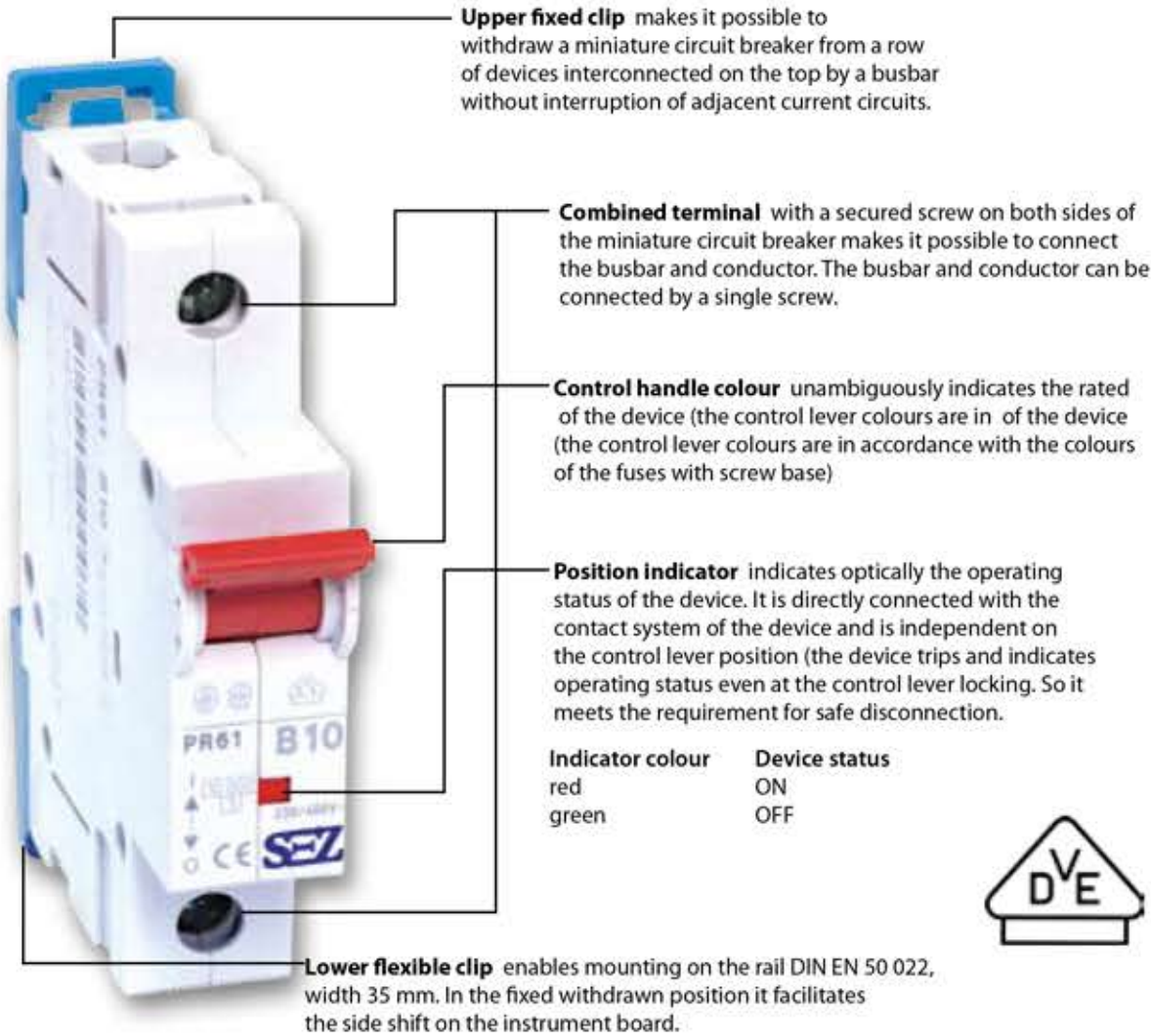


## **Modular DIN – rail equipment**

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| Circuit breakers PR 60                                            | A3  |
| Circuit breakers PR 60 J                                          | A12 |
| Circuit breakers PR 120                                           | A16 |
| Modular switches RV 60, RV 120                                    | A18 |
| Signal lamp RSB, RS                                               | A20 |
| Accessories to PR 60                                              | A21 |
| Residual current circuit breakers PFB and PCHB                    | A27 |
| Residual current circuit breakers with overcurrent protection PFI | A31 |
| Motor protection switches MIS                                     | A34 |
| Accessories to MIS                                                | A36 |
| Multifunction time relay CRM 91 UNI                               | A38 |
| Staircase switch CRM 4                                            | A41 |
| Power relay VS 116 K                                              | A46 |
| Installation contactors IK                                        | A47 |
| Contactors KNL                                                    | A58 |

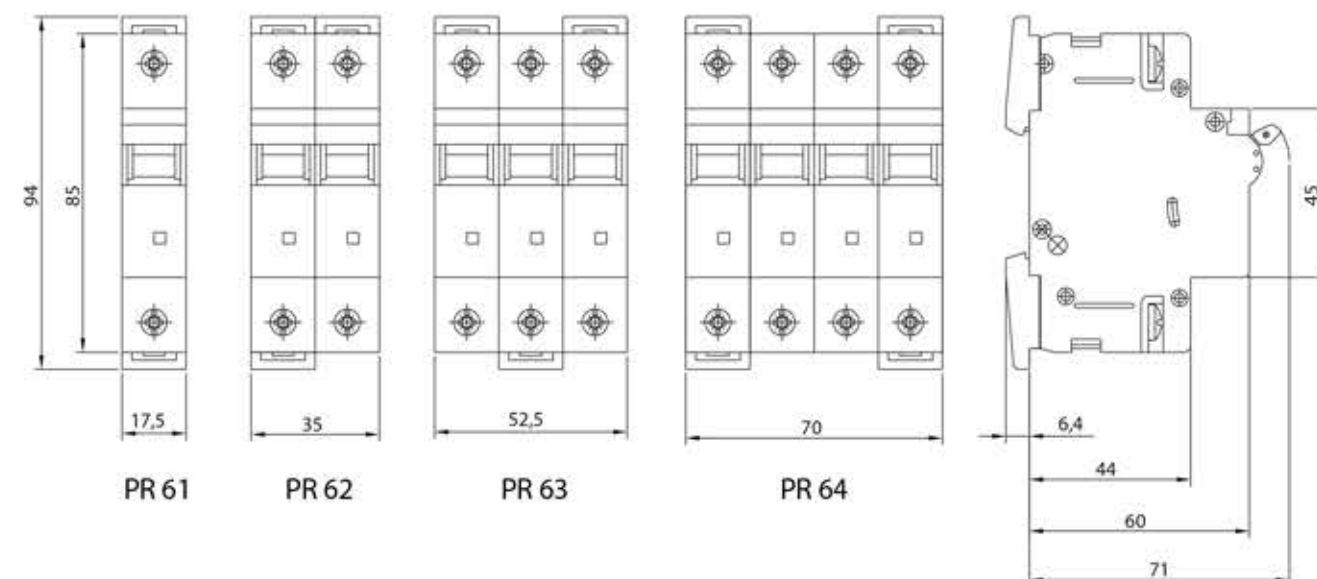
- Circuit breakers PR series are mechanical switching devices able to switch, conduct and switch-off the current under normal conditions and able to switch, conduct and automatically switch-off the current under abnormal circuit conditions such as short circuit.
- They are used to protect house installations and industrial electric distributions and devices against overcurrents.
- They are designed to be operated by untrained persons and they are maintenance-free.
- Handles of circuit breakers characteristic B, C, D are coloured like the rated currents of designation of the threaded fuse cartridges: 0,5-4 A - brown, 6-8 A - red, 16 A - gray, 20 A blue, 25 A - yellow, 32 and 35 A - violet, 40 A - black, 50 A - white, 63 A - orange, M - characteristic circuit breakers have black handles
- There is optical state indicator on the front side of the circuit breaker indicating operation state of the device (green target visible = closed contacts, red target visible = opened contacts). The state indicator is directly connected to the device contact system and it does not depend on the handle position (circuit breaker also can switch-off when the handle is sealed - it is corresponding with safe switch-off conditions)
- MCBs are commonly delivered with identification label of grey colour RAL 7035, placed on the front side above the operating handle intended for direct description. **There is a possibility to order following identification labels:**
  - of grey colour with text (lights, sockets, boilers, heating, main MCB, etc.)
  - of blue colour
  - transparent, under which there is a possibility to put paper labels with dimensions 4,3 x 9,5 mm
- **Simple assembly:**
  - lower flexible clip for fastening to the rail 35 x 7,5 in accordance with EN 60 715 - it allows also to take out circuit breaker from the line of devices together connected by lower busbar strip without interrupting of adjacent current circuits.
  - upper fixed clip - it allows to take out circuit breaker from the line of devices connected together by upper busbar strip
- with two clips for mounting on panel fixed with screws M5.
- Sealable in ON and OFF position.
- There is a possibility to use throughout covers for both terminals (the modular width 17,5 mm) which can be sealed by blinder.
- Connection:
  - conductors 1 – 25 mm<sup>2</sup>
  - busbar strip – top and low terminal allows connecting of pin and fork busbar strip.
  - simultaneous connection of conductors and busbars
- Method of connection: for AC MCBs optional, that means that input and output terminals can be changed. , for DC MCBs, the polarity of terminals has to be observed.



## Technical data

|                                                          |                 |                                                                                           |            |
|----------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|------------|
| Standards                                                |                 | EN 60898-1                                                                                | EN 60947-2 |
| Pole configuration                                       |                 | 1, 1+N, 2, 3, 3+N, 4                                                                      |            |
| Tripping characteristics                                 |                 | B, C, D                                                                                   | M          |
| Rated current I <sub>n</sub>                             | A               | 0,5 - 63                                                                                  | 0,2 - 63   |
| Rated voltage U <sub>n</sub>                             | V               | 230; 230/400; 400                                                                         | 230; 400   |
| Rated insulation voltage U <sub>i</sub>                  | V               | 400                                                                                       |            |
| Rated impulse withstand voltage U <sub>imp</sub>         | V               | 4 000                                                                                     |            |
| Rated DC voltage U <sub>n</sub>                          | V               | max. 60 - (for one pole $\tau = 15\text{ms}$ )                                            |            |
| Rated frequency                                          | Hz              | 50 - 60                                                                                   |            |
| Short circuit breaking capacity                          | kA              | 10                                                                                        |            |
| Selection category                                       |                 | 3                                                                                         |            |
| Ultimate short circuit breaking capacity I <sub>cu</sub> | kA              |                                                                                           | 10         |
| Service short circuit breaking capacity I <sub>cs</sub>  | kA              |                                                                                           | 7,5        |
| Utilization category                                     |                 |                                                                                           | A          |
| Electrical endurance                                     |                 | 4 000 cycles                                                                              |            |
| Mechanical endurance                                     |                 | 100 000 cycles                                                                            |            |
| Terminal capacity                                        | mm <sup>2</sup> | 1 - 25 for Cu wires 2,5 - 25 for Al wires - special Type                                  |            |
| Mounting                                                 |                 | on rail DIN 35x7,5 EN 60 715; on panel                                                    |            |
| Degree of protection                                     |                 | IP 20 IP 40 front                                                                         |            |
| Ambient temperature                                      | °C              | -25 up to +55                                                                             |            |
| Mounting position                                        |                 | optional                                                                                  |            |
| Vibration resistance                                     |                 | 3g (8 - 50 Hz)                                                                            |            |
| Approvals                                                |                 | ESS, ESE, VDE                                                                             | ESS        |
| Accessories                                              |                 | Auxiliary and signal contacts - PKJ, 2PKJ, PKJ+SKJ<br>Shunt trips - VC, undervoltage trip |            |

## Dimensional drawing of PR 60



## Characteristics B

## Characteristics C

## Characteristics D

| Rated current I <sub>n</sub> , A | Type        | Ordering number | Type        | Ordering number | Type        | Ordering number |
|----------------------------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 0,5                              | PR 61-B 0,5 | 0099100         | PR 61-C 0,5 | 0099200         | PR 61-D 0,5 | 0099300         |
| 1                                | PR 61-B 1   | 0099101         | PR 61-C 1   | 0099201         | PR 61-D 1   | 0099301         |
| 2                                | PR 61-B 2   | 0099102         | PR 61-C 2   | 0099202         | PR 61-D 2   | 0099302         |
| 3                                | PR 61-B 3   | 0099103         | PR 61-C 3   | 0099203         | PR 61-D 3   | 0099303         |
| 4                                | PR 61-B 4   | 0099104         | PR 61-C 4   | 0099204         | PR 61-D 4   | 0099304         |
| 6                                | PR 61-B 6   | 0099105         | PR 61-C 6   | 0099205         | PR 61-D 6   | 0099305         |
| 8                                | PR 61-B 8   | 0099106         | PR 61-C 8   | 0099206         | PR 61-D 8   | 0099306         |
| 10                               | PR 61-B 10  | 0099107         | PR 61-C 10  | 0099207         | PR 61-D 10  | 0099307         |
| 13                               | PR 61-B 13  | 0099108         | PR 61-C 13  | 0099208         | PR 61-D 13  | 0099308         |
| 16                               | PR 61-B 16  | 0099109         | PR 61-C 16  | 0099209         | PR 61-D 16  | 0099309         |
| 20                               | PR 61-B 20  | 0099110         | PR 61-C 20  | 0099210         | PR 61-D 20  | 0099310         |
| 25                               | PR 61-B 25  | 0099111         | PR 61-C 25  | 0099211         | PR 61-D 25  | 0099311         |
| 32                               | PR 61-B 32  | 0099112         | PR 61-C 32  | 0099212         | PR 61-D 32  | 0099312         |
| 35                               | PR 61-B 35  | 0099116         | PR 61-C 35  | 0099216         | PR 61-D 35  | 0099316         |
| 40                               | PR 61-B 40  | 0099113         | PR 61-C 40  | 0099213         | PR 61-D 40  | 0099313         |
| 50                               | PR 61-B 50  | 0099114         | PR 61-C 50  | 0099214         | PR 61-D 50  | 0099314         |
| 63                               | PR 61-B 63  | 0099115         | PR 61-C 63  | 0099215         | PR 61-D 63  | 0099315         |
| 0,5                              | PR 62-B 0,5 | 0099120         | PR 62-C 0,5 | 0099220         | PR 62-D 0,5 | 0099320         |
| 1                                | PR 62-B 1   | 0099121         | PR 62-C 1   | 0099221         | PR 62-D 1   | 0099321         |
| 2                                | PR 62-B 2   | 0099122         | PR 62-C 2   | 0099222         | PR 62-D 2   | 0099322         |
| 3                                | PR 62-B 3   | 0099123         | PR 62-C 3   | 0099223         | PR 62-D 3   | 0099323         |
| 4                                | PR 62-B 4   | 0099124         | PR 62-C 4   | 0099224         | PR 62-D 4   | 0099324         |
| 6                                | PR 62-B 6   | 0099125         | PR 62-C 6   | 0099225         | PR 62-D 6   | 0099325         |
| 8                                | PR 62-B 8   | 0099126         | PR 62-C 8   | 0099226         | PR 62-D 8   | 0099326         |
| 10                               | PR 62-B 10  | 0099127         | PR 62-C 10  | 0099227         | PR 62-D 10  | 0099327         |
| 13                               | PR 62-B 13  | 0099128         | PR 62-C 13  | 0099228         | PR 62-D 13  | 0099328         |
| 16                               | PR 62-B 16  | 0099129         | PR 62-C 16  | 0099229         | PR 62-D 16  | 0099329         |
| 20                               | PR 62-B 20  | 0099130         | PR 62-C 20  | 0099230         | PR 62-D 20  | 0099330         |
| 25                               | PR 62-B 25  | 0099131         | PR 62-C 25  | 0099231         | PR 62-D 25  | 0099331         |
| 32                               | PR 62-B 32  | 0099132         | PR 62-C 32  | 0099232         | PR 62-D 32  | 0099332         |
| 35                               | PR 62-B 35  | 0099136         | PR 62-C 35  | 0099236         | PR 62-D 35  | 0099336         |
| 40                               | PR 62-B 40  | 0099133         | PR 62-C 40  | 0099233         | PR 62-D 40  | 0099333         |
| 50                               | PR 62-B 50  | 0099134         | PR 62-C 50  | 0099234         | PR 62-D 50  | 0099334         |
| 63                               | PR 62-B 63  | 0099135         | PR 62-C 63  | 0099235         | PR 62-D 63  | 0099335         |
| 0,5                              | PR 63-B 0,5 | 0099140         | PR 63-C 0,5 | 0099240         | PR 63-D 0,5 | 0099340         |
| 1                                | PR 63-B 1   | 0099141         | PR 63-C 1   | 0099241         | PR 63-D 1   | 0099341         |
| 2                                | PR 63-B 2   | 0099142         | PR 63-C 2   | 0099242         | PR 63-D 2   | 0099342         |
| 3                                | PR 63-B 3   | 0099143         | PR 63-C 3   | 0099243         | PR 63-D 3   | 0099343         |
| 4                                | PR 63-B 4   | 0099144         | PR 63-C 4   | 0099244         | PR 63-D 4   | 0099344         |
| 6                                | PR 63-B 6   | 0099145         | PR 63-C 6   | 0099245         | PR 63-D 6   | 0099345         |
| 8                                | PR 63-B 8   | 0099146         | PR 63-C 8   | 0099246         | PR 63-D 8   | 0099346         |
| 10                               | PR 63-B 10  | 0099147         | PR 63-C 10  | 0099247         | PR 63-D 10  | 0099347         |
| 13                               | PR 63-B 13  | 0099148         | PR 63-C 13  | 0099248         | PR 63-D 13  | 0099348         |
| 16                               | PR 63-B 16  | 0099149         | PR 63-C 16  | 0099249         | PR 63-D 16  | 0099349         |
| 20                               | PR 63-B 20  | 0099150         | PR 63-C 20  | 0099250         | PR 63-D 20  | 0099350         |
| 25                               | PR 63-B 25  | 0099151         | PR 63-C 25  | 0099251         | PR 63-D 25  | 0099351         |
| 32                               | PR 63-B 32  | 0099152         | PR 63-C 32  | 0099252         | PR 63-D 32  | 0099352         |
| 35                               | PR 63-B 35  | 0099156         | PR 63-C 35  | 0099256         | PR 63-D 35  | 0099356         |
| 40                               | PR 63-B 40  | 0099153         | PR 63-C 40  | 0099253         | PR 63-D 40  | 0099353         |
| 50                               | PR 63-B 50  | 0099154         | PR 63-C 50  | 0099254         | PR 63-D 50  | 0099354         |
| 63                               | PR 63-B 63  | 0099155         | PR 63-C 63  | 0099255         | PR 63-D 63  | 0099355         |
| 0,5                              | PR 64-B 0,5 | 0099700         | PR 64-C 0,5 | 0099720         | PR 64-D 0,5 | 0099740         |
| 1                                | PR 64-B 1   | 0099701         | PR 64-C 1   | 0099721         | PR 64-D 1   | 0099741         |
| 2                                | PR 64-B 2   | 0099702         | PR 64-C 2   | 0099722         | PR 64-D 2   | 0099742         |
| 3                                | PR 64-B 3   | 0099703         | PR 64-C 3   | 0099723         | PR 64-D 3   | 0099743         |
| 4                                | PR 64-B 4   | 0099704         | PR 64-C 4   | 0099724         | PR 64-D 4   | 0099744         |
| 6                                | PR 64-B 6   | 0099705         | PR 64-C 6   | 0099725         | PR 64-D 6   | 0099745         |
| 8                                | PR 64-B 8   | 0099706         | PR 64-C 8   | 0099726         | PR 64-D 8   | 0099746         |
| 10                               | PR 64-B 10  | 0099707         | PR 64-C 10  | 0099727         | PR 64-D 10  | 0099747         |
| 13                               | PR 64-B 13  | 0099708         | PR 64-C 13  | 0099728         | PR 64-D 13  | 0099748         |
| 16                               | PR 64-B 16  | 0099709         | PR 64-C 16  | 0099729         | PR 64-D 16  | 0099749         |
| 20                               | PR 64-B 20  | 0099710         | PR 64-C 20  | 0099730         | PR 64-D 20  | 0099750         |
| 25                               | PR 64-B 25  | 0099711         | PR 64-C 25  | 0099731         | PR 64-D 25  | 0099751         |
| 32                               | PR 64-B 32  | 0099712         | PR 64-C 32  | 0099732         | PR 64-D 32  | 0099752         |
| 35                               | PR 64-B 35  | 0099716         | PR 64-C 35  | 0099736         | PR 64-D 35  | 0099756         |
| 40                               | PR 64-B 40  | 0099713         | PR 64-C 40  | 0099733         | PR 64-D 40  | 0099753         |
| 50                               | PR 64-B 50  | 0099714         | PR 64-C 50  | 0099734         | PR 64-D 50  | 0099754         |
| 63                               | PR 64-B 63  | 0099715         | PR 64-C 63  | 0099735         | PR 64-D 63  | 0099755         |

Scheme



1 - pole

Scheme



2 - pole

Scheme



3 - pole

Scheme



4 - pole

## Characteristics M

| Rated current $I_n$ , A | Type        | Ordering code |
|-------------------------|-------------|---------------|
| 0,2                     | PR 61-M 0,2 | 0099400       |
| 0,3                     | PR 61-M 0,3 | 0099401       |
| 0,4                     | PR 61-M 0,4 | 0099402       |
| 0,6                     | PR 61-M 0,6 | 0099403       |
| 0,8                     | PR 61-M 0,8 | 0099404       |
| 1,2                     | PR 61-M 1,2 | 0099405       |
| 2                       | PR 61-M 2   | 0099406       |
| 3                       | PR 61-M 3   | 0099407       |
| 4,2                     | PR 61-M 4,2 | 0099408       |
| 6                       | PR 61-M 6   | 0099409       |
| 8                       | PR 61-M 8   | 0099410       |
| 10                      | PR 61-M 10  | 0099411       |
| 12                      | PR 61-M 12  | 0099412       |
| 14                      | PR 61-M 14  | 0099413       |
| 17                      | PR 61-M 17  | 0099414       |
| 21                      | PR 61-M 21  | 0099415       |
| 25                      | PR 61-M 25  | 0099416       |
| 32                      | PR 61-M 32  | 0099417       |
| 40                      | PR 61-M 40  | 0099418       |
| 50                      | PR 61-M 50  | 0099419       |
| 63                      | PR 61-M 63  | 0099420       |
| 0,2                     | PR 62-M 0,2 | 0099425       |
| 0,3                     | PR 62-M 0,3 | 0099426       |
| 0,4                     | PR 62-M 0,4 | 0099427       |
| 0,6                     | PR 62-M 0,6 | 0099428       |
| 0,8                     | PR 62-M 0,8 | 0099429       |
| 1,2                     | PR 62-M 1,2 | 0099430       |
| 2                       | PR 62-M 2   | 0099431       |
| 3                       | PR 62-M 3   | 0099432       |
| 4,2                     | PR 62-M 4,2 | 0099433       |
| 6                       | PR 62-M 6   | 0099434       |
| 8                       | PR 62-M 8   | 0099435       |
| 10                      | PR 62-M 10  | 0099436       |
| 12                      | PR 62-M 12  | 0099437       |
| 14                      | PR 62-M 14  | 0099438       |
| 17                      | PR 62-M 17  | 0099439       |
| 21                      | PR 62-M 21  | 0099440       |
| 25                      | PR 62-M 25  | 0099441       |
| 32                      | PR 62-M 32  | 0099442       |
| 40                      | PR 62-M 40  | 0099443       |
| 50                      | PR 62-M 50  | 0099444       |
| 63                      | PR 62-M 63  | 0099445       |
| 0,2                     | PR 63-M 0,2 | 0099450       |
| 0,3                     | PR 63-M 0,3 | 0099451       |
| 0,4                     | PR 63-M 0,4 | 0099452       |
| 0,6                     | PR 63-M 0,6 | 0099453       |
| 0,8                     | PR 63-M 0,8 | 0099454       |
| 1,2                     | PR 63-M 1,2 | 0099455       |
| 2                       | PR 63-M 2   | 0099456       |
| 3                       | PR 63-M 3   | 0099457       |
| 4,2                     | PR 63-M 4,2 | 0099458       |
| 6                       | PR 63-M 6   | 0099459       |
| 8                       | PR 63-M 8   | 0099460       |
| 10                      | PR 63-M 10  | 0099461       |
| 12                      | PR 63-M 12  | 0099462       |
| 14                      | PR 63-M 14  | 0099463       |
| 17                      | PR 63-M 17  | 0099464       |
| 21                      | PR 63-M 21  | 0099465       |
| 25                      | PR 63-M 25  | 0099466       |
| 32                      | PR 63-M 32  | 0099467       |
| 40                      | PR 63-M 40  | 0099468       |
| 50                      | PR 63-M 50  | 0099469       |
| 63                      | PR 63-M 63  | 0099470       |

Scheme



1 - pole

Scheme



2 - pole

Scheme



3 - pole

Internal impedances, power losses, loop impedances and rated currents corrections of the PR60 circuit-breakers.

| R. curr.<br>$I_n$ (A) | Internal impedance   |                  | Power losses        |                 | Maximum impedance of fault loop |                 |                   | Rated currents correction at the ambient air temperature from -20°C to +60°C. |       |      |      |      |      |      |      |      |
|-----------------------|----------------------|------------------|---------------------|-----------------|---------------------------------|-----------------|-------------------|-------------------------------------------------------------------------------|-------|------|------|------|------|------|------|------|
|                       | char.B,C,D<br>Z (mΩ) | char.M<br>Z (mΩ) | char.B,C,D<br>P (W) | char.M<br>P (W) | char.B<br>Z (Ω)                 | char.C<br>Z (Ω) | char.D,M<br>Z (Ω) | -20°C                                                                         | -10°C | 0°C  | 10°C | 20°C | 30°C | 40°C | 50°C | 60°C |
| 0,2                   |                      | 45100            |                     | 1,8             | 230,0                           | 127,8           | 71,9              | 0,24                                                                          | 0,24  | 0,23 | 0,22 | 0,21 | 0,2  | 0,19 | 0,18 | 0,17 |
| 0,3                   |                      | 19500            |                     | 1,8             | 153,3                           | 85,2            | 47,9              | 0,36                                                                          | 0,35  | 0,34 | 0,33 | 0,32 | 0,3  | 0,28 | 0,26 | 0,25 |
| 0,4                   |                      | 10650            |                     | 1,7             | 115,0                           | 63,9            | 35,9              | 0,48                                                                          | 0,47  | 0,46 | 0,44 | 0,42 | 0,4  | 0,37 | 0,35 | 0,33 |
| 0,5                   | 6600                 |                  | 1,7                 |                 | 92,0                            | 51,1            | 28,8              | 0,61                                                                          | 0,59  | 0,57 | 0,55 | 0,53 | 0,5  | 0,47 | 0,44 | 0,42 |
| 0,6                   |                      | 4300             |                     | 1,5             | 76,7                            | 42,6            | 24,0              | 0,73                                                                          | 0,71  | 0,68 | 0,66 | 0,63 | 0,6  | 0,56 | 0,53 | 0,50 |
| 0,8                   |                      | 3100             | 2,0                 |                 | 57,5                            | 31,9            | 18,0              | 0,97                                                                          | 0,94  | 0,91 | 0,88 | 0,84 | 0,8  | 0,74 | 0,70 | 0,67 |
| 1                     | 1650                 |                  | 1,7                 |                 | 46,0                            | 25,6            | 14,4              | 1,21                                                                          | 1,18  | 1,14 | 1,10 | 1,05 | 1,0  | 0,93 | 0,88 | 0,83 |
| 1,2                   |                      | 1350             |                     | 1,9             | 38,3                            | 21,3            | 12,0              | 1,45                                                                          | 1,42  | 1,37 | 1,32 | 1,26 | 1,2  | 1,12 | 1,06 | 1,00 |
| 2                     | 370                  | 490              | 1,5                 | 2,0             | 23,0                            | 12,8            | 7,2               | 2,42                                                                          | 2,36  | 2,28 | 2,20 | 2,10 | 2,0  | 1,86 | 1,76 | 1,67 |
| 3                     | 210                  | 230              | 1,9                 | 2,1             | 15,3                            | 8,5             | 4,8               | 3,63                                                                          | 3,54  | 3,42 | 3,30 | 3,15 | 3,0  | 2,79 | 2,64 | 2,50 |
| 4                     | 126                  |                  | 2,0                 |                 | 11,5                            | 6,4             | 3,6               | 4,84                                                                          | 4,72  | 4,56 | 4,40 | 4,20 | 4,0  | 3,72 | 3,52 | 3,33 |
| 4,2                   |                      | 120              |                     | 2,1             | 11,0                            | 6,1             | 3,4               | 5,1                                                                           | 5,0   | 4,8  | 4,6  | 4,4  | 4,2  | 3,9  | 3,7  | 3,5  |
| 6                     | 51                   | 69               | 1,8                 | 2,5             | 7,7                             | 4,3             | 2,4               | 7,3                                                                           | 7,1   | 6,8  | 6,6  | 6,3  | 6    | 5,6  | 5,3  | 5,0  |
| 8                     | 21                   | 35               | 1,3                 | 2,2             | 5,8                             | 3,2             | 1,8               | 9,7                                                                           | 9,4   | 9,1  | 8,8  | 8,4  | 8    | 7,4  | 7,0  | 6,7  |
| 10                    | 14,8                 | 23,5             | 1,5                 | 2,4             | 4,6                             | 2,6             | 1,4               | 12,1                                                                          | 11,8  | 11,4 | 11,0 | 10,5 | 10   | 9,3  | 8,8  | 8,3  |
| 12                    |                      | 18,7             |                     | 2,7             | 3,8                             | 2,1             | 1,2               | 14,5                                                                          | 14,2  | 13,7 | 13,2 | 12,6 | 12   | 11,2 | 10,6 | 10,0 |
| 13                    | 11,3                 |                  | 1,9                 |                 | 3,5                             | 2,0             | 1,1               | 15,7                                                                          | 15,3  | 14,8 | 14,3 | 13,7 | 13   | 12,1 | 11,5 | 10,8 |
| 14                    |                      | 12,4             |                     | 2,4             | 3,3                             | 1,8             | 1,0               | 16,9                                                                          | 16,5  | 16,0 | 15,4 | 14,7 | 14   | 13,0 | 12,3 | 11,7 |
| 16                    | 7,5                  |                  | 1,9                 |                 | 2,9                             | 1,6             | 0,9               | 19,4                                                                          | 18,9  | 18,2 | 17,6 | 16,8 | 16   | 14,9 | 14,1 | 13,3 |
| 17                    |                      | 8,6              |                     | 2,5             | 2,7                             | 1,5             | 0,8               | 20,6                                                                          | 20,1  | 19,4 | 18,7 | 17,9 | 17   | 15,8 | 15,0 | 14,2 |
| 20                    | 6,3                  |                  | 2,5                 |                 | 2,3                             | 1,3             | 0,7               | 24,2                                                                          | 23,6  | 22,8 | 22,0 | 21,0 | 20   | 18,6 | 17,6 | 16,7 |
| 21                    |                      | 7,1              |                     | 3,1             | 2,2                             | 1,2             | 0,7               | 25,4                                                                          | 24,8  | 23,9 | 23,1 | 22,1 | 21   | 19,5 | 18,5 | 17,5 |
| 25                    | 4,4                  | 4,6              | 2,8                 | 2,9             | 1,8                             | 1,0             | 0,6               | 30,3                                                                          | 29,5  | 28,5 | 27,5 | 26,3 | 25   | 23,3 | 22,0 | 20,8 |
| 32                    | 3,1                  | 3,6              | 3,2                 | 3,7             | 1,4                             | 0,8             | 0,4               | 38,7                                                                          | 37,8  | 36,5 | 35,2 | 33,6 | 32   | 29,8 | 28,2 | 26,7 |
| 35                    | 3,1                  | 3,6              | 3,8                 | 4,4             | 1,3                             | 0,7             | 0,4               | 42,3                                                                          | 41,3  | 39,9 | 38,5 | 36,8 | 35   | 32,6 | 30,8 | 29,2 |
| 40                    | 2,5                  | 3                | 4,0                 | 4,8             | 1,2                             | 0,6             | 0,4               | 48,4                                                                          | 47,2  | 45,6 | 44,0 | 42,0 | 40   | 37,2 | 35,2 | 33,3 |
| 50                    | 2,2                  | 2,4              | 5,5                 | 6,0             | 0,9                             | 0,5             | 0,3               | 60,5                                                                          | 59,0  | 57,0 | 55,0 | 52,5 | 50   | 46,5 | 44,1 | 41,7 |
| 63                    | 1,6                  | 1,8              | 6,4                 | 7,1             | 0,7                             | 0,4             | 0,2               | 76,2                                                                          | 74,3  | 71,8 | 69,3 | 66,2 | 63   | 58,6 | 55,5 | 52,5 |

## Instantaneous tripping characteristics

(according to EN 60 898-1, EN 60 947-2)

B - for protection of electrical circuits with equipment, which do not cause currents surges (protection of lines)

C - for protection of electrical circuits with equipment, which cause currents surges (illuminaires groups, installations with motors)

D - for protection of electrical circuits with equipment, which cause high currents surges (installations comprising motors, transformers and inductances)

M - for protection of motors in relation to current rating

| Instantaneous tripping characteristics | thermal release test current |                     | tripping time<br>t | electromagnetic release test current |                   | tripping time<br>t |
|----------------------------------------|------------------------------|---------------------|--------------------|--------------------------------------|-------------------|--------------------|
|                                        | I1                           | I2                  |                    | I4                                   | I5                |                    |
| B                                      | 1,13.I <sub>n</sub>          |                     | ≥ 1                | 3.I <sub>n</sub>                     |                   | ≥ 0,1s             |
|                                        |                              | 1,45.I <sub>n</sub> | < 1                |                                      | 5.I <sub>n</sub>  | < 0,1 s            |
| C                                      | 1,13.I <sub>n</sub>          |                     | ≥ 1                | 5.I <sub>n</sub>                     |                   | ≥ 0,1 s            |
|                                        |                              | 1,45.I <sub>n</sub> | < 1                |                                      | 10.I <sub>n</sub> | < 0,1 s            |
| D                                      | 1,13.I <sub>n</sub>          |                     | ≥ 1                | 10.I <sub>n</sub>                    |                   | ≥ 0,1 s            |
|                                        |                              | 1,45.I <sub>n</sub> | < 1                |                                      | 20.I <sub>n</sub> | < 0,1 s            |
| M                                      | 1,05.I <sub>n</sub>          |                     | ≥ 1                | 10.I <sub>n</sub>                    |                   | ≥ 0,1 s            |
|                                        |                              | 1,3.I <sub>n</sub>  | < 1                |                                      | 16.I <sub>n</sub> | < 0,1 s            |

|                          |                                  |                           |               |                           |                 |
|--------------------------|----------------------------------|---------------------------|---------------|---------------------------|-----------------|
| Characteristics B, C, D: | For I3 = 2,55.I <sub>n</sub> is: | for I <sub>n</sub> ≤ 32 A | 1s < t < 60 s | for I <sub>n</sub> > 32 A | 1s < t < 120 s  |
| Characteristics M:       | For I3 = 7.I <sub>n</sub> is:    | for I <sub>n</sub> < 10 A | 2s < t < 8 s  | for I <sub>n</sub> ≥ 10 A | 0,3 s < t < 4 s |

## Influence of frequency on magnetic trip:

|              |    |    |      |
|--------------|----|----|------|
| Frequency Hz | 16 | 50 | 400  |
| Coefficient  | 1  | 1  | 1,45 |

Corresponding amper rates, at which the magnetic trip starts to work, has to be multiplied by this coefficient.

