

# General Catalogue



Quality made in



D946E211



**Contactors, Motor-Starter (D677E)**

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Technical data, dimension sketches, illustration and weights given in our list and printed matter, are subject to changed without notice.





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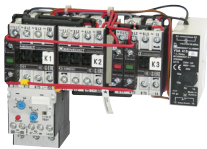
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## General

### Test Authorities, Registration Mark, Approvals

Low voltage switchgear from Benedict GmbH is built and tested to national and international specifications. All devices suit all important specifications without any test obligation, like VDE, BS and also relative to IEC Recommendations and to European Standards like IEC 947 and EN 60947. It is for this reason of our Low voltage switchgear is used all over the world. In order to provide special versions, limitations to the max. voltages, currents and power ratings or special markings are sometimes necessary.

### Quality Control System

Since November 1991 Benedict GmbH has been certified according to the quality control system **ÖNORM EN ISO 29001**. The target of the ISO-certification is, to grant the customer the quality of the performance of his supplier, who is audited in accordance with this standard.

### CE-Marking



The manufacturer has to sign his products with the CE-Marking. With the CE-Marking the manufacturer confirms the accordance with the different EEC Directives. The CE-Marking is absolutely necessary to sell the products in the EEC.

Below you find the EEC Directives concerning our products.

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC

RoHS + WEEE 2002/95/EC + "002/96/EC

| Country  | North America       | Russia         | China          |
|--|---------------------|----------------|----------------|
| State deputy or private examination (state admitted) | UL<br>Canada, USA   | EAC            | CCC            |
| Label marking of examination boards                  | Listed<br>Component |                |                |
| Duty of approvals                                    | all switchgear      | all switchgear | all switchgear |

### Explanations for choice and supply of low voltage switchgear in Canada and USA

#### Marking of auxiliary contacts

At several devices in UL-data are two voltages for auxiliary contacts mentioned (e. g.: 600 volts at same potential, 150 volts at different potentials). That means, if the voltage is higher than 150 volts, the control voltage applied to input terminals must be at the same potential.

Low voltage switchgear for auxiliary circuits (e. g. contactor relays, control units, auxiliary contacts in general) usually approved for "Heavy Duty" or "Standard Duty" UL and besides these marked with the admissible max. voltage or with short codes (see table).

| Marking of auxiliary contacts according to CSA and UL | Max. rated values per pole |                |         | Cont. Current A | Contact Rating Code Designation |
|---|----------------------------|----------------|---------|-----------------|---------------------------------|
|   | Voltage V                  | Current Make A | Break A |                 |                                 |
| Heavy Duty (HD or HVY DTY)                            | AC 120                     | 60             | 6       | 10              | A150                            |
|   | AC 240                     | 30             | 3       | 10              | A300                            |
|   | AC 480                     | 15             | 1,5     | 10              | A600                            |
|   | AC 600                     | 12             | 1,2     | 10              | A600                            |
|   | DC 125                     | 2,2            | 2,2     | 10              | N150                            |
|   | DC 250                     | 1,1            | 1,1     | 10              | N300                            |
|   | DC 600                     | 0,4            | 0,4     | 10              | N600                            |
| Standard Duty (SD or STD DTY)                         | AC 120                     | 30             | 3       | 5               | B150                            |
|   | AC 240                     | 15             | 1,5     | 5               | B300                            |
|   | AC 480                     | 7,5            | 0,75    | 5               | B600                            |
|   | AC 600                     | 6              | 0,6     | 5               | B600                            |
|   | DC 125                     | 1,1            | 1,1     | 5               | P150                            |
|   | DC 250                     | 0,55           | 0,55    | 5               | P300                            |
|   | DC 600                     | 0,2            | 0,2     | 5               | P600                            |
| -   | AC 120                     | 15             | 1,5     | 2,5             | C150                            |
|   | AC 240                     | 7,5            | 0,75    | 2,5             | C300                            |
|   | AC 480                     | 3,75           | 0,375   | 2,5             | C600                            |
|   | AC 600                     | 3              | 0,3     | 2,5             | C600                            |
|   | DC 125                     | 0,55           | 0,55    | 2,5             | Q150                            |
|   | DC 250                     | 0,27           | 0,27    | 2,5             | Q300                            |
|   | DC 600                     | 0,1            | 0,1     | 2,5             | Q600                            |
| -   | AC 120                     | 3,6            | 0,6     | 1               | D150                            |
|   | AC 240                     | 1,8            | 0,3     | 1               | D300                            |
|   | DC 125                     | 0,22           | 0,22    | 1               | R150                            |
|   | DC 250                     | 0,11           | 0,11    | 1               | R300                            |
| -   | AC 120                     | 1,8            | 0,3     | 0,5             | E150                            |

#### Discernment at UL-Standards

##### Recognized Component Industrial Control Equipment

UL issues yellow "Guide cards" with Guide- and File-No.

Devices have permission to be marked with on the label



##### Listed Industrial Control Equipment

UL issues white "Guide cards" with Guide- and File-No.

Devices have to be marked with the "UL-Listing Mark"



Devices as components approved for "factory wiring": devices for employment in control panels, when they are selected, mounted and wired according to the charging conditions by skilled worker.

Devices approved for "field wiring",

- a) devices for employment in control panels, when they are mounted and wired by skilled worker.
- b) devices for retail in USA







Valid UL-Standards:  
UL 508 "Standard for Industrial Control Equipment" (partly limited)

Valid UL-Standards:  
UL 508 "Standard for Industrial Control Equipment" (unlimited)







Are devices approved as "Listed Equipment" the approval is also valid for using as "Recognized Component" .



# Approvals

| Country  | North America   |   | Switzerland  | Europe  | Russia<br>EAC   | China   | CENELEC<br>CB-Certificates |
|--|---|---|--|---|---|---|----------------------------|
| Type   | UL<br> |  | SEV<br> |  |  |  |                            |
| <b>Micro Contactor Relays, Micro Contactors K0, Micro Reversing Contactors and Accessories</b> |   |   |  |   |   |   |                            |
| K0-04D..   | o   | -   | -  | o   | -   | -   | -                          |
| K0-05D..   | o   | -   | -  | o   | -   | o   | -                          |
| K0W05D..   | o   | -   | -  | o   | -   | o   | -                          |
| <b>Mini Contactor Relays, Mini Contactors, Mini Reversing Contactors K1 and Accessories</b>    |   |   |  |   |   |   |                            |
| K1-07D..(=)  | o   | -   | -  | o   | o   | -   | o                          |
| K1-07L..(=)  | -   | o   | -  | o   | o   | -   | o                          |
| K1-07F..(=)  | -   | o   | -  | o   | o   | -   | -                          |
| K1-09D..(=)  | o   | -   | -  | o   | o   | o   | o                          |
| K1-09L..(=)  | -   | o   | -  | o   | o   | o   | o                          |
| K1-09F..(=)  | -   | o   | -  | o   | o   | o   | -                          |
| K1-12D..(=)  | o   | -   | -  | o   | o   | o   | -                          |
| K1W09D01(=)  | o   | -   | -  | o   | o   | o   | -                          |
| K1W12D01(=)  | o   | -   | -  | o   | o   | o   | -                          |
| K1W09L01(=)  | -   | o   | -  | o   | o   | o   | -                          |
| HK..., HKM..   | o   | -   | -  | o   | o   | -   | o                          |
| RC-K1  | o   | -   | -  | o   | o   | -   | -                          |
| <b>Contactor Relays, Contactors Series K3</b>  |   |   |  |   |   |   |                            |
| K3-07ND..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-10N..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-14N..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-18N..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-22N..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-24A..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-32A..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-40A..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-50A..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-62A..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-74A..(=)  | o   | -   | o  | o   | o   | o   | o                          |
| K3-90A..(=)  | o   | -   | -  | o   | o   | o   | -                          |
| K3-115A..(=)   | o   | -   | -  | o   | o   | o   | -                          |
| K3-151A..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-176A..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-210A..(=)   | x   | -   | -  | o   | o   | -   | -                          |
| K3-260A..(=)   | x   | -   | -  | o   | o   | -   | -                          |
| K3-316A..(=)   | x   | -   | -  | o   | o   | -   | -                          |
| K3-450A..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-550A..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-700A..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-860A..(=)   | o   | -   | -  | o   | o   | -   | -                          |
| K3-1000A..(=)  | -   | -   | -  | o   | o   | -   | -                          |
| K3-1200A..(=)  | o   | -   | -  | o   | o   | -   | -                          |
| <b>Contactor Relays, Contactors DC operated Series KG3</b>                                     |   |   |  |   |   |   |                            |
| KG3-07..   | o   | -   | -  | o   | o   | -   | o                          |
| KG3-10..., -14..   | o   | -   | -  | o   | o   | -   | o                          |
| KG3-18..., -22..   | o   | -   | -  | o   | o   | -   | o                          |
| KG3-24..., -32..   | o   | -   | -  | o   | o   | -   | o                          |
| KG3-40..   | o   | -   | -  | o   | o   | -   | o                          |
| <b>Capacitor Contactors Series K3</b>  |   |   |  |   |   |   |                            |
| K3-18K..   | o   | -   | -  | o   | o   | o   | o                          |
| K3-24K..   | o   | -   | -  | o   | o   | o   | o                          |
| K3-32K..   | o   | -   | -  | o   | o   | o   | o                          |
| K3-50K..   | o   | -   | -  | o   | o   | o   | o                          |
| K3-62K..   | o   | -   | -  | o   | o   | o   | o                          |
| K3-74K..   | o   | -   | -  | o   | o   | o   | o                          |
| K3-90K..   | o   | -   | -  | o   | o   | o   | -                          |
| K3-115K..  | o   | -   | -  | o   | o   | o   | -                          |
| <b>Aux. Contacts</b>   |   |   |  |   |   |   |                            |
| HN..., HTN..   | o   | -   | -  | o   | o   | o   | o                          |
| HA..   | o   | -   | -  | o   | o   | -   | o                          |
| HB..   | o   | -   | -  | o   | o   | o   | o                          |
| K2-DK, K2-SK   | o   | -   | -  | o   | o   | -   | -                          |
| HKA..., HKT..  | o   | -   | -  | o   | o   | -   | -                          |
| HKF22  | -   | -   | -  | o   | o   | -   | -                          |
| o approved in standard version      x pending      - not provided to be tested                 |   |   |  |   |   |   |                            |

# Approvals

| Country  | North America   |   | Switzerland   | Europe  | Russia<br>EAC   | China   | CENELEC<br>CB-Certificates |
|--|---|---|---|---|---|---|----------------------------|
| Typ  | UL  |   | SEV   |   |   |   |                            |
|  |  |  |  |  |  |  |                            |
| <b>Accessories</b>   |   |   |   |   |   |   |                            |
| K2-T.E, -A   | -   | -   | -   | 0   | 0   | -   | -                          |
| K2-TP  | 0   | -   | -   | 0   | 0   | -   | -                          |
| K2-L   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K2-IN.   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K2-UN.   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K2-IM  | -   | -   | -   | 0   | 0   | -   | -                          |
| K2-E   | 0   | -   | -   | 0   | 0   | -   | -                          |
| VG-K2  | -   | -   | -   | 0   | 0   | -   | -                          |
| RC-K3  | 0   | -   | -   | 0   | 0   | -   | -                          |
| <b>Reversing Contactors Series K3NWU</b>                   |   |   |   |   |   |   |                            |
| K3NWU-10   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K3NWU-14   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K3NWU-18   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K3NWU-22   | 0   | -   | -   | 0   | 0   | -   | -                          |
| K3WU-24  | 0   | -   | -   | 0   | 0   | -   | -                          |
| K3WU-32  | 0   | -   | -   | 0   | 0   | -   | -                          |
| K3WU-40  | 0   | -   | -   | 0   | 0   | -   | -                          |
| <b>D.O.L Starters</b>                                      |   |   |   |   |   |   |                            |
| P1..   | 0   | -   | -   | 0   | 0   | -   | -                          |
| <b>Thermal Overload Relays</b>                             |   |   |   |   |   |   |                            |
| U3/32  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U3/42  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U3/74  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U12/16E  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U12/16A  | -   | -   | -   | 0   | 0   | -   | 0                          |
| U12/16EM   | -   | -   | -   | 0   | 0   | -   | 0                          |
| U12/16EQ   | -   | -   | -   | 0   | 0   | -   | 0                          |
| U32  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U60  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U85  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| U180   | x   | -   | -   | 0   | 0   | -   | -                          |
| U320   | x   | -   | -   | 0   | 0   | -   | -                          |
| U800   | -   | -   | -   | 0   | 0   | -   | -                          |
| <b>Modular Contactors</b>                                  |   |   |   |   |   |   |                            |
| R20  | 0   | -   | 0   | 0   | 0   | -   | 0                          |
| R25  | 0   | -   | 0   | 0   | 0   | -   | 0                          |
| R40  | 0   | -   | 0   | 0   | 0   | -   | 0                          |
| R63  | 0   | -   | 0   | 0   | 0   | -   | 0                          |
| R40, R63 2-polig   | -   | -   | -   | 0   | 0   | -   | 0                          |
| RH11   | 0   | -   | -   | 0   | 0   | -   | 0                          |
| <b>Push Buttons</b>  |   |   |   |   |   |   |                            |
| B(C,K,S)3/4/5D   | 0   | -   | -   | 0   | 0   | -   | 0                          |
| <b>Contactors Relays and Contactors Series K3 (RAST 5)</b> |   |   |   |   |   |   |                            |
| K3-10/14/18/22NR   | 0   | -   | -   | 0   | 0   | 0   | 0                          |
| <b>Contactors for DC-Loads</b>                             |   |   |   |   |   |   |                            |
| K3DC-20 bis 80   | 0   | -   | -   | 0   | 0   | -   | 0                          |
| K3DC-100   | -   | -   | -   | 0   | 0   | -   | 0                          |
| K3PV-30 bis 60   | -   | -   | -   | 0   | 0   | -   | 0                          |
| K3PV-80  | 0   | -   | -   | 0   | 0   | -   | 0                          |
| K3PV-100   | -   | -   | -   | 0   | 0   | -   | 0                          |
| K3PV-150 bis 450   | 0   | -   | -   | 0   | 0   | -   | 0                          |
| <b>Main Contactors Series K3</b>                           |   |   |   |   |   |   |                            |
| K3-10/14/18/22NBD  | -   | -   | -   | 0   | 0   | -   | 0                          |

o approved in standard version

x pending

- not provided to be tested

# Approvals

| Country | North America   |   | Switzerland   | Europe  | Russia<br>EAC   | China   | CENELEC<br>CB-Certificates |
|---------|---|---|---|---|---|---|----------------------------|
| Typ     | UL  |   | SEV   | CE  | EAC   | CCC   |                            |
|         |  |  |  |  |  |  |                            |

## Motor Protection Circuit Breakers Series M4-..

|         |   |   |   |   |   |   |   |
|---------|---|---|---|---|---|---|---|
| M4-32T  | o | - | - | o | o | - | - |
| M4-32R  | o | - | - | o | o | - | - |
| M4-63R  | o | - | - | o | o | - | - |
| M4-100R | o | - | - | o | o | - | - |

## Zubehör

|       |   |   |   |   |   |   |   |
|-------|---|---|---|---|---|---|---|
| M4 HQ | o | - | - | o | o | - | - |
| M4 HS | o | - | - | o | o | - | - |
| M4 MA | o | - | - | o | o | - | - |
| M4 M  | o | - | - | o | o | - | - |
| M4 U  | o | - | - | o | o | - | - |
| M4 A  | o | - | - | o | o | - | - |

## Motor Protection Circuit Breakers Series MU25A-..

|       |   |   |   |   |   |   |   |
|-------|---|---|---|---|---|---|---|
| MU25A | o | - | - | o | - | - | - |
|-------|---|---|---|---|---|---|---|

## Accessories

|          |   |   |   |   |   |   |   |
|----------|---|---|---|---|---|---|---|
| MU25A-PS | o | - | - | o | - | - | - |
| MU25A-PV | o | - | - | o | - | - | - |
| MU25A-A  | o | - | - | o | - | - | - |
| MU25A-U  | o | - | - | o | - | - | - |

## Mini DC-Isolators

|                   |   |   |   |   |   |   |   |
|-------------------|---|---|---|---|---|---|---|
| LSM(O)16/25/32/38 | o | - | - | - | o | - | - |
|-------------------|---|---|---|---|---|---|---|

## DC-Switch Disconnectors, 2, 2+2, 4 pole

|               |   |   |   |   |   |   |   |
|---------------|---|---|---|---|---|---|---|
| LS16/20/25/32 | o | - | - | o | o | o | o |
| LS40/55/65    | o | - | - | o | o | o | o |

## DC-Switch Disconnectors, 3+2, 4+2, 6, 8 pole

|               |   |   |   |   |   |   |   |
|---------------|---|---|---|---|---|---|---|
| LS16/20/25/32 | o | - | - | o | o | o | - |
| LS40/55/65    | o | - | - | o | o | o | - |

## AC-Main Switches

|                |   |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|---|
| LTS20/25/32/40 | o | - | - | o | o | - | o |
| LTS63/80       | o | - | - | o | o | - | o |
| LTS85/100/125  | o | - | - | o | o | - | o |

## AC-Cam Switches

|         |   |   |   |   |   |   |   |
|---------|---|---|---|---|---|---|---|
| M4H     | o | - | - | o | o | - | o |
| M10     | o | - | - | o | o | - | o |
| M10H(D) | o | - | - | o | o | - | o |
| M20     | o | - | - | o | o | - | o |
| N33F    | o | - | - | o | o | - | o |
| N40     | o | - | - | o | o | - | o |
| N60     | o | - | - | o | o | - | o |
| N61     | o | - | - | o | o | - | o |
| N80     | o | - | - | o | o | - | o |
| N100    | o | - | - | o | o | - | o |
| N200    | o | - | - | o | o | - | o |
| L400    | o | - | - | o | o | - | o |

o approved in standard version

x pending

- not provided to be tested



**cUL<sup>us</sup> - and cRU<sup>us</sup> - Guide- and File-No.**

These data are important for UL-inspectors.  
Devices

| Devices  | Guide-No.         |      |                   |       | File-No. |
|--|-------------------|------|-------------------|-------|----------|
|  | cUL <sup>us</sup> |      | cRU <sup>us</sup> |       |          |
|  | Canada            | USA  | Canada            | USA   |          |
| Contactors                                       | NLDX7             | NLDX | NLDX8             | NLDX2 | E41502   |
| Revering Contactors                              | NLDX7             | NLDX | -                 | -     | E41502   |
| Contactors Relays, Accessories                   | NKCR7             | NKCR | NKCR8             | NKCR2 | E66273   |
| Thermal Overload Relays                          | NKCR7             | NKCR | -                 | -     | E66273   |
| Cam Switches                                     | NLRV7             | NLRV | -                 | -     | E129916  |
| Circuit Breakers as Manual Motor Controller      | NLRV7             | NLRV | -                 | -     | E129916  |
| Circuit Breakers as Combination Motor Controller | NKJH7             | NKJH | -                 | -     | E197641  |
| Bus Bar Assemblies                               | NLRV7             | NLRV | -                 | -     | E129916  |
| Accessories for Circuit Breakers                 | NKCR7             | NKCR | -                 | -     | E66273   |

## Technical Information

### Degree of protection acc. to IEC 60947-1

Protection ratings are prefixed by the internationally agreed letters IP followed by two digits.

1<sup>st</sup> digit: Pertains to solid objects  
2<sup>nd</sup> digit: Pertains to water.

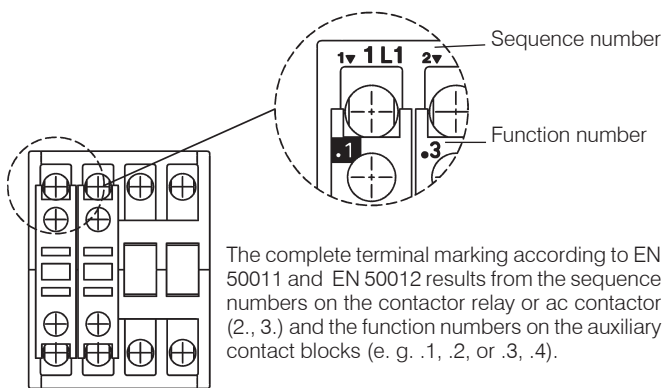
| 1 <sup>st</sup> digit | Short description  | Definition   |
|-----------------------|--|--|
| 1                     | Protected against solid objects greater than 50 mm   | Excludes solid objects exceeding 50 mm in diameter and protects against contact with live and moving parts by a large body surface such as a hand (but not against deliberate access).   |
| 2L                    | Protected against solid objects greater than 12,5 mm and against contact by standard test finger | Excludes solid objects exceeding 12,5 mm in diameter and protects against contact with live and moving parts by a standard test finger or similar objects not exceeding 80 mm in length. |
| 3                     | Protected against solid objects  | Excludes solid objects exceeding 2,5 mm in diameter or thickness, greater than 2,5mm   |
| 4                     | Protected against solid objects greater than 1 mm  | Excludes solid objects exceeding 1 mm in diameter or thickness.  |
| 5                     | Dust protected   | Prevents ingress of dust in quantities and locations that would interfere with the intended operation of the equipment.  |
| 6                     | Dust tight   | Prevents ingress of dust.  |

### Terminal markings acc. to EN50011

Auxiliary contacts of AC contactors and contacts of contactor relays and thermal overload relays are particularly marked. The terminal markings of normally-open contacts are printed as positive figures, they of normally-closed contacts as negative figures.

This gives a clear indication of the function of the contacts.

The figure below illustrates the determination of terminal markings for contactors with auxiliary contact blocks.



| 2 <sup>nd</sup> digit | Short description                                      | Definition   |
|-----------------------|--|--|
| 1                     | Protected against dripping water                       | Dripping water (vertically falling drops) shall have no harmful effect.  |
| 2                     | Protected against dripping water when tilted up to 15° | Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position.                 |
| 3                     | Protected against spraying water                       | Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.   |
| 4                     | Protected against splashing water                      | Water splashed against the enclosure from any direction shall have no harmful effect.  |
| 5                     | Protected against water jets                           | Water protected by a nozzle against the enclosure from any direction shall have no harmful effect.   |
| 6                     | Protected against heavy seas                           | Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.                                       |
| 7                     | Protected against the effects of immersion             | Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under standard conditions of pressure and time. |
| 8                     | Protected against submersion                           | No ingress of water.   |

### Resistance to climatic conditions acc. to IEC60068

Open-type devices are climate-resistant in the constant climate according to IEC60068-2-78 (this is a climate with an ambient temperature of 40°C and an atmospheric humidity of 90 to 95%).

Enclosed devices are climate-resistant in an alternating climate according to IEC 68-2-30 (this is a moist alternating climate with a 24-hour cycle between climates with an ambient temperature of 25°C, and an atmospheric humidity of 95 to 100% and an ambient temperature of 40°C, and an atmospheric humidity of 90 to 96% in the presence of condensation during rises in temperature).

Data are valid up to an altitude of 2000m above sea level.

### Short circuit protection

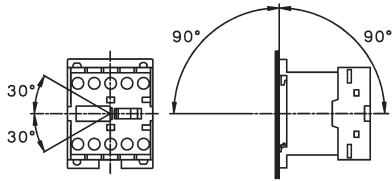
Back up fuses should be used to protect contactors and starters against short circuits. For starters the device with the smaller admissible fuse at the main and at the control circuit (contactor or thermal overload) determines the fuse size.

After a short circuit devices have to be checked for correct operation. Disconnect power before proceeding with any work on the equipment!

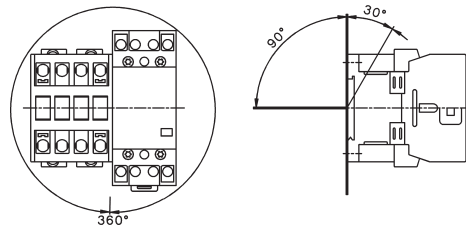
# Technical Information

## Mounting positions of contactors

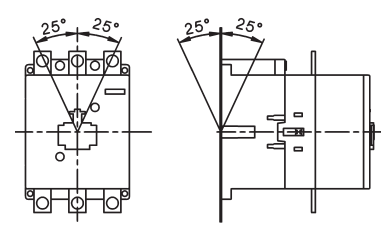
K0-.. / K1-..



K(G)3-07.. to K3-115.., R20-.. to R63-..









K3-151.. to K3-1200..  
K3DC-20.. to K3DC-100..  
K3PV-12.. to K3PV-450..



## Terminal screws

| Devices<br>Type   | Kind of connection    |                       |                                | Screw driver                           | Tightening torque                                |                                      |
|---|-----------------------|-----------------------|--------------------------------|--|--|--------------------------------------|
|   | Screw with washer     | Screw with clamp box  | Screw w. nut                   |  | Nm   | lb. inch                             |
| <b>Micro Contactors</b> , all conductors<br>K0-..   | M2,5                  | -                     | -                              | Pz1                                    | 0,6 - 0,8  | 5 - 7                                |
| <b>Mini Contactors</b> , all conductors<br>K1-..  | M3,5                  | -                     | -                              | Pz2                                    | 0,8 - 1,4  | 7 - 12                               |
| <b>Contactors Relays</b> , all conductors<br>K(G)3-07..   | M3,5                  | -                     | -                              | Pz2                                    | 0,8 - 1,4  | 7 - 12                               |
| <b>Contactors</b><br>Main conductor   |                       |                       |                                |  |  |                                      |
| K(G)3-10.. bis K3-22..  | M3,5                  | -                     | -                              | Pz2                                    | 0,8 - 1,4  | 7 - 12                               |
| K(G)3-24.. bis K3-40..  | -                     | M5                    | -                              | Pz2                                    | 2,5 - 3  | 22 - 26                              |
| K3-50.. bis K3-74..   | -                     | M6                    | -                              | Pz3                                    | 3,5 - 4,5  | 31 - 40                              |
| K2-23, -30, -37A00-40<br>K2-45, -60A00-40   | M4<br>-               | -<br>M6               | -<br>-                         | Pz2<br>Pz3                             | 1,2 - 1,8<br>3,5 - 4,5                           | 11 - 16<br>31 - 40                   |
| K3-90, K3-115   | -                     | -                     | M8                             | 4mm hex socket                         | 4 - 6,5  | 35 - 57                              |
| K3-116.. bis K3-176..<br>K3-210.. bis K3-316..<br>K3-450.. bis K3-700..<br>K3-860..<br>K3-1000.., K3-1200.. | -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>- | M8<br>M10<br>M12<br>M14<br>M12 |  | 17<br>35<br>60<br>75<br>60                       | 150<br>315<br>540<br>675<br>540      |
| Auxiliary conductor<br>K(G)3-10 bis K3-22   | M3,5                  | -                     | -                              | Pz2                                    | 0,8 - 1,4  | 7 - 12                               |
| Coil conductor<br>K(G)3-10 bis K3-1200  | M3,5                  | -                     | -                              | Pz2                                    | 0,8 - 1,4  | 7 - 12                               |
| <b>Accessories</b><br>HK, HKM<br>HA, HN, K2-..., HB..   | M3,5<br>M3,5          | -<br>-                | -<br>-                         | Pz2<br>Pz2                             | 0,8 - 1,4<br>0,8 - 1,4                           | 7 - 12<br>7 - 12                     |
| <b>Thermal Overload Relays</b><br>Main conductor  |                       |                       |                                |  |  |                                      |
| U12/16  | M4                    | -                     | -                              | Pz2                                    | 1,2 - 1,8  | 11 - 16                              |
| U3/32<br>U3/42<br>U3/74   | M3,5<br>M5<br>-       | -<br>-<br>M6          | -<br>-<br>-                    | Pz2<br>Pz2<br>Pz3                      | 0,8 - 1,4<br>2,5 - 3<br>3,5 - 4,5                | 7 - 12<br>22 - 26<br>31 - 40         |
| UAT21<br>UAT22<br>UAT23   | -<br>-<br>-           | M4<br>M4<br>M5        | -<br>-<br>-                    | Size 3, 4<br>Size 3, 4<br>Size 3, 4, 5 | 1,2 - 1,8<br>1,2 - 1,8<br>2,5 - 3                | 11 - 16<br>11 - 16<br>22 - 26        |
| Auxiliary conductor<br>All devices  | M3,5                  | -                     | -                              | Pz2                                    | 0,8 - 1,4  | 7 - 12                               |
| <b>Contactors for Distribution Boards</b><br>Conductors   |                       |                       |                                |  |  |                                      |
| R20, R25<br>R40, R63<br>K1R   | -<br>-<br>M3,5        | M3,5<br>M5<br>-       | -<br>-<br>-                    | Pz1<br>Pz2<br>Pz2                      | 0,8 - 1,4<br>2,5 - 3<br>0,8 - 1,4                | 7 - 12<br>22 - 26<br>7 - 12          |
| Coil conductor<br>R20, R25<br>R40, R63 (2pole / 4 pole)<br>K1R<br>RH11                                      | -<br>-<br>M3,5<br>-   | M3<br>M3<br>-<br>M3   | -<br>-<br>-<br>-               | Pz1<br>Pz1<br>Pz2<br>Pz1               | 0,6 - 1,2<br>0,6 - 1,2<br>0,8 - 1,4<br>0,6 - 1,2 | 5 - 11<br>5 - 11<br>7 - 12<br>5 - 11 |




|   |   |                     |
|---|---|---------------------|
|    | <p>Micro Contactor Relays</p>                                 | <p>12</p>           |
|    | <p>Micro Contactors</p>                                       | <p>14</p>           |
|    | <p>Micro Contactors With Solder Pins</p> <p>Coil voltages</p> | <p>16</p> <p>16</p> |
|  | <p>Micro Reversing Contactor</p>                              | <p>18</p>           |
|  | <p>Technical Data</p>   | <p>20</p>           |
|  | <p>Dimensions</p>   | <p>24</p>           |

# Micro Contactor Relays 4-pole

AC Operated

**Ratings Therm.**      **Contacts 2)**      **Type**      **Coil voltage 1)**  
 Distinc.      Additional      **24**      24V 50/60Hz  
 Number      Contact      **230**      220-240V 50Hz/60Hz

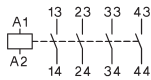
**AC15**      Rated Current       **Blocks**  
**230V**      400V       $I_{th}$       acc. to      Type      **↓**      Pack      Weight  
**A**      A      A      NO      NC      EN50011      Type      pcs.      kg/pc.

## 4-pole, with Screw Terminals

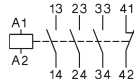


| Type | 3 | 1,5 | 5 | 4 | - | 40E | - | K0-04D40 ... | 10 | 0,07 |
|------|---|-----|---|---|---|-----|---|--------------|----|------|
|      | 3 | 1,5 | 5 | 3 | 1 | 31E | - | K0-04D31 ... | 10 | 0,07 |
|      | 3 | 1,5 | 5 | 2 | 2 | 22E | - | K0-04D22 ... | 10 | 0,07 |

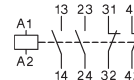
**K0-04D40**



**K0-04D31**



**K0-04D22**



1) Other coil voltages on request.  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

# Micro Contactor Relays 4-pole

DC Operated

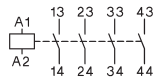
| Ratings Therm. | Contacts <sup>2)</sup> | Distinc. Number | Additional Contact | Type            | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|----------------|------------------------|-----------------|--------------------|-----------------|----------------------------|-----------|---------------|
| <b>AC15</b>    | Rated Current          |                 |                    |                 | <b>= 24</b>                |           |               |
| <b>230V A</b>  | 400V A                 | $I_{th}$ A      | NO NC              | acc. to EN50011 | 24V=DC                     |           |               |
|                |                        |                 |                    | Blocks Type     |                            |           |               |



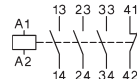
## 4-pole, with Screw Terminals

|          |     |   |   |   |     |   |                      |    |      |
|----------|-----|---|---|---|-----|---|----------------------|----|------|
| <b>3</b> | 1,5 | 5 | 4 | - | 40E | - | <b>K0-04D40= ...</b> | 10 | 0,09 |
| <b>3</b> | 1,5 | 5 | 3 | 1 | 31E | - | <b>K0-04D31= ...</b> | 10 | 0,09 |
| <b>3</b> | 1,5 | 5 | 2 | 2 | 22E | - | <b>K0-04D22= ...</b> | 10 | 0,09 |

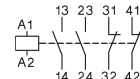
**K0-04D40**



**K0-04D31**



**K0-04D22**



1) Other coil voltages on request.

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.



# Micro Contactors

AC Operated



| Power Ratings  | Rated Current     | Aux. Contacts <sup>2)</sup> |            | Type                    | Coil voltage <sup>1)</sup>        | Pack pcs. | Weight kg/pc. |
|--|-------------------|-----------------------------|------------|-------------------------|-----------------------------------|-----------|---------------|
|  |                   | Built-in                    | Additional |                         |                                   |           |               |
| AC2, AC3<br><b>380V</b><br><b>400V</b><br><b>415V</b><br><b>kW</b> | 660V<br>690V<br>A | AC1                         | NO NC      | <b>24</b><br><b>230</b> | 24V 50/60Hz<br>220-240V 50Hz/60Hz |           |               |
|  |                   |                             |            | ↓                       |                                   |           |               |

## 3-pole, with Screw Terminals

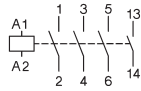
|     |   |    |   |   |   |                     |    |      |
|-----|---|----|---|---|---|---------------------|----|------|
| 2,2 | - | 12 | 1 | - | - | <b>K0-05D10 ...</b> | 10 | 0,07 |
|-----|---|----|---|---|---|---------------------|----|------|

|     |   |    |   |   |   |                     |    |      |
|-----|---|----|---|---|---|---------------------|----|------|
| 2,2 | - | 12 | - | 1 | - | <b>K0-05D01 ...</b> | 10 | 0,07 |
|-----|---|----|---|---|---|---------------------|----|------|

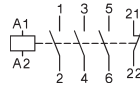
## 4-pole, With Screw Terminals

|     |   |    |   |   |   |                        |    |      |
|-----|---|----|---|---|---|------------------------|----|------|
| 2,2 | - | 12 | - | - | - | <b>K0-05D00-40 ...</b> | 10 | 0,07 |
|-----|---|----|---|---|---|------------------------|----|------|

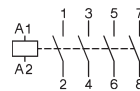
**K0-05D10**



**K0-05D01**



**K0-05D00-40**



1) Other coil voltages see page 14.

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

# Micro Contactors

DC Operated



| Power Ratings | Rated Current | Aux. Contacts <sup>2)</sup> |            | Type        | Coil voltage <sup>1)</sup><br>= 24 24V= DC | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|------------|-------------|--|-----------|---------------|
|               |               | Built-in                    | Additional |             |  |           |               |
| AC2, AC3      | AC1           |                             |            |             |  |           |               |
| <b>380V</b>   |               |                             |            |             |  |           |               |
| <b>400V</b>   | 660V          |                             |            |             |  |           |               |
| <b>415V</b>   | 690V          | 440V                        |            |             |  |           |               |
| <b>kW</b>     | <b>kW</b>     | <b>A</b>                    | NO NC      | Blocks Type |  |           |               |

## 3-pole, with Screw Terminals

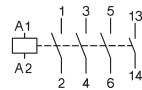
|     |   |    |   |   |   |                      |    |      |
|-----|---|----|---|---|---|----------------------|----|------|
| 2,2 | - | 12 | 1 | - | - | <b>K0-05D10= ...</b> | 10 | 0,09 |
|-----|---|----|---|---|---|----------------------|----|------|

|     |   |    |   |   |   |                      |    |      |
|-----|---|----|---|---|---|----------------------|----|------|
| 2,2 | - | 12 | - | 1 | - | <b>K0-05D01= ...</b> | 10 | 0,09 |
|-----|---|----|---|---|---|----------------------|----|------|

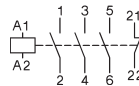
## 4-pole, With Screw Terminals

|     |   |    |   |   |   |                         |    |      |
|-----|---|----|---|---|---|-------------------------|----|------|
| 2,2 | - | 12 | - | - | - | <b>K0-05D00-40= ...</b> | 10 | 0,09 |
|-----|---|----|---|---|---|-------------------------|----|------|

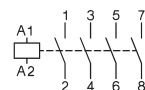
**K0-05D10**



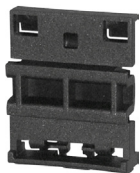
**K0-05D01**



**K0-05D00-40**



# Snap-On Adapter



| For Type | Specification          | Type  | Pack pcs.. | Weight kg/pc. |
|----------|------------------------|-------|------------|---------------|
| K0       | Snap on Adapter for K0 | P1039 | 10         | 0,0061        |

for snap-on mounting of contactor K0 on 35mm DIN-rail acc. DIN EN 50022

1) Other coil voltages see page 14.  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

# Micro Contactors

# AC Operated

| Power Ratings | Rated Current | Aux. Contacts <sup>2)</sup> |            | Type | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|------------|------|----------------------------|-----------|---------------|
|               |               | Built in                    | Additional |      |                            |           |               |
| AC2, AC3      | AC1           |                             |            |      | 24V 50/60Hz                |           |               |
| <b>380V</b>   |               |                             |            |      | 220-240V 50Hz/60Hz         |           |               |
| <b>400V</b>   | 660V          |                             |            |      |                            |           |               |
| <b>415V</b>   | 690V          | 440V                        |            |      |                            |           |               |
| <b>kW</b>     | <b>kW</b>     | <b>A</b>                    | NO NC      | Type |                            |           |               |



### 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

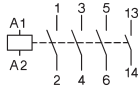
|     |   |   |   |   |   |                     |    |      |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | 1 | - | - | <b>K0-05L10</b> ... | 10 | 0,07 |
|-----|---|---|---|---|---|---------------------|----|------|

|     |   |   |   |   |   |                     |    |      |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | - | 1 | - | <b>K0-05L01</b> ... | 10 | 0,07 |
|-----|---|---|---|---|---|---------------------|----|------|

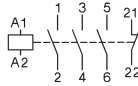
### 4-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

|     |   |   |   |   |   |                        |    |      |
|-----|---|---|---|---|---|------------------------|----|------|
| 2,2 | - | 9 | - | - | - | <b>K0-05L00-40</b> ... | 10 | 0,07 |
|-----|---|---|---|---|---|------------------------|----|------|

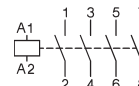
**K0-05L10**



**K0-05L01**



**K0-05L00-40**



## Coil voltages for AC operated contactors

| Suffix to contactor type<br>e.g. K0-05D10 24 | Voltage Marking at the coil for |           | Rated Control Voltage U <sub>s</sub> range for 50Hz |           |           |           | for 60Hz |      |
|--|---------------------------------|-----------|---|-----------|-----------|-----------|----------|------|
|  | 50Hz                            | 60Hz      | min.  | max.      | min.      | max.      | min.     | max. |
| 12   | 12                              | 12        | 11  | 12        | 12        | 12        |          |      |
| <b>24</b>                                    | <b>24</b>                       | <b>24</b> | <b>22</b>   | <b>24</b> | <b>24</b> | <b>24</b> |          |      |
| 42   | 42                              | 42        | 38,5  | 42        | 42        | 42        |          |      |
| 48   | 48                              | 48        | 48  | 50        | 48        | 52        |          |      |
| 90   | 100                             | 100       | 90  | 100       | 100       | 105       |          |      |
| 95   | 95-100                          | 105-110   | 95  | 100       | 105       | 110       |          |      |
| 100  | 100                             | 110-115   | 100   | 105       | 110       | 115       |          |      |
| 105  | 105-110                         | 115-120   | 105   | 110       | 115       | 120       |          |      |
| 110  | 110-115                         | 120-125   | 110   | 115       | 120       | 125       |          |      |
| 180  | 200                             | 200       | 185   | 200       | 200       | 210       |          |      |

| Suffix to contactor type<br>e.g. K0-05D10 230 | Voltage Marking at the coil for |                | Rated Control Voltage U <sub>s</sub> range for 50Hz |            |            |            | for 60Hz |      |
|---|---------------------------------|----------------|---|------------|------------|------------|----------|------|
|   | 50Hz                            | 60Hz           | min.  | max.       | min.       | max.       | min.     | max. |
| 200   | 200                             | 200-220        | 195   | 205        | 200        | 220        |          |      |
| 210   | 205-215                         | 220-230        | 205   | 215        | 220        | 230        |          |      |
| 220   | 210-220                         | 220-240        | 210   | 220        | 220        | 240        |          |      |
| <b>230</b>                                    | <b>220-230</b>                  | <b>230-250</b> | <b>220</b>  | <b>230</b> | <b>230</b> | <b>250</b> |          |      |
| 240   | 230-240                         |                | 230   | 240        | 250        | 260        |          |      |

**Standard voltages in bold type letters**  
**Operating range of magnet-coils: 0,85 x U<sub>s</sub>**  
**(min. value of rated control voltage)**  
**up to 1,1 x U<sub>s</sub>**  
**(max. value of rated control voltage)**

Coil not exchangeable

1) Other coil voltages see page 14.

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

# Micro Contactors

DC Operated

| Power Ratings  | Rated Current      | Aux. Contacts <sup>2)</sup> |            | Type | Coil voltage <sup>1)</sup><br>= 24 24V= DC | Pack pcs. | Weight kg/pc. |
|--|--------------------|-----------------------------|------------|------|--|-----------|---------------|
|  |                    | Built in                    | Additional |      |  |           |               |
| AC2, AC3<br><b>380V</b><br><b>400V</b><br><b>415V</b><br><b>kW</b> | 660V<br>690V<br>kW | AC1<br>440V<br>A            |            |      |  |           |               |
|  |                    |                             | NO NC      | Type | ↓  |           |               |



### 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

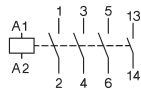
|     |   |   |   |   |   |                     |    |      |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | 1 | - | - | <b>K0-05L10 ...</b> | 10 | 0,07 |
|-----|---|---|---|---|---|---------------------|----|------|

|     |   |   |   |   |   |                     |    |      |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | - | 1 | - | <b>K0-05L01 ...</b> | 10 | 0,07 |
|-----|---|---|---|---|---|---------------------|----|------|

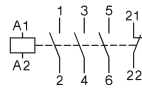
### 4-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

|     |   |   |   |   |   |                        |    |      |
|-----|---|---|---|---|---|------------------------|----|------|
| 2,2 | - | 9 | - | - | - | <b>K0-05L00-40 ...</b> | 10 | 0,07 |
|-----|---|---|---|---|---|------------------------|----|------|

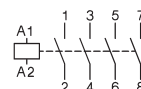
**K0-05L10**



**K0-05L01**



**K0-05L00-40**



1) Other coil voltages see page 14.  
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

# Micro Reversing Contactors, Mechanical Interlocked

AC Operated

| Power Ratings | Rated Current | Aux. Contacts <sup>2)</sup> |  | Type    | Coil voltage <sup>1)</sup><br>24V 50/60Hz<br>220-240V 50Hz/60Hz | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|--|---------|---|-----------|---------------|
|               |               | Built-in                    | Additional on left hand side Contactor |         |   |           |               |
| AC2, AC3      | AC1           |                             |  |         |   |           |               |
| <b>380V</b>   |               |                             |  |         |   |           |               |
| <b>400V</b>   | 660V          |                             |  |         |   |           |               |
| <b>415V</b>   | 690V          | 440V                        |  |         |   |           |               |
| <b>kW</b>     | <b>kW</b>     | <b>A</b>                    | NO NC                                  | K1 Type |   |           |               |

## 3-pole, with Screw Terminals



|     |   |    |   |   |   |   |                       |   |      |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | - | 2 | - | - | <b>K0W05D01MC ...</b> | 1 | 0,14 |
|-----|---|----|---|---|---|---|-----------------------|---|------|

|     |   |    |   |   |   |   |                       |   |      |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | 2 | - | - | - | <b>K0W05D10MC ...</b> | 1 | 0,14 |
|-----|---|----|---|---|---|---|-----------------------|---|------|

## 4-pole, with Screw Terminals



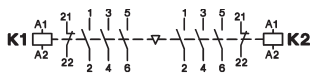
|     |   |    |   |   |   |   |                          |   |      |
|-----|---|----|---|---|---|---|--------------------------|---|------|
| 2,2 | - | 12 | - | - | - | - | <b>K0W05D00-40MC ...</b> | 1 | 0,14 |
|-----|---|----|---|---|---|---|--------------------------|---|------|

## 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

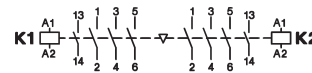
|     |   |                   |   |   |   |   |                       |   |      |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx <sup>3)</sup> | - | 2 | - | - | <b>K0W05L01MC ...</b> | 1 | 0,14 |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|

|     |   |                   |   |   |   |   |                       |   |      |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx <sup>3)</sup> | 2 | - | - | - | <b>K0W05L10MC ...</b> | 1 | 0,14 |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|

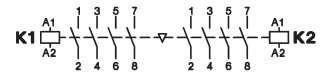
**K0W05D01MC**



**K0W05D10MC**



**K0W05D00-40MC**



# Reversing Starter Connector



For Reversing Starter Types, incl. Coil Connector

| Type              | Pack pcs.     | Weight kg/pc. |
|-------------------|---------------|---------------|
| <b>K0W05D..MC</b> | <b>K0W-VB</b> | 1 0,01        |

1) Other coil voltages see page 14.

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

3) Data on request.

# Micro Reversing Contactors, Mechanical Interlocked

DC Operated

| Power Ratings  | Rated Current                     | Aux. Contacts <sup>2)</sup> |   | Type    | Coil voltage <sup>1)</sup><br>= 24 24V= DC | Pack pcs. | Weight kg/pc. |
|--|-----------------------------------|-----------------------------|---|---------|--|-----------|---------------|
|  |                                   | Built-in                    | Additional  |         |  |           |               |
| AC2, AC3<br><b>380V</b><br><b>400V</b><br><b>415V</b><br><b>kW</b> | AC1<br>660V<br>690V<br>440V<br>kW |                             | on left hand side<br>on right hand side<br>Contactor<br>Contactor |         |  |           |               |
|  |                                   |                             | NO NC   | K1 Type | K2 Type                                    |           |               |

## 3-pole, with Screw Terminals



|     |   |    |   |   |   |   |                       |   |      |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | - | 2 | - | - | <b>K0W05D01MC ...</b> | 1 | 0,14 |
|-----|---|----|---|---|---|---|-----------------------|---|------|

|     |   |    |   |   |   |   |                       |   |      |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | 2 | - | - | - | <b>K0W05D10MC ...</b> | 1 | 0,14 |
|-----|---|----|---|---|---|---|-----------------------|---|------|

## 4-pole, with Screw Terminals



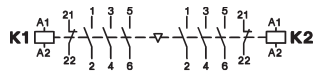
|     |   |    |   |   |   |   |                          |   |      |
|-----|---|----|---|---|---|---|--------------------------|---|------|
| 2,2 | - | 12 | - | - | - | - | <b>K0W05D00-40MC ...</b> | 1 | 0,14 |
|-----|---|----|---|---|---|---|--------------------------|---|------|

## 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

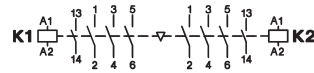
|     |   |                   |   |   |   |   |                       |   |      |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx <sup>3)</sup> | - | 2 | - | - | <b>K0W05L01MC ...</b> | 1 | 0,14 |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|

|     |   |                   |   |   |   |   |                       |   |      |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx <sup>3)</sup> | 2 | - | - | - | <b>K0W05L10MC ...</b> | 1 | 0,14 |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|

**K0W05D01MC**



**K0W05D10MC**



**K0W05D00-40MC**



1) Other coil voltages see page 14.  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.  
 3) Data on request.

# Micro Contactors

## Data according to IEC 60947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts   | Type  | K0-05D..   | K0-05L..                        |
|---|---|--|---------------------------------|
| <b>Rated insulation voltage <math>U_i</math></b>                                  | V AC  | 440 <sup>1)</sup>  | 440 <sup>1)</sup>               |
| <b>Making capacity <math>I_{eff}</math></b><br>at $U_e = 440V$ AC                 | A   | 65   | 65                              |
| <b>Breaking capacity <math>I_{eff}</math></b><br>$\cos\phi = 0,65$<br>400V AC     | A   | 50   | 50                              |
| <b>Utilization category AC1</b>   |   |  |                                 |
| <b>Switching of resistive load</b>  |   |  |                                 |
| Rated operational current $I_e (=I_{th})$ at 40°C, open                           | <b>A</b>  | <b>12</b>  | <b>9</b>                        |
| Rated operational power of three-phase resistive loads<br>50-60Hz, $\cos\phi = 1$ | 230V kW<br>240V kW<br>400V kW<br>415V kW<br>440V kW | 4,7<br>4,8<br>8,3<br>8,6<br>9,0  | 3,5<br>3,7<br>3,3<br>6,4<br>6,8 |
| Rated operational current $I_e (=I_{th})$ at 60°C, enclosed                       | A   | 8  | 6                               |
| Rated operational power of three-phase resistive loads<br>50-60Hz, $\cos\phi = 1$ | 230V kW<br>240V kW<br>400V kW<br>415V kW<br>440V kW | 3,1<br>3,3<br>5,5<br>5,7<br>6,0  | 2,3<br>2,4<br>4,1<br>4,3<br>4,5 |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$                   | mm <sup>2</sup>                                     | 1,5  | -                               |
| <b>Utilization category AC2 and AC3</b>   |   |  |                                 |
| <b>Switching of three-phase motors</b>  |   |  |                                 |
| Rated operational current $I_e$<br>open and enclosed                              | 220V A<br>230V A<br>240V A                          | 6,2<br>6,2<br>5,6  | 6,2<br>6,2<br>5,6               |
|   | <b>380-400V A</b><br>415-440V A                     | <b>5</b><br>5  | <b>5</b><br>5                   |
| Rated operational power of three-phase motors<br>50-60Hz                          | 220-240V kW<br><b>380-440V kW</b>                   | 1,5<br><b>2,2</b>  | 1,5<br>2,2                      |
| <b>Utilization category AC4</b>   |   |  |                                 |
| <b>Switching of squirrel cage motors, inching</b>                                 |   |  |                                 |
| Rated operational current $I_e$<br>open and enclosed                              | 220V A<br>230V A<br>240V A                          | 4,9<br>4,9<br>4,1  | 4,9<br>4,9<br>4,1               |
|   | <b>380-400V A</b><br>415-440V A                     | <b>3,5</b><br>3,5  | <b>3,5</b><br>3,5               |
| Rated operational power of three-phase motors<br>50-60Hz                          | 220-240V kW<br><b>380-440V kW</b>                   | 1,1<br><b>1,5</b>  | 1,1<br>1,5                      |
| <b>Utilization category AC5a</b>  |   |  |                                 |
| <b>Switching of gas discharge lamps</b>   |   |  |                                 |
| Rated operational current $I_e$<br>per pole at 220/230V                           |   |  |                                 |
| Fluorescent lamps,<br>uncompensated and serial compensated                        | A   | 6  | 6                               |
| parallel compensated<br>dual-connection   | A<br>A  | 0,5<br>9   | 0,5<br>9                        |
| Metal halide lamps <sup>2)</sup> ,<br>uncompensated                               | A   | 6  | 6                               |
| parallel compensated  | A   | 0,5  | 0,5                             |
| Mercury-vapour lamps <sup>3)</sup> ,<br>uncompensated                             | A   | 9  | 9                               |
| parallel compensated  | A   | 0,5  | 0,5                             |
| Mixed light lamps <sup>4)</sup>   | A   | 9  | 9                               |
| <b>LED-Lamps</b>  |   |  |                                 |
| consider the inrush current of the lamp ballast<br>and $\cos\phi$ of the lamp     | max. lamps per pole ( $I_{nLED} \leq I_{th}$ ) =    | $\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$ |                                 |
| max inrush current of contactor   | A   | 91   | 91                              |
| <b>Utilization category AC5b</b>  |   |  |                                 |
| <b>Switching of incandescent lamps<sup>5)</sup></b>                               |   |  |                                 |
| Rated operational current $I_e$<br>per pole at 220/230V                           | A   | 3  | 3                               |

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 4kV$ .  
Data for other conditions on request.

2) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

3) High-pressure lamps

4) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

5) Current inrush approx. 16 x  $I_e$

# Micro Contactors

## Data according to IEC 60947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts   | Type  | K0-05D..                       | K0-05L..         |
|---|---|--------------------------------|------------------|
| <b>Utilization category DC1</b>   |   |                                |                  |
| <b>Switching of resistive load</b>  | 1 pole 24V A                                      | 12                             | 9                |
| Time constant L/R ≤1ms  | 60V A   | 12                             | 9                |
| Rated operational current I <sub>e</sub>  | 110V A  | 2                              | 2                |
|   | 180V A  | 0,6                            | 0,6              |
|   | 220V A  | 0,4                            | 0,4              |
|   | 3 poles in series 24V A                           | 12                             | 9                |
|   | 60V A   | 12                             | 9                |
|   | 110V A  | 12                             | 9                |
|   | 180V A  | 12                             | 9                |
|   | 220V A  | 8                              | 8                |
| <b>Utilization category DC3 and DC5</b>   |   |                                |                  |
| <b>Switching of shunt motors and series motors</b>  | 1 pole 24V A                                      | 12                             | 9                |
| Time constant L/R ≤15ms   | 60V A   | 4                              | 4                |
| Rated operational current I <sub>e</sub>  | 110V A  | 1                              | 1                |
|   | 180V A  | 0,5                            | 0,5              |
|   | 220V A  | 0,3                            | 0,3              |
|   | 3 Pole in Serie 24V A                             | 12                             | 9                |
|   | 60V A   | 12                             | 9                |
|   | 110V A  | 6                              | 6                |
|   | 180V A  | 4                              | 4                |
|   | 220V A  | 1                              | 1                |
| <b>Maximum ambient temperature</b>  |   |                                |                  |
| Operation   | open °C   | -40 to +60 (+90) <sup>1)</sup> |                  |
|   | enclosed °C                                       | -40 to +40                     |                  |
|   | with thermal overload relay open °C               | -25 to +60                     |                  |
|   | enclosed °C                                       | -25 to +40                     |                  |
| Storage   | °C  | -50 to +90                     |                  |
| <b>Short circuit protection</b>   |   |                                |                  |
| for contactors without thermal overload relay   |   |                                |                  |
| Rated short circuit current   | "I <sub>r</sub> " kA                              | 1                              | 1                |
|   | "I <sub>q</sub> " kA                              | -                              | -                |
| Coordination-type "1" according to IEC 947-4-1  |   |                                |                  |
| Contact welding without hazard of persons max. fuse size  | gL (gG) A   | 32                             | 32               |
| Coordination-type "2" according to IEC 947-4-1  |   |                                |                  |
| Light contact welding accepted max. fuse size   | gL (gG) A   | -                              | -                |
| Contact welding not accepted max. fuse size   | gL (gG) A   | -                              | -                |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |   |                                |                  |
| <b>Cable cross-sections</b>   |   |                                |                  |
| for contactors  |   |                                |                  |
| main connector  | solid or stranded mm <sup>2</sup>                 | 0,5 - 1,5                      | Solder Connector |
|   | flexible mm <sup>2</sup>                          | 0,5 - 1,5                      | Ø 1,15           |
| Cables per clamp  | flexible with multicore cable end mm <sup>2</sup> | 0,5 - 1,5                      | -                |
|   | solid or stranded AWG                             | 2                              | -                |
| <b>Frequency of operation z</b>   |   |                                |                  |
| contactors without thermal overload relay   | without load 1/h                                  | 10000                          | 10000            |
|   | AC3, I <sub>e</sub> 1/h                           | 600                            | 600              |
|   | AC4, I <sub>e</sub> 1/h                           | 120                            | 120              |
|   | DC3, I <sub>e</sub> 1/h                           | 600                            | 600              |
| <b>Mechanical life</b>  |   |                                |                  |
| AC operated   | S x10 <sup>6</sup>                                | 3                              | 3                |
|   | S x10 <sup>6</sup>                                | 4                              | 4                |
| <b>Short time current</b>   |   |                                |                  |
|   | 10s-current A                                     | 50                             | 50               |
| <b>Power loss per pole</b>  |   |                                |                  |
|   | at I <sub>e</sub> /AC3 400V W                     | 0,2                            | 0,2              |
| <b>Resistance to shock according to IEC 68-2-27</b>   |   |                                |                  |
| Shock time 20ms sine-wave   |   |                                |                  |
| AC operated   | NO g  | 2,5                            | 2,5              |
|   | NC g  | 2,5                            | 2,5              |

1) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>e</sub>/AC1 according to I<sub>e</sub>/AC3.



# Micro Contactors

## Data according to IEC 60947-5-1, VDE 0660, EN 60947-5-1

| Auxiliary Contacts   |                                   |                 | Type      | K0-04D..<br>K0-05D..           | K0-04L..<br>K0-05L.. |
|--|-----------------------------------|-----------------|-----------|--------------------------------|----------------------|
| <b>Rated insulation voltage</b>  | <b>U<sub>i</sub></b>              | VAC             |           | 440 <sup>1)</sup>              | 440 <sup>1)</sup>    |
| <b>Thermal rated current I<sub>th</sub></b> to 440V  |                                   |                 |           |                                |                      |
| Ambient temperature  | 40°C                              | A               |           | 5                              | 5                    |
|  | 60°C                              | A               |           | 3                              | 3                    |
| <b>Verlustleistung</b> pro Pol   | bei I <sub>th</sub>               | W               |           | 0,25                           | 0,25                 |
| <b>Utilization category AC15</b>   |                                   |                 |           |                                |                      |
| Rated operational current I <sub>e</sub>   | 220-240V                          | A               |           | 3                              | 3                    |
|  | 380-415V                          | A               |           | 1,5                            | 1,5                  |
|  | 440V                              | A               |           | 1                              | 1                    |
| <b>Utilization category DC13</b>   |                                   |                 |           |                                |                      |
| Rated operational current I <sub>e</sub>   | 24V                               | A               |           | 2                              | 2                    |
|  | 60V                               | A               |           | 1,6                            | 1,6                  |
|  | 110V                              | A               |           | 0,3                            | 0,3                  |
|  | 180V                              | A               |           | 0,2                            | 0,2                  |
|  | 220V                              | A               |           | 0,05                           | 0,05                 |
| <b>Maximum ambient temperature</b>   |                                   |                 |           |                                |                      |
| Operation  | open                              | °C              |           | -40 to +60 (+90) <sup>2)</sup> |                      |
|  | enclosed                          | °C              |           | -40 to +40                     |                      |
| Storage  |                                   | °C              |           | -40 to +90                     |                      |
| <b>Short circuit protection</b>  |                                   |                 |           |                                |                      |
| short-circuit current 1kA,<br>contact welding not accepted<br>max. fuse size   |                                   |                 | gL (gG) A | 10                             | 10                   |
| For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size. |                                   |                 |           |                                |                      |
| <b>Power consumption of coils</b>  |                                   |                 |           |                                |                      |
| AC operated  | inrush                            | VA              |           | 9                              | 9                    |
|  | sealed                            | VA              |           | 4                              | 4                    |
|  |                                   | W               |           | 1,8                            | 1,8                  |
| DC operated  | inrush                            | W               |           | 2,5                            | 2,5                  |
|  | sealed                            | W               |           | 2,5                            | 2,5                  |
| <b>Operation range of coils</b>  |                                   |                 |           |                                |                      |
| in multiples of control voltage U <sub>s</sub>   |                                   | AC              |           | 0,85 - 1,1                     | 0,85 - 1,1           |
|  |                                   | DC              |           | 0,8 - 1,1                      | 0,8 - 1,1            |
| <b>Switching time</b> at control voltage U <sub>s</sub> ±10% <sup>3) 4)</sup>  |                                   |                 |           |                                |                      |
| AC operated  | make time                         | ms              |           | 13 - 18                        | 13 - 18              |
|  | release time                      | ms              |           | 5 - 10                         | 5 - 10               |
|  | arc duration                      | ms              |           | 10 - 15                        | 10 - 15              |
| DC operated  | make time                         | ms              |           | 10 - 40                        | 10 - 40              |
|  | release time                      | ms              |           | 2 - 10                         | 2 - 10               |
|  | arc duration                      | ms              |           | 10 - 15                        | 10 - 15              |
| <b>Cablecross-section</b>  |                                   |                 |           |                                |                      |
| all connectors   | solid                             | mm <sup>2</sup> |           | 0,5 - 1,5                      | Solder Connector     |
|  | flexible                          | mm <sup>2</sup> |           | 0,5 - 1,5                      | Ø 1,15               |
|  | flexible with multicore cable end | mm <sup>2</sup> |           | 0,5 - 1,5                      |                      |
| Clamps per pole  |                                   |                 |           | 2                              | -                    |
|  | solid or stranded                 | AWG             |           | 20 - 14                        | -                    |

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry); U<sub>imp</sub> = 4kV.  
Data for other conditions on request.

2) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced thermal rated current I<sub>th</sub> to I<sub>e</sub>/AC15.

3) Summary switching time = release time + arc duration.

4) Release time of NC make time of NO increase when suppressor units for voltage peak protection are used (Varistor, RC-units, Diode units).

5) Data on request.

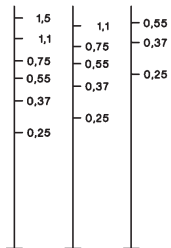
# Micro Contactors for North America

## Data according to UL508

| Main Contacts (cULus)                                 |                     | Type | K0-05D..<br>K0W05D01.. | K0-04D.. | K0-05L.. | K0-04L.. |
|---|---------------------|------|------------------------|----------|----------|----------|
| Rated operational current "General Use"               |                     | A    | 12                     | 5        | 9        | 5        |
| Rated operational power of three motors at 60Hz (3ph) | 110-120V            | hp   | 1/2                    | -        | 1/2      | -        |
|   | 200-208V            | hp   | 1                      | -        | 1        | -        |
|   | 220-240V            | hp   | 1                      | -        | 1        | -        |
|   | 277V                | hp   | 1 1/2                  | -        | 1 1/2    | -        |
| Rated operational power of AC motors at 60Hz (1ph)    | 110-120V            | hp   | 1/6                    | -        | 1/6      | -        |
|   | 200-208V            | hp   | 1/2                    | -        | 1/2      | -        |
|   | 220-240V            | hp   | 3/4                    | -        | 3/4      | -        |
| Fuse / Short-circuit current                          |                     | A/kA | 30/5                   | -        | 30/5     | -        |
| Rated voltage   |                     | VAC  | 480                    | 480      | 480      | 480      |
| <b>Auxiliary Contacts (cULus)</b>                     |                     |      |                        |          |          |          |
|   | heavy pilot duty    | AC   | B300                   | B300     | B300     | B300     |
|   | standard pilot duty | DC   | R300                   | R300     | R300     | R300     |

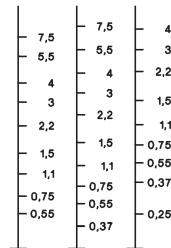
### Motor Rating P<sub>n</sub> = AC4

440/ 380/ 220/  
460V 400V 230V  
kW kW kW

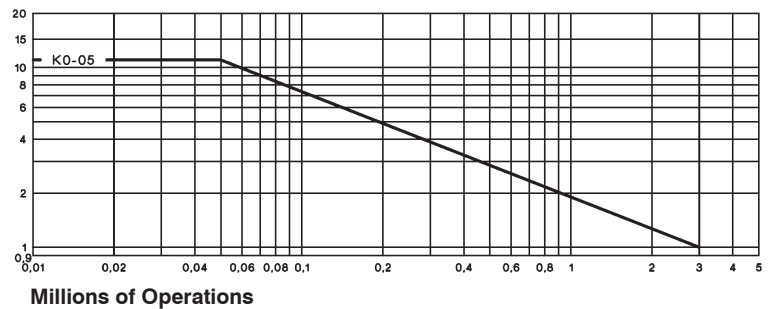


### Motor Rating P<sub>n</sub> = AC3

440/ 380/ 220/  
460V 400V 230V  
kW kW kW



### Breaking Current I<sub>a</sub> (= I<sub>e</sub> = AC1) A

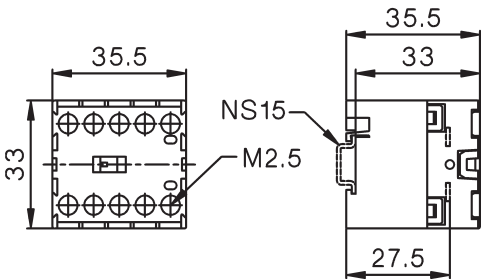


# Micro Contactors

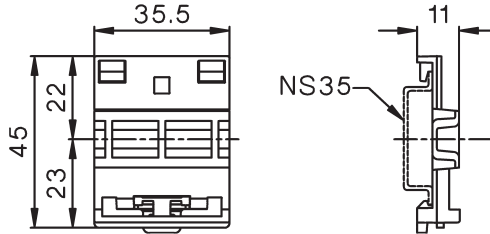
## Dimensions

AC or DC operated  
with screw terminals

K0-04D.. (=)  
K0-05D.. (=)

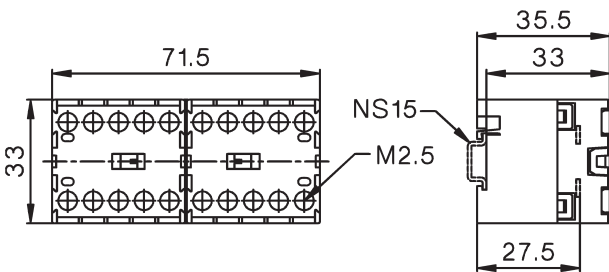


Snap-On Adapter P1039

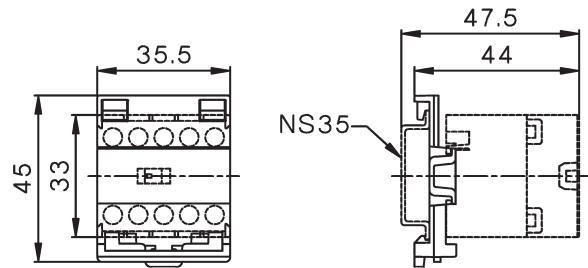


Reversing Contactors  
with screw terminals

K0W05D..MC

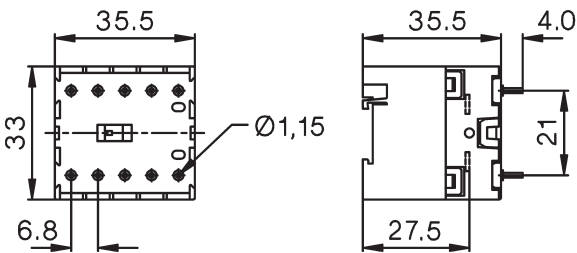


K0-..D.. with Snap-On Adapter P1039



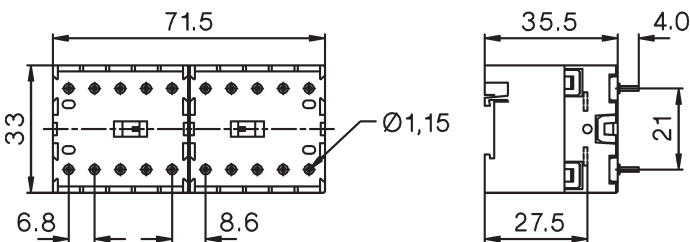
AC or DC operated  
with solder connections

K0-04L.. (=)  
K0-05L.. (=)



Reversing Contactors  
with solder connections

K0W05L..MC



|   |  |                     |
|---|--|---------------------|
|    | <p>Mini Contactor Relays 4-pole<br/>Auxiliary Contact Blocks</p> <p>Interface Contactor Relays</p> | <p>26</p> <p>27</p> |
|    | <p>Mini Contactors<br/>Auxiliary Contact Blocks</p>  | <p>28</p>           |
|    | <p>Mini Contactors With Fast On Tab Connectors</p>   | <p>30</p>           |
|  | <p>Mini Contactors With Solder Pins</p> <p>Coil voltages</p>                                       | <p>30</p> <p>30</p> |
|  | <p>Mini Reversing Contactors<br/>Auxiliary Contact Blocks</p>                                      | <p>32</p>           |
|  | <p>Technical Data</p>  | <p>33</p>           |
|  | <p>Dimensions</p>  | <p>38</p>           |

# Mini Contactor Relays 4-pole

AC Operated

| Ratings       | Therm. Distinc. Number | Contacts <sup>2)</sup> Additional Contact | Type        | Coil voltage <sup>1)</sup> |
|---------------|------------------------|---|-------------|----------------------------|
| <b>AC15</b>   |                        |   |             |                            |
| <b>230V A</b> | 400V A                 | Rated Current I <sub>th</sub> A           | NO NC       | acc. to EN50011            |
|               |                        |   | Blocks Type | Pack pcs.                  |
|               |                        |   |             | Weight kg/pc.              |

## 4-pole, With Screw Terminals



| 3 | 2 | 10 | 4 | - | 40E | 1 HK.. | K1-07D40 ... | 10 | 0,16 |
|---|---|----|---|---|-----|--------|--------------|----|------|
| 3 | 2 | 10 | 3 | 1 | 31E | 1 HK.. | K1-07D31 ... | 10 | 0,16 |
| 3 | 2 | 10 | 2 | 2 | 22E | 1 HK.. | K1-07D22 ... | 10 | 0,16 |

# Auxiliary Contact Blocks For Contactor Relays

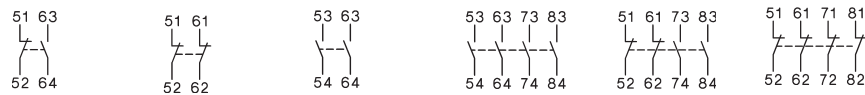


| Ratings       | Thermal Rated Current | Contacts <sup>2)</sup> NO NC | Type | Pack pcs. | Weight kg/pc. |    |      |
|---------------|-----------------------|------------------------------|------|-----------|---------------|----|------|
| <b>AC15</b>   |                       |                              |      |           |               |    |      |
| <b>230V A</b> | 400V A                |                              |      |           |               |    |      |
| 3             | 2                     | 10                           | 1    | 1         | HK11          | 10 | 0,04 |
| 3             | 2                     | 10                           | -    | 2         | HK02          | 10 | 0,04 |
| 3             | 2                     | 10                           | 2    | -         | HK20          | 10 | 0,04 |
| 3             | 2                     | 10                           | 4    | -         | HK40          | 10 | 0,04 |
| 3             | 2                     | 10                           | 2    | 2         | HK22          | 10 | 0,04 |
| 3             | 2                     | 10                           | -    | 4         | HK04          | 10 | 0,04 |

Aux. Contact Blocks

HK11      HK02      HK20      HK40      HK22      HK04

Wiring Diagrams





Distinc. Number according to EN50011 for Contactor Relay with Auxiliary Contact Block

|          |            |            |            |            |            |            |
|----------|------------|------------|------------|------------|------------|------------|
| K1-07D40 | <b>51E</b> | <b>42E</b> | <b>60E</b> | <b>80E</b> | <b>62E</b> | <b>44E</b> |
| K1-07D31 | 42Y        | 33Y        | 51Y        | 71Y        | 53Y        | 35Y        |
| K1-07D22 | 33Y        | 24Y        | 42Y        | 62Y        | 44Y        | 26Y        |

Preferable combinations with distinctive letter ".E" according to DIN EN 50011

1) Other coil voltages see page 30  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.  
 3) with built-in coil suppressor (varistor)

# DC Solenoid Operated

| Type | Coil voltage <sup>1)</sup> |                                       | Contacts <sup>2)</sup>  |   | Additional Contact Blocks       | Pack pcs. | Weight kg/pc. | Wiring Diagrams |
|------|----------------------------|---------------------------------------|---|---|---------------------------------|-----------|---------------|-----------------|
|      | 24                         | 24VS                                  | NO  | NC  |                                 |           |               |                 |
|      | 24V= DC                    | 24V= DC with protection <sup>2)</sup> |  |  | Distinc. Number acc. to EN50011 |           |               |                 |

## 4-pole, With Screw Terminals, Coil 2,5W



|                      |   |   |     |        |    |      |   |
|----------------------|---|---|-----|--------|----|------|---|
| <b>K1-07D40= ...</b> | 4 | - | 40E | 1 HK.. | 10 | 0,19 |  |
|----------------------|---|---|-----|--------|----|------|---|

|                      |   |   |     |        |    |      |   |
|----------------------|---|---|-----|--------|----|------|---|
| <b>K1-07D31= ...</b> | 3 | 1 | 31E | 1 HK.. | 10 | 0,19 |  |
|----------------------|---|---|-----|--------|----|------|---|

|                      |   |   |     |        |    |      |   |
|----------------------|---|---|-----|--------|----|------|---|
| <b>K1-07D22= ...</b> | 2 | 2 | 22E | 1 HK.. | 10 | 0,19 |  |
|----------------------|---|---|-----|--------|----|------|---|

## 4-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor <sup>3)</sup>



|                       |   |   |   |   |    |      |   |
|-----------------------|---|---|---|---|----|------|---|
| <b>K1-07D40= 24VR</b> | 4 | - | - | - | 10 | 0,20 |  |
|-----------------------|---|---|---|---|----|------|---|

|                       |   |   |   |   |    |      |  |
|-----------------------|---|---|---|---|----|------|--|
| <b>K1-07D31= 24VR</b> | 3 | 1 | - | - | 10 | 0,20 |  |
|-----------------------|---|---|---|---|----|------|--|

|                       |   |   |   |   |    |      |   |
|-----------------------|---|---|---|---|----|------|---|
| <b>K1-07D22= 24VR</b> | 2 | 2 | - | - | 10 | 0,20 |  |
|-----------------------|---|---|---|---|----|------|---|

1) Other coil voltages on request  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.  
 3) with integrated coil suppressor (Transient Voltage Suppressor Diode)

## Mini Contactors

## AC Operated

| Power Ratings    | Rated Current | Aux. Contacts <sup>2)</sup> |            | Type | Coil voltage <sup>1)</sup>                             | Pack pcs. | Weight kg/pc. |
|------------------|---------------|-----------------------------|------------|------|--|-----------|---------------|
|                  |               | Built-in                    | Additional |      |  |           |               |
| AC2, AC3         | AC1           |                             |            |      |  |           |               |
| <b>380V</b>      |               |                             |            |      | <b>24</b> 24V 50/60Hz                                  |           |               |
| <b>400V</b> 660V |               |                             |            |      | <b>230</b> 220-230V 50Hz                               |           |               |
| <b>415V</b> 690V | 690V          |                             |            |      | <b>24VS</b> 24V 50/60Hz w. protection <sup>3)</sup>    |           |               |
| <b>kW</b> kW     | A             |                             |            |      | <b>230VS</b> 220-230V 50Hz w. protection <sup>3)</sup> |           |               |
|                  |               |                             |            |      | <b>24VM</b> 24V 50/60Hz 24V= DC                        |           |               |
|                  |               |                             |            |      | <b>230VM</b> 220-240V 50/60Hz 220V= DC                 |           |               |
|                  |               |                             |            |      |  |           |               |



### 3-pole, With Screw Terminals

| Rated Current | Rated Voltage | Rated Power | Built-in | Additional | Type    | Pack pcs.           | Weight kg/pc. |
|---------------|---------------|-------------|----------|------------|---------|---------------------|---------------|
| 4             | 4             | 20          | 1        | -          | 1 HKM.. | <b>K1-09D10 ...</b> | 10 0,16       |
| 5,5           | 5,5           | 20          | 1        | -          | 1 HKM.. | <b>K1-12D10 ...</b> | 10 0,16       |

| Rated Current | Rated Voltage | Rated Power | Built-in | Additional | Type  | Pack pcs.           | Weight kg/pc. |
|---------------|---------------|-------------|----------|------------|-------|---------------------|---------------|
| 4             | 4             | 20          | -        | 1          | 1HK.. | <b>K1-09D01 ...</b> | 10 0,16       |
| 5,5           | 5,5           | 20          | -        | 1          | 1HK.. | <b>K1-12D01 ...</b> | 10 0,16       |

### 4-pole, With Screw Terminals

| Rated Current | Rated Voltage | Rated Power | Built-in | Additional | Type  | Pack pcs.              | Weight kg/pc. |
|---------------|---------------|-------------|----------|------------|-------|------------------------|---------------|
| 4             | 4             | 20          | -        | -          | 1HK.. | <b>K1-09D00-40 ...</b> | 10 0,16       |
| 5,5           | 5,5           | 20          | -        | -          | 1HK.. | <b>K1-12D00-40 ...</b> | 10 0,16       |

## Auxiliary Contact Blocks for Contactors K1-..

| Ratings     | Thermal Rated Current | Contacts <sup>2)</sup> | Type  | Pack pcs.    | Weight kg/pc. |
|-------------|-----------------------|------------------------|-------|--------------|---------------|
| <b>AC15</b> |                       |                        |       |              |               |
| <b>230V</b> | 400V                  |                        |       |              |               |
| <b>A</b>    | A                     | A                      | NO NC |              |               |
| <b>3</b>    | 2                     | 10                     | 1 1   | <b>HKM11</b> | 10 0,04       |
| <b>3</b>    | 2                     | 10                     | - 2   | <b>HKM02</b> | 10 0,04       |
| <b>3</b>    | 2                     | 10                     | 2 2   | <b>HKM22</b> | 10 0,04       |

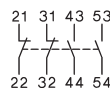
Aux. Contact Blocks

HKM11

HKM02

HKM22

Wiring Diagrams



Contactors with Auxiliary Contact Block

Contacts according to EN50012

| Contactors | 21 | 12 | 32 | - | - | - | - |
|------------|----|----|----|---|---|---|---|
| K1-..D10   |    |    |    |   |   |   |   |

Contacts according to DIN EN50005

| Contactors  | 21 | 12 | 32 | 12 | 03 | 41 | 23 |
|-------------|----|----|----|----|----|----|----|
| K1-..D01    | -  | -  | -  | 12 | 03 | 41 | 23 |
| K1-..D00-40 | -  | -  | -  | 11 | 02 | 40 | 22 |

Prefer combinations according to EN50012

## Suppressor Units for Contactors K1-..



| Voltage Range V  | Capacitance / Resistance | Type             | Pack pcs. | Weight kg/pc. |
|------------------|--------------------------|------------------|-----------|---------------|
| 12 - 48V AC/DC   | 1600nF / 22 Ohm          | <b>RC-K1 24</b>  | 10        | 0,01          |
| 48 - 127V AC/DC  | 680nF / 270 Ohm          | <b>RC-K1 110</b> | 10        | 0,01          |
| 110 - 250V AC/DC | 220nF / 2200 Ohm         | <b>RC-K1 230</b> | 10        | 0,01          |



1) Other coil voltages see page 30

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.

3) with built-in coil suppressor (varistor)

# DC Solenoid Operated

## Type

|   |   |             |
|---|---|-------------|
| Coil voltage <sup>1)</sup>                        | Aux. Contacts <sup>2)</sup>   | Additional  |
| <b>24</b> 24V= DC                                 | Built   | Overload    |
| <b>24VS</b> 24V= DC with protection <sup>3)</sup> | in  | Relay       |
| ↓   |   | see page114 |
|   | NO NC   | Type        |

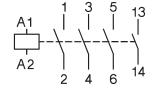
Pack pcs. Weight kg/pc.

Wiring Diagrams

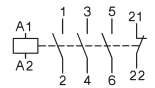


### 3-pole, With Screw Terminals, Coil 2,5W

|                      |   |   |         |            |    |      |
|----------------------|---|---|---------|------------|----|------|
| <b>K1-09D10= ...</b> | 1 | - | 1 HKM.. | U12/16..K1 | 10 | 0,19 |
| <b>K1-12D10= ...</b> | 1 | - | 1 HKM.. | U12/16..K1 | 10 | 0,19 |

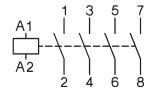


|                      |   |   |        |            |    |      |
|----------------------|---|---|--------|------------|----|------|
| <b>K1-09D01= ...</b> | - | 1 | 1 HK.. | U12/16..K1 | 10 | 0,19 |
| <b>K1-12D01= ...</b> | - | 1 | 1 HK.. | U12/16..K1 | 10 | 0,19 |



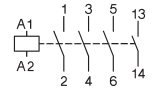
### 4-pole, With Screw Terminals, Coil 2,5W

|                         |   |   |   |            |    |      |
|-------------------------|---|---|---|------------|----|------|
| <b>K1-09D00-40= ...</b> | - | - | - | U12/16..K1 | 10 | 0,19 |
| <b>K1-12D00-40= ...</b> | - | - | - | U12/16..K1 | 10 | 0,19 |

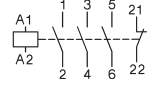


### 3-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor <sup>3)</sup>

|                      |   |   |   |            |    |      |
|----------------------|---|---|---|------------|----|------|
| <b>K1-09D10=24VR</b> | 1 | - | - | U12/16..K1 | 10 | 0,20 |
|----------------------|---|---|---|------------|----|------|



|                         |   |   |   |            |    |      |
|-------------------------|---|---|---|------------|----|------|
| <b>K1-09D01= 24VR -</b> | - | 1 | - | U12/16..K1 | 10 | 0,20 |
|-------------------------|---|---|---|------------|----|------|



1) Other coil voltages on request  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.  
 3) with integrated coil suppressor (Transient Voltage Suppressor Diode)



# Mini Contactors

# AC Operated

| Power Ratings | Rated Current | Aux. Contacts <sup>2)</sup> |            | Type | Coil voltage <sup>1)</sup>                |
|---------------|---------------|-----------------------------|------------|------|---|
|               |               | Built in                    | Additional |      |   |
| AC2, AC3      | AC1           |                             |            |      | 24V 50/60Hz                               |
| <b>380V</b>   |               |                             |            |      | 220-230V 50Hz                             |
| <b>400V</b>   | 660V          |                             |            |      | 24V 50/60Hz w. protection <sup>2)</sup>   |
| <b>415V</b>   | 690V          | 690V                        |            |      | 220-230V 50Hz w. protection <sup>2)</sup> |
| <b>kW</b>     | kW            | A                           | NO NC      | Type | 24V DC                                    |
|               |               |                             |            |      | 220-240V 50/60Hz 220V DC                  |
|               |               |                             |            |      | Pack pcs.                                 |
|               |               |                             |            |      | Weight kg/pc.                             |

### 3-pole, with Fast On Tab Connectors 1 x 6,3mm or 2 x 2,8mm



|   |   |    |   |   |         |                     |    |      |
|---|---|----|---|---|---------|---------------------|----|------|
| 4 | 4 | 16 | 1 | - | 1 HKM.. | <b>K1-09F10</b> ... | 10 | 0,16 |
| 4 | 4 | 16 | - | 1 | 1 HK..  | <b>K1-09F01</b> ... | 10 | 0,16 |

### 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications



|   |   |    |   |   |   |                     |    |      |
|---|---|----|---|---|---|---------------------|----|------|
| 4 | 4 | 16 | 1 | - | - | <b>K1-09L10</b> ... | 10 | 0,16 |
| 4 | 4 | 16 | - | 1 | - | <b>K1-09L01</b> ... | 10 | 0,16 |

### 4-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

|   |   |    |   |   |   |                        |    |      |
|---|---|----|---|---|---|------------------------|----|------|
| 4 | 4 | 16 | - | - | - | <b>K1-09L00-40</b> ... | 10 | 0,16 |
|---|---|----|---|---|---|------------------------|----|------|

## Coil voltages for AC operated contactors

| Suffix to contactor type<br>e.g.<br>K1-09D10 24 | Voltage Marking at the coil for |           | Rated Control Voltage U <sub>s</sub> range for 50Hz for 60Hz |           |           |           |
|---|---------------------------------|-----------|--|-----------|-----------|-----------|
|   | 50Hz                            | 60Hz      | min.   | max.      | min.      | max.      |
| 12  | 12                              | 12        | 11   | 12        | 12        | 12        |
| <b>24</b>                                       | <b>24</b>                       | <b>24</b> | <b>22</b>  | <b>24</b> | <b>24</b> | <b>24</b> |
| 42  | 42                              | 42        | 38,5   | 42        | 42        | 42        |
| 48  | 48                              | 48        | 48   | 50        | 48        | 52        |
| 90  | 100                             | 100       | 90   | 100       | 100       | 105       |
| 95  | 95-100                          | 105-110   | 95   | 100       | 105       | 110       |
| 100   | 100                             | 110-115   | 100  | 105       | 110       | 115       |
| 105   | 105-110                         | 115-120   | 105  | 110       | 115       | 120       |
| 110   | 110-115                         | 120-125   | 110  | 115       | 120       | 125       |
| 180   | 200                             | 200       | 185  | 200       | 200       | 210       |

| Suffix to contactor type<br>e.g.<br>K1-09D10 230 | Voltage Marking at the coil for |                | Rated Control Voltage U <sub>s</sub> range for 50Hz for 60Hz |            |            |            |
|--|---------------------------------|----------------|--|------------|------------|------------|
|  | 50Hz                            | 60Hz           | min.   | max.       | min.       | max.       |
| 200  | 200                             | 200-220        | 195  | 205        | 200        | 220        |
| 210  | 205-215                         | 220-230        | 205  | 215        | 220        | 230        |
| 220  | 210-220                         | 220-240        | 210  | 220        | 220        | 240        |
| <b>230</b>                                       | <b>220-230</b>                  | <b>230-250</b> | <b>220</b>   | <b>230</b> | <b>230</b> | <b>250</b> |
| 240  | 230-240                         | 240-260        | 230  | 240        | 240        | 260        |
| 400  | 380-400                         | 400-440        | 380  | 400        | 400        | 440        |
| 500  | 475-500                         | 520-545        | 475  | 500        | 520        | 545        |
| 550  | 525-550                         | 600            | 525  | 550        | 570        | 600        |

**Standard voltages in bold type letters**  
**Operating range of magnet-coils: 0,85 x U<sub>s</sub> (min. value of rated control voltage) up to 1,1 x U<sub>s</sub> (max. value of rated control voltage)**

Coil not exchangeable

1) Other coil voltages see page 28

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.

3) with built-in coil suppressor (varistor)

# DC Solenoid Operated

## Type

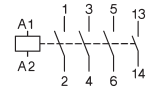
| Coil voltage <sup>1)</sup>                        | Aux. Contacts <sup>2)</sup> | Additional               | Pack | Weight |
|---|-----------------------------|--------------------------|------|--------|
| <b>24</b> 24V= DC                                 | Built                       | Overload                 | pcs. | kg/pc. |
| <b>24VS</b> 24V= DC with protection <sup>3)</sup> | in                          | Relay see pages 115, 117 |      |        |
| ↓   | NO NC                       | Type                     |      |        |



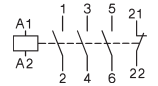
### 3-pole, with Fast On Tab Connectors 1 x 6,3mm or 2 x 2,8mm

|                        |   |   |                       |    |      |
|------------------------|---|---|-----------------------|----|------|
| <b>K1-09F10= . . .</b> | 1 | - | 1 HKM.. <sup>4)</sup> | 10 | 0,19 |
|------------------------|---|---|-----------------------|----|------|

Wiring Diagrams

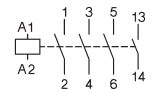


|                        |   |   |                      |    |      |
|------------------------|---|---|----------------------|----|------|
| <b>K1-09F01= . . .</b> | - | 1 | 1 HK.. <sup>4)</sup> | 10 | 0,19 |
|------------------------|---|---|----------------------|----|------|

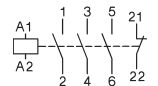


### 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

|                        |   |   |   |    |      |
|------------------------|---|---|---|----|------|
| <b>K1-09L10= . . .</b> | 1 | - | - | 10 | 0,19 |
|------------------------|---|---|---|----|------|

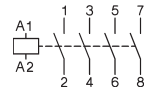


|                        |   |   |   |    |      |
|------------------------|---|---|---|----|------|
| <b>K1-09L01= . . .</b> | - | 1 | - | 10 | 0,19 |
|------------------------|---|---|---|----|------|



### 4-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

|                           |   |   |   |    |      |
|---------------------------|---|---|---|----|------|
| <b>K1-09L00-40= . . .</b> | - | - | - | 10 | 0,19 |
|---------------------------|---|---|---|----|------|



1) Other coil voltages on request  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.  
 3) with integrated coil suppressor (Transient Voltage Suppressor Diode)  
 4) U12/16E K3 with U12SMK3 for single mounting

# Mini Reversing Contactors, Mechanical Interlocked

AC Operated

| Power Ratings | Rated Current | AC1      | Aux. Contacts <sup>2)</sup> |  | Type    | Coil voltage <sup>1)</sup>              | Pack pcs. | Weight kg/pc. |
|---------------|---------------|----------|-----------------------------|--|---------|---|-----------|---------------|
|               |               |          | Built-in                    | Additional on left hand side Contactor |         |   |           |               |
| AC2, AC3      |               |          |                             |  |         | 24V 50/60Hz                             |           |               |
| <b>380V</b>   |               |          |                             |  |         | 220-230V 50Hz                           |           |               |
| <b>400V</b>   | 660V          |          |                             |  |         | 24V 50/60Hz w. protection <sup>3)</sup> |           |               |
| <b>415V</b>   | 690V          | 690V     |                             |  |         | 220-230V 50Hz w. prot. <sup>3)</sup>    |           |               |
| <b>kW</b>     | <b>kW</b>     | <b>A</b> |                             |  |         | 24V 50/60Hz 24V DC                      |           |               |
|               |               |          | NO NC                       | K1 Type                                | K2 Type | 220-240V 50/60Hz 220V DC                |           |               |

## 3-pole, with Screw Terminals

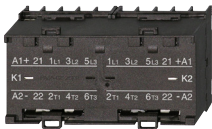


|            |     |    |   |   |        |        |                       |   |      |
|------------|-----|----|---|---|--------|--------|-----------------------|---|------|
| <b>4</b>   | 4   | 20 | - | 2 | HKM11V | HKM11X | <b>K1W09D01MC ...</b> | 1 | 0,32 |
| <b>5,5</b> | 5,5 | 20 | - | 2 | HKM11V | HKM11X | <b>K1W12D01MC ...</b> | 1 | 0,32 |
| <b>4</b>   | 4   | 20 | 2 | - | -      | HKM..  | <b>K1W09D10MC ...</b> | 1 | 0,32 |
| <b>5,5</b> | 5,5 | 20 | 2 | - | -      | HKM..  | <b>K1W12D10MC ...</b> | 1 | 0,32 |

## 4-pole, with Screw Terminals

|            |     |    |   |   |   |       |                         |   |      |
|------------|-----|----|---|---|---|-------|-------------------------|---|------|
| <b>4</b>   | 4   | 20 | - | - | - | HKM.. | <b>K1W09D00-40MC ..</b> | 1 | 0,32 |
| <b>5,5</b> | 5,5 | 20 | - | - | - | HKM.. | <b>K1W12D00-40MC ..</b> | 1 | 0,32 |

## 3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications



|          |   |    |   |   |   |   |                       |   |      |
|----------|---|----|---|---|---|---|-----------------------|---|------|
| <b>4</b> | 4 | 16 | - | 2 | - | - | <b>K1W09L01MC ...</b> | 1 | 0,32 |
| <b>4</b> | 4 | 16 | 2 | - | - | - | <b>K1W09L10MC ...</b> | 1 | 0,32 |

# Auxiliary Contact Blocks for Mini Reversing Contactors K1-..

| Ratings  | AC15 | 400V | Thermal Rated Current | Contacts <sup>2)</sup> |    | Type          | Pack pcs. | Weight kg/pc. |
|----------|------|------|-----------------------|------------------------|----|---------------|-----------|---------------|
|          |      |      |                       | NO                     | NC |               |           |               |
| <b>3</b> | 2    |      | 10                    | 1                      | 1  | <b>HKM11V</b> | 10        | 0,04          |
| <b>3</b> | 2    |      | 10                    | 1                      | 1  | <b>HKM11X</b> | 10        | 0,04          |



Aux. Contact Blocks

HKM11V      HKM11X

Wiring Diagrams



# Reversing Starter Connector



For Reversing Starter Types, incl. Coil Connector

| Type                          | Pack pcs. | Weight kg/pc. |
|-------------------------------|-----------|---------------|
| <b>K1W09D..MC, K1W12D..MC</b> | <b>1</b>  | <b>0,01</b>   |

1) Other coil voltages see page 30  
 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.  
 3) with built-in coil suppressor (varistor)

# DC Solenoid Operated

## Type

**24** Coil voltage <sup>1)</sup>  
**24VS** 24V= DC  
 ↓ 24V= DC with protection <sup>2)</sup>

Additional  
 Overload  
 Relay  
 see  
 page114  
 Type

Pack pcs. Weight kg/pc.

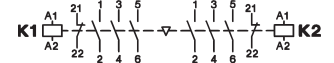
Wiring Diagrams

### 3-pole, with Screw Terminals



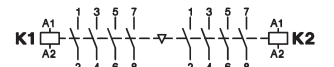
|                 |            |   |      |
|-----------------|------------|---|------|
| K1W09D01MC= ... | U12/16..K1 | 1 | 0,32 |
| K1W12D01MC= ... | U12/16..K1 | 1 | 0,32 |

|                 |            |   |      |
|-----------------|------------|---|------|
| K1W09D10MC= ... | U12/16..K1 | 1 | 0,32 |
| K1W12D10MC= ... | U12/16..K1 | 1 | 0,32 |



### 4-pole, with Screw Terminals

|                   |            |   |      |
|-------------------|------------|---|------|
| K1W09D00-40MC= .. | U12/16..K1 | 1 | 0,32 |
| K1W12D00-40MC= .. | U12/16..K1 | 1 | 0,32 |

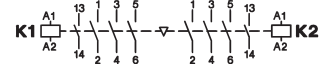
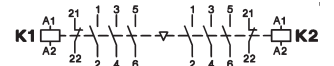


### 3-pole, with Solder Pins Ø1,15 for Printed Circuits Applications



|                 |   |   |      |
|-----------------|---|---|------|
| K1W09L01MC= ... | - | 1 | 0,32 |
|-----------------|---|---|------|

|                 |   |   |      |
|-----------------|---|---|------|
| K1W09L10MC= ... | - | 1 | 0,32 |
|-----------------|---|---|------|



1) Other coil voltages on request  
 2) with integrated coil suppressor (Transient Voltage Suppressor Diode)

# Mini Contactors

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts   | Type   | K1-09D..          | K1-09F..                    | K1-09L..          | K1-12D..          |
|---|--|-------------------|-----------------------------|-------------------|-------------------|
| <b>Rated insulation voltage <math>U_i</math></b>                | V AC   | 690 <sup>1)</sup> | 690 <sup>1)</sup>           | 690 <sup>2)</sup> | 690 <sup>1)</sup> |
| <b>Making capacity <math>I_{eff}</math></b>                     | at $U_e = 690V$ AC                             | A                 | 165                         | 165               | 165               |
| <b>Breaking capacity <math>I_{eff}</math></b>                   | 400V AC  | A                 | 100                         | 100               | 100               |
| $\cos\varphi = 0,65$  | 500V AC  | A                 | 90                          | 90                | 90                |
|   | 690V AC  | A                 | 80                          | 80                | 80                |
| <b>Utilization category AC1</b>                                 |  |                   |                             |                   |                   |
| <b>Switching of resistive load</b>                              |  |                   |                             |                   |                   |
| Rated operational current $I_e (=I_{th})$ at 40°C, open         | <b>A</b>                                       | <b>20</b>         | <b>16</b>                   | <b>16</b>         | <b>20</b>         |
| Rated operational power of three-phase resistive loads          |  |                   |                             |                   |                   |
| 50-60Hz, $\cos\varphi = 1$                                      | 230V kW  | 7,9               | 6                           | 6                 | 7,9               |
|   | 240V kW  | 8,3               | 6,5                         | 6,5               | 8,3               |
|   | 400V kW  | 13,8              | 11                          | 11                | 13,8              |
|   | 415V kW  | 14,3              | 11,5                        | 11,5              | 14,3              |
| Rated operational current $I_e (=I_{the})$ at 60°C, enclosed    | A  | 16                | 12                          | 12                | 16                |
| Rated operational power of three-phase resistive loads          |  |                   |                             |                   |                   |
| 50-60Hz, $\cos\varphi = 1$                                      | 230V kW  | 6,3               | 4,5                         | 4,5               | 6,3               |
|   | 240V kW  | 6,7               | 5                           | 5                 | 6,7               |
|   | 400V kW  | 11                | 8                           | 8                 | 11                |
|   | 415V kW  | 11,5              | 8,5                         | 8,5               | 11,5              |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$ | mm <sup>2</sup>                                | 2,5               | 2,5                         | -                 | 2,5               |
| <b>Utilization category AC2 and AC3</b>                         |  |                   |                             |                   |                   |
| <b>Switching of three-phase motors</b>                          |  |                   |                             |                   |                   |
| Rated operational current $I_e$                                 |  |                   |                             |                   |                   |
| open and enclosed   | 220V A   | 12                | 12                          | 12                | 15                |
|   | 230V A   | 11,5              | 11,5                        | 11,5              | 14,5              |
|   | 240V A   | 11                | 11                          | 11                | 14                |
|   | <b>380-400V A</b>                              | <b>9</b>          | <b>9</b>                    | <b>9</b>          | <b>12</b>         |
|   | 415-440V A                                     | 8                 | 8                           | 8                 | 11                |
|   | 500V A   | 7                 | 7                           | 7                 | 9                 |
|   | 660-690V A                                     | 5                 | 5                           | 5                 | 6,5               |
| Rated operational power of three-phase motors                   |  |                   |                             |                   |                   |
| 50-60Hz   | 220-240V kW                                    | 3                 | 3                           | 3                 | 4                 |
|   | <b>380-440V kW</b>                             | <b>4</b>          | <b>4</b>                    | <b>4</b>          | <b>5,5</b>        |
|   | 500-690V kW                                    | 4                 | 4                           | 4                 | 5,5               |
| <b>Utilization category AC4</b>                                 |  |                   |                             |                   |                   |
| <b>Switching of squirrel cage motors, inching</b>               |  |                   |                             |                   |                   |
| Rated operational current $I_e$                                 |  |                   |                             |                   |                   |
| open and enclosed   | 220V A   | 12                | 12                          | 12                | 15                |
|   | 230V A   | 11,5              | 11,5                        | 11,5              | 14,5              |
|   | 240V A   | 11                | 11                          | 11                | 14                |
|   | <b>380-400V A</b>                              | <b>9</b>          | <b>9</b>                    | <b>9</b>          | <b>12</b>         |
|   | 415-440V A                                     | 8                 | 8                           | 8                 | 11                |
|   | 500V A   | 7                 | 7                           | 7                 | 9                 |
|   | 660-690V A                                     | 5                 | 5                           | 5                 | 6,5               |
| Rated operational power of three-phase motors                   |  |                   |                             |                   |                   |
| 50-60Hz   | 220-240V kW                                    | 3                 | 3                           | 3                 | 4                 |
|   | <b>380-440V kW</b>                             | <b>4</b>          | <b>4</b>                    | <b>4</b>          | <b>5,5</b>        |
|   | 500-690V kW                                    | 4                 | 4                           | 4                 | 5,5               |
| <b>Utilization category AC5a</b>                                |  |                   |                             |                   |                   |
| <b>Switching of gas discharge lamps</b>                         |  |                   |                             |                   |                   |
| Rated operational current $I_e$                                 |  |                   |                             |                   |                   |
| per pole at 220/230V  |  |                   |                             |                   |                   |
| Fluorescent lamps,  |  |                   |                             |                   |                   |
| uncompensated and serial compensated                            | A  | 10                | 10                          | 10                | 10                |
| parallel compensated  | A  | 2                 | 2                           | 2                 | 2                 |
| dual-connection   | A  | 16                | 16                          | 16                | 16                |
| Metal halide lamps <sup>3)</sup> ,                              |  |                   |                             |                   |                   |
| uncompensated   | A  | 10                | 10                          | 10                | 10                |
| parallel compensated  | A  | 2                 | 2                           | 2                 | 2                 |
| Mercury-vapour lamps <sup>4)</sup> ,                            |  |                   |                             |                   |                   |
| uncompensated   | A  | 16                | 16                          | 16                | 16                |
| parallel compensated  | A  | 2                 | 2                           | 2                 | 2                 |
| Mixed light lamps <sup>5)</sup>                                 | A  | 16                | 16                          | 16                | 16                |
| <b>LED-Lamps</b>  |  |                   |                             |                   |                   |
| consider the inrush current of the lamp ballast                 |  |                   |                             |                   |                   |
| and $\cos\varphi$ of the lamp                                   | max. lamps per pole ( $I_{rLED} \leq I_{th}$ ) | =                 | inrush current of contactor |                   |                   |
|   |  |                   | inrush current of lamp/EVG  |                   |                   |
| max inrush current of contactor                                 | A  | 233               | 233                         | 233               | 233               |

## Utilization category AC5b Switching of incandescent lamps <sup>6)</sup>

Rated operational current  $I_e$

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry);  $U_{imp} = 8kV$ . Data for other conditions on request.

