

Motor protection switches

MS32, MSB32, MS18, MSB18



- Versions:
 - MS32 / MS18 - with thermal and magnetic releases
 - MSB32 / MSB18 - with a thermal release only
- Manual control:
 - START, STOP, push-buttons - with a trip indication (i.e. push-buttons stay in the middle position)
- Automatic switch-off at over-current with thermal or magnetic release
- Control with under-voltage release or shunt release
- An auxiliary switch for side mounting or flush mounting used for indication of the switching state
- Indication of release with trip indicating auxiliary switch
- ON/OFF buttons position unequivocally indicates switching position of main circuit contacts
- Contact material
 - Resistant to contact welding
 - Enables low contact heating
- Isolating distance between contacts: 4.5 mm per contact place
- Connection of a rigid or flexible conductor
- Assembly to 35 mm wide mounting rail in compliance with EN 60715
- Vertical or horizontal operational position

TECHNICAL DATA

| | | | | |
|--------------|--|-------------------|----------------------|--|
| GENERAL | Standards | | | IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204, UL 508, CSA 22.2 No.14 |
| | Approvals | | | UL |
| | Climatic class | | | constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30 |
| | Degree of protection | | | IP20, after terminals covering IP40 |
| | Ambient temperature | | °C | -25 ... +60 |
| | Storage temperature | | °C | -25 ... +70 |
| | Temperature range of thermal compensation for overload release | | °C | -5 ... +40 |
| | Mechanical and electrical endurance | | op. c. | 100,000 |
| | Max. operating cycles | | op. / h | 25 |
| | Shock resistance acc. to IEC 68-2-27 | | g | 20 |
| | Vibration resistance acc. to IEC 68-2-6 | | | 5 g at f = 5 ... 150 Hz |
| | Overvoltage category / pollution degree | | | III / 3 |
| | Rated insulation voltage | U_i | V | 690 |
| | Rated impulse withstand voltage | U_{imp} | kV | 6 |
| Weight | | kg | 0.279 | |
| MAIN CIRCUIT | Designation of connection terminals | | | 1 – L1 ; 3 – L2 ; 5 – L3 ; 2 – T1 ; 4 – T2 ; 6 – T3 |
| | Terminal capacity | rigid flexible | S mm ² | 0.75 ... 10 0.75 ... 6 |
| | Screw | | | with self-lifting clamp, protected against drop out |
| | Screw head | | | PZ2 |
| | Tightening torque | | | Nm 2.0 |

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TECHNICAL DATA

| MAIN CIRCUIT | | | | MS32 / MS18 | MSB32 / MSB18 |
|--------------|---|----------------|---|--|---|
| | Max. operational voltage | U _e | V | 690 | 400 |
| | Setting range | | A | 0.1 - 0.16; 0.16 - 0.25; 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 9 - 14; 13 - 18; 17 - 23 (only MS32); 20 - 27 (only MS32); 25 - 32 (only MS32) | 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 9 - 14; 13 - 18; 17 - 23 (only MSB32); 20 - 27 (only MSB32); 25 - 32 (only MSB32) |
| | No. of poles | | | 3 | |
| | Operating current of thermal overload release | I | | 1,05 I _r < I ≤ 1,20 I _r I _r ...current setting value | |
| | Sensitivity to phase failure | | | yes | |
| | Power dissipation per pole at the upper setting limit | P | W | 2 - 2,5 | |
| | Utilization category acc. to IEC/EN 60947-4-1 | | | AC-3 | |
| | acc. to IEC/EN 60947-2 | | | A | |
| | Trip class acc. To IEC/EN 60947-4-1 | | | 10 | |

