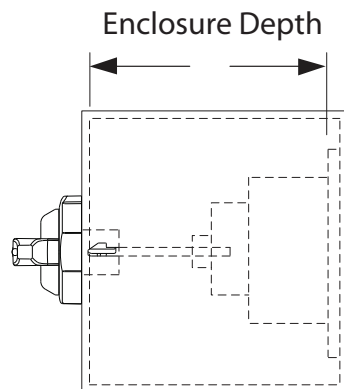


Figure 141 - 140G-H-RVM... Minimum/Maximum Enclosure Depth (for J-Frame Molded Case Circuit Breakers)



	Minimum	Maximum
12 in. Shaft	8 in. (205 mm)	18.25 in. (464 mm)
21 in. Shaft		27.25 in. (692 mm)
12 in. Shaft w/NFPA	9.25 in. (235 mm)	18.25 in. (464 mm)
21 in. Shaft w/NFPA		27.25 in. (692 mm)

Note: this figure depicts the minimum and maximum enclosure sizes that will accommodate the MCCB, operator, and handle. See [Figure 142](#) for overall assembly dimensions and handle cutout.

Figure 142 - Cat. No. 140G-H-RVM... Variable Depth Rotary Handle Operating Mechanism (For J-Frame Molded Case Circuit Breaker)

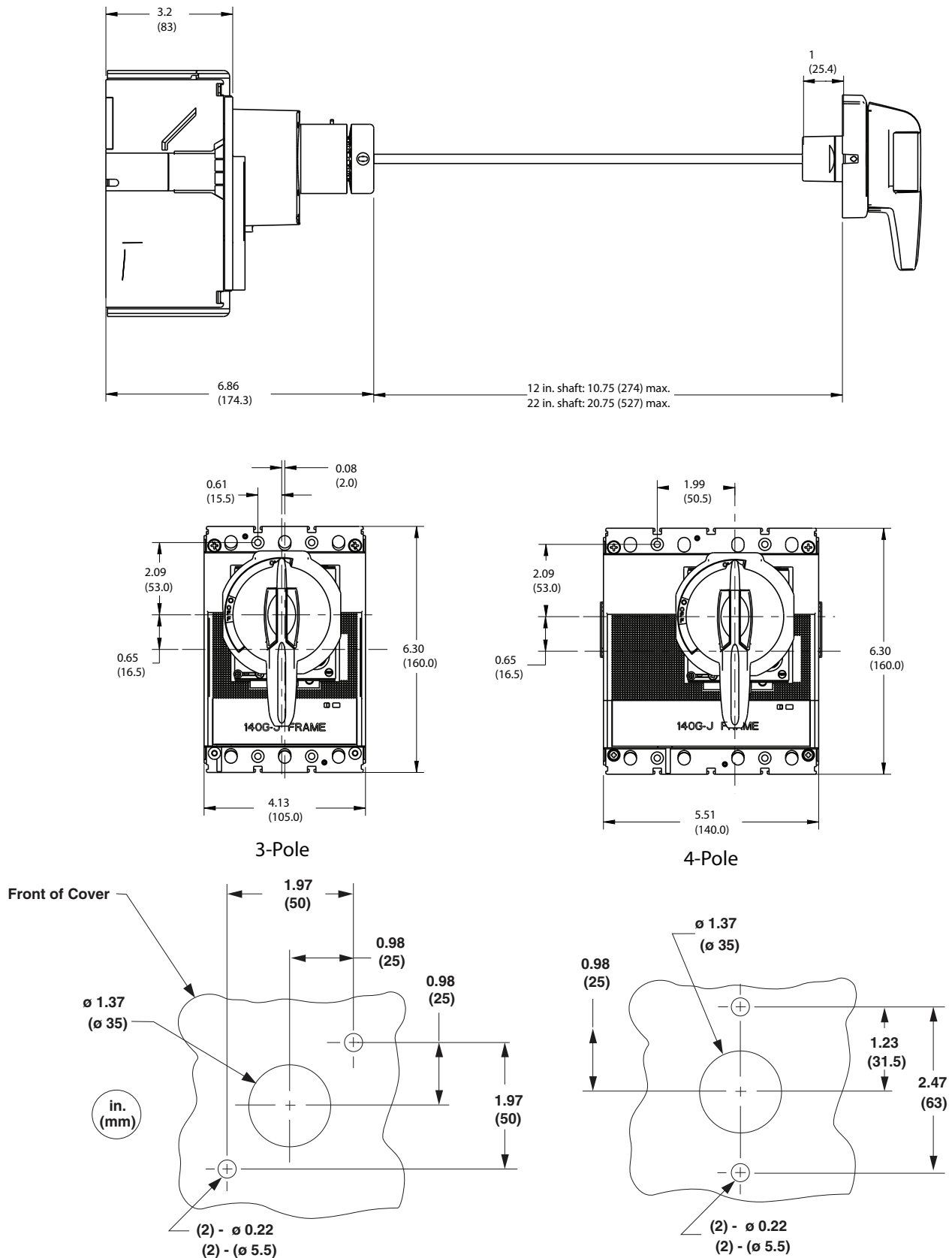
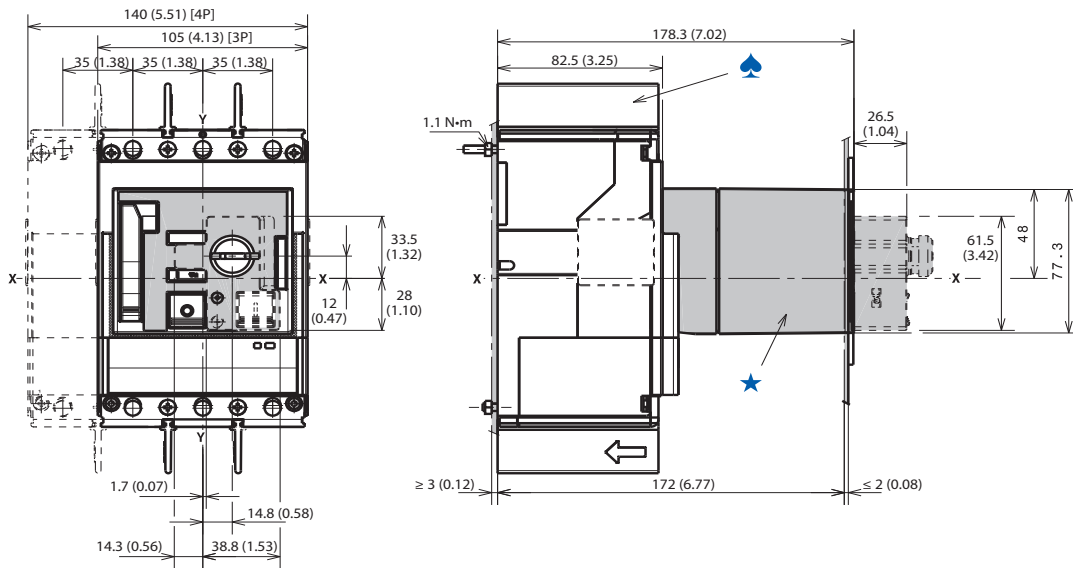


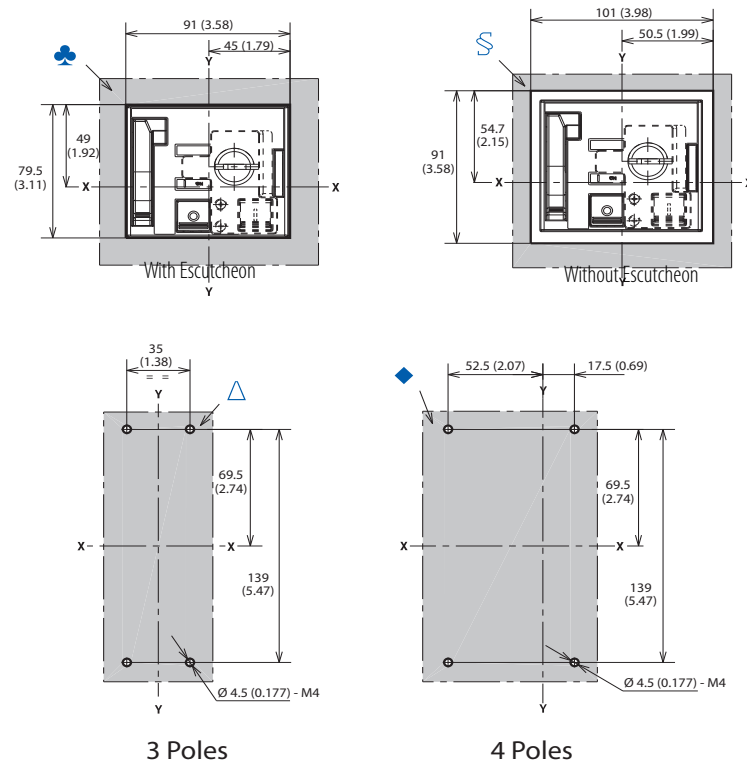
Figure 143 - Cat. No. 140G-H-EOP... Motor Operator – For H- & J-Frame Molded Case Circuit Breaker



★ Motor operator.

♣ Required 25 mm insulating phase barriers provided.

Figure 144 - Door Drilling Template



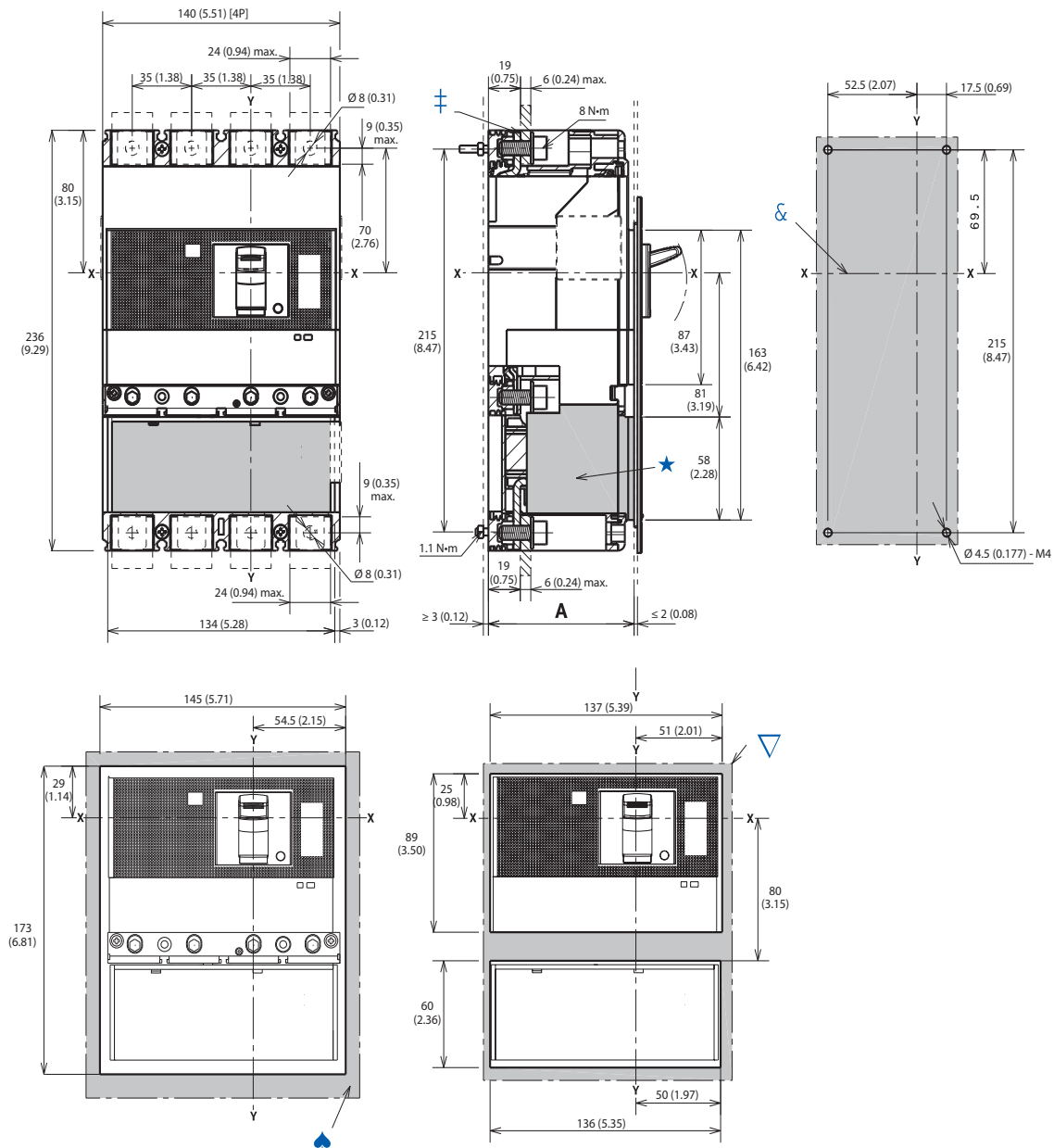
§ Door drilling template (with escutcheon).

♣ Door drilling template (without escutcheon).

△ Drilling template for 3-pole molded case circuit breaker, mounted on mounting plate.

◆ Drilling template for 4-pole molded case circuit breaker, mounted on mounting plate.

Figure 145 - Cat. No. 140G-J-EP2504 Residual Current Release Module for 4-Pole Molded Case Circuit Breakers



Description	No. of Poles	A
With escutcheon	4	86 (3.39)
Without escutcheon	4	83.5 (3.29)

★ Residual current module.

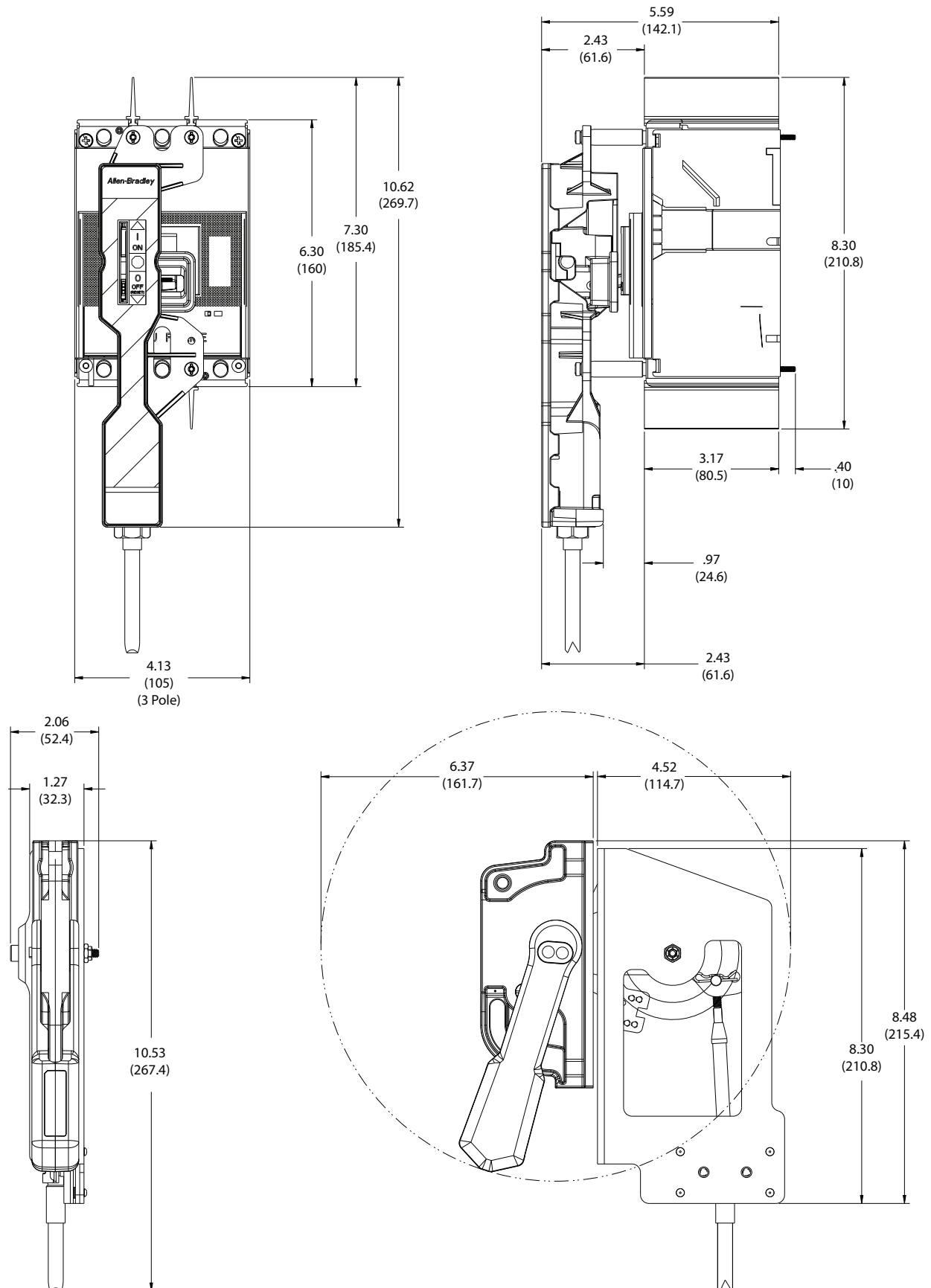
‡ End cap terminals for ring or busbar connection.

