

MKB Miniature Circuit Breakers

MKB miniature circuit breaker, rated voltage AC120/240 V, a selection of currents between 10A and 60A, short circuit breaking current 10kA, providing 1P/2P/3P circuit breakers suitable for 50/60Hz. MKB miniature circuit breakers can be used for surface, flush or DIN-rail mounted.

According to the usage preferences of the UL market, MKB miniature circuit breakers have been designed with two connection types: standard junction box method and quick plug-in terminal. The circuit breakers and terminals comply with UL 489 certification requirements and have obtained UL and CSA certificates. The product is suitable for normal connection and disconnection in situations such as terminal power distribution and industrial control, as well as providing protection under abnormal conditions such as short circuits and overloads.



Certified



Technical Data

| | |
|--|--|
| Rated current in (A) | 10, 15, 20, 25, 30, 35, 40, 45, 50, 60 |
| Poles | 1P, 2P, 3P |
| Rated voltage AC (V) | 1P: 120/240 2P: 120/240 3P: 240 |
| Rated insulation voltage U_i (V) | 690 |
| Rated impulse withstand voltage U_{imp} (KV) | 4 |
| Interrupting Rating | |
| - 1P/2P, 120/240VAC (kA) | 10 |
| - 3P, 240V AC (kA) | 10 |
| Switching Operations | |
| - Full Load Operations | 10,000 |
| - No Load Operations | 20,000 |
| Reference ambient temperature (F /°C) | 104/40 |
| Protective Class | IP20 |

Features

- Automatically open a circuit under overload or short circuit conditions.
- Can be surface, flush or DIN-rail mounted.
- Are fully tested, UL listed, and CSA certified, for reverse connection without restrictive line/load markings.
- QC terminal design to provide reliable wire connections.
- When the MKB miniature circuit breaker is tripped, the handle assumes a position between ON (I) and OFF and the red Trip indicator appears in a window in the circuit breaker case. Reset the circuit breaker and Trip indicator by pushing the handle to OFF and then to ON.

Selection Guide

MKB - M 1P 20 GG -XXX

MeK-tronics Circuit breakers
MKB Series

Packaging Style:
-: Bulk packaging
Y: Individual packaging
A through Z: Customer Identification

Type:
M: Miniature Circuit Breaker (MCB)

Typical Circuit Diagram Selection:
1P: 1 Pole, 2P: 2 Poles, 3P: 3 Poles

Current rating Selection:
10A, 15A, 20A, 25A, 30A, 35A, 40A, 45A, 50A, 60A

Termination:
GA: LUGS/QUICK CONNECT
GG: LUGS

XXX:
Blank: Standard parts
XXX: Customer code

Remarks: GG - Std. Lugs on all terminals

GA - Lugs on One Side / QC terminals on Opposite Side



Tripping Mechanisms

A tripping mechanism is an assembly within the circuit breaker molded case that causes the circuit breaker to open automatically under sustained overload or short circuit conditions. The tripping mechanisms in multi-pole circuit breakers operate such that an overcurrent on any pole of the circuit breaker will cause all poles of the circuit breaker to open simultaneously. Thermal and magnetic factory calibration (with current) is performed on each pole of every MKB circuit breaker.

Interrupting Rating

The interrupting rating of a circuit breaker is the highest current at rated voltage that the circuit breaker is intended to interrupt under standard test conditions. Circuit breakers must be chosen with interrupting ratings equal to or greater than the maximum available short-circuit current at the point where the circuit breaker is applied in the system.

UL Listed Interrupting Rating—RMS Sym. Amperes:

- ✓ 10kA, at AC Volts: 120/240V AC. (1P&2P Breaker)
- ✓ 10kA, at AC Volts: 240V AC. (3P Breaker)

Ambient Temperature Rating

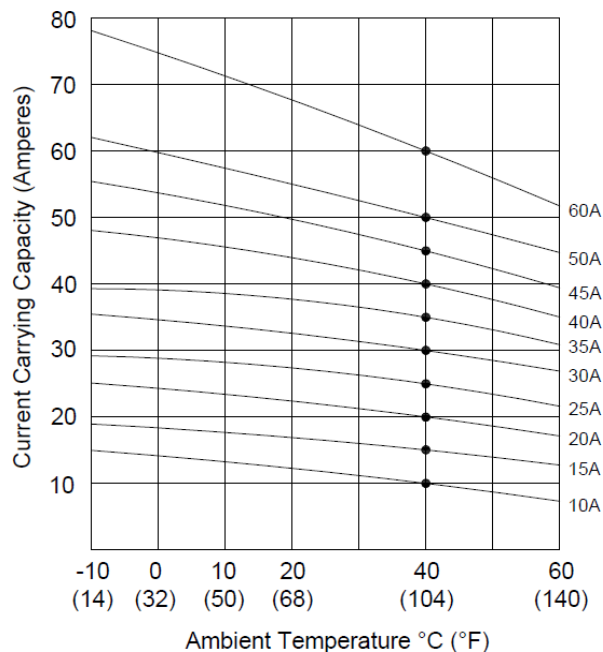
- ✓ Operation temperature: $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$ ($14^{\circ}\text{F} \sim 140^{\circ}\text{F}$)
- ✓ Storage temperature: $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$ ($-40^{\circ}\text{F} \sim 158^{\circ}\text{F}$)
- ✓ Relative Humidity: 90-95%RH (Below $40^{\circ}\text{C}/104^{\circ}\text{F}$)
- ✓ Altitude: $\leq 2000\text{m}$ (6562 feet)

Derating of Thermal-magnetic Circuit Breakers for Ambient Conditions

MKB thermal-magnetic circuit breakers are to be applied in ambient temperatures within the range of 14°F to 140°F (-10°C to 60°C). Use the following derating guidelines:

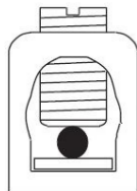
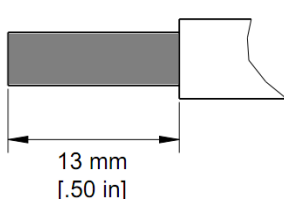
- ✓ **Ambient Temperatures between 77°F and 104°F (25°C and 40°C):**
 - No derating is necessary.
- ✓ **Ambient Temperatures Between 14°F and 75°F (-10°C and 24°C):**
 - Thermal-magnetic circuit breakers operating within this ambient temperature range will carry more than their continuous current rating without tripping. Conductor and equipment damage can result if they are not in the same low ambient environment as the circuit breaker.
 - Nuisance tripping will not be a problem. However, if closer protection of the equipment and conductor is required, the increased current carrying capacity of the circuit breaker at the lower ambient temperature should be taken into consideration.

- ✓ **Ambient Temperatures Between 106° F and 140° F (41° C and 60° C):**
 - Thermal-magnetic circuit breakers operating within this ambient temperature range will carry less than their continuous current rating and must be carefully selected to prevent nuisance tripping.
- ✓ **To determine the continuous current carrying capacity of a thermal-magnetic circuit breaker at an ambient temperature other than 104° F (40° C), perform the following steps:**
 1. Choose the ambient rerating curve for the specific amperage rating of the circuit breaker you wish to apply. Note that the curve crosses the 104° F (40° C) ambient temperature line at the circuit breaker's rated continuous current carrying capacity (Circuit Breaker Handle Rating on the curve).
 2. Follow this curve to the appropriate ambient temperature.
 3. Read the adjusted continuous current carrying capacity at this point (on the left axis).
 4. Add in any other applicable factors, such as continuous loading, per the NEC requirement.