2) Suitable at 690V for pollution degree 2,  $U_{imp} = 6kV$ .

Pollution degree 3  $U_i = 690V$  non-tracking of the printed circuit CTI  $\geq 600$

Pollution degree 3  $U_i = 500V$  non-tracking of the printed circuit CTI  $\geq 400$

Pollution degree 3  $U_i = 400V$  non-tracking of the printed circuit CTI  $\geq 100$

3) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

4) High-pressure lamps

5) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

6) Current inrush approx.  $16 \times I_e$

# Mini Contactors

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts   | Type                              | K1-09D..                       | K1-09F..  | K1-09L..     | K1-12D..         |           |
|---|-----------------------------------|--------------------------------|-----------|--------------|------------------|-----------|
| <b>Utilization category DC1</b>   |                                   |                                |           |              |                  |           |
| <b>Switching of resistive load</b>  | 1 pole 24V A                      | 20                             | 16        | 16           | 20               |           |
| Time constant L/R ≤15ms   | 60V A                             | 20                             | 16        | 16           | 20               |           |
| Rated operational current I <sub>e</sub>  | 110V A                            | 5                              | 5         | 5            | 5                |           |
|   | 220V A                            | 0,6                            | 0,6       | 0,6          | 0,6              |           |
| 3 poles in series   | 24V A                             | 20                             | 20        | 20           | 20               |           |
|   | 60V A                             | 20                             | 20        | 20           | 20               |           |
|   | 110V A                            | 20                             | 20        | 20           | 20               |           |
|   | 220V A                            | 16                             | 16        | 16           | 16               |           |
| <b>Utilization category DC3 and DC5</b>   |                                   |                                |           |              |                  |           |
| <b>Switching of shunt motors and series motors</b>  | 1 pole 24V A                      | 20                             | 16        | 16           | 20               |           |
| Time constant L/R ≤15ms   | 60V A                             | 5                              | 5         | 5            | 5                |           |
| Rated operational current I <sub>e</sub>  | 110V A                            | 1                              | 1         | 1            | 1                |           |
|   | 220V A                            | 0,15                           | 0,15      | 0,15         | 0,15             |           |
| 3 poles in series   | 24V A                             | 20                             | 16        | 16           | 20               |           |
|   | 60V A                             | 20                             | 16        | 16           | 20               |           |
|   | 110V A                            | 20                             | 16        | 16           | 20               |           |
|   | 220V A                            | 2                              | 2         | 2            | 2                |           |
| <b>Maximum ambient temperature</b>  |                                   |                                |           |              |                  |           |
| Operation   | open °C                           | -40 to +60 (+90) <sup>1)</sup> |           |              |                  |           |
|   | enclosed °C                       | -40 to +40                     |           |              |                  |           |
| with thermal overload relay   | open °C                           | -25 to +60                     |           |              |                  |           |
|   | enclosed °C                       | -25 to +40                     |           |              |                  |           |
| Storage   | °C                                | -50 to +90                     |           |              |                  |           |
| <b>Short circuit protection</b> for contactors without O/L relay  |                                   |                                |           |              |                  |           |
| Rated short circuit current   | "I"<br>"I <sub>c</sub> "          | kA<br>kA                       | 3<br>-    | 3<br>-       | 3<br>-           |           |
| Coordination-type "1" according to IEC 947-4-1<br>Contact welding without hazard of persons<br>max. fuse size   | gL (gG)                           | A                              | 40        | 40           | 40               |           |
| Coordination-type "2" according to IEC 947-4-1<br>Light contact welding accepted<br>max. fuse size  | gL (gG)                           | A                              | 25        | 25           | 25               |           |
| Contact welding not accepted<br>max. fuse size  | gL (gG)                           | A                              | 10        | 10           | 10               |           |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |                                   |                                |           |              |                  |           |
| <b>Cable cross-sections</b><br>for contactors without thermal overload relay  |                                   |                                |           |              |                  |           |
| main connector  | solid or stranded                 | mm <sup>2</sup>                | 0,5 - 2,5 | Fast on      | Solder connector | 0,5 - 2,5 |
|   | flexible                          | mm <sup>2</sup>                | 0,5 - 2,5 | 1x 6,3 x 0,8 | Ø 1,15           | 0,5 - 2,5 |
| Cables per clamp  | flexible with multicore cable end | mm <sup>2</sup>                | 0,5 - 1,5 | or           | -                | 0,5 - 1,5 |
|   | solid or stranded                 | AWG                            | 2         | 2x 2,8 x 0,8 | -                | 2         |
|   |                                   |                                | 18 - 14   |              |                  | 18 - 14   |
| <b>Frequency of operations z</b>  |                                   |                                |           |              |                  |           |
| without load  | 1/h                               |                                | 10000     | 10000        | 10000            | 10000     |
| Contactors without thermal overload relay   | AC3, I <sub>e</sub>               | 1/h                            | 600       | 600          | 600              | 700       |
|   | AC4, I <sub>e</sub>               | 1/h                            | 120       | 120          | 120              | 150       |
|   | DC3, I <sub>e</sub>               | 1/h                            | 600       | 600          | 600              | 700       |
| <b>Mechanical life</b>  | AC operated                       | S x 10 <sup>6</sup>            | 5         | 5            | 5                | 5         |
|   | DC operated                       | S x 10 <sup>6</sup>            | 15        | 15           | 15               | 15        |
| <b>Short time current</b>   | 10s-current                       | A                              | 96        | 96           | 96               | 120       |
| <b>Power loss</b> per pole  | at I <sub>e</sub> /AC3 400V       | W                              | 0,15      | 0,15         | 0,15             | 0,25      |
| <b>Resistance to shock according to IEC 68-2-27</b>   |                                   |                                |           |              |                  |           |
| Shock time 20ms sine-wave<br>AC operated  | NO                                | g                              | 5         | 5            | 5                | 5         |
|   | NC                                | g                              | 5         | 5            | 5                | 5         |
| DC operated   | NO                                | g                              | 8         | 8            | 8                | 8         |
|   | NC                                | g                              | 6         | 6            | 6                | 6         |

1) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>e</sub>/AC1 according to I<sub>e</sub>/AC3

# Mini Contactors

## Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1

| Auxiliary Contacts   |  |  | Type  | K1-07D..<br>K1-09D..<br>K1-12D.. | K1-07D..=(VM)<br>K1-09D..=(VM)<br>K1-12D..=(VM) | K1-07D..= 24VR<br>K1-09D..= 24VR | K1-09F..=(VM)     | K1-07L..=(VM)<br>K1-09L..=(VM) | HK..              |
|--|--|--|---|----------------------------------|---|----------------------------------|-------------------|--------------------------------|-------------------|
| <b>Rated insulation voltage <math>U_i</math></b>   |  |  | V AC  | 690 <sup>1)</sup>                | 690 <sup>1)</sup>                               | 690 <sup>1)</sup>                | 690 <sup>1)</sup> | 690 <sup>2)</sup>              | 690 <sup>1)</sup> |
| <b>Thermal rated current <math>I_{th}</math> to 690V</b>   |  |  |   |                                  |   |                                  |                   |                                |                   |
| Ambient temperature  |  |  | 40°C A  | 10                               | 10  | 10                               | 10                | 10                             | 10                |
|  |  |  | 60°C A  | 6                                | 6   | 6                                | 6                 | 6                              | 6                 |
| <b>Power loss per pole</b>   |  |  | at $I_{th}$ W                                     | 0,5                              | 0,5   | 0,5                              | 0,5               | 0,5                            | 0,5               |
| <b>Utilization category AC15</b>   |  |  |   |                                  |   |                                  |                   |                                |                   |
| Rated operational current $I_e$  |  |  | 220-240V A  | 3                                | 3   | 3                                | 3                 | 3                              | 3                 |
|  |  |  | 380-415V A  | 2                                | 2   | 2                                | 2                 | 2                              | 2                 |
|  |  |  | 440V A  | 1,6                              | 1,6   | 1,6                              | 1,6               | 1,6                            | 1,6               |
|  |  |  | 500V A  | 1,2                              | 1,2   | 1,2                              | 1,2               | 1,2                            | 1,2               |
|  |  |  | 660-690V A  | 0,6                              | 0,6   | 0,6                              | 0,6               | 0,6                            | 0,6               |
| <b>Utilization category DC13</b>   |  |  |   |                                  |   |                                  |                   |                                |                   |
| Rated operational current $I_e$  |  |  | 60V A   | 2                                | 2   | 2                                | 2                 | 2                              | 2                 |
|  |  |  | 110V A  | 0,4                              | 0,4   | 0,4                              | 0,4               | 0,4                            | 0,4               |
|  |  |  | 220V A  | 0,1                              | 0,1   | 0,1                              | 0,1               | 0,1                            | 0,1               |
| <b>Maximum ambient temperature</b>   |  |  |   |                                  |   |                                  |                   |                                |                   |
| Operation  |  |  | open °C   | -40 to +60 (+90) <sup>3)</sup>   |   |                                  |                   |                                |                   |
|  |  |  | enclosed °C                                       | -40 to +40                       |   |                                  |                   |                                |                   |
| Storage  |  |  | °C  | -40 to +90                       |   |                                  |                   |                                |                   |
| <b>Short circuit protection</b>  |  |  |   |                                  |   |                                  |                   |                                |                   |
| short-circuit current 1kA,<br>contact welding not accepted<br>max. fuse size   |  |  | gL (gG) A   | 20                               | 20  | 20                               | 20                | 20                             | 20                |
| For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size. |  |  |   |                                  |   |                                  |                   |                                |                   |
| <b>Power consumption of coils</b>  |  |  |   |                                  |   |                                  |                   |                                |                   |
| AC operated  |  |  | inrush VA   | 25                               | -   | -                                | 25                | 25                             | -                 |
|  |  |  | sealed VA   | 4 - 5                            | -   | -                                | 4 - 5             | 4 - 5                          | -                 |
|  |  |  | W   | 1,2                              | -   | -                                | 1,2               | 1,2                            | -                 |
| DC operated  |  |  | inrush W  | -                                | 2,5   | 1,5                              | 2,5               | 2,5                            | -                 |
| and ...VM (AC/DC)  |  |  | sealed W  | -                                | 2,5   | 1,5                              | 2,5               | 2,5                            | -                 |
| <b>Operation range of coils</b>  |  |  |   |                                  |   |                                  |                   |                                |                   |
| in multiples of control voltage $U_s$  |  |  |   | 0,85 - 1,1                       | 0,8 - 1,1                                       | 19 - 30V DC                      | 0,85 - 1,1        | 0,85 - 1,1                     | -                 |
| <b>Switching time at control voltage <math>U_s \pm 10\%</math> <sup>4) 5)</sup></b>  |  |  |   |                                  |   |                                  |                   |                                |                   |
| AC operated  |  |  | make time ms                                      | 15 - 19                          | -   | -                                | 15 - 19           | 15 - 19                        | -                 |
|  |  |  | release time ms                                   | 8 - 25                           | -   | -                                | 8 - 25            | 8 - 25                         | -                 |
|  |  |  | arc duration ms                                   | 10 - 15                          | -   | -                                | 10 - 15           | 10 - 15                        | -                 |
| DC operated  |  |  | make time ms                                      | -                                | 15 - 50   | 15 - 50                          | 15 - 50           | 15 - 50                        | -                 |
|  |  |  | release time ms                                   | -                                | 8 - 25  | 8 - 25                           | 8 - 25            | 8 - 25                         | -                 |
|  |  |  | arc duration ms                                   | -                                | 10 - 15   | 10 - 15                          | 10 - 15           | 10 - 15                        | -                 |
| <b>Cable cross-section</b>   |  |  |   |                                  |   |                                  |                   |                                |                   |
| all connectors   |  |  | solid mm <sup>2</sup>                             | 0,5 - 2,5                        | 0,5 - 2,5                                       | 0,5 - 2,5                        | Fast on           | Solder connector               | 0,5 - 2,5         |
|  |  |  | flexible mm <sup>2</sup>                          | 0,5 - 2,5                        | 0,5 - 2,5                                       | 0,5 - 2,5                        | 1x 6,3 x 0,8      | Ø 1,15                         | 0,5 - 2,5         |
|  |  |  | flexible with multicore cable end mm <sup>2</sup> | 0,5 - 1,5                        | 0,5 - 1,5                                       | 0,5 - 1,5                        | or                |                                | 0,5 - 1,5         |
|  |  |  |   |                                  |   |                                  | 2x 2,8 x 0,8      |                                |                   |
| Clamps per pole  |  |  |   | 2                                | 2   | 2                                | -                 | -                              | 2                 |
|  |  |  | solid or stranded AWG                             | 18 - 14                          | 18 - 14   | 18 - 14                          |                   |                                | 18 - 14           |

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

2) Suitable at 690V for pollution degree 2,  $U_{imp} = 6kV$ .  
Pollution degree 3  $U_i = 690V$  non-tracking of the printed circuit CTI  $\geq 600$   
Pollution degree 3  $U_i = 500V$  non-tracking of the printed circuit CTI  $\geq 400$   
Pollution degree 3  $U_i = 400V$  non-tracking of the printed circuit CTI  $\geq 100$

3) With reduced control voltage range 0,9 up to  $1,0 \times U_s$  and with reduced thermal rated current  $I_{th}$  to  $I_e/AC15$

4) Summary switching time = release time + arc duration

5) Release time of NC make time of NO increase when suppressor units for voltage peak protection are used (Varistor, RC-units, Diode units).

# Mini Contactors for North America

## Data according to UL508

| Main Contacts (cULus)                                       |                     | Type | K1-09D..<br>K1W09D01 | K1-09F.. | K1-09L..          | K1-07D.. | K1-12D..<br>K1W12D01 | HK.. |
|---|---------------------|------|----------------------|----------|-------------------|----------|----------------------|------|
| Rated operational current "General Use"                     |                     | A    | 15                   | 15       | 20                | 10       | 20                   | 10   |
| Rated operational power of three-phase motors at 60Hz (3ph) | 110-120V            | hp   | 1½                   | 1½       | 1½                | -        | 2                    | -    |
|   | 200-208V            | hp   | 3                    | 3        | 3                 | -        | 3                    | -    |
|   | 220-240V            | hp   | 3                    | 3        | 3                 | -        | 3                    | -    |
|   | 440-480V            | hp   | 5                    | 5        | 5                 | -        | 7½                   | -    |
|   | 550-600V            | hp   | 7½                   | 7½       | 7½                | -        | 10                   | -    |
| Rated operational power of AC motors at 60Hz (1ph)          | 110-120V            | hp   | ½                    | ½        | ½                 | -        | ¾                    | -    |
|   | 200-208V            | hp   | 1                    | 1        | 1                 | -        | 1½                   | -    |
|   | 220-240V            | hp   | 1½                   | 1½       | 1½                | -        | 2                    | -    |
| Fuse / Short-circuit current                                |                     | A/kA | 30/5                 | 30/5     | 30/5              | -        | 30/5                 | -    |
| Rated voltage   |                     | V AC | 600                  | 600      | 600 <sup>1)</sup> | 600      | 600                  | 600  |
| <b>Auxiliary Contacts (cULus)</b>                           |                     |      |                      |          |                   |          |                      |      |
|   | heavy pilot duty    | AC   | A600                 | A600     | A600              | A600     | A600                 | A600 |
|   | standard pilot duty | DC   | Q600                 | Q600     | Q600              | Q600     | Q600                 | Q600 |

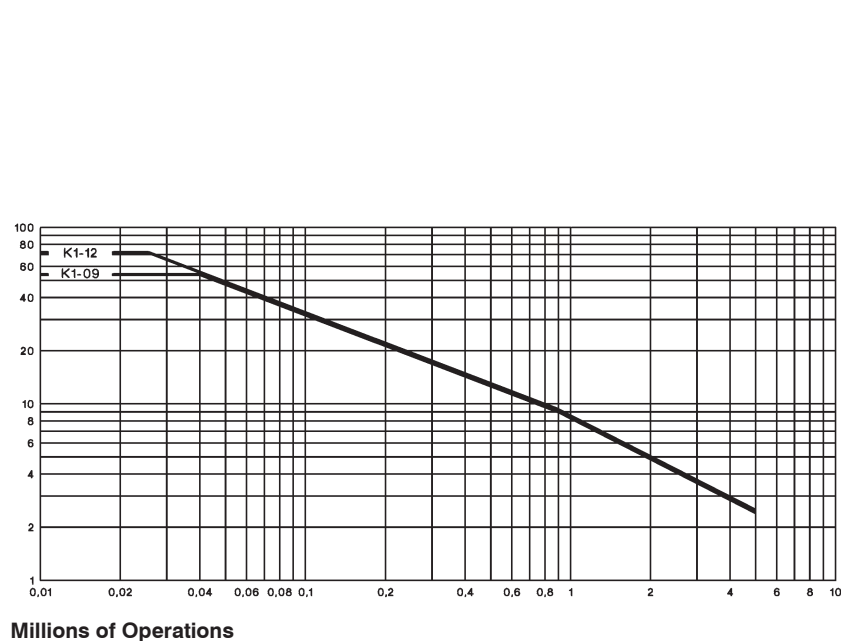
### Motor Rating P<sub>n</sub> = AC4

| 660/690V | 500V | 380/400V | 220/230V |
|----------|------|----------|----------|
| kW       | kW   | kW       | kW       |
| 110      | 75   | 55       | 30       |
| 90       | 55   | 45       | 22       |
| 75       | 45   | 37       | 18,5     |
| 55       | 37   | 30       | 15       |
| 45       | 30   | 22       | 11       |
| 37       | 22   | 18,5     | 7,5      |
| 30       | 18,5 | 15       | 5,5      |
| 22       | 15   | 11       | 4        |
| 18,5     | 11   | 7,5      | 3        |
| 15       | 7,5  | 5,5      | 2,2      |
| 11       | 5,5  | 4        | 1,5      |
| 7,5      | 4    | 3        | 1,1      |
| 5,5      | 3    | 2,2      | 0,75     |
| 4        | 2,2  | 1,5      | 0,55     |
| 3        | 1,5  | 1,1      | 0,37     |
| 2,2      | 1,1  | 0,75     | 0,25     |
| 1,5      | 0,75 | 0,55     |          |
| 1,1      | 0,55 | 0,37     |          |
| 0,75     | 0,37 | 0,25     |          |
| 0,55     | 0,25 |          |          |
| 0,37     |      |          |          |
| 0,25     |      |          |          |

### Motor Rating P<sub>n</sub> = AC3

| 660/690V | 500V | 380/400V | 220/230V |
|----------|------|----------|----------|
| kW       | kW   | kW       | kW       |
| 600      | 400  | 315      | 200      |
| 600      | 315  | 250      | 160      |
| 400      | 250  | 200      | 132      |
| 315      | 200  | 160      | 110      |
| 250      | 160  | 132      | 90       |
| 200      | 132  | 110      | 75       |
| 160      | 110  | 90       | 55       |
| 132      | 90   | 75       | 45       |
| 110      | 75   | 55       | 37       |
| 90       | 55   | 45       | 30       |
| 75       | 45   | 37       | 22       |
| 55       | 37   | 30       | 18,5     |
| 45       | 30   | 22       | 15       |
| 37       | 22   | 18,5     | 11       |
| 30       | 18,5 | 15       | 7,5      |
| 22       | 15   | 11       | 5,5      |
| 18,5     | 11   | 7,5      | 4        |
| 15       | 7,5  | 5,5      | 3        |
| 11       | 5,5  | 4        | 2,2      |
| 7,5      | 4    | 3        | 1,5      |
| 5,5      | 3    | 2,2      | 1,1      |
| 4        | 2,2  | 1,5      | 0,75     |
| 3        | 1,5  | 1,1      | 0,55     |
| 2,2      | 1,1  | 0,75     | 0,37     |
| 1,5      | 0,75 | 0,55     | 0,25     |
| 1,1      | 0,55 | 0,37     |          |
| 0,75     | 0,37 | 0,25     |          |
| 0,55     | 0,25 |          |          |
| 0,37     |      |          |          |
| 0,25     |      |          |          |

### Breaking Current I<sub>a</sub> (= I<sub>e</sub> = AC1) A



| 1) Pollution degree | CTI - PWB | U <sub>i</sub> |
|---------------------|-----------|----------------|
| 2                   | ≥ 100     | 600V           |
| 3                   | ≥ 400     | 480V           |
| 3                   | 100 - 400 | 240V           |

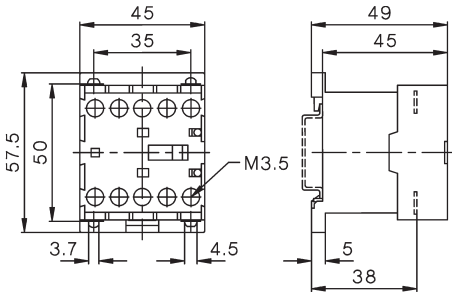


# Mini Contactors

## Dimensions

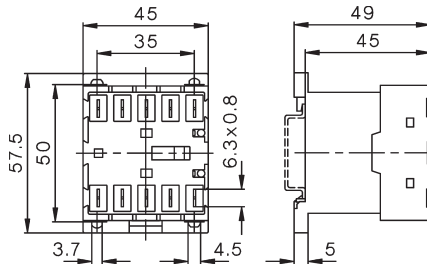
**AC and DC operated**  
with screw terminals

**K1-07D..**  
**K1-09D..**  
**K1-12D..**



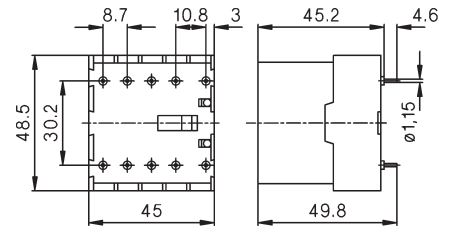
with fast on terminals

**K1-07F..**  
**K1-09F..**



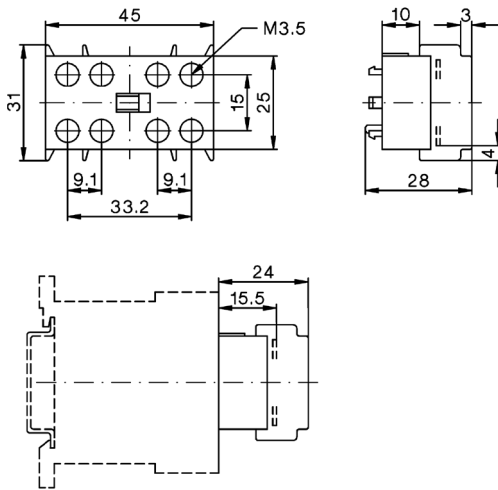
**AC and DC operated**  
with solder connections

**K1-07L..**  
**K1-09L..**



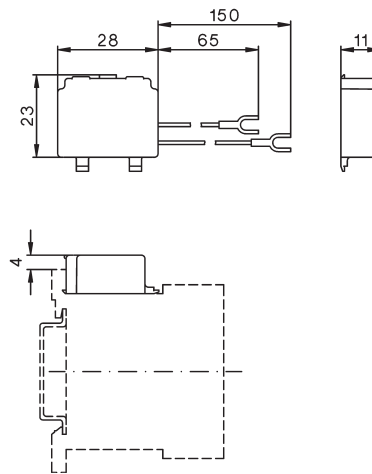
## Auxiliary Contact Blocks

**HK..**



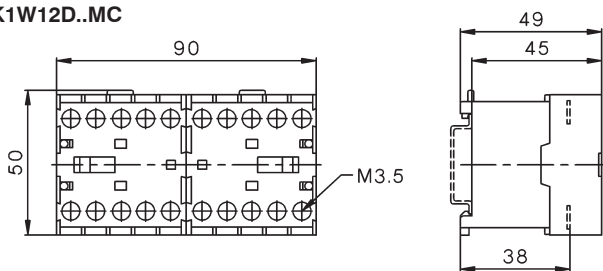
## Suppressor Units

**RC-K1**



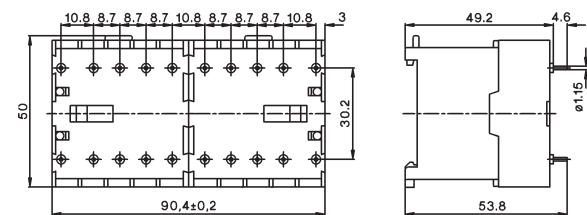
## Reversing Contactors

**K1W09D..MC**  
**K1W12D..MC**

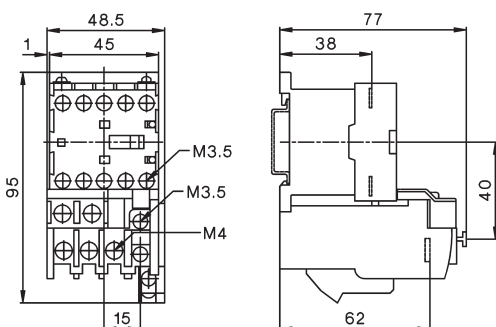


## Reversing Contactors

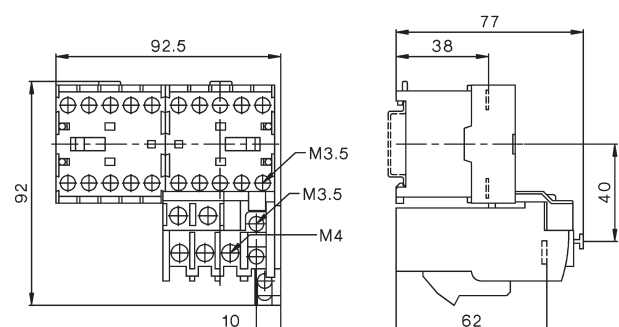
**K1W09L..MC**



**K1-09 + U12/16.. K1**  
**K1-12**



**K1W09D..MC + U12/16E K1**  
**K1W09D..MC + U12/16E K1**





Contactor Relays 4-pole, AC Operated

40



Auxiliary Contact Blocks 1-pole

40



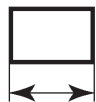
Contactor Relays 4-pole, DC Operated

41



Technical Data

42



Dimensions

44

## Contactors Relays

AC Operated

| Ratings |                      | Contacts |                         |                           |         | Type | Coil voltage <sup>1)</sup> |           |               |               |               |                            |
|---------|----------------------|----------|-------------------------|---------------------------|---------|------|----------------------------|-----------|---------------|---------------|---------------|----------------------------|
| AC15    | Therm. Rated Current | Built-in | Distinc. Number acc. to | Additional Contact Blocks |         | 24   | 110                        | 230       | 400           |               |               |                            |
| 230V    | A                    | $I_{th}$ | NO                      | NC                        | EN50011 | Type | 24V 50/60Hz                | 110V 50Hz | 110-120V 60Hz | 220-240V 50Hz | 230-264V 60Hz | 400-440V 60Hz              |
| A       | A                    | A        |                         |                           |         |      |                            |           |               |               |               | Pack Weight<br>pcs. kg/pc. |



### 4-pole, contacts suitable for electronic circuits according to EN947-5-4<sup>2)</sup>

| 4 | 2 | 10 | 4 | - | 40E | max. 4 | K3-07ND40 ... | 1 | 0,22 |
|---|---|----|---|---|-----|--------|---------------|---|------|
| 4 | 2 | 10 | 3 | 1 | 31E | HN..   | K3-07ND31 ... | 1 | 0,22 |
| 4 | 2 | 10 | 2 | 2 | 22E | max. 2 | K3-07ND22 ... | 1 | 0,22 |
| 4 | 2 | 10 | - | 4 | 04E | HB..   | K3-07ND04 ... | 1 | 0,22 |

## Auxiliary Contact Blocks <sup>3)</sup>

| Ratings |      | Thermal Rated Current | Contacts <sup>2)</sup> |    |    |    | Type | Pack pcs. | Weight kg/pc. |
|---------|------|-----------------------|------------------------|----|----|----|------|-----------|---------------|
| AC15    | 230V | A                     | NO                     | NC | EM | LB |      |           |               |
| A       | A    | A                     |                        |    |    |    |      |           |               |
|         |      |                       |                        |    |    |    |      |           |               |



### 1-pole, contacts suitable for electronic circuits according to EN947-5-4<sup>2)</sup>

| 3 | 2 | 10 | 1 | - | - | - | HN10  | 10 | 0,02 |
|---|---|----|---|---|---|---|-------|----|------|
| 3 | 2 | 10 | - | 1 | - | - | HN01  | 10 | 0,02 |
| 3 | 2 | 10 | - | - | 1 | - | HN10U | 10 | 0,02 |
| 3 | 2 | 10 | - | - | - | 1 | HN01U | 10 | 0,02 |

### 1-pole, for high switching capacity

| 6 | 3 | 25 | 1 | - | - | - | HA10 | 10 | 0,03 |
|---|---|----|---|---|---|---|------|----|------|
| 6 | 3 | 25 | - | 1 | - | - | HA01 | 10 | 0,03 |

Accessories see pages 52 - 55.

1) Other coil voltages see page 57

2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.

3) Technical Data see page 62

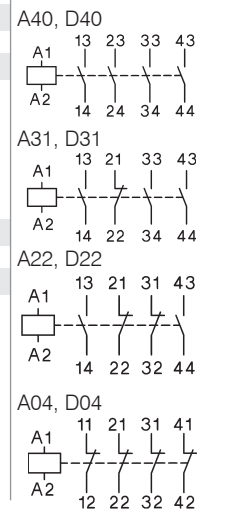
## DC Operated

| Type | Coil voltage <sup>1)</sup> |         | Contacts |                         |                           | Pack pcs. | Weight kg/pc. | Wiring Diagrams |
|------|----------------------------|---------|----------|-------------------------|---------------------------|-----------|---------------|-----------------|
|      |                            |         | Built-in | Distinc. Number acc. to | Additional Contact Blocks |           |               |                 |
|      | <b>24</b>                  | 24V DC  |          |                         |                           |           |               |                 |
|      | <b>48</b>                  | 48V DC  |          |                         |                           |           |               |                 |
|      | <b>110</b>                 | 110V DC |          |                         |                           |           |               |                 |
|      | <b>220</b>                 | 220V DC |          |                         |                           |           |               |                 |
|      | ↓                          |         | NO       | NC                      | EN50011                   | Type      |               |                 |



### 3W Coil power, for high switching capacity <sup>3)</sup>

|                      |   |   |     |        |   |      |
|----------------------|---|---|-----|--------|---|------|
| <b>KG3-07A40</b> ... | 4 | - | 40E | max. 4 | 1 | 0,53 |
| <b>KG3-07A31</b> ... | 3 | 1 | 31E | HN..   | 1 | 0,53 |
| <b>KG3-07A22</b> ... | 2 | 2 | 22E | or     | 1 | 0,53 |
| <b>KG3-07A04</b> ... | - | 4 | 04E | HA..   | 1 | 0,53 |

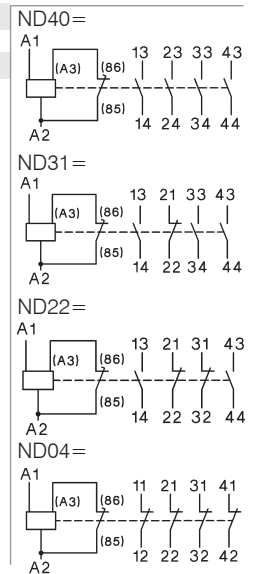


### 3W Coil power, for electronic circuits <sup>2)3)</sup>

|                      |   |   |     |        |   |      |
|----------------------|---|---|-----|--------|---|------|
| <b>KG3-07D40</b> ... | 4 | - | 40E | max. 4 | 1 | 0,53 |
| <b>KG3-07D31</b> ... | 3 | 1 | 31E | HN..   | 1 | 0,53 |
| <b>KG3-07D22</b> ... | 2 | 2 | 22E |        | 1 | 0,53 |
| <b>KG3-07D04</b> ... | - | 4 | 04E |        | 1 | 0,53 |

### with double winding coil, for electronic circuits <sup>2)</sup>

|                       |   |   |     |        |   |      |
|-----------------------|---|---|-----|--------|---|------|
| <b>K3-07ND40=</b> ... | 4 | - | 40E | max. 3 | 1 | 0,25 |
| <b>K3-07ND31=</b> ... | 3 | 1 | 31E | HN..   | 1 | 0,25 |
| <b>K3-07ND22=</b> ... | 2 | 2 | 22E | max. 2 | 1 | 0,25 |
| <b>K3-07ND04=</b> ... | - | 4 | 04E | HB..   | 1 | 0,25 |



- 1) Other coil voltages on request
- 2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.
- 3) with integrated coil suppressor (Transient Voltage Suppressor Diode)

# Contactors Relays

Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1

|   |  |  | Type                     | K3-07ND                        | K3-07ND=  | KG3-07A               | KG3-07D               |
|---|--|--|--------------------------|--------------------------------|-----------|-----------------------|-----------------------|
| <b>Rated insulation voltage <math>U_i</math><sup>1)</sup></b> |  |  | V AC                     | 690                            | 690       | 690                   | 690                   |
| <b>Thermal rated current <math>I_{th}</math> to 690V</b>      |  |  |                          |                                |           |                       |                       |
| Ambient temperature   |  |  | 40°C A                   | 10                             | 10        | 20                    | 10                    |
|   |  |  | 60°C A                   | 6                              | 6         | 16                    | 6                     |
| <b>Frequency of operations z</b>                              |  |  | 1/h                      | 10000                          | 10000     | 10000                 | 10000                 |
| <b>Mechanical life</b>  |  |  | S x 10 <sup>6</sup>      | 10                             | 10        | 10                    | 50                    |
| <b>Utilization category AC15</b>                              |  |  |                          |                                |           |                       |                       |
| Rated operational current $I_e$                               |  |  | 220-240V A               | 4                              | 4         | 12                    | 4                     |
|   |  |  | 380-415V A               | 2                              | 2         | 4                     | 2                     |
|   |  |  | 440V A                   | 1,6                            | 1,6       | 4                     | 1,6                   |
|   |  |  | 500V A                   | 1,2                            | 1,2       | 3                     | 1,2                   |
|   |  |  | 660-690V A               | 0,6                            | 0,6       | 1                     | 0,6                   |
| <b>Utilization category DC13</b>                              |  |  |                          |                                |           |                       |                       |
| Rated operational current $I_e$                               |  |  | 24-60V A                 | 3,5                            | 3,5       | 8                     | 3,5                   |
| per pole  |  |  | 110V A                   | 0,5                            | 0,5       | 1                     | 0,5                   |
|   |  |  | 220V A                   | 0,1                            | 0,1       | 0,1                   | 0,1                   |
| <b>Power consumption of coils</b>                             |  |  |                          |                                |           |                       |                       |
| AC operated   |  |  | inrush VA                | 30 - 45                        | -         | -                     | -                     |
|   |  |  | sealed VA                | 7 - 10                         | -         | -                     | -                     |
|   |  |  | W                        | 2,6 - 3                        | -         | -                     | -                     |
| DC operated   |  |  | inrush W                 | -                              | 75        | 3                     | 3                     |
|   |  |  | sealed W                 | -                              | 2         | 3                     | 3                     |
| <b>Operation range of coils</b>                               |  |  |                          |                                |           |                       |                       |
| in multiples of control voltage $U_s$                         |  |  |                          | 0,85 - 1,1                     | 0,8 - 1,1 | 0,8 - 1,1             | 0,8 - 1,1             |
| <b>Switching time</b> at control voltage $U_s \pm 10\%$       |  |  |                          |                                |           |                       |                       |
| make time   |  |  | ms                       | 8 - 16                         | 8 - 16    | 65 - 85               | 65 - 85               |
| release time  |  |  | ms                       | 5 - 13                         | 5 - 13    | 20 - 30 <sup>3)</sup> | 20 - 30 <sup>3)</sup> |
| <b>Maximum ambient temperature</b>                            |  |  |                          |                                |           |                       |                       |
| Operation   |  |  | open °C                  | -40 to +60 (+90) <sup>2)</sup> |           |                       |                       |
|   |  |  | enclosed °C              |                                |           |                       |                       |
| Storage   |  |  | °C                       | -40 to +40                     |           |                       |                       |
|   |  |  |                          | -40 to +90                     |           |                       |                       |
| <b>Short circuit protection</b>                               |  |  |                          |                                |           |                       |                       |
| short-circuit current 1kA,<br>contact welding not accepted    |  |  |                          |                                |           |                       |                       |
| max. fuse size  |  |  | gL (gG) A                | 20                             | 20        | 25                    | 20                    |
| <b>Cable cross-section</b>                                    |  |  |                          |                                |           |                       |                       |
| Connector   |  |  | solid mm <sup>2</sup>    | 0,75 - 6                       |           |                       |                       |
|   |  |  | flexible mm <sup>2</sup> |                                |           |                       |                       |
| flexible with multicore cable end                             |  |  | mm <sup>2</sup>          |                                |           |                       |                       |
| Magnet coil   |  |  | solid mm <sup>2</sup>    | 0,75 - 2,5                     |           |                       |                       |
|   |  |  | flexible mm <sup>2</sup> |                                |           |                       |                       |
| flexible with multicore cable end                             |  |  | mm <sup>2</sup>          |                                |           |                       |                       |
| Clamps per pole   |  |  |                          | 2                              |           |                       |                       |
| Connector   |  |  | solid AWG                | 18 - 10                        |           |                       |                       |
|   |  |  | flexible AWG             |                                |           |                       |                       |
| Clamps per pole   |  |  |                          | 2                              |           |                       |                       |
| Magnet coil   |  |  | solid AWG                | 14 - 12                        |           |                       |                       |
|   |  |  | flexible AWG             |                                |           |                       |                       |
| Clamps per pole   |  |  |                          | 2                              |           |                       |                       |

## Data according to UL508

|   |  |  |                  |      |      |      |      |
|---|--|--|------------------|------|------|------|------|
| Rated operational current "General Use" |  |  | A                | 10   | 10   | 20   | 10   |
| Rated operational voltage               |  |  | max. V AC        | 600  | 600  | 600  | 600  |
| <b>Auxiliary Contacts</b>               |  |  | heavy pilot duty | A600 | A600 | A600 | A600 |

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

2) With reduced control voltage range 0,9 up to 1,0 x  $U_s$  and with reduced thermal rated current  $I_{th}$  according to  $I_e/AC15$

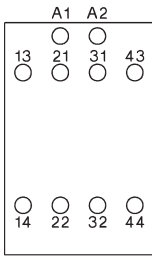
3) with built-in coil suppressor

# Contactor Relays

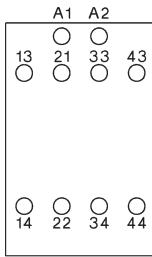
## Position of Terminals

AC operated

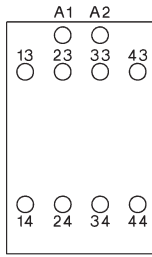
**K3-07ND22**



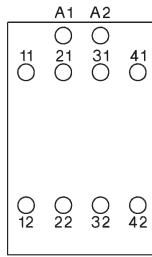
**K3-07ND31**



**K3-07ND40**

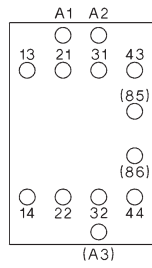


**K3-07ND04**

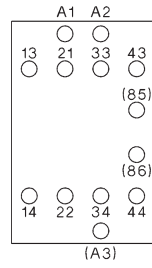


DC operated with double wound coil

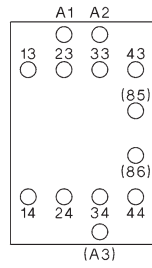
**K3-07ND22=**



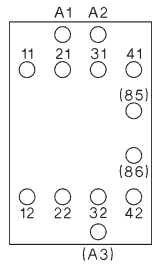
**K3-07ND31=**



**K3-07ND40=**

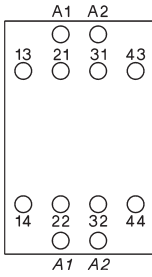


**K3-07ND04=**

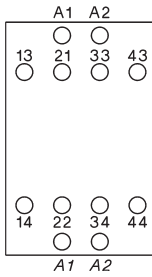


DC solenoid operated

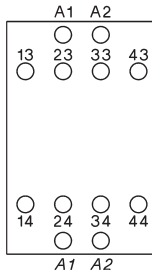
**KG3-07A22**  
**KG3-07D22**



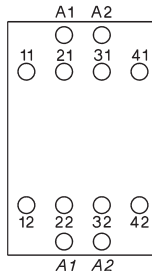
**KG3-07A31**  
**KG3-07D31**



**KG3-07A40**  
**KG3-07D40**



**KG3-07A04**  
**KG3-07D04**

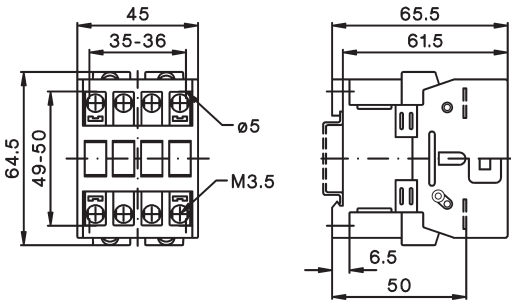


# Contactors Relays

## Dimensions

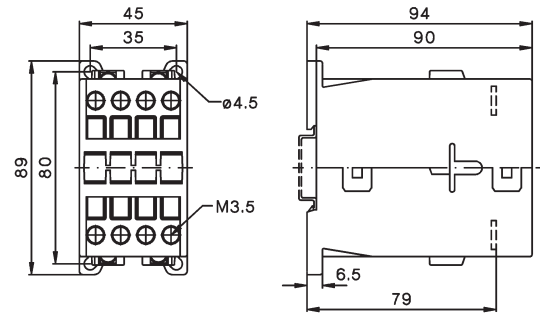
AC operated

K3-07ND..



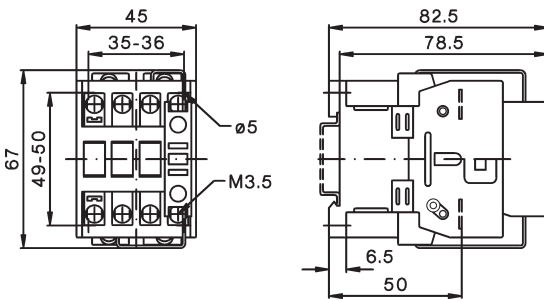
DC solenoid operated

KG3-07..



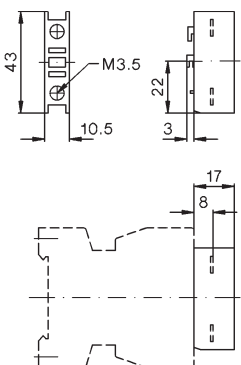
DC operated with double winding coil

K3-07ND.. =

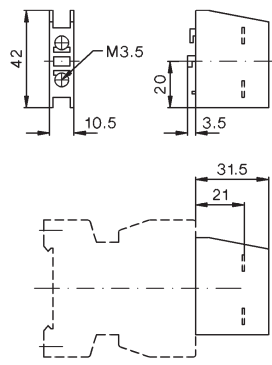











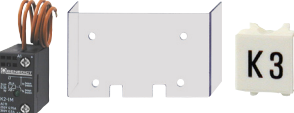




Auxiliary contact blocks

HN10, HN01



HA10, HA01



|   |  |    |                            |
|---|--|----|----------------------------|
|    | Contactor overview   | 46 | Contactors, Motor-Starters |
|    | Contactors 3-pole, AC Operated   | 48 |                            |
|    | Contactors 3-pole, DC Operated   | 49 | Circuit Breakers           |
|    | Contactors 4-pole  | 50 |                            |
|    | Capacitor Switching Contactors   | 51 | Manual Motor-Starters      |
|    | Auxiliary Contact Blocks<br>Snap-on Momentary Contacts<br>Additional Fourth Poles for Contactors | 52 |                            |
|   | Pneumatic Timers<br>Electronic Timers On-delay<br>Electronic Timers Off-delay                    | 53 | Switches                   |
|  | Mechanical Interlocks<br>Latches<br>Additional Terminals, Parallel Connectors                    | 54 |                            |
|  | Indicator Units<br>Fuse Holders<br>Suppressor Units  | 55 | AC-Main Switches           |
|  | Interface<br>Terminal Covers<br>Mounting Parts   | 56 |                            |
|  | Control Voltages   | 57 | DC-Switch Disconnectors    |
|  | Spare Coils AC-operated<br>Feeder Groups   | 58 |                            |
|  | Spare Coils DC-operated<br>Spare Contacts  | 59 | Push Buttons               |
|  | Technical Data   | 62 |                            |
|  | Dimensions   | 82 | Representatives, Suppliers |

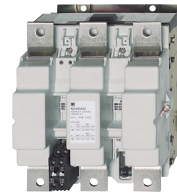









## Contactors 3-pole

- Up to 1200A AC3
- Up to 1350A AC1
- DIN-rail mounting up to AC3 115A
- International Approvals
- Data according to IEC 947 / EN 60947



| Ratings                        |                      | 10A  | 14A    | 18A  | 22A    | 24A  | 32A    | 40A  | 50A        | 62A                            | 74A   | 90A                            | 115A   |
|--------------------------------|----------------------|--|--------|--|--------|--|--------|--|------------|--------------------------------|-------|--------------------------------|--------|
| AC3 400V                       | Motor                | 4kW  | 5,5kW  | 7,5kW  | 11kW   | 11kW   | 15kW   | 18,5kW                                       | 22kW       | 30kW                           | 37kW  | 45kW                           | 55kW   |
|                                | 380-400V<br>660-690V | 5,5kW  | 7,5kW  | 10kW   | 10kW   | 15kW   | 18,5kW | 18,5kW                                       | 30kW       | 37kW                           | 45kW  | 55kW                           | 55kW   |
| AC1 690V at 40°C               |                      | 25A  | 25A    | 32A  | 32A    | 50A  | 65A    | 80A  | 110A       | 120A                           | 130A  | 160A                           | 200A   |
| Type                           | K3-                  | 10ND10   | 14ND10 | 18ND10                                       | 22ND10 | 24A00  | 32A00  | 40A00  | 50A00      | 62A00                          | 74A00 | 90A00                          | 115A00 |
| Auxiliary contacts             |                      | 1NO  | 1NO    | 1NO  | 1NO    | -  | -      | -  | -          | -                              | -     | -                              | -      |
| Type                           | K3-                  | 10ND01   | 14ND01 | 18ND01                                       | 22ND01 |  |        |  |            |                                |       |                                |        |
| Auxiliary contacts             |                      | 1NC  | 1NC    | 1NC  | 1NC    |  |        |  |            |                                |       |                                |        |
| Cable cross-section            |                      |  |        |  |        |  |        |  |            |                                |       |                                |        |
| Solid                          | mm <sup>2</sup>      | 0,75 - 6   |        |  |        | 1,5 - 25   |        |  | 4 - 50     |                                |       | 10 - 120                       |        |
| Flexible                       | mm <sup>2</sup>      | 1 - 4  |        |  |        | 2,5 - 16   |        |  | 10 - 35    |                                |       | 10 - 95                        |        |
| Auxiliary contact              |                      |  |        |  |        |  |        |  |            |                                |       |                                |        |
| I <sub>th</sub> 40°C           | A                    | 10   |        |  |        | -  |        |  | -          |                                |       | -                              |        |
| AC15 230V                      | A                    | 3  |        |  |        | -  |        |  | -          |                                |       | -                              |        |
| 400V                           | A                    | 2  |        |  |        | -  |        |  | -          |                                |       | -                              |        |
| Power consumption              |                      | 33 - 45  |        |  |        | 90 - 115   |        |  | 140 - 165  |                                |       | 280                            |        |
| of coils                       | hold VA              | 7 - 10   |        |  |        | 9 - 13   |        |  | 13 - 18    |                                |       | 5                              |        |
| Operation range of coils       |                      | 0,85 - 1,1   |        |  |        | 0,85 - 1,1                                       |        |  | 0,85 - 1,1 |                                |       | 0,85 - 1,1                     |        |
| Mounting                       |                      | 35mm DIN-rail or base                              |        |  |        |  |        |  |            |                                |       | 2x DIN-rail or base            |        |
| Additional aux. contact blocks |                      | <b>HN10</b><br>1NO<br>f. low level switching       |        | <b>HN01</b><br>1NC<br>f. low level switching |        | <b>HA10</b><br>1NO<br>25A I <sub>th</sub>        |        | <b>HA01</b><br>1NC<br>25A I <sub>th</sub>    |            | max.<br>4 HN..<br>or<br>4 HA.. |       | max.<br>7 HN..<br>or<br>7 HA.. |        |
| Additional aux. contact blocks |                      | <b>HB11-1</b><br>1NO+1NC<br>f. low level switching |        | max.<br>2 HB..                               |        | <b>HB11</b><br>1NO+1NC<br>f. low level switching |        | <b>HB02</b><br>2NC<br>f. low level switching |            | max.<br>2 HB..                 |       |                                |        |
| Overload Relay (thermal)       |                      |  |        |  |        |  |        |  |            |                                |       |                                |        |
| Type                           |                      | <b>U3/32</b>                                       |        |  |        | <b>U3/42</b>                                     |        |  |            | <b>U3/74</b>                   |       | <b>U85</b>                     |        |
|                                |                      | <b>U12/16..K3</b>                                  |        |  |        |  |        |  |            |                                |       |                                |        |
| Number of Setting Ranges from  |                      | 16<br>0,12 - 30A                                   |        | 16<br>0,12 - 32A                             |        | 4<br>10 - 42A                                    |        | 5<br>20 - 74A                                |            | 2<br>60 - 120A                 |       |                                |        |
| Busbar sets                    |                      | -  |        |  |        | -  |        |  |            | -                              |       | -                              |        |



|   |   |                       |                        |                       |   |  |                                  |   |  |                        |  |
|---|---|-----------------------|------------------------|-----------------------|---|--|----------------------------------|---|--|------------------------|--|
| <b>150A</b>   | <b>175A</b>   | <b>210A</b>           | <b>260A</b>            | <b>315A</b>           | <b>450A</b>   | <b>550A</b>  | <b>700A</b>                      | <b>860A</b>   | <b>1000A</b>                           | <b>1200A</b>           |  |
| <b>75kW</b><br>90kW   | <b>90kW</b><br>110kW  | <b>110kW</b><br>160kW | <b>132kW</b><br>210kW  | <b>160kW</b><br>250kW | <b>250kW</b><br>375kW   | <b>300kW</b><br>475kW  | <b>400kW</b><br>630kW            | <b>500kW</b><br>700kW   | <b>580kW</b><br>850kW                  | <b>680kW</b><br>1000kW |  |
| 250A  | 300A  | 350A                  | 450A                   | 600A                  | 700A  | 800A   | 1000A                            | 1100A   | 1200A                                  | 1350A                  |  |
| <b>151A00</b>   | <b>176A00</b>   | <b>210A00</b>         | <b>260A00</b>          | <b>316A00</b>         | <b>450A22</b>   | <b>550A22</b>  | <b>700A22</b>                    | <b>860A22</b>   | <b>1000A12</b>                         | <b>1200A12</b>         |  |
| -   | -   | -                     | -                      | -                     | 2NO+2NC   | 2NO+2NC  | 2NO+2NC                          | 2NO+2NC   | 1NO+2NC                                | 1NO+2NC                |  |
| 2 x 16-120<br>2 x 16-120  |   | busbar<br>30x6        | busbar<br>30x6         | busbar<br>30x6        | busbar<br>30x5  | busbar<br>40x6   | busbar<br>50x8                   | busbar<br>50x8  | busbar<br>50x10                        | busbar<br>50x10        |  |
| -<br>-<br>-   |   | -                     | -                      | -                     |   | 10<br>3<br>2   |                                  |   | 10<br>3<br>2                           |                        |  |
| 350<br>5<br>0,85 - 1,1  | 350<br>5  | 360<br>5              | 360<br>5<br>0,85 - 1,1 | 360<br>5              | 800-950<br>9-11   | 800-950<br>9-11  | 1350-1600<br>21-25<br>0,85 - 1,1 | 1350-1600<br>21-25  | 2400<br>70<br>0,85-1,1                 | 2400<br>70             |  |
| base  |   |                       |                        |                       |   |  |                                  |   |  |                        |  |
|  | <b>HKT11 HKT22</b><br>1NO+1NC 2NO+2NC<br>max. 1 pc.                                 |                       |                        |                       |  | <b>HKF22</b><br>2NO+2NC<br>max. 1 pc.  |                                  |  | <b>HKB11</b><br>1NO+1NC<br>max. 2 pcs. |                        |  |
|  | <b>HKA11</b><br>1NO+1NC<br>max. 2 pcs.  |                       |                        |                       | -   | -  | -                                | -   | -                                      | -                      |  |
|  |  |                       |                        |                       |   |  |                                  |   |  |                        |  |
| <b>U180</b>   | <b>U320</b>   |                       |                        |                       |   | <b>U800</b>  |                                  |   |  |                        |  |
| 1   | 2   |                       |                        |                       |   | 3  |                                  |   |  |                        |  |
| 120 - 180A  | 144 - 320A  |                       |                        |                       |   | 240 - 800A   |                                  |   |  |                        |  |
| integrated  | integrated  |                       |                        |                       |   | SU840/550  |                                  | SU840/860   |  |                        |  |

