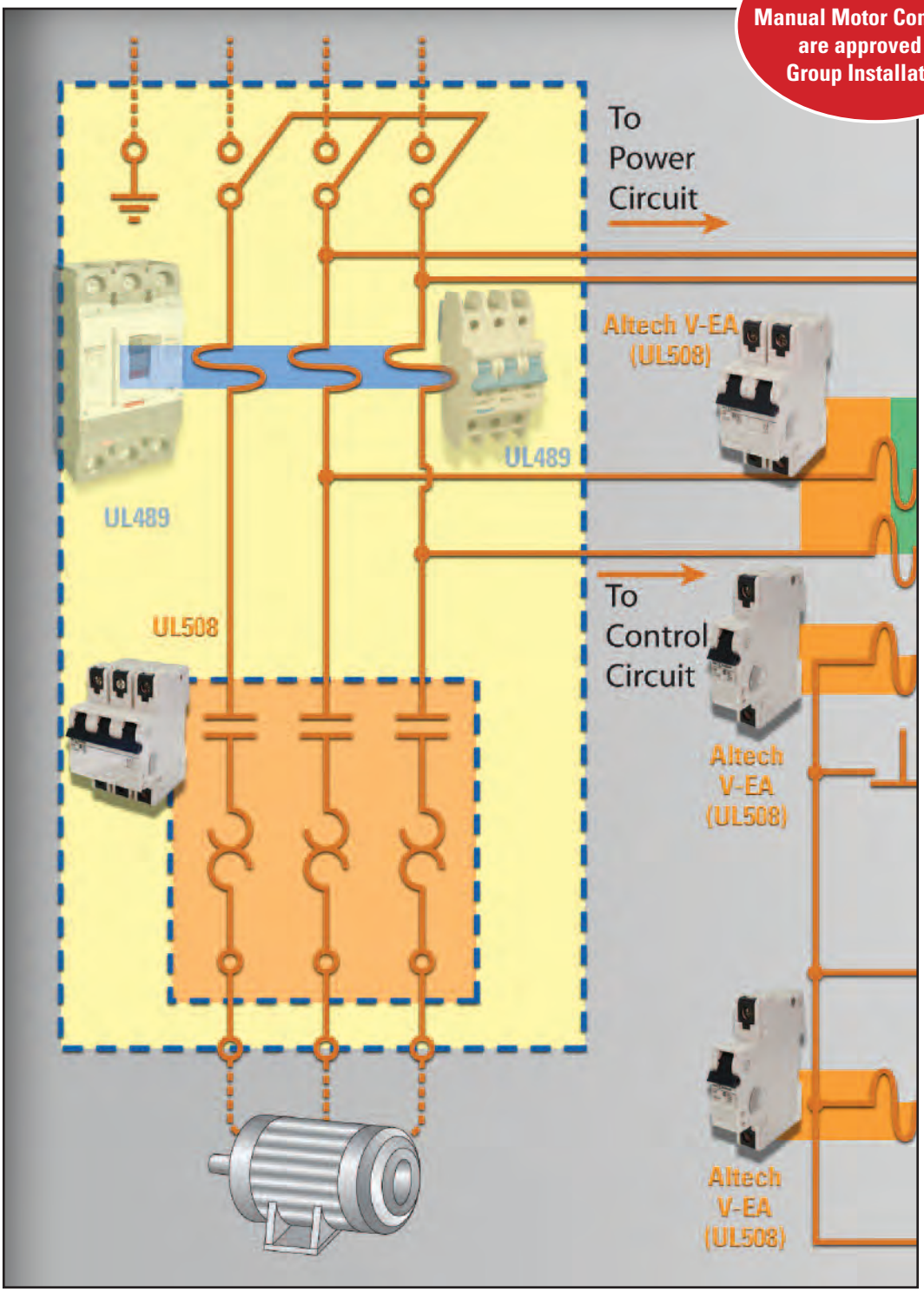
Typical UL508 Application

Power Circuit of a UL508A Panel

Altech's V-EA UL508 Manual Motor Controllers are approved for Group Installations



Disclaimer: This an application example. Installation should be done by a qualified electrician under the guidance of UL/NEC® specifications..

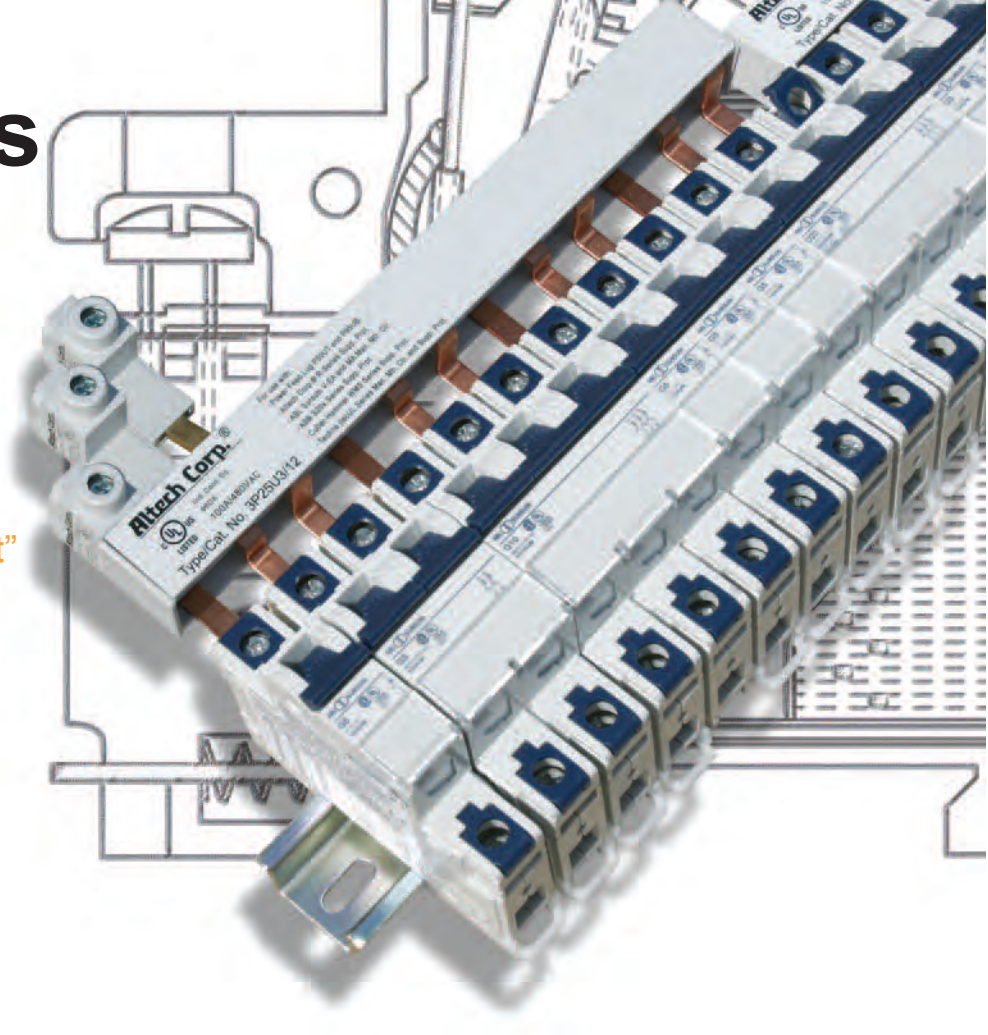
V-EA Series

508 listed
E137938

C22.2 No.14 certified
LR104391

UL508 Listed
Manual Motor Controllers
“Suitable as Motor Disconnect”