Connecting Wires

See circuit breaker for lug wire range and tightening torque.



Terminal Screw: Torque 45 LB-IN



Wire Gauge, Std. Lugs

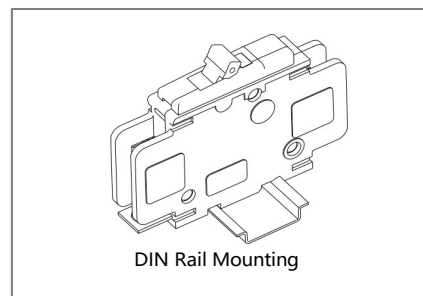
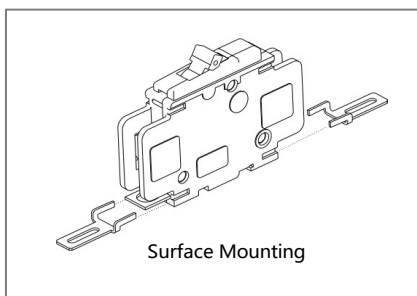
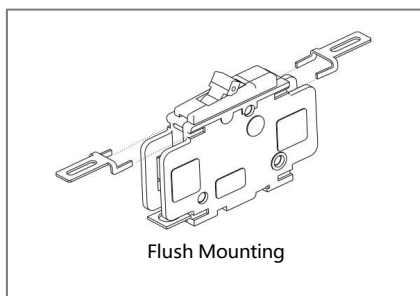
| Type | Ampere | No. of pole | Cu wire | | Al wire | |
|------|--------|-------------|-------------|----------|-------------|----------|
| | | | No. of wire | Size AWG | No. of wire | Size AWG |
| Lugs | 10 | 1/2 | 1 | 14 | 1 | 12 |
| | 15 | 1/2/3 | 1 | 14 | 1 | 12 |
| | 20 | 1/2/3 | 1 | 12 | 1 | 10 |
| | 25 | 1/2/3 | 1 | 10 | 1 | 10 |
| | 30 | 1/2/3 | 1 | 10 | 1 | 8 |
| | 35 | 1/2/3 | 1 | 10 | 1 | 8 |
| | 40 | 1/2/3 | 1 | 8 | 1 | 8 |
| | 45 | 1/2/3 | 1 | 8 | 1 | 8 |
| | 50 | 1/2/3 | 1 | 8 | 1 | 6 |
| | 60 | 1/2/3 | 1 | 6 | 1 | 4 |

Wire Gauge, QC terminals

| Type | Ampere | No. of pole | Cu wire | |
|------|--------|-------------|-------------|----------|
| | | | No. of wire | Size AWG |
| QC | 10 | 1/2 | 1 | 14 |
| | 15 | 1/2/3 | 1 | 14 |
| | 20 | 1/2/3 | 1 | 12 |
| | 25 | 1/2/3 | 1 | 10 |
| | 30 | 1/2/3 | 1 | 10 |
| | 35 | 1/2/3 | 2 | 12 |
| | 40 | 1/2/3 | 2 | 12 |
| | 45 | 1/2/3 | 2 | 10 |
| | 50 | 1/2/3 | 2 | 10 |
| | 60 | 1/2/3 | 2 | 10 |

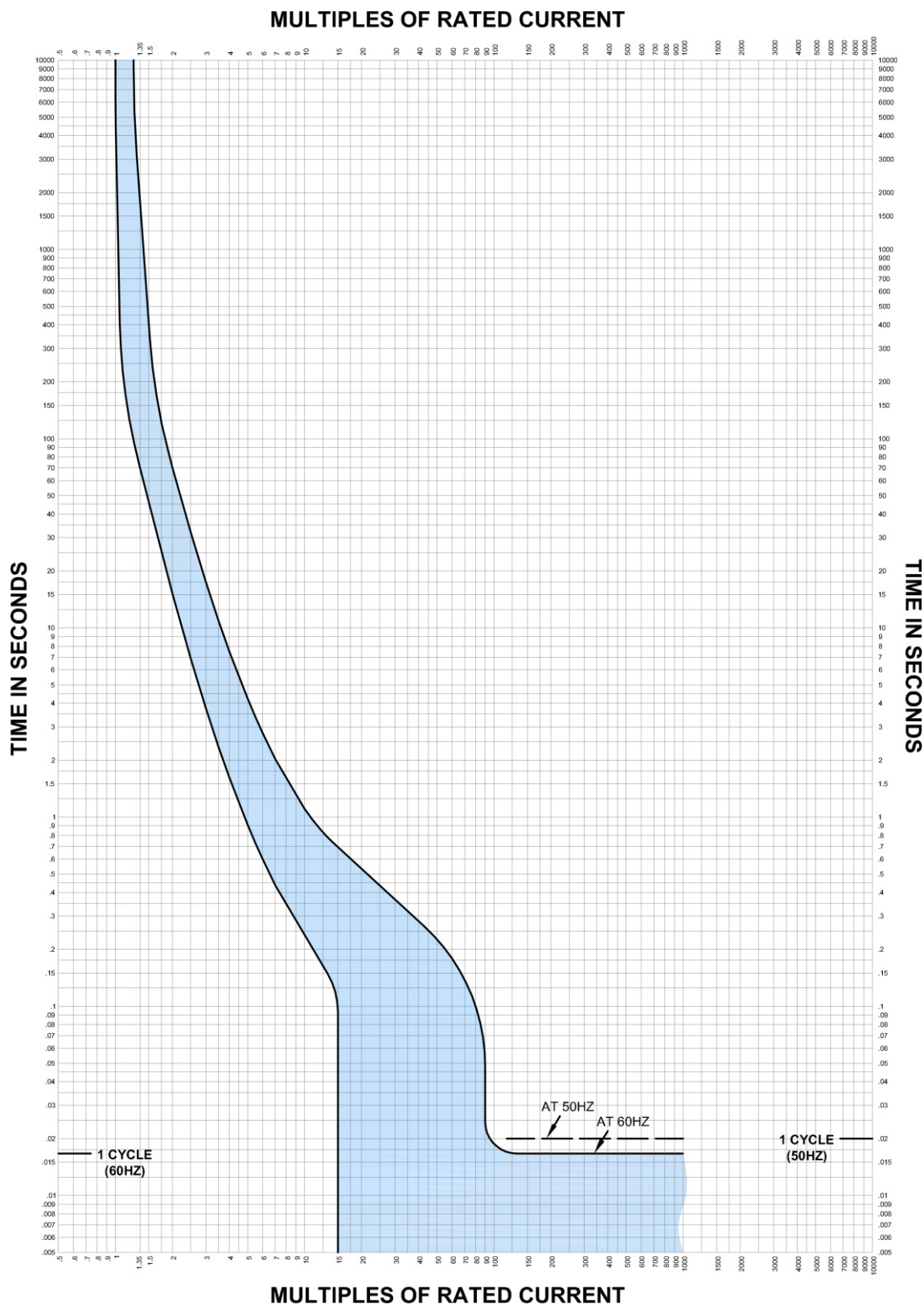
Mounting

MKB circuit breakers offer three different installation methods, each of which fully considers the convenience of on-site use. The standard installation bracket can quickly support Flush Mounting and Surface Mounting methods, while the plastic structure located at the bottom of the circuit breaker can be easily and reliably fixed to the standard DIN rail.