## Selectivity of miniature circuit breakers PR 60

Selectivity of miniature circuit breakers PR 60 of characteristic B with backup fuses [kA]

| PR 60     | NH gG |     |     |     |     |     |     |     |
|-----------|-------|-----|-----|-----|-----|-----|-----|-----|
| $I_n$ (A) | 20    | 25  | 32  | 40  | 50  | 63  | 80  | 100 |
| ≤1        | 0,5   | 1,1 | 5   | 10  | 10  | 10  | 10  | 10  |
| 2         | 0,5   | 0,9 | 2,5 | 10  | 10  | 10  | 10  | 10  |
| 4         | 0,5   | 0,8 | 1,3 | 4,8 | 6   | 10  | 10  | 10  |
| 6         | 0,5   | 0,8 | 1,1 | 2,5 | 3,5 | 5   | 8   | 10  |
| 8         | 0,5   | 0,7 | 1   | 2   | 2,3 | 3   | 6   | 10  |
| 10        | 0,5   | 0,7 | 0,9 | 1,8 | 2,1 | 2,7 | 5   | 8,5 |
| 13        | 0,5   | 0,6 | 0,8 | 1,6 | 2   | 2,6 | 4,2 | 7   |
| 16        |       | 0,6 | 0,8 | 1,5 | 1,9 | 2,5 | 3,8 | 6,5 |
| 20        |       | 0,5 | 0,7 | 1,4 | 1,8 | 2,4 | 3,6 | 6,1 |
| 25        |       |     | 0,7 | 1,3 | 1,8 | 2,3 | 3,4 | 5,8 |
| 32        |       |     |     | 1,2 | 1,7 | 2,2 | 3,3 | 5,3 |
| 40        |       |     |     |     |     | 2,1 | 3,2 | 5,1 |
| 50        |       |     |     |     |     | 2   | 3   | 4,8 |
| 63        |       |     |     |     |     |     |     | 4,5 |

| PR 60     | PV gG |     |     |     |     |     |     |     |
|-----------|-------|-----|-----|-----|-----|-----|-----|-----|
| $I_n$ (A) | 20    | 25  | 32  | 40  | 50  | 63  | 80  | 100 |
| ≤1        | 0,5   | 7   | 10  | 10  | 10  | 10  | 10  | 10  |
| 2         |       | 3   | 9   | 10  | 10  | 10  | 10  | 10  |
| 4         |       | 2   | 6   | 6,5 | 8   | 10  | 10  | 10  |
| 6         |       | 1,8 | 4,5 | 5,1 | 6,2 | 10  | 10  | 10  |
| 8         |       | 1,5 | 3,6 | 4,4 | 5,3 | 10  | 10  | 10  |
| 10        |       | 1   | 3   | 3,8 | 4,7 | 8,5 | 10  | 10  |
| 13        |       |     | 2,2 | 3,5 | 4,1 | 6,8 | 7,8 | 10  |
| 16        |       |     | 1,4 | 3,1 | 3,7 | 5,5 | 6,6 | 10  |
| 20        |       |     |     | 2,9 | 3,4 | 4,7 | 5,9 | 8,8 |
| 25        |       |     |     |     | 3,1 | 4,3 | 5,4 | 7,8 |
| 32        |       |     |     |     |     | 4   | 5   | 7   |
| 40        |       |     |     |     |     | 3,8 | 4,6 | 6,3 |
| 50        |       |     |     |     |     | 1,2 | 4,4 | 6   |
| 63        |       |     |     |     |     |     | 4,2 | 5,6 |

Selectivity of miniature circuit breakers PR 60 of characteristic C with backup fuses [kA]

| PR 60     | NH gG |     |     |     |     |     |     |     |
|-----------|-------|-----|-----|-----|-----|-----|-----|-----|
| $I_n$ (A) | 20    | 25  | 32  | 40  | 50  | 63  | 80  | 100 |
| ≤1        | 0,5   | 1,3 | 10  | 10  | 10  | 10  | 10  | 10  |
| 2         | 0,5   | 0,9 | 3,5 | 10  | 10  | 10  | 10  | 10  |
| 4         | 0,5   | 0,8 | 2,5 | 3   | 3,5 | 5   | 10  | 10  |
| 6         | 0,5   | 0,8 | 1   | 2   | 2,3 | 3   | 8   | 10  |
| 8         | 0,5   | 0,8 | 0,9 | 1,6 | 2   | 2,7 | 6   | 8,5 |
| 10        |       | 0,7 | 0,8 | 1,5 | 1,9 | 2,6 | 5   | 7   |
| 13        |       |     | 0,8 | 1,4 | 1,8 | 2,5 | 4,2 | 6,5 |
| 16        |       |     |     | 1,3 | 1,7 | 2,4 | 3,8 | 6,1 |
| 20        |       |     |     | 1,2 | 1,6 | 2,3 | 3,6 | 5,8 |
| 25        |       |     |     |     | 1,5 | 2,2 | 3,4 | 5,3 |
| 32        |       |     |     |     |     | 2,1 | 3,3 | 5,1 |
| 40        |       |     |     |     |     | 2   | 3,1 | 4,8 |
| 50        |       |     |     |     |     |     |     | 4,5 |
| 63        |       |     |     |     |     |     |     |     |

| PR 60     | PV gG |     |     |     |     |     |     |     |
|-----------|-------|-----|-----|-----|-----|-----|-----|-----|
| $I_n$ (A) | 20    | 25  | 32  | 40  | 50  | 63  | 80  | 100 |
| ≤1        | 0,5   | 7   | 10  | 10  | 10  | 10  | 10  | 10  |
| 2         | 0,5   | 4   | 7   | 10  | 10  | 10  | 10  | 10  |
| 4         |       | 2,5 | 5   | 6,5 | 10  | 10  | 10  | 10  |
| 6         |       | 1,8 | 4,2 | 5,1 | 7   | 10  | 10  | 10  |
| 8         |       | 1,2 | 3,6 | 4,4 | 5,6 | 10  | 10  | 10  |
| 10        |       |     | 3   | 3,8 | 4,7 | 10  | 10  | 10  |
| 13        |       |     | 2,2 | 3,5 | 4,1 | 7   | 10  | 10  |
| 16        |       |     | 1,4 | 3,1 | 3,7 | 5,5 | 10  | 10  |
| 20        |       |     |     | 2,9 | 3,4 | 4,7 | 10  | 10  |
| 25        |       |     |     |     | 3,1 | 4,3 | 10  | 10  |
| 32        |       |     |     |     |     | 4   | 6   | 10  |
| 40        |       |     |     |     |     |     | 4,6 | 10  |
| 50        |       |     |     |     |     |     | 4,4 | 7   |
| 63        |       |     |     |     |     |     |     | 5,6 |

Selectivity of miniature circuit breakers PR 60 of characteristic D with backup fuses [kA]

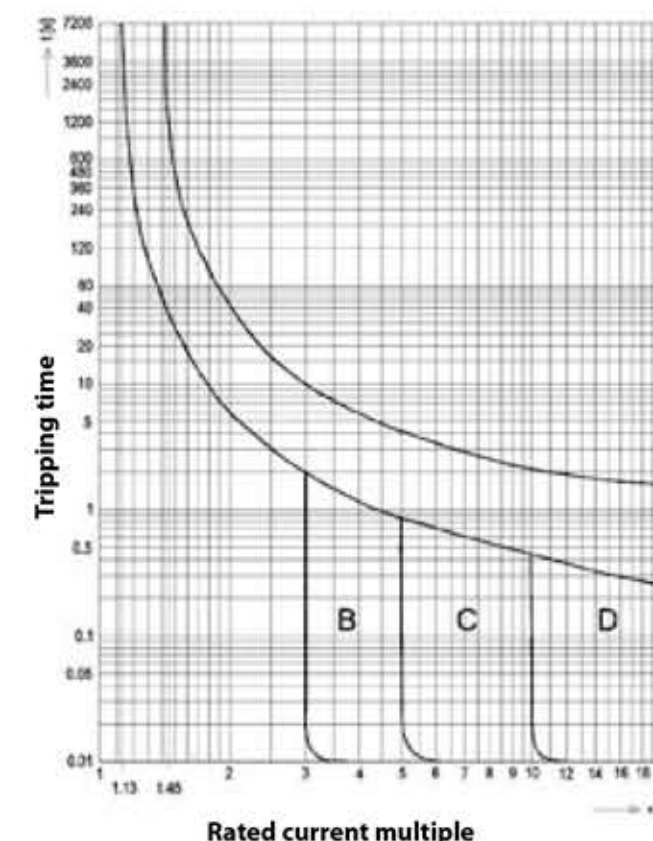
| PR 60     | NH gG |     |     |     |     |     |     |     |
|-----------|-------|-----|-----|-----|-----|-----|-----|-----|
| $I_n$ (A) | 20    | 25  | 32  | 40  | 50  | 63  | 80  | 100 |
| ≤1        | 5     | 8   | 10  | 10  | 10  | 10  | 10  | 10  |
| 2         | 1,7   | 2   | 5   | 10  | 10  | 10  | 10  | 10  |
| 4         | 0,7   | 1,1 | 2   | 3   | 3,5 | 5,1 | 10  | 10  |
| 6         | 0,6   | 1   | 1,4 | 2   | 2,4 | 3,5 | 7,5 | 10  |
| 8         | 0,5   | 0,9 | 1,2 | 1,6 | 2,1 | 2,7 | 5   | 10  |
| 10        | 0,5   | 0,8 | 1   | 1,5 | 2   | 2,6 | 4,5 | 10  |
| 13        |       | 0,7 | 0,9 | 1,4 | 1,9 | 2,5 | 4,1 | 8   |
| 16        |       | 0,6 | 0,8 | 1,3 | 1,7 | 2,4 | 3,8 | 6,1 |
| 20        |       |     | 0,5 | 1,2 | 1,6 | 2,3 | 3,6 | 5,8 |
| 25        |       |     |     | 1,1 | 1,5 | 2,2 | 3,4 | 5,3 |
| 32        |       |     |     |     | 1,4 | 2,1 | 3,3 | 5,1 |
| 40        |       |     |     |     |     | 1,9 | 3,1 | 4,8 |
| 50        |       |     |     |     |     |     | 2,5 | 4,5 |
| 63        |       |     |     |     |     |     |     | 4   |

| PR 60     | PV gG |     |     |     |     |     |    |     |
|-----------|-------|-----|-----|-----|-----|-----|----|-----|
| $I_n$ (A) | 20    | 25  | 32  | 40  | 50  | 63  | 80 | 100 |
| ≤1        | 0,5   | 7   | 10  | 10  | 10  | 10  | 10 | 10  |
| 2         | 0,5   | 4   | 8   | 10  | 10  | 10  | 10 | 10  |
| 4         |       | 2,5 | 5   | 7   | 10  | 10  | 10 | 10  |
| 6         |       | 1,8 | 3   | 5   | 7   | 10  | 10 | 10  |
| 8         |       | 1,2 | 1,5 | 2,5 | 5,6 | 10  | 10 | 10  |
| 10        |       |     |     |     | 4,7 | 10  | 10 | 10  |
| 13        |       |     |     |     | 3,8 | 7   | 10 | 10  |
| 16        |       |     |     |     | 2,6 | 6   | 10 | 10  |
| 20        |       |     |     |     |     | 5,5 | 10 | 10  |
| 25        |       |     |     |     |     | 5   | 10 | 10  |
| 32        |       |     |     |     |     |     | 6  | 10  |
| 40        |       |     |     |     |     |     |    | 10  |
| 50        |       |     |     |     |     |     |    |     |
| 63        |       |     |     |     |     |     |    |     |

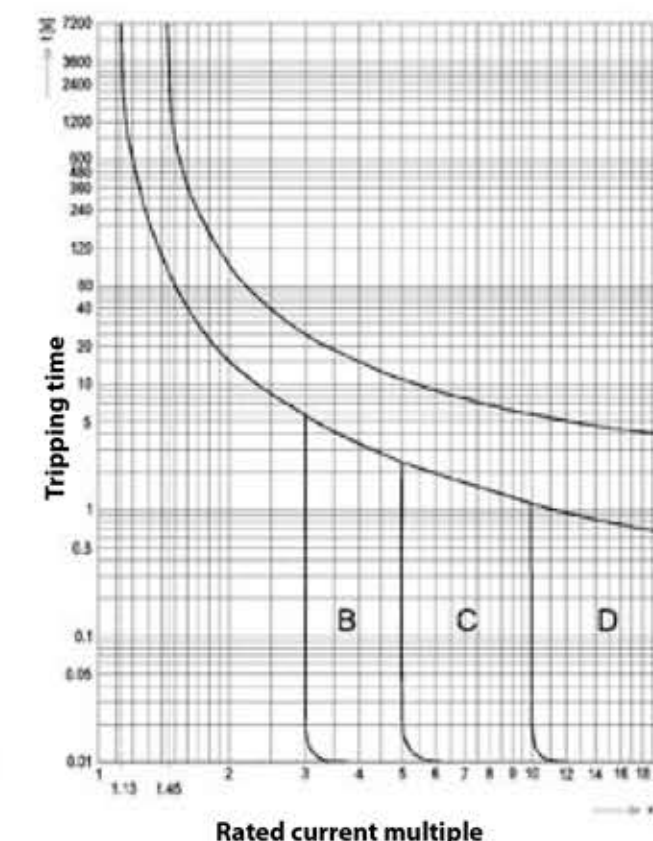
In case of short-circuit after the circuit breaker PR 60 with backup fuse, selectivity of particular combination is guaranteed up to the value of the short-circuit current  $I_k$  stated in the tables.

## Instantaneous tripping characteristics of circuit breakers PR 60

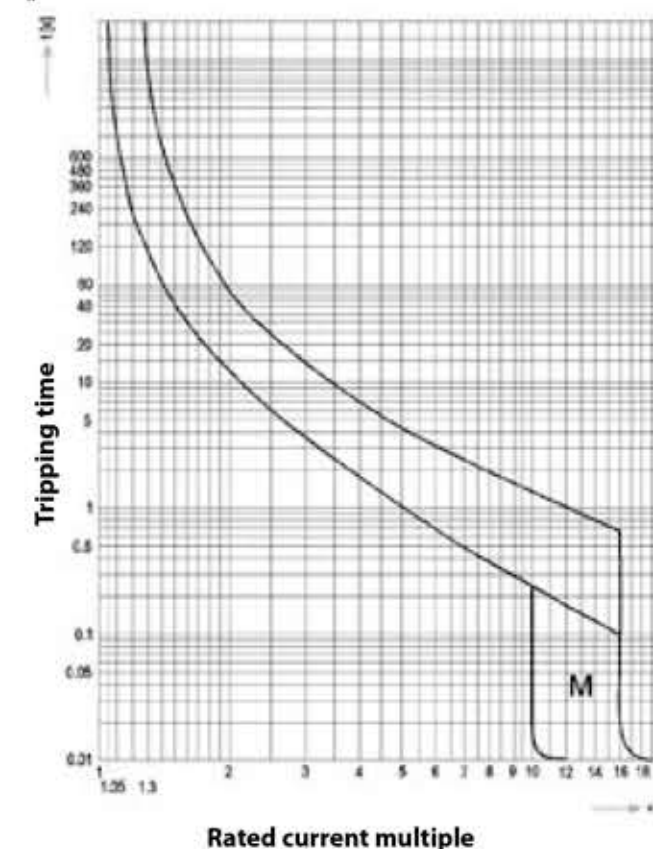
$I_n \geq 10$  A Characteristics B, C, D EN 60 898



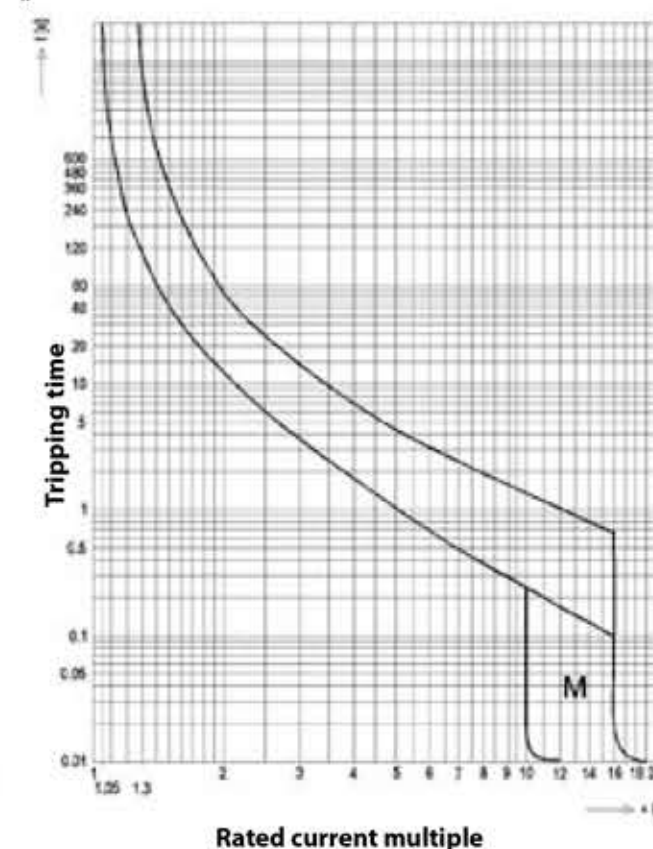
$I_n < 10$  A Characteristics B, C, D EN 60 898



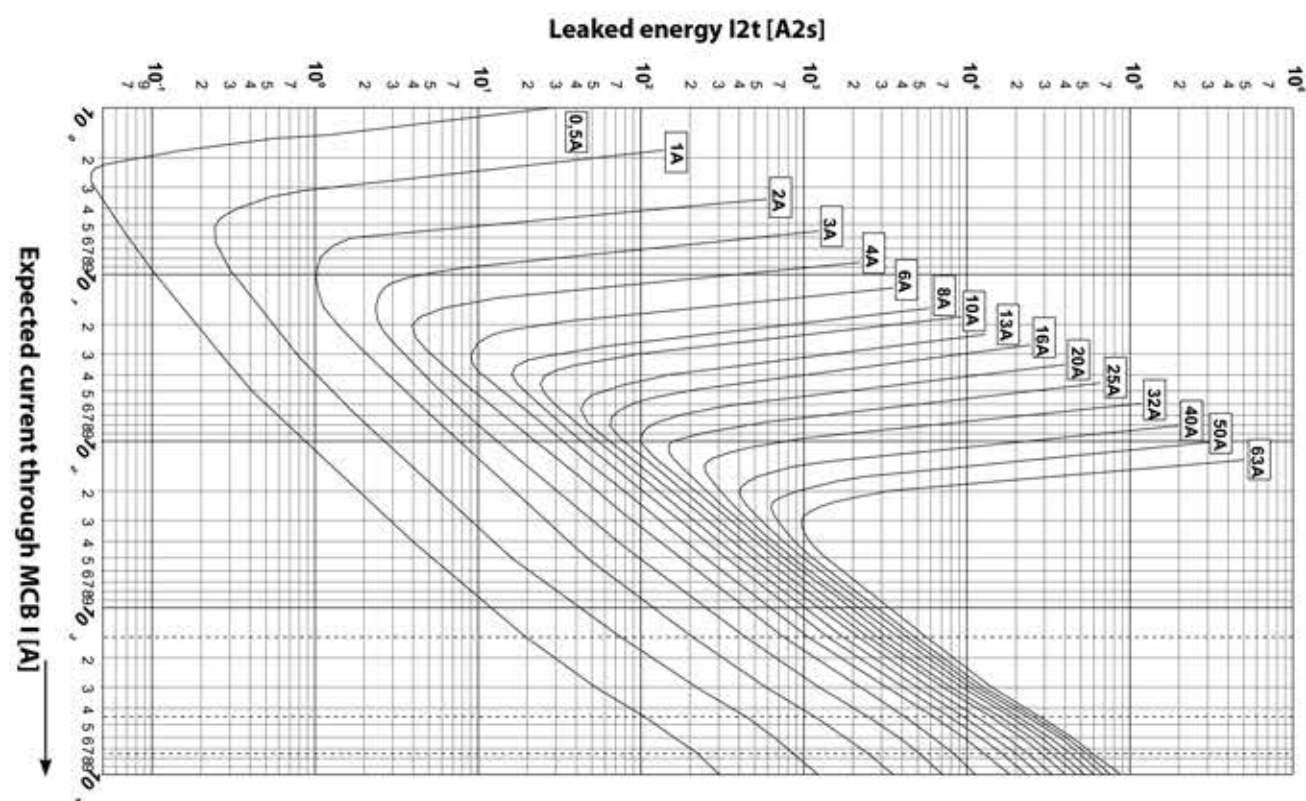
$I_n > 10$  A Characteristics M EN 60 947-2



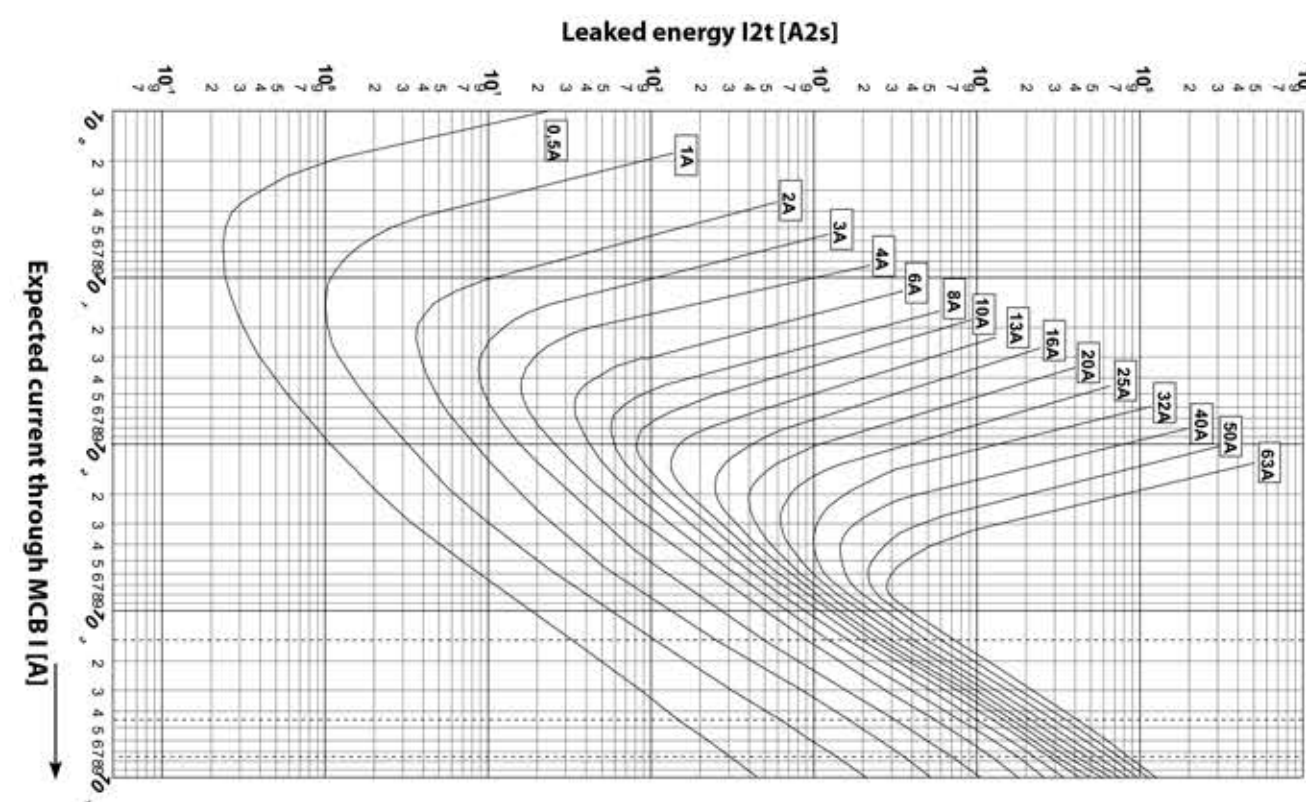
$I_n \leq 10$  A Characteristics M EN 60 947-2



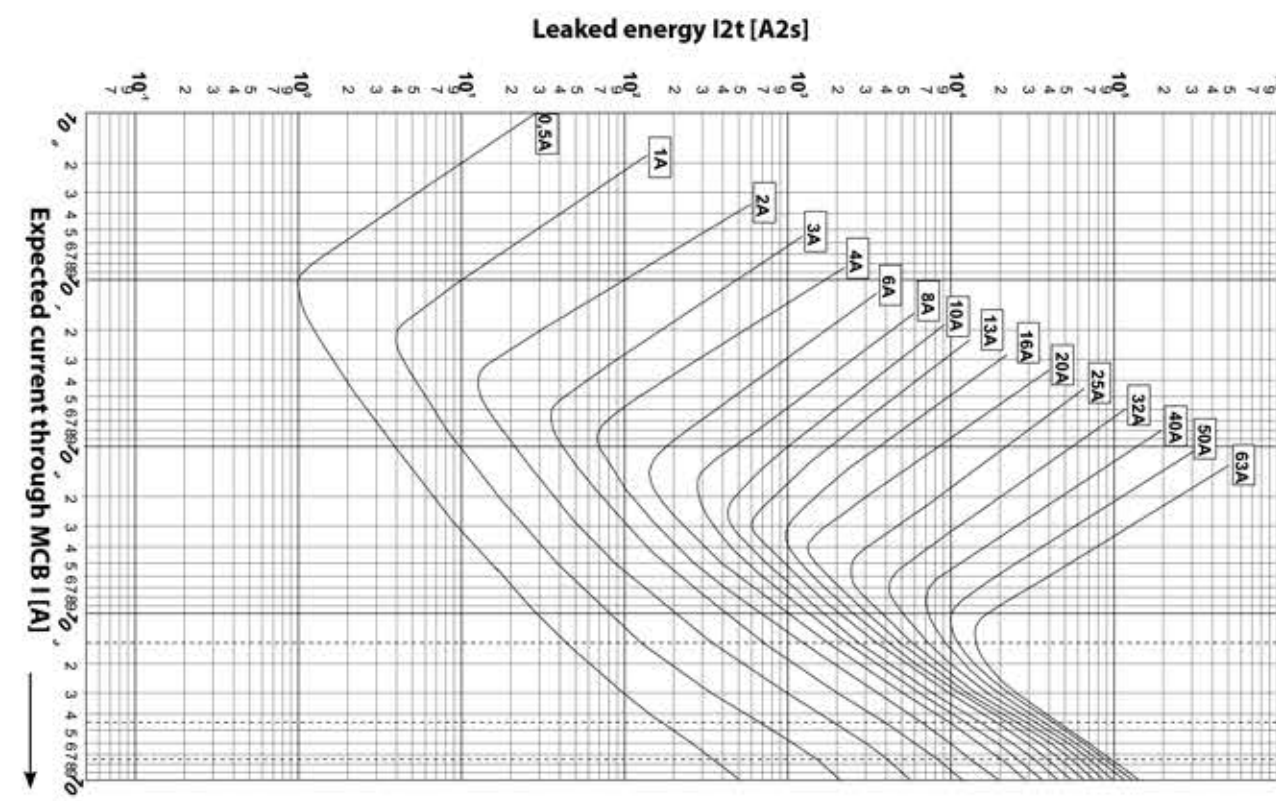
**Charts of leaked energy  $I^2t$  of MCBS PR 60  
with tripping characteristic B**



**Charts of leaked energy  $I^2t$  of MCBS PR 60  
with tripping characteristic C**

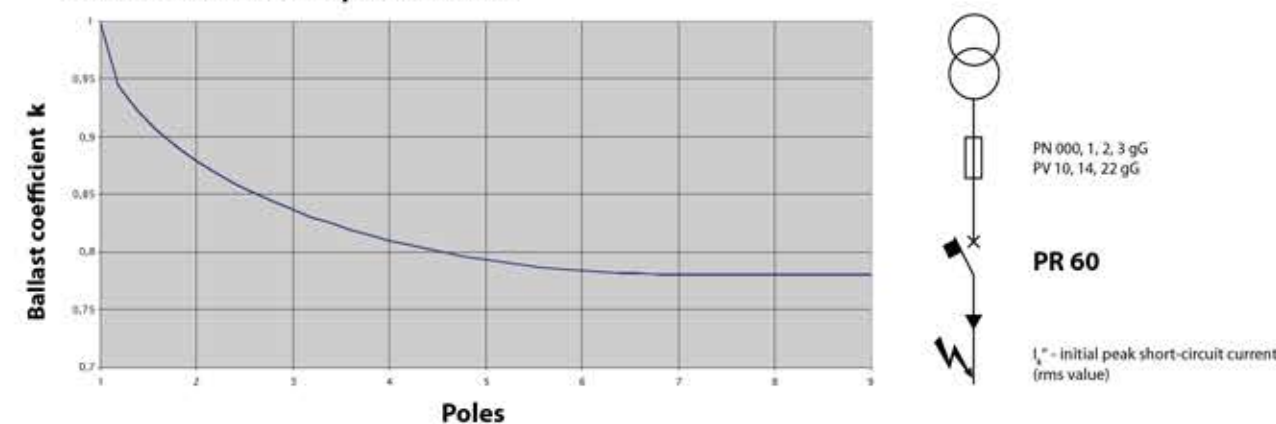


**Charts of leaked energy  $I^2t$  of MCBS PR 60  
with tripping characteristic D**



### Correction of rated currents of miniature circuit breakers PR 60

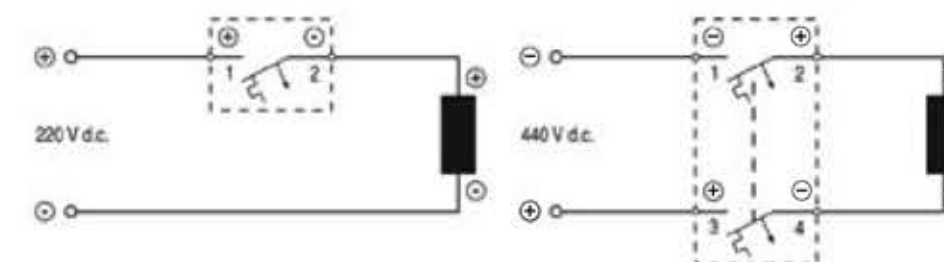
Correction of rated currents of miniature circuit breakers installed side by side (A)  
Valid for reference temperature 30°C.