♣ Drilling template — door with direct rotary mechanism with escutcheon.

▽ Drilling template — door with direct rotary mechanism, without escutcheon.

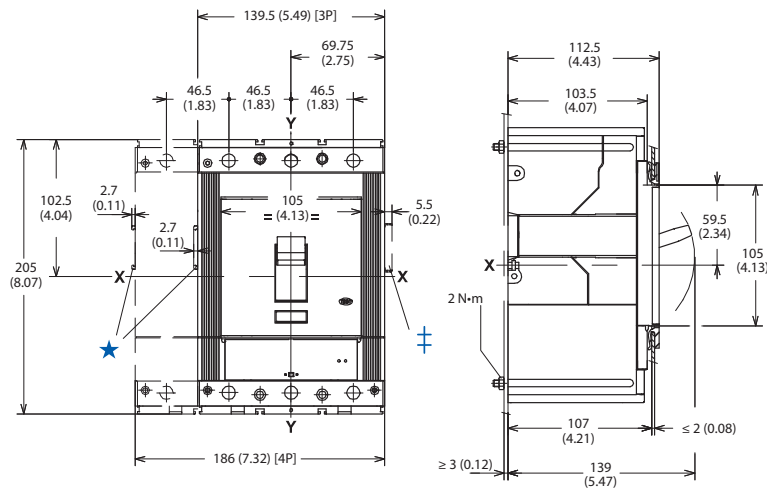
& Drilling template — molded case circuit breaker mounting on mounting plate.

Figure 146 - J-Frame Flex Cable Operator and Actuator



Bulletin 140G/MG K-Frame

Figure 147 - Panel Mounted Molded Case Circuit Breaker

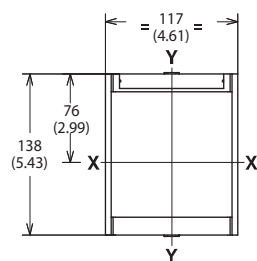


★ Overall dimensions with optional shunt trip or undervoltage relay installed.

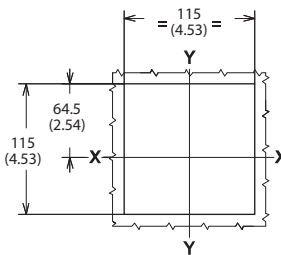
‡ Overall dimensions with optional auxiliary contacts installed.

Figure 148 - Drilling Templates for Molded Case Circuit Breaker Mounting

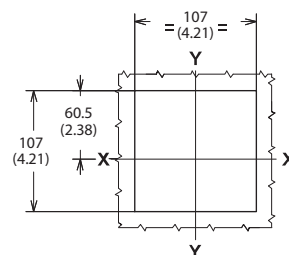
Escutcheon for compartment door



Drilling template for compartment door

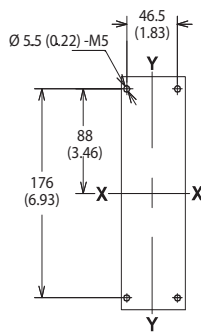


With escutcheon (3...4 poles)

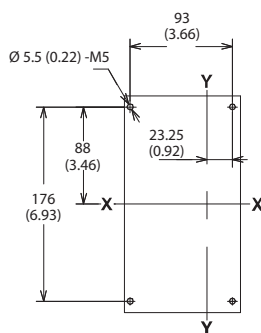


Without escutcheon (3...4 poles)

Drilling template for mounting plate



3 poles



4 poles

Figure 149 - Cat. Nos. 140G-K-ECM, -ECM4 Terminals

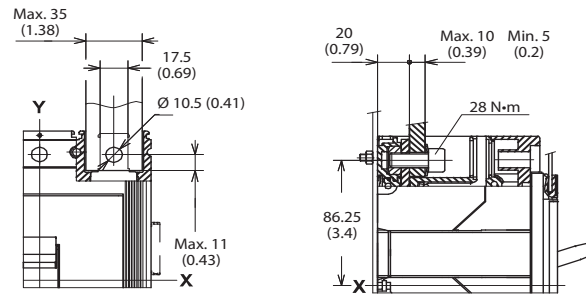


Figure 150 - Cat. Nos. 140G-K-TLC13, -TLC14 Terminals

- 250...500 MCM (120...240 mm²)

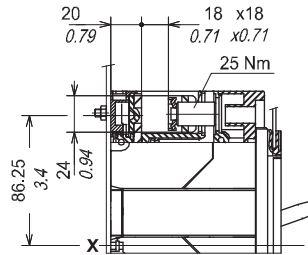
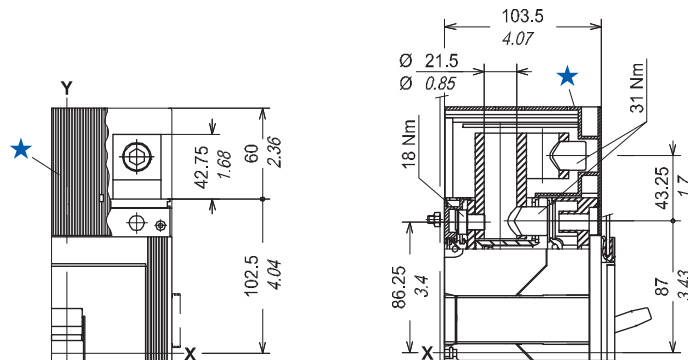


Figure 151 - Cat. Nos. 140G-K-TLA23, -TLA24, -TLC23, -TLC24 Terminals

- (2) 2/0...250 MCM ((2) 95...120 mm²)



★ Terminal covers with IP40 protection

Figure 152 - Cat. Nos. 140G-K-TLA13, -TLA14 Terminals

- 250...500 MCM (120...240 mm²)

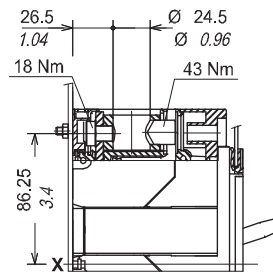


Figure 153 - Cat. Nos. 140G-K-TLA2A3 Terminals

- (2) 3/0...500 MCM [(2) 95...240 mm²]

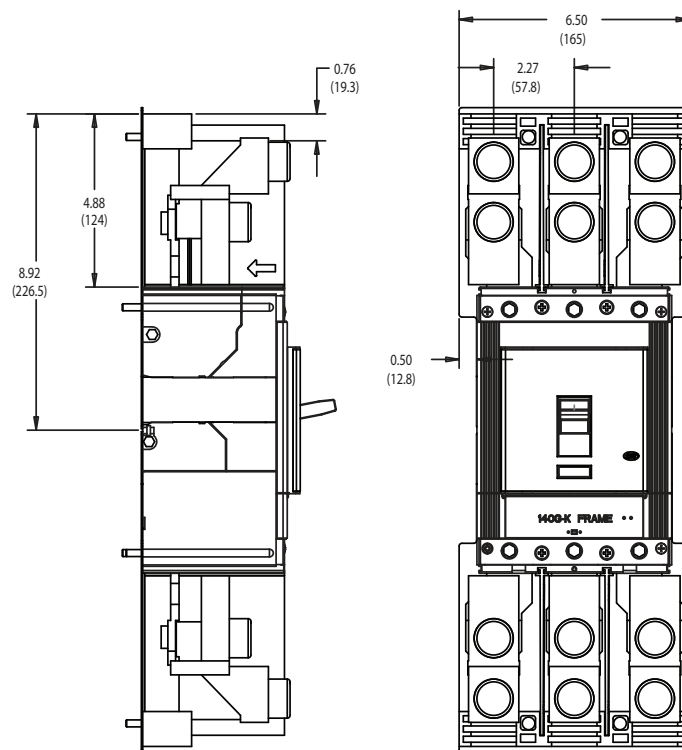
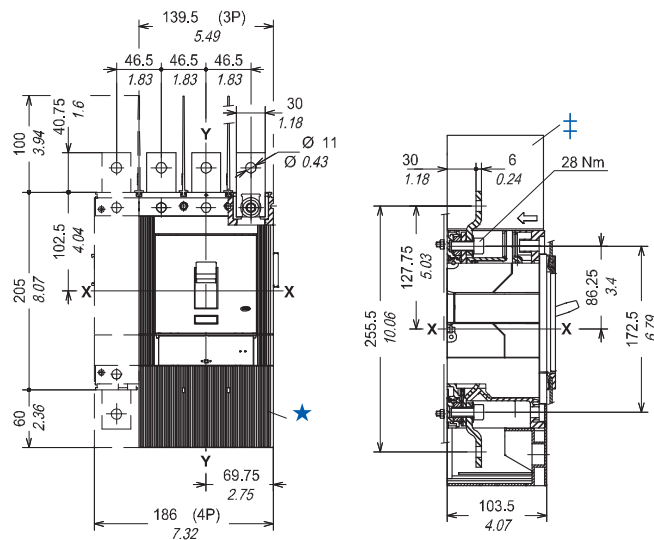


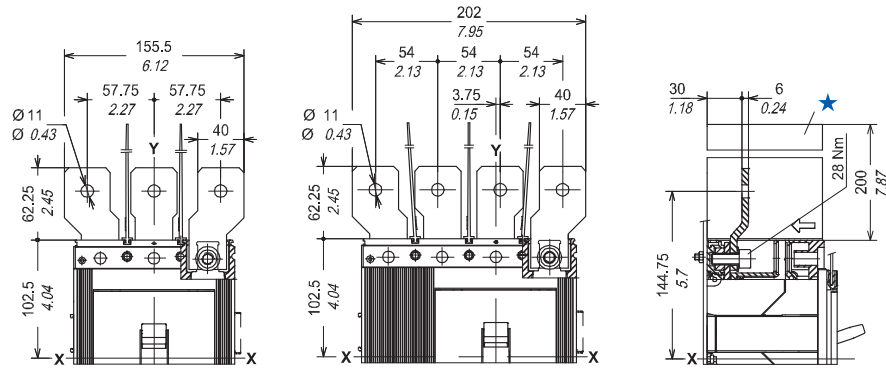
Figure 154 - Cat. Nos. 140G-K-EXT3, -EXT4 Extended Terminals



★ Terminal covers with IP40 protection

‡ Required 100 mm insulating phase barriers provided

Figure 155 - Cat. Nos. 140G-K-EXS3, -EXS4 Spreader Terminals



★ Required 200 mm insulating phase barriers provided

Figure 156 - Cat. No. 140G-K-RMB, -RMY Rotary Handle Operating Mechanism — Door Mounted

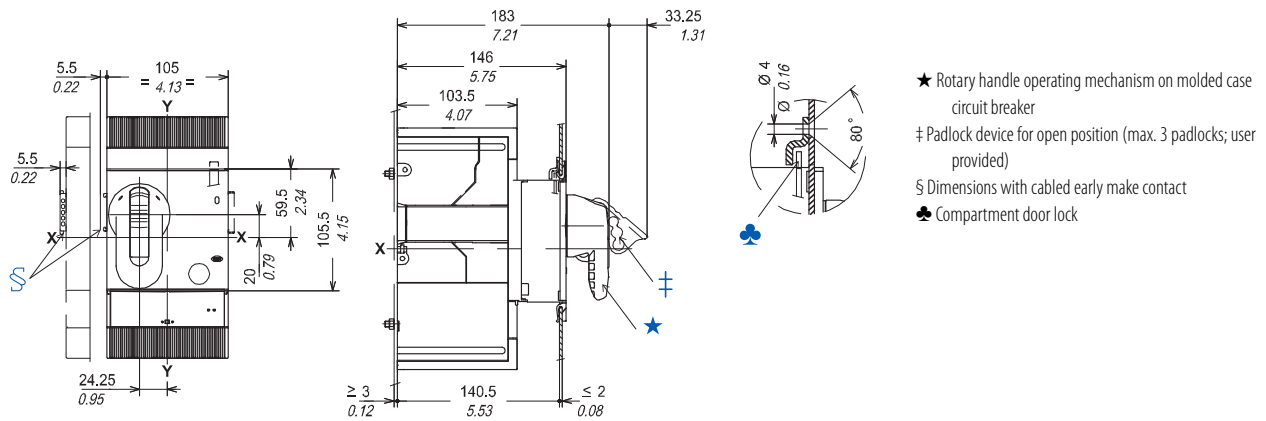
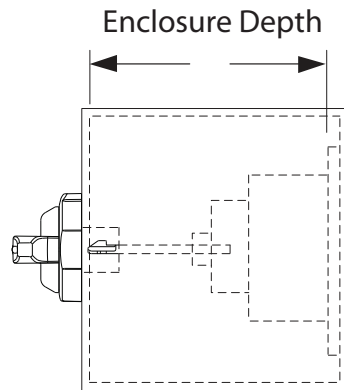


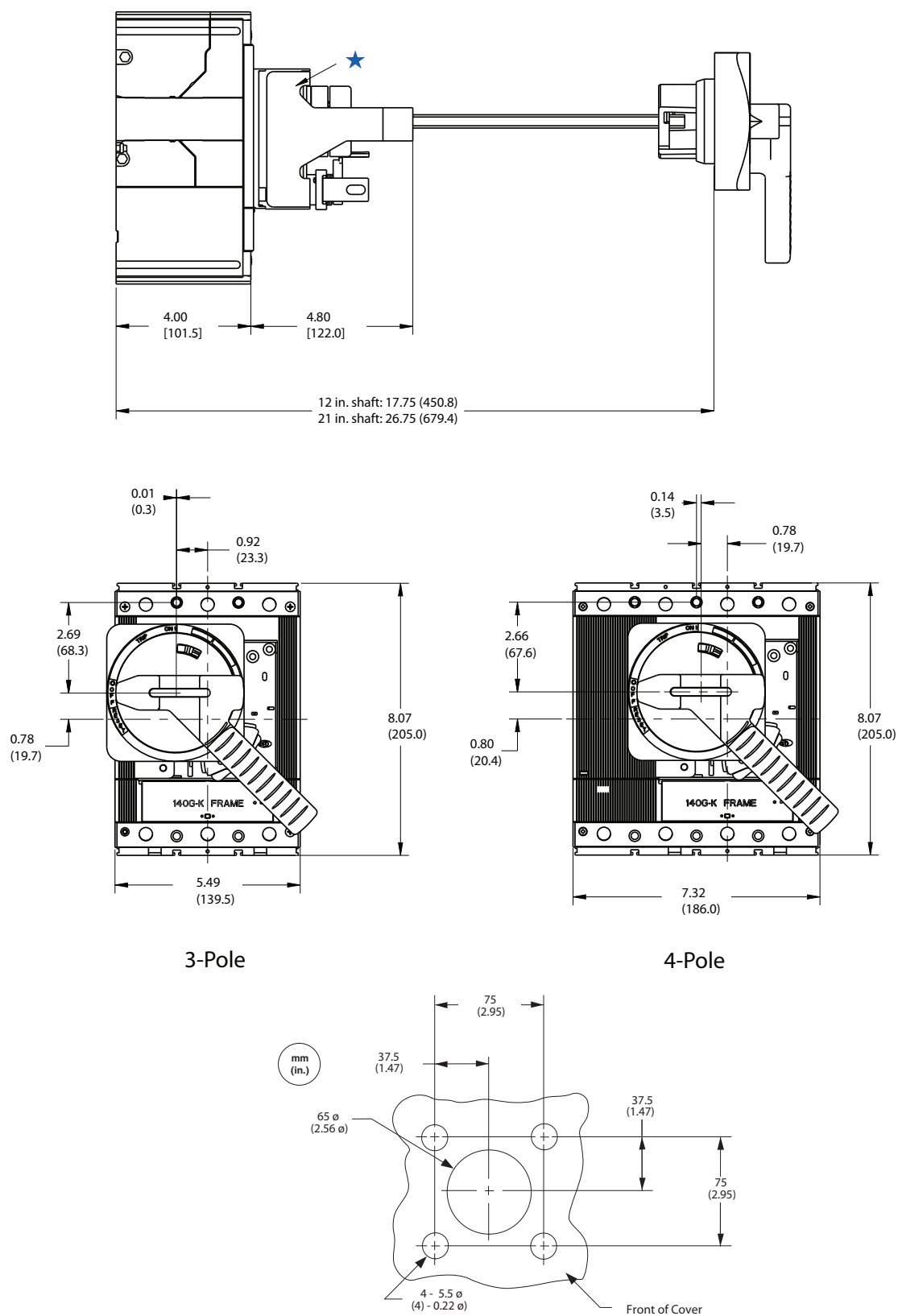
Figure 157 - 140G-K-RVM... Minimum/Maximum Enclosure Depth



	Minimum	Maximum
12 in. Shaft	9 in. (229 mm)	17.75 in. (450 mm)
21 in. Shaft		26.75 in. (679 mm)
12 in. Shaft w/NFPA	11 in. (280 mm)	17.75 in. (450 mm)
21 in. Shaft w/NFPA		26.75 in. (679 mm)

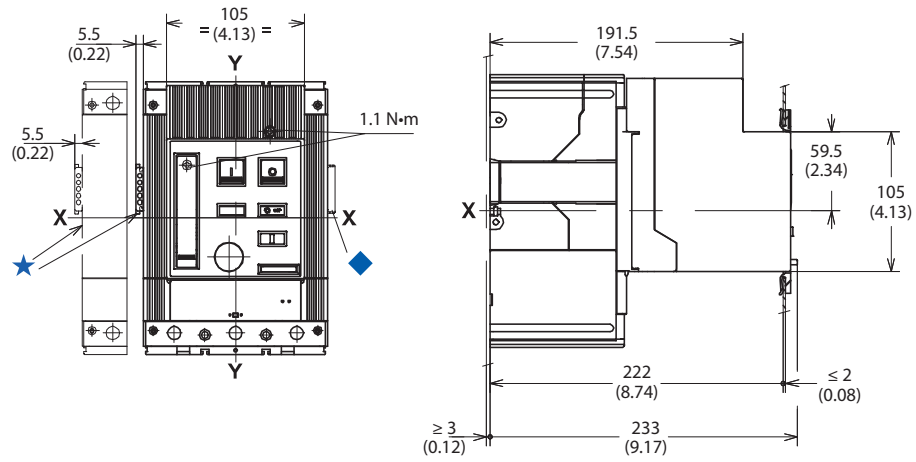
Note: this figure depicts the minimum and maximum enclosure sizes that will accommodate the MCCB, operator, and handle. See [Figure 158](#) for overall assembly dimensions and handle cutout.

