

MS-Series

CIRCUIT BREAKER

Designed and tested to operate flawlessly in the harshest of environments, the MS-Series sealed toggle circuit breaker is ideally suited for COTS (commercial off the shelf) military applications. Our space saving envelope meets IP68 requirements and features a durable metal and sealed mounting bushing with MIL-PRF-39019F ingress protection when mounted in a panel.

This class-leading, affordable circuit breaker was designed in accordance with the requirements of MIL-PRF-55629 and MIL STD 202, making it the best choice for those applications where shock, vibration, moisture resistance, salt spray and thermal shock are of the utmost consideration. The MS-Series' compact size and reliability make it ideal for crucial communication equipment and other mission critical components.

1-3 poles; 0.02-30 amps; 65VDC, 240VAC, 120/240VAC; UL, cUL recognized & TUV pending.



Eco-Friendly

Resources:

[Download 3D CAD Files](#)



[Watch Product Video](#)



Product Highlights:

- ♦ Sealed Toggle Actuator
- ♦ MIL-PRF-39019F Ingress Protection
- ♦ MIL-PRF-55629 and MIL STD 202 Compliant
- ♦ Compact Design

Typical Applications:

- ♦ COTS Military
 - Communication Equipment
- ♦ Off Highway Equipment
 - Construction, Mining & Agriculture
- ♦ Generators & Power Supplies
- ♦ Harsh Environment Applications



Carling Technologies™

Innovative Designs. Powerful Solutions.