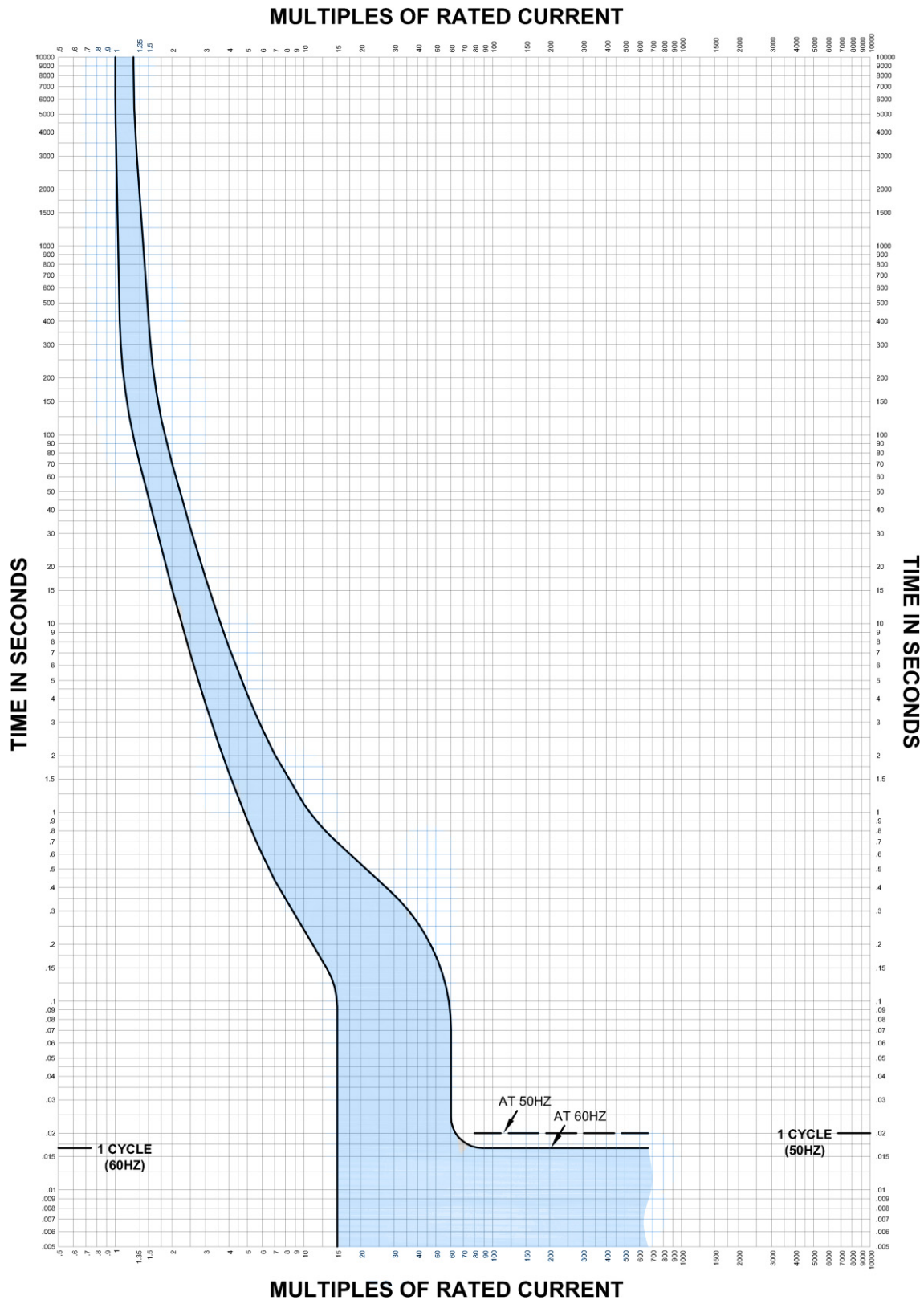


Tripping Curves -10A, 1P/2P



This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.