- DIN Rail Mounted
- 17.5mm width per pole
- Thermal Magnetic
- 480Y/277V AC, 50/60Hz
- 10kA Short Circuit Withstand Capacity
- Applications Include:
  - AC Motor Starting, Across the Line
  - AC General Use
  - AC Resistance
  - AC Discharge Lamps (Ballast)
  - AC Incandescent Lamps (Tungsten)

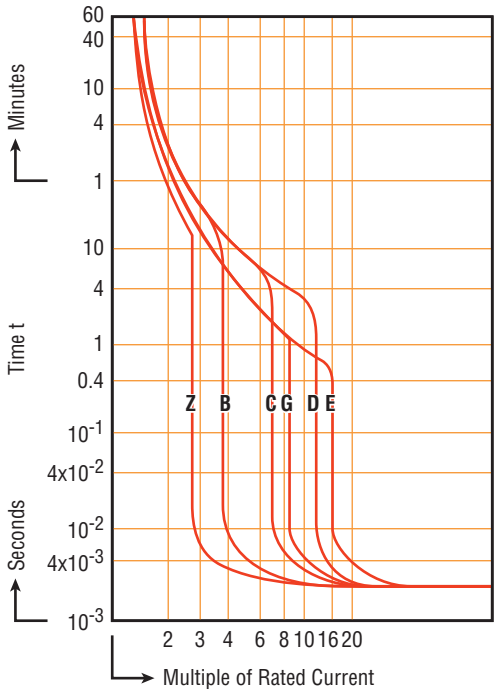


Voltage Rating	480Y/277VAC 0.3-25A: 1 pole - 42VDC; 2 Pole - 80VDC 30-60A: 1 pole - 24VDC; 2 Pole - 60VDC
Short Circuit Withstand Rating (UL/CSA - Ratings)	0.3-60A (RC): 10kA with UL-listed RK5 back-up fuse or MCCB
Group Short Circuit Withstand Rating (UL/CSA - Ratings)	0.3-10A (RC): 10kA; 12-60A (RC): 5kA no branch circuit protection required
Interrupting Capacity (VDE - Ratings)	0.3-63A (RC): 10kA
Calibration Temperature	40°C (104°F)
Operating Temperature	-25°C to 55°C (-13°F to 131°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Terminal Size Acceptability	Top: 18-3 AWG; Bottom: 18-2 AWG (Line/Load reversible)
Terminal Torque	20 lb.in.
Terminal Protection Degree	IP20
Horse Power Ratings	see page 32
Mechanical Endurance Ratings	see page 33

short circuit Withstand ratings for v-ea manual motor controller

Trip Curve	Backup Protection / Amp Range	UL-Listed RK5-Fuse up to 10kA	UL-Listed MCCB up to 10kA	No BCP Required up to:
all	0.3 - 10A	4xRC* min 15A, max 70A	4xRC* min 15A, max 70A	10kA
all	12 - 30/32A	4xRC* max 125A	4xRC* max 125A	5kA
all	40 - 50A	4xRC* max 200A	4xRC* max 200A	5kA
all	60 / 63A	4xRC* max 250A	4xRC* max 250A	5kA

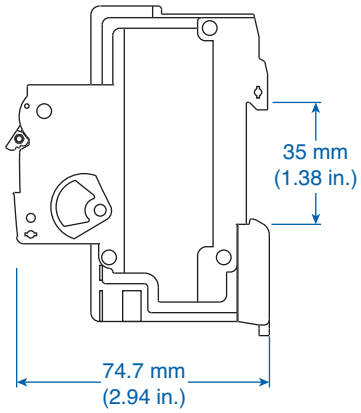
*up to nearest rated current

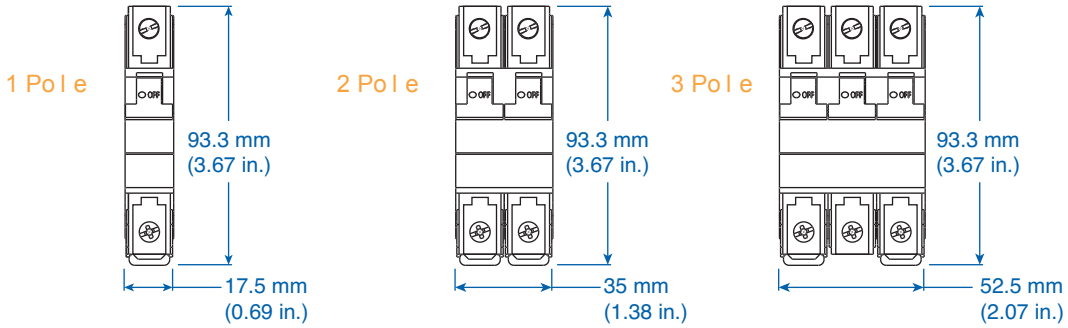


Time versus Current Trip Curve

For the exact trip curve, please refer to pages 30-31.

Dimensions in mm
side view





Application Overview

Trip-Characteristics*				Applications												
Characteristic Trip Boundaries				Lighting Wiring Protection Control Circuits	Business Equipment Appliances	Transformers	Power Supplies Heaters	Motors				General Electronics	Solenoid	Semi-conductors Components/ devices with low surge-current and short circuit withstand capabilities	Reactive Load
Thermal Trip		Magnetic Trip						General	Low Inrush	High Inrush	High Efficiency				
Must not Trip>100ms	Must Trip <1hr	Must not Trip>100ms	Must Trip at 100ms												
B-Characteristics				■	■							■			
1.13xRC	1.45xRC	3xRC	5xRC												
C-Characteristics				■	■				■						
1.13xRC	1.45xRC	5xRC	10xRC												
D-Characteristics						■	■			■					■
1.13xRC	1.45xRC	10xRC	16xRC												
E-Characteristics						■	■				■				
1.05xRC	1.35xRC	14xRC	18xRC												
G-Characteristics				■		■		■	■				■		
1.05xRC	1.35xRC	8xRC	10xRC												
Z-Characteristics												■		■	
1.05xRC	1.35xRC	2xRC	3xRC												

**The value of each characteristic is shown vertically beneath its corresponding heading.*

Warning!
This information should only be used as a selection guide. The use of a Miniature Circuit Breaker/Manual Motor Controller in an application with a certain Trip-Characteristic always requires prototype testing! It is the responsibility of the circuit design engineer to select the appropriate Miniature Circuit Breaker/Manual Motor Controller for his specific application.

B-Trip Characteristic

UL508 Listed
E137938

Application Examples:

Business equipment, wiring protection, lighting, appliances, control circuits, some motors and some electronic applications. Relatively long thermal trip delay but low magnetic trip point.



One Pole

Standard Pack: 12

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
1.0A	**1B1UM**	UL SP
1.6A	**1B1.6UM**	UL SP
2.0A	**1B2UM**	UL SP
2.5A	**1B2.5UM**	UL SP
3.0A	**1B3UM**	UL SP
3.5A	**1B3.5UM**	UL SP
4.0A	**1B4UM**	UL SP
5.0A	**1B5UM**	UL SP
6.0A	**1B6UM**	UL SP VDE
8.0A	NA	
10A	**1B10UM**	UL SP VDE
12A	NA	
13A	**1B13UM**	UL SP VDE
15A	**1B15UM**	UL SP
16A	**1B16UM**	UL SP VDE
20A	**1B20UM**	UL SP VDE
25A	**1B25UM**	UL SP VDE
30A	**1B30UM**	UL SP
32A	**1B32UM**	UL SP
40A	**1B40UM**	UL SP
50A	**1B50UM**	UL SP
60A	**1B60UM**	UL SP
63A	**1B63UM**	