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MS-Series

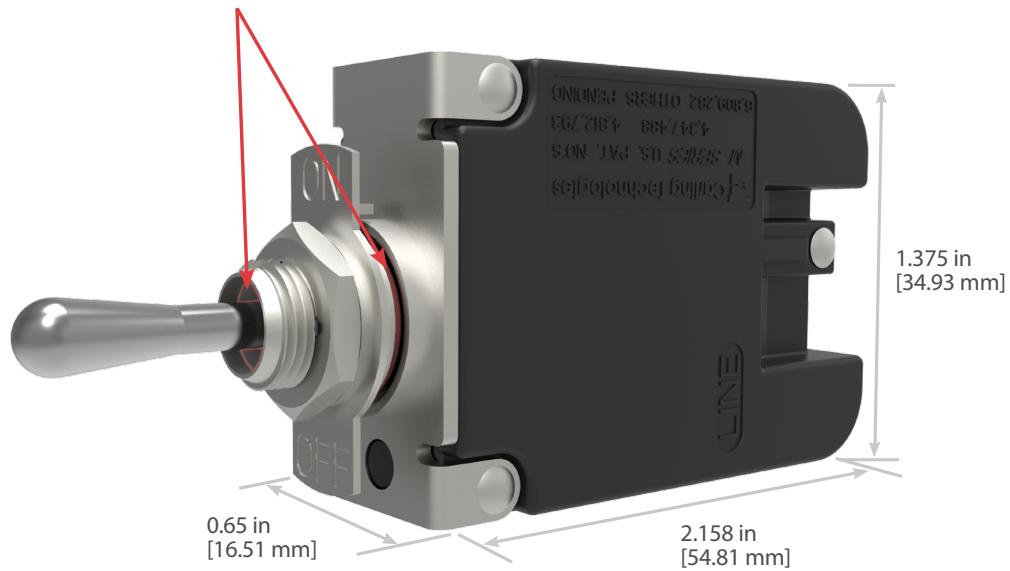
DESIGN FEATURES

SEALS

IP68 Designed and tested to comply with MIL-PRF-39019F Ingress Protection

COMPACT SIZE

Max performance in compact size: 0.20-30 Amps; 65 VDC, 240 VAC 120/240 VAC

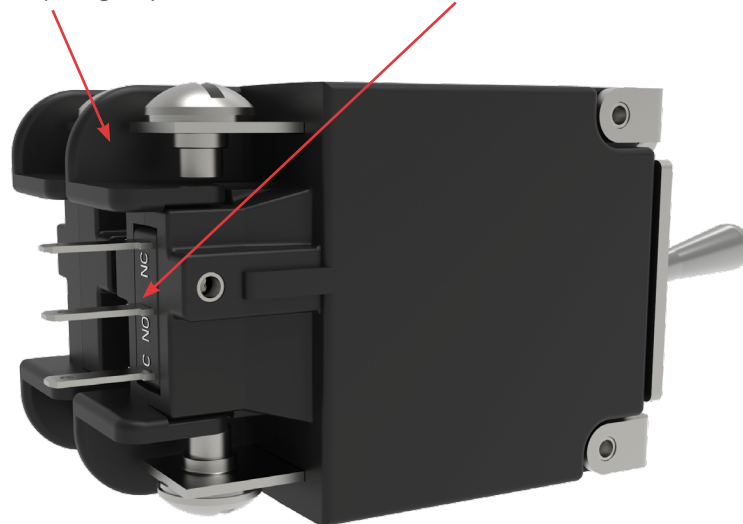


TERMINAL BARRIERS

Meet UL 1077 Spacing Requirements

OPTIONAL AUXILIARY SWITCH

Provides Breaker Status Indication



Electrical Tables

Table A: Lists UL & cUL Configuration & Performance Capabilities

| MS-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | |
|-------------------------------------------------------|------------|-----------|-------|----------------------|----------------|--------------------------------------------|-----|
| Circuit Configuration | Voltage | | | Current Rating | | Short Circuit Capacity (Amps) ¹ | |
| | Max Rating | Frequency | Phase | General Purpose Amps | Poles Breaking | UL / cUL | |
| | | | | | | U1 | U3 |
| Series | 65 | DC | --- | 0.02 - 30 | 1 | 3000 | 300 |
| | 240 | 50 / 60 | 1 | 0.02 - 30 | 1, 2 | 2000 | 300 |
| | 120 / 240 | 50 / 60 | 1 | 0.02 - 30 | 2 or 3 | 2000 | 300 |

Notes:

1 Short Circuit Current Rating (SC) Codes — The short-circuit current rating, followed by a letter and number designating the test conditions and any calibration following the short-circuit test as defined below:

U - Indicates that the short circuit test was performed without a series fuse

1 - Indicates that a re-calibration was not performed as part of the short circuit testing

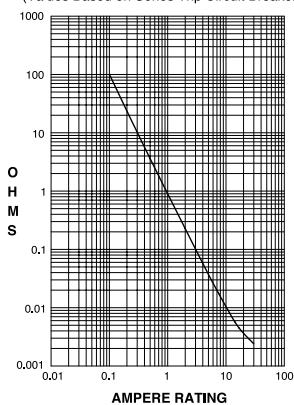
3 - Indicates that the protector has proven to be suitable for further use after the short circuit test

Re-calibration, dielectric strength and voltage withstand tests were performed after the short circuit testing

Electrical

| | |
|-------------------------|------------------------------------------------------------------------------------|
| Current Ratings | .02 - 30 Amps |
| Voltage Rating | 65VDC, 240VAC, 120/240VAC |
| Short Circuit Rating | See Table A |
| Auxiliary Switch Rating | 5A @ 125VAC, 3A @ 32VDC, .1A @ 125VAC, 32VDC |
| Dielectric Strength | UL,CSA 1500V, 50/60 Hz for one minute between all electrically isolated terminals. |
| Insulation Resistance | Minimum of 100 Megohms @ 500VDC |
| Time Delay | See delay curve |
| Impedance | |

RESISTANCE, IMPEDANCE VALUES
from Line to Load Terminals
(Values Based on Series Trip Circuit Breaker)



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.20 - 30.0 | 25% |

Physical

| | |
|-----------------|--------------------------------------|
| Number of Poles | 1-3 poles |
| Weight | Approximately 1.8 oz (50 G) per pole |
| Dimensions | See form & fit drawing |

Agency Certifications

UL Standard 1077



CUL Standard C22.2

*Manufacturer reserves the right to change product specification without prior notice.