## Technical data PR 60 J – DC

|                                                   |                 |                                                                        |            |
|---------------------------------------------------|-----------------|------------------------------------------------------------------------|------------|
| Standards                                         |                 | EN 60898-1                                                             | EN 60947-2 |
| Pole configuration                                |                 | 1,2                                                                    |            |
| Tripping characteristics                          |                 | C                                                                      | M          |
| Rated current $I_n$                               | A               | 0,5 - 63                                                               |            |
| Rated DC voltage $U_n$                            | V               | 220 – 1 pole, 440 – 2 poles, $\tau = \text{min. } 3\text{ms}$          |            |
| Rated insulation voltage $U_i$                    | V               | 400                                                                    |            |
| Rated impulse withstand voltage $U_{imp}$         | V               | 4 000                                                                  |            |
| Short circuit breaking capacity                   | kA              | 4,5                                                                    |            |
| Ultimate short circuit breaking capacity $I_{cu}$ | kA              |                                                                        | 4,5        |
| Service short circuit breaking capacity $I_{cs}$  | kA              |                                                                        | 4,5        |
| Utilization category                              |                 |                                                                        | A          |
| Electrical endurance                              |                 | 4 000 cycles                                                           |            |
| Mechanical endurance                              |                 | 100 000 cycles                                                         |            |
| Terminal capacity                                 | mm <sup>2</sup> | 1 - 25 for Cu wires<br>2,5 - 25 for Al wires - special type            |            |
| Mounting                                          |                 | on rail DIN 35x7,5 EN 60 715; on panel                                 |            |
| Degree of protection                              |                 | IP 20; IP 40 front                                                     |            |
| Ambient temperature                               | °C              | -25 up to +55                                                          |            |
| Mounting position                                 |                 | optional                                                               |            |
| Vibration resistance                              |                 | 3g (8 - 50 Hz)                                                         |            |
| Approvals                                         |                 | ESS                                                                    |            |
| Accessories                                       |                 | Auxiliary and signal contacts - PKJ, 2PKJ, PKJ+SKJ<br>Shunt trips - VC |            |

## Protection of DC circuits



It is possible to use both PR 60 and PR 60 J miniature circuit breakers for protection of DC circuits depending on voltage.

For voltage  $U_n$  up to:

- 40 V d.c. use miniature circuit breakers PR 60. Source poles (+) and (-) can be connected to the circuit breaker terminals arbitrarily.
- 220 V d.c. or 440 V d.c., use miniature circuit breakers PR 61J or PR 62J. As these miniature circuit breakers are equipped with permanent magnets, source poles (+) and (-) must be connected to identically marked terminals of the circuit breakers (see connection example).

### Characteristics C

| Rated current $I_n$ , A | Type designation | Ordering number |
|-------------------------|------------------|-----------------|
| 0,5                     | PR 61J-C 0,5     | 0099510         |
| 1                       | PR 61 J-C 1      | 0099511         |
| 2                       | PR 61 J-C 2      | 0099512         |
| 3                       | PR 61 J-C 3      | 0099513         |
| 4                       | PR 61 J-C 4      | 0099514         |
| 6                       | PR 61 J-C 6      | 0099515         |
| 8                       | PR 61 J-C 8      | 0099516         |
| 10                      | PR 61 J-C 10     | 0099517         |
| 13                      | PR 61 J-C 13     | 0099518         |
| 16                      | PR 61 J-C 16     | 0099519         |
| 20                      | PR 61 J-C 20     | 0099520         |
| 25                      | PR 61 J-C 25     | 0099521         |
| 32                      | PR 61 J-C 32     | 0099522         |
| 40                      | PR 61 J-C 40     | 0099523         |
| 50                      | PR 61 J-C 50     | 0099524         |
| 63                      | PR 61 J-C 63     | 0099525         |

### Characteristics M

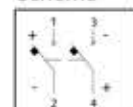
| Rated current $I_n$ , A | Type designation | Ordering number |
|-------------------------|------------------|-----------------|
| 0,8                     | PR 61J-M 0,8     | 0099530         |
| 1,2                     | PR 61J-M 1,2     | 0099531         |
| 2                       | PR 61 J-M 2      | 0099532         |
| 3                       | PR 61 J-M 3      | 0099533         |
| 4,2                     | PR 61 J-M 4,2    | 0099534         |
| 6                       | PR 61 J-M 6      | 0099535         |
| 8                       | PR 61 J-M 8      | 0099536         |
| 10                      | PR 61 J-M 10     | 0099537         |
| 12                      | PR 61 J-M 12     | 0099538         |
| 14                      | PR 61 J-M 14     | 0099539         |
| 17                      | PR 61 J-M 17     | 0099540         |
| 21                      | PR 61 J-M 21     | 0099541         |
| 25                      | PR 61 J-M 25     | 0099542         |
| 32                      | PR 61 J-M 32     | 0099543         |
| 40                      | PR 61 J-M 40     | 0099544         |
| 50                      | PR 61 J-M 50     | 0099545         |
| 63                      | PR 61 J-M 63     | 0099546         |

Scheme



1 - pole

Scheme



2 - poles

- circuit breakers PR 120 series are mechanical switching devices able to switch, conduct and switch – off the current under normal conditions and able to switch, conduct and automatically switch – off the current under abnormal conditions such as short circuit.
- they are used to protect house installations and industrial electric distributions
- they are designed to be operated by untrained persons and they are maintenance – free
- tripping characteristic B, C, D
- mounting on rail 35 x 7,5 in accordance with EN 60 715
- sealable in ON and OFF position
- conductors 1 – 50 mm<sup>2</sup>
- breaking capacity 15kA

## Technical data

|                          |                 |                                                  |
|--------------------------|-----------------|--------------------------------------------------|
| Standards                |                 | EN 60 898 - 1                                    |
| Pole configurations      |                 | 1; 1+N; 2; 3; 3+N; 4                             |
| Rated current            | $I_n$           | A 16, 20, 25, 32, 40, 50, 63, 80, 100, 125       |
| Tripping characteristics |                 | B, C, D                                          |
| Rated voltage            | $U_n$           | V 230, 230/400, 400                              |
| Rated frequency          | Hz              | 50                                               |
| Breaking capacity        | $I_{cn}$        | kA 10, 15                                        |
| Electrical endurance     |                 | 4 000 cycles                                     |
| Conductors               | mm <sup>2</sup> | 1 - 50                                           |
| Mounting                 |                 | on rail DIN 35x7,5 EN 60 715                     |
| Protection degree        |                 | IP 20, IP 40 front                               |
| Ambient temperature      |                 | -5°C up to +40°C                                 |
| Approved                 |                 | according to label                               |
| Rated DC                 |                 | max 110DC (for one pole, $\tau=4ms$ )            |
| Accessories              |                 | shunt trips VC, auxiliary contacts PK120, 2PK120 |

## Characteristics B

| Ord. code | Type         | Ord. code | Type         | Ord. code | Type         | Ord. code | Type         |
|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|
| 0097000   | PR 121 B 16  | 0097010   | PR 122 B 16  | 0097020   | PR 123 B 16  | 0097030   | PR 124 B 16  |
| 0097001   | PR 121 B 20  | 0097011   | PR 122 B 20  | 0097021   | PR 123 B 20  | 0097031   | PR 124 B 20  |
| 0097002   | PR 121 B 25  | 0097012   | PR 122 B 25  | 0097022   | PR 123 B 25  | 0097032   | PR 124 B 25  |
| 0097003   | PR 121 B 32  | 0097013   | PR 122 B 32  | 0097023   | PR 123 B 32  | 0097033   | PR 124 B 32  |
| 0097004   | PR 121 B 40  | 0097014   | PR 122 B 40  | 0097024   | PR 123 B 40  | 0097034   | PR 124 B 40  |
| 0097005   | PR 121 B 50  | 0097015   | PR 122 B 50  | 0097025   | PR 123 B 50  | 0097035   | PR 124 B 50  |
| 0097006   | PR 121 B 63  | 0097016   | PR 122 B 63  | 0097026   | PR 123 B 63  | 0097036   | PR 124 B 63  |
| 0097007   | PR 121 B 80  | 0097017   | PR 122 B 80  | 0097027   | PR 123 B 80  | 0097037   | PR 124 B 80  |
| 0097008   | PR 121 B 100 | 0097018   | PR 122 B 100 | 0097028   | PR 123 B 100 | 0097038   | PR 124 B 100 |
| 0097009   | PR 121 B 125 | 0097019   | PR 122 B 125 | 0097029   | PR 123 B 125 | 0097039   | PR 124 B 125 |

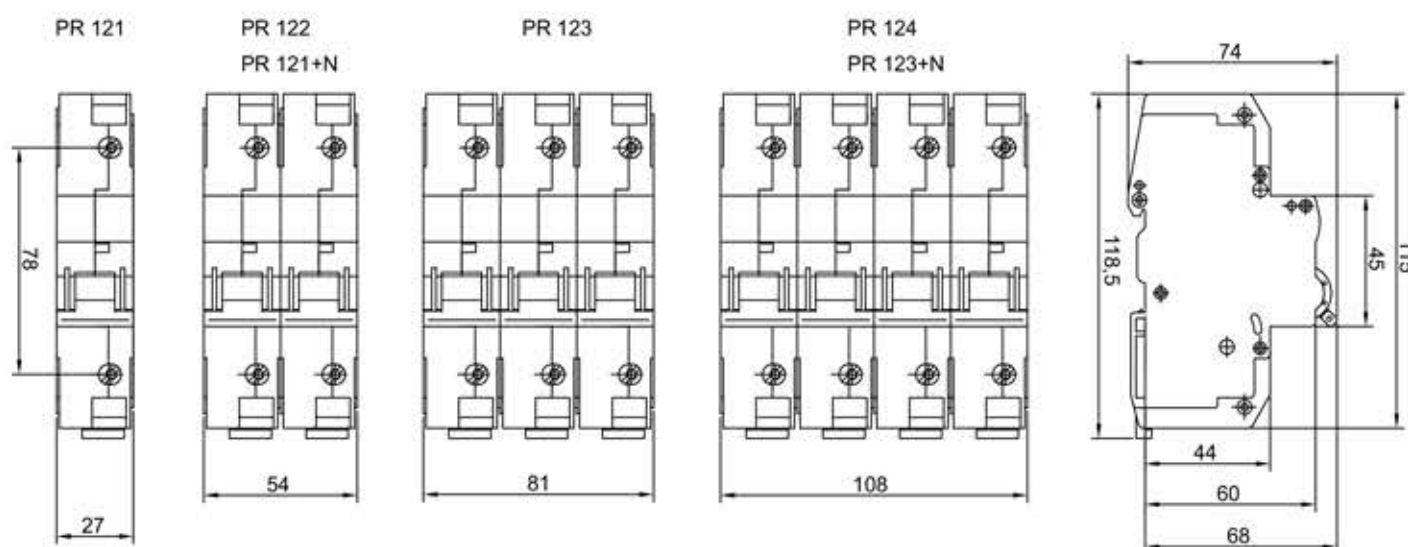
## Characteristics C

| Ord. code | Type         | Ord. code | Type         | Ord. code | Type         | Ord. code | Type         |
|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|
| 0097100   | PR 121 C 16  | 0097110   | PR 122 C 16  | 0097120   | PR 123 C 16  | 0097130   | PR 124 C 16  |
| 0097101   | PR 121 C 20  | 0097111   | PR 122 C 20  | 0097121   | PR 123 C 20  | 0097131   | PR 124 C 20  |
| 0097102   | PR 121 C 25  | 0097112   | PR 122 C 25  | 0097122   | PR 123 C 25  | 0097132   | PR 124 C 25  |
| 0097103   | PR 121 C 32  | 0097113   | PR 122 C 32  | 0097123   | PR 123 C 32  | 0097133   | PR 124 C 32  |
| 0097104   | PR 121 C 40  | 0097114   | PR 122 C 40  | 0097124   | PR 123 C 40  | 0097134   | PR 124 C 40  |
| 0097105   | PR 121 C 50  | 0097115   | PR 122 C 50  | 0097125   | PR 123 C 50  | 0097135   | PR 124 C 50  |
| 0097106   | PR 121 C 63  | 0097116   | PR 122 C 63  | 0097126   | PR 123 C 63  | 0097136   | PR 124 C 63  |
| 0097107   | PR 121 C 80  | 0097117   | PR 122 C 80  | 0097127   | PR 123 C 80  | 0097137   | PR 124 C 80  |
| 0097108   | PR 121 C 100 | 0097118   | PR 122 C 100 | 0097128   | PR 123 C 100 | 0097138   | PR 124 C 100 |
| 0097109   | PR 121 C 125 | 0097119   | PR 122 C 125 | 0097129   | PR 123 C 125 | 0097139   | PR 124 C 125 |

## Characteristics D

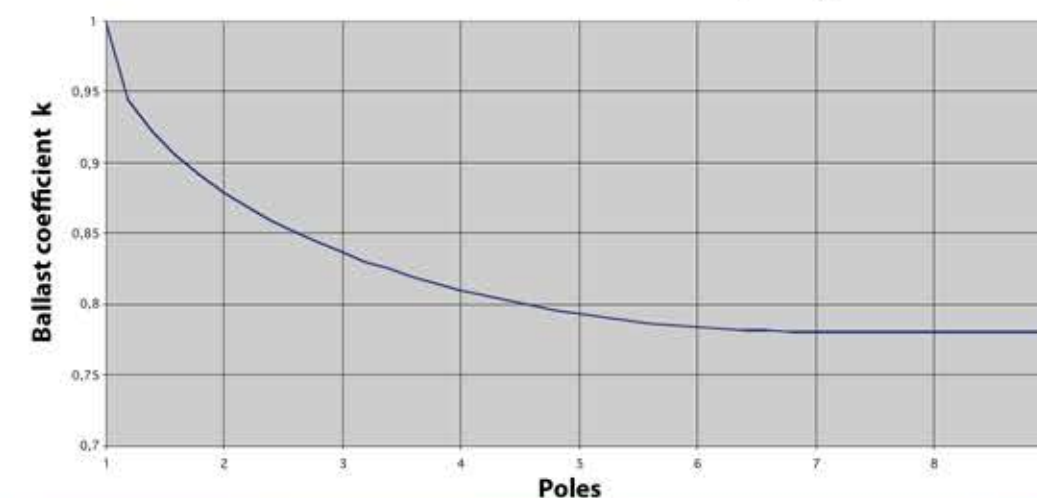
| Ord. code | Type         | Ord. code | Type         | Ord. code | Type         | Ord. code | Type         |
|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|
| 0097200   | PR 121 D 16  | 0097210   | PR 122 D 16  | 0097220   | PR 123 D 16  | 0097230   | PR 124 D 16  |
| 0097201   | PR 121 D 20  | 0097211   | PR 122 D 20  | 0097221   | PR 123 D 20  | 0097231   | PR 124 D 20  |
| 0097202   | PR 121 D 25  | 0097212   | PR 122 D 25  | 0097222   | PR 123 D 25  | 0097232   | PR 124 D 25  |
| 0097203   | PR 121 D 32  | 0097213   | PR 122 D 32  | 0097223   | PR 123 D 32  | 0097233   | PR 124 D 32  |
| 0097204   | PR 121 D 40  | 0097214   | PR 122 D 40  | 0097224   | PR 123 D 40  | 0097234   | PR 124 D 40  |
| 0097205   | PR 121 D 50  | 0097215   | PR 122 D 50  | 0097225   | PR 123 D 50  | 0097235   | PR 124 D 50  |
| 0097206   | PR 121 D 63  | 0097216   | PR 122 D 63  | 0097226   | PR 123 D 63  | 0097236   | PR 124 D 63  |
| 0097207   | PR 121 D 80  | 0097217   | PR 122 D 80  | 0097227   | PR 123 D 80  | 0097237   | PR 124 D 80  |
| 0097208   | PR 121 D 100 | 0097218   | PR 122 D 100 | 0097228   | PR 123 D 100 | 0097238   | PR 124 D 100 |
| 0097209   | PR 121 D 125 | 0097219   | PR 122 D 125 | 0097229   | PR 123 D 125 | 0097239   | PR 124 D 125 |

## Dimensional drawing



## Correction of rated currents of miniature circuit breakers PR 120

Correction of rated currents of miniature circuit breakers installed side by side (A) Valid for reference temperature 30°C.

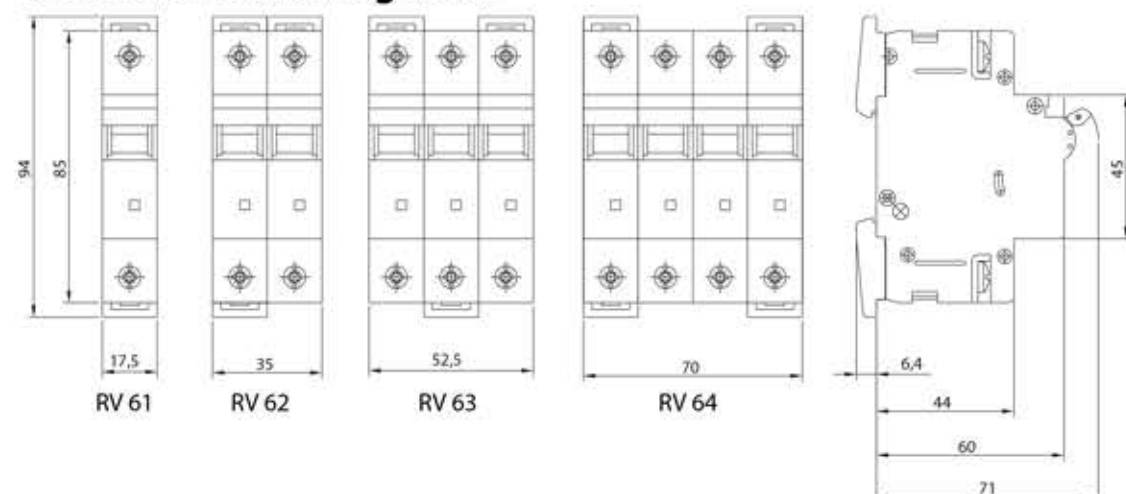


- modular switches RV 60 are mechanical devices used for switching of electrical circuits
- they are used in house, commercial and industrial distributions

## Technical data

|                                                      |                 |                                                                                            |    |    |    |    |    |  |
|------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------|----|----|----|----|----|--|
| Standards                                            |                 | EN 60947-3                                                                                 |    |    |    |    |    |  |
| Pole configuration                                   |                 | 1; 1+N; 2; 3; 3+N                                                                          |    |    |    |    |    |  |
| Rated insulation voltage $U_i$                       | V               | 400V                                                                                       |    |    |    |    |    |  |
| Rated impulse withstand voltage $U_{imp}$            | V               | 6 000                                                                                      |    |    |    |    |    |  |
| Rated operational voltage $U_e$                      | V               | 230; 400                                                                                   |    |    |    |    |    |  |
| Rated frequency                                      | Hz              | 50 - 60                                                                                    |    |    |    |    |    |  |
| Rated thermal current $I_{th}$                       | A               | 10                                                                                         | 16 | 25 | 32 | 40 | 63 |  |
| Utilization category                                 |                 | AC 22A                                                                                     |    |    |    |    |    |  |
| Rated operational currents $I_e$                     | A               | 10                                                                                         | 16 | 25 | 32 | 40 | 63 |  |
| Rated conditional short circuit current with fuse gG | kA              | 10                                                                                         | 10 | 10 | 6  | 6  | 3  |  |
|                                                      | A               | 10                                                                                         | 16 | 25 | 35 | 40 | 63 |  |
| Electrical endurance                                 |                 | 1 500 cycles                                                                               |    |    |    |    |    |  |
| Mechanical endurance                                 |                 | 100 000 cycles                                                                             |    |    |    |    |    |  |
| Terminal capacity                                    | mm <sup>2</sup> | 1 – 25 for Cu wires; 2,5 – 25 for Al wires                                                 |    |    |    |    |    |  |
| Mounting                                             |                 | on rail DIN 35x7,5 EN 60 715; on panel                                                     |    |    |    |    |    |  |
| Degree of protection                                 |                 | IP 20, IP 40 front                                                                         |    |    |    |    |    |  |
| Ambient temperature                                  | °C              | -25 up to +55                                                                              |    |    |    |    |    |  |
| Mounting position                                    |                 | optional                                                                                   |    |    |    |    |    |  |
| Vibration resistance                                 |                 | 3g ( 8 - 50 Hz )                                                                           |    |    |    |    |    |  |
| Approvals                                            |                 | according to label                                                                         |    |    |    |    |    |  |
| Accessories                                          |                 | Auxiliary and signal contacts - PKJ, 2PKJ, PKJ+SKJ<br>Shunt trips – VC , undervoltage trip |    |    |    |    |    |  |

## Dimensional drawing RV 60



| Current | Type        | Ordering Code | Current | Type        | Ordering Code | Poles |
|---------|-------------|---------------|---------|-------------|---------------|-------|
| 10 A    | RV 61 10A   | 0099856       | 16 A    | RV 61 16A   | 0099857       | 1     |
| 10 A    | RV 61+N 10A | 0099859       | 16 A    | RV 61+N 16A | 0099873       | 1+N   |
| 10 A    | RV 62 10A   | 0099875       | 16 A    | RV 62 16A   | 0099876       | 2     |
| 10 A    | RV 63 10A   | 0099878       | 16 A    | RV 63 16A   | 0099879       | 3     |
| 10 A    | RV 63+N 10A | 0099929       | 16 A    | RV 63+N 16A | 0099930       | 3+N   |
| 25 A    | RV 61 25A   | 0099830       | 32 A    | RV 61 32A   | 0099858       | 1     |
| 25 A    | RV 61+N 25A | 0099840       | 32 A    | RV 61+N 32A | 0099874       | 1+N   |
| 25 A    | RV 62 25A   | 0099842       | 32 A    | RV 62 32A   | 0099877       | 2     |
| 25 A    | RV 63 25A   | 0099844       | 32 A    | RV 63 32A   | 0099928       | 3     |
| 25 A    | RV 63+N 25A | 0099846       | 32 A    | RV 63+N 32A | 0099938       | 3+N   |
|         |             |               | 63 A    | RV 61 63A   | 0099831       | 1     |
|         |             |               | 63 A    | RV 61+N 63A | 0099841       | 1+N   |
|         |             |               | 63 A    | RV 62 63A   | 0099843       | 2     |
|         |             |               | 63 A    | RV 63 63A   | 0099845       | 3     |
|         |             |               | 63 A    | RV 63+N 63A | 0099847       | 3+N   |

- modular switches RV 120 are mechanical devices used for switching of electrical circuits
- they are used in house, commercial and industrial distributions
- conductors 1 - 50 mm<sup>2</sup>

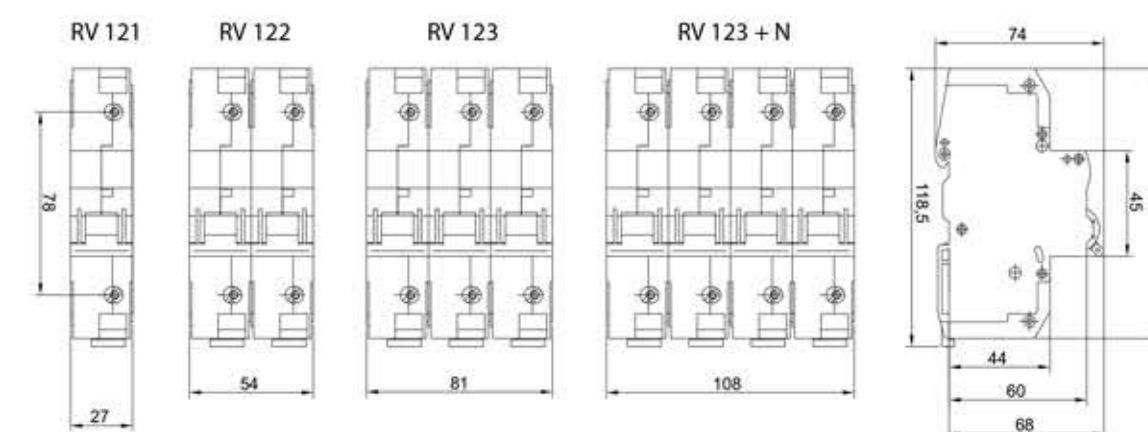


| Ord. code | Type                   |
|-----------|------------------------|
| 0089200   | RV 121 125A            |
| 0089201   | RV 122 125A            |
| 0089202   | RV 123 125A            |
| 0089203   | RV 124 125A            |
| 0089204   | RV 121N 125A + N-Pole  |
| 0089205   | RV 123N 125A + N-Pole  |
| 0089210   | RV 123 125A + VC230VAC |

## Technical data RV 120

|                                              |                                                  |
|----------------------------------------------|--------------------------------------------------|
| Standards                                    | EN 60947 - 3                                     |
| Number of poles                              | 1, 1+N, 2, 3, 3+N                                |
| Rated thermal current (A)                    | 125                                              |
| Rated voltage $U_n$ (V)                      | 230, 400                                         |
| Rated insulation voltage $U_i$ (V)           | 690                                              |
| Rated discharge voltage $U_{imp}$ (V)        | 6000                                             |
| Rated frequency (Hz)                         | 50                                               |
| Rated operational current $I_e$ (A)          | 100 for category AC 22A<br>40 for category AC 23 |
| Rated conditional short-circuit current (kA) | 3 with fuses 100 A gG<br>6 with fuses 63 A gG    |
| Electrical endurance (switching cycles)      | 1500                                             |
| Mechanical endurance (switching cycles)      | 10000                                            |
| Connecting wires (mm <sup>2</sup> )          | 1 - 50                                           |
| Mounting                                     | on rail DIN 35 x 7,5 EN 60 715                   |
| Degree of protection                         | IP 20 - clamps<br>IP 40 - from the front panel   |
| Ambient temperature (°C)                     | - 25 up to + 55                                  |
| Operating position                           | optional                                         |
| Resistance against vibrations                | 3g (8 - 50 Hz)                                   |
| Accessories                                  | shunt trips VC, auxiliary contacts PK120, 2PK120 |

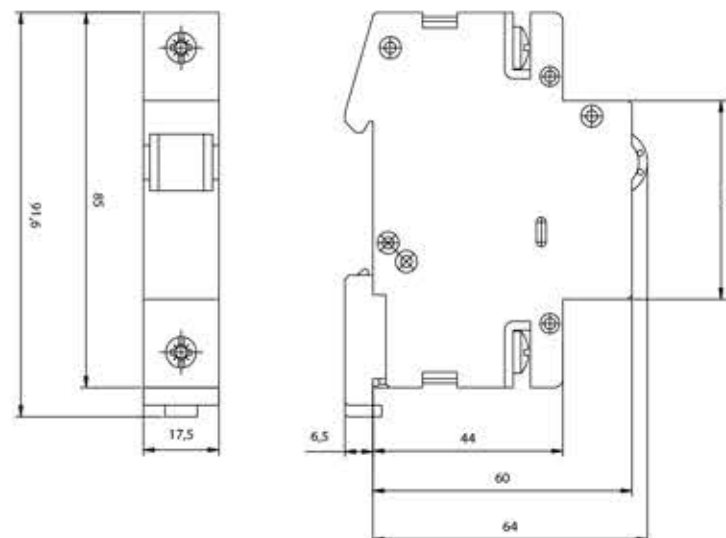
## Dimensional drawing RV 120



## Technical data RS, RSB

|                              |                 |                                                           |
|------------------------------|-----------------|-----------------------------------------------------------|
| Standards                    |                 | EN 60 947-5-1                                             |
| Number of poles              |                 | 1                                                         |
| Rated voltage U <sub>n</sub> | V               | AC 24, 48, 110, 230<br>DC 24, 48, 110, 220                |
| Light source                 |                 | high capacity LED diode                                   |
| Light source capacity        | W               | 0,8                                                       |
| Colours                      |                 | green - G, red - R, blue - B, transparent - T, yellow - Y |
| Illumination                 |                 | constant - RS<br>blinking - RSB                           |
| Terminal capacity            | mm <sup>2</sup> | 0,75 - 6 for Cu conductors                                |
| Mounting                     |                 | on rail DIN 35x7,5 EN 60 715<br>on board                  |
| Degree of protection         |                 | IP 20<br>IP 40 from the front panel                       |
| Ambient air temperature      | °C              | from -25 to +55                                           |
| Working positions            |                 | optional                                                  |

## Dimensional drawing of RS, RSB



| Colour | Voltage | Type   | Ordering number | Type    | Ordering number |
|--------|---------|--------|-----------------|---------|-----------------|
| T      | 24 V    | RST24  | 0025725         | RSBT24  | 0025705         |
| R      | 24 V    | RSR24  | 0025726         | RSBR24  | 0025706         |
| B      | 24 V    | RSB24  | 0025727         | RSBB24  | 0025707         |
| G      | 24 V    | RSG24  | 0025728         | RSBG24  | 0025708         |
| Y      | 24 V    | RSY24  | 0025729         | RSBY24  | 0025709         |
| T      | 48 V    | RST48  | 0025720         | RSBT48  | 0025745         |
| R      | 48 V    | RSR48  | 0025721         | RSBR48  | 0025746         |
| B      | 48 V    | RSB48  | 0025722         | RSBB48  | 0025747         |
| G      | 48 V    | RSG48  | 0025723         | RSBG48  | 0025748         |
| Y      | 48 V    | RSY48  | 0025724         | RSBY48  | 0025749         |
| T      | 110 V   | RST110 | 0025710         | RSBT110 | 0025735         |
| R      | 110 V   | RSR110 | 0025711         | RSBR110 | 0025736         |
| B      | 110 V   | RSB110 | 0025712         | RSBB110 | 0025737         |
| G      | 110 V   | RSG110 | 0025713         | RSBG110 | 0025738         |
| Y      | 110 V   | RSY110 | 0025714         | RSBY110 | 0025739         |
| T      | 230 V   | RST230 | 0025740         | RSBT230 | 0025730         |
| R      | 230 V   | RSR230 | 0025741         | RSBR230 | 0025731         |
| B      | 230 V   | RSB230 | 0025742         | RSBB230 | 0025732         |
| G      | 230 V   | RSG230 | 0025743         | RSBG230 | 0025733         |
| Y      | 230 V   | RSY230 | 0025744         | RSBY230 | 0025734         |

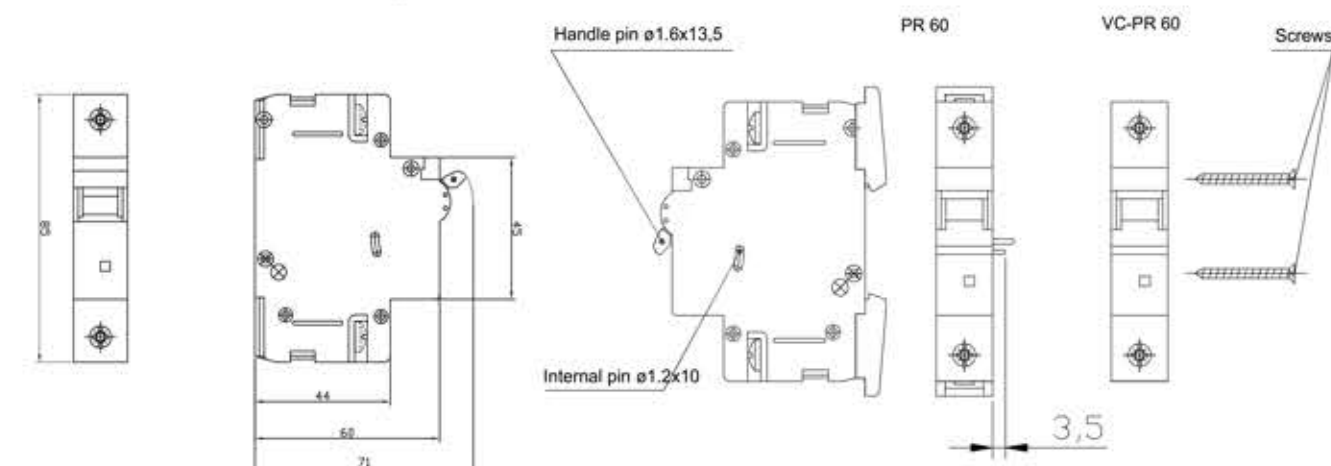
## Shunt trip – VC

- accessories to the circuit-breaker PR 60, PR 60J, PE 60, modular switches RV 60 and residual current devices
- utilized for the tripping of circuit-breaker (modular switch) by means of outer source of voltage in instantaneous tripping of the circuit
- it is delivered as separate unit or assembled together with circuit-breaker (modular switch)
- it is mounted on right hand side of the circuit-breaker (switch), left side of residual current devices

## Technical data

|                                            |                 |                                                                                                  |
|--------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------|
| Standards                                  |                 | EN 60 947-1 (IEC 60947-1)                                                                        |
| Rated voltage                              | V               | AC: 400, 230, 110, 60, 48, 24, 12<br>DC: 110, 48, 24                                             |
| Rated insulation voltage                   | V               | 400                                                                                              |
| Max. switching off current (voltage of VC) | A (V)           | AC: 0,5(400); 0,6(230); 0,5(110); 0,9(60); 0,8(48); 2,8(24); 6(12)<br>DC: 0,6(110); 2(48); 3(24) |
| Rated impulse withstand voltage            | kV              | 4                                                                                                |
| Rated making overvoltage                   | kV              | 4                                                                                                |
| range of activity voltage                  | %               | 70-110                                                                                           |
| Tripping time                              | ms              | max. 50                                                                                          |
| Rated frequency                            | Hz              | 50                                                                                               |
| Mounting                                   |                 | on right side of circuit breaker (switch), left side of residual current device                  |
| Degree of protection                       |                 | IP 20                                                                                            |
| Terminal capacity                          | mm <sup>2</sup> | 1 - 6 Cu                                                                                         |

## Dimensional drawing VC - PR 60



| Operational voltage | Type       | Ordering code | Operational voltage | Type       | Ordering code |
|---------------------|------------|---------------|---------------------|------------|---------------|
| 12 V ~              | VC 12 V ~  | 0099860       | 230 V ~             | VC 230 V ~ | 0099865       |
| 24 V ~              | VC 24 V ~  | 0099861       | 400 V ~             | VC 400 V ~ | 0099866       |
| 48 V ~              | VC 48 V ~  | 0099862       | 24 V =              | VC 24 V =  | 0099867       |
| 60 V ~              | VC 60 V ~  | 0099863       | 48 V =              | VC 48 V =  | 0099868       |
| 110 V ~             | VC 110 V ~ | 0099864       | 110 V =             | VC 110 V = | 0099869       |

## Instructions guide for the mounting of a shunt trip VC-PR 60

- on right side of all executions PR 60, PR 60J, PE 60 and modular switches RV 60
- circuit breaker and shunt trip have to be in switch-off position
- insert pin Ø 1,6 mm into aperture of operating lever and into aperture of switching system Ø 1,2 mm (pins are part of delivery)
- approach shunt trip to the circuit breaker in order to achieve engagement of pins into appropriate parts of circuit breaker and switching system of VC-PR 60
- into free holes in shunt trip VC-PR60 enter stainless steel screws and slightly tight the screws to attach it to the PR60
- check the function of VC-PR60 with PR60 by switching on the the MCB and pushing the mechanism through the hole for pin Ø 1,2 mm with appropriate tool.

