

# 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,<br>IEC/EN 60204, UL 508, CSA 22.2 No.14 |
|                   | Approvals                                                      |  |           |                 | UL                                                                                          |
|                   | Climatic class                                                 |  |           |                 | constant damp heat acc. to IEC 60068-2-78<br>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                                              |  | S         | mm <sup>2</sup> | 0.75 ... 10                                                                                 |
|                   | rigid                                                          |  |           |                 | 0.75 ... 6                                                                                  |
|                   | flexible                                                       |  |           |                 |                                                                                             |
|                   | Screw                                                          |  |           |                 | with self-lifting clamp,<br>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 <sub>e</sub> | V | 690                                                                                                                                                                                                            | 400                                                                                                                                                                                   |
|              | Setting range                                         |                | A | 0.1 - 0.16; 0.16 - 0.25;<br>0.25 - 0.4; 0.4 - 0.63;<br>0.63 - 1; 1 - 1.6; 1.6 - 2.5;<br>2.5 - 4; 4 - 6.3; 6.3 - 10; 9 -<br>14; 13 - 18;<br>17 - 23 (only MS32);<br>20 - 27 (only MS32);<br>25 - 32 (only MS32) | 0.25 - 0.4; 0.4 - 0.63;<br>0.63 - 1; 1 - 1.6; 1.6 - 2.5;<br>2.5 - 4; 4 - 6.3; 6.3 - 10; 9 -<br>14; 13 - 18;<br>17 - 23 (only MSB32);<br>20 - 27 (only MSB32);<br>25 - 32 (only MSB32) |
|              | No. of poles                                          |                |   | 3                                                                                                                                                                                                              |                                                                                                                                                                                       |
|              | Operating current of thermal<br>overload release      | I              |   | 1,05 I <sub>r</sub> < I ≤ 1,20 I <sub>r</sub><br>I <sub>r</sub> ...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<br>230 V<br>240 V | 220 V<br>230 V<br>240 V | 380 V<br>400 V<br>415 V | 440 V         | 500 V         | 660 V<br>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, MSB32, MS18, MSB18

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        |                                                  |       |       |       |
| MS32 – 4    | MS18 - 4    | 55                                             | 100                                                                     | 100      | 100      | 100      | 100      | 100      | 3        | 3        |                                                  |       |       |       |
| 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    |
| MS32 – 14   | MS18 - 14   | 170                                            | 25                                                                      | 12.5     | 25       | 12.5     | 6        | 4.5      | 3        | 2        | 80                                               | 63    | 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<br>$U_e < 400$ 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 push-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

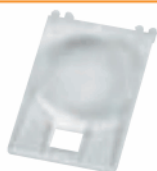
|                                            |          |                 |              |
|--------------------------------------------|----------|-----------------|--------------|
| Rated insulation voltage                   | $U_i$    | V               | 500          |
| Thermal current                            | $I_{th}$ | 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 <sup>2</sup> | 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 <sup>2</sup> | 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



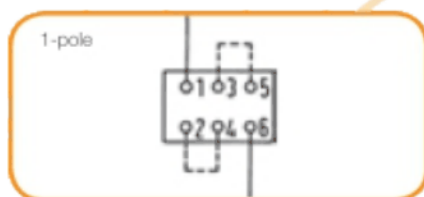
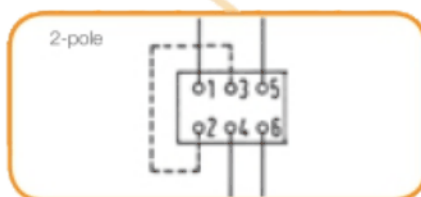
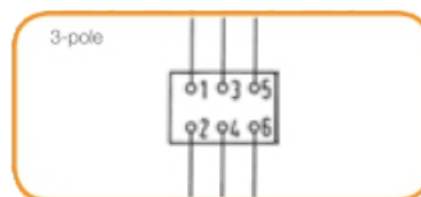
#### UR - Under-voltage release AR - Shunt release