Figure 158 - Cat. No. 140G-K-RVM... Variable Depth Rotary Handle Operating Mechanism



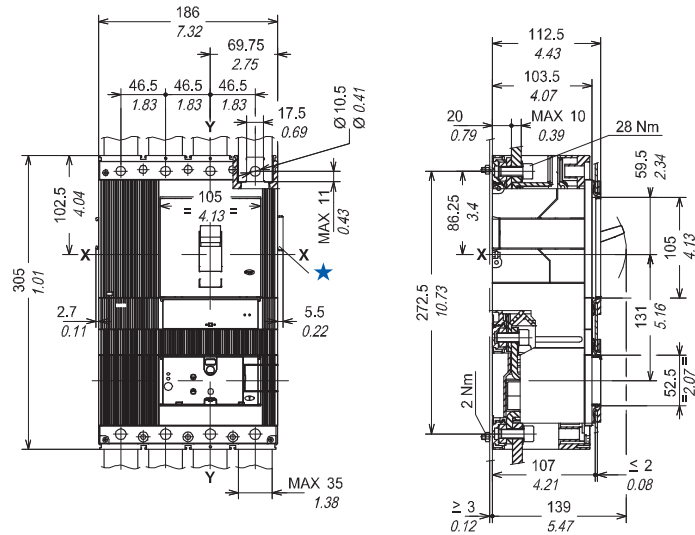
★Optional support bracket

Figure 159 - Cat No. 140G-K-EOP... Motor Operator



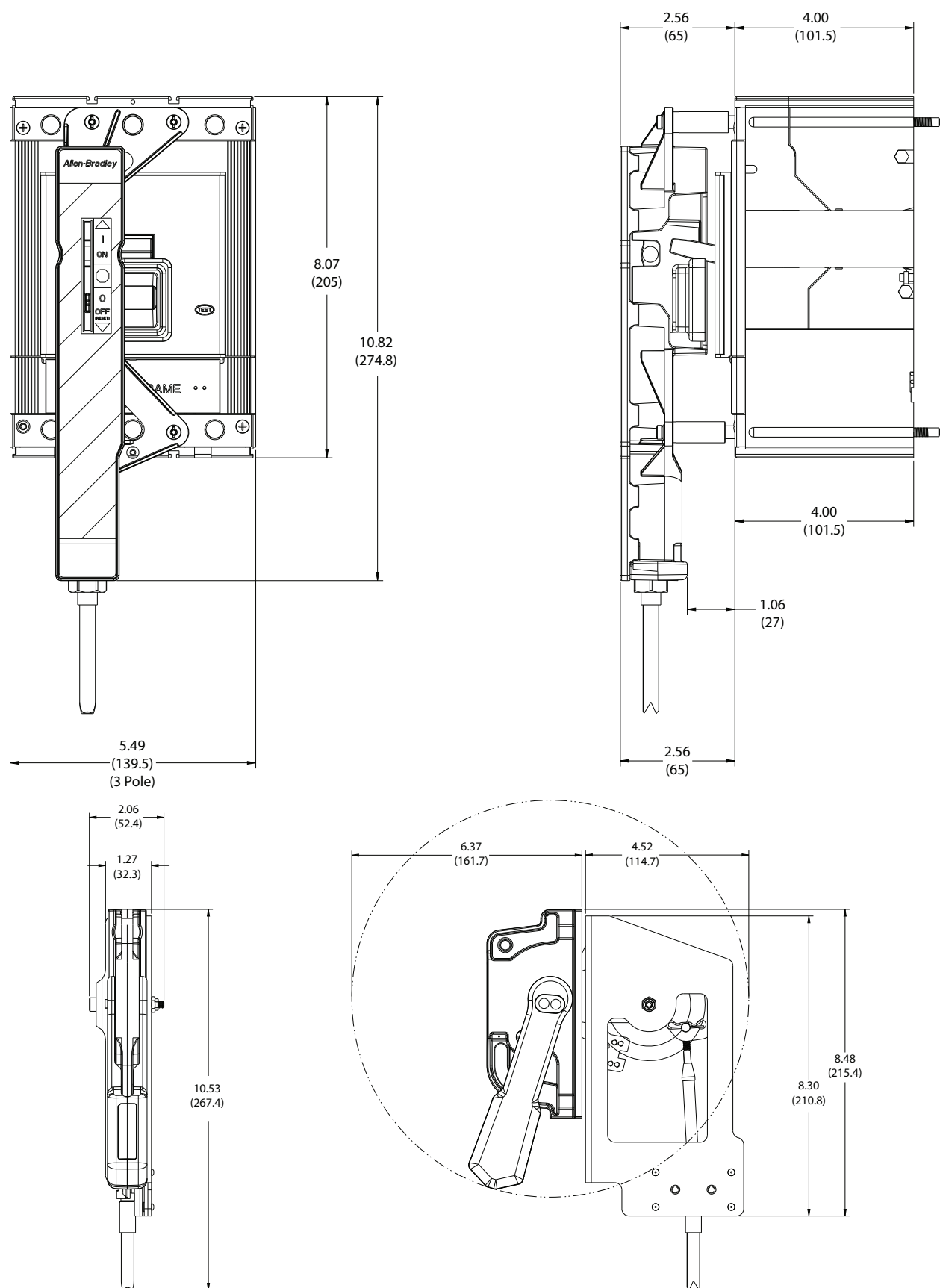
- ★ Additional width with optional shunt trip or UV relay installed.
- ◆ Additional width with optional auxiliary contacts installed.

Figure 160 - Cat. No. 140G-K-ELP Residual Current Release Module for 4-Pole Molded Case Circuit Breakers



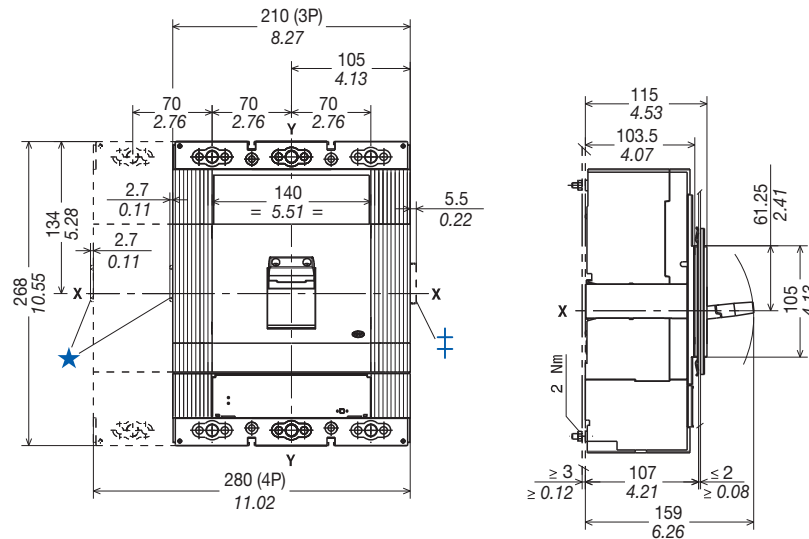
- ★ Overall dimensions with cabled auxiliary contacts mounted.

Figure 161 - K-Frame Flex Cable Operator and Actuator



Bulletin 140G/MG M-Frame

Figure 162 - Panel Mounted Molded Case Circuit Breaker

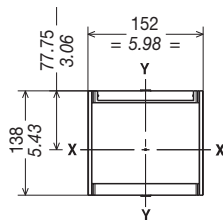


★ Overall dimensions with optional shunt trip or UV relay installed.

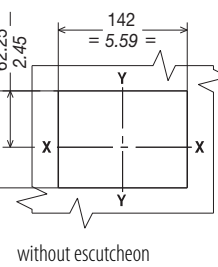
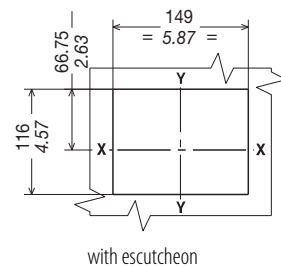
‡ Overall dimensions with optional auxiliary contacts installed.

Figure 163 - Drilling Templates for Molded Case Circuit Breaker Mounting

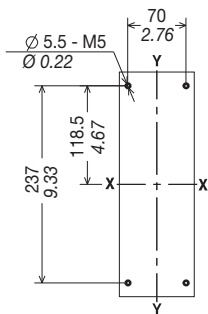
Escutcheon for compartment door



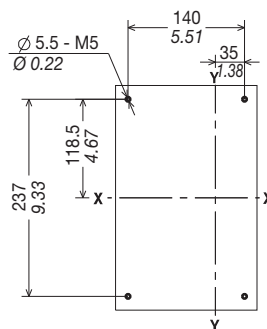
Drilling template for compartment door



Drilling template for mounting plate



3 Poles



4 Poles

Figure 164 - Cat. No. 140G-M-ECM Terminals

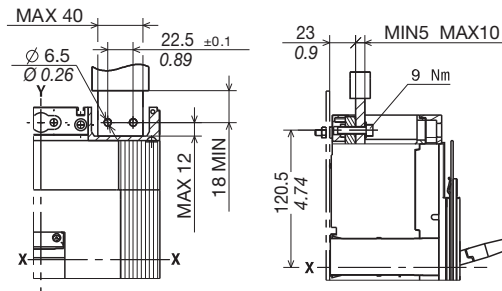


Figure 165 - Cat. No. 140G-M-TLA23, -TLA24, -TLC23, -TLC24 Terminals

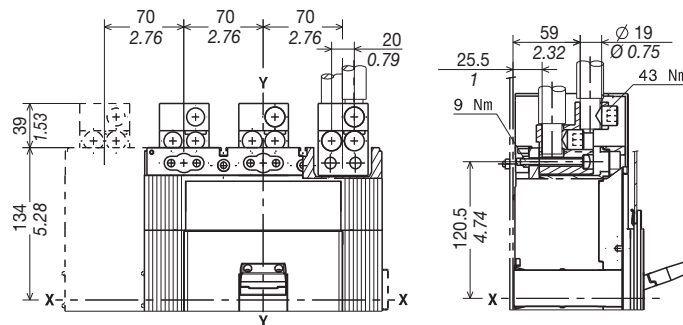


Figure 166 - Cat. Nos. 140G-M-EXT3, -EXT4 Extended Terminals

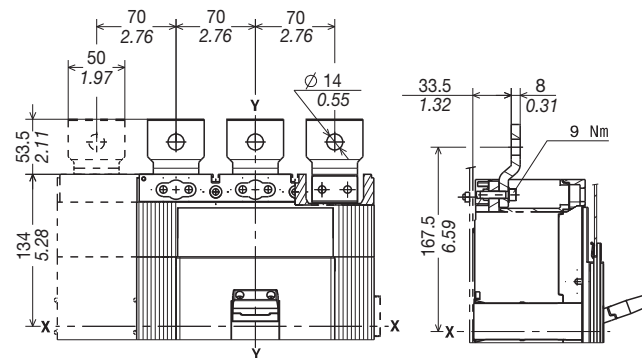


Figure 167 - Cat. Nos. 140G-M-EXSLI3, -EXSLO3, -EXS4 Spreader Terminals

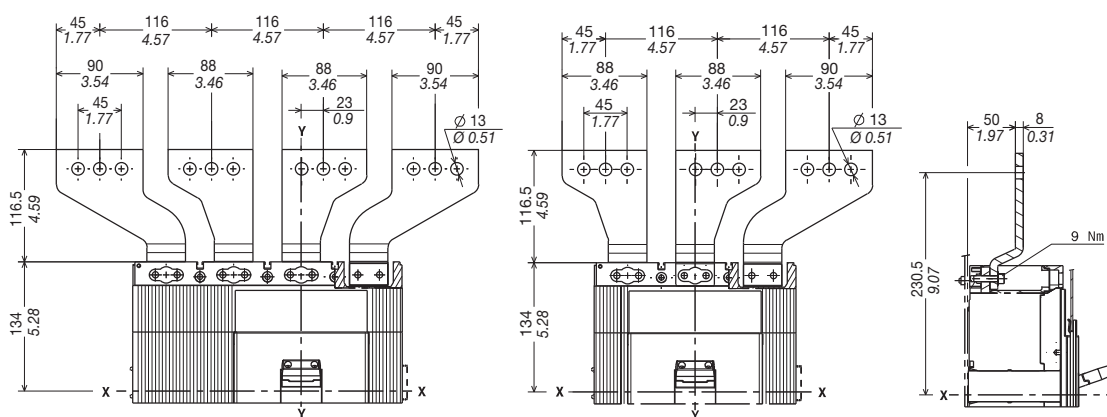
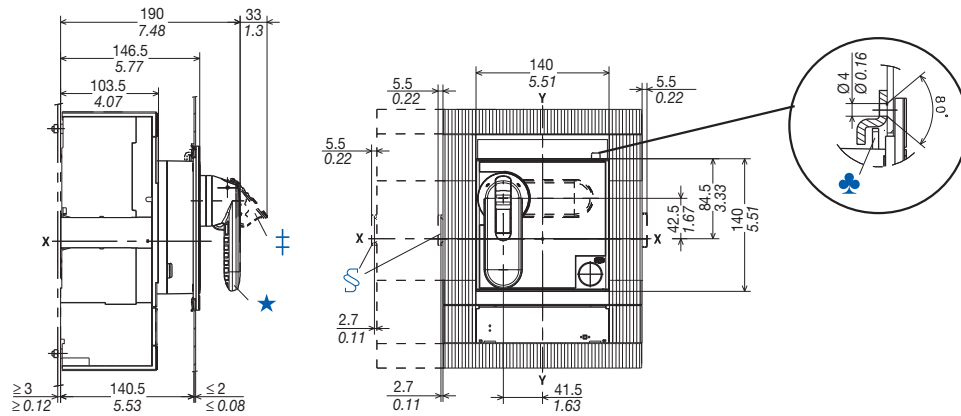


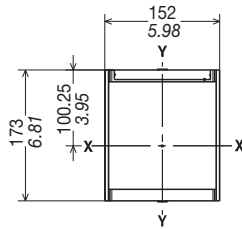
Figure 168 - Cat. No. 140G-M-RMB, -RMY Rotary Handle Operating Mechanism — Door Mounted



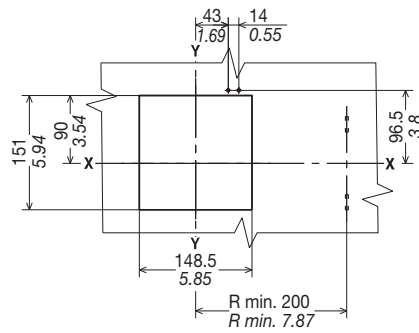
- ★ Rotary handle operating mechanism on molded case circuit breaker
- ‡ Padlock device for open position (max. 3 padlocks; user provided)
- § Dimension with cabled early make contact
- ♣ Compartment door lock

Figure 169 - Drilling Templates for Molded Case Circuit Breaker Mounting

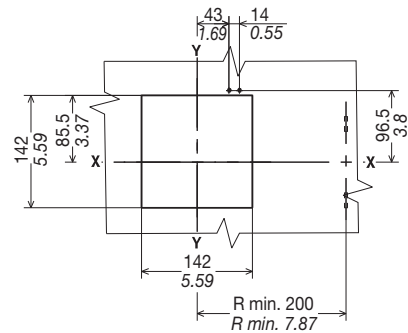
Escutcheon for compartment door



Drilling template for compartment door

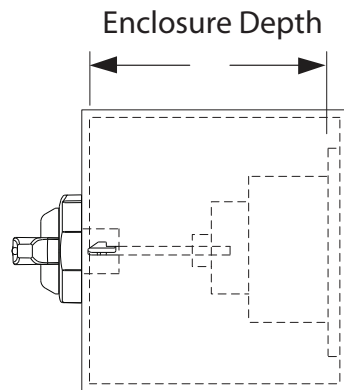


with escutcheon



without escutcheon

Figure 170 - 140G-K-RVM... Minimum/Maximum Enclosure Depth (for M-Frame Molded Case Circuit Breakers)



	Minimum	Maximum
12 in. Shaft	9 in. (229 mm)	17.75 in. (450 mm)
21 in. Shaft		26.75 in. (679 mm)
12 in. Shaft w/NFPA	11 in. (280 mm)	17.75 in. (450 mm)
22 in. Shaft w/NFPA		26.75 in. (679 mm)

Note: this figure depicts the minimum and maximum enclosure sizes that will accommodate the MCCB, operator, and handle. See [Figure 158](#) for overall dimensions and handle cutout.