Three Pole

Standard Pack: 4

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
1.0A	**3B1UM**	UL SP
1.6A	**3B1.6UM**	UL SP
2.0A	**3B2UM**	UL SP
2.5A	**3B2.5UM**	UL SP
3.0A	**3B3UM**	UL SP
3.5A	**3B3.5UM**	UL SP
4.0A	**3B4UM**	UL SP
5.0A	**3B5UM**	UL SP
6.0A	**3B6UM**	UL SP VDE
8.0A	NA	
10A	**3B10UM**	UL SP VDE
12A	NA	
13A	**3B13UM**	UL SP VDE
15A	**3B15UM**	UL SP
16A	**3B16UM**	UL SP VDE
20A	**3B20UM**	UL SP VDE
25A	**3B25UM**	UL SP VDE
30A	**3B30UM**	UL SP
32A	**3B32UM**	UL SP
40A	**3B40UM**	UL SP
50A	**3B50UM**	UL SP
60A	**3B60UM**	UL SP
63A	**3B63UM**	



Two Pole

Standard Pack: 6

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
1.0A	**2B1UM**	UL SP
1.6A	**2B1.6UM**	UL SP
2.0A	**2B2UM**	UL SP
2.5A	**2B2.5UM**	UL SP
3.0A	**2B3UM**	UL SP
3.5A	**2B3.5UM**	UL SP
4.0A	**2B4UM**	UL SP
5.0A	**2B5UM**	UL SP
6.0A	**2B6UM**	UL SP VDE
8.0A	NA	
10A	**2B10UM**	UL SP VDE
12A	NA	
13A	**2B13UM**	UL SP VDE
15A	**2B15UM**	UL SP
16A	**2B16UM**	UL SP VDE
20A	**2B20UM**	UL SP VDE
25A	**2B25UM**	UL SP VDE
30A	**2B30UM**	UL SP
32A	**2B32UM**	UL SP
40A	**2B40UM**	UL SP
50A	**2B50UM**	UL SP
60A	**2B60UM**	UL SP
63A	**2B63UM**	



Add-on Neutral Pole

Rating	Type/ Cat. No.	Approvals
0.3-63A/ 480Y/277V	**N63UM**	UL SP

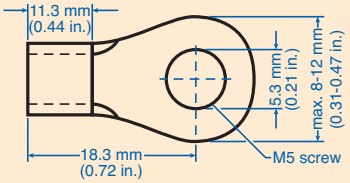
Standard Pack: 5

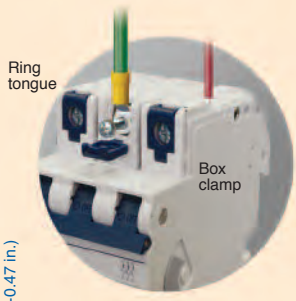
Weight:
0.775kg (1.71lb.)

Standard Dual Connection Terminal

- Box clamp terminals
  Top: 18-3 AWG;
  Bottom: 18-2 AWG
  (Line/Load reversible)
- Ring tongue terminals

Dimensions*:





** May differ by manufacturer.*

Top terminal ring tongue maximum thickness 1.6 mm.

C-Trip Characteristic

Application Examples:

Low inrush motors, lighting, wiring protection, appliances, business equipment, and control circuit applications. Relatively long thermal trip delay and medium magnetic trip point.

UL508 Listed
E137938



One Pole

Standard Pack: 12

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**1C03UM**	
0.5A	**1C05UM**	
0.75A	**1C075UM**	
0.8A	NA	
1.0A	**1C1UM**	
1.6A	**1C1.6UM**	
2.0A	**1C2UM**	
2.5A	**1C2.5UM**	
3.0A	**1C3UM**	
3.5A	**1C3.5UM**	
4.0A	**1C4UM**	
5.0A	**1C5UM**	
6.0A	**1C6UM**	
8.0A	**1C8UM**	
10A	**1C10UM**	
12A	NA	
13A	**1C13UM**	
15A	**1C15UM**	
16A	**1C16UM**	
20A	**1C20UM**	
25A	**1C25UM**	
30A	**1C30UM**	
32A	**1C32UM**	
40A	**1C40UM**	
50A	**1C50UM**	
60A	**1C60UM**	
63A	**1C63UM**	



Three Pole

Standard Pack: 4

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**3C03UM**	
0.5A	**3C05UM**	
0.75A	**3C075UM**	
0.8A	NA	
1.0A	**3C1UM**	
1.6A	**3C1.6UM**	
2.0A	**3C2UM**	
2.5A	**3C2.5UM**	
3.0A	**3C3UM**	
3.5A	**3C3.5UM**	
4.0A	**3C4UM**	
5.0A	**3C5UM**	
6.0A	**3C6UM**	
8.0A	**3C8UM**	
10A	**3C10UM**	
12A	NA	
13A	**3C13UM**	
15A	**3C15UM**	
16A	**3C16UM**	
20A	**3C20UM**	
25A	**3C25UM**	
30A	**3C30UM**	
32A	**3C32UM**	
40A	**3C40UM**	
50A	**3C50UM**	
60A	**3C60UM**	
63A	**3C63UM**	



Two Pole

Standard Pack: 6

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**2C03UM**	
0.5A	**2C05UM**	
0.75A	**2C075UM**	
0.8A	NA	
1.0A	**2C1UM**	
1.6A	**2C1.6UM**	
2.0A	**2C2UM**	
2.5A	**2C2.5UM**	
3.0A	**2C3UM**	
3.5A	**2C3.5UM**	
4.0A	**2C4UM**	
5.0A	**2C5UM**	
6.0A	**2C6UM**	
8.0A	**2C8UM**	
10A	**2C10UM**	
12A	NA	
13A	**2C13UM**	
15A	**2C15UM**	
16A	**2C16UM**	
20A	**2C20UM**	
25A	**2C25UM**	
30A	**2C30UM**	
32A	**2C32UM**	
40A	**2C40UM**	
50A	**2C50UM**	
60A	**2C60UM**	
63A	**2C63UM**	



Add-on Neutral Pole

Rating	Type/ Cat. No.	Approvals
0.3-63A/ 480Y/277V	**N63UM**	

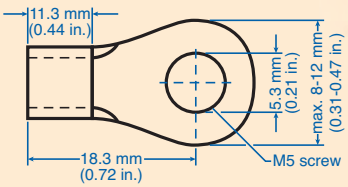
Standard Pack: 5

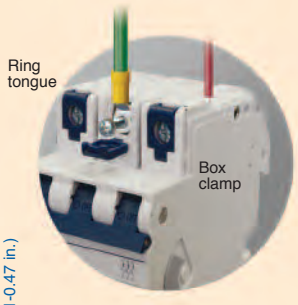
Weight:
0.775kg (1.71lb.)

Standard Dual Connection Terminal

- Box clamp terminals
  Top: 18-3 AWG;
  Bottom: 18-2 AWG
  (Line/Load reversible)
- Ring tongue terminals

Dimensions*:





** May differ by manufacturer.*

Top terminal ring tongue maximum thickness 1.6 mm.

D-Trip Characteristic

UL508 Listed
E137938

Application Examples:

High inrush motors, transformers, power supplies, heaters and reactive loads. Relatively long thermal trip delay and very high magnetic trip point.