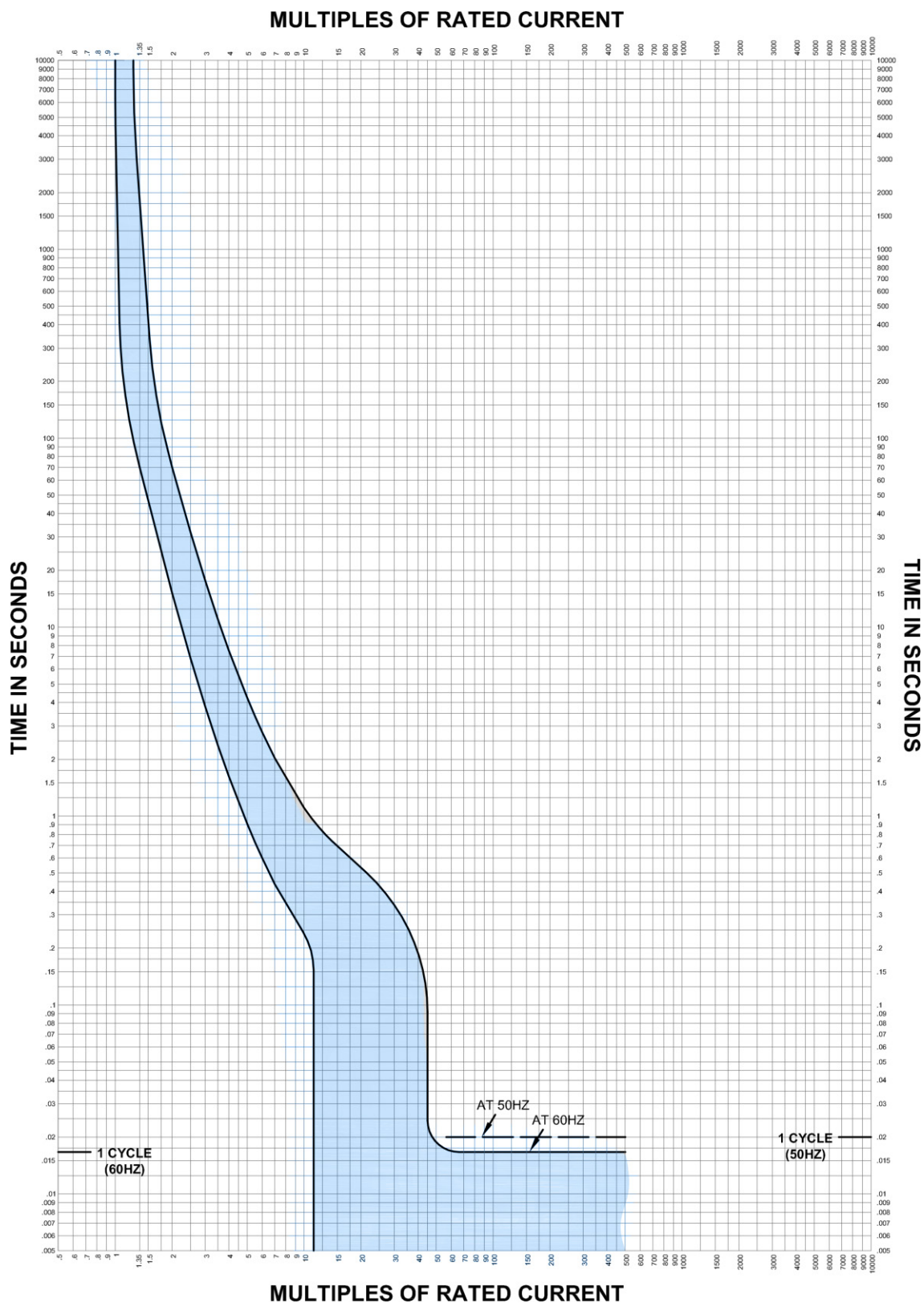
Tripping Curves -15A, 1P/2P/3P



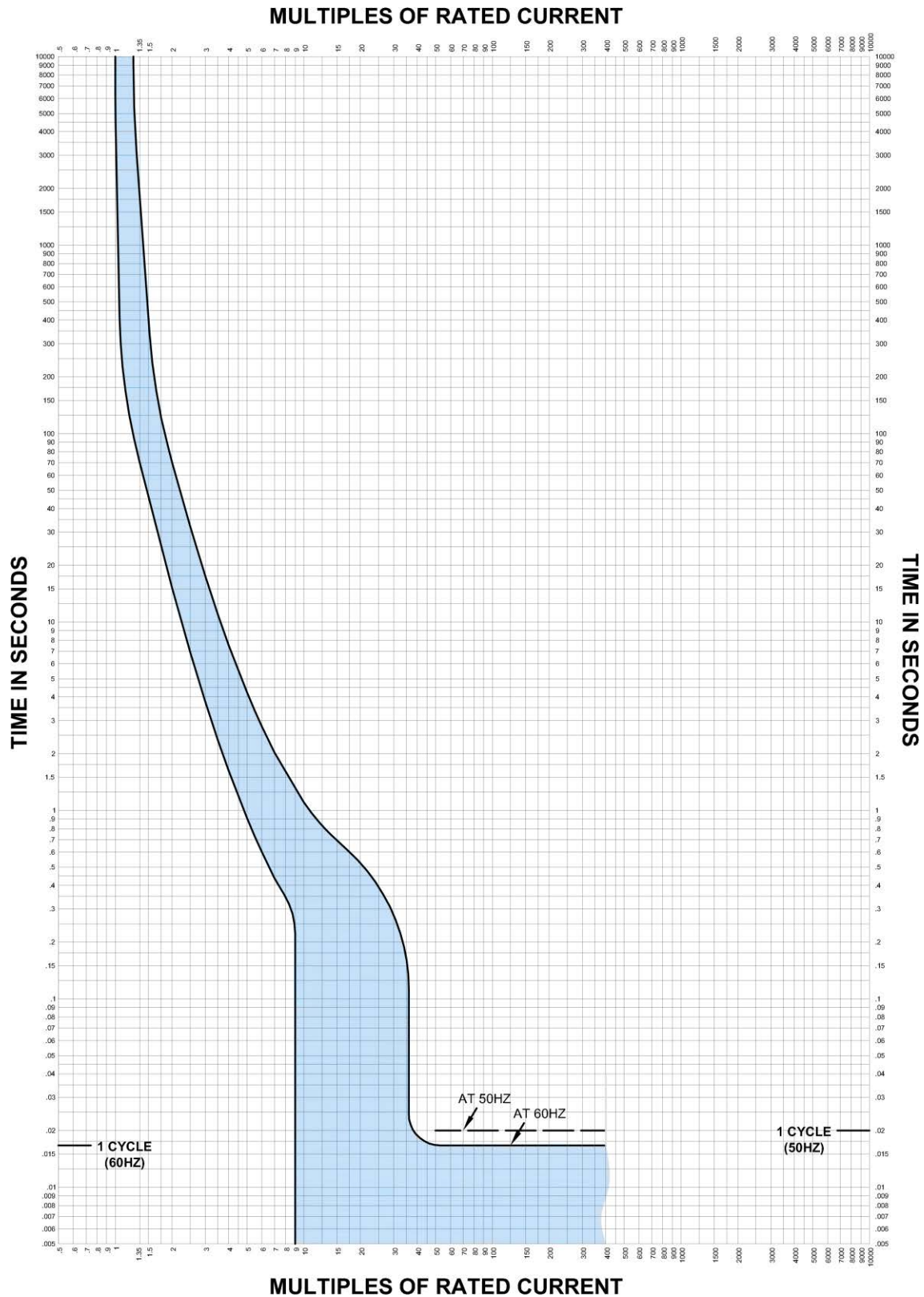
This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.



