
# LSIS Electric Products

## ACB / MCCB / MCB / MC&TOR / Mini-MS / MMS / EMPR

## Air circuit breakers

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### Susol series

- 85, 100 and 130kA short circuit current with instantaneous at 508V
- High functional digital trip relays
- UL approved

## Molded Case Circuit Breakers

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### Susol series

- 2, 3 pole series up to 1200AF
- UL approved

## Miniature circuit breakers

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- UL 1077 R-Series

## Contactors & Overload Relays

Page 14

### Metasol series

- 3 and 4 pole series up to 800AF Mini-contactors available
- AC/DC common use coil from 150AF to 800AF
- Thermal (Bimetallic) and electronic type overload relays are available
- UL approved

## Mini contactors

Page 22


## Manual motor starters

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## Electronic motor protection relays (Electronic type overload relays)

Page 27

- Various connection & mount
- Reliability by real-time data processing and high precision.
- Wide current setting range & Various protection functions
- Inverse or definite time mode
- Display the causes of the fault by LED
- Ampere meter, Load rate Display type
- Standard, Ground fault and short circuit protection type
- Unit or Extension in one body by cable option
- CE marked and UL approved type

# Air circuit breakers

## Ratings for UL Listed/ANSI Certified Susol UA Circuit Breakers

| TYPE | | | | | Susol UAS-□□D | |
|---|---|---|---|---|---|---|
| AF | | | | | 08 | 16 |
| Rated current (In max) | (A) | | | at 40°C | 800 | 1600 |
| Rated current | (A) | | | at 40°C | | 800 |
| | | | | | 400 | 1000 |
| | | | | | 600 | 1200 |
| | | | | | 630 | 1250 |
| | | | | | 800 | 1600 |
| Rated Maximum Voltage | (V) | | | | 254V / 508V / 635V | |
| Frequency | (Hz) | | | | 50/60 | |
| Number of poles | (P) | | | | 3P / 4P | |
| Type of Trip relay (Electronic trip device) | | | | | N, A, P, S (4 type) | |
| Rated short circuit current (Sym.) UL 1066 ANSI C37.13 | (kA) | With instantaneous | AC | 635V | 65 | |
| | | | | 508V | 85 | |
| | | | | 254V | 85 | |
| | | Without instantaneous | AC | 635V | 65 | |
| | | | | 508V | 65 | |
| | | | | 254V | 65 | |
| Rated short Time current | (kA) | | | | 65 | |
| Operating time (t) | (ms) | Maximum total breaking time | | | 50ms | |
| | | Maximum closing time | | | 80ms | |
| Life cycle ACB | (time) | Mechanical | Without maintenance | | 12,500 | |
| | | | With maintenance | | | |
| | | Electrical | Without maintenance | | 2,800 | |
| | | | With maintenance | | | |
| Weight | lb (kg) | Drawout type | Main Body with Cradle | 3P | 154 (70) | |
| | | | | 4P | 187 (85) | |
| | | | Only Cradle | 3P | 71 (32) | |
| | | | | 4P | 84 (38) | |
| | | Fixed type | Motor charging type | 3P | 77 (35) | |
| | | | | 4P | 99 (45) | |
| External dimension   | Draw-out type | Inch (mm) | H×W×D | 3P | 16.93×13.15×16.02 (430×334×407) | |
| | | | | 4P | 16.93×16.5×16.02 (430×419×407) | |
| | Fixed type | Inch (mm) | H×W×D | 3P | 11.81×11.81×11.61 (300×300×295) | |
| | | | | 4P | 11.81×15.16×11.61 (300×385×295) | |
| Enclosure dimension | | Inch (mm) | H×W×D | 3P | 19.69×15.75×13.39 (500×400×340) | |
| | | | | 4P | 19.69×19.69×13.39 (500×500×340) | |

| Susol | | | | |
|---|---|---|---|---|
| UAH-□□E | | | | |
| 08 | 16 | 20 | 25 | 32 |
| 800 | 1600 | 2000 | 2500 | 3200 |
| 400 | 800 | 1000 | 1200 | 1600 |
| 600 | 1000 | 1200 | 1250 | 2000 |
| 630 | 1200 | 1250 | 1600 | 2500 |
| 800 | 1250 | 1600 | 2000 | 3000 |
| | 1600 | 2000 | 2500 | 3200 |
| 254V / 508V / 635V | | | | |
| 50/60 | | | | |
| 3P / 4P | | | | |
| N, A, P, S (4 type) | | | | |
| 85 | | | | |
| 100 | | | | |
| 100 | | | | |
| 85 | | | | |
| 85 | | | | |
| 85 | | | | |
| 85 | | | | |
| 50ms | | | | |
| 80ms | | | | |
| 12,500 | | | | 5,000 |
| | | | | |
| 2,800 | | | | 1,000 |
| | | | | |
| 214 (97) | | | 245 (111) | 326 (148) |
| 269 (122) | | | 309 (140) | 414 (188) |
| 99 (45) | | | 123 (56) | 205 (93) |
| 121 (55) | | | 152 (69) | 256 (116) |
| 101 (46) | | | 110 (50) | 196 (89) |
| 126 (57) | | | 137 (62) | 249 (113) |
| 16.93×16.22×16.02 (430×412×407) | | | | |
| 16.93×20.75×16.02 (430×527×407) | | | | |
| 11.81×14.88×11.61 (300×378×295) | | | | |
| 11.81×19.41×11.61 (300×493×295) | | | | |
| 19.69×19.69×13.39 (500×500×340) | | | | |
| 19.69×24.21×13.39 (500×615×340) | | | | |

| Susol | | |
|---|---|---|
| UAH-□□G | | |
| 32 | 40 | 50 |
| 3200 | 4000 | 5000 |
| 1600 | 2000 | 2500 |
| 2000 | 2500 | 3000 |
| 2500 | 3000 | 3200 |
| 3000 | 3200 | 3600 |
| 3200 | 3600 | 4000 |
| | 4000 | 5000 |
| 254V / 508V / 635V | | |
| 50/60 | | |
| 3P / 4P | | |
| N, A, P, S (4 type) | | |
| 100 | | |
| 130 | | |
| 130 | | |
| 100 | | |
| 100 | | |
| 100 | | |
| 100 | | |
| 50ms | | |
| 90ms | | |
| 5,000 | | |
| | | |
| 1,000 | | |
| | | |
| 489 (222) | | |
| 626 (284) | | |
| 276 (125) | | |
| 355 (161) | | |
| 227 (103) | | |
| 287 (130) | | |
| 18.11×30.91×16.02 (460×785×407) | | |
| 18.11×39.96×16.02 (460×1015×407) | | |
| 11.81×29.57×11.61 (300×751×295) | | |
| 11.81×38.62×11.61 (300×981×295) | | |
| 31.5×32.48×13.39 (800×825×340) | | |
| 31.5×41.54×13.39 (800×1055×340) | | |

# Trip relay(OCR)

The trip relay of Susol ACB provides the additional protection functions for voltage, frequency, unbalance, and others in addition to main protection functions for over current, short-circuit, ground fault. It supports the advanced measurement functions for voltage, current, power, electric energy, harmonics, communication function, and others.

Analog trip function interlocked with mechanism enhanced a durability of devices as well as the breaking capacity of ACB.

Zone selective interlocking function makes the protective coordination more simple and thermal memory can be applied to various loads.