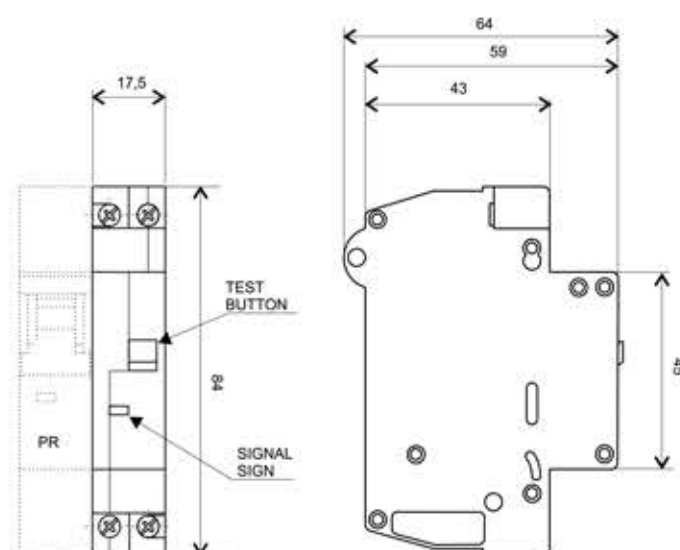
## Undervoltage trip PC

- accessories to PR 60, PR 120, RV 60, RV 120
- they are using to protection against rerun-up of motor by failure in mains
- signalisation of release position green/red
- auxiliary button for correct function control
- mounting to circuit breakers in mill

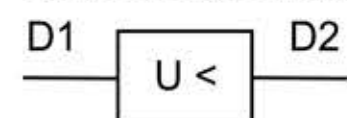
## Technical data

|                      |                                                              |
|----------------------|--------------------------------------------------------------|
| Standards            | EN 60947 - 1                                                 |
| Rated voltage        | 24, 48, 120, 230, 400 V AC                                   |
| Rated frequency      | 50 Hz                                                        |
| Maximal using        | 3 W                                                          |
| Attachment           | on the right side                                            |
| Connecting wires     | 0,75 - 2,5 mm <sup>2</sup>                                   |
| Degree of protection | IP 20                                                        |
| Turn on limit        | up 85 % from U <sub>n</sub><br>down 35 % from U <sub>n</sub> |

## Dimensional drawing of PC



## Connecting scheme



| Type      | Ordering designation |
|-----------|----------------------|
| PC 24 V~  | 0090550              |
| PC 48 V~  | 0090551              |
| PC 120 V~ | 0090552              |
| PC 230 V~ | 0090553              |
| PC 400 V~ | 0090554              |



## Auxiliary and signal contacts PKJ, 2PKJ, PKJ+SKJ (TEST)

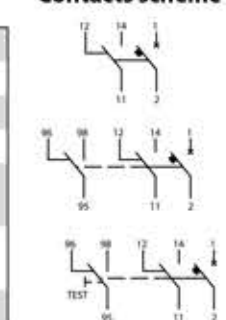
- these are accessories to circuit-breakers PR 60, PR 60J, PE 60, modular switches RV 60, residual current devices
- can be obtained as separate units or mounted together with circuit-breaker (modular switch)
- they are mounted on the left hand side of the circuit-breaker (modular switch) by means of pins and screws
- serve for signalling of contact position of circuit-breaker

- Types:**
- PKJ, 2PKJ: single or double auxiliary changeover contacts; position of contacts correspond to the position of the main contacts of circuit-breaker (modular switch)
  - PKJ + SKJ: auxiliary changeover contact plus signal changeover contact; position of auxiliary contact correspond to the position of the main contacts of circuit-breaker (modular switch); signal changeover contact indicate opening of circuit breaker by operating means; signal contact do not changes his position
  - PKJ+SKJ+TEST: functions of PKJ and SKJ are identical with functions stated in previous paragraph; TEST button has two functions:
    - signalling the position of signal contacts;
    - testing of control circuit (non-stable change of position of the contacts) by slight move of push-button upwards or downwards without change of contact position of circuit-breaker

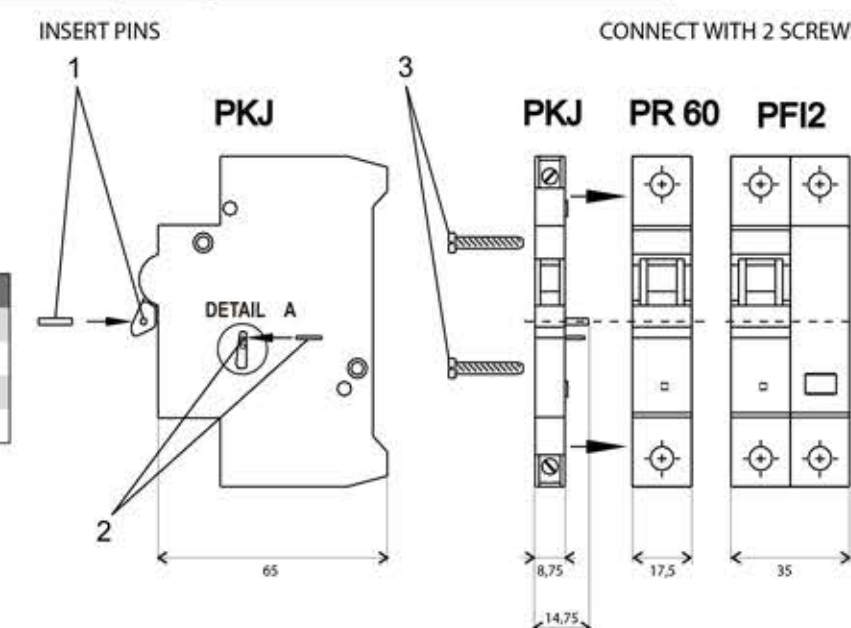
## Technical data

|                                                                |                                                                                |
|----------------------------------------------------------------|--------------------------------------------------------------------------------|
| Standards                                                      | EN 60947-5-1 (IEC 60947-5-1)                                                   |
| Rated insulation voltage U <sub>i</sub>                        | V 400                                                                          |
| Rated operational voltage U <sub>e</sub>                       | V 230                                                                          |
| Rated thermal current I <sub>th</sub>                          | A 16                                                                           |
| Rated operational current I <sub>e</sub>                       | A 4 (AC 15 at U <sub>e</sub> = 230 V)<br>0,5 (DC 13 at U <sub>e</sub> = 110 V) |
| Conditional short circuit current with fuse 16A I <sub>k</sub> | A 800                                                                          |
| Max. conventional back-up fuses                                | A 16 gL                                                                        |
| Rated frequency                                                | Hz 50 - 60                                                                     |
| Mounting                                                       | on left side of device                                                         |
| Degree of protection                                           | IP 20                                                                          |
| Terminal capacity                                              | mm <sup>2</sup> 0,5 - 2,5 Cu                                                   |

## Contacts scheme



| Type             | Ordering code |
|------------------|---------------|
| PKJ              | 0099010       |
| 2 PKJ            | 0099011       |
| PKJ + SKJ        | 0099012       |
| PKJ + SKJ + TEST | 0099013       |



1. Pin of handle Ø 1,6 mm
2. Pin Ø 1,2 mm, l=10 mm
3. Screws

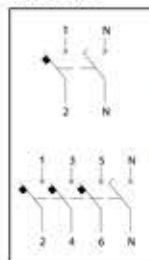
## Instructions guide for the mounting of auxiliary contacts

1. In the block of auxiliary contacts insert into handle the pin of Ø1,6 mm and into the opening of the switching system the pin Ø1,2 mm.
2. Approach contacts block to PR 60 (PFI2) to let the pins snap into relevant device pieces. During the assembly must be both handles the PR 60 (PFI2) and the contact block handle OFF.
3. Insert into free openings in the contact block the tapping screw and attach freely to PR 60 (PFI2).
4. Verify mechanical function of auxiliary contact with PR 60 (PFI2) by pushing through the device opening Ø1,2 mm with appropriate device the mechanical part (pin, needle etc.)

## N-POLE

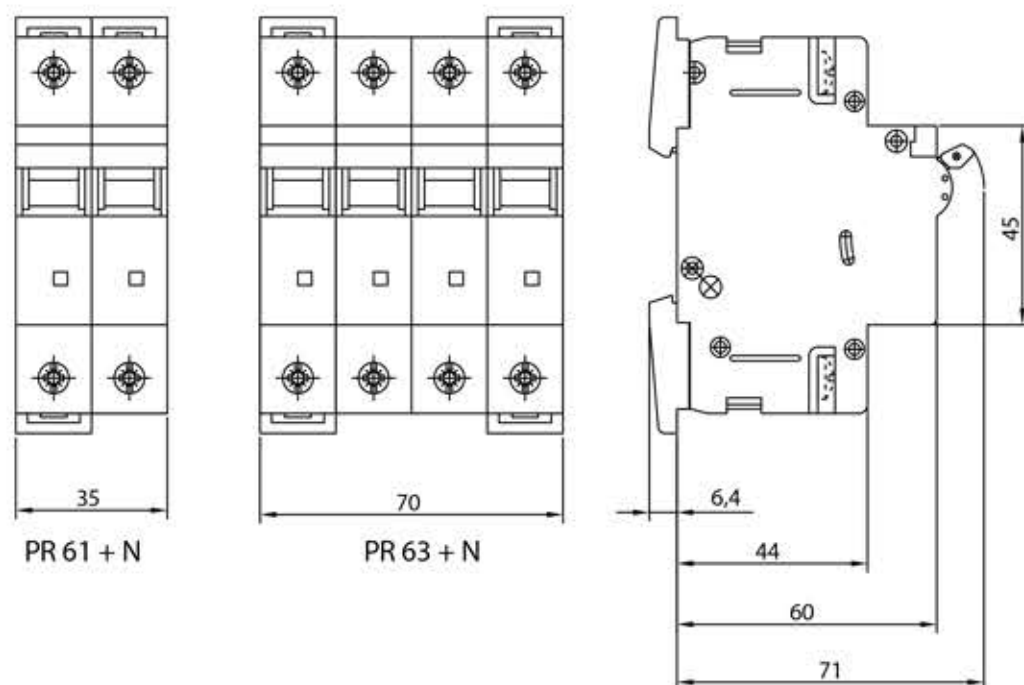
- assembling with circuit breaker at manufacturer's site according to the requirement of the customer
- neutral pole can be assembled to all AC circuit breakers PR 61 and PR 63 (current ratings, tripping characteristics)
- neutral pole is without release, on making of circuit breaker it makes before the other contacts and during breaking it breaks after the other poles
- on ordering of neutral pole please state type and ordering number of the circuit breaker and type and ordering number of the neutral pole

Scheme



| Type                                       | Ordering Nr. |
|--------------------------------------------|--------------|
| N-pole of circuit breaker PR 60 0,2 - 25 A | 0099600      |
| N-pole of circuit breaker PR 60 32 - 63 A  | 0099601      |

## Dimensional drawing of PR 60 + N



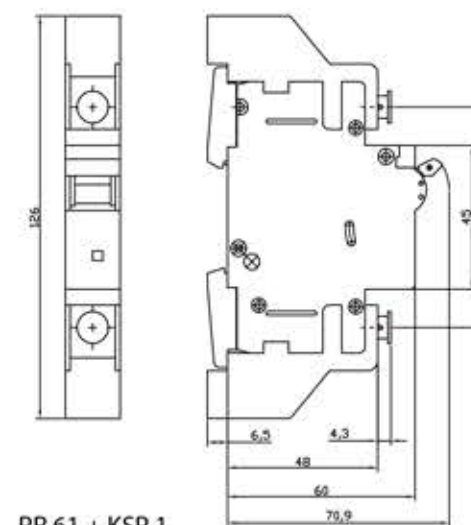
## Covers of terminal – KSP 1, KSP 3

- accessories to the circuit-breaker PR 60, PR 60J, PE 60, PE 40 and modular switches RV 60...
  - used for the improving of degree of protection to value IP 30 and together with sealing blind also for sealing of terminals
  - single pole cover of terminals KSP 1 do not increase width of module of circuit breaker (modular switch); for the protection of both terminals two covers are needed
  - three pole cover of terminals KSP 3 is applicable only for PR 63 and RV 63; the width of three pole module will change from 52,5 to 57 mm.
- For the fixing of cover to circuit-breaker (modular switch) there is necessary sealing blind PZ

| Type  | Ordering Nr. |
|-------|--------------|
| KSP 1 | 1990354      |
| KSP 3 | 1990353      |

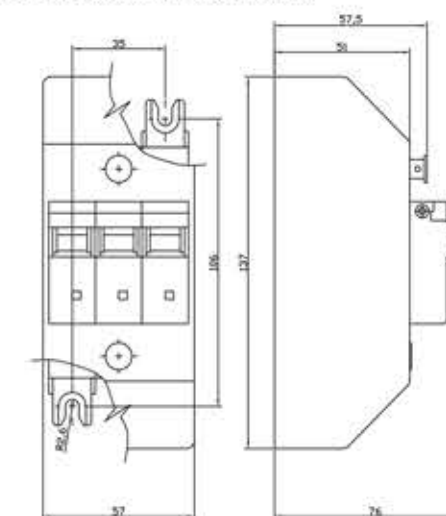
## Dimensional drawing of KSP 1, KSP 3

PR 61, PR 61 J, PE 61, RV 61  
with single pole cover of terminals (KSP 1)



PR 61 + KSP 1

PR 63, PE 63 and RV 63 with clips for mounting on board  
and with three pole cover of terminals (KSP 3)  
Incorporating sealing blind (PZ)



PR 63 + KSP 3

KSP 1



KSP 3



## Locking of operating means – UP



- accessories to the circuit-breaker PR60, PR60J, PE 60, RV 60...
- utilized for the safety locking of operating means in closed or open position of circuit breaker (modular switch) by means of padlock with maximum diameter of shank Ø 4,5 mm

| Type      | Ordering Nr. |
|-----------|--------------|
| UP blue   | 0099025      |
| UP yellow | 0099026      |
| UP black  | 0099027      |
| UP grey   | 0099028      |

## Sealing blind – PZ

- accessories to the circuit-breaker PR 60, PR 60J, PE 60 and modular switches RV 60...
- utilized for sealing of single pole covers KSP 1 and three pole covers KSP 3 and for mounting three pole covers KSP 3 too
- for sealing can be used sealing wire with maximum diameter Ø 1,5 mm

| Type | Ordering code |
|------|---------------|
| PZ   | 1990356       |



## Clips – PPL, PL, PP

- accessories to the circuit-breaker PR 60, PR 60J and modular switches RV 60...
- flexible clip on rail PPL and clip on rail PL are utilized for the fixing of circuit-breakers (modular switches) on DIN rail 35 x 7,5 mm;
- clip on board is utilized for fixing of circuit-breakers (switches) on board by means of screws M4 or M5. For one device 2 slips are necessary;
- standard circuit-breaker (modular switch) is delivered with clip PL and flexible clip PPL
- clips can be replaced by simple withdrawal and insertion

| Type | Ordering code |
|------|---------------|
| PL   | 1990350       |
| PPL  | 1990351       |
| PP   | 1990352       |



PL



PPL



PP



WITH A RESIDUAL CURRENT CIRCUIT BREAKER (RCCB) THE FOLLOWING PROTECTIVE MEASURES ARE AVAILABLE:

- protection in cases of indirect contact
- protection in cases of direct contact
- prevention of fires caused by ground-fault currents

### FEATURES

- suitable for protection of electrical circuits in residential buildings, non-residential buildings or industrial applications
- PFB and PCHB devices are working according IEC 61008-1 / EN 61008-1
- simple and solid fixing to 35 mm mounting rail in compliance to EN 6071
- range of rated residual operating currents I 10, 30, 100, 300, 500 mA (I = 10mA is for devices with rated current up to 25A include)
- optical indicator, on the front side indicating operating state of device (green target visible closed contacts, red target visible opened contacts)
- connected clamp headed/stirrupted range of connecting wires 1 - 25 mm<sup>2</sup>
- working position optional
- there is possibility to use auxiliary contacts for type PFB
- PFB devices are compatible with circuit breakers PR 60, PE 60, RV 60, PFI dimensions

PFB2



PFB4



PCHB2



PCHB4



### TYPES

RCCBs are manufactured in compliance with EN 61008 standard:

- type A - sensitive to alternating and pulsating dc residual operating currents.
- type AC - sensitive only to alternating residual operating currents of sine form.

### SPECIAL VERSIONS

Four-pole selective switches (switches with delayed break-out) are available at customer's request. Their rated currents are 25, 40 or 63A, and rated differential currents are 0,1 A or 0,3 A. Break out times at different values of differential currents comply with the EN 61008 standard.

At customers's request, special K switches with delayed tripping time (min. inactive period 10 ms) and high resistance to surge currents (up to 3 kA) are also available. Their rated currents are 40 or 63 A, and their rated differential currents are 0,03; 0,1; 0,3 or 0,5 A.

## Technical data

| Types                                   |                |                | PFB2                                            | PFB4       | PCHB2                    | PCHB4      |
|-----------------------------------------|----------------|----------------|-------------------------------------------------|------------|--------------------------|------------|
| Number of poles                         |                |                | 2                                               | 4          | 2                        | 4          |
| Rated current                           | $I_n$          | A              | 16 - 63                                         | 16 - 63    | 16 - 100                 | 16 - 100   |
| Rated residual operating current        | $I_{\Delta n}$ | A              | 0,01 - 0,5                                      | 0,03 - 0,5 | 0,01 - 0,5               | 0,03 - 0,5 |
| Rated voltage                           | $U_n$          | V              | 230                                             | 230/400    | 230                      | 230/400    |
| Rated frequency                         |                | Hz             | 50                                              | 50         | 50/60                    | 50/60      |
| Rated res. making and breaking capacity | $I_m$          | $I_{\Delta m}$ | 630                                             | 630        | 800; 1000 for $I_n=100A$ |            |
| Rated res. making and breaking capacity | $I_{\Delta m}$ |                |                                                 |            |                          |            |
| Max. conventional back-up fuses GL      | $I_n$          | A              | 63; 80 for $I_n=63$ and 80A; 100 for $I_n=100A$ |            |                          |            |
| Rated conditional short-circuit current | $I_{nc}$       | A              | 10000; 6000 for $I_n=100A$                      |            |                          |            |
| Protection degree                       |                |                | IP 20; IP40 after installation                  |            |                          |            |
| Mounting position                       |                |                | optional                                        |            |                          |            |
| Ambient temperature                     |                | °C             | from -25°C to +40°C                             |            |                          |            |
| Weight                                  |                | g              | 250                                             | 435        | 230                      | 390        |
| Terminal capacity                       |                | mm²            | 1 to 25                                         |            | 1 to 35                  |            |
| Accessories                             |                |                | auxiliary and signal contacts                   |            | sealing covers           |            |

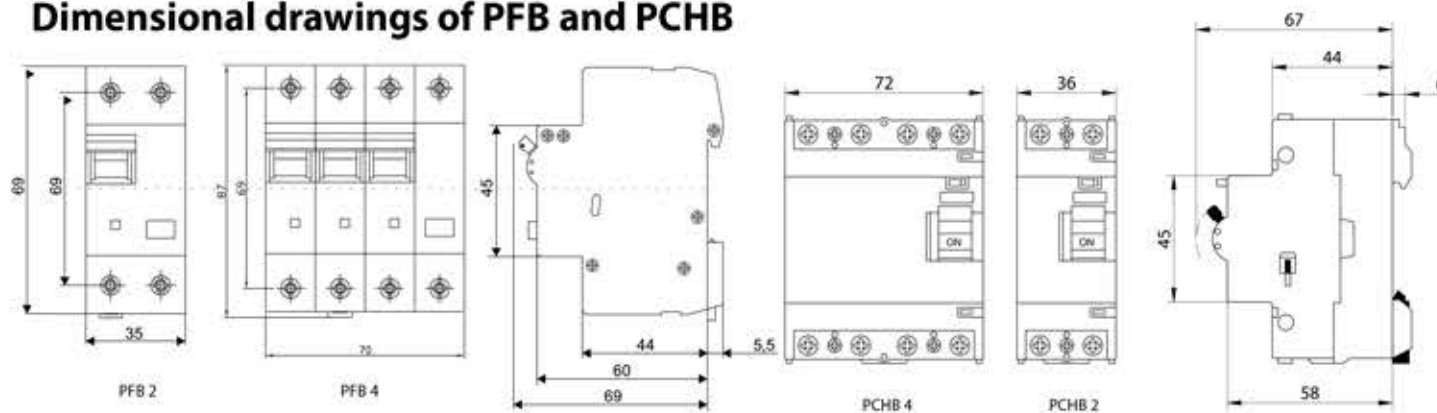
## PFB - 2

| 2 pole version          | Ordering Nr. |           |
|-------------------------|--------------|-----------|
|                         | Type A       | Type AC   |
| $I_{\Delta n} = 0,01 A$ |              |           |
| PFB2 - 16/0,01          | 0090660      | 0090660AC |
| PFB2 - 25/0,01          | 0090661      | 0090661AC |
| $I_{\Delta n} = 0,03 A$ |              |           |
| PFB2 - 16/0,03          | 0090662      | 0090662AC |
| PFB2 - 25/0,03          | 0090663      | 0090663AC |
| PFB2 - 40/0,03          | 0090664      | 0090664AC |
| PFB2 - 63/0,03          | 0090665      | 0090665AC |
| $I_{\Delta n} = 0,1 A$  |              |           |
| PFB2 - 16/0,1           | 0090666      | 0090666AC |
| PFB2 - 25/0,1           | 0090667      | 0090667AC |
| PFB2 - 40/0,1           | 0090668      | 0090668AC |
| PFB2 - 63/0,1           | 0090669      | 0090669AC |
| $I_{\Delta n} = 0,3 A$  |              |           |
| PFB2 - 16/0,3           | 0090670      | 0090670AC |
| PFB2 - 25/0,3           | 0090671      | 0090671AC |
| PFB2 - 40/0,3           | 0090672      | 0090672AC |
| PFB2 - 63/0,3           | 0090673      | 0090673AC |
| $I_{\Delta n} = 0,5 A$  |              |           |
| PFB2 - 16/0,5           | 0090674      | 0090674AC |
| PFB2 - 25/0,5           | 0090675      | 0090675AC |
| PFB2 - 40/0,5           | 0090676      | 0090676AC |
| PFB2 - 63/0,5           | 0090677      | 0090677AC |

## PCHB - 2

| 2 pole version          | Ordering Nr.  |  |
|-------------------------|---------------|--|
|                         | Type A        |  |
| $I_{\Delta n} = 0,01 A$ |               |  |
| PCHB2 - 16/0,01         | PCHB2/721011  |  |
| PCHB2 - 25/0,01         | PCHB2/722011  |  |
| $I_{\Delta n} = 0,03 A$ |               |  |
| PCHB2 - 16/0,03         | PCHB2/721031  |  |
| PCHB2 - 25/0,03         | PCHB2/722031  |  |
| PCHB2 - 40/0,03         | PCHB2/724031  |  |
| PCHB2 - 63/0,03         | PCHB2/726031  |  |
| PCHB2 - 80/0,03         | PCHB2/728031  |  |
| PCHB2 - 100/0,03        | PCHB2/7210031 |  |
| $I_{\Delta n} = 0,1 A$  |               |  |
| PCHB2 - 16/0,1          | PCHB2/721101  |  |
| PCHB2 - 25/0,1          | PCHB2/722101  |  |
| PCHB2 - 40/0,1          | PCHB2/724101  |  |
| PCHB2 - 63/0,1          | PCHB2/726101  |  |
| PCHB2 - 80/0,1          | PCHB2/728101  |  |
| PCHB2 - 100/0,1         | PCHB2/7210101 |  |
| $I_{\Delta n} = 0,3 A$  |               |  |
| PCHB2 - 16/0,3          | PCHB2/721301  |  |
| PCHB2 - 25/0,3          | PCHB2/721301  |  |
| PCHB2 - 40/0,3          | PCHB2/724301  |  |
| PCHB2 - 63/0,3          | PCHB2/726301  |  |
| PCHB2 - 80/0,3          | PCHB2/728301  |  |
| PCHB2 - 100/0,3         | PCHB2/7210301 |  |

## Dimensional drawings of PFB and PCHB



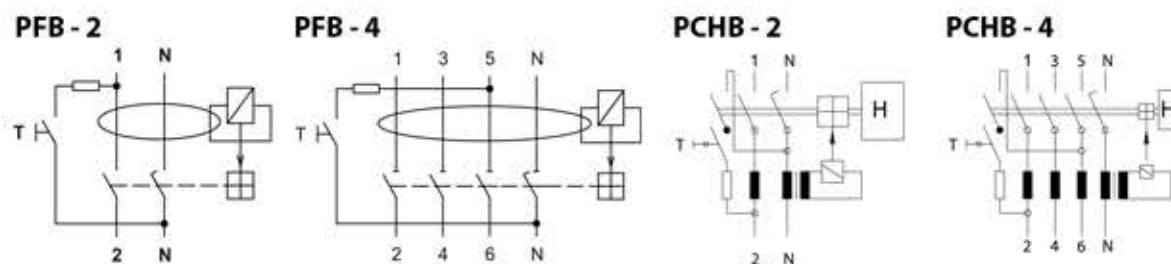
## PFB - 4

| 4 pole version          | Ordering Nr. |           |
|-------------------------|--------------|-----------|
|                         | Type A       | Type AC   |
| $I_{\Delta n} = 0,03 A$ |              |           |
| PFB4 - 16/0,03          | 0090682      | 0090682AC |
| PFB4 - 25/0,03          | 0090683      | 0090683AC |
| PFB4 - 40/0,03          | 0090684      | 0090684AC |
| PFB4 - 63/0,03          | 0090685      | 0090685AC |
| $I_{\Delta n} = 0,1 A$  |              |           |
| PFB4 - 16/0,1           | 0090686      | 0090686AC |
| PFB4 - 25/0,1           | 0090687      | 0090687AC |
| PFB4 - 40/0,1           | 0090688      | 0090688AC |
| PFB4 - 63/0,1           | 0090689      | 0090689AC |
| $I_{\Delta n} = 0,3 A$  |              |           |
| PFB4 - 16/0,3           | 0090690      | 0090690AC |
| PFB4 - 25/0,3           | 0090691      | 0090691AC |
| PFB4 - 40/0,3           | 0090692      | 0090692AC |
| PFB4 - 63/0,3           | 0090693      | 0090693AC |
| $I_{\Delta n} = 0,5 A$  |              |           |
| PFB4 - 16/0,5           | 0090694      | 0090694AC |
| PFB4 - 25/0,5           | 0090695      | 0090695AC |
| PFB4 - 40/0,5           | 0090696      | 0090696AC |
| PFB4 - 63/0,5           | 0090697      | 0090697AC |

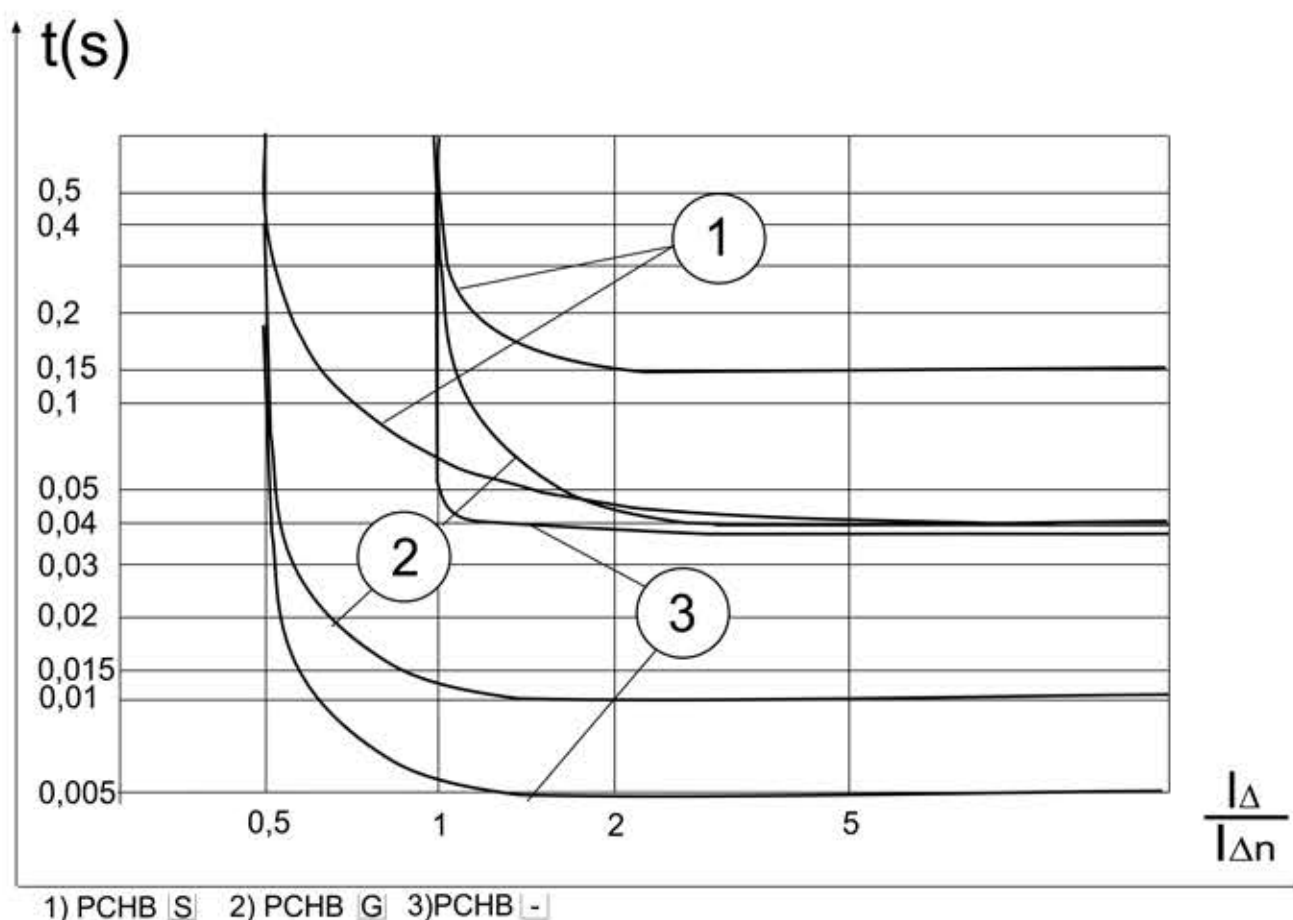
## PCHB - 4

| 4 pole version          | Ordering Nr.  |  |
|-------------------------|---------------|--|
|                         | Type A        |  |
| $I_{\Delta n} = 0,03 A$ |               |  |
| PCHB4 - 25/0,03         | PCHB4/742031  |  |
| PCHB4 - 40/0,03         | PCHB4/744031  |  |
| PCHB4 - 63/0,03         | PCHB4/746031  |  |
| PCHB4 - 80/0,03         | PCHB4/748031  |  |
| PCHB4 - 100/0,03        | PCHB4/7410031 |  |
| $I_{\Delta n} = 0,1 A$  |               |  |
| PCHB4 - 25/0,1          | PCHB4/742101  |  |
| PCHB4 - 40/0,1          | PCHB4/744101  |  |
| PCHB4 - 63/0,1          | PCHB4/746101  |  |
| PCHB4 - 80/0,1          | PCHB4/748101  |  |
| PCHB4 - 100/0,1         | PCHB4/7410101 |  |
| $I_{\Delta n} = 0,3 A$  |               |  |
| PCHB4 - 25/0,3          | PCHB4/742301  |  |
| PCHB4 - 40/0,3          | PCHB4/744301  |  |
| PCHB4 - 63/0,3          | PCHB4/746301  |  |
| PCHB4 - 80/0,3          | PCHB4/748301  |  |
| PCHB4 - 100/0,3         | PCHB4/7410301 |  |
| $I_{\Delta n} = 0,5 A$  |               |  |
| PCHB4 - 40/0,5          | PCHB4/744501  |  |

## Contacts scheme



## Instantaneous tripping characteristics PCHB



## BASIC TERMS AND SYMBOLS

• **Rated residual current  $I_{\Delta n}$**  is the value of residual current  $I_{\Delta n}$  specified by the manufacturer at which the residual current circuit breaker must switch out under specified conditions. Alternating residual current must release the residual current circuit breaker within  $(0.5 \div 1) I_{\Delta n}$ .