SWITCH SELECTION FOR MOTOR PROTECTION

| Standard motor powers | | | | | | Setting range |
|-------------------------|-------------------------|-------------------------|---------------|---------------|----------------|---------------|
| Single-phase | Three-phase | | | | | |
| 220 V 230 V 240 V | 220 V 230 V 240 V | 380 V 400 V 415 V | 440 V | 500 V | 660 V 690 V | |
| kW | | | | | | A |
| | | | | | 0.06 | 0.1 ... 0.16 |
| | | 0.06 | 0.06 | 0.06 ... 0.9 | 0.06 ... 0.12 | 0.16 ... 0.25 |
| | 0.06 | 0.09 | 0.12 | 0.09 ... 0.12 | 0.18 | 0.25 ... 0.4 |
| | 0.09 | 0.12 ... 0.18 | 0.18 | 0.18 | 0.25 | 0.4 ... 0.63 |
| 0.06 ... 0.09 | 0.09 ... 0.12 | 0.18 ... 0.25 | 0.25 ... 0.37 | 0.25 ... 0.37 | 0.37 ... 0.55 | 0.63 ... 1 |
| 0.12 | 0.18 ... 0.25 | 0.37 ... 0.55 | 0.37 ... 0.55 | 0.55 ... 0.75 | 0.75 ... 1.1 | 1 ... 1.6 |
| 0.18 ... 0.25 | 0.37 | 0.75 | 0.75 ... 1.1 | 1.1 | 1.5 | 1.6 ... 2.5 |
| 0.37 | 0.55 ... 0.75 | 1.1 ... 1.5 | 1.5 | 1.5 ... 2.2 | 2.2 ... 3 | 2.5 ... 4 |
| 0.55 ... 0.75 | 1.1 ... 1.5 | 2.2 | 2.2 ... 3 | 2.2 ... 3 | 4 | 4 ... 6.3 |
| 1.1 ... 1.5 | 1.5 ... 2.2 | 3 ... 4 | 4 | 4 ... 5.5 | 5.5 ... 7.5 | 6.3 ... 10 |
| 2.2 | 2.2 ... 3 | 5.5 | 5.5 ... 7.5 | 5.5 ... 7.5 | 9 ... 11 | 9 ... 14 |
| 3 | 4 | 7.5 | 7.5 ... 9 | 9 ... 11 | 15 | 13 ... 18 |
| | 5.5 | 9 ... 11 | 11 | 11 | 15 ... 18.5 | 17 ... 23 |
| | 5.5 ... 7.5 | 11 | 11 | 15 | 18.5 ... 22 | 20 ... 27 |
| | 7.5 | 15 | 15 | 18.5 | 22 | 25 ... 32 |

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MS32 motor protection switches, rated ultimate and service short-circuit breaking capacity I_{cu} and I_{cs} , and max. back-up fuses if short circuit current I_{cp} exceeds I_{cu} :

| Type | | Operating current of short-circuit release (A) | Rated ultimate short-circuit breaking capacity I_{cu} · I_{cs} (kA) | | | | | | | | Max. back-up fuse, if $I_{cp} > I_{cu}$ (gL) (A) | | | | | |
|-------------|-------------|--|---|----------|----------|----------|----------|----------|----------|----------|--|-------|-------|-------|----|----|
| | | | 230 V | | 400 V | | 500 V | | 690 V | | 230 V | 400 V | 500 V | 690 V | | |
| | | | I_{cu} | I_{cs} | I_{cu} | I_{cs} | I_{cu} | I_{cs} | I_{cu} | I_{cs} | | | | | | |
| MS32 - 0.16 | MS18 - 0.16 | 2 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | No back-up fuse required | | | | | |
| MS32 - 0.25 | MS18 - 0.25 | 3 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | | | |
| MS32 - 0.4 | MS18 - 0.4 | 5 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | | | |
| MS32 - 0.63 | MS18 - 0.63 | 8 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | | | |
| MS32 - 1 | MS18 - 1 | 13 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | | | |
| MS32 - 1.6 | MS18 - 1.6 | 22 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | | | |
| MS32 - 2.5 | MS18 - 2.5 | 33 | 100 | 100 | 100 | 100 | 100 | 100 | 5 | 5 | | | | | 16 | |
| MS32 - 4 | MS18 - 4 | 55 | 100 | 100 | 100 | 100 | 100 | 100 | 3 | 3 | | | | | 25 | |
| MS32 - 6.3 | MS18 - 6.3 | 84 | 100 | 100 | 100 | 100 | 6 | 4.5 | 3 | 2 | | | | | 35 | 35 |
| MS32 - 10 | MS18 - 10 | 126 | 100 | 100 | 100 | 100 | 6 | 4.5 | 3 | 2 | | | | | 50 | 35 |
| MS32 - 14 | MS18 - 14 | 170 | 25 | 12.5 | 25 | 12.5 | 6 | 4.5 | 3 | 2 | 80 | 63 | 50 | 50 | | |
| MS32 - 18 | MS18 - 18 | 230 | 25 | 12.5 | 25 | 12.5 | 6 | 4.5 | 3 | 2 | 80 | 63 | 50 | 50 | | |
| MS32 - 23 | | 270 | 25 | 12.5 | 25 | 12.5 | 4 | 3 | 3 | 2 | 80 | 80 | 50 | 50 | | |
| MS32 - 27 | | 360 | 25 | 12.5 | 25 | 12.5 | 4 | 3 | 3 | 2 | 80 | 80 | 50 | 50 | | |
| MS32 - 32 | | 400 | 25 | 12.5 | 25 | 12.5 | 4 | 3 | 3 | 2 | 80 | 80 | 50 | 50 | | |