Tripping Curves -20A, 1P/2P/3P



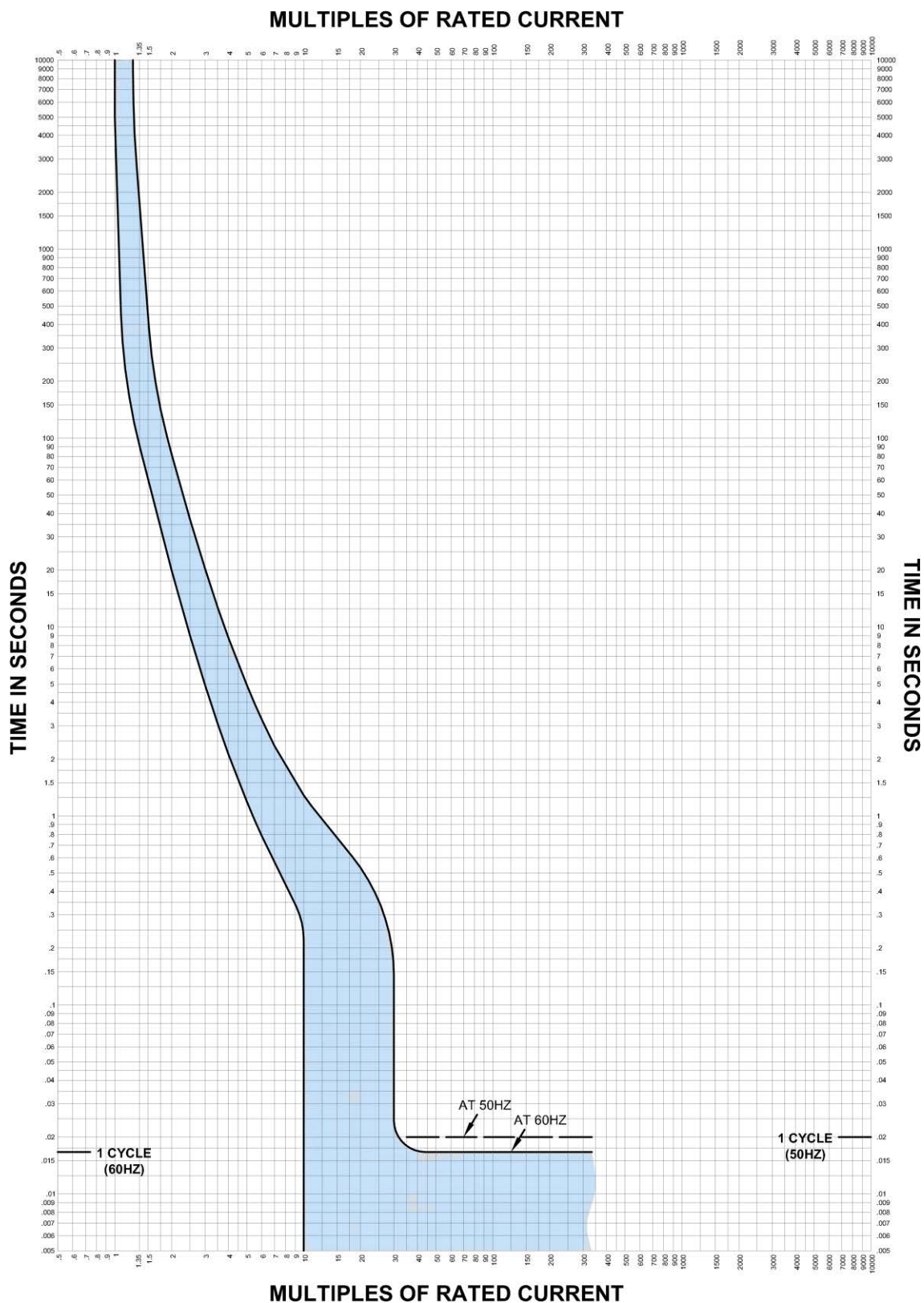
Tripping Curves -25A, 1P/2P/3P



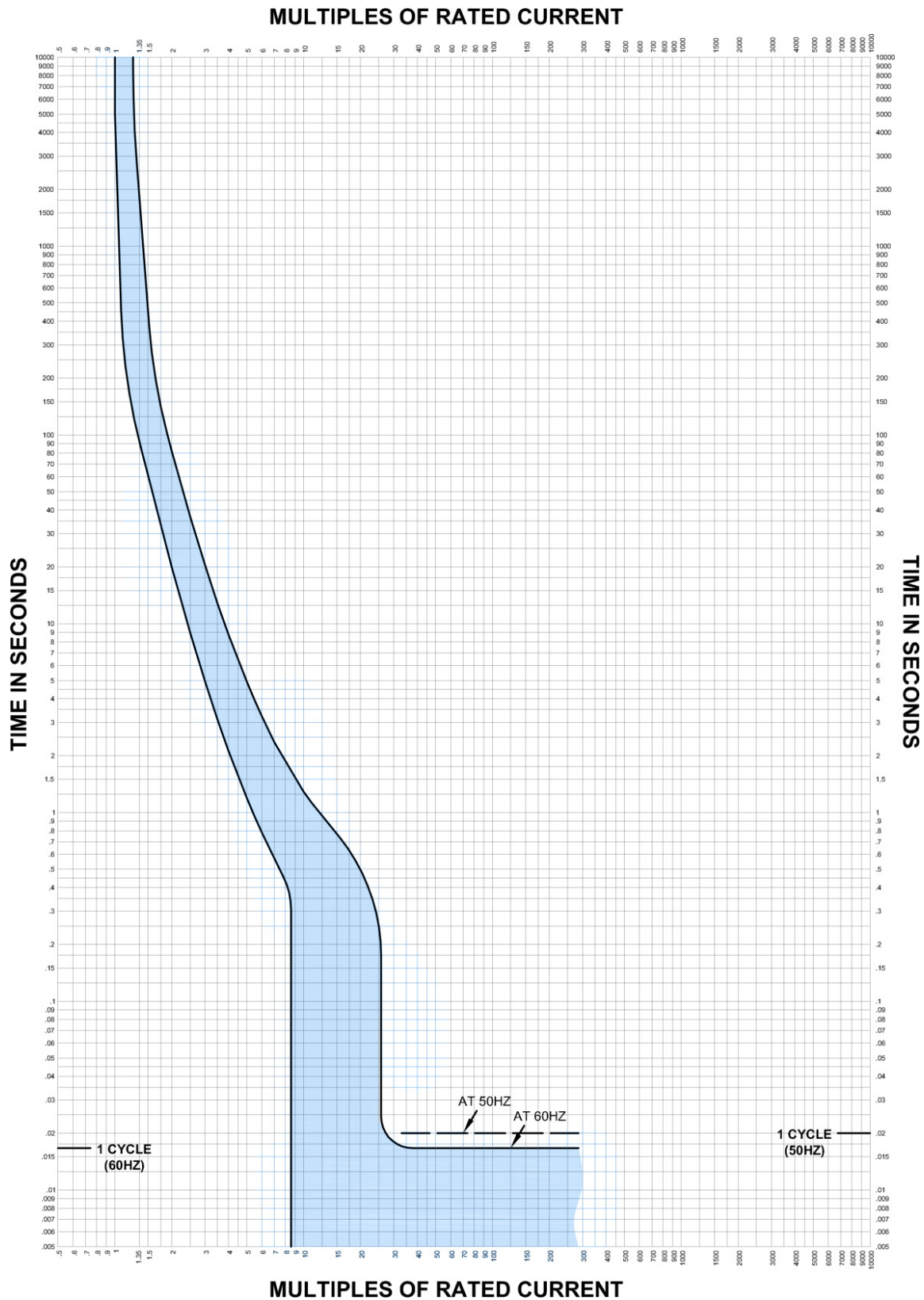
This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.