• **Rated conditional short-circuit current  $I_{nc}$**  – short-circuit strength. The function and design principle does not allow for the residual current circuit breaker use for protection against short-circuit. For circuit protection it is necessary to use a circuit breaker or a fuse. These elements cut the short-circuited circuit safely off. The residual current circuit breaker must only withstand the through-going short-circuit current. The amplitude of the maximum through current is defined as rated conditional short-circuit current  $I_{nc}$ . The short-circuit strength is then expressed by the current  $I_{nc}$ . For example, on the rating plate,  $I_{nc} = 10 \text{ kA}$  is expressed by the following symbol:

$I_{nc} = 10 \text{ kA}$

• **Residual current circuit breaker – type AC** – reacts to sine-wave residual current – it is used in conventional AC networks.

• **Residual current circuit breaker – type A** – reacts to sine-wave alternating and pulsating direct residual currents – it is used in conventional AC networks and the networks with phase power regulation etc.

• **Residual current circuit breaker – type G** – special residual current circuit breaker reducing the number of undesirable releases. It is mainly installed before the devices causing short-time (up to 10 ms) stray currents.

Identification: G  
Release delay: 10 ms

• **Residual current circuit breaker – type S** – special residual current circuit breaker, which is mainly intended for selective switching of residual current circuit breakers and reduction of undesirable releases. It is installed before the devices causing short-time (up to 40 ms) stray currents. Identification: S release delay: 40 ms Selective (discriminating) switching means that if the residual current circuit breakers are connected in series, only the device in which circuit a failure occurs will release. More specifically, only the device in which the release residual current appears due to a failure in the protected circuit will release. The advantage consists in maintaining the power supply in the other circuits not affected by the failure. Such function of the protected circuit is achieved by connection of the selective residual current circuit breaker before the standard or G type residual current circuit breaker, with the following ratio of rated residual currents:  $I_{\Delta n S} \geq 3 \times I_{\Delta n G}$  rated residual of the selective residual current circuit breaker  $I_{\Delta n S}$  maximum rated residual current of G type residual current circuit breaker. The main reason of selective switching is higher time delay of the selective residual current breakers in releasing (compared to standard or G type ones).

- device is a combination of residual current circuit breaker and circuit breaker for rated current 6, 10, 13, 16, 20, 25, 32, 40 A
- they are used in house and similar installations
- protection against:
  - additional protection in the even direct contact
  - indirect contact
  - fire
  - overcurrents
  - short circuit (breaking capacity 10 kA)
- range of rated residual operating current  $I_{\Delta n}$  is 10, 30, 100, 300, 500 mA ( $I_{\Delta n} = 10 \text{ mA}$  for devices with rated current up to 25 A including)
- tripping characteristics B, C according STN EN 61 009-1
- simple assembly with spring clamps to the strip 35 x 7,5 EN 60 715
- sealable in on and off position
- optical state indicator on the front side indicating operation state of device (green target visible – closed contacts, red target visible – opened contacts)
- connected clamp headed/stirrupted range of connecting wires 1 - 25 mm<sup>2</sup>
- working position optional
- there is a possibility to use auxiliary contacts
- Type K - special version with delayed tripping min. 10ms

PFI 2



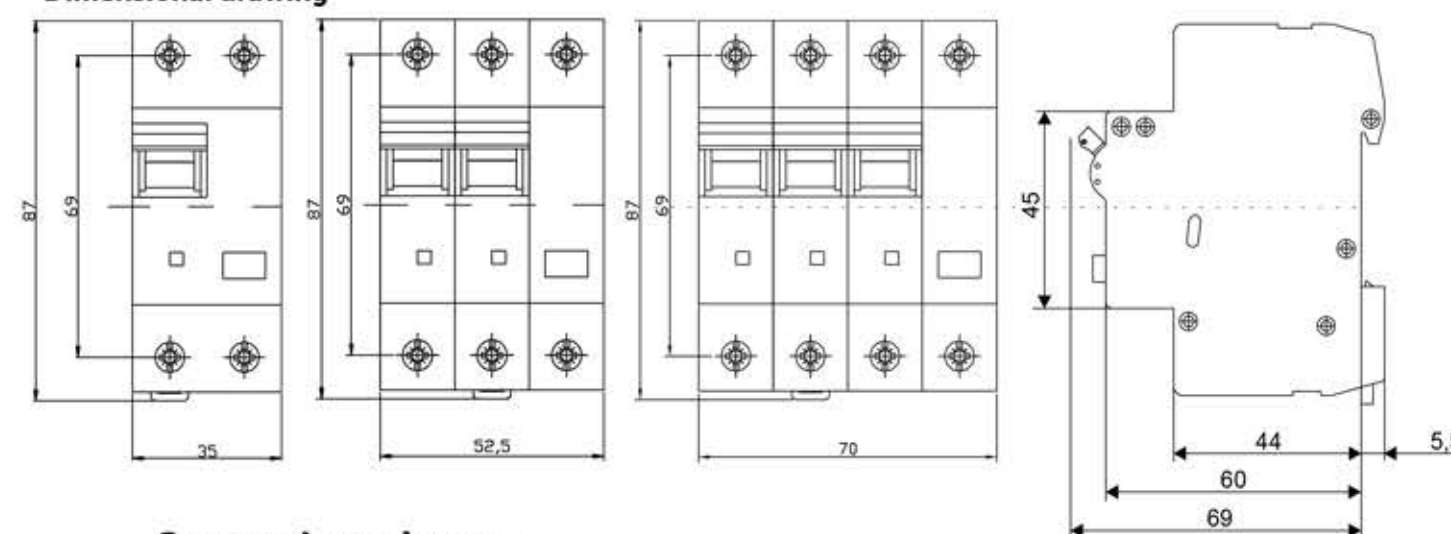
PFI 3



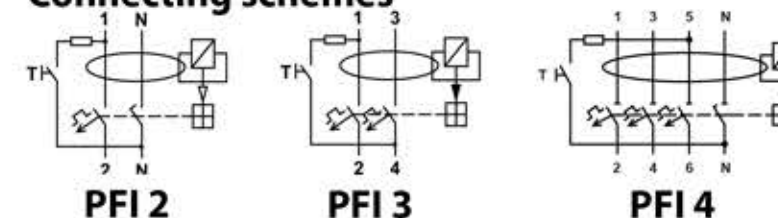
PFI 4



Dimensional drawing



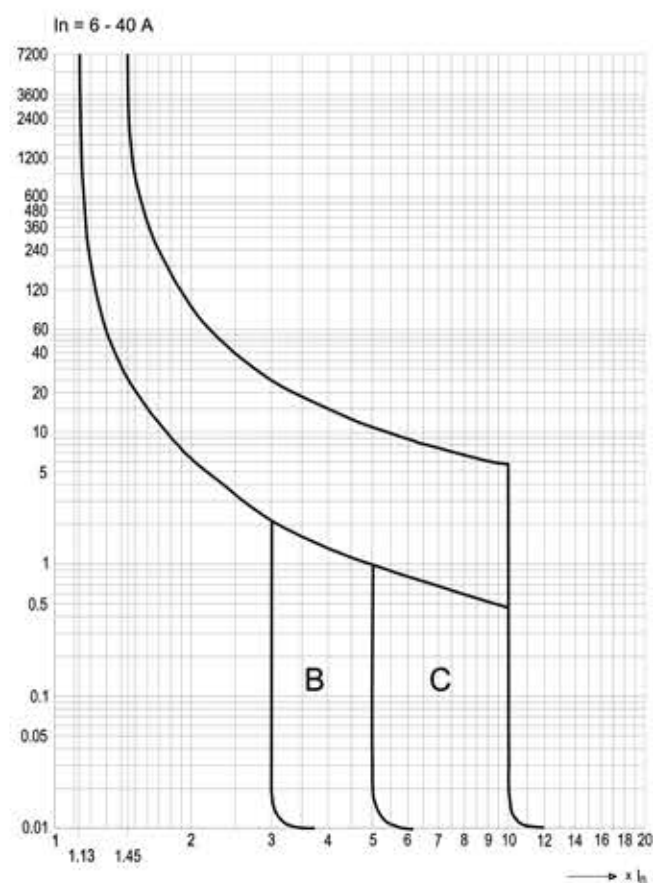
Connecting schemes



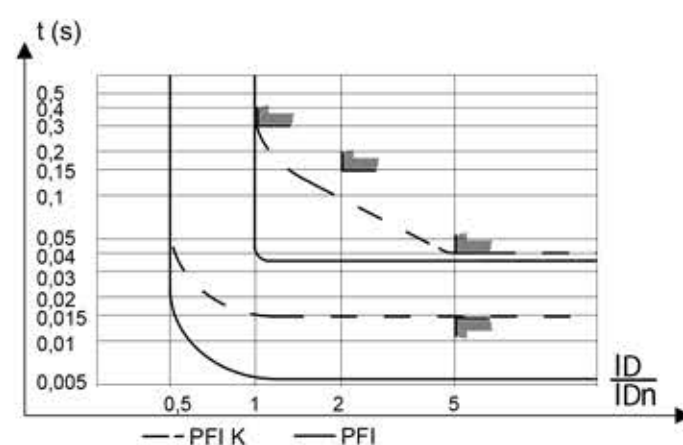
## Technical data

|                                       |                 | PFI 2                                | PFI 3              | PFI 4                |
|---------------------------------------|-----------------|--------------------------------------|--------------------|----------------------|
| No of poles                           |                 | 2                                    | 2                  | 4                    |
| No of modules                         |                 | 2                                    | 3                  | 4                    |
| Tripping characteristics              |                 | B, C                                 |                    |                      |
| Rated current $I_n$                   | A               | 6,10,13,16, 25,32,40                 |                    |                      |
| Rated residual current $I_{\Delta n}$ | A               | 0,01-0,5 up to 25 A                  | 0,03-0,5 from 25 A | 0,03; 0,1 ; 0,3; 0,5 |
| Rated voltage $U_n$                   | V               | 230                                  | 230                | 400                  |
| Rated frequency                       | Hz              | 50                                   |                    |                      |
| Rated short circuit capacity $I_{cn}$ | A               | 10 000                               |                    |                      |
| Selection class                       |                 | 3                                    |                    |                      |
| Residual operating current            |                 | type A – AC and pulsating DC current |                    |                      |
| Electrical endurance                  |                 | 4000                                 |                    |                      |
| Mechanical endurance                  |                 | 10000                                |                    |                      |
| Degree of protection                  |                 | IP20, IP40 front                     |                    |                      |
| Mounting position                     |                 | optional                             |                    |                      |
| Ambient temperature                   | °C              | -25 up to +40                        |                    |                      |
| Connecting clamps                     |                 | Headed/stirrupted                    |                    |                      |
| Terminal capacity                     | mm <sup>2</sup> | 1-25                                 |                    |                      |
| Accessories                           |                 | Auxiliary contacts, shunt trips VC   |                    |                      |

## Tripping characteristics



## Tripping characteristics



## PFI 2

## Characteristics B

| Ord. code | Type          | Ord. code | Type          |
|-----------|---------------|-----------|---------------|
| 0090600   | PFI2 B6/0,01  | 0090700   | PFI2 C6/0,01  |
| 0090601   | PFI2 B10/0,01 | 0090701   | PFI2 C10/0,01 |
| 0090619   | PFI2 B13/0,01 | 0090705   | PFI2 C13/0,01 |
| 0090602   | PFI2 B16/0,01 | 0090702   | PFI2 C16/0,01 |
| 0090603   | PFI2 B20/0,01 | 0090703   | PFI2 C20/0,01 |
| 0090604   | PFI2 B25/0,01 | 0090704   | PFI2 C25/0,01 |
| 0090610   | PFI2 B6/0,03  | 0090710   | PFI2 C6/0,03  |
| 0090611   | PFI2 B10/0,03 | 0090711   | PFI2 C10/0,03 |
| 0090618   | PFI2 B13/0,03 | 0090718   | PFI2 C13/0,03 |
| 0090612   | PFI2 B16/0,03 | 0090712   | PFI2 C16/0,03 |
| 0090613   | PFI2 B20/0,03 | 0090713   | PFI2 C20/0,03 |
| 0090614   | PFI2 B25/0,03 | 0090714   | PFI2 C25/0,03 |
| 0090615   | PFI2 B32/0,03 | 0090715   | PFI2 C32/0,03 |
| 0090616   | PFI2 B40/0,03 | 0090716   | PFI2 C40/0,03 |
| 0090620   | PFI2 B6/0,1   | 0090720   | PFI2 C6/0,1   |
| 0090621   | PFI2 B10/0,1  | 0090721   | PFI2 C10/0,1  |
| 0090622   | PFI2 B16/0,1  | 0090722   | PFI2 C16/0,1  |
| 0090623   | PFI2 B20/0,1  | 0090723   | PFI2 C20/0,1  |
| 0090624   | PFI2 B25/0,1  | 0090724   | PFI2 C25/0,1  |
| 0090625   | PFI2 B32/0,1  | 0090725   | PFI2 C32/0,1  |
| 0090626   | PFI2 B40/0,1  | 0090726   | PFI2 C40/0,1  |
| 0090630   | PFI2 B6/0,3   | 0090730   | PFI2 C6/0,3   |
| 0090631   | PFI2 B10/0,3  | 0090731   | PFI2 C10/0,3  |
| 0090632   | PFI2 B16/0,3  | 0090732   | PFI2 C16/0,3  |
| 0090633   | PFI2 B20/0,3  | 0090733   | PFI2 C20/0,3  |
| 0090634   | PFI2 B25/0,3  | 0090734   | PFI2 C25/0,3  |
| 0090635   | PFI2 B32/0,3  | 0090735   | PFI2 C32/0,3  |
| 0090636   | PFI2 B40/0,3  | 0090736   | PFI2 C40/0,3  |
| 0090640   | PFI2 B6/0,5   | 0090740   | PFI2 C6/0,5   |
| 0090641   | PFI2 B10/0,5  | 0090741   | PFI2 C10/0,5  |
| 0090642   | PFI2 B16/0,5  | 0090742   | PFI2 C16/0,5  |
| 0090643   | PFI2 B20/0,5  | 0090743   | PFI2 C20/0,5  |
| 0090644   | PFI2 B25/0,5  | 0090744   | PFI2 C25/0,5  |
| 0090645   | PFI2 B32/0,5  | 0090745   | PFI2 C32/0,5  |
| 0090646   | PFI2 B40/0,5  | 0090746   | PFI2 C40/0,5  |

## PFI 4

## Characteristics B

| Ord. code | Type          | Ord. code | Type         | Ord. code | Type         | Ord. code | Type         |
|-----------|---------------|-----------|--------------|-----------|--------------|-----------|--------------|
| 0090900   | PFI4 B6/0,03  | 0090940   | PFI4 B6/0,1  | 0090950   | PFI4 B6/0,3  | 0090910   | PFI4 B6/0,5  |
| 0090901   | PFI4 B10/0,03 | 0090941   | PFI4 B10/0,1 | 0090951   | PFI4 B10/0,3 | 0090911   | PFI4 B10/0,5 |
| 0090902   | PFI4 B13/0,03 | 0090942   | PFI4 B13/0,1 | 0090952   | PFI4 B13/0,3 | 0090912   | PFI4 B13/0,5 |
| 0090903   | PFI4 B16/0,03 | 0090943   | PFI4 B16/0,1 | 0090953   | PFI4 B16/0,3 | 0090913   | PFI4 B16/0,5 |
| 0090904   | PFI4 B20/0,03 | 0090944   | PFI4 B20/0,1 | 0090954   | PFI4 B20/0,3 | 0090914   | PFI4 B20/0,5 |
| 0090905   | PFI4 B25/0,03 | 0090945   | PFI4 B25/0,1 | 0090955   | PFI4 B25/0,3 | 0090915   | PFI4 B25/0,5 |
| 0090906   | PFI4 B32/0,03 | 0090946   | PFI4 B32/0,1 | 0090956   | PFI4 B32/0,3 | 0090916   | PFI4 B32/0,5 |
| 0090907   | PFI4 B40/0,03 | 0090947   | PFI4 B40/0,1 | 0090957   | PFI4 B40/0,3 | 0090917   | PFI4 B40/0,5 |

## Characteristics C

| Ord. code | Type          | Ord. code | Type         | Ord. code | Type         | Ord. code | Type         |
|-----------|---------------|-----------|--------------|-----------|--------------|-----------|--------------|
| 0090920   | PFI4 C6/0,03  | 0090960   | PFI4 C6/0,1  | 0091220   | PFI4 C6/0,3  | 0090930   | PFI4 C6/0,5  |
| 0090921   | PFI4 C10/0,03 | 0090961   | PFI4 C10/0,1 | 0091221   | PFI4 C10/0,3 | 0090931   | PFI4 C10/0,5 |
| 0090922   | PFI4 C13/0,03 | 0090962   | PFI4 C13/0,1 | 0091222   | PFI4 C13/0,3 | 0090932   | PFI4 C13/0,5 |
| 0090923   | PFI4 C16/0,03 | 0090963   | PFI4 C16/0,1 | 0091223   | PFI4 C16/0,3 | 0090933   | PFI4 C16/0,5 |
| 0090924   | PFI4 C20/0,03 | 0090964   | PFI4 C20/0,1 | 0091224   | PFI4 C20/0,3 | 0090934   | PFI4 C20/0,5 |
| 0090925   | PFI4 C25/0,03 | 0090965   | PFI4 C25/0,1 | 0091225   | PFI4 C25/0,3 | 0090935   | PFI4 C25/0,5 |
| 0090926   | PFI4 C32/0,03 | 0090966   | PFI4 C32/0,1 | 0091226   | PFI4 C32/0,3 | 0090936   | PFI4 C32/0,5 |
| 0090927   | PFI4 C40/0,03 | 0090967   | PFI4 C40/0,1 | 0091227   | PFI4 C40/0,3 | 0090937   | PFI4 C40/0,5 |

**MIS** – motor protection switch with thermal and magnetic short-circuit release.

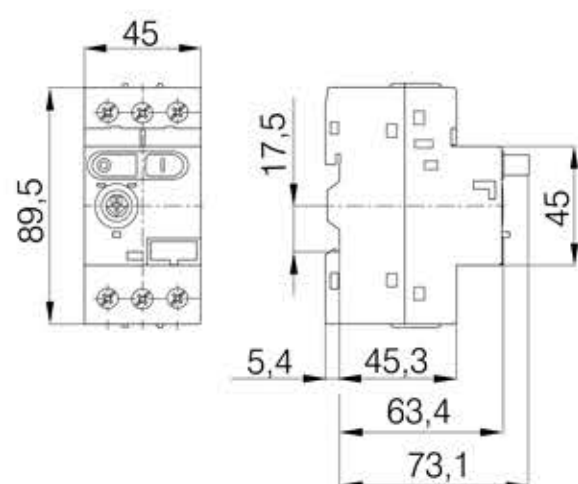
- reacts to phase failure in compliance with EN 60947-4-1, IEC 947-4-1, VDE 0660/102
- reliable protection especially at overloads and in certain cases also at short circuits
- simple and fast mounting by snap fitting on 35 mm wide mounting rail in compliance with EN 60715; fixing with two screws is also possible
- they are convenient also for mounting in an installation distribution box
- main application field: control (start-up, protection and switch-off) of AC electric motors with powers up to 11 kW (380/400 V) or other consumers up to 32 A; it can also be used as the main switch according to EN 60204 or VDE 0113 standards
- numerous accessories make the application field wider and enable the fulfillment of the majority of user's demands



## Technical data

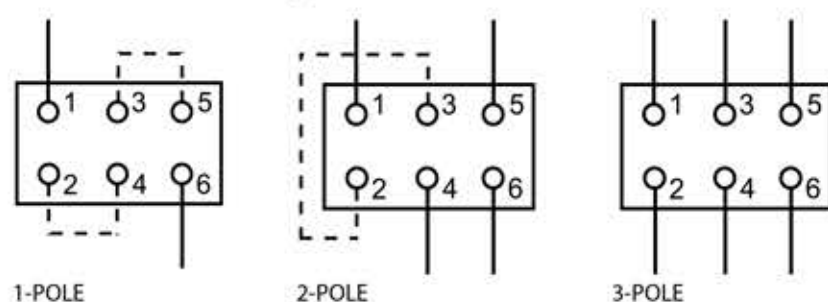
| Type        | Setting range | Operating current | Rated ultimate short-circuit breaking of short-circuit capacity (IEC 947-2, EN 60947-2) Icu (kA)      |                 |                 |                 |                 |                 |                 |                 | Max. Back-up fuses (GL,M) if short-circuit current exceeds breaking capacity MIS |       |       |       |   |  |  |
|-------------|---------------|-------------------|-------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------------------------------------------|-------|-------|-------|---|--|--|
|             | (A)           | (A)               | 230 V                                                                                                 |                 | 400 V           |                 | 500 V           |                 | 690 V           |                 | 230 V                                                                            | 400 V | 500 V | 690 V |   |  |  |
|             |               |                   | I <sub>cu</sub>                                                                                       | I <sub>sc</sub> | I <sub>cu</sub> | I <sub>sc</sub> | I <sub>cu</sub> | I <sub>sc</sub> | I <sub>cu</sub> | I <sub>sc</sub> |                                                                                  |       |       |       |   |  |  |
| MIS 32-0,16 | 0,1...0,16    | 2                 | Switches are short-circuit proof for any value of prospective short-circuit current I <sub>cc</sub> . |                 |                 |                 |                 |                 |                 |                 | No back-up fuses required.<br>Breaking capacity > I <sub>cc</sub>                |       |       |       |   |  |  |
| MIS 32-0,25 | 0,16...0,25   | 3                 |                                                                                                       |                 |                 |                 |                 |                 |                 |                 |                                                                                  |       |       |       |   |  |  |
| MIS 32-0,4  | 0,25...0,4    | 5                 |                                                                                                       |                 |                 |                 |                 |                 |                 |                 |                                                                                  |       |       |       |   |  |  |
| MIS 32-0,63 | 0,4...0,63    | 8                 |                                                                                                       |                 |                 |                 |                 |                 |                 |                 |                                                                                  |       |       |       |   |  |  |
| MIS 32-1    | 0,63...1      | 12                |                                                                                                       |                 |                 |                 |                 |                 |                 |                 |                                                                                  |       |       |       |   |  |  |
| MIS 32-1,6  | 1...1,6       | 20                |                                                                                                       |                 |                 |                 |                 |                 |                 |                 |                                                                                  |       |       |       |   |  |  |
| MIS 32-2,5  | 1,6...2,5     | 33                |                                                                                                       |                 |                 |                 |                 |                 |                 |                 | 5                                                                                |       | 5     |       |   |  |  |
| MIS 32-4    | 2,5...4       | 44                |                                                                                                       |                 |                 |                 |                 |                 |                 |                 | 3                                                                                |       | 3     |       |   |  |  |
| MIS 32-6,3  | 4...6,3       | 75                |                                                                                                       |                 |                 |                 |                 |                 |                 |                 | 6                                                                                |       | 4,5   | 3     | 2 |  |  |
| MIS 32-10   | 6,3...10      | 120               |                                                                                                       |                 |                 |                 |                 |                 |                 |                 | 6                                                                                |       | 4,5   | 3     | 2 |  |  |
| MIS 32-14   | 9...14        | 160               | 25                                                                                                    | 12,5            | 25              | 12,5            | 6               | 4,5             | 3               | 2               | 80                                                                               | 63    | 50    | 50    |   |  |  |
| MIS 32-18   | 13...18       | 230               | 25                                                                                                    | 12,5            | 25              | 12,5            | 6               | 4,5             | 3               | 2               | 80                                                                               | 63    | 50    | 50    |   |  |  |
| MIS 32-23   | 17...23       | 270               | 25                                                                                                    | 12,5            | 25              | 12,5            | 4               | 3               | 3               | 2               | 80                                                                               | 80    | 50    | 50    |   |  |  |
| MIS 32-27   | 20...27       | 360               | 25                                                                                                    | 12,5            | 25              | 12,5            | 4               | 3               | 3               | 2               | 80                                                                               | 80    | 50    | 50    |   |  |  |
| MIS 32-32   | 25...32       | 400               | 25                                                                                                    | 12,5            | 25              | 12,5            | 4               | 3               | 3               | 2               | 80                                                                               | 80    | 50    | 50    |   |  |  |

## Dimensional drawing of MIS

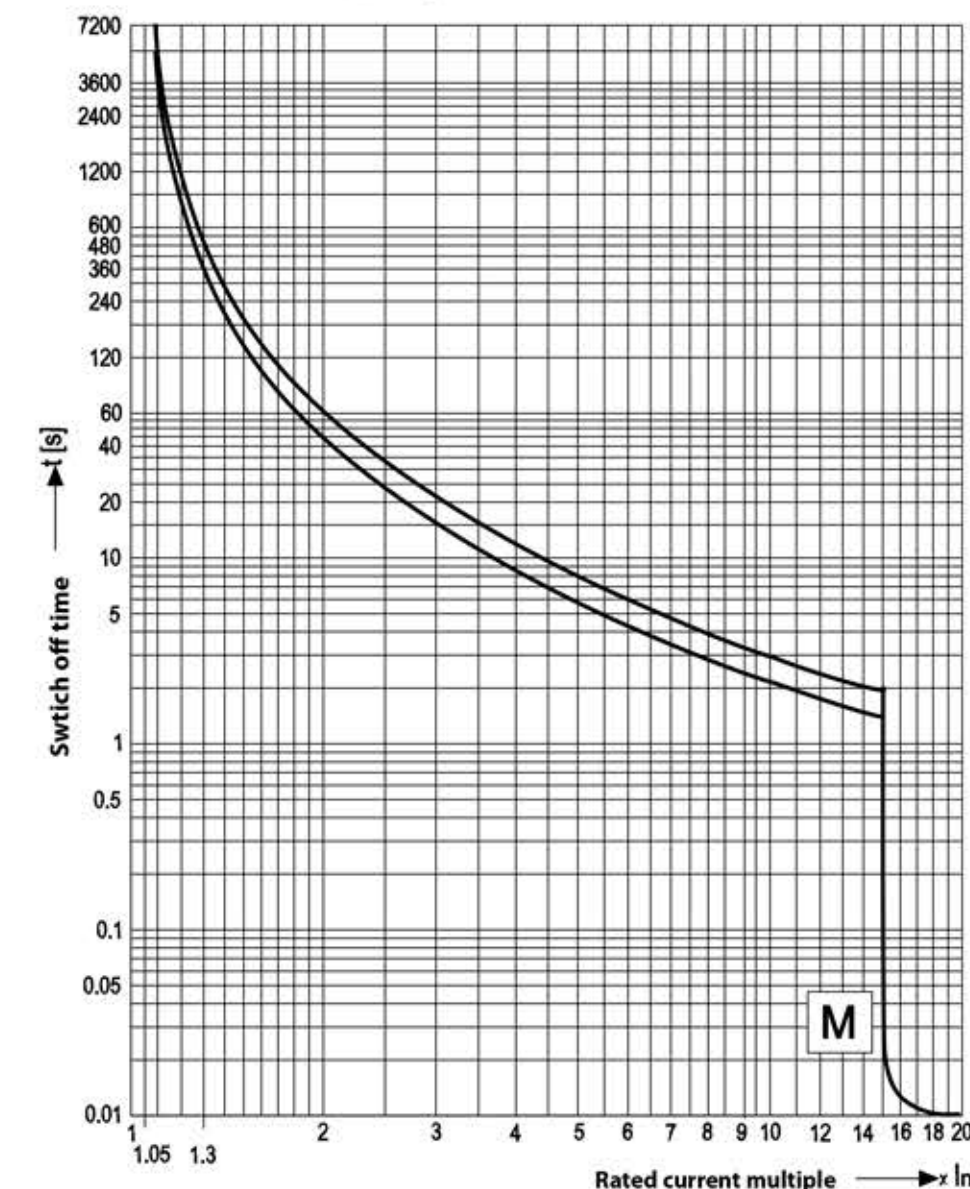


| Type       | Ordering number | Setting scale |
|------------|-----------------|---------------|
| MIS - 0,16 | MIS32 - 0,16    | 0,1 - 0,16    |
| MIS - 0,25 | MIS32 - 0,25    | 0,16 - 0,25   |
| MIS - 0,4  | MIS32 - 0,4     | 0,25 - 0,4    |
| MIS - 0,63 | MIS32 - 0,63    | 0,4 - 0,63    |
| MIS - 1    | MIS32 - 1       | 0,63 - 1      |
| MIS - 1,6  | MIS32 - 1,6     | 1 - 1,6       |
| MIS - 2,5  | MIS32 - 2,5     | 1,6 - 2,5     |
| MIS - 4    | MIS32 - 4       | 2,5 - 4       |
| MIS - 6,3  | MIS32 - 6,3     | 4 - 6,3       |
| MIS - 10   | MIS32 - 10      | 6,3 - 10      |
| MIS - 14   | MIS32 - 14      | 9 - 14        |
| MIS - 18   | MIS32 - 18      | 13 - 18       |
| MIS - 23   | MIS32 - 23      | 17 - 23       |
| MIS - 27   | MIS32 - 27      | 20 - 27       |
| MIS - 32   | MIS32 - 32      | 25 - 32       |