MSB32 / MSB18 motor protection switches and max. back-up fuses for short-circuit protection:

| Type | | Max. back-up fuse $U_e < 400$ V gL (A) |
|--------------|--------------|--|
| MSB32 - 0.4 | MSB18 - 0.4 | 2 |
| MSB32 - 0.63 | MSB18 - 0.63 | 2 |
| MSB32 - 1 | MSB18 - 1 | 4 |
| MSB32 - 1.6 | MSB18 - 1.6 | 6 |
| MSB32 - 2.5 | MSB18 - 2.5 | 6 |
| MSB32 - 4 | MSB18 - 4 | 10 |
| MSB32 - 6.3 | MSB18 - 6.3 | 16 |
| MSB32 - 10 | MSB18 - 10 | 25 |
| MSB32 - 14 | MSB18 - 14 | 25 |
| MSB32 - 18 | MSB18 - 18 | 35 |
| MSB32 - 23 | | 35 |
| MSB32 - 27 | | 50 |
| MSB32 - 32 | | 50 |

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ACCESSORIES

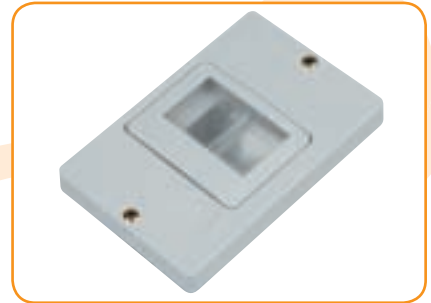
The MS32 or MSB32 motor protective circuit breaker with all accessories can be built in an enclosure or under a frame and a front plate



HO-41/55 - Enclosure IP41/55



FP-41/55 - Frame IP41/55



P-41/55 - Front plate IP41/55

ACCESSORIES USED FOR ALL ENCLOSURES



E - Emergency stop push-button available also with a key-lock.



HZ - Padlocking feature



M - Push-button diaphragm

The manufacturer also supplies an enclosure, a frame and a front plate with degree of protection IP55 (HO-55, FP-55, P-55) where the diaphragm is already inserted. However, it should be removed if a padlocking feature or an emergency stop bush-button is built-in.



NL - Neutral link

One N/PE neutral link is already mounted in the enclosures HO-41/55 or frames FP-41/55. A place for an additional neutral link is also provided.



