

# Beyond X™

## Electric Products

MCB / MC&TOR / MMS / MCCB
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LS ELECTRIC

# Electric Products

Customer satisfaction with world-class products and services
LS ELECTRIC is committed to excellence!



Miniature Circuit Breakers



Surge Protective Device





Vacuum Circuit Breakers



Air Circuit Breakers



Molded Case Circuit Breakers



Contactors & Overload Relays

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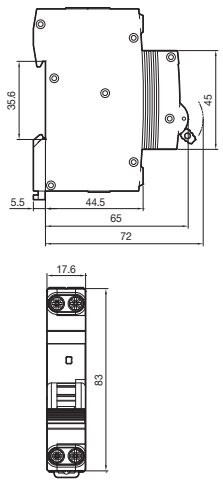
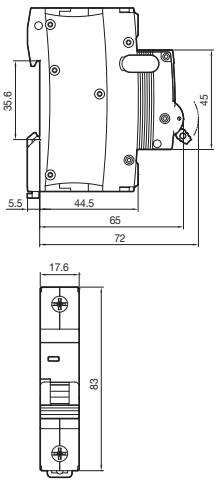

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# Miniature Circuit Breakers

## 1, 2, 3 and 4pole series up to 125AF [IEC/EN 60898-1, IEC/EN 60947-2]

### MCB, Switch-Disconnector

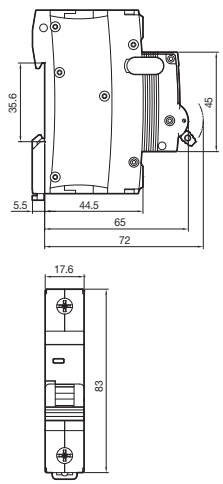
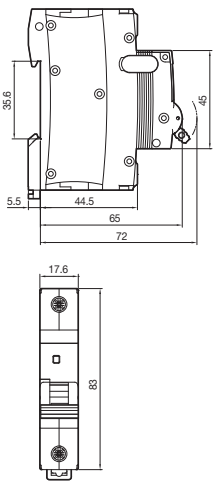
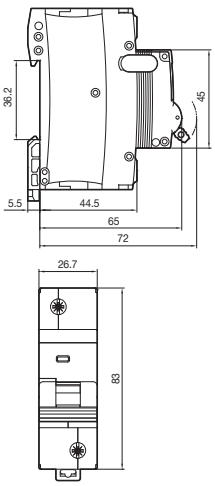
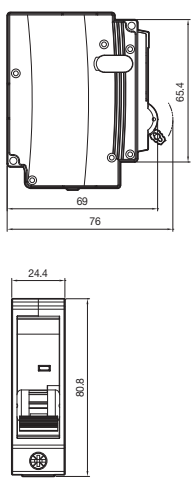
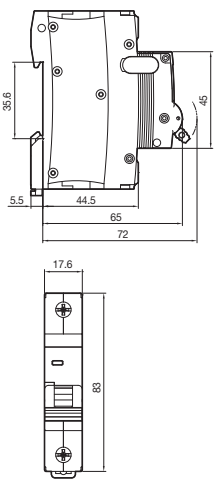
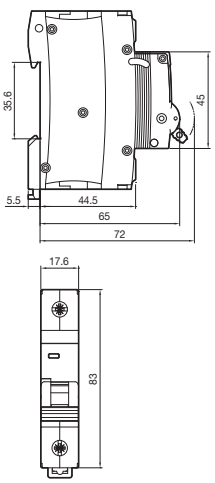


| Type | MCB(Miniature circuit breaker) | | | | | | |
|---|---|---|---|---|---|---|---|
| | LA 40E | LA40N | LA63E | LA63N | LA63Nd | LA63H | LA63Hd |
| Protection | Overload/ short circuit | Overload/ short circuit | Overload/ short circuit | Overload/short circuit | | Overload/short circuit | |
| Standards | IEC/EN 60898-1 | IEC/EN 60898-1 | IEC/EN 60898-1 | IEC/EN 60898-1/ 60947-2 | | IEC/EN 60898-1/ 60947-2 | |
| Rated voltage (Ue) | 240VAC | 240VAC | 240/415VAC | 240/415VAC, 70/125VDC | | 240/415VAC, 70/125VDC | |
| Poles | 1P+N | 1P+N | 1P, 1P+N, 2P, 3P, 3P+N, 4P | 1P, 1P+N, 2P, 3P, 3P+N, 4P | | 1P, 1P+N, 2P, 3P, 3P+N, 4P | |
| Rated current (In) | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40A | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40A | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | |
| Breaking capacity | 4.5kA | 6kA | 4.5kA | 6kA | 6kA | 10kA | 10kA |
| Isolation function | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Tripping curve | B, C, D | B, C, D | B, C, D | B, C, D | B, C, D | B, C, D | B, C, D |
| Electrical durability | 4000 | 4000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| Mechanical durability | 10000 | 10000 | 20000 | 20000 | 20000 | 20000 | 20000 |
| Terminal capacity | Cable up to 16mm² | Cable up to 16mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 25mm² |
| Accessory | - | - | AX, AL, SHT, U/OVT | AX, AL, SHT, U/ OVT | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT |
| Dimension |  | | |  | | | |








| | MCB(Miniature circuit breaker) | | | | | Switch-Disconnector |
|---|---|---|---|---|---|---|
| | **LA63L** | **LA100H** | **LA125H** | **LA63HP** | **LA63HDC** | **LA125D** |
| | Overload/short circuit | Overload/short circuit | Overload/short circuit | Overload/short circuit | Overload/short circuit | - |
| | IEC/EN 60898-1/ 60947-2 | IEC/EN 60947-2 | IEC/EN 60947-2 | IEC/EN 60947-2 | IEC/EN 60947-2 | IEC/EN 60947-3 |
| | 240/415VAC, 70/125VDC | 240/415VAC | 240/415VAC | 240/415VAC | 250/500/750/1000VDC | 240/415VAC |
| | 1P, 1P+N, 2P, 3P, 3P+N, 4P | 1P, 2P, 3P, 4P | 1P, 2P, 3P, 4P | 1P, 2P, 3P, 4P | 1P, 2P, 3P, 4P | 1P, 2P, 3P, 4P |
| | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 63, 80, 100A | 10, 16, 20, 25, 32, 40, 50, 63, 80, 100, 125A | 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 40, 50, 63, 80, 100, 125A |
| | AC 1~4A : 70kA<br>AC 6~32A : 25kA<br>AC 40~63A : 15kA<br>DC 1~63A : 15kA | 10kA | 10~63A : 20kA<br>80~125A : 10kA | 10kA | 10kA | - |
| | Yes | Yes | Yes | Yes | Yes | Yes |
| | B, C, D | C(8In), D(12In) | C(8In), D(12In) | B(4In), C(8In) | C(6In), D(12In) | - |
| | 10000 | 1500 | 1500 | 4000 | 1500 | 1500(125A 1000) |
| | 20000 | 10000 | 10000 | 10000 | 20000 | 10000 |
| | Cable up to 25mm² | Cable up to 50mm² | Cable up to 50mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 50mm² |
| | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | - | AX, AL, SHT | AX |
| |  |  |  |  |  |  |

# Residual Current Circuit Breakers

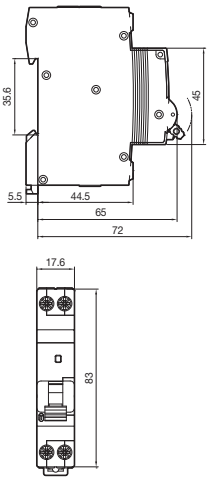
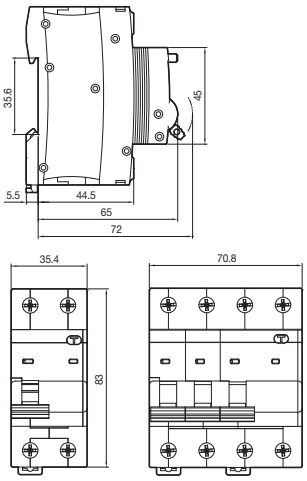
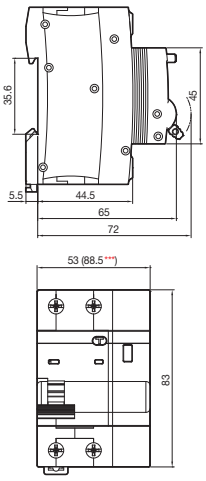
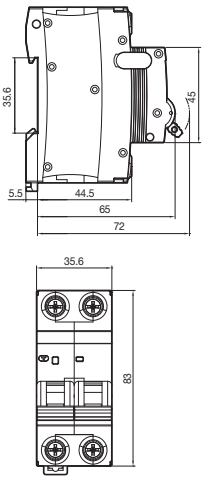
## 2 and 4 pole series up to 100AF

### RCBO, RCCB







| Type | RCBO(Residual Current Breaker with Overcurrent protection) | | | | | |
|---|---|---|---|---|---|---|
| | LB40NN | LB40N | LB40H | LB40NB | LB63N | |
| Pro tection | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | |
| Standards | IEC/EN 61009-1 | IEC/EN 61009-1 | IEC/EN 61009-1 | IEC/EN 61009-1, 62423 | IEC/EN 61009-1 | |
| Operation type | AC, A | AC, A | AC, A | B | AC, A | |
| Rated voltage (Ue) | 240VAC | 240/415VAC | 240/415VAC | 240/415VAC | 240VAC | |
| Poles | 1P+N | 1P+N, 3P+N | 1P+N, 3P+N | 1P+N, 3P+N | 1P+N | |
| Rated current (In) | 6, 10, 13, 16, 20, 25, 32, 40A | 6, 10, 13, 16, 20, 25, 32, 40A | 6, 10, 13, 16, 20, 25, 32, 40A | 6, 10, 13, 16, 20 25, 32, 40A | 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | |
| Breaking capacity | 6kA | 6kA | 10kA | 6kA | 6kA | |
| Isolation function | Yes | Yes | Yes | Yes | Yes | |
| Tripping curve | B, C | B, C, D | B, C, D | B, C, D | B, C, D | |
| Sensitivity, mA | 10, 30, 100, 300 | 30, 100, 300 | 30, 100, 300 | 30, 100, 300 | 30, 50, 100, 300 | |
| Terminal capacity | Cable up to 16mm² | Cable up to 16mm² | Cable up to 16mm² | Cable up to 16mm² | Cable up to 25mm² | |
| Accessory | - | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | |
| Dimension |  |  | |  |  | |



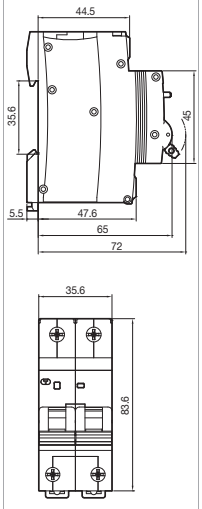
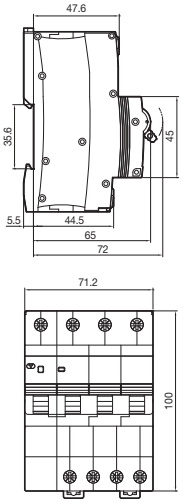
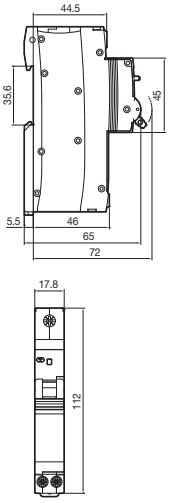
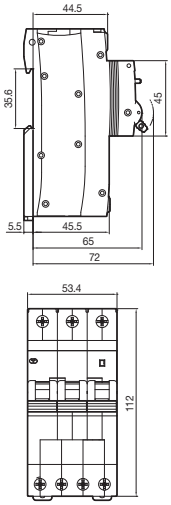
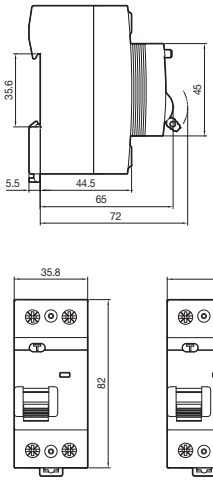
* LC63N's neutral is on the left of RCCB and LC63NR's neutral is on the right of RCCB
* LC100H's neutral is on the left of RCCB and LC100HR's neutral is on the right of RCCB
** AC(S), A(S) is Earth-leakage protection time delayed product
*** LB40NB 3P+N's width









| | RCBO(Residual Current Breaker with Overcurrent protection) | | | | RCCB(Residual Current Circuit Breaker) | | |
|---|---|---|---|---|---|---|---|
| | **LB63H** | **LB63H4** | **LB50HW** | **LB63HW** | **LC63N/LC63NR*** | **LC100H/LC100HR*** | **LC80HB** |
| | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | Leakage current/ Overload/Short circuit | Leakage current | Leakage current | Leakage current |
| | IEC/EN 61009-1 | IEC/EN 61009-1 | IEC/EN 61009-1 | IEC/EN 61009-1 | IEC/EN 61008-1 | IEC/EN 61008-1 | IEC/EN 61008-1, 62423 |
| | AC, A | AC, A | AC, A | AC, A | AC, A | AC, A, AC(S)**, A(S)** | B |
| | 240VAC | 415VAC | 230/240VAC | 400/415VAC | 240/415VAC | 240/415VAC | 240/415VAC |
| | 2P | 4P | 1P+N | 3P+N | 1P+N, 3P+N | 1P+N, 3P+N | 1P+N, 3P+N |
| | 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 6, 10, 13, 16, 20 25, 32, 40, 50A | 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A | 16, 25, 32, 40, 50, 63A | 16, 25, 32, 40, 50, 63, 80, 100A | 16, 25, 32, 40, 50, 63, 80A |
| | 10kA | 10kA | 10kA | 10kA | - | - | - |
| | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | B, C, D | B, C, D | B, C, D | B, C, D | - | - | - |
| | 30, 50, 100, 300 | 30, 50, 100, 300 | 10, 30, 100, 300 | 10, 30, 100, 300 | 30, 100, 300 | 30, 100, 300 | 30, 100, 300 |
| | Cable up to 25mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 25mm² | Cable up to 50mm² | Cable up to 50mm² |
| | - | - | - | - | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT | AX, AL, SHT, U/OVT |
| |  |  |  |  |  | | |

# Surge Protective Device

## BK Series (Din-rail type)

### Product description

The BK Series AC/DIN type surge protect protects a 50/60Hz electric system from surge voltages.
When the protective device is activated (in an anomaly or an accident), the red lever in the status indicator protrudes.



### Product rating <Uc: 385V>

| Item | | | AC Type | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | BK05S-T3 | BK10S-T2 | BK20S-T2 | BK30S-T2 | BK40S-T2 | BK12S-T1 Note4) |
| No. of poles | | [Pole] | 2, 4P | 1, 1+N, 2, 3, 3+N, 4P | | | | |
| Rated voltages | | Un [V] | 230/440V | | | | | |
| Max. continued-operation voltage | Uc [V] | - | 385 | 385 | 385 | 385 | 385 | 385 |
| | | N-PE | | 255 | 255 | 255 | 255 | 255 |
| Voltage protection level | Up [kV] | - | ≤0.8 | ≤1.5 | ≤1.8 | ≤2.0 | ≤2.5 | ≤2.5 |
| | | N-PE | - | ≤1.0 | ≤1.2 | ≤1.5 | ≤2.0 | ≤2.5 |
| | Up [kV] ⓚ | - | ≤2.0 | ≤1.5 | ≤1.8 | - | ≤2.5 | - |
| | | N-PE | - | ≤2.5 | ≤2.5 | - | ≤3.5 | - |
| Nominal discharge current | | In [kA] | | 10 | 20 | 30 | 40 | - |
| Max. discharge current | | Imax [kA] | - | 20 | 40 | 60 | 80 | - |
| Impulse current | | Iimp [kA] | - | - | - | - | - | 12.5 (10/350) |
| Open circuit voltage | | Uoc [kV] | 10 | - | - | - | - | - |
| Grades | | Test class | Class III | Class II | | | | Class I (Built-in type) |
| Reaction time | | | < 25ns | | | | | |
| Status indication Note2) | | | Have Status indication | | | | | |
| Operating temperature range | | | -40℃~80℃ | | | | | |
| Cross-sectional area of the connecting wires | | | 6~16mm² | 6~32mm² | | | | 16~32mm² |
| Accessories | | | AL Note3) | | | | | - |
| Standard | | | IEC 61643-11 / KS C IEC 61643-11 / UL1449 | | | | | |
| Certification | | | CE, UL, KS, S | CE, UL, KS, S | CE, UL, KS, S | CE, UL | CE, UL, KS, S | CE |

Note)
1. When the protective device is activated (in an anomaly or an accident) in products with Class II and III indication features, the red lever in the status indicator protrudes.
2. With a product with Class I indication feature, a green light will turn on when the protective device is in a normal condition. The green light will go off when the protective device is activated (for an anomaly or an accident.)
3. The AL contact accessories are not sold separately. You need to choose these accessories when you place your order for the product. Please be mindful of this fact when you place your order.
4. The Class I products are integrated with the MOVs, which cannot be detached.

## Product description

The BK Series AC/DIN type surge protect protects a 50/60Hz electric system from surge voltages.
When the protective device is activated (in an anomaly or an accident), the red lever in the status indicator protrudes.






## Product rating <Uc: 460V>

| Item | | | AC Type | | | |
|---|---|---|---|---|---|---|
| | | | BK10S-T2 | BK20S-T2 | BK30S-T2 | BK40S-T2 |
| No. of poles | | [Pole] | 1, 1+N, 2, 3, 3+N, 4P | | | |
| Rated voltages | | Un [V] | 254/440V | | | |
| Max. continued-operation voltage | Uc [V] | - | 460 | 460 | 460 | 460 |
| | | N-PE | 255 | 255 | 255 | 255 |
| Voltage protection level | Up [kV] | - | ≤1.5 | ≤2.0 | ≤2.2 | ≤2.5 |
| | | N-PE | ≤1.0 | ≤1.2 | ≤1.5 | ≤2.0 |
| | Up [kV] ㉿ | - | - | - | - | - |
| | | N-PE | - | - | - | - |
| Nominal discharge current | | In [kA] | 10 | 20 | 30 | 40 |
| Max. discharge current | | Imax [kA] | 20 | 40 | 60 | 80 |
| Impulse current | | Iimp [kA] | - | - | - | - |
| Open circuit voltage | | Uoc [kV] | - | - | - | - |
| Grades | | Test class | Class II | | | |
| Reaction time | | | < 25ns | | | |
| Status indication Note2) | | | Have Status indication | | | |
| Operating temperature range | | | -40℃~80℃ | | | |
| Cross-sectional area of the connecting wires | | | 6~32mm² | | | |
| Accessories | | | AL Note3) | | | |
| Standard | | | IEC 61643-11, UL1449 | | | |
| Certification | | | CE, S | CE, S, UL | CE, S, UL | CE, S, UL |

Note)
1. When the protective device is activated (in an anomaly or an accident) in products with Class II and III indication features, the red lever in the status indicator protrudes.
2. With a product with Class I indication feature, a green light will turn on when the protective device is in a normal condition. The green light will go off when the protective device is activated (for an anomaly or an accident.)
3. The AL contact accessories are not sold separately. You need to choose these accessories when you place your order for the product. Please be mindful of this fact when you place your order.

# Surge Protective Device

## BK Series (DC/DIN Type)

### Product description

The BK Series DC/DIN type surge protect protects a DC electric system from surge voltages.
When the protective device is in a normal condition, the indication display will be green. The display will turn black when the protective device is activated (for an anomaly or an accident.)






### Product rating

| Item | | DC Type | | | |
|---|---|---|---|---|---|
| | | BK20S-DC110 | BK20S-DC600 | BK20S-DC1000 | BK20S-DC1500 |
| No. of poles | [Pole] | 2P | 3P | | |
| Rated voltages | Un [V] | DC110 | DC600 | DC1000 | DC1500 |
| Max. continued-operation voltage | Uc [V] | DC220 | DC700 | DC1200 | DC1500 |
| Voltage protection level | Up [kV] | ≤1.0 | ≤2.5 | ≤3.9 | ≤4.5 |
| Nominal discharge current | In [kA] | 20 | 20 | 20 | 20 |
| Max. discharge current | Imax [kA] | 40 | 40 | 40 | 40 |
| Impulse current | Iimp [kA] | - | - | - | - |
| Grades | Test Class | Class II | | | |
| Reaction time | | < 25ns | | | |
| Status indication | | Have Status indication | | | |
| Operating temperature range | | -40℃~80℃ | | | |
| Cross-sectional area of the connecting wires | | 6mm² or more | | | |
| Accessories | | AL Note1) | | | |
| Standard | | IEC 61643-11 / UL1449 | | | |
| Certification | | CE | CE, UL | CE, UL | CE |
| SPD Disconnector | MCCB | TD100 2P 32A | TD100 3P 32A | TD100 4P 32A | TSD250N/H 4P 63A (Under development) |
| | MCB | BK63H-DC 2P 40A | BK63H-DC 3P 40A | BK63H-DC 4P 40A | - |

Note) 1. The AL contact accessories are not sold separately.
You need to choose these accessories when you place your order for the product.
Please be mindful of this fact when you place your order.

# SD Series (SPD Disconnector)

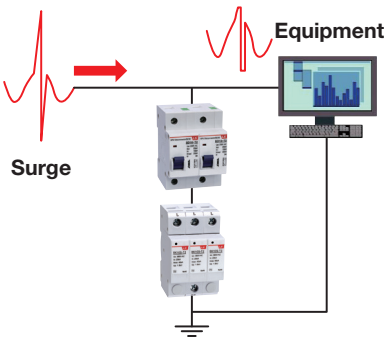
## Product description

SPD Disconnector is a device that separates the SPD from the system during SPD failure and maintenance work. It has a trip function that can detect and cut off leakage current caused by SPD deterioration (varistor burnout, etc.) and has a high surge resistance to prevent the unintended trip operation of the Disconnector.



## Product rating

| Item | | SD10-T2 | SD20-T2 | SD30-T2 | SD40-T2 | SD13-T1 |
|---|---|---|---|---|---|---|
| No. of poles | | 1, 2, 3, 4P | | | | |
| Rated voltages | Ue [V] | 230/400 | | | | |
| Rated insulation voltage | Ui [V] | 500 | | | | |
| Voltage protection level | Up [kV] | 0.25 | 0.4 | 0.5 | 0.7 | 0.3 |
| Nominal discharge current | In [kA] | 10 | 20 | 30 | 40 | - |
| Max. discharge current | Imax [kA] | 20 | 40 | 60 | 80 | - |
| Impulse current | Iimp [kA] | - | - | - | - | 12.5kA |
| Grades | Test Class | Class II, III | Class II | | | Class I |
| Short circuit current | Isc [kA] | 25 | | | | |
| Frequency | [Hz] | 50/60 | | | | |
| Min. delay current | It | 3A (<10s) | | | | |
| Min. instantaneous current | Ii | 5A (>0.1s), 10A(<0.1s) | | | | |
| Protection degree | | IP20 | | | | |
| Max. connection wire range | | 25mm² | | | | |
| AL connection wire range | | 1.5mm² | | | | |
| Operating temperature range | | -25℃~60℃ | | | | |
| Ambient humidity | | 20%~90% | | | | |
| Din-Rail | | EN60715 (35mm) | | | | |






- Convenient SPD replacement
- High surge resistance
- Leakage current detection
- Prevent malfunctions in case of short circuit
- Easy installation using DIN rail

* AL available for SD20-T2 and SD-40T2

# Surge Protective Device

## SP Series (Box type)

### Product description

The SP series surge protective device is applied to the alternating current 50/60Hz, 220V/380V power system and provides the protection from the surge overvoltage of an electric system. Moreover, the protection module, disconnectable device (fuse), and fastened power and ground wires are organized into the allin-one steel cabinet with convenient installation and stability.
If the protective device is normal, the display becomes green. The display becomes red after operation (abnormal or after an accident).