Tripping Curves -30A, 1P/2P/3P



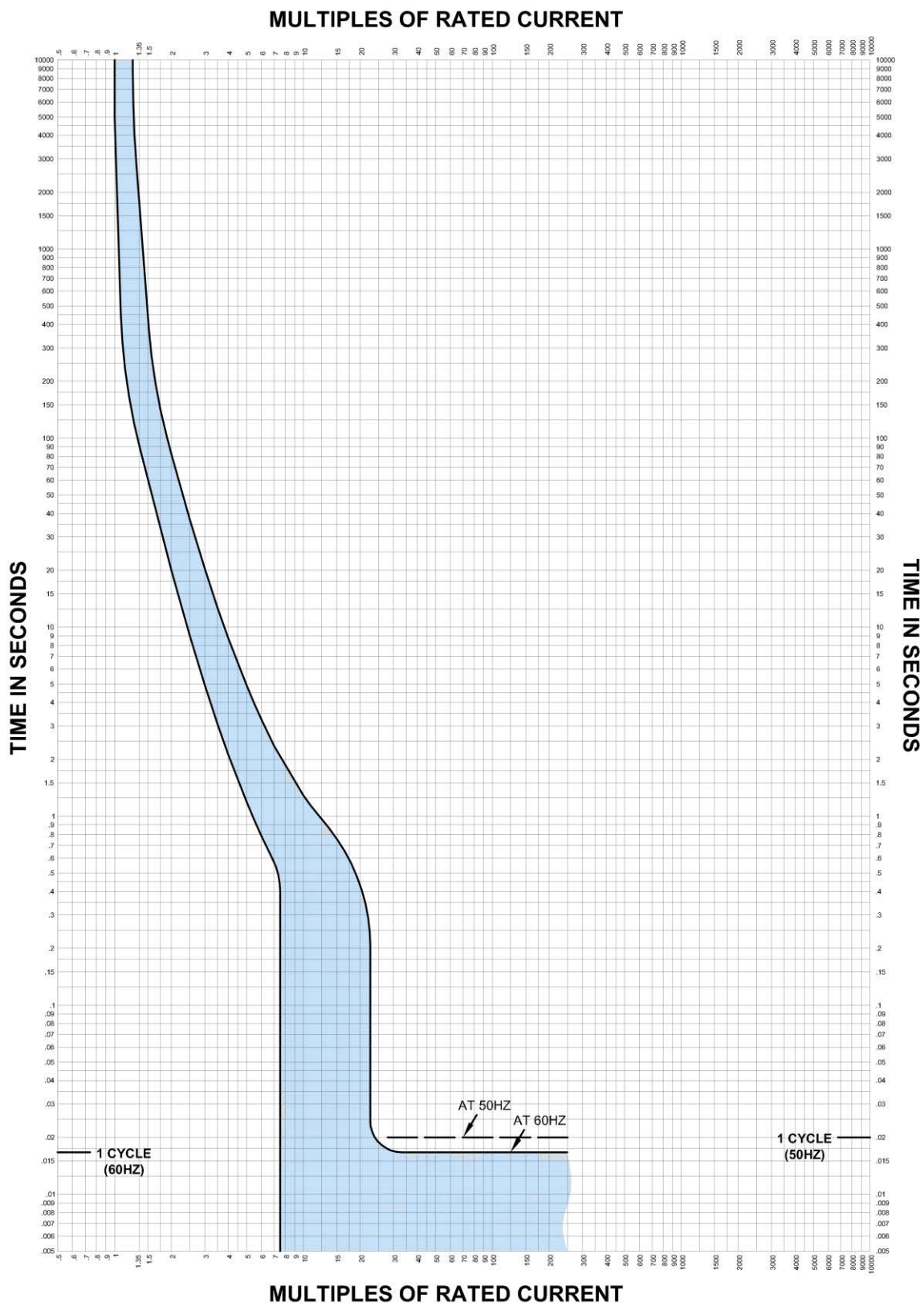
Tripping Curves -35A, 1P/2P/3P



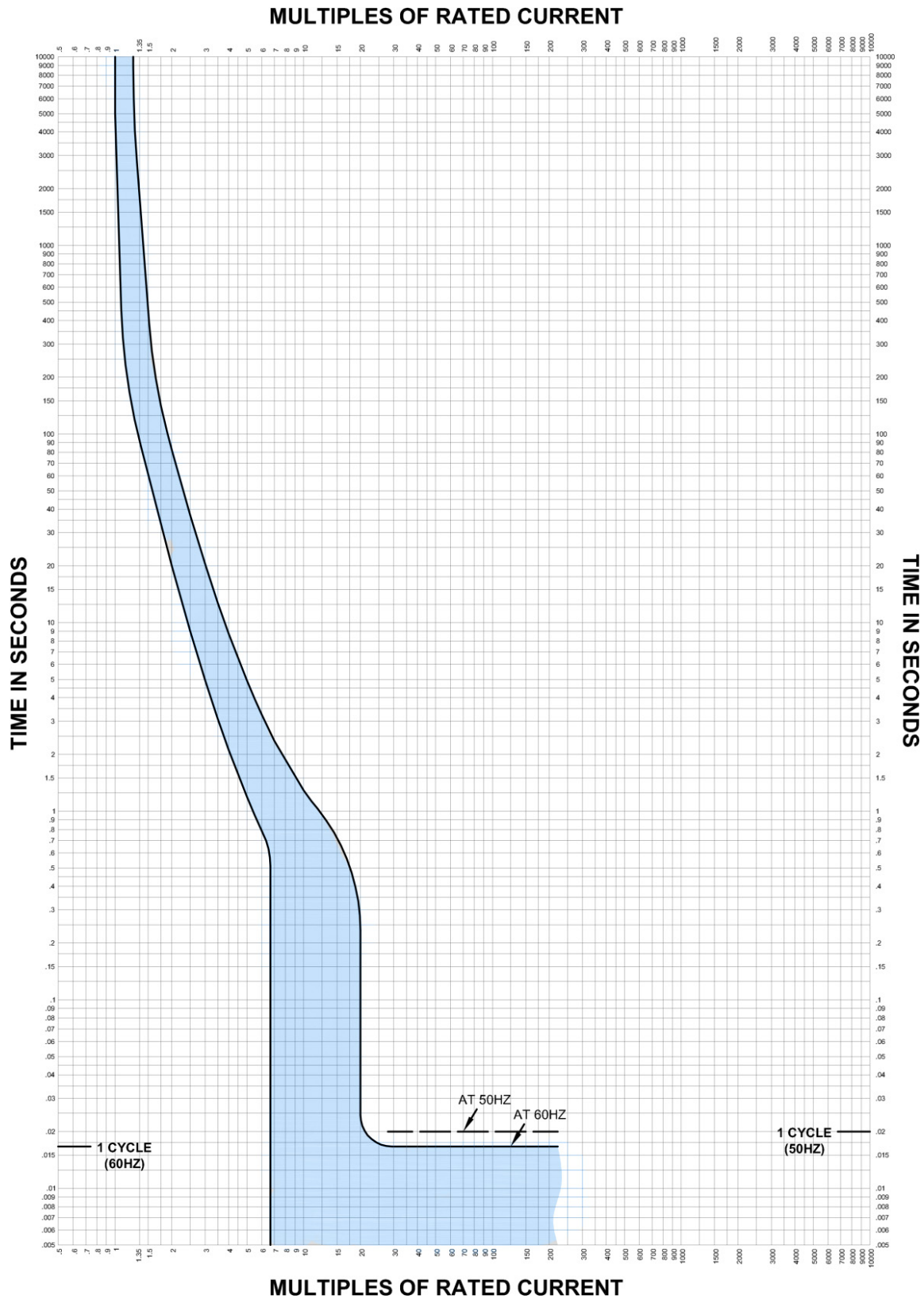
This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.