SS - Signal lamp (B-white, R-red, Z-green)

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AUXILIARY SWITCH FOR SIDE MOUNTING HS, AUXILIARY CONTACT BLOCK HSV, TRIP INDICATING CONTACT BLOCK HRS



HS - Auxiliary switch

HS 11 - with 1 make and 1 break contact
 HS 10 - with 1 make contact
 HS 20 - with 2 make contacts

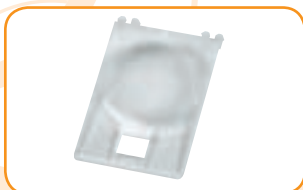
| | | | |
|--|----------|-----------------|--------------|
| Rated insulation voltage | U_i | V | 500 |
| Thermal current | I_{th} | A | 5 |
| Electrical rating acc. to IEC/EN 60947-5-1 | | | |
| B300 | AC-15 | U_e | V 240 |
| | | I_e | A 1,5 |
| R300 | DC-13 | U_e | V 250 |
| | | I_e | A 0,1 |
| Terminal capacity | S | mm ² | 0,75 ... 2,5 |
| Tightening torque | | Nm | 1 |



HSV - Auxiliary contact block* HRS - Trip indicating contact block**

HSV 10 - with 1 make contact
 HSV 01 - with 1 break contact
 HRS 10 - with 1 make contact
 HRS 01 - with 1 break contact

| | | | |
|--|----------|-----------------|--------------|
| Rated insulation voltage | U_i | V | 300 |
| Thermal current | I_{th} | A | 1 |
| Electrical rating acc. to IEC/EN 60947-5-1 | | | |
| B300 | AC-15 | U_e | V 240 |
| | | I_e | A 1,5 |
| R300 | DC-13 | U_e | V 125 |
| | | I_e | A 0,22 |
| Terminal capacity | S | mm ² | 0,75 ... 2,5 |
| Tightening torque | | Nm | 1 |



PP - Sealing plate

* HSV contact remains in its normal position when MS32 / MS18 is in OFF or trip position

** HRS contact changes state from its normal position when MS32 / MS18 trip due to overload, short-circuit or manual depression of the TEST lever

UNDER-VOLTAGE RELEASE UR AND SHUNT RELEASE AR



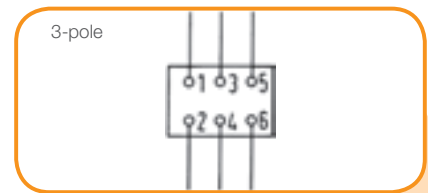
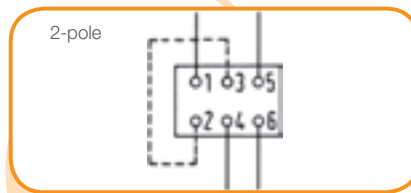
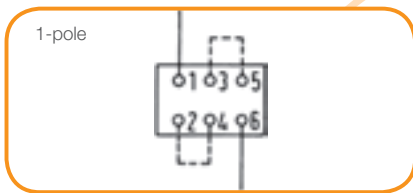
UR - Under-voltage release AR - Shunt release

| | | | |
|-------------------|-------|-----------------|--------------|
| Control voltages | U_c | V | 24 ... 600 |
| Rated frequency | f | Hz | 50 or 60 |
| Terminal capacity | S | mm ² | 0.75 ... 2.5 |
| Tightening torque | | Nm | 1 |

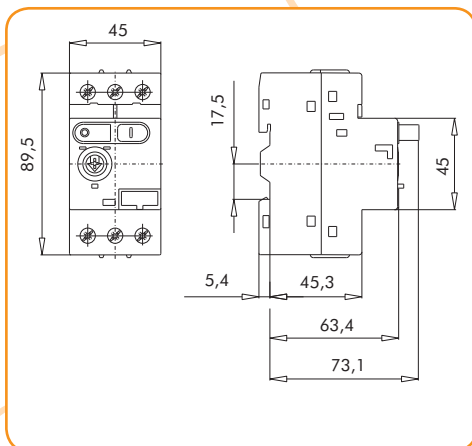
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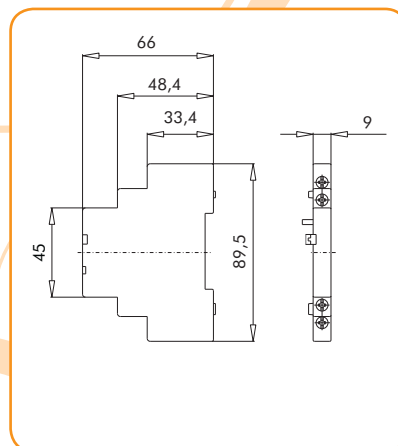
CONNECTION DIAGRAM