### Product rating
#### - Single phase 2W+G (SPL)

| SPD Type | | | SPL (AC 110/220V) | SPL (AC 220V) | |
|---|---|---|---|---|---|
| | | | SPL3-20S | SPL2-40S | SPL2-80S |
| Class | | | Class III | Class II | |
| Rated system | | [Pole] | 2W+G | 2W+G | |
| Rated voltage, Un | AC | [V] | 110, 220 | 220 | |
| Max. continuous operating voltage, Uc | AC | [V] | 275 | 385 | |
| Voltage protection level, Up | | [kV] | 1.5 | 2.5 | 3.0 |
| Operation voltage, Uoc | | [kV/kA] | 20/10 | - | - |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | - | 20 | 40 |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | - | 40 | 80 |
| Response time, tA | | [ns] | < 5 ns | < 5 ns | |
| Operating temperature range | | [℃] | -40 ~ +70℃ | -40 ~ +70℃ | |
| Operating frequency | | [Hz] | 50/60 Hz | 50/60 Hz | |
| Mounting on | | | Screw | Screw | |
| Operation status indication | | | Normal operation: Green, Abnormal/After an accident: Red | | |
| Protection degree | | | IP20 | IP20 | |
| Protection mode | | | L-N, N-PE (G), L-PE (G) | L-N, N-PE (G) | |
| Ground | | | TN | TN | |
| Certification | | | CE | KS, CE | |






### Product rating
#### - Three phase 3W+G (SPT) AC 220V

| SPD Type | | | SPT (AC 220V) | | | |
|---|---|---|---|---|---|---|
| | | | SPT2-40S | SPT2-80S | SPT1-120S | SPT1-160S |
| Class | | | Class II | | Class I, Class II | |
| Rated system | | [Pole] | 3W+G | | | |
| Rated voltage, Un | AC | [V] | 220 | | | |
| Max. continuous operating voltage, Uc | AC | [V] | 385 | | | |
| Voltage protection level, Up | | [kV] | 2.5 | 3.0 | 2.0 | 2.0 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | 20 | 40 | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | 40 | 80 | 120 | 160 |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | - | - | 6.5 | 6.5 |
| Response time, tA | | [ns] | < 5 ns | | | |
| Operating temperature range | | [℃] | -40 ~ +70℃ | | | |
| Operating frequency | | [Hz] | 50/60 Hz | | | |
| Mounting on | | | Screw | | | |
| Operation status indication | | | Normal operation: Green, Abnormal/After an accident: Red | | | |
| Protection degree | | | IP20 | | | |
| Protection mode | | | L-PE (G) | | | |
| Ground | | | TN | | | |
| Certification | | | KS, CE | | | |

* SPT can not be used in Delta wiring grounding system



## Product rating
### - Three phase 3W+G (SPT) AC 380V

| SPD Type | | | SPT (AC 380V) | | | |
|---|---|---|---|---|---|---|
| | | | SPT2-40S | SPT2-80S | SPT1-120S | SPT1-160S |
| Class | | | Class II | | Class I, Class II | |
| Rated system | | [Pole] | 3W+G | | | |
| Rated voltage, Un | AC | [V] | 380 | | | |
| Max. continuous operating voltage, Uc | AC | [V] | 385 | | | |
| Voltage protection level, Up | | [kV] | 2.5 | 3.0 | 2.0 | 2.0 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | 20 | 40 | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | 40 | 80 | 120 | 160 |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | - | - | 6.5 | 6.5 |
| Response time, tA | | [ns] | < 5 ns | | | |
| Operating temperature range | | [℃] | -40 ~ +70℃ | | | |
| Operating frequency | | [Hz] | 50/60 Hz | | | |
| Mounting on | | | Screw | | | |
| Operation status indication | | | Normal operation: Green, Abnormal/After an accident: Red | | | |
| Protection degree | | | IP20 | | | |
| Protection mode | | | L-PE (G) | | | |
| Ground | | | TN | | | |
| Certification | | | KS, CE | | | |

* SPT can not be used in Delta wiring grounding system



## Product rating
### - Three phase 3W+G (SPT) AC 440V

| SPD Type | | | SPT (AC 440V) | | | |
|---|---|---|---|---|---|---|
| | | | SPT2-40S | SPT2-80S | SPT1-120S | SPT1-160S |
| Class | | | Class II | | Class I, Class II | |
| Rated system | | [Pole] | 3W+G | | | |
| Rated voltage, Un | AC | [V] | 440 | | | |
| Max. continuous operating voltage, Uc | AC | [V] | 385 | | | |
| Voltage protection level, Up | | [kV] | 2.5 | 3.0 | 2.0 | 2.0 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | 20 | 40 | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | 40 | 80 | 120 | 160 |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | - | - | 6.5 | 6.5 |
| Response time, tA | | [ns] | < 5 ns | | | |
| Operating temperature range | | [℃] | -40 ~ +70℃ | | | |
| Operating frequency | | [Hz] | 50/60 Hz | | | |
| Mounting on | | | Screw | | | |
| Operation status indication | | | Normal operation: Green, Abnormal/After an accident: Red | | | |
| Protection degree | | | IP20 | | | |
| Protection mode | | | L-PE (G) | | | |
| Ground | | | TN | | | |
| Certification | | | KS, CE | | | |

* SPT can not be used in Delta wiring grounding system

# Surge Protective Device

## SP Series (Box type)



### Product rating
### - Three phase 4W +G (SPY) 127S

| SPD Type | | | SPY (AC 127/220V) | | | | |
|---|---|---|---|---|---|---|---|
| | | | SPY2-40S | SPY2-80S | SPY1-120S | SPY1-160S | SPY1-200S * |
| Class | | | Class II | | Class I, Class II | | |
| Rated system | | [Pole] | 4W+G | | | | |
| Rated voltage, Un | AC | [V] | 127/220 | | | | |
| Max. continuous operating voltage, Uc | AC | [V] | 385 | | | | |
| Voltage protection level, Up | | [kV] | 2.5 | 3.0 | 2.0 | 2.0 | 2.0 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | 20 | 40 | - | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | 40 | 80 | 120 | 160 | 200 |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | - | - | 6.5 | 6.5 | 12.5 |
| Response time, tA | | [ns] | < 5 ns | | | | |
| Operating temperature range | | [℃] | -40 ~ +70℃ | | | | |
| Operating frequency | | [Hz] | 50/60 Hz | | | | |
| Mounting on | | | Screw | | | | |
| Operation status indication | | | Normal operation: Green, Abnormal/After an accident: Red | | | | |
| Protection degree | | | IP20 | | | | |
| Protection mode | | | L-N, N-PE (G) | | | | |
| Ground | | | TN | | | | |
| Certification | | | KS, CE | | | | |

* The wiring direction of SPY1-200S is located on the side. (Refer to external dimension)



### Product rating
### - Three phase 4W+G (SPY) 220S

| SPD Type | | | SPY (AC 220/380V) | | | | |
|---|---|---|---|---|---|---|---|
| | | | SPY2-40S | SPY2-80S | SPY1-120S | SPY1-160S | SPY1-200S * |
| Class | | | Class II | | Class I, Class II | | |
| Rated system | | [Pole] | 4W+G | | | | |
| Rated voltage, Un | AC | [V] | 220/380 | | | | |
| Max. continuous operating voltage, Uc | AC | [V] | 385 | | | | |
| Voltage protection level, Up | | [kV] | 2.5 | 3.0 | 2.0 | 2.0 | 2.0 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | 20 | 40 | - | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | 40 | 80 | 120 | 160 | 200 |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | - | - | 6.5 | 6.5 | 12.5 |
| Response time, tA | | [ns] | < 5 ns | | | | |
| Operating temperature range | | [℃] | -40 ~ +70℃ | | | | |
| Operating frequency | | [Hz] | 50/60 Hz | | | | |
| Mounting on | | | Screw | | | | |
| Operation status indication | | | Normal operation: Green, Abnormal/After an accident: Red | | | | |
| Protection degree | | | IP20 | | | | |
| Protection mode | | | L-N, N-PE (G) | | | | |
| Ground | | | TN | | | | |
| Certification | | | KS, CE | | | | |

* The wiring direction of SPY1-200S is located on the side. (Refer to external dimension)

## Product rating
### - Iimp 12.5kA Class I SPD





| SPD Type | | | SPL1-13/50S | SPT1-13S | SPY1-13/50S |
|---|---|---|---|---|---|
| Class | | | | Class I | |
| Rated system | | [Pole] | 2W+G | 3W+G | 4W+G |
| Rated voltage, Un | AC | [V] | 220 | 380 | 380/220 |
| Max. continuous operating voltage, Uc | AC | [V] | | 320 | |
| Voltage protection level, Up | | [kV] | L-N : 1.2, N-PE : 1.8 | L-N : 1.2, N-PE : 1.8 | L-N : 1.2, N-PE : 1.8 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | - | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | - | - | - |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | 12.5/50 | 12.5 | 12.5/50 |
| Response time, tA | | [ns] | | < 5 ns | |
| Operating temperature range | | [℃] | | -40 ~ +70℃ | |
| Operating frequency | | [Hz] | | 50/60 Hz | |
| Mounting on | | | | Screw | |
| Operation status indication | | | | Normal operation: Green, Abnormal/After an accident: Red | |
| Protection degree | | | | IP20 | |
| Protection mode | | | L-N, N-PE (G) | L-PE (G) | L-N, N-PE (G) |
| Ground | | | | TN/TT/IT | |
| Certification | | | | KS, CE | |

* SPT can not be used in Delta wiring grounding system

## Product rating
### - Iimp 25kA Class I SPD





| SPD Type | | | SPL1-25/50S | SPT1-25S | SPY1-25/100S |
|---|---|---|---|---|---|
| Class | | | | Class I | |
| Rated system | | [Pole] | 2W+G | 3W+G | 4W+G |
| Rated voltage, Un | AC | [V] | 220 | 380 | 380/220 |
| Max. continuous operating voltage, Uc | AC | [V] | | 320 | |
| Voltage protection level, Up | | [kV] | L-N : 1.3, N-PE : 2.0 | L-N : 1.3, N-PE : 2.0 | L-N : 1.3, N-PE : 2.0 |
| Nominal discharge current, In (8/20㎲) | | [kA, per mode] | - | - | - |
| Maximum discharge current, Imax (8/20㎲) | | [kA, per mode] | - | - | - |
| Lightning impulse current, Iimp (10/350㎲) | | [kA, per mode] | 25/50 | 25 | 25/100 |
| Response time, tA | | [ns] | | < 5 ns | |
| Operating temperature range | | [℃] | | -40 ~ +70℃ | |
| Operating frequency | | [Hz] | | 50/60 Hz | |
| Mounting on | | | | Screw | |
| Operation status indication | | | | Normal operation: Green, Abnormal/After an accident: Red | |
| Protection degree | | | | IP20 | |
| Protection mode | | | N-PE (G) | L-PE (G) | L-N, N-PE (G) |
| Ground | | | | TN/TT/IT | |
| Certification | | | | KS, CE | |

* SPT can not be used in Delta wiring grounding system

# Contactors & Overload relays

## Metasol MC 3P 18 to 150A

### 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 | | | ● | ● | ● | ● | ● | ● | ● | ● |
| | Lug 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 | | | |
| Current and power | AC-1, Thermal current | | [A] | 25 | 25 | 25 | 32 | 25 | 27 | 40 | 45 |
| | AC-3 | 200/240V | [kW] | 2.2 | 2.5 | 3.5 | 4.5 | 2.5 | 3.5 | 4.5 | 5.5 |
| | | | [A] | 9 | 11 | 13 | 18 | 11 | 13 | 18 | 22 |
| | | 380/440V | [kW] | 3 | 4 | 5.5 | 7.5 | 4 | 5.5 | 7.5 | 11 |
| | | | [A] | 7 | 9 | 12 | 18 | 9 | 12 | 18 | 22 |
| | | 500/550V | [kW] | 3 | 4 | 7.5 | 7.5 | 4 | 7.5 | 7.5 | 15 |
| | | | [A] | 6 | 7 | 12 | 13 | 7 | 12 | 13 | 20 |
| | | 690V | [kW] | 3 | 4 | 7.5 | 7.5 | 4 | 7.5 | 7.5 | 15 |
| | | | [A] | 4 | 5 | 9 | 9 | 6 | 9 | 9 | 18 |
| | | 1000V | [kW] | - | - | - | - | - | - | - | - |
| | | | [A] | - | - | - | - | - | - | - | - |
| Rated Short-time withstand current (IEC 60947) | 1s | | [A] | 210 | 250 | 280 | 300 | 250 | 280 | 300 | 400 |
| | 10s | | [A] | 105 | 110 | 120 | 130 | 110 | 120 | 154 | 186 |
| | 30s | | [A] | 70 | 70 | 80 | 85 | 70 | 80 | 100 | 130 |
| | 1min | | [A] | 61 | 61 | 61 | 70 | 61 | 61 | 84 | 90 |
| | 10min | | [A] | 40 | 45 | 47 | 50 | 45 | 50 | 60 | 60 |
| | 30min | | [A] | 30 | 30 | 30 | 40 | 30 | 30 | 40 | 50 |
| | ≥15min | | [A] | 25 | 26 | 28 | 30 | 26 | 28 | 30 | 45 |
| UL rating (50/60Hz) | Continuous curren | | [A] | 25 | 25 | 25 | 32 | 25 | 25 | 40 | 40 |
| | Single phase | 110-120V | [HP] | 0.5 | 0.5 | 1 | 2 | 0.5 | 1 | 2 | 2 |
| | | 220-240V | [HP] | 1.5 | 1.5 | 2 | 3 | 1.5 | 2 | 3 | 3 |
| | Three phase | 200-208V | [HP] | 2 | 2 | 3 | 7.5 | 2 | 3 | 7.5 | 7.5 |
| | | 220-240V | [HP] | 3 | 3 | 5 | 7.5 | 3 | 5 | 7.5 | 10 |
| | | 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 | 1 | 00 | 0 | 1 | - |
| Size and weight  | AC control | Weight | [kg] | 0,33 | | | | 0.34 | | | |
| | | Size(W×H×D) | [mm] | 45×73.5×80.4 | | | | 45×73.5×87.4 | | | |
| | DC control | Weight | [kg] | 0.4 | | | | 0.41 | | | |
| | | Size(W×H×D) | [mm] | 45×73.5×96.6 | | | | 45×73.5×103.6 | | | |
| 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 | | ● | ● |
| | Lug clamp terminals | | - | - |
| Rated operational voltage, Ue | | [V] | 690 | 690 |
| Rated insulation voltage, Ui | | [V] | 690 | 690 |
| Rated impulse withstand voltage, Uimp | | [kV] | 6 | 6 |
| Trip class | | | 10A, 20 | 10A, 20 |
| Setting range | | | 0.1~18A | 0.1~40A |
| Size and weight  | Weight | kg | 0.1 | 0.17 |
| | Size(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 | | | 150AF | |
|---|---|---|---|---|---|---|---|---|
| MC-32a | MC-40a | MC-50a | MC-65a | MC-75a | MC-85a | MC-100a | MC-130a | MC-150a |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| - | - | ● | ● | ● | ● | ● | ● | ● |
| 3pole | | 3pole | | 3pole | | | 3pole | |
| 1000V | | 1000V | | 1000V | | | 1000V | |
| 1000V | | 1000V | | 1000V | | | 1000V | |
| 50/60Hz | | 50/60Hz | | 50/60Hz | | | 50/60Hz | |
| 8kV | | 8kV | | 8kV | | | 8kV | |
| 1800 operations per hour | | 1800 operations per hour | | 1800 operations per hour | | | 1200 operations per hour | |
| 12 mil. operations | | 12 mil. operations | | 12 mil. operations | | | 5 mil. operations | |
| 2 mil. operations | | 2 mil. operations | | 2 mil. operations | | 1 mil. operations | 1 mil. operations | |
| 55 | 60 | 100 | 115 | 125 | 135 | 160 | 200 | 250 |
| 7.5 | 11 | 15 | 18.5 | 22 | 25 | 30 | 37 | 45 |
| 32 | 40 | 55 | 65 | 75 | 85 | 105 | 130 | 150 |
| 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 60 | 75 |
| 32 | 40 | 50 | 65 | 75 | 85 | 105 | 130 | 150 |
| 18.5 | 22 | 30 | 33 | 37 | 45 | 55 | 60 | 70 |
| 28 | 32 | 43 | 60 | 64 | 75 | 85 | 90 | 100 |
| 18.5 | 22 | 30 | 33 | 37 | 45 | 55 | 55 | 55 |
| 20 | 23 | 28 | 35 | 42 | 45 | 65 | 60 | 60 |
| 22 | 22 | 30 | 30 | 37 | 37 | 37 | 75 | 75 |
| 17 | 17 | 23 | 23 | 28 | 28 | 28 | 50 | 50 |
| 600 | 700 | 1000 | 1050 | 1100 | 1200 | 1320 | 1350 | 1800 |
| 260 | 300 | 550 | 700 | 750 | 800 | 900 | 950 | 1200 |
| 160 | 190 | 330 | 380 | 400 | 450 | 500 | 700 | 800 |
| 100 | 120 | 250 | 270 | 300 | 350 | 400 | 550 | 600 |
| 70 | 80 | 150 | 200 | 220 | 270 | 270 | 350 | 450 |
| 55 | 65 | 90 | 120 | 140 | 170 | 180 | 200 | 300 |
| 50 | 60 | 87 | 96 | 114 | 150 | 160 | 175 | 280 |
| 50 | 60 | 70 | 100 | 110 | 135 | 160 | 200 | 250 |
| 3 | 3 | 3 | 5 | 5 | 7.5 | 10 | 10 | 15 |
| 5 | 7.5 | 10 | 15 | 15 | 15 | 20 | 20 | 25 |
| 7.5 | 15 | 20 | 25 | 25 | 30 | 30 | 40 | 40 |
| 10 | 15 | 25 | 30 | 30 | 40 | 40 | 40 | 50 |
| 20 | 30 | 40 | 50 | 50 | 60 | 75 | 75 | 100 |
| 25 | 30 | 50 | 60 | 60 | 75 | 75 | 75 | 75 |
| 1P | 2 | - | - | - | 3 | - | - | 4 |
| 0.55 | | 1.05 | | 1.93 | | | 2.4 | |
| 69×83×90 | | 79×106×119 | | 94×140×135.8 | | | | |
| 0.77 | | 1.3 | | 2.8 | | | 119×158×130.3 | |
| 69×83×117.1 | | 79×106×146.4 | | 94×140×172.3 | | | | |
| 2a2b | | 2a2b | | 2a2b | | | 2a2b | |
| UA-1 | | UA-1 | | UA-1 | | | UA-1 | |
| UA-2, UA-4 | | UA-2, UA-4 | | UA-2, UA-4 | | | UA-2, UA-4 | |






| MT-32/□ | MT-63/□ | MT-95/□ | MT-150/□ |
|---|---|---|---|
| ● | ● | ● | ● |
| - | ● | ● | ● |
| 690 | 690 | 690 | 690 |
| 690 | 690 | 690 | 690 |
| 6 | 6 | 6 | 6 |
| 10A, 20 | 10A, 20 | 10A, 20 | 10A, 20 |
| 0.1~40A | 4~65A | 7~100A | 34~150A |
| 0.17 | 0.31/0.33 | 0.48/0.5 | 0.67 |
| 45×75×90 | 55×81×100 | 70×97×110 | 95×109×113 |

# Contactors & Overload relays

## Metasol MC 3P 225 to 2100A

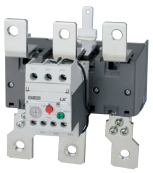




### MC type
### Magnetic Contactors

| Frame size | | | | 225AF | | 400AF | | |
|---|---|---|---|---|---|---|---|---|
| Type | | | | MC-185a | MC-225a | MC-265a | MC-330a | MC-400a |
| | Screws clamp terminals | | | ● | ● | ● | ● | ● |
| Number of poles | | | | 3 | | 3 | | |
| Rated operational voltage, Ue | | | | 1000 | | 1000 | | |
| Rated insulation voltage, Ui | | | | 1000 | | 1000 | | |
| Rated frequency | | | | 50/60 | | 50/60 | | |
| Rated impulse withstand voltage, Uimp | | | | 8 | | 8 | | |
| Maximum operating rate in operating cycles per hour(AC3) | | | | 1200 operations per hour | | 1200 operations per hour | | |
| Durability | Mechanical | | | 5mil. operations | | 5mil. operations | | 2.5mil. operations |
| | Electrical | | | 1mil. operations | | 1mil. operations | | 0.5mil. operations |
| Current and power | AC-1, Thermal current | | [A] | 300 | 350 | 400 | 500 | 520 |
| | AC-3 | 200/240V | [kW] | 55 | 75 | 80 | 90 | 125 |
| | | | [A] | 185 | 225 | 265 | 330 | 400 |
| | | 380/440V | [kW] | 90 | 132 | 147 | 160 | 200 |
| | | | [A] | 185 | 225 | 265 | 330 | 400 |
| | | 500/550V | [kW] | 110 | 132 | 147 | 160 | 225 |
| | | | [A] | 180 | 200 | 225 | 280 | 350 |
| | | 690V | [kW] | 110 | 140 | 160 | 200 | 250 |
| | | | [A] | 120 | 150 | 185 | 220 | 300 |
| | | 1000V | [kW] | 132 | 132 | 147 | 147 | 147 |
| | | | [A] | 90 | 90 | 105 | 105 | 105 |
| Rated Short-time withstand current (IEC 60947) | | 1s | [A] | 2000 | 2500 | 3500 | 4000 | 4600 |
| | | 10s | [A] | 1500 | 1700 | 2400 | 3000 | 4400 |
| | | 30s | [A] | 1000 | 1200 | 1500 | 2500 | 2974 |
| | | 1min | [A] | 800 | 1000 | 1100 | 1700 | 1846 |
| | | 10min | [A] | 520 | 700 | 800 | 1000 | 1313 |
| | | 30min | [A] | 350 | 500 | 600 | 620 | 760 |
| | | ≥15min | [A] | 320 | 400 | 500 | 553 | 699 |
| UL rating (50/60Hz) | Continuous curren | | [A] | 300 | 350 | 400 | 500 | 520 |
| | Single phase | 110-120V | [HP] | 15 | 15 | - | - | - |
| | | 220-240V | [HP] | 30 | 40 | - | - | - |
| | Three phase | 200-208V | [HP] | 60 | 60 | 75 | 100 | 125 |
| | | 220-240V | [HP] | 60 | 75 | 100 | 100 | 150 |
| | | 440-480V | [HP] | 125 | 150 | 200 | 200 | 300 |
| | | 550-600V | [HP] | 125 | 150 | 200 | 200 | 300 |
| | NEMA size | | | - | - | 5 | - | - |
| Size and weight  | AC control | Weight | [kg] | 5.4 | | 9.2 | | |
| | | Size(W×H×D) | [mm] | 138×203×185.1 | | 163×243×204.4 | | |
| | DC control | Weight | [kg] | | | | | |
| | | Size(W×H×D) | [mm] | | | | | |
| **Auxiliary(standard)** | | | | 2a2b | | 2a2b | | |
| Auxiliary | Side mount | | | AU-100, AU-100E (Max.4a4b) | | AU-100, AU-100E (Max.4a4b) | | |
| | Front mount | | | - | | - | | |