One Pole

Standard Pack: 12

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**1D03UM**	
0.5A	**1D05UM**	
0.75A	**1D075UM**	
0.8A	NA	
1.0A	**1D1UM**	
1.6A	**1D1.6UM**	
2.0A	**1D2UM**	
2.5A	**1D2.5UM**	
3.0A	**1D3UM**	
3.5A	**1D3.5UM**	
4.0A	**1D4UM**	
5.0A	**1D5UM**	
6.0A	**1D6UM**	
8.0A	**1D8UM**	
10A	**1D10UM**	
12A	NA	
13A	**1D13UM**	
15A	**1D15UM**	
16A	**1D16UM**	
20A	**1D20UM**	
25A	**1D25UM**	
30A	**1D30UM**	
32A	**1D32UM**	
40A	**1D40UM**	
50A	**1D50UM**	
60A	**1D60UM**	
63A	**1D63UM**	



Three Pole

Standard Pack: 4

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**3D03UM**	
0.5A	**3D05UM**	
0.75A	**3D075UM**	
0.8A	NA	
1.0A	**3D1UM**	
1.6A	**3D1.6UM**	
2.0A	**3D2UM**	
2.5A	**3D2.5UM**	
3.0A	**3D3UM**	
3.5A	**3D3.5UM**	
4.0A	**3D4UM**	
5.0A	**3D5UM**	
6.0A	**3D6UM**	
8.0A	**3D8UM**	
10A	**3D10UM**	
12A	NA	
13A	**3D13UM**	
15A	**3D15UM**	
16A	**3D16UM**	
20A	**3D20UM**	
25A	**3D25UM**	
30A	**3D30UM**	
32A	**3D32UM**	
40A	**3D40UM**	
50A	**3D50UM**	
60A	**3D60UM**	
63A	**3D63UM**	



Two Pole

Standard Pack: 6

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**2D03UM**	
0.5A	**2D05UM**	
0.75A	**2D075UM**	
0.8A	NA	
1.0A	**2D1UM**	
1.6A	**2D1.6UM**	
2.0A	**2D2UM**	
2.5A	**2D2.5UM**	
3.0A	**2D3UM**	
3.5A	**2D3.5UM**	
4.0A	**2D4UM**	
5.0A	**2D5UM**	
6.0A	**2D6UM**	
8.0A	**2D8UM**	
10A	**2D10UM**	
12A	NA	
13A	**2D13UM**	
15A	**2D15UM**	
16A	**2D16UM**	
20A	**2D20UM**	
25A	**2D25UM**	
30A	**2D30UM**	
32A	**2D32UM**	
40A	**2D40UM**	
50A	**2D50UM**	
60A	**2D60UM**	
63A	**2D63UM**	



Add-on Neutral Pole

Rating	Type/ Cat. No.	Approvals
0.3-63A/ 480Y/277V	**N63UM**	

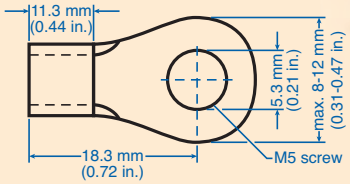
Standard Pack: 5

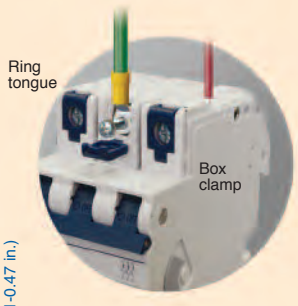
Weight:
0.775kg (1.71lb.)

Standard Dual Connection Terminal

- Box clamp terminals
  Top: 18-3 AWG;
  Bottom: 18-2 AWG
  (Line/Load reversible)
- Ring tongue terminals

Dimensions*:





** May differ by manufacturer.*

Top terminal ring tongue maximum thickness 1.6 mm.

E-Trip Characteristic

UL508 Listed

E137938

Application Examples:

High efficiency motors, which have exceedingly high inrush currents. Relatively short thermal trip delays and very high magnetic trip points.



One Pole

Standard Pack: 12

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**1E03UM**	
0.5A	**1E05UM**	
0.75A	**1E075UM**	
0.8A	NA	
1.0A	**1E1UM**	
1.6A	**1E1.6UM**	
2.0A	**1E2UM**	
2.5A	**1E2.5UM**	
3.0A	**1E3UM**	
3.5A	**1E3.5UM**	
4.0A	**1E4UM**	
5.0A	**1E5UM**	
6.0A	**1E6UM**	
8.0A	**1E8UM**	
10A	**1E10UM**	
12A	**1E12UM**	
13A	**1E13UM**	
15A	**1E15UM**	
16A	**1E16UM**	
20A	**1E20UM**	
25A	**1E25UM**	
30A	**1E30UM**	
32A	**1E32UM**	
40A	**1E40UM**	
50A	**1E50UM**	
60A	**1E60UM**	
63A	**1E63UM**	



Three Pole

Standard Pack: 4

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**3E03UM**	
0.5A	**3E05UM**	
0.75A	**3E075UM**	
0.8A	NA	
1.0A	**3E1UM**	
1.6A	**3E1.6UM**	
2.0A	**3E2UM**	
2.5A	**3E2.5UM**	
3.0A	**3E3UM**	
3.5A	**3E3.5UM**	
4.0A	**3E4UM**	
5.0A	**3E5UM**	
6.0A	**3E6UM**	
8.0A	**3E8UM**	
10A	**3E10UM**	
12A	**3E12UM**	
13A	**3E13UM**	
15A	**3E15UM**	
16A	**3E16UM**	
20A	**3E20UM**	
25A	**3E25UM**	
30A	**3E30UM**	
32A	**3E32UM**	
40A	**3E40UM**	
50A	**3E50UM**	
60A	**3E60UM**	
63A	**3E63UM**	



Two Pole

Standard Pack: 6

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**2E03UM**	
0.5A	**2E05UM**	
0.75A	**2E075UM**	
0.8A	NA	
1.0A	**2E1UM**	
1.6A	**2E1.6UM**	
2.0A	**2E2UM**	
2.5A	**2E2.5UM**	
3.0A	**2E3UM**	
3.5A	**2E3.5UM**	
4.0A	**2E4UM**	
5.0A	**2E5UM**	
6.0A	**2E6UM**	
8.0A	**2E8UM**	
10A	**2E10UM**	
12A	**2E12UM**	
13A	**2E13UM**	
15A	**2E15UM**	
16A	**2E16UM**	
20A	**2E20UM**	
25A	**2E25UM**	
30A	**2E30UM**	
32A	**2E32UM**	
40A	**2E40UM**	
50A	**2E50UM**	
60A	**2E60UM**	
63A	**2E63UM**	



Add-on Neutral Pole

Rating	Type/ Cat. No.	Approvals
0.3-63A/ 480Y/277V	**N63UM**	

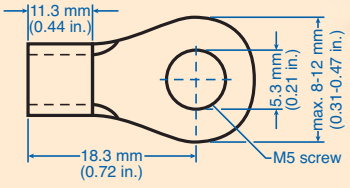
Standard Pack: 5

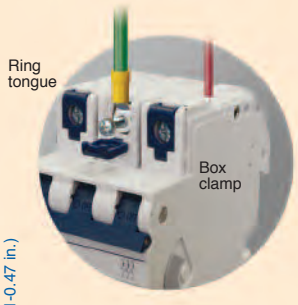
Weight:
0.775kg (1.71lb.)

Standard Dual Connection Terminal

- Box clamp terminals
  Top: 18-3 AWG;
  Bottom: 18-2 AWG
  (Line/Load reversible)
- Ring tongue terminals

Dimensions*:





** May differ by manufacturer.*

Top terminal ring tongue maximum thickness 1.6 mm.

G-Trip Characteristic

UL508 Listed
E137938

Application Examples:

General industrial, including motors, some transformers, solenoids, control circuits, lighting and wiring. Meets the US trip norms with relatively short thermal trip delay and high magnetic trip point.



