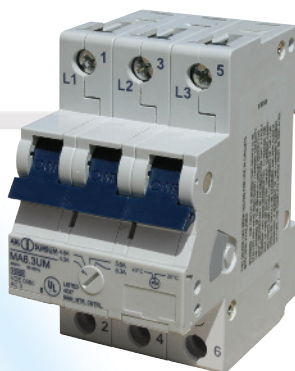


# MA- Series

## Three Phase Adjustable Trip Miniature Circuit Breakers/ Manual Motor Controllers



UL508 listed  
E137938



CAN/CSA-C22.2 No.14 certified



The MA was designed to handle the high inrush loads of 3 phase transformers, power supplies, motors, etc. The MA protects wiring and equipment from damage caused by the three major classes of over-current, yet greatly reduces the number of nuisance trips in high starting and inrush current circuits.

An IEC device with excellent ratings under a UL listing at 480Y/277V (including group ratings) and at 500V under international standards, the Altech/ABL Sursum MA provides short and long term cost effective circuit protection for USA and/or export applications. The short term advantages include: (1) adjustable thermal trip allows finalization of initial designs before procurement of the load equipment is complete; (2) snap-on mounting for readily available, internationally standardized DIN Rail saves panel layout design time as well as installation and change labor; (3) large cage-clamp terminals with screws suitable to power screwdrivers, simplifies and speeds wiring; (4) convenient switched disconnect during factory testing and/or initial start-up saves time and aggravation. The key long term advantage is customer satisfaction and proven over-current protection of wiring and equipment (and the lack of rework/repair costs).

### Type Designation

| MA                                 | 16                  | U                                                      | M                              |
|------------------------------------|---------------------|--------------------------------------------------------|--------------------------------|
| (a)                                | (b)                 | (c)                                                    | (d)                            |
| (a) = MA - Manual Motor Controller | (b) = Rated Current | (c) = U - US Housing<br>= R - US Housing + Ring Tongue | (d) = M - Part No. Designation |

|                                                                 |                                                 |
|-----------------------------------------------------------------|-------------------------------------------------|
| <b>Voltage Rating</b>                                           | 480Y/277V AC                                    |
| <b>AIC (Interrupt Capacity)</b>                                 | 0.16A-2.5A: 42kA; 4.0A-16A: 14kA; 20A-40A: 10kA |
| <b>Standard Short Circuit Withstand Rating (UL/CSA Ratings)</b> | 0.16A-2.5A: 42kA; 4.0A-16A: 14kA                |
| <b>Group Short Circuit Ratings (UL/CSA Ratings)</b>             | see above                                       |
| <b>Typical Life</b>                                             | 6000 on/off operations with 2xRC                |
| <b>Calibration Temperature</b>                                  | 25°C, +0°, -5° (77°F, +0° -9°)                  |
| <b>Standard Pack and Weight</b>                                 | 1/450g (1.0 lb.)                                |
| <b>Terminal Size Acceptability</b>                              | Top/Bottom: 18-3 AWG                            |
| <b>Terminal Torque (min/max)</b>                                | 2 Nm (17.7 lb.in.) / 2.5Nm (22.2 lb.in)         |

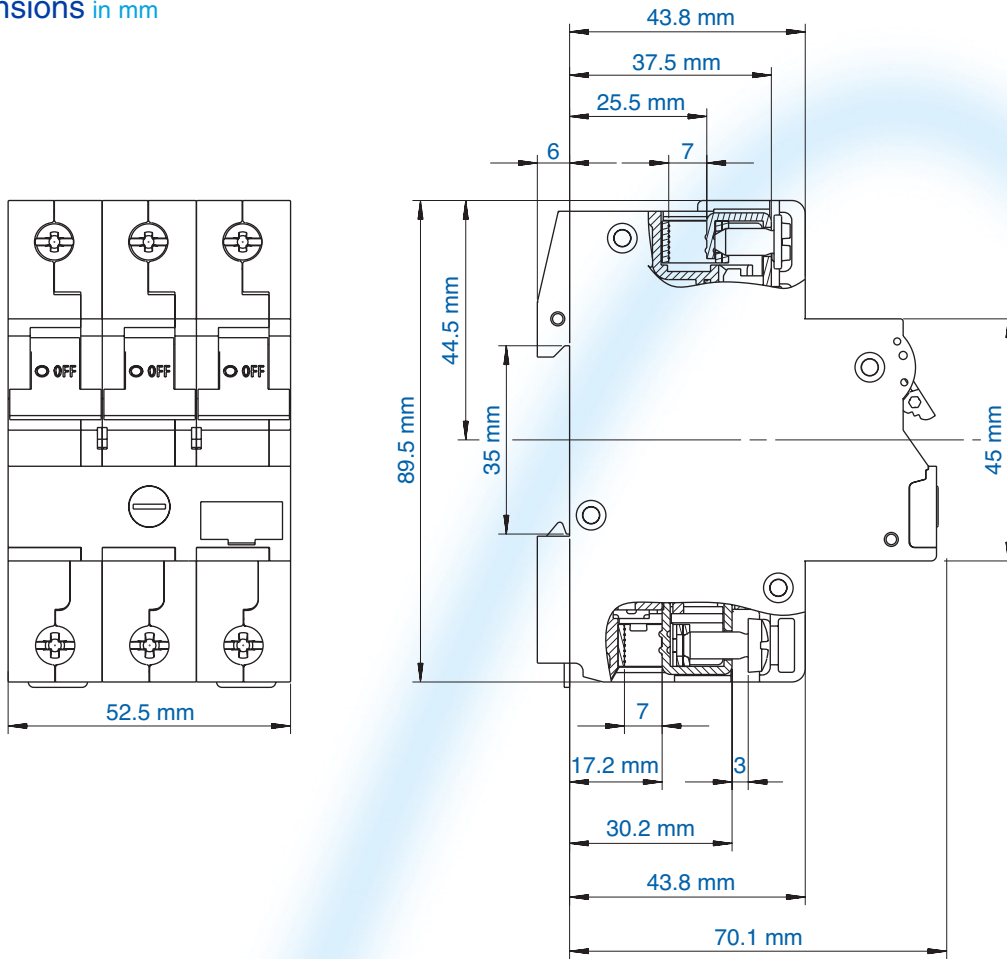
| Cat. No. | Rated Current | FLA Dial Adjustment Markings | GROUP SHORT CIRCUIT RATING AT 480VAC <sup>a</sup> (and BCP size) | 3Ø HORSEPOWER RATINGS AT NOMINAL LINE VOLTAGE (See Note for HEA Definition) |               |               |                   |                   |
|----------|---------------|------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------|---------------|-------------------|-------------------|
|          |               |                              |                                                                  | 110-120V HP (HEA)                                                           | 200V HP (HEA) | 208V HP (HEA) | 220-240V HP (HEA) | 460-480V HP (HEA) |
| MA016UM  | 0.16A         | 0.1/ 0.12/0.14/0.16          | 42kARMS symmetrical (max. 1200A MCCB or RK5)                     |                                                                             |               |               |                   |                   |
| MA025UM  | 0.25A         | 0.16/0.19/0.22/0.25          |                                                                  |                                                                             |               |               |                   |                   |
| MA040UM  | 0.40A         | 0.25/0.30/0.35/0.40          |                                                                  |                                                                             |               |               |                   |                   |
| MA063UM  | 0.63A         | 0.40/0.48/0.56/0.63          |                                                                  |                                                                             |               |               |                   |                   |
| MA1.0UM  | 1.0A          | 0.63/0.75/0.87/1.0           |                                                                  |                                                                             |               |               |                   |                   |
| MA1.6UM  | 1.6A          | 1.0/1.2/1.4/1.6              |                                                                  |                                                                             |               |               |                   |                   |
| MA2.5UM  | 2.5A          | 1.6/1.9/2.2/2.5              | 14kARMS symmetrical (max. 350A MCCB or RK5)                      |                                                                             |               |               |                   |                   |
| MA4.0UM  | 4.0A          | 2.5/3.0/3.5/4.0              |                                                                  | 1/2 (4.0)                                                                   | 3/4 (3.2)     | 3/4 (3.1)     | 1 (3.6)           | 2 (3.42)          |
| MA6.3UM  | 6.3A          | 4.0/4.8/5.6/6.3              |                                                                  | 3/4 (5.6)                                                                   | 1 1/2 (6.0)   | 1 1/2 (5.7)   | 1 1/2 (5.2)       | 3 (4.8)           |
| MA10UM   | 10A           | 6.3/7.5/8.7/10               |                                                                  | 1 (7.2)                                                                     | 2 (7.8)       | 2 (7.5)       | 3 (9.6)           | 5 (7.6)           |
| MA16UM   | 16A           | 10/12/14/16                  |                                                                  | 2 (13.6)                                                                    | 3 (11.0)      | 3 (10.6)      | 5 (15.2)          | 10 (14.0)         |
| MA20UM   | 20A           | 16/17/18.5/20                |                                                                  | 3 (19.2)                                                                    | 5 (17.5)      | 5 (16.7)      | 5 (15.2)          | 10 (14.0)         |
| MA25UM   | 25A           | 20/21.5/23/25                | 10kARMS symmetrical (max. 350A MCCB or RK5)                      | 3 (19.2)                                                                    | 5 (17.5)      | 7 1/2 (24.2)  | 7 1/2 (22.0)      | 15 (21.0)         |
| MA32UM   | 32A           | 25/27/30/32                  |                                                                  | 5 (30.4)                                                                    | 7 1/2 (25.0)  | 7 1/2 (24.2)  | 10 (28.0)         | 20 (27.0)         |
| MA40UM   | 40A           | 32/34/37/40                  |                                                                  | 5 (30.4)                                                                    | 10 (32.0)     | 10 (31.0)     | 10 (28.0)         | 25 (34.0)         |

Through MA2.5U, ampere rated for motor circuits having a full-load-ampere (FLA) not exceeding the MA's general purpose rated current (RC, equals maximum dial setting) and a locked rotor current not exceeding 6 times the MA's RC.

Note: **HEA - Horsepower Equivalent Amperes**, the nominal amperage assigned to standard motor horsepower ratings in design guide tables such as NFPA-70 Tables 430-248, 430-249, 430-250; UL1077 Table 16.2; CSA - C22.2 No. 235-M89 Tables 44 and 45; CSA-C22.2 No. 14-M91 Table 19, etc. Multiply HEA values (in parenthesis) by 1.1 if power factor is 90%, and by 1.2 if power factor is 80%.

<sup>a</sup> The standard-circuit short-circuit rating is 14kA for all types. Group ratings can be used in a standard circuit (e.g., MA1.0U at 42kA), but a higher standard rating cannot be used in a group circuit (e.g., MA40U at 14kA only in standard circuit.)

Dimensions in mm



**MA- Series Trip Curves**



MA/USA Manual Motor Controller



## Auxiliary Contact, Alarm Switch

| Type/ Cat No. | Description                   | Contacts Type      | Std Pk |
|---------------|-------------------------------|--------------------|--------|
| H10UM         | 1 Auxiliary Contact           | 1NO                | 6      |
| H11UM         | 2 Auxiliary Contacts          | 1NO + 1NC          | 6      |
| H12UM         | 3 Auxiliary Contacts          | 1NO + 2NC          | 6      |
| H21UM         | 3 Auxiliary Contacts          | 2NO + 1NC          | 6      |
| HLS11M*       | 1 Auxiliary/1 Signal Contacts | 1CO + 1CO (Signal) | 6      |

### Rated Operating Currents

10A@240V AC  
3A@110V AC  
1A@220V AC

### Minimum Contact Load

1mA @ 24V DC

### Torque

max. 0.8Nm (7 lb.in)

### Wire Range:

#### Single Wire

1.0mm<sup>2</sup> - 2.5mm<sup>2</sup> (18-14 AWG)

#### Stranded Wire

1.0mm<sup>2</sup> - 1.5mm<sup>2</sup> (18-16 AWG)

#### Stranded Wire with Ferrule

1.0mm<sup>2</sup> - 1.5mm<sup>2</sup> (18-16 AWG)



## Shunt Trip

| Type/ Cat No. | Description               | Max. Operating Current @ Un                 | Std Pk |
|---------------|---------------------------|---------------------------------------------|--------|
| FA12UM        | 12V AC/DC                 | 1.3A                                        | 5      |
| FA24UM        | 24V AC/DC                 | 0.6A                                        | 5      |
| FA48UM        | 48 - 72V AC/DC            | 0.2A                                        | 5      |
| FA110UM       | 110 - 240V AC/DC, 277V AC | 0.25A @ 110V<br>0.5A @ 240V<br>0.58A @ 277V | 5      |



## Undervoltage Trip\*

| Type/ Cat No. | Line Voltage V <sub>E</sub> | Std Pk |
|---------------|-----------------------------|--------|
| UA120UM       | 120V AC, 60Hz               | 5      |

Reset-Hold Voltage = 0.85 x V<sub>E</sub>  
Drop-Out Voltage = 0.35 ~ 0.7 x V<sub>E</sub>  
V<sub>E</sub> = Rated Voltage



## Neutral Pole

| Type/ Cat No. | Rated Current In | Rated Voltage | Std Pk |
|---------------|------------------|---------------|--------|
| N63UM         | 0.3 - 63A        | 480Y/277V AC  | 6      |

## Touch Protection Caps

to cover the terminal screw holes on the switching devices, neutral Poles and shunt trips for increased touch protection.



| Type/ Cat No. | Std Pk |
|---------------|--------|
| BS.UL         | 100    |

## Mounting Screw 34mm

to connect the auxiliary contact and shunt trip or neutral Pole to the circuit breaker.



| Type/ Cat No. | Std Pk |
|---------------|--------|
| E983419       | 10     |



## Lock-out Adapter

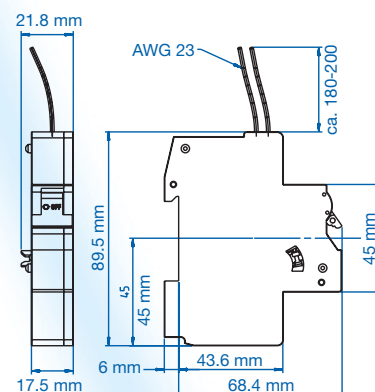
| Type/ Cat No. | Std Pk |
|---------------|--------|
| EASS          | 10     |



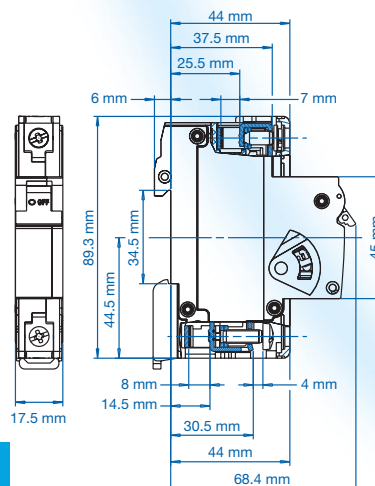
Dimensions HxxUM.



Dimensions HLS11M.



Dimensions UA120UM.



Dimensions N63UM, FxaxxUM.

\* UL Pending



**Cooling Spacer**  
**Cat. No. 15.960**

## TEMPERATURE CORRECTION CURVE

Ambient Temperature and Adjacent Mounting/Loading Adjustment

(V-EA/MA Ambient Temperature - 25°C to 55°C, Storage Temperature -40°C to 70°C)



\* V-EA and MA can also be locked in the on and off position by simply using a common lead or meter seal, which gets fed through the hole in the handle and a corresponding hole in the housing.

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