

Beyond X™

# Metasol
# Manual Motor Starters




LS ELECTRIC

# Metasol Meta Solution

# MANUAL MOTOR STARTERS

**LS ELECTRIC Manual Motor Starters (MMS) ensure safe operations through improved short circuit performance with added value through robust trip function and enhanced quality serving as a new motor protection solution!**

## The products offer reliable performance, superior durability and global competitiveness.

MMS provides high performance for short circuit, overload and phase failure protection with high durability to keep your system and load devices safe.
The global products have passed IEC and UL specifications and have been verified for their excellence.




MMS-32D MMS-32S MMS-32H MMS-63S



MMS-100H



## Certification

• IEC60947 / UL508 / K 60947 / GB 14048

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# New Performance

LS ELECTRIC Manual Motor Starters (MMS) serves as motor protection
with high performance and reliability.
The products feature better technology and reliability than existing Meta-MEC MMS
units due to existing overload and phase failure protection functions,
upgraded short-circuit capabilities and quality.
User conditions are met for safe operation in accordance with IEC and UL standards.




## Metasol
## Manual Motor Starters

### Enhanced trip function
- New application of MMS-32/63 trip indicator enhances the visibility of trip

### Reinforced product reliability
- Reinforced breaking reliability compared to existing Meta-MEC MMS

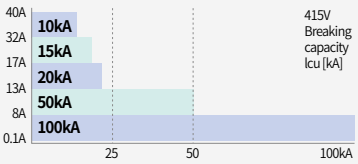
### Compatibility and design differentiation
- Same external dimensions as Meta-MEC MMS
- Consistency with Metasol MC by changing color

### 32AF

**0.1~0.16... 28~40A (17 Step)**

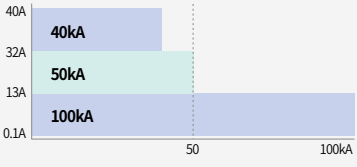


**MMS-32S**
- Standard






**MMS-32H**
**MMS-32HI**
- High break
- Magnetic release



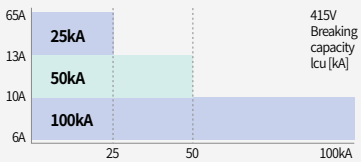



## 63AF

### 6~10... 47~65A (10 Step)

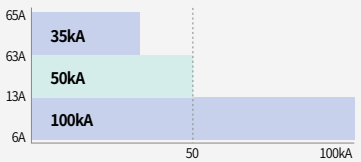


**MMS-63S**
- Standard






**MMS-63H**
**MMS-63HI**
- High break
- Magnetic release

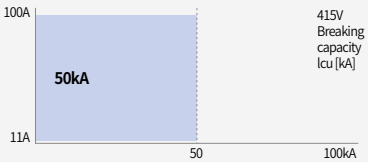



## 100AF

### 11~17... 80~100A (10 Step)



**MMS-100S**
- Standard






**MMS-100H**
**MMS-100HI**
- High break
- Magnetic release



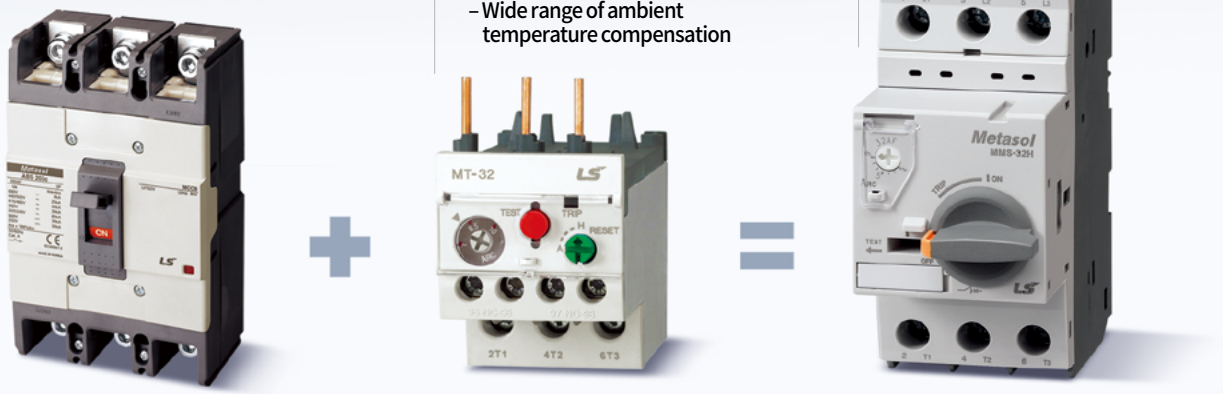
# Multi-functional and Compact Size

MMS combines the functions of MCCB and TOR. The products feature simple and easy wiring capable of supporting reduced panel size. Compact designs are available up to 100 kA breaking capacity to meet various system protection requirements.

**MCCB function**
- Over load protection
- Short protection

**TOR function**
- Protection function
  - Over load protection
  - Phase failure protection
- Other function
  - Current modification
  - Wide range of ambient temperature compensation

**MMS**
(Manual Motor Starter)




## Variety of performance




| Function | Notes |
|---|---|
| Miniaturization | Panel size can be reduced to 50% or less |
| High breaking capacity | 32AF : 50~100kA (Previous 10kA) |
| Various protection features | Over load, Short circuit, Phase failure protection |
| Current modification | ±20% |
| Temperature used | -20°C~+60°C |
| Standard | IEC (60947-1, 2, 4), UL508 (Type E), GB 14048 |
| Size | MMS-32D follows DIN 43880 standards. |

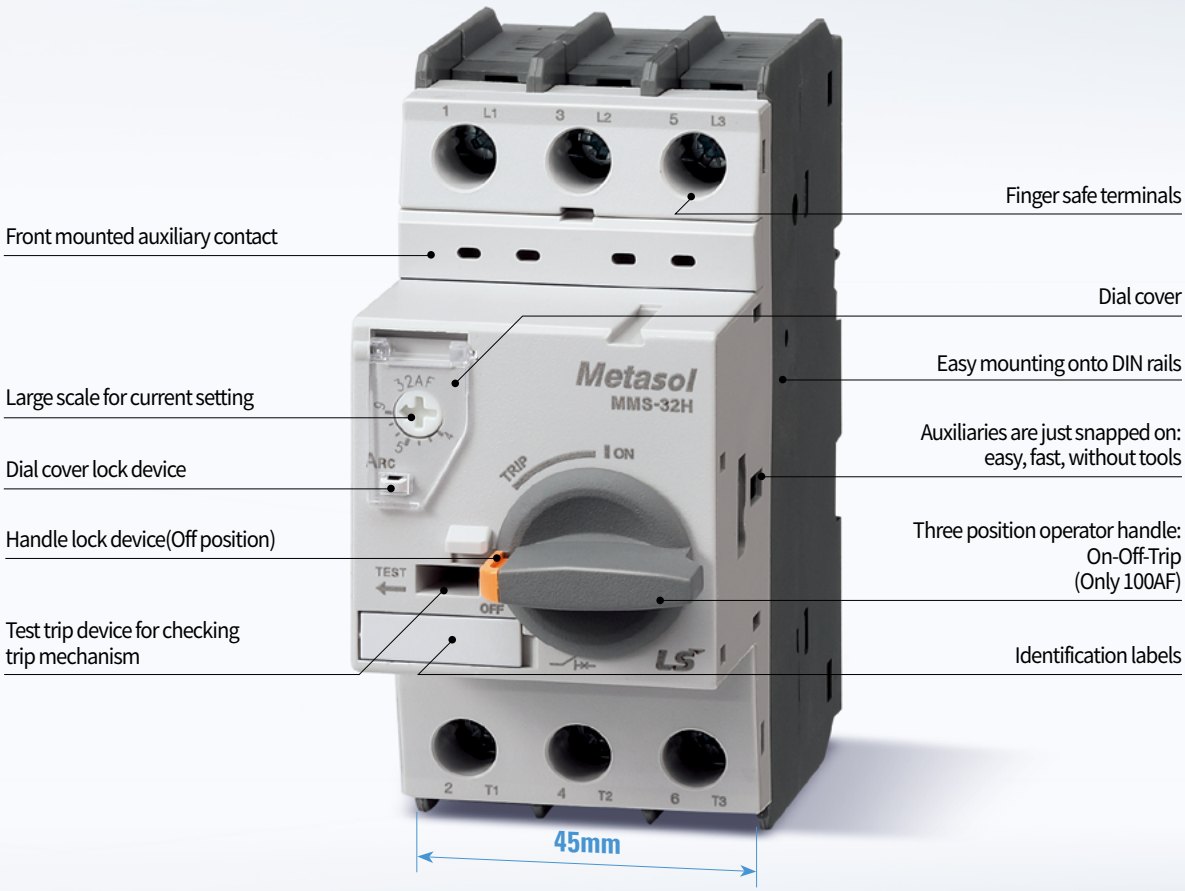



## Feature

- 5mm width (32AF), 55mm width (63AF), 70mm width (100AF)
- Three position operator : On-Off-Trip (Only 100AF)
- Complete range of common accessories
- Handle lock in the Off position
- Class 10 overload trip characteristics
- Trip test
- Finger safe terminal
- Din rail and screw mounting
- Ready for IE3

# External appearance

## MMS 32H... 40A [Scale 1:1]




### Handle lock



### Dial cover



### Terminals



MMS-32 (Screw)



MMS-63 (Lug)

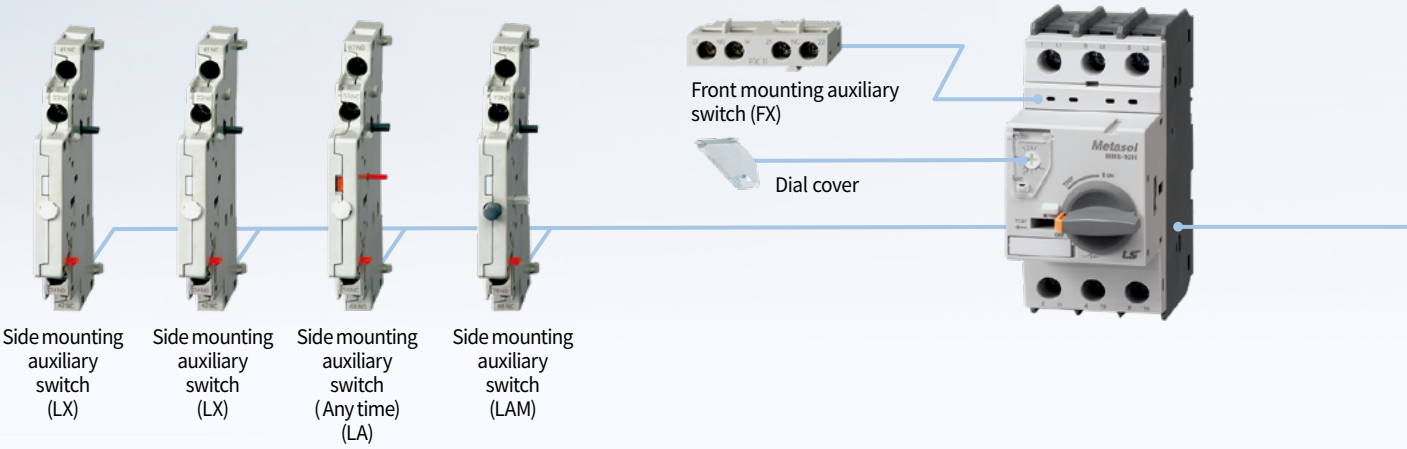


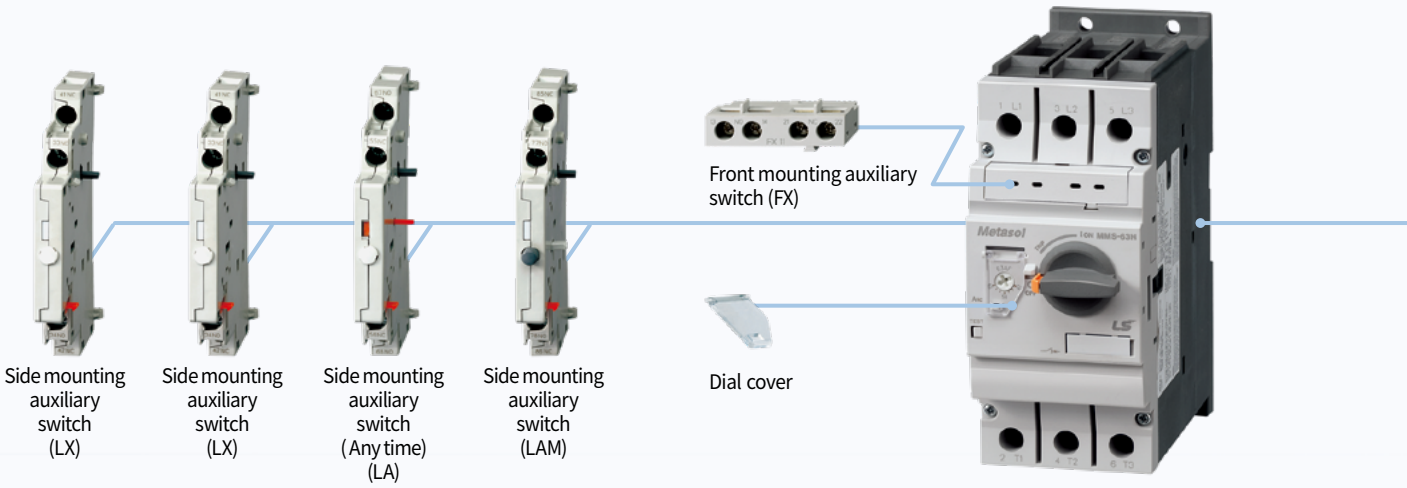
MMS-100 (Lug)

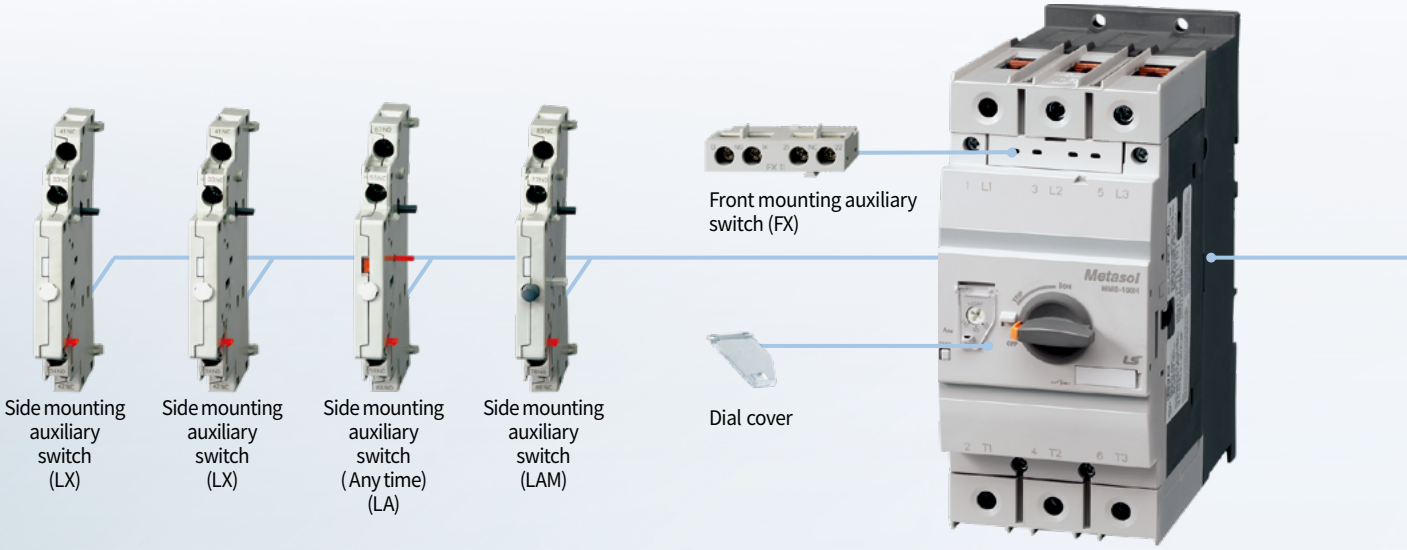
Note) For 32AF products, the O-ring is available as a separate item; for products 63AF and above, O-ring fastening is possible with the standard lug type.

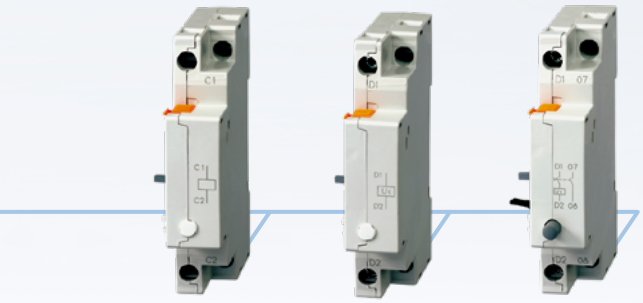
# Convenience

## Various accessories, common up to 100AF



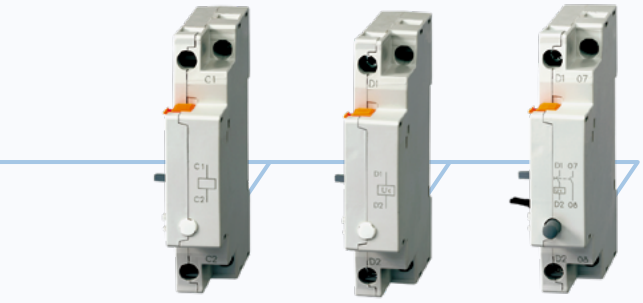





Side mounting shunt release (RS)

Side mounting undervoltage release (RU)

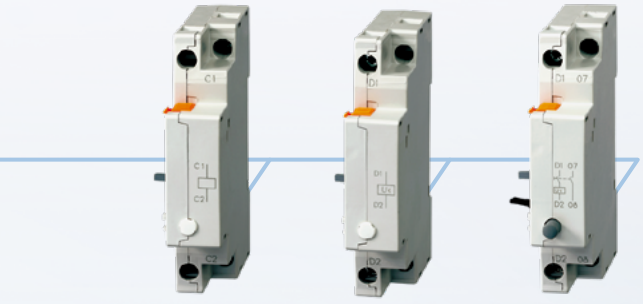
Side mounting undervoltage release with switch (RUX)



Side mounting shunt release (RS)

Side mounting undervoltage release (RU)

Side mounting undervoltage release with switch (RUX)



Side mounting shunt release (RS)

Side mounting undervoltage release (RU)

Side mounting undervoltage release with switch (RUX)

## Direct adaptor
Mini-MC




Mini-MC (9~16A)

## Direct adaptor
Metasol Susol-MC



Metasol : MC-6a~100a
Susol : MC-9~95

Note:
1. Refer to page 20 for installation of accessories.
2. LX, LA, and LAM are left attachment accessories and RS, RU, and RUX are right attachment accessories.
3. Mini-MC and Metasol/Susol MC can be connected directly to MMS. (Refer to page 20 for details of DA connectors)
4. RUX : Not available with MMS-32S.

# Product Selection Guide





Terminal cover detachable type



Terminal cover detachable type

| Frame | | 32AF | | |
|---|---|---|---|---|
| Type | Current adjustable type | MMS-32D | MMS-32S | MMS-32H |
| | Instantaneous type | - | - | MMS-32HI |
| Breaking capacity | | | Standard | High breaking |
| Handle type | | Button | Toggle | Rotary |
| Number of poles | | 3 | 3 | 3 |
| Rated operational voltage (Ue) | | AC 400/415V | Up to 690V | Up to 690V |
| Rated frequency | | 50/60Hz | 50/60 Hz | 50/60 Hz |
| Rated insulation voltage (Ui) | | 690V | 690V | 690V |
| Rated impulse voltage (Uimp) | | 6kV | 6kV | 6kV |
| Utilization category | IEC 60 947-2 (Breaker) | Cat. A | Cat. A | Cat. A |
| | IEC 60 947-4 (Motor starter) | AC 3 | AC 3 | AC 3 |
| Mechanical endurance (Operating) | | 100,000 | 100,000 | 100,000 |
| Electrical endurance (Cycles) | | 100,000 | 100,000 | 100,000 |
| Max operating frequency per hour (Ope./h) | | 25 | 25 | 25 |
| Temperature compensation (Operation) | | -5 ~ +40°C | -20 ~ +60°C | -20 ~ +60°C |
| Instantaneous short circuit release | | 14.4 X Ie max. | 13 × Ie max. | 13 × Ie max. |
| Overload protection | | ○ | ○ | MMS-32H(○), MMS-32HI(×) |
| Phase failure function | | ○ | ○ | MMS-32H(○), MMS-32HI(×) |
| Trip indicating function | | × | × | ○ |
| Test function | | ○ | ○ | ○ |
| Certification | | CE, CCC | CE, CCC, UL, EAC, Marine, KC | |
| Weight (g) | | 285 | 320 | 360 |

| Rated operational current (Ie) /(MMS-32D) | Thermal release adjustment range (Ie) /(MMS-32D) | 415V 400V | | 240V 230V 220V | | 415V 400V | | 460V 440V | | 525V 500V | | 690V 600V | | 240V 230V 220V | | 415V 400V | | 460V 440V | | 525V 500V | | 690V 600V | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics |
| 0.16 | 0.1~0.16 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 0.25 | 0.16~0.25 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 0.4 | 0.25~0.4 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 0.63 | 0.4~0.63 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1 | 0.63~1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1.6 | 1~1.6 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 3 | 3 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 2.5 | 1.6~2.5 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 38 | 3 | 3 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 8 | 8 |
| 4 | 2.5~4 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 38 | 15 | 11 | 3 | 3 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 8 | 8 |
| 6/(6.3) | 4~6/(4~6.3) | 100 | 100 | 100 | 100 | 100 | 100 | 15 | 11 | 10 | 8 | 3 | 3 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 6 | 6 |
| 8 | 5~8 | - | - | 100 | 100 | 100 | 100 | 15 | 11 | 10 | 8 | 3 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 50 | 38 | 6 | 6 |
| 10 | 6~10 | 100 | 100 | 100 | 100 | 50 | 38 | 15 | 11 | 6 | 5 | 3 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 50 | 38 | 6 | 6 |
| 13/(14) | 9~13/(9~14) | 15 | 7.5 | 100 | 100 | 50 | 38 | 10 | 8 | 6 | 5 | 3 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 42 | 32 | 6 | 6 |
| 17/(18) | 11~17/(13~18) | 15 | 7.5 | 50 | 38 | 20 | 15 | 10 | 8 | 6 | 5 | 3 | 3 | 100 | 100 | 50 | 38 | 25 | 15 | 10 | 8 | 4 | 4 |
| 22/(23) | 14~22/(17~23) | 15 | 6 | 40 | 30 | 15 | 11 | 8 | 6 | 6 | 5 | 3 | 3 | 100 | 100 | 50 | 38 | 25 | 15 | 10 | 8 | 4 | 4 |
| 26/(25) | 18~26/(20~25) | 15 | 6 | 40 | 30 | 15 | 11 | 8 | 6 | 5 | 4 | 3 | 3 | 100 | 100 | 50 | 38 | 25 | 15 | 10 | 8 | 4 | 4 |
| 32 | 22~32/(24~32) | 10 | 6 | 30 | 22 | 15 | 11 | 6 | 4 | 5 | 4 | 3 | 3 | 100 | 100 | 50 | 38 | 25 | 15 | 10 | 8 | 4 | 4 |
| 40 | 28~40 | - | - | 20 | 15 | 10 | 8 | 5 | 3 | 4 | 3 | 2 | 2 | 100 | 100 | 40 | 30 | 15 | 11 | 8 | 6 | 3 | 3 |
| 50 | 34~50 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 63 | 45~63 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 65 | 47~65 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 75 | 55~75 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 90 | 70~90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 100 | 80~100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Rated breaking capacity (kA)

Note: Safety certification is obtained based on 220V and 460V.