Figure 171 - Cat. No. 140G-M-RVM... Variable Depth Rotary Handle Operating Mechanism

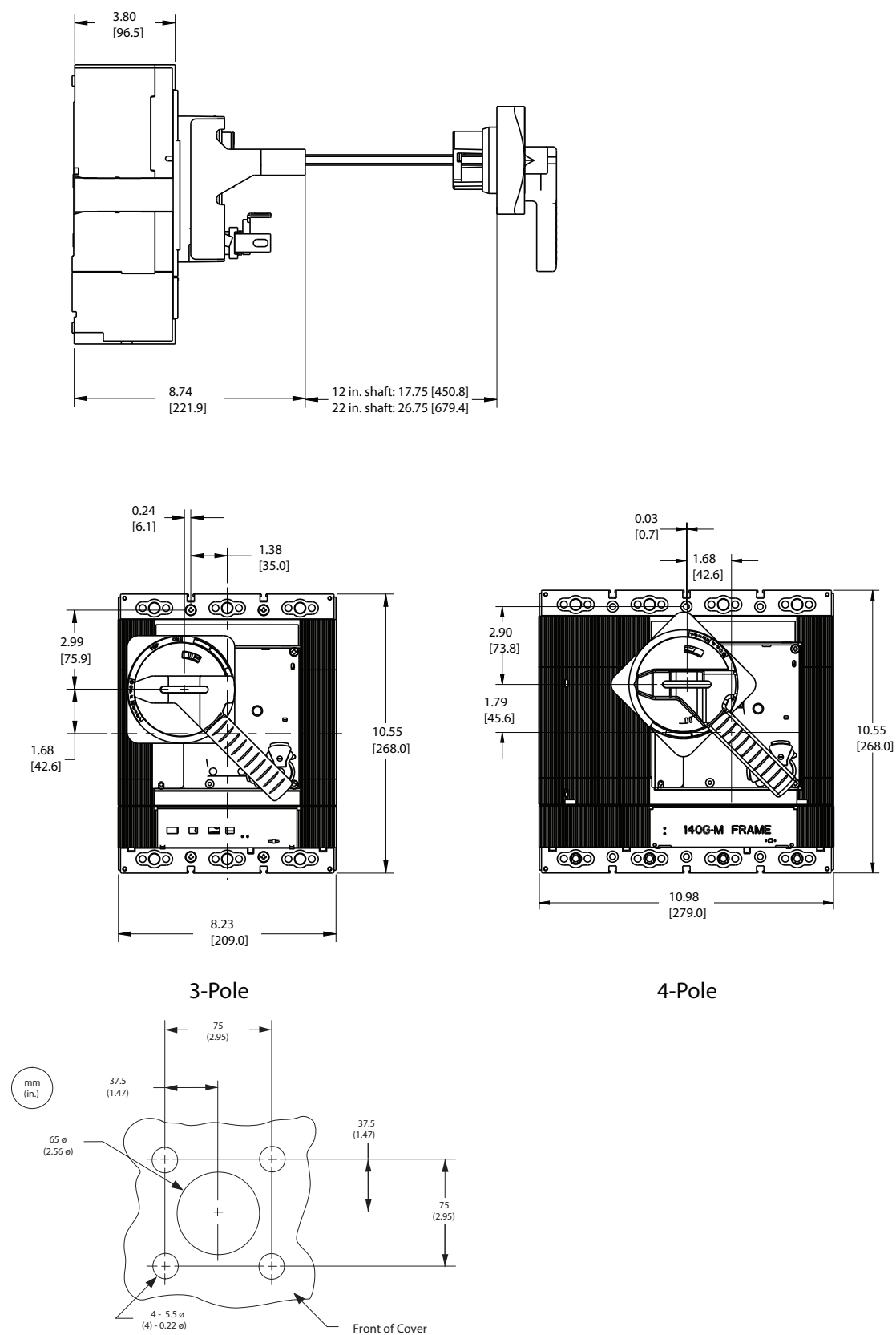
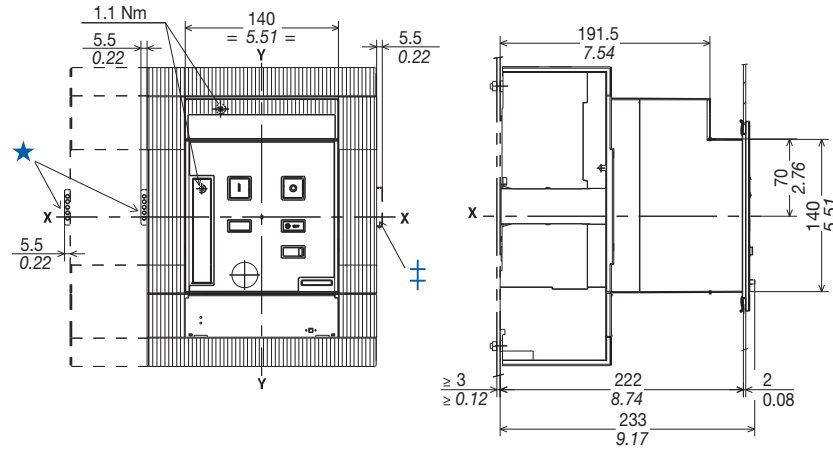


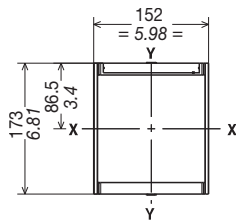
Figure 172 - Cat. No. 140G-M-EOP, -ECOP Motor Operator



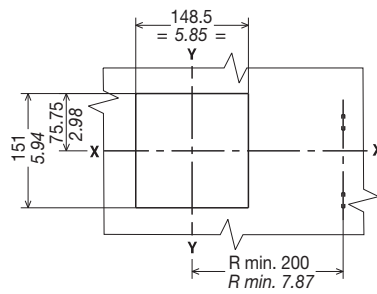
★ Overall dimension with optional shunt trip or undervoltage relay installed.
 ‡ Overall dimension with optional auxiliary contacts installed.

Figure 173 - Drilling Templates for Molded Case Circuit Breaker Mounting

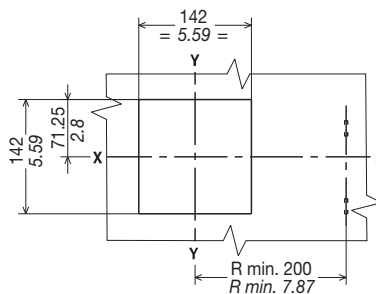
Escutcheon for compartment door



Drilling template for compartment door



with escutcheon



without escutcheon

Figure 174 - M-Frame Flex Cable Operator and Actuator, Right Hand

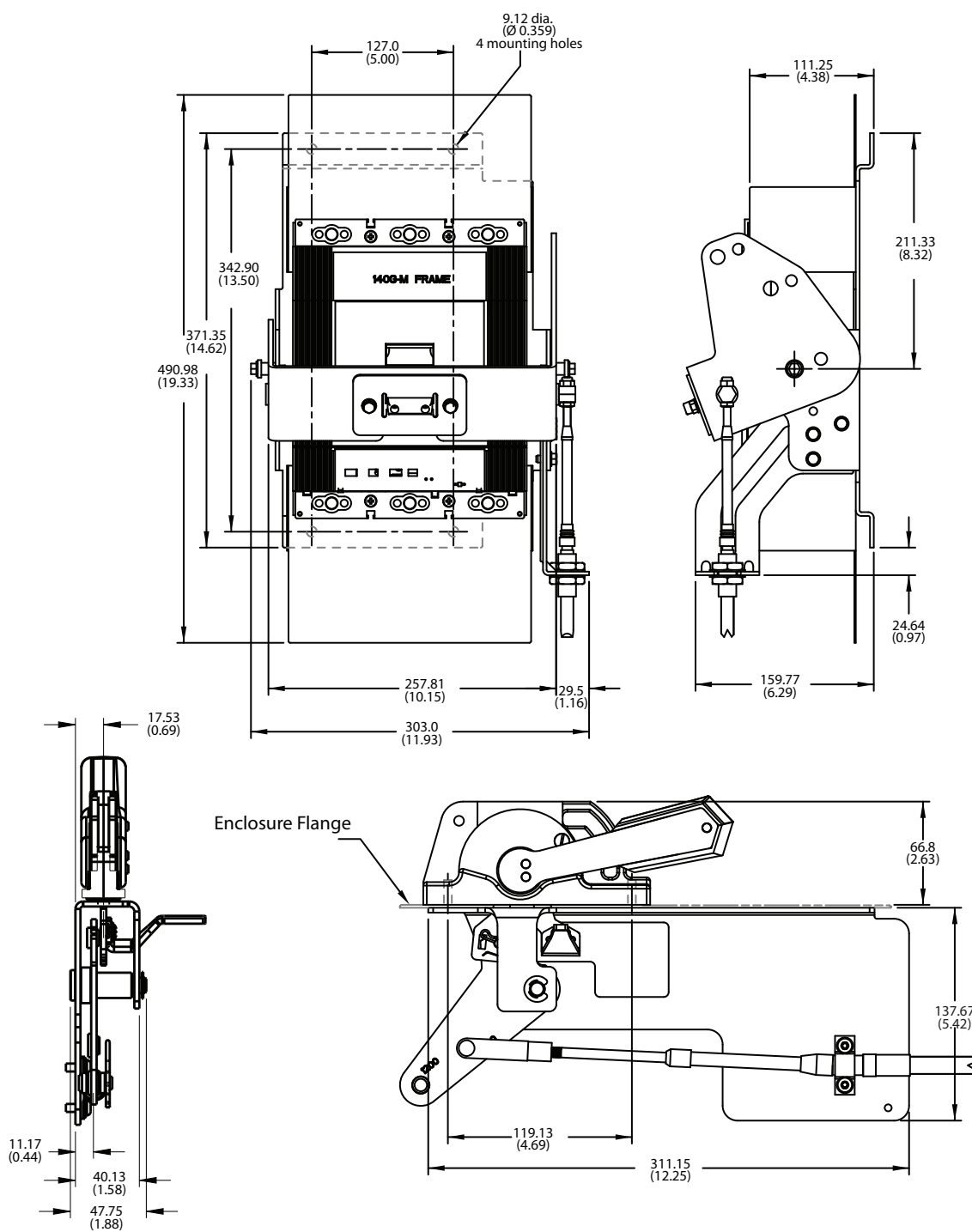
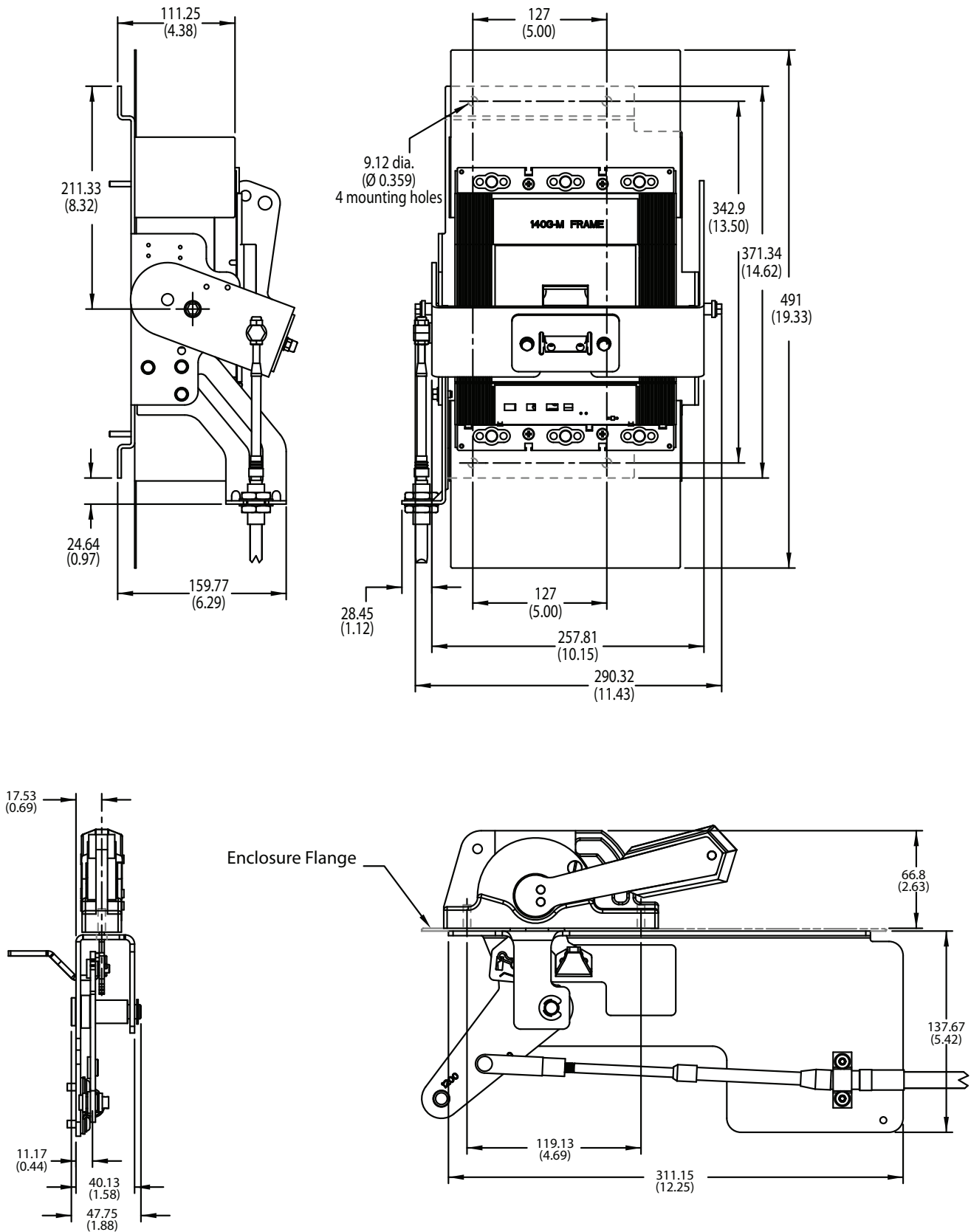
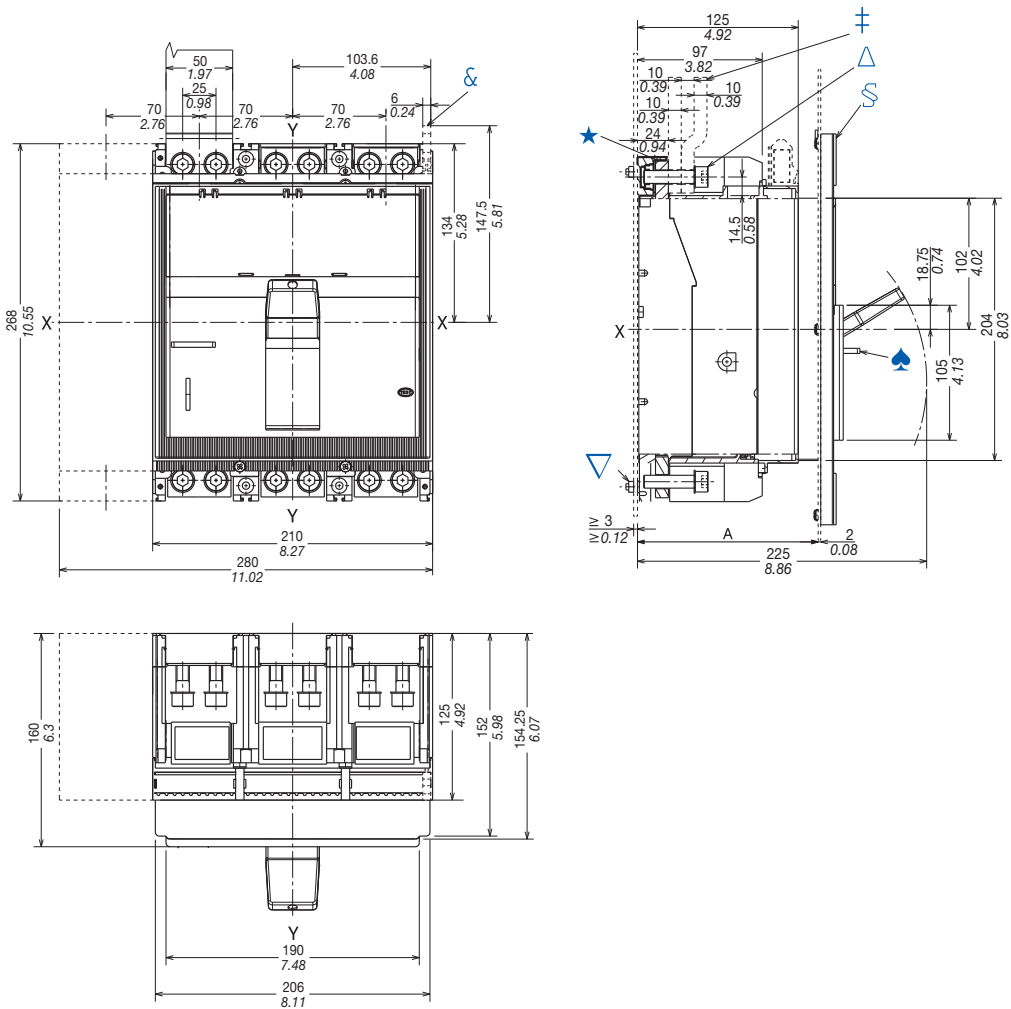