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

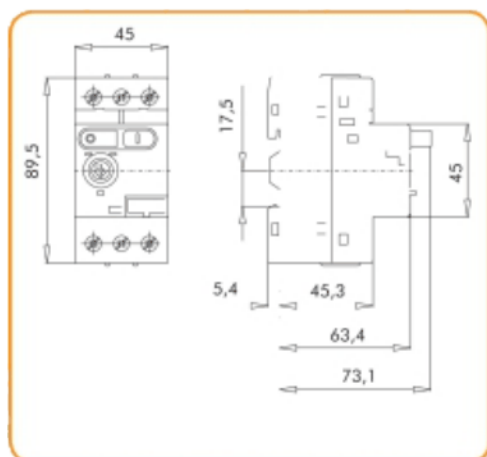
# Motor protection switches

## MS32, MSB32, MS18, MSB18

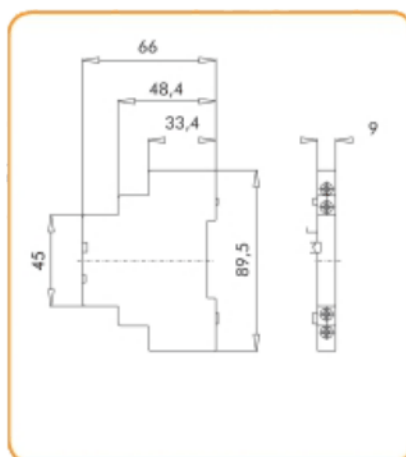
### CONNECTION DIAGRAM



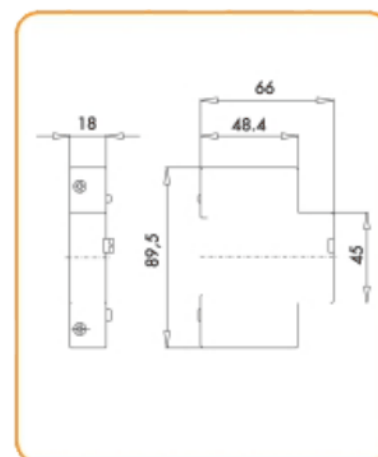
### DIMENSIONS



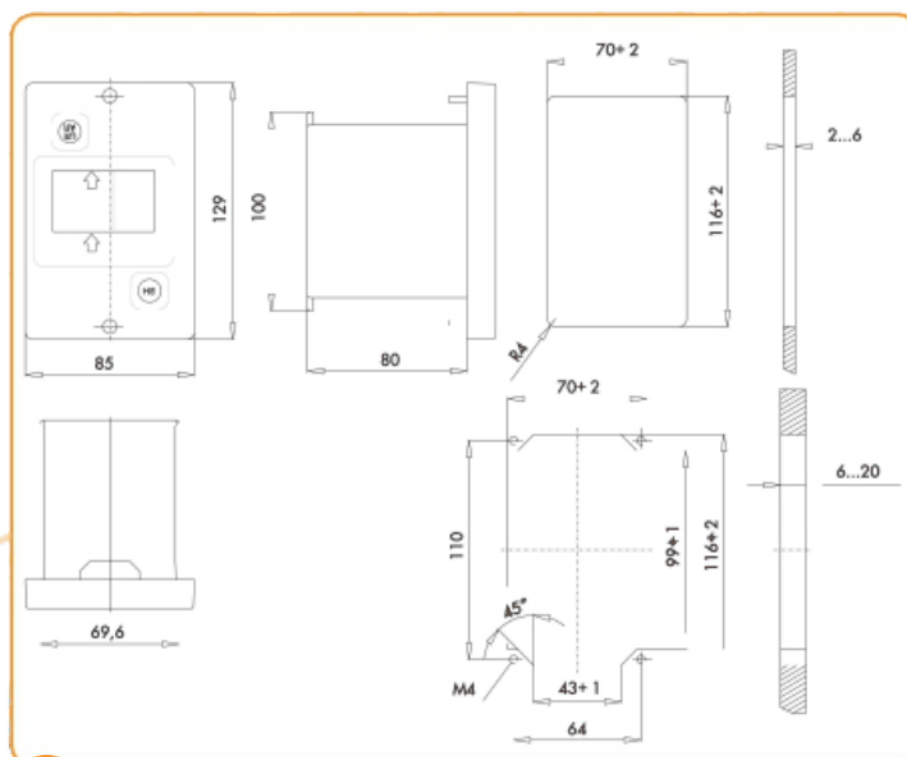
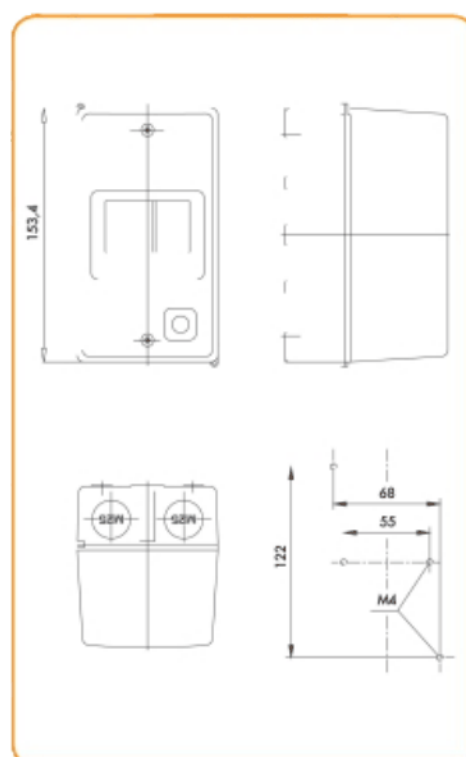
MS32 / MS18, MSB31 / MSB18  
Motor protection switch