Note: There is no current adjustment range for HI products (refer to page 15 for model and rating).





| Frame | | 63AF | |
|---|---|---|---|
| Type | Current adjustable type | MMS-63S | MMS-63H |
| | Instantaneous type | - | MMS-63HI |
| Breaking capacity | | Standard | High breaking |
| Handle type | | Rotary | Rotary |
| Number of poles | | 3 | 3 |
| Rated operational voltage (Ue) | | Up to 690V | Up to 690V |
| Rated frequency | | 50/60 Hz | 50/60 Hz |
| Rated insulation voltage (Ui) | | 1000V | 1000V |
| Rated impulse voltage (Uimp) | | 8kV | 8kV |
| Utilization category | IEC 60 947-2 (Breaker) | Cat. A | Cat. A |
| | IEC 60 947-4 (Motor starter) | AC 3 | AC 3 |
| Mechanical endurance (Operating) | | 50,000 | 50,000 |
| Electrical endurance (Cycles) | | 25,000 | 25,000 |
| Max operating frequency per hour (Ope./h) | | 25 | 25 |
| Temperature compensation (Operation) | | -20 ~ +60°C | -20 ~ +60°C |
| Instantaneous short circuit release | | 13 × Ie max. | 13 × Ie max |
| Overload protection | | ○ | MMS-32H(○), MMS-32HI(×) |
| Phase failure function | | ○ | MMS-32H(○), MMS-32HI(×) |
| Trip indicating function | | ○ | ○ |
| Test function | | ○ | ○ |
| Certification | | CE, CCC, UL, EAC, Marine, KC | |
| Weight (g) | | 1,000 | |

| | Rated operational current (Ie) /(MMS-32D) | Thermal release adjustment range (Ie) /(MMS-32D) | 240V 230V 220V | | 415V 400V | | 460V 440V | | 252V 500V | | 690V 600V | | 240V 230V 220V | | 415V 400V | | 460V 440V | | 525V 500V | | 690V 600V | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | cu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics |
| Rated breaking capacity (kA) | 0.16 | 0.1~0.16 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 0.25 | 0.16~0.25 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 0.4 | 0.25~0.4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 0.63 | 0.4~0.63 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1 | 0.63~1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1.6 | 1~1.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2.5 | 1.6~2.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4 | 2.5~4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/(6.3) | 4~6/(4~6.3) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8 | 5~8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10 | 6~10 | 100 | 100 | 100 | 100 | 15 | 12 | 10 | 8 | 4 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 50 | 38 | 6 | 5 |
| | 13/(14) | 9~13/(9~14) | 100 | 100 | 50 | 38 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 42 | 32 | 6 | 5 |
| | 17/(18) | 11~17/(13~18) | 100 | 100 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 50 | 38 | 12 | 9 | 5 | 5 |
| | 22/(23) | 14~22/(17~23) | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 50 | 38 | 12 | 9 | 5 | 5 |
| | 26/(25) | 18~26/(20~25) | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 12 | 9 | 5 | 5 |
| | 32 | 22~32/(24~32) | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 |
| | 40 | 28~40 | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 |
| | 50 | 34~50 | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 |
| | 63 | 45~63 | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 27 | 8 | 5 | 5 |
| | 65 | 47~65 | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 75 | 50 | 35 | 27 | 25 | 19 | 6 | 5 | 3 | 3 |
| | 75 | 55~75 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 90 | 70~90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 100 | 80~100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note) Safety certification is obtained based on 220V and 460V.

Note) There is no current adjustment range for HI products. (Refer to page 15 for Model and Rating)

# Product Selection Guide





| Frame | | 100AF | |
|---|---|---|---|
| Type | Current adjustable type | MMS-100S | MMS-100H |
| | Instantaneous type | - | MMS-100HI |
| Breaking capacity | | Standard | High breaking |
| Handle type | | Rotary | Rotary |
| Number of poles | | 3 | 3 |
| Rated operational voltage (Ue) | | Up to 690V | Up to 690V |
| Rated frequency | | 50/60 Hz | 50/60 Hz |
| Rated insulation voltage (Ui) | | 1000V | 1000V |
| Rated impulse voltage (Uimp) | | 8kV | 8kV |
| Utilization category | IEC 60 947-2 (Breaker) | Cat. A | Cat. A |
| | IEC 60 947-4 (Motor starter) | AC 3 | AC 3 |
| Mechanical endurance (Operating) | | 50,000 | 50,000 |
| Electrical endurance (Cycles) | | 25,000 | 25,000 |
| Max operating frequency per hour (Ope./h) | | 25 | 25 |
| Temperature compensation (Operation) | | -20 ~ +60°C | -20 ~ +60°C |
| Instantaneous short circuit release | | 13 × Ie max. | 13 × Ie max. |
| Overload protection | | ○ | MMS-32H(○), MMS-32HI(×) |
| Phase failure function | | ○ | MMS-32H(○), MMS-32HI(×) |
| Trip indicating function | | ○ | ○ |
| Test function | | ○ | ○ |
| Certification | | | |
| Weight (g) | | 2,200 | |

| Rated operational current (Ie) /(MMS-32D) | Thermal release adjustment range (Ie) /(MMS-32D) | 240V 230V 220V | | 415V 400V | | 460V 440V | | 525V 500V | | 690V 600V | | 240V 230V 220V | | 415V 400V | | 460V 440V | | 525V 500V | | 690V 600V | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics |
| 0.16 | 0.1~0.16 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.25 | 0.16~0.25 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.4 | 0.25~0.4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.63 | 0.4~0.63 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1 | 0.63~1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.6 | 1~1.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2.5 | 1.6~2.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | 2.5~4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6/(6.3) | 4~6/(4~6.3) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | 5~8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 10 | 6~10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13/(14) | 9~13/(9~14) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 17/(18) | 11~17/(13~18) | 100 | 100 | 50 | 38 | 40 | 30 | 25 | 19 | 10 | 8 | 100 | 100 | 100 | 100 | 50 | 38 | 35 | 27 | 12 | 9 |
| 22/(23) | 14~22/(17~23) | 100 | 100 | 50 | 38 | 40 | 30 | 25 | 19 | 10 | 8 | 100 | 100 | 100 | 50 | 50 | 38 | 35 | 27 | 12 | 9 |
| 26/(25) | 18~26/(20~25) | 100 | 100 | 50 | 38 | 40 | 30 | 25 | 19 | 10 | 8 | 100 | 100 | 100 | 50 | 50 | 38 | 35 | 27 | 12 | 9 |
| 32 | 22~32/(24~32) | 100 | 100 | 50 | 38 | 40 | 30 | 15 | 11 | 10 | 8 | 100 | 100 | 100 | 50 | 50 | 38 | 25 | 19 | 12 | 9 |
| 40 | 28~40 | 100 | 100 | 50 | 38 | 40 | 30 | 15 | 11 | 6 | 5 | 100 | 100 | 100 | 50 | 50 | 38 | 20 | 15 | 12 | 9 |
| 50 | 34~50 | 100 | 100 | 50 | 38 | 40 | 30 | 12 | 9 | 6 | 5 | 100 | 100 | 100 | 50 | 50 | 38 | 15 | 11 | 10 | 8 |
| 63 | 45~63 | 100 | 100 | 50 | 38 | 40 | 30 | 12 | 9 | 6 | 5 | 100 | 100 | 100 | 50 | 50 | 38 | 15 | 11 | 8 | 6 |
| 65 | 47~65 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 75 | 55~75 | 100 | 100 | 50 | 38 | 40 | 30 | 8 | 6 | 5 | 4 | 100 | 100 | 75 | 50 | 50 | 38 | 12 | 9 | 6 | 6 |
| 90 | 70~90 | 100 | 100 | 50 | 38 | 40 | 30 | 8 | 6 | 5 | 4 | 100 | 100 | 75 | 50 | 50 | 38 | 12 | 9 | 6 | 6 |
| 100 | 80~100 | 100 | 100 | 50 | 38 | 40 | 30 | 8 | 6 | 5 | 4 | 100 | 100 | 75 | 50 | 50 | 38 | 12 | 9 | 6 | 6 |

Note) Safety certification is obtained based on 220V and 460V.

Note) There is no current adjustment range for HI products. (Refer to page 15 for Model and Rating)

## Standard type

- Adjustable thermal release
- Magnetic release 13 Ie max.
- Trip class 10
- Protective function
- Phase-failure protection
  - Phase-failure
  - Short circuit
  - Overload



MMS-32D



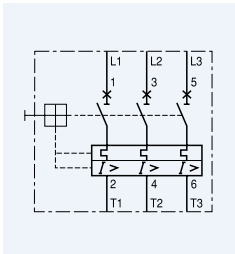
MMS-32S



MMS-63S



MMS-100S




Circuit diagram

| Type | Rated operational current Ie [A] | Thermal release adjustment range [A] | Magnetic release operating current [A] | Switching of 3 phase AC motors, AC-2, AC-3 | | | | | | 400/415V | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3-phase [kW] (50/60Hz) | | | 3-phase [HP] (60Hz) | | | | |
| | | | | 230V | 400V | 690V | 230V | 460V | 575V | Icu [kA] | Ics [kA] |
| MMS-32D | 0.16 | 0.1~0.16 | 2.3 | - | - | 0.06 | - | - | - | 100 | 100 |
| | 0.25 | 0.16~0.25 | 3.6 | - | 0.06 | 0.12 | - | - | - | 100 | 100 |
| | 0.4 | 0.25~0.4 | 5.8 | 0.06 | 0.09 | 0.18 | - | - | - | 100 | 100 |
| | 0.63 | 0.4~0.63 | 9.1 | 0.09 | 0.18 | 0.25 | - | - | - | 100 | 100 |
| | 1 | 0.63~1 | 14.4 | 0.18 | 0.25 | 0.55 | - | - | 1/2 | 100 | 100 |
| | 1.6 | 1~1.6 | 23.0 | 0.25 | 0.55 | 1.1 | - | 3/4 | 3/4 | 100 | 100 |
| | 2.5 | 1.6~2.5 | 36.0 | 0.37 | 0.75 | 1.5 | 1/2 | 1 | 1.5 | 100 | 100 |
| | 4 | 2.5~4 | 57.6 | 0.75 | 1.5 | 3.0 | 3/4 | 2 | 3 | 100 | 100 |
| | 6.3 | 4~6.3 | 90.7 | 1.5 | 2.2 | 4.0 | 1.5 | 3 | 5 | 100 | 100 |
| | 10 | 6~10 | 144.0 | 2.2 | 4.0 | 7.5 | 3 | 5 | 7.5 | 100 | 100 |
| | 14 | 9~14 | 201.6 | 3.0 | 5.5 | 11 | 3 | 10 | 10 | 15 | 7.5 |
| | 18 | 13~18 | 259.2 | 4.0 | 7.5 | 15 | 5 | 10 | 15 | 15 | 7.5 |
| | 23 | 17~23 | 331.2 | 5.5 | 11 | 18.5 | 7.5 | 15 | 20 | 15 | 6 |
| | 25 | 20~25 | 360.0 | 5.5 | 11 | 22 | 7.5 | 15 | 20 | 15 | 6 |
| | 32 | 24~32 | 460.8 | 7.5 | 15 | 30 | 10 | 20 | 25 | 10 | 6 |
| MMS-32S | 0.16 | 0.1...0.16 | 2.1 | - | 0.02 | - | - | - | - | 100 | 100 |
| | 0.25 | 0.16...0.25 | 3.3 | 0.03 | 0.06 | - | - | - | - | 100 | 100 |
| | 0.4 | 0.25...0.4 | 5.2 | 0.06 | 0.09 | - | - | - | - | 100 | 100 |
| | 0.63 | 0.4...0.63 | 8.2 | 0.09 | 0.12 | 0.25 | - | - | - | 100 | 100 |
| | 1 | 0.63...1.0 | 13 | 0.12 | 0.25 | 0.55 | - | 1/2 | 1/2 | 100 | 100 |
| | 1.6 | 1.0...1.6 | 20.8 | 0.25 | 0.55 | 1.1 | 1/3 | 3/4 | 1 | 100 | 100 |
| | 2.5 | 1.6...2.5 | 32.5 | 0.37 | 0.75 | 1.5 | 1/2 | 1½ | 1½ | 100 | 100 |
| | 4 | 2.5...4.0 | 52 | 0.75 | 1.5 | 3 | 1 | 2 | 3 | 100 | 100 |
| | 6 | 4...6 | 78 | 1.5 | 2.2 | 4 | 1½ | 5 | 5 | 100 | 100 |
| | 8 | 5...8 | 104 | 1.5 | 3 | 5.5 | 2 | 5 | 5 | 100 | 100 |
| | 10 | 6...10 | 130 | 3 | 4 | 7.5 | 3 | 7½ | 10 | 50 | 38 |
| | 13 | 9...13 | 169 | 3 | 5.5 | 11 | 3 | 7½ | 10 | 50 | 38 |
| | 17 | 11...17 | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 20 | 15 |
| | 22 | 14...22 | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 15 | 11 |
| | 26 | 18...26 | 338 | 5.5 | 11 | 18.5 | 7½ | 15 | 20 | 15 | 11 |
| | 32 | 22...32 | 416 | 7.5 | 15 | 22 | 10 | 20 | 30 | 15 | 11 |
| | 40 | 28~40 | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 10 | 8 |
| MMS-63S | 10 | 6~10 | 130 | 3 | 4 | 7.5 | 3 | 7½ | 10 | 100 | 100 |
| | 13 | 9~13 | 169 | 3 | 5.5 | 11 | 3 | 7½ | 10 | 50 | 38 |
| | 17 | 11~17 | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 25 | 19 |
| | 22 | 14~22 | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 25 | 19 |
| | 26 | 18~26 | 338 | 5.5 | 11 | 18.5 | 10 | 20 | 25 | 25 | 19 |
| | 32 | 22~32 | 416 | 7.5 | 15 | 22 | 10 | 25 | 30 | 25 | 19 |
| | 40 | 28~40 | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 25 | 19 |
| | 50 | 34~50 | 650 | 11 | 22 | 45 | 15 | 40 | 50 | 25 | 19 |
| | 63 | 45~63 | 819 | 15 | 30 | 55 | 20 | 50 | 60 | 25 | 19 |
| | 65 | 47~65 | 845 | 15 | 30 | 55 | 20 | 50 | 60 | 25 | 19 |
| MMS-100S | 17 | 11~17 | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 50 | 38 |
| | 22 | 14~22 | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 50 | 38 |
| | 26 | 18~26 | 338 | 5.5 | 11 | 18.5 | 10 | 20 | 25 | 50 | 38 |
| | 32 | 22~32 | 416 | 7.5 | 15 | 22 | 10 | 25 | 30 | 50 | 38 |
| | 40 | 28~40 | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 50 | 38 |
| | 50 | 34~50 | 650 | 11 | 22 | 45 | 15 | 40 | 50 | 50 | 38 |
| | 63 | 45~63 | 819 | 15 | 30 | 55 | 20 | 50 | 60 | 50 | 38 |
| | 75 | 55~75 | 975 | 22 | 37 | 63 | 25 | 60 | 75 | 50 | 38 |
| | 90 | 70~90 | 1170 | 30 | 45 | 75 | 30 | 75 | 100 | 50 | 38 |
| | 100 | 80~100 | 1300 | 30 | 45 | 90 | 40 | 75 | 100 | 50 | 38 |

# Model and Rating

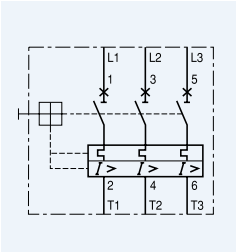
## High breaking type

- Adjustable thermal release
- Magnetic release 13 Ie max.
- Trip class 10
- Protective function
- Phase-failure protection
  - Phase-failure
  - Short circuit
  - Overload


MMS-32H


MMS-63H


MMS-100H



Circuit diagram

| Type | Rated operational current Ie [A] | Thermal release adjustment range [A] | Magnetic release operating current [A] | Switching of 3 phase AC motors, AC-2, AC-3 | | | | | | 400/415V | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3-phase [kW] (50/60Hz) | | | 3-phase [HP] (60Hz) | | | | |
| | | | | 230V | 400V | 690V | 230V | 460V | 575V | Icu [kA] | Ics [kA] |
| MMS-32H | 0.16 | 0.1...0.16 | 2.1 | - | 0.02 | - | - | - | - | 100 | 100 |
| | 0.25 | 0.16...0.25 | 3.3 | 0.03 | 0.06 | - | - | - | - | 100 | 100 |
| | 0.4 | 0.25...0.4 | 5.2 | 0.06 | 0.09 | - | - | - | - | 100 | 100 |
| | 0.63 | 0.4...0.63 | 8.2 | 0.09 | 0.12 | 0.25 | - | - | - | 100 | 100 |
| | 1 | 0.63...1.0 | 13 | 0.12 | 0.25 | 0.55 | - | 1/2 | 1/2 | 100 | 100 |
| | 1.6 | 1.0...1.6 | 20.8 | 0.25 | 0.55 | 1.1 | 1/3 | 3/4 | 1 | 100 | 100 |
| | 2.5 | 1.6...2.5 | 32.5 | 0.37 | 0.75 | 1.5 | 1/2 | 1½ | 1½ | 100 | 100 |
| | 4 | 2.5...4.0 | 52 | 0.75 | 1.5 | 3 | 1 | 2 | 3 | 100 | 100 |
| | 6 | 4...6 | 78 | 1.5 | 2.2 | 4 | 1½ | 5 | 5 | 100 | 100 |
| | 8 | 5...8 | 104 | 1.5 | 3 | 5.5 | 2 | 5 | 5 | 100 | 100 |
| | 10 | 6...10 | 130 | 3 | 4 | 7.5 | 3 | 7½ | 10 | 100 | 100 |
| | 13 | 9...13 | 169 | 3 | 5.5 | 11 | 3 | 7½ | 10 | 100 | 100 |
| | 17 | 11...17 | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 50 | 38 |
| | 22 | 14...22 | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 50 | 38 |
| | 26 | 18...26 | 338 | 5.5 | 11 | 18.5 | 7½ | 15 | 20 | 50 | 38 |
| | 32 | 22...32 | 416 | 7.5 | 15 | 22 | 10 | 20 | 30 | 50 | 38 |
| | 40 | 28~40 | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 40 | 30 |
| MMS-63H | 10 | 6~10 | 130 | 3 | 4 | 7.5 | 3 | 7½ | 10 | 100 | 100 |
| | 13 | 9~13 | 169 | 3 | 5.5 | 11 | 3 | 7½ | 10 | 100 | 100 |
| | 17 | 11~17 | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 50 | 50 |
| | 22 | 14~22 | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 50 | 50 |
| | 26 | 18~26 | 338 | 5.5 | 11 | 18.5 | 10 | 20 | 25 | 50 | 50 |
| | 32 | 22~32 | 416 | 7.5 | 15 | 22 | 10 | 25 | 30 | 50 | 50 |
| | 40 | 28~40 | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 50 | 50 |
| | 50 | 34~50 | 650 | 11 | 22 | 45 | 15 | 40 | 50 | 50 | 50 |
| | 63 | 45~63 | 819 | 15 | 30 | 55 | 20 | 50 | 60 | 50 | 50 |
| | 65 | 47~65 | 845 | 15 | 30 | 55 | 20 | 50 | 60 | 35 | 27 |
| MMS-100H | 17 | 11~17 | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 100 | 100 |
| | 22 | 14~22 | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 100 | 50 |
| | 26 | 18~26 | 338 | 5.5 | 11 | 18.5 | 10 | 20 | 25 | 100 | 50 |
| | 32 | 22~32 | 416 | 7.5 | 15 | 22 | 10 | 25 | 30 | 100 | 50 |
| | 40 | 28~40 | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 100 | 50 |
| | 50 | 34~50 | 650 | 11 | 22 | 45 | 15 | 40 | 50 | 100 | 50 |
| | 63 | 45~63 | 819 | 15 | 30 | 55 | 20 | 50 | 60 | 100 | 50 |
| | 75 | 55~75 | 975 | 22 | 37 | 63 | 25 | 60 | 75 | 75 | 50 |
| | 90 | 70~90 | 1170 | 30 | 45 | 75 | 30 | 75 | 100 | 75 | 50 |
| | 100 | 80~100 | 1300 | 30 | 45 | 90 | 40 | 75 | 100 | 75 | 50 |

# Instantaneous type

- Without thermal releases
- Magnetic release 13 Ie max.
- Protective function
  - Short circuit