### MT type
### Thermal Overload Relays

| Type | | | MT-225/□ | MT-400/□ |
|---|---|---|---|---|
| | Screws clamp terminals | | ● | ● |
| Rated operational voltage, Ue | | [V] | 690 | 690 |
| Rated insulation voltage, Ui | | [V] | 690 | 690 |
| Rated impulse withstand voltage, Uimp | | [kV] | 6 | 6 |
| Trip class | | | 10A, 20 | 10A, 20 |
| Setting range | | | 65~240A | 85~400A |
| Size and weight  | Weight | kg | 2.5 | 2.6 |
| | Size(W×H×D) | [mm] | 147×141×184 | 151×171×198 |

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







| 800AF | | | 1260AF | 2650AF | | | |
|---|---|---|---|---|---|---|---|
| MC-500a | MC-630a | MC-800a | MC-1260a | MC-1400a | MC-1700a | MC-2100a | MC-2650a |
| ● | ● | ● | ● | ● | ● | ● | ● |
| 3 | | | 3 | 3 | | | |
| 1000 | | | 1000 | 1000 | | | |
| 1000 | | | 1000 | 1000 | | | |
| 50/60 | | | 50/60 | 50/60 | | | |
| 8 | | | 8 | 8kV | | | |
| 1200 operations per hour | | | 300 operations per hour | 300 operations per hour | | | |
| 2.5mil. operations | | | 0.5mil. operations | 0.5mil. operations | | | 0.3mil. operations |
| 0.5mil. operations | | | 0.05mil. operations | 0.05mil. operations | | | 0.02mil. operations |
| 700 | 900 | 1050 | 1260 | 1400 | 1700 | 2100 | 2650 |
| 147 | 190 | 220 | - | 290 | 310 | - | - |
| 500 | 630 | 800 | - | 860 | 1050 | - | - |
| 265 | 330 | 440 | - | 550 | 700 | 900 | - |
| 500 | 630 | 800 | - | 860 | 1050 | 1450 | - |
| 265 | 330 | 500 | - | - | - | - | - |
| 400 | 500 | 720 | - | - | - | - | - |
| 300 | 400 | 500 | - | 800 | 1000 | - | - |
| 380 | 420 | 630 | - | 800 | 950 | - | - |
| 280 | 280 | 280 | - | - | - | - | - |
| 220 | 220 | 220 | - | - | - | - | - |
| 6000 | 7000 | 7500 | 8000 | - | - | - | - |
| 5050 | 6400 | 7000 | 7200 | 8000 | 10000 | 10000 | 10000 |
| 4400 | 4500 | 4900 | 5200 | - | - | - | - |
| 3400 | 3500 | 3800 | 4000 | 4500 | 5500 | 5500 | 5500 |
| 2000 | 2200 | 2500 | 2300 | - | - | - | - |
| 1400 | 1550 | 1550 | 3000 | 2600 | 3000 | 3000 | 3000 |
| 1100 | 1300 | 1300 | 1500 | - | - | - | - |
| 700 | 900 | 1050 | 1260 | 1400 | 1700 | 2100 | 2650 |
| - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - |
| 150 | 200 | 200 | | | | | |
| 200 | 250 | 300 | | | | | |
| 400 | 500 | 600 | | | | | |
| 400 | 500 | 600 | | | | | |
| 6 | - | 7 | - | - | - | - | - |
| 22.2<br>285×310×246 | | | 24<br>285×352×246 | 33.8<br>431×380×246 | | | 47<br>431×392×246 |
| 2a2b | | | 2a2b | 2a2b | | | |
| AU-100, AU-100E (Max.4a4b) | | | AU-100, AU-100E (Max.4a4b) | AU-100, AU-100E (Max.4a4b) | | | |
| - | | | - | - | | | |



| MT-800/□ |
|---|
| ● |
| 690 |
| 690 |
| 6k |
| 10A, 20 |
| 200~800A |
| 11.5 |
| 360×530×212 |

# Contactors

## 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 | |
| Current | Thermal current | | [A] | 25 | 25 | 25 | 40 |
| and | AC-1 | 200/240V | [kW] | 9 | 9 | 9 | 15 |
| Power | | | [A] | 25 | 25 | 25 | 40 |
| | | 380/440V | [kW] | 17 | 17 | 17 | 27 |
| | | | [A] | 25 | 25 | 25 | 40 |
| | | 500/550V | [kW] | 21 | 21 | 21 | 35 |
| | | | [A] | 25 | 25 | 25 | 40 |
| | | 690V | [kW] | 27 | 27 | 27 | 44 |
| | | | [A] | 25 | 25 | 25 | 40 |
| 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 |
| | Three | 200-208V | [HP] | 2 | 2 | 3 | 7.5 |
| | Phase | 220-240V | [HP] | 3 | 3 | 5 | 7.5 |
| | | 440-480V | [HP] | 5 | 5 | 7.5 | 10 |
| | | 550-600V | [HP] | 7.5 | 7.5 | 10 | 15 |
| Size and weight  | AC control | Weight | [kg] | 0.33 | | | |
| | | Size(W×H×D) | [mm] | 45×73.5×80.4 | | | |
| | DC control | Weight | [kg] | 0.4 | | | |
| | | Size(W×H×D) | [mm] | 45×73.5×96.6 | | | |
| **Auxiliary(standard)** | | | | - | | | |
| Auxiliary | Side mount | | | UA-1 | | | |
| | Front mount | | | UA-2, UA-4 | | | |







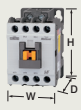
| 22AF | 40AF | | 85AF | | | |
|---|---|---|---|---|---|---|
| MC-12a/4 | MC-32a/4 | MC-40a/4 | MC-50a/4 | MC-65a/4 | MC-75a/4 | MC-85a/4 |
| ● | ● | | ● | | | |
| 4pole | 4pole | | 4pole | | | |
| 690V | 690V | | 690V | | | |
| 690V | 690V | | 1000V | | | |
| 50/60Hz | 50/60Hz | | 50/60Hz | | | |
| 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 | | | |
| 40 | 50 | 60 | 80 | 100 | 110 | 135 |
| 15 | 18 | 22 | 30 | 37 | 41 | 51 |
| 40 | 50 | 60 | 80 | 100 | 110 | 135 |
| 27 | 35 | 42 | 56 | 70 | 76 | 95 |
| 40 | 50 | 60 | 80 | 100 | 110 | 135 |
| 35 | 43 | 52 | 70 | 88 | 97 | 120 |
| 40 | 50 | 60 | 80 | 100 | 110 | 135 |
| 44 | 55 | 66 | 88 | 110 | 120 | 150 |
| 40 | 50 | 60 | 80 | 100 | 110 | 135 |
| 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 |
| 0.4<br>47.2×80×86.8 | 0.59<br>59×83.5×94.5 | | 1.2<br>91×123.5×117.8 | | | |
| 0.5<br>47.2×80×113.2 | 0.7<br>59×83.5×121 | | 1.29<br>91×123.5×117.8 | | | |
| - | - | | - | | | |
| UA-1 | UA-1 | | UA-1 | | | |
| UA-2, UA-4 | UA-2, UA-4 | | UA-2, UA-4 | | | |

# Contactors

## 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 | | | | | | 4 | | |
| Rated operational voltage (Ue) | | | | | | 690 | | |
| Rated insulation voltage (Ui) | | | | | | 1000 | | |
| Rated frequency | | | | | | 50/60 | | |
| Rated impulse withstand voltage, Uimp | | | | | | 8 | | |
| Maximum operating rate in operating cycles per hour(AC1) | | | | | | 1200 operations per hour | | |
| Durability | Mechanical | | | | | 5 mil. operations | | |
| | Electrical | | | | | 0.8 mil. operations | | |
| Current | Thermal current | | [A] | 200 | 250 | 275 | 300 | 350 |
| and | AC-1 | 200/240V | [kW] | 57 | 60 | 76 | 87 | 100 |
| Power | | | [A] | 200 | 250 | 275 | 300 | 350 |
| | | 380/440V | [kW] | 106 | 110 | 142 | 165 | 185 |
| | | | [A] | 200 | 250 | 275 | 300 | 350 |
| | | 500/550V | [kW] | 132 | 137 | 180 | 205 | 230 |
| | | | [A] | 200 | 250 | 275 | 300 | 350 |
| | | 690V | [kW] | 165 | 170 | 225 | 255 | 290 |
| | | | [A] | 200 | 250 | 275 | 300 | 350 |
| UL rating | Continuous current | | A | 200 | 250 | 275 | 300 | 350 |
| (50/60Hz) | Single | 110-120V | [HP] | 7.5 | 10 | 15 | 15 | 15 |
| | Phase | 220-240V | [HP] | 15 | 20 | 25 | 30 | 40 |
| | Three | 200-208V | [HP] | 30 | 40 | 40 | 60 | 60 |
| | Phase | 220-240V | [HP] | 30 | 40 | 50 | 60 | 75 |
| | | 440-480V | [HP] | 60 | 75 | 100 | 125 | 150 |
| | | 550-600V | [HP] | 60 | 75 | 100 | 125 | 150 |
| Size and weight  | AC control | Weight | [kg] | | | 5.6 | | |
| | | Size(W×H×D) | [mm] | | | 175×203×185 | | |
| | DC control | Weight | [kg] | | | 5.6 | | |
| | | Size(W×H×D) | [mm] | | | 175×203×185 | | |
| **Auxiliary(standard)** | | | | **2a2b** | | | | |
| Auxiliary | Side mount | | | | | AU-100, AU-100E | | |
| | Front mount | | | | | - | | |

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



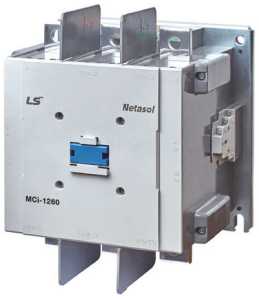


| 400AF | | | 800AF | | |
|---|---|---|---|---|---|
| MC-265a/4 | MC-330a/4 | MC-400a/4 | MC-500a/4 | MC-630a/4 | MC-800a/4 |
| | ● | | | ● | |
| | 4 | | | 4 | |
| | 690 | | | 690 | |
| | 1000 | | | 1000 | |
| | 50/60 | | | 50/60 | |
| | 8kV | | | 8 | |
| | 1200 operations per hour | | | 1200 operations per hour | |
| | 2.5 mil. operations | | | 2.5 mil. operations | |
| | 0.5 mil. operations | | | 0.5 mil. operations | |
| 400 | 500 | 520 | 700 | 900 | 1050 |
| 115 | 135 | 160 | 245 | 255 | 310 |
| 400 | 500 | 520 | 700 | 900 | 1050 |
| 215 | 250 | 300 | 450 | 470 | 570 |
| 400 | 500 | 520 | 700 | 900 | 1050 |
| 265 | 315 | 375 | 560 | 590 | 710 |
| 400 | 500 | 520 | 700 | 900 | 1050 |
| 335 | 390 | 470 | 710 | 740 | 900 |
| 400 | 500 | 520 | 700 | 900 | 1050 |
| 400 | 500 | 520 | 700 | 900 | 1050 |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 75 | 100 | 125 | 150 | 200 | 200 |
| 100 | 100 | 150 | 200 | 250 | 300 |
| 200 | 200 | 300 | 400 | 500 | 600 * |
| 200 | 200 | 300 | 400 | 500 | 600 ** |
| | 9.9 | | | 26.3 | |
| | 206×243×205 | | | 346×310×244 | |
| | 9.9 | | | 26.3 | |
| | 206×243×205 | | | 346×310×244 | |
| | 2a2b | | | 2a2b | |
| | AU-100, AU-100E | | | AU-100, AU-100E | |
| | - | | | - | |

# Contactors

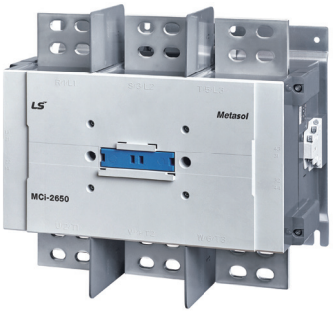
## Metasol MCi 3P 1260 to 2650A

### Renewable Magnetic Contactor




- Eco-friendly contact material applied (Cd free)
- Type 2 coordination data with MCCB or ACB

| Frame size | | | | 1260AF | | |
|---|---|---|---|---|---|---|
| Type | | | | MCi-900 | MCi-1050 | MCi-1260 |
| | Screw clamp terminals | | | | ● | |
| Number of poles | | | pole | | 3 | |
| Rated operational voltage (Ue) | | | Vac | | 1000 | |
| Rated insulation voltage (Ui) | | | Vac | | 1000 | |
| Rated frequency | | | Hz | | 50/60 | |
| Rated impulse withstand voltage (Uimp) | | | kV | | 8 | |
| Mechanical operating cycle | | | cycles/hour | 600 | 600 | 300 |
| Eelectrical operating cycle | | | cycles/hour | 600 | 600 | 300 |
| Durability | Mechanical | | million | 100 | 100 | 50 |
| | Electrical (AC-1@690V) | | million | 26 | 26 | 15 |
| | Electrical (AC-1@400V) | | million | 50 | 50 | 20 |
| Current and Power | AC-1 1000V 55/60/70°C | | A | 900/850/700 | 1050/875/720 | 1260/1060/900 |
| (IEC) | Thermal current | | A | 900 | 1050 | 1260 |
| | Heat dissipation | | W | 100 | 170 | 170 |
| Rated Short-time | 1s | | A | 7000 | 7500 | 8000 |
| withstand current((Icw) | 10s | | A | 6400 | 7000 | 7200 |
| (IEC 60947) | 1min | | A | 3500 | 3800 | 4000 |
| | 10min | | A | 1550 | 1550 | 2300 |
| max. breaking capacity | 400V | | A | 6000 | 7500 | 7500 |
| (Icd) | 690V | | A | 5000 | 7000 | 7000 |
| | 1000V | | A | 2000 | 2500 | 2500 |
| Type-2 Coordination (with MCCB or ACB) | | | kA | | 42kA (Break time: less than 20ms) | |
| Current and HP | Thermal current | | | 900 | 1050 | 1260 |
| (UL) | Single phase | 110~120V | HP | - | - | - |
| | | 220~240V | HP | - | - | - |
| | Three phase | 200~208V | HP | 200 | 200 | - |
| | | 220~240V | HP | 250 | 300 | - |
| | | 440~480V | HP | 500 | 600 | - |
| | | 550~600V | HP | 500 | 600 | - |
| Weight (kg) | | | | 22.2 | 22.2 | 25 |
| Size (W×H×D) | | | mm | 285×310×246 | 285×310×246 | 285×352×246 |
| **Auxiliary(standard)** | | | | **2a2b** | | |
| Auxiliary | Side Mount | | | AU-100, AU-100E (max.4a4b) | | |
| | Front Mount | | | - | | |




| 2650AF | | |
|---|---|---|
| MCi-1700 | MCi-2100 | MCi-2650 |
| | ● | |
| | 3 | |
| | 1000 | |
| | 1000 | |
| | 50/60 | |
| | 8 | |
| | 300 | |
| 300 | 300 | 120 |
| 50 | 50 | 30 |
| 5 | 5 | 2 |
| 5 | 5 | 5 |
| 1700/1450/1300 | 2100/1750/1500 | 2650/2350/2150 |
| 1700 | 2100 | 2650 |
| 220 | 350 | 350 |
| | 12000 | |
| | 10000 | |
| | 5500 | |
| | 3000 | |
| 9000 | 12000 | 1200 |
| 8000 | 8500 | 8500 |
| 3000 | 3150 | 3150 |
| | 42kA (Break time: less than 50ms) | |
| 1700 | 2100 | 2650 |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| 34.6 | 34.6 | 47 |
| 431×380×246 | 431×380×246 | 431×392×246 |
| **2a2b** | | |
| AU-100, AU-100E (max.4a4b) | | |
| - | | |

# Mini Contactors

## Mini MC 6~16A

**Mini contactors**

3NO main contacts
1 auxiliary contacts



**Screw clamp type**



**Fast-on type**



**Cage clamp type**



**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 | 16 |
| | 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 | |
| 4-pole, Front mount | AU-4M | AU-4MF | AU-4MC | AU-1MP |
| 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
Type GT



GT-12M

**Setting ranges (A)**

| | |
|---|---|
| 0.1 - 0.16 | 4 - 6 |
| 0.16 - 0.25 | 5 - 8 |
| 0.25 - 0.4 | 6 - 9 |
| 0.4 - 0.63 | 7 - 10 |
| 0.63 - 1 | 9 - 13 |
| 1 - 1.6 | 12 - 16 |
| 1.6 - 2.5 | |
| 2.5 - 4 | |



Base for separate mount

| | |
|---|---|
| Differential | GTK-12M |
| Non-differential (3-heater) | GTH-12M/3 |
| Non-differential (2-heater) | GTH-12M |

## DMPi Series



DMPi

## Rated specifications

| Connection method | | Penetrated / Terminal type |
|---|---|---|
| Protection functions | | Overcurrent, phase fail, phase unbalance, stall, locked rotor,reverse phase, ground fault (Type option)Instance (Type option) |
| Connection method | | Penetrated / Terminaltype |
| Operating time characteristics | | Thermal heat build-up inverse time / Non-thermal heat build-up inverse time / Definite time |
| Rated current | | 0.5~6A/5~65A(Rating option upon placing an order) |
| Display | | 4 digit, 7-Segment |
| Operating power | | AC/DC 85~260V, AC/DC 24V(50Hz/60Hz) |
| Reset method | Automatic | 1~20min (only for overcurrent) |
| | Manual | (Electrical reset) |
| Installation / Mounting method | | Display can be installed separately, 35mm DIN rail / Screw installation |
| Tolerance | Current | ±3% |
| | Time | ±5% |
| | 4~20mA output | ±5% |
| Time setting | Startup delay | 1~200sec |
| | Operation delay | 1~60sec |
| Aux. contact | Composition | 3-SPST(Power supply 1a1b, i nstantaneous operation 1a) Note1) |
| | Capacity | 3A/250VAC Resistive Load |
| | Contact minimum load | 100mA / 6VDC : (95-996, 97-98) |
| | | 10mA / 5VDC ( 07-08) |
| ZCT Input | External | 200mA/100mV(Exclusive ZCT) Note2) |
| | Built-in | Support (Separate connection unnecessary Note2) |
| Service environment | Service temperature | -20°C ~ 60°C |
| | Storage temperature | -30°C ~ 70°C |
| | Relative humidity | Below 50% RH (Without condensation) |
| Insulation resistance | | 100MΩ/500VDC |
| Lightning impulse voltage | | 1.2X50us 5kV Prototype waveform supply |
| Fast transient | | 2kV/1Min |
| Power consumption | | Below 2W |

Note) 1. See No. 21 to 23 of A-Group in Setting Menu if single phase is set, the device measures R/S/T phase. In HMI, the maximum phase of three phases is displayed without any indication of phase.
2. It is used when zero current detection type is selected.
3. This product is used to protect a low-voltage motor with 1000V or less

# Manual Motor Starters

## Metasol Series ... IEC rating





Terminal cover detachable type



Terminal cover detachable type

### MMS

| 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℃ | -20 ~ +60℃ | | | | | | | | | -20 ~ +60℃ | | | | | | | | | | | |
| Instantaneous short circuit release | | 14.4 × 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 | | ○ | ○ | | | | | | | | | ○ | | | | | | | | | | | |
| Weight (g) | | 285 | 320 | | | | | | | | | 360 | | | | | | | | | | | |
| Rated breaking capacity (kA) | 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 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note) 1. Safety certification is obtained based on 220V and 460V.
2. There is no current adjustment range for HI products.






| | 63AF | | | | | | | | | | | | | | | | | | | | 100AF | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MMS-63S | | | | | | | | | | MMS-63H | | | | | | | | | | MMS-100S | | | | | | | | | | MMS-100H | | | | | | | | | |
| | - | | | | | | | | | | MMS-63HI | | | | | | | | | | - | | | | | | | | | | MMS-100HI | | | | | | | | | |
| | Standard | | | | | | | | | | High breaking | | | | | | | | | | Standard | | | | | | | | | | High breaking | | | | | | | | | |
| | Rotary | | | | | | | | | | Rotary | | | | | | | | | | Rotary | | | | | | | | | | Rotary | | | | | | | | | |
| | 3 | | | | | | | | | | 3 | | | | | | | | | | 3 | | | | | | | | | | 3 | | | | | | | | | |
| | Up to 690V | | | | | | | | | | Up to 690V | | | | | | | | | | Up to 690V | | | | | | | | | | Up to 690V | | | | | | | | | |
| | 50/60 Hz | | | | | | | | | | 50/60 Hz | | | | | | | | | | 50/60 Hz | | | | | | | | | | 50/60 Hz | | | | | | | | | |
| | 1000V | | | | | | | | | | 1000V | | | | | | | | | | 1000V | | | | | | | | | | 1000V | | | | | | | | | |
| | 8kV | | | | | | | | | | 8kV | | | | | | | | | | 8kV | | | | | | | | | | 8kV | | | | | | | | | |
| | Cat. A | | | | | | | | | | Cat. A | | | | | | | | | | Cat. A | | | | | | | | | | Cat. A | | | | | | | | | |
| | AC 3 | | | | | | | | | | AC 3 | | | | | | | | | | AC 3 | | | | | | | | | | AC 3 | | | | | | | | | |
| | 50,000 | | | | | | | | | | 50,000 | | | | | | | | | | 50,000 | | | | | | | | | | 50,000 | | | | | | | | | |
| | 25,000 | | | | | | | | | | 25,000 | | | | | | | | | | 25,000 | | | | | | | | | | 25,000 | | | | | | | | | |
| | 25 | | | | | | | | | | 25 | | | | | | | | | | 25 | | | | | | | | | | 25 | | | | | | | | | |
| | -20 ~ +60℃ | | | | | | | | | | -20 ~ +60℃ | | | | | | | | | | -20 ~ +60℃ | | | | | | | | | | -20 ~ +60℃ | | | | | | | | | |
| | 13 × Ie max. | | | | | | | | | | 13 × Ie max | | | | | | | | | | 13 × Ie max. | | | | | | | | | | 13 × Ie max. | | | | | | | | | |
| | ○ | | | | | | | | | | MMS-63H(○), MMS-63HI(×) | | | | | | | | | | ○ | | | | | | | | | | MMS-100H(○), MMS-100HI(×) | | | | | | | | | |
| | ○ | | | | | | | | | | MMS-63H(○), MMS-63HI(×) | | | | | | | | | | ○ | | | | | | | | | | MMS-100H(○), MMS-100HI(×) | | | | | | | | | |
| | ○ | | | | | | | | | | ○ | | | | | | | | | | ○ | | | | | | | | | | ○ | | | | | | | | | |
| | ○ | | | | | | | | | | ○ | | | | | | | | | | ○ | | | | | | | | | | ○ | | | | | | | | | |
| | 1,000 | | | | | | | | | | 1,000 | | | | | | | | | | 2,200 | | | | | | | | | | 2,200 | | | | | | | | | |
| | 240V 230V 220V | | 415V 400V | | 460V 440V | | 252V 500V | | 690V 600V | | 240V 230V 220V | | 415V 400V | | 460V 440V | | 525V 500V | | 690V 600V | | 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 | cu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics | Icu | Ics |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 100 | 100 | 15 | 12 | 10 | 8 | 4 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 50 | 38 | 6 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 50 | 38 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 100 | 100 | 50 | 38 | 42 | 32 | 6 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 100 | 100 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 50 | 38 | 12 | 9 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 25 | 19 | 10 | 8 | 100 | 100 | 100 | 100 | 50 | 38 | 35 | 27 | 12 | 9 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 50 | 38 | 12 | 9 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 25 | 19 | 10 | 8 | 100 | 100 | 100 | 50 | 50 | 38 | 35 | 27 | 12 | 9 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 12 | 9 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 25 | 19 | 10 | 8 | 100 | 100 | 100 | 50 | 50 | 38 | 35 | 27 | 12 | 9 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 15 | 11 | 10 | 8 | 100 | 100 | 100 | 50 | 50 | 38 | 25 | 19 | 12 | 9 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 15 | 11 | 6 | 5 | 100 | 100 | 100 | 50 | 50 | 38 | 20 | 15 | 12 | 9 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 12 | 9 | 6 | 5 | 100 | 100 | 100 | 50 | 50 | 38 | 15 | 11 | 10 | 8 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 100 | 100 | 50 | 50 | 35 | 27 | 10 | 8 | 5 | 5 | 100 | 100 | 50 | 38 | 40 | 30 | 12 | 9 | 6 | 5 | 100 | 100 | 100 | 50 | 50 | 38 | 15 | 11 | 8 | 6 |
| | 50 | 38 | 25 | 19 | 10 | 8 | 6 | 5 | 4 | 3 | 75 | 50 | 35 | 27 | 25 | 19 | 6 | 5 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 100 | 50 | 38 | 40 | 30 | 8 | 6 | 5 | 4 | 100 | 100 | 75 | 50 | 50 | 38 | 12 | 9 | 6 | 6 |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 100 | 50 | 38 | 40 | 30 | 8 | 6 | 5 | 4 | 100 | 100 | 75 | 50 | 50 | 38 | 12 | 9 | 6 | 6 |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 100 | 50 | 38 | 40 | 30 | 8 | 6 | 5 | 4 | 100 | 100 | 75 | 50 | 50 | 38 | 12 | 9 | 6 | 6 |