# Air circuit breakers

## Trip relay types

| Classification | N type | A type | P type | S type |
|---|---|---|---|---|
| Externals |  |  |  |  |
| Current protection | • L / S / I / G | • L / S / I / G / Thermal<br>• ZSI(Protective coordination) | • L / S / I / G / Thermal(Continuous)<br>• ZSI(Protective coordination) | • P type |
| Other protection | - | • Earth leakage (Option) | • Earth leakage(Option)<br>• Over/Under current<br>• Over/Under frequency<br>• Unbalance(Voltage/Current)<br>• Reverse power | • P type |
| Measurement function | - | • Current (R / S / T / N) | • 3 Phase Voltage/Current RMS/Vector<br>• Power(P, Q, S), PF(3-Phase)<br>• Energy(Positive/Negative)<br>• Frequency, Demand | • 3 Phase Voltage/Current RMS/Vector<br>• Power(P, Q, S), PF(3-Phase)<br>• Energy(Positive/Negative)<br>• Frequency, Demand<br>• Voltage/Current harmonics (1st~63th)<br>• 3 Phase Waveforms<br>• THD, TDD, K-Factor |
| Fine adjustment | - | - | • Fine adjustment for long/short time delay/instantaneous/ ground | • P type |
| Pre Trip Alarm | - | - | • Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm) | • P type |
| Digital Output | - | • 3DO (Fixed)<br>• L, S/I, G Alarm | • 3DO (Programmable)<br>• Trip, Alarm, General | • P type |
| IDMTL setting | - | - | • Compliance with IEC60255-3 SIT, VIT, EIT, DT | • P type |
| Communication | - | • Modbus/RS−485<br>• Profibus−DP | • Modbus / RS-485<br>• Profibus-DP | • Modbus / RS-485<br>• Profibus-DP |
| Power supply | • Self Power<br>- Power source works over 20% of load current. | • Self Power<br>- Power source works over 20% of load current.<br>- External power source are required for comm.<br>• AC/DC 100~250V<br>• DC 24~60V | • AC/DC 100~250V<br>• DC 24~60V<br>Basic protection function(L / S / I / G) is still under normal operation without control power. | • AC/DC 100~250V<br>• DC 24~60V |
| RTC timer | • Available | • Available | • Available | • Available |
| LED for trip info. | • Long time delay<br>• Short time delay/Instantaneous<br>• Ground fault | • N type | • N type | • N type |
| Fault recording | - | • 10 records (Fault/Current/Date and Time) | • 256 records (Fault/Current/Date and Time) | • 256 records<br>• Last fault wave recording (3 Phase) |
| Event recording | - | - | • 256 records(Content, Status, Date) | • P type |
| Operating button | • Reset button | • Reset, Menu Up/Down, Left/Right, Enter | • A type | • A type |

# Molded case circuit breakers

## 2, 3 pole series up to 800AF

TD series

| | | | TD125U | |
|---|---|---|---|---|
| Frame size | | [AF] | 125 | |
| Rated current In | | [A] | 15, 20, 30, 40, 50, 60, 80, 100, 125 | |
| No. of Poles | | | 2, 3 | |
| Rated operational voltage, Ue AC | | [V] | 600 | |
| UL interrupting rating | | [kA] | NU | HU |
| | AC 50/60Hz | 120V | 50 | 100 |
| | | 240 V | 50 | 100 |
| | | 480 V | 35 | 65 |
| | | 600 V | 10 | 14 |
| Reference standard | | | UL 489 | |
| Trip unit (Thermal-Magnetic) | | | | |
| | ●Fixed-thermal, Fixed-magnetic | FTU | ● | |
| | ●Adjustable-thermal, Fixed-magnetic | FMU | ● | |
| | ●Adjustable-thermal, Adjustable-magnetic (3Pole) | ATU | - | |
| | ●Molded Case Switch MCS | | ● | |
| Variable accessories | | | | |
| | AX | | ● | |
| | AL | | ● | |
| | SHT | | ● | |
| | UVT | | ● | |
| | Extended rotary handle | | ● | |
| | Flange handle | | ● | |
| | Locking devices (Removable, Fixed) | | ● | |
| | Mechanical interlock device | | ● | |
| Mechanical life | | [operations] | 4,000 | |
| Electrical life @600V AC | | [operations] | 4,000 | |
| Weight 3-Pole | | [lbs/kg] | 2.65/1.2 | |
| Basic dimension, W×H×D 3-Pole | | [inch/mm] | 3.54×6.46×3.39/90×164×86 | |

## TS series

| TS250U | | TS400U | | TS800U | |
|---|---|---|---|---|---|
| 250 | | 400 | | 800 | |
| 150, 160, 175, 200, 225, 250 | | 300, 350, 400 | | 500, 600, 700, 800 | |
| 2, 3 | | 2, 3 | | 2, 3 | |
| 600 | | 600 | | 600 | |
| NU | HU | NU | HU | NU | HU |
| | | | | | |
| 50 | 100 | 50 | 100 | 50 | 100 |
| 35 | 65 | 35 | 65 | 35 | 65 |
| 10 | 18 | 14 | 20 | 18 | 25 |
| UL 489 | | UL 489 | | UL 489 | |
| | | | | | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● (3Ø ) | | ● (3Ø ) | | ● (3Ø ) | |
| ● | | ● | | ● | |
| | | | | | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| ● | | ● | | ● | |
| 5,000 | | 5,000 | | 3,000 | |
| 1,000 | | 1,000 | | 500 | |
| 4.19/1.9 | | 12.57/5.7 | | 29.98/13.6 | |
| 4.13×7.01×3.39/105×178×86 | | 5.51×11.50×4.33/140×292×110 | | 8.27×16.85×5.31/210×428×135 | |

# Molded case circuit breakers

## will be available within 2Q, 2013

Maximum
Rated Current
(Amperes)

| Circuit Breaker | | UTE100 | | UTE100 | | UTS150 | | |
|---|---|---|---|---|---|---|---|---|
| Breaker Type | | E | N | E | N | N | H | L |
| Pole | | 2 | | 3 | | 2, 3 | | |
| Breaker Capacity | 120/240V | 50 | 65 | 50 | 65 | - | - | - |
| (kA rms) | 240V | 50 | 65 | 50 | 65 | 65 | 100 | 150 |
| ac50~60Hz | 480V | 25 | 35 | 25 | 35 | 35 | 65 | 100 |
| NEMA, UL | 600V | - | - | - | - | 18 | 35 | 50 |
| | 600Y347V | 14 | 18 | 14 | 18 | - | - | - |
| MCCB | Amperes | 15~100A | | 15~100A | | 40~150A | | |
| Trip Units | ATU | - | | - | | ● | | |
| F : Fixed A : Adjustable | FMU | - | | ● | | ● | | |
| T : Thermal M : Magnetic | FTU | ● | | ● | | ● | | |
| E : Electronics | ETM | - | | - | | - | | |
| MCP | Amperes | - | | - | | 1.6~60A | | |
| | | | | | | 70~150A | | |
| | MCP | - | | - | | ● | | |
| MCS | Amperes | 100A | | 100A | | 150A | | |
| | MCS | ● | | ● | | ● | | |
| Unit Mounted | | ● | | ● | | ● | | |
| Rear Connection | | - | | - | | - | | |
| Mechanical Lugs | | ● | | ● | | ● | | |
| Power Distribution connectors | | - | | - | | - | | |
| Busbar connectors | | ● | | ● | | ● | | |
| Control Wire Terminal Kit | | - | | - | | ● | | |
| Terminal Shields | | - | | - | | - | | |
| Interphase Barriers | | ● | | ● | | ● | | |
| Shunt Trip | | ● | | ● | | ● | | |
| Undervoltage Trip | | ● | | ● | | ● | | |
| Auxiliary Switch | | ● | | ● | | ● | | |
| Alarm Switch | | ● | | ● | | ● | | |
| Flange Cable Handle | | - | | ● | | ● | | |
| Flange Variable-Depth Mechanism | | - | | ● | | ● | | |
| Directly-Mounted Rotary Operating Handle | | - | | ● | | ● | | |
| NEMA-Door-Mounted Operating Mechanisms | | - | | ● | | ● | | |
| IEC-Door-Mounted Operating Mechanisms | | - | | ● | | ● | | |
| Mechanical Interlocks | | - | | ● | | ● | | |
| Handle Padlock Attachment | | ● | | ● | | ● | | |
| Dimensions | | W | H | D | | W | H | D |
| Inches(mm) | 2-Pole | 2.01(51) | 5.12(130) | 3.23(82) | | 4.13(105) | 6.46(165) | 3.39(86) |
| | 3-Pole | 2.99(76) | 5.12(130) | 3.23(82) | | 4.13(105) | 6.46(165) | 3.39(86) |