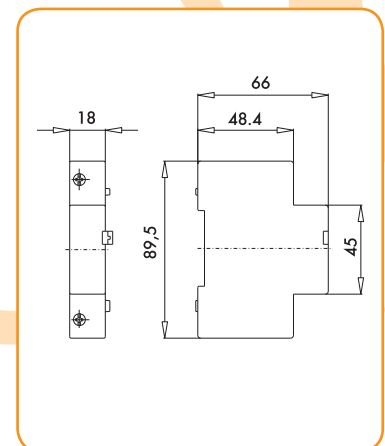
DIMENSIONS



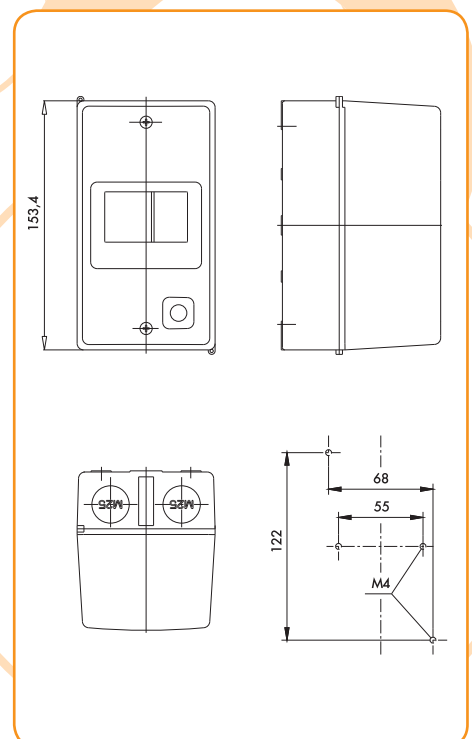
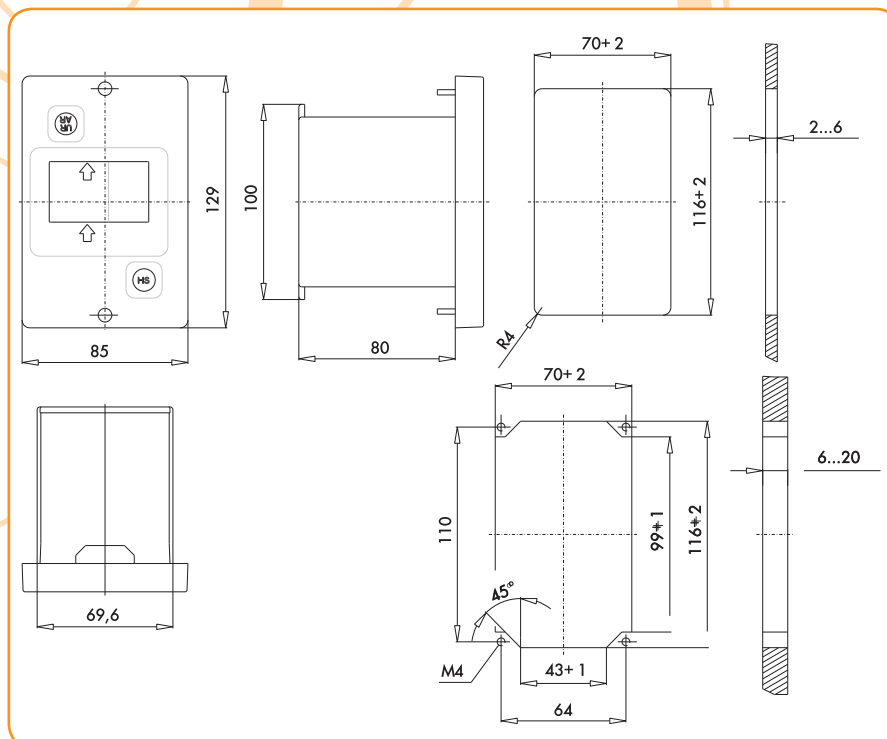
MS32 / MS18, MSB31 / MSB18
Motor protection switch