# Molded Case Circuit Breakers

## Susol MCCB 100AF to 800AF Series

### MCCB

| Type | | | | TE100 | | TE160 | | TD100 | | | TD160 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frame size | | | [AF] | 100 | | 160 | | 100 | | | 160 | | |
| Rated current, In ♣ | | | [A] | 16~100 | | 100, 125, 160 | | 16, 20, 25, 32, 40, 60, 63, 80, 100 | | | 100, 125, 160, 1P: 16~160 | | |
| No. of poles | | | | 3,4 | | 3,4 | | 2*, 3, 4 | | | 1, 2*, 3, 4 | | |
| Rated operational voltage, Ue | AC | | [V] | 690 | | 690 | | 690 | | | 690, 1P; 240 | | |
| | DC | | [V] | 500 | | 500 | | 500 | | | 500, 1P:250 | | |
| Rated impulse withstand voltage, Uimp | | | [kV] | 8 | | 8 | | 8 | | | 8 | | |
| Rated insulation voltage, Ui | | | [V] | 750 | | 750 | | 1000 | | | 1000 | | |
| Rated ultimate short-circuit breaking capacity, Icu | | | | S | N | S | N | N | H | L | N | H | L |
| AC 50/60Hz | 220/240V | | [kA] | 50 | 85 | 50 | 85 | 85 | 100 | 200 | 85 (1P:30) | 100 (1P:50 | 200 |
| | 380/415V | | [kA] | 37 | 50 | 37 | 50 | 50 | 85 | 150 | 50 | 85 | 150 |
| | 440/460V | | [kA] | 25 | 37 | 25 | 37 | 50 | 70 | 130 | 50 | 70 | 130 |
| | 480/500V | | [kA] | 18 | 25 | 18 | 25 | 30 | 50 | 65 | 30 | 50 | 65 |
| | 525V | | [kA] | - | - | - | - | 22 | 35 | 50 | 22 | 35 | 50 |
| | 660/690V | | [kA] | 6 | 8 | 6 | 8 | 10 | 10 | 10 | 10 | 10 | 10 |
| DC | 250V | | [kA] | 37 | 50 | 37 | 50 | 42 | 65 | 100 | 42 (1P:16) | 65 (1P:25) | 100 |
| | 500V (2poles in series) | | [kA] | 37 | 50 | 37 | 50 | 42 | 65 | 100 | 42 | 65 | 100 |
| Rated service breaking capacity, Ics | | | | | | | | | | | | | |
| AC 50/60Hz | 220~525V | | [%Icu] | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | 660/690V | | [kA] | - | - | - | - | 5 | 5 | 5 | 5 | 5 | 5 |
| DC | | | [%Icu] | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Rated short-circuit making capacity Icm | | | | | | | | | | | | | |
| AC 50/60Hz | 220/240V | | [kA] | 105 | 187 | 105 | 187 | 187 | 220 | 440 | 187 (1P:105) | 220 (1P:105) | 440 |
| | 380/415V | | [kA] | 77.7 | 105 | 77.7 | 105 | 105 | 187 | 330 | 105 | 187 | 330 |
| | 440/460V | | [kA] | 52.5 | 77.7 | 52.5 | 77.7 | 105 | 154 | 286 | 105 | 154 | 286 |
| | 480/500V | | [kA] | 36 | 52.5 | 36 | 52.5 | 63 | 105 | 143 | 63 | 105 | 143 |
| | 525V | | [kA] | - | - | - | - | 46 | 74 | 105 | 46 | 74 | 105 |
| | 660/690V | | [kA] | 9.2 | 13.6 | 9.2 | 13.6 | 17 | 17 | 17 | 17 | 17 | 17 |
| Category of utilization | | | | A | | A | | A | | | A | | |
| Isolation behavior | | | | ● | | ● | | ● | | | ● | | |
| Trip unit (release) | | | | | | | | | | | | | |
| Thermal-Magnetic | | | | | | | | | | | | | |
| ● fixed-thermal, fixed-magnetic | | | FTU | ● | | ● | | ● | | | ● | | |
| ● adjustable-thermal, fixed-magnetic | | | FMU | ● | | ● | | ● | | | ●** | | |
| ● adjustable-thermal, adjustable-magnetic | | | ATU | - | | - | | - | | | - | | |
| ● magnetic only | | | MTU | - | | - | | - | | | - | | |
| Electronic | | | | | | | | | | | | | |
| ● LSI | | | ETS | - | | - | | - | | | - | | |
| ● LSI | | | ETM | - | | - | | - | | | - | | |
| Option | Earth-fault protection, Ig | | | - | | - | | - | | | - | | |
| | Zone selective interlocking, ZSI | | | - | | - | | - | | | - | | |
| | Ammeter | | | - | | - | | - | | | - | | |
| | Communication | | | - | | - | | - | | | - | | |
| | Earth-leakage protection module | | | - | | - | | - | | | - | | |
| Connection | fixed | front-connection | | ● | | ● | | ● | | | ● | | |
| | | rear-connection | | ● | | ● | | ● | | | ●** | | |
| | plug-in | front-connection | | - | | - | | ● | | | ●** | | |
| | | rear-connection | | - | | - | | ● | | | ●** | | |
| Mechanical life | | | [operations] | 25000 | | 25000 | | 25000 | | | 25000 | | |
| Electrical life @ 415 V AC | | | [operations] | 10000 | | 10000 | | 10000 | | | 10000 | | |
| Basic dimensions, W×H×D (front connection) | | 1-pole | [mm] | - | | - | | - | | | 35×140×86 | | |
| | | 3-pole | [mm] | 76×130×82 | | 76×130×82 | | 90×140×86 | | | 90×140×86 | | |
| | | 4-pole | [mm] | 101×130×82 | | 101×130×82 | | 120×140×86 | | | 120×140×86 | | |
| Weight (front connection) | | 1-pole | [kg] | - | | - | | - | | | 0.57 | | |
| | | 3-pole | [kg] | 1.05 | | 1.05 | | 1.5 | | | 1.5 | | |
| | | 4-pole | [kg] | 1.35 | | 1.35 | | 1.8 | | | 1.8 | | |
| Reference standard | | | | IEC60947-2 | | IEC60947-2 | | IEC60947-2 | | | IEC60947-2 | | |

Note) ● applicable or available

♣ Applicable to MCCBs equipped with FTU, FMU, ATU ** Not applicable to 1pole
* 2 pole MCCB in 3pole frame size

※ The trip unit ATU is available from 125A



| TS100 | | | TS160 | | | TS250 | | | TS400 | | | TS630 | | | TS800 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | | | 160 | | | 250 | | | 400 | | | 630 | | | 800 | | |
| 40, 50, 63, 80, 100 | | | (100)※, 125, 160 | | | 125, 160, 200, 250 | | | 300, 400 | | | 500, 630 | | | 700, 630 | | |
| 2*, 3, 4 | | | 2*, 3, 4 | | | 2*, 3, 4 | | | 2*, 3, 4 | | | 2*, 3, 4 | | | 2*, 3, 4 | | |
| 690 | | | 690 | | | 690 | | | 690 | | | 690 | | | 690 | | |
| 500 | | | 500 | | | 500 | | | 500 | | | 500 | | | 500 | | |
| 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | |
| 1000 | | | 1000 | | | 1000 | | | 1000 | | | 1000 | | | 1000 | | |
| N | H | L | N | H | L | N | H | L | N | H | L | N | H | L | N | H | L |
| 100 | 120 | 200 | 100 | 120 | 200 | 100 | 120 | 200 | 100 | 120 | 200 | 100 | 120 | 200 | 100 | 120 | 200 |
| 50 | 85 | 150 | 50 | 85 | 150 | 50 | 85 | 150 | 65 | 85 | 150 | 65 | 85 | 150 | 65 | 100 | 150 |
| 50 | 70 | 130 | 50 | 70 | 130 | 50 | 70 | 130 | 65 | 85 | 130 | 65 | 85 | 130 | 65 | 100 | 130 |
| 42 | 65 | 85 | 42 | 65 | 85 | 42 | 65 | 85 | 42 | 65 | 85 | 42 | 65 | 85 | 42 | 85 | 100 |
| 22 | 35 | 50 | 22 | 35 | 50 | 22 | 35 | 50 | 22 | 35 | 50 | 22 | 35 | 50 | 22 | 35 | 50 |
| 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 20 | 35 | 10 | 20 | 35 | 10 | 20 | 35 |
| 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 |
| 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 | 50 | 85 | 100 |
| | | | | | | | | | | | | | | | | | |
| 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 10 | 12 | 12 | 10 | 12 | 12 | 10 | 20 | 20 |
| 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | | | | | | | | | | | | | | | | |
| 220 | 264 | 440 | 220 | 264 | 440 | 220 | 264 | 440 | 220 | 264 | 440 | 220 | 264 | 440 | 220 | 264 | 440 |
| 105 | 187 | 330 | 105 | 187 | 330 | 105 | 187 | 330 | 143 | 187 | 330 | 143 | 187 | 330 | 143 | 220 | 330 |
| 105 | 154 | 286 | 105 | 154 | 286 | 105 | 154 | 286 | 143 | 187 | 286 | 143 | 187 | 286 | 143 | 220 | 286 |
| 88 | 143 | 187 | 88 | 143 | 187 | 88 | 143 | 187 | 88 | 143 | 187 | 88 | 143 | 187 | 88 | 187 | 220 |
| 46 | 74 | 105 | 46 | 74 | 105 | 46 | 74 | 105 | 46 | 74 | 105 | 46 | 74 | 105 | 46 | 74 | 105 |
| 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 40 | 74 | 17 | 40 | 74 | 17 | 40 | 74 |
| A | | | A | | | A | | | A | | | A | | | A | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| - | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| | | | | | | | | | | | | | | | | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| - | | | - | | | - | | | ● | | | ● | | | ● | | |
| - | | | - | | | - | | | ● | | | ● | | | ● | | |
| - | | | - | | | - | | | ● | | | ● | | | ● | | |
| - | | | - | | | - | | | ● | | | ● | | | ● | | |
| - | | | - | | | - | | | ● | | | ● | | | ● | | |
| - | | | - | | | - | | | ● | | | ● | | | ● | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| ● | | | ● | | | ● | | | ● | | | ● | | | ● | | |
| 25000 | | | 25000 | | | 25000 | | | 20000 | | | 20000 | | | 10000 | | |
| 10000 | | | 10000 | | | 10000 | | | 10000 | | | 6000 | | | 3000 | | |
| - | | | - | | | - | | | - | | | - | | | - | | |
| 105×160×86 | | | 105×160×86 | | | 105×160×86 | | | 140×260×110 | | | 140×260×110 | | | 210×320×135 | | |
| 140×160×86 | | | 140×160×86 | | | 140×160×86 | | | 186.5×260×110 | | | 186.5×260×110 | | | 280×320×135 | | |
| - | | | - | | | - | | | - | | | - | | | - | | |
| 2 | | | 2 | | | 2 | | | 5.4 | | | 5.4 | | | 15.1 | | |
| 2.6 | | | 2.6 | | | 2.6 | | | 7.2 | | | 7.2 | | | 19.6 | | |
| IEC60947-2 | | | IEC60947-2 | | | IEC60947-2 | | | IEC60947-2 | | | IEC60947-2 | | | IEC60947-2 | | |

| | Amb. Temp. | -5°C | 0°C | 10°C | 20°C | 25°C | 30°C | 35°C | 40°C | 45°C | 50°C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calibrated for 40°C | TD160 | 122.5% | 120.0% | 115.0% | 110.0% | 107.5% | 105.0% | 102.5% | 100.0% | 97.5% | 95.0% |
| | TS250 | 122.5% | 120.0% | 115.0% | 110.0% | 107.5% | 105.0% | 102.5% | 100.0% | 97.5% | 95.0% |
| | TS630 | 110.0% | 109.0% | 107.0% | 105.0% | 104.0% | 103.0% | 101.5% | 100.0% | 98.5% | 97.0% |
| | TS800 | 110.0% | 109.0% | 107.0% | 105.0% | 104.0% | 103.0% | 101.5% | 100.0% | 98.5% | 97.0% |
| Calibrated for 50°C | TD160 | 122.0% | 120.0% | 116.0% | 112.0% | 110.0% | 108.0% | 106.0% | 104.0% | 102.0% | 100.0% |
| | TS250 | 122.0% | 120.0% | 116.0% | 112.0% | 110.0% | 108.0% | 106.0% | 104.0% | 102.0% | 100.0% |
| | TS630 | 122.2% | 112.0% | 110.0% | 108.0% | 107.0% | 106.0% | 104.5% | 103.0% | 101.5% | 100.0% |
| | TS800 | 112.2% | 112.0% | 110.0% | 108.0% | 107.0% | 106.0% | 104.5% | 103.0% | 101.5% | 100.0% |

# Molded Case Circuit Breakers

## Susol MCCB 1600AF Series







## Electrical characteristics

| | | | | TS1000 | | | TS1250 | | TS1600 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type | | | | TS1000 | | | TS1250 | | TS1600 | |
| Ampere frame | | | | 1000 | | | 1250 | | 1600 | |
| Pole | | | | 3, 4 | | | 3, 4 | | 3, 4 | |
| Rated current,(A) | | In | -5~40°C | 800, 1000 | | | 1250 | | 1600 | |
| | | | 50°C | 800, 1000 | | | 1250 | | 1560 | |
| | | | 65°C | 800, 1000 | | | 1240 | | 1420 | |
| Rated insulation voltage, (V) | | Ui | | 1000 | | | 1000 | | 1000 | |
| Rated impulse withstand voltage, (kV) | | | Uimp | 8 | | | 8 | | 8 | |
| Rated operational voltage, (V) | | Ue | AC50/60Hz | 690 | | | 690 | | 690 | |
| | | | DC | - | | | - | | - | |
| Rated short-circuit breaking capacity | | | | N | H | L | N | H | N | H |
| IEC60947-2 | Rated ultimate short-circuit | | 220/240V | 55 | 75 | 200 | 55 | 75 | 55 | 75 |
| AC50/60Hz | breaking capacity, (kA) (Icu) | | 380/415V | 50 | 70 | 150 | 50 | 70 | 50 | 70 |
| (sym) | | | 440/460V | 50 | 65 | 130 | 50 | 65 | 50 | 65 |
| | | | 480/500V | 40 | 50 | 100 | 40 | 50 | 40 | 50 |
| | | | 660/690V | 35 | 45 | - | 35 | 45 | 35 | 45 |
| | | DC | 250V 2P | - | - | - | - | - | - | - |
| | | | 500V 2P | - | - | - | - | - | - | - |
| | | | 750V 3P | - | - | - | - | - | - | - |
| | Rated service breaking capacity (Ics) | | %Icu | 100% | 75% | 100% | 100% | 75% | 100% | 75% |
| | Rated short-time | | 1s | 25 | | 12 | 25 | | 25 | |
| | withstand current (kA) (Icw) | | 3s | - | | | - | | - | |
| Overriding instantaneous protection | | | kA peak | 50 | | 30 | 50 | | 50 | |
| Isolation | | | | ○ | | | ○ | | ○ | |
| Category | | | | B | | A | B | | B | |
| Life cycle Note 1) | Mechanical (operations) | | | 10000 | | 4000 | 10000 | | 10000 | |
| | Electrical (operations) | 440V | In/2 | 6000 | | 4000 | 5000 | | 5000 | |
| | | | In | 5000 | | 3000 | 4000 | | 2000 | |
| | | 690V | In/2 | 4000 | | 3000 | 3000 | | 2000 | |
| | | | In | 2000 | | 2000 | 2000 | | 1000 | |
| Pollution degree | | | | 3 | | | 3 | | 3 | |
| Dimension (mm) | | | 3-pole | 210×327×152.5 | | | | | | |
| (W×H×D) | | | 4-pole | 280×327×152.5 | | | | | | |
| Weight (kg) | | | 3-pole | 13 | | | | | | |
| | | | 4-pole | 16.8 | | | | | | |

Note) 1. Life cycle does not mean guarantee but limitation
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

## Overview

| Classification | N type | A type | P type | S type |
|---|---|---|---|---|
| Externals |  |  |  |  |
| Current protection | • L / S / I / G / Thermal | • 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 powe | • 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 25% of current of In (one pole) | • Self Power<br>- Power source works over 25% of current of In (one pole)<br>- External power source is 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<br>Basic protection function(L / S / I / G) is still under normal operation without control power. |
| 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 | - | • 256 records | • 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

## Metasol 30AF to 250AF Series

### MCCB

| Frame Size (AF) | | 30 | 50 | | | 60 | |
|---|---|---|---|---|---|---|---|
| Type | | S-Type | N-Type | S-Type | H-Type | N-Type | S-Type |
| Type and Pole | 2 pole | ABS32c | ABN52c | ABS52c | ABH52c | ABN62c | ABS62c |
| | 3 pole | ABS33c | ABN53c | ABS53c | ABH53c | ABN63c | ABS63c |
| | 4 pole | ABS34c | ABN54c | ABS54c | ABH54c | ABN64c | ABS64c |
| Rated current, In | (A) | (3, 5, 10)<br>15, 20, 30 | 15, 20, 30, 40, 50 | | 15, 20, 30,<br>40, 50 | 15, 20, 30, 40, 50, 60 | |
| Rated operational | AC(V) | 690 | 690 | 690 | 690 | 690 | 690 |
| voltage, Ue | DC(V) | 500 | 500 | 500 | 500 | 500 | 500 |
| Rated insulation voltage, Ui | (V) | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| Rated impulse withstand voltage, Uimp | (kV) | 8 | 8 | 8 | 8 | 8 | 8 |
| Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, IEC 60947-2 | | | | | | | |
| AC | 690V | 2.5 | 2.5 | 5 | 10 | 2.5 | 5 |
| | 480/500V | 7.5 | 7.5 | 10 | 35 | 7.5 | 10 |
| | 415/460V | 14 (10) | 14 | 18 | 50 | 14 | 18 |
| | 380V | 18 (14) | 18 | 22 | 50 | 18 | 22 |
| | 220/250V | 30 (25) | 30 | 35 | 100 | 30 | 35 |
| DC | 500V(3P) | 5 | 5 | 10 | 30 | 5 | 10 |
| | 250V(2P) | 5 | 5 | 10 | 30 | 5 | 10 |
| Service breaking capacity(%Icu), Ics | | 100 | 100 | 100 | 100 | 100 | 100 |
| Category of use | | A | A | A | A | A | A |
| Endurance | Mechanical | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| (Number of operations) | Electrical | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Type of trip unit | | | | | | | |
| Thermal-magnetic release | | fixed | fixed | fixed | fixed | fixed | fixed |
| Hydraulic-magnetic release | | - | - | - | - | - | - |
| Magnetic release only without thermal trip | | | | | | | |
| Earth leakage protection | for 3 pole | ▲ | ▲ | ▲ | ▲ | ▲ | ▲ |
| Accessories | | | | | | | |
| Electrical auxiliaries | Auxiliary switch | ● | ● | ● | ● | ● | ● |
| | Alarm switch | ● | ● | ● | ● | ● | ● |
| | Shunt trip | ● | ● | ● | ● | ● | ● |
| | Undervoltage trip | ● | ● | ● | ● | ● | ● |
| External accessories | Direct rotary handle | ● | ● | ● | ● | ● | ● |
| | Extended rotary handle | ● | ● | ● | ● | ● | ● |
| | Terminal shield | ● | ● | ● | ● | ● | ● |
| | Insulation barrier | ● | ● | ● | ● | ● | ● |
| | Rear connection | ● | ● | ● | ● | ● | ● |
| | Pad handle lock | ● | ● | ● | ● | ● | ● |
| | Plug-in device | ● | ● | ● | ● | ● | ● |
| Dimensions (mm) | W×H×D (3P) | 75×130×60 | 75×130×60 | | 90×155×60 | 75×130×60 | |
| Weight(kg) | 2 pole | 0.5 | 0.5 | 0.5 | 0.7 | 0.5 | 0.5 |
| | 3 pole | 0.7 | 0.7 | 0.7 | 1 | 0.7 | 0.7 |
| | 4 pole | 0.9 | 0.9 | 0.9 | 1.2 | 0.9 | 0.9 |