| UTS250 | | | UTS400 | | | UTS600 | | | UTS800 | | | UTS1200 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | H | L | N | H | L | N | H | L | N | H | L | N | H | P | L |
| 2, 3 | | | 2, 3 | | | 2, 3 | | | 3 | | | 3 | | | |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 65 | 100 | 150 | 65 | 100 | 150 | 65 | 100 | 150 | 65 | 100 | 150 | 50 | 100 | 65 | 150 |
| 35 | 65 | 100 | 35 | 65 | 100 | 35 | 65 | 100 | 35 | 65 | 100 | 35 | 65 | 50 | 100 |
| 18 | 35 | 50 | 18 | 35 | 50 | 18 | 35 | 50 | 18 | 35 | 50 | 18 | 25 | 50 | 35 |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 150~250A | | | 250/300/350/400A | | | 500/600A | | | 400/600/630/800A | | | 800/1000/1200A | | | |
| ● | | | ● | | | ● | | | - | | | - | | | |
| ● | | | ● | | | ● | | | - | | | - | | | |
| ● | | | ● | | | ● | | | - | | | - | | | |
| - | | | - | | | - | | | ● | | | ● | | | |
| 150~250A | | | 320A | | | 500A | | | 800A | | | 1200A | | | |
| - | | | - | | | - | | | - | | | - | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| 250A | | | 400A | | | 600A | | | 800A | | | 1200A | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| - | | | - | | | - | | | - | | | - | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| - | | | - | | | - | | | - | | | - | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | - | | | - | | | - | | | - | | | |
| - | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | |
| W | H | D | W | H | D | W | H | D | W | H | D | W | H | D | |
| 4.13(105) | 7.48(190) | 3.39(86) | 5.51(140) | 11.5(292) | 4.33(110) | 5.51(140) | 13.39(340) | 4.33(110) | 8.5(216) | 13(330) | 6(152.5) | 8.5(216) | 16.26(413) | 6(152.5) | |
| 4.13(105) | 7.48(190) | 3.39(86) | 5.51(140) | 11.5(292) | 4.33(110) | 5.51(140) | 13.39(340) | 4.33(110) | 8.5(216) | 13(330) | 6(152.5) | 8.5(216) | 16.26(413) | 6(152.5) | |

# Miniature circuit breakers

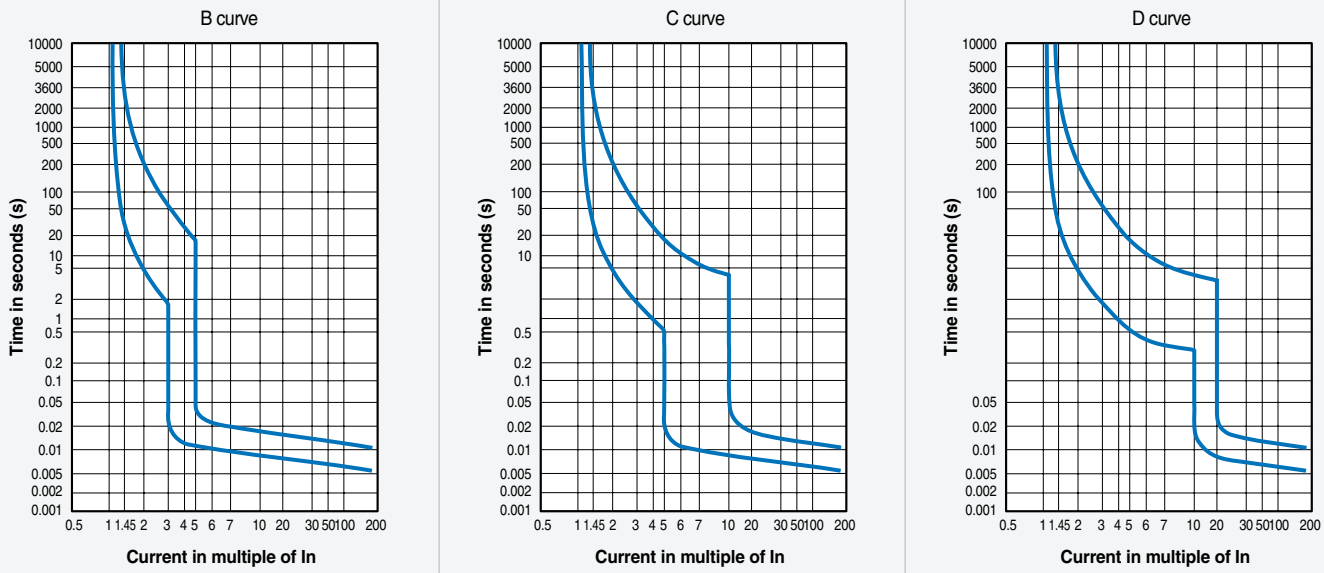
## UL 1077 R-Series

BKN-b 1P | BKN-b 2P | BKN-b 3P | BKN-b 4P

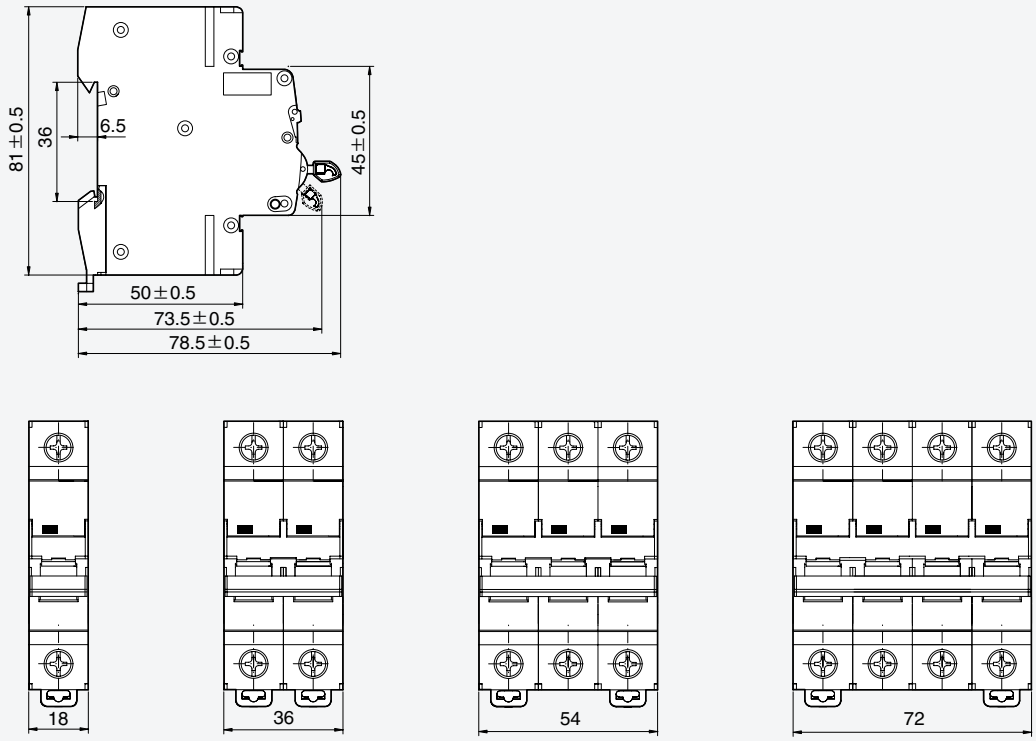
## Ratings

| | |
|---|---|
| Standard | UL 1077 |
| Certificate | CCC, KEMA CB, SABS, UL 1077 |
| Protection | Overload, Short circuit protection |
| Rated current (In) | 1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63A |
| Pole No. | 1P, 1P+N, 2P, 3P, 3P+N, 4P |
| Rated voltage | 1P, 2P 120/240VAC<br>1Pole+N 120VAC<br>3P, 3P+N, 4P 240VAC<br>1P, 1P+N, 2P 277VAC<br>3P, 3P+N, 4P 480VAC |
| Rated frequency | 50/60Hz |
| Calibration temperature | 25±3°C (77°±5F°) |
| Rated short-circuit capacity | 1P, 2P 120/240VAC 10kA<br>1Pole+N 120VAC 10kA<br>3P, 3P+N, 4P 240VAC 10kA<br>1P+N 277VAC 10kA<br>1P, 2P 277VAC 6kA<br>3P, 3P+N, 4P 480VAC 6kA |
| Tripping curve | B, C, D curve |
| Trip type | Thermal Magnetic |
| Type of terminal | Pillar type terminal |
| Terminal size acceptability - Min/Max | 2.5mm2(12AWG) / 25mm2(4AWG) |
| Terminal torque | 2Nm(17.5 lb . in.) |
| Installation | Mounting on 35mm Din rail |
| Width | 18mm per pole |
| Terminal protection degree | IP 20 |
| Electrical Endurance | 6000 |
| Maximum frequency (time/h) | 360 |