One Pole

Standard Pack: 12

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**1G03UM**	
0.5A	**1G05UM**	
0.75A	NA	
0.8A	**1G08UM**	
1.0A	**1G1UM**	
1.6A	**1G1.6UM**	
2.0A	**1G2UM**	
2.5A	**1G2.5UM**	
3.0A	**1G3UM**	
3.5A	**1G3.5UM**	
4.0A	**1G4UM**	
5.0A	**1G5UM**	
6.0A	**1G6UM**	
8.0A	**1G8UM**	
10A	**1G10UM**	
12A	**1G12UM**	
13A	**1G13UM**	
15A	**1G15UM**	
16A	**1G16UM**	
20A	**1G20UM**	
25A	**1G25UM**	
30A	**1G30UM**	
32A	**1G32UM**	
40A	**1G40UM**	
50A	**1G50UM**	
60A	**1G60UM**	
63A	**1G63UM**	



Three Pole

Standard Pack: 4

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**3G03UM**	
0.5A	**3G05UM**	
0.75A	NA	
0.8A	**3G08UM**	
1.0A	**3G1UM**	
1.6A	**3G1.6UM**	
2.0A	**3G2UM**	
2.5A	**3G2.5UM**	
3.0A	**3G3UM**	
3.5A	**3G3.5UM**	
4.0A	**3G4UM**	
5.0A	**3G5UM**	
6.0A	**3G6UM**	
8.0A	**3G8UM**	
10A	**3G10UM**	
12A	**3G12UM**	
13A	**3G13UM**	
15A	**3G15UM**	
16A	**3G16UM**	
20A	**3G20UM**	
25A	**3G25UM**	
30A	**3G30UM**	
32A	**3G32UM**	
40A	**3G40UM**	
50A	**3G50UM**	
60A	**3G60UM**	
63A	**3G63UM**	



Two Pole

Standard Pack: 6

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**2G03UM**	
0.5A	**2G05UM**	
0.75A	NA	
0.8A	**2G08UM**	
1.0A	**2G1UM**	
1.6A	**2G1.6UM**	
2.0A	**2G2UM**	
2.5A	**2G2.5UM**	
3.0A	**2G3UM**	
3.5A	**2G3.5UM**	
4.0A	**2G4UM**	
5.0A	**2G5UM**	
6.0A	**2G6UM**	
8.0A	**2G8UM**	
10A	**2G10UM**	
12A	**2G12UM**	
13A	**2G13UM**	
15A	**2G15UM**	
16A	**2G16UM**	
20A	**2G20UM**	
25A	**2G25UM**	
30A	**2G30UM**	
32A	**2G32UM**	
40A	**2G40UM**	
50A	**2G50UM**	
60A	**2G60UM**	
63A	**2G63UM**	



Add-on Neutral Pole

Rating	Type/ Cat. No.	Approvals
0.3-63A/ 480Y/277V	**N63UM**	

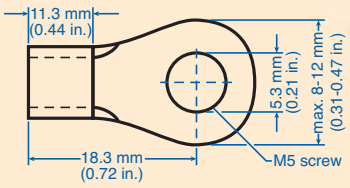
Standard Pack: 5

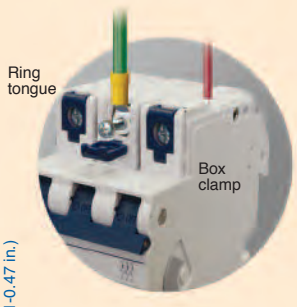
Weight:
0.775kg (1.71lb.)

Standard Dual Connection Terminal

- Box clamp terminals
  Top: 18-3 AWG;
  Bottom: 18-2 AWG
  (Line/Load reversible)
- Ring tongue terminals

Dimensions*:





** May differ by manufacturer.*

Top terminal ring tongue maximum thickness 1.6 mm.

Z-Trip Characteristic

UL508 Listed

E137938

Application Examples:

Semiconductors, components which fail-short (vs. fail-open), and components/devices with low surge-current and short circuit withstand capabilities. Relatively short thermal delay and very low magnetic trip point.



One Pole

Standard Pack: 12

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**1Z03UM**	UL SP
0.5A	**1Z05UM**	UL SP
0.75A	**1Z075UM**	UL SP
0.8A	NA	
1.0A	**1Z1UM**	UL SP
1.6A	**1Z1.6UM**	UL SP
2.0A	**1Z2UM**	UL SP
2.5A	**1Z2.5UM**	UL SP
3.0A	**1Z3UM**	UL SP
3.5A	**1Z3.5UM**	UL SP
4.0A	**1Z4UM**	UL SP
5.0A	**1Z5UM**	UL SP
6.0A	**1Z6UM**	UL SP
8.0A	**1Z8UM**	UL SP
10A	**1Z10UM**	UL SP
12A	**1Z12UM**	UL SP
13A	**1Z13UM**	UL SP
15A	**1Z15UM**	UL SP
16A	**1Z16UM**	UL SP
20A	**1Z20UM**	UL SP
25A	**1Z25UM**	UL SP
30A	**1Z30UM**	UL SP
32A	**1Z32UM**	UL SP
40A	**1Z40UM**	UL SP
50A	**1Z50UM**	UL SP



Three Pole

Standard Pack: 4

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**3Z03UM**	UL SP
0.5A	**3Z05UM**	UL SP
0.75A	**3Z075UM**	UL SP
0.8A	NA	
1.0A	**3Z1UM**	UL SP
1.6A	**3Z1.6UM**	UL SP
2.0A	**3Z2UM**	UL SP
2.5A	**3Z2.5UM**	UL SP
3.0A	**3Z3UM**	UL SP
3.5A	**3Z3.5UM**	UL SP
4.0A	**3Z4UM**	UL SP
5.0A	**3Z5UM**	UL SP
6.0A	**3Z6UM**	UL SP
8.0A	**3Z8UM**	UL SP
10A	**3Z10UM**	UL SP
12A	**3Z12UM**	UL SP
13A	**3Z13UM**	UL SP
15A	**3Z15UM**	UL SP
16A	**3Z16UM**	UL SP
20A	**3Z20UM**	UL SP
25A	**3Z25UM**	UL SP
30A	**3Z30UM**	UL SP
32A	**3Z32UM**	UL SP
40A	**3Z40UM**	UL SP
50A	**3Z50UM**	UL SP



Two Pole

Standard Pack: 6

Weight:
0.3A - 32A
1.75kg (3.86 lb.)
40A - 63A
2.07kg (4.56 lb.)

Rated Current	Type/ Cat. No.	Approvals
0.3A	**2Z03UM**	UL SP
0.5A	**2Z05UM**	UL SP
0.75A	**2Z075UM**	UL SP
0.8A	NA	
1.0A	**2Z1UM**	UL SP
1.6A	**2Z1.6UM**	UL SP
2.0A	**2Z2UM**	UL SP
2.5A	**2Z2.5UM**	UL SP
3.0A	**2Z3UM**	UL SP
3.5A	**2Z3.5UM**	UL SP
4.0A	**2Z4UM**	UL SP
5.0A	**2Z5UM**	UL SP
6.0A	**2Z6UM**	UL SP
8.0A	**2Z8UM**	UL SP
10A	**2Z10UM**	UL SP
12A	**2Z12UM**	UL SP
13A	**2Z13UM**	UL SP
15A	**2Z15UM**	UL SP
16A	**2Z16UM**	UL SP
20A	**2Z20UM**	UL SP
25A	**2Z25UM**	UL SP
30A	**2Z30UM**	UL SP
32A	**2Z32UM**	UL SP
40A	**2Z40UM**	UL SP
50A	**2Z50UM**	UL SP



Add-on Neutral Pole

Rating	Type/ Cat. No.	Approvals
0.3-63A/ 480Y/277V	**N63UM**	UL SP

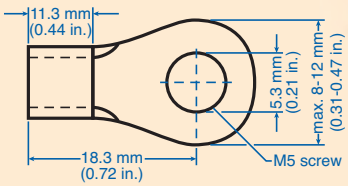
Standard Pack: 5

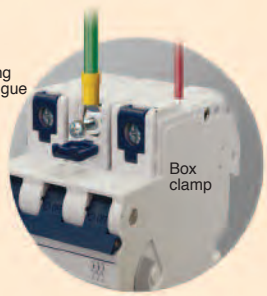
Weight:
0.775kg (1.71lb.)