Note) 1. ● applicable or available
2. ▲ available as a separate breaker
3. The Ics(service breaking capacity) of ABN100e, ABL125/250AF are in ( )



| 100 | | 125 | | | 250 | | | |
|---|---|---|---|---|---|---|---|---|
| N-Type | | S-Type | H-Type | L-Type | N-Type | S-Type | H-Type | L-Type |
| ABN102c | ABN102e | ABS102c | ABH102c | ABL102c | ABN202c | ABS202c | ABH202c | ABL202c |
| ABN103c | ABN103e | ABS103c | ABH103c | ABL103c | ABN203c | ABS203c | ABH203c | ABL203c |
| ABN104c | ABN104e | ABS104c | ABH104c | ABL104c | ABN204c | ABS204c | ABH204c | ABL204c |
| 15, 20, 30, 40, 50, 60, 75, 100 | | 15, 20, 30, 40, 50, 60, 75, 100, 125 | | | 100, 125, 150, 175, 200, 225, 250 | | | |
| 690 | | 690 | 690 | 690 | 690 | 690 | 690 | 690 |
| 500 | | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| 1000 | | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| 8 | | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | | | | | | |
| 5 | 7.5 (5) | 8 | 10 | 10 (10) | 8 | 8 | 10 | 10 (10) |
| 10 | 14 (10) | 25 | 35 | 35 (35) | 18 | 26 | 35 | 35 (35) |
| 18 | 31 (18) | 37 | 50 | 60 (50) | 26 | 37 | 50 | 60 (50) |
| 22 | 31 (22) | 42 | 50 | 60 (50) | 30 | 42 | 50 | 60 (50) |
| 35 | 50 (35) | 85 | 100 | 100 (100) | 65 | 85 | 100 | 100 (100) |
| 10 | 15 (10) | 20 | 30 | 30 (30) | 10 | 20 | 30 | 30 (30) |
| 10 | 15 (10) | 20 | 30 | 30 (30) | 10 | 20 | 30 | 30 (30) |
| 100 | ( ) | 100 | 100 | ( ) | 100 | 100 | 100 | ( ) |
| A | A | A | A | A | A | A | A | A |
| 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| | | | | | | | | |
| fixed | fixed | fixed | fixed | fixed | fixed | fixed | fixed | fixed |
| - | - | - | - | - | - | - | - | - |
| | | | | | | | | |
| ▲ | ▲ | ▲ | ▲ | ▲ | ▲ | ▲ | ▲ | ▲ |
| | | | | | | | | |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 75×130×60 | | 90×155×60 | | | 105×165×60 | | | |
| 0.5 | 0.5 | 0.7 | 0.7 | 0.7 | 1.1 | 1.1 | 1.1 | 1.1 |
| 0.7 | 0.7 | 1 | 1 | 1 | 1.2 | 1.2 | 1.2 | 1.2 |
| 0.9 | 0.9 | 1.2 | 1.2 | 1.2 | 1.6 | 1.6 | 1.6 | 1.6 |

| | Amb. Temp. | -5°C | 0°C | 10°C | 20°C | 25°C | 30°C | 35°C | 40°C | 45°C | 50°C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calibrated for 40°C | In=15 to 30 | 111.9% | 111.3% | 110.0% | 108.0% | 106.6% | 104.9% | 102.7% | 100.0% | 96.8% | 93.3% |
| | In=40 to 100 | 110.2% | 109.8% | 108.7% | 107.0% | 105.8% | 104.3% | 102.4% | 100.0% | 97.2% | 94.0% |
| | In=100 to 225 | 114.3% | 113.2% | 110.6% | 107.5% | 105.8% | 104.0% | 102.0% | 100.0% | 97.9% | 95.6% |
| | In=250 to 800 | 110.0% | 109.0% | 107.0% | 105.0% | 104.0% | 103.0% | 101.5% | 100.0% | 98.5% | 97.0% |

# Molded Case Circuit Breakers

## Metasol 400AF to 1200AF Series

### MCCB

| Frame Size (AF) | | 400 | | | |
|---|---|---|---|---|---|
| Type | | N-Type | S-Type | H-Type | L-Type |
| Type and Pole | 2 pole | ABN402c | ABS402c | ABH402c | ABL402c |
| | 3 pole | ABN403c | ABS403c | ABH403c | ABL403c |
| | 4 pole | ABN404c | ABS404c | ABH404c | ABL404c |
| Rated current, In | (A) | 250, 300, 350, 400 | | | |
| Rated operational | AC(V) | 690 | 690 | 690 | 690 |
| voltage, Ue | DC(V) | 500 | 500 | 500 | 500 |
| Rated insulation voltage, Ui | (V) | 1000 | 1000 | 1000 | 1000 |
| Rated impulse withstand voltage, Uimp | (kV) | 8 | 8 | 8 | 8 |
| Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, IEC 60947-2 | | | | | |
| AC | 690V | 5 | 8 | 10 | 14 |
| | 480/500V | 18 | 35 | 50 | 65 |
| | 415/460V | 37 | 50 | 65 | 85 |
| | 380V | 42 | 65 | 70 | 100 |
| | 220/250V | 50 | 75 | 85 | 125 |
| DC | 500V(3P) | 10 | 20 | 40 | 40 |
| | 250V(2P) | 10 | 20 | 40 | 40 |
| Service breaking capacity(%Icu), Ics | | 100 | 100 | 100 | 75 |
| Category of use | | A | A | A | A |
| Endurance | Mechanical | 4,000 | 4,000 | 4,000 | 4,000 |
| (Number of operations) | Electrical | 1,000 | 1,000 | 1,000 | 1,000 |
| Type of trip unit | | | | | |
| Thermal-magnetic release | | fixed | fixed | fixed | fixed |
| Hydraulic-magnetic release | | - | - | - | - |
| Magnetic release only without thermal trip | | - | - | - | - |
| Earth leakage protection | for 3 pole | ▲ | ▲ | ▲ | ▲ |
| Accessories | | | | | |
| Electrical auxiliaries | Auxiliary switch | ● | ● | ● | ● |
| | Alarm switch | ● | ● | ● | ● |
| | Shunt trip | ● | ● | ● | ● |
| | Undervoltage trip | ● | ● | ● | ● |
| External accessories | Direct rotary handle | ● | ● | ● | ● |
| | Extended rotary handle | ● | ● | ● | ● |
| | Terminal shield | ● | ● | ● | ● |
| | Insulation barrier | ● | ● | ● | ● |
| | Rear connection | ● | ● | ● | ● |
| | Mechanical interlock | ● | ● | ● | ● |
| | Plug-in device | ● | ● | ● | ● |
| Dimensions (mm) | W×H×D (3P) | 140×257×109 | | | |
| Weight(kg) | 2 pole | 5.2 | 5.2 | 5.2 | 5.2 |
| | 3 pole | 6.2 | 6.2 | 6.2 | 6.2 |
| | 4 pole | 7.8 | 7.8 | 7.8 | 7.8 |

Note) 1. ● applicable or available
2. ▲ available as a separate breaker



| | 800 | | | 1000 | | 1200 | | |
|---|---|---|---|---|---|---|---|---|
| | N-Type | S-Type | L-Type | S-Type | L-Type | S-Type | | L-Type |
| | ABN802c | ABS802c | ABL802c | - | - | - | - | - |
| | ABN803c | ABS803c | ABL803c | ABS1003b | ABL1003b | ABS1203b | ABS1203bE | ABL1203b |
| | ABN804c | ABS804c | ABL804c | ABS1004b | ABL1004b | ABS1204b | - | ABL1204b |
| | | 500, 630, 700, 800 | | 1000 | | | 1200 | |
| | 690 | 690 | 690 | 600 | 600 | 600 | 600 | 600 |
| | 500 | 500 | 500 | - | - | - | - | - |
| | 1000 | 1000 | 1000 | 690 | 690 | 690 | 690 | 690 |
| | 8 | 8 | 8 | 6 | 6 | 6 | 6 | 6 |
| | | | | | | | | |
| | 8 | 10 | 14 | - | - | - | - | - |
| | 25 | 45 | 65 | 50 | 75 | 50 | 50 | 75 |
| | 37 | 65 | 85 | 65 | 85 | 65 | 65 | 85 |
| | 45 | 75 | 100 | 65 | 85 | 65 | 65 | 85 |
| | 50 | 85 | 125 | 100 | 125 | 100 | 100 | 125 |
| | 10 | 20 | 40 | - | - | - | - | - |
| | 10 | 20 | 40 | - | - | - | - | - |
| | 100 | 100 | 75 | 50 | 50 | 50 | 50 | 50 |
| | A | A | A | A | A | A | A | A |
| | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| | | | | | | | | |
| | fixed | fixed | fixed | fixed | fixed | fixed | - | fixed |
| | - | - | - | - | - | - | Adjustable | - |
| | - | - | - | - | - | - | - | - |
| | ▲ | ▲ | ▲ | - | - | - | ● | - |
| | | | | | | | | |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | - | - | - | - | - |
| | ● | ● | ● | - | - | - | - | - |
| | ● | ● | ● | - | - | - | - | - |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | - | - | - | - | - |
| | ● | ● | ● | - | - | - | - | - |
| | | 210×280×109 | | 220×400×105 | | | 220×400×105 | |
| | 11 | 11 | 11 | - | - | - | - | - |
| | 11.5 | 11.5 | 11.5 | 19.6 | 19.6 | - | - | - |
| | 18.2 | 18.2 | 18.2 | - | - | 25.7 | 25.7 | 25.7 |

| | Amb. Temp. | -5°C | 0°C | 10°C | 20°C | 25°C | 30°C | 35°C | 40°C | 45°C | 50°C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calibrated for 40°C | In=15 to 30 | 111.9% | 111.3% | 110.0% | 108.0% | 106.6% | 104.9% | 102.7% | 100.0% | 96.8% | 93.3% |
| | In=40 to 100 | 110.2% | 109.8% | 108.7% | 107.0% | 105.8% | 104.3% | 102.4% | 100.0% | 97.2% | 94.0% |
| | In=100 to 225 | 114.3% | 113.2% | 110.6% | 107.5% | 105.8% | 104.0% | 102.0% | 100.0% | 97.9% | 95.6% |
| | In=250 to 800 | 110.0% | 109.0% | 107.0% | 105.0% | 104.0% | 103.0% | 101.5% | 100.0% | 98.5% | 97.0% |

# Earth Leakage Circuit Breakers

## Metasol 30AF to 250AF Series

### ELCB

| Frame Size (AF) | | | 30 | 50 | | |
|---|---|---|---|---|---|---|
| Type | | | S-Type | N-Type | S-Type | H-Type |
| Type and pole | | 2-pole | EBS32c | EBN52c | - | - |
| | | 3-pole | EBS33c | EBN53c | EBS53c | EBH53c |
| | | 4-pole | EBS34c | - | EBS54c | EBH54c |
| Protective function | | | Overload, Short-circuit and ground fault | Overload, Short-circuit and ground fault | | Overload, Short-circuit and ground fault |
| Rated current, In | | (A) | (5, 10) Note 2), 15, 20, 30 | 15, 20, 30, 40, 50 | | 15, 20, 30, 40, 50 |
| Rated impulse withstand voltage, Uimp | | (kV) | 6 | 6 | | 6 |
| Instantaneous type | Rated residual current, I△n | (mA) | 30, 100, 100/200/500 100/300/500 | 30, 100, 100/200/500, 100/300/500 | | 30, 100, 100/200/500 100/300/500 |
| Time delay type | Residual current off-time at I△n | sec | ≤ 0.1 | ≤ 0.1 | | ≤ 0.1 |
| | Rated operational voltage, Ue | AC (V) | 220/460 | 220/460 | | 220/460 |
| | Rated residual current | 1A | 0.1/0.2/0.5/1 | 0.1/0.2/0.5/1 | | 0.1/0.2/0.5/1 |
| | Intentional time delay | 1s | 0/0.2/0.5/1 | 0/0.2/0.5/1 | | 0/0.2/0.5/1 |
| | Rated residual current | 2A | 0.1/0.4/1/2 | 0.1/0.4/1/2 | | 0.1/0.4/1/2 |
| | Intentional time delay | 2s | 0.5/1/1.5/2 | 0.5/1/1.5/2 | | 0.5/1/1.5/2 |
| Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2 | | | | | | |
| AC | | 460V | 14 (10) | 14 | 18 | 50 |
| | | 415V | 14 (10) | 14 | 18 | 50 |
| | | 220/250V | 30 (25) | 30 | 35 | 100 |
| Service breaking capacity(%Icu), Ics | | | 100 | 100 | 100 | 100 |
| Category of use | | | A | A | A | A |
| Endurance | Mechanical | | 20,000 | 20,000 | 20,000 | 20,000 |
| (Number of operations) | Electrical | | 5,000 | 5,000 | 5,000 | 5,000 |
| Type of trip unit | | | | | | |
| Overcurrent pick-up | | | Thermal-magnetic | Thermal-magnetic | | |
| Earth leakage pick-up | | | Electronic | Electronic | | |
| Accessories | | | | | | |
| Electrical auxiliaries | Auxiliary switch | | ● | ● | ● | ● |
| | Alarm switch | | ● | ● | ● | ● |
| External accessories | Insulation barrier | | ● | ● | ● | ● |
| | Terminal cover (Long) | | ● | ● | ● | ● |
| | Terminal cover (Short) | | ● | ● | ● | ● |
| | Rotary handle (Direct) | | ● | ● | ● | ● |
| | Rotary handle (Direct, Key lock) | | ● | ● | ● | ● |
| | Rotary handle (Extended) | | ● | ● | ● | ● |
| | Rear terminal (Bar) | | | | | ● |
| | Rear terminal (Round) | | ● | ● | ● | ● |
| | Pad handle lock | | ● | ● | ● | ● |
| Dimensions (mm) | W×H×D (3P) | | 75×130×60 | 75×130×60 | | 90×155×60 |
| Weight(kg) | 2 pole | | - | 0.5 | - | - |
| | 3 pole | | 0.7 | 0.7 | 0.7 | 1 |
| | 4 pole | | 0.9 | - | 0.9 | 1.2 |

Note) 1. ● applicable or available
2. The short-circuit breaking capacities in ( ) are applied to the rated current in (5, 10A)



| | 60 | | 100 | 125 | | 250 | | |
|---|---|---|---|---|---|---|---|---|
| | N-Type | S-Type | N-Type | S-Type | H-Type | N-Type | S-Type | H-Type |
| | - | - | EBN102c | - | - | EBN202c | - | - |
| | EBN63c | EBS63c | EBN103c | EBS103c | EBH103c | EBN203c | EBS203c | EBH203c |
| | - | EBS64c | EBN104c | EBS104c | EBH104c | - | EBS204c | EBH204c |
| | Overload, Short-circuit and ground fault | | Overload, Short-circuit and ground fault | Overload, Short-circuit and ground fault | | Overload, Short-circuit and ground fault | | |
| | 60 | | 60, 75, 100 | 15, 20, 30, 40, 50, 60, 75, 100, 125 | | 100, 125, 150, 175, 200, 225, 250 | | |
| | 6 | | 6 | 6 | | 6 | | |
| | 30, 100, 100/200/500, 100/300/500 | | 30, 100, 100/200/500, 100/300/500 | 30, 100, 100/200/500, 100/300/500 | | 30, 100, 100/200/500, 100/300/500 | | |
| | ≤ 0.1 | | ≤ 0.1 | ≤ 0.1 | | ≤ 0.1 | | |
| | 220/460 | | 220/460 | 220/460 | | 220/460 | | |
| | 0.1/0.2/0.5/1 | | 0.1/0.2/0.5/1 | 0.1/0.2/0.5/1 | | 0.1/0.2/0.5/1 | | |
| | 0/0.2/0.5/1 | | 0/0.2/0.5/1 | 0/0.2/0.5/1 | | 0/0.2/0.5/1 | | |
| | 0.1/0.4/1/2 | | 0.1/0.4/1/2 | 0.1/0.4/1/2 | | 0.1/0.4/1/2 | | |
| | 0.5/1/1.5/2 | | 0.5/1/1.5/2 | 0.5/1/1.5/2 | | 0.5/1/1.5/2 | | |
| | | | | | | | | |
| | 14 | 18 | 18 | 37 | 50 | 26 | 37 | 50 |
| | 14 | 18 | 18 | 37 | 50 | 26 | 37 | 50 |
| | 30 | 35 | 35 | 85 | 100 | 65 | 85 | 100 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | A | A | A | A | A | A | A | A |
| | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| | | | | | | | | |
| | Thermal-magnetic | | Thermal-magnetic | Thermal-magnetic | | Thermal-magnetic | | |
| | Electronic | | Electronic | Electronic | | Electronic | | |
| | | | | | | | | |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● | ● | ● | ● |
| | 75×130×60 | | 75×130×60 | 90×155×60 | | 105×165×60 | | |
| | - | - | 0.5 | - | - | 1.1 | - | - |
| | 0.7 | 0.7 | 0.7 | 1 | 1 | 1.2 | 1.2 | 1.2 |
| | - | 0.9 | 0.9 | 1.2 | 1.2 | - | 1.5 | 1.5 |

# Earth Leakage Circuit Breakers

## Metasol 400AF to 1200AF Series

### ELCB

| Frame Size (AF) | | | 400 | | | |
|---|---|---|---|---|---|---|
| Type | | | N-Type | S-Type | H-Type | L-Type |
| Type and pole | | 3-pole | EBN403c | EBS403c | EBH403c | EBL403c |
| | | 4-pole | EBN404c | EBS404c | EBH404c | EBL404c |
| Protective function | | | Overload, Short-circuit and ground fault | | | |
| Rated current, In | | (A) | 250, 300, 350, 400 | | | |
| Rated impulse withstand voltage, Uimp | | (kV) | 6 | | | |
| Rated operational voltage, Ue | | AC (V) | 220/460 | | | |
| Instantaneous type | Rated residual current, I△n | (mA) | 30, 100/200/500 | | | |
| | Residual current off-time at I△n | sec | ≤ 0.1 | ≤ 0.1 | ≤ 0.1 | ≤ 0.1 |
| Time delay type | Rated residual current | A | 0.1/0.4/1/2 | 0.1/0.4/1/2 | 0.1/0.4/1/2 | 0.1/0.4/1/2 |
| | Intentional time delay | s | 0.5/1/1.5/2 | 0.5/1/1.5/2 | 0.5/1/1.5/2 | 0.5/1/1.5/2 |
| Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2 | | | | | | |
| AC | | 415/460V | 37 | 50 | 65 | 85 |
| | | 220/250V | 50 | 75 | 85 | 125 |
| Service breaking capacity(%Icu), Ics | | | 100 | 100 | 100 | 100 |
| Category of use | | | A | A | A | A |
| Endurance | Mechanical | | 4,000 | 4,000 | 4,000 | 4,000 |
| (Number of operations) | Electrical | | 1,000 | 1,000 | 1,000 | 1,000 |
| Type of trip unit | | | | | | |
| Overcurrent pick-up | | | Thermal-magnetic | | | |
| Earth leakage pick-up | | | Electronic | | | |
| Accessories | | | | | | |
| Electrical auxiliaries | Auxiliary switch | | ● | ● | ● | ● |
| | Alarm switch | | ● | ● | ● | ● |
| | Shunt trip | | ● | ● | ● | ● |
| | Undervoltage trip | | ● | ● | ● | ● |
| External accessories | Insulation barrier | | ● | ● | ● | ● |
| | Terminal cover (Long) - 2, 3 pole | | ● | ● | ● | ● |
| | Terminal cover (Long) - 4 pole | | ● | ● | ● | ● |
| | Rotary handle (Direct) | | ● | ● | ● | ● |
| | Rotary handle (Extended) | | ● | ● | ● | ● |
| | Mechanical interlock - 2, 3 pole | | ● | ● | ● | ● |
| | Mechanical interlock - 4 pole | | ● | ● | ● | ● |
| | Rear terminal - 2 pole | | ● | ● | ● | ● |
| | Rear terminal - 3 pole | | ● | ● | ● | ● |
| | Rear terminal - 4 pole | | ● | ● | ● | ● |
| Dimensions (mm) | W×H×D (3P) | | 140×257×109 | | | |
| Weight(kg) | 3 pole | | 7 | 7 | 7 | 7 |
| | 4 pole | | 8.4 | 8.4 | 7 | 7 |

Note) 1. ● applicable or available



| | 800 | | | 1000 | 1200 |
|---|---|---|---|---|---|
| | N-Type | S-Type | L-Type | S-Type | S-Type |
| | EBN803c | EBS803c | EBL803c | EBS1003b | EBS1203b |
| | - | - | - | - | - |
| | Overload, Short-circuit and ground fault | | | Overload, Short-circuit and Ground fault | |
| | 500, 630, 700, 800 | | | 1000 | 1200 |
| | 6 | | | - | - |
| | 220/460 | | | 220/460 | 220/460 |
| | 30, 100/200/500 | | | 100/200/500 | 100/200/500 |
| | ≤ 0.1 | ≤ 0.1 | ≤ 0.1 | ≤ 0.1 | ≤ 0.1 |
| | 0.1/0.4/1/2 | 0.1/0.4/1/2 | 0.1/0.4/1/2 | - | - |
| | 0.5/1/1.5/2 | 0.5/1/1.5/2 | 0.5/1/1.5/2 | - | - |
| | | | | | |
| | 37 | 65 | 85 | 85 | 85 |
| | 50 | 85 | 125 | 125 | 125 |
| | 100 | 100 | 75 | - | - |
| | A | A | A | - | - |
| | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| | 500 | 500 | 500 | 500 | 500 |
| | | | | | |
| | Thermal-magnetic | | | Thermal-magnetic | |
| | Electronic | | | Electronic | |
| | | | | | |
| | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | ● |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | ● | ● | ● | - | - |
| | 210×280×109 | | | 220×565×105 | |
| | 11.5 | 11.5 | 11.5 | 27.1 | 27.1 |
| | - | - | - | - | - |

# Air Circuit Breakers

## Susol ACB Series



## Circuit Breaker

| | | | | AH-D | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Type | | | | AH-06D | AH-08D | AH-10D | AH-13D | AH-16D | AH-20D |
| Ampere frame | (AF) | | | 630 | 800 | 1000 | 1250 | 1600 | 2000 |
| Rated current (A) | (In max) | | at 40℃ | 200, 400, 630 | 200, 400, 630, 800 | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600 | 1000, 1250, 1600, 2000 |
| Setting current (A)* | Control trip relay ( ... × In max) | | | 0.4 ~ 1.0 | | | | | |
| Rated current of neutral pole (A) | | | | 630 | 800 | 1000 | 1250 | 1600 | 2000 |
| Rated insulation voltage (V) | (Ui) | | | 1,000 | | | | | |
| Rated operational voltage (V) | (Ue) | | | 690 | | | | | |
| Rated impulse withstand voltage (kV) | (Uimp) | | | 12 | | | | | |
| Frequency (Hz) | | | | 50/60 | | | | | |
| Number of poles (P) | | | | 3/4 | | | | | |
| Rated breaking capacity (kA sym) AC 50/60Hz | (Icu) | IEC 60947-2 KS C 4620 | 220V/230V/380V/415V | 85 | | | | | |
| | | | 460V/480V/500V | 85 | | | | | |
| | | | 550V/600V/690V | 65 | | | | | |
| Rated service breaking capacity (kA) | (Ics) | | ... %×Icu | 100% | | | | | |
| Rated making capacity (kA peak) AC 50/60Hz | (Icm) | IEC 60947-2 KS C 4620 | 220V/230V/380V/415V | 187 | | | | | |
| | | | 460V/480V/500V | 187 | | | | | |
| | | | 550V/600V/690V | 143 | | | | | |
| Rated short-time withstand current (kA) | (Icw) | | 1 sec | 65 | | | | | |
| | | | 2 sec | 60 | | | | | |
| | | | 3 sec | 50 | | | | | |
| Operating time (ms) | | | Maximum total breaking time | Less than 25ms under Icw/Less than 75ms over Icw | | | | | |
| | | | Maximum closing time | 80ms under | | | | | |
| Life cycle (time) | | Mechanical | | 20,000 | | | | | |
| | | Electrical | | 5,000 | | | | | |
| Connections** | Draw-out / Fixed | | Horizontal connection | ● | | | | | - |
| | | | Vertical connection | ○ | | | | | ● |
| | | | Front connection | ○ | | | | | - |
| | | | Mixed connection | ○ | | | | | - |
| Weight (kg) (3P/4P) | Draw-out type | Main body (With cradle) | Motor charging type | 63/74 | | | | | 70/85 |
| | | | Manual charging type | 61/72 | | | | | 68/83 |
| | | Cradle only | | 29/32 | | | | | 33/40 |
| | Fixed type | | Motor charging type | 34/44 | | | | | 38/47 |
| | | | Manual charging type | 32/42 | | | | | 36/45 |
| External dimensions (mm) (H×W×D)   | | Draw-out type | 3P | 430×334×375 | | | | | |
| | | | 4P | 430×419×375 | | | | | |
| | | Fixed type | 3P | 300×300×295 | | | | | |
| | | | 4P | 300×385×295 | | | | | |
| Trip relay | | | | N, A, P, S type | | | | | |
| Certificate & Approval | | | | KS / KEMA / KERI / GOST / CCC | | | | | |