## Operating curve




## Dimensions



# Contactors & Overload relays

## Metasol MC 3P 18 to 100A

## MC type
## Magnetic Contactors

| Frame size | | | | 18AF | | | | 22AF | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | | | | MC-6a | MC-9a | MC-12a | MC-18a | MC-9b | MC-12b | MC-18b | MC-22b* |
| | screws clamp terminals | | | ● | ● | ● | ● | ● | ● | ● | ● |
| Number of poles | | | | 3pole | | | | 3pole | | | |
| Rated operational voltage, Ue | | | | 690V | | | | 690V | | | |
| Rated insulation voltage, Ui | | | | 690V | | | | 690V | | | |
| Rated frequency | | | | 50/60Hz | | | | 50/60Hz | | | |
| Rated impulse withstand voltage, Uimp | | | | 6kV | | | | 6kV | | | |
| Maximum operating rate in operating cycles per hour(AC3) | | | | 1800 operations per hour | | | | 1800 operations per hour | | | |
| Durability | Mechanical | | | 15 mil. operations | | | | 15 mil. operations | | | |
| | Electrical | | | 2.5 mil. operations | | | | 2.5 mil. operations | | | |
| UL rating | Continuous current | | A | 25 | 25 | 25 | 32 | 25 | 25 | 40 | 40 |
| (50/60Hz) | Single | 110~120V | HP | 0.5 | 0.5 | 0.75 | 1 | 0.5 | 0.75 | 1 | 2 |
| | phase | 220~240V | HP | 1.5 | 1.5 | 2 | 3 | 1.5 | 2 | 3 | 3 |
| | | 200~208V | HP | 2 | 2 | 3 | 5 | 2 | 3 | 5 | 7.5 |
| | Three | 220~240V | HP | 3 | 3 | 5 | 7.5 | 3 | 5 | 7.5 | 10 |
| | phase | 440~480V | HP | 5 | 5 | 7.5 | 10 | 5 | 7.5 | 10 | 15 |
| | | 550~600V | HP | 7.5 | 7.5 | 10 | 15 | 7.5 | 10 | 15 | 20 |
| | NEMA size | | | 00 | 00 | 0 | 0 | 00 | 00 | 0 | 1 |
| Size and weight | AC control | Weight | kg | 0.33 | | | | 0.34 | | | |
| | | Size | inch | 1.77×2.89×3.17 | | | | 1.77×2.89×3.44 | | | |
|  | | W×H×D | (mm) | (45×73.5×80.4) | | | | (45×73.5×87.4) | | | |
| | DC control | Weight | kg | 0.5 | | | | 0.51 | | | |
| | | Size | inch | 1.77×2.89×4.36 | | | | 1.77×2.89×4.63 | | | |
| | | W×H×D | (mm) | (45×73.5×110.7) | | | | (45×73.5×117.7) | | | |
| Auxiliary(standard) | | | | 1a or 1b | | | | 1a1b | | | |
| Auxiliary | Side mount | | | UA-1 | | | | UA-1 | | | |
| | Front mount | | | UA-2, UA-4 | | | | UA-2, UA-4 | | | |

Note) Minimum conduct current of Auxiliary contactor is DC 17V 5mA.

## MT type
## Thermal Overload Relays

| Type | | | | MT-12/□ | MT-32/□ |
|---|---|---|---|---|---|
| | Screws clamp terminals | | | ● | ● |
| Rated operational voltage, Ue | | | | 690V | 690V |
| Rated insulation voltage, Ui | | | | 690V | 690V |
| Rated impulse withstand voltage, Uimp | | | | 6kV | 6kV |
| Trip class | | | | 10A, 20 | 10A, 20 |
| Setting range | | | | 0.1~18A | 0.1~40A |
| Size and weight | | Weight | kg | 0.1 | 0.17 |
|  | | Size | inch | 1.77×2.88×2.51 | 1.77×2.95×3.54 |
| | | W×H×D | (mm) | (45×73.2×63.7) | (45×75×90) |

* The safety cover of magnetic contactor and thermal overload relay is optional.

| 40AF | | 65AF | | 100AF | | |
|---|---|---|---|---|---|---|
| MC-32a | MC-40a | MC-50a | MC-65a | MC-75a | MC-85a | MC-100a |
| ● | ● | ● | ● | ● | ● | ● |
| 3pole | | 3pole | | 3pole | | |
| 690V | | 690V | | 690V | | |
| 1000V | | 1000V | | 1000V | | |
| 50/60Hz | | 50/60Hz | | 50/60Hz | | |
| 8kV | | 8kV | | 8kV | | |
| 1800 operations per hour | | 1800 operations per hour | | 1800 operations per hour | | |
| 12 mil. operations | | 12 mil. operations | | 12 mil. operations | | |
| 2 mil. operations | | 2 mil. operations | | 2 mil. operations | | |
| 50 | 60 | 70 | 100 | 110 | 135 | 160 |
| 2 | 3 | 3 | 5 | 5 | 7.5 | 10 |
| 5 | 7.5 | 10 | 15 | 15 | 15 | 20 |
| 7.5 | 15 | 20 | 25 | 25 | 30 | 30 |
| 10 | 15 | 25 | 30 | 30 | 40 | 40 |
| 20 | 30 | 40 | 50 | 50 | 60 | 75 |
| 25 | 30 | 50 | 60 | 60 | 75 | 75 |
| 1 | 1 | 2 | 2 | 2 | 3 | 3 |
| 0.4<br>1.77×3.27×3.54<br>(45×83×90) | | 0.9<br>2.17×4.17×4.69<br>(55×106×119) | | 1.6<br>2.76×5.51×5.35<br>(70×140×135.8) | | |
| 0.6<br>1.77×3.27×4.61<br>(45×83×117.1) | | 1.2<br>2.17×4.17×5.76<br>(55×106×146.4) | | 2.6<br>2.76×5.51×6.78<br>(70×140×172.3) | | |
| | | | | | | |
| UA-1 | | UA-1 | | UA-1 | | |
| UA-2, UA-4 | | UA-2, UA-4 | | UA-2, UA-4 | | |

| MT-32/□ | MT-63/□ | MT-95/□ |
|---|---|---|
| ● | ● | ● |
| 690V | 690V | 690V |
| 690V | 690V | 690V |
| 6kV | 6kV | 6kV |
| 10A, 20 | 10A, 20 | 10A, 20 |
| 0.1~40A | 4~65A | 7~100A |
| 0.17 | 0.31/0.33 | 0.48/0.5 |
| 1.77×2.95×3.54<br>(45×75×90) | 2.17×3.19×3.94<br>(55×81×100) | 2.76×3.82×4.33<br>(70×97×110) |

# Contactors & Overload relays

## Metasol MC 3P 150 to 800A

## MC type
## Magnetic Contactors

| Frame size | | | | 150AF | | 225AF | |
|---|---|---|---|---|---|---|---|
| Type | | | | MC-130a | MC-150a | MC-185a | MC-225a |
| | screws clamp terminals | | | ● | ● | ● | ● |
| Number of poles | | | | 3pole | | 3pole | |
| Rated operational voltage, Ue | | | | 690V | | 690V | |
| Rated insulation voltage, Ui | | | | 1000V | | 1000V | |
| Rated frequency | | | | 50/60Hz | | 50/60Hz | |
| Rated impulse withstand voltage, Uimp | | | | 8kV | | 8kV | |
| Maximum operating rate in operating cycles per hour(AC3) | | | | 1200 operations per hour | | 1200 operations per hour | |
| Durability | Mechanical | | | 5 mil. operations | | 5 mil. operations | |
| | Electrical | | | 1 mil. operations | | 1 mil. operations | |
| UL rating (50/60Hz) | Continuous current | | A | 160 | 210 | 230 | 275 |
| | Single phase | 110~120V | HP | 10 | 15 | 15 | 15 |
| | | 220~240V | HP | 20 | 25 | 30 | 40 |
| | Three phase | 200~208V | HP | 40 | 40 | 60 | 60 |
| | | 220~240V | HP | 40 | 50 | 60 | 75 |
| | | 440~480V | HP | 75 | 100 | 125 | 150 |
| | | 550~600V | HP | 75 | 75 | 125 | 150 |
| | NEMA size | | | 3 | 4 | 4 | 4 |
| Size and weight | AC control | Weight | kg | 2.4 | | 5.4 | |
| | | Size | inch | 3.74×6.22×5.20 | | 5.43×7.99×7.16 | |
| | | W×H×D | (mm) | (95×158×132) | | (138×203×181) | |
| | DC control | Weight | kg | 2.3 | | | |
| | | Size | inch | 3.74×6.22×5.20 | | | |
| | | W×H×D | (mm) | (95×158×132) | | | |
| Auxiliary(standard) | | | | | | 2a2b | |
| Auxiliary | Side mount | | | UA-1 | | AU-100 (Max.4NO4NC) | |
| | Front mount | | | UA-2, UA-4 | | - | |