Standard Dual Connection Terminal

- Box clamp terminals
  Top: 18-3 AWG;
  Bottom: 18-2 AWG
  (Line/Load reversible)
- Ring tongue terminals

Dimensions*:





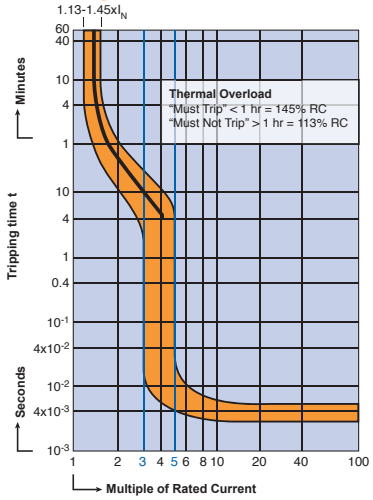
** May differ by manufacturer.*

Top terminal ring tongue maximum thickness 1.6 mm.

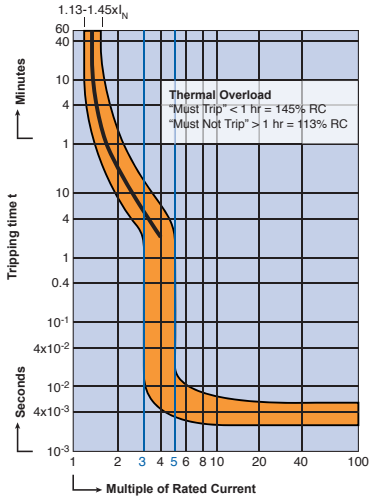
V-EA Trip Curves

B Trip Curve

V-EA-B Trip
1.0A Through 10A Rated Current



V-EA-B Trip
13A Through 63A Rated Current

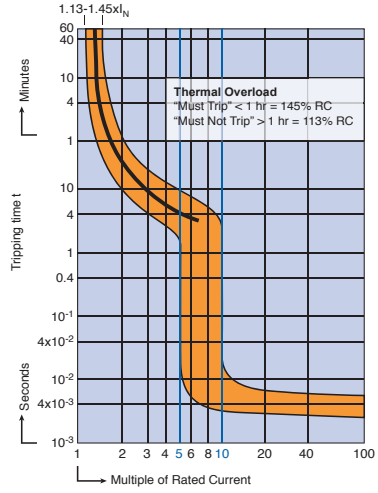


"B" Magnetic Trip Parameters
Rated current 1.0A to 63A.

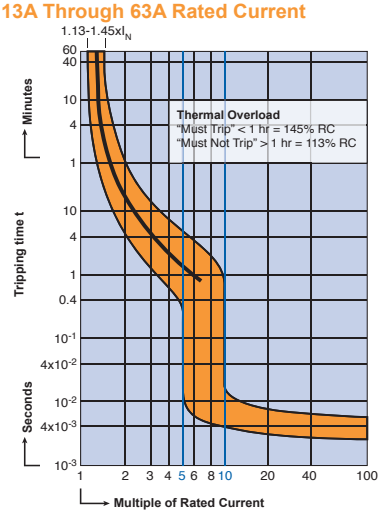
1. Hold for a minimum of 100ms at surge of 3 times rated current.
2. Trip in under 100ms at 5 times rated current.

C Trip Curve

V-EA-C Trip
0.3A Through 10A Rated Current



V-EA-C Trip
13A Through 63A Rated Current

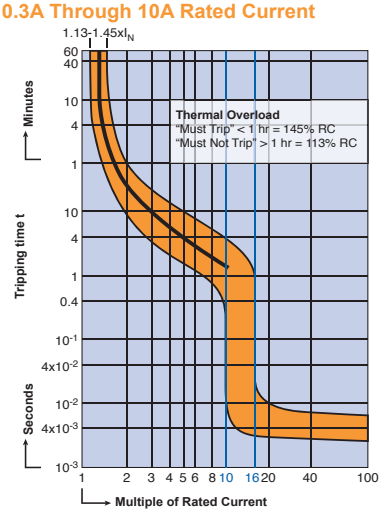


"C" Magnetic Trip Parameters
Rated current 0.3A to 63A.

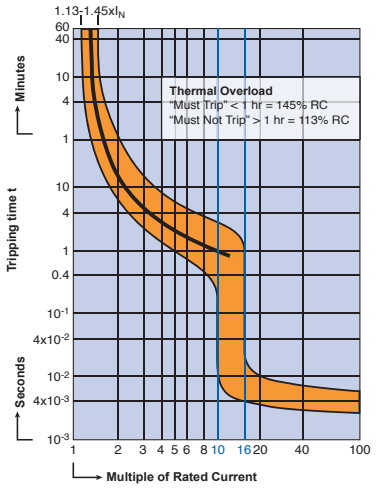
1. Hold for a minimum of 100ms at surge of 5 times rated current.
2. Trip in under 100ms at 10 times rated current.

D Trip Curve

V-EA-D Trip
0.3A Through 10A Rated Current



V-EA-D Trip
13A Through 63A Rated Current



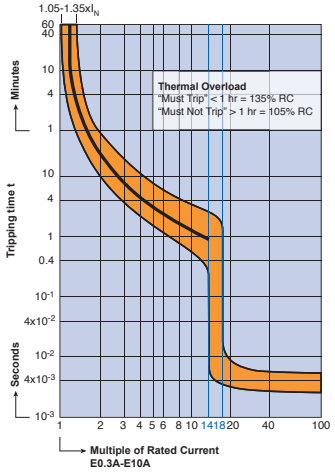
"D" Magnetic Trip Parameters
Rated current 0.3A to 63A.

1. Hold for a minimum of 100ms at surge of 10 times rated current.
2. Trip in under 100ms at 16 times rated current.

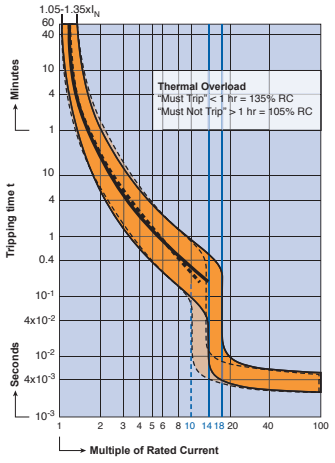
V-EA Trip Curves

E Trip Curve

V-EA-E Trip
0.3A Through 10A Rated Current



V-EA-E Trip
12A Through 60A Rated Current

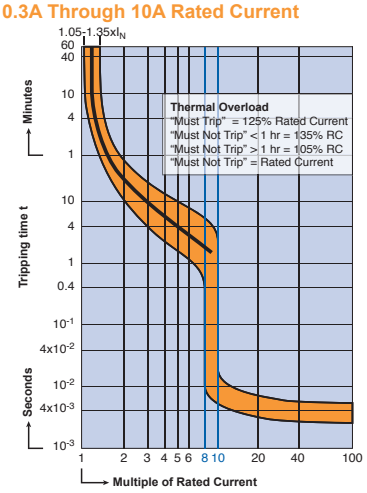


"E" Magnetic Trip Parameters
Rated Current, 0.3A to 50A, 60/63A (dotted line).

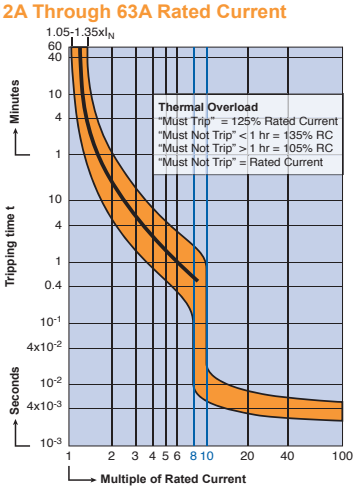
Magnetic Trip:
1. Hold for a minimum of 100ms at surge of 14 times (60A, 10 times) rated current.
2. Trip in under 100ms at 18 times (60A, 14 times) rated current.