* Refer to trip relay specification. ** ●: Standard, ○: Option

Note) 1. Life time does not mean guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee
**2. For the Marine application, please refer to the Marine ACB catalog. (MAR suffix)**
3. In case of Marine ACB, please contact us.
4. The use of AN-D, AS-D, AH-D and AS-F in IT systems is limited to 500 V network voltage.
5. AH-20D, AH-40E types are equipped with vertical-only terminals.





| AH-E | | | | | | | | | AH-G | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AH-06E | AH-08E | AH-10E | AH-13E | AH-16E | AH-20E | AH-25E | AH-32E | AH-40E | AH-40G | AH-50G | AH-63G |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 4000 | 4000 | 5000 | 6300 |
| 400, 630 | 400, 630 800, (800) | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600, (1600) | 1000, 1250, 1600, 2000 | 1250, 1600, 2000, 2500 | 1600, 2000, 2500, 3200 | 2000, 2500, 3200, 4000, (3200) | 2000, 2500, 3200, 4000 | 2500, 3200, 4000, 5000 | 3200, 4000, 5000, 6300 |
| 0.4 ~ 1.0 | | | | | | | | | | | |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 4000 | 4000 | 5000 | 6300 |
| 1,000 | | | | | | | | | 1,000 | | |
| 690 | | | | | | | | | 690 | | |
| 12 | | | | | | | | | 12 | | |
| 50/60 | | | | | | | | | 50/60 | | |
| 3/4 | | | | | | | | | 3/4 | | |
| 100 | | | | | | | | | 150 | | |
| 100 | | | | | | | | | 150 | | |
| 85 | | | | | | | | | 100 | | |
| 100% | | | | | | | | | 100% | | |
| 220 | | | | | | | | | 330 | | |
| 220 | | | | | | | | | 330 | | |
| 187 | | | | | | | | | 220 | | |
| 85 | | | | | | | | | 100 | | |
| 75 | | | | | | | | | 85 | | |
| 65 | | | | | | | | | 75 | | |
| Less than 25ms under Icw/Less than 75ms over Icw | | | | | | | | | Less than 25ms under Icw/Less than 75ms over Icw | | |
| 80ms under | | | | | | | | | 90ms under | | |
| 15,000 | | | | | | | | | 10,000 | | |
| 5,000 | | | | | | | | | 2,000 | | |
| ● | | | | | | | | - | ○ | | |
| ○ | | | | | | | | ● | ● | | |
| ○ | | | | | | | | - | - | | |
| ○ | | | | | | | | - | - | | |
| 87/103 | | | | | | | | 107/139 | 181/223 | | 186/230 |
| 85/101 | | | | | | | | 102/145 | 179/221 | | 184/228 |
| 44/55 | | | | | | | | 65/85 | 97/117 | | 102/124 |
| 44/55 | | | | | | | | 61/81 | 98/123 | | 103/130 |
| 42/53 | | | | | | | | 60/80 | 96/121 | | 101/128 |
| 430×412×375 | | | | | | | | | 460×785×375 | | |
| 430×527×375 | | | | | | | | | 460×1015×375 | | |
| 300×378×295 | | | | | | | | | 300×751×295 | | |
| 300×493×295 | | | | | | | | | 300×981×295 | | |
| N, A, P, S type | | | | | | | | | N, A, P, S type | | |
| KS / KEMA / KERI / GOST / CCC | | | | | | | | | KS / KEMA / KERI / GOST / CCC | | |

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.
※ It is possible to connect power and load side reversely, but please use it for normal connection for maintenance and safety.

# Air Circuit Breakers

## Susol ACB Series



## Switch-Disconnector

| | | | | DH-D | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Type | | | | DH-06D | DH-08D | DH-10D | DH-13D | DH-16D | DH-20D |
| Ampere frame | (AF) | | | 630 | 800 | 1000 | 1250 | 1600 | 2000 |
| Rated current (A) | (In max) | | at 40℃ | 200, 400, 630 | 200, 400, 630, 800 | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600 | 1000, 1250, 1600, 2000 |
| Setting current (A)* | Control trip relay ( ... × In max) | | | 0.4 ~ 1.0 | | | | | |
| Rated current of neutral pole (A) | | | | 630 | 800 | 1000 | 1250 | 1600 | 2000 |
| Rated insulation voltage (V) | (Ui) | | | 1,000 | | | | | |
| Rated operational voltage (V) | (Ue) | | | 690 | | | | | |
| Rated impulse withstand voltage (kV) | (Uimp) | | | 12 | | | | | |
| Frequency (Hz) | | | | 50/60 | | | | | |
| Number of poles (P) | | | | 3/4 | | | | | |
| Rated making capacity (kA peak) | (Icm) | IEC 60947-2 AC | ~ 690V | 143 | | | | | |
| Rated short-time withstand current (kA) | (Icw) | | 1 sec | 65 | | | | | |
| | | | 2 sec | 60 | | | | | |
| | | | 3 sec | 50 | | | | | |
| Operating time (ms) | | | Maximum total breaking time | Less than 25ms under Icw/Less than 75ms over Icw | | | | | |
| | | | Maximum closing time | 80ms under | | | | | |
| Life cycle (time) | | Mechanical | | 20,000 | | | | | |
| | | Electrical | | 5,000 | | | | | |
| Connections** | Draw-out / Fixed | | Horizontal connection | ● | | | | | - |
| | | | Vertical connection | ○ | | | | | ● |
| | | | Front connection | ○ | | | | | - |
| | | | Mixed connection | ○ | | | | | - |
| Weight (kg) (3P/4P) | Draw-out type | Main body (With cradle) | Motor charging type | 63/74 | | | | | 70/85 |
| | | | Manual charging type | 61/72 | | | | | 68/83 |
| | | Cradle only | | 29/32 | | | | | 33/40 |
| | Fixed type | | Motor charging type | 34/44 | | | | | 38/47 |
| | | | Manual charging type | 32/42 | | | | | 36/45 |
| External dimensions (mm) (H×W×D) |  | Draw-out type | 3P | 430×334×375 | | | | | |
| | | | 4P | 430×419×375 | | | | | |
| | | Fixed type | 3P | 300×300×295 | | | | | |
| | | | 4P | 300×385×295 | | | | | |



* Refer to trip relay specification. ** ●: Standard, ○: Option

Note) 1. Life time does not mean guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-3 within the term of guarantee
2. In case of Marine ACB, please contact us.
3. DH-20D, DH-40E types are equipped with vertical-only terminals.



| DH-E | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DH-06E | DH-08E | DH-10E | DH-13E | DH-16E | DH-20E | DH-25E | DH-32E | DH-40E |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 4000 |
| 400,<br>630 | 400,<br>630<br>800,<br>(800) | 630,<br>800,<br>1000 | 630,<br>800,<br>1000,<br>1250 | 800,<br>1000,<br>1250,<br>1600, (1600) | 1000,<br>1250,<br>1600,<br>2000 | 1250,<br>1600,<br>2000,<br>2500 | 1600,<br>2000,<br>2500,<br>3200 | 2000,<br>2500,<br>3200,<br>4000, (3200) |
| 0.4 ~ 1.0 | | | | | | | | |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2500 | 3200 | 4000 |
| 1,000 | | | | | | | | |
| 690 | | | | | | | | |
| 12 | | | | | | | | |
| 50/60 | | | | | | | | |
| 3/4 | | | | | | | | |
| 187 | | | | | | | | |
| 85 | | | | | | | | |
| 75 | | | | | | | | |
| 65 | | | | | | | | |
| Less than 25ms under Icw/Less than 75ms over Icw | | | | | | | | |
| 80ms under | | | | | | | | |
| 15,000 | | | | | | | | |
| 5,000 | | | | | | | | |
| ● | | | | | | | | - |
| ○ | | | | | | | | ● |
| ○ | | | | | | | | - |
| ○ | | | | | | | | - |
| 87/103 | | | | | | | | 107/139 |
| 85/101 | | | | | | | | 102/145 |
| 44/55 | | | | | | | | 65/85 |
| 44/55 | | | | | | | | 61/81 |
| 42/53 | | | | | | | | 60/80 |
| 430×412×375 | | | | | | | | |
| 430×527×375 | | | | | | | | |
| 300×378×295 | | | | | | | | |
| 300×493×295 | | | | | | | | |

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.

# Air Circuit Breakers

## Metasol ACB Series



## Circuit Breaker

| | | | | AN-D | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | | | | AN-06D | AN-08D | AN-10D | AN-13D | AN-16D |
| Ampere frame | (AF) | | | 630 | 800 | 1000 | 1250 | 1600 |
| Rated current (A) | (In max) | | at 40℃ | 200, 400, 630 | 200, 400, 630, 800 | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600 |
| Setting current (A)* | Control trip relay ( ... × In max) | | | 0.4 ~ 1.0 | | | | |
| Rated current of neutral pole (A) | | | | 630 | 800 | 1000 | 1250 | 1600 |
| Rated insulation voltage (V) | (Ui) | | | 1,000 | | | | |
| Rated operational voltage (V) | (Ue) | | | 690 | | | | |
| Rated impulse withstand voltage (kV) | (Uimp) | | | 12 | | | | |
| Frequency (Hz) | | | | 50/60 | | | | |
| Number of poles (P) | | | | 3/4 | | | | |
| Rated breaking capacity (kA sym) AC 50/60Hz | (Icu) | IEC 60947-2 KS C 4620 | 220V/230V/380V/415V | 65 | | | | |
| | | | 460V/480V/500V | 65 | | | | |
| | | | 550V/600V/690V | 50 | | | | |
| Rated service breaking capacity (kA) | (Ics) | | ... %×Icu | 100% | | | | |
| Rated making capacity (kA peak) AC 50/60Hz | (Icm) | IEC 60947-2 KS C 4620 | 220V/230V/380V/415V | 143 | | | | |
| | | | 460V/480V/500V | 143 | | | | |
| | | | 550V/600V/690V | 105 | | | | |
| Rated short-time withstand current (kA) | (Icw) | | 1 sec | 50 | | | | |
| | | | 2 sec | 42 | | | | |
| | | | 3 sec | 36 | | | | |
| Operating time (ms) | | | Maximum total breaking time | Less than 25ms under Icw/Less than 75ms over Icw | | | | |
| | | | Maximum closing time | 80ms under | | | | |
| Life cycle (time) | | Mechanical | | 20,000 | | | | |
| | | Electrical | | 5,000 | | | | |
| Connections** | Draw-out / Fixed | | Horizontal connection | ● | | | | |
| | | | Vertical connection | ○ | | | | |
| | | | Front connection | ○ | | | | |
| | | | Mixed connection | ○ | | | | |
| Weight (kg) (3P/4P) | Draw-out type | Main body (With cradle) | Motor charging type | 63/74 | | | | |
| | | | Manual charging type | 61/72 | | | | |
| | | Cradle only | | 29/32 | | | | |
| | Fixed type | | Motor charging type | 34/44 | | | | |
| | | | Manual charging type | 32/42 | | | | |
| External dimensions (mm) (H×W×D) |  | Draw-out type | 3P | 43×334×375 | | | | |
| | | | 4P | 430×419×375 | | | | |
| | | Fixed type | 3P | 300×300×295 | | | | |
| | | | 4P | 300×385×295 | | | | |
| Trip relay | | | | N, A, P, S type | | | | |
| Certificate & Approval | | | | KS / KEMA / KERI / GOST | | | | |



* Refer to trip relay specification. ** ●: Standard, ○: Option

Note) 1. Life time does not mean guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee
**2. For the Marine application, please refer to the Marine ACB catalog. (MAR suffix)**
3. The use of AN-D, AS-D and AS-F in IT systems is limited to 500 V network voltage.
4. AS-20D, AS-40E types are equipped with vertical-only terminals.







| AS-D | | | | | | AS-E | | | | AS-F | | AS-G | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AS-06D | AS-08D | AS-10D | AS-13D | AS-16D | AS-20D | AS-20E | AS-25E | AS-32E | AS-40E | AS-40F | AS-50F | AS-40G | AS-50G | AS-63G |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2000 | 2500 | 3200 | 4000 | 4000 | 5000 | 4000 | 5000 | 6300 |
| 200, 400, 630 | 200, 400, 630, 800 | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600 | 1000, 1250, 1600, 2000 | 630, 800, 1000, 1250, 1600, 2000 | 1250, 1600, 2000, 2500 | 1600, 2000, 2500, 3200 | 2000, 2500, 3200, 4000 | 2000, 2500, 3200, 4000 (3200, 4000) | 2500, 3200, 4000, 5000 | 2000, 2500, 3200, 4000 | 2500, 3200, 4000, 5000 | 3200, 4000, 5000, 6300 |
| 0.4 ~ 1.0 | | | | | | 0.4 ~ 1.0 | | | | 0.4 ~ 1.0 | | 0.4 ~ 1.0 | | |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2000 | 2500 | 3200 | 4000 | 4000 | 5000 | 4000 | 5000 | 6300 |
| 1,000 | | | | | | 1,000 | | | | 1,000 | | 1,000 | | |
| 690 | | | | | | 690 | | | | 690 | | 690 | | |
| 12 | | | | | | 12 | | | | 12 | | 12 | | |
| 50/60 | | | | | | 50/60 | | | | 50/60 | | 50/60 | | |
| 3/4 | | | | | | 3/4 | | | | 3/4 | | 3/4 | | |
| 70 | | | | | | 85 | | | | 100 | | 120 | | |
| 70 | | | | | | 85 | | | | 100 | | 120 | | |
| 65 | | | | | | 85 | | | | 85 | | 100 | | |
| 100% | | | | | | 100% | | | | 100% | | 100% | | |
| 154 | | | | | | 187 | | | | 220 | | 264 | | |
| 154 | | | | | | 187 | | | | 220 | | 264 | | |
| 143 | | | | | | 187 | | | | 187 | | 220 | | |
| 65 | | | | | | 85 | | | | 85 | | 100 | | |
| 50 | | | | | | 75 | | | | 75 | | 85 | | |
| 42 | | | | | | 65 | | | | 65 | | 75 | | |
| Less than 25ms under Icw/Less than 75ms over Icw | | | | | | Less than 25ms under Icw/Less than 75ms over Icw | | | | Less than 25ms under Icw/Less than 75ms over Icw | | | | |
| 80ms under | | | | | | 80ms under | | | | 90ms under | | 90ms under | | |
| 20,000 | | | | | | 15,000 | | | | 10,000 | | 10,000 | | |
| 5,000 | | | | | | 5,000 | | | | 2,000 | | 2,000 | | |
| ● | | | | | - | ● | | | - | ○ | | ○ | | |
| ○ | | | | | ● | ○ | | | ● | ● | | ● | | |
| ○ | | | | | - | ○ | | | - | - | | - | | |
| ○ | | | | | - | ○ | | | - | - | | - | | |
| 63/74 | | | | | 70/85 | 87/103 | | | 104/147 | 107/139 | | 181/223 | | 186/230 |
| 61/72 | | | | | 63/83 | 85/101 | | | 102/145 | 102/145 | | 179/221 | | 184/228 |
| 29/32 | | | | | 33/40 | 44/50 | | | 58/70 | 65/85 | | 97/117 | | 102/124 |
| 34/44 | | | | | 38/47 | 44/55 | | | 63/100 | 61/81 | | 98/123 | | 103/130 |
| 32/42 | | | | | 36/45 | 42/53 | | | 61/98 | 60/80 | | 96/121 | | 101/128 |
| 430×334×375 | | | | | | 430×412×375 | | | | 460×629×375 | | 460×785×375 | | |
| 430×419×375 | | | | | | 430×527×375 | | | | 460×799×375 | | 460×1015×375 | | |
| 300×300×295 | | | | | | 300×378×295 | | | | 300×597×295 | | 300×751×295 | | |
| 300×385×295 | | | | | | 300×493×295 | | | | 300×767×295 | | 300×981×295 | | |
| N, A, P, S type | | | | | | N, A, P, S type | | | | N, A, P, S type | | N, A, P, S type | | |
| KS / KEMA / KERI / GOST | | | | | | KS / KEMA / KERI / GOST | | | | KS / KEMA / KERI / GOST | | | | |

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.
※ It is possible to connect power and load side reversely, but please use it for normal connection for maintenance and safety.

# Air Circuit Breakers

## Metasol ACB Series



### Switch-Disconnector

| | | | | DN-D | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | | | | DN-06D | DN-08D | DN-10D | DN-13D | DN-16D |
| Ampere frame | (AF) | | | 630 | 800 | 1000 | 1250 | 1600 |
| Rated current (A) | (In max) | | at 40℃ | 200, 400, 630 | 400, 630, 800 | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600 |
| Setting current | (A) | Control trip relay ( ... × In max) | | 0.4~1.0 | | | | |
| Rated current of neutral pole | (A) | | | 630 | 800 | 1000 | 1250 | 1600 |
| Rated insulation voltage (V) | (Ui) | | | 1000 | | | | |
| Rated operational voltage (V) | (Ue) | | | 690 | | | | |
| Rated impulse withstand voltage (kV) | (Uimp) | | | 12 | | | | |
| Frequency (Hz) | | | | 50/60 | | | | |
| Number of poles (P) | | | | 3/4 | | | | |
| Rated making capacity (kA peak) | (Icm) | IEC 60947-3 AC | 690V / 600V / 550V | 105 | | | | |
| Rated short-time withstand current (kA) | (Icw) | | 1 sec | 50 | | | | |
| | | | 2 sec | 42 | | | | |
| | | | 3 sec | 36 | | | | |
| Operating time (ms) | | | Total breaking time | Less than 25ms under Icw/Less than 75ms over Icw | | | | |
| | | | Closing time | 80ms under | | | | |
| Life cycle (time) | | | Mechanical | 20000 | | | | |
| | | | Electrical | 5000 | | | | |
| Connections | Draw-out type/ Fixed type | | Horizontal connection | ● | | | | |
| | | | Vertical connection | ○ | | | | |
| | | | Front connection | ○ | | | | |
| | | | Mixed connection | ○ | | | | |
| Weight (kg) (3P/4P) | Draw-out type | Main body (With cradle) | Motor charging type | 63/74 | | | | |
| | | | Manual charging type | 61/72 | | | | |
| | | Cradle only | | 29/32 | | | | |
| | Fixed type | | Motor charging type | 34/44 | | | | |
| | | | Manual charging type | 32/42 | | | | |
| External dimensions (mm) (H×W×D) |  | Draw-out type | 3P | 430×334×375 | | | | |
| | | | 4P | 430×419×375 | | | | |
| | | Fixed type | 3P | 300×300×295 | | | | |
| | | | 4P | 300×385×295 | | | | |



Note) 1. Life time does not mean guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-3 within the term of guarantee
2. DS-20D, DS-40E types are equipped with vertical-only terminals.





| DS-D | | | | | | DS-E | | | |
|---|---|---|---|---|---|---|---|---|---|
| DS-06D | DS-08D | DS-10D | DS-13D | DS-16D | DS-20D | DS-20E | DS-25E | DS-32E | DS-40E |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 2000 | 2500 | 3200 | 4000 |
| 200, 400, 630 | 400, 630, 800 | 630, 800, 1000 | 630, 800, 1000, 1250 | 800, 1000, 1250, 1600 | 1000, 1250, 1600, 2000 | 400, 630 800, 1000, 1250, 1600, 2000 | 1250, 1600, 2000, 2500 | 1600, 2000, 2500, 3200 | 2000, 2500, 3200, 4000 |
| 0.4~1.0 | | | | | | 0.4~1.0 | | | |
| 630 | 800 | 1000 | 1250 | 1600 | 2000 | 630, 800, 1000, 1250, 1600, 2000 | 2500 | 3200 | 4000 |
| 1000 | | | | | | 1000 | | | |
| 690 | | | | | | 690 | | | |
| 12 | | | | | | 12 | | | |
| 50/60 | | | | | | 50/60 | | | |
| 3/4 | | | | | | 3/4 | | | |
| 143 | | | | | | 187 | | | |
| 65 | | | | | | 85 | | | |
| 50 | | | | | | 75 | | | |
| 42 | | | | | | 65 | | | |
| Less than 25ms under Icw/Less than 75ms over Icw | | | | | | Less than 25ms under Icw/Less than 75ms over Icw | | | |
| 80ms under | | | | | | 80ms under | | | |
| 20000 | | | | | | 15000 | | | |
| 5000 | | | | | | 5000 | | | |
| ● | | | | | - | ● | | | - |
| ○ | | | | | ● | ○ | | | ● |
| ○ | | | | | - | ○ | | | - |
| ○ | | | | | - | ○ | | | - |
| 63/74 | | | | | 70/85 | 87/103 | | | 107/139 |
| 61/72 | | | | | 68/83 | 85/101 | | | 102/145 |
| 29/32 | | | | | 33/40 | 44/50 | | | 65/85 |
| 34/44 | | | | | 38/47 | 44/55 | | | 61/81 |
| 32/42 | | | | | 36/45 | 42/53 | | | 60/80 |
| 430×334×375 | | | | | | 430×412×375 | | | |
| 430×419×375 | | | | | | 430×527×375 | | | |
| 300×300×295 | | | | | | 300×378×295 | | | |
| 300×385×295 | | | | | | 300×493×295 | | | |

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.

## Trip relay

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.



# Trip relay types

## N type




- L/S/I/G
- Self Power
- RTC Timer mounted
- Fault indicator (LED)
- NFC

## A type




- L/S/I/G (or Gext)
- ZSI (Protective coordination)
- Remote Reset
- ERMS, Local/Remote DI (Selectable)

- Modbus/RS-485
- USB Terminal (Power, Communication)
- Ethernet (Optional product required)
- Self Power
- AC/DC 100~250V
- RTC Timer mounter
- Fault Recording(127EA)
- Fault Wave Recording (6EA)
- DC 24 ~ 48V

## P type




- L(N)/S1/I/G(or Gext)
- Thermal(linear hot start)
- UV1/OV1/RV/D/S(V)1/VU/IU
- UF1/OF1/ROCOF/RP/RQ1/OP/OQ/UP
- Measurement: V/A/W/Wh/F/PF
- ZSI (Protective coordination)
- Remote Reset
- ERMS , Local/Remote DI (selectable)

- USB Terminal (Power, Communication)
- Modbus/RS-485
- Bluetooth (Option)
- Ethernet (Optional product required)

- Self Power
- AC/DC 100~250V
- RTC Timer mounted
- Event Recording (255EA)
- Fault Recording (127EA)
- Fault Wave (6EA)
- DC 24 ~ 48V

## S type




- L(N)/S(1,2)/I/G(or Gext)
- Thermal (linear hot start)
- UV(1,2)/OV(1,2)/RV/D/S(V)(1,2)/VU/IU
- UF(1,2)/OF(1,2)/ROCOF/RP/RQ(1,2)/OP/OQ/UP
- Measurement: V/A/W/Wh/F/PF
- Relay Group control (A,B)
- ZSI(Protective coordination)
- Remote Reset
- ERMS, Local/Remote, Group A/B DI (selectable)

- USB Terminal (Power, Communication)
- Modbus/RS-485
- Bluetooth
- Ethernet (Optional product required)
- NFC

- Self Power
- AC/DC 100~250V
- RTC Timer mounted
- Event Recording (255EA)
- Fault Recording (127EA)
- Fault Wave (6EA)
- DC 24 ~ 48V

# LS Final Distribution Boards

LS Final Distribution Boards is fully type-tested by DEKRA and specially designed for residential and commercial area for the protection of people and equipment.