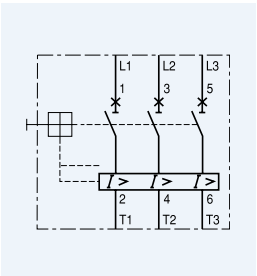
MMS-32HI



MMS-63HI



MMS-100HI



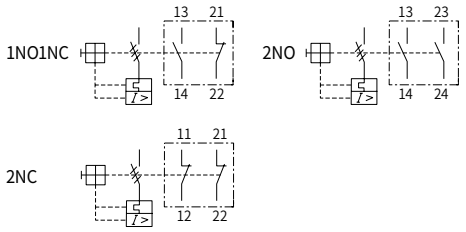

Circuit diagram

| Type | Rated operational current Ie [A] | Thermal release adjustment range [A] | Magnetic release operating current [A] | Switching of 3 phase AC motors, AC-2, AC-3 | | | | | | 400/415V | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3-phase [kW] (50/60Hz) | | | 3-phase [HP] (60Hz) | | | | |
| | | | | 230V | 400V | 690V | 230V | 460V | 575V | Icu [kA] | Ics [kA] |
| MMS-32HI | 0.16 | - | 2.1 | - | 0.02 | - | - | - | - | 100 | 100 |
| | 0.25 | - | 3.3 | 0.03 | 0.06 | - | - | - | - | 100 | 100 |
| | 0.4 | - | 5.2 | 0.06 | 0.09 | - | - | - | - | 100 | 100 |
| | 0.63 | - | 8.2 | 0.09 | 0.12 | 0.25 | - | - | - | 100 | 100 |
| | 1 | - | 13 | 0.12 | 0.25 | 0.55 | - | 1/2 | 1/2 | 100 | 100 |
| | 1.6 | - | 20.8 | 0.25 | 0.55 | 1.1 | 1/3 | 3/4 | 1 | 100 | 100 |
| | 2.5 | - | 32.5 | 0.37 | 0.75 | 1.5 | 1/2 | 1½ | 1½ | 100 | 100 |
| | 4 | - | 52 | 0.75 | 1.5 | 3 | 1 | 2 | 3 | 100 | 100 |
| | 6 | - | 78 | 1.5 | 2.2 | 4 | 1½ | 5 | 5 | 100 | 100 |
| | 8 | - | 104 | 1.5 | 3 | 5.5 | 2 | 5 | 5 | 100 | 100 |
| | 10 | - | 130 | 3 | 4 | 7.5 | 3 | 7½ | 10 | 100 | 100 |
| | 13 | - | 169 | 3 | 5.5 | 11 | 3 | 7½ | 10 | 100 | 100 |
| | 17 | - | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 50 | 38 |
| | 22 | - | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 50 | 38 |
| | 26 | - | 338 | 5.5 | 11 | 18.5 | 7½ | 15 | 20 | 50 | 38 |
| | 32 | - | 416 | 7.5 | 15 | 22 | 10 | 20 | 30 | 50 | 38 |
| | 40 | - | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 40 | 30 |
| MMS-63HI | 10 | - | 130 | 3 | 4 | 7.5 | 3 | 7½ | 10 | 100 | 100 |
| | 13 | - | 169 | 3 | 5.5 | 11 | 3 | 7½ | 10 | 100 | 100 |
| | 17 | - | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 50 | 50 |
| | 22 | - | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 50 | 50 |
| | 26 | - | 338 | 5.5 | 11 | 18.5 | 10 | 20 | 25 | 50 | 50 |
| | 32 | - | 416 | 7.5 | 15 | 22 | 10 | 25 | 30 | 50 | 50 |
| | 40 | - | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 50 | 50 |
| | 50 | - | 650 | 11 | 22 | 45 | 15 | 40 | 50 | 50 | 50 |
| | 63 | - | 819 | 15 | 30 | 55 | 20 | 50 | 60 | 50 | 50 |
| | 65 | - | 845 | 15 | 30 | 55 | 20 | 50 | 60 | 35 | 27 |
| MMS-100HI | 17 | - | 221 | 4 | 7.5 | 11 | 5 | 10 | 15 | 100 | 100 |
| | 22 | - | 286 | 4 | 7.5 | 15 | 7½ | 15 | 20 | 100 | 50 |
| | 26 | - | 338 | 5.5 | 11 | 18.5 | 10 | 20 | 25 | 100 | 50 |
| | 32 | - | 416 | 7.5 | 15 | 22 | 10 | 25 | 30 | 100 | 50 |
| | 40 | - | 520 | 7.5 | 18.5 | 30 | 15 | 30 | 40 | 100 | 50 |
| | 50 | - | 650 | 11 | 22 | 45 | 15 | 40 | 50 | 100 | 50 |
| | 63 | - | 819 | 15 | 30 | 55 | 20 | 50 | 60 | 100 | 50 |
| | 75 | - | 975 | 22 | 37 | 63 | 25 | 60 | 75 | 75 | 50 |
| | 90 | - | 1170 | 30 | 45 | 75 | 30 | 75 | 100 | 75 | 50 |
| | 100 | - | 1300 | 30 | 45 | 90 | 40 | 75 | 100 | 75 | 50 |

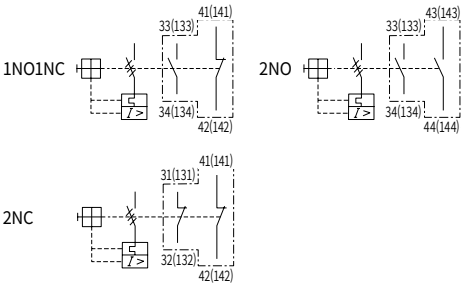
# Accessories

## Auxiliary contact

### FX
### Auxiliary switch

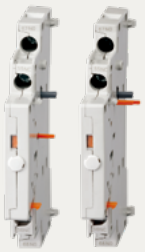
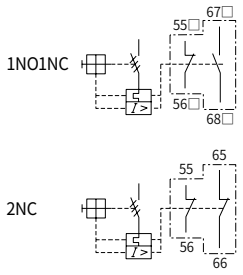
| Picture | Description | Connection diagram |
|---|---|---|
|  | • Front mounting<br>• 2-pole<br>• One front mounting module per circuit breaker |  |

### LX
### Auxiliary switch

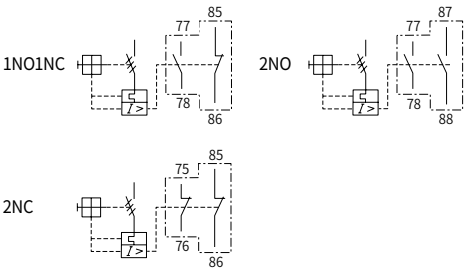
| Picture | Description | Connection diagram |
|---|---|---|
|  | • Side mounting on the left<br>• 2-pole<br>• One side mounting module per circuit breaker |  |

## Alarm contact

### LA
### Any trip alarm switch
32FA, 63/100AF

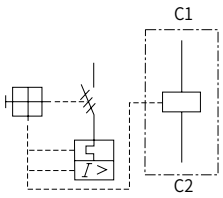
| Picture | Description | Connection diagram |
|---|---|---|
|  | • Operates in case of trip<br>• Side mounting on the left<br>• 2-pole<br>• Set LA first in case of using LX together (MMS-63 cannot accept LX and LA together) |  |

### LAM
### Magnetic trip alarm switch

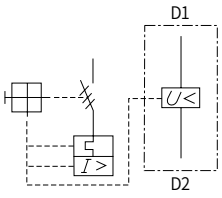
| Picture | Description | Connection diagram |
|---|---|---|
|  | • Short circuit trip only action<br>• Side mounting on the left<br>• 2-pole<br>• Set LAM first in case of using LX together |  |

# Trip device

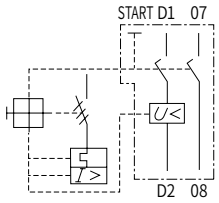
## RS
## Shunt release

| Picture | Rated voltage | Description | Connection diagram |
|---|---|---|---|
|  | • 24V 50Hz / 28V 60Hz<br>• 110 50Hz / 120V 60Hz<br>• 220~230V 50Hz / 240~260V 60Hz<br>• 240V 50Hz / 277V 60Hz<br>• 380~400V 50Hz / 440~460V 60Hz<br>• 415~440V 50Hz / 460~480V 60Hz | • Side mounting on the right<br>• One side mounting module per circuit breaker.<br>• Cannot use with RU or RUX |  |

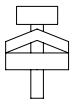
## RU
## Undervoltage release

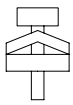
| Picture | Rated voltage | Description | Connection diagram |
|---|---|---|---|
|  | • 24V 50Hz / 28V 60Hz<br>• 110 50Hz / 120V 60Hz<br>• 220~230V 50Hz / 240~260V 60Hz<br>• 240V 50Hz / 277V 60Hz<br>• 380~400V 50Hz / 440~460V 60Hz<br>• 415~440V 50Hz / 460~480V 60Hz | • Side mounting on the right<br>• One side mounting module per circuit breaker.<br>• Cannot use with RU or RUX |  |

## RUX
## Undervoltage release with switch

| Picture | Rated voltage | Description | Connection diagram |
|---|---|---|---|
|  | • 24V 50Hz / 28V 60Hz<br>• 110 50Hz / 120V 60Hz<br>• 220~230V 50Hz / 240~260V 60Hz<br>• 240V 50Hz / 277V 60Hz<br>• 380~400V 50Hz / 440~460V 60Hz<br>• 415~440V 50Hz / 460~480V 60Hz | • Side mounting on the right<br>• One side mounting module per circuit breaker.<br>• Cannot use with RU or RUX<br>• Cannot attach to MMS-32S |  |

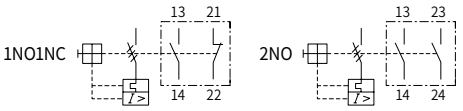
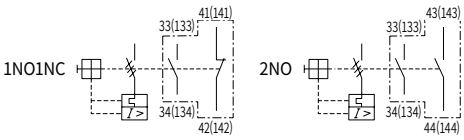
## Auxiliaries

| Contents | | | Auxiliary contacts for front mounting FX | | Auxiliary contacts for front mounting LX | | Alarm switch for left side mounting LA | |
|---|---|---|---|---|---|---|---|---|
| Rated thermal current / th | | | | | | | | |
| at 40°C ambient temperature | | [A] | 5 | | 10 | | 10 | |
| at 60°C ambient temperature | | [A] | 3 | | 6 | | 6 | |
| Contact class coordination | | | | | | | | |
| according to NEMA | | AC | A 300 | | A 600 | | A 600 | |
| (UL/CSA standards) | | DC | R 300 | | Q 300 | | Q 300 | |
| Back-up fuses gG, gL | | [A] | 16 | | 16 | | 16 | |
| Rated supply current | | [V] | - | 240 | 24 | 240 | 24 | 240 |
| | C-15 | [A] | - | 3 | 6 | 4 | 6 | 4 |
| | DC-13: | [V] | 24 | 220 | 24 | 220 | 24 | 220 |
| | | [A] | 1 | 0.1 | 2 | 0.25 | 2 | 0.25 |
| Weight (g) | | | 18 | | 30 | | 40 | |
| Terminal parts | | | | |  | | | |
| Wire | | | | | Pozidriv size 2 | | | |
| Single-core | 1 conductor | [㎟] / [AWG | 0.5...2.5 / 20...14 | | 0.5...2.5 / 20...14 | | | |
| | 2 conductor | [㎟] / [AWG | - | | 0.5...2.5 / 20...14 | | | |
| Stranded | 1 conductor | [㎟] / [AWG | 0.5...4 / 20...10 | | 0.5...4 / 20...10 | | | |
| | 2 conductor | [㎟] / [AWG | 0.75...2.5 / 18...14 | | 0.75...2.5 / 18...14 | | | |
| Tightening torque | | [Nm] / [lb-in] | 0.8...1.2 / 7...10 | | 0.8...1.2 / 7...10 | | | |

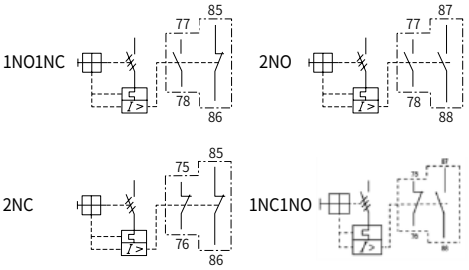
| Contents | | | Shunt release for right side mounting RS | Undervoltage release for right side mounting RU | Undervoltage release with 2 auxiliary contacts for right side mounting RUX |
|---|---|---|---|---|---|
| Actuating voltage(V) | | | | | |
| Pull-in | | | 0.85...1.1×Us | 0.7...1.1×Us | 0.85...1.1×Us |
| Drop-out | | | 0.7...0.35×Us | | 0.7...0.35×Us |
| Rated control voltage(V) | | | | | |
| min.: | | | 24V 50Hz / 28V 60Hz | 24V 50Hz / 28V 60Hz | 24V 50Hz / 28V 60Hz |
| max.: | | | 415~440V 50Hz / 460~480V 60Hz | 415~440V 50Hz / 460~480V 60Hz | 415~440V 50Hz / 460~480V 60Hz |
| Coil rating(W) | | | | | |
| Pull-in | | | 8.5VA, 6W | 8.5VA, 6W | 8.5VA, 6W |
| Hold | | | 3VA, 1.2W | 3VA, 1.2W | 3VA, 1.2W |
| Opening time (ms) | | | 20 | - | 20 |
| Weight (g) | | | 120 | 110 | 110 |
| Terminal parts | | | |  | |
| Wire | | | | Pozidriv size 2 | |
| Single-core | 1 conductor | [㎟] / [AWG] | | 0.5...2.5 / 20...14 | |
| | 2 conductor | [㎟] / [AWG] | | 0.5...2.5 / 20...14 | |
| Stranded | 1 conductor | [㎟] / [AWG] | | 0.5...4 / 20...10 | |
| | 2 conductor | [㎟] / [AWG] | | 0.75...2.5 / 18...14 | |
| Tightening torque | | [Nm] / [lb-in] | | 0.8...1.2 / 7...10 | |

# Auxiliary contact

## Auxiliary switch

| Picture | Model | Description | Connection diagram |
|---|---|---|---|
|  | FXN-11<br>FXN-20 | • Front mounting<br>• Only 1 unit can be installed |  |
|  | LXN-11<br>LXN-20 | • Side mounting on the left<br>• 2 LXN can be installed together |  |

## Magnetic trip alarm switch

| Picture | Model | Description | Connection diagram |
|---|---|---|---|
|  | LAMN-1001<br>LAMN-1010<br>LAMN-0101<br>LAMN-0110 | • Side mounting on the left<br>• Only 1 unit can be installed |  |

## Shunt release

Shunt release

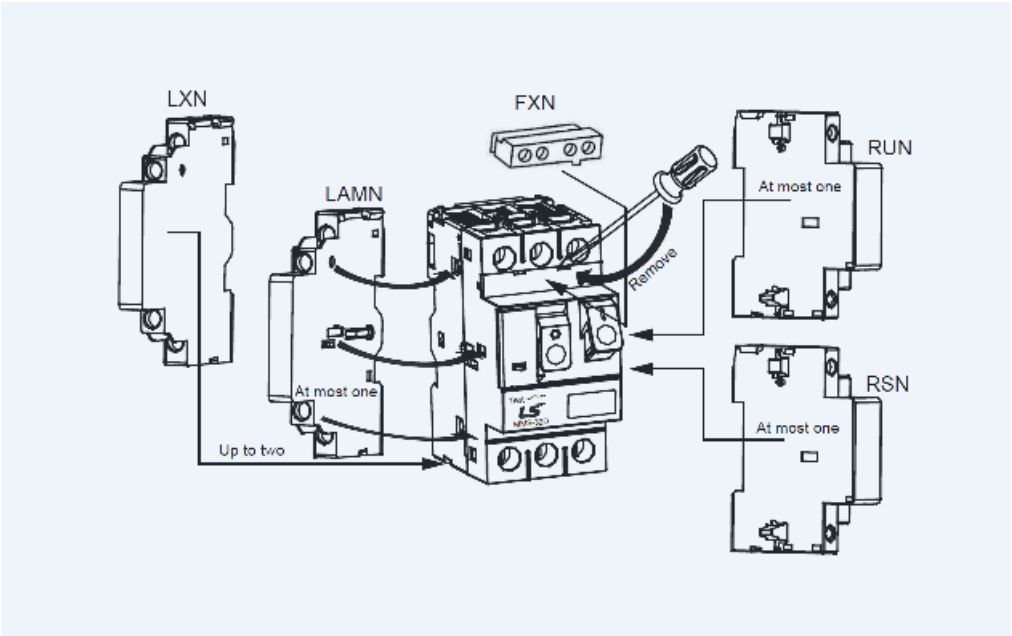
| Picture | Model | Rated voltage | Description |
|---|---|---|---|
|  | RSN110 | 110~127V 50/60Hz | • Side mounting on the right<br>• Either one shunt or undervoltage release can be installed. |
| | RSN220 | 220~240V 50/60Hz | |
| | RSN380 | 380~415V 50/60Hz | |

## Undervoltage release

Undervoltage release

| Picture | Model | Rated voltage | Description |
|---|---|---|---|
|  | RUN110 | 110~127V 50/60Hz | • Side mounting on the right<br>• Either one shunt or undervoltage release can be installed. |
| | RUN220 | 220~240V 50/60Hz | |
| | RUN380 | 380~415V 50/60Hz | |

## Installation of accessories



# Electrical auxiliaries

## E-handle (Rotary-type)



MMS E-Handle is a Rotary-type Handle accessory which can be attached to the front to control and verify the ON, TRIP and OFF condition of Manual Motor Starters based on situation of closing panel.

- Application model : MMS-32H/HI, 63S/H/HI, 100S/H/HI
- Operation temp : -20 ~ +60°C
- CE and UL certified
- Degree of protection : IP65(UL Type1, Type3R)
- Locking device : Lockable in on/off position
- Material of insulation : Plastic(PA66)

| Type | Application MMS | Notes |
|---|---|---|
| MEH-32 | MMS-32H, 32HI | Length of shaft : 115 or 315mm |
| MEH-63 | MMS-63S, 63H, 63HI | |
| MEH-100 | MMS-100S, 100H, 100HI | |

## Phase bus system



This device is for parallel connection with power terminals in the circuit lined up by MMS, offering simplified wiring with compact wiring space.

- Application model : MMS-32, 63
- Safety cover built-in
- CE and UL certified
- RoHS compliance

| Type | Application MMS | Number of terminals | Rated current | Safety cover attached |
|---|---|---|---|---|
| PB-322 | MMS-32S, 32H, 32HI | 2 (MMS 2) | 63A | PBPC-32 |
| PBL-322 | MMS-32S, 32H, 32HI with Aux (LX or LA or LAM) | 2 (MMS 2) | | |
| PB-323 | MMS-32S, 32H, 32HI | 3 (MMS 3) | | |
| PBL-323 | MMS-32S, 32H, 32HI with Aux (LX or LA or LAM) | 3 (MMS 3) | | |
| PB-324 | MMS-32S, 32H, 32HI | 4 (MMS 4) | | |
| PB-325 | MMS-32S, 32H, 32HI | 5 (MMS 5) | | |
| PB-632 | MMS-63S, 63H, 63HI | 2 (MMS 2) | 108A | PBPC-63 |
| PB-633 | MMS-63S, 63H, 63HI | 3 (MMS 3) | | |

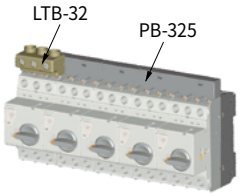
# Electrical auxiliaries

## Line terminal block

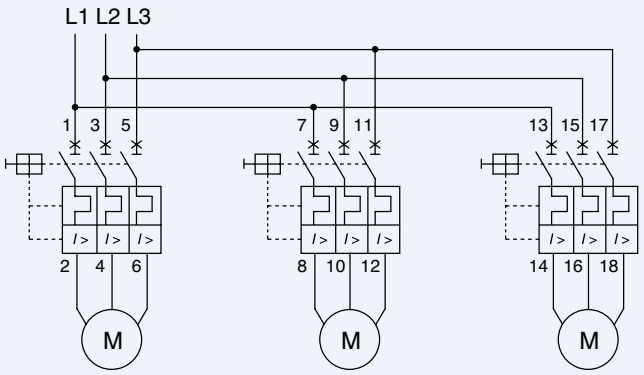
Lug type is installed for convenient wiring.



| Model | LTB-32 |
|---|---|
| Pole | 3P |
| Mounting location | Upstream |
| IP degree of protection | IP20 according to IEC 60529 |
| Rated insulation voltage (Ui) | 690V according to IEC 60947-1 |
| Rated operational current (Ie) | 63A |
| Terminal torque | 1.7 N.m- on screw clamp terminals |




**Diagram**




## Terminal block (TB-32)

This accessory device ensures insulation distance between phases.
When this device is used, it meets the requirements of UL Combination Motor Controller Type E.

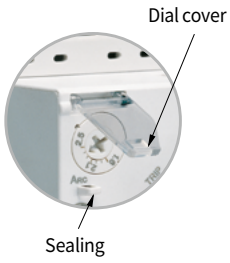
• Application model : MMS-32H, MMS-32HI



## Dial cover

Dial cover is used to protect the set value from unintended operation and tampering.

• Application Model : MMS-32, 63,100 (All types)



## Enclosure



The MMS enclosure case cover is dust-proof and corrosion-proof.
The case cover is designed for use in dust-filled areas such as cement plants,
cotton mills as well as in the presence of corrosive gas or liquids (excluding explosive or flammable gas) such as fertilizer, refinery and plating plants.

- Application Model : MMS-32
- Operation temp : -20 ~ +60°C
- Degree of protection : IP65
- Material of insulation :Plastic(ABS)
- CE and UL certified

| Type | Application MMS | Notes |
|---|---|---|
| EPH-32 | MMS-32H, 32HI | Surface mount |

## Insulation barrier

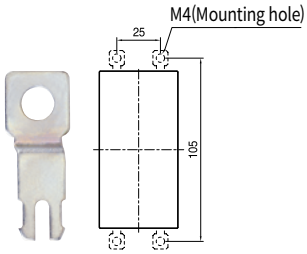


Insulation barrier is used to enlarge creepage distance and clearance to meet UL requirements.

- Application Model : MMS-100

| Type | Application MMS |
|---|---|
| IB100 | MMS-100S, 100H, 100HI |

## Screw mounting holder




32AF MMS is only for DIN rail mounting by itself.
The screw mounting holder is used to mount MMS on a panel via screws.

- Application Model : MMS-32

| Type | Application MMS | Notes |
|---|---|---|
| MP-32 | MMS-32S, 32H, 32HI | For M4 screw |

# Electrical auxiliaries

## Direct adaptor and mounting unit

### Direct adaptor, DA

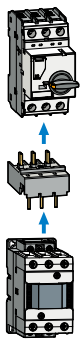
The direct adaptor is used to connect the MMS directly with a contactor.

### Mounting unit, MU

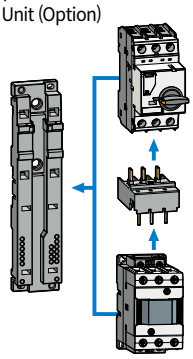
This device is an attachment module to connect joined MMS with a contactor.