Tripping Curves -40A, 1P/2P/3P



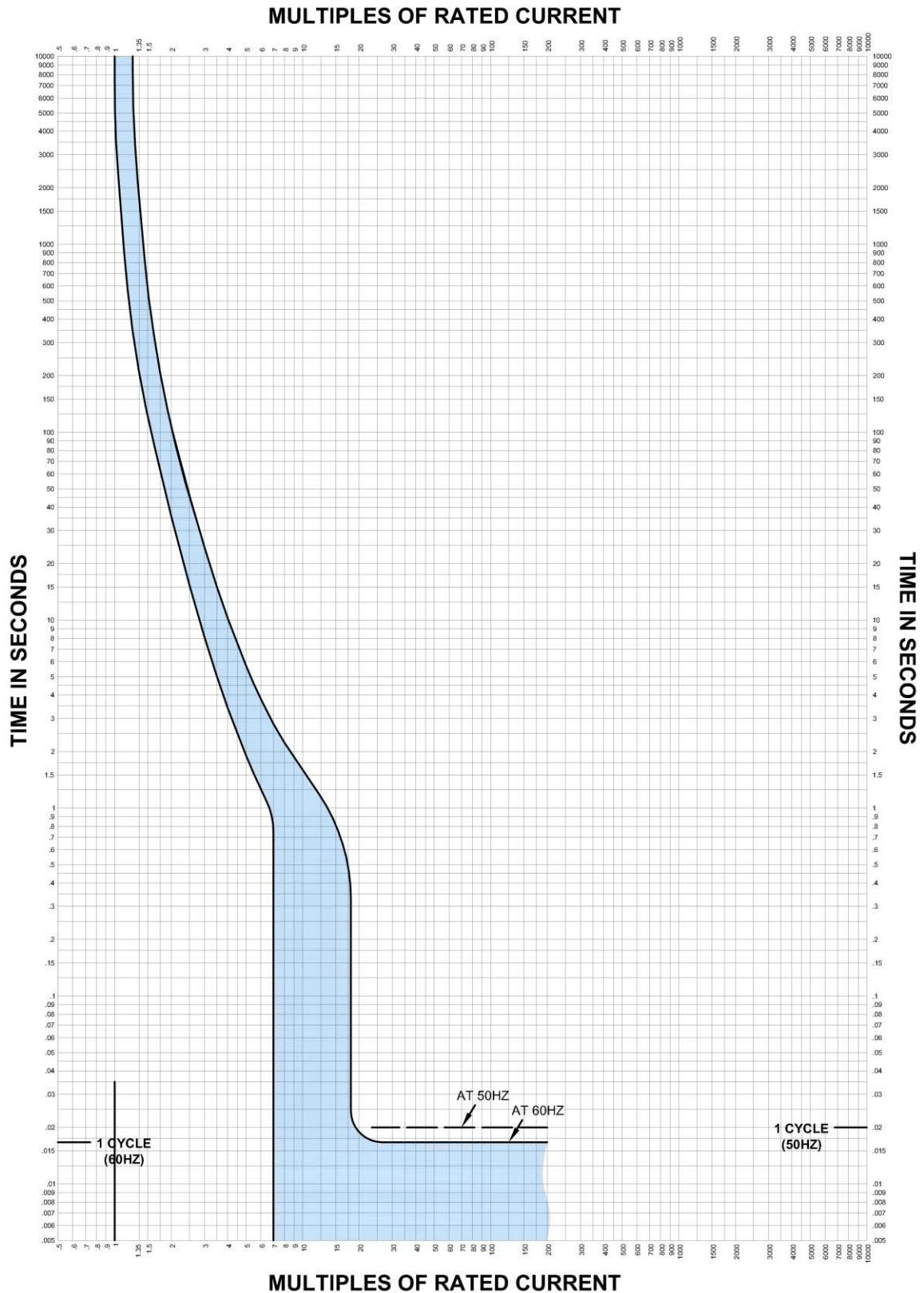
Tripping Curves -45A, 1P/2P/3P



This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.

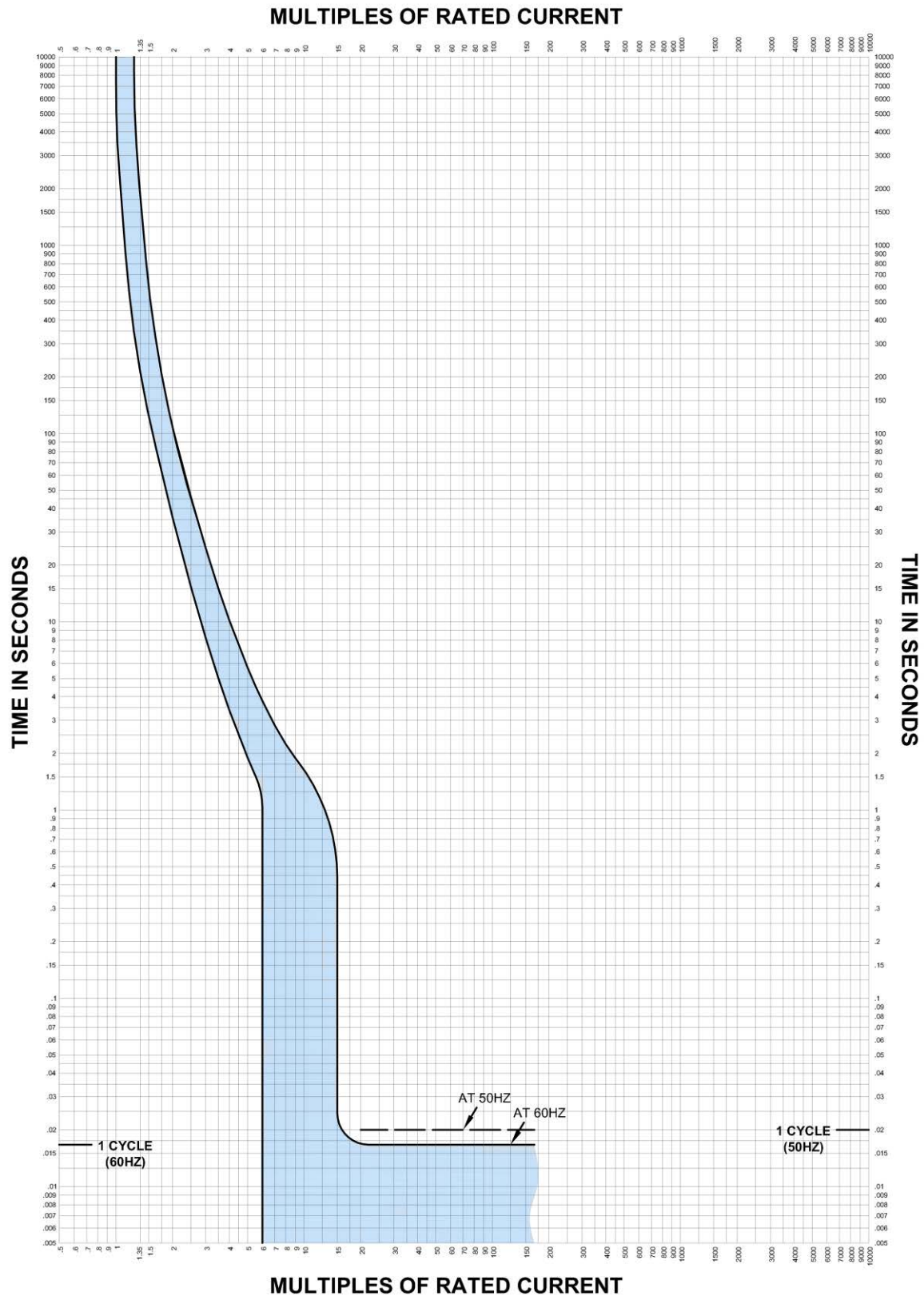


Tripping Curves -50A, 1P/2P/3P



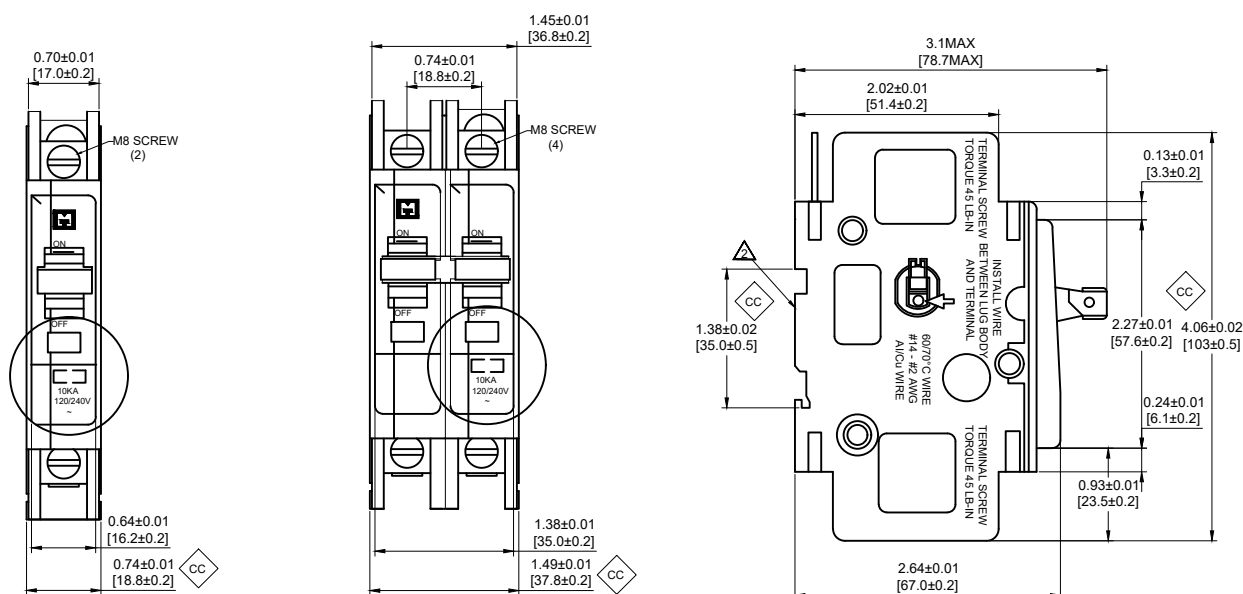
This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.