شركة أبوظبي للتوزيع
Abu Dhabi Distribution Co.



## Full range of Residential & Commercial Distribution System



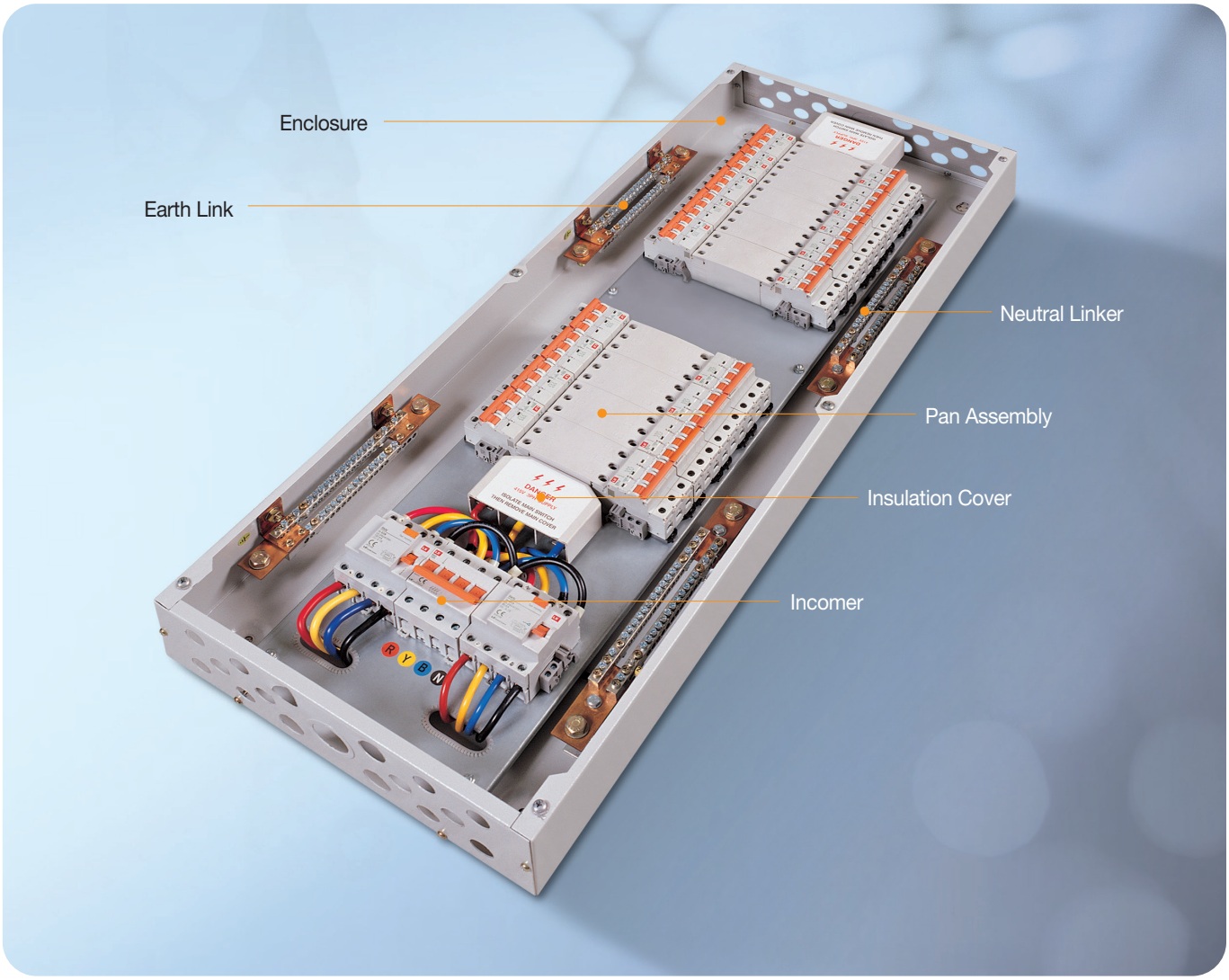
### Features:

- Designed to provide higher level of safety for final distribution board
- Pan assembly type busbar systems to provide easier cabling
- Split neutral bars provide easy connection and maximum cable space
- Easy and safe mounting of LS Miniature Circuit Breaker
- Flush and surface mounted
-Tin plate and cooper busbar
- Galvanized 1.2mm steel sheet



### Technical Description

- In compliance with standards : IEC 61439-1&2 Ed.3
- Short-circuit withstand: 17kA/0.2s
- Peak short time withstand: 35kA
- Index of degree: IP 4X
- Rated operational Voltage(Ue): 415V
- Rated insulation Voltage(Ui): 460V
- Rated Frequence: 50/60Hz
- Rated impuls withstand Voltage(Uimp): 4kV
- Rated Current (In): Upto 125A




## Pan Assembly System



- Rigid and removable pan assembly to provide easier cabling
- Modular panel system
- Flexible connect with CB, RCCB and Disconnect switch

# LS Final Distribution Boards

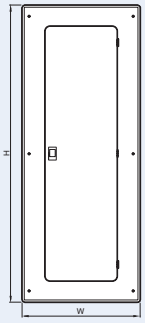
## Specific of FDB (Split busbar type)

**with incoming Isolator feeding two ELCBs**

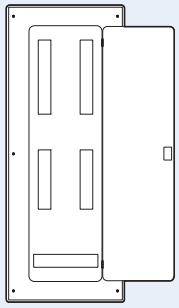




Side view



Front view


Door opened view




**Selection of Enclosure**

| Code Description | Type | Dimension |
|---|---|---|
| 02+02 Way Split DB | Flush | 530H×430W×110D mm |
| 04+02 Way Split DB | | 580H×430W×110D mm |
| 04+04 Way Split DB | | 680H×430W×110D mm |
| 06+04 Way Split DB | | 780H×430W×110D mm |
| 06+06 Way Split DB | | 780H×430W ×110D mm |
| 08+06 Way Split DB | | 830H×430W×110D mm |
| 08+08 Way Split DB | | 980H×430W×110D mm |
| 10+08 Way Split DB | | 980H×430W×110D mm |
| 12+06 Way Split DB | | 980H×430W×110D mm |
| 02+02 Way Split DB | Surface | 510H×410W×110D mm |
| 04+02 Way Split DB | | 560H×410W×110D mm |
| 04+04 Way Split DB | | 660H×410W×110D mm |
| 06+04 Way Split DB | | 760H×410W×110D mm |
| 06+06 Way Split DB | | 760H×410W×110D mm |
| 08+06 Way Split DB | | 810H×410W×110D mm |
| 08+08 Way Split DB | | 960H×410W×110D mm |
| 10+08 Way Split DB | | 960H×410W×110D mm |
| 12+06 Way Split DB | | 960H×410W×110D mm |

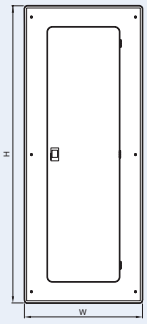
## Single busbar & Single Incomer type

**With Incoming 4P ELCB/MCB/Isolator**

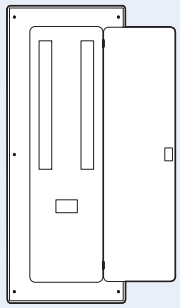




Side view



Front view


Door opened view




**Selection of Enclosure**

| Code Description | Type | Dimension |
|---|---|---|
| 4 Way DB 1 INC | Flush | 530H×430W×110D mm |
| 6 Way DB 1 INC | | 580H×430W×110D mm |
| 8 Way DB 1 INC | | 680H×430W×110D mm |
| 12 Way DB 1 INC | | 780H×430W×110D mm |
| 14 Way DB 1 INC | | 830H×430W×110D mm |
| 18 Way DB 1 INC | | 980H×430W×110D mm |
| 20 Way DB 1 INC | | Customized available |
| 24 Way DB 1 INC | | Customized available |
| 4 Way DB 1 INC | Surface | 510H×410W×110 D mm |
| 6 Way DB 1 INC | | 560H×410W×110 D mm |
| 8 Way DB 1 INC | | 660H×410W×110 D mm |
| 12 Way DB 1 INC | | 760H×410W×110 D mm |
| 14 Way DB 1 INC | | 810H×410W×110 D mm |
| 18 Way DB 1 INC | | 960H×410W×110 D mm |
| 20 Way DB 1 INC | | Customized available |
| 24 Way DB 1 INC | | Customized available |

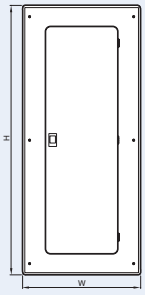
# Specific of FDB (Single busbar & Dual Incomer type)

### With Incoming Isolator & ELCB

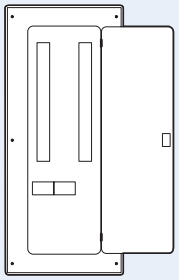





Side view




Front view



Door opened view



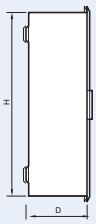

### Selection of Enclosure

| Code Description | Type | Dimension |
|---|---|---|
| 4 Way DB 2 INC | Flush | 530H×430W×110D mm |
| 6 Way DB 2 INC | | 580H×430W×110D mm |
| 8 Way DB 2 INC | | 680H×430W×110D mm |
| 12 Way DB 2 INC | | 780H×430W×110D mm |
| 14 Way DB 2 INC | | 830H×430W×110D mm |
| 18 Way DB 2 INC | | 980H×430W×110D mm |
| 20 Way DB 2 INC | | Customized available |
| 24 Way DB 2 INC | | Customized available |
| 4 Way DB 2 INC | Surface | 510H×410W×110D mm |
| 6 Way DB 2 INC | | 560H×410W×110D mm |
| 8 Way DB 2 INC | | 660H×410W×110D mm |
| 12 Way DB 2 INC | | 760H×410W×110D mm |
| 14 Way DB 2 INC | | 810H×410W×110D mm |
| 18 Way DB 2 INC | | 960H×410W×110D mm |
| 20 Way DB 2 INC | | Customized available |
| 24 Way DB 2 INC | | Customized available |

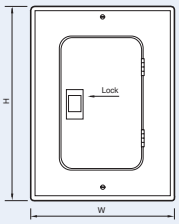
# SP&N Consumer Unit

### Incoming 2P ELCB / MCB / Isolator






Side view




Front view




### Selection of Enclosure

| Code Description | Type | Dimension |
|---|---|---|
| 6 Way 1P C.Unit | | 320H×240W×100D mm |
| 9 Way 1P C.Unit | | 370H×240W×100D mm |
| 12 Way 1P C.Unit | | 420H×250W×100D mm |
| 15 Way 1P C.Unit | | 490H×250W×100D mm |
| 18 Way 1P C.Unit | | 550H×250W×100D mm |
| 22 Way 1P C.Unit | | Customized available |

# LS SMDB Solution

- LS SMDB Solutions are arranged for 3 Phase and neutral incoming supply and specially designed easy to install MCCBs.
- These are fitted with Form 3b and 2 busbar assemblies, tested and DEKRA Certified.

شركة أبوظبي للتوزيع
Abu Dhabi Distribution Co.



## Rating

- A wide choice of incoming MCCBs make LS SMDB panesboards flexible to suit most of the requirements and represent excellent value and will apeal to consultants, contractors, end users and OEMs. These are offered in ratings of 125A, 250A, 400A, 630A.
- All incoming and outgoing MCCBs have Thermal/Magnetic fixed and adjustable tripping mechanisms incorporated with a trip-to-test button. These are available in ratings as follows : 16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160, 250, 400, 630A.

## Technical Specifications

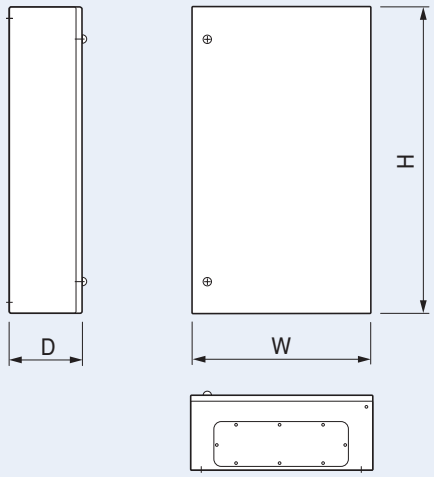
**Constructional Characteristics**

- Complied with IEC 61439-1&2 Ed.3
- Fully Type Tested, DEKRA Certified
- Degree of protection : IP41 as per IEC 60529
- Form of separation: Form 3b
- Enclosure constructed from rigid folded zinc phosphate and protected both internally and externally with polyester powder coating

**Electrical Characteristics**

- Rated Operational Voltage Ue: upto 690V
- Rated Insulation voltage Ui: upto 750V
- Rated Frequency: 50/60Hz
- Rated Impulse withstand voltage Uimp: 8kV
- Rated Short time Icw & peak withstand Ipk Current: 36kA/1S

# Incoming Devices (MCCB Panelboards)




**Metasol Series**

| Incoming Breaker 250 Amps Outgoing Breaker 100 Amps | | | | Incoming Breaker 400 Amps Outgoing Breaker 100 Amps | | | | Incoming Breaker 630 Amps Outgoing Breaker 100 Amps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of Ways | Width | Height | Depth | No of Ways | Width | Height | Depth | No of Ways | Width | Height | Depth |
| 2 | 700 | 800 | 180 | 4 | 700 | 1000 | 250 | | | | |
| 4 | 700 | 800 | 180 | 6 | 700 | 1000 | 250 | 6 | 800 | 1000 | 250 |
| 6 | 700 | 800 | 180 | 8 | 700 | 1200 | 250 | 8 | 800 | 1200 | 250 |
| 8 | 700 | 1000 | 180 | 10 | 700 | 1400 | 250 | 10 | 800 | 1400 | 250 |
| 10 | 700 | 1200 | 180 | 12 | 700 | 1400 | 250 | 12 | 800 | 1400 | 250 |
| 12 | 700 | 1200 | 180 | 14 | 700 | 1600 | 250 | 14 | 800 | 1600 | 250 |

**Susol TD/TS Series**

| Incoming Breaker 250 Amps Outgoing Breaker 100 Amps | | | | Incoming Breaker 400 Amps Outgoing Breaker 100 Amps | | | | Incoming Breaker 630 Amps Outgoing Breaker 100 Amps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No of Ways | Width | Height | Depth | No of Ways | Width | Height | Depth | No of Ways | Width | Height | Depth |
| 2 | 700 | 800 | 180 | 4 | 700 | 1000 | 250 | | | | |
| 4 | 700 | 800 | 180 | 6 | 700 | 1000 | 250 | 6 | 800 | 1000 | 250 |
| 6 | 700 | 800 | 180 | 8 | 700 | 1200 | 250 | 8 | 800 | 1200 | 250 |
| 8 | 700 | 1000 | 180 | 10 | 700 | 1400 | 250 | 10 | 800 | 1400 | 250 |
| 10 | 700 | 1200 | 180 | 12 | 700 | 1400 | 250 | 12 | 800 | 1400 | 250 |
| 12 | 700 | 1200 | 180 | 14 | 700 | 1600 | 250 | 14 | 800 | 1600 | 250 |

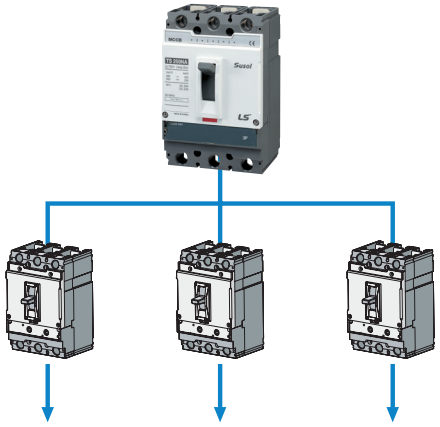
# LS SMDB Solution

## Incoming Devices

### LS “Susol series” range of MCCBs

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Rated current, In | 250A ..... 630A | | | | | | | | |
| Rated operational voltage, Ue | 750V | | | | | | | | |
| MCCB breaker type | TS250 | | | TS400 | | | TS630 | | |
| Ultimate breaking capacity, Icu (kA rms) at 415V | N | H | L | N | H | L | N | H | L |
| | 50 | 85 | 150 | 50 | 85 | 150 | 50 | 85 | 150 |
| Service breaking capacity, Ics.....% Icu | 100% Icu | | | 100% Icu | | | 100% Icu | | |
| Protection trip unit | Thermal magnetic / Electronic | | | | | | | | |
| Switch disconnector type TS | TS250NA | | | TS400NA | | | TS630NA | | |
| Short-circuit making capacity Icm (kApeak) (with upstream circuit breaker) | 4.9 | | | 7.1 | | | 8.5 | | |

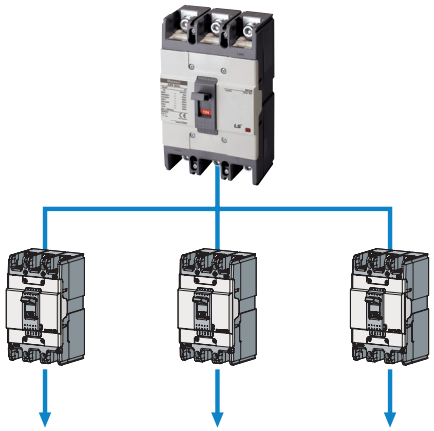
**Incoming application**



### LS “Metasol series” range of MCCBs

| | | | |
|---|---|---|---|
| Rated current, In | 250A ..... 630A | | |
| Rated operational voltage, Ue | 690V | | |
| Breaker type | ABS203c | ABS403c | ABS803c |
| Ultimate breaking capacity, Icu (kA rms) at 415V | 37 | 50 | 65 |
| Service breaking capacity, Ics.....% Icu | 100% Icu | 100% Icu | 100% Icu |
| Protection trip unit | Thermal magnetic | | |

**Incoming application**

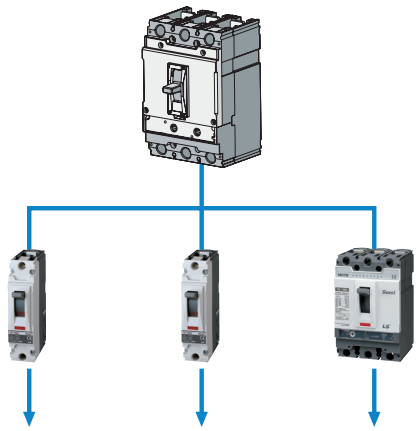


# Outgoing devices

## LS “Susol series” range of MCCBs

| | | | | | | |
|---|---|---|---|---|---|---|
| Rated current, In | 16A ..... 250A | | | | | |
| Rated operational voltage, Ue | upto 750V | | | | | |
| Breaker type | TD100, TD160, TS100, TS160, TS250 | | | | | |
| | N | | H | | L | |
| No. of poles | 1P | 3P | 1P | 3P | 1P | 3P |
| Ultimate breaking capacity, Icu (kA rms) at 240V | 30 | 100 | 50 | 120 | - | 200 |
| Service breaking capacity, Ics.....% Icu | 100% Icu | | | | | |
| Protection trip unit | Thermal magnetic / Electronic | | | | | |

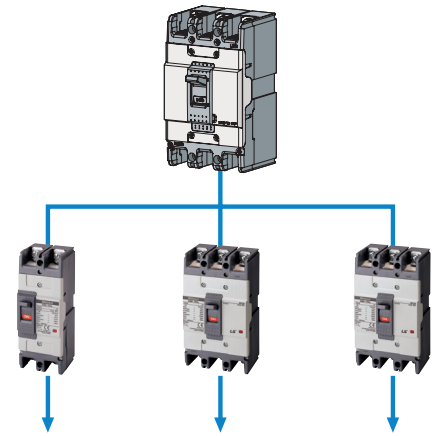
**Incoming application**



## LS “Metasol series” range of MCCBs

| | | | | | | |
|---|---|---|---|---|---|---|
| Rated current, In | 15A ..... 100A | | | | | |
| Rated operational voltage, Ue | upto 415V - Single pole<br>upto 690V - Three pole | | | | | |
| Breaker type | ABS103c | | | | | |
| | N | | H | | L | |
| No. of poles | 2P | 3P | 2P | 3P | 2P | 3P |
| Ultimate breaking capacity, Icu (kA rms) at 240V | 35 | | 85 | | 100 | |
| Ultimate breaking capacity, Icu (kA rms) at 415V | 18 | | 37 | | 50 | |
| Service breaking capacity, Ics.....% Icu | 100% Icu | | | | | |
| Protection trip unit | Thermal magnetic | | | | | |

**Incoming application**



# Vacuum Circuit Breakers

## Susol VCB Series

### VL-06

| Type | | | VL-06□08□04 | VL-06□13□06 |
|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | |
| Rated normal current | | Ir (A) | 400 | 630 |
| Rated frequency | | fr (Hz) | 50/60 | |
| Rated short-circuit current | | Isc (kA) | 8 | 12.5 |
| Rated short-time withstand current | | Ik/tk (kA/s) | 8/3 | 12.5/3 |
| Rated short-circuit breaking capacity | | (MVA) | 100 | 160 |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | |
| Rated short-circuit making current | | (Cycle) | 3 | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | |
| | Impulse (1.2×50㎲) | Up (kV) | 60 | |
| Rated operating sequence | | | O-0.3s-CO-15s-CO | |
| Control voltage | Closing coil | (V) | AC/DC 100~130, AC/DC 200~250, DC 125, DC 24~30, DC 48~60, AC 48 | |
| | Trip coil | (V) | AC/DC 100~130, AC/DC 200~250, DC 125, DC 24~30, DC 48~60, AC 48 | |
| Auxiliary contacts | | | 2a2b, 4a4b, 6a6b | |
| Rated opening time | | (sec) | ≤ 0.04 | |
| No-load closing time | | (sec) | ≤ 0.06 | |
| Type test class | Mechanical | | M2 | |
| | Electrical | | E2 (List1) | |
| | Capacitive current switching | | C2 | |
| Installation version | Fixed | | P type | |
| | Drawout | | E, F, G type (for MESG) | |
| Phase distance | | (mm) | 130 | |
| Weight | Breaker (E, F, G, K type) | (kg) | 37 | 37 |
| | Cradle (E, F, G, K type) | (kg) | 18, 25, 32 | 19, 26, 33 |
| Standarde aplicate | | | IEC 62271-100, JEC 2300/JIS C 4603, V-check (KESCO) | |

### VL-06/12/17

| Type | | | VL-06□20/25□06/13/20 | | | VL-12□20/25□06/13/20 | | | VL-17□20/25□06/13/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | | | 12 | | | 17.5 | | |
| Rated normal current | | Ir (A) | 630 | 1250 | 2000 | 630 | 1250 | 2000 | 630 | 1250 | 2000 |
| Rated frequency | | fr (Hz) | 50/60 | | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 20, 25 | | | | | | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 20/3, 25/3 | | | | | | | | |
| Rated short-circuit breaking capacity | | (MVA) | 250/310 | | | 410/520 | | | 600/750 | | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | | | 28 (42) | | | 38 | | |
| | Impulse (1.2×50㎲) | Up (kV) | 60 | | | 75 (82) | | | 95 | | |
| Rated operating sequence | | | O-0.3s-CO-15s-CO | | | | | | | | |
| Control voltage | Closing coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250 | | | | | | | | |
| | Trip coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250 | | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | | |
| | Electrical | | E2 (List3) | | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | | |
| Installation version * | Fixed | | P type | | | | | | | | |
| | Drawout | | E, F, G type (for MESG), H type (for MCSG) | | | E, F type (for MESG), H type (for MCSG) | | | | | |
| Phase distance ** | | (mm) | 150 | | | 150 (210) | | | 150 (210) | | |
| Weight | Breaker (E, F, G, K type) | (kg) | 100 | 100 | 130 | 115 (120) | 115 (120) | 130 (140) | 115 (120) | 115 (120) | 130 (140) |
| | Cradle (E, F, G, K type) | (kg) | 170 | 170 | 180 | 170 (200) | 170 (200) | 180 (200) | 170 (200) | 170 (200) | 180 (200) |
| Standarde aplicate | | | IEC 62271-100, KERI/KEMA, V-check (KESCO) | | | | | | | | |

* H type is a box type cradle with CB compartment style structure.
** ( ) displays option of phase distance.