Contactor, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches








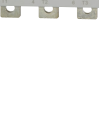


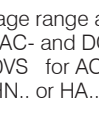
DC-Switch Disconnect

Push Buttons

Representatives, Suppliers

# Contactors 3-pole

# AC Operated

| Ratings   |      | Rated Current | Aux. Contacts   |   | Type                     | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|---|------|---------------|---|---|--------------------------|----------------------------|-----------|---------------|
| AC2, AC3  |      |               | Built-in  | Additional see page 52  |                          |                            |           |               |
| 380V  |      |               |   |   |                          |                            |           |               |
| 400V  | 660V | AC1           |  |  |                          | 24                         |           |               |
| 415V  | 690V | 690V          |   |   |                          | 110                        |           |               |
| kW  | kW   | A             | NO  | NC  | Typ                      | 230                        |           |               |
|   |      |               |   |   |                          | 400                        |           |               |
|    |      |               |   |   |                          |                            |           |               |
| <b>4</b>  | 5,5  | 25            | 1   | -   | max. 4                   |                            | 1         | 0,23          |
| <b>4</b>  | 5,5  | 25            | -   | 1   | HN.. or HA..             |                            | 1         | 0,23          |
| <b>5,5</b>  | 7,5  | 25            | 1   | -   | and 2 HB..               |                            | 1         | 0,23          |
| <b>5,5</b>  | 7,5  | 25            | -   | 1   |                          |                            | 1         | 0,23          |
| <b>7,5</b>  | 10   | 32            | 1   | -   |                          |                            | 1         | 0,23          |
| <b>7,5</b>  | 10   | 32            | -   | 1   |                          |                            | 1         | 0,23          |
| <b>11</b>   | 10   | 32            | 1   | -   |                          |                            | 1         | 0,23          |
| <b>11</b>   | 10   | 32            | -   | 1   |                          |                            | 1         | 0,23          |
|   |      |               |   |   |                          |                            |           |               |
|    |      |               |   |   |                          |                            |           |               |
| <b>11</b>   | 15   | 50            | -   | -   | max. 4                   |                            | 1         | 0,48          |
| <b>15</b>   | 18,5 | 65            | -   | -   | HN.. or HA..             |                            | 1         | 0,48          |
| <b>18,5</b>   | 18,5 | 80            | -   | -   | and 2 HB..               |                            | 1         | 0,48          |
|   |      |               |   |   |                          |                            |           |               |
|    |      |               |   |   |                          |                            |           |               |
| <b>22</b>   | 30   | 110           | -   | -   | max. 4 (3) <sup>4)</sup> |                            | 1         | 0,85          |
| <b>30</b>   | 37   | 120           | -   | -   | HN.. or HA..             |                            | 1         | 0,85          |
| <b>37</b>   | 45   | 130           | -   | -   | and 2 HB..               |                            | 1         | 0,85          |
|   |      |               |   |   |                          |                            |           |               |
|  |      |               |   |   |                          |                            |           |               |
| <b>45</b>   | 55   | 160           | -   | -   | max. 7                   |                            | 1         | 2,2           |
| <b>55</b>   | 55   | 200           | -   | -   | HN.. or HA..             |                            | 1         | 2,2           |
|   |      |               |   |   | and 2 HB..               |                            |           |               |
|   |      |               |   |   |                          |                            |           |               |
|  |      |               |   |   |                          |                            |           |               |
| <b>75</b>   | 110  | 250           | -   | -   | 1 HKT..                  |                            | 1         | 4             |
| <b>90</b>   | 132  | 300           | -   | -   | and 2 HKA11              |                            | 1         | 4             |
|   |      |               |   |   |                          |                            |           |               |
|  |      |               |   |   |                          |                            |           |               |
| <b>110</b>  | 160  | 350           | -   | -   |                          |                            | 1         | 7,2           |
| <b>132</b>  | 210  | 450           | -   | -   |                          |                            | 1         | 7,2           |
| <b>160</b>  | 250  | 600           | -   | -   |                          |                            | 1         | 7,2           |
|   |      |               |   |   |                          |                            |           |               |
|  |      |               |   |   |                          |                            |           |               |
| <b>250</b>  | 375  | 700           | 2   | 2   | 1 HKF22                  |                            | 1         | 13            |
| <b>300</b>  | 475  | 800           | 2   | 2   |                          |                            | 1         | 13,5          |
|   |      |               |   |   |                          |                            |           |               |
|  |      |               |   |   |                          |                            |           |               |
| <b>400</b>  | 630  | 1000          | 2   | 2   |                          |                            | 1         | 26,5          |
| <b>500</b>  | 700  | 1100          | 2   | 2   |                          |                            | 1         | 27,6          |
|   |      |               |   |   |                          |                            |           |               |
|  |      |               |   |   |                          |                            |           |               |
| <b>580</b>  | 850  | 1200          | 1   | 2   | 2 HKB11                  |                            | 1         | 49            |
| <b>680</b>  | 1000 | 1350          | 1   | 2   |                          |                            | 1         | 53            |

1) Coil voltage range and other coil voltages see page 57

2) Type for AC- and DC-operating: e.g.: 230: 220-240V 50/60Hz and 220V DC (with integrated coil suppressor)

3) Type 230VS for AC-operating 220-240V 50Hz (with integrated coil suppressor)

4) max. 3 HN.. or HA.. for DC-operated Contactors.

# DC Operated

| Type | Coil voltage <sup>1)</sup> | Coil power | Additional Overload Relay | W/W | Type | Pack pcs. | Weight kg/pc. |
|------|----------------------------|------------|---------------------------|-----|------|-----------|---------------|
|      |                            |            |                           |     |      |           |               |
|      | <b>24</b>                  | 24V DC     |                           |     |      |           |               |
|      | <b>48</b>                  | 48V DC     |                           |     |      |           |               |
|      | <b>110</b>                 | 110V DC    |                           |     |      |           |               |
|      | <b>220</b>                 | 110V DC    |                           |     |      |           |               |

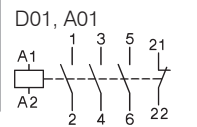
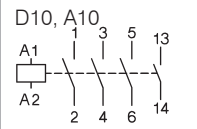
Wiring Diagram

Coil Circuits see page 53

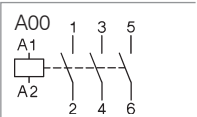
Terminal Markings



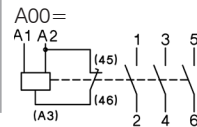
|                                    |  |     |                     |   |      |
|------------------------------------|--|-----|---------------------|---|------|
| <b>KG3-10A10</b> ... <sup>5)</sup> |  | 3/3 | U3/32               | 1 | 0,53 |
| <b>KG3-10A01</b> ... <sup>5)</sup> |  | 3/3 | U12/16E<br>U12/16EQ | 1 | 0,53 |
| <b>KG3-14A10</b> ... <sup>5)</sup> |  | 3/3 | UAT21               | 1 | 0,53 |
| <b>KG3-14A01</b> ... <sup>5)</sup> |  | 3/3 |                     | 1 | 0,53 |
| <b>KG3-18A10</b> ... <sup>5)</sup> |  | 3/3 |                     | 1 | 0,53 |
| <b>KG3-18A01</b> ... <sup>5)</sup> |  | 3/3 |                     | 1 | 0,53 |
| <b>KG3-22A10</b> ... <sup>5)</sup> |  | 3/3 |                     | 1 | 0,53 |
| <b>KG3-22A01</b> ... <sup>5)</sup> |  | 3/3 |                     | 1 | 0,53 |



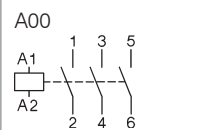
|                                    |  |     |       |   |      |
|------------------------------------|--|-----|-------|---|------|
| <b>KG3-24A00</b> ... <sup>5)</sup> |  | 4/4 | U3/32 | 1 | 0,57 |
| <b>KG3-32A00</b> ... <sup>5)</sup> |  | 4/4 | U3/42 | 1 | 0,57 |
| <b>KG3-40A00</b> ... <sup>5)</sup> |  | 4/4 | UAT.. | 1 | 0,57 |



|                      |  |       |       |   |     |
|----------------------|--|-------|-------|---|-----|
| <b>K3-50A00=</b> ... |  | 200/6 | U3/74 | 1 | 0,9 |
| <b>K3-62A00=</b> ... |  | 200/6 |       | 1 | 0,9 |
| <b>K3-74A00=</b> ... |  | 200/6 |       | 1 | 0,9 |



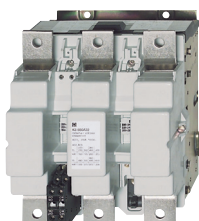
|                                    |  |       |     |   |     |
|------------------------------------|--|-------|-----|---|-----|
| <b>K3-90A00</b> ... <sup>2)</sup>  |  | 280/5 | U85 | 1 | 2,2 |
| <b>K3-115A00</b> ... <sup>2)</sup> |  | 280/5 |     | 1 | 2,3 |



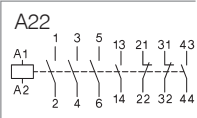
|                                    |  |       |      |   |   |
|------------------------------------|--|-------|------|---|---|
| <b>K3-151A00</b> ... <sup>2)</sup> |  | 350/5 | U180 | 1 | 4 |
| <b>K3-176A00</b> ... <sup>2)</sup> |  | 350/5 |      | 1 | 4 |



|                                    |  |       |      |   |     |
|------------------------------------|--|-------|------|---|-----|
| <b>K3-210A00</b> ... <sup>2)</sup> |  | 360/5 | U320 | 1 | 7,2 |
| <b>K3-260A00</b> ... <sup>2)</sup> |  | 360/5 |      | 1 | 7,2 |
| <b>K3-316A00</b> ... <sup>2)</sup> |  | 360/5 |      | 1 | 7,2 |

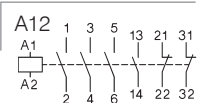


|                                    |  |        |            |   |      |
|------------------------------------|--|--------|------------|---|------|
| <b>K3-450A22</b> ... <sup>2)</sup> |  | 800/10 | U800       | 1 | 13   |
| <b>K3-550A22</b> ... <sup>2)</sup> |  | 800/10 | +SU840/550 | 1 | 13,5 |



|                                    |  |         |            |   |      |
|------------------------------------|--|---------|------------|---|------|
| <b>K3-700A22</b> ... <sup>2)</sup> |  | 1500/20 | U800       | 1 | 26,5 |
| <b>K3-860A22</b> ... <sup>2)</sup> |  | 1500/20 | +SU840/860 | 1 | 27,6 |

|                        |  |         |  |   |    |
|------------------------|--|---------|--|---|----|
| <b>K3-1000A12=</b> ... |  | 2100/60 |  | 1 | 49 |
| <b>K3-1200A12=</b> ... |  | 2100/60 |  | 1 | 53 |



1) Other coil voltages on request

2) Type for AC- and DC-operating: e.g.: 24: 24V 50/60Hz and 24V DC (with integrated coil suppressor)

5) with integrated coil suppressor

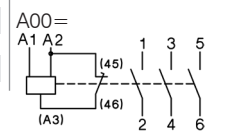
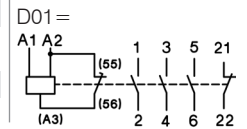
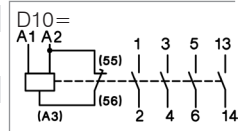
## Contactors 3-pole

DC operated with dual-wound coil



| Ratings     |           | Rated Current | Aux. Contacts |                        | Type         | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|-------------|-----------|---------------|---------------|------------------------|--------------|----------------------------|-----------|---------------|
| AC2         | AC3       |               | Built-in      | Additional see page 52 |              |                            |           |               |
| <b>380V</b> |           | AC1           |               |                        |              | <b>24</b> 24V= DC          |           |               |
| <b>400V</b> | 660V      | 690V          | NO            | NC                     | Type         | <b>48</b> 48V= DC          |           |               |
| <b>415V</b> | 690V      |               |               |                        |              | <b>110</b> 110V= DC        |           |               |
| <b>kW</b>   | <b>kW</b> | <b>A</b>      |               |                        |              | <b>220</b> 220V= DC        |           |               |
| <b>4</b>    | 5,5       | 25            | 1             | -                      | max. 3       |                            | 1         | 0,25          |
| <b>4</b>    | 5,5       | 25            | -             | 1                      | HN.. or HA.. |                            | 1         | 0,25          |
| <b>5,5</b>  | 7,5       | 25            | 1             | -                      | and 2 HB..   |                            | 1         | 0,25          |
| <b>5,5</b>  | 7,5       | 25            | -             | 1                      |              |                            | 1         | 0,25          |
| <b>7,5</b>  | 10        | 32            | 1             | -                      |              |                            | 1         | 0,25          |
| <b>7,5</b>  | 10        | 32            | -             | 1                      |              |                            | 1         | 0,25          |
| <b>11</b>   | 10        | 32            | 1             | -                      |              |                            | 1         | 0,25          |
| <b>11</b>   | 10        | 32            | -             | 1                      |              |                            | 1         | 0,25          |
| <b>11</b>   | 15        | 50            | -             | -                      | max. 3       |                            | 1         | 0,55          |
| <b>15</b>   | 18,5      | 65            | -             | -                      | HN.. or HA.. |                            | 1         | 0,55          |
| <b>18,5</b> | 18,5      | 80            | -             | -                      | and 2 HB..   |                            | 1         | 0,55          |

Wiring Diagram



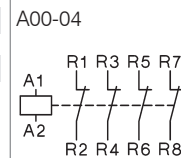
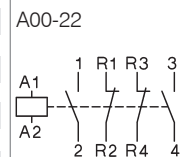
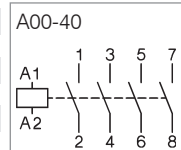
## Contactors 4-pole

AC or DC operated



| Ratings     |             | Rated Current | Aux. Contacts |                        | Type                 | Coil voltage <sup>2)</sup>        | Pack pcs. | Weight kg/pc. |
|-------------|-------------|---------------|---------------|------------------------|----------------------|-----------------------------------|-----------|---------------|
| AC2         | AC1         |               | Built-in      | Additional see page 52 |                      |                                   |           |               |
| <b>380V</b> |             | AC1           |               |                        |                      | <b>24</b> 24V 50/60Hz             |           |               |
| <b>400V</b> |             | 690V          | NO            | NC                     | Type                 | <b>110</b> 110V 50/60Hz           |           |               |
| <b>415V</b> | <b>400V</b> |               |               |                        |                      | <b>230</b> 220-240V 50Hz          |           |               |
| <b>kW</b>   | <b>kW</b>   | <b>A</b>      |               |                        |                      | <b>400</b> 380-415V 50Hz          |           |               |
|             |             |               |               |                        |                      | <b>= 24</b> 24V= DC <sup>3)</sup> |           |               |
| <b>4</b>    | <b>17,5</b> | 25            | -             | -                      | max. 4 <sup>3)</sup> |                                   | 1         | 0,23          |
| <b>4</b>    | <b>17,5</b> | 25            | -             | -                      | HN.. or HA..         |                                   | 1         | 0,23          |
| <b>4</b>    | <b>17,5</b> | 25            | -             | -                      | and 2 HB..           |                                   | 1         | 0,23          |
| <b>5,5</b>  | <b>17,5</b> | 25            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>5,5</b>  | <b>17,5</b> | 25            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>5,5</b>  | <b>17,5</b> | 25            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>7,5</b>  | <b>22</b>   | 32            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>7,5</b>  | <b>22</b>   | 32            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>7,5</b>  | <b>22</b>   | 32            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>11</b>   | <b>22</b>   | 32            | -             | -                      |                      |                                   | 1         | 0,23          |
| <b>11</b>   | <b>31</b>   | 45            | -             | -                      | max. 4               |                                   | 1         | 0,65          |
| <b>15</b>   | <b>34,5</b> | 50            | -             | -                      | HN..                 |                                   | 1         | 0,65          |
| <b>18,5</b> | <b>34,5</b> | 50            | -             | -                      | or HA..              |                                   | 1         | 0,65          |
| <b>22</b>   | <b>62</b>   | 110           | -             | -                      | max. 6 <sup>5)</sup> |                                   | 1         | 1,1           |
| <b>30</b>   | <b>69</b>   | 120           | -             | -                      | HN.. or HA..         |                                   | 1         | 1,1           |
| <b>37</b>   | <b>76</b>   | 130           | -             | -                      | and 2 HB..           |                                   | 1         | 1,1           |
| <b>15</b>   | <b>43</b>   | 63            | -             | -                      | 1 HKT.               |                                   | 1         | 1,4           |
| <b>15</b>   | <b>43</b>   | 63            | -             | -                      | +                    |                                   | 1         | 1,4           |
|             |             |               |               |                        | 2 HKA11              |                                   |           |               |
| <b>30</b>   | <b>85</b>   | 125           | -             | -                      |                      |                                   | 1         | 2,42          |
| <b>30</b>   | <b>85</b>   | 125           | -             | -                      |                      |                                   | 1         | 2,42          |
| <b>45</b>   | <b>94</b>   | 135           | -             | -                      |                      |                                   | 1         | 2,42          |
| <b>55</b>   | <b>139</b>  | 200           | -             | -                      |                      |                                   | 1         | 4,7           |
| <b>75</b>   | <b>173</b>  | 250           | -             | -                      |                      |                                   | 1         | 4,7           |
| <b>90</b>   | <b>208</b>  | 300           | -             | -                      |                      |                                   | 1         | 4,7           |
| <b>110</b>  | <b>242</b>  | 350           | -             | -                      |                      |                                   | 1         | 8             |
| <b>132</b>  | <b>310</b>  | 450           | -             | -                      |                      |                                   | 1         | 8             |
| <b>160</b>  | <b>415</b>  | 600           | -             | -                      |                      |                                   | 1         | 8             |

Wiring Diagram



1) Other coil voltages on request

2) Coil voltage range and non-standard coil voltages see page 57

3) DC operated with dual-wound coil, max. 3 additional aux. contacts

4) with integrated coil suppressor (AC/DC coil)

5) DC operated with dual-wound coil, max. 5 additional aux. contacts

# Capacitor Switching Contactors

for use with reactive or non-reactive capacitor banks



### Rated Operational Power at 50/60Hz

Ambient Temperature

| 50°C        |      | 60°C |      |
|-------------|------|------|------|
| <b>380V</b> | 415V | 660V | 380V |
| <b>400V</b> | 440V | 690V | 400V |
| <b>kVAr</b> | kVAr | kVAr | kVAr |

| Aux. Contacts |    | Type |
|---------------|----|------|
| Built-in Add. |    |      |
| NO            | NC | pcs. |

| Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|----------------------------|-----------|---------------|
| 230                        |           |               |
| 220-240V 50Hz              |           |               |

|                      |                      |                      |                     |                     |                      |   |   |                 |   |   |      |
|----------------------|----------------------|----------------------|---------------------|---------------------|----------------------|---|---|-----------------|---|---|------|
| 0-12,5               | 0-13                 | 0-20                 | 0-12,5              | 0-13                | 0-20                 | 1 | - | 1 <sup>2)</sup> | <b>K3-18NK10</b> ...                    | 1 | 0,34 |
| 0-12,5               | 0-13                 | 0-20                 | 0-12,5              | 0-13                | 0-20                 | - | 1 | 1 <sup>2)</sup> | <b>K3-18NK01</b> ...                    | 1 | 0,34 |
| 0-12,5               | 0-13                 | 0-20                 | 0-12,5              | 0-13                | 0-20                 | 1 | - | 1 <sup>2)</sup> | <b>K3-18NBK10</b> ...                   | 1 | 0,40 |
| 10-20                | 10,5-22              | 17-33                | 10-20               | 10,5-22             | 17-33                | - | - | 3 <sup>3)</sup> | <b>K3-24K00</b> ...                     | 1 | 0,62 |
| 10-25                | 10,5-27              | 17-41                | 10-25               | 10,5-27             | 17-41                | - | - | 3 <sup>3)</sup> | <b>K3-32K00</b> ...                     | 1 | 0,62 |
| 20-33,3              | 23-36                | 36-55                | 20-33,3             | 23-36               | 36-55                | - | - | 3 <sup>3)</sup> | <b>K3-50K00</b> ...                     | 1 | 1,0  |
| 20-50                | 23-53                | 36-82                | 20-50               | 23-53               | 36-82                | - | - | 3 <sup>3)</sup> | <b>K3-62K00</b> ...                     | 1 | 1,0  |
| 20-75 <sup>4)</sup>  | 23-75 <sup>4)</sup>  | 36-120 <sup>4)</sup> | 20-60               | 23-64               | 36-100               | - | - | 3 <sup>3)</sup> | <b>K3-74K00</b> ...                     | 1 | 1,0  |
| 33-80                | 36-82                | 57-120               | 33-75               | 36-77               | 57-120               | - | - | 6 <sup>5)</sup> | <b>K3-90K00</b> ... / VS <sup>7)</sup>  | 1 | 2,3  |
| 33-100 <sup>6)</sup> | 36-103 <sup>6)</sup> | 57-148 <sup>6)</sup> | 33-90 <sup>6)</sup> | 36-93 <sup>6)</sup> | 57-148 <sup>6)</sup> | - | - | 6 <sup>5)</sup> | <b>K3-115K00</b> ... / VS <sup>7)</sup> | 1 | 2,3  |

**Specification:** Contactors K3-..K are suitable for switching low-inductive and low loss capacitors in capacitor banks (IEC70 and 831, VDE 0560) without and with reactors.

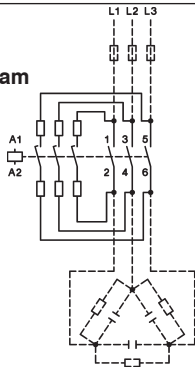
Capacitor switching contactors are fitted with early make contacts and damping resistors, to reduce the value of make current <70 x I<sub>e</sub>.

**Operating Conditions:** Capacitor switching contactors are protected against contact welding for a prospective making current of 200 x I<sub>e</sub>.

### Technical Data acc. to IEC 947-4-1, IEC 947-5-1, EN 60947-4-1, EN 60947-5-1, VDE 0660

| Type   |   | K3-18NK     | K3-18NBK <sup>8)</sup> | K3-24K       | K3-32K       | K3-50K       | K3-62K       | K3-74K        | K3-90K        | K3-115K       |
|--|---|-------------|------------------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Max. frequency of operations z                 | 1/h                                     | 120         | 120                    | 120          | 120          | 120          | 120          | 80            | 80            | 80            |
| Contact life non reactive cap. banks           | S x 10 <sup>3</sup>                     | 250         | 250                    | 150          | 150          | 150          | 150          | 120           | 120           | 120           |
|  | reactive cap. banks S x 10 <sup>3</sup> | 400         | 400                    | 300          | 300          | 300          | 300          | 200           | 200           | 200           |
| <b>Rated operational current I<sub>e</sub></b> | at 50°C                                 | <b>0-18</b> | <b>0-18</b>            | <b>14-28</b> | <b>14-36</b> | <b>30-48</b> | <b>30-72</b> | <b>30-108</b> | <b>50-115</b> | <b>50-144</b> |
|  | at 60°C                                 | <b>0-18</b> | <b>0-18</b>            | <b>14-28</b> | <b>14-36</b> | <b>30-48</b> | <b>30-72</b> | <b>30-87</b>  | <b>50-108</b> | <b>50-130</b> |
| Rated operational current I <sub>th</sub>      | at 50°C                                 | A           | 32                     | 45           | 45           | 60           | 100          | 110           | 120           | 155           |
|  | at 60°C                                 | A           | 32                     | 40           | 40           | 55           | 90           | 100           | 110           | 145           |
| Overload factor acc. to EN 61921: 30% min.     | at 50°C                                 | %           | 78                     | 150          | 60           | 67           | 108          | 53            | 11            | 35            |
|  | at 60°C                                 | %           | 78                     | 122          | 43           | 53           | 88           | 39            | 26            | 34            |
| Fuses gL (gG)                                  | from / to                               | A           | 35 / 63                | 35 / 63      | 50 / 80      | 63 / 100     | 80 / 160     | 125 / 160     | 160/200       | 160/200       |

### Typical Circuit Diagram

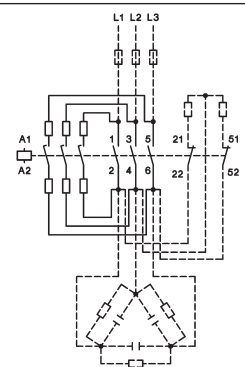


### Wiring Diagram for Quick Discharge Resistors

Make sure that the current of the discharge resistors is not higher than the rated current (AC1) of the auxiliary contacts

### Mounting instructions:

In the area of capacitor switching contactors, difficulty inflammable and self-extinguishing materials shall be used only, because abnormal temperatures within the area of the resistor spirals cannot be excluded.



- 1) Coil voltage range and non-standard coil voltages see page 57
- 2) 1 HN.. or HA.. snap-on
- 3) 2HB.. for side mounting and 1 HN.. or HA.. snap-on
- 4) Consider the max. thermal current of the contactor K3-74A: I<sub>th</sub> 130A
- 5) 2 HB.. on the left or right side and 4 HN.. or HA.. snap-on
- 6) Consider the min. cross-section of conductor at max. load
- 7) Type 230 for AC- and DC-operating 220-240V 50/60Hz and 220V DC (with integrated coil suppressor)  
Type 230VS for AC-operating 220-240V 50Hz (with integrated coil suppressor)
- 8) Cable cross sections: 2,5 - 16mm<sup>2</sup>



## Auxiliary Contact Blocks for contactors K(G)3-07.. to K3-115.., type HN.. for low level switching <sup>1)</sup>



| Rated Operational Current |                   |                  | Contacts |    |    |    | Type         | Pack pcs. | Weight kg/pc. |
|---------------------------|-------------------|------------------|----------|----|----|----|--------------|-----------|---------------|
| AC15<br>230V<br>A         | AC15<br>400V<br>A | AC1<br>690V<br>A | NO       | NC | EM | LB |              |           |               |
| 3                         | 2                 | 10               | 1        | -  | -  | -  | <b>HN10</b>  | 10        | 0,02          |
| 3                         | 2                 | 10               | -        | 1  | -  | -  | <b>HN01</b>  | 10        | 0,02          |
| 3                         | 2                 | 10               | -        | -  | 1  | -  | <b>HN10U</b> | 10        | 0,02          |
| 3                         | 2                 | 10               | -        | -  | -  | 1  | <b>HN01U</b> | 10        | 0,02          |
| 6                         | 3                 | 25               | 1        | -  | -  | -  | <b>HA10</b>  | 10        | 0,03          |
| 6                         | 3                 | 25               | -        | 1  | -  | -  | <b>HA01</b>  | 10        | 0,03          |

## Auxiliary Contact Blocks for contactors K3-.., for low level switching <sup>1) 3)</sup>



| Rated Operational Current |                   |                  | mounting:<br>1 HB.. on left side<br>and 1 HB.. on right side | Contacts |    | Type          | Pack pcs. | Weight kg/pc. |
|---------------------------|-------------------|------------------|--|----------|----|---------------|-----------|---------------|
| AC15<br>230V<br>A         | AC15<br>400V<br>A | AC1<br>690V<br>A |  | NO       | NC |               |           |               |
| 3                         | 2                 | 10               | for K3-10 to K3-22   | 1        | 1  | <b>HB11-1</b> | 10        | 0,02          |
| 3                         | 2                 | 10               | for K3-24 to K3-115  | 1        | 1  | <b>HB11</b>   | 10        | 0,02          |
| 3                         | 2                 | 10               | for K3-24 to K3-115  | -        | 2  | <b>HB02</b>   | 10        | 0,02          |

## Auxiliary Contact Blocks for contactors K3-41.., K3-96.., K3-116.. to K3-1200.., for low level switching <sup>1)</sup>



| Rated Operational Current |                   |                  | For contactors                 | Contacts        |    | Type         | Pack pcs. | Weight kg/pc. |
|---------------------------|-------------------|------------------|--------------------------------|-----------------|----|--------------|-----------|---------------|
| AC15<br>230V<br>A         | AC15<br>400V<br>A | AC1<br>690V<br>A |                                | NO              | NC |              |           |               |
| 3                         | 2                 | 10               | K3-116 to K3-316 top           | 1               | 1  | <b>HKT11</b> | 1         | 0,04          |
| 3                         | 2                 | 10               | K3-116 to K3-316 top           | 2               | 2  | <b>HKT22</b> | 1         | 0,05          |
| 3                         | 2                 | 10               | K3-116 to K3-316 outside       | 1               | 1  | <b>HKA11</b> | 1         | 0,05          |
| 6                         | 3                 | 16               | K3-450 to K3-860 <sup>2)</sup> | 2 <sup>2)</sup> | 2  | <b>HKF22</b> | 1         | 0,12          |
| 6                         | 3                 | 16               | K3-1000, K3-1200 inside        | 1               | 1  | <b>HKB11</b> | 1         | 0,17          |

## Snap-on Momentary Contacts for K(G)3-07.. to K3-115.. for low level switching <sup>1)</sup>



| Rated Operational Current |                   |                  | Specification   | Contacts |    | Type         | Pack pcs. | Weight kg/pc. |
|---------------------------|-------------------|------------------|-----------------|----------|----|--------------|-----------|---------------|
| AC15<br>230V<br>A         | AC15<br>400V<br>A | AC1<br>690V<br>A |                 | NO       | NC |              |           |               |
| 3                         | 2                 | 10               | manual operated | 1        | -  | <b>HTN10</b> | 10        | 0,02          |
| 3                         | 2                 | 10               | manual operated | -        | 1  | <b>HTN01</b> | 10        | 0,02          |

## Terminal Blocks for contactors K(G)3-07.. to K3-115.. and K2-..



| Specification              | Thermal Current I <sub>th</sub><br>A | Type         | Pack pcs. | Weight kg/pc. |
|----------------------------|--------------------------------------|--------------|-----------|---------------|
| 2 terminals interconnected | 26                                   | <b>K2-DK</b> | 10        | 0,02          |
| 2 terminals insulated      | 26                                   | <b>K2-SK</b> | 10        | 0,02          |

1) Contacts suitable for electronic circuits, according to IEC60947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F. Technical data see page 80.

2) Contact travel of make contacts adjustable, see page 81.

3) Except K3-41A00.. and K3-96A00..

# Electronic Timer

for mounting on DIN-rail, Control voltage 24-240V AC/DC, 1 changeover contact  
 OFF-delay without auxiliary voltage  
 Replace Pneumatic Timer K2-TP. and K2-TA



| 5 Functions in one device   | 4 Time ranges in one device s                | Rated Current AC1 250V A | Type               | Pack pcs. | Weight kg/pc. |
|---|--|--------------------------|--------------------|-----------|---------------|
| ON-delay,<br>OFF-delay,<br>Single shot trailing edge,<br>Single shot leading edge,<br>Single shot leading and trailing edge | 0,1 - 1,<br>1 - 10,<br>6 - 60 a.<br>18 - 180 | 5                        | <b>K3-T180 240</b> | 1         | 0,085         |

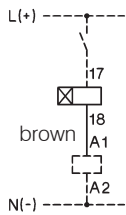
## Electronic Timer On-delay for contactors K(G)3-07.. to K3-115.. and K2-..

Timer will be connected with the contactor coil, can be snapped onto the contactor and occupies 2 add-on spaces. Contactor switches On-delay.

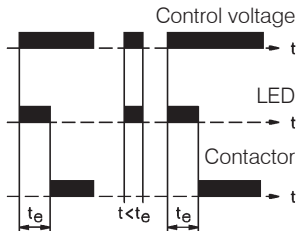


| Operational Voltage V | Time Range s | Rated Current AC15 A | Type                | Pack pcs. | Weight kg/pc. |
|-----------------------|--------------|----------------------|---------------------|-----------|---------------|
| 24 - 60V AC/DC        | 1 - 30       | 0,75                 | <b>K2-TE30 60</b>   | 1         | 0,08          |
| 100 - 250V AC/DC      | 1 - 30       | 0,75                 | <b>K2-TE30 250</b>  | 1         | 0,08          |
| 24 - 60V AC/DC        | 10 - 180     | 0,75                 | <b>K2-TE180 60</b>  | 1         | 0,08          |
| 100 - 250V AC/DC      | 10 - 180     | 0,75                 | <b>K2-TE180 250</b> | 1         | 0,08          |
| 24 - 60V AC/DC        | 30 - 600     | 0,75                 | <b>K2-TE600 60</b>  | 1         | 0,08          |
| 100 - 250V AC/DC      | 30 - 600     | 0,75                 | <b>K2-TE600 250</b> | 1         | 0,08          |

### Wiring Diagram



### Timing Chart



### Operation Range

Time repeat accuracy  
 Recovery time (typical)

$0,8 - 1,1 \times U_s$   
 $\leq 1\%$   
 50ms

**Voltage Drop** after the time delay  $t_e$   
 (Control voltage 24V: use contactor with 20V-coil)  
 Max. inrush current (peak value)

<3V  
 25A <10ms

### Duty Cycle

Ambient temperature  
 Short circuit protection

100%  
 $-40^\circ - +60^\circ\text{C}$   
 2A



## Latch for contactors K(G)3-07.. to K3-74.. and K2-..

with NC aux. contact  
duty cycle 10%, max. 30 sec. AC / max. 20 sec. DC  
power consumption max. 35VA



For Contactors

K3-07 to K3-22, K2-07 to K2-16

K3-24 to K3-40, K2-23 to K2-37, KG3-10 to KG3-40

K3-50 to K3-74, K2-45 to K2-60

| Type       | Coil voltage      |
|------------|-------------------|
| <b>24</b>  | 22-26V 50/60Hz    |
| <b>110</b> | 100-120V 50/60Hz  |
| <b>230</b> | 210 -250V 50/60Hz |
| <b>400</b> | 360-440V 50/60Hz  |



Pack Weight  
pcs. kg/pc.

|  | Type                | Pack pcs. | Weight kg/pc. |
|--|---------------------|-----------|---------------|
| K3-07 to K3-22, K2-07 to K2-16                   | <b>K2-L22 . . .</b> | 1         | 0,08          |
| K3-24 to K3-40, K2-23 to K2-37, KG3-10 to KG3-40 | <b>K2-L40 . . .</b> | 1         | 0,08          |
| K3-50 to K3-74, K2-45 to K2-60                   | <b>K2-L74 . . .</b> | 1         | 0,08          |

Technical data see page 74

**Latch / Magnetic latch for Contactors K3-151 to K3-1200 on request**

## Indicator Units for contactors K(G)3-07.. to K3-115.. and K2-..



| Specifications   | Voltage Range    | Type          | Pack pcs. | Weight kg/pc. |
|--|------------------|---------------|-----------|---------------|
| <b>Coil Current Indicator</b> , green (LED)  | 24 - 660V AC/DC  | <b>K2-ING</b> | 10        | 0,02          |
| <b>Coil Current Indicator</b> , red (LED)  | 24 - 660V AC/DC  | <b>K2-INR</b> | 10        | 0,02          |
| To connect in series with the contactor coil. In case of coil interruption the indication goes out. Voltage drop appr. 2 volts |                  |               |           |               |
| <b>Voltage Indicator</b> , clear (glow-disc. I.)   | 220 - 415V AC/DC | <b>K2-UN</b>  | 10        | 0,02          |
| <b>Voltage Indicator</b> , red (LED)   | 24 - 120V AC/DC  | <b>K2-UNR</b> | 10        | 0,02          |
| To connect parallel to the contactor coil. In case of applied voltage the indication also lights at coil interruption.         |                  |               |           |               |

## Snap-On Adapter



| For Type  | Specification  | Type         | Pack pcs. | Weight kg/pc. |
|---|--|--------------|-----------|---------------|
| K2-DK, K2-SK, K2-TE, K2-TA<br>K2-F, K2-RF<br>K2-IN., K2-UN. | for snap-on mounting of accessories on 35mm DIN-rail acc. DIN EN 50022 | <b>K2-SM</b> | 10        | 0,009         |

## Additional 4<sup>th</sup> Poles for contactors K3-315.. to K3-1200



| For Contactors         | Thermal Current $I_{th}$<br>A | Type          | Pack<br>pcs. | Weight<br>kg/pc. |
|------------------------|-------------------------------|---------------|--------------|------------------|
| K3-315, K3-450, K3-550 | <b>325</b>                    | <b>NP325</b>  | 1            | 0,7              |
| K3-315, K3-450, K3-550 | <b>500</b>                    | <b>NP500</b>  | 1            | 1,3              |
| K3-450, K3-550         | <b>760</b>                    | <b>NP760</b>  | 1            | 1,4              |
| K3-700, K3-860         | <b>500</b>                    | <b>NP501</b>  | 1            | 1,3              |
| K3-700, K3-860         | <b>1000</b>                   | <b>NP1000</b> | 1            | 1,6              |
| K3-1000, K3-1200       | <b>1000</b>                   | <b>NP1001</b> | 1            | 1,6              |

## Mechanical Interlocks



| Interlocks contactor with contactor<br>Type                              | Type   | Mounting   | Type                         | Pack<br>pcs. | Weight<br>kg/pc. |
|--|--|------------|------------------------------|--------------|------------------|
| K3-07 to K3-40<br>KG3-07 to KG3-22<br>KG3-24 to KG3-40<br>K2-07 to K2-37 | K3-07 to K3-40<br>KG3-07 to KG3-22<br>KG3-24 to KG3-40<br>K2-07 to K2-37 | horizontal | <b>LG10889</b> <sup>1)</sup> | 10           | 0,006            |
| K3-24 to K3-74<br>K2-23 to K2-60   | K3-50 to K3-74<br>K2-45 to K2-60   | horizontal | <b>LG10890</b> <sup>1)</sup> | 1            | 0,010            |
| K3-90, K3-115  | K3-90, K3-115  | horizontal | <b>LG11478</b> <sup>1)</sup> | 1            | 0,010            |
| K65 to K110  | K65 to K110  | horizontal | <b>LG8511</b>                | 1            | 0,076            |
| K3-116 to K3-316   | K3-116 to K3-316   | horizontal | <b>LG11223H</b>              | 1            | 0,06             |
| K3-315 to K3-550   | K3-315 to K3-550   | horizontal | <b>LG10400H</b>              | 1            | 0,8              |
| K3-315 to K3-550   | K3-315 to K3-550   | vertical   | <b>LG10400V</b>              | 1            | 0,8              |
| K3-450, K3-550   | K3-700, K3-860   | horizontal | <b>LG10399H</b>              | 1            | 1,6              |
| K3-450, K3-550   | K3-700, K3-860   | vertical   | <b>LG10399V</b>              | 1            | 0,9              |
| K3-700, K3-860   | K3-700, K3-860   | horizontal | <b>LG10402H</b>              | 1            | 1,5              |
| K3-700, K3-860   | K3-700, K3-860   | vertical   | <b>LG10402V</b>              | 1            | 0,9              |
| K3-700, K3-860   | K3-1000, K3-1200   | horizontal | <b>LG10401H</b>              | 1            | 1,9              |
| K3-700, K3-860   | K3-1000, K3-1200   | vertical   | <b>LG10401V</b>              | 1            | 1,6              |
| K3-1000, K3-1200   | K3-1000, K3-1200   | horizontal | <b>LG10403H</b>              | 1            | 1,8              |
| K3-1000, K3-1200   | K3-1000, K3-1200   | vertical   | <b>LG10403V</b>              | 1            | 1,5              |

1) clamps for mounting incl.

## Terminal Covers for terminal protection according to DIN 57106, VBG 4



| For Contactors           | Specification          | Type            | Pack<br>pcs. | Weight<br>kg/pc. |
|--------------------------|------------------------|-----------------|--------------|------------------|
| K65 to K110 (spare part) | for 6 terminals        | <b>LG9333</b>   | 1            | 0,045            |
| K3-151, K3-176           | 3-pole for 3 terminals | <b>LG10404</b>  | 1            | 0,12             |
| K3-116 to K3-176         | 4-pole for 4 terminals | <b>LG104044</b> | 1            | 0,14             |
| K3-210, K3-260, K3-316   | for 3 terminals        | <b>LG11457</b>  | 1            | 0,14             |
| K3-200                   | for 3 terminals        | <b>LG10405</b>  | 1            | 0,18             |
| K3-315, K3-450           | for 3 terminals        | <b>LG10406</b>  | 1            | 0,28             |
| K3-550                   | for 3 terminals        | <b>LG10407</b>  | 1            | 0,34             |
| K3-700                   | for 3 terminals        | <b>LG10408</b>  | 1            | 0,39             |
| K3-860                   | for 3 terminals        | <b>LG10409</b>  | 1            | 0,49             |

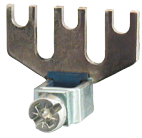
## Additional Terminals



| For Contactors  | Cable Cross-sections to clamp mm <sup>2</sup><br>solid or<br>stranded | flexible | flex. with multi-<br>core cable end | Type           | Pack<br>pcs. | Weight<br>kg/pc. |
|---|---|----------|-------------------------------------|----------------|--------------|------------------|
| <b>Additional Terminal Single Pole, with fingertouch protection</b> |   |          |                                     |                |              |                  |
| K(G)3-10 to K(G)3-22  | 0,75 - 10   | 0,75 - 6 | 0,75 - 6                            | <b>LG9339N</b> | 6            | 0,009            |
| K2-09 to K2-16  |   |          |                                     |                |              |                  |
| K3-151 to K3-176  |   | 16 - 120 | + 16 - 95                           | <b>LG11224</b> | 1            | 0,10             |

1) Inclusively mounting clamps

## Parallel Connectors



| For Contactors | Cable Cross-sections to clamp mm <sup>2</sup><br>solid or<br>stranded | flexible | flex. with multi-<br>core cable end | Type | Pack<br>pcs. | Weight<br>kg/pc. |
|----------------|---|----------|-------------------------------------|------|--------------|------------------|
|----------------|---|----------|-------------------------------------|------|--------------|------------------|

### Parallel Connectors, 3 Poles Parallel

Current-carrying capacity: 2,5 x AC1-value of the contactor

|                      |                            |        |        |               |    |       |
|----------------------|----------------------------|--------|--------|---------------|----|-------|
| K(G)3-10 to K(G)3-22 | terminal hole for screw M5 |        |        | <b>LG9241</b> | 50 | 0,004 |
| K2-09 to K2-16       |                            |        |        |               |    |       |
| K2-23 to K2-37       | 4 - 35                     | 6 - 25 | 4 - 25 | <b>LG5587</b> | 10 | 0,022 |

### Parallel Connectors, 4 Poles Parallel

Current-carrying capacity: 3,2 x AC1-value of the contactor

|                      |                            |  |  |               |    |       |
|----------------------|----------------------------|--|--|---------------|----|-------|
| K(G)3-10 to K(G)3-22 | terminal hole for screw M5 |  |  | <b>LG7360</b> | 10 | 0,006 |
| K2-09 to K2-16       |                            |  |  |               |    |       |

## Suppressor Units



| Voltage Range<br>V | Mounting |  | Type | Pack<br>pcs. | Weight<br>kg/pc. |
|--------------------|----------|--|------|--------------|------------------|
|--------------------|----------|--|------|--------------|------------------|

### RC-units for contactors K3-07 - K3-74

|                  |           |                  |                   |    |      |
|------------------|-----------|------------------|-------------------|----|------|
| 12 - 48V AC/DC   | to snap   | 1600nF / 22 Ohm  | <b>RC-K3N 24</b>  | 10 | 0,01 |
| 48 - 127V AC/DC  | on the    | 680nF / 270 Ohm  | <b>RC-K3N 110</b> | 10 | 0,01 |
| 110 - 230V AC/DC | contactor | 220nF / 2200 Ohm | <b>RC-K3N 230</b> | 10 | 0,01 |
| 230 - 415V AC/DC |           | 120nF / 620 Ohm  | <b>RC-K3N 400</b> | 10 | 0,01 |

### RC-units for contactors K3-07 - K3-74 and reversing contactors K3NWU10 - K3WU74

|                  |           |                  |                    |    |      |
|------------------|-----------|------------------|--------------------|----|------|
| 12 - 48V AC/DC   | to snap   | 1600nF / 22 Ohm  | <b>RC-K3NW 24</b>  | 10 | 0,01 |
| 48 - 127V AC/DC  | on the    | 680nF / 270 Ohm  | <b>RC-K3NW 110</b> | 10 | 0,01 |
| 110 - 230V AC/DC | contactor | 220nF / 2200 Ohm | <b>RC-K3NW 230</b> | 10 | 0,01 |
| 230 - 415V AC/DC |           | 120nF / 620 Ohm  | <b>RC-K3NW 400</b> | 10 | 0,01 |

## Mounting Parts



| Description | For Type | Specification | Type | Pack<br>pcs. | Weight<br>kg/pc. |
|-------------|----------|---------------|------|--------------|------------------|
|-------------|----------|---------------|------|--------------|------------------|

|                               |                                   |  |               |    |       |
|-------------------------------|-----------------------------------|--|---------------|----|-------|
| <b>Clamp,<br/>no distance</b> | K3-07 to K3-115<br>K2-07 to K2-37 | To join contactors<br>without distance,<br>2 pieces required | <b>P426-1</b> | 50 | 0,001 |
|-------------------------------|-----------------------------------|--|---------------|----|-------|



|                                |                                   |   |               |    |       |
|--------------------------------|-----------------------------------|---|---------------|----|-------|
| <b>Clamp,<br/>7mm distance</b> | K3-07 to K3-115<br>K2-07 to K2-37 | To join contactors<br>with 7mm distance,<br>2 pieces required | <b>P418-1</b> | 10 | 0,002 |
|--------------------------------|-----------------------------------|---|---------------|----|-------|

|                                 |                                   |  |               |    |       |
|---------------------------------|-----------------------------------|--|---------------|----|-------|
| <b>Clamp,<br/>12mm distance</b> | K3-07 to K3-115<br>K2-07 to K2-37 | To join contactors<br>with 12mm distance,<br>2 pieces required | <b>P807-1</b> | 10 | 0,002 |
|---------------------------------|-----------------------------------|--|---------------|----|-------|

|                             |                                       |  |               |    |       |
|-----------------------------|---------------------------------------|--|---------------|----|-------|
| <b>Clamp<br/>asymmetric</b> | K3-07 to K3-40<br>with K3-50 to K3-74 | To join contactors<br>with 12mm distance,<br>2 pieces required | <b>P785-1</b> | 10 | 0,002 |
|-----------------------------|---------------------------------------|--|---------------|----|-------|



|                        |                |                     |             |  |  |
|------------------------|----------------|---------------------|-------------|--|--|
| <b>Retention clamp</b> | K3-10 to K3-74 | To close contactors | <b>P725</b> |  |  |
|------------------------|----------------|---------------------|-------------|--|--|

## Marking System for contactors K3-07.. to K3-115.., K2-.. and aux. contact blocks HN and HA



| Description | Specification | Type | Pack<br>pcs. | Weight<br>kg/100pc |
|-------------|---------------|------|--------------|--------------------|
|-------------|---------------|------|--------------|--------------------|

|                      |                                      |               |     |       |
|----------------------|--------------------------------------|---------------|-----|-------|
| <b>Marking Plate</b> | 2-section without marking, divisible | <b>P487-1</b> | 100 | 0,025 |
|----------------------|--------------------------------------|---------------|-----|-------|

|                      |                                      |               |     |       |
|----------------------|--------------------------------------|---------------|-----|-------|
| <b>Marking Plate</b> | 3-section without marking, divisible | <b>P971-1</b> | 100 | 0,038 |
|----------------------|--------------------------------------|---------------|-----|-------|

|                      |                                      |               |     |       |
|----------------------|--------------------------------------|---------------|-----|-------|
| <b>Marking Plate</b> | 4-section without marking, divisible | <b>P245-1</b> | 100 | 0,050 |
|----------------------|--------------------------------------|---------------|-----|-------|

|                      |                            |                 |     |       |
|----------------------|----------------------------|-----------------|-----|-------|
| <b>Marking Plate</b> | marked, choice of K1...K32 | <b>P245-K..</b> | 100 | 0,013 |
|----------------------|----------------------------|-----------------|-----|-------|

## Coil voltages for AC operated contactors

Type-suffix for coil-types K6/.. to K45/...  
for contactor-types K3-07.. to K3-74

| Suffix to contactor type | to coil type | Voltage Marking at the coil |                       | Rated Control Voltage U <sub>s</sub> range |                   |                 |                   |
|--------------------------|--------------|-----------------------------|-----------------------|--|-------------------|-----------------|-------------------|
|                          |              | for 50Hz V                  | for 60Hz V            | for 50Hz min. V                            | max. V            | for 60Hz min. V | max. V            |
| 6                        | 41.6         | 6                           |                       | 6  | 6,6               | 6,6             | 7,3               |
| 6,6                      | 41.6,6       | 6,6                         |                       | 6,6  | 7,3               | 7,3             | 8                 |
| 7,3                      | 41.7,3       | 7,3                         |                       | 7,3  | 8                 | 8               | 9                 |
| 8                        | 41.8         | 8                           |                       | 8  | 9                 | 9               | 10                |
| 9                        | 41.9         | 9                           |                       | 9  | 10                | 10              | 11                |
| 10                       | 41.10        | 10                          |                       | 10   | 11                | 11              | 12                |
| 11                       | 41.11        | 11                          | 12                    | 11   | 12                | 12              | 13,2              |
| 12                       | 41.12        | 12                          |                       | 12   | 13,2              | 13,2            | 14,5              |
| 13,2                     | 41.13        | 13,2                        |                       | 13,2                                       | 14,5              | 14,5            | 16                |
| 14,5                     | 41.14        | 14,5                        |                       | 14,5                                       | 16                | 16              | 18                |
| 16                       | 41.16        | 16                          |                       | 16   | 18                | 18              | 20                |
| 18                       | 41.18        | 18                          |                       | 18   | 20                | 20              | 22                |
| 20                       | 41.20        | 20                          |                       | 20   | 22                | 22              | 24                |
| <b>24</b>                | <b>4.24</b>  | <b>24</b>                   | <b>24</b>             | <b>22</b>                                  | <b>24</b>         | <b>24</b>       | <b>27</b>         |
| 25                       | 41.25        | 25                          |                       | 24   | 27                | 27              | 30                |
| 27                       | 41.27        | 27                          | 32                    | 27   | 30                | 30              | 33                |
| 32                       | 41.32        | 32                          | 36                    | 30   | 33                | 33              | 36                |
| 33                       | 41.33        | 36                          | 36                    | 33   | 36                | 36              | 39                |
| 36                       | 41.36        | 36                          | 42                    | 36   | 39                | 39              | 42                |
| 40                       | 41.40        | 42                          | 42                    | 39   | 42                | 42              | 47                |
| <b>42</b>                | <b>4.42</b>  | <b>42</b>                   | <b>48</b>             | <b>42</b>                                  | <b>47</b>         | <b>47</b>       | <b>52</b>         |
| 48                       | 41.48        | 48                          | 48                    | 44   | 48                | 48              | 52                |
| 55                       | 41.55        | 55                          | 60                    | 52   | 58                | 58              | 65                |
| 60                       | 41.60        | 60                          |                       | 58   | 65                | 65              | 72                |
| 65                       | 41.65        | 65                          |                       | 65   | 72                | 72              | 80                |
| 75                       | 41.75        | 75                          |                       | 72   | 80                | 80              | 90                |
| 85                       | 41.85        | 85                          |                       | 80   | 90                | 90              | 100               |
| 90                       | 41.90        | 100                         | 100                   | 90   | 100               | 100             | 110               |
| <b>110</b>               | <b>4.110</b> | <b>110</b>                  | <b>110-120</b>        | <b>100</b>                                 | <b>110</b>        | <b>110</b>      | <b>122</b>        |
| 115                      | 41.115       | 115                         | 125                   | 110  | 122               | 122             | 135               |
| 127                      | 41.127       | 127                         |                       | 122  | 135               | 135             | 150               |
| 140                      | 41.140       | 140                         |                       | 135  | 150               | 150             | 165               |
| 150                      | 41.150       | 150                         |                       | 150  | 165               | 165             | 180               |
| 165                      | 41.165       | 165                         | 180-208               | 165  | 180               | 180             | 208               |
| 180                      | 41.180       | 180-210 <sup>1)</sup>       | 200-240 <sup>1)</sup> | 180  | 210 <sup>1)</sup> | 200             | 240 <sup>1)</sup> |
| 190R <sup>2)</sup>       | 41.190       | 200-240                     | 200-240               | 200  | 240               | 200             | 240               |
| 200                      | 41.200       | 200-230 <sup>1)</sup>       | 220-240               | 200  | 230 <sup>1)</sup> | 220             | 240               |
| <b>230</b>               | <b>4.230</b> | <b>220-240</b>              | <b>230-264</b>        | <b>220</b>                                 | <b>240</b>        | <b>230</b>      | <b>264</b>        |
| 254                      | 41.254       | 254                         | 277                   | 240  | 264               | 264             | 290               |
| 270                      | 41.270       | 270                         |                       | 264  | 290               | 290             | 315               |
| 300                      | 41.300       | 300                         |                       | 290  | 315               | 315             | 345               |
| 320                      | 41.320       | 320                         |                       | 315  | 345               | 345             | 380               |
| 345                      | 41.345       | 345-400 <sup>1)</sup>       | 380-440 <sup>1)</sup> | 345  | 400 <sup>1)</sup> | 380             | 440 <sup>1)</sup> |
| 390R <sup>2)</sup>       | 41.390       | 400-480                     | 400-480               | 400  | 480               | 400             | 480               |
| <b>400</b>               | <b>4.400</b> | <b>380-415</b>              | <b>400-440</b>        | <b>380</b>                                 | <b>415</b>        | <b>400</b>      | <b>460</b>        |
| 415                      | 41.415       | 415-440                     | 440-480               | 400  | 440               | 440             | 480               |
| 440                      | 41.440       | 440-480                     | 480-500               | 440  | 480               | 480             | 530               |
| 480                      | 41.480       | 480-500                     | 530-580               | 480  | 530               | 530             | 580               |
| 500                      | 41.500       | 500-550                     | 550-600               | 500  | 550               | 550             | 600               |
| 550                      | 41.550       | 550-600                     | 600                   | 550  | 600               | 600             | (650)             |

### Standard voltages in bold type letters.

- 1) Operating range of magnet-coils: 0,85 x U<sub>s</sub> (min. value of rated control voltage) up to 1,05 x U<sub>s</sub> (max. value of rated control voltage).  
2) Reduction of mechanical life to 10% of normal life. It is not admissible as a spare coil in a contactor for different coil voltages.