Auxiliary switch HS



Under-voltage release UR
Shunt release AR

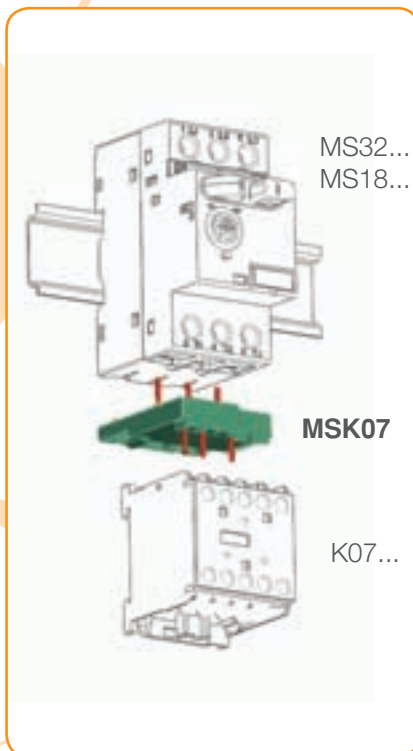


Motor protection switches

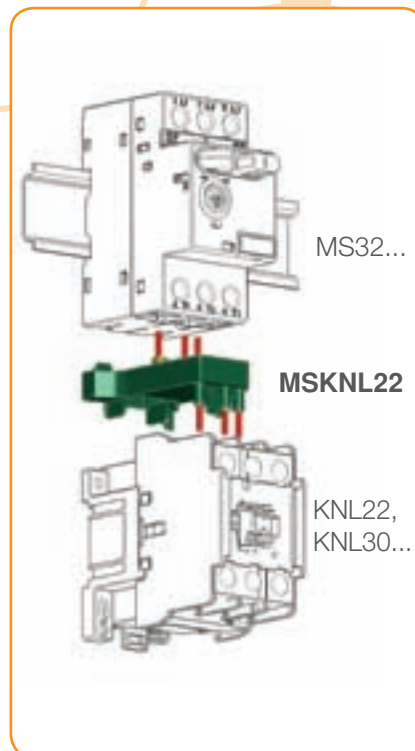
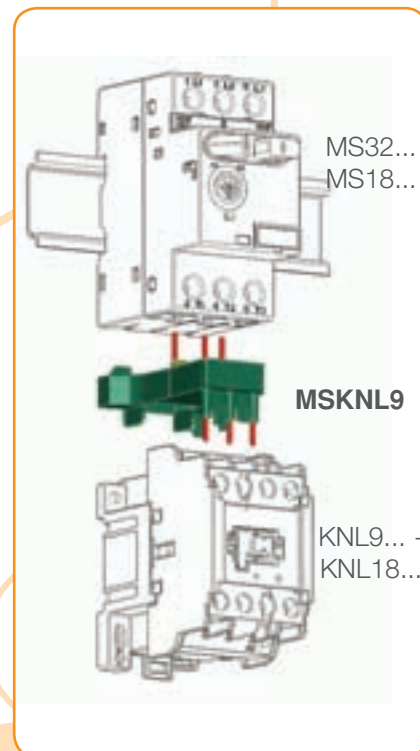
CONNECTION BLOCKS

MSK07, MSKNL9 and MSKNL22 adapters are used for connecting a motor protection switch with a contactor forming a single-unit starter for quick assembly to a 35 mm wide mounting rail (EN 60715).

Adapter for connecting MS32 / MS18 motor protection switch with K07 mini contactor



Adapter for connecting MS32 / MS18 motor protection switch with KNL9-KNL18 contactor



Adapter for connecting MS32 motor protection switch with KNL22, KNL30 contactor