## Connection diagram



## Instantaneous tripping characteristics of MIS



## Selection MIS to electromotor

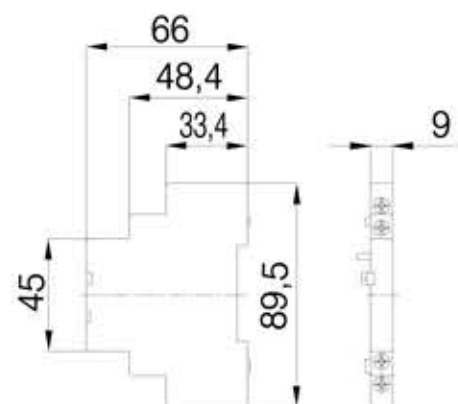
| 1-pole                  | 3-pole                  |                         |             |             |                | Setting range of thermal release<br>(A) |
|-------------------------|-------------------------|-------------------------|-------------|-------------|----------------|-----------------------------------------|
| 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...0,09 | 0,06...0,12    | 0,16...0,25                             |
| -                       | 0,06                    | 0,09                    | 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                                 |

## AUXILIARY CONTACTS HS 20, HS 10, HS11

| Type | Ordering No. |
|------|--------------|
| HS20 | MIS32 - HS20 |
| HS10 | MIS32 - HS10 |
| HS11 | MIS32 - HS11 |

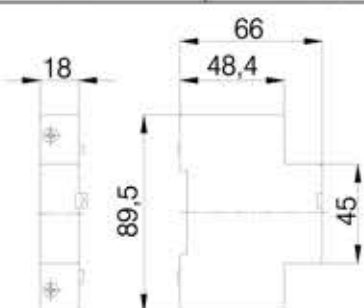


### Dimensional drawing of HS



## UNDER-VOLTAGE RELEASE UR, SHUNT RELEASE AR, 24 – 400 V; 50, 60 HZ

| Type   | Ordering No. |
|--------|--------------|
| UR ... | MIS32 - UR   |
| AR ... | MIS32 - AR   |



## PADLOCK FEATURE HZ

| Type | Ordering No. |
|------|--------------|
| HZ   | MIS32 - HZ   |



## PUSH-BUTTON DIAPHRAGM M

The manufacturer supplies also an enclosure and a front plate with protection degree IP 55 (O-55, CP-55); in this case the diaphragm is already mounted. However, it should be removed, if a lock or the emergency stop push-buttons are built-in.

| Type | Ordering No. |
|------|--------------|
| M    | MIS32 - M    |



## Enclosure IP 41/55, HO-41/55, front plate IP 41/55, FP-41/55



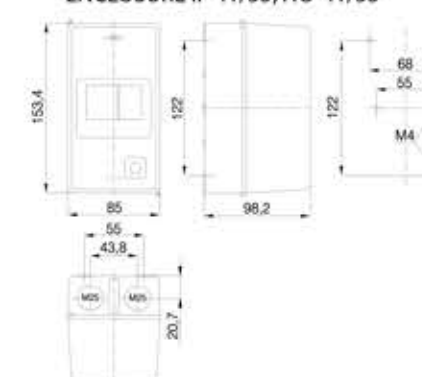
The MIS or MIST motor protection switch with all accessories can be built into an enclosure or in a front plate.  
One N/PE neutral link is usually built in the enclosure or front plate. A place to mount additional neutral link is also available.

| Type  | Ordering No.  |
|-------|---------------|
| HO-55 | MIS32 - HO-55 |
| HO-41 | MIS32 - HO-41 |
| FP-55 | MIS32 - FP-55 |

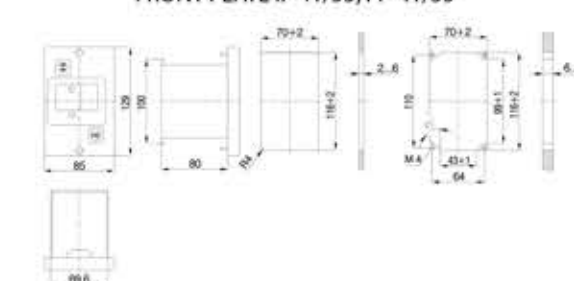


### Dimensional drawing HO, FP

ENCLOSURE IP 41/55, HO-41/55



FRONT PLATE IP 41/55, FP-41/55



## Signal lamp SS... 220,240,400V (B- white, R- red, Z- green)



| Type | Ordering No. |
|------|--------------|
| SS   | MIS32 - SS   |
| SSR  | MIS32 - SSR  |
| SSZ  | MIS32 - SSZ  |

### Possibility ordering

- Relative auxiliary switch HRS, auxiliary flush type switch HSV  
VERSION: HRS 01, HRS 10, HSV 01, HSV 10
- EMERGENCY STOP PUSH-BUTTON NAT,  
is available also with a key.
- NEUTRAL LINK N/PE  
One N/PE neutral link is usually built in the enclosure or front plate. A place to mount additional neutral link is also available.

Universal supply voltage 10 functions:

- 5 time functions controlled via supply voltage
- 4 time functions controlled via control input
- 1 function of memory (latching) relay

Time scale 0,1 s - 10 days divided into 10 ranges: (0,1s - 1s / 1s - 10s / 0,1min - 1 min / 1 min - 10min / 0,1h - 1 h / 1h - 10h / 0,1day - 1 day / 1day - 10days / only ON / only OFF). Output contact: 1 x 16A changeover.

Output indication: multifunction red LED flashing at certain states.

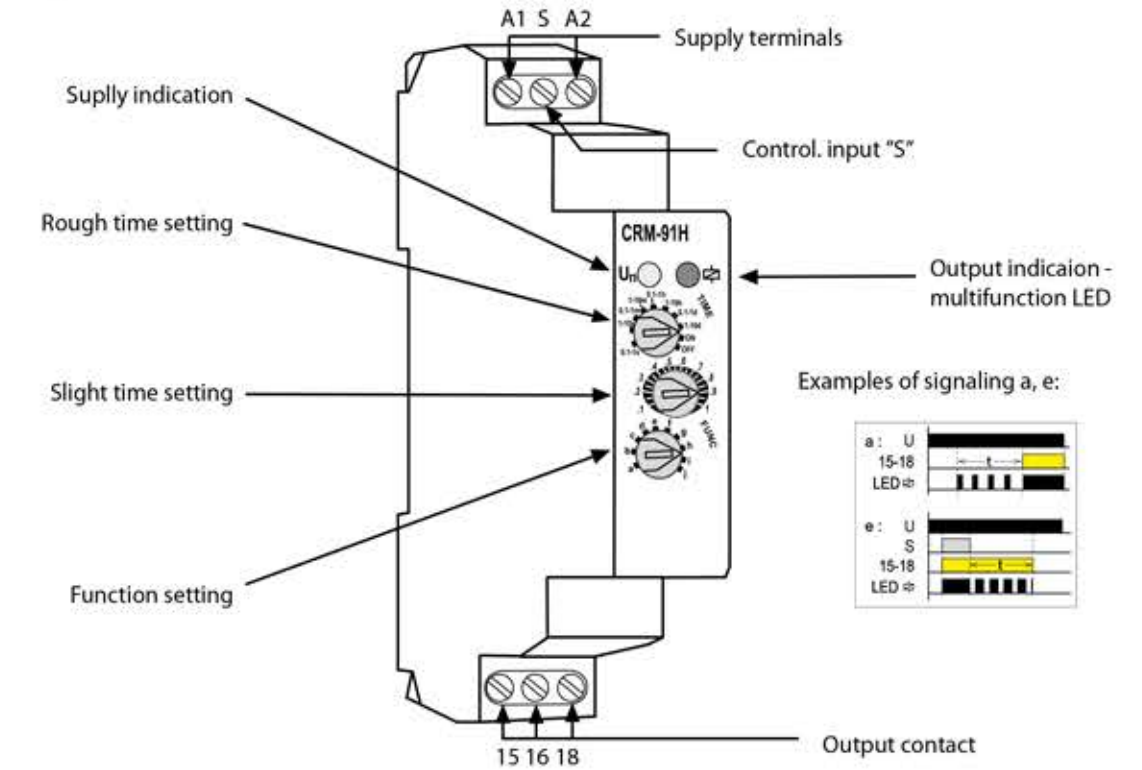
## Technical data

|                           |                                  |
|---------------------------|----------------------------------|
| Number of functions       | 10                               |
| Supply                    | A1 - A2                          |
| Supply voltage            | AC/DC 12 - 240 V (AC 50 - 60 Hz) |
| Consumption               | AC 0.7 3 VA / DC 0.5 1.7 W       |
| Supply voltage tolerance  | -15% ; +10%                      |
| Supply Indication         | green LED                        |
| Time ranges               | 0,1 s - 10 Days                  |
| Time setting              | rotary switch                    |
| Time deviation            | 5% mechanical setting            |
| Repeat accuracy           | 0,2% - set value stability       |
| Temperature coefficient   | 0,01% / °C, at 20°C              |
| <b>Output</b>             |                                  |
| Changeover contacts       | 1                                |
| Rated current             | 16A / AC1                        |
| Breaking capacity         | 4000VA / AC1, 384 W/DC           |
| Inrush current            | 30A / <3s                        |
| Switching voltage         | 250V AC1 / 24V DC                |
| Min. breaking capacity DC | 500 mW                           |
| Output indication         | multifunction red LED            |
| Mechanical life           | 3 x 10 <sup>7</sup>              |
| Electrical life           | 0,7 x 10 <sup>5</sup>            |
| <b>Controlling</b>        |                                  |
| Control voltage           | AC/DC 12 - 240V                  |
| Consumption of input      | AC 0,025 - 0,2VA / DC 0,1 - 0,7W |
| Load between S-A2         | yes                              |
| Glow tubes                | no                               |
| Control terminals         | A1 - S                           |
| Impulse lenght            | min. 25 ms / max. unlimited      |
| Reset time                | max. 150 ms                      |
| Operating temperature     | -20 ... +55°C                    |
| Storing temperature       | -30 ... +70°C                    |
| Electrical strenght       | 2,5kV                            |
| Operation position        | optional                         |
| Mounting                  | EN 60715                         |
| Protection degree         | IP40                             |
| Overvoltage cathegory     | III.                             |
| Pollutiondegree           | 2                                |
| Max. cable size           | 2,5 mm <sup>2</sup>              |
| Dimension                 | 90 x 17,6 x 65 mm                |
| Weight                    | 68 g                             |
| Standards                 | EN 61812-1, EN 50081, EN 61010-1 |

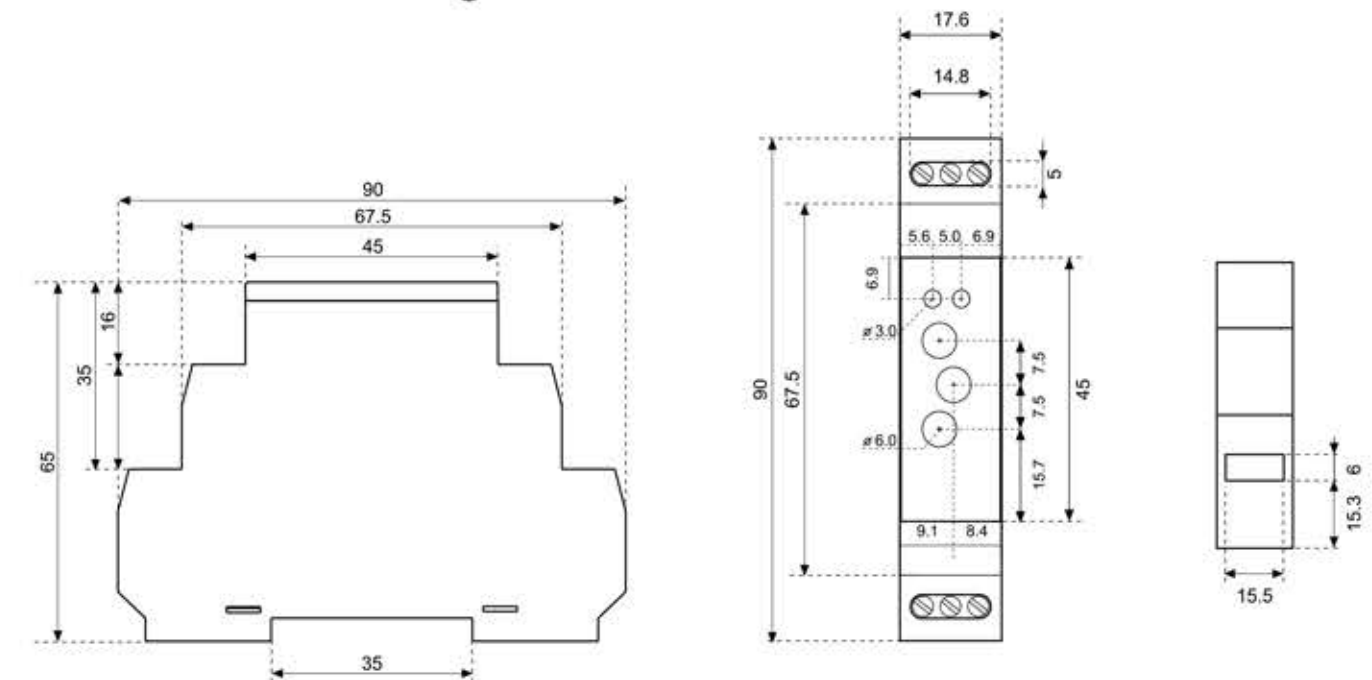
|              |         |
|--------------|---------|
| Order number | CRM91H0 |
|--------------|---------|



## Description



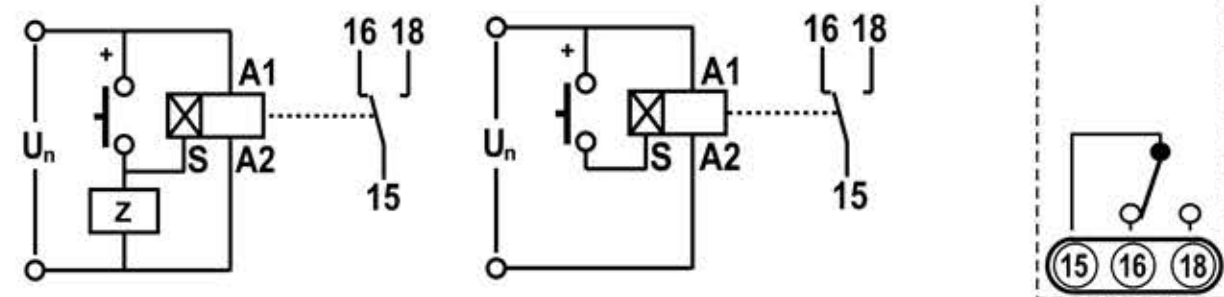
## Dimensional drawing of CRM 91 H UNI



## Connection scheme

### Load with control. Input possible.

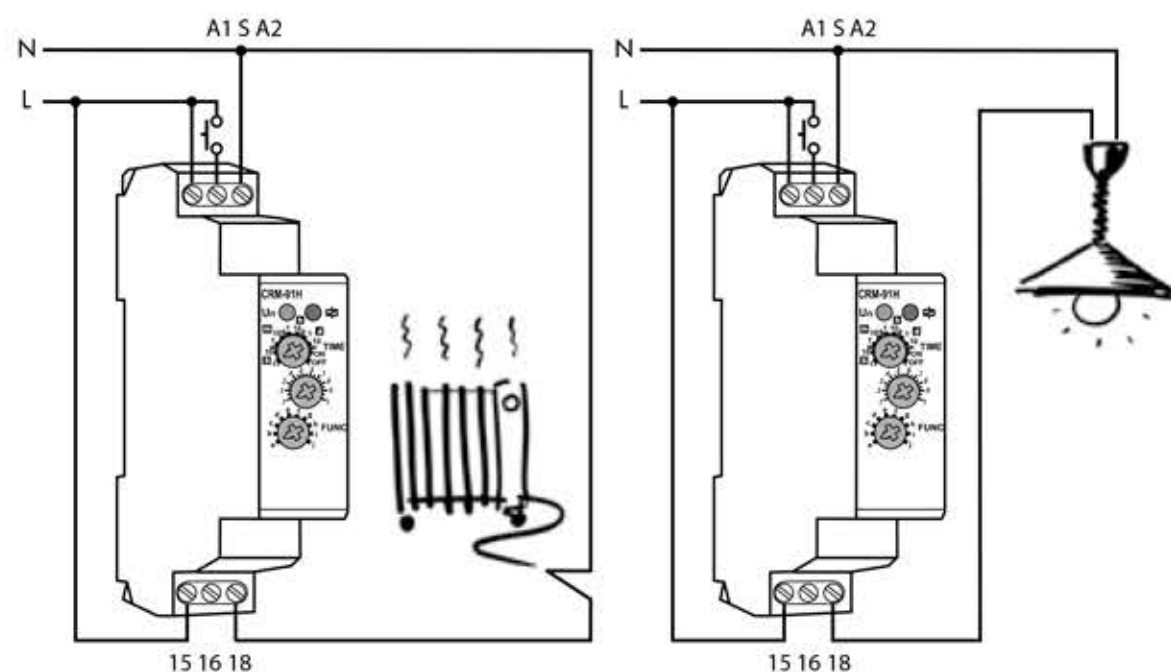
Load between S-A2 possible to connect in parallel way, without disturbing of proper operation of the relay.



## Examples of application:

For electrical appliances with the need to change status by the exact timing:

- lighting
- heating
- motors, pumps
- machines, mechanisms ...



Supply voltage: AC 230V. Function delay OFF responding to make of control button – protection against fixing of button (for example with match).

Time range: 0,5 – 10 min. Operation switch: AUTO – normal function acc. to set time

OFF – permanent off (e.g. service of lights)

ON – permanent on (e.g. service)

Time setting via potentiometer. Output contact relay 16 Amp: load up to 4000 VA / AC1. Glow-lamps in button possible.

## Technical data

|                           |                                  |
|---------------------------|----------------------------------|
| Function                  | delay off                        |
| Supply                    | A1 - A2                          |
| Supply voltage            | AC 230V / 50 60Hz                |
| Consumption               | AC max. 12VA / 1,8W              |
| Supply voltage tolerance  | -15%; +10%                       |
| Supply indication         | green LED                        |
| Time ranges               | 0,5 - 10 min                     |
| Time setting              | potentiometer                    |
| Time deviation            | 10% mechanical setting           |
| Repeat accuracy           | 5% - set value stability         |
| Temperature coefficient   | 0,05%/°C, at 20°C                |
| <b>Output</b>             |                                  |
| Number of contacts        | 1 x changeover                   |
| Rated current             | 16A/AC1                          |
| Breaking capacity         | 4000VA/AC1, 384W/DC              |
| Inrush current            | 30A/ <3s                         |
| Switching voltage         | 250V AC1 / 24V DC                |
| Min. breaking capacity DC | 500mW                            |
| Output indication         | red LED                          |
| Mechanical life           | 3 x 10 <sup>7</sup>              |
| Electrical life           | 0,7 x 10 <sup>5</sup>            |
| <b>Controlling</b>        |                                  |
| Control. voltage          | AC 230V                          |
| Consumption of input      | AC 0,53VA                        |
| Load between S-A2         | yes                              |
| Glow tubes                | yes, max. 20 pcs at 1mA          |
| Control. terminals        | A1 - S                           |
| Impulse length            | min. 25 ms / max. unlimited      |
| Reset time                | max. 150 ms                      |
| Operating temperature     | -20 ... +55°C                    |
| Storage temperature       | -30 ... +70°C                    |
| Electrical strength       | 2,5kV                            |
| Operating position        | optional                         |
| Mounting                  | DIN rail EN 60715                |
| Protection degree         | IP40 from the front panel        |
| Overvoltage category      | III.                             |
| Pollution degree          | 2                                |
| Max. cable size           | 2,5 mm <sup>2</sup>              |
| Dimensions                | 90 x 17,6 x 65 mm                |
| Weight                    | 53 g                             |
| Standards                 | EN 61812-1, EN 50081, EN 61010-1 |



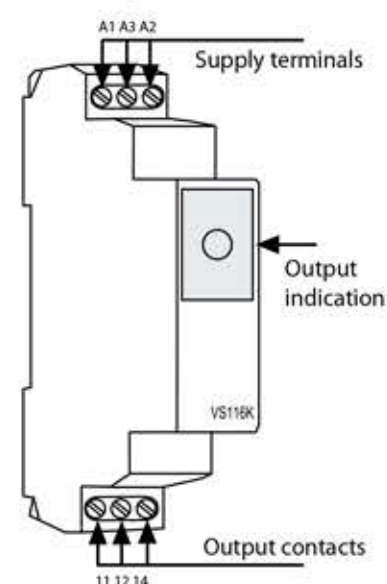
|               |         |
|---------------|---------|
| Ordering code | CRM4000 |
|---------------|---------|



Supply voltage: AC 230V and AC/DC 24V. Noiseless switching. Output contact: 1x 16A changeover. Highly luminous LED output indication. The possibility to choose the colour of output indication: red, green, yellow or white.



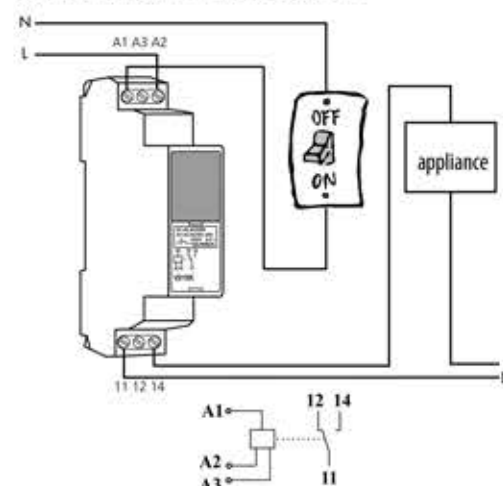
## Description



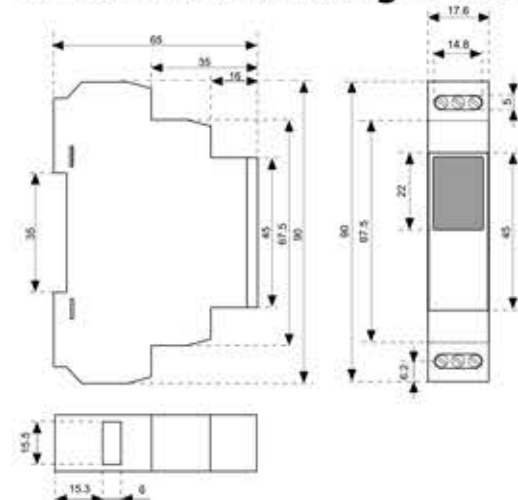
## Technical data

|                           |      |                                    |
|---------------------------|------|------------------------------------|
| Supply                    | 230V | A1 - A2                            |
| Supply voltage            | 230V | AC 230V / 50 - 60Hz                |
| Consumption               |      | AC max. 7,5VA / 1W                 |
| Supply                    | 24V  | A1 - A3                            |
| Supply voltage            | 24V  | AC/DC 24V (50-60Hz)                |
| Consumption               |      | AC 1VA/DC 1W                       |
| Supply voltage tolerance  |      | -15%; +10%                         |
| <b>Output</b>             |      |                                    |
| Number of contacts        |      | 1 x changeover                     |
| Rated current             |      | 16A/AC1                            |
| Breaking capacity         |      | 4000VA/AC1, 384W/DC                |
| Inrush current            |      | 30A/ <3s                           |
| Switching voltage         |      | 250V AC1 / 24V DC                  |
| Min. breaking capacity DC |      | 500mW                              |
| Output indication         |      | high intensity of LED              |
| Mechanical life           |      | 3 x 10 <sup>7</sup>                |
| Electrical life           |      | 0,7 x 10 <sup>5</sup>              |
| Time between switches     |      | min. 2s                            |
| Operating temperature     |      | -20 ... +55°C                      |
| Storage temperature       |      | -30 ... +70°C                      |
| Electrical strength       |      | 2,5kV                              |
| Operating position        |      | optional                           |
| Mounting                  |      | DIN rail EN 60715                  |
| Protection degree         |      | IP40 from the front panel          |
| Overvoltage category      |      | III.                               |
| Pollution degree          |      | 2                                  |
| Max. cable size           |      | 2,5 mm <sup>2</sup>                |
| Dimensions                |      | 90 x 17,6 x 65 mm                  |
| Weight                    |      | 58 g                               |
| Standards                 |      | EN 60669-2-2, EN 50081, EN 61010-1 |
| Ordering code             |      | VS116K0                            |

## Connection scheme



## Dimensional drawing of VS 116 K



## IKA 20, IKD 20, IKA 25, IKD 25, IK 40, IK 63

Installation contactors are applied for automatic control of electric devices in installations of dwellings, offices shops and hospitals. They are particularly suitable for switching lighting, heat pumps, air-conditioning and similar equipment and are also intended for switching single phase and three phase electric motors. They excel in silent operation. Contactors can be built in electric distribution panels on 35 mm mounting rails (in compliance with EN 60715). Sealing of contactors cover is also possible. Coils of contactors IK22, IK24, IK40 and IK63 are DC driven with rectifier that enables DC or AC voltage control. Four-pole make contacts of a contactor can be applied as main or auxiliary contacts.



### An auxiliary switch with two contacts can be attached:

- version 11 is provided with one make and one brake contact - 1NO+1NC
- version 20 is provided with two make contacts - 2NO

## Technical data

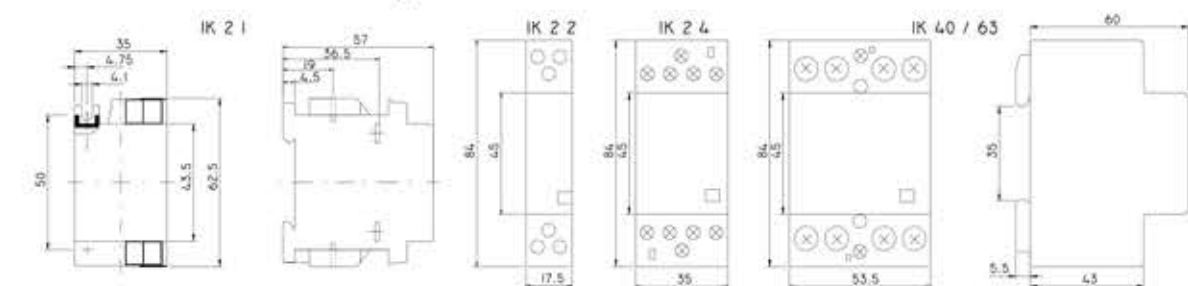
| Type                                    |                                          | IKA 20                                                                                          | IKD 20               | IK 21            | IKA 25           | IKD 25           | IK 40            | IK 63            | Aux. switch<br>IKN |
|-----------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------|------------------|------------------|------------------|------------------|------------------|--------------------|
| Standards                               |                                          | IEC 947-4-1, IEC 947-5-1, IEC 1095, EN 60 947-4-1, EN 60 947-5-1, EN 61 095, VDE 0660, VDE 0637 |                      |                  |                  |                  |                  |                  |                    |
| Permissible ambient temperature         |                                          | -5 ... +55                                                                                      |                      |                  |                  |                  |                  |                  |                    |
| Storage temperature                     |                                          | +30 ... +80                                                                                     |                      |                  |                  |                  |                  |                  |                    |
| Overvoltage protection                  |                                          | -                                                                                               | 430                  | -                | -                | 430              | 430              | 430              | -                  |
| Mechanical endurance (switching cycles) |                                          | 3 x 10 <sup>6</sup>                                                                             |                      |                  |                  |                  |                  |                  |                    |
| Protection class to DIN 40 050, IEC 529 |                                          | IP 20                                                                                           |                      |                  |                  |                  |                  |                  |                    |
| General                                 | Side-by-side assembly at u <sub>ie</sub> | no limitation                                                                                   |                      |                  |                  |                  |                  |                  | -                  |
|                                         |                                          | no limitation                                                                                   |                      |                  |                  |                  |                  |                  | max. 3 contacts    |
| Rated insulation voltage                |                                          | U <sub>i</sub> V                                                                                | 440                  | 440              | 415              | 440              | 440              | 500              | 500                |
|                                         |                                          | U <sub>imp</sub> kV                                                                             | 4                    | 4                | 4                | 4                | 4                | 4                | 4                  |
| Rated thermal current                   |                                          | I <sub>th</sub> A                                                                               | 20                   | 20               | 20               | 25               | 25               | 40               | 63                 |
| Rated operational current               |                                          | I <sub>e</sub> A                                                                                | 20                   | 20               | 20               | 25               | 25               | 40               | 63                 |
| AC1                                     | Operational power rating                 | 230V                                                                                            | 4                    | 4                | 7,5              | 9                | 9                | 16               | 40                 |
|                                         |                                          | 400V                                                                                            | -                    | -                | 13               | 16               | 16               | 26               | 40                 |
| AC3                                     | Operational power rating                 | 230V                                                                                            | 1,3 only for NO      | 1,3 only for NO  | 1,1              | 2,2              | 2,2              | 5,5              | 8,5                |
|                                         |                                          | 400V                                                                                            | -                    | -                | 2,2              | 4                | 4                | 11               | 15                 |
| DC1                                     | Rated operational current at:            | 1 pole                                                                                          | U <sub>e</sub> =24V  | 20               | 20               | 20               | 25               | 25               | 40                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =110V | 1                | 1                | 2                | 2                | 2                | 4                  |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =220V | 0,5              | 0,5              | 0,5              | 0,5              | 0,5              | 0,8                |
|                                         |                                          | 2 poles connected in series                                                                     | U <sub>e</sub> =24V  | -                | 20               | 20               | -                | -                | 40                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =110V | 3                | 3                | 4                | 4                | 4                | 10                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =220V | 1,5              | 1,5              | 1,5              | 1,5              | 1,5              | 6                  |
|                                         |                                          | 3 poles connected in series                                                                     | U <sub>e</sub> =24V  | -                | -                | 20               | -                | -                | 40                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =110V | -                | -                | 6                | 6                | 6                | 40                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =220V | -                | -                | 2,5              | 2,5              | 2,5              | 20                 |
|                                         |                                          | 4 poles connected in series                                                                     | U <sub>e</sub> =24V  | -                | -                | 20               | 25               | 25               | 40                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =110V | -                | -                | 6                | 6                | 6                | 40                 |
|                                         |                                          |                                                                                                 | U <sub>e</sub> =220V | -                | -                | 3,5              | 3,5              | 3,5              | 40                 |
| Main contacts                           | AC1                                      |                                                                                                 |                      | 200.000          | 200.000          | 200.000          | 200.000          | 200.000          | 100.000            |
|                                         | AC3                                      |                                                                                                 |                      | 300.000          | 300.000          | 300.000          | 500.000          | 500.000          | 150.000            |
|                                         | AC5a High pressure vapour lamps          |                                                                                                 |                      | 100.000 at 32 µF | 100.000 at 32 µF | 100.000 at 32 µF | 100.000 at 32 µF | 100.000 at 32 µF | 100.000 at 32 µF   |
|                                         | AC5b Incandescent lamps                  |                                                                                                 |                      | -                | -                | 50.000 at 1,5 kW | 50.000 at 1,5 kW | 20.000 at 1,5 kW | 100.000 at 4 kW    |
|                                         | AC7a Resistive household devices         |                                                                                                 |                      | 200.000          | 100.000          | 200.000          | 200.000          | 200.000          | 100.000            |
|                                         | AC7b Inductive household devices         |                                                                                                 |                      | 300.000          | 300.000          | 300.000          | 500.000          | 500.000          | 150.000            |
|                                         | Maximum operating frequency              | p.c/h                                                                                           | 600                  | 600              | 360              | 600              | 600              | 120              | 120                |
|                                         | Stray power per current path             | W                                                                                               | 1,7                  | 1,7              | 2                | 2,2              | 2,2              | 4                | 8                  |
| Back-up fuse gL max. rating             |                                          | A                                                                                               | 20                   | 20               | 25               | 35               | 35               | 63               | 80                 |