G Trip Curve

V-EA-G Trip
0.3A Through 10A Rated Current



V-EA-G Trip
12A Through 63A Rated Current

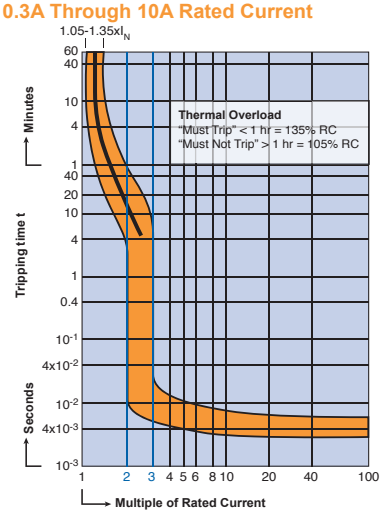


"G" Magnetic Trip Parameters
Rated Current, 0.3A to 63A.

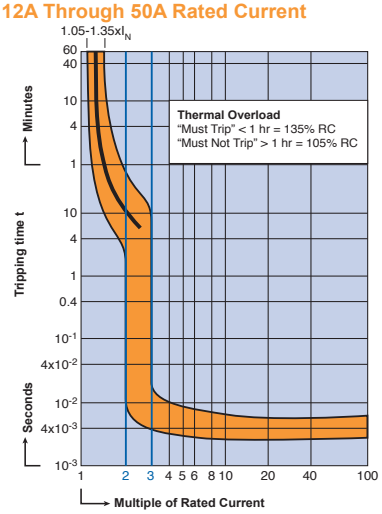
Magnetic Trip:
1. Hold for a minimum of 100ms at surge of 8 times rated current.
2. Trip in under 100ms at 10 times rated current.

Z Trip Curve

V-EA-Z Trip
0.3A Through 10A Rated Current



V-EA-Z Trip
12A Through 50A Rated Current



"Z" Trip Parameters
Rated Current, 0.3A to 50A.

Magnetic Trip:
1. Hold for a minimum of 100ms at 2 times rated current.
2. Trip in under 100ms at 3 times rated current.

Table HP 1: AMPERE RATINGS & HORSEPOWER RATING 1 PHASE

			FLA & LRC CONVERTED TO TABLE HORSEPOWER (SEE NOTE #2) USE FLA & LRC RATINGS WHERE NO HP RATING IS GIVEN					
			NOMINAL CIRCUIT VOLTAGE					
V-EA RATED CURRENT (SEE NOTE #1)	MOTOR NAMEPLATE FLA RATING	MOTOR NAMEPLATE STARTING/ LRC RATING	110-120 VAC	200 VAC	208 VAC	220-240 VAC	265 VAC	277 VAC
0.30A 0.50A 0.75A	0.30A 0.50A 0.75A	1.80A 3.00A 4.35A						
0.80A 1.0A 1.6A	0.80A 1.0A 1.6A	4.8A 6.0A 9.6A						
2.0A 2.5A 3.0A	2.0A 2.5A 3.0A	12.0A 15.0A 18.0A		1/6hp 1/6hp	1/6hp 1/6hp	1/6hp 1/6hp 1/4hp	1/6hp 1/6hp 1/4hp	1/6hp 1/4hp 1/3hp
3.5A 4.0A	3.5A 4.0A	21.0A 24.0A		1/4hp 1/4hp	1/4hp 1/3hp	1/4hp 1/3hp	1/3hp 1/3hp	1/3hp 1/3hp
5.0A 6.0A 8.0A	5.0A 6.0A 8.0A	30.0A 36.0A 48.0A	1/6hp 1/4hp 1/3hp	1/3hp 1/2hp 3/4hp	1/2hp 1/2hp 3/4hp	1/2hp 1/2hp 1hp	1/2hp 3/4hp 1hp	1/2hp 3/4hp 1hp
10.0A	10.0A	60.0A	1/2hp	1hp	1hp	1 1/2hp	1 1/2hp	2hp
12.0A 12.5A	12.0A 12.5A	72.0A 75.0A	1/2hp 1/2hp	1 1/2hp 1 1/2hp	1 1/2hp 1 1/2hp	2hp 2hp	2hp 2hp	2hp 2hp
13.0A 15.0A 16.0A	13.0A 15.0A 16.0A	78.0A 90.0A 96.0A	1/2hp 3/4hp 1hp	1 1/2hp 2hp 2hp	1 1/2hp 2hp 2hp	2hp 2hp 2hp	2hp 3hp 3hp	2hp 3hp 3hp
20.0A 25.0A	20.0A 25.0A	120.0A 150.0A	1 1/2hp 2hp	3hp 3hp	3hp 3hp	3hp 3hp	3hp 5hp	3hp 5hp
30.0A	30.0A	180.0A	2hp	3hp	3hp	5hp	5hp	5hp
32.0A	32.0A	192.0A	2hp	3hp	5hp	5hp	5hp	5hp
40.0A	40.0A	240.0A	3hp	5hp	7 1/2hp	7 1/2hp	7 1/2hp	7 1/2hp
50.0A 60.0A	50.0A 60.0A	300.0A 360.0A	3hp 5hp	7 1/2hp 10hp	10hp 10hp	10hp 10hp	10hp 10hp	10hp 15hp

NOTE #1: For AC motor circuit nameplate full load current, AC general-use loads, AC resistance loads, AC incandescent lamp (tungsten) loads, AC electric discharge lamp (ballast) loads.
NOTE #2: Conversions per UL508® Table 45.2 and NFPA-70: National Electrical Code® 2008 Tables 430-248 and 430-251(A).