Figure 175 - M-Frame Flex Cable Operator and Actuator, Left Hand (requires 140G-BML, sold separately)



Bulletin 140G/MG N-Frame

Figure 176 - Panel Mounted Molded Case Circuit Breaker

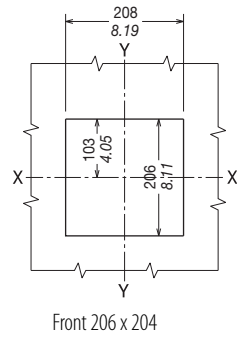
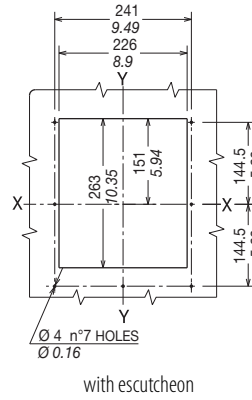
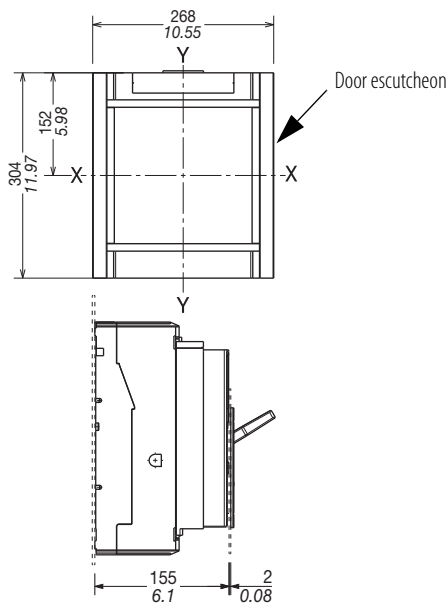


- ★ End cap terminals for ring or busbar connection.
- # Busbars.
- \$ Door escutcheon.
- Δ Tightening torque: 18 N•m.
- ♠ Padlock (optional).
- ▽ Tightening torque: 2.5 N•m.
- & Terminal for customer wiring connection.

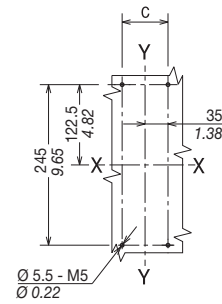
Description	A
With escutcheon	125...141
Without escutcheon	147

Figure 177 - Drilling Templates for Molded Case Circuit Breaker Mounting

Escutcheon for compartment door

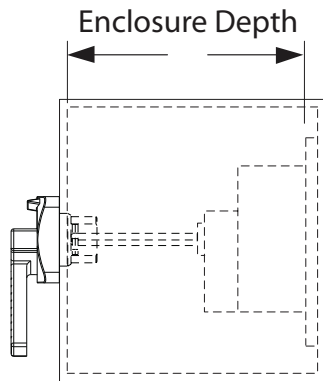


Drilling template for mounting plate



No. of Poles	C
3	70
4	140

Figure 178 - 140G-N-RVM... Minimum/Maximum Enclosure Depth



	Minimum	Maximum
12 in. Shaft	7.75 in. (196 mm)	17.75 in. (450 mm)
21 in. Shaft		26.75 in. (679 mm)

Note: this figure depicts the minimum and maximum enclosure sizes that will accommodate the MCCB, operator, and handle. See [Figure 179](#) for operator dimensions.

Figure 179 - Cat. No. 140G-N-RVM... Variable Depth Rotary Handle Operating Mechanism

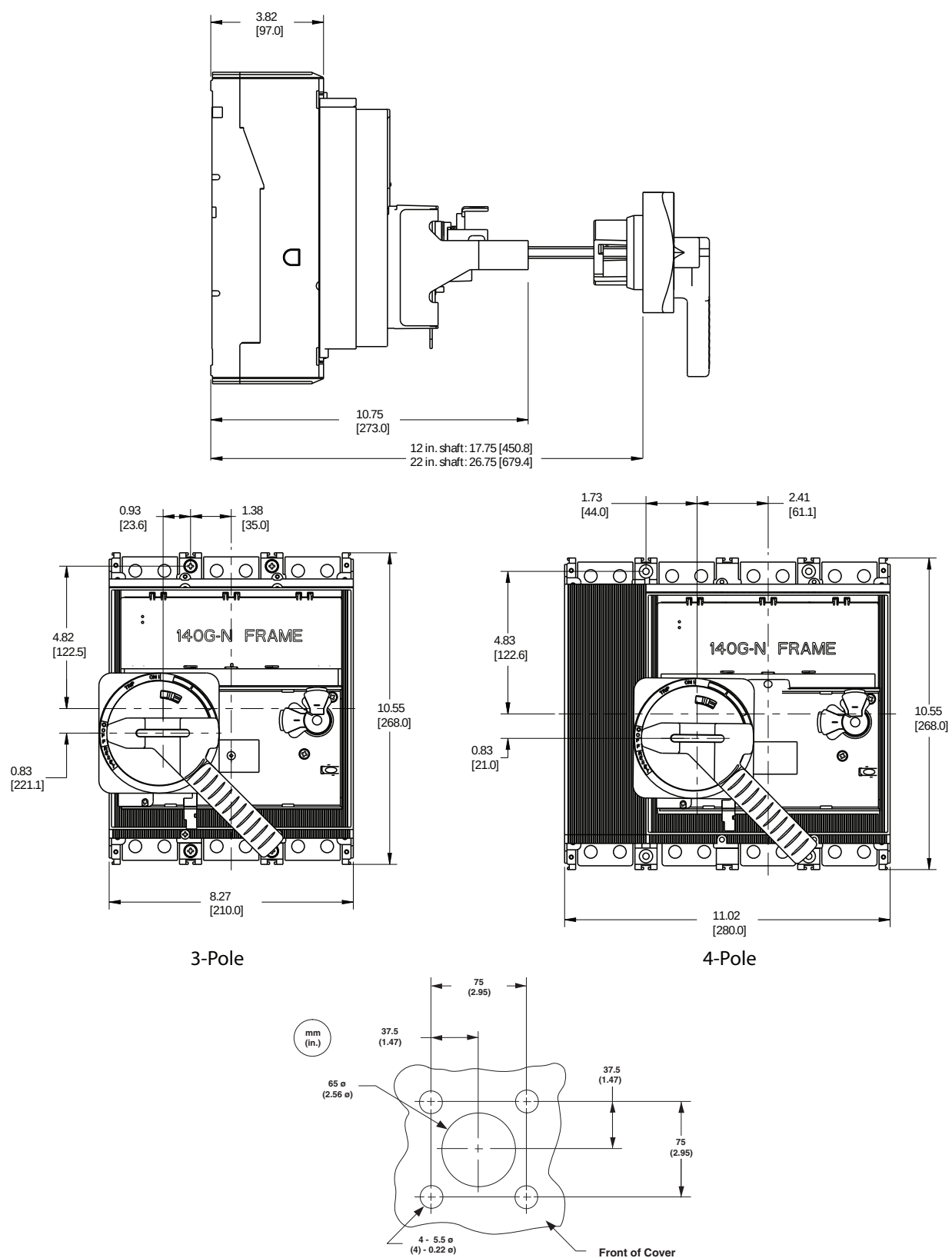
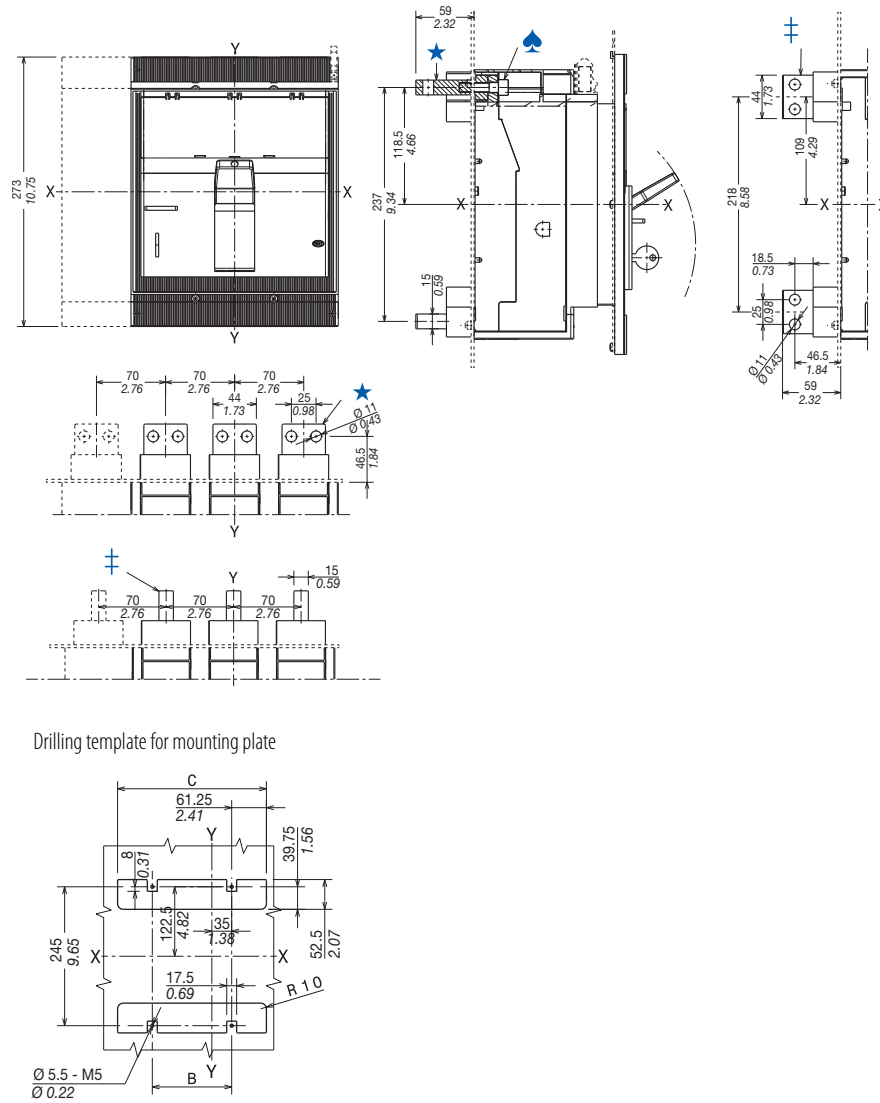


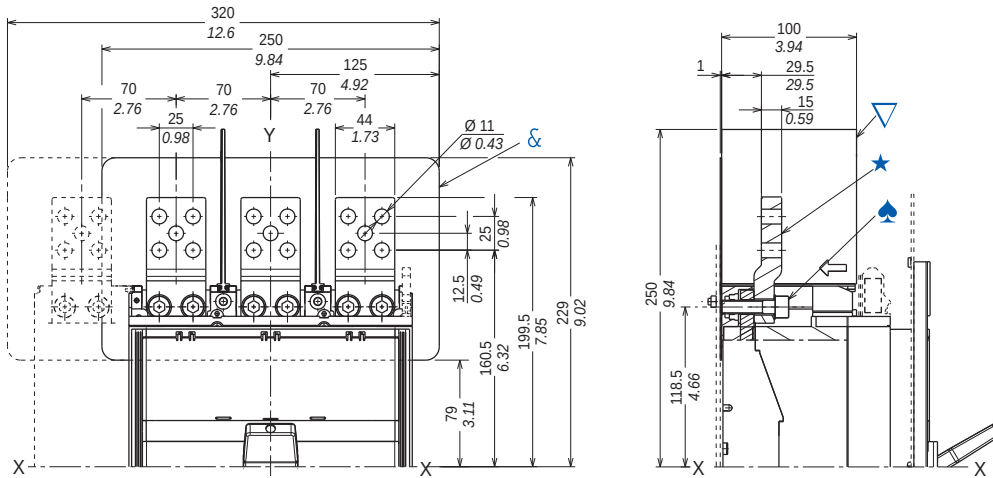
Figure 180 - Cat. Nos. 140G-N-TLH3, -TLV3, TLH4, TLV4 Terminals



- ★ Rear horizontal terminals
- ‡ Rear vertical terminals
- ♣ Tightening torque: 20 N·m

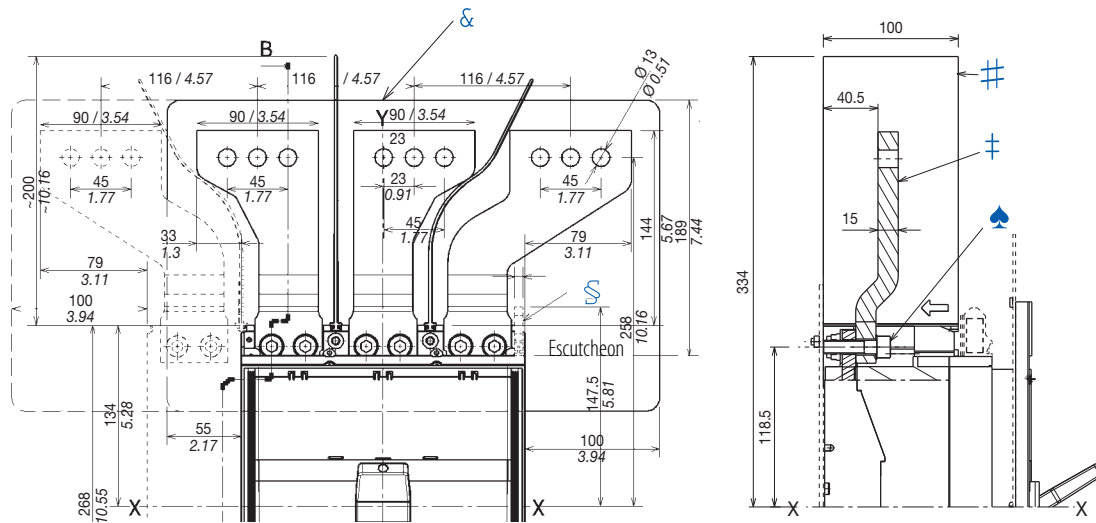
No. of Poles	B	C
3	70	192.5
4	140	262.5

Figure 181 - Cat. No. 140G-N-EXT3, -EXT4 Extended Front Terminals



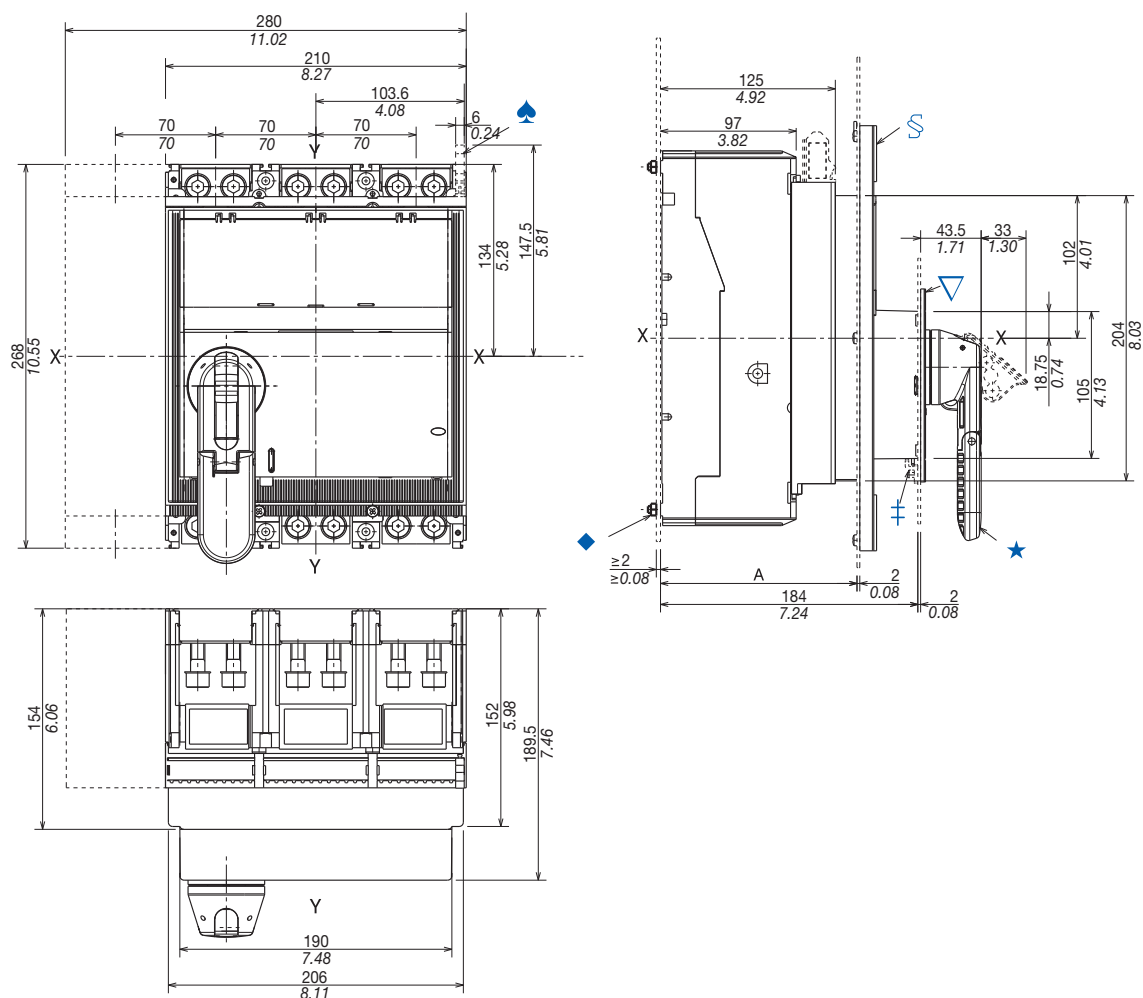
- ★ Extended terminals.
- ▽ Required 100 mm insulating phase barriers provided.
- ♣ Tightening torque: 18 N·m.
- & Required insulator panel, supplied with extenders.