Tripping Curves -60A, 1P/2P/3P

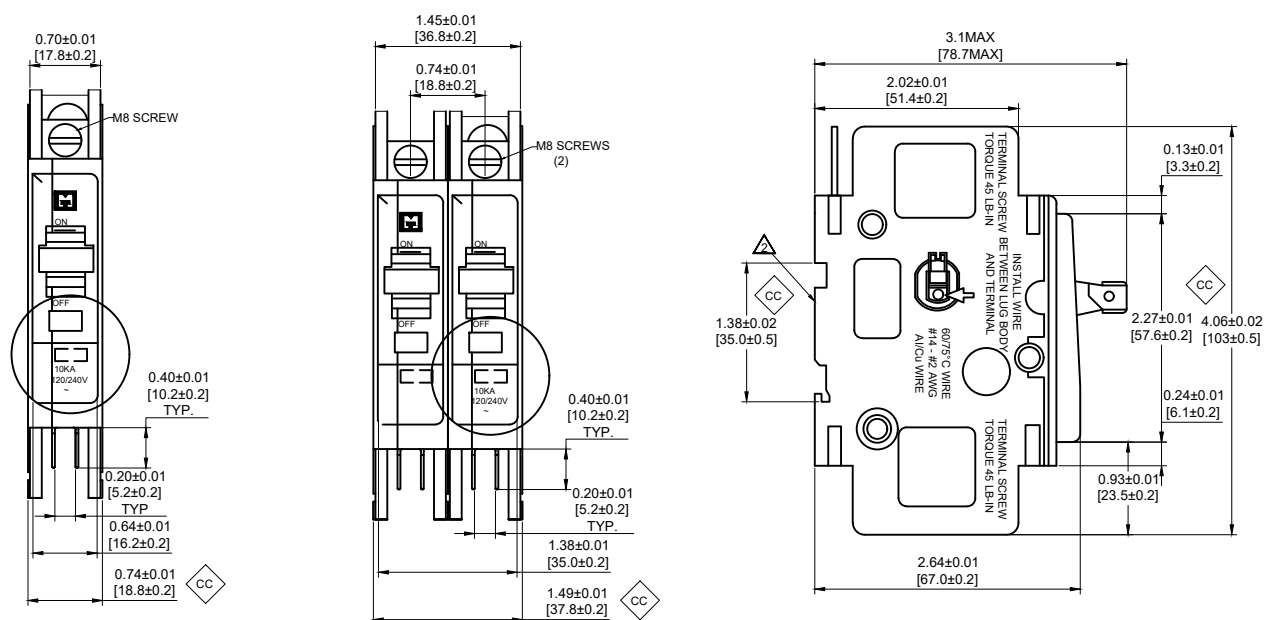


This curve is to be used for application and coordination purposes only. All time/Current curve data is based on 25°C ambient cold start. Terminations are made with conductors of appropriate length and ratings.


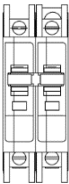
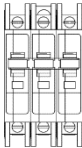
MKB Miniature Circuit Breakers, S-Std. Lugs on all terminals



MKB Miniature Circuit Breakers, Q-Lugs on One Side / QC terminals on Opposite Side




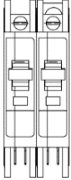
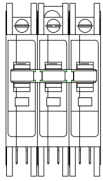
MKB Miniature Circuit Breakers, GG

| | Poles | Rated Voltage | Interrupt Rating | Rated current | Cat. No. |
|---|-------|---------------|------------------|---------------|-------------|
| | | V | kA | A | |
|  | 1P | AC 120/240 | 10 | 10 | MKB-M1P10GG |
| | | | | 15 | MKB-M1P15GG |
| | | | | 20 | MKB-M1P20GG |
| | | | | 25 | MKB-M1P25GG |
| | | | | 30 | MKB-M1P30GG |
| | | | | 35 | MKB-M1P35GG |
| | | | | 40 | MKB-M1P40GG |
| | | | | 45 | MKB-M1P45GG |
| | | | | 50 | MKB-M1P50GG |
| | | | | 60 | MKB-M1P60GG |
|  | 2P | AC 120/240 | 10 | 10 | MKB-M2P10GG |
| | | | | 15 | MKB-M2P15GG |
| | | | | 20 | MKB-M2P20GG |
| | | | | 25 | MKB-M2P25GG |
| | | | | 30 | MKB-M2P30GG |
| | | | | 35 | MKB-M2P35GG |
| | | | | 40 | MKB-M2P40GG |
| | | | | 45 | MKB-M2P45GG |
| | | | | 50 | MKB-M2P50GG |
| | | | | 60 | MKB-M2P60GG |
|  | 3P | AC 240 | 10 | 15 | MKB-M3P15GG |
| | | | | 20 | MKB-M3P20GG |
| | | | | 25 | MKB-M3P25GG |
| | | | | 30 | MKB-M3P30GG |
| | | | | 35 | MKB-M3P35GG |
| | | | | 40 | MKB-M3P40GG |
| | | | | 45 | MKB-M3P45GG |
| | | | | 50 | MKB-M3P50GG |
| | | | | 60 | MKB-M3P60GG |

GG-Std. Lugs on all terminals



MKB Miniature Circuit Breakers, GA

| | Poles | Rated Voltage | Interrupt Rating | Rated current | Cat. No. |
|---|-------|---------------|------------------|---------------|-------------|
| | | V | kA | A | |
|  | 1P | AC 120/240 | 10 | 10 | MKB-M1P10GA |
| | | | | 15 | MKB-M1P15GA |
| | | | | 20 | MKB-M1P20GA |
| | | | | 25 | MKB-M1P25GA |
| | | | | 30 | MKB-M1P30GA |
| | | | | 35 | MKB-M1P35GA |
| | | | | 40 | MKB-M1P40GA |
| | | | | 45 | MKB-M1P45GA |
| | | | | 50 | MKB-M1P50GA |
| | | | | 60 | MKB-M1P60GA |
|  | 2P | AC 120/240 | 10 | 10 | MKB-M2P10GA |
| | | | | 15 | MKB-M2P15GA |
| | | | | 20 | MKB-M2P20GA |
| | | | | 25 | MKB-M2P25GA |
| | | | | 30 | MKB-M2P30GA |
| | | | | 35 | MKB-M2P35GA |
| | | | | 40 | MKB-M2P40GA |
| | | | | 45 | MKB-M2P45GA |
| | | | | 50 | MKB-M2P50GA |
| | | | | 60 | MKB-M2P60GA |
|  | 3P | AC 240 | 10 | 15 | MKB-M3P15GA |
| | | | | 20 | MKB-M3P20GA |
| | | | | 25 | MKB-M3P25GA |
| | | | | 30 | MKB-M3P30GA |
| | | | | 35 | MKB-M3P35GA |
| | | | | 40 | MKB-M3P40GA |
| | | | | 45 | MKB-M3P45GA |
| | | | | 50 | MKB-M3P50GA |
| | | | | 60 | MKB-M3P60GA |

GA- Lugs on One Side / QC terminals on Opposite Side



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