### Maximum number of lamps per pole



| Type                                                 |         | IKA 20 | IKD 20 | IK 21 | IKA 25 | IKD 25 | IK 40 | IK 63 |
|------------------------------------------------------|---------|--------|--------|-------|--------|--------|-------|-------|
| Light bulbs                                          | 60 W    | 21     | 21     | 25    | 25     | 25     | 65    | 85    |
|                                                      | 100 W   | 13     | 13     | 15    | 15     | 15     | 40    | 50    |
|                                                      | 200 W   | 7      | 7      | 7     | 7      | 7      | 20    | 25    |
|                                                      | 500 W   | 3      | 3      | 3     | 3      | 3      | 8     | 10    |
|                                                      | 1 000 W | 1      | 1      | 1     | 1      | 1      | 4     | 5     |
| Energy saving lamps                                  | 7 W     | 10     | 10     | 15    | 15     | 15     | 100   | 150   |
|                                                      | 11 W    | 10     | 10     | 15    | 15     | 15     | 100   | 150   |
|                                                      | 15 W    | 5      | 5      | 15    | 15     | 15     | 100   | 150   |
|                                                      | 20 W    | 3      | 3      | 10    | 10     | 10     | 70    | 70    |
| Halide discharge lamp                                | 200 W   | -      | -      | 5     | 5      | 5      | 15    | 20    |
|                                                      | 300 W   | -      | -      | 3     | 3      | 3      | 10    | 13    |
|                                                      | 500 W   | -      | -      | 2     | 2      | 2      | 6     | 8     |
|                                                      | 1 000 W | -      | -      | 1     | 1      | 1      | 3     | 4     |
| Low-pressure sodium discharge lamp (noncompensated)  | 35 W    | 5      | 5      | 6     | 6      | 6      | 13    | 20    |
|                                                      | 55 W    | 5      | 5      | 6     | 6      | 6      | 13    | 20    |
|                                                      | 90 W    | 3      | 3      | 4     | 4      | 4      | 9     | 14    |
|                                                      | 135 W   | 2      | 2      | 3     | 3      | 3      | 6     | 9     |
|                                                      | 180 W   | 3      | 3      | 3     | 3      | 3      | 6     | 9     |
| High-pressure sodium discharge lamp (noncompensated) | 50 W    | 12     | 12     | 12    | 12     | 12     | 24    | 38    |
|                                                      | 70 W    | 10     | 10     | 10    | 10     | 10     | 20    | 30    |
|                                                      | 110 W   | 8      | 8      | 7     | 7      | 7      | 16    | 25    |
|                                                      | 150 W   | 6      | 6      | 5     | 5      | 5      | 10    | 16    |
|                                                      | 250 W   | 3      | 3      | 3     | 3      | 3      | 6     | 10    |
|                                                      | 400 W   | 2      | 2      | 2     | 2      | 2      | 4     | 6     |
| Low-pressure sodium discharge lamp (compensated)     | 35 W    | 1      | 1      | 1     | 1      | 1      | 10    | 16    |
|                                                      | 55 W    | 1      | 1      | 1     | 1      | 1      | 10    | 16    |
|                                                      | 90 W    | -      | -      | 1     | 1      | 1      | 8     | 12    |
|                                                      | 135 W   | -      | -      | -     | -      | -      | 4     | 7     |
|                                                      | 180 W   | -      | -      | -     | -      | -      | 4     | 7     |
| High-pressure sodium discharge lamp (compensated)    | 50 W    | 3      | 3      | 3     | 3      | 3      | 22    | 33    |
|                                                      | 70 W    | 2      | 2      | 2     | 2      | 2      | 18    | 27    |
|                                                      | 110 W   | 2      | 2      | 2     | 2      | 2      | 18    | 27    |
|                                                      | 150 W   | 1      | 1      | 1     | 1      | 1      | 10    | 16    |
|                                                      | 250 W   | -      | -      | 1     | 1      | 1      | 6     | 9     |
|                                                      | 400 W   | -      | -      | -     | -      | -      | 4     | 7     |
| Fluorescent tubes (non-compensated)                  | 18 W    | 24     | 24     | 24    | 24     | 24     | 45    | 70    |
|                                                      | 36 W    | 17     | 17     | 20    | 20     | 20     | 45    | 70    |
|                                                      | 58 W    | 10     | 10     | 13    | 13     | 13     | 25    | 43    |
| Fluorescent tubes (compensated)                      | 18 W    | 6      | 6      | 8     | 8      | 8      | 45    | 70    |
|                                                      | 36 W    | 6      | 6      | 8     | 8      | 8      | 45    | 70    |
|                                                      | 58 W    | 4      | 4      | 5     | 5      | 5      | 25    | 43    |
| Fluorescent tubes (duo-connection)                   | 18 W    | 2x22   | 2x22   | 2x48  | 2x48   | 2x48   | 2x100 | 2x150 |
|                                                      | 36 W    | 2x17   | 2x17   | 2x24  | 2x24   | 2x24   | 2x65  | 2x95  |
|                                                      | 58 W    | 2x10   | 2x10   | 2x15  | 2x15   | 2x15   | 2x40  | 2x60  |
| Fluorescent tubes with electronic ballast            | 1x18 W  | 22     | 22     | 30    | 15     | 15     | 60    | 80    |
|                                                      | 1x36 W  | 12     | 12     | 16    | 14     | 14     | 30    | 42    |
|                                                      | 1x58 W  | 8      | 8      | 12    | 12     | 12     | 22    | 30    |
|                                                      | 2x18 W  | 23     | 23     | 32    | 13     | 13     | 40    | 48    |
|                                                      | 2x36 W  | 12     | 12     | 16    | 9      | 9      | 20    | 26    |
|                                                      | 2x58 W  | 7      | 7      | 10    | 7      | 7      | 10    | 18    |

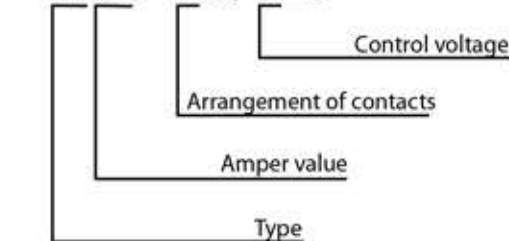
### Dimensional drawing of IK



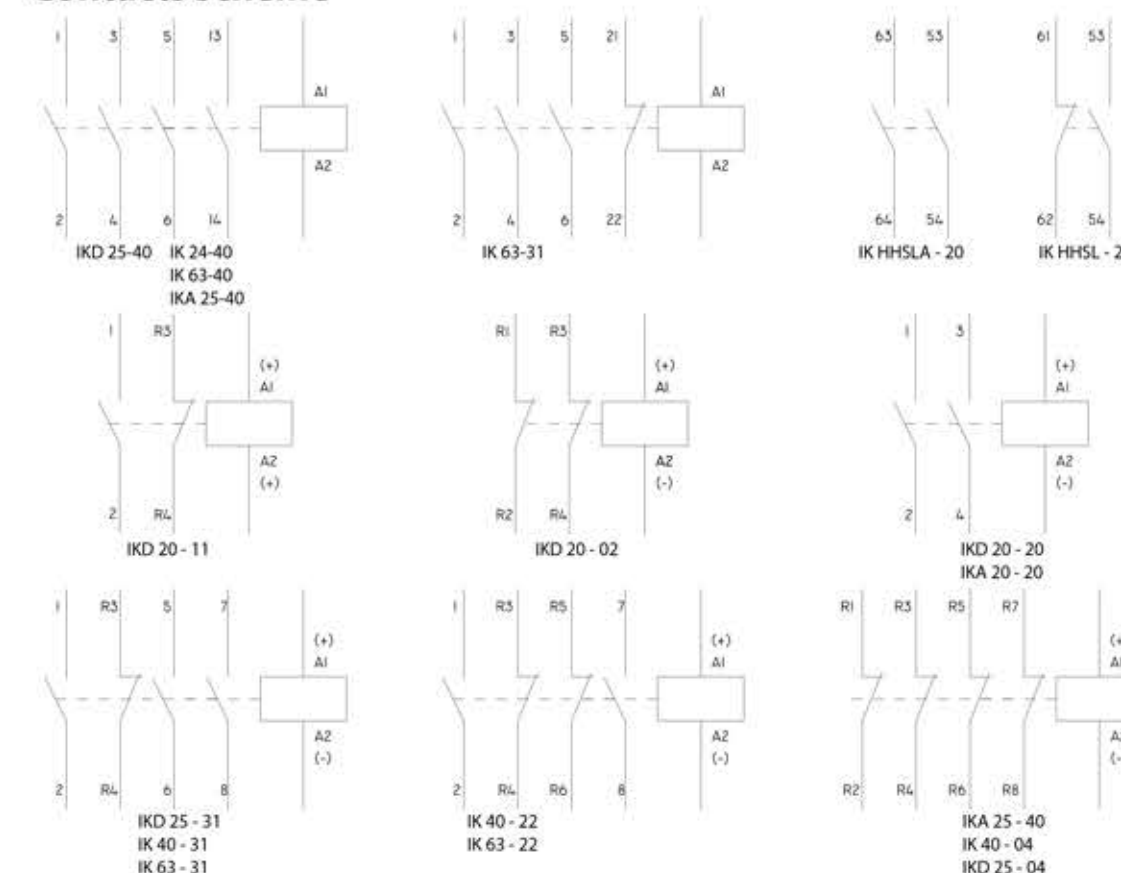
| Type                      | Ordering Nr. |
|---------------------------|--------------|
| IKA20, 20/220/230V, 50/60 | IKA20020     |
| IKA25, 40/220/230V, 50/60 | IKA25020     |
| IKD20, 02/220/230V, 50/60 | IKD20002     |
| IKD20, 10/220/230V, 50/60 | IKD20010     |
| IKD20, 11/220/230V, 50/60 | IKD20011     |
| IKD20, 20/24              | IKD2002/24   |
| IKD20, 20/220/230V, 50/60 | IKD20020     |
| IKD25, 04/220/230V, 50/60 | IKD25004     |
| IKD25, 22/220/230V, 50/60 | IKD25022     |
| IKD25, 31/220/230V, 50/60 | IKD25031     |
| IKD25, 40/220/230V, 50/60 | IKD25040     |
| IK21, 10/220/230V, 50     | IK21010      |
| IK21, 01/220/230V, 50     | IK21001      |
| IK40, 40/220/230V, 50/60  | IK40040      |
| IK40, 31/220/230V, 50/60  | IK40031      |
| IK40, 22/220/230V, 50/60  | IK40022      |
| IK40, 04/220/230V, 50/60  | IK40004      |
| IK63, 40/220/230V, 50/60  | IK63040      |
| IK63, 31/220/230V, 50/60  | IK63031      |
| IK63, 22/220/230V, 50/60  | IK63022      |

### Ordering data

IK63 - 40 / 220



### Contacts scheme

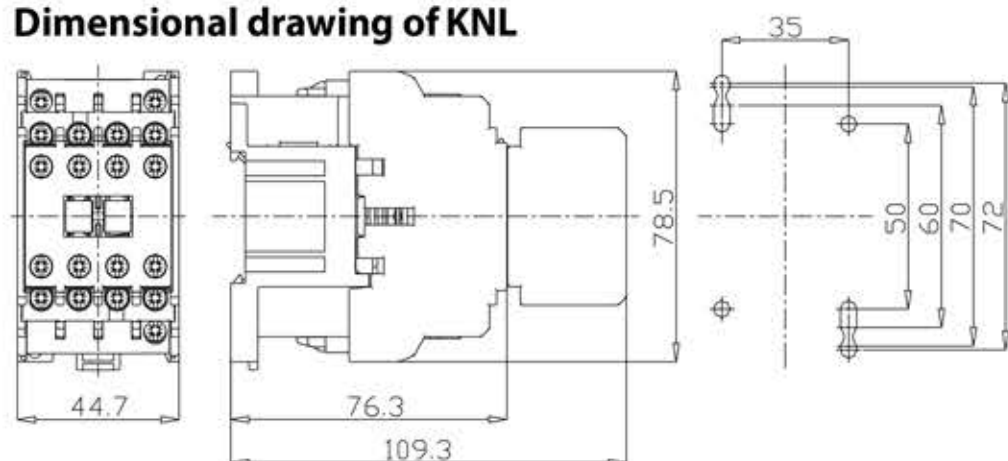


## KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

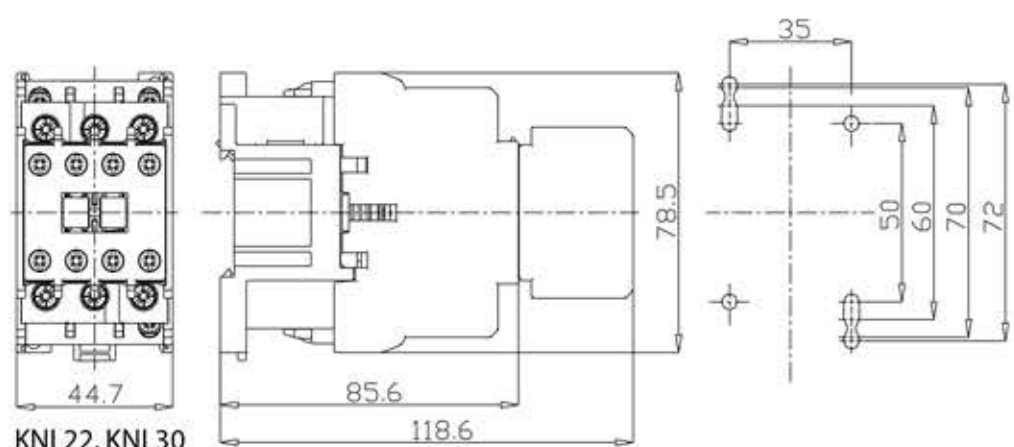


- Adaptable to various control requirements with ability of mounting from one to four additional auxiliary contacts.
- Versatile product capable of adaptation to different control requirements with capability of mounting from one to four additional auxiliary contacts (just for KNL6).
- Capability of incorporating RC suppressor to prevent voltage peaks at switch-off of control coil.
- Uniform marking of connection terminals in compliance with EN 50005 and EN 50011.
- Covered terminals - finger protection according to VDE 0106 and BGA 2.
- Capability of quick fitting to 35 mm wide mounting rail according to EN 60715.
- Open and funnel-shaped connection terminals - providing fast and simple connection.
- Combination head screws; standard or posidrive screwdrivers can be used.
- Specially shaped contact surfaces - high contact reliability even at low voltages (just for KNL6 and auxiliary contacts for KNL9 - KNL30).
- Uniform and easily exchangeable coils for the whole system.
- Mechanical interlock is possible for KNL9 - KNL30.
- Possibility of individual marking on a special plate - simple identification of a contactor in the circuit.
- Auxiliary contacts make or break which also serve as pushbuttons (just for KNL9 - KNL30).
- Uniform contactor width - 45 mm.
- Third coil terminal.

### Dimensional drawing of KNL



KNL6, KNL9, KNL12, KNL16, KNL18



KNL22, KNL30

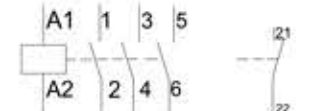
## Contactors relays

| Type / Ord. Nr. | Arrangement of contacts and terminal designation | AC-15 Rated operational current $I_n$ |      |      |      | Conventional thermal current $I_{th}$ |
|-----------------|--------------------------------------------------|---------------------------------------|------|------|------|---------------------------------------|
|                 |                                                  | 230V                                  | 400V | 500V | 690V |                                       |
| KNL6-22         | A1 13 21 31 43<br>A2 14 22 32 44                 | 6A                                    | 4A   | 2A   | 1A   | 20A                                   |
| KNL6-31         | A1 13 21 33 43<br>A2 14 22 34 44                 |                                       |      |      |      |                                       |
| KNL6-40         | A1 13 23 33 43<br>A2 14 24 34 44                 |                                       |      |      |      |                                       |

## Contactors relays

|                                                      |                                                                    |          |               |     |     |     |
|------------------------------------------------------|--------------------------------------------------------------------|----------|---------------|-----|-----|-----|
| Standards                                            | VDE 0660, IEC/EN 60947-5-1                                         |          |               |     |     |     |
| Approvals                                            | UL                                                                 |          |               |     |     |     |
| Climatic class                                       | Damp heat, constant, acc. to IEC 60068-2-78                        |          |               |     |     |     |
| Ambient temperature                                  | open                                                               | °C       | - 25 ... + 55 |     |     |     |
|                                                      | enclosed                                                           | °C       | - 25 ... + 40 |     |     |     |
| Weight                                               |                                                                    | g        | 300           |     |     |     |
| Rated insulation voltage                             | U <sub>i</sub>                                                     | V        | 690           |     |     |     |
| Conventional thermal current I <sub>th</sub> = rated |                                                                    |          |               |     |     |     |
| Operating current I <sub>e</sub> at AC-1             | I <sub>th</sub>                                                    | A        | 20            |     |     |     |
| Rated operating current AC-15                        | U <sub>e</sub>                                                     | V        | 230           | 400 | 500 | 690 |
|                                                      | I <sub>e</sub>                                                     | A        | 6             | 4   | 2   | 1   |
| Rated operating current DC-13                        | U <sub>e</sub>                                                     | V        | 24            | 60  | 110 | 220 |
|                                                      | I <sub>e</sub>                                                     | A        | 10            | 4   | 0,9 | 0,4 |
| Short-circuit protection - max. current of fuse      | I <sub>v</sub>                                                     | A        | 20            |     |     |     |
| Coil consumption                                     | switch-on                                                          | VA       | 66            |     |     |     |
|                                                      | P <sub>c</sub>                                                     | W        | 48            |     |     |     |
|                                                      | operation                                                          | VA       | 8             |     |     |     |
|                                                      |                                                                    | W        | 2,5           |     |     |     |
| Standard AC control voltages 50/60 Hz                |                                                                    |          | 24            |     |     |     |
|                                                      | U <sub>c</sub>                                                     | V        | 110/125       |     |     |     |
|                                                      |                                                                    |          | 220/224       |     |     |     |
|                                                      |                                                                    |          | 380/415       |     |     |     |
| Operating range                                      | U <sub>c</sub>                                                     | %        | 85 ... 110    |     |     |     |
| Operating position                                   | Mounting to vertical or horizontal level, permitted deviation ±20° |          |               |     |     |     |
| Maximum operating frequency                          |                                                                    | op. c./h | 6000          |     |     |     |
| Endurance                                            | mechanical                                                         | op. c.   | 10 x 106      |     |     |     |
|                                                      | electrical                                                         | op. c.   | see diagram 1 |     |     |     |
| Terminal capacity                                    | flexible S                                                         | mm²      | 0,75 ... 4    |     |     |     |
|                                                      | flexible S                                                         | mm²      | 0,5 ... 2,5   |     |     |     |

## MOTOR CONTACTORS

| Type<br>Conventional | Arrangement of contacts<br>and terminal designation                               | Auxiliary<br>contacts | AC-3 Rated power of threephase motors - |      |      |      | thermal current I <sub>th</sub> |
|----------------------|-----------------------------------------------------------------------------------|-----------------------|-----------------------------------------|------|------|------|---------------------------------|
|                      |                                                                                   |                       | normal load P <sub>m</sub> (kW)         |      |      |      |                                 |
|                      |                                                                                   |                       | 230V                                    | 400V | 500V | 690V |                                 |
| KNL9-10              |  |                       | 2,2                                     | 4    | 5,5  | 5,5  |                                 |
| KNL12-10             |                                                                                   |                       | 3                                       | 5,5  | 5,5  | 5,5  | 25                              |
| KNL16-10             |                                                                                   |                       | 4                                       | 7,5  | 7,5  | 7,5  |                                 |
| KNL18-10             |                                                                                   |                       | 4                                       | 9    | 9    | 9    | 32                              |
| KNL9-01              |  |                       | 2,2                                     | 4    | 5,5  | 5,5  |                                 |
| KNL12-01             |                                                                                   |                       | 3                                       | 5,5  | 5,5  | 5,5  | 25                              |
| KNL16-01             |                                                                                   |                       | 4                                       | 7,5  | 7,5  | 7,5  |                                 |
| KNL18-01             |                                                                                   |                       | 4                                       | 9    | 9    | 9    | 32                              |
| KNL9-22sp41          |  |                       | 1,5                                     | -    | -    | -    |                                 |
| KNL12-22sp41         |                                                                                   |                       | 1,5                                     | -    | -    | -    | 25                              |
| KNL16-22sp41         |                                                                                   |                       | 2,2                                     | -    | -    | -    |                                 |
| KNL22-00             |  |                       | 5,5                                     | 11   | 11   | 11   | 35                              |
| KNL30-00             |                                                                                   |                       | 7,5                                     | 15   | 15   | 15   | 35                              |

### 1 Single phase

Special versions of KNL9-10sp4, KNL12-10sp4 and KNL16-10sp4 are also available (4 main contacts).

### Standard AC control voltages:

| Volts    | 24 | 42 | 48 | 110/125 | 220/240 | 380/415 | 440 | 480/520 |
|----------|----|----|----|---------|---------|---------|-----|---------|
| 50/60 Hz | B7 | D7 | E7 | F7      | M7      | Q7      | R7  | S7      |

## MOTOR CONTACTORS

| Type                                                |          |                 | KNL9                                                                                     | KNL12 | KNL16 | KNL18 | KNL22        | KNL30 |
|-----------------------------------------------------|----------|-----------------|------------------------------------------------------------------------------------------|-------|-------|-------|--------------|-------|
| Standards                                           |          |                 | IEC/EN 60947-4-1, VDE 0660                                                               |       |       |       |              |       |
| Approvals                                           |          |                 | UL, CSA                                                                                  |       |       |       |              |       |
| Climatic class                                      |          |                 | Damp heat, constant, acc. to IEC 60068-2-78<br>Damp heat, cyclic, acc. to IEC 60068-2-30 |       |       |       |              |       |
| Ambient temperature                                 | open     | °C              | - 25 ... + 55                                                                            |       |       |       |              |       |
|                                                     | enclosed | °C              | - 25 ... + 40                                                                            |       |       |       |              |       |
| Weight                                              |          | g               | 300                                                                                      |       |       |       | 320          |       |
| Rated insulation voltage                            | $U_i$    | V               | 690                                                                                      |       |       |       |              |       |
| Conventional thermal current                        | $I_{th}$ | A               | 25                                                                                       | 25    | 25    | 32    | 35           | 35    |
| AC-3 Rated power of threephase motors - normal load | $P_m$    | kW              | 2,2                                                                                      | 3     | 4     | 4     | 5,5          | 7,5   |
|                                                     |          |                 | 4                                                                                        | 5,5   | 7,5   | 9     | 11           | 15    |
| 500 V                                               |          |                 | 5,5                                                                                      | 5,5   | 7,5   | 9     | 11           | 15    |
| 690 V                                               |          |                 | 5,5                                                                                      | 7,5   | 7,5   | 9     | 11           | 15    |
| AC-4 Rated power of threephase motors - heavy load  | $P_m$    | kW              | 0,75                                                                                     | 1,1   | 1,5   | 1,5   | 2,2          | 4     |
|                                                     |          |                 | 1,5                                                                                      | 2,2   | 3     | 3     | 4            | 6,5   |
| 500 V                                               |          |                 | 1,5                                                                                      | 2,2   | 3     | 3     | 4            | 6,5   |
| 690 V                                               |          |                 | 1,5                                                                                      | 2,2   | 3     | 3     | 4            | 6,5   |
| Electrical endurance of contacts                    | AC-3     |                 | see diagram 2                                                                            |       |       |       |              |       |
|                                                     | AC-4     |                 | see diagram 3                                                                            |       |       |       |              |       |
| Rated operational current DC-1                      | 1        |                 | 15 / 6 / 4                                                                               |       |       |       | 28 / 7 / 4   |       |
| at: 24/110/220 V                                    | 2        |                 | 18 / 12 / 8                                                                              |       |       |       | 30 / 23 / 13 |       |
| DC-2, DC-3                                          | 3        | A               | 20 / 15 / 10                                                                             |       |       |       | 30 / 25 / 20 |       |
|                                                     | 1        |                 | 12 / 2 / 0,75                                                                            |       |       |       | 18 / 2 / 1   |       |
| 1) numbers of poles in series DC-4                  | 2        |                 | 15 / 8 / 1,5                                                                             |       |       |       | 23 / 13 / 2  |       |
| DC-5                                                | 3        |                 | 18 / 12 / 6                                                                              |       |       |       | 28 / 18 / 9  |       |
| Mechanical endurance                                |          | op. c.          | 107                                                                                      |       |       |       |              |       |
| Short-circuit protection - max. fuse rating gL      | $I_v$    | A               | 25                                                                                       | 25    | 35    | 35    | 50           | 50    |
| Terminal capacity                                   | rigid    | mm <sup>2</sup> | 0,75 ... 4                                                                               |       |       |       | 2,5 ... 10   |       |
|                                                     | flexible | mm <sup>2</sup> | 0,5 ... 2,5                                                                              |       |       |       | 1,5 ... 6    |       |

## KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

| Type                                           |                                                    |           |                 | KNL9                                                                         | KNL12    | KNL16 | KNL18 | KNL22 | KNL30 |
|------------------------------------------------|----------------------------------------------------|-----------|-----------------|------------------------------------------------------------------------------|----------|-------|-------|-------|-------|
| AUXILIARY CONTACTS                             | Rated insulation voltage                           |           | $U_i$           | V                                                                            | 690      |       |       |       | -     |
|                                                | Conventional thermal current                       |           |                 |                                                                              |          |       |       |       |       |
|                                                | $I_{th}$ = rated operational current $I_n$ at AC-1 |           | $I_{th}$        | A                                                                            | 20       |       |       |       | -     |
|                                                | AC-15 Rated operational current                    | 230 V     | $I_e$           | A                                                                            | 6        |       |       |       | -     |
|                                                |                                                    | 400 V     |                 |                                                                              | 4        |       |       |       | -     |
|                                                |                                                    | 500 V     |                 |                                                                              | 2        |       |       |       | -     |
|                                                |                                                    | 690 V     |                 |                                                                              | 1        |       |       |       | -     |
|                                                | DC-13 Rated operational current                    | 24 V      | $I_e$           | A                                                                            | 10       |       |       |       | -     |
|                                                |                                                    | 60 V      |                 |                                                                              | 4        |       |       |       | -     |
|                                                |                                                    | 110 V     |                 |                                                                              | 0.9      |       |       |       | -     |
| 220 V                                          |                                                    |           |                 | 0.4                                                                          |          |       |       | -     |       |
| Short-circuit protection - max. fuse rating gL |                                                    | $I_v$     | A               | 20                                                                           |          |       |       | -     |       |
| Terminal capacity                              | rigid                                              | S         | mm <sup>2</sup> | 0,75 ... 4                                                                   |          |       |       |       |       |
|                                                | flexible                                           | S         | mm <sup>2</sup> | 0,5 ... 2,5                                                                  |          |       |       |       |       |
| MAGNETIC SYSTEM                                | Coil consumption                                   | switch-on | $P_c$           | VA                                                                           | 66       |       |       |       |       |
|                                                |                                                    |           |                 | W                                                                            | 48       |       |       |       |       |
|                                                |                                                    | operation | $P_c$           | VA                                                                           | 8        |       |       |       |       |
|                                                |                                                    |           |                 | W                                                                            | 2.5      |       |       |       |       |
|                                                | Standard AC control voltages 50/60 Hz              |           | $U_c$           | V                                                                            | 110/125  |       |       |       |       |
|                                                |                                                    |           |                 |                                                                              | 220/224  |       |       |       |       |
|                                                | Operating range                                    |           | $U_c$           | %                                                                            | 80...110 |       |       |       |       |
|                                                | frequency - max.                                   |           |                 | op. c./h                                                                     | 3000     |       |       |       |       |
| Operating position                             |                                                    |           |                 | Mounting on vertical or horizontal level, permitted deviation $\pm 20^\circ$ |          |       |       |       |       |

Diagram 1

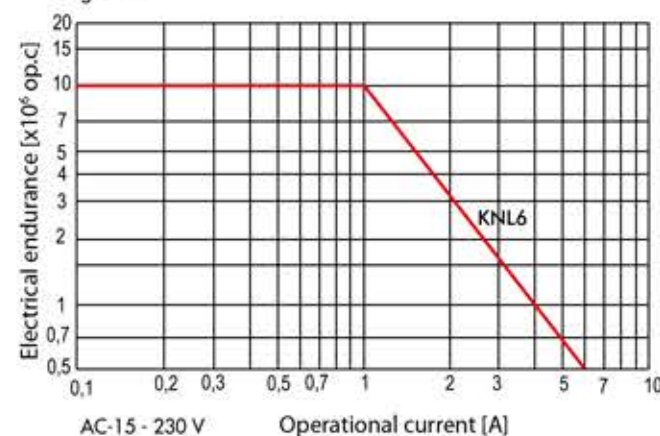


Diagram 2

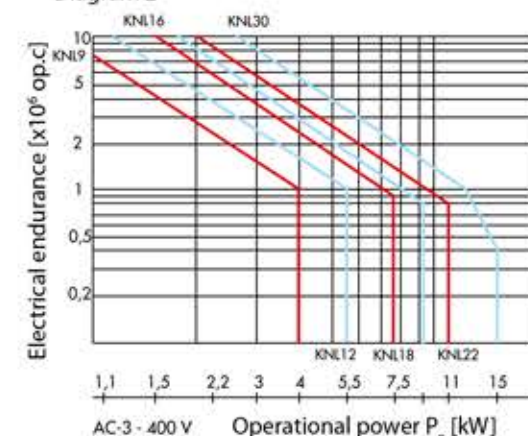
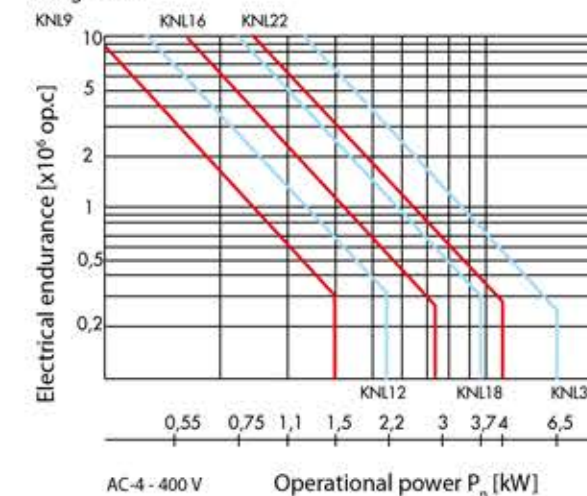


Diagram 3

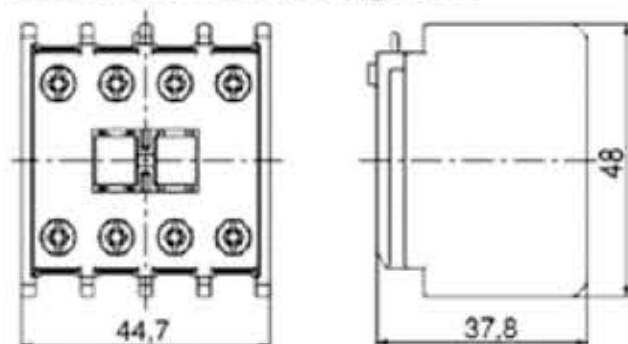


## Auxiliary contact NDL

Two- and four-pole auxiliary contact modules  
(mounting on basic contactor) NDL1, NDL2, NDL3