## MT type
## Thermal Overload Relays

| Type | | | | MT-150/□ | MT-225/□ |
|---|---|---|---|---|---|
| | Screws clamp terminals | | | ● | ● |
| Rated operational voltage, Ue | | | | 690V | 690V |
| Rated insulation voltage, Ui | | | | 690V | 690V |
| Rated impulse withstand voltage, Uimp | | | | 6kV | 6kV |
| Trip class | | | | 10A, 20 | 10A, 20 |
| Setting range | | | | 34~150A | 65~240A |
| Size and weight | | Weight | kg | 0.67 | 2.5 |
| | | Size | inch | 3.74×4.29×4.45 | 5.79×5.55×7.24 |
| | | W×H×D | (mm) | (95×109×113) | (147×141×184) |

* The safety cover of magnetic contactor and thermal overload relay is optional.

| 400AF | | |
|---|---|---|
| MC-265a | MC-330a | MC-400a |
| ● | ● | ● |
| 3pole | | |
| 690V | | |
| 1000V | | |
| 50/60Hz | | |
| 8kV | | |
| 1200 operations per hour | | |
| 5 mil. operations | | 2.5 mil. operations |
| 1 mil. operations | | 0.5 mil. operations |
| 300 | 350 | 450 |
| - | - | - |
| - | - | - |
| 75 | 100 | 125 |
| 100 | 125 | 150 |
| 200 | 250 | 300 |
| 200 | 250 | 300 |
| 5 | 5 | 5 |
| 9.2 | | |
| 6.48×9.92×7.80<br>(163×243×198) | | |

| 800AF | | |
|---|---|---|
| MC-500a | MC-630a | MC-800a |
| ● | ● | ● |
| 3pole | | |
| 690V | | |
| 1000V | | |
| 50/60Hz | | |
| 8kV | | |
| 1200 operations per hour | | |
| 2.5 mil. operations | | |
| 0.5 mil. operations | | |
| 580 | 660 | 900 |
| - | - | - |
| - | - | - |
| 150 | 200 | 200 |
| 200 | 250 | 300 |
| 400 | 500 | 600 |
| 400 | 500 | 600 |
| 6 | 6 | 7 |
| 22.4 | | |
| 11.22×12.29×9.53<br>(285×312×242) | | |

| 2a2b |
|---|
| AU-100 (Max.4NO4NC) |
| - |

| MT-400/□ |
|---|
| ● |
| 690V |
| 690V |
| 6kV |
| 10A, 20 |
| 85~400A |
| 2.6 |
| 5.94×6.73×7.79<br>(151×171×198) |

| 2a2b |
|---|
| AU-100 (Max.4NO4NC) |
| - |

| MT-800/□ |
|---|
| ● |
| 690V |
| 690V |
| 6kV |
| 10A, 20 |
| 200~800A |
| 11.5 |
| 14.17×20.87×8.35<br>(360×530×212) |

## Metasol MC 4P 18 to 85A

# MC type
# Magnetic Contactors

| Frame size | | | | 18AF | | | |
|---|---|---|---|---|---|---|---|
| Type | | | | MC-6a/4 | MC-9a/4 | MC-12a/4 | MC-18a/4 |
| | Screw clamp terminal | | | | ● | | |
| Number of poles | | | | 4pole | | | |
| Rated operational voltage (Ue) | | | | 690V | | | |
| Rated insulation voltage (Ui) | | | | 690V | | | |
| Rated frequency | | | | 50/60Hz | | | |
| Rated impulse withstand voltage, Uimp | | | | 6kV | | | |
| Maximum operating rate in operating cycles per hour(AC1) | | | | 1800 operations per hour | | | |
| Durability | Mechanical | | | 15 mil. Operations | | | |
| Electrical | | | | 0.5 mil. Operations | | 0.8 mil. Operations | |
| UL rating | Continuous current | | A | 25 | 25 | 25 | 32 |
| (50/60Hz) | Single | 110~120V | HP | 0.5 | 0.5 | 0.75 | 1 |
| | Phase | 220~240V | HP | 1.5 | 1.5 | 2 | 3 |
| | | 200~208V | HP | 2 | 2 | 3 | 5 |
| | Three | 220~240V | HP | 3 | 3 | 5 | 7.5 |
| | Phase | 440~480V | HP | 5 | 5 | 7.5 | 10 |
| | | 550~600V | HP | 7.5 | 7.5 | 10 | 15 |
| | NEMA Size | | Size and | 00 | 00 | 0 | 0 |
| AC | Weight | kg | | 0.33 | | | |
| weight | Control | Size | inch | 1.77×2.89×3.11 | | | |
|  | | W×H×D | (mm) | (45×73.5×79) | | | |
| | DC | Weight | kg | 0.5 | | | |
| | Control | Size | inch | 1.77×2.89×4.36 | | | |
| | | W×H×D | (mm) | (45×73.5×110.7) | | | |
| Auxiliary(standard) | | | | - | | | |
| Auxiliary | Side Mount | | | UA-1 | | | |
| | Front Mount | | | AU-2, AU-4 | | | |

| 22AF | 40AF | | 85AF | | | |
|---|---|---|---|---|---|---|
| MC-22a/4 | MC-32a/4 | MC-40a/4 | MC-50a/4 | MC-65a/4 | MC-75a/4 | MC-85a/4 |
| ● | ● | | ● | | | |
| 4pole | 4pole | | 4pole | | | |
| 690V | 690V | | 690V | | | |
| 690V | 690V | | 1000V | | | |
| 50/60Hz | 50/60Hz | | 50/60Hz | | | |
| 6kV | 6kV | | 8kV | | | |
| 1800 operations per hour | 1800 operations per hour | | 1800 operations per hour | | | |
| 15 mil. Operations | 15 mil. Operations | | 12 mil. Operations | | | |
| 1 mil. Operations | 1 mil. Operations | | 1 mil. Operations | | | |
| 32 | 45 | 50 | 70 | 80 | 90 | 100 |
| 2 | 2 | 3 | 3 | 5 | 5 | 7.5 |
| 3 | 5 | 5 | 7.5 | 10 | 15 | 15 |
| 7.5 | 7.5 | 10 | 10 | 15 | 20 | 25 |
| 7.5 | 10 | 10 | 15 | 20 | 25 | 30 |
| 10 | 20 | 25 | 30 | 40 | 50 | 50 |
| 15 | 20 | 25 | 30 | 40 | 50 | 50 |
| 1 | 1 | 1 | 2 | 2 | 2 | 3 |
| 0.4 | 0.59 | | 1.2 | | | |
| 1.86×3.15×3.42 | 2.32×3.29×3.72 | | 3.58×4.86×4.64 | | | |
| (47.2×80×86.8) | (59×83.5×94.5) | | (91×123.5×117.8) | | | |
| 0.5 | 0.7 | | 1.29 | | | |
| 1.86×3.15×4.47 | 2.32×3.29×4.76 | | 3.58×4.86×4.64 | | | |
| (47.2×80×113.2) | (59×83.5×121) | | (91×123.5×117.8) | | | |
| - | - | | - | | | |
| AU-1 | AU-1 | | AU-1 | | | |
| AU-2, AU-4 | AU-2, AU-4 | | AU-2, AU-4 | | | |