• Application Model : MMS+Susol MC (MC-9~95), Mini MC

Direct adaptor only



Direct adaptor + Mounting Unit (Option)

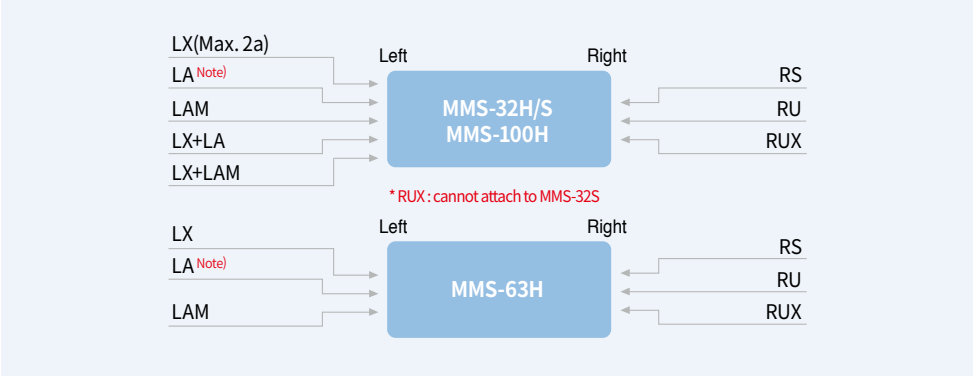


| Direct adaptor | | Mounting unit | Combined devices | Applying contactor |
|---|---|---|---|---|
| Frame | Name | | | |
| DA-16 | DA-16SA | MU-45 | MMS-32S + GMC-6M~16M | Mini-MC |
| | DA-16SD | | MMS-32S + GMD-6M~16 | |
| | DA-16HA | | MMS-32H + GMC-6M~16M | |
| | DA-16HD | | MMS-32H + GMD-6M~16M | |
| DA-18 | DA-18SA | | MMS-32S + MC-6a~18a | Metasol MC |
| | DA-18SD | | MMS-32S + MC-6a~18a DC | |
| | DA-18HA | | MMS-32H + MC-6a~18a | |
| | DA-18HD | | MMS-32H + MC-6a~18a DC | |
| DA-22 | DA-22SA | | MMS-32S + MC-9b~22b | |
| | DA-22SD | | MMS-32S + MC-9b~22b DC | |
| | DA-22HA | | MMS-32H + MC-9b~22b | |
| | DA-22HD | | MMS-32H + MC-9b~22b DC | |
| DA-32 | DA-32SA | | MMS-32S + MC-9~32(32a, 40a) | Susol, Metasol MC |
| | DA-32SD | | MMS-32S + MC-9~32(32a, 40a) DC | |
| | DA-32HA | | MMS-32H + MC-9~32(32a, 40a) | |
| | DA-32HD | | MMS-32H + MC-9~32(32a, 40a) DC | |
| DA-63 | DA-63A | MU-55 | MMS-63AF + MC-35~63 (50a, 65a) | Susol, Metasol MC (Lug type only) |
| | DA-63D | | MMS-63AF + MC-35~63 (50a, 65a) DC | |
| DA-95A | DA-95A | MU-70 | MMS-100AF + MC-65~95 (75a, 85a, 100a) | |
| | DA-95D | | MMS-100AF + MC-65~95 (75a, 85a, 100a) DC | |

# Possible combination chart

## Standard combination chart

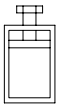
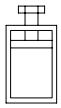
Please read this chart completely before installing auxiliaries.
Improper combination can cause electric failure or accident.




Note: LA (32 on 63/100 are separate).

# Installation and use environment

## Terminals

| Contents | | | MMS-32S | MMS-32H | MMS-63S, 63H | MMS-100S, 100H |
|---|---|---|---|---|---|---|
| Conformity to standards | | | IEC60947-2, IEC60947-4-1<br>UL508, UL508 Type E (except MMS-32S) | | | |
| Approvals | | | CE, UL | | | |
| Terminal parts | | |  |  |  |  |
| Wire | | | | | | |
| Single-core | 1 conductor | [㎟] / [AWG] | 1...10 / 18...8 | 1...10 / 18...8 | 0.75...35 / 18...2 | 2.5...70 / 12...2/0 |
| | 2 conductor | [㎟] / [AWG] | 1...6 / 18...10 | 1...6 / 18...10 | 0.75...25 / 18...4 | 2.5...50 / 12...1/0 |
| Stranded | 1 conductor | [㎟] / [AWG] | 1...6 / 18...10 | 1...6 / 18...10 | 0.75...35 / 18...2 | 2.5...70 / 12...2/0 |
| | 2 conductor | [㎟] / [AWG] | 1...6 / 18...10 | 1...6 / 18...10 | 0.75...25 / 18...4 | 2.5...50 / 12...1/0 |
| Flexible | 1 conductor | [㎟] / [AWG] | 1...6 / 18...10 | 1...6 / 18...10 | 0.75...25 / 18...4 | 2.5...50 / 12...1/0 |
| | 2 conductor | [㎟] / [AWG] | 0.75...4 / 18...10 | 0.75...4 / 18...10 | 0.75...16 / 18...6 | 2.5...35 / 10...2 |
| Tightening torque | | [Nm] / [lb-in] | 0.8...2.5 / 7...22 | 0.8...2.5 / 7...22 | 3...4.5 / 26...39 | 4...6 / 35...53 |

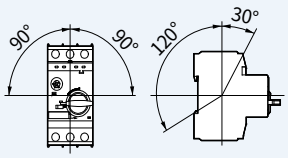
## Power consumption

| Contents | MMS-32S | MMS-32H | MMS-63S, 63H | MMS-100S, 100H |
|---|---|---|---|---|
| Total power loss pv circuit breaker at rated load operating temperature [W] | In = 0.16~1.6A : 4.4<br>In = 2.5~26A : 7.4<br>In = 32A : 4.0<br>In = 40A : 7.4 | In = 0.16~1.6A : 4.4<br>In = 2.5~26A : 7.4<br>In = 32A : 4.0<br>In = 40A : 7.4 | In = 10~22A : 10.2<br>In = 26~65A : 9.7 | In = 17~32A : 15<br>In = 40~63A : 21.8<br>In = 75~100A : 17.8 |

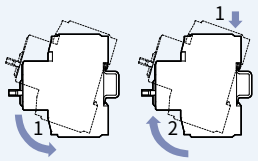
## Installation and use method

### Mounting

- 35mm DIN rail for MMS32~63
- 35mm or 75mm DIN rail for MMS100
  - Use 15mm depth for 35mm DIN rail



Operating positions



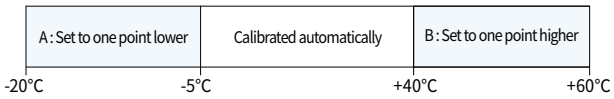
DIN rail mounting

### Environment

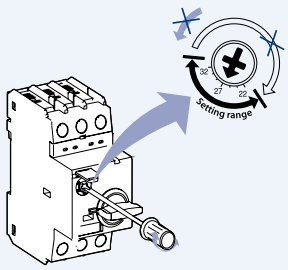
- Ambient air temperature
  - Storage : - 50 ~ 80°C
  - Operation : - 20 ~ 60°C
- Ambient temperature compensation : - 5···+ 40 °C
- Maximum operating altitude : 2000m
- Degree of protection: IP20
- Shock resistance : 25g
- Vibration resistance : 5~150Hz

### Caution for thermal adjustments

1. Keep the setting range as shown below.
2. Moving counterclockwise out of the setting range may cause damage to the device.
3. Calibration by ambient air temperature




* Operation outside of standard air temperature range ( -5°C~+40°C) needs calibration by one point



Dial setting method

# Installation of auxiliaries

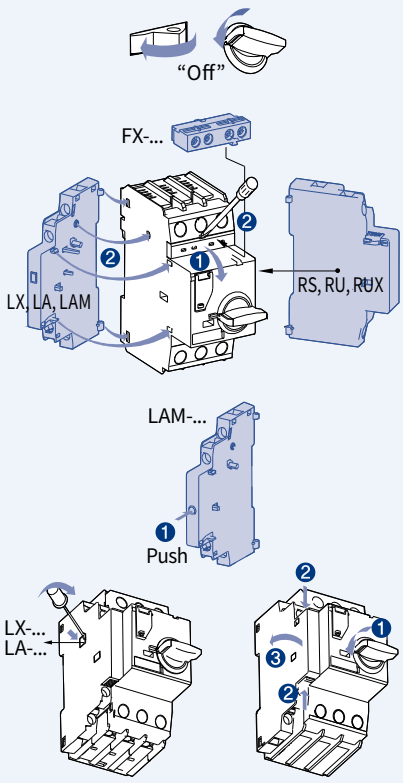
## MMS-32S/H/HI

Note:
Refer to page 17 for MMS-32D Installation of auxiliaries.

Be sure to turn off the MMS main switch before any action.

- To install FX remove the cover ❶ first.
- 2 LX can be installed together.
- Only one auxiliary among RU, RS and RUX can be mounted on the right side of MMS.
- Do not apply trip signal to RS longer than 10 sec.
- Refer to the possible combination chart for the mounting of LX, LA and LAM on left side of MMS.
- Push the trip button before installation of LAM
- Do not operate the alarm contact point (LA) when the operation switch is in the trip position.
- Remove the indicated part in the fig. before the additional installation of LX
- Be sure to turn off the MMS main switch before separation.
- Softly push the separation button on the side of the auxiliary and pull it.

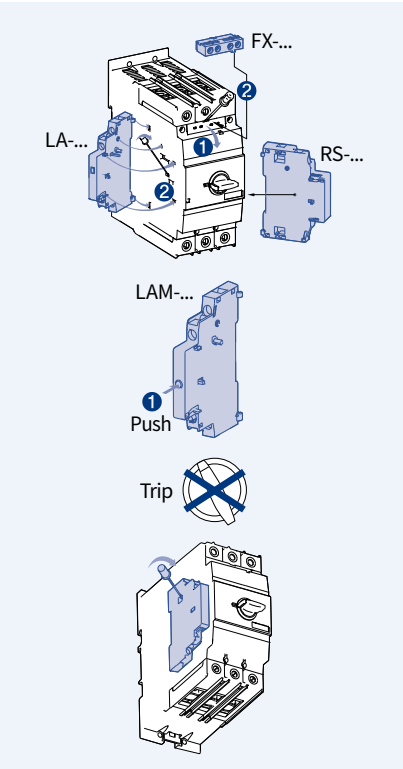
- Make sure to choose proper LA before use because LA for MMS-32 and MMS-63/100 are different.




## MMS-63, 100S/H/HI

- To install FX remove the cover ❶ first.
- 2 LX can be installed together. (only 1 each for MMS-63)
- Only one auxiliary among RU, RS and RUX can be mounted on the right side of MMS.
- Do not apply trip signal to RS longer than 10 sec.
- Refer to the possible combination chart for the mounting of LX, LA and LAM on left side of MMS.
- Do not use with LA-... (32) It is only for MMS-32.
- Push the trip button before installation of LAM
- Do not install LA with MMS-100in TRIP status
- Remove the indicated part as shown in the above fig. before the additional installation of LX
- Be sure to turn off the MMS main switch before separation.
- Softly push the separation button on the side of the auxiliary and pull it.

- Make sure to choose proper LA before use because LA for MMS-32 and MMS-63/100 are different.



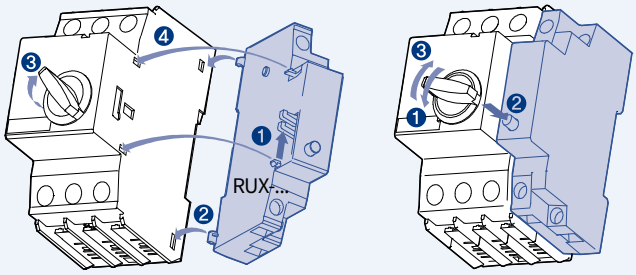
## How to Install and reset RUX

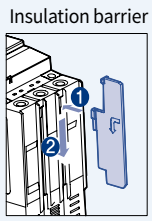
### Installing

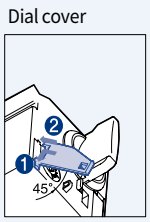
(1) Check if the trip button of RUX is "UP" . If not, push the side lever ❶ or proper setting.
(2) Fit both lower hooks ❷ into the MMS.
(3) Rotate the handle of MMS to the 20-30 degrees ❸ to on direction and keep the setting.
(4) Fit both upper hooks ❹ into the MMS.
(5) Input power to the RUX.
(6) Turn on the MMS handle.

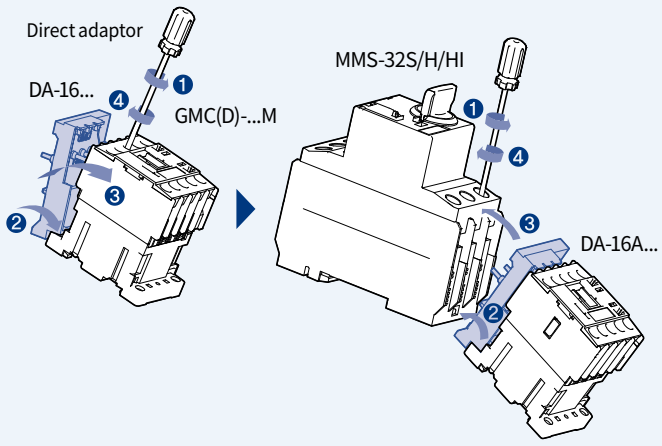
### Resetting

The trip button of RUX does not come "UP" in the event of tripping due to undervoltage.
To turn on the MMS after tripping ❶ turn off the MMS and check if the trip button of RUX comes "UP" .
❷ push the trip button ❸ to turn on the MMS



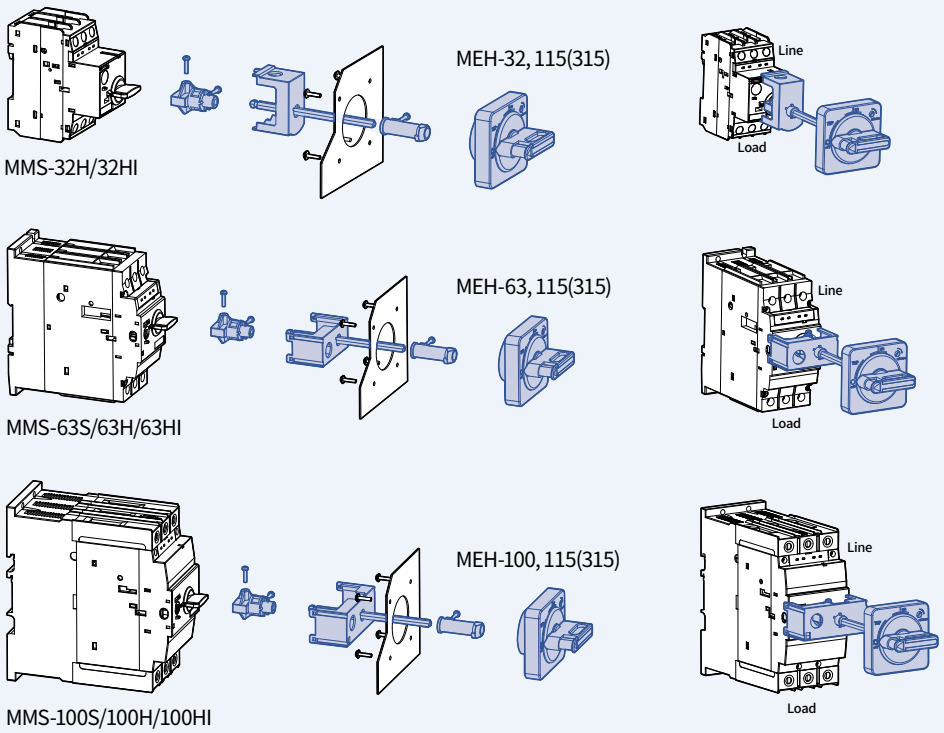



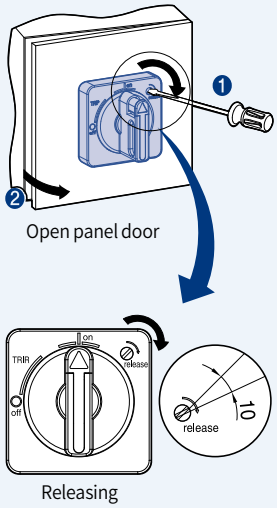
## Installation of auxiliaries

### E-handle structure



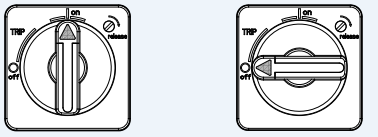

### E-handle locking device

When opening the panel door at ON position



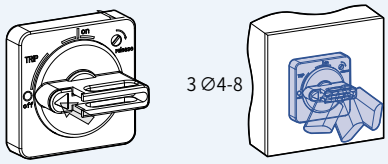

Locking
Installation at On or Off position

❶ Set to desired position by turning the handle

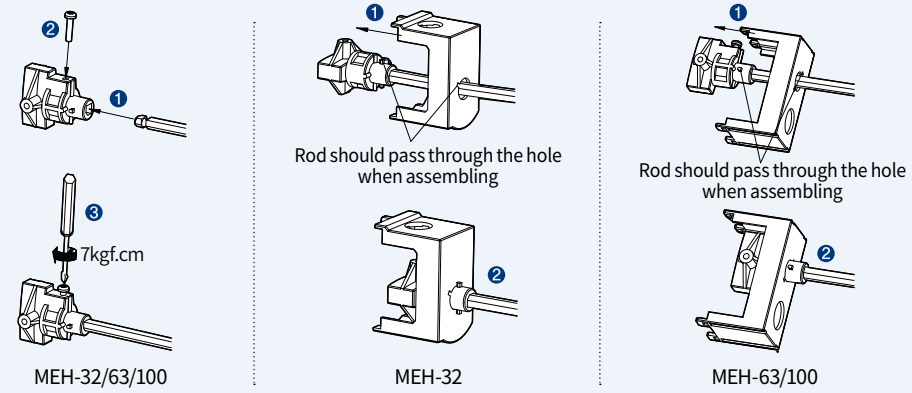


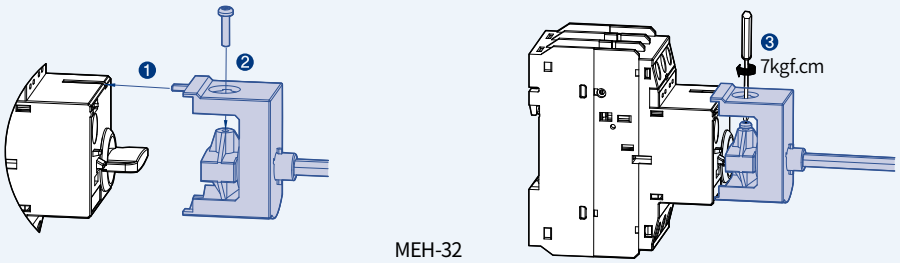

❷ Pushing

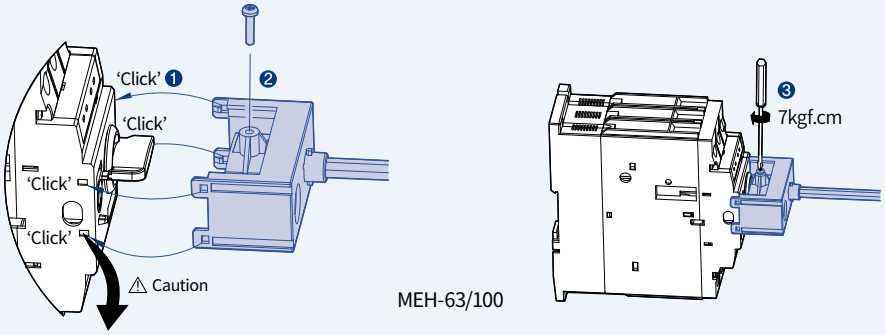
❸ Locking



## E-handle installation

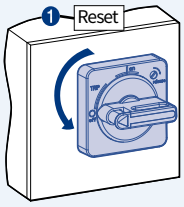


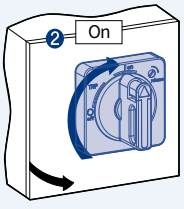




Assembly restrictions
Assembling is available for MMS-63/100 with 4 holes on the main cover which was produced after June 2007 based on manufacturing date.

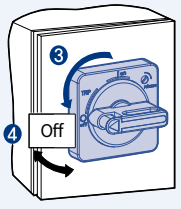
## E-handle operating test




※Caution
Locking knob can be damaged when opening the door at ON or TRIP position




At On position
Panel door cannot be opened

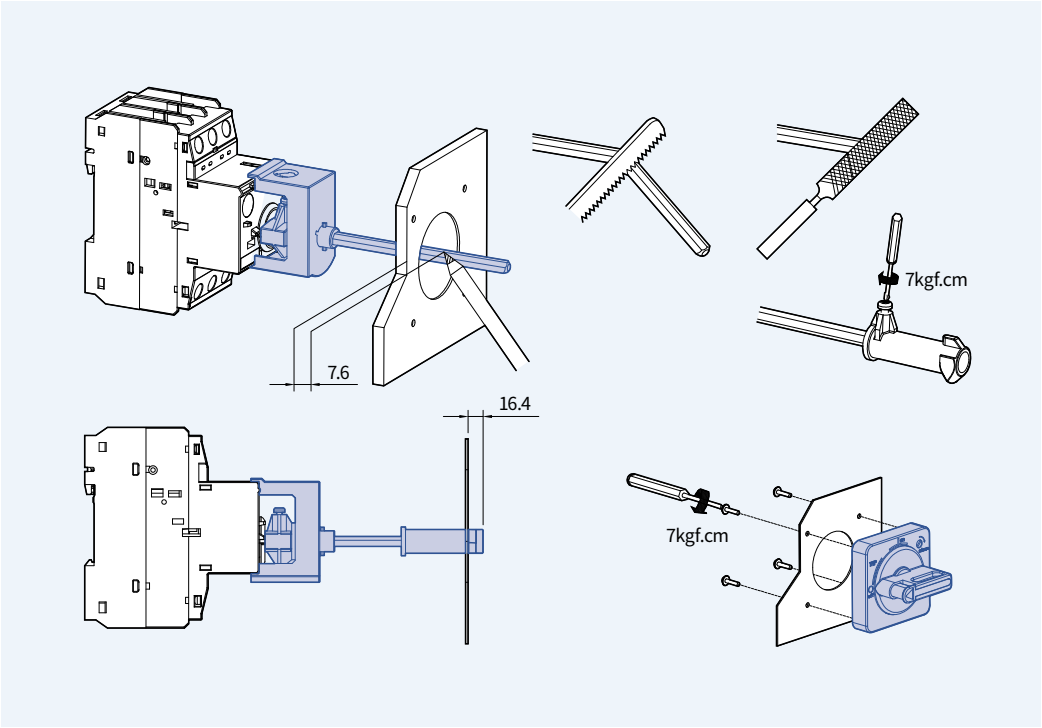



At Trip position Panel door cannot be opened.
At Off position Panel door can be opened