Table HP 2: AMPERE RATING & HORSEPOWER RATING 3 PHASE & 2 PHASE - 4 WIRE

			FLA & LRC RATINGS CONVERTED TO TABLE HORSEPOWER (SEE NOTE #2) USE FLA & LRC RATINGS WHERE NO HP IS LISTED									
V-EA RATED CURRENT (SEE NOTE #1)	MOTOR NAMEPLATE FLA RATING	MOTOR NAMEPLATE STARTING/ LRC RATING	110-120 VAC		200 VAC		208 VAC		220-240 VAC (SEE NOTE #3)		440-480 VAC	
			Motor Design		Motor Design		Motor Design		Motor Design		Motor Design	
			B, C, D	E	B, C, D	E	B, C, D	E	B, C, D	E	B, C, D	E
0.30A 0.50A 0.75A	0.30A 0.50A 0.75A	3.0A 5.0A 7.5A										
0.80A 1.0A 1.6A	0.80A 1.0A 1.6A	8.0A 10.0A 16.0A									1/2hp	1/2hp
2.0A 2.5A 3.0A	2.0A 2.5A 3.0A	20.0A 25.0A 30.0A			1/2hp 1/2hp	1/2hp 1/2hp	1/2hp 1/2hp	1/2hp 1/2hp	1/2hp 1/2hp 1/2hp	1/2hp 1/2hp 1/2hp	3/4hp 1hp 1 1/2hp	3/4hp 1hp 1 1/2hp
3.5A 4.0A	3.5A 4.0A	35.0A 40.0A			1/2hp 3/4hp	1/2hp 3/4hp	3/4hp 3/4hp	3/4hp 3/4hp	3/4hp 3/4hp	3/4hp 3/4hp	2hp 2hp	2hp 2hp
5.0A 6.0A 8.0A	5.0A 6.0A 8.0A	42.0A 50.4A 67.2A	1/2hp 1/2hp 3/4hp	1/2hp 1/2hp 3/4hp	1hp 1hp 2hp	1hp 1hp 2hp	1hp 1hp 2hp	1hp 1hp 2hp	1hp 1 1/2hp 2hp	1hp 1 1/2hp 2hp	3hp 3hp 5hp	3hp 3hp 5hp
10.0A	10.0A	84.0A	1hp	1hp	2hp	2hp	2hp	2hp	3hp	3hp	5hp	5hp
12.0A 12.5A	12.0A 12.5A	100.8A 105.0A	1 1/2hp 1 1/2hp	1 1/2hp 1 1/2hp	3hp 3hp	3hp 3hp	3hp 3hp	3hp 3hp	3hp 3hp	3hp 3hp	7 1/2hp 7 1/2hp	7 1/2hp 7 1/2hp
13.0A 15.0A 16.0A	13.0A 15.0A 16.0A	109.2A 126.0A 134.4A	1 1/2hp 2hp 2hp	1 1/2hp 2hp 2hp	3hp 3hp 3hp	3hp 3hp 3hp	3hp 3hp 3hp	3hp 3hp 3hp	3hp 3hp 5hp	3hp 3hp 5hp	7 1/2hp 10hp 10hp	7 1/2hp 10hp 10hp
20.0A 25.0A	20.0A 25.0A	168.0A 210.0A	3hp 3hp	3hp 3hp	5hp 5hp	5hp 5hp	5hp 7 1/2hp	5hp 7 1/2hp	5hp 7 1/2hp	5hp 7 1/2hp	10hp 15hp	10hp 15hp
30.0A	30.0A	252.0A	5hp	5hp	5hp	5hp	7 1/2hp	7 1/2hp	10hp	10hp	20hp	20hp
32.0A	32.0A	268.8A	5hp	5hp	5hp	5hp	10hp	10hp	10hp	10hp	20hp	20hp
40.0A	40.0A	226.0A	5hp	5hp	10hp	7 1/2hp	10hp	7 1/2hp	10hp	10hp	30hp	20hp
50.0A 60.0A	50.0A 60.0A	282.5A 339.0A	7 1/2hp 10hp	7 1/2hp 10hp	15hp 15hp	10hp 10hp	15hp 20hp	10hp 10hp	15hp 20hp	10hp 15hp	30hp 40hp	25hp 30hp

NOTE #1: For AC motor circuit nameplate full load current, AC general-use loads, AC resistance loads, AC incandescent lamp (tungsten) loads, AC electric discharge lamp (ballast) loads.
NOTE #2: Conversions per UL508® proposed Tables 45.2 and 45.4 and NFPA-70: National Electrical Code® 2008 Tables 430-249, 430-250 and 430-251B).

V-EA INTERNAL RESISTANCE

Rated Current (Amp)	Trip Characteristic					
	B (Ohms)	C (Ohms)	D (Ohms)	E (Ohms)	G (Ohms)	Z (Ohms)
0.3	—	16.8620	16.8620	14.52000	16.8620	31.5060
0.5	—	6.8540	6.0009	5.92000	6.8540	10.2460
0.75/0.8	—	3.0540	3.0540	2.70000	3.0540	5.3920
1.0	—	1.7000	1.7560	1.48000	1.7560	2.6910
1.6	—	0.5870	0.5870	0.57400	0.5870	0.9440
2.0	—	0.4190	0.4190	0.40500	0.4190	0.8900
2.5	—	0.2950	0.2950	0.26900	0.2950	0.4290
3.0	—	0.2020	0.2020	0.18600	0.2020	0.3460
3.5	—	0.1390	0.1390	0.13900	0.1390	0.1790
4.0	—	0.1090	0.1090	0.10600	0.1090	0.1620
5.0	—	0.0654	0.0654	0.05900	0.0654	0.1050
6.0	0.0528	0.0528	0.0491	0.04600	0.0491	0.0823
8.0	—	0.0278	0.0240	0.03040	0.0333	0.0371
10	0.0216	0.0216	0.0187	0.02020	0.0211	0.0278
12/12.5	—	—	—	0.00724	0.0084	0.0151
13	0.0113	0.0084	0.0085	0.00724	0.0084	0.0151
15/16	0.0085	0.0085	0.0076	0.00731	0.0076	0.0114
20	0.0067	0.0067	0.0064	0.00582	0.0064	0.0075
25	0.0050	0.0050	0.0041	0.00411	0.0046	0.0050
30/32	0.0032	0.0032	0.0027	0.00272	0.0030	0.0032
40	0.0025	0.0025	0.0022	0.00212	0.0022	0.0022
50	0.0019	0.0019	0.0018	0.00184	0.0019	0.00195
60/63	0.0018	0.0018	0.0017	0.00172	0.00179	—

Resistances listed are “hot” values, as opposed to cold start values. Operating voltage drop across the V-EA and power loss per pole can be approximated with basic formulas:

$V_{DROP} = I_{OPERATING} \times R_{TABLE}$

$P_{LOSS\ P/P} = I^2_{OPERATING} \times R_{TABLE}$

Voltage drops should be reviewed when V-EAs with high internal resistance are used (e.g., load voltage minimums). Power loss should be reviewed when V-EAs with high rated currents are used (e.g., enclosure heating).

The listed V-EA internal resistance values should not be used in calculations of available short-circuit current downstream of the V-EA. The dynamic impedance of the V-EA under short-circuit conditions can vary significantly from internal resistance values in normal operation.

line current frequency effects on trip curves

Frequency Effects on Magnetic Trip Curves					
Trip Curve	Trip Zone At 16 2/3 - 60Hz (x RC)	Trip Zone At 100 Hz (x RC)	Trip Zone At 200 Hz (x RC)	Trip Zone At 400 Hz (x RC)	Trip Zone At DC (x RC)
Z	2 - 3	2.2 - 3.3	2.4 - 3.6	2.8 - 4.2	3.0 - 4.5
B	3 - 5	3.3 - 5.5	3.6 - 6.0	4.2 - 7.0	4.5 - 7.5
C	5 - 10	5.5 - 11.0	6.0 - 12	7.0 - 14.0	7.5 - 15.0
G	8 - 10	8.8 - 11.0	9.6 - 12.0	11.2 - 14.0	12.0 - 15.0
D	10 - 16	11.0 - 17.6	12.0 - 19.2	14.0 - 22.4	15.0 - 24.0
E	14 - 18	15.4 - 19.8	16.8 - 21.6	19.6 - 25.2	21.0 - 27.0

The thermal trip is not affected by the frequency of the line current. The magnetic trip is within the trip zone of the characteristic curve for frequencies from 16 2/3 to 60Hz. At lower and higher frequencies, the magnetic trip will be delayed longer than indicated by the characteristic curve, roughly as follows:

At 100Hz: Mag. Trip Current = 1.1 x curve current
At 200Hz: Mag. Trip Current = 1.2 x curve current
At 400Hz: Mag. Trip Current = 1.4 x curve current
At DC: Mag. Trip Current = 1.5 x curve current

For example, at 16 2/3 - 60 Hz the magnetic trip zone for the “G” characteristic is 8 to 10 times the rated current of the specific V-EA (i.e., hold for at least 100ms at 8 x RC, trip in less than 100ms at 10 x RC). With a 400Hz current, a magnetic trip at 10 x RC would be greatly delayed (thermal would likely trip first), as the magnetic trip zone is now 11.2 to 14 x RC. If a quicker magnetic trip is required with 400Hz, the “B” or “C” characteristic should be considered.

mechanical endurance ratings (on/off operations)

Application	2 x (1.15 x RC)	2 x RC	RC	No Load	Total
AC General Use	—	6000	—	4000	10000
AC Motor Starting Across the Line	1000	—	5000	4000	10000
AC Incandescent Lamps (Tungsten)	—	—	6000	4000	10000
AC Electrical Discharge Lamps (Ballast)	—	6000	—	4000	10000
AC Resistance	—	6000	—	4000	10000

Manufacturers self certification	20000 ON/OFF operations with no load