## Metasol MC 4P 225 to 800A

# MC type
# Magnetic Contactors

| Frame size | | | | 225AF | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | | | | MC-100a/4 | MC-130a/4 | MC-150a/4 | MC-185a/4 | MC-225a/4 |
| | Screw clamp terminal | | | | | ● | | |
| Number of poles | | | | 4pole | | | | |
| Rated operational voltage (Ue) | | | | 690V | | | | |
| Rated insulation voltage (Ui) | | | | 1000V | | | | |
| Rated frequency | | | | 50/60Hz | | | | |
| Rated impulse withstand voltage, Uimp | | | | 8kV | | | | |
| Maximum operating rate in operating cycles per hour(AC1) | | | | 1200 operations per hour | | | | |
| Durability | Mechanical | | | 5 mil. Operations | | | | |
| Electrical | | | | 0.8 mil. Operations | | | | |
| UL rating | Continuous current | | A | 160 | 160 | 210 | 230 | 275 |
| (50/60Hz) | Single | 110~120V | HP | 7.5 | 10 | 15 | 15 | 15 |
| | Phase | 220~240V | HP | 15 | 20 | 25 | 30 | 40 |
| | | 200~208V | HP | 30 | 40 | 40 | 60 | 60 |
| | Three | 220~240V | HP | 30 | 40 | 50 | 60 | 75 |
| | Phase | 440~480V | HP | 60 | 75 | 100 | 125 | 150 |
| | | 550~600V | HP | 60 | 75 | 100 | 125 | 150 |
| | NEMA Size | | Size and | 3 | 3 | 4 | 4 | 4 |
| AC | Weight | kg | | | | | | |
| weight | Control | Size | inch | | | | | |
|  | | W×H×D | (mm) | | | 5.6<br>6.89×7.99×7.28<br>(175×203×185) | | |
| | DC | Weight | kg | | | | | |
| | Control | Size | inch | | | | | |
| | | W×H×D | (mm) | | | | | |
| Auxiliary(standard) | | | | 2a2b | | | | |
| Auxiliary | Side Mount | | | AU-100 | | | | |
| | Front Mount | | | - | | | | |

* - FLA = 722 A, LRA = 5618 A
** - FLA = 566 A, LRA = 4495 A

| 400AF | | |
|---|---|---|
| MC-265a/4 | MC-330a/4 | MC-400a/4 |
| | ● | |
| | 4pole | |
| | 690V | |
| | 1000V | |
| | 50/60Hz | |
| | 8kV | |
| | 1200 operations per hour | |
| | 2.5 mil. Operations | |
| | 0.5 mil. Operations | |
| 300 | 350 | 450 |
| - | - | - |
| - | - | - |
| 75 | 100 | 125 |
| 100 | 125 | 150 |
| 200 | 250 | 300 |
| 200 | 250 | 300 |
| 5 | 5 | 5 |
| | 9.9 | |
| | 8.11×9.57×8.07 | |
| | (206×243×205) | |
| 2a2b | | |
| | AU-100 | |
| | - | |

| 800AF | | |
|---|---|---|
| MC-500a/4 | MC-630a/4 | MC-800a/4 |
| | ● | |
| | 4pole | |
| | 690V | |
| | 1000V | |
| | 50/60Hz | |
| | 8kV | |
| | 1200 operations per hour | |
| | 2.5 mil. Operations | |
| | 0.5 mil. Operations | |
| 580 | 660 | 900 |
| - | - | - |
| - | - | - |
| 150 | 200 | 200 |
| 200 | 250 | 300 |
| 400 | 500 | 600 * |
| 400 | 500 | 600 ** |
| 6 | 6 | 7 |
| | 26.3 | |
| | 13.62×12.20×9.61 | |
| | (346×310 ×244) | |
| 2a2b | | |
| | AU-100 | |
| | - | |

# Mini contactors

## 6 to 16A

| **Mini contactors**<br><br>3NO main contacts<br>1 auxiliary contacts | |  <br>**Screw clamp type** | |  <br>**Fast-on type** | |  <br>**Cage clamp type** | |  <br>**Solder pin type** | |
|---|---|---|---|---|---|---|---|---|---|
| ***Frame size*** | | ***6A*** | | ***9A*** | | ***12A*** | | ***16A*** | |
| Screw clamp type | AC coil | GMC-6M | | GMC-9M | | GMC-12M | | GMC-16M | |
| | DC coil | GMD-6M | | GMD-9M | | GMD-12M | | GMD-16M | |
| Fast-on type | AC coil | GMC-6MF | | GMC-9MF | | GMC-12MF | | GMC-16MF | |
| | DC coil | GMD-6MF | | GMD-9MF | | GMD-12MF | | GMD-16MF | |
| Cage clamp type | AC coil | GMC-6MC | | GMC-9MC | | GMC-12MC | | GMC-16MC | |
| | DC coil | GMD-6MC | | GMD-9MC | | GMD-12MC | | GMD-16MC | |
| Solder pin type | AC coil | GMC-6MP | | GMC-9MP | | GMC-12MP | | GMC-16MP | |
| | DC coil | GMD-6MP | | GMD-9MP | | GMD-12MP | | GMD-16MP | |
| Ratings / IEC60947-4 | | kW | A | kW | A | kW | A | kW | A |
| AC1 | | | 20 | | 20 | | 20 | | 20 |
| AC3 | 200/240V | 1.5 | 7 | 2.2 | 9 | 3 | 12 | 4 | 15 |
| | 380/440V | 2.2 | 6 | 4 | 9 | 5.5 | 12 | 7.5 | 16 |
| | 500/550V | 3 | 5 | 3.7 | 6 | 4 | 7 | 5.5 | 9 |
| | 690V | 3 | 4 | 4 | 5 | 4 | 5 | 4 | 5 |
| Ratings / UL508 | | hp | A | hp | A | hp | A | hp | A |
| continuous current | | Ith = 20A (maximum for cage clamp type is 10A) | | | | | | | |
| single phase | 120V | 1/2 | | 1/2 | | 1 * | | - | |
| | 230V/240V | 1 | | 1.5 | | 2 * * | | - | |
| three phase | 240V | 1.5 | | 3 | | 3 | | - | |
| | 480V | 3 | | 5 | | 7.5 * * * | | - | |
| | 600V | 3 | | 5 | | 7.5 | | - | |
| | Wire Range : Copper, 75°C, Stranded, 18-12AWG | | | | | | | | |
| NEMA size | | 00 | | 00 | | 00 | | 0 | |
| Additional auxiliary contacts | | **Screw clamp type** | | **Fast-on type** | | **Cage clamp type** | | **Solder pin type** | |
| 2-pole, Front mount | | AU-2M | | AU-2MF | | AU-2MC | | AU-1MP | |
| 4-pole, Front mount | | AU-4M | | AU-4MF | | AU-4MC | | | |
| 2-pole, Side mount | | AU-1M | | AU-1MF | | AU-1MC | | | |

Note) * = 1/2 for cage clamp type, ** = 1.5hp for cage clamp type, *** = 5hp for cage clamp type
16AF : not approved from UL

## Overload Relays

| Bimetallic style<br>Type GT |  <br>GT-12M | **Setting ranges (A)** | 0.1 - 0.16<br>0.16 - 0.25<br>0.25 - 0.4<br>0.4 - 0.63<br>0.63 - 1<br>1 - 1.6<br>1.6 - 2.5<br>2.5 - 4 | 4 - 6<br>5 - 8<br>6 - 9<br>7 - 10<br>9 - 13<br>12 - 16 |  <br>Base for separate mount |
|---|---|---|---|---|---|
| Differential | GTK-12M | | | | |
| Non-differential (3-heater) | GTH-12M/3 | | | | |
| Non-differential (2-heater) | GTH-12M | | | | |

# Manual motor starters

## Technical information

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

**Combination Motor Controller**
- Group Installation
- Type E starter

### MMS 32S

| *Rated operational current Ie* | *[A]* | *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 | 10 | 10 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Motor load** | | | | | | | | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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 |

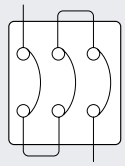
### MMS 63S

| *Rated operational current Ie* | *[A]* | *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** | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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 |
| **Maximum rated current of fuse or breaker** | [A] | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |

### MMS 100S

| *Rated operational current Ie* | *[A]* | *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** | | | | | | | | | | | |
| 1 Phase 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3 Phase 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 |
| **Maximum rated current of fuse or breaker** | [A] | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |

In case of 1-phase use in series as shown below



# Manual motor starters

## Technical information

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

**Combination Motor Controller**
- Group Installation
- Type E starter

## MMS 32H

| *Rated operational current Ie* | *[A]* | *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** | | | | | | | | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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 |
| **Maximum rated current of fuse or breaker** | [A] | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |

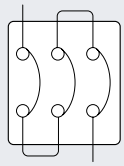
## MMS 63H

| *Rated operational current Ie* | *[A]* | *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 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 600V | [kA] | 25 | 25 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Motor load** | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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 |
| **Maximum rated current of fuse or breaker** | [A] | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |

## MMS 100H

| *Rated operational current Ie* | *[A]* | *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** | | | | | | | | | | | |
| 1 Phase 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3 Phase 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 |
| **Maximum rated current of fuse or breaker** | [A] | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |

In case of 1-phase use in series as shown below



## MMS 32S

| *Rated operational current Ie* | *[A]* | *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 | 10 | 10 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Motor load** | | | | | | | | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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 | 150 |
| **Max. breaker size** | [A] | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 125 | 150 |

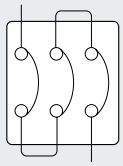
## MMS 63S

| *Rated operational current Ie* | *[A]* | *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 |
| **Motor load** | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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* | *[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** | | | | | | | | | | | |
| 1 Phase 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3 Phase 200V | [HP] | 3 | 5 | 7½ | 7½ | 10 | 15 | 20 | 20 | 25 | 30 |
| 3 Phase 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 |

In case of 1-phase use
in series as shown below



# Manual motor starters

## Technical information

### Manual motor controller (UL508)

## MMS 32H

| *Rated operational current Ie* | *[A]* | *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** | | | | | | | | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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 | 150 |
| **Max. breaker size** | [A] | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 125 | 150 |

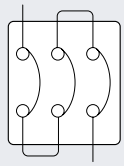
## MMS 63H

| *Rated operational current Ie* | *[A]* | *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** | | | | | | | | | | | |
| 1 Phase 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 |
| 3 Phase 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* | *[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** | | | | | | | | | | | |
| 1 Phase 115V | [HP] | 1 | 1½ | 2 | 2 | 3 | 3 | 5 | 5 | 7½ | 10 |
| 230V | [HP] | 3 | 3 | 3 | 5 | 7½ | 10 | 10 | 15 | 20 | 20 |
| 3 Phase 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 |

In case of 1-phase use in series as shown below



# Electronic motor protection relays

## GMP Series

| Ratings | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | |  |  | |  | |  | |
| **Model** | | **GMP22-2P (1c)** | **GMP22-2P(1a1b)** | **GMP22-3P/3PR** | **GMP22-2S** | **GMP22-3S/3SR** | **GMP22-2T** | **GMP22-3T/3TR** |
| Type | | Pin type | | | Screw type | | Tunnel type | |
| No. of CT | | 2CT | 2CT | 3CT | 2CT | 3CT | 2CT | 3CT |
| Protection | Overcurrent | ● | ● | ● | ● | ● | ● | ● |
| | Phase failure Note1) | ● | ● | ● | ● | ● | ● | ● |
| | Lock/Stall | ● | ● | ● | ● | ● | ● | ● |
| | Phase unbalance | - | - | ● | - | ● | - | ● |
| | Reverse phase | - | - | ●(3PR) | - | ●(3PR) | - | ●(3PR) |
| Current setting range (A) | | 0.3~1.5, 1~5, 4.4~22 | | | | | | |
| Operating time characteristics | | Inverse time (GMP22-2PD: Definite time) | | | | | | |
| Time setting (sec) | Inverse time | 0~30 sec | | | | | | |
| | Definite D-time | 0.2~60 sec for GMP22-2PD | | | | | | |
| | O-time | 5sec (Fixed) for GMP22-2PD | | | | | | |
| | Reset-time | Manual reset | | | | | | |
| Tolerance | Current | ±5% | | | | | | |
| | Time | ±5%(or±0.5sec) | | | | | | |
| Control power | Voltage | AC 110V/220V(±10%) | AC 100~260V(±10%) | | | | | |
| | Frequency | 50/60Hz | | | | | | |
| Aux. contact | Contact Note 3) | 1SPDT (1c) | 2SPST (1a1b) | | | | | |
| | Ratings | 5A/250VAC Resistive load | 3A/250VAC Resistive load | | | | | |
| | Operate | (95 ┤├ 96 Close) | (95 ┤├ 96 Close) (97 ┤├ 98 Open) | | | | | |
| Insulation resistance | | Min 100MΩ at 500Vdc | | | | | | |
| Surge endurance (IEC 61000-4-5) | | 5kV Apply the standard wave | | | | | | |
| Fast transient burst (IEC 61000-4-4) | | 2kV | | | | | | |
| Environment | Operation | -25~70℃ | | | | | | |
| Temperature | Storage | -30~80℃ | | | | | | |
| | Relative humidity | 30~90%RH(No freezing) | | | | | | |
| Trip indicator | | Red LED | Red/Green LED | | Red LED | Red/Green LED | Red LED | Red/Green LED |
| Dimension | W×H×D inch | 1.73×2.80×3.07 | 2.09×3.07×3.44 | | 2.87×2.68×3.44 | | 2.09×1.50×3.44 | |
| | (mm) | (44×71×78) | (53×78×87.5) | | (53×68×87.5) | | (53×38×87.5) | |
| Mounting type | | Direct mount onto a Metasol MC (MC-9b-22b) | | | Separate mount (Screw or Din-rail) Note2) | | | |
| Certification | | UL, cUL, CE | | | | | | |

Note) 1. When it is 2CT model, only two-phase protection is available
2. The bracket for Din-rail mount is optional
3. When power applied Aux. contact operate

# Electronic motor protection relays

## GMP Series

| Ratings | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  | |  | |  | |  | |  | |
| **Model** | | **GMP40-2P** | **GMP40-3P/3PR** | **GMP40-2S** | **GMP40-3S/3SR** | **GMP40-2T** | **GMP40-3T/3TR** | **GMP80-2S** | **GMP80-3S/3SR** | **GMP60T** | **GMP60TE** |
| Type | | Pin type * | | Screw type | | Tunnel type | | Screw type | | Tunnel type | |
| No. of CT | | 2CT | 3CT | 2CT | 3CT | 2CT | 3CT | 2CT | 3CT | 2CT | |
| Protection | Overcurrent | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | Phase failure Note1) | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | Lock/Stall | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | Phase unbalance | - | ● | - | ● | - | ● | - | ● | - | |
| | Reverse phase | - | ●(3PR) | - | ●(3PR) | - | ●(3PR) | - | ●(3PR) | - | |
| Current setting range(A) | | 4~20, 8~40 | | | | | | 16~80 | | 0.5~6, 3~30, 5~60 | |
| Operating time characteristics | | Inverse time characteristics, Definite (GMP-PD Type) | | | | | | | | Definite | |
| Time setting (sec) | Inverse time | 0~30 sec | | | | | | | | - | |
| | Definite D-time | 0.2~60 sec (GMP40-2PD) | | | | | | | | 0.2~30 sec | |
| | O-time | 5sec (Fixed) (GMP40-2PD) | | | | | | | | 0.2~30 sec | 5 sec (Fixed) |
| | Reset time | Manual reset (Auto Reset type : GMP□-A) | | | | | | | | - | GMP-TA |
| Tolerance | Current | ±5% | | | | | | | | ±5% | |
| | Time | ±5% (or±0.5 sec) | | | | | | | | ±5% (or±5 sec) | |
| Control power | Voltage Note3) | AC 100~260V | | | | | | | | AC 110V/260V | |
| | Frequency | 50/60Hz | | | | | | | | 50/60Hz | |
| Aux. contact | Contact Note4) | 2SPST (1a1b) | | | | | | | | 1SPDT (1c) | |
| | Ratings | 3A/250VAC Resistive load | | | | | | | | 1A/250VAC Resistive load | |
| | Operate | (95 ↓↑96 Close) (97 98↑Open) | | | | | | | | - | |
| Insulation resistance | | Min 100MΩ at 500Vdc | | | | | | | | Min 100MΩ at 500Vdc | |
| Surge endurance (IEC 61000-4-5) | | 5kV Apply the standard wave | | | | | | | | 5kV Apply the standard wave | |
| Fast transient burst (IEC 61000-4-4) | | 2kV | | | | | | | | 2kV | |
| Environment | Operation | -25~70°C | | | | | | | | -25~70°C | |
| Temperature | Storage | -30~80°C | | | | | | | | -30~80°C | |
| | Relative humidity | 30~90%RH (No freezing) | | | | | | | | 30~90%RH (No freezing) | |
| Trip indicator | | Red LED | Red/Green LED | Red LED | Red/Green LED | Red LED | Red/Green LED | Red LED | 2Red LEDs | Red LED | |
| Dimension | W×H×D inch | 2.09×3.07×3.44 | | 2.09×2.68×3.44 | | 2.09×2.68×3.44 | | 3.50×3.05×3.83 | | 2.83×2.64×2.72 | |
| | (mm) | (53×78×87.5) | | (53×68×87.5) | | (53×38×87.5) | | (89×77.5×97.4) | | (72×67×69) | |
| Mounting type | | Direct mount onto a Metasol MC (MC-32a, 40a) | | Separate mount (Screw or Din-rail) | | | | | | Separate mount (Screw or Din-rail) | |
| Certification | | UL, cUL, CE | | | | | | | | | |