## VL-06/12/17

| Type | | | VL-06□32□06/13/20 | | | VL-12□32□06/13/20/25 | | | | VL-17□32□06/13/20/25 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | | | 12 | | | | 17.5 | | | |
| Rated normal current | | Ir (A) | 630 | 1250 | 2000 | 630 | 1250 | 2000 | 2500 | 630 | 1250 | 2000 | 2500 |
| Rated frequency | | fr (Hz) | 50/60 | | | | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 31.5 | | | | | | | | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 31.5/3(4 Note 1)) | | | | | | | | | | |
| Rated short-circuit breaking capacity | | (MVA) | 393 | | | 655 | | | | 955 | | | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | | | 28 | | | | 38 | | | |
| | Impulse (1.2×50μs) | Up (kV) | 60 | | | 75 | | | | 95 | | | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | | | | | | | |
| Control voltage | Closing coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250 | | | | | | | | | | |
| | Trip coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250 | | | | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | | | | |
| | Electrical | | E2 (List3) | | | | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | | | | |
| Installation version * | Fixed | | P type | | | | | | | | | | |
| | Drawout | | H type (for MCSG) | E, F, Fs, G, Gs, K type (for MESG) H type (for MCSG) | | H type (for MCSG | Gs,K type (for MESG) H type (for MCSG) | | H type (for MCSG | H type (for MCSG) | | | |
| Phase distance ** | | (mm) | 150 | | | 150 (210) | | | 210 (275) | 150 (210) | | | 210 (275) |
| Weight | Breaker (H type) | (kg) | 100 | 100 | 130 | 115/120 | 115/120 | 130/140 | 160/175 | 115/120 | 115/120 | 130/140 | 160/175 |
| | Cradle (H, type) | (kg) | 170 | 170 | 200 | 170/200 | 170/200 | 170/200 | 260/290 | 170/200 | 170/200 | 170/200 | 260/290 |
| | Breaker (P, E, F, G, K type) | (kg) | 85 | 85 | 100 | 85/100 | 85/100 | 100/115 | 120/135 | 85/100 | 85/100 | 100/115 | 120/135 |
| Standarde aplicate | | | IEC 62271-100, KERI, V-check(KESCO) | | | | | | | | | | |

* H type is a box type cradle with CB compartment style structure. ** ( ) displays option of phase distance.
Nota 1) For Icw 4s, please contact us.

## VL-20/25

| Type | | | VL-20,25□13□06/13 | | VL-20,25□16□06/13 | | VL-20,25□25□06/13/20/25 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 24/25.8 | | 24/25.8 | | 24/25.8 | | | |
| Rated normal current | | Ir (A) | 630 | 1250 | 630 | 1250 | 630 | 1250 | 2000 | 2500 |
| Rated frequency | | fr (Hz) | 50/60 Note 1) | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 12.5 | | 16 | | 25 | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 12.5/3 Note 2) | | 16/3 Note 2) | | 25/3 Note 2) | | | |
| Rated short-circuit breaking capacity | | (MVA) | 520/560 | | 665/715 | | 1040/1120 | | | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 50/60 | | | | | | | |
| | Impulse (1.2×50μs) | Up (kV) | 125 | | | | | | | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | | | | |
| Control voltage | Closing coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250 | | | | | | | |
| | Trip coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250 | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | |
| | Electrical | | E2 (List3) | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | |
| Installation version * | Fixed | | P type | | | | | | | |
| | Drawout | | E, F, G type (for MESG), K, H type (for MCSG) | | | | | | | H type (for MCSG) |
| Phase distance ** | | (mm) | 210/265/275 | | | | | | | 275 |
| Weight | Breaker (H type) | (kg) | 120 (130) | | 130 (140) | | | | 150 (160) | |
| | Cradle (H, type) | (kg) | 200 (220) | | 200 (220) | | | | 200 (220) | |
| | Breaker (P, E, F, G, K type) | (kg) | 110 | 115 | 120 | | | | 135 | - |
| Standarde aplicate | | | IEC 62271-100, KERI, V-check(KESCO) | | | | | | | |

* H type is a box type cradle with CB compartment style structure. ** ( ) displays option of phase distance.
Nota 1) 24/25.8kV 25kA 2000A(Phase distance 210mm): 60Hz available only 2) For Icw 4s, please contact us.

# Vacuum Circuit Breakers

## Susol VCB Series

### VL-36

| Type | | | VH-36□25□06 | VH-36□25□13 | VH-36□25□20 | VH-36□25□25 |
|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 36 | | | |
| Rated normal current | | Ir (A) | 630 | 1250 | 2000 | 2500 |
| Rated frequency | | fr (Hz) | 50/60 | | | |
| Rated short-circuit current | | Isc (kA) | 60 | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 25/3(4 Note 1)) | | | |
| Rated short-circuit breaking capacity | | (MVA) | 1560 | | | |
| Rated short-circuit making current | | Ip (kA) | 62.5/65 | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 70 | | | |
| | Impulse (1.2×50㎲) | Up (kV) | 170 | | | |
| Rated operating sequence | | | O-0.3s-CO-15s-CO | | | |
| Control voltage | Closing coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220, AC 48, AC 100~130, AC 220~250 | | | |
| | Trip coil | (V) | DC 24~30, DC 48~60, DC 110, DC 125, DC 220, AC 48, AC 100~130, AC 220~250 | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | |
| No-load closing time | | (sec) | ≤ 0.07 | | | |
| Type test class | Mechanical | | M2 | | | |
| | Electrical | | E2 (List3) | | | |
| | Capacitive current switching | | C2 | | | |
| Installation version | Fixed | | P type | | | |
| | Drawout | | H type (for MCSG) | | | |
| Phase distance | | (mm) | 275 | | | |
| Weight | Breaker (H type) | (kg) | 260 | 260 | 280 | 300 |
| | Cradle (H, type) | (kg) | 440 | 440 | 450 | 460 |
| Standards | | | IEC 62271-100 | | | |

Note 1) For Icw 4s, please contact us.

### LVB-06/12

| Type | | | VH-06□32□32 | VH-06□40□12, 20, 32 | | | VH-12□32□32 | VH-12□40□12, 20, 32 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | 7.2 | | | 12 | 12 | | |
| Rated normal current | | Ir (A) | 3150 * | 1250 | 2000 | 3150 * | 3150 * | 1250 | 2000 | 3150 * |
| Rated frequency | | fr (Hz) | 50/60 | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 31.5 | 40 | | | 31.5 | 40 | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 31.5/3 | 40/3 | | | 31.5/3 | 40/3 | | |
| Rated short-circuit breaking capacity | | (MVA) | 393 | 499 | | | 655 | 831 | | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | | | | 28 | | | |
| | Impulse (1.2×50㎲) | Up (kV) | 60 | | | | 75 | | | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | |
| | Electrical | | E2 (List1) | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | |
| Installation version * | Fixed | | P type | | | | - | | | |
| | Drawout | | E,F,G type (for MESG), MCSG Cradle | | | | MCSG Cradle | | | |
| Phase distance | | (mm) | 210 | 150 | | 210 | 210 | 150 | | 210 |
| Weight | Breaker (MESG, MCSG type) | (kg) | 210, 220 | 135, 160 | 135, 160 | 210, 220 | 220 | 164 | 165 | 220 |
| | Cradle (MESG, MCSG type) | (kg) | 135, 155 | 55, 110 | 63, 117 | 135, 155 | 155 | 110 | 117 | 155 |
| Standards | | | IEC 62271-100, KERI/KEMA, V-check(KESCO) | | | | | | | |

* MCSG style drawable type provides a cradle for builting in the switchgear, not a box type for CB compartment. Ordering type is LVB.
Note 1) H type that is a box type cradle for enabling a CB compartment in MCSG is under development. Consult us for ordering.
2) Some LVB is the ordering name of the switchboard for export

## VH-06/12/17

| Type | | | VH-06/12□40□13/20 | | | | VH-06/12/17□40□13/20 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | | 12 | | 7.2 | | 12 | | 17.5 | |
| Rated normal current | | Ir (A) | 1250 | 2000 | 1250 | 2000 | 1250 | 2000 | 1250 | 2000 | 1250 | 2000 |
| Rated frequency | | fr (Hz) | 50/60 | | | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 40 | | | | | | | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 40/4 | | | | | | | | | |
| Rated short-circuit breaking capacity | | (MVA) | 499 | | 831 | | 499 | | 831 | | 1212 | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | | 28 (42) | | 20 | | 28 (42) | | 38 | |
| | Impulse (1.2×50㎲) | Up (kV) | 60 | | 75 | | 60 | | 75 | | 95 | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | O-0.3s-CO-15s-CO | | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | | | |
| | Electrical | | E2 (List3) | | | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | | | |
| Installation version | Drawout | | Fs, Gs, K, H type | | | | K, H type | | | | | |
| Phase distance | | (mm) | 150 | | | | 210 | | | | | |
| Weight | Breaker (H type) | (kg) | 165 | | | | 215 | | | | | |
| | Cradle (H, type) | (kg) | 205 | | | | 226 | | | | | |
| Standards | | | IEC 62271-100 | | | | | | | | | |

## VH-06/12/17

| Type | | | VH-06/12/17□32/40□32 | | | | |
|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | 12 | 17.5 | | |
| Rated normal current | | Ir (A) | 3150 | | | | |
| Rated frequency | | fr (Hz) | 50/60 | | | | |
| Rated short-circuit current | | Isc (kA) | 31.5/40 | | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 40/4 | | | | |
| Rated short-circuit breaking capacity | | (MVA) | 393/499 | 655/831 | 955/1212 | | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | 28 (42) | 38 | | |
| | Impulse (1.2×50㎲) | Up (kV) | 60 | 75 | 95 | | |
| Rated operating sequence | | | O-0.3s-CO-15s-CO | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | |
| Type test class | Mechanical | | M2 | | | | |
| | Electrical | | E2 (List3) | | | | |
| | Capacitive current switching | | C2 | | | | |
| Installation version | Drawout | | Fs, Gs, K, H type | Gs, K, H type | K, H type | K type | H type |
| Phase distance | | (mm) | 210 | 210 | 210 | 254 | 275 |
| Weight | Breaker (H type) | (kg) | 240 | 240 | 240 | 280 | 280 |
| | Cradle (H, type) | (kg) | 235 | 235 | 235 | 250 | 250 |
| Standards | | | IEC 62271-100 | | | | |

# Vacuum Circuit Breakers

## Susol VCB Series

### VH-06/12/17

| Type | | | VH-06□50□13/20/25/32 | | | | VH-12□50□13/20/25/32 | | | | VH-17□50□13/20/25/32 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | | | | 12 | | | | 17.5 | | | |
| Rated normal current | | Ir (A) | 1250 | 2000 | 2500 | 3150 | 1250 | 2000 | 2500 | 3150 | 1250 | 2000 | 2500 | 3150 |
| Rated frequency | | fr (Hz) | 60 | | | | | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 50 | | | | | | | | | | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 50/3 | | | | | | | | | | | |
| Rated short-circuit breaking capacity | | (MVA) | 623 | | | | 1039 | | | | 1515 | | | |
| Rated short-circuit making current | | Ip (kA) | 2.6×Isc (60Hz) | | | | | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | | | | 28 (42) Note) | | | | 38 | | | |
| | Impulse (1.2×50μs) | Up (kV) | 60 | | | | 75 | | | | 95 | | | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | | | | | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | | | | | |
| | Electrical | | E2 (List3) | | | | | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | | | | | |
| Installation version | Fixed | | P type | | | | | | | | | | | |
| | Drawout | | H type (for MCSG) | | | | | | | | | | | |
| Phase distance | | (mm) | 210 | | 275 | | 210 | | 275 | | 210 | | 275 | |
| Weight | Breaker (H type) | (kg) | 230 | 287 | | 290 | 230 | 287 | | 290 | 230 | 287 | | 290 |
| | Cradle (H, type) | (kg) | 175 | 320 | | 320 | 175 | 320 | | 320 | 175 | 320 | | 320 |
| Standarde aplicate | | | IEC 62271-100, KERI/KEMA, V-check(KESCO) | | | | | | | | | | | |

* H type is a box type cradle with CB compartment style structure.
Note) Contact us.

### VH-06/12/17

| Type | | | VH-06/12/17□40□40 | | | VH-06/12/17□50□40 | | |
|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | 12 | 17.5 | 7.2 | 12 | 17.5 |
| Rated normal current | | Ir (A) | 4000 | | | | | |
| Rated frequency | | fr (Hz) | 50/60 | | | | | |
| Rated short-circuit current | | Isc (kA) | 40 | | | 50 | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 40/4 | | | 50/4 | | |
| Rated short-circuit breaking capacity | | (MVA) | 499 | 831 | 1212 | 624 | 1040 | 1515 |
| Rated short-circuit making current | | Ip (kA) | 104 | | | 130 | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | 28 (42) | 38 | 20 | 28 (42) | 38 |
| | Impulse (1.2×50μs) | Up (kV) | 60 | 75 | 95 | 60 | 75 | 95 |
| Rated operating sequence | | | O-0.3s-CO-15s-CO | | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | |
| Type test class | Mechanical | | M2 | | | | | |
| | Electrical | | E2 (List3) | | | | | |
| | Capacitive current switching | | C2 | | | | | |
| Installation version | Fixed | | - | - | P type | - | - | P type |
| | Drawout | | H type | H type | H type | H type | H type | H type |
| Phase distance | | (mm) | 275 | | | | | |
| Weight | Breaker (H type) | (kg) | 395 | | | | | |
| | Cradle (H, type) | (kg) | 200 | | | | | |
| Standarde aplicate | | | IEC 62271-100 | | | | | |

## VH-06/12

| Type | | | VH-06H40,50L50 | VH-12H40,50L50 |
|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 7.2 | 12 |
| Rated normal current | | Ir (A) | 5000 | 5000 |
| Rated frequency | | fr (Hz) | 50/60 | |
| Rated short-circuit current | | Isc (kA) | 40/50 | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 50/4 | |
| Rated short-circuit breaking capacity | | (MVA) | 624 | 1040 |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | |
| Rated short-circuit making current | | (Cycle) | 3 | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 20 | 20 |
| | Impulse (1.2×50μs) | Up (kV) | 60 | 75 |
| Rated operating sequence | | | O-0.3s-CO-15s-CO | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | |
| Auxiliary contacts | | | 4a4b, 10a10b | |
| Rated opening time | | (sec) | ≤ 0.04 | |
| No-load closing time | | (sec) | ≤ 0.06 | |
| Type test class | Mechanical | | M2 | |
| | Electrical | | E2 (List3) | |
| | Capacitive current switching | | C2 | |
| Installation version | Fixed | | P type | |
| | Drawout | | H type (for MCSG) | |
| Phase distance | | (mm) | 320 | |
| Weight | Breaker (H type) | (kg) | 430 | |
| | Cradle (H, type) | (kg) | 200 | |
| Standards | | | IEC 62271-100 | |

## VH-20/25

| Type | | | VH-20,25□25□25 | VH-20,25□32□13/20/32 | | | VH-20,25□40□13/20/32 | | |
|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 24/25.8 | | | | | | |
| Rated normal current | | Ir (A) | 2500 | 1250 | 2000 | 3150 | 1250 | 2000 | 3150 |
| Rated frequency | | fr (Hz) | 50/60 | 60 | | | 50/60 | | |
| Rated short-circuit current | | Isc (kA) | 25 | 31.5 | | | 40 | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 25/3 | 31.5/3 | | | 40/3 | | |
| Rated short-circuit breaking capacity | | (MVA) | 1039/1117 | 1309/1407 | | | 1662/1787 | | |
| Rated short-circuit making current | | Ip (kA) | 2.6×Isc (60Hz) | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 50 (65) Note) | | | | | | |
| | Impulse (1.2×50μs) | Up (kV) | 125 | | | | | | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | |
| | Electrical | | E2 (List3) | | | | | | |
| | Capacitive current switching | | C2 | | | | | | |
| Installation version | Fixed | | P type | | | | | | |
| | Drawout | | H type (for MCSG) | | | | | | |
| Phase distance | | (mm) | 275 | 210 (275) | 210 (275) | 275 | 210 (275) | 210 (275) | 275 |
| Weight | Breaker (H type) | (kg) | 295 | 256 (273) | 256 (273) | 318 | 256 (273) | 256 (273) | 318 |
| | Cradle (H, type) | (kg) | 316 | 257 (284) | 257 (284) | 316 | 257 (284) | 257 (284) | 316 |
| Standarde aplicate | | | IEC 62271-100, KERI/KEMA, V-check(KESCO) | | | | | | |

* H type is a box type cradle with CB compartment style structure. ** ( ) displays option of phase distance. *** Rated frequency(fr) 50Hz is certified only to 24kV.
**** Rated operating sequence O-0.3s-CO-15s-CO is certified only to 24kV 40kA.
Note) Contact us.

# Vacuum Circuit Breakers

## Susol VCB Series

### VH-36

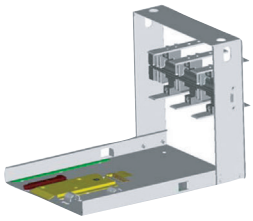
| Type | | | VH-36□25□13/20/32 | | | VH-36□32□13/20/32 | | | VH-36□40□13/20/32 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated voltage | | Ur (kV) | 36 | | | | | | | | |
| Rated normal current | | Ir (A) | 1250 | 2000 | 3150 | 1250 | 2000 | 3150 | 1250 | 2000 | 3150 |
| Rated frequency | | fr (Hz) | 50/60 | | | | | | | | |
| Rated short-circuit current | | Isc (kA) | 25 | | | 31.5 | | | 40 | | |
| Rated short-time withstand current | | Ik/tk (kA/s) | 25/3 | | | 31.5/3 | | | 40/3 | | |
| Rated short-circuit breaking capacity | | (MVA) | 1559 | | | 1964 | | | 2494 | | |
| Rated short-circuit making current | | Ip (kA) | 2.5×Isc (50Hz)/2.6×Isc (60Hz) | | | | | | | | |
| Rated short-circuit making current | | (Cycle) | 3 | | | | | | | | |
| Rated withstand voltage | Power frequency (1 min) | Ud (kV) | 70 (95) Note) | | | | | | | | |
| | Impulse (1.2×50㎲) | Up (kV) | 170 | | | | | | | | |
| Rated operating sequence | | | O-0.3s-CO-3min-CO | | | | | | | | |
| Control voltage | Closing coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | | |
| | Trip coil | (V) | DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220 | | | | | | | | |
| Auxiliary contacts | | | 4a4b, 10a10b | | | | | | | | |
| Rated opening time | | (sec) | ≤ 0.04 | | | | | | | | |
| No-load closing time | | (sec) | ≤ 0.06 | | | | | | | | |
| Type test class | Mechanical | | M2 | | | | | | | | |
| | Electrical | | E2 (List3) | | | | | | | | |
| | Capacitive current switching | | C2 | | | | | | | | |
| Installation version * | Fixed | | P type | | | | | | | | |
| | Drawout | | H type (for MCSG) | | | | | | | | |
| Phase distance | | (mm) | 300 | | | | | | | | |
| Weight | Breaker (E, F, G, K type) | (kg) | 400 | | 490 | 400 | | 490 | 400 | | 490 |
| | Cradle (E, F, G, K type) | (kg) | 700 | | 750 | 700 | | 750 | 700 | | 750 |
| Standarde aplicate | | | IEC 62271-100, KERI/KEMA, V-check (KESCO) | | | | | | | | |

* H type is a box type cradle with CB compartment style structure.
Note) Contact us.

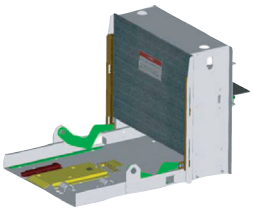
## Accessories

| Type | Breakers | Main | Cradle |
|---|---|---|---|
| VL:<br>7.2kV<br>8/12.5kA |  | • Secondary trip coil<br>• Under voltage trip release<br>• Current trip coil<br>• Position S/W<br>• Keylock<br>• Button padlock<br>• Button cover<br>• Mechanical position indicator | • Mechanical position indicator |
| VL:<br>20/25kA |  | • Secondary trip coil<br>• Under voltage trip release<br>• Current trip coil<br>• Position S/W<br>• Keylock<br>• Button padlock<br>• Button cover<br>• Plug interlock<br>• Mechanical position indicator | • Earthing S/W<br>• Earthing with electromechanical interlock<br>• Earthing S/W with position S/W<br>• Earthing S/W with keylock<br>• Door interlock<br>• MOC<br>• TOC<br>• Shutter padlock<br>• Emergency mechanical trip device |
| VH |  | • Secondary trip coil<br>• Under voltage trip release<br>• Current trip coil<br>• Position S/W<br>• Keylock<br>• Button padlock<br>• Button cover<br>• Plug interlock<br>• Mechanical position indicator | • Earthing S/W<br>• Earthing with electromechanical interlock<br>• Earthing S/W with position S/W<br>• Earthing S/W with keylock<br>• Door interlock<br>• MOC<br>• TOC<br>• Shutter padlock<br>• Emergency mechanical trip device |

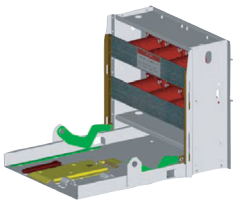
## Various type of Cradle



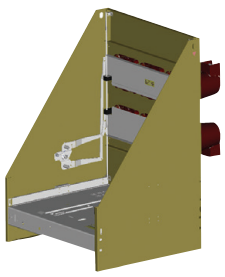
**E type**
- No Shutter
- For MESG



**F type**
- Insulation Shutter
- For MESG



**G type**
- Bushing
- Insulation Shutter
- For MESG



**K type**
- Bushing
- Closed Compartment structure
- For MCSG



**H type**
- Bushing
- Metal Insulation Shutter
- Closed Compartment structure
- Earthing Switch & Interlock
- For MCSG
- Door Interlock

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