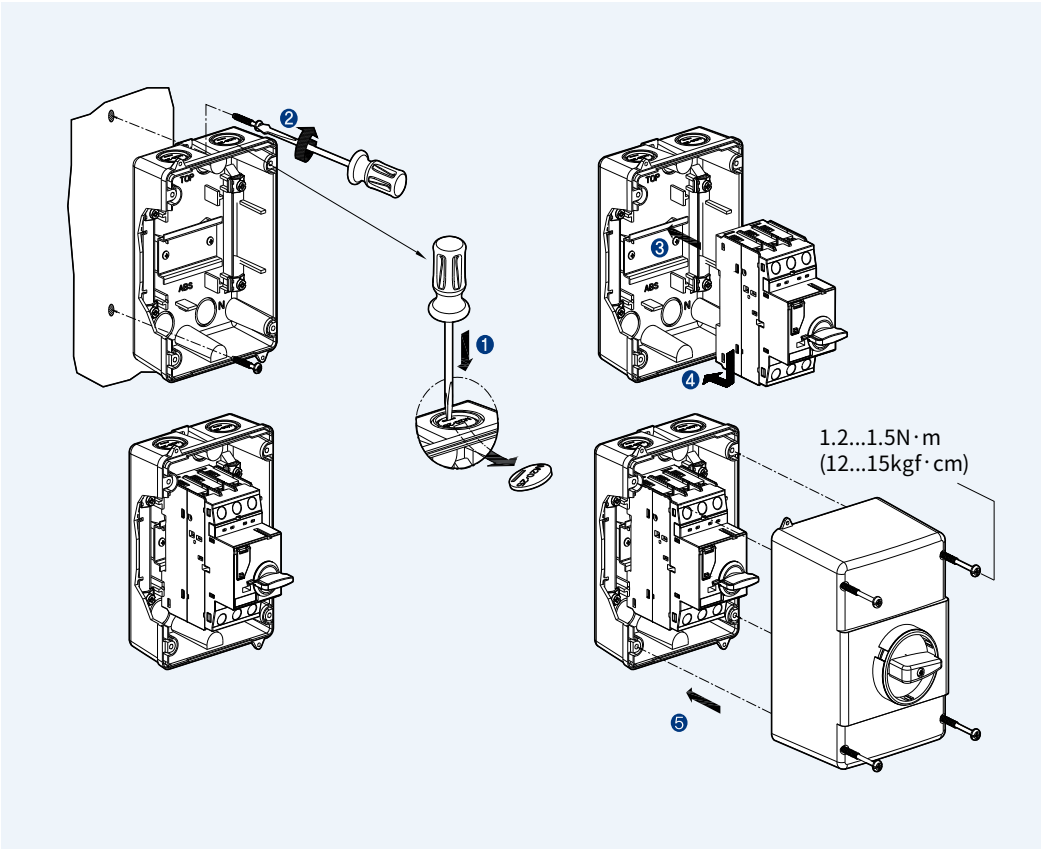
## Installation of auxiliaries

[mm]

### E-handle cutting off the shaft and applying the handle




### Enclosure



# **IEC performance data** (Motor protection)

## Standard type MMS-32S

| Rated operational current Ie | | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6 | 8 | 10 | 13 | 17 | 22 | 26 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching of standard three-phase motors AC-2, AC-3 | | | | | | | | | | | | | | | | | | |
| 230/240V | [kW] | - | 0.03 | 0.06 | 0.09 | 0.12 | 0.18/0.25 | 0.37 | 0.55/0.75 | 1.1/1.5 | 1.5 | 2.2/3 | 3 | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 |
| 400/415V | [kW] | 0.02 | 0.06 | 0.09 | 0.12 | 0.18/0.25 | 0.37/0/55 | 0.75 | 1.1/1.5 | 22 | 3 | 3.7/4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 18.5 |
| 500V | [kW] | - | - | - | 0.25 | 0.25 | 0.55/0/75 | 1.1 | 1.5/2.2 | 3 | 3.7 | 4/5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 |
| 690V | [kW] | - | - | - | 0.25 | 0.37/0.55 | 0.75/1.1 | 1.5 | 2.2/3 | 3.7/4 | 5.5 | 7.5 | 11 | 11 | 11 | 18.5 | 22 | 30 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * | * | * | * | 125 | 125 | 125 | 125 |
| 400/415V | [kA] | * | * | * | * | * | * | * | * | * | * | 80 | 80 | 100 | 100 | 100 | 100 | 100 |
| 400/460V | [kA] | * | * | * | * | * | * | * | 50 | 50 | 63 | 63 | 80 | 80 | 100 | 100 | 100 | 100 |
| 500V | [kA] | * | * | * | * | * | * | 50 | 40 | 50 | 63 | 63 | 80 | 80 | 80 | 80 | 80 | 80 |
| 690V | [kA] | * | * | * | * | * | 20 | 35 | 40 | 50 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 80 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 40 | 40 | 30 | 20 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 20 | 15 | 15 | 15 | 10 |
| 440/460V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 15 | 15 | 15 | 10 | 10 | 8 | 8 | 6 | 5 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 15 | 10 | 10 | 6 | 6 | 6 | 6 | 6 | 5 | 4 |
| 690V | [kA] | 100 | 100 | 100 | 100 | 100 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 30 | 30 | 22 | 15 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 15 | 11 | 11 | 11 | 8 |
| 440/460V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 11 | 11 | 11 | 8 | 8 | 6 | 6 | 4 | 3 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 11 | 8 | 8 | 5 | 5 | 5 | 5 | 5 | 4 | 3 |
| 690V | [kA] | 100 | 100 | 100 | 100 | 100 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |

## Standard type MMS-63S

| Rated operational current Ie | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching of standard three-phase motors AC-2, AC-3 | | | | | | | | | | | |
| 230/240V | [kW] | 2.2/3 | 3 | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 15 |
| 400/415V | [kW] | 3.7/4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 30 |
| 500V | [kW] | 4.5/5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 | 37 | 37 |
| 690V | [kW] | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 | 45 | 55 | 55 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | 125 | 125 | 160 | 160 | 160 | 200 | 200 |
| 400/415V | [kA] | * | 80 | 100 | 125 | 125 | 125 | 125 | 160 | 160 | 160 |
| 440/460V | [kA] | 80 | 80 | 100 | 100 | 100 | 100 | 100 | 100 | 125 | 125 |
| 500V | [kA] | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| 690V | [kA] | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 80 | 80 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 400/415V | [kA] | 100 | 50 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| 440/460V | [kA] | 15 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 500V | [kA] | 10 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 690V | [kA] | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| 400/415V | [kA] | 100 | 83 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| 440/460V | [kA] | 12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 500V | [kA] | 8 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 690V | [kA] | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

## Standard type MMS-100S

| Rated operational current Ie | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching of standard three-phase motors AC-2, AC-3 | | | | | | | | | | | |
| 230/240V | [kW] | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 22 | 30 | 30 |
| 400/415V | [kW] | 7.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 45 |
| 500V | [kW] | 11 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 63 |
| 690V | [kW] | 11 | 15 | 18.5 | 22 | 30 | 45 | 55 | 63 | 75 | 90 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | 100 | 125 | 125 | 125 | 160 | 160 | 160 | 160 | 160 | 160 |
| 440/460V | [kA] | 100 | 125 | 125 | 125 | 125 | 125 | 160 | 160 | 160 | 160 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 125 | 125 | 125 |
| 690V | [kA] | 63 | 80 | 80 | 80 | 80 | 80 | 80 | 100 | 125 | 125 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 440/460V | [kA] | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| 500V | [kA] | 25 | 25 | 25 | 15 | 15 | 12 | 12 | 8 | 8 | 8 |
| 690V | [kA] | 10 | 10 | 10 | 10 | 6 | 6 | 6 | 5 | 5 | 5 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| 440/460V | [kA] | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 500V | [kA] | 19 | 19 | 19 | 11 | 11 | 9 | 9 | 6 | 6 | 6 |
| 690V | [kA] | 8 | 8 | 8 | 8 | 5 | 5 | 5 | 4 | 4 | 4 |

# IEC performance data (Motor protection)

## High breaking type MMS-32H

| Rated operational current Ie | | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6 | 8 | 10 | 13 | 17 | 22 | 26 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching of standard three-phase motors AC-2, AC-3 | | | | | | | | | | | | | | | | | | |
| 230/240V | [kW] | - | 0.03 | 0.06 | 0.09 | 0.12 | 0.18/0.25 | 0.37/0.55 | 0.55/0.75 | 1.1/1.5 | 1.5 | 2.2/3 | 3 | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 |
| 400/415V | [kW] | 0.02 | 0.06 | 0.09 | 0.12 | 0.18/0.25 | 0.37/0.5 | 0.55/0.75 | 1.1/1.5 | 2.2 | 3 | 3.7/4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 18.5 |
| 500V | [kW] | - | - | - | 0.25 | 0.37 | 0.55/0/75 | 1,1 | 1.5/2.2 | 3 | 3.7 | 4/5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 |
| 690V | [kW] | - | - | - | 0.25 | 0.37/0.55 | 0.75/1.1 | 1.5 | 2.2/3 | 3.7/4 | 5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | * | * | * | * | * | * | * | * | * | * | * | * | 100 | 125 | 125 | 125 | 160 |
| 400/460V | [kA] | * | * | * | * | * | * | * | * | * | 80 | 80 | 80 | 80 | 100 | 100 | 100 | 125 |
| 500V | [kA] | * | * | * | * | * | * | * | * | * | 63 | 80 | 80 | 80 | 80 | 80 | 80 | 100 |
| 690V | [kA] | * | * | * | * | * | * | 35 | 40 | 50 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 80 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 50 | 50 | 40 |
| 440/460V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 50 | 25 | 25 | 25 | 25 | 15 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 42 | 10 | 10 | 10 | 10 | 8 |
| 690V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 8 | 8 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 3 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 38 | 38 | 30 |
| 440/460V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 38 | 15 | 15 | 15 | 15 | 11 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 32 | 8 | 8 | 8 | 8 | 6 |
| 690V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 8 | 8 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 3 |

## High breaking type MMS-63H

| Rated operational current Ie | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching of standard three-phase motors AC-2, AC-3 | | | | | | | | | | | |
| 230/240V | [kW] | 2.2/3 | 3 | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 15 |
| 400/415V | [kW] | 3.7/4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 30 |
| 500V | [kW] | 4/5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 | 37 | 37 |
| 690V | [kW] | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 | 45 | 55 | 55 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | * | * | 100 | 125 | 125 | 125 | 160 | 160 | 160 | 160 |
| 400/460V | [kA] | 100 | 100 | 100 | 125 | 125 | 125 | 125 | 125 | 160 | 160 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 690V | [kA] | 63 | 63 | 63 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 75 |
| 400/415V | [kA] | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 35 |
| 440/460V | [kA] | 50 | 50 | 50 | 50 | 35 | 35 | 35 | 35 | 35 | 25 |
| 500V | [kA] | 50 | 42 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 6 |
| 690V | [kA] | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 |
| 400/415V | [kA] | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 27 |
| 440/460V | [kA] | 38 | 38 | 38 | 38 | 27 | 27 | 27 | 27 | 27 | 19 |
| 500V | [kA] | 38 | 32 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 5 |
| 690V | [kA] | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 |

## High breaking type MMS-100H

| Rated operational current Ie | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Switching of standard three-phase motors AC-2, AC-3 | | | | | | | | | | | |
| 230/240V | [kW] | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 22 | 30 | 30 |
| 400/415V | [kW] | 7.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 45 |
| 500V | [kW] | 11 | 11 | 15 | 22 | 30 | 37 | 37 | 45 | 55 | 63 |
| 690V | [kW] | 11 | 15 | 18.5 | 22 | 30 | 45 | 55 | 63 | 75 | 90 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/460V | [kA] | 125 | 125 | 125 | 160 | 160 | 160 | 200 | 200 | 200 | 200 |
| 500V | [kA] | 100 | 125 | 125 | 125 | 160 | 160 | 160 | 160 | 160 | 160 |
| 690V | [kA] | 80 | 80 | 80 | 80 | 80 | 100 | 100 | 125 | 160 | 160 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 75 | 75 | 75 |
| 440/460V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 500V | [kA] | 35 | 35 | 35 | 35 | 20 | 15 | 15 | 12 | 12 | 12 |
| 690V | [kA] | 12 | 12 | 12 | 12 | 12 | 10 | 8 | 6 | 6 | 6 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 440/460V | [kA] | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| 500V | [kA] | 27 | 27 | 27 | 19 | 15 | 11 | 11 | 9 | 9 | 9 |
| 690V | [kA] | 9 | 9 | 9 | 9 | 9 | 8 | 6 | 6 | 6 | 6 |

* Short circuit proof up to 50 or 100kA. No back up fuse required.

## Instantaneous type MMS-32HI

| Rated operational current Ie | | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6 | 8 | 10 | 13 | 17 | 22 | 26 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-2, AC-3 | | | | | | | | | | | | | | | | | | |
| 230/240V | [kW] | - | 0.03 | 0.06 | 0.09 | 0.12 | 0.18/0.25 | 0.37 | 0.55/0.75 | 1.1/1.5 | 1.5 | 2.2/3 | 3 | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 |
| 400/415V | [kW] | 0.02 | 0.06 | 0.09 | 0.12 | 0.18/0.25 | 0.37/0.55 | 0.75 | 1.1/1.5 | 2.2 | 3 | 3.7/4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 18.5 |
| 500V | [kW] | - | - | - | 0.25 | 0.37 | 0.55/0.75 | 1.1 | 1.5/2.2 | 3 | 3.7 | 4/5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 |
| 690V | [kW] | - | - | - | 0.25 | 0.37/0.55 | 0.75/1.1 | 1.5 | 2.2/3 | 3.7/4 | 5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | * | * | * | * | * | * | * | * | * | * | * | * | 100 | 125 | 125 | 125 | 160 |
| 400/460V | [kA] | * | * | * | * | * | * | * | * | * | 80 | 80 | 80 | 80 | 100 | 100 | 100 | 125 |
| 500V | [kA] | * | * | * | * | * | * | * | * | * | 63 | 80 | 80 | 80 | 80 | 80 | 80 | 100 |
| 690V | [kA] | * | * | * | * | * | * | 35 | 40 | 50 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 80 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 50 | 50 | 40 |
| 440/460V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 50 | 25 | 25 | 25 | 25 | 15 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 42 | 10 | 10 | 10 | 10 | 8 |
| 690V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 8 | 8 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 3 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 38 | 38 | 30 |
| 440/460V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 38 | 15 | 15 | 15 | 15 | 11 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 38 | 38 | 32 | 8 | 8 | 8 | 8 | 6 |
| 690V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 8 | 8 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 3 |

## Instantaneous type MMS-63HI

| Rated operational current Ie | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-2, AC-3 | | | | | | | | | | | |
| 230/240V | [kW] | 2.2/3 | 3 | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 15 |
| 400/415V | [kW] | 3.7/4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 30 |
| 500V | [kW] | 4/5.5 | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 | 37 | 37 |
| 690V | [kW] | 7.5 | 11 | 11 | 15 | 18.5 | 22 | 30 | 45 | 55 | 55 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | * | * | 100 | 125 | 125 | 125 | 160 | 160 | 160 | 160 |
| 400/460V | [kA] | 100 | 100 | 100 | 125 | 125 | 125 | 125 | 125 | 160 | 160 |
| 500V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 690V | [kA] | 63 | 63 | 63 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 75 |
| 400/415V | [kA] | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 35 |
| 440/460V | [kA] | 50 | 50 | 50 | 50 | 35 | 35 | 35 | 35 | 35 | 25 |
| 500V | [kA] | 50 | 42 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 6 |
| 690V | [kA] | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 |
| 400/415V | [kA] | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 27 |
| 440/460V | [kA] | 38 | 38 | 38 | 38 | 27 | 27 | 27 | 27 | 27 | 19 |
| 500V | [kA] | 38 | 32 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 5 |
| 690V | [kA] | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 |

## Instantaneous type MMS-100HI

| Rated operational current Ie | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-2, AC-3 | | | | | | | | | | | |
| 230/240V | [kW] | 3.7/4 | 4 | 5.5 | 7.5 | 7.5 | 11 | 15 | 22 | 30 | 30 |
| 400/415V | [kW] | 7.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 45 |
| 500V | [kW] | 11 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 63 |
| 690V | [kW] | 11 | 15 | 18.5 | 22 | 30 | 45 | 55 | 63 | 75 | 90 |
| Back-up fuses gG, gL,, only if Icc>Icu ( * = No back up fuse required) | | | | | | | | | | | |
| 230/240V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/415V | [kA] | * | * | * | * | * | * | * | * | * | * |
| 400/460V | [kA] | 125 | 125 | 125 | 160 | 160 | 160 | 200 | 200 | 200 | 200 |
| 500V | [kA] | 100 | 125 | 125 | 125 | 160 | 160 | 160 | 160 | 160 | 160 |
| 690V | [kA] | 80 | 80 | 80 | 80 | 80 | 100 | 100 | 125 | 160 | 160 |
| Ultimate short-circuit breaking capacity Icu | | | | | | | | | | | |
| 230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 75 | 75 | 75 |
| 440/460V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 500V | [kA] | 35 | 35 | 35 | 25 | 20 | 15 | 15 | 12 | 12 | 12 |
| 690V | [kA] | 12 | 12 | 12 | 12 | 12 | 10 | 8 | 6 | 6 | 6 |
| Rated service short-circuit breaking capacity Ics | | | | | | | | | | | |
| F230/240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 400/415V | [kA] | 100 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 440/460V | [kA] | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 |
| 500V | [kA] | 27 | 27 | 27 | 19 | 15 | 11 | 11 | 9 | 9 | 9 |
| 690V | [kA] | 9 | 9 | 9 | 9 | 9 | 8 | 6 | 6 | 6 | 6 |

# **Manual motor controller** (UL 508, CSA C22.2 as manual motor controllers)

## Type E start

Combination Motor Controller: Integrates motor control and overcurrent protection in a single device.
→ Can be used independently without need for additional protection devices.

MMS-63S

| Rated operational current Ie | | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 50 | 50 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 |
| | 230V | [HP] | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 10 |
| 3Ø | 200V | [HP] | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 |
| | 230V | [HP] | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 20 |
| | 460V | [HP] | 5 | 7½ | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 40 |
| | 575V | [HP] | 7½ | 10 | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 |

MMS-100S

| Rated operational current Ie | | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 40 | 40 | 40 | 40 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| | 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3Ø | 200V | [HP] | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 | 25 | 30 |
| | 230V | [HP] | 5 | 7 | 7½ | 10 | 10 | 15 | 20 | 25 | 30 | 30 |
| | 460V | [HP] | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 50 | 60 | 75 |
| | 575V | [HP] | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 | 75 | 100 |

### MMS-32H

| Rated operational current Ie | | | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6 | 8 | 10 | 13 | 17 | 22 | 26 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 30 | 30 | 30 | 30 | 30 |
| | 600V | [kA] | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | - | - | - | - | - | - | - | 1/8 | 1/4 | 1/3 | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 |
| | 230V | [HP] | - | - | - | - | - | 1/10 | 1/6 | 1/3 | 1/2 | 1 | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ |
| 3Ø | 200V | [HP] | - | - | - | - | - | - | 1/2 | 3/4 | 1 | 2 | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 |
| | 230V | [HP] | - | - | - | - | - | - | 1/2 | 3/4 | 1½ | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 |
| | 460V | [HP] | - | - | - | - | - | 3/4 | 1 | 2 | 3 | 5 | 5 | 7½ | 10 | 15 | 15 | 20 | 30 |
| | 575V | [HP] | - | - | - | - | 1/2 | 3/4 | 1½ | 3 | 5 | 5 | 7½ | 10 | 15 | 20 | 20 | 30 | 30 |

### MMS-63H

| Rated operational current Ie | | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| | 600V | [kA] | 25 | 25 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 |
| | 230V | [HP] | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 10 |
| 3Ø | 200V | [HP] | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 |
| | 230V | [HP] | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 20 |
| | 460V | [HP] | 5 | 7½ | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 40 |
| | 575V | [HP] | 7½ | 10 | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 |

### MMS-100H

| Rated operational current Ie | | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 65 | 65 | 65 | 65 | 65 | 65 | 50 | 50 | 50 | 50 |
| | 600V | [kA] | 25 | 25 | 25 | 20 | 20 | 20 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| | 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3Ø | 200V | [HP] | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 | 25 | 30 |
| | 230V | [HP] | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 25 | 30 | 30 |
| | 460V | [HP] | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 50 | 60 | 75 |
| | 575V | [HP] | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 | 75 | 100 |

## Manual motor controller (UL 508)

Manual Motor Controller: Designed manual control of small motors.
→ Must be used in conjunction with a separate circuit breaker or fuse.

* Choose CMC if motor protection is required. Select MMC if only simple control is needed.