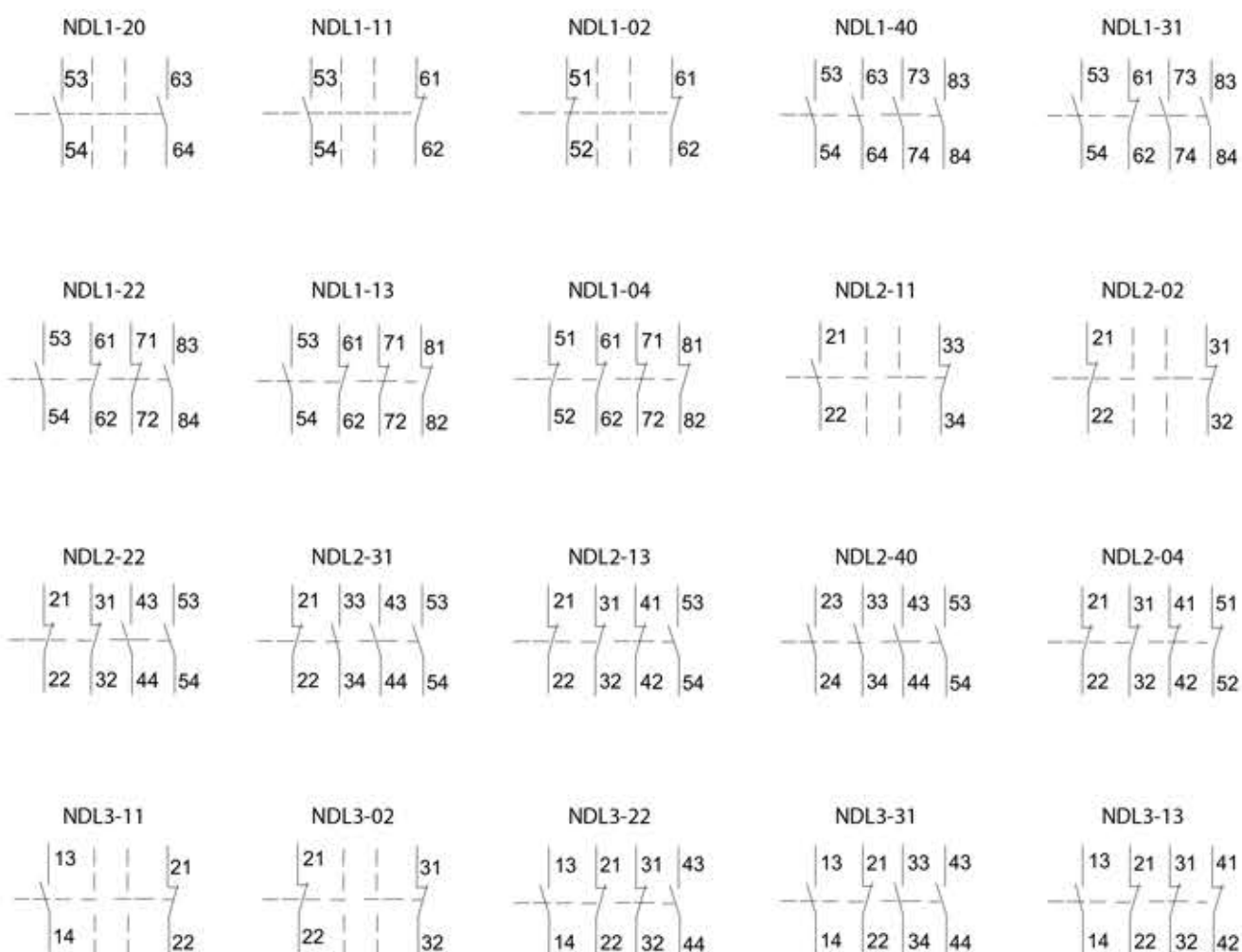


### Dimensional drawing NDL



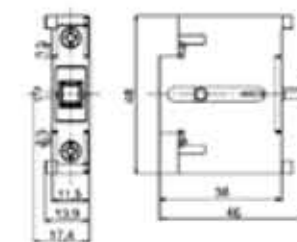
| Type / Ord. Nr.                      | Version                        | AC 15 Rated operational current I <sub>e</sub> (A) |       |       |       |
|--------------------------------------|--------------------------------|----------------------------------------------------|-------|-------|-------|
| NDL1 (for KNL6)                      | 20, 11, 02, 40, 31, 22, 13, 04 | 230 V                                              | 400 V | 500 V | 690 V |
| NDL2 (for KNL9, KNL12, KNL16, KNL18) | 11, 02, 22, 31, 13, 40, 04     | 6                                                  | 4     | 2     | 1     |
| NDL3 (for KNL22, KNL30)              | 11, 02, 22, 31, 13             | 6                                                  | 4     | 2     | 1     |

### Connecting programs

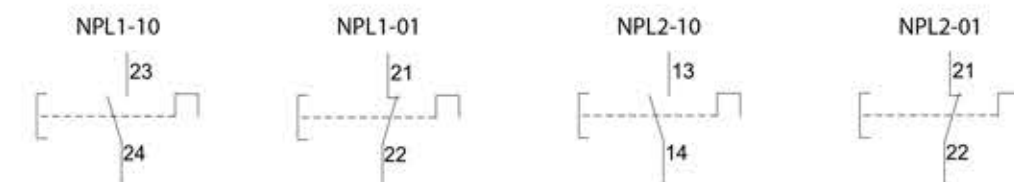


## Auxiliary contact NPL

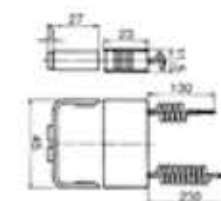
Single-pole auxiliary contact for  
side mounting + push button  
NPL1, NPL2



| Type / Ord. Nr.                           | Version | AC 15 Rated operational current I <sub>e</sub> (A) |       |       |       |
|-------------------------------------------|---------|----------------------------------------------------|-------|-------|-------|
| NPL1 (just for KNL9, KNL12, KNL16, KNL18) | 10, 01  | 230 V                                              | 400 V | 500 V | 690 V |
| NPL2 (just for KNL22, KNL30)              | 10, 01  | 6                                                  | 4     | 2     | 1     |



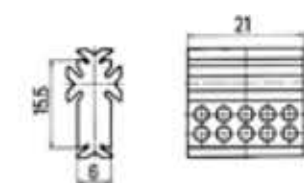
## RC suppressor



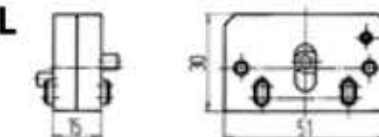
| Type                                     | RC1       | RC2        | RC3         | RC4         |
|------------------------------------------|-----------|------------|-------------|-------------|
| Control voltage range U <sub>c</sub> (V) | 24 ... 48 | 48 ... 250 | 250 ... 380 | 380 ... 500 |



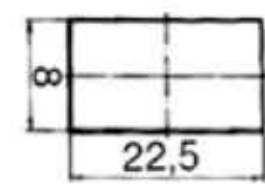
## Distance spacer DZ



## Mechanical interlock MBL



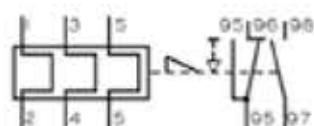
## Identification plate NT



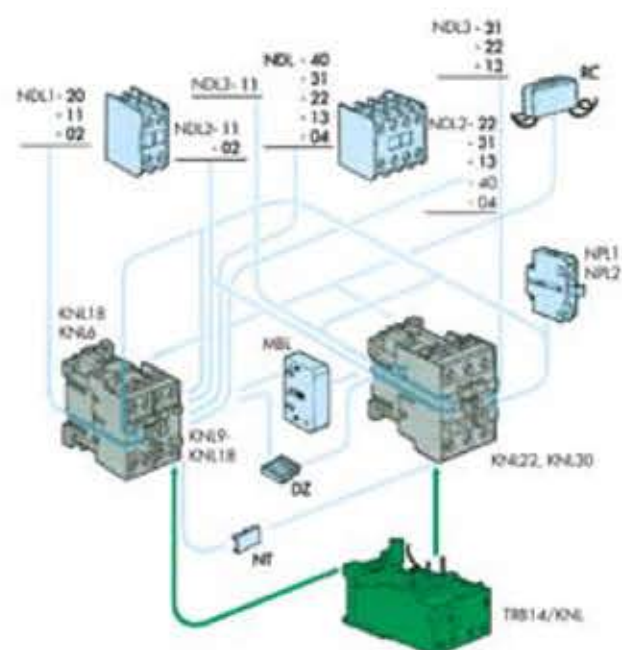
## Thermal overload relay TRB14/KNL



Connection diagram



| Type / Ord. Nr. | AC-15 Rated operational current I <sub>n</sub> (A) |       |       | Relay setting range (A) |            |                         |                            |            |           |
|-----------------|----------------------------------------------------|-------|-------|-------------------------|------------|-------------------------|----------------------------|------------|-----------|
|                 | 230 V                                              | 400 V | 500 V | 0,15 - 0,25             | 0,24 - 0,4 | 0,38 - 0,63             | 0,6 - 1,0                  | 0,96 - 1,6 | 1,5 - 2,5 |
| TRB14 / KNL     | 3 A                                                | 2 A   | 1 A   | 2,4 - 4,0               | 3,8 - 6,3  | 6,0 - 10,0              | 9,6 - 16,0 (TRB14 / KNL16) |            |           |
|                 |                                                    |       |       | 9,6 - 16,0              | 15 - 25    | 24 - 40 (TRB40 / KNL16) |                            |            |           |



## ORDERING DATA

Type designation and height of control voltages should be given when ordering.

**KNL16 -10 - M7**

control voltage, frequency

Type

## KNL6G, KNL9G, KNL12G, KNL16G, KNL22G, KNL30G

KNLG contactors are for DC control voltage.

## Application

KNL6G contactors relays are applied for switching control, signal and measuring circuits. KNL9G - KNL30G motor contactors are used for switching motors. Of course, both can be used for switching other ohmic, inductive and capacitive consumers. Protection class is IP20, which means that contactors must be mounted in dry and clean ambient. If the ambient is damp or dusty, they must be mounted in a suitable box. Contactors can be built in electric distribution panels on 35 mm mounting rails (in compliance with EN 60 715) or they are fixed with screws on a vertical level (permitted deviation  $\pm 20^\circ$ ).



## Technical data

| Type                         |                 |                 |                 | KNL6G                              | KNL9G | KNL12G | KNL16G     | KNL22G | KNL30G |
|------------------------------|-----------------|-----------------|-----------------|------------------------------------|-------|--------|------------|--------|--------|
| Standards                    |                 |                 |                 | IEC/EN 60947-4-1, IEC/EN 60947-5-1 |       |        |            |        |        |
| Rated insulation voltage     |                 | U <sub>i</sub>  | V               | 690                                |       |        |            |        |        |
| Conventional thermal current |                 | I <sub>th</sub> | A               | 20                                 | 25    | 25     | 25         | 35     | 35     |
| Back-up fuse gL max. rating  |                 | I <sub>n</sub>  | A               | 20                                 | 25    | 25     | 25         | 50     | 50     |
| Ambient temperature          | open            |                 | °C              | -25 ... +60                        |       |        |            |        |        |
|                              | In box          |                 | °C              | -25 ... +40                        |       |        |            |        |        |
| Ambient temperature          | in rush         | P <sub>c</sub>  | W               | 110                                |       |        |            |        |        |
|                              | holding         |                 | W               | 3                                  |       |        |            |        |        |
| Range of control voltage     |                 | U <sub>c</sub>  | V               | 24 ... 240                         |       |        |            |        |        |
| Range of activity            |                 | U <sub>c</sub>  | %               | 85 ... 110                         |       |        |            |        |        |
| Maximum operating frequency  |                 |                 | op. c./h        | 3000                               |       |        |            |        |        |
| Mechanical endurance         |                 |                 | op. c.          | 5 x 10 <sup>6</sup>                |       |        |            |        |        |
| Terminal capacity            | single stranded |                 | mm <sup>2</sup> | 0,75 ... 4                         |       |        | 2,5 ... 10 |        |        |
|                              | fine stranded   |                 |                 | 0,5 ... 2,5                        |       |        | 1,5 ... 6  |        |        |

## Standard DC control voltages

| Volts | 12 | 24 | 48 | 60 | 72 | 110 | 125 | 220 | 240 |
|-------|----|----|----|----|----|-----|-----|-----|-----|
|       | JD | BD | ED | ND | SD | FD  | GD  | MD  | MUD |

## Auxiliary contacts

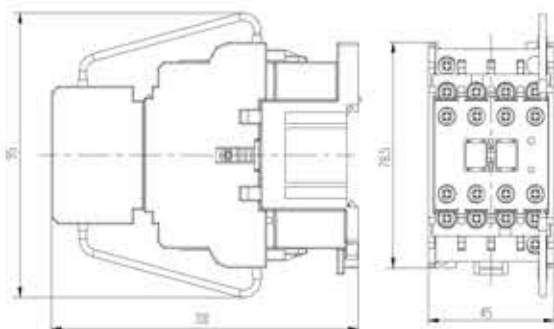
|                                  |                |   |     |     |     |     |
|----------------------------------|----------------|---|-----|-----|-----|-----|
| AC15 - Rated operational current | U <sub>e</sub> | V | 230 | 400 | 500 | 690 |
|                                  | I <sub>e</sub> | A | 6   | 4   | 2   | 1   |
| DC13 - Rated operational current | U <sub>e</sub> | V | 24  | 60  | 110 | 220 |
|                                  | I <sub>e</sub> | A | 10  | 4   | 0,9 | 0,4 |

## Motor contactors KNL9G - KNL30G

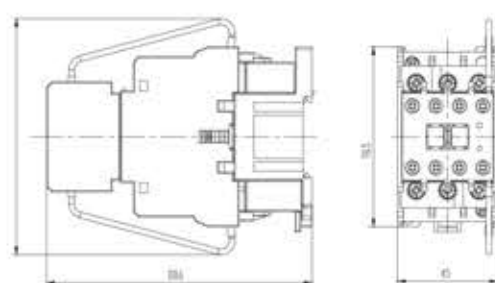
| Type                                                    |       |    | KNL9G | KNL12G | KNL16G | KNL22G | KNL30G |
|---------------------------------------------------------|-------|----|-------|--------|--------|--------|--------|
| AC-3-Rated power of three-phase - motors - normal load  | 230 V | kW | 2.2   | 3      | 4      | 5.5    | 7.5    |
|                                                         | 400 V |    | 4     | 5.5    | 7.5    | 11     | 15     |
|                                                         | 500 V |    | 5.5   | 5.5    | 7.5    | 11     | 15     |
|                                                         | 690 V |    | 5.5   | 7.5    | 7.5    | 11     | 15     |
| AC-4 - Rated power of three-phase - motors - heavy load | 230 V | kW | 0.75  | 1.1    | 1.5    | 2.2    | 4      |
|                                                         | 400 V |    | 1.5   | 2.2    | 3      | 4      | 6.5    |
|                                                         | 500 V |    | 1.5   | 2.2    | 3      | 4      | 6.5    |
|                                                         | 690 V |    | 1.5   | 2.2    | 3      | 4      | 6.5    |

## Dimensional drawing of KNLG

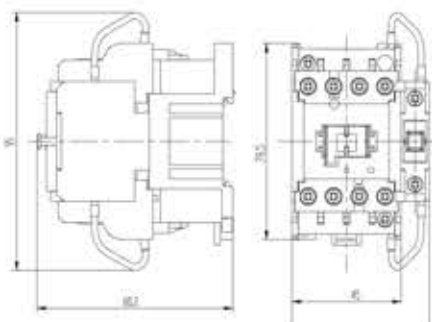
KNL6G + NDL - KNL16G + NDL



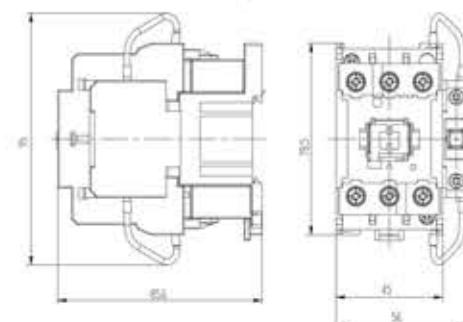
KNL22G + NDL, KNL30G + NDL



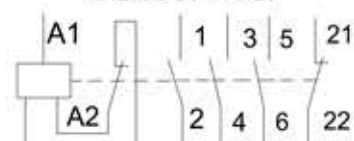
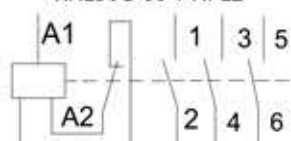
KNL6G + NPL - KNL16G + NPL



KNL22G + NPL, KNL30G + NPL



## Contacts scheme

KNL6G-10, KNL9G-10+NPL1  
KNL12G-10+NPL1  
KNL16G-10+NPL1KNL6G-10 + NDL1-21  
KNL9G-10 + NDL2-21  
KNL12G-10 + NDL2-21  
KNL16G-10 + NDL2-21KNL6G-01  
KNL9G-01 + NPL1  
KNL12G-01 + NPL1  
KNL16G-01 + NPL1KNL6G-01 + NDL1-12  
KNL9G-01 + NDL2-12  
KNL12G-01 + NDL2-12  
KNL16G-01 + NDL2-12KNL22G-00 + NPL2  
KNL30G-00 + NPL2KNL22G-00 + NDL3-03  
KNL30G-00 + NDL3-03

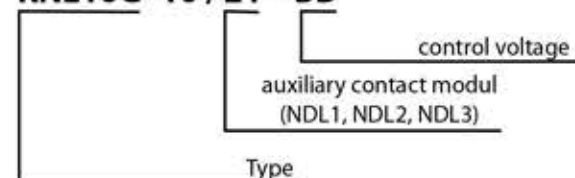
Contactors in combination with NDL may have number of auxiliary contacts: -30, -21, -12, -03, -10, -01

## Ordering data

Type designation and height of control voltages should be given when ordering.

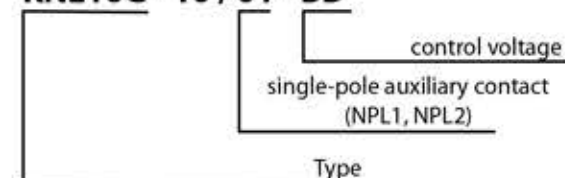
## KNLG + NDL

## KNL16G - 10 / 21 - BD



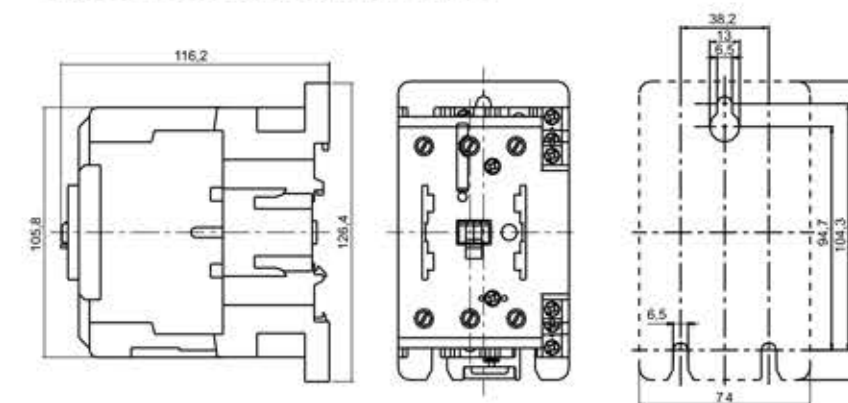
## KNLG + NPL

## KNL16G - 10 / 01 - BD



## KNL40, KNL65

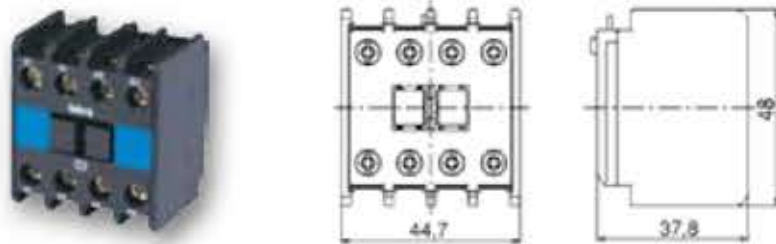
## Dimensional drawing KNL 40, 65



## Technical data

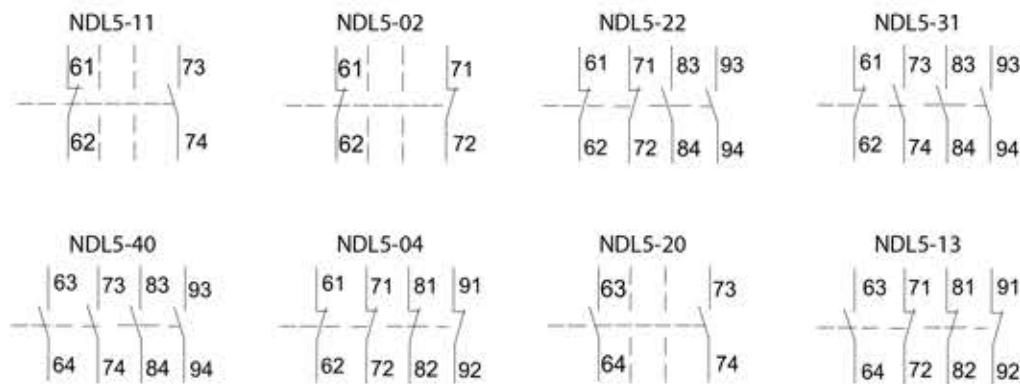
| Type               |                                                  |          | KNL40                                          | KNL65                                      |
|--------------------|--------------------------------------------------|----------|------------------------------------------------|--------------------------------------------|
| MAIN CONTACTS      | Standards                                        |          | IEC/EN 60947-4-1, IEC/EN 60947-5-1<br>VDE 0660 |                                            |
|                    | Mechanical endurance operations                  |          | 8 x 10 <sup>6</sup>                            |                                            |
|                    | Ambient temperature                              | open     | °C                                             | -5 ... +55                                 |
|                    |                                                  | enclosed | °C                                             | -5 ... +40                                 |
|                    | Rated insulation voltage                         |          | U <sub>i</sub>                                 | V 690                                      |
|                    | Short-circuit protection - max. fuse ratinggGL   |          | A                                              | 63 80                                      |
|                    | AC-1 Rated thermal current                       |          | I <sub>th</sub>                                | A 60 80                                    |
|                    | AC-3/AC-4 Rated operating current I <sub>e</sub> | 400 V    | A                                              | 40/18,5 65/28                              |
|                    |                                                  | 690 V    |                                                | 34/9 42/14                                 |
|                    |                                                  | 230 V    | kW                                             | 11 18,5                                    |
| AUXILIARY CONTACTS | Rated motor powers                               | 400 V    |                                                | 18,5 30                                    |
|                    |                                                  | 690 V    |                                                | 30 37                                      |
|                    | Terminal capacity                                | rigid    | mm <sup>2</sup>                                | 25 25                                      |
|                    |                                                  | flexible |                                                | 25 25                                      |
|                    | Rated thermal current                            |          | I <sub>th</sub>                                | A 10                                       |
|                    |                                                  | 230 V    | A                                              | 6                                          |
|                    |                                                  | 400 V    |                                                | 4                                          |
|                    |                                                  | 500 V    |                                                | 2                                          |
|                    |                                                  | 690 V    |                                                | 1                                          |
|                    | AC-15 Rated operating current I <sub>e</sub>     | 24 V     | A                                              | 4                                          |
| MAGNETIC SYSTEM    | DC-13 Rated operating current I <sub>e</sub>     | 110 V    |                                                | 0,25                                       |
|                    |                                                  | 220 V    |                                                | 0,1                                        |
|                    | Contact arrangement                              |          |                                                | 11                                         |
|                    | Terminal capacity                                | rigid    | mm <sup>2</sup>                                | 1 ... 2,5                                  |
|                    |                                                  | flexible |                                                | 1 ... 2,5                                  |
|                    | Rated control voltage U <sub>c</sub>             | min.     | V                                              | 12                                         |
|                    |                                                  | max.     |                                                | 520                                        |
|                    | Standard control voltages U <sub>c</sub>         |          | V                                              | 24, 110/115, 220/240, 380/400<br>(50/60Hz) |
|                    | Range of control voltage                         |          |                                                | 85 ... 110                                 |
|                    | Coil consumption                                 | in rush  | VA                                             | 200                                        |
|                    |                                                  | holding  | W                                              | 20 6 - 10                                  |

## Mechanical interlock MBL40



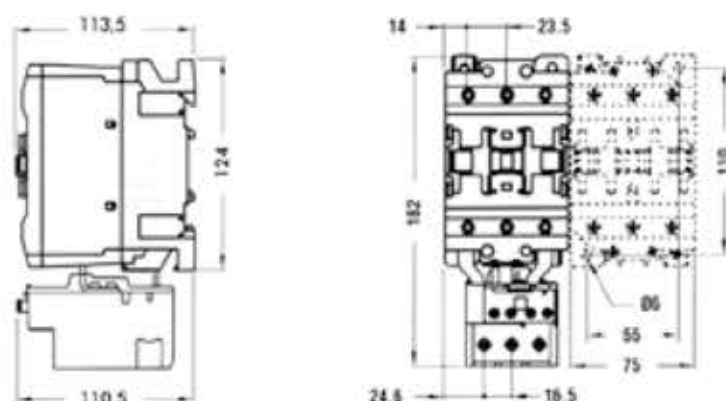
## Ordering data

**KNL40/65 - 11 - 220/240 - 50/60**



| Type / Ord. Nr. | AC 15 Rated operational current I <sub>N</sub> 50/60 Hz |       | Relay setting range (A) |         |         |         |
|-----------------|---------------------------------------------------------|-------|-------------------------|---------|---------|---------|
|                 | 230 V                                                   | 400 V |                         |         |         |         |
| BR43            | 4 A                                                     | 2 A   | 14,5 - 21               | 21 - 30 | 30 - 43 | 43 - 63 |

Dimensional drawing



| Typ                                                     |                               |                 |                 | KNL80                                         | KNL90 | KNL110 |
|---------------------------------------------------------|-------------------------------|-----------------|-----------------|-----------------------------------------------|-------|--------|
| OPERATING CONDITIONS                                    |                               |                 |                 |                                               |       |        |
| Ambient temperature                                     | operation                     |                 | °C              | -50 to +70                                    |       |        |
|                                                         | storage                       |                 |                 | -60 to +80                                    |       |        |
| Operation mode                                          | normal                        |                 |                 | on vertical plane                             |       |        |
|                                                         | allowable                     |                 |                 | ± 30°                                         |       |        |
| Fixing                                                  |                               |                 |                 | Screw or DIN rail 35 mm and 75 mm (EN 60 715) |       |        |
| Correspondance to standards                             |                               |                 |                 | IEC/EN 60947- 4 - 1                           |       |        |
| POLE CHARACTERISTICS                                    |                               |                 |                 |                                               |       |        |
| Rated insulation voltage                                |                               | U <sub>i</sub>  | V               | 690                                           |       |        |
| Conventional thermal current at (<40°C)                 |                               |                 | I <sub>th</sub> | 125                                           | 125   | 125    |
| Rated operational current at                            | AC-3 (380/400)                | I <sub>e</sub>  | A               | 80                                            | 95    | 110    |
| Rated operational current at                            | AC-4 (380/400) <sup>(1)</sup> | I <sub>e</sub>  | A               | 38                                            | 43    | 50     |
| Short-time allowable current for (IEC/EN 60947-1) - 10s |                               | I <sub>cu</sub> | A               | 480                                           | 760   | 880    |
| Short – circuit protection fuse                         | gG                            |                 | A               | 160                                           | 160   | 160    |
|                                                         | aM                            |                 | A               | 80                                            | 100   | 125    |
| Making capacity (RMS value)                             |                               |                 | a               | 1200                                          |       |        |
| Breaking capacity at voltage                            | < 440V                        |                 |                 | 1200                                          | 1200  | 1200   |
|                                                         | 500V                          |                 | A               | 1050                                          | 1050  | 1050   |
|                                                         | 690V                          |                 |                 | 800                                           | 800   | 800    |
| Resistance at I <sub>e</sub> for AC-3                   |                               |                 | mΩ              | 0.6                                           | 0.6   | 0.6    |
| Consumption per pole at I <sub>th</sub>                 |                               |                 | W               | 9.4                                           | 9.4   | 9.4    |
| (average values)                                        |                               |                 | W               | 3.8                                           | 5.4   | 7.3    |
| Terminals                                               | Type                          |                 |                 | lug clamp <sup>2</sup>                        |       |        |
|                                                         | A                             |                 |                 | 12.3                                          |       |        |
|                                                         | B                             |                 |                 | 12                                            |       |        |
|                                                         | screw                         |                 |                 | M6                                            |       |        |
| Min.-max. tightening torque for contact terminals       |                               |                 | Nm              | 4 - 5                                         |       |        |
| Min.-Max. tightening torque for coil terminals          |                               |                 | Nm              | 0,8 - 1                                       |       |        |
| Max. cable section connectable                          | AWG                           |                 | An°             | 2                                             |       |        |
| with 1 conductor                                        | Flexible lug (min.-max.)      |                 | mm²             | 6 - 50                                        |       |        |
| Power terminal protection according to EN 60529         |                               |                 |                 | IP20                                          |       |        |

Standard AC control voltages: 24, 48, 110, 220/230, 240, 380/400 V

<sup>1)</sup> current values guarantee an electrical life of about 200.000 cycles

<sup>2)</sup> in addition the main terminal, the following dimensions refer to the second entry of flexible bars: 12,3 x 3,8 mm

| Type                               |       |            |          | KNL80 | KNL90 | KNL110 |
|------------------------------------|-------|------------|----------|-------|-------|--------|
| <b>AC CONTROL</b>                  |       |            |          |       |       |        |
| Rated control voltage at 50/60 Hz  | from  |            | V        | 24    |       |        |
|                                    | to    |            |          | 500   |       |        |
| Average coil consumption           | 50 Hz | in-rush    | VA       | 210   |       |        |
|                                    |       | holding    |          | 18    |       |        |
|                                    | 60 Hz | in-rush    | VA       | 252   |       |        |
|                                    |       | holding    |          | 21.6  |       |        |
| Power dissipation at 50 Hz         |       |            | W        | 6     | 6     | 6      |
| <b>OPERATING TIMES</b>             |       |            |          |       |       |        |
| With control AC                    |       | closing NO | ms       | 31-25 | 31-25 | 31-25  |
|                                    |       | opening NO |          | 8-12  | 8-12  | 8-12   |
| <b>LIFE (millions)</b>             |       |            |          |       |       |        |
| Mechanical AC - control            |       |            | op. c.   | 15    | 15    | 15     |
| Electrical $I_e$ at 400 V and AC-3 |       |            | op. c.   | 1.3   | 1.2   | 0.8    |
| <b>MAXIMUM OPERATING FREQUENCY</b> |       |            |          |       |       |        |
| Mechanical operations              |       |            | op. c./h | 3600  |       |        |
| Electromagnet                      |       |            | op. c./h | 3600  |       |        |
| Pole                               |       |            | op. c./h | 3600  |       |        |

Utilisation category AC-3

Maximum operational power at ambient temperature &lt; 55°C

| Type / Ord. Nr. | Operational current<br>( $U_e < 440$ V)<br>A | Operational power |                 |             |             |             |                 |              |
|-----------------|----------------------------------------------|-------------------|-----------------|-------------|-------------|-------------|-----------------|--------------|
|                 |                                              | 220/230 V<br>kW   | 380/400 V<br>kW | 415 V<br>kW | 440 V<br>kW | 500 V<br>kW | 660/690 V<br>kW | 1000 V<br>kW |
| KNL80           | 80                                           | 23                | 41              | 46          | 46          | 56          | 74              | 37           |
| KNL90           | 95                                           | 27.6              | 50              | 55          | 55          | 56          | 74              | 45           |
| KNL110          | 110                                          | 33                | 61              | 66          | 70          | 59          | 80              | 45           |