Auxiliary switch HS



Under-voltage release UR  
Shunt release AR

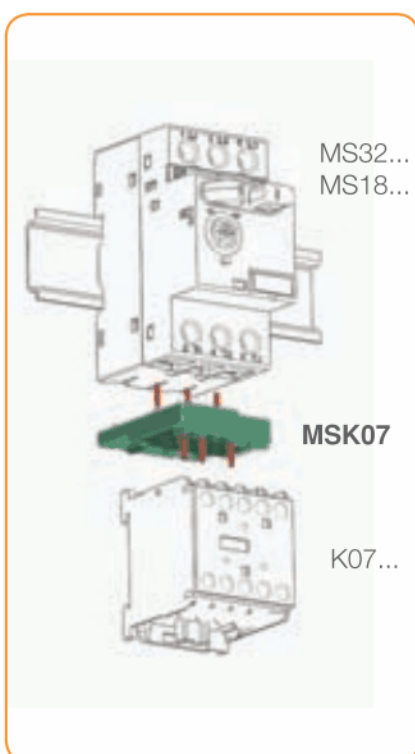


# Motor protection switches

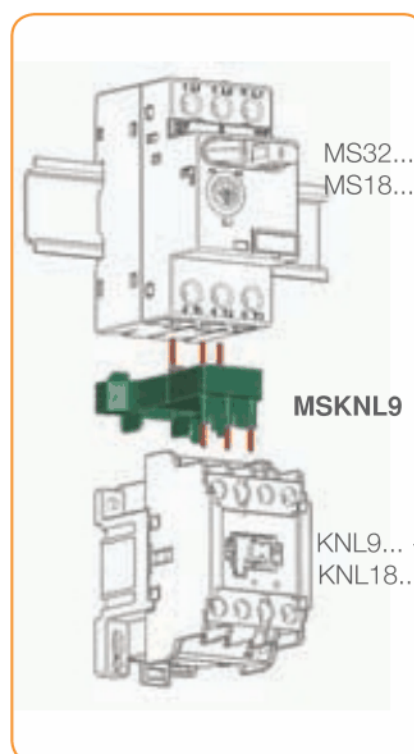
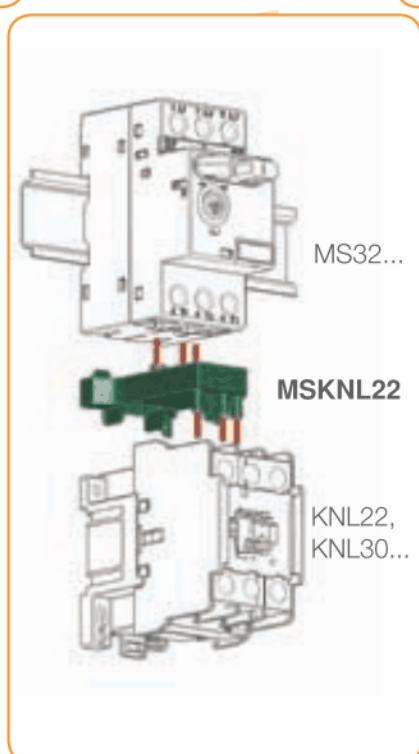
## CONNECTION BLOCKS

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