### MMS-32S

| Rated operational current Ie | | | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6 | 8 | 10 | 13 | 17 | 22 | 26 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 50 | 50 | 40 | 30 | 30 | 20 | 20 |
| | 480V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 25 | 25 | 10 | 10 | 10 | 10 | 7.5 | 7.5 | 7.5 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 1 0 | 10 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Motor load | | | | | | | | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | - | - | - | - | - | - | - | 1/8 | 1/4 | 1/3 | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 |
| | 230V | [HP] | - | - | - | - | - | 1/10 | 1/6 | 1/3 | 1/2 | 1 | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ |
| 3Ø | 200V | [HP] | - | - | - | - | - | - | 1/2 | 3/4 | 1 | 2 | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 |
| | 230V | [HP] | - | - | - | - | - | - | 1/2 | 3/4 | 1½ | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 |
| | 460V | [HP] | - | - | - | - | - | 3/4 | 1 | 2 | 3 | 5 | 5 | 7½ | 10 | 15 | 15 | 20 | 30 |
| | 575V | [HP] | - | - | - | - | 1/2 | 3/4 | 1½ | 3 | 5 | 5 | 7½ | 10 | 15 | 20 | 20 | 30 | 30 |
| Max. fuse size | | [A] | 1 | 1 | 1 | 1 | 3 | 6 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 125 | 125 |
| Max. breaker size | | [A] | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 125 | 125 |

### MMS-63S

| Rated operational current Ie | | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 모터부하 | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 |
| | 230V | [HP] | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 10 |
| 3Ø | 200V | [HP] | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 |
| | 230V | [HP] | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 20 |
| | 460V | [HP] | 5 | 7½ | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 40 |
| | 575V | [HP] | 7½ | 10 | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 |
| Max. fuse size | | [A] | 40 | 50 | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 250 |
| Max. breaker size | | [A] | 40 | 50 | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 250 |

### MMS-100S

| Rated operational current Ie | | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| | 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3Ø | 200V | [HP] | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 | 25 | 30 |
| | 230V | [HP] | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 25 | 30 | 30 |
| | 460V | [HP] | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 50 | 60 | 75 |
| | 575V | [HP] | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 | 75 | 100 |
| Max. fuse size | | [A] | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 |
| Max. breaker size | | [A] | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 |

## MMS-32H

| Rated operational current Ie | | | 0.16 | 0.25 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6 | 8 | 10 | 13 | 17 | 22 | 26 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 30 | 30 | 30 | 30 | 30 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | - | - | - | - | - | - | - | 1/8 | 1/4 | 1/3 | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 |
| | 230V | [HP] | - | - | - | - | - | 1/10 | 1/6 | 1/3 | 1/2 | 1 | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ |
| 3Ø | 200V | [HP] | - | - | - | - | - | - | 1/2 | 3/4 | 1 | 2 | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 |
| | 230V | [HP] | - | - | - | - | - | - | 1/2 | 3/4 | 1½ | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 |
| | 460V | [HP] | - | - | - | - | - | 3/4 | 1 | 2 | 3 | 5 | 5 | 7½ | 10 | 15 | 15 | 20 | 30 |
| | 575V | [HP] | - | - | - | - | 1/2 | 3/4 | 1½ | 3 | 5 | 5 | 7½ | 10 | 15 | 20 | 20 | 30 | 30 |
| Max. fuse size | | [A] | 1 | 1 | 1 | 1 | 3 | 6 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 125 | 125 |
| Max. breaker size | | [A] | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 125 | 125 |

## MMS-63H

| Rated operational current Ie | | | 10 | 13 | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1/2 | 1/2 | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 |
| | 230V | [HP] | 1½ | 2 | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 10 |
| 3Ø | 200V | [HP] | 2 | 3 | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 |
| | 230V | [HP] | 3 | 3 | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 20 |
| | 460V | [HP] | 5 | 7½ | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 40 |
| | 575V | [HP] | 7½ | 10 | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 |
| Max. fuse size | | [A] | 40 | 50 | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 250 |
| Max. breaker size | | [A] | 40 | 50 | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 250 |

## MMS-100H

| Rated operational current Ie | | | 17 | 22 | 26 | 32 | 40 | 50 | 63 | 75 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. short-circuit current | | | | | | | | | | | | |
| | 240V | [kA] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 480V | [kA] | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| | 600V | [kA] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Motor load | | | | | | | | | | | | |
| 1Ø | 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| | 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3Ø | 200V | [HP] | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 | 25 | 30 |
| | 230V | [HP] | 5 | 7½ | 7½ | 10 | 10 | 15 | 20 | 25 | 30 | 30 |
| | 460V | [HP] | 10 | 15 | 15 | 20 | 30 | 30 | 40 | 50 | 60 | 75 |
| | 575V | [HP] | 15 | 20 | 20 | 30 | 30 | 40 | 60 | 60 | 75 | 100 |
| Max. fuse size | | [A] | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 |
| Max. breaker size | | [A] | 60 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 |

## Type '2' coordination according to IEC60947-4-1

Short-circuit Current Iq : 50kA
Voltage : 400/415V, 50/60Hz

| Standard Motors AC at 400/415V 1500rpm | | Manual motor starter | | | Contactor | |
|---|---|---|---|---|---|---|
| | | Circuit breaker | Thermal overload release setting range | Magnetic release response current | | |
| [kW] | [A] | Type | [A] | [A] | Type | [A] |
| - | - | MMS-32S 0.16A | 0.1~0.16 | 2.1 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.06 | 0.2 | MMS-32S 0.25A | 0.16~0.25 | 3.3 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.09 | 0.3 | MMS-32S 0.4A | 0.25~0.4 | 5.2 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.12 | 0.4 | MMS-32S 0.63A | 0.4~0.63 | 8.2 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.18 | 0.6 | MMS-32S 1A | 0.63~1 | 13 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.25 | 0.8 | MMS-32S 1A | 0.63~1 | 13 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.37 | 1.1 | MMS-32S 1.6A | 1~1.6 | 20.8 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.55 | 1.5 | MMS-32S 1.6A | 1~1.6 | 20.8 | GMC-6M / MC-9a / MC-9b | 6 / 9 |
| 0.75 | 1.9 | MM-32S 2.5A | 1.6~2.5 | 32.5 | MC-12a / MC-12b | 12 |
| 1.1 | 2.7 | MMS-32S 4A | 2.5~4 | 52 | MC-18a / MC-18b | 18 |
| 1.5 | 3.6 | MMS-32S 4A | 2.5~4 | 52 | MC-18a / MC-18b | 18 |
| 2.2 | 5.2 | MMS-32S 6A | 4~6 | 78 | MC-18a / MC-18b | 18 |
| 3 | 6.8 | MMS-32S 8A | 5~8 | 104 | MC-18a / MC-18b | 18 |
| 4 | 9 | MMS-32S 10A | 6~10 | 130 | MC-18a / MC-18b | 18 |
| 5.5 | 11.5 | MMS-32H 13A | 9~13 | 169 | MC-22b | 22 |
| 7.5 | 15.5 | MMS-32H 17A | 11~17 | 221 | MC-22b | 22 |
| 10 | 20 | MMS-32H 22A | 14~22 | 286 | MC-32a | 32 |
| 11 | 22 | MMS-32H 26A | 18~26 | 338 | MC-32a | 32 |
| 15 | 29 | MMS-32H 32A | 22~32 | 416 | MC-32a | 32 |
| 18.5 | 35 | MMS-63H 40A | 28~40 | 520 | MC-40a | 40 |
| 22 | 41 | MMS-63H 50A | 34~50 | 650 | MC-50a | 50 |
| 30 | 55 | MMS-63H 63A | 45~63 | 819 | MC-65a | 65 |
| 37 | 67 | MMS-100S 75A | 55~75 | 975 | MC-75a | 75 |
| - | - | MMS-100S 90A | 70~90 | 1170 | MC-85a | 85 |
| 45 | 80 | MMS-100S 100A | 80~100 | 1300 | MC-85a | 85 |

### Definition of type '2' coordination according to IEC 60947-4-1 :

- The contactor or the starter must not endanger individuals or systems in the event of a short-circuit.
- The contactor or the starter must be suitable for general applications.
- No damage to the overload relay or other parts may occur with the exception of welding the contactor or starter contacts provided that the components can be easily separated without significant deformation (such as with a screwdriver).

# LS MMS ready for IE3-rated motors

| Type | Rated current(A) | Short-circuit current(A) | Current range(A) | | | Short-circuit current ratio | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Mid | Max | Min | Mid | Max |
| 32 | 0.16A | 2.1 | 0.1 | 0.13 | 0.16 | 20.8 | 16.0 | 13.0 |
| | 0.25A | 3.3 | 0.16 | 0.2 | 0.25 | 20.3 | 16.3 | 13.0 |
| | 0.4A | 5.2 | 0.25 | 0.33 | 0.4 | 20.8 | 15.8 | 13.0 |
| | 0.63A | 8.2 | 0.4 | 0.52 | 0.63 | 20.5 | 15.8 | 13.0 |
| | 1A | 13.0 | 0.63 | 0.81 | 1 | 20.6 | 16.0 | 13.0 |
| | 1.6A | 20.8 | 1 | 1.3 | 1.6 | 20.8 | 16.0 | 13.0 |
| | 2.5A | 32.5 | 1.6 | 2.1 | 2.5 | 20.3 | 15.5 | 13.0 |
| | 4A | 52 | 2.5 | 3.3 | 4 | 20.8 | 15.8 | 13.0 |
| | 6A | 78 | 4 | 5 | 6 | 19.5 | 15.6 | 13.0 |
| | 8A | 104 | 5 | 6.5 | 8 | 20.8 | 16.0 | 13.0 |
| | 10A | 130 | 6 | 8 | 10 | 21.7 | 16.3 | 13.0 |
| | 13A | 169 | 9 | 11 | 13 | 18.8 | 15.4 | 13.0 |
| | 17A | 221 | 11 | 14 | 17 | 20.1 | 15.8 | 13.0 |
| | 22A | 286 | 14 | 18 | 22 | 20.4 | 15.9 | 13.0 |
| | 26A | 338 | 18 | 22 | 26 | 18.8 | 15.4 | 13.0 |
| | 32A | 416 | 22 | 27 | 32 | 18.9 | 15.4 | 13.0 |
| | 40A | 520 | 28 | 34 | 40 | 18.6 | 15.3 | 13.0 |
| 63 | 10A | 130 | 6 | 8 | 10 | 21.7 | 16.3 | 13.0 |
| | 13A | 169 | 9 | 11 | 13 | 18.8 | 15.4 | 13.0 |
| | 17A | 221 | 11 | 14 | 17 | 20.1 | 15.8 | 13.0 |
| | 22A | 286 | 14 | 17 | 22 | 20.4 | 16.8 | 13.0 |
| | 26A | 338 | 18 | 22 | 26 | 18.8 | 15.4 | 13.0 |
| | 32A | 416 | 22 | 27 | 32 | 18.9 | 15.4 | 13.0 |
| | 40A | 520 | 28 | 34 | 40 | 18.6 | 15.3 | 13.0 |
| | 50A | 650 | 34 | 42 | 50 | 19.1 | 15.5 | 13.0 |
| | 63A | 819 | 45 | 54 | 63 | 18.2 | 15.2 | 13.0 |
| | 65A | 845 | 47 | 56 | 65 | 18.0 | 15.1 | 13.0 |
| 100 | 17A | 221 | 11 | 14 | 17 | 20.1 | 15.8 | 13.0 |
| | 22A | 286 | 14 | 18 | 22 | 20.4 | 15.9 | 13.0 |
| | 26A | 338 | 18 | 22 | 26 | 18.8 | 15.4 | 13.0 |
| | 32A | 416 | 22 | 27 | 32 | 18.9 | 15.4 | 13.0 |
| | 40A | 520 | 28 | 34 | 40 | 18.6 | 15.3 | 13.0 |
| | 50A | 650 | 34 | 42 | 50 | 19.1 | 15.5 | 13.0 |
| | 63A | 819 | 45 | 54 | 63 | 18.2 | 15.2 | 13.0 |
| | 75A | 975 | 55 | 65 | 75 | 17.7 | 15.0 | 13.0 |
| | 90A | 1170 | 70 | 80 | 90 | 16.7 | 14.6 | 13.0 |
| | 100A | 1300 | 80 | 90 | 100 | 16.3 | 14.4 | 13.0 |

## IE3 De-rating table

**What is the IE3?**

Motors rated from IE1 through IE4 vary in energy efficiency with IE3 being more efficient compared to IE1 and IE2-rated motors.

**Why IE3?**

As part of the EU Environmental policy "20/30-20-20" strategy, the EU is committed to achieving the following by 2020:

- Reduce Greenhouse Gas Emissions by up to 30%
- Increase the Share of Renewable Energy to 20% and
- Boost Energy Efficiency by 20%

IEC 60034-30 standard specifies IE classes for motors in accordance with the above requirements. Therefore, consumers must comply with the standard when using MMS products.

**How to select MMS?**

To meet the IE3 motor starting current and inrush current, adhering to the de-rating table is recommended. (13 times the rated current)

**Example:**

When selecting product A or B:
A: MMS setting scale 11 ~ 17A
B: MMS setting scale 14 ~ 22A
Rated motor current : 16A

The short-circuit current of MMS A is 221A (17*13), and MMS B is 286A (22*13).
When applying the motor's rated current( 16A) to MMS A, the multiplier of the short-circuit current is 13.8 times. When applying the motor's rated current (16A) to MMS B, the multiplier of the short-circuit current is 17.9 times. If IE3 motor or above is used here, malfunction can occur due to higher starting current compared to IE1 or 2 motor. Therefore, MMS B is recommended since it has the higher multiplier of the short-circuit current.

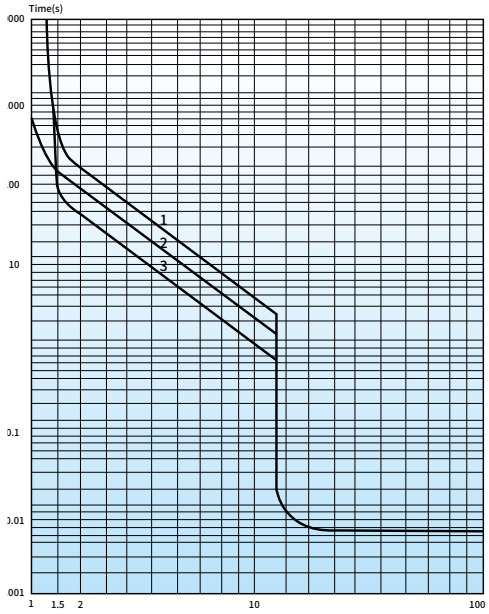


# Characteristic curve

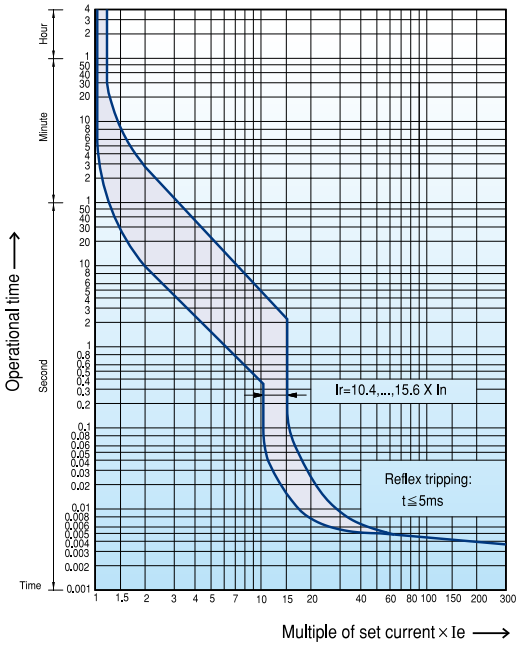
[mm]

## Tripping curve

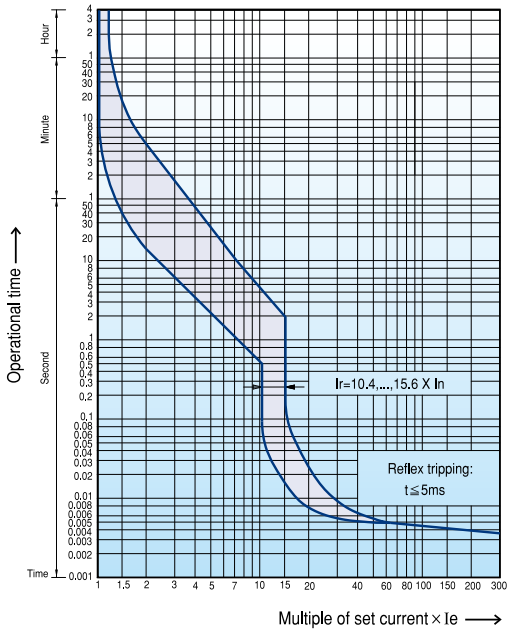
### MMS-32D




### MMS-32AF




### MMS-63, 100AF




### Thermal release trip current

The adjustable inverse bimetal trip reliability feature protects motors against overloads.
The curve shows the mean operating current at an ambient temperature of 20°C starting from cold. Careful testing and setting ensures effective motor protection even in the case of single phase.

### Magnetic release trip current

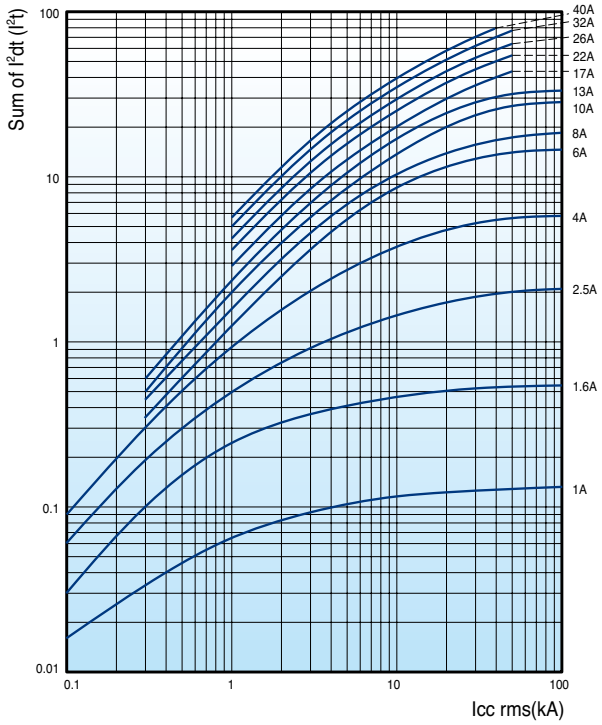
The instantaneous magnetic trip has a fixed operating current setting. This corresponds to 13 times the maximum value of the setting range. At a lower setting it is correspondingly higher.

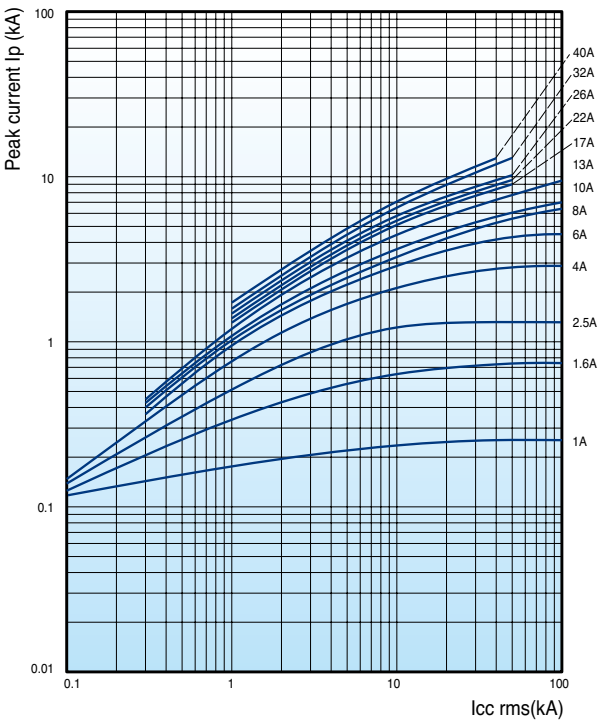
### Current setting Ie

The overload trip corresponds to a thermal overload relay in a motor starter conforming to IEC 947-4-1. If a different value is prescribed (e.g. reduced Ie for cooling medium having a temperature higher than 40°C or a place of installation higher than 2000m above sea level), the setting current is equal to the reduced rated current Ie of the motor.

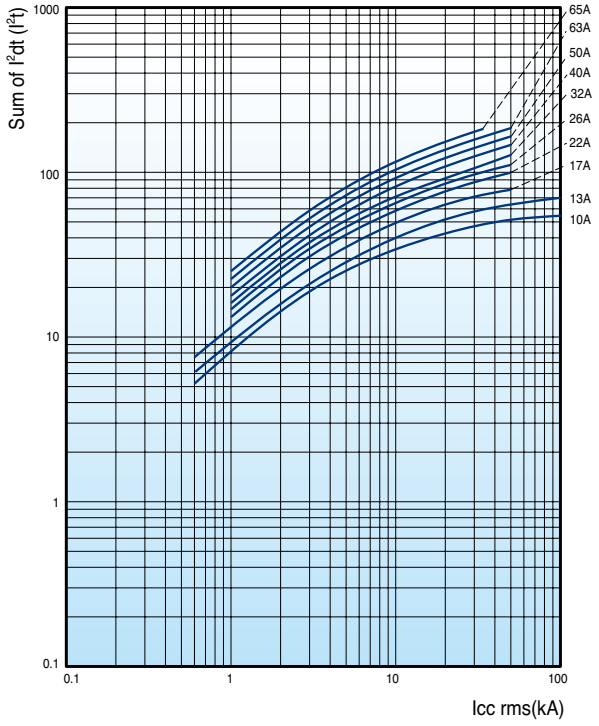
## Thermal limit on short-circuit
## Thermal limit in kA2s in the magnetic operating zone (Ue=415V)

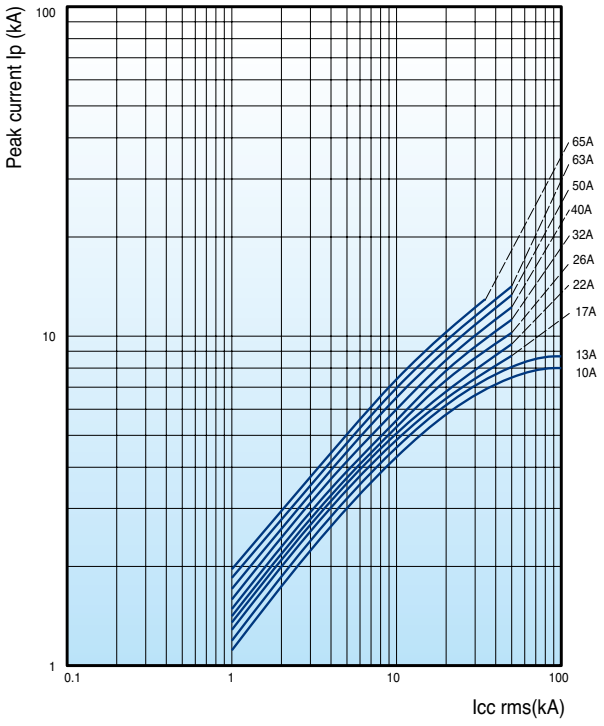
### MMS-32S/H/HI



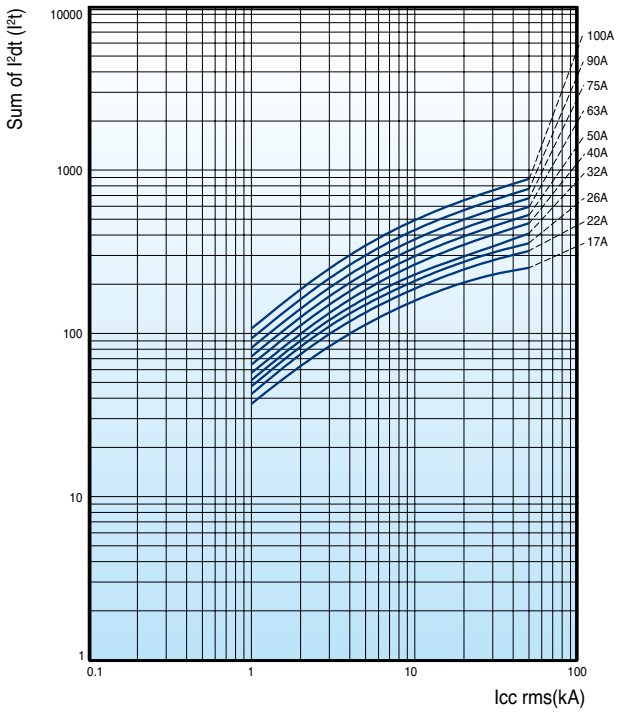
## MMS-63S/H/HI

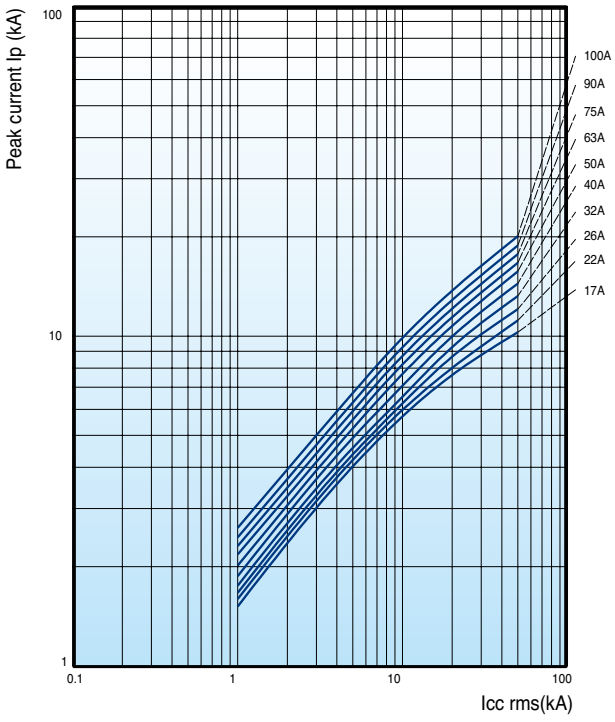

Sum of I²dt (I²t)
1000
100
10
1
0.1
0.1
1
10
100
Icc rms(kA)
65A
63A
50A
40A
32A
26A
22A
17A
13A
10A