Type-suffix for coil-types K85/... and K110/...  
for contactor-types K85 to K110

| Suffix to contactor type | to coil type | Voltage Marking at the coil |            | Rated Control Voltage U <sub>s</sub> range |            |                 |            |
|--------------------------|--------------|-----------------------------|------------|--|------------|-----------------|------------|
|                          |              | for 50Hz V                  | for 60Hz V | for 50Hz min. V                            | max. V     | for 60Hz min. V | max. V     |
| 20                       | 4.20         | 20                          | 24         | 20   | 22         | 24              | 26         |
| 24                       | 4.24         | 24                          |            | 24   | 27         | 29              | 32         |
| 42                       | 4.42         | 42                          |            | 42   | 47         | 50              | 56         |
| 110                      | 4.110        | 110-120                     |            | 110  | 122        | 132             | 146        |
| <b>230</b>               | <b>4.230</b> | <b>220-240</b>              | <b>277</b> | <b>220</b>                                 | <b>240</b> | <b>264</b>      | <b>288</b> |
| 400                      | 4.400        | 380-415                     | 460-480    | 380  | 415        | 455             | 498        |

Type-suffix for coil-types K3-1200/...  
for contactor-types K3-1000.. to K3-1200..

|            |              |                |   |            |            |            |            |
|------------|--------------|----------------|---|------------|------------|------------|------------|
| 110        | 4.110        | 110-115        | - | 110        | 115        | 110        | 115        |
| <b>230</b> | <b>4.230</b> | <b>220-230</b> | - | <b>220</b> | <b>230</b> | <b>220</b> | <b>230</b> |
| <b>400</b> | <b>4.400</b> | <b>380-400</b> | - | <b>380</b> | <b>400</b> | <b>380</b> | <b>400</b> |
| 440        | 4.440        | 440            | - | 440        | 440        | 440        | 440        |

## Coil voltages for AC and DC operated contactors

Type-suffix for coil-types K3-115/.. to K3-860/...  
for contactor-types K3-90.. to K3-860..

| Suffix to contactor type | to coil type | Voltage Marking at the coil |            | Rated Control Voltage U <sub>s</sub> range |            |                 |            |
|--------------------------|--------------|-----------------------------|------------|--|------------|-----------------|------------|
|                          |              | for 50/60Hz V               | for DC V   | for 50Hz min. V                            | max. V     | for 60Hz min. V | max. V     |
| 24                       | 4.24         | 24                          | 24         | 22   | 24         | 22              | 24         |
| 48                       | 4.48         | 48                          | 48         | 44   | 48         | 44              | 48         |
| 110                      | 4.110        | 110-120                     | 110        | 110  | 120        | 110             | 120        |
| <b>230</b>               | <b>4.230</b> | <b>220-240</b>              | <b>220</b> | <b>220</b>                                 | <b>240</b> | <b>220</b>      | <b>240</b> |
| <b>400</b>               | <b>4.400</b> | <b>380-415</b>              | -          | <b>380</b>                                 | <b>415</b> | <b>380</b>      | <b>415</b> |

## Coil voltages for AC operated contactors

Type-suffix for coil-types K3-115/..AC  
for contactor-types K3-90..AC to K3-115..AC

| Suffix to contactor type | to coil type   | Voltage Marking at the coil |            | Rated Control Voltage U <sub>s</sub> range |            |                 |            |
|--------------------------|----------------|-----------------------------|------------|--|------------|-----------------|------------|
|                          |                | for 50Hz V                  | for 60Hz V | for 50Hz min. V                            | max. V     | for 60Hz min. V | max. V     |
| <b>110AC</b>             | <b>4.110AC</b> | 110-122                     | 132-146    | 110  | 122        | 132             | 146        |
| <b>230AC</b>             | <b>4.230AC</b> | <b>220-240</b>              | <b>277</b> | <b>220</b>                                 | <b>240</b> | <b>264</b>      | <b>288</b> |

Other coil voltages on request

**Operating range of magnet-coils: 0,85 x U<sub>s</sub> (min. value of rated control voltage) up to 1,1 x U<sub>s</sub> (max. value of rated control voltage)**

With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> at ambient temperature 60 - 90°C

## Spare Coils for AC operated contactors



|                                |                                    | Type                 | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|--------------------------------|------------------------------------|----------------------|----------------------------|-----------|---------------|
| For Contactors                 |                                    | <b>4.24</b>          | 24V 50Hz                   |           |               |
|                                |                                    | <b>4.42</b>          | 42V 50Hz                   |           |               |
|                                |                                    | <b>4.110</b>         | 110V 50Hz                  |           |               |
|                                |                                    | <b>41.180</b>        | 180V 50Hz, 220V 60Hz       |           |               |
|                                |                                    | <b>4.230</b>         | 220-240V 50Hz              |           |               |
|                                |                                    | <b>4.400</b>         | 380-415V 50Hz              |           |               |
|                                |                                    | ↓                    |                            |           |               |
| K3-07N.. up to K3-22N..        |                                    | <b>K10N/ ... EUR</b> |                            | 1         | 0,053         |
| K3-07.. up to K3-22..          |                                    | <b>K3-6/ ...</b>     |                            | 10        | 0,040         |
| K2-07.. up to K2-16..          |                                    | <b>K6/ ...</b>       |                            | 10        | 0,040         |
| K3-24.. up to K3-40..          |                                    | <b>K24/ ...</b>      |                            | 1         | 0,085         |
| K2-23.. up to K2-37..          |                                    | <b>K23/ ...</b>      |                            | 1         | 0,085         |
| K3-50.. up to K3-74..          | <b>3 pole contactor</b>            | <b>K45/ ...</b>      |                            | 1         | 0,110         |
| K3-50.. up to K3-74..          | <b>4 pole contactor</b>            | <b>K50/ ...</b>      |                            | 1         | 0,110         |
| K85.., K110..                  |                                    | <b>K110/ ...</b>     |                            | 1         | 0,220         |
| K3-90.., K3-115.. (AC/DC coil) |                                    | <b>K115/ ...</b>     |                            | 1         | 0,230         |
|                                |                                    | Type                 | Coil voltage <sup>1)</sup> |           |               |
|                                |                                    | <b>4.110</b>         | 110V 50Hz, 110-115V 60Hz   |           |               |
|                                |                                    | <b>4.230</b>         | 220-230V 50Hz              |           |               |
|                                |                                    | <b>4.400</b>         | 380-400V 50Hz              |           |               |
|                                |                                    | ↓                    |                            |           |               |
| K3-150.., K3-175..             |                                    | <b>K3-175/ ...</b>   |                            | 1         | 0,38          |
| K3-1000.., K3-1200..           | without feeder group <sup>2)</sup> | <b>K3-1200/ ...</b>  |                            | 1         | 3,12          |

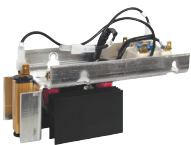
## Spare Coils for AC and DC operated contactors



|                    |                                    | Type               | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|--------------------|------------------------------------|--------------------|----------------------------|-----------|---------------|
| For Contactors     |                                    | <b>4.24</b>        | 24V 50/60Hz / 24V DC       |           |               |
|                    |                                    | <b>4.110</b>       | 110-120V 50/60Hz / 110V DC |           |               |
|                    |                                    | <b>4.230</b>       | 220-240V 50/60Hz / 220V DC |           |               |
|                    |                                    | <b>4.400</b>       | 380-415V 50/60Hz           |           |               |
|                    |                                    | ↓                  |                            |           |               |
| K3-90.., K3-115..  | with feeder group                  | <b>K3-115/ ...</b> |                            | 1         | 0,30          |
| K3-151.., K3-176.. | with feeder group                  | <b>K3-176/ ...</b> |                            | 1         | 0,68          |
| K3-210.., K3-316.. | with feeder group                  | <b>K3-316/ ...</b> |                            | 1         | 0,68          |
| K3-450.., K3-550.. | without feeder group <sup>2)</sup> | <b>K3-550/ ...</b> |                            | 1         | 1,63          |
| K3-700.., K3-860.. | without feeder group <sup>2)</sup> | <b>K3-860/ ...</b> |                            | 1         | 2,44          |

## Spare Feeder Groups for contactors K3-450.. to K3-860..

In case of changing control voltage, change coil and feeder group too



|                    |             | Type                 | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|--------------------|-------------|----------------------|----------------------------|-----------|---------------|
| For Contactors     |             | <b>110</b>           | 110-120V 50/60Hz / 110V DC |           |               |
|                    |             | <b>230</b>           | 220-240V 50/60Hz / 220V DC |           |               |
|                    |             | <b>400</b>           | 380-415V 50/60Hz           |           |               |
|                    |             | ↓                    |                            |           |               |
| K3-450.., K3-550.. | K3-550/4... | <b>K3-550/FG ...</b> |                            | 1         | 0,33          |
| K3-700.., K3-860.. | K3-860/4..  | <b>K3-860/FG ...</b> |                            | 1         | 0,54          |

1) Coil voltage range and non-standard coil voltages see page 57

2) In case of changing control voltage, change coil and feeder group too

# Spare Coils for DC operated contactors

Aux. Contact Block for dual-wound coil

| Type          | Coil voltage <sup>1)</sup> |
|---------------|----------------------------|
| <b>47.24</b>  | 24V DC                     |
| <b>47.48</b>  | 48V DC                     |
| <b>47.110</b> | 110V DC                    |
| <b>47.220</b> | 220V DC                    |

For Contactors

| For Contactors                                  | Aux. Contact Block | Type             | Pack pcs. | Weight kg/pc. |
|---|--------------------|------------------|-----------|---------------|
| K3-07N..= up to K3-22N..=                       | HN01U              | <b>K10N/ ...</b> | 1         | 0,052         |
| K3-07..= up to K3-22..=                         | HN01U              | <b>K3-6/ ...</b> | 1         | 0,042         |
| K2-07..= up to K2-16..=                         | HN01U              | <b>K6/ ...</b>   | 1         | 0,042         |
| K3-24..= up to K3-40..=                         | HN01X              | <b>K24/ ...</b>  | 1         | 0,090         |
| K2-23..= up to K2-37..=                         | HN01X              | <b>K23/ ...</b>  | 1         | 0,090         |
| K3-50..= up to K3-74..= <b>3 pole contactor</b> | HN01Z              | <b>K45/ ...</b>  | 1         | 0,115         |
| K3-50..= up to K3-74..= <b>4 pole contactor</b> | HN01Z              | <b>K50/ ...</b>  | 1         | 0,115         |
| K85.., K110..=                                  | -                  | <b>K110/ ...</b> | 1         | 0,225         |
| K3-90., K3-115.. (AC/DC coil)                   | -                  | see page 58      | 1         | 0,230         |



| Type          | Coil voltage <sup>1)</sup> |
|---------------|----------------------------|
| <b>43.110</b> | 110V DC                    |
| <b>43.220</b> | 220V DC                    |

For Contactors

| For Contactors        | Aux. Contact Block                 | Type                | Pack pcs. | Weight kg/pc. |
|-----------------------|------------------------------------|---------------------|-----------|---------------|
| K3-1000.., K3-1200..= | without feeder group <sup>2)</sup> | <b>K3-1200/ ...</b> | 1         | 3,12          |

## Wiring Diagrams for Coil Circuit

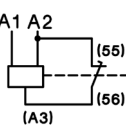
AC operated,

**K3-07..**  
up to **K110..**



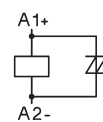
DC operated with dual-wound coil

**K3-07..=**  
up to **K3-22..=**

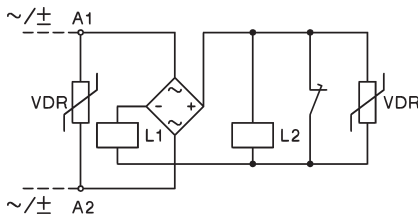


DC operated

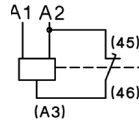
**KG3..**



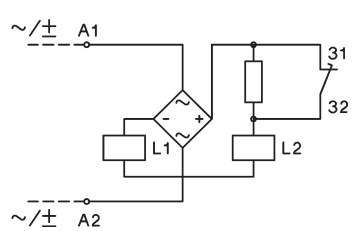
AC and DC operated with dual-wound coil  
**K3-90A00, K3-115A00**  
**K3-151A00, K3-176A00**  
**K3-210A00 to K3-316A00**



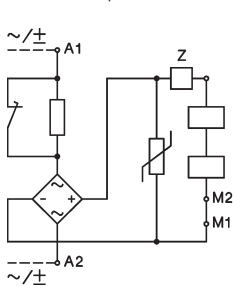
**K3-24..=**  
to  
**K3-74..=**



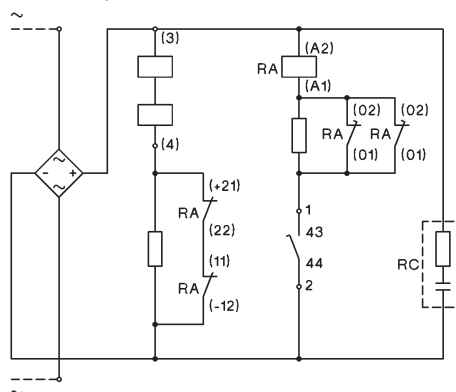
AC and DC operated with series resistor  
**K3-200A21**  
**K3-315A21**



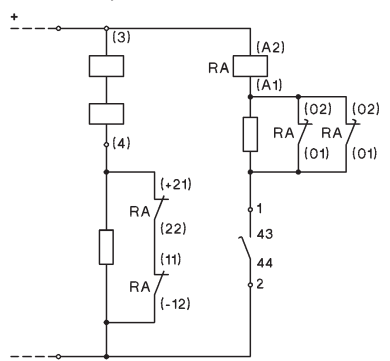
AC and DC operated with series resistor  
**K3-450..** up to **K3-860..**



DC operated with DC coil  
**K3-1000.., K3-1200..**



AC operated with DC coil  
**K3-1000.., K3-1200..**



Adjustable dropout operating time for K3-450.. to K3-860..  
150-200ms: Wiring see above (delivery standard)  
500-1000ms: Jumper device "Z"  
approx. 20ms: Special wiring see package folder

Contactors K3-1000.., K3-1200..  
For control voltages up to 125V  
NC contacts 21-22 and 11-12 are connected parallel,  
for higher voltages contacts are connected in series (delivery standard).

1) Other coil voltages on request  
2) In case of changing control voltage, change coil and feeder group too

## Spare Contacts

| <b>Main Contacts</b><br>for Contactors | <b>Type</b>        | Pack<br>pcs. | Weight<br>kg/pc. |
|--|--------------------|--------------|------------------|
| K85..                                  | <b>EK85/1</b>      | 3            | 0,235            |
| K110..                                 | <b>EK110/1</b>     | 3            | 0,275            |
| K3-150..                               | <b>EK3-150/10</b>  | 1            | 0,32             |
| K3-151..                               | <b>EK3-151/10</b>  | 1            | 0,16             |
| K3-175..                               | <b>EK3-175/10</b>  | 1            | 0,32             |
| K3-176..                               | <b>EK3-176/10</b>  | 1            | 0,16             |
| K3-200..                               | <b>EK3-200/10</b>  | 1            | 0,18             |
| K3-210..                               | <b>EK3-210/10</b>  | 1            | 0,18             |
| K3-260..                               | <b>EK3-260/10</b>  | 1            | 0,30             |
| K3-315..                               | <b>EK3-315/10</b>  | 1            | 0,34             |
| K3-316..                               | <b>EK3-316/10</b>  | 1            | 0,34             |
| K3-450..                               | <b>EK3-450/10</b>  | 1            | 0,35             |
| K3-550..                               | <b>EK3-550/10</b>  | 1            | 0,35             |
| K3-700..                               | <b>EK3-700/10</b>  | 1            | 0,85             |
| K3-860..                               | <b>EK3-860/10</b>  | 1            | 1,0              |
| K3-1000..                              | <b>EK3-1000/10</b> | 1            | 1,4              |
| K3-1200..                              | <b>EK3-1200/10</b> | 1            | 1,4              |





# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts  | Type               | K(G)3-10  | K(G)3-14   | K(G)3-18   | K(G)3-22  | K(G)3-24  | K(G)3-32  | K(G)3-40    | K3-50      | K3-62      | K3-74      |
|--|--------------------|-----------|------------|------------|-----------|-----------|-----------|-------------|------------|------------|------------|
| <b>Rated insulation voltage <math>U_i</math></b> <sup>1)</sup>                 | V AC               | 690       | 690        | 690        | 690       | 690       | 690       | 690         | 830        | 830        | 830        |
| <b>Making capacity <math>I_{eff}</math></b> at $U_e = 690V$ AC                 | A                  | 200       | 200        | 200        | 200       | 400       | 500       | 500         | 700        | 900        | 900        |
|  | 1000V AC           | -         | -          | -          | -         | -         | -         | -           | -          | -          | -          |
| <b>Breaking capacity <math>I_{eff}</math></b> 400V AC                          | A                  | 180       | 180        | 200        | 200       | 380       | 400       | 400         | 600        | 800        | 800        |
| K3-10 to K3-22 $\cos\phi = 0,65$   | A                  | 150       | 150        | 180        | 180       | 300       | 370       | 370         | 500        | 700        | 700        |
| K3-24 to K3-1200 $\cos\phi = 0,35$   | A                  | 100       | 100        | 150        | 150       | 260       | 340       | 340         | 400        | 500        | 500        |
|  | 1000V AC           | -         | -          | -          | -         | -         | -         | -           | -          | -          | -          |
| <b>Utilization category AC1</b>  |                    |           |            |            |           |           |           |             |            |            |            |
| <b>Switching of resistive load</b>   |                    |           |            |            |           |           |           |             |            |            |            |
| Rated operational current $I_e (=I_{th})$ at 40°C, open                        | 690V A             | <b>25</b> | <b>25</b>  | <b>32</b>  | <b>32</b> | <b>50</b> | <b>65</b> | <b>80</b>   | <b>110</b> | <b>120</b> | <b>130</b> |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 220V kW            | 9,5       | 9,5        | 12,2       | 12,2      | 19,0      | 24,7      | 30,4        | 41,9       | 45,7       | 49,5       |
|  | 230V kW            | 9,9       | 9,9        | 12,7       | 12,7      | 19,9      | 25,9      | 31,8        | 43,8       | 47,7       | 51,7       |
|  | 240V kW            | 10,4      | 10,4       | 13,3       | 13,3      | 20,8      | 27,0      | 33,2        | 45,7       | 49,8       | 54,0       |
|  | 380V kW            | 16,4      | 16,4       | 21,0       | 21,0      | 32,9      | 42,7      | 52,6        | 72,3       | 78,9       | 85,5       |
|  | 400V kW            | 17,3      | 17,3       | 22,1       | 22,1      | 34,6      | 45,0      | 55,4        | 76,1       | 83,0       | 90,0       |
|  | 415V kW            | 17,9      | 17,9       | 23,0       | 23,0      | 35,9      | 46,7      | 57,4        | 79,0       | 86,2       | 93,3       |
|  | 440V kW            | 19,0      | 19,0       | 24,4       | 24,4      | 38,1      | 49,5      | 60,9        | 83,7       | 91,3       | 99,0       |
|  | 500V kW            | 21,6      | 21,6       | 27,7       | 27,7      | 43,3      | 56,2      | 69,2        | 95,2       | 103,8      | 112,5      |
|  | 660V kW            | 28,5      | 28,5       | 36,5       | 36,5      | 57,1      | 74,2      | 91,3        | 125,6      | 137,0      | 148,4      |
|  | 690V kW            | 29,8      | 29,8       | 38,2       | 38,2      | 59,7      | 77,6      | 95,5        | 131,3      | 143,2      | 155,2      |
|  | 1000V kW           | -         | -          | -          | -         | -         | -         | -           | -          | -          | -          |
| Rated operational current $I_e (=I_{th})$ at 40°C, inside the enclosure 60°C   | 690V A             | 25        | 25         | 32         | 32        | 40        | 55        | 65          | 90         | 100        | 110        |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 220V kW            | 9,5       | 9,5        | 12,2       | 12,2      | 15,2      | 20,9      | 24,7        | 34,3       | 38,1       | 41,9       |
|  | 230V kW            | 9,9       | 9,9        | 12,7       | 12,7      | 15,9      | 21,9      | 25,9        | 35,8       | 39,8       | 43,8       |
|  | 240V kW            | 10,4      | 10,4       | 13,3       | 13,3      | 16,6      | 22,8      | 27,0        | 37,4       | 41,5       | 45,7       |
|  | 380V kW            | 16,4      | 16,4       | 21,0       | 21,0      | 26,3      | 36,2      | 42,7        | 59,2       | 65,7       | 72,3       |
|  | 400V kW            | 17,3      | 17,3       | 22,1       | 22,1      | 27,7      | 38,1      | 45,0        | 62,3       | 69,2       | 76,1       |
|  | 415V kW            | 17,9      | 17,9       | 23,0       | 23,0      | 28,7      | 39,5      | 46,7        | 64,6       | 71,8       | 79,0       |
|  | 440V kW            | 19,0      | 19,0       | 24,4       | 24,4      | 30,4      | 41,9      | 49,5        | 68,5       | 76,1       | 83,7       |
|  | 500V kW            | 21,6      | 21,6       | 27,7       | 27,7      | 34,6      | 47,6      | 56,2        | 77,9       | 86,5       | 95,2       |
|  | 660V kW            | 28,5      | 28,5       | 36,5       | 36,5      | 45,7      | 62,8      | 74,2        | 102,8      | 114,2      | 125,6      |
|  | 690V kW            | 29,8      | 29,8       | 38,2       | 38,2      | 47,7      | 65,7      | 77,6        | 107,4      | 119,4      | 131,3      |
|  | 1000V kW           | -         | -          | -          | -         | -         | -         | -           | -          | -          | -          |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$                | mm <sup>2</sup>    | 4         | 4          | 6          | 6         | 10        | 16        | 25          | 35         | 50         | 50         |
| <b>Utilization category AC2 and AC3</b>  |                    |           |            |            |           |           |           |             |            |            |            |
| <b>Switching of three-phase motors</b>   |                    |           |            |            |           |           |           |             |            |            |            |
| Rated operational current $I_e$ open and enclosed                              | 220V A             | 12        | 15         | 18         | 22        | 24        | 32        | 40          | 50         | 63         | 74         |
|  | 230V A             | 11,5      | 14,5       | 18         | 22        | 24        | 32        | 40          | 50         | 62         | 74         |
|  | 240V A             | 11        | 14         | 18         | 22        | 24        | 32        | 40          | 50         | 62         | 74         |
|  | <b>380-400V A</b>  | <b>10</b> | <b>14</b>  | <b>18</b>  | <b>22</b> | <b>24</b> | <b>32</b> | <b>40</b>   | <b>50</b>  | <b>62</b>  | <b>74</b>  |
|  | 415V A             | 9         | 14         | 18         | 22        | 23        | 30        | 40          | 50         | 62         | 74         |
|  | 440V A             | 9         | 14         | 18         | 22        | 23        | 30        | 40          | 50         | 62         | 74         |
|  | 500V A             | 8,9       | 11,9       | 15         | 15        | 22,5      | 28,5      | 28,5        | 44         | 54         | 64,5       |
|  | 660-690V A         | 6,7       | 9          | 12         | 12        | 17,5      | 21        | 21          | 33         | 42         | 49         |
|  | 1000V A            | -         | -          | -          | -         | -         | -         | -           | -          | -          | -          |
| Rated operational power of three-phase motors 50-60Hz                          | 220-230V kW        | 3         | 4          | 5          | 6         | 6         | 8,5       | 11          | 12,5       | 18,5       | 22         |
|  | 240V kW            | 3         | 4          | 5          | 7         | 7         | 9         | 11,5        | 13,5       | 19         | 23         |
|  | <b>380-400V kW</b> | <b>4</b>  | <b>5,5</b> | <b>7,5</b> | <b>11</b> | <b>11</b> | <b>15</b> | <b>18,5</b> | <b>22</b>  | <b>30</b>  | <b>37</b>  |
|  | 415V kW            | 4,5       | 6          | 8,5        | 12        | 12        | 16        | 20          | 24         | 33         | 40         |
|  | 440V kW            | 4,5       | 6          | 8,5        | 12        | 12        | 16        | 20          | 24         | 33         | 40         |
|  | 500V kW            | 5,5       | 7,5        | 10         | 10        | 15        | 18,5      | 18,5        | 30         | 37         | 45         |
|  | 660-690V kW        | 5,5       | 7,5        | 10         | 10        | 15        | 18,5      | 18,5        | 30         | 37         | 45         |
|  | 1000V kW           | -         | -          | -          | -         | -         | -         | -           | -          | -          | -          |

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

# Contactors

Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Type            | K3-90      | K3-115     | K3-116     | K3-151     | K3-176     | K3-210     | K3-260     | K3-316     | K3-450     | K3-550     | K3-700      | K3-860      | K3-1000     | K3-1200     |
|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| V AC            | 1000       | 1000       | 1000       | 1000       | 1000       | 1000       | 1000       | 1000       | 1000       | 1000       | 690         | 690         | 690         | 690         |
| A               | 1100       | 1200       | 1200       | 1500       | 2000       | 2100       | 2600       | 3200       | 4500       | 5500       | 7000        | 8600        | 10000       | 12000       |
| A               | 540        | 600        | 600        | 720        | 840        | 1020       | 1200       | 1500       | 2400       | 3000       | -           | -           | -           | -           |
| A               | 950        | 1100       | 1000       | 1200       | 1500       | 1600       | 2100       | 2600       | 4500       | 5500       | 7000        | 8000        | 8000        | 10000       |
| A               | 850        | 1000       | 1000       | 1200       | 1500       | 1600       | 2100       | 2600       | 4500       | 5500       | 7000        | 8000        | 8000        | 10000       |
| A               | 600        | 600        | 800        | 1000       | 800        | 1200       | 1900       | 2300       | 3200       | 4400       | 5600        | 6900        | 7000        | 8000        |
| A               | 450        | 450        | 400        | 500        | 600        | 700        | 850        | 1000       | -          | -          | -           | -           | -           | -           |
| <b>A</b>        | <b>160</b> | <b>200</b> | <b>200</b> | <b>250</b> | <b>300</b> | <b>350</b> | <b>450</b> | <b>600</b> | <b>700</b> | <b>800</b> | <b>1000</b> | <b>1100</b> | <b>1200</b> | <b>1350</b> |
| kW              | 60         | 76         | 76         | 95         | 114        | 133        | 171        | 228        | 266        | 304        | 381         | 419         | 457         | 514         |
| kW              | 63         | 79         | 79         | 99         | 119        | 139        | 179        | 238        | 279        | 318        | 398         | 438         | 478         | 537         |
| kW              | 66         | 83         | 83         | 103        | 124        | 145        | 187        | 249        | 291        | 332        | 415         | 457         | 498         | 561         |
| kW              | 105        | 131        | 131        | 165        | 197        | 230        | 296        | 394        | 460        | 526        | 658         | 724         | 789         | 888         |
| kW              | 110        | 138        | 138        | 173        | 208        | 242        | 311        | 415        | 485        | 554        | 692         | 762         | 831         | 935         |
| kW              | 115        | 143        | 143        | 179        | 215        | 251        | 323        | 430        | 503        | 574        | 718         | 790         | 862         | 970         |
| kW              | 121        | 152        | 152        | 190        | 228        | 266        | 342        | 456        | 533        | 609        | 762         | 838         | 914         | 1028        |
| kW              | 138        | 173        | 173        | 216        | 260        | 303        | 389        | 518        | 606        | 692        | 866         | 952         | 1039        | 1169        |
| kW              | 182        | 228        | 228        | 285        | 343        | 400        | 514        | 684        | 800        | 914        | 1143        | 1257        | 1371        | 1543        |
| kW              | 191        | 239        | 239        | 298        | 358        | 418        | 537        | 715        | 836        | 955        | 1195        | 1314        | 1434        | 1613        |
| kW              | 221        | 277        | 216        | 345        | 415        | 433        | 546        | 727        | 692        | 911        | -           | -           | -           | -           |
| A               | 145        | 170        | 170        | 180        | 200        | 280        | 360        | 400        | 550        | 600        | 800         | 875         | 960         | 1080        |
| kW              | 55         | 64         | 64         | 68         | 76         | 106        | 137        | 152        | 209        | 228        | 304         | 333         | 365         | 411         |
| kW              | 57         | 67         | 67         | 71         | 79         | 111        | 143        | 159        | 219        | 239        | 318         | 348         | 382         | 430         |
| kW              | 59         | 70         | 70         | 74         | 83         | 116        | 150        | 166        | 228        | 249        | 332         | 363         | 399         | 448         |
| kW              | 95         | 111        | 111        | 118        | 131        | 184        | 237        | 263        | 362        | 395        | 526         | 575         | 631         | 710         |
| kW              | 100        | 117        | 117        | 124        | 138        | 193        | 249        | 277        | 381        | 415        | 554         | 606         | 665         | 748         |
| kW              | 104        | 122        | 122        | 129        | 143        | 201        | 259        | 287        | 395        | 431        | 575         | 628         | 690         | 776         |
| kW              | 110        | 129        | 129        | 137        | 152        | 213        | 274        | 304        | 419        | 457        | 609         | 666         | 731         | 823         |
| kW              | 125        | 147        | 147        | 155        | 173        | 242        | 312        | 346        | 476        | 519        | 692         | 757         | 831         | 935         |
| kW              | 165        | 194        | 194        | 205        | 228        | 320        | 412        | 457        | 628        | 685        | 914         | 1000        | 1097        | 1234        |
| kW              | 173        | 202        | 202        | 215        | 239        | 334        | 430        | 478        | 657        | 717        | 956         | 1045        | 1147        | 1290        |
| kW              | 166        | 187        | 216        | 277        | 346        | 388        | 499        | 554        | 692        | 866        | -           | -           | -           | -           |
| mm <sup>2</sup> | 95         | 120        | 95         | 95         | 120        | 240        | 2x150      | 2x(30x6)   | 2x(40x5)   | 2x(50x5)   | 2x(60x5)    | 2x(60x6)    | 2x(60x6)    | 2x(60x8)    |
| A               | 90         | 115        | 115        | 150        | 175        | 210        | 260        | 315        | 450        | 550        | 700         | 860         | 1000        | 1200        |
| A               | 90         | 115        | 115        | 150        | 175        | 210        | 260        | 315        | 450        | 550        | 700         | 860         | 1000        | 1200        |
| A               | 90         | 115        | 115        | 150        | 175        | 210        | 260        | 315        | 450        | 550        | 700         | 860         | 1000        | 1200        |
| <b>A</b>        | <b>90</b>  | <b>115</b> | <b>115</b> | <b>150</b> | <b>175</b> | <b>210</b> | <b>260</b> | <b>315</b> | <b>450</b> | <b>550</b> | <b>700</b>  | <b>860</b>  | <b>1000</b> | <b>1200</b> |
| A               | 90         | 115        | 115        | 150        | 175        | 210        | 260        | 315        | 450        | 550        | 700         | 860         | 1000        | 1200        |
| A               | 90         | 115        | 115        | 150        | 175        | 210        | 260        | 315        | 450        | 550        | 700         | 860         | 1000        | 1200        |
| A               | 79         | 79         | 115        | 150        | 175        | 210        | 260        | 315        | 450        | 550        | 700         | 860         | 1000        | 1200        |
| A               | 60         | 60         | 100        | 120        | 140        | 150        | 180        | 240        | 400        | 500        | 630         | 700         | 860         | 1000        |
| A               | 45         | 45         | 45         | 60         | 70         | 85         | 100        | 125        | 200        | 250        | -           | -           | -           | -           |
| kW              | 25         | 33         | 30         | 40         | 50         | 60         | 75         | 90         | 132        | 175        | 225         | 280         | 325         | 390         |
| kW              | 27         | 35         | 35         | 45         | 55         | 65         | 80         | 100        | 140        | 185        | 235         | 290         | 335         | 400         |
| <b>kW</b>       | <b>45</b>  | <b>55</b>  | <b>55</b>  | <b>75</b>  | <b>90</b>  | <b>110</b> | <b>132</b> | <b>160</b> | <b>250</b> | <b>300</b> | <b>400</b>  | <b>500</b>  | <b>580</b>  | <b>680</b>  |
| kW              | 49         | 63         | 59         | 80         | 95         | 115        | 140        | 180        | 257        | 315        | 415         | 515         | 600         | 710         |
| kW              | 49         | 63         | 63         | 85         | 100        | 125        | 150        | 190        | 270        | 335        | 450         | 530         | 630         | 750         |
| kW              | 55         | 55         | 75         | 90         | 100        | 132        | 160        | 210        | 300        | 375        | 500         | 600         | 720         | 850         |
| kW              | 55         | 55         | 90         | 110        | 132        | 132        | 160        | 210        | 375        | 500        | 630         | 700         | 850         | 1000        |
| kW              | 55         | 55         | 55         | 75         | 90         | 110        | 132        | 160        | 280        | 355        | -           | -           | -           | -           |

# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts   | Type               | K(G)3-10  | K(G)3-14   | K(G)3-18   | K(G)3-22   | K(G)3-24   | K(G)3-32  | K(G)3-40    | K3-50     | K3-62     | K3-74     |
|---|--------------------|-----------|------------|------------|------------|--|-----------|-------------|-----------|-----------|-----------|
| <b>Utilization category AC4</b>   |                    |           |            |            |            |  |           |             |           |           |           |
| <b>Switching of squirrel cage motors, inching</b>                           |                    |           |            |            |            |  |           |             |           |           |           |
| Rated operational current $I_e$   | 220V A             | 12        | 15         | 18         | 18         | 24   | 30        | 40          | 50        | 63        | 63        |
| open and enclosed   | 230V A             | 11,5      | 14,5       | 18         | 18         | 24   | 30        | 40          | 50        | 62        | 62        |
|   | 240V A             | 11        | 14         | 18         | 18         | 24   | 32        | 40          | 50        | 62        | 62        |
|   | <b>380-400V A</b>  | <b>10</b> | <b>14</b>  | <b>18</b>  | <b>18</b>  | <b>24</b>  | <b>32</b> | <b>40</b>   | <b>50</b> | <b>62</b> | <b>62</b> |
|   | 415V A             | 9         | 14         | 18         | 18         | 23   | 30        | 37          | 45        | 60        | 60        |
|   | 440V A             | 9         | 14         | 18         | 18         | 23   | 30        | 37          | 45        | 55        | 55        |
|   | 500V A             | 9         | 12         | 16         | 16         | 17,5   | 21        | 21          | 33        | 42        | 42        |
|   | 660V A             | 7         | 9          | 9          | 9          | 17   | 20        | 20          | 31        | 40        | 40        |
|   | 690V A             | 6,5       | 8,5        | 8,5        | 8,5        | 17   | 20        | 20          | 31        | 40        | 40        |
|   | 1000V A            | -         | -          | -          | -          | -  | -         | -           | -         | -         | -         |
| Rated operational power of three-phase motors 50-60Hz                       | 220-230V kW        | 3         | 4          | 5          | 5          | 6  | 8,5       | 11          | 12,5      | 18,5      | 18,5      |
|   | 240V kW            | 3         | 4          | 5          | 5          | 7  | 9         | 11,5        | 13,5      | 19        | 19        |
|   | <b>380-400V kW</b> | <b>4</b>  | <b>5,5</b> | <b>7,5</b> | <b>7,5</b> | <b>11</b>  | <b>15</b> | <b>18,5</b> | <b>22</b> | <b>30</b> | <b>30</b> |
|   | 415V kW            | 4,5       | 6          | 8,5        | 8,5        | 12   | 16        | 20          | 24        | 33        | 33        |
|   | 440V kW            | 4,5       | 6          | 8,5        | 8,5        | 12   | 16        | 20          | 24        | 33        | 33        |
|   | 500V kW            | 5,5       | 7,5        | 10         | 10         | 15   | 18,5      | 18,5        | 30        | 37        | 37        |
|   | 660-690V kW        | 5,5       | 7,5        | 10         | 10         | 15   | 18,5      | 18,5        | 30        | 37        | 37        |
|   | 1000V kW           | -         | -          | -          | -          | -  | -         | -           | -         | -         | -         |
| <b>Utilization category AC5a</b>  |                    |           |            |            |            |  |           |             |           |           |           |
| <b>Switching of gas discharge lamps</b>                                     |                    |           |            |            |            |  |           |             |           |           |           |
| Rated operational current $I_e$ per pole at 220/230V                        |                    |           |            |            |            |  |           |             |           |           |           |
| Fluorescent lamps, uncompensated and serial compensated                     | A                  | 20        | 20         | 25         | 25         | 40   | 52        | 64          | 88        | 96        | 104       |
| parallel compensated  | A                  | 7         | 9          | 9          | 9          | 18   | 22        | 22          | 30        | 40        | 40        |
| dual-connection   | A                  | 22,5      | 22,5       | 28         | 28         | 45   | 58        | 72          | 98        | 108       | 117       |
| Metal halide lamps <sup>1)</sup> , uncompensated                            | A                  | 12        | 15         | 19         | 19         | 30   | 39        | 48          | 66        | 72        | 78        |
| parallel compensated  | A                  | 7         | 9          | 9          | 9          | 18   | 22        | 22          | 30        | 40        | 40        |
| Mercury-vapour lamps <sup>2)</sup> , uncompensated                          | A                  | 22,5      | 25         | 28         | 28         | 45   | 58        | 72          | 99        | 108       | 117       |
| parallel compensated  | A                  | 7         | 9          | 9          | 9          | 18   | 22        | 22          | 30        | 40        | 40        |
| Mixed light lamps <sup>3)</sup>   | A                  | 20        | 20         | 25         | 25         | 40   | 52        | 64          | 88        | 96        | 104       |
| <b>LED-Lamps</b>  |                    |           |            |            |            |  |           |             |           |           |           |
| consider the inrush current of the lamp ballast and $\cos\phi$ of the lamp. |                    |           |            |            |            |  |           |             |           |           |           |
| max. lamps per pole ( $I_{rLED} \leq I_{rn}$ )                              |                    |           |            |            |            | = $\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$ |           |             |           |           |           |
| max inrush current of contactor   | A                  | 282       | 282        | 282        | 282        | 564  | 705       | 705         | 987       | 1269      | 1268      |
| <b>Utilization category AC5b</b>  |                    |           |            |            |            |  |           |             |           |           |           |
| <b>Switching of incandescent lamps <sup>4)</sup></b>                        |                    |           |            |            |            |  |           |             |           |           |           |
| Rated operational current $I_e$ per pole at 220/230V                        | A                  | 12,5      | 12,5       | 12,5       | 12,5       | 25   | 31        | 31          | 43        | 56        | 56        |

1) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

2) High-pressure lamps

3) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

4) Current inrush approx.  $16 \times I_e$

# Contactors

Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Type      | K3-90  | K3-115    | K3-151    | K3-176    | K3-210    | K3-260     | K3-316     | K3-450     | K3-550     | K3-700     | K3-860     | K3-1000    | K3-1200    |
|-----------|--|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|
| A         | 85   | 98        | 55        | 63        | 85        | 100        | 120        | 150        | 180        | 230        | 280        | 340        | 400        |
| A         | 85   | 98        | 55        | 63        | 85        | 100        | 120        | 150        | 180        | 230        | 280        | 340        | 400        |
| A         | 85   | 98        | 55        | 63        | 85        | 100        | 120        | 150        | 180        | 230        | 280        | 340        | 400        |
| <b>A</b>  | <b>85</b>  | <b>85</b> | <b>55</b> | <b>63</b> | <b>85</b> | <b>100</b> | <b>120</b> | <b>150</b> | <b>180</b> | <b>230</b> | <b>280</b> | <b>340</b> | <b>400</b> |
| A         | 85   | 85        | 55        | 63        | 85        | 100        | 120        | 150        | 180        | 230        | 280        | 340        | 400        |
| A         | 85   | 85        | 55        | 63        | 85        | 100        | 120        | 150        | 180        | 230        | 280        | 340        | 400        |
| A         | 85   | 85        | -         | -         | -         | -          | -          | -          | -          | -          | -          | -          | -          |
| A         | 60   | 60        | -         | -         | -         | -          | -          | -          | -          | -          | -          | -          | -          |
| A         | 57,5   | 57,5      | -         | -         | -         | -          | -          | -          | -          | -          | -          | -          | -          |
| A         | -  | -         | -         | -         | -         | -          | -          | -          | -          | -          | -          | -          | -          |
| kW        | 25   | 30        | 15        | 18,5      | 25        | 30         | 37         | 45         | 51         | 68         | 80         | 110        | 132        |
| kW        | 27   | 32        | 15,5      | 19        | 26        | 31         | 38         | 47         | 53         | 71         | 83         | 115        | 137        |
| <b>kW</b> | <b>45</b>  | <b>45</b> | <b>25</b> | <b>30</b> | <b>45</b> | <b>55</b>  | <b>63</b>  | <b>75</b>  | <b>90</b>  | <b>120</b> | <b>150</b> | <b>185</b> | <b>220</b> |
| kW        | 49   | 49        | 25        | 33        | 45        | 55         | 65         | 80         | 100        | 132        | 160        | 200        | 230        |
| kW        | 49   | 49        | 30        | 34        | 48        | 55         | 67         | 85         | 100        | 132        | 160        | 200        | 230        |
| kW        | 55   | 55        | 25        | 30        | 55        | 65         | 75         | 100        | 110        | 150        | 185        | 220        | 257        |
| kW        | 55   | 55        | 25        | 30        | 55        | 65         | 75         | 100        | 110        | 150        | 185        | 220        | 257        |
| kW        | -  | -         | -         | -         | -         | -          | -          | -          | -          | -          | -          | -          | -          |
| A         | 100  | 120       | 120       | 140       | 180       | 220        | 280        | 360        | 450        | 570        | 700        | 850        | 1000       |
| A         | 55   | 70        | 85        | 100       | 130       | 160        | 200        | 300        | 360        | 460        | 550        | 660        | 800        |
| A         | 112  | 144       | 120       | 140       | 180       | 220        | 280        | 360        | 450        | 570        | 700        | 850        | 1000       |
| A         | 85   | 90        | 95        | 110       | 140       | 180        | 230        | 300        | 380        | 490        | 610        | 750        | 890        |
| A         | 55   | 70        | 75        | 85        | 110       | 140        | 170        | 260        | 300        | 400        | 480        | 580        | 700        |
| A         | 112  | 144       | 120       | 140       | 180       | 220        | 280        | 360        | 450        | 570        | 700        | 850        | 1000       |
| A         | 55   | 70        | 75        | 85        | 110       | 140        | 170        | 260        | 300        | 400        | 480        | 580        | 700        |
| A         | 100  | 120       | 100       | 120       | 160       | 200        | 250        | 320        | 400        | 500        | 600        | 700        | 800        |
|           | $\text{max. lamps per pole } (I_{nLED} \leq I_n) = \frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$ |           |           |           |           |            |            |            |            |            |            |            |            |
| A         | 1551   | 1692      | 2115      | 2820      | 2961      | 3666       | 4512       | 6345       | 7755       | 9870       | 12126      | 14100      | 16920      |
| A         | 69   | 75        | 100       | 120       | 160       | 190        | 220        | 260        | 315        | 440        | 500        | 560        | 630        |

# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts                                      |                   | Type | K(G)3-10 | K(G)3-14 | K(G)3-18 | K(G)3-22 | K(G)3-24 | K(G)3-32 | K(G)3-40 | K3-50 | K3-62 | K3-74             |
|--|-------------------|------|----------|----------|----------|----------|----------|----------|----------|-------|-------|-------------------|
| <b>Utilization category AC6a</b>                   |                   |      |          |          |          |          |          |          |          |       |       |                   |
| <b>Transformer primary switching</b>               |                   |      |          |          |          |          |          |          |          |       |       |                   |
| at inrush  |                   | n    | 30       | 30       | 30       | 30       | 30       | 30       | 30       | 30    | 30    | 30                |
| Rated operational current $I_e$                    | 400V              | A    | 4,5      | 5,5      | 7,5      | 7,5      | 10,5     | 13,5     | 13,5     | 20    | 27    | 33                |
| Rated operational power                            | 220-230V          | kVA  | 1,8      | 2,2      | 3        | 3        | 4,2      | 5,4      | 5,4      | 8     | 10,7  | 13                |
| dependent on inrush n                              | 240V              | kVA  | 1,9      | 2,3      | 3,1      | 3,1      | 4,3      | 5,6      | 5,6      | 8,3   | 11,2  | 13,5              |
|  | 380-400V          | kVA  | 3,1      | 3,8      | 5,2      | 5,2      | 7,3      | 9,3      | 9,3      | 13,5  | 18,5  | 22,5              |
| For different inrush-factors x                     | 415-440V          | kVA  | 3,4      | 4,2      | 5,7      | 5,7      | 8        | 10,2     | 10,2     | 15    | 20,5  | 25                |
| use the following formula:                         | 500V              | kVA  | 3,9      | 4,8      | 6,5      | 6,5      | 9        | 11,5     | 11,5     | 17    | 23    | 28                |
| $P_x = P_n * (n/x)$                                | 660-690V          | kVA  | 5,4      | 6,5      | 9        | 9        | 12,5     | 16       | 16       | 24    | 32    | 39                |
| <b>Utilization category AC6b</b>                   |                   |      |          |          |          |          |          |          |          |       |       |                   |
| <b>Switching of three-phase capacitors</b>         |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Maximum inrush current (peak value)                |                   |      |          |          |          |          |          |          |          |       |       |                   |
| as multiple k of the                               |                   |      |          |          |          |          |          |          |          |       |       |                   |
| capacitor rated current                            |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Rated operational current $I_e$                    | 500V              | k    | 35       | 25       | 20       | 20       | 25       | 25       | 25       | 25    | 25    | 20                |
|  |                   | A    | 8        | 12       | 15,5     | 15,5     | 23       | 32       | 32       | 45    | 60    | 70                |
| Rated operational current                          | 220-230V          | kVAr | 3        | 4,5      | 6        | 6        | 8,5      | 12       | 12       | 17    | 24    | 28                |
| ( $\sin\phi=1$ )                                   | 240V              | kVAr | 3,5      | 5        | 6,5      | 6,5      | 9,5      | 13       | 13       | 18,5  | 25    | 29                |
|  | 380-400V          | kVAr | 5        | 7,5      | 10       | 10       | 15       | 20       | 20       | 29    | 39    | 46                |
| For different multiples x                          | 415-440V          | kVAr | 5,5      | 8        | 11       | 11       | 16       | 22       | 22       | 32    | 43    | 50                |
| use the following formula:                         | 500V              | kVAr | 7        | 10       | 13       | 13       | 20       | 26       | 26       | 39    | 50    | 58                |
| $P_x = P_k * (k/x)$                                | 660-690V          | kVAr | 7        | 10       | 13       | 13       | 20       | 26       | 26       | 40    | 50    | 58                |
| <b>Switching of reactive capacitor banks</b>       |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Rated operational current $I_e$                    | 690V              | A    | 8        | 13       | 18       | 20       | 28       | 36       | 42       | 48    | 72    | 108 <sup>1)</sup> |
| Rated operational power                            | 220-230V          | kVAr | 2,9      | 5        | 7        | 7,5      | 11       | 14       | 16       | 20    | 28    | 33                |
|  | 240V              | kVAr | 3,1      | 5,4      | 7        | 8        | 11       | 14       | 17       | 20    | 28    | 36                |
|  | 380-400V          | kVAr | 5        | 9        | 12,5     | 13       | 20       | 25       | 27,5     | 33,3  | 50    | 75 <sup>1)</sup>  |
|  | 415-440V          | kVAr | 5,5      | 9,5      | 13       | 14       | 22       | 27       | 30       | 36    | 53    | 75 <sup>1)</sup>  |
|  | 500V              | kVAr | 6        | 11       | 15       | 17       | 25       | 30       | 36       | 40    | 60    | 75                |
|  | 660-690V          | kVAr | 8        | 15       | 20       | 22       | 33       | 41       | 48       | 55    | 82    | 100               |
|  | 1000V             | kVAr | -        | -        | -        | -        | -        | -        | -        | -     | -     | -                 |
| <b>Utilization category DC1</b>                    |                   |      |          |          |          |          |          |          |          |       |       |                   |
| <b>Switching of resistive load</b>                 |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Time constant $L/R \leq 1ms$                       |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Rated operational current $I_e$                    | 1 pole            | 24V  | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 60V  | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 110V | A        | 6        | 6        | 6        | 6        | 10       | 10       | 12    | 12    | 12                |
|  |                   | 220V | A        | 0,8      | 0,8      | 0,8      | 0,8      | 1,4      | 1,4      | 1,4   | 1,4   | 1,4               |
|  | 3 poles in series | 24V  | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 60V  | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 110V | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 220V | A        | 16       | 20       | 20       | 20       | 30       | 35       | 35    | 63    | 80                |
| <b>Utilization category DC3 and DC5</b>            |                   |      |          |          |          |          |          |          |          |       |       |                   |
| <b>Switching of shunt motors and series motors</b> |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Time constant $L/R \leq 15ms$                      |                   |      |          |          |          |          |          |          |          |       |       |                   |
| Rated operational current $I_e$                    | 1 pole            | 24V  | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 60V  | A        | 6        | 6        | 6        | 6        | 30       | 30       | 30    | 60    | 60                |
|  |                   | 110V | A        | 1,2      | 1,2      | 1,2      | 1,2      | 1,8      | 1,8      | 1,8   | 1,8   | 1,8               |
|  |                   | 220V | A        | 0,2      | 0,2      | 0,2      | 0,2      | 0,2      | 0,2      | 0,2   | 0,25  | 0,25              |
|  | 3 poles in series | 24V  | A        | 20       | 25       | 32       | 32       | 50       | 65       | 80    | 110   | 130               |
|  |                   | 60V  | A        | 20       | 25       | 32       | 32       | 40       | 40       | 40    | 80    | 80                |
|  |                   | 110V | A        | 20       | 20       | 20       | 20       | 40       | 40       | 40    | 80    | 80                |
|  |                   | 220V | A        | 2,5      | 2,5      | 2,5      | 2,5      | 4        | 4        | 4     | 5     | 5                 |

1) Consider resistive load ( $I_{ln}$ ). see page 62

# Contactors




Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Type | K3-90 | K3-115 | K3-151 | K3-176 | K3-210 | K3-260 | K3-316 | K3-450 | K3-550 | K3-700 | K3-860 | K3-1000 | K3-1200 |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| n    | 30    | 30     | 30     | 30     | 30     | 30     | 30     | 30     | 30     | 30     | 30     | 30      | 30      |
| A    | 38    | 50     | 65     | 80     | 90     | 120    | 142    | 203    | 248    | 315    | 390    | 450     | 540     |
| kVA  | 15    | 20     | 25     | 30     | 34     | 45     | 54     | 77     | 95     | 120    | 148    | 170     | 200     |
| kVA  | 15,5  | 20,5   | 27     | 33     | 37     | 50     | 59     | 80     | 100    | 130    | 160    | 185     | 220     |
| kVA  | 26    | 34     | 45     | 55     | 60     | 80     | 95     | 140    | 170    | 210    | 270    | 310     | 370     |
| kVA  | 29    | 38     | 46     | 57     | 63     | 85     | 100    | 145    | 175    | 220    | 280    | 320     | 380     |
| kVA  | 33    | 43     | 55     | 69     | 75     | 100    | 120    | 170    | 210    | 270    | 330    | 380     | 460     |
| kVA  | 45    | 60     | 56     | 69     | 100    | 135    | 160    | 200    | 250    | 320    | 350    | 500     | 600     |
| k    | 20    | 20     | 20     | 20     | 25     | 20     | 20     | 20     | 20     | 20     | 20     | 20      | 20      |
| A    | 87    | 100    | 120    | 155    | 195    | 225    | 255    | 300    | 370    | 440    | 520    | 680     | 760     |
| kVAr | 33    | 38     | 45     | 60     | 75     | 90     | 100    | 115    | 145    | 170    | 200    | 260     | 290     |
| kVAr | 36    | 42     | 52     | 62     | 78     | 94     | 104    | 120    | 150    | 175    | 205    | 270     | 300     |
| kVAr | 57    | 65     | 80     | 100    | 130    | 155    | 170    | 200    | 250    | 300    | 350    | 450     | 500     |
| kVAr | 60    | 70     | 95     | 110    | 135    | 165    | 175    | 210    | 260    | 310    | 360    | 465     | 520     |
| kVAr | 70    | 80     | 100    | 130    | 170    | 194    | 220    | 260    | 320    | 380    | 450    | 590     | 660     |
| kVAr | 70    | 80     | 100    | 130    | 170    | 194    | 220    | 260    | 320    | 380    | 450    | 590     | 660     |
| A    | 115   | 144    | 115    | 140    | 200    | 225    | 250    | 330    | 420    | 550    | 600    | 680     | 760     |
| kVAr | 45    | 55     | 43     | 53     | 76     | 85     | 95     | 125    | 160    | 209    | 228    | 260     | 290     |
| kVAr | 45    | 55     | 45     | 55     | 80     | 90     | 100    | 130    | 170    | 220    | 240    | 280     | 310     |
| kVAr | 80    | 100    | 75     | 90     | 130    | 145    | 160    | 210    | 270    | 350    | 390    | 440     | 480     |
| kVAr | 100   | 120    | 80     | 100    | 140    | 160    | 170    | 230    | 290    | 380    | 420    | 470     | 530     |
| kVAr | 105   | 125    | 95     | 120    | 170    | 190    | 210    | 280    | 350    | 450    | 500    | 570     | 640     |
| kVAr | 120   | 148    | 125    | 150    | 200    | 230    | 260    | 350    | 450    | 600    | 650    | 700     | 800     |
| kVAr | 160   | 200    | 155    | 200    | 300    | 340    | 400    | 500    | 650    | -      | -      | -       | -       |
| A    | 160   | 200    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 160   | 200    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 20    | 25     | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 2     | 2,5    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 160   | 200    | 200    | 250    | 350    | 400    | 450    | 600    | 760    | 1000   | 1100   | 1200    | 1350    |
| A    | 160   | 200    | 200    | 250    | 350    | 400    | 450    | 600    | 760    | 1000   | 1100   | 1200    | 1350    |
| A    | 160   | 200    | 150    | 170    | 250    | 280    | 315    | 400    | 480    | 560    | 630    | 800     | 900     |
| A    | 100   | 160    | 80     | 100    | 150    | 180    | 200    | 250    | 315    | 400    | 450    | 500     | 600     |
| A    | 160   | 200    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 85    | 110    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 2     | 2,5    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 0,5   | 0,5    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 160   | 200    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 100   | 110    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 100   | 110    | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |
| A    | 7     | 8      | -      | -      | -      | -      | -      | -      | -      | -      | -      | -       | -       |

Contactors, Motor-Starters  
Circuit Breakers  
Manual Motor-Starters  
Switches  
AC-Main Switches  
DC-Switch Disconnectors  
Push Buttons  
Representatives, Suppliers

# Contactors

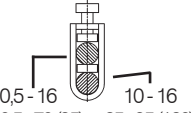





## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts   | Type                              | K(G)3-10   | K(G)3-14 | K(G)3-18 | K(G)3-22   | K(G)3-24 | K(G)3-32 | K(G)3-40   | K3-50 | K3-62 | K3-74 |
|---|-----------------------------------|--|----------|----------|--|----------|----------|--|-------|-------|-------|
| <b>Maximum ambient temperature</b>  |                                   |  |          |          |  |          |          |  |       |       |       |
| Operation   | open                              | -40 to +60 (+90) <sup>1)</sup>   |          |          |  |          |          |  |       |       |       |
|   | enclosed                          | -40 to +40   |          |          |  |          |          |  |       |       |       |
| with thermal overload relay   | open                              | -25 to +60   |          |          |  |          |          |  |       |       |       |
| enclosed  |                                   | -25 to +40   |          |          |  |          |          |  |       |       |       |
| Storage   |                                   | -50 to +90   |          |          |  |          |          |  |       |       |       |
| <b>Short circuit protection</b> without O/L relay   |                                   |  |          |          |  |          |          |  |       |       |       |
| Rated short circuit current   | "I <sub>r</sub> "                 | 10   | 10       | 10       | 10   | 10       | 10       | 10   | 10    | 10    | 10    |
|   | "I <sub>q</sub> "                 | -  | -        | -        | -  | -        | -        | -  | -     | -     | -     |
| Coordination-type "1" according to IEC 947-4-1  |                                   |  |          |          |  |          |          |  |       |       |       |
| Contact welding without hazard of persons   |                                   |  |          |          |  |          |          |  |       |       |       |
| max. fuse size  | gL (gG) A                         | 63   | 63       | 63       | 63   | 100      | 100      | 100  | 160   | 160   | 160   |
| Coordination-type "2" according to IEC 947-4-1  |                                   |  |          |          |  |          |          |  |       |       |       |
| Light contact welding accepted  |                                   |  |          |          |  |          |          |  |       |       |       |
| max. fuse size  | gL (gG) A                         | 25   | 35       | 35       | 35   | 50       | 50       | 50   | 100   | 125   | 125   |
| Contact welding not accepted  |                                   |  |          |          |  |          |          |  |       |       |       |
| max. fuse size  | gL (gG) A                         | 16   | 16       | 16       | 16   | 25       | 35       | 35   | 50    | 63    | 63    |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |                                   |  |          |          |  |          |          |  |       |       |       |
| <b>Cable cross-sections</b>   |                                   |  |          |          |  |          |          |  |       |       |       |
| for contactors without thermal overload relay   |                                   |  |          |          |  |          |          |  |       |       |       |
| 1 cable per clamp   |                                   |  |          |          |  |          |          |  |       |       |       |
| main connector  | solid or stranded                 |  |          |          |  |          |          |  |       |       |       |
|   | flexible                          | 0,75 - 6   |          |          | 1,5 - 25   |          |          | 4 - 50   |       |       |       |
|   | flexible with multicore cable end | 1 - 4  |          |          | 2,5 - 16   |          |          | 10 - 35  |       |       |       |
| 2 cables per clamp  |                                   |  |          |          |  |          |          |  |       |       |       |
| main connector  | solid or stranded                 | 6+(1-6) / 4+(0,75-4)   |          |          | 16+(2,5-16) / 10+(4-16)  |          |          | 50+4 / 35+6 / 25+(6-16)  |       |       |       |
|   | flexible                          | 2,5+(0,75-2,5) / 1,5+(0,75-1,5)  |          |          | 6+(4-16) / 4+(2,5-16)  |          |          | 16+(6-16) / 10+(6-16)  |       |       |       |
| 1 cable per clamp   |                                   |  |          |          |  |          |          |  |       |       |       |
| main connector  | solid                             | 18 - 10  |          |          | 16 - 10  |          |          | 12 - 10  |       |       |       |
|   | flexible                          | 18 - 10  |          |          | 14 - 4   |          |          | 10 - 0   |       |       |       |
| 2 cables per clamp  |                                   |  |          |          |  |          |          |  |       |       |       |
| main connector  | solid                             | 10+(16-10) / 12+(18-12)  |          |          | 10+(16-10) / 12+(18-12)  |          |          | 10+(12-10) / 12+12   |       |       |       |
|   | flexible                          | 14+(18-14) / 16+(18-16)  |          |          | 14+(18-14) / 16+(18-16)  |          |          | 1+(12-10) / 2+(8-12)   |       |       |       |
| <b>Frequency of operations z</b>  |                                   |  |          |          |  |          |          |  |       |       |       |
| Contactors without thermal overload relay   |                                   |  |          |          |  |          |          |  |       |       |       |
| without load  | 1/h                               | 10000  |          |          | 7000   |          |          | 7000   |       |       |       |
| AC3, I <sub>e</sub>   | 1/h                               | 600  |          |          | 600  |          |          | 400  |       |       |       |
| AC4, I <sub>e</sub>   | 1/h                               | 120  |          |          | 120  |          |          | 120  |       |       |       |
| DC3, I <sub>e</sub>   | 1/h                               | 600  |          |          | 600  |          |          | 400  |       |       |       |
| <b>Mechanical life</b>  |                                   |  |          |          |  |          |          |  |       |       |       |
| AC operated   | S x 10 <sup>6</sup>               | 10   |          |          | 10   |          |          | 10   |       |       |       |
| DC operated   | S x 10 <sup>6</sup>               | 10   |          |          | 10   |          |          | 10   |       |       |       |
| DC-solenoid operated (KG3)  | S x 10 <sup>6</sup>               | 50   |          |          | 50   |          |          | -  |       |       |       |
| <b>Short time current</b>   |                                   |  |          |          |  |          |          |  |       |       |       |
| 10s-current   | A                                 | 96   | 120      | 144      | 176  | 184      | 240      | 296  | 450   | 504   | 592   |
| 120s-current  | A                                 | 42   | 52       | 58       | 66   | 80       | 97       | 110  | 195   | 203   | 222   |
| <b>Power loss per pole</b>  |                                   |  |          |          |  |          |          |  |       |       |       |
| contact resistance  | at I <sub>e</sub> /AC3 400V       | 0,21   | 0,35     | 0,5      | 0,75   | 0,7      | 1,3      | 2  | 2,2   | 3,9   | 5,5   |
|   | mOhm                              | 2,1  | 1,8      | 1,5      | 1,5  | 1,2      | 1,2      | 1,2  | 1     | 1     | 1     |
| <b>Resistance to shock acc. to IEC 60068-2-27</b>   |                                   |  |          |          |  |          |          |  |       |       |       |
| Shock time 20ms sine-wave   | NO                                | 10   | 10       | 10       | 10   | 8        | 8        | 8  | 8     | 8     | 8     |
|   | NC                                | 6  | 6        | 6        | 6  | -        | -        | -  | -     | -     | -     |

1) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>e</sub>/AC1, no deratings for I<sub>e</sub>/AC3 values.

# Contactors

Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Type                | K3-90  | K3-115      | K3-116  | K3-151 | K3-176  | K3-210 | K3-260  | K3-316 | K3-450  | K3-550 | K3-700  | K3-860 | K3-1000   | K3-1200 |
|---------------------|--|-------------|---|--------|---|--------|---|--------|---|--------|---|--------|---|---------|
| °C                  | -40 bis +60 (+90) <sup>1)</sup>  |             |   |        |   |        |   |        |   |        |   |        |   |         |
| °C                  | -40 to +40   |             |   |        |   |        |   |        |   |        |   |        |   |         |
| °C                  | -25 to +60   |             |   |        |   |        |   |        |   |        |   |        |   |         |
| °C                  | -25 to +40   |             |   |        |   |        |   |        |   |        |   |        |   |         |
| °C                  | -50 to +90   |             |   |        |   |        |   |        |   |        |   |        |   |         |
| °C                  |  |             | -25 to +55 (+70) <sup>2)</sup>  |        |   |        |   |        |   |        |   |        |   |         |
| °C                  |  |             | -25 to +40  |        |   |        |   |        |   |        |   |        |   |         |
| °C                  |  |             | -25 to +55  |        |   |        |   |        |   |        |   |        |   |         |
| °C                  |  |             | -25 to +40  |        |   |        |   |        |   |        |   |        |   |         |
| °C                  |  |             | -55 to +80  |        |   |        |   |        |   |        |   |        |   |         |
| kA                  | 10   | 10          | -   | -      | -   | -      | -   | -      | -   | -      | -   | -      | -   | -       |
| kA                  | -  | -           | -   | -      | -   | -      | -   | -      | -   | -      | -   | -      | -   | -       |
| A                   | 250  | 250         | 200   | 250    | 315   | 400    | 450   | 500    | 630   | 630    | 800   | 1000   | 1000  | 1250    |
| A                   | 160  | 200         | 160   | 200    | 250   | 315    | 400   | 400    | 500   | 560    | -   | -      | -   | -       |
| A                   | 100  | 125         | 125   | 160    | 200   | 250    | 315   | -      | -   | -      | -   | -      | -   | -       |
| mm <sup>2</sup>     |  |             |  |        |  |        |  |        |  |        |  |        |  |         |
| mm <sup>2</sup>     | 0,5-16   | 10-16       | busbar<br>18 x 4  |        | busbar<br>25 x 6  |        | busbar<br>30 x 5  |        | busbar<br>40 x 6  |        | busbar<br>50 x 8  |        | busbar<br>50 x 8  |         |
| mm <sup>2</sup>     | 0,5-70 (95)  | 25-95 (120) | screw<br>M8   |        | screw<br>M10  |        | screw<br>M12  |        | screw<br>M12  |        | screw<br>M12  |        | screw<br>M14  |         |
| mm <sup>2</sup>     | 0,5-70   | 10-95       | M8  |        | M10   |        | M12   |        | M12   |        | M12   |        | M14   |         |
| mm <sup>2</sup>     | 0,5 - 95 + 10 - 120  |             |   |        |   |        |   |        |   |        |   |        |   |         |
| mm <sup>2</sup>     | 0,5 - 70 + 25 - 95   |             |   |        |   |        |   |        |   |        |   |        |   |         |
| mm <sup>2</sup>     |  |             |   |        |   |        |   |        |   |        |   |        |   |         |
| AWG                 | 18 - 10  | -           |   |        |   |        |   |        |   |        |   |        |   |         |
| AWG                 | 18 - 3/0   | 8 - 4/0     |   |        |   |        |   |        |   |        |   |        |   |         |
| AWG                 | -  | -           |   |        |   |        |   |        |   |        |   |        |   |         |
| AWG                 | 18 - 3/0 + 8 - 4/0   |             |   |        |   |        |   |        |   |        |   |        |   |         |
| 1/h                 | 3000   |             | 1200  |        | 1200  |        | 1200  |        | 1200  |        | 1200  |        | 300   |         |
| 1/h                 | 300  |             | 240   |        | 150   |        | 50  |        | 25  |        | 20  |        | 20  |         |
| 1/h                 | 120  |             | -   |        | -   |        | -   |        | -   |        | -   |        | -   |         |
| 1/h                 | 300  |             | -   |        | -   |        | -   |        | -   |        | -   |        | -   |         |
| S x 10 <sup>6</sup> | 5  |             | 10  |        | 5   |        | 5   |        | 5   |        | 5   |        | 5 <sup>3)</sup>   |         |
| S x 10 <sup>6</sup> | 5  |             | 10  |        | 5   |        | 5   |        | 5   |        | 5   |        | 5 <sup>3)</sup>   |         |
| S x 10 <sup>6</sup> | -  |             | -   |        | -   |        | -   |        | -   |        | -   |        | -   |         |
| A                   | 680  | 880         | 920   | 1200   | 1400  | 1800   | 2200  | 2600   | 3600  | 4400   | 5600  | 6900   | 8000  | 9600    |
| A                   | 275  | 330         | 410   | 500    | 575   | 800    | 900   | 1000   | 1400  | 1750   | 2200  | 2600   | 3000  | 3600    |
| W                   | 4,8  | 7,9         | 7,9   | 9      | 11  | 8      | 11  | 14,9   | 26,3  | 33,3   | 49  | 59,2   | 60  | 72      |
| mOhm                | 0,6  | 0,5         | 0,5   | 0,4    | 0,35  | 0,18   | 0,16  | 0,15   |   |        |   |        |   |         |
| g                   | 7  | 7           | -   | -      | -   | -      | -   | -      | -   | -      | -   | -      | -   | -       |
| g                   | 5  | 5           | -   | -      | -   | -      | -   | -      | -   | -      | -   | -      | -   | -       |

1) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>b</sub>/AC1, no deratings for I<sub>b</sub>/AC3 values.

2) With reduced control voltage range 1,0 x U<sub>s</sub> and with reduced rated current I<sub>b</sub>/AC1 no deratings for I<sub>b</sub>/AC3 values.

3) After each 1x10<sup>6</sup> operations magnetic core and built-in auxiliary contact block must be changed.



# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Auxiliary Contacts   |  |  | Type  | K(G)3-10              | K(G)3-14 | K(G)3-18 | K(G)3-22 | K(G)3-24              | K(G)3-32 | K(G)3-40 | K3-50 | K3-62 | K3-74 |  |
|--|--|--|---|-----------------------|----------|----------|----------|-----------------------|----------|----------|-------|-------|-------|--|
| <b>Rated insulation voltage <math>U_i</math> <sup>1)</sup></b>               |  |  | V~  | 690                   |          |          |          | -                     |          | -        |       |       |       |  |
| <b>Thermal rated current <math>I_{th}</math> to 690V</b>                     |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| Ambient temperature  |  |  | 40°C A  | 10                    |          |          |          | (16) <sup>5)</sup>    |          | -        |       |       |       |  |
|  |  |  | 60°C A  | 6                     |          |          |          | (12) <sup>5)</sup>    |          | -        |       |       |       |  |
| <b>Utilization category AC15</b>   |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| Rated operational current $I_e$  |  |  | 220-240V A  | 3                     |          |          |          | (12) <sup>5)</sup>    |          | -        |       |       |       |  |
|  |  |  | 380-415V A  | 2                     |          |          |          | (4) <sup>5)</sup>     |          | -        |       |       |       |  |
|  |  |  | 440V A  | 1,6                   |          |          |          | (4) <sup>5)</sup>     |          | -        |       |       |       |  |
|  |  |  | 500V A  | 1,2                   |          |          |          | (3) <sup>5)</sup>     |          | -        |       |       |       |  |
|  |  |  | 660-690V A  | 0,6                   |          |          |          | (1) <sup>5)</sup>     |          | -        |       |       |       |  |
| <b>Utilization category DC13</b>   |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| Rated operational current $I_e$  |  |  | 60V A   | 3,5                   |          |          |          | (8) <sup>5)</sup>     |          | -        |       |       |       |  |
|  |  |  | 110V A  | 0,5                   |          |          |          | (1) <sup>5)</sup>     |          | -        |       |       |       |  |
|  |  |  | 220V A  | 0,1                   |          |          |          |                       |          | -        |       |       |       |  |
| <b>Short circuit protection</b>  |  |  | For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse. |                       |          |          |          |                       |          |          |       |       |       |  |
| short-circuit current 1kA,<br>contact welding not accepted<br>max. fuse size |  |  | gL (gG) A   | 20                    |          |          |          | (25) <sup>5)</sup>    |          | -        |       | -     |       |  |
| <b>Control Circuit</b>   |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| <b>Power consumption of coils</b>  |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| AC operated  |  |  | inrush VA   | 33-45                 |          |          |          | 90-115                |          | 140-165  |       |       |       |  |
|  |  |  | sealed VA   | 7-10                  |          |          |          | 9-13                  |          | 13-18    |       |       |       |  |
|  |  |  | W   | 2,6-3                 |          |          |          | 2,7-4                 |          | 5,4-7    |       |       |       |  |
| DC operated  |  |  | inrush W  | 75                    |          |          |          | 140                   |          | 200      |       |       |       |  |
| double winding coil  |  |  | sealed W  | 2                     |          |          |          | 2                     |          | 6        |       |       |       |  |
| DC solenoid operated (KG3)   |  |  | inrush W  | 3                     |          |          |          | 4                     |          | -        |       |       |       |  |
|  |  |  | sealed W  | 3                     |          |          |          | 4                     |          | -        |       |       |       |  |
| <b>Operation range of coils</b>  |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| in multiples of control voltage $U_c$  |  |  | AC operated   | 0,85-1,1              |          |          |          | 0,85-1,1              |          | 0,85-1,1 |       |       |       |  |
|  |  |  | DC operated   | 0,8-1,1               |          |          |          | 0,8-1,1               |          | 0,8-1,1  |       |       |       |  |
| <b>Switching time</b> at control voltage $U_c \pm 10\%$ <sup>2) 3)</sup>     |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| AC operated  |  |  | make time ms  | 8-16                  |          |          |          | 10-25                 |          | 12-28    |       |       |       |  |
|  |  |  | release time ms   | 5-13                  |          |          |          | 8-15                  |          | 8-15     |       |       |       |  |
|  |  |  | arc duration ms   | 10-15                 |          |          |          | 10-15                 |          | 10-15    |       |       |       |  |
| DC operated  |  |  | make time ms  | 8-12                  |          |          |          | 10-20                 |          | 12-23    |       |       |       |  |
| double winding coil  |  |  | release time ms   | 8-13                  |          |          |          | 10-15                 |          | 10-18    |       |       |       |  |
|  |  |  | arc duration ms   | 10-15                 |          |          |          | 10-15                 |          | 10-15    |       |       |       |  |
| DC solenoid operated (KG3)   |  |  | make time ms  | 65 - 85               |          |          |          | 65 - 85               |          | -        |       |       |       |  |
|  |  |  | release time ms   | 20 - 30 <sup>4)</sup> |          |          |          | 20 - 30 <sup>4)</sup> |          | -        |       |       |       |  |
|  |  |  | arc duration ms   | 10-15                 |          |          |          | 10-15                 |          | -        |       |       |       |  |
| <b>Cable cross-section</b>   |  |  |   |                       |          |          |          |                       |          |          |       |       |       |  |
| Auxiliary connector  |  |  | solid mm <sup>2</sup>   | 0,75-6                |          |          |          | -                     |          | -        |       |       |       |  |
|  |  |  | flexible mm <sup>2</sup>  | 1-4                   |          |          |          | -                     |          | -        |       |       |       |  |
|  |  |  | flexible with multicore cable end mm <sup>2</sup>   | 0,75-4                |          |          |          | -                     |          | -        |       |       |       |  |
| Magnet coil  |  |  | solid mm <sup>2</sup>   | 0,75-2,5              |          |          |          | 0,75-2,5              |          | 0,75-2,5 |       |       |       |  |
|  |  |  | flexible mm <sup>2</sup>  | 0,5-2,5               |          |          |          | 0,5-2,5               |          | 0,5-2,5  |       |       |       |  |
|  |  |  | flexible with multicore cable end mm <sup>2</sup>   | 0,5-1,5               |          |          |          | 0,5-1,5               |          | 0,5-1,5  |       |       |       |  |
| Clamps per pole  |  |  |   | 2                     |          |          |          | 2                     |          | 2        |       |       |       |  |
| Auxiliary connector  |  |  | solid AWG   | 18 - 10               |          |          |          | -                     |          | -        |       |       |       |  |
|  |  |  | flexible AWG  | 18 - 10               |          |          |          | -                     |          | -        |       |       |       |  |
| Magnet coil  |  |  | solid AWG   | 14 - 12               |          |          |          | 14 - 12               |          | 14 - 12  |       |       |       |  |
|  |  |  | flexible AWG  | 18 - 12               |          |          |          | 18 - 12               |          | 18 - 12  |       |       |       |  |
| Clamps per pole  |  |  |   | 2                     |          |          |          | 2                     |          | 2        |       |       |       |  |

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request

2) Total breaking time = release time + arc duration

3) Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

4) with built-in coil suppressor 5) for contactors KG3-...A.. only

# Contactors

Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Type            | K3-90               | K3-115 | K3-116 | K3-151               | K3-176 | K3-210 | K3-260               | K3-316 | K3-450                           | K3-550 | K3-700               | K3-860 | K3-1000              | K3-1200 |
|-----------------|---------------------|--------|--------|----------------------|--------|--------|----------------------|--------|----------------------------------|--------|----------------------|--------|----------------------|---------|
| V~              | -                   | -      | -      | -                    | -      | -      | -                    | -      | 690                              | -      | 690                  | -      | 690                  | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 10                               | -      | 10                   | -      | 10                   | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| -               | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 3                                | -      | 3                    | -      | 3                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 2                                | -      | 2                    | -      | 2                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 1,5                              | -      | 1,5                  | -      | 1,5                  | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 1,5                              | -      | 1,5                  | -      | 1,5                  | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 1                                | -      | 1                    | -      | 1                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 1                                | -      | 1                    | -      | 1                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 0,5                              | -      | 0,5                  | -      | 0,5                  | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| A               | -                   | -      | -      | -                    | -      | -      | -                    | -      | 10                               | -      | 10                   | -      | 10                   | -       |
| VA              | 165-220             | -      | -      | 350                  | -      | -      | 360                  | -      | 800-950                          | -      | 1350-1600            | -      | 2400                 | -       |
| VA              | 2,5-5               | -      | -      | 5                    | -      | -      | 5                    | -      | 9-11                             | -      | 21-25                | -      | 70                   | -       |
| W               | 2,5-5               | -      | -      | 5                    | -      | -      | 5                    | -      | 9-11                             | -      | 21-25                | -      | 70                   | -       |
| W               | 250                 | -      | -      | 350                  | -      | -      | 360                  | -      | 700-850                          | -      | 1300-1550            | -      | 2100                 | -       |
| W               | 5                   | -      | -      | 5                    | -      | -      | 5                    | -      | 8-10                             | -      | 18-22                | -      | 60                   | -       |
| W               | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| W               | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | 0,85-1,1<br>0,8-1,1 | -      | -      | 0,85-1,1<br>0,85-1,1 | -      | -      | 0,85-1,1<br>0,85-1,1 | -      | 0,85-1,1<br>0,85-1,1             | -      | 0,85-1,1<br>0,85-1,1 | -      | 0,85-1,1<br>0,85-1,1 | -       |
| ms              | 20-35               | -      | -      | 30-60                | -      | -      | 40-60                | -      | 50-100                           | -      | 50-100               | -      | 50-100               | -       |
| ms              | 35-50               | -      | -      | 30-80                | -      | -      | 15-45                | -      | 150-200 / 500-1000 <sup>1)</sup> | -      | 25-50                | -      | 25-50                | -       |
| ms              | 10-15               | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | 20-35               | -      | -      | 30-60                | -      | -      | 40-60                | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | 35-50               | -      | -      | 30-80                | -      | -      | 15-45                | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | 10-15               | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| ms              | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| mm <sup>2</sup> | -                   | -      | -      | -                    | -      | -      | -                    | -      | 0,75-2,5                         | -      | 0,75-2,5             | -      | 0,75-2,5             | -       |
| mm <sup>2</sup> | -                   | -      | -      | -                    | -      | -      | -                    | -      | 0,75-2,5                         | -      | 0,75-2,5             | -      | 0,75-2,5             | -       |
| mm <sup>2</sup> | -                   | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
| mm <sup>2</sup> | 0,75-2,5            | -      | -      | 1-2,5                | -      | -      | 1-2,5                | -      | 1-2,5                            | -      | 1-2,5                | -      | 1-2,5                | -       |
| mm <sup>2</sup> | 0,5-2,5             | -      | -      | 1-2,5                | -      | -      | 1-2,5                | -      | 1-2,5                            | -      | 1-2,5                | -      | 1-2,5                | -       |
| mm <sup>2</sup> | 0,5-1,5             | -      | -      | -                    | -      | -      | -                    | -      | -                                | -      | -                    | -      | -                    | -       |
|                 | 2                   | -      | -      | 2                    | -      | -      | 2                    | -      | 2                                | -      | 2                    | -      | 2                    | -       |
| AWG             | -                   | -      | -      | -                    | -      | -      | -                    | -      | 16 - 12                          | -      | 16 - 12              | -      | 16 - 12              | -       |
| AWG             | -                   | -      | -      | -                    | -      | -      | -                    | -      | 16 - 12                          | -      | 16 - 12              | -      | 16 - 12              | -       |
| AWG             | 14 - 12             | -      | -      | 16 - 12              | -      | -      | 16 - 12              | -      | 16 - 12                          | -      | 16 - 12              | -      | 16 - 12              | -       |
| AWG             | 18 - 12             | -      | -      | 16 - 12              | -      | -      | 16 - 12              | -      | 16 - 12                          | -      | 16 - 12              | -      | 16 - 12              | -       |
|                 | 2                   | -      | -      | 2                    | -      | -      | 2                    | -      | 2                                | -      | 2                    | -      | 2                    | -       |

1) Normal or delayed drop is adjustable

Contactors, Motor-Starters  
Circuit Breakers  
Manual Motor-Starters  
Switches  
AC-Main Switches  
DC-Switch Disconnectors  
Push Buttons  
Representatives, Suppliers

# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts  | Type               | K2-09     | K2-12      | K2-16      | K2-23     | K2-30     | K2-37       | K2-45     | K2-60      | K85        | K110       |
|--|--------------------|-----------|------------|------------|-----------|-----------|-------------|-----------|------------|------------|------------|
| <b>Rated insulation voltage <math>U_i</math></b> <sup>1)</sup>                 | V~                 | 690       | 690        | 690        | 690       | 690       | 690         | 690       | 690        | 750        | 750        |
| <b>Making capacity <math>I_{eff}</math></b> at $U_e = 690V\sim$                | A                  | 200       | 200        | 200        | 400       | 500       | 500         | 700       | 900        | 1100       | 1200       |
| <b>Breaking capacity <math>I_{eff}</math></b> 400V~                            | A                  | 180       | 180        | 200        | 380       | 400       | 400         | 600       | 800        | 950        | 1100       |
| K2-09 to K2-16 $\cos\phi = 0,65$ 500V AC                                       | A                  | 150       | 150        | 180        | 300       | 370       | 370         | 500       | 700        | 850        | 1100       |
| K2-23 to K3-1200 $\cos\phi = 0,35$ 690V AC                                     | A                  | 100       | 100        | 150        | 260       | 340       | 340         | 400       | 500        | 600        | 600        |
|  | A                  | -         | -          | -          | -         | -         | -           | -         | -          | -          | -          |
| <b>Utilization category AC1</b>  |                    |           |            |            |           |           |             |           |            |            |            |
| <b>Switching of resistive load</b>   |                    |           |            |            |           |           |             |           |            |            |            |
| Rated operational current $I_e (=I_{th})$ at 40°C, open                        | <b>A</b>           | <b>25</b> | <b>25</b>  | <b>25</b>  | <b>45</b> | <b>50</b> | <b>50</b>   | <b>80</b> | <b>100</b> | <b>150</b> | <b>170</b> |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 220V kW            | 9,5       | 9,5        | 9,5        | 17        | 19        | 19          | 30        | 38         | 57         | 64         |
|  | 230V kW            | 10        | 10         | 10         | 18        | 20        | 20          | 31,5      | 40         | 59         | 67         |
|  | 240V kW            | 10,5      | 10,5       | 10,5       | 18,5      | 20,5      | 20,5        | 33        | 41         | 62         | 70         |
|  | 380V kW            | 16,5      | 16,5       | 16,5       | 29,5      | 33        | 33          | 52        | 65         | 98         | 111        |
|  | 400V kW            | 17,5      | 17,5       | 17,5       | 31        | 34,5      | 34,5        | 55        | 69         | 103        | 117        |
|  | 415V kW            | 18        | 18         | 18         | 32        | 36        | 36          | 57        | 71         | 107        | 122        |
|  | 440V kW            | 19        | 19         | 19         | 34        | 38        | 38          | 61        | 76         | 114        | 129        |
|  | 500V kW            | 21,5      | 21,5       | 21,5       | 39        | 43        | 43          | 69        | 86         | 130        | 147        |
|  | 660V kW            | 28,5      | 28,5       | 28,5       | 51        | 57        | 57          | 91        | 114        | 171        | 194        |
|  | 690V kW            | 29,5      | 29,5       | 29,5       | 53,5      | 60        | 60          | 95        | 119        | 179        | 203        |
| Rated operational current $I_e (=I_{th})$ at 60°C, enclosed                    | A                  | 20        | 25         | 25         | 35        | 40        | 40          | 63        | 80         | 100        | 125        |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 220V kW            | 7,5       | 9,5        | 9,5        | 13        | 15        | 15          | 24        | 30         | 38         | 47         |
|  | 230V kW            | 8         | 10         | 10         | 13,5      | 16        | 16          | 25        | 31,5       | 40         | 49         |
|  | 240V kW            | 8         | 10,5       | 10,5       | 14,5      | 16,5      | 16,5        | 26        | 33         | 41         | 52         |
|  | 380V kW            | 13        | 16,5       | 16,5       | 23        | 26        | 26          | 41        | 52         | 65         | 82         |
|  | 400V kW            | 13,5      | 17,5       | 17,5       | 24        | 27,5      | 27,5        | 43        | 55         | 69         | 86         |
|  | 415V kW            | 14        | 18         | 18         | 25        | 28,5      | 28,5        | 45        | 57         | 71         | 89         |
|  | 440V kW            | 15        | 19         | 19         | 26,5      | 30        | 30          | 48        | 61         | 71         | 95         |
|  | 500V kW            | 17        | 21,5       | 21,5       | 30        | 34        | 34          | 54        | 69         | 86         | 116        |
|  | 660V kW            | 22,5      | 28,5       | 28,5       | 40        | 45        | 45          | 72        | 91         | 114        | 142        |
|  | 690V kW            | 23,5      | 29,5       | 29,5       | 42        | 48        | 48          | 75        | 95         | 119        | 149        |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$                | mm <sup>2</sup>    | 4         | 4          | 4          | 10        | 10        | 10          | 25        | 35         | 50         | 70         |
| <b>Utilization category AC2 and AC3</b>  |                    |           |            |            |           |           |             |           |            |            |            |
| <b>Switching of three-phase motors</b>   |                    |           |            |            |           |           |             |           |            |            |            |
| Rated operational current $I_e$ open and enclosed                              | 220V A             | 12        | 15         | 18         | 23        | 30        | 37          | 45        | 63         | 85         | 110        |
|  | 230V A             | 11,5      | 14,5       | 17,5       | 23        | 30        | 37          | 45        | 61         | 85         | 110        |
|  | 240V A             | 11        | 14         | 17         | 23        | 30        | 37          | 45        | 60         | 85         | 110        |
|  | <b>380-400V A</b>  | <b>10</b> | <b>12</b>  | <b>16</b>  | <b>23</b> | <b>30</b> | <b>37</b>   | <b>45</b> | <b>60</b>  | <b>85</b>  | <b>110</b> |
|  | 415-440V A         | 9         | 12         | 16         | 23        | 30        | 37          | 45        | 60         | 85         | 110        |
|  | 500V A             | 9         | 12         | 16         | 23        | 30        | 30          | 45        | 55         | 85         | 110        |
|  | 660V A             | 7         | 9          | 9          | 17,5      | 21        | 21          | 33        | 42         | 60         | 60         |
|  | 690V A             | 6,5       | 8,5        | 8,5        | 17        | 20        | 20          | 31        | 40         | 58         | 58         |
| Rated operational power of three-phase motors 50-60Hz                          | 220-230V kW        | 3         | 4          | 5          | 6         | 8,5       | 11          | 12,5      | 18,5       | 25         | 33         |
|  | 240V kW            | 3         | 4          | 5          | 7         | 9         | 11,5        | 13,5      | 19         | 27         | 35         |
|  | <b>380-400V kW</b> | <b>4</b>  | <b>5,5</b> | <b>7,5</b> | <b>11</b> | <b>15</b> | <b>18,5</b> | <b>22</b> | <b>30</b>  | <b>45</b>  | <b>55</b>  |
|  | 415V kW            | 4,5       | 6          | 8,5        | 12        | 16        | 20          | 24        | 33         | 49         | 63         |
|  | 440V kW            | 4,5       | 6          | 8,5        | 12        | 16        | 20          | 24        | 33         | 49         | 63         |
|  | 500V kW            | 5,5       | 7,5        | 10         | 15        | 18,5      | 18,5        | 30        | 37         | 55         | 55         |
|  | 660-690V kW        | 5,5       | 7,5        | 7,5        | 15        | 18,5      | 18,5        | 30        | 37         | 55         | 55         |

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

# Contactors

Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts   | Type                    | K2-09     | K2-12      | K2-16      | K2-23     | K2-30     | K2-37       | K2-45     | K2-60     | K85       | K110      |
|---|-------------------------|-----------|------------|------------|-----------|-----------|-------------|-----------|-----------|-----------|-----------|
| <b>Utilization category AC4</b>   |                         |           |            |            |           |           |             |           |           |           |           |
| <b>Switching of squirrel cage motors, inching</b>                                 |                         |           |            |            |           |           |             |           |           |           |           |
| Rated operational current $I_e$   | 220V A                  | 12        | 15         | 16         | 23        | 30        | 37          | 45        | 63        | 85        | 98        |
| open and enclosed   | 230V A                  | 11,5      | 14,5       | 16         | 23        | 30        | 37          | 45        | 61        | 85        | 98        |
|   | 240V A                  | 11        | 14         | 16         | 23        | 30        | 37          | 45        | 60        | 85        | 98        |
|   | <b>380-400V A</b>       | <b>10</b> | <b>12</b>  | <b>16</b>  | <b>23</b> | <b>30</b> | <b>37</b>   | <b>45</b> | <b>60</b> | <b>85</b> | <b>85</b> |
|   | 415V A                  | 9         | 12         | 16         | 21        | 28        | 37          | 45        | 60        | 85        | 85        |
|   | 440V A                  | 9         | 12         | 16         | 21        | 28        | 37          | 45        | 60        | 85        | 85        |
|   | 500V A                  | 9         | 12         | 16         | 17        | 23        | 23          | 45        | 55        | 85        | 85        |
|   | 660V A                  | 7         | 9          | 9          | 13        | 17        | 17          | 33        | 42        | 60        | 60        |
|   | 690V A                  | 6,5       | 8,5        | 8,5        | 12,5      | 16,5      | 16,5        | 31        | 40        | 57,5      | 57,5      |
| Rated operational power of three-phase motors                                     | 220-230V kW             | 3         | 4          | 5          | 6         | 8,5       | 11          | 12,5      | 18,5      | 25        | 30        |
| 50-60Hz   | 240V kW                 | 3         | 4          | 5          | 7         | 9         | 11,5        | 13,5      | 19        | 27        | 32        |
|   | <b>380-400V kW</b>      | <b>4</b>  | <b>5,5</b> | <b>7,5</b> | <b>11</b> | <b>15</b> | <b>18,5</b> | <b>22</b> | <b>30</b> | <b>45</b> | <b>45</b> |
|   | 415-440V kW             | 4,5       | 6          | 8,5        | 11        | 15        | 20          | 24        | 33        | 49        | 49        |
|   | 500V kW                 | 5,5       | 7,5        | 10         | 11        | 15        | 15          | 30        | 37        | 55        | 55        |
|   | 660-690V kW             | 5,5       | 7,5        | 7,5        | 11        | 15        | 15          | 30        | 37        | 55        | 55        |
| <b>Utilization category AC5a</b>  |                         |           |            |            |           |           |             |           |           |           |           |
| <b>Switching of gas discharge lamps</b>   |                         |           |            |            |           |           |             |           |           |           |           |
| Rated operational current $I_e$ per pole at 220/230V                              |                         |           |            |            |           |           |             |           |           |           |           |
| Fluorescent lamps, uncompensated  | A                       | 20        | 20         | 20         | 35        | 40        | 40          | 65        | 85        | 100       | 120       |
| Fluorescent lamps, compensated  | A                       | 7         | 9          | 9          | 18        | 22        | 22          | 30        | 40        | 55        | 70        |
| Fluorescent lamps, dual-connection  | A                       | 22,5      | 22,5       | 22,5       | 41        | 45        | 45          | 72        | 90        | 112       | 144       |
| Metal-halide lamps <sup>1)</sup> , uncompensated                                  | A                       | 12        | 15         | 15         | 28        | 30        | 30          | 50        | 62        | 85        | 90        |
| Metal-halide lamps <sup>1)</sup> , compensated                                    | A                       | 7         | 9          | 9          | 18        | 22        | 22          | 30        | 40        | 55        | 70        |
| Mercury-vapour lamps <sup>2)</sup> , uncompensated                                | A                       | 22,5      | 25         | 25         | 41        | 45        | 45          | 72        | 90        | 112       | 144       |
| Mercury-vapour lamps <sup>2)</sup> , compensated                                  | A                       | 7         | 9          | 9          | 18        | 22        | 22          | 30        | 40        | 55        | 70        |
| Mixed light lamps <sup>3)</sup>   | A                       | 20        | 20         | 20         | 35        | 40        | 40          | 65        | 85        | 100       | 120       |
| <b>Utilization category AC5b</b>  |                         |           |            |            |           |           |             |           |           |           |           |
| <b>Switching of incandescent lamps<sup>4)</sup></b>                               |                         |           |            |            |           |           |             |           |           |           |           |
| Rated operational current $I_e$ per pole at 220/230V                              | A                       | 12,5      | 12,5       | 12,5       | 25        | 31        | 31          | 43        | 56        | 69        | 75        |
| <b>Utilization category AC6a</b>  |                         |           |            |            |           |           |             |           |           |           |           |
| <b>Transformer primary switching</b>  |                         |           |            |            |           |           |             |           |           |           |           |
| at inrush   | n                       | 30        | 30         | 30         | 30        | 30        | 30          | 30        | 30        | 30        | 30        |
| Rated operational current $I_e$   | 400V A                  | 4,5       | 5,5        | 7,5        | 10,5      | 13,5      | 13,5        | 20        | 27        | 38        | 50        |
| Rated operational power dependent on inrush n                                     | 220-230V kVA            | 1,8       | 2,2        | 3          | 4,2       | 5,4       | 5,4         | 8         | 10,7      | 15        | 20        |
|   | 240V kVA                | 1,9       | 2,3        | 3,1        | 4,3       | 5,6       | 5,6         | 8,3       | 11,2      | 15,5      | 20,5      |
|   | 380-400V kVA            | 3,1       | 3,8        | 5,2        | 7,3       | 9,3       | 9,3         | 13,5      | 18,5      | 26        | 34        |
| For different inrush-factors x use the following formula: $P_x = P_n \cdot (n/x)$ | 415-440V kVA            | 3,4       | 4,2        | 5,7        | 8         | 10,2      | 10,2        | 15        | 20,5      | 29        | 38        |
|   | 500V kVA                | 3,9       | 4,8        | 6,5        | 9         | 11,5      | 11,5        | 17        | 23        | 33        | 43        |
|   | 660-690V kVA            | 5,4       | 6,5        | 9          | 12,5      | 16        | 16          | 24        | 32        | 45        | 60        |
| <b>Utilization category DC1</b>   |                         |           |            |            |           |           |             |           |           |           |           |
| <b>Switching of resistive load</b>  |                         |           |            |            |           |           |             |           |           |           |           |
| Time constant $L/R \leq 1ms$  | 1 pole 24V A            | 20        | 25         | 25         | 45        | 50        | 50          | 80        | 100       | 150       | 170       |
| Rated operational current $I_e$   | 60V A                   | 20        | 25         | 25         | 45        | 50        | 50          | 80        | 100       | 150       | 170       |
|   | 110V A                  | 6         | 6          | 6          | 10        | 10        | 10          | 12        | 12        | 20        | 25        |
|   | 220V A                  | 0,8       | 0,8        | 0,8        | 1,4       | 1,4       | 1,4         | 1,4       | 1,4       | 2         | 2,5       |
|   | 2 poles in series 24V A |           |            |            | 45        | 50        | 50          |           |           |           |           |
|   | 60V A                   |           |            |            | 45        | 50        | 50          |           |           |           |           |
|   | 110V A                  |           |            |            | 45        | 50        | 50          |           |           |           |           |
|   | 220V A                  |           |            |            | 10        | 10        | 10          |           |           |           |           |
|   | 3 poles in series 24V A | 20        | 25         | 25         | 45        | 50        | 50          | 80        | 100       | 150       | 170       |
|   | 60V A                   | 20        | 25         | 25         | 45        | 50        | 50          | 80        | 100       | 150       | 170       |
|   | 110V A                  | 20        | 25         | 25         | 45        | 50        | 50          | 80        | 100       | 150       | 170       |
|   | 220V A                  | 16        | 20         | 20         | 30        | 35        | 35          | 63        | 80        | 100       | 160       |

1) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

2) High-pressure lamps

3) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

4) Current inrush approx.  $16 \times I_e$

5) With central compensation pay attention to the current inrush (capacitor switching contactors)

# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts   |                                   |                     | Type | K2-09                          | K2-12 | K2-16 | K2-23             | K2-30 | K2-37 | K2-45                | K2-60 | K85                   | K110 |
|---|-----------------------------------|---------------------|------|--------------------------------|-------|-------|-------------------|-------|-------|----------------------|-------|-----------------------|------|
| <b>Utilization category DC3 and DC5</b>   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| <b>Switching of shunt motors and series motors</b>  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Time constant L/R ≤15ms   | 1 pole                            | 24V                 | A    | 20                             | 25    | 25    | 45                | 50    | 50    | 80                   | 100   | 150                   | 170  |
| Rated operational current I <sub>e</sub>  |                                   | 60V                 | A    | 6                              | 6     | 6     | 30                | 30    | 30    | 60                   | 60    | 85                    | 110  |
|   |                                   | 110V                | A    | 1,2                            | 1,2   | 1,2   | 1,8               | 1,8   | 1,8   | 1,8                  | 1,8   | 2                     | 2,5  |
|   |                                   | 220V                | A    | 0,2                            | 0,2   | 0,2   | 0,2               | 0,2   | 0,2   | 0,25                 | 0,25  | 0,5                   | 0,5  |
|   |                                   | 2 poles in series   | 24V  | A                              |       |       |                   | 45    | 50    | 50                   |       |                       |      |
|   |                                   | 60V                 | A    |                                |       |       | 45                | 50    | 50    |                      |       |                       |      |
|   |                                   | 110V                | A    |                                |       |       | 30                | 30    | 30    |                      |       |                       |      |
|   |                                   | 220V                | A    |                                |       |       | 1,8               | 1,8   | 1,8   |                      |       |                       |      |
|   | 3 poles in series                 | 24V                 | A    | 20                             | 25    | 25    | 45                | 50    | 50    | 80                   | 100   | 150                   | 170  |
|   |                                   | 60V                 | A    | 20                             | 25    | 25    | 40                | 40    | 40    | 80                   | 80    | 100                   | 110  |
|   |                                   | 110V                | A    | 20                             | 20    | 20    | 40                | 40    | 40    | 80                   | 80    | 100                   | 110  |
|   |                                   | 220V                | A    | 2,5                            | 2,5   | 2,5   | 4                 | 4     | 4     | 5                    | 5     | 7                     | 8    |
| <b>Maximum ambient temperature</b>  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Operation   | open                              | °C                  |      | -40 to +60 (+90) <sup>1)</sup> |       |       |                   |       |       |                      |       |                       |      |
|   | enclosed                          | °C                  |      | -40 to +40                     |       |       |                   |       |       |                      |       |                       |      |
| with thermal overload relay   | open                              | °C                  |      | -25 to +60                     |       |       |                   |       |       |                      |       |                       |      |
|   | enclosed                          | °C                  |      | -25 to +40                     |       |       |                   |       |       |                      |       |                       |      |
| Storage   |                                   | °C                  |      | -50 to +90                     |       |       |                   |       |       |                      |       |                       |      |
| <b>Short circuit protection</b>   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| for contactors without thermal overload relay   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Coordination-type "1" according to IEC 947-4-1  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Contact welding without hazard of persons   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| max. fuse size  | gL (gG)                           | A                   |      | 63                             | 63    | 63    | 80                | 80    | 80    | 160                  | 160   | 250                   | 250  |
| Coordination-type "2" according to IEC 947-4-1  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Light contact welding accepted  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| max. fuse size  | gL (gG)                           | A                   |      | 25                             | 35    | 35    | 50                | 50    | 50    | 100                  | 125   | 160                   | 200  |
| Contact welding not accepted  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| max. fuse size  | gL (gG)                           | A                   |      | 16                             | 16    | 16    | 25                | 35    | 35    | 50                   | 63    | 100                   | 125  |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| <b>Cable cross-sections</b>   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| for contactors without thermal overload relay   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| main connector  | solid or stranded                 | mm <sup>2</sup>     |      | 0,75 - 4                       |       |       | 1,5-10 + 1,5-6    |       |       | 4 - 35 <sup>2)</sup> |       | 10 - 70 <sup>2)</sup> |      |
|   | flexible                          | mm <sup>2</sup>     |      | 0,75 - 2,5                     |       |       | 1,5-6 + 1,5-4     |       |       | 6 - 25 <sup>2)</sup> |       | 10 - 70 <sup>2)</sup> |      |
| Cables per clamp  | flexible with multicore cable end | mm <sup>2</sup>     |      | 0,5 - 2,5                      |       |       | 1,5-6 + 1,5-4     |       |       | 4 - 25               |       | 10 - 35               |      |
|   |                                   |                     |      | 2                              |       |       | 1+1               |       |       | 1                    |       | 1                     |      |
| main connector  | solid                             | AWG                 |      | 14 - 10                        |       |       | 14 - 10 + 14 - 10 |       |       | 10                   |       | 10                    |      |
|   | flexible                          | AWG                 |      | 18 - 10                        |       |       | 14 - 8 + 14 - 10  |       |       | 10 - 2               |       | 6 - 0                 |      |
| Cables per clamp  |                                   |                     |      | 2                              |       |       | 1+1               |       |       | 1                    |       | 1                     |      |
| <b>Frequency of operations z</b>  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Contactors without thermal overload relay   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
|   | without load                      | 1/h                 |      | 10000                          |       |       | 7000              |       |       | 7000                 |       | 3000                  |      |
|   | AC3, I <sub>e</sub>               | 1/h                 |      | 600                            |       |       | 600               |       |       | 400                  |       | 300                   |      |
|   | AC4, I <sub>e</sub>               | 1/h                 |      | 120                            |       |       | 120               |       |       | 120                  |       | 120                   |      |
|   | DC3, I <sub>e</sub>               | 1/h                 |      | 600                            |       |       | 600               |       |       | 400                  |       | 300                   |      |
| <b>Mechanical life</b>  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| AC operated   |                                   | S x 10 <sup>6</sup> |      | 10                             |       |       | 10                |       |       | 10                   |       | 5                     |      |
| DC operated with economy resistor   |                                   | S x 10 <sup>6</sup> |      | 10                             |       |       | 10                |       |       | 10                   |       | 5                     |      |
| <b>Short time current</b>   |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
|   | 10s-current                       | A                   |      | 96                             | 120   | 144   | 184               | 240   | 296   | 360                  | 504   | 680                   | 880  |
| <b>Power loss per pole</b>  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
|   | at I <sub>e</sub> /AC3 400V       | W                   |      | 0,21                           | 0,26  | 0,4   | 0,63              | 1,1   | 1,7   | 1,8                  | 3,6   | 4,3                   | 6,0  |
| <b>Resistance to shock acc. to IEC 68-2-27</b>  |                                   |                     |      |                                |       |       |                   |       |       |                      |       |                       |      |
| Shock time 20ms sine-wave   | NO                                | g                   |      | 10                             | 10    | 10    | 8                 | 8     | 8     | 8                    | 8     | 7                     | 7    |
|   | NC                                | g                   |      | 6                              | 6     | 6     | 5                 | 5     | 5     | -                    | -     | 5                     | 5    |

1) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>e</sub> /AC1 according to I<sub>e</sub> /AC3

2) Maximum cable cross-section with prepared conductor

# Contactors

Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Auxiliary Contacts  | Type  | K2-09 | K2-12    | K2-16 | K2-23 | K2-30    | K2-37 | K2-45    | K2-60 | K85      | K110     |
|---|---|-------|----------|-------|-------|----------|-------|----------|-------|----------|----------|
| <b>Rated insulation voltage <math>U_i</math> <sup>1)</sup></b>  | V AC  |       | 690      |       |       | 690      |       |          | -     |          | 690      |
| <b>Thermal rated current <math>I_{th}</math> to 690V</b>  |   |       |          |       |       |          |       |          |       |          |          |
| Ambient temperature   | 40°C A  |       | 16       |       |       | 16       |       |          | -     |          | 16       |
|   | 60°C A  |       | 12       |       |       | 12       |       |          | -     |          | 12       |
| <b>Utilization category AC15</b>  |   |       |          |       |       |          |       |          |       |          |          |
| Rated operational current $I_e$   | 220-240V A  |       | 12       |       |       | 12       |       |          | -     |          | 12       |
|   | 380-415V A  |       | 4        |       |       | 4        |       |          | -     |          | 6        |
|   | 440V A  |       | 4        |       |       | 4        |       |          | -     |          | 6        |
|   | 500V A  |       | 3        |       |       | 3        |       |          | -     |          | 4        |
|   | 660-690V A  |       | 1        |       |       | 1        |       |          | -     |          | 2        |
| <b>Utilization category DC13</b>  |   |       |          |       |       |          |       |          |       |          |          |
| Rated operational current $I_e$   | 60V A   |       | 8        |       |       | 8        |       |          | -     |          | 8        |
|   | 110V A  |       | 1        |       |       | 1        |       |          | -     |          | 1        |
|   | 220V A  |       | 0,1      |       |       | 0,1      |       |          | -     |          | 0,1      |
| <b>Short circuit protection</b><br>short-circuit current 1kA,<br>contact welding not accepted<br>max. fuse size gL (gG) A<br>For contactors with thermal overload relay the<br>device with the smaller admissible control fuse<br>(contactor or thermal overload relay)<br>determines the fuse. |   |       | 25       |       |       | -        |       |          | -     |          | 25       |
| <b>Control Circuit</b>  |   |       |          |       |       |          |       |          |       |          |          |
| <b>Power consumption of coils</b>   |   |       |          |       |       |          |       |          |       |          |          |
| AC operated   | inrush VA   |       | 33-45    |       |       | 90-115   |       | 140-165  |       | 280-350  | 350-420  |
|   | sealed VA   |       | 7-10     |       |       | 9-13     |       | 13-18    |       | 16-23    | 23-29    |
|   | W   |       | 2,6-3    |       |       | 2,7-4    |       | 5,4-7    |       | 4-6      | 6-7,3    |
| DC operated   | inrush W  |       | 75       |       |       | 140      |       | 200      |       | 170      | 320      |
| with economic circuit   | sealed W  |       | 2        |       |       | 2        |       | 6        |       | 2        | 4        |
| <b>Operation range of coils</b><br>in multiples of control voltage $U_s$  |   |       |          |       |       |          |       |          |       |          |          |
|   | AC operated                                       |       | 0,85-1,1 |       |       | 0,85-1,1 |       | 0,85-1,1 |       | 0,85-1,1 | 0,85-1,1 |
|   | DC operated                                       |       | 0,8-1,1  |       |       | 0,8-1,1  |       | 0,8-1,1  |       | 0,8-1,1  | 0,8-1,1  |
| <b>Switching time</b> at control voltage $U_s \pm 10\%$ <sup>2) 3)</sup>  |   |       |          |       |       |          |       |          |       |          |          |
| AC operated   | make time ms                                      |       | 8-16     |       |       | 10-25    |       | 12-28    |       | 13-30    | 13-30    |
|   | release time ms                                   |       | 5-13     |       |       | 8-15     |       | 8-15     |       | 8-15     | 8-15     |
|   | arc duration ms                                   |       | 10-15    |       |       | 10-15    |       | 10-15    |       | 10-15    | 10-15    |
| DC operated   | make time ms                                      |       | 8-12     |       |       | 10-20    |       | 12-23    |       | 20-30    | 20-30    |
| with AC magnet system   | release time ms                                   |       | 8-13     |       |       | 10-15    |       | 10-18    |       | 10-18    | 10-18    |
|   | arc duration ms                                   |       | 10-15    |       |       | 10-15    |       | 10-15    |       | 10-15    | 10-15    |
| <b>Cable cross-section</b>  |   |       |          |       |       |          |       |          |       |          |          |
| Auxiliary connector   | solid mm <sup>2</sup>                             |       | 0,75-4   |       |       | -        |       | -        |       | 0,75-2,5 | 0,75-2,5 |
|   | flexible mm <sup>2</sup>                          |       | 0,75-2,5 |       |       | -        |       | -        |       | 0,75-2,5 | 0,75-2,5 |
|   | flexible with multicore cable end mm <sup>2</sup> |       | 0,5-2,5  |       |       | -        |       | -        |       | 0,5-1,5  | 0,5-1,5  |
| Magnet coil   | solid mm <sup>2</sup>                             |       | 0,75-2,5 |       |       | 0,75-2,5 |       | 0,75-2,5 |       | 0,75-2,5 | 0,75-2,5 |
|   | flexible mm <sup>2</sup>                          |       | 0,5-2,5  |       |       | 0,5-2,5  |       | 0,5-2,5  |       | 0,5-2,5  | 0,5-2,5  |
|   | flexible with multicore cable end mm <sup>2</sup> |       | 0,5-1,5  |       |       | 0,5-1,5  |       | 0,5-1,5  |       | 0,5-1,5  | 0,5-1,5  |
| Clamps per pole   |   |       | 2        |       |       | 2        |       | 2        |       | 2        | 2        |

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request

2) Total breaking time = release time + arc duration

3) Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

# Contactors for North America

## Data according to UL508

| Main Contacts (cULus)  |          | Type | K(G)3-10 | K(G)3-14 | K(G)3-18 | K(G)3-22 | K(G)3-24 | K(G)3-32 | K(G)3-40 | K3-50   | K3-62   | K3-74   |
|--|----------|------|----------|----------|----------|----------|----------|----------|----------|---------|---------|---------|
| Rated operational current "General Use"                                      |          | A    | 25       | 25       | 30       | 30       | 50       | 65       | 80       | 110     | 120     | 130     |
| <b>Motor DOL 3-phase at 60Hz</b>   |          |      |          |          |          |          |          |          |          |         |         |         |
| Rated operational power  | 110-120V | hp   | 1½       | 2        | 2        | 3        | 5        | 5        | 7½       | 10      | 10      | 10      |
|  | 200V     | hp   | 3        | 3        | 5        | 5        | 7½       | 10       | 10       | 15      | 20      | 25      |
|  | 220-240V | hp   | 3        | 3        | 7½       | 7½       | 10       | 10       | 15       | 20      | 25      | 30      |
|  | 277V     | hp   | 3        | 5        | 7½       | 7½       | 7½       | 10       | 15       | 20      | 25      | 30      |
|  | 380-415V | hp   | 5        | 5        | 10       | 10       | 10       | 15       | 20       | 25      | 30      | 40      |
|  | 440-480V | hp   | 5        | 7½       | 10       | 15       | 15       | 20       | 25       | 30      | 40      | 50      |
| 550-600V   | hp       | 7½   | 10       | 15       | 20       | 20       | 25       | 30       | 40       | 50      | 50      |         |
| <b>Motor DOL 1-phase at 60Hz</b>   |          |      |          |          |          |          |          |          |          |         |         |         |
| Rated operational power of AC motors at 60Hz (1ph)                           | 110-120V | hp   | ½        | ¾        | 1        | 1½       | 1½       | 2        | 3        | 3       | 5       | 7½      |
|  | 200V     | hp   | 1        | 1,5      | 2        | 3        | 3        | 5        | 7½       | 7½      | 10      | 15      |
|  | 220-240V | hp   | 1½       | 2        | 3        | 3        | 5        | 5        | 7½       | 10      | 15      | 15      |
|  | 277V     | hp   | 2        | 3        | 3        | 5        | 5        | 7½       | 10       | 10      | 15      | 15      |
|  | 380-415V | hp   | 3        | 3        | 5        | 5        | 5        | 7½       | 10       | 15      | 20      | 20      |
|  | 440-480V | hp   | 3        | 5        | 5        | 7½       | 7½       | 10       | 15       | 20      | 25      | 25      |
| 550-600V   | hp       | 3    | 5        | 7½       | 10       | 10       | 15       | 20       | 25       | 30      | 30      |         |
| <b>Motor DOL 3-phase according to ASME A17.5</b>                             |          |      |          |          |          |          |          |          |          |         |         |         |
| Rated operational current  | 600V     | A    | -        | -        | -        | -        | 15       | 22       | -        | 27      | 37      | -       |
| Rated operational power of 3-phase motors for elevators (500.000 operations) | 110-120V | hp   | -        | -        | -        | -        | 2        | 3        | -        | 3       | 5       | -       |
|  | 200V     | hp   | -        | -        | -        | -        | 3        | 5        | -        | 7½      | 10      | -       |
|  | 220-240V | hp   | -        | -        | -        | -        | 5        | 7½       | -        | 7½      | 10      | -       |
|  | 440-480V | hp   | -        | -        | -        | -        | 10       | 15       | -        | 20      | 25      | -       |
| 550-600V   | hp       | -    | -        | -        | -        | 10       | 20       | -        | 25       | 30      | -       |         |
| Rated current 2 series contacts  | 600V     | A    | -        | -        | -        | -        | 22       | 27       | -        | 44      | 52      | 66      |
| Fuse Class RK5 / Short-circuit current                                       |          | A/kA | 50/5     | 50/5     | 70/5     | 90/5     | 90/5     | 125/5    | 175/5    | 200/5   | 250/5   | 300/5   |
| Fuse Class T / Short-circuit current   |          | A/kA | 45/100   | 50/100   | 70/100   | 90/100   | 110/100  | 150/100  | 150/100  | 175/100 | 175/100 | 175/100 |
| Rated voltage  |          | V    | 600      | 600      | 600      | 600      | 600      | 600      | 600      | 600     | 600     | 600     |
| <b>Auxiliary Contacts (cULus)</b>  |          |      | A600     | A600     | A600     | A600     | -        | -        | -        | -       | -       | -       |

| Main Contacts (cULus)                   |          | Type | K2-09 | K2-12 | K2-16 | K2-23 | K2-30 | K2-45 | K2-60 | K85  | K110  |  |
|---|----------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|--|
| Rated operational current "General Use" |          | A    | 25    | 25    | 25    | 40    | 40    | 72    | 90    | 125  | 150   |  |
| <b>Motor DOL 3-phase at 60Hz</b>        |          |      |       |       |       |       |       |       |       |      |       |  |
| Rated operational power                 | 110-120V | hp   | 1½    | 2     | 2     | 3     | 5     | -     | -     | 15   | -     |  |
|   | 200V     | hp   | 2     | 3     | 3     | 5     | 7½    | 10    | 15    | -    | 30    |  |
|   | 220-240V | hp   | 3     | 3     | 5     | 7½    | 10    | 15    | 20    | 35   | 40    |  |
|   | 440-480V | hp   | 5     | 7½    | 10    | 15    | 20    | 30    | 40    | 65   | 75    |  |
| 550-600V                                | hp       | 7½   | 10    | 15    | 20    | 25    | 40    | 50    | 85    | 100  |       |  |
| <b>Motor DOL 1-phase at 60Hz</b>        |          |      |       |       |       |       |       |       |       |      |       |  |
| Rated operational power                 | 110-120V | hp   | ½     | ¾     | 1     | 1½    | 2     | 3     | 5     | 8    | 10    |  |
|   | 200V     | hp   | 1     | 2     | 2     | 3     | 3     | 5     | 7½    | -    | 20    |  |
|   | 220-240V | hp   | 1½    | 2     | 3     | 3     | 5     | 7½    | 10    | 20   | 20    |  |
| Fuse / Short-circuit current            |          | A/kA | 30/5  | 40/5  | 50/5  | 60/5  | 110/5 | 175/5 | 175/5 | -    | 300/5 |  |
| Rated voltage                           |          | V    | 600   | 600   | 600   | 600   | 600   | 600   | 600   | 600  | 600   |  |
| <b>Auxiliary Contacts (cULus)</b>       |          |      | A600  | A600  | A600  | A600  | A600  | -     | -     | A600 | A600  |  |

# Contactors for North America

## Data according to UL508

| Type | K3-90                 | K3-115                | K3-116 | K3-151 | K3-176 | K3-210 | K3-260 | K3-316 | K3-450  | K3-550  | K3-700  | K3-860  | K3-1000 | K3-1200 |
|------|-----------------------|-----------------------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| A    | 160                   | 200                   | 150    | 180    | 220    | 250    | 300    | 350    | 420     | 520     | 700     | 810     | -       | 1215    |
| hp   | 15                    | 20                    | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 25                    | 35                    | 30     | 40     | 50     | 60     | 75     | 100    | 125     | 150     | 200     | 250     | -       | 450     |
| hp   | 35                    | 40                    | 40     | 50     | 60     | 75     | 100    | 125    | 125     | 150     | 250     | 300     | -       | 450     |
| hp   | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 50                    | 60                    | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 65                    | 75                    | 75     | 100    | 125    | 150    | 200    | 250    | 250     | 350     | 500     | 600     | -       | 900     |
| hp   | 85                    | 100                   | 100    | 125    | 150    | 200    | 250    | 300    | 250     | 350     | 500     | 600     | -       | 900     |
| hp   | 8                     | 10                    | 10     | 15     | 25     | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 15                    | 20                    | 20     | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 20                    | 25                    | -      | 25     | 30     | 40     | 50     | 50     | -       | -       | -       | -       | -       | -       |
| hp   | 20                    | 25                    | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 30                    | 40                    | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 40                    | 50                    | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | 50                    | 60                    | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| A    | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| hp   | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| A    | -                     | -                     | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| A/kA | 300/10                | 300/10                | 225/10 | 300/10 | 350/10 | 400/18 | 500/18 | 500/18 | 1200/18 | 1200/18 | 2000/30 | 2000/30 | -       | 2000/42 |
| A/kA | 300/100 <sup>3)</sup> | 300/100 <sup>3)</sup> | -      | -      | -      | -      | -      | -      | -       | -       | -       | -       | -       | -       |
| V    | 600                   | 600                   | 600    | 600    | 600    | 600    | 600    | 600    | 600     | 600     | 600     | 600     | -       | 600     |
|      | -                     | -                     | -      | -      | -      | -      | -      | -      | A600    | A600    | A600    | A600    | -       | A600    |

| Main Contacts (cULus)  | Type     | K3-18NK | K3-18NBK | K3-24K  | K3-32K  | K3-50K   | K3-62K  | K3-74K              | K3-90K                | K3-115K               |                      |
|--|----------|---------|----------|---------|---------|----------|---------|---------------------|-----------------------|-----------------------|----------------------|
| Rated operational power of<br>3-phase cap. banks 110-120V<br>at 60Hz (3ph) | 200V     | kVAr    | 0-3,5    | 0-3,5   | 3-5,5   | 3-7      | 6,5-10  | 6,5-15              | 6,5-18 <sup>1)</sup>  | 10-24                 | 10-28 <sup>2)</sup>  |
|  | 220-240V | kVAr    | 0-6      | 0-6     | 4,5-10  | 4,5-12,5 | 10-16,7 | 10-25               | 10-32 <sup>1)</sup>   | 17-40                 | 17-46 <sup>2)</sup>  |
|  |          | kVAr    | 0-7      | 0-7     | 5,5-11  | 5,5-15   | 12,5-20 | 12,5-30             | 12,5-36 <sup>1)</sup> | 20-47                 | 20-56 <sup>2)</sup>  |
|  | 440-480V | kVAr    | 0-15     | 0-15    | 11,5-25 | 11,5-30  | 25-40   | 25-60               | 25-72 <sup>1)</sup>   | 40-95                 | 40-114 <sup>2)</sup> |
| 550-600V   | kVAr     | 0-18    | 0-18     | 14,5-30 | 14,5-35 | 31-50    | 31-75   | 31-90 <sup>1)</sup> | 50-120                | 50-143 <sup>2)</sup>  |                      |
| Fuse Class RK5 /<br>Short-circuit current                                  | A/kA     | 70/5    | 70/5     | 90/5    | 125/5   | 200/5    | 250/5   | 300/5               | 300/10                | 300/10                |                      |
| Fuse Class T /<br>Short-circuit current                                    | A/kA     | 80/100  | 80/100   | 110/100 | 150/100 | 175/100  | 175/100 | 175/100             | 300/100 <sup>3)</sup> | 300/100 <sup>3)</sup> |                      |
| Rated voltage  | V        | 600     | 600      | 600     | 600     | 600      | 600     | 600                 | 600                   | 600                   |                      |
| <b>Auxiliary Contacts (cULus)</b>  |          | A600    | A600     | -       | -       | -        | -       | -                   | -                     | -                     |                      |

1) Consider the max. thermal current of the contactor K3-74A: I<sub>th</sub> 130A

2) Consider the min. cross-section of conductor at max. load

3) Class T and Class RK1



# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

### Contact Life

For selection of the suitable contactor-type according to supply voltage, power rating and application (utilization category AC1, AC3 or AC4) use contact life characteristic diagram.

For the most common supply voltages four scales of power ratings  $P_n$  are provided for each utilization category.

Select contactor-type according to utilization category **AC3** (breaking current  $I_a = I_e$ ) using the **motor rating** scales to the right, according to utilization category **AC4** (breaking current  $I_a = 6 \times I_e$ ) using the **motor rating** scales to the left. <sup>1)</sup>

Select contactor-type according to utilization category **AC1** (breaking current  $I_a = I_e/AC1$ ) using the **breaking current** scale. <sup>1)</sup>

For contactors frequently used under AC3/AC4-mixed service conditions calculate contact life with the formula:

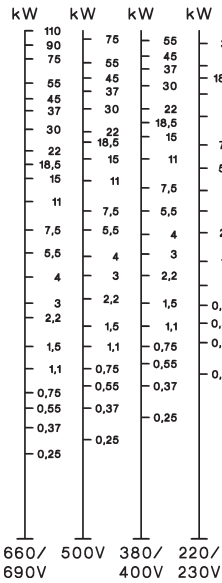
$$M = \frac{AC3}{1 + \frac{\%AC4}{100} \times \left( \frac{AC3}{AC4} - 1 \right)}$$

M = Contact life (switching cycles) for AC3/AC4-mixed operations  
 AC3 = Contact life (switching cycles) for AC3 operations (normal switching conditions). Breaking current  $I_a =$  rated motor current  $I_e$ .  
 AC4 = Contact life (switching cycles) for AC4 operations (inching). Breaking current  $I_a =$  multiples of rated motor current  $I_e$ .  
 %AC4 = Percents of AC4-operations related to the total cycles.

#### Motor Rating

##### $P_n = AC4$

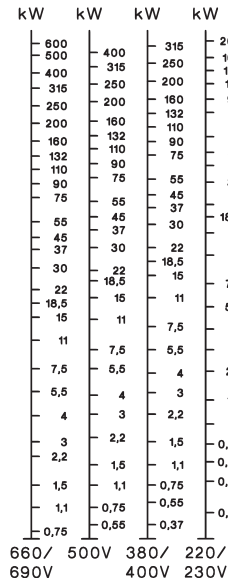
660/ 500V 380/ 220/  
690V 400V 230V



#### Motor Rating

##### $P_n = AC3$

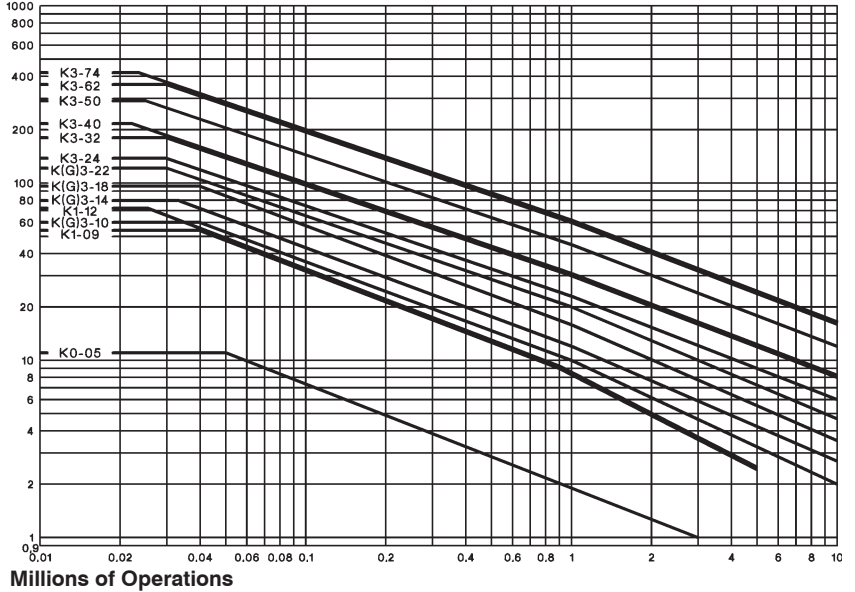
660/ 500V 380/ 220/  
690V 400V 230V



#### Breaking Current

##### $I_a (= I_e = AC1)$

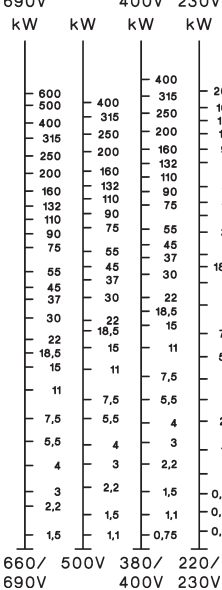
A



#### Motor Rating

##### $P_n = AC4$

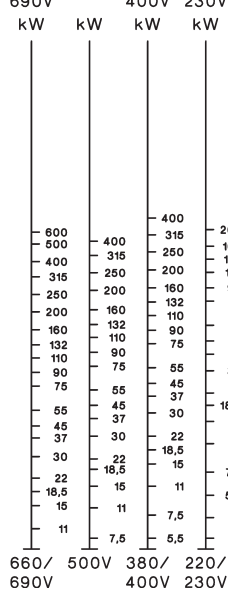
660/ 500V 380/ 220/  
690V 400V 230V



#### Motor Rating

##### $P_n = AC3$

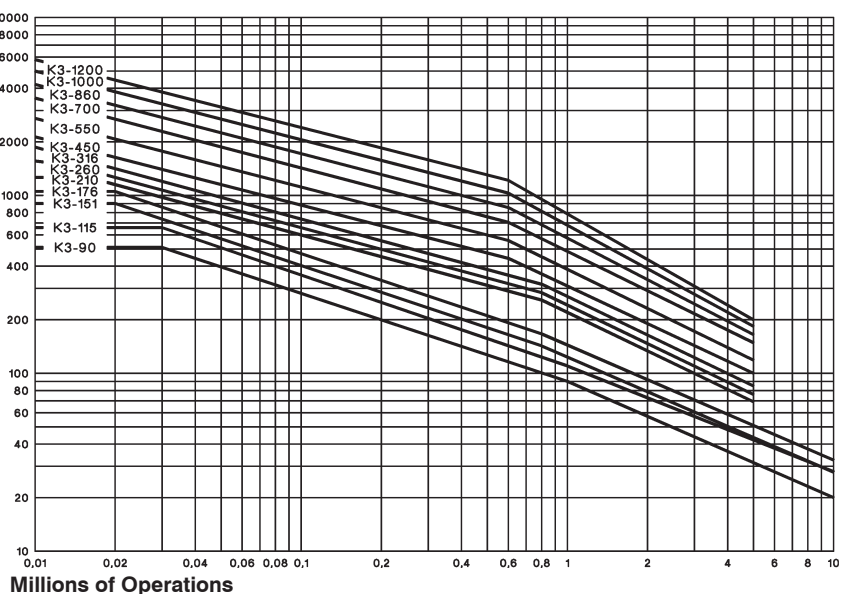
660/ 500V 380/ 220/  
690V 400V 230V



#### Breaking Current

##### $I_a (= I_e = AC1)$

A



1) Pay attention to the approved rated values of the selected contactor according to the national approvals

# Contactors

## Utilization Categories

For easier choice of devices and in order to make the comparison of different products simpler are utilization categories for contactors and motor-starters according to IEC 947-4-1 and VDE 0660 Part

102, for control circuit devices and switching elements according to IEC 947-5-1 and VDE 0660 Part 200 determined. The table offers different utilization categories, typical applications and assorted test conditions.

| Type of current     | Category                                     | Typical applications  | Rated operational current            | Test conditions for the number of on-load operating cycles |   |  |  |           |            | Test conditions for making and breaking capacities |               |               |           |           |               |
|---------------------|--|---|--------------------------------------|--|---|--|--|-----------|------------|--|---------------|---------------|-----------|-----------|---------------|
|                     |  |   |                                      | Make   |   |  | Break  |           |            | Make   |               |               | Break     |           |               |
|                     |  |   |                                      | $I/I_e$  | $U/U_e$                                   | cosφ   | $I_c/I_e$                                    | $U_c/U_e$ | cosφ       | $I/I_e$  | $U/U_e$       | cosφ          | $I_c/I_e$ | $U_c/U_e$ | cosφ          |
| Alternating Current | <b>AC1</b>                                   | Non-inductive or slightly inductive loads resistance furnaces                               | all values                           | 1  | 1   | 0,95   | 1  | 1         | 0,95       | 1,5  | 1,05          | 0,8           | 1,5       | 1,05      | 0,8           |
|                     | <b>AC2</b>                                   | Slip-ring motors: starting, switching off   | all values                           | 2,5  | 1   | 0,65   | 2,5  | 1         | 0,65       | 4  | 1,05          | 0,65          | 4         | 1,05      | 0,65          |
|                     | <b>AC3</b>                                   | Squirrel-cage motors: starting, switching off motors during running                         | 17A < $I_e \leq 17A$<br>100A<br>100A | 6 1 0,65<br>6 1 0,35<br>6 1 0,35                           | 1 0,17 0,65<br>1 0,17 0,35<br>1 0,17 0,35 | 10 1,05 0,45<br>10 1,05 0,45<br>10 1,05 0,35 | 8 1,05 0,45<br>8 1,05 0,45<br>8 1,05 0,35    |           |            |  |               |               |           |           |               |
|                     | <b>AC4</b>                                   | Squirrel-cage motors: starting, plugging, inching   | 17A < $I_e \leq 17A$<br>100A<br>100A | 6 1 0,65<br>6 1 0,35<br>6 1 0,35                           | 6 1 0,65<br>6 1 0,35<br>6 1 0,35          | 12 1,05 0,45<br>12 1,05 0,45<br>12 1,05 0,35 | 10 1,05 0,45<br>10 1,05 0,45<br>10 1,05 0,35 |           |            |  |               |               |           |           |               |
|                     | <b>AC5a</b>                                  | Switching of electric discharge lamp controls   | all values                           | -  | -   | -  | -  | -         | -          | 3  | 1,05          | 0,45          | 3         | 1,05      | 0,45          |
|                     | <b>AC5b</b>                                  | Switching of incandescent lamps   | all values                           | -  | -   | -  | -  | -         | -          | 1,5  | 1,05          | <sup>1)</sup> | 4         | 1,05      | <sup>1)</sup> |
|                     | <b>AC6a</b>                                  | Switching of transformers   | $I_e \leq 100A$<br>$I_e > 100A$      | - - -<br>- - -   | - - -<br>- - -                            | 4,5 1,05 0,45<br>4,5 1,05 0,35               | 3,6 1,05 0,45<br>3,6 1,05 0,35               |           |            |  |               |               |           |           |               |
|                     | <b>AC6b</b>                                  | Switching of capacitors   | -                                    | -  | -   | -  | -  | -         | -          | <sup>2)</sup>                                      | <sup>2)</sup> |               |           |           |               |
|                     | <b>AC7a</b>                                  | Slightly inductive loads in household appliances and similar applications                   | all values                           | -  | -   | -  | -  | -         | -          | 1,5  | 1,05          | 0,8           | 1,5       | 1,05      | 0,8           |
|                     | <b>AC7b</b>                                  | Motor loads for household applications  | $I_e \leq 100A$<br>$I_e > 100A$      | - - -<br>- - -   | - - -<br>- - -                            | 8 1,05 0,45<br>8 1,05 0,35                   | 6 1,05 0,45<br>6 1,05 0,35                   |           |            |  |               |               |           |           |               |
|                     | <b>AC8a</b>                                  | Hermetic refrigerant compressor motor control with manual resetting of overload releases    | $I_e \leq 100A$<br>$I_e > 100A$      | - - -<br>- - -   | - - -<br>- - -                            | 6 1,05 0,45<br>6 1,05 0,35                   | 6 1,05 0,45<br>6 1,05 0,35                   |           |            |  |               |               |           |           |               |
|                     | <b>AC8b</b>                                  | Hermetic refrigerant compressor motor control with automatic resetting of overload releases | $I_e \leq 100A$<br>$I_e > 100A$      | - - -<br>- - -   | - - -<br>- - -                            | 6 1,05 0,45<br>6 1,05 0,35                   | 6 1,05 0,45<br>6 1,05 0,35                   |           |            |  |               |               |           |           |               |
|                     | <b>AC12</b>                                  | Control of resistive loads and solid state loads with isolation by opto couplers            | all values                           | -  | -   | -  | -  | -         | -          | 1  | 1             | 0,9           | 1         | 1         | 0,9           |
|                     | <b>AC13</b>                                  | Control of solid state loads with transformer isolation                                     | all values                           | -  | -   | -  | -  | -         | -          | 10   | 1,1           | 0,65          | 1,1       | 1,1       | 0,65          |
|                     | <b>AC14</b>                                  | Control of small electromagnetic loads ( $\leq 72VA$ )                                      | -                                    | -  | -   | -  | -  | -         | -          | 6  | 1,1           | 0,7           | 6         | 1,1       | 0,7           |
| <b>AC15</b>         | Control of electromagnetic load ( $> 72VA$ ) | -   | 10                                   | 1  | 0,7                                       | 1  | 1  | 0,4       | 10         | 1,1  | 0,3           | 10            | 1,1       | 0,3       |               |
| Direct Current      | <b>DC1</b>                                   | Non-inductive or slightly inductive loads resistance furnaces                               | all values                           | 1  | 1   | 1  | 1  | 1         | 1          | 1,5  | 1,05          | 1             | 1,5       | 1,05      | 1             |
|                     | <b>DC3</b>                                   | Shunt-motors: starting, plugging, inching dynamic braking of d.c. motors                    | all values                           | 2,5  | 1   | 2  | 2,5  | 1         | 2          | 4  | 1,05          | 2,5           | 4         | 1,05      | 2,5           |
|                     | <b>DC5</b>                                   | Series-motors: starting, plugging, inching dynamic braking of d.c. motors                   | all values                           | 2,5  | 1   | 7,5  | 2,5  | 1         | 7,5        | 4  | 1,05          | 15            | 4         | 1,05      | 15            |
|                     | <b>DC6</b>                                   | Switching of incandescent lamps   | all values                           | -  | -   | -  | -  | -         | -          | 1,5  | 1,05          | <sup>1)</sup> | 4         | 1,05      | <sup>1)</sup> |
|                     | <b>DC12</b>                                  | Control of resistive loads and solid state loads with isolation by opto couplers            | all values                           | -  | -   | -  | -  | -         | -          | 1  | 1             | 1             | 1         | 1         | 1             |
|                     | <b>DC13</b>                                  | Control of electromagnets   | all values                           | 1  | 1   | $\leq 300$                                   | 1  | 1         | $\leq 300$ | 1,1  | 1,1           | $\leq 300$    | 1,1       | 1,1       | $\leq 300$    |
|                     | <b>DC14</b>                                  | Control of electromagnetic loads having economy resistors in circuit                        | all values                           | -  | -   | -  | -  | -         | -          | 10   | 1,1           | 15            | 10        | 1,1       | 15            |

1) Test with incandescent lamps

2) Test conditions according to standard

## Accessories

### Data according to IEC 947-5-1, EN 60947-5-1, VDE 0660

| Type   |                 | HN       | HTN      | HA       | HB       | HKT      | HKA      | HKF<br>HKB | K2-DK<br>K2-SK | K2-L <sup>2)</sup> |
|--|-----------------|----------|----------|----------|----------|----------|----------|------------|----------------|--------------------|
| <b>Rated insulation voltage</b> $U_i$ <sup>1)</sup>  | V AC            | 690      | 690      | 690      | 690      | 690      | 690      | 690        | 690            | 690                |
| <b>Thermal rated current</b> $I_{th}$ to bis 690V  |                 |          |          |          |          |          |          |            |                |                    |
| Ambient temperature  | max. 40°C A     | 10       | 10       | 25       | 10       | 10       | 10       | 16         | 26             | 10                 |
|  | max. 60°C A     | 6        | 6        | 20       | 6        | -        | -        | -          | -              | 6                  |
| <b>Frequency of operations</b> $z$   | 1/h             | 3000     | -        | 3000     | 3000     | -        | -        | -          | -              | 3000               |
| <b>Mechanical life</b>   | $S \times 10^6$ | 10       | 10       | 10       | 10       | -        | -        | -          | -              | 10                 |
| <b>Power loss</b> per pole at $I_n/AC1$  | W               | 0,5      | 0,5      | 1,5      | 0,5      | -        | -        | -          | -              | -                  |
| <b>Utilization category AC15</b>   |                 |          |          |          |          |          |          |            |                |                    |
| Rated operational current $I_e$  | 220-240V A      | 3        | 3        | 6        | 3        | 3        | 3        | 3          | -              | 3                  |
|  | 380-400V A      | 2        | 2        | 3        | 2        | 2        | 2        | 2          | -              | 2                  |
|  | 440V A          | 1,6      | 1,6      | 2        | 1,6      | 1,5      | 1,5      | 1,5        | -              | 1,6                |
|  | 500V A          | 1,2      | 1,2      | 2        | 1,2      | 1,5      | 1,5      | 1,5        | -              | 1                  |
|  | 660-690V A      | 0,6      | 0,6      | 1        | 0,6      | 1        | 1        | 1          | -              | 0,5                |
| <b>Utilization category DC13</b>   |                 |          |          |          |          |          |          |            |                |                    |
| Rated operational current $I_e$  | 24V A           | 2        | 2        | 8        | 2        | 5        | 4        | 6          | -              | 2                  |
|  | 48V A           | 2        | 2        | 8        | 2        | 2        | 1,5      | 3          | -              | 2                  |
|  | 60V A           | 2        | 2        | 8        | 2        | -        | -        | -          | -              | 2                  |
|  | 110V A          | 0,4      | 0,4      | 1        | 0,4      | 0,8      | 0,5      | 1          | -              | 0,4                |
|  | 220V A          | 0,1      | 0,1      | 0,1      | 0,1      | 0,4      | 0,2      | 0,5        | -              | 0,1                |
| <b>Short circuit protection</b><br>short-circuit current 1kA,<br>contact welding not accepted<br>max. fuse size  | gL (gG) A       | 20       | 20       | 25       | 20       | 10       | 10       | 10         | -              | 10                 |
| For contactors with thermal overload relay or auxiliary contacts the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size. |                 |          |          |          |          |          |          |            |                |                    |
| <b>Cable cross-sections</b>  |                 |          |          |          |          |          |          |            |                |                    |
| solid or stranded  | mm <sup>2</sup> | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5   | 0,75-2,5       | 0,75-2,5           |
| flexible   | mm <sup>2</sup> | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5 | 0,75-2,5   | 0,75-2,5       | 0,75-2,5           |
| flexible with multicore cable end  | mm <sup>2</sup> | 0,5-1,5  | 0,5-1,5  | 0,5-1,5  | 0,5-1,5  | 0,5-1,5  | 0,5-1,5  | 0,5-1,5    | 0,5-1,5        | 0,5-1,5            |
| solid  | AWG             | 14 - 12  | 14 - 12  | 14 - 12  | 14 - 12  | 14 - 12  | 14 - 12  | 14 - 12    | 14 - 12        | 14 - 12            |
| flexible   | AWG             | 18 - 12  | 18 - 12  | 18 - 12  | 18 - 12  | 18 - 12  | 18 - 12  | 18 - 12    | 18 - 12        | 18 - 12            |
| Cables per clamp   |                 | 2        | 2        | 2        | 2        | 2        | 2        | 2          | 2              | 2                  |

### Data according to CSA, UL and CUL

| Type                                    |           | HN   | HTN  | HA   | HB.. | HKA, HKT<br>HKF | K2-DK<br>K2-SK | K2-L <sup>2)</sup> |
|---|-----------|------|------|------|------|-----------------|----------------|--------------------|
| Rated operational current "General Use" | A         | 10   | 10   | 16   | 10   | 10              | -              | -                  |
| Rated operational voltage               | max. V AC | 600  | 600  | 600  | 600  | 600             | -              | 600                |
| <b>Auxiliary Contacts</b>               |           | A600 | A600 | A600 | A600 | A600            | -              | Intermittent duty  |

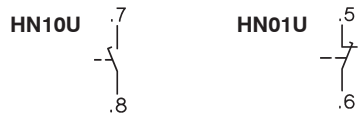
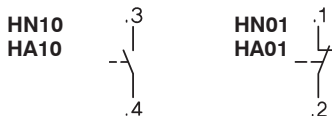
1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request.

2) Command duration min. 30ms, 10% duty cycle, max. 30 sec.

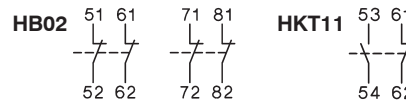
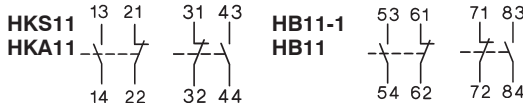
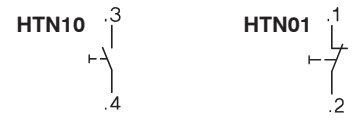
# Contactors and Accessories

## Wiring diagrams

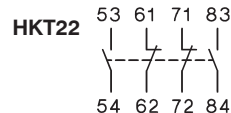
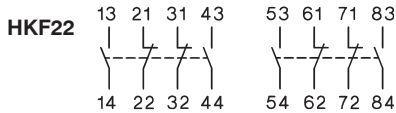
### Auxiliary contact blocks



### Snap-on momentary contact blocks



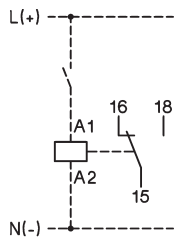
HB11, HB02:  
Correct terminal marking  
is given by mounting.



### Indicator units

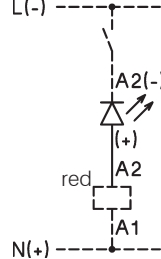
#### Electronic timer

##### K3-T180 240



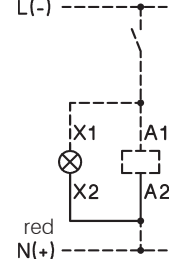
#### Coil current indicator

##### K2-ING K2-INR



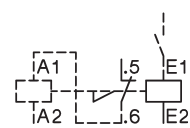
#### Voltage indicator

##### K2-UN K2-UNR



#### Latch

##### K2-L..



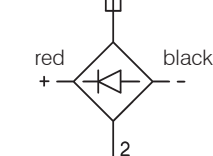
#### Fuse holder

##### K2-F



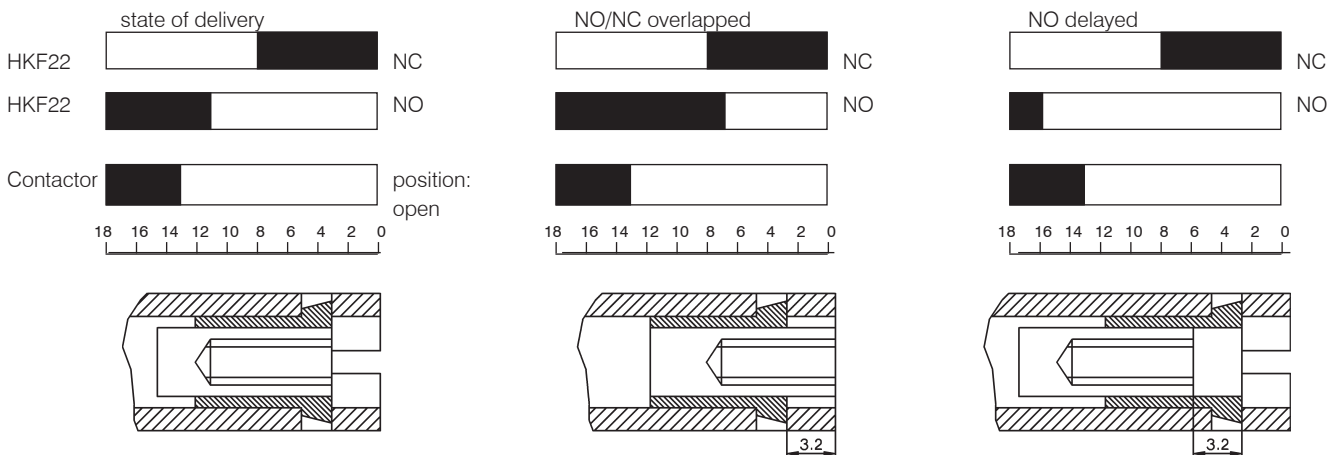
with rectifier

##### K2-RF1 K2-RF3



Colours mentioned in  
wiring diagram refer to  
the outgoing  
connection wires  
of the device.