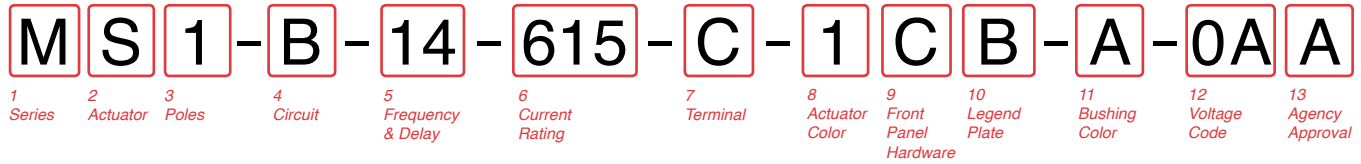
Mechanical

| | |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------|
| Current Ratings | 10,000 On-Off operations @ 6 per minute with rated current and voltage. |
| Trip Free | Trips on short circuit and overload, even when the actuator is forcibly held in the "On" position. |
| Trip Indication | The operating handle moves positively to the "Off" position when a short circuit or overload causes the circuit breaker to trip. |

Environmental

Designed in accordance with requirements of specification MIL PRF-55629 & MIL-STD-202G as follows:

| | |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shock | Withstands 100G's, 6ms, saw tooth while carrying rated current per Method 213, Condition I. Instantaneous curves tested at 80% of rated current. |
| Vibration | Withstands 0.060" excursion from 10-55 Hz, and 10G's 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous curves tested at 80% of rated current. |
| Salt Spray | Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs) |
| Moisture Resistance | Method 106G |
| Thermal Shock | Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C) |
| Operating Temperature | -40°C to +85°C |
| Ingress Protection Level | MIL-PRF-55629C when mounted in panel. |
| Other | Materials used in this product are non-nutrient to fungus growth. |



1 SERIES

M

2 ACTUATOR

S Sealed Toggle

3 POLES

1 One **2** Two **3** Three

4 CIRCUIT

A Switch Only (no coil)^{1,2}
B Series Trip (current)
M Series Trip (current) Aux switch .110 QC x 0.20 QC (silver contacts)
9 Series Trip (current) Aux switch .110 QC x 0.20 QC (gold contacts)

5 FREQUENCY & DELAY

| | |
|--------------------------------------------------|------------------------------------------------------|
| 03 DC, 50/60 Hz, Switch Only ¹ | 32 DC, 50/60 Hz Short |
| 10 DC, Instantaneous | 34 DC, 50/60 Hz Medium |
| 12 DC, Short | 62 50/60 Hz Short, Hi-Inrush ⁴ |
| 14 DC, Medium | 64 50/60 Hz Medium, Hi-Inrush ⁴ |
| 20 50/60 Hz Instantaneous | 72 DC, Short, High-Inrush ⁴ |
| 22 50/60 Hz Short | 74 DC, Medium, High-Inrush ⁴ |
| 24 50/60 Hz Medium | 92 DC, 50/60 Hz Short, Hi-Inrush ⁴ |
| 30 DC, 50/60 Hz Instantaneous | 94 DC, 50/60 Hz Medium, In-rush ⁴ |

6 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------------|---------|------------|-------|------------|-------|
| 220 | 0.200 | 295 | 0.950 | 460 | 6.00 |
| 225 | 0.250 | 410 | 1.00 | 465 | 6.50 |
| 230 | 0.300 | 512 | 1.25 | 470 | 7.00 |
| 235 | 0.350 | 415 | 1.50 | 475 | 7.50 |
| 240 | 0.400 | 517 | 1.75 | 480 | 8.00 |
| 245 | 0.450 | 420 | 2.00 | 485 | 8.50 |
| 250 | 0.500 | 522 | 2.25 | 490 | 9.00 |
| 255 | 0.550 | 425 | 2.50 | 495 | 9.50 |
| 260 | 0.600 | 527 | 2.75 | 610 | 10.00 |
| 265 | 0.650 | 430 | 3.00 | 710 | 10.50 |
| 270 | 0.700 | 435 | 3.50 | 611 | 11.00 |
| 275 | 0.750 | 440 | 4.00 | 711 | 11.50 |
| 280 | 0.800 | 445 | 4.50 | 612 | 12.00 |
| 285 | 0.850 | 450 | 5.00 | 712 | 12.50 |
| 290 | 0.900 | 455 | 5.50 | 613 | 13.00 |

Notes:

- ¹ Series code "A" only available with delay code "03"
- ² Only available when tied to a protected pole
- ³ Requires a 2 or 3 pole device
- ⁴ Only available without agency approvals (Approval Code A)

7 TERMINAL

1 Push-On 0.250 Tab (QC)
2 Screw 8-32 (Upturned Lugs)
3 Screw 8-32 (Bus Type)
C Screw Terminal M4 (Upturned Lugs)
E Screw Terminal M4 (Bus Type)
L Solder Lug

8 ACTUATOR & MARKING COLOR

1 Dull Metallic

9 FRONT PANEL HARDWARE

A No Outer Panel Hardware
B Hex Nut, Nickel Plated
C Hex Nut, Nickel Plated with Locking Ring
F Panel Dress Nut, Nickel Plated
G Panel Dress Nut, Nickel Plated with Locking Ring

10 LEGEND PLATE

A No Legend Plate
B On-Off Vertical
C On-Off Horizontal
D I-O Vertical
E I-O Horizontal
F Dual Vertical
G Dual Horizontal

11 BUSHING COLOR

A Nickel Plated / Multipole Version

12 VOLTAGE CODE

0A 65 VDC
0D 240 VAC
0C 120/240 VAC³
0N 65 VDC / 120/240 VAC³
17 65 VDC / 240 VAC

13 AGENCY APPROVAL

A Without approvals
B UL Recognized
C UL & cUL Recognized

Form & Fit



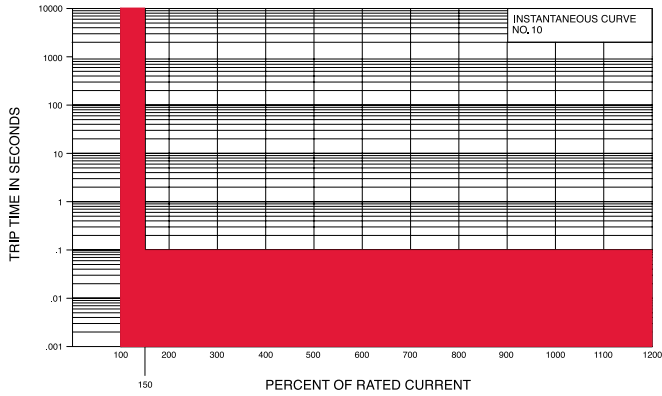
PANEL MOUNTING DETAIL
PANEL THICKNESS 0.125" TO 0.156"

- Notes:
 1 All dimensions are in inches [millimeters].
 2 Tolerance ±.020 [.51] unless otherwise specified.

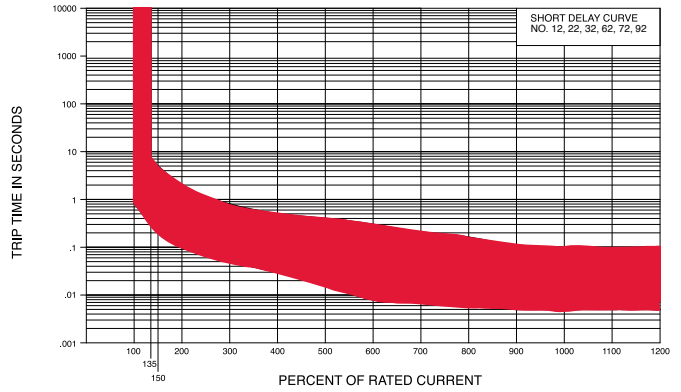
Delay Curve

Dual Rated AC/DC

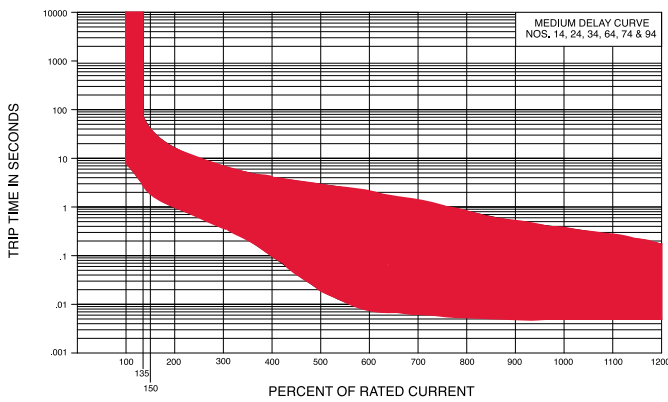
Instantaneous



Short

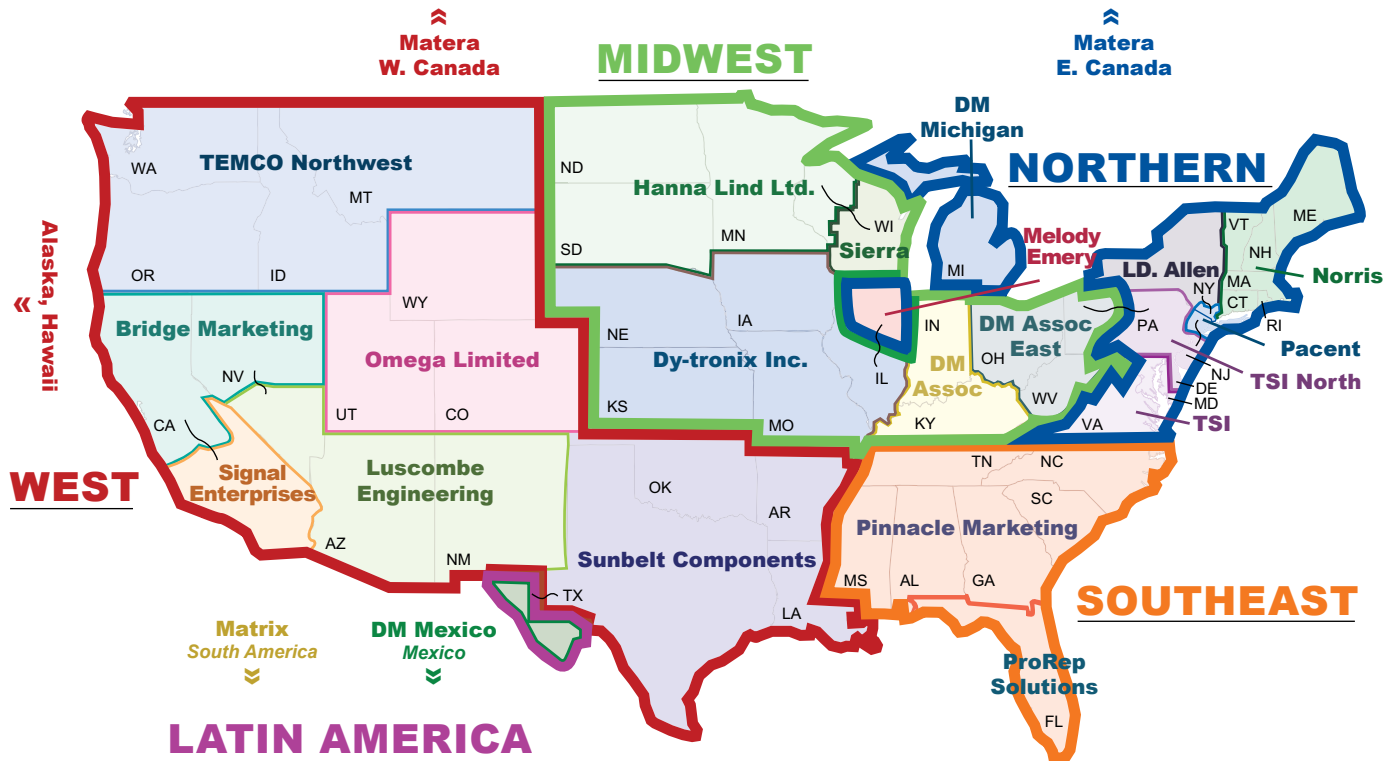


Medium



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