Figure 182 - Cat. Nos. 140G-N-EXSL13 Top (3-Pole), 140G-N-EXS4 (4-Pole) Rear Spread Terminals (IEC only)



- ‡ Extended spread terminals.
- # Required 200 mm insulating phase barriers provided.
- ♣ Tightening torque: 18 N·m.
- § Terminal for auxiliary contacts.
- & Required insulator panel, supplied with extenders.

Figure 183 - Cat. No. 140G-N-RMB, -RMY Rotary Handle Operating Mechanism



★ Rotary handle operating mechanism on molded case circuit breaker.

‡ Compartment door interlock.

§ Door escutcheon.

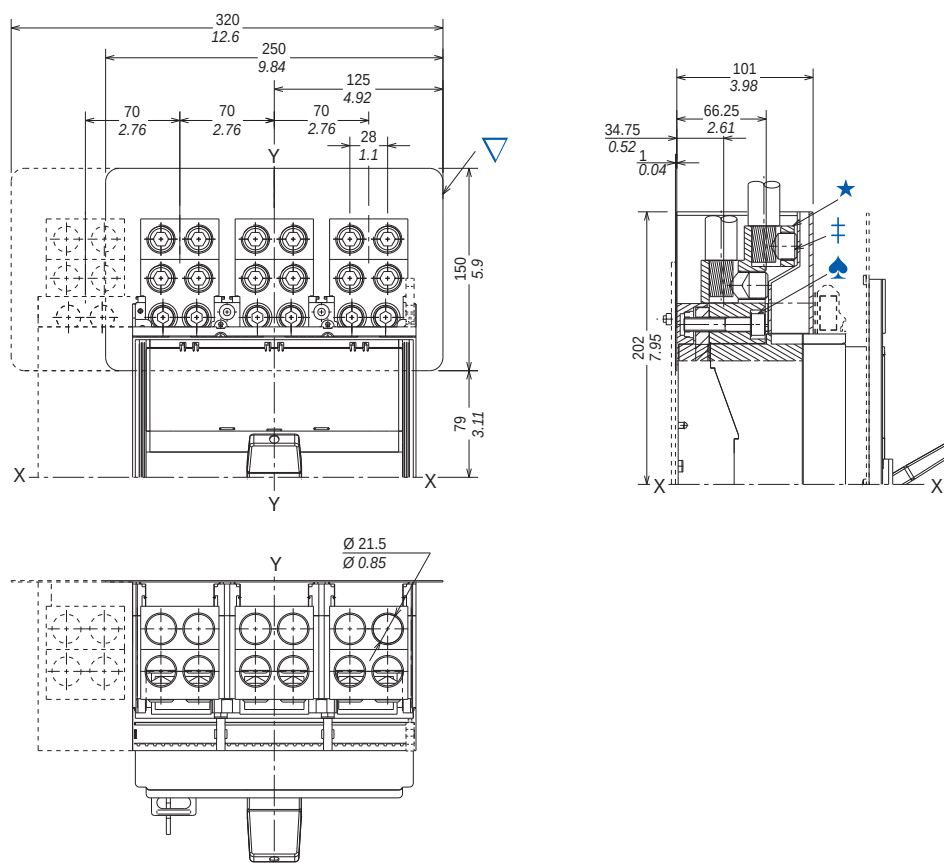
◆ Tightening torque: 2.5 N·m.

♣ Terminal for customer wiring connection.

▽ Reduced flange of rotary handle for door (optional).

Description	A
With escutcheon	125...141
Without escutcheon	147

Figure 184 - Cat. No. 140G-N-TLA43, -TLA44, -TLC43, -TLC44 Terminals



- ★ Terminals for cable connection.
- ‡ Tightening torque: 43 N·m.
- ♣ Tightening torque: 18 N·m.
- ▽ Required insulator panel, supplied with extenders.

Figure 185 - N-Frame Flex Cable Operator and Actuator, Right Hand

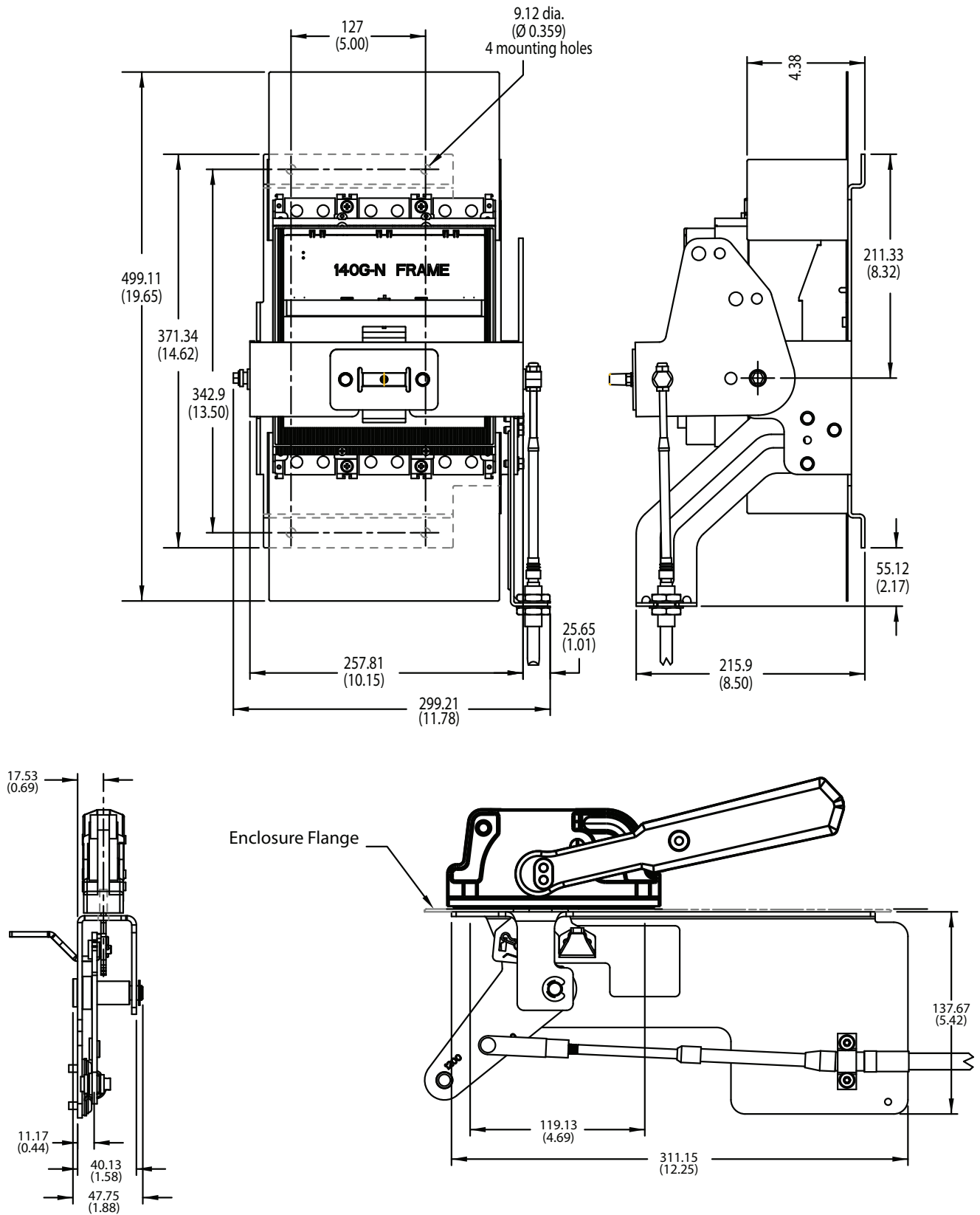
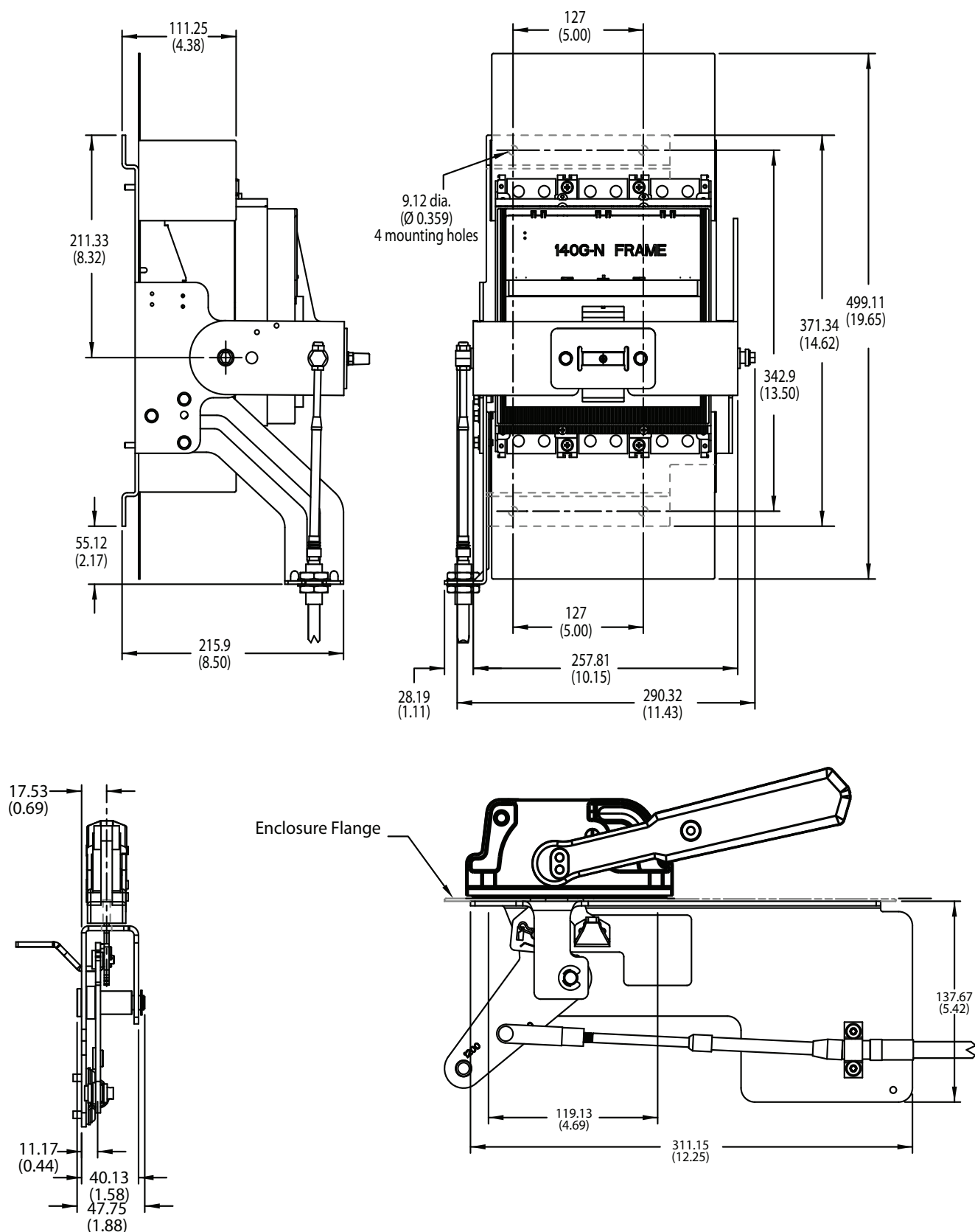
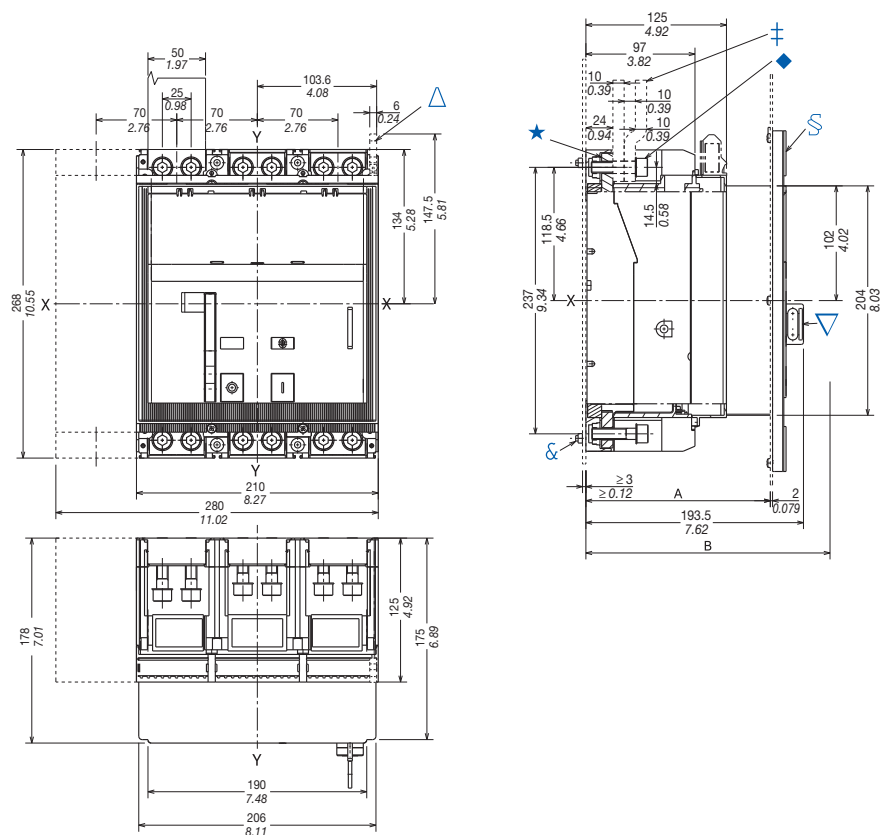


Figure 186 - N-Frame Flex Cable Operator and Actuator, Left Hand (requires 140G-BML, sold separately)



Bulletin 140G NS-Frame

Figure 187 - Panel Mounted Molded Case Circuit Breaker



★ End Cap terminals for ring or busbar connection.

‡ Busbars.

§ Door escutcheon.

◆ Tightening torque: 18 N•m.

▽ Padlock (optional).

& Tightening torque: 2.5 N•m.

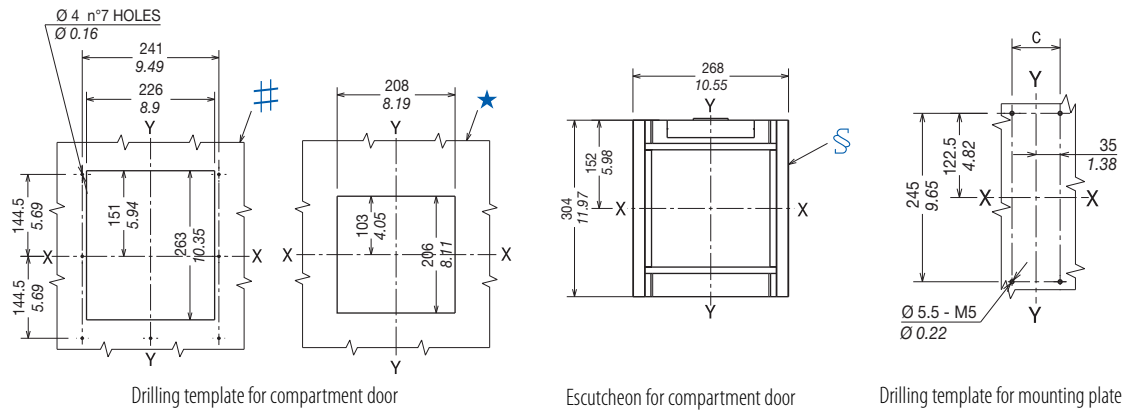
△ Terminals for cable connection.