Note) 1. When it is 2CT model, only two-phase protection is available.
2. GMP60T/TE: AC24V, 48V or 380V, 50/60Hz types a option.
3. When power applied the Aux. contact operate.

| *Ratings* | |  | |  | |
|---|---|---|---|---|---|
| ***Model*** | | ***DMP06-S/SZ/SI*** | ***DMP60-Sa/SZa*** | ***DMP06-T/TZ/TI*** | ***DMP60-Ta/TZa*** |
| Wiring | | Screw type | | Tunnel type | |
| Panel mount | | Unit or Extension Note1) | | Unit or Extension Note1) | |
| Operation time | | Inverse/Definite | | Inverse/Definite | |
| Protection | Over current | According to the setting time | | According to the setting time | |
| | Phase failure | 3 sec | | 3 sec | |
| | Reverse phase | Within 0.1 sec | | Within 0.1 sec | |
| | Lock/Stall | Within 0.5 sec | | Within 0.5 sec | |
| | Phase unbalance | 5 sec | | 5 sec | |
| | Under current | 3 sec | | 3 sec | |
| | Ground fault | Within 0.05~1 sec. (DMP□-Z/Za) | | Within 0.05~1 sec. (DMP□-T/Ta) | |
| | Short circuit | Within 50ms (DMP□-SI) | | Within 50ms (DMP□-TI) | |
| Alarm | | Variable (60~110% of the setting current) | | Variable (60~110% of the setting current) | |
| Current setting range (A) | | 6: 0.5~6A, 60: 5~60A | | 6: 0.5~6A, 60: 5~60A | |
| Time setting (sec) | Definite D time | 0~60 sec | | 0~60 sec | |
| | O time | 0~30 sec | | 0~30 sec | |
| | Inverse time | 0~60 sec | | 0~60 sec | |
| | A time (Reset) | Manual reset | | Manual reset | |
| Tolerance | Current | ±5% | | ±5% | |
| | Time | ±5% (or±0.5 sec) | | ±5% (or±0.5 sec) | |
| Operating power | Voltage | AC 110V or 220V, 50/60Hz | | AC 110V or 220V, 50/60Hz | |
| Aux. contact | | S, SI Type: 2a1b, SZ Type: 2a, 1a1b, 2b | | T, TI Type: 2a1b, TZ Type: 2a, 1a1b, 2b | |
| Insulation resistance | | Over DC 500V 100㏁ | | Over DC 500V 100㏁ | |
| Surge impulse voltage (IEC 61000-4-5) | | 5kV | | 5kV | |
| Fast transient burst (IEC 61000-4-4) | | 2kV | | 2kV | |
| Environment Temperature | Operation | -25~70℃ | | -25~70℃ | |
| | Storage | -30~80℃ | | -30~80℃ | |
| | Relative humidity | 30~90% RH (No freezing) | | 30~90% RH (No freezing) | |
| Display | 7-Segment | Cause of a fault, Current | | Cause of a fault, Current | |
| | Bar-Graph | 60~110% of real load current | | 60~110% of real load current | |
| Mounting type | | 35mm Din-rail/Panel | | 35mm Din-rail/Panel | |
| Certification | | UL, cUL, CE (Except DMP36 type), KR, LR, ABS | | | |

Note) 1. In extension type, the digital EMPR is calibrated with combining the display past and main body so, please cautious not to combine the display part and main body with different part No.
2. Zero current sensing by zero sequence CT and Residual circuit.
3. DMP-a Type option : Operating time, Fault event save, 3phase current Ampere meter Function

# Electronic motor protection relays

## Accessories

### CT, ZCT, Cable and Terminal

## CT Ratings

| Type | | 2CT | 3CT |
|---|---|---|---|
| CT ratio | 100 : 5A | DCT-100 | |
| | 150 : 5A | DCT-150 | SCT-150 |
| | 200 : 5A | DCT-200 | SCT-200 |
| | 300 : 5A | DCT-300 | SCT-300 |
| | 400 : 5A | DCT-400 | SCT-400 |
| Class | | 1.0 | |
| Burden | | 5VA | |
| Insulation voltage | | 600VAC | |
| Insulated impulse voltage | | 2kV | |
| Insulation resistance | | 10MΩ (DC 500V Megger) | |
| Mounting | | Panel | |

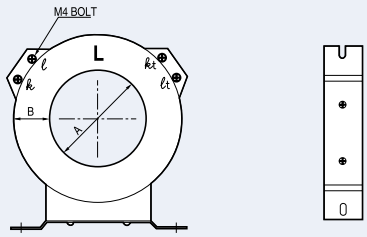
Note) Please use DCT for LS Electronic Motor Protection Relay only.

DCT

SCT

## ZCT (Zero Sequence CT) Ratings

| Type | Diameter (A) | Ratio | Diameter (A) |
|---|---|---|---|
| LZT-030 | 30 | 0.5 | |
| LZT-050 | 50 | 0.7 | 100mA/40~55mV |
| LZT-065 | 65 | 0.9 | 200mA/100mV |
| LZT-080 | 80 | 1.5 | |

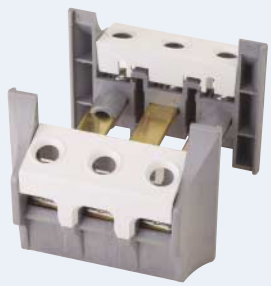



## Cable

| Applicable Type | DMP, IMP Series |
|---|---|
| Spec. | 1m, 1.5m, 2m, 3m, 4m |

* Panel mount: Extension cable

## Terminal Block



| Applicable Type | DMP Series, GMP60-3T, 3TZ, 3TN |
|---|---|
| Spec. | 60A bellow |

# Vacuum Circuit Breakers

## Susol VCB Series

### 27kV 25kA 1200/2000A

## 27kV (VH-27)

| *Item* | | | *VH-27□25□12* | *VH-27□25□20* |
|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 27 | |
| Rated short-circuit current | | Isc (kA) | 25 | |
| Rated normal current | | Ir (A) | 1200 | 2000 |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 60 | |
| | Impulse (1.2×50㎲) | Up (kV) | 150 | |
| Rated frequency | | fr (Hz) | 60 | |
| Rated short-circuit making current | | Ip (kA) | 65 | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 25/2 | |
| Rated breaking time | | (cycle) | 3 | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | |
| Control voltage | Closing coil | (V) | DC 125V | |
| | Trip coil | (V) | DC 125V | |
| Auxiliary contacts | Point of contacter | | 4a4b, 10a10b | |
| | Class | | Class 1 | |
| Trip coil 저항 | | (Ω) | 37±10% | |
| Closing coil 저항 | | (Ω) | 37±10% | |
| Rated short-circuit breaking capacity | | (MVA) | 1169 | |
| Rated opening time | | (sec) | ≤ 40 | |
| No-load closing time | | (sec) | ≤ 60 | |
| VI stroke | | (mm) | 17~18 | |
| Weight | Breaker | (kg) | 400 | |
| | Cradle | (kg) | 400 | |

* Lifetime with maintenance.
** H type is a box type cradle with CB compartment style structure.

*Green Innovators of Innovation*

Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact a qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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Specifications in this catalog are subject to change without notice due to continuous product development and improvement.


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