### Regulation of switch position of aux. contact block HKF22 for contactors K3-450 to K3-860



Standard position of regulation screw

Regulation screw position (unscrew by 4 turns)

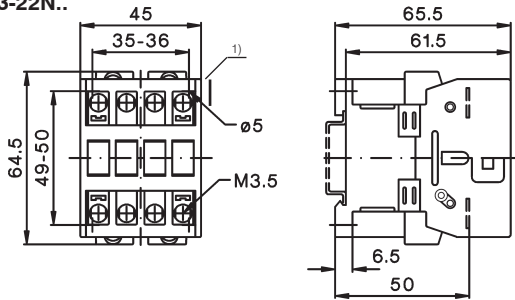
Regulation screw position (screw by 4 turns)

# Contactors

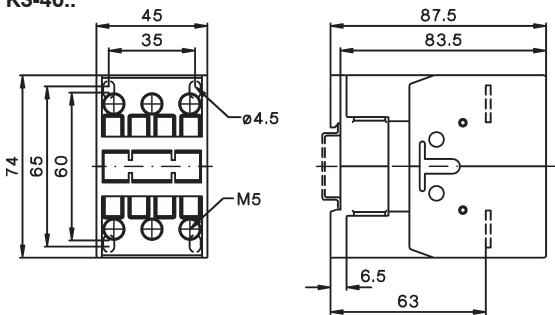
## Dimensions

### AC operated

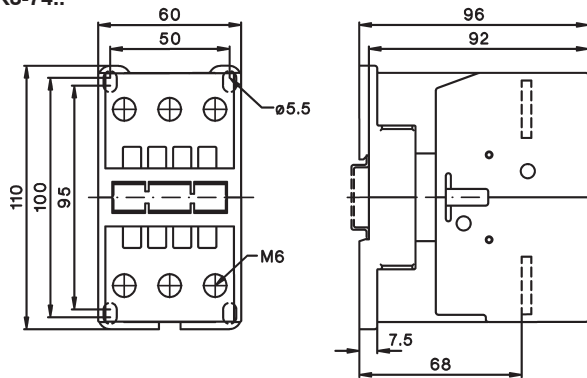
K3-10N..  
K3-14N..  
K3-18N..  
K3-22N..



K3-24..  
K3-32..  
K3-40..

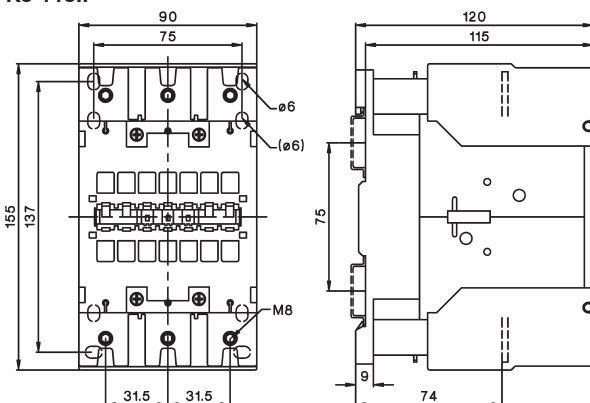


K3-50..  
K3-62..  
K3-74..



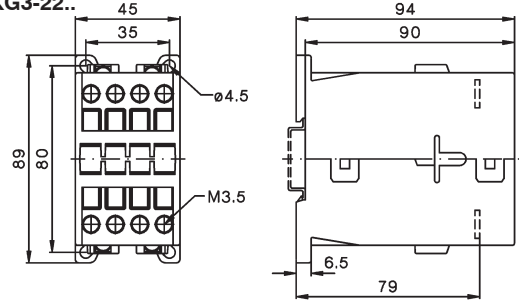
### AC and DC operated

K3-90..  
K3-115..

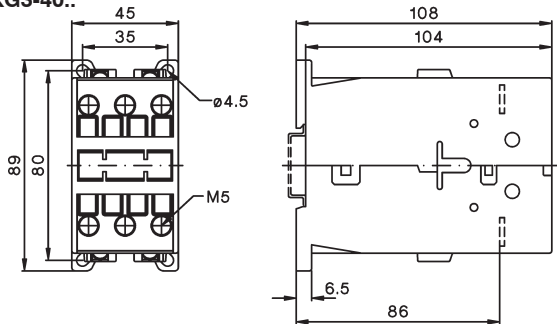


### DC operated

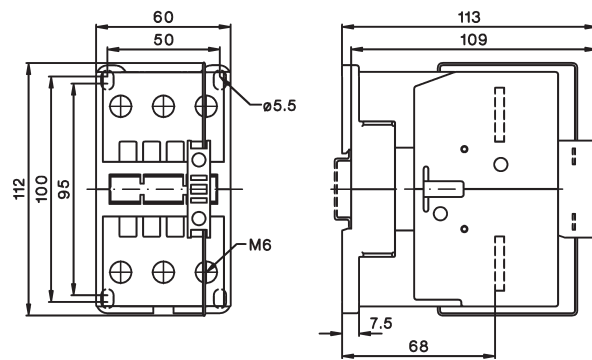
KG3-10..  
KG3-14..  
KG3-18..  
KG3-22..



KG3-24..  
KG3-32..  
KG3-40..



K3-50..=  
K3-62..=  
K3-74..=

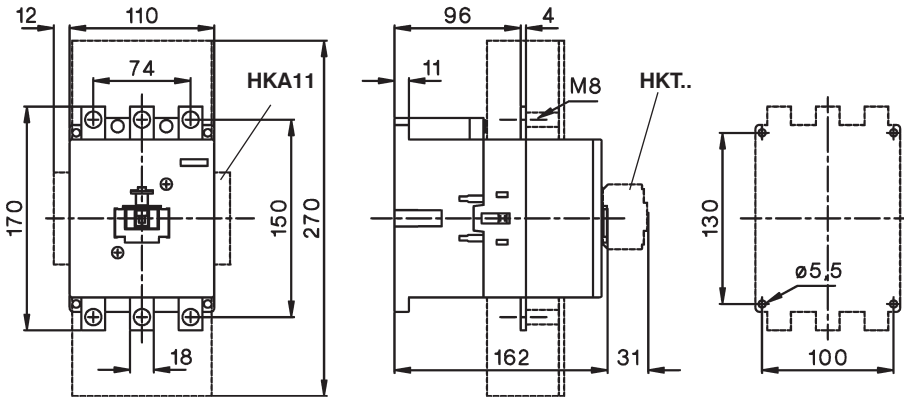


1) Minimum side distance to  
conductive parts for coil voltage:  
500V  $U_{imp}=6kV$  2mm  
660-690V  $U_{imp}=8kV$  4,5mm

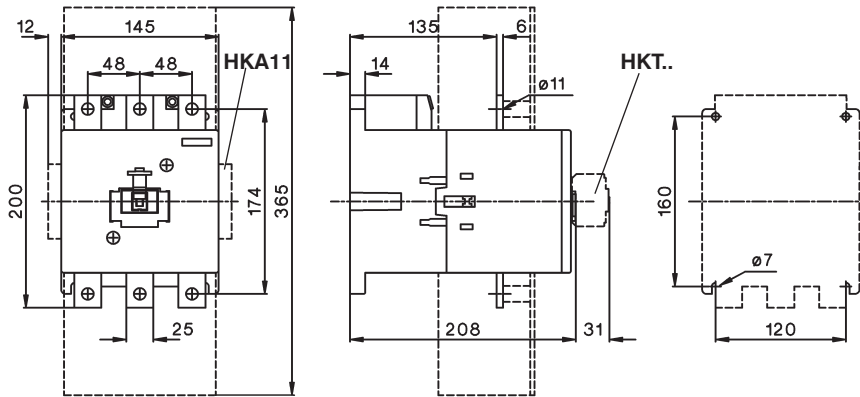
# Contactors

Dimensions, AC operated, DC operated

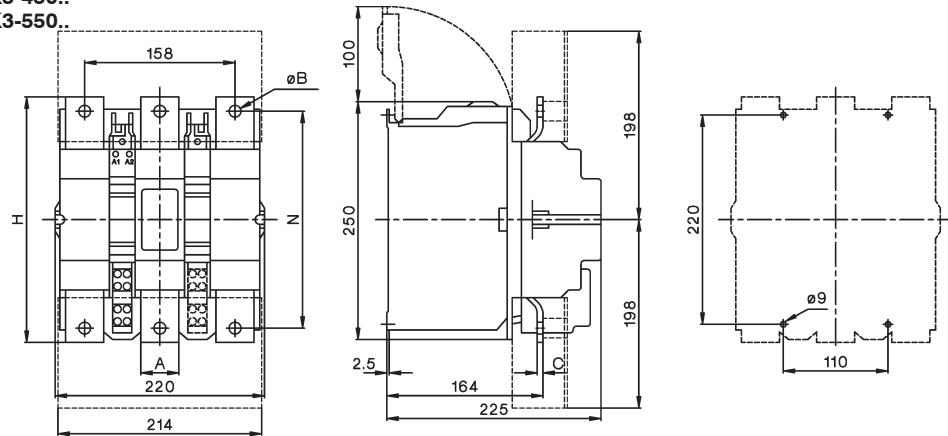
K3-151..  
K3-176..



K3-210..  
K3-260..  
K3-316..

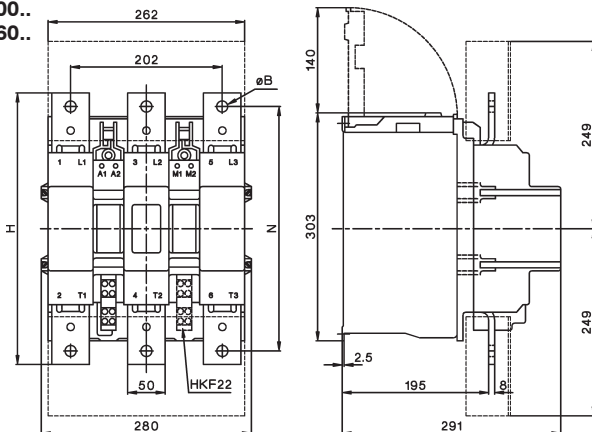


K3-450..  
K3-550..



| Type   | A  | B    | C | H   | N   |
|--------|----|------|---|-----|-----|
| K3-450 | 40 | 10,5 | 4 | 233 | 206 |
| K3-550 | 40 | 12,5 | 6 | 258 | 228 |

K3-700..  
K3-860..



| Type   | B  | H   | N   |
|--------|----|-----|-----|
| K3-700 | 13 | 310 | 277 |
| K3-860 | 15 | 361 | 325 |

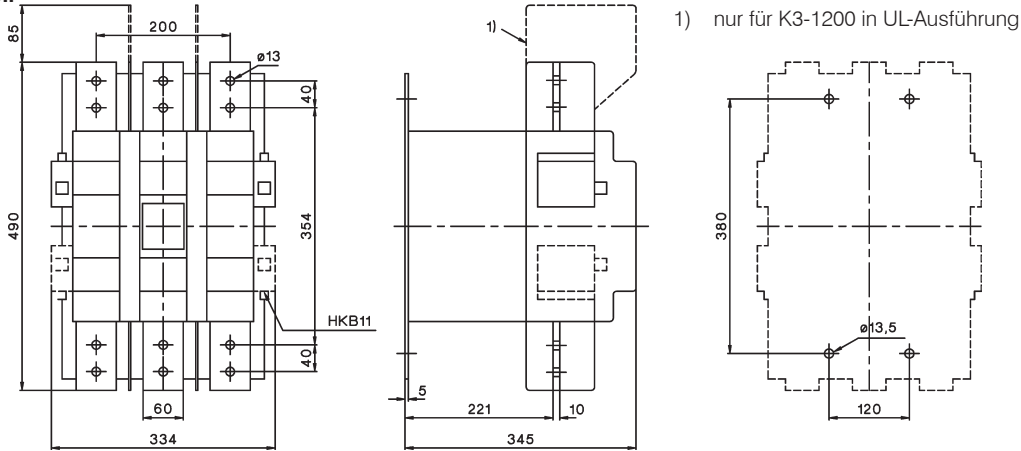
# Contactors

## Dimensions

AC operated, DC operated

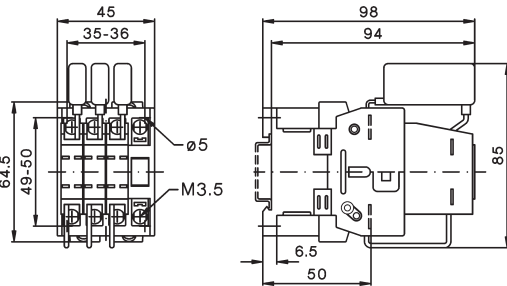
K3-1000..

K3-1200..

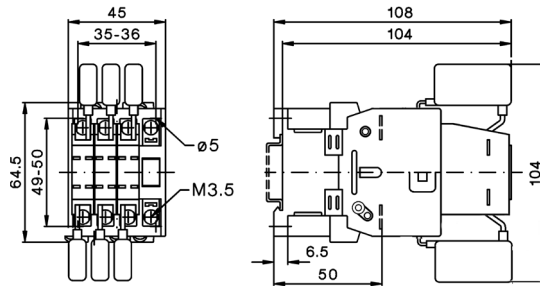


## Capacitor Switching Contactors, AC operated

K3-18NK..

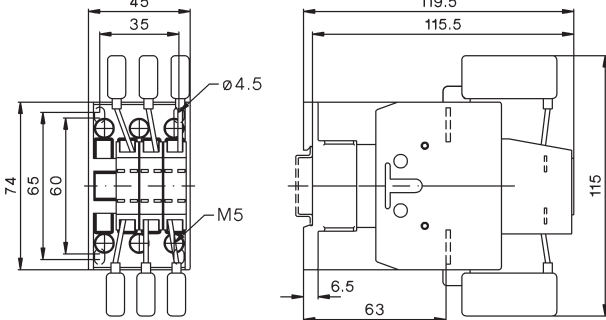


K3-18NBK..



K3-24K..

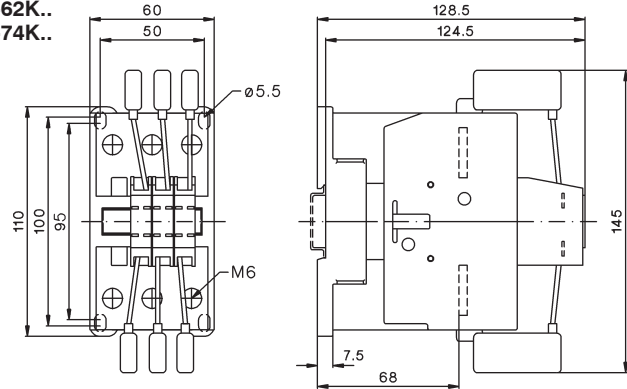
K3-32K..



K3-50K..

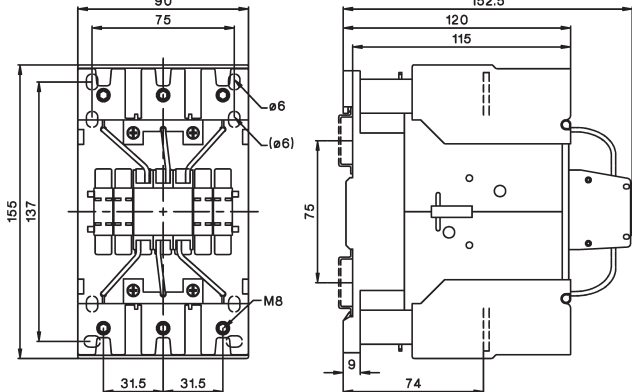
K3-62K..

K3-74K..



K3-90K..

K3-115K..

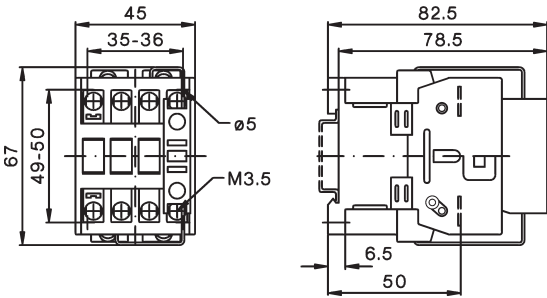


# Contactors

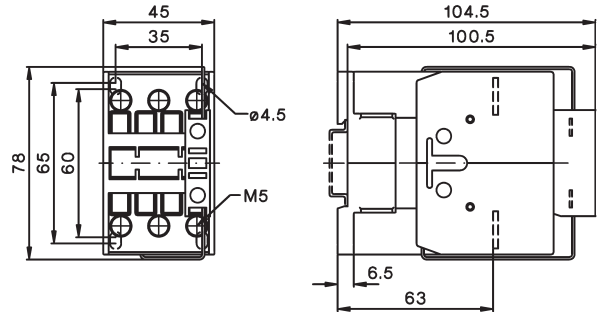
## Dimensions

### Contactors DC operated

- K3-10N..=
- K3-14N..=
- K3-18N..=
- K3-22N..=

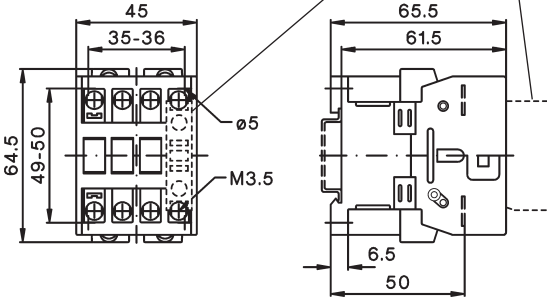


- K3-24..=
- K3-32..=
- K3-40..=

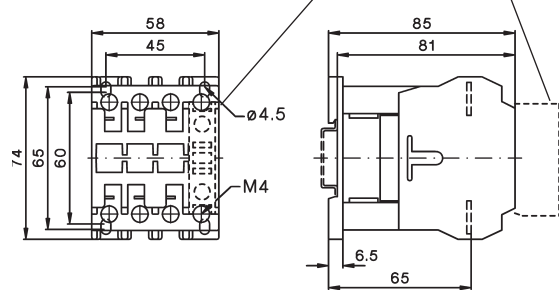


### Contactors 4-pole, AC operated / DC operated

- K3-10NA00-40
- K3-14NA00-40
- K3-18NA00-40
- K3-22NA00-40

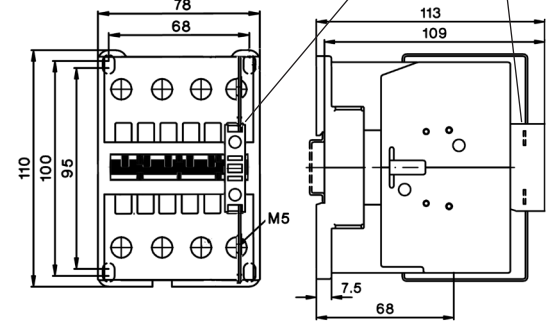


- K2-23A00-40
- K2-30A00-40
- K2-37A00-40

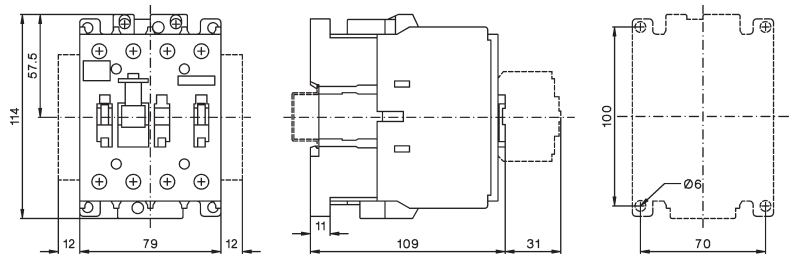


### Contactors 4-pole, AC operated / DC operated

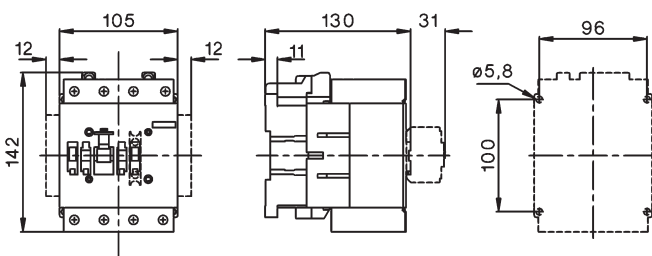
- K3-50A00-40
- K3-62A00-40
- K3-74A00-40



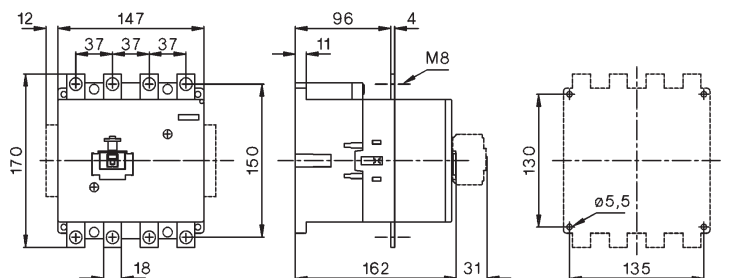
- K3-41A00-40



- K3-96A00-40



- K3-116A00-40
- K3-151A00-40

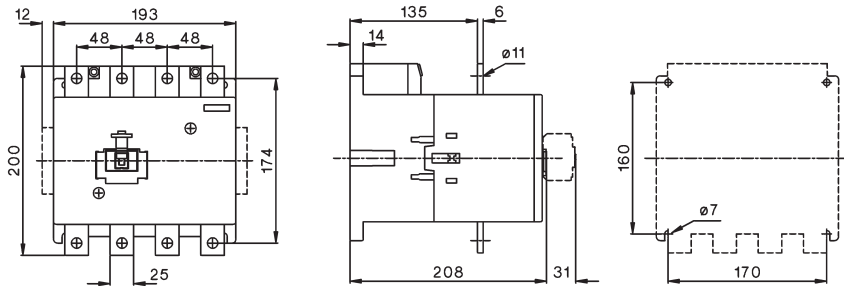




# Contactors

Contactors 4-pole, AC and DC operated

K3-210A00-40  
K3-260A00-40  
K3-316A00-40



## Dimensions Accessories

Aux. cont. blocks, terminal blocks

Snap-on momentary cont. blocks

Auxiliary contact blocks

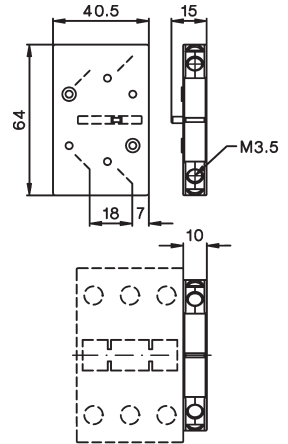
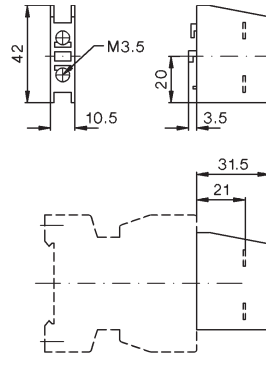
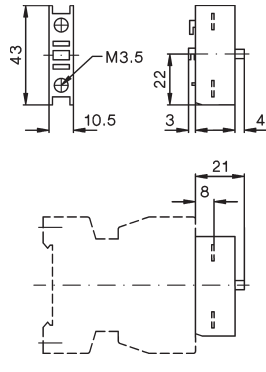
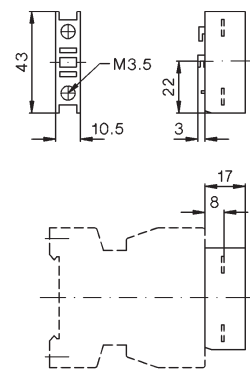
HN10, HN01

K2-SK, K2-DK

HTN10, HTN01

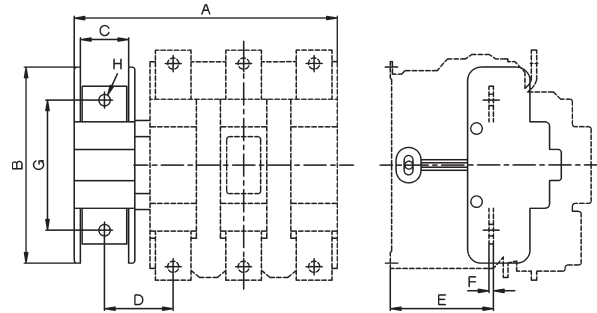
HA10, HA01

HB11-1, HB11, HB02



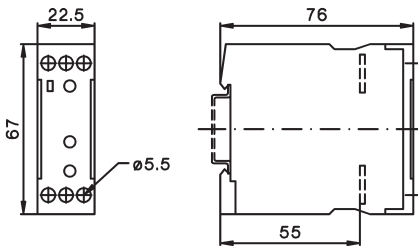
## 4. pole for contactors K3-200 to K3-1200

| Type   | A   | B   | C  | D   | E   | F | G   | H   |
|--------|-----|-----|----|-----|-----|---|-----|-----|
| NP175  | 223 | 148 | 26 | 52  | 98  | 5 | 122 | M8  |
| NP350  | 223 | 148 | 26 | 52  | 98  | 5 | 122 | M8  |
| NP325  | 262 | 148 | 26 | 55  | 116 | 5 | 122 | M10 |
| NP500  | 294 | 220 | 53 | 72  | 138 | 5 | 152 | M12 |
| NP760  | 294 | 220 | 53 | 72  | 138 | 5 | 152 | M12 |
| NP501  | 348 | 220 | 53 | 73  | 145 | 5 | 152 | M12 |
| NP1000 | 348 | 220 | 53 | 73  | 145 | 8 | 152 | M12 |
| NP1001 | 410 | 220 | 53 | 110 | 157 | 8 | 152 | M12 |



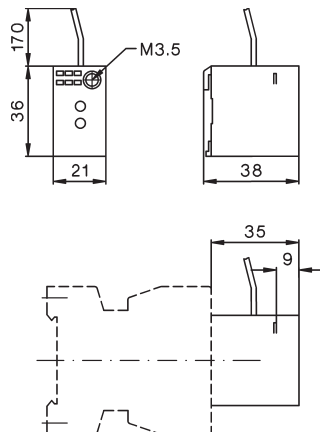
## Electronic timer

K3-T180 240



## Electronic timer on-delay

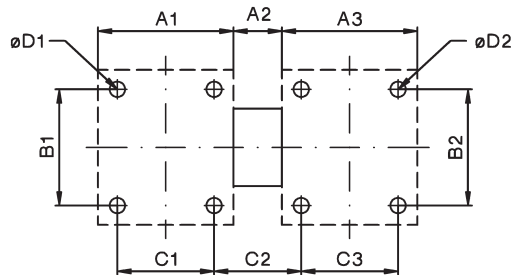
K2-TE..



# Contactors

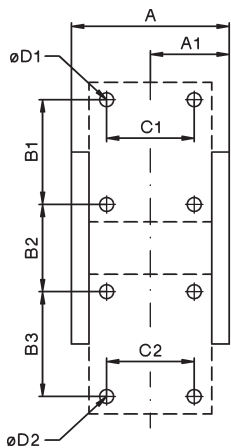
## Dimensions Accessories

### Mechanical interlocks

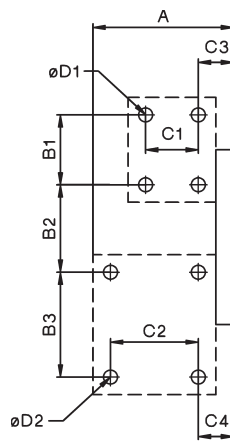


| Type            | Contactor 1        | Contactor 2        | A1  | A2 | A3  | B1  | B2  | C1  | C2    | C3  | D1   | D2   |                  |
|-----------------|--------------------|--------------------|-----|----|-----|-----|-----|-----|-------|-----|------|------|------------------|
| <b>LG10889</b>  | K3-07 to K3-40     | K3-07 to K3-40     | 45  | 7  | 45  | 50  | 50  | 35  | 17    | 35  | 4,5  | 4,5  |                  |
| <b>LG10889</b>  | KG3-07 to KG3-22   | KG3-07 to KG3-22   | 45  | 7  | 45  | 80  | 50  | 35  | 17    | 35  | 4,5  | 4,5  |                  |
| <b>LG10889</b>  | KG3-24 to KG3-40   | KG3-22 to KG3-40   | 45  | 7  | 45  | 80  | 50  | 35  | 17    | 35  | 4,5  | 4,5  |                  |
| <b>LG10890</b>  | K3-50 to K3-74     | K3-24 to K3-40     | 60  | 12 | 55  | 100 | 65  | 50  | 22    | 45  | 5,5  | 4,5  |                  |
| <b>LG10890</b>  | K3-50 to K3-74     | K3-50 to K3-74     | 60  | 12 | 60  | 100 | 100 | 50  | 22    | 50  | 5,5  | 5,5  |                  |
| <b>LG11478</b>  | K3-90 to K3-115    | K3-90 to K3-115    | 90  | 12 | 90  | 100 | 100 | 75  | 27    | 75  | 5,5  | 5,5  |                  |
| <b>LG8511</b>   | K65 - K110         | K65 - K110         | 90  | 12 | 90  | 100 | 100 | 75  | 27    | 75  | 6    | 6    |                  |
| <b>LG11223H</b> | K3-151, -176       | K3-151, -176       | 110 | 30 | 110 | 130 | 130 | 100 | 40    | 100 | 6    | 6    | 3-pole contactor |
| <b>LG11223H</b> | K3-116,-151, -176  | K3-116,-151, -176  | 147 | 30 | 147 | 130 | 130 | 135 | 42    | 135 | 6    | 6    | 4-pole contactor |
| <b>LG11223H</b> | K3-210, -260, -316 | K3-210, -260, -316 | 145 | 30 | 145 | 160 | 160 | 120 | 55    | 120 | 6    | 6    | 3-pole contactor |
| <b>LG11223H</b> | K3-210, -260, -316 | K3-210, -260, -316 | 193 | 30 | 193 | 160 | 160 | 170 | 55    | 170 | 6    | 6    | 4-pole contactor |
| <b>LG10400H</b> | K3-450, K3-550     | K3-450, K3-550     | 220 | 42 | 220 | 220 | 220 | 110 | 152   | 110 | 9    | 9    |                  |
| <b>LG10402H</b> | K3-700, -860       | K3-700, -860       | 280 | 32 | 280 | 280 | 280 | 175 | 137   | 175 | 11   | 11   |                  |
| <b>LG10403H</b> | K3-1000, -1200     | K3-1000, -1200     | 334 | 46 | 334 | 380 | 380 | 120 | 260   | 120 | 13,5 | 13,5 |                  |
| <b>LG10399H</b> | K3-450, -550       | K3-700, -860       | 220 | 37 | 280 | 220 | 280 | 110 | 144,5 | 175 | 9    | 11   |                  |
| <b>LG10401H</b> | K3-700, -860       | K3-1000, -1200     | 280 | 73 | 334 | 280 | 380 | 175 | 232,5 | 120 | 11   | 13,5 |                  |

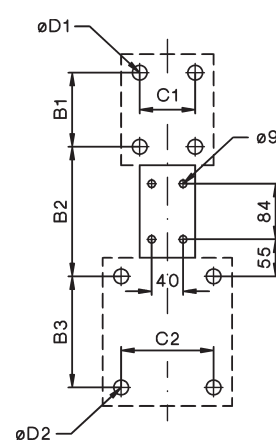
**LG10400V, LG10402V**



**LG10399V**



**LG10403V, LG10401V**



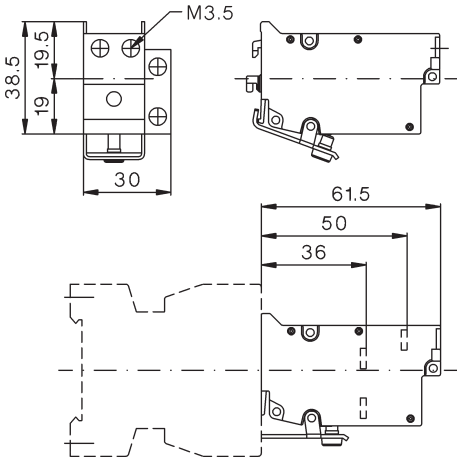
| Type            | Contactor 1     | Contactor 2     | A   | A1  | B1  | B2  | B3  | C1  | C2  | C3 | C4   | D1   | D2   |
|-----------------|-----------------|-----------------|-----|-----|-----|-----|-----|-----|-----|----|------|------|------|
| <b>LG10400V</b> | K3-315 - K3-550 | K3-315 - K3-550 | 250 | 134 | 220 | 94  | 220 | 110 | 110 | -  | -    | 9    | 9    |
| <b>LG10402V</b> | K3-700, -860    | K3-700, -860    | 302 | 162 | 280 | 200 | 280 | 175 | 175 | -  | -    | 11   | 11   |
| <b>LG10403V</b> | K3-1000, -1200  | K3-1000, -1200  | -   | -   | 380 | 280 | 380 | 120 | 120 | -  | -    | 13,5 | 13,5 |
| <b>LG10399V</b> | K3-450, -550    | K3-700, -860    | 302 | -   | 220 | 150 | 280 | 110 | 175 | 51 | 74,5 | 9    | 11   |
| <b>LG10401V</b> | K3-700, -860    | K3-1000, -1200  | -   | -   | 280 | 240 | 380 | 175 | 120 | -  | -    | 11   | 13,5 |

# Contactors

## Dimensions Accessories

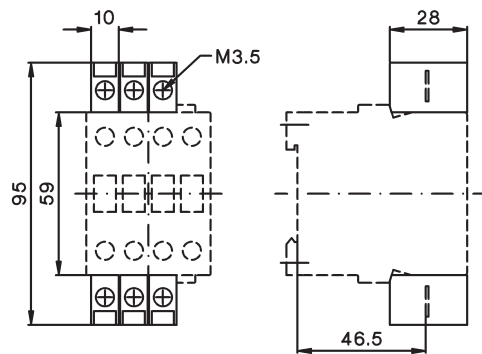
### Latch

#### K2-L..



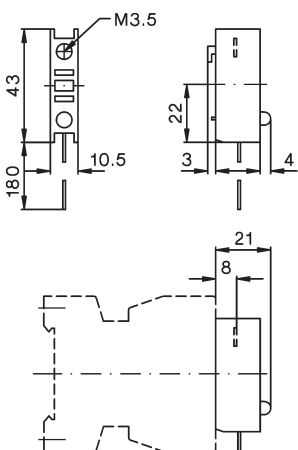
### Contactors with additional terminals

#### LG9339N (2 x 3 pieces) for K3-10N. to K3-22N.



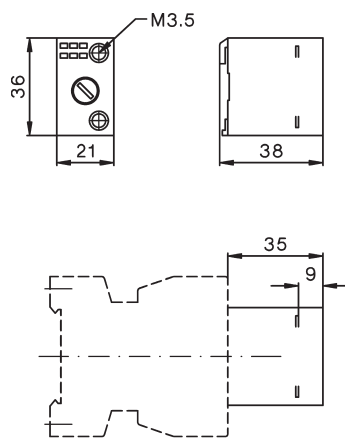
### Indicator units

#### K2-ING, K2-INR K2-UN, K2-UNR



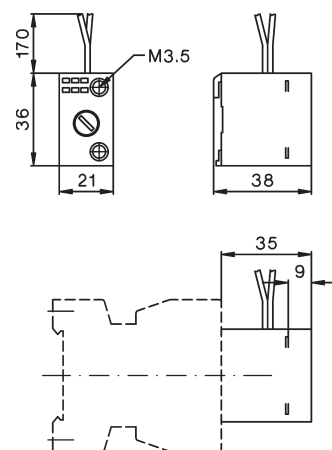
### Fuse holder

#### K2-RF



### Fuse holder with rectifier

#### K2-RF1 K2-RF3

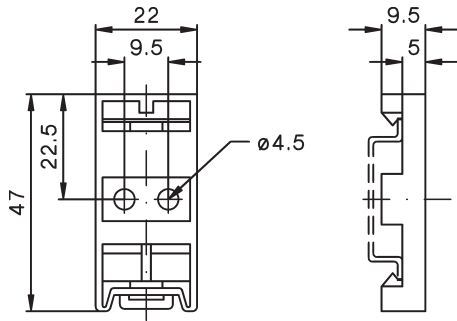


# Contactors

## Dimensions Accessories

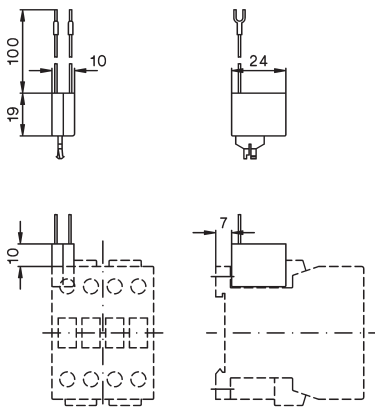
### Snap-on adapter

#### K2-SM

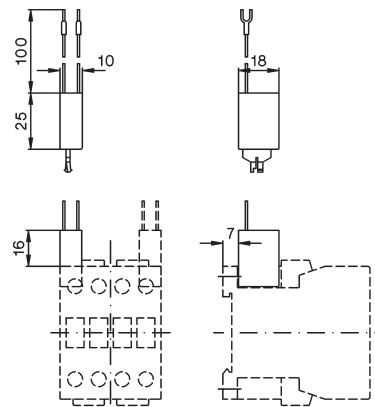


### Suppressor units

#### RC-K3N ..



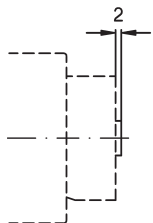
#### RC-K3NW ..



### Marking systems

marking label

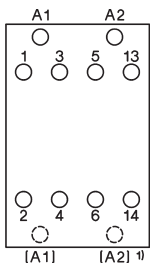
**P487-1** or **P245-**.



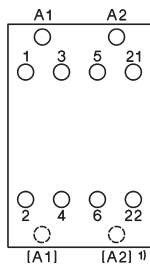
# Contactors

## Position of terminals

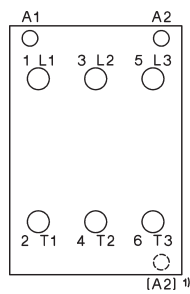
K3-10ND10  
K3-14ND10  
K3-18ND10  
K3-22ND10  
K3-18NK10



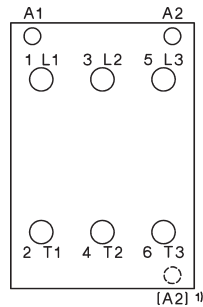
K3-10ND01  
K3-14ND01  
K3-18ND01  
K3-22ND01  
K3-18NK01



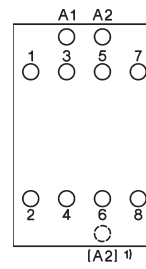
K3-24A00, K3-24K00  
K3-32A00, K3-32K00  
K3-40A00



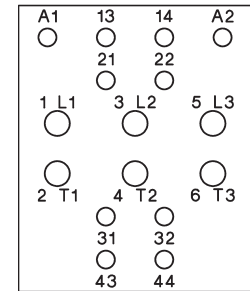
K3-50A00, K3-50K00  
K3-62A00, K3-62K00  
K3-74A00, K3-74K00



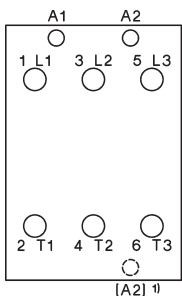
K3-10NA00-40  
K3-14NA00-40  
K3-18NA00-40  
K3-22NA00-40  
K2-23A00-40 to  
K2-60A00-40



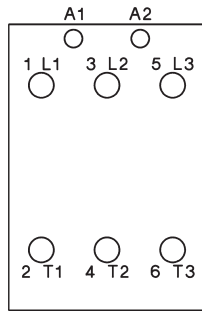
K85A22  
K110A22



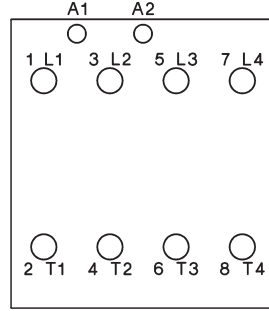
K3-90A00  
K3-115A00



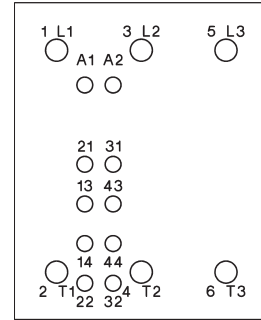
K3-151A00  
K3-176A00  
K3-210A00  
K3-260A00  
K3-316A00



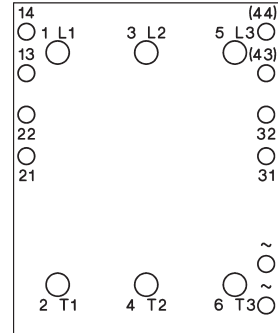
K3-116A00-40  
K3-151A00-40  
K3-176A00-40  
K3-210A00-40  
K3-260A00-40  
K3-316A00-40



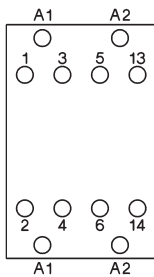
K3-450A22  
K3-550A22  
K3-700A22  
K3-860A22



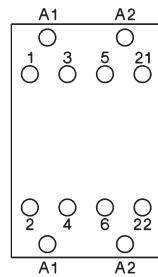
K3-1000A12  
K3-1200A12



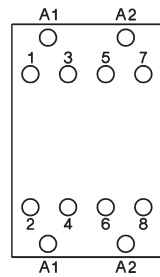
KG3-10A10  
KG3-14A10  
KG3-18A10  
KG3-22A10



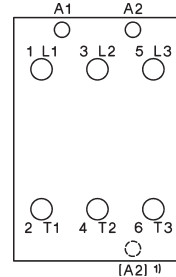
KG3-10A01  
KG3-14A01  
KG3-18A01  
KG3-22A01



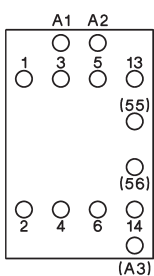
KG3-10A00-40  
KG3-14A00-40  
KG3-18A00-40  
KG3-22A00-40



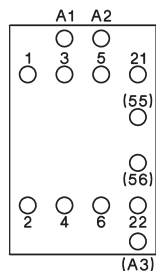
KG3-24A00  
KG3-32A00  
KG3-40A00



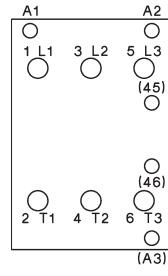
K3-10ND10=  
K3-14ND10=  
K3-18ND10=  
K3-22ND10=



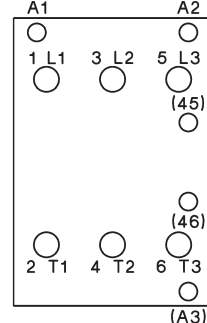
K3-10ND01=  
K3-14ND01=  
K3-18ND01=  
K3-22ND01=



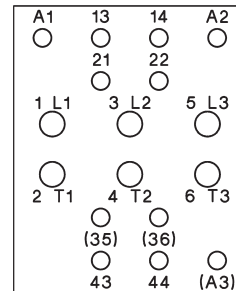
K3-24A00=  
K3-32A00=  
K3-40A00=



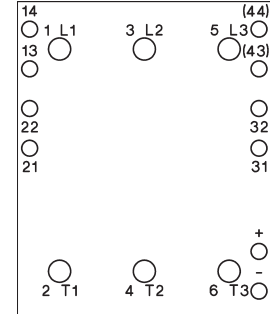
K3-50A00=  
K3-62A00=  
K3-74A00=



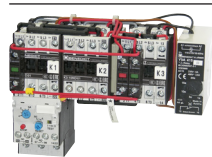
K85A21=  
K110A21=



K3-1000A12=  
K3-1200A12=



1) Type-suffix "EUR" with additional coil terminal  
Ordering example: K3-10ND10 EUR 230



Star-Delta Starters Open Type

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Star-Delta Starters Enclosed  
Enclosure for Star-Delta Starters

94

94



Accessories

95



Reversing Contactors

96



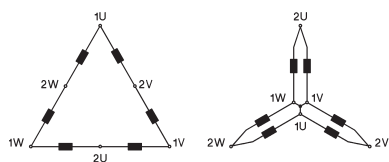
Pole Changing Starters

98



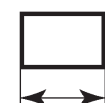
Technical Data

100



Wiring Diagrams

103

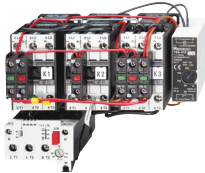
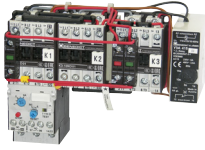


Dimensions

107

# Star-Delta Starters Open Type

AC Operated



| Ratings |      | Rated Current |      | order separately    | Type              | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|---------|------|---------------|------|---------------------|-------------------|----------------------------|-----------|---------------|
| AC3     |      |               |      |                     |                   | 220-240V 50Hz              |           |               |
| 380V    |      |               |      |                     |                   | 380-415V 50Hz              |           |               |
| 400V    | 660V | AC3           |      | Overload Relay      |                   |                            |           |               |
| 415V    | 500V | 690V          | 400V |                     |                   |                            |           |               |
| kW      | kW   | kW            | A    | Type                |                   |                            |           |               |
| 7,5     | 7,5  | 11            | 16   | U3/32<br>U12/16E K3 | <b>K3NY15 ...</b> |                            | 1         | 0,9           |
| 15      | 18,5 | 15            | 30   |                     | <b>K3NY26 ...</b> |                            | 1         | 0,9           |
| 22      | 30   | 22            | 45   | U3/42               | <b>K3Y40 ...</b>  |                            | 1         | 1,4           |
| 30      | 37   | 30            | 60   |                     | <b>K3Y52 ...</b>  |                            | 1         | 1,8           |
| 45      | 55   | 45            | 85   | U3/74               | <b>K3Y80 ...</b>  |                            | 1         | 3,5           |
| 55      | 75   | 55            | 109  |                     | <b>K3Y100 ...</b> |                            | 1         | 3,7           |
| 75      | 90   | 90            | 150  | U85                 | <b>K3Y140 ...</b> |                            | 1         | 6,6           |
| 110     | 132  | 110           | 205  |                     | <b>K3Y200 ...</b> |                            | 1         | 7             |
| 132     | 160  | 160           | 240  | U180                | <b>K3Y240 ...</b> |                            | 1         | 15            |
| 160     | 180  | 180           | 300  |                     | <b>K3Y300 ...</b> |                            | 1         | 15            |

Star-delta starters are wired to accept thermal overload relay. The thermal overload relay has to be ordered separately. For full load current setting use the YD-dial of thermal overload relay.

**Ordering Example:** Star-Delta Starter, open type, rated AC3 at 400V 205A rated control voltage 230V 50Hz - **Order Type: K3Y200 230 + U85 120**

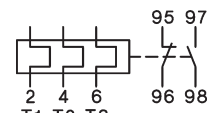
## Thermal Overload Relays

| Rated Motor Current<br>A | Type | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|--------------------------|------|-----------|---------------|----------------|
|--------------------------|------|-----------|---------------|----------------|

For Star-Delta Starters K3NY15.. to K3Y40..



|             |                      |   |      |  |
|-------------|----------------------|---|------|--|
| 7 - 10,5    | <b>U12/16E 6 K3</b>  | 1 | 0,10 |  |
| 10,5 - 15,5 | <b>U12/16E 9 K3</b>  | 1 | 0,10 |  |
| 14 - 19     | <b>U12/16E 11 K3</b> | 1 | 0,10 |  |
| 18 - 24     | <b>U12/16E 14 K3</b> | 1 | 0,10 |  |
| 23 - 31     | <b>U12/16E 18 K3</b> | 1 | 0,10 |  |

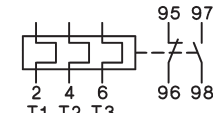


manual reset

For Star-Delta Starters K3NY15.. to K3Y52..



|             |                 |   |      |  |
|-------------|-----------------|---|------|--|
| 7 - 10,5    | <b>U3/32 6</b>  | 1 | 0,14 |  |
| 10,5 - 15,5 | <b>U3/32 9</b>  | 1 | 0,14 |  |
| 14 - 19     | <b>U3/32 11</b> | 1 | 0,14 |  |
| 18 - 24     | <b>U3/32 14</b> | 1 | 0,14 |  |
| 23 - 31     | <b>U3/32 18</b> | 1 | 0,14 |  |
| 30 - 41     | <b>U3/32 24</b> | 1 | 0,14 |  |
| 40 - 55     | <b>U3/32 32</b> | 1 | 0,14 |  |

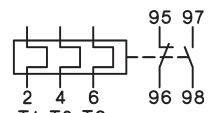


manual and auto reset

For Star-Delta Starters K3Y40.., K3Y52..



|         |                 |   |      |  |
|---------|-----------------|---|------|--|
| 24 - 35 | <b>U3/42 20</b> | 1 | 0,30 |  |
| 35 - 48 | <b>U3/42 28</b> | 1 | 0,30 |  |
| 48 - 73 | <b>U3/42 42</b> | 1 | 0,30 |  |



manual and auto reset

1) Coil voltage range and other coil voltages see page 100

| Components for Combinations |                   |                         | Electronic Timer | Mechanical Interlock between K2 and K3 | Star-Delta Starter Connector Type | Auxiliary Contacts Built-in for use on Contactor |          |         | Free Space for Aux. Contact Blocks on Contactor |          |         |
|-----------------------------|-------------------|-------------------------|------------------|--|-----------------------------------|--|----------|---------|---|----------|---------|
| Line Contactor              | Delta Contactor   | Star Contactor          |                  |  |                                   | Line K1  | Delta K2 | Star K3 | Line K1   | Delta K2 | Star K3 |
| K1 Type                     | K2 Type           | K3 Type                 | K4 Type          | K2 and K3 Type                         |                                   |  |          |         |   |          |         |
| K3-10ND01 + HN10            | K3-10ND01         | K3-10ND10 + HN10 + HN01 | Y9A              | LG10889                                | K3NY-VB10                         | -  | -        | -       | 3   | 4        | 2       |
| K3-18ND01 + HN10            | K3-18ND01         | K3-14ND10 + HN10 + HN01 | Y9A              | LG10889                                | K3NY-VB10                         | -  | -        | -       | 3   | 4        | 2       |
| K3-24A00 + HN10 + HN01      | K3-24A00 + HN01   | K3-24A00 + 2HN10 + HN01 | Y9A              | LG10889                                | K3Y-VB24                          | -  | -        | -       | 2   | 3        | 1       |
| K3-32A00 + HN10