Description	A
With escutcheon	125 ... 184 (4.92 ... 7.24)
Without escutcheon	170 (6.7)

Description	B
Standard	208 (8.19)

No. of Poles	C
3	70 (2.76)
4	140 (5.51)

Figure 188 - Drilling Templates for Molded Case Circuit Breaker Mounting



S Door escutcheon

Compartment door with escutcheon

★ Compartment door without escutcheon

Figure 189 - Cat. Nos. 140G-N-TLA63, -TLA64, -TLC63, -TLC64 Terminals

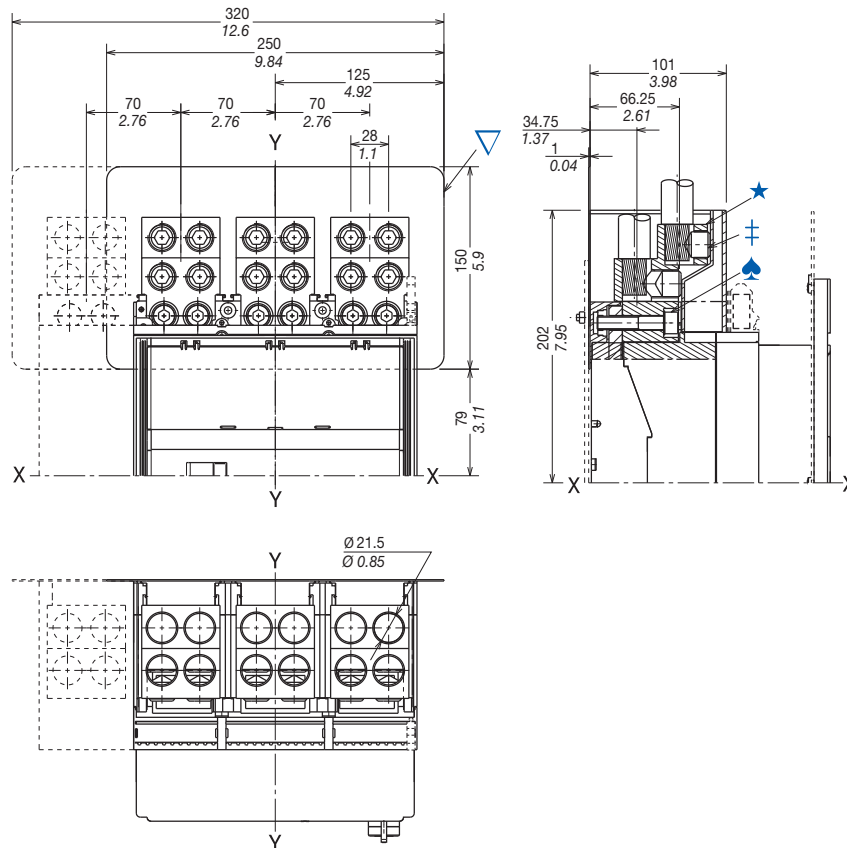


Figure 190 - Cat. Nos. 140G-N-TLV3, -TLV4, -TLH3, -TLH4 Rear Terminals

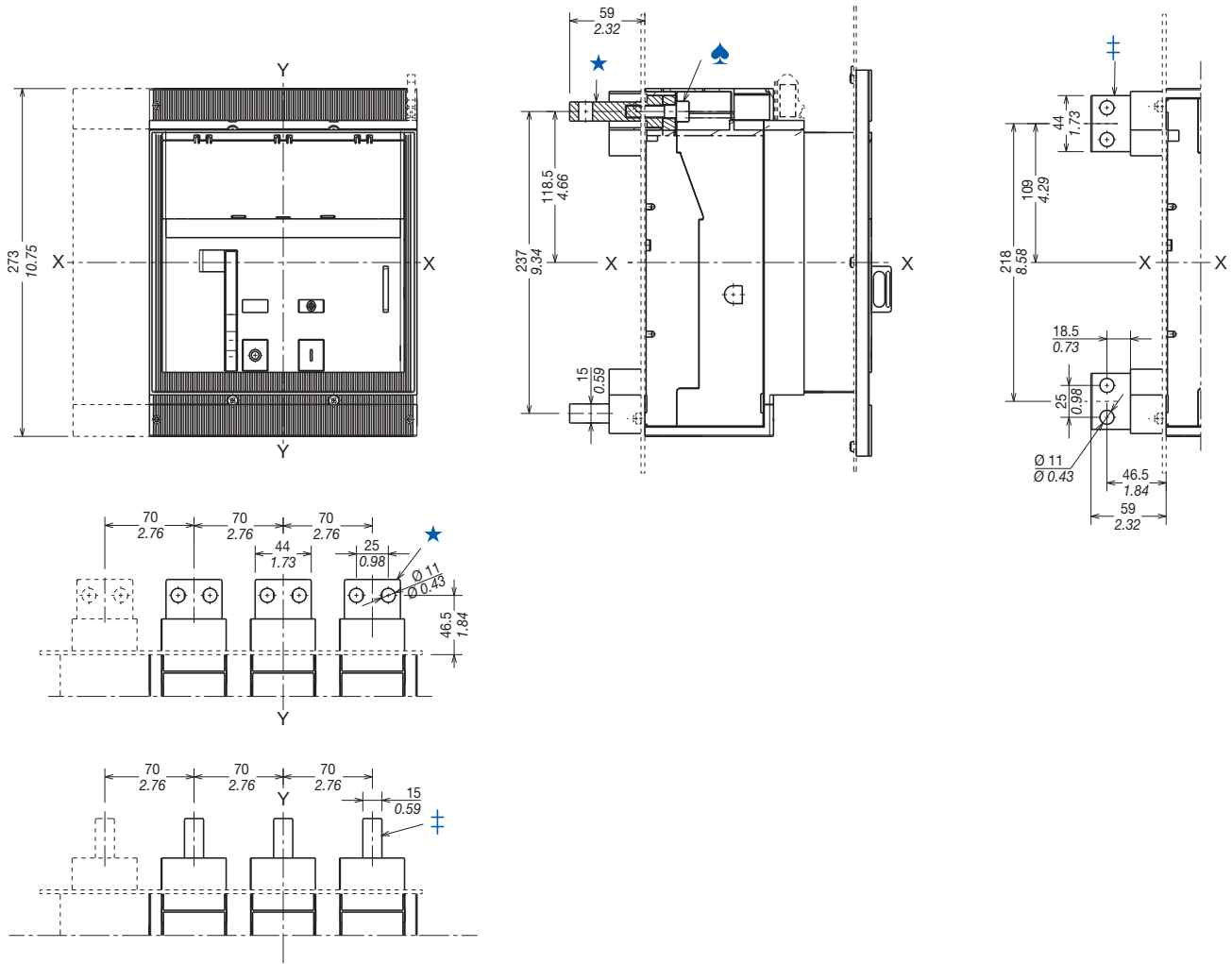
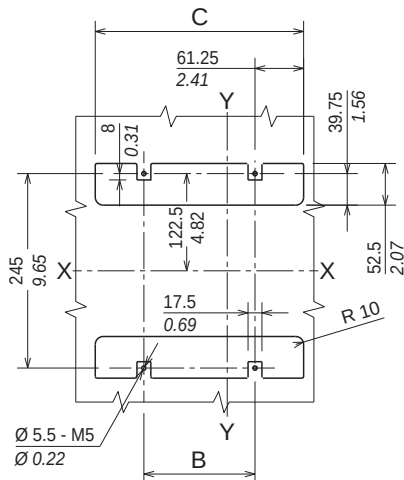
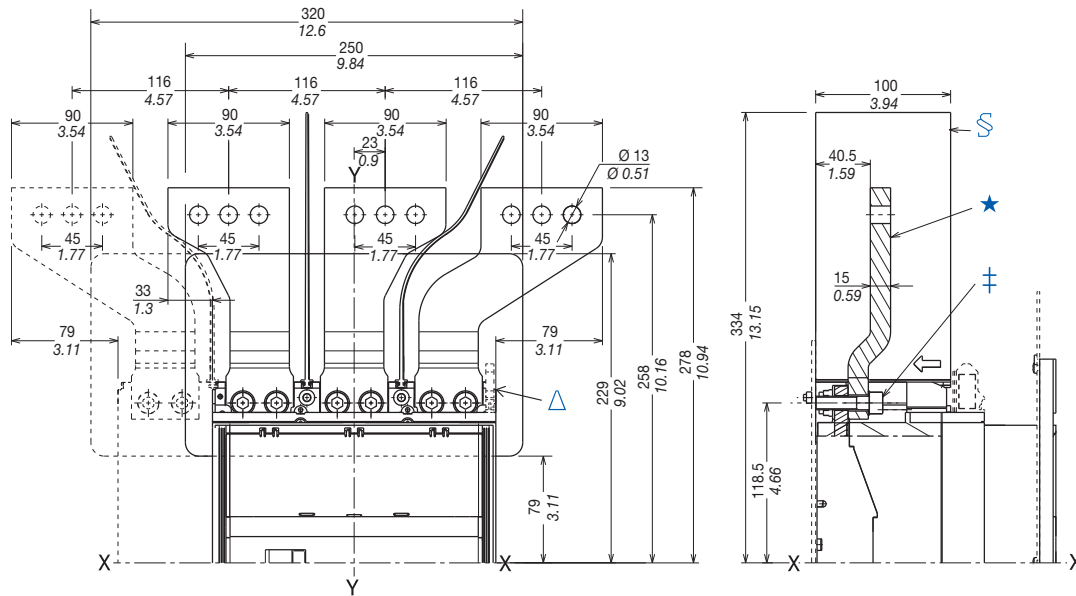


Figure 191 - Drilling template for mounting plate



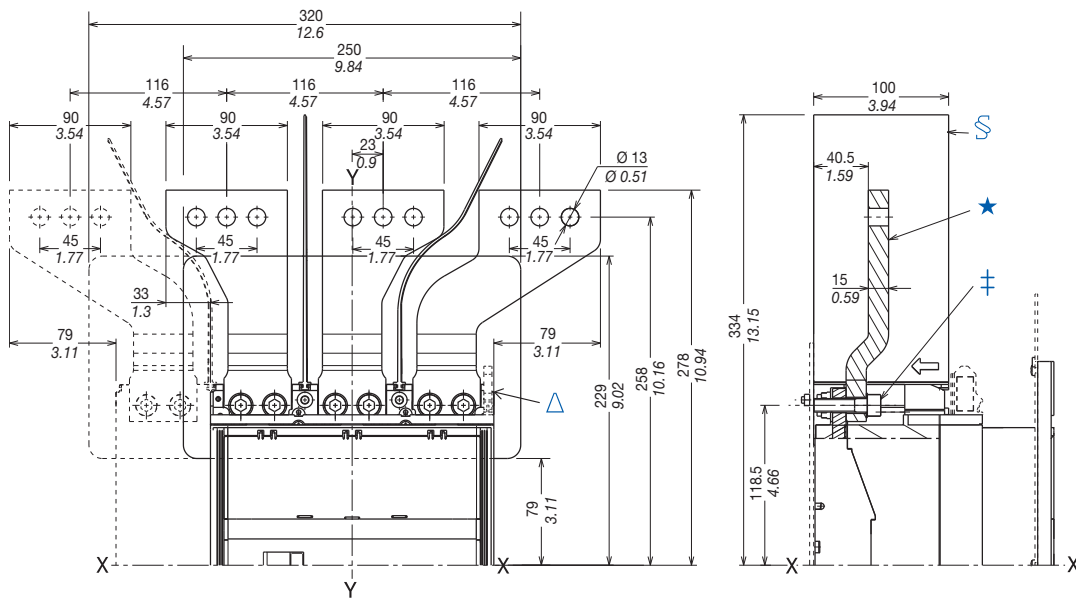
No. of Poles	B	C
3	70 (2.76)	192.5 (7.58)
4	140 (5.51)	262.5 (10.33)

Figure 192 - Cat. No. 140G-N-EXSLI3, -EXSL03, -EXS4 Extended Front Spreader Terminals (IEC only)



- ★ Extended spread terminals.
- ‡ Tightening torque: 18 N·m.
- § Required 200 mm insulating phase barriers provided.
- △ Required insulator panel, supplied with spreaders.

Figure 193 - Cat. Nos. 140G-N-EXT3, -EXT4 Extended Front Terminals (IEC only)



- ‡ Tightening torque: 18 N·m.
- ♣ Required insulator panel, supplied with extended Terminals.
- △ Extended terminals.
- ◆ Required 100 mm insulating phase barriers provided.
- ♠ Terminal for customer wiring connection.

Bulletin 140G R-Frame

Panel Mounted Breakers

Figure 194 - 2000 A (80/100%)...2500 A (80%) Breakers

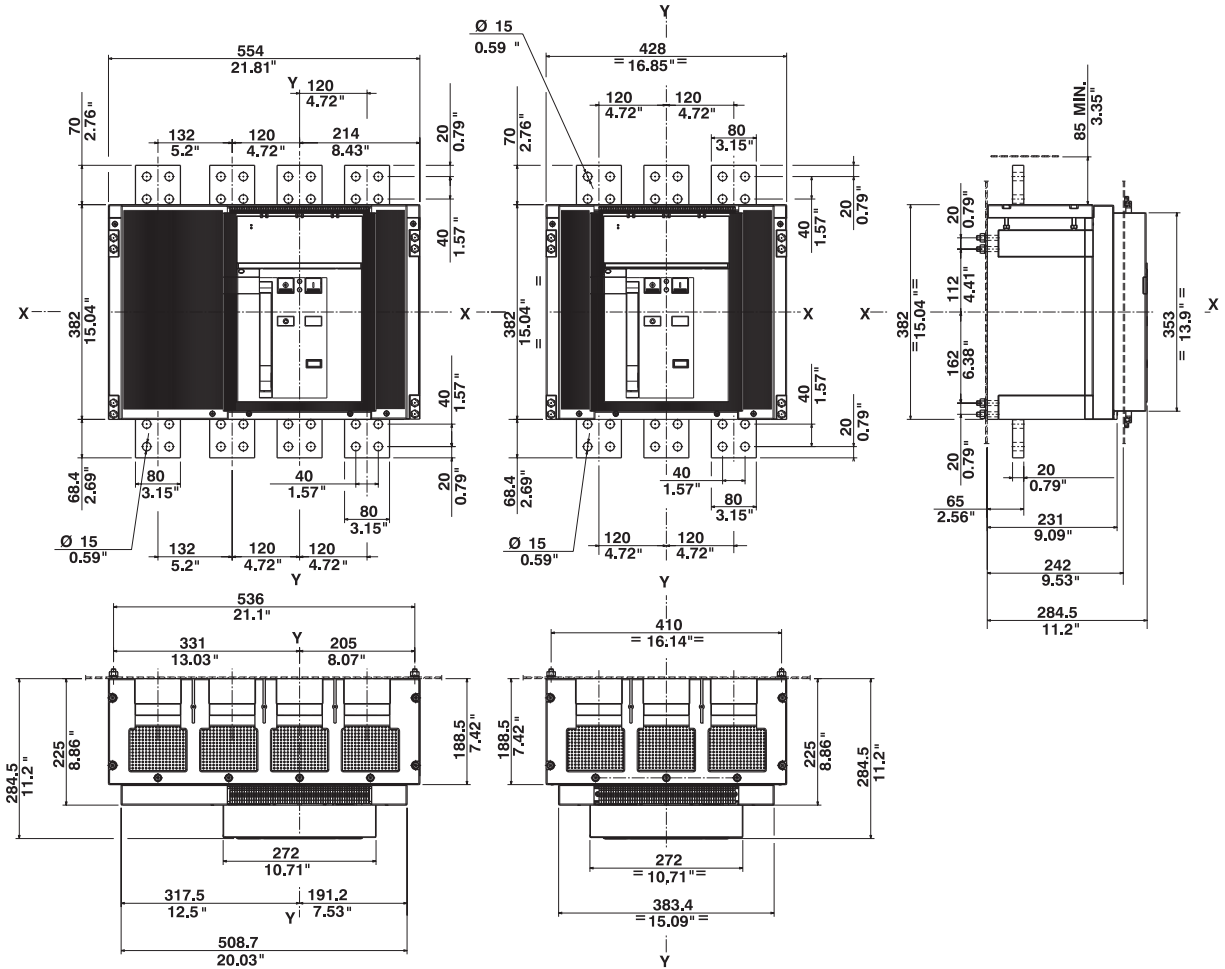


Figure 195 - Drilling Templates

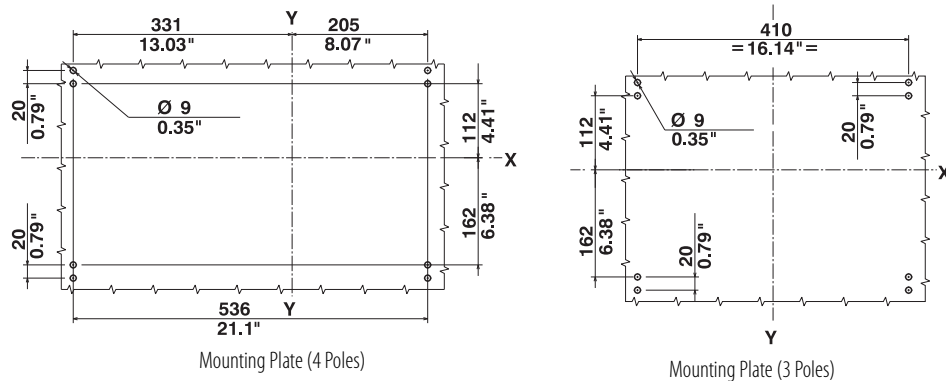


Figure 196 - Version with Vertical Rear Terminals, 2500 A (100% rated)/3000 A (80% rated)

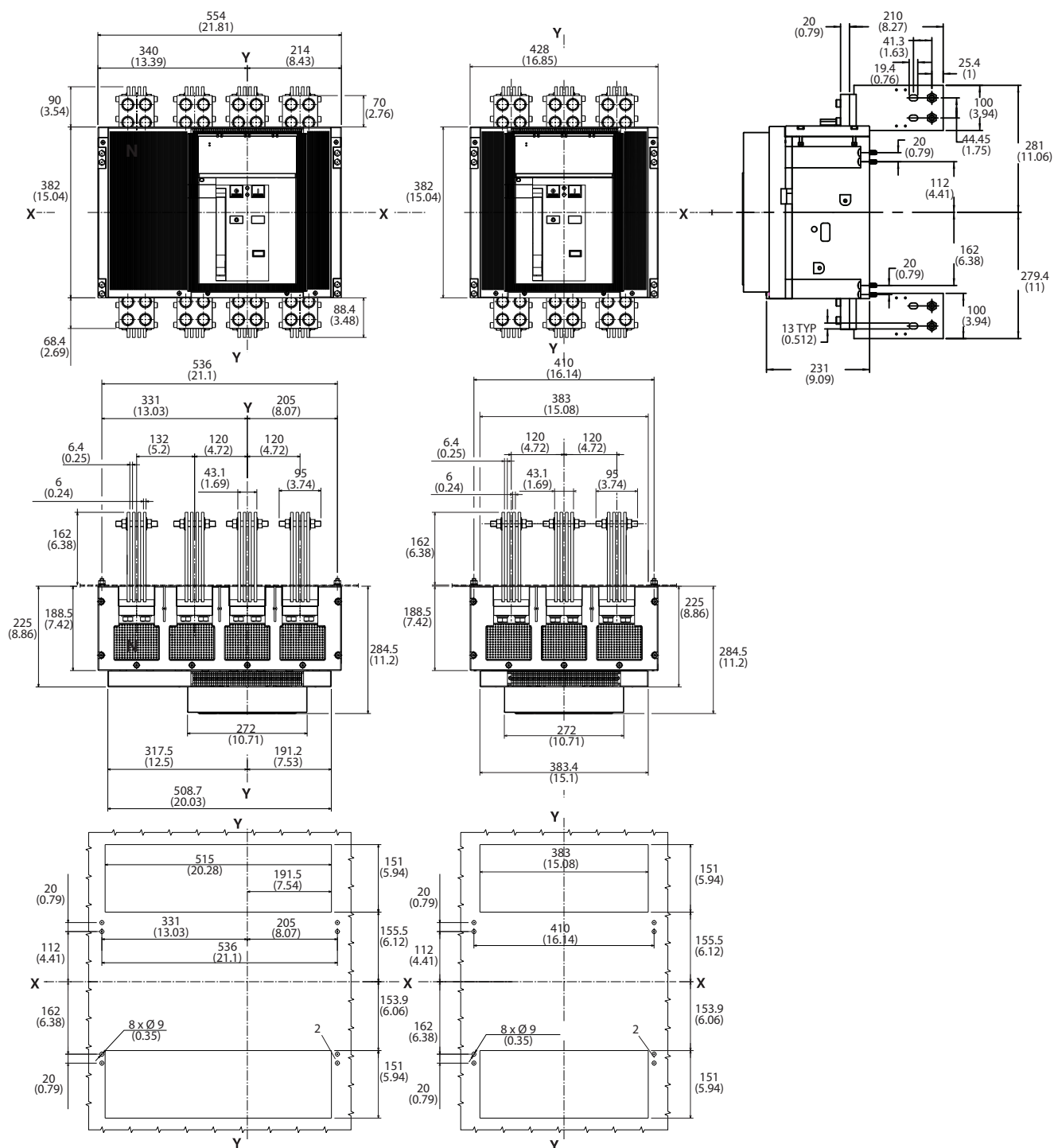


Figure 197 - 3000 A Breakers (100% rated)

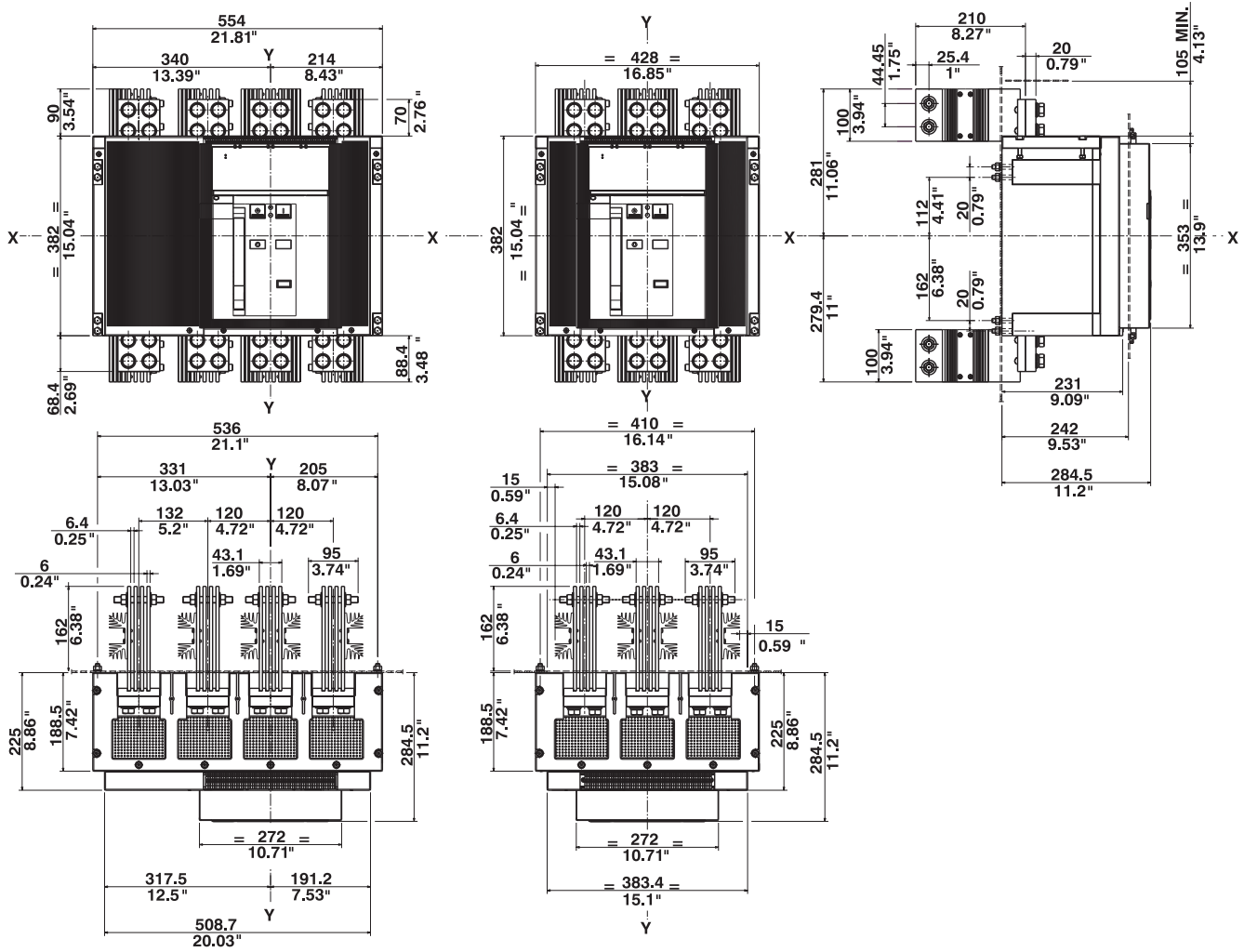
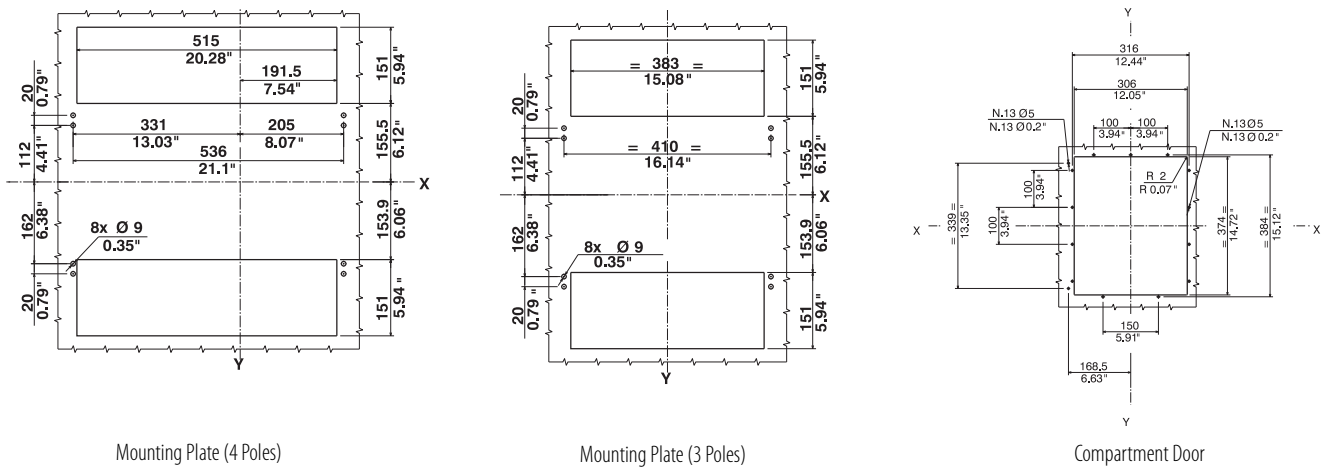


Figure 198 - Drilling Templates



Mounting Plate (4 Poles)

Mounting Plate (3 Poles)

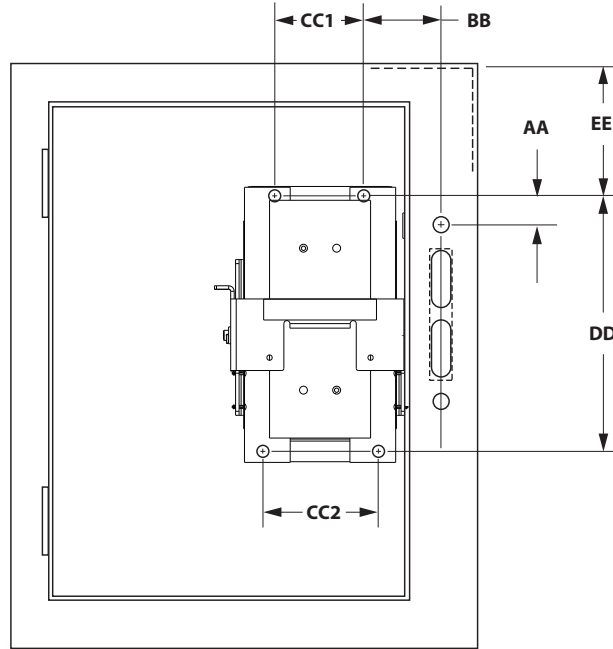
Compartment Door



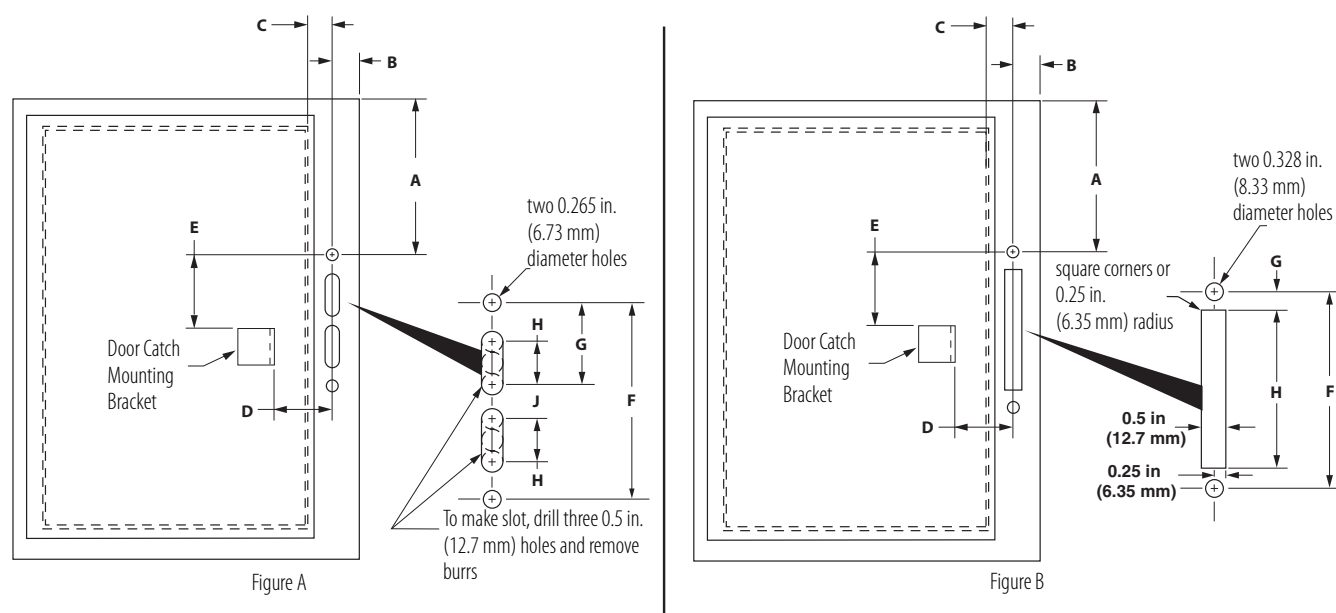
Bulletin 1494V Variable Depth, Flange-Operated Circuit Breaker Operating Mechanisms

Dimensions are in inches (mm). Dimensions are not to be used for manufacturing purposes.

Figure 200 - Enclosure with Handle Cutout



140G/MG Frame Size	AA	BB	CC1	CC2	DD	EE Wire Bending Space
G, H, I, J	5/16 (7.94)	1-41/64 (41.67)	3 (76.2)	3-1/2 (88.9)	7-1/2 (190.5)	6 (152.4)
K	29/64 (11.51)	1-47/64 (44.05)	4 (101.6)	4-1/2 (114.3)	9-5/16 (236.54)	12 (304.8)
M, N	4-1/2 (114.3)	4-1/32 (102.4)	5 (127)	5 (127)	13-1/2 (342.9)	12 (304.8)

Figure 201 - Enclosure without Handle Cutout

140G/MG Frame Size	Handle Cat. No.	A (min)	B (Min)	C (Max)	D	E	F	G	H	J
H	1494F-M1 (Figure A)	3-1/2 (88.9)	29/32 (23.01)	1-3/32 (27.8)	1-5/8 (41.3)	2-11/32 (59.5)	4-11/16 (119.1)	1-9/16 (39.7)	1 (25.4)	7/8 (22.23)
J		10-29/32 (277)	29/32 (23.01)	1-3/32 (27.8)	1-5/8 (41.3)	2-11/32 (59.5)	4-11/16 (119.1)	1-9/16 (39.7)	1 (25.4)	7/8 (22.23)
K		13-3/32 (332.6)	29/32 (23.01)	1-3/32 (27.8)	1-5/8 (41.3)	2-11/32 (59.5)	4-11/16 (119.1)	1-9/16 (39.7)	1 (25.4)	7/8 (22.23)
M	1494F-M2 (Figure B)	17-5/16 (439.74)	1-3/8 (34.9)	1-3/32 (27.8)	2 (50.8)	3-23/32 (94.5)	6-1/2 (165.1)	5/16 (7.94)	5-1/2 (139.7)	—
N		21-7/8 (555.63)	1-3/8 (34.9)	1-3/32 (27.8)	2 (50.8)	3-23/32 (94.5)	6-1/2 (165.1)	5/16 (7.94)	5-1/2 (139.7)	—

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