Peak current Ip (kA)
100
10
1
0.1
1
10
100
Icc rms(kA)
65A
63A
50A
40A
32A
26A
22A
17A
13A
10A

## Thermal limit in kA2s in the magnetic operating zone (Ue=415V)

### MMS-100S/H/HI

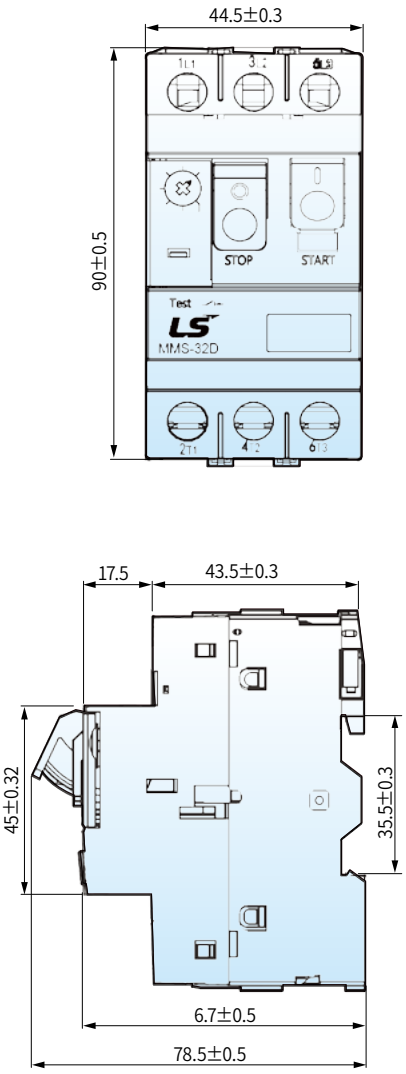


# MMS

[mm]

## MMS-32D



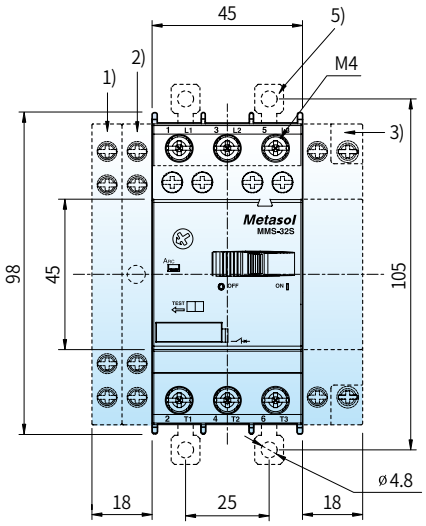
# Dimensions

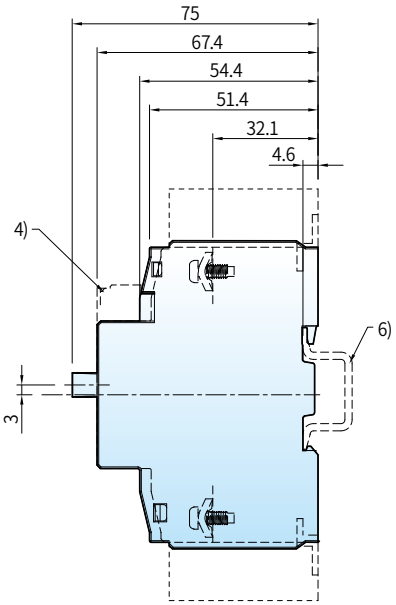
## MMS

[mm]

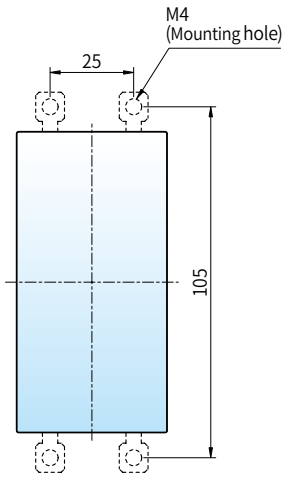
### MMS-32S

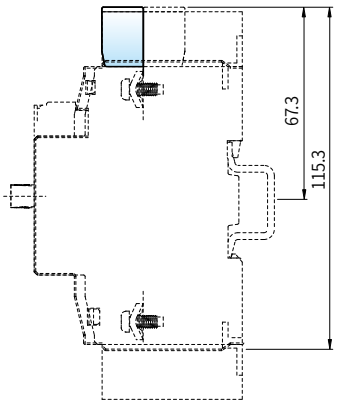
1) Side auxiliary switch
2) Side magnetic trip alarm switch
3) Side shunt release or side undervoltage release
4) Front auxiliary switch
5) Push-in lugs for screw mounting
6) 35㎜ standard mounting rail acc. to EN 50 022

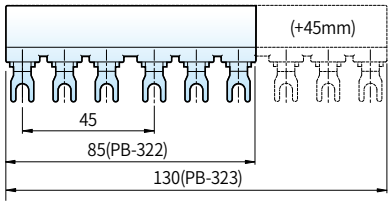


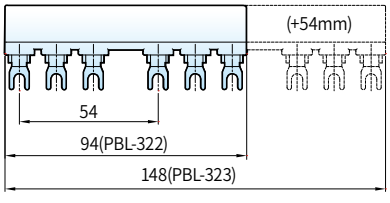

0.32kg




MMS-32S+PB-32
PB-322 (2 Terminals), PB-323 (3 Terminals)
PB-324 (4 Terminals), PB-325 (5 Terminals)

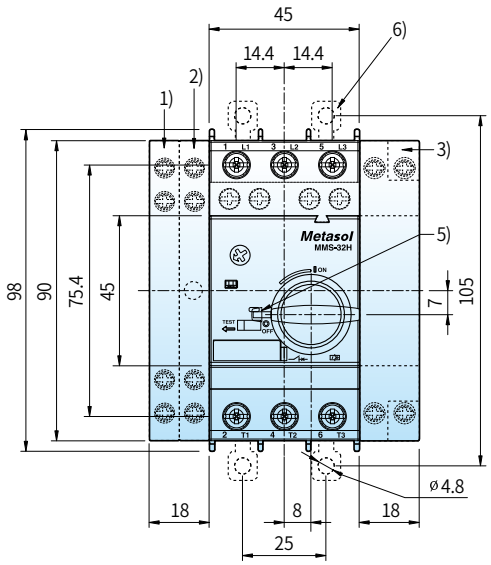


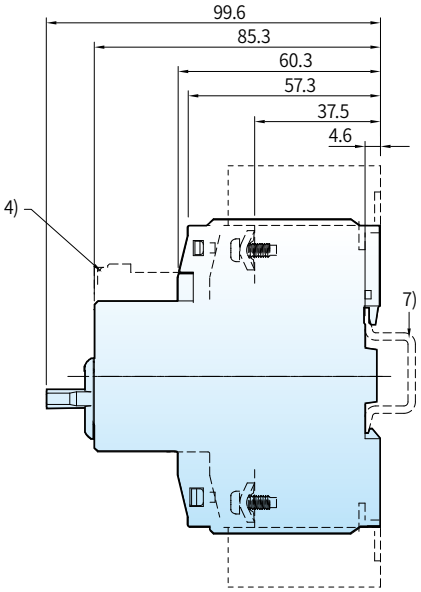

MMS-32S+PBL-32
PBL-322(2 Terminals), PBL-323 (3 Terminals)

[mm]

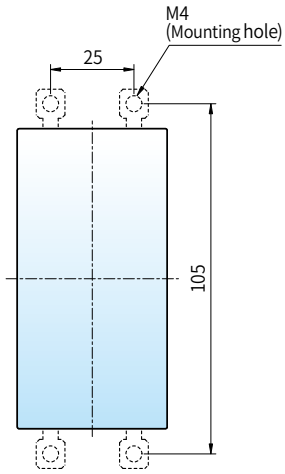
## MMS-32H, 32HI

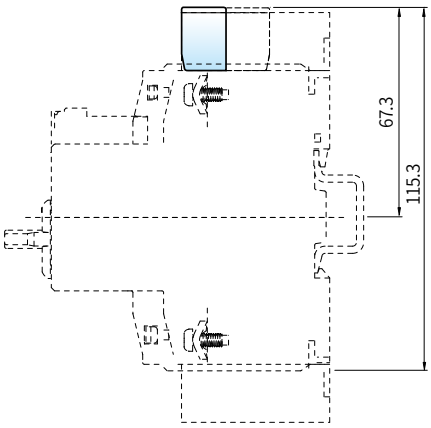
1) Side auxiliary switch
2) Side magnetic trip alarm switch
3) Side shunt release or side undervoltage release
4) Front auxiliary switch
5) Handle lock in Off position(Ø5㎜)
6) Push-in lugs for screw mounting
7) 35㎜ standard mounting rail acc. to EN 50 022

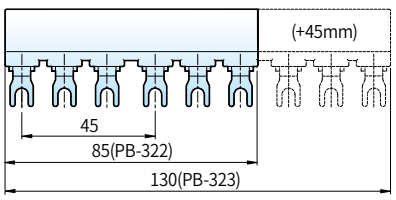


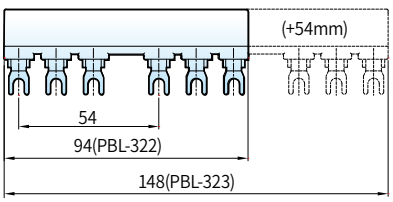

0.36kg




MMS-32H/HI+PB-32
PB-322 (2 Terminals), PB-323 (3 Terminals)
PB-324 (4 Terminals), PB-325 (5 Terminals)



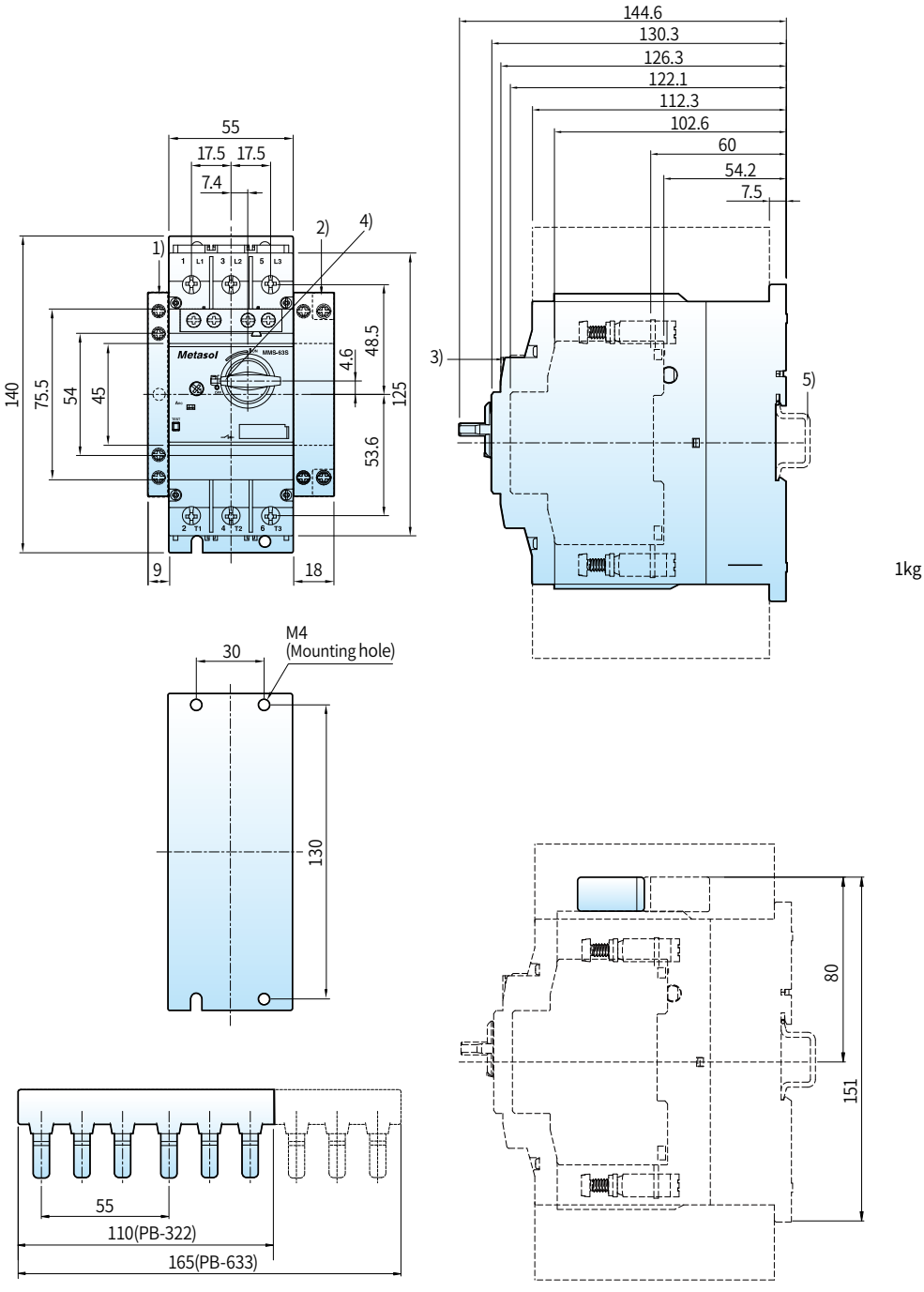

MMS-32H,HI+PBL-32
PBL-322 (2 Terminals), PBL-323 (3 Terminals)

# MMS

[mm]

## MMS-63S, 63H, 63HI

1) Side auxiliary switch or side magnetic trip alarm switch
2) Side shunt release or side undervoltage release
3) Front auxiliary switch
4) Handle lock in Off position(Ø5㎜)
5) 35㎜ standard mounting rail acc. to EN 50 022



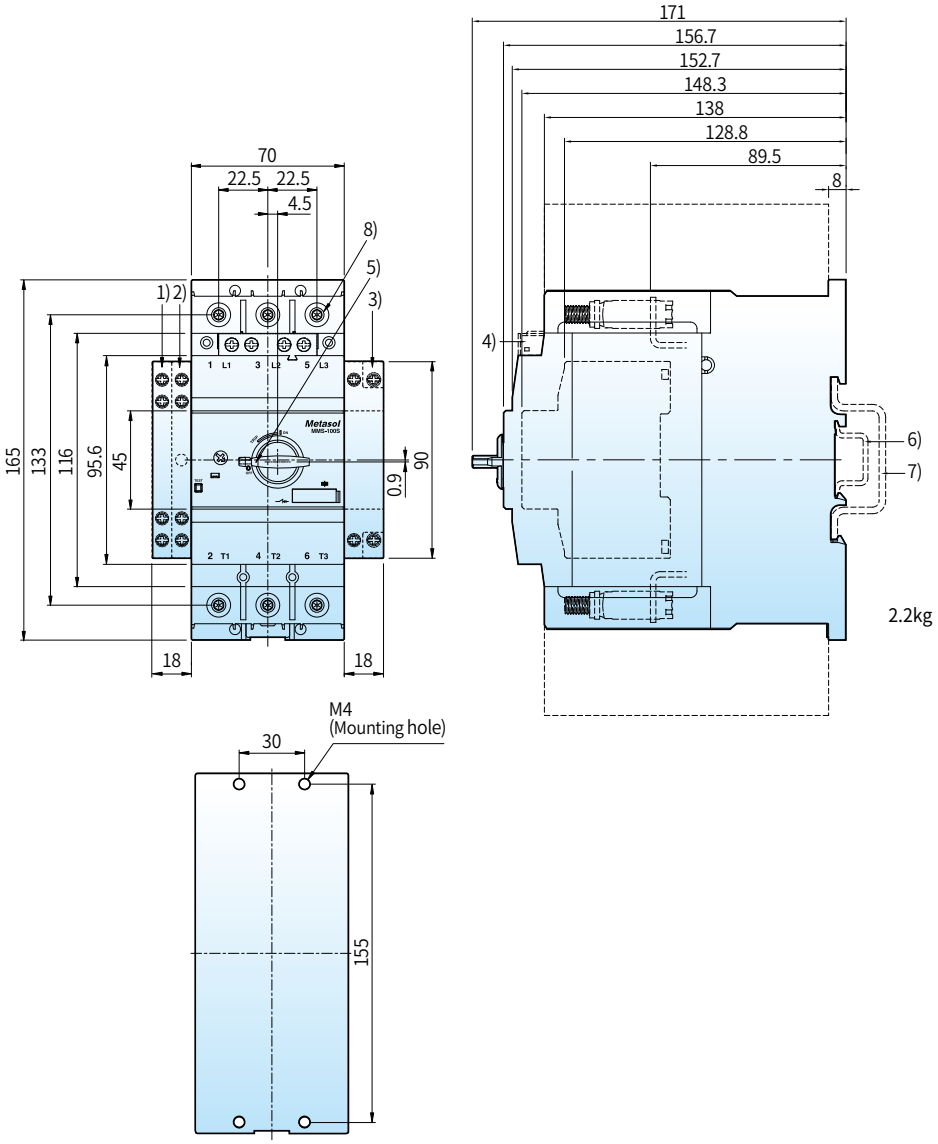

1kg

MMS-63S/H/HI+PB-63
PB-632 (2 Terminals), PB-633 (3 Terminals)

[mm]

## MMS-100S, 100H, 100HI

1) Side auxiliary switch
2) Side magnetic trip alarm switch
3) Side shunt release or side undervoltage release
4) Front auxiliary switch
5) Handle lock in Off position(Ø5㎜)
6) 35㎜ standard mounting rail acc. to EN 50 022
7) 75㎜ standard mounting rail acc. to EN 50 023
8) 4㎜ hexagon socket screw

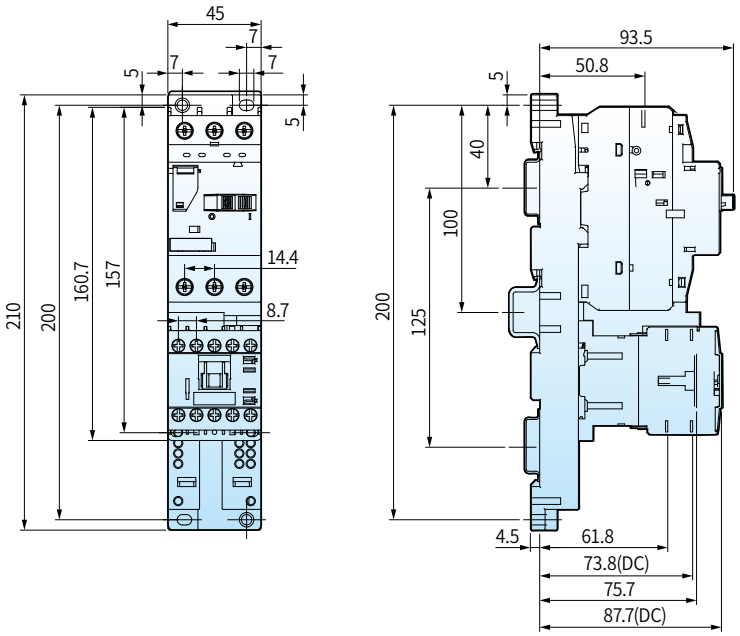


# Dimensions

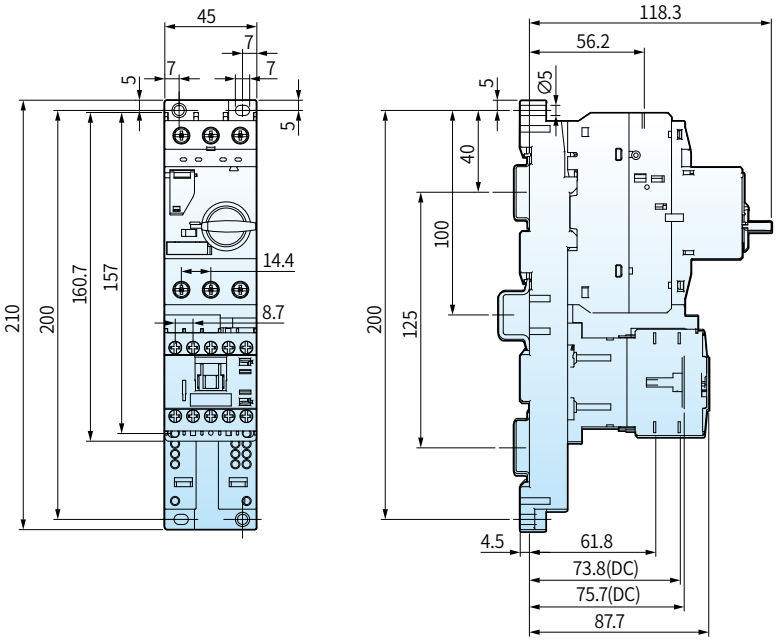
## MMS + Mini-MS

[mm]

### MMS-32S+ GMC(D)-6M~16M



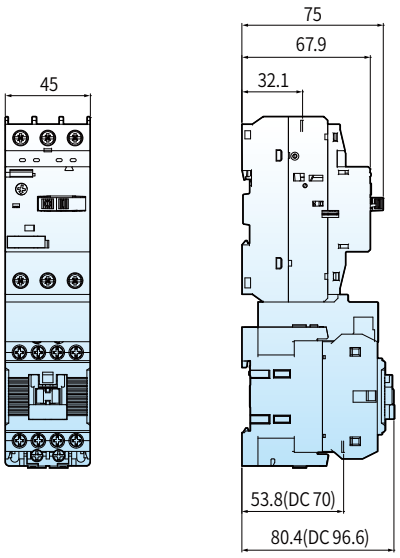

### MMS-32H+ GMC(D)-6M~16M



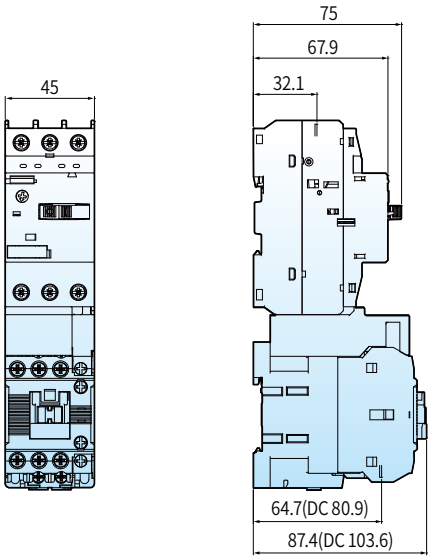
# MMS + Metasol MC

[mm]

## MMS-32S+ MC-6a~18a




## MMS-32S+ MC-9b~22b

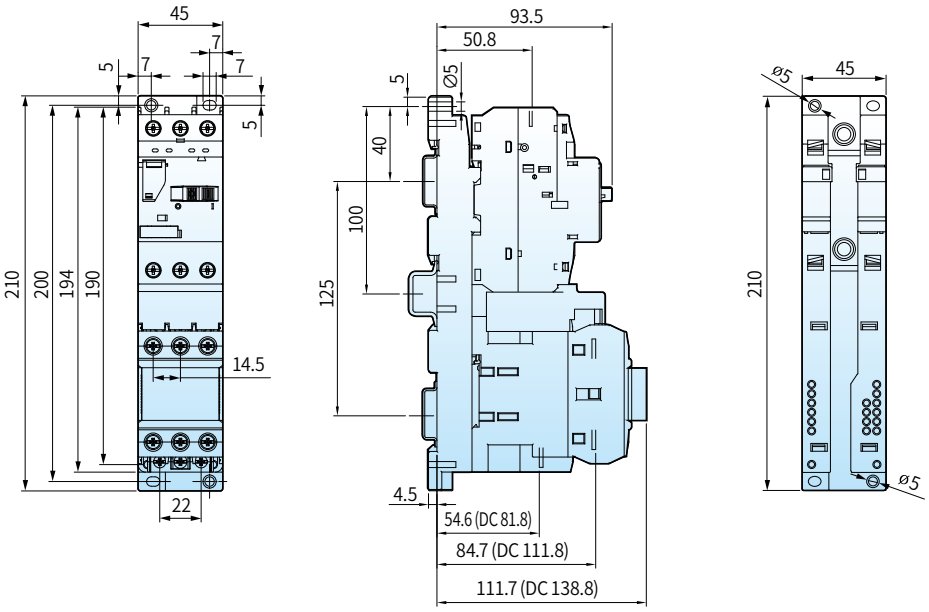


# Dimensions

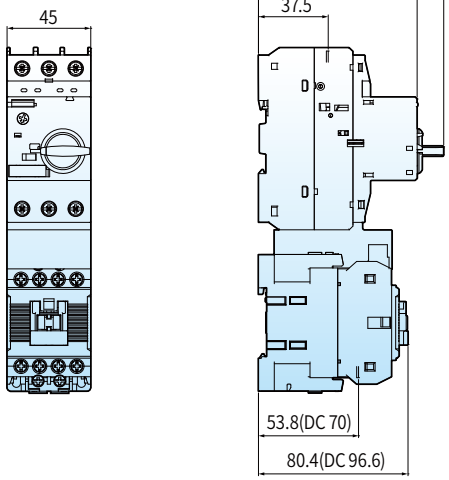
## MMS + Metasol MC

[mm]

### MMS-32S+MC-32a

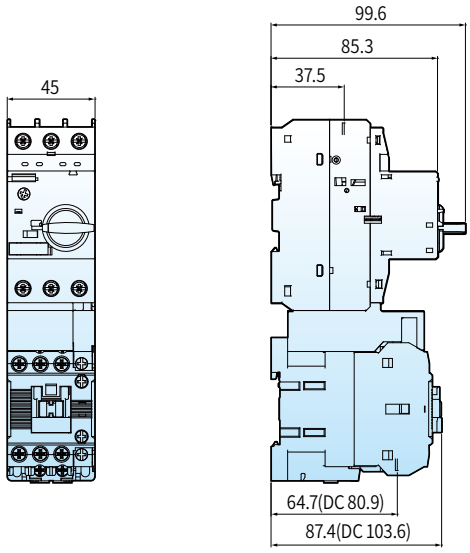



### MMS-32H, HI+MC-6a~18a

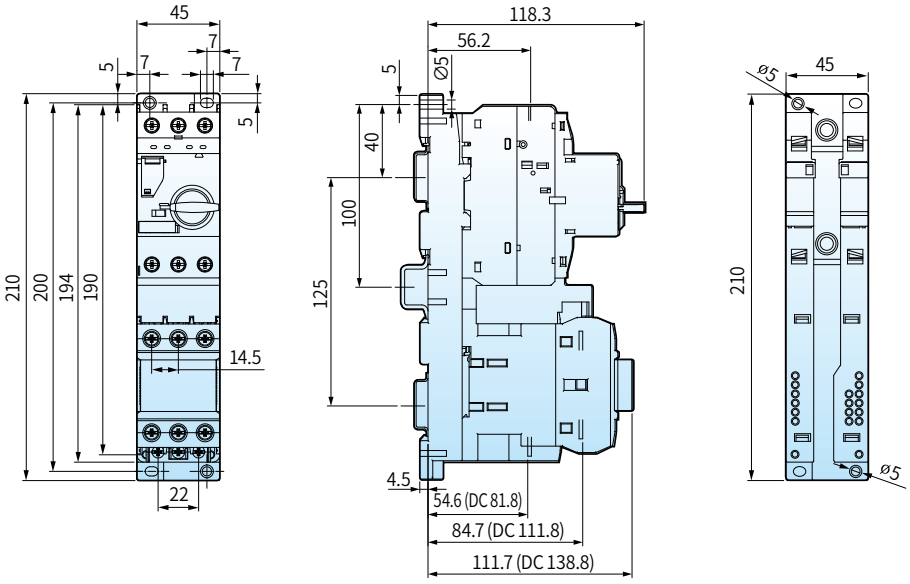


[mm]

## MMS-32H, HI+MC-9b~22b




## MMS-32H+MC-32a

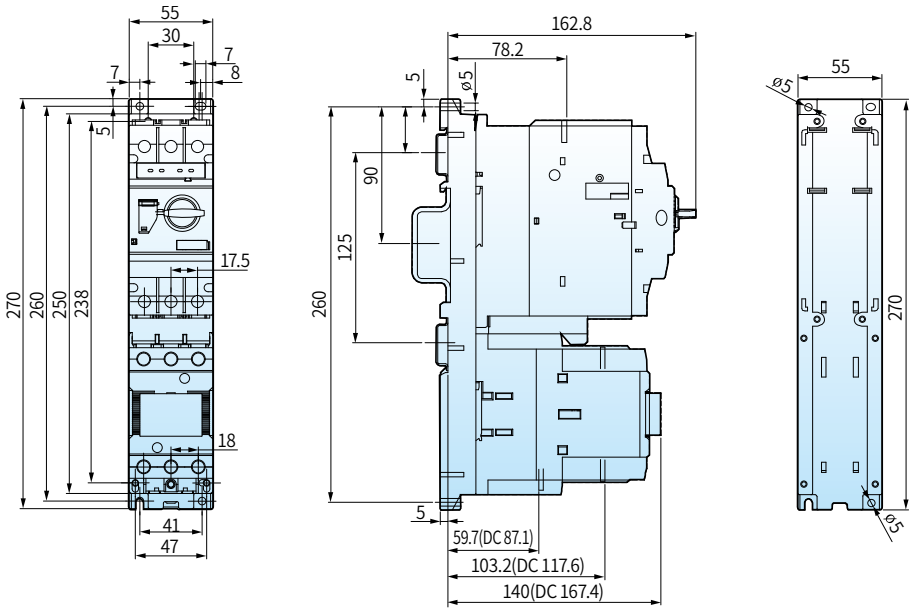


# Dimensions

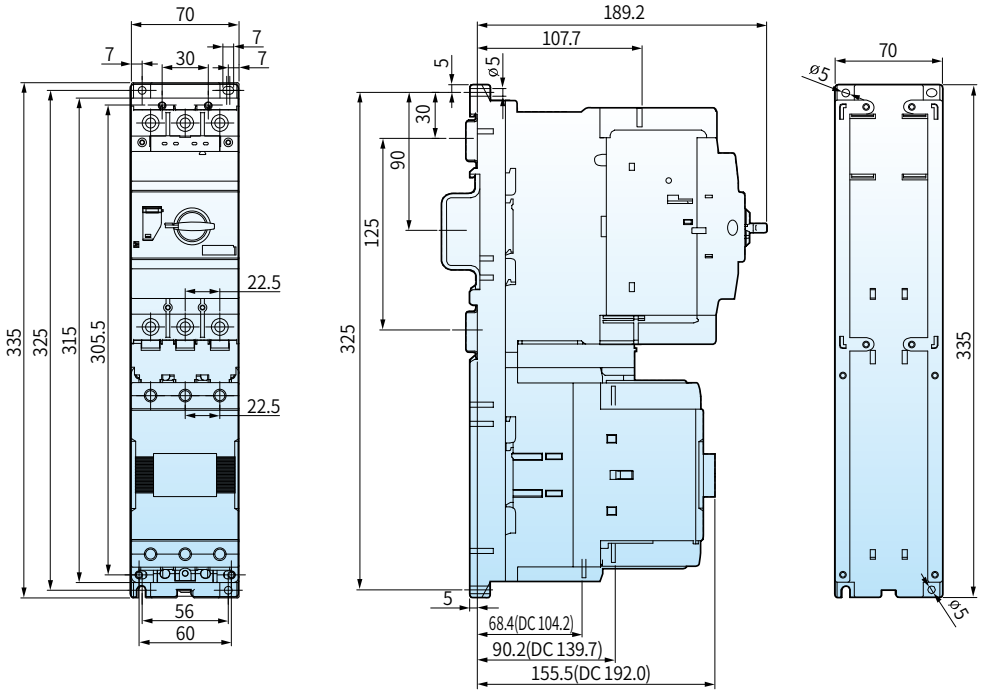
## MMS + Metasol MC

[mm]

### MMS-63H+MC-63a



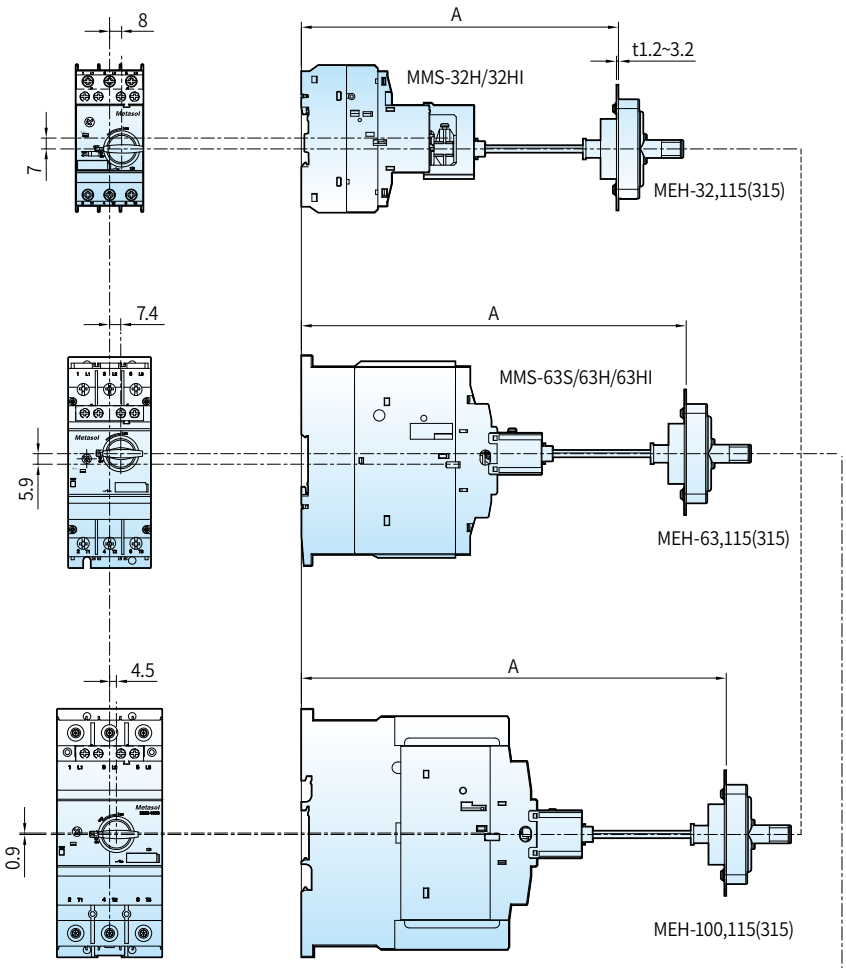

### MMS-100H+MC-100a



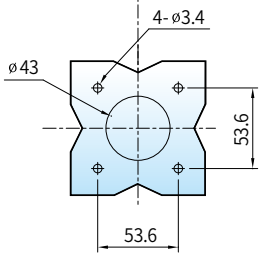
# External accessories

[mm]

## E-handle



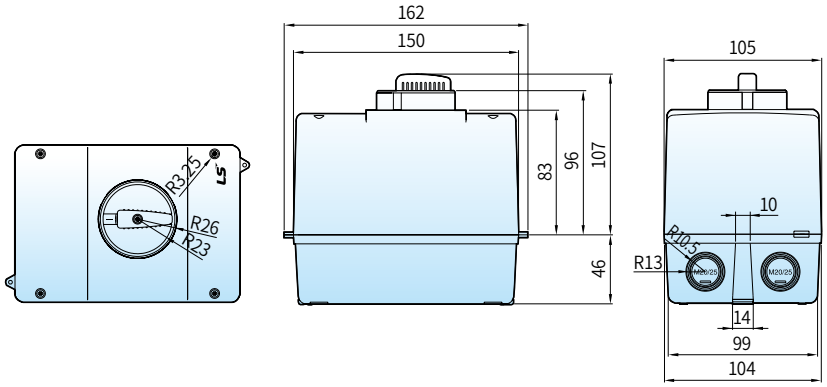

| E-handle type | A(mm) | MMS type |
|---|---|---|
| MEH-32, 115 | min : 148.6 | MMS-32H/32HI |
| | max:210.6 (Shaft 115mm) | |
| MEH-32, 315 | min : 148.6 | |
| | max:410.6 (Shaft 315mm) | |
| MEH-63, 115 | min : 193.6 | MMS-63S/63H/63HI |
| | max:255.6 (Shaft 115mm) | |
| MEH-63, 315 | min : 193.6 | |
| | max:455.6 (Shaft 315mm) | |
| MEH-100, 115 | min : 220 | MMS-100S/100H/100HI |
| | max:282 (Shaft 115mm) | |
| MEH-100, 315 | min : 220 | |
| | max:482 (Shaft 315mm) | |



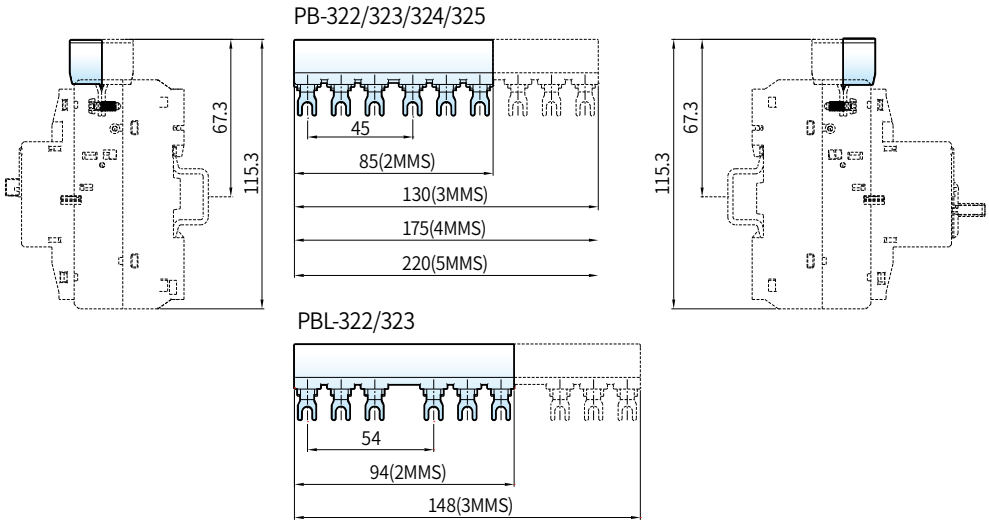
## External accessories

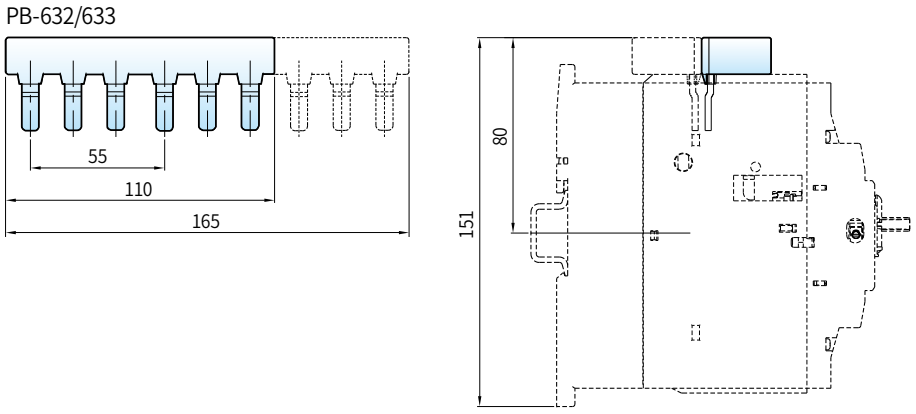
[mm]

### Enclosure



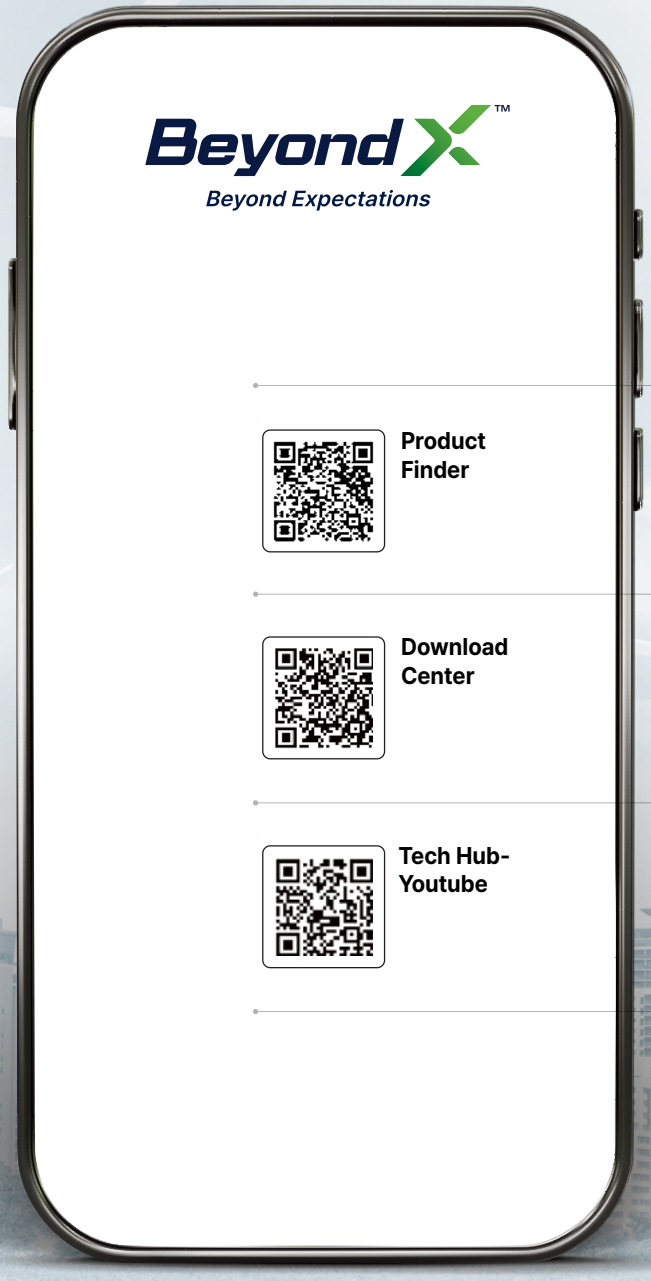

### Phase bus



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127 LS-ro (Hogye-dong) Dongan-gu, Anyang-si, Gyeonggi-Do, 14119, Korea

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LS Yongsan Tower, 92, Hangang-daero, Yongsan-gu, Seoul, 04386, Korea
TEL: 82-2-2034-4916, 4684, 4429

**China**

LS ELECTRIC (Dalian) Co., Ltd.
+86-411-8730-5872
china.dalian@lselectric.com.cn

LS ELECTRIC (Wuxi) Co., Ltd.
+86-510-6851-6666
china.wuxi@lselectric.com.cn

LS ELECTRIC (Lishui) Co., Ltd.
+86-578-6866-780
china.lishui@lselectric.com.cn

Shanghai Office
+86-21-5237-9977
china@lselectric.com.cn

Beijing Office
+86-10-5095-1631
china@lselectric.com.cn

Guangzhou Office
+86-20-3818-2883
china@lselectric.com.cn

Qingdao Office
+86-532-8501-2065
china@lselectric.com.cn

Chengdu Office
+86-28-8670-3201
china@lselectric.com.cn

Nanjing Office
+86-25-84 67-0005
china@lselectric.com.cn

**India**

India Office
+91-80-6142-9108
Info_india@ls-electric.com

**Indonesia**

PT. LS ELECTRIC INDONESIA
+62-21-2933-7614
indonesia@ls-electric.com

**Italy**

Italy Office
+39-030-8081-833
italia@ls-electric.com

**Japan**

LS ELECTRIC Japan Co., Ltd.
+81-3-6268-8241
japan@ls-electric.com

Tokyo Office
+81-3-6268-8241
tokyo@ls-electric.com

**Netherlands**

LS ELECTRIC Europe B.V.
+31-20-654-1424
europartner@ls-electric.com

**Russia**

Moscow Office
+7-499-682-6130
info@lselectric-ru.com

**Singapore**

Singapore Office
+65-6958-8162
singapore@ls-electric.com

**Spain**

LS ELECTRIC IBERIA S.L.U.
+34-910-28-02-74
iberia@ls-electric.com

**Thailand**

Bangkok Office
+66-2-128-0295
thailand@ls-electric.com

**Türkiye**

LS ELECTRIC Türkiye Co., Ltd.
+90-212-806-1252
turkiye@ls-electric.com

**U.A.E.**

LS ELECTRIC Middle East FZE (Dubai)
+971-4-886-5360
middleeast@ls-electric.com

**USA**

LS ELECTRIC America Inc.
+1-800-891-2941
sales.us@lselectricamerica.com

LS ENERGY SOLUTIONS LLC
+1-980-221-0654
info@ls-es.com

MCM Engineering II
+1-435-865-0125
sales.us@lselectricamerica.com

America Western Office
+1-949-333-3140
america@ls-electric.com

America Bastrop Campus
+1-800-891-2941 EXT 2
power_support.us@lselectricamerica.com

**Vietnam**

LS ELECTRIC Vietnam Co., Ltd.
+84-222-2221-110
vietnam@ls-electric.com

Hanoi Office
+84-24-6275-8054
vietnam@ls-electric.com

Ho Chi Minh Office
+84-3823-7890
vietnam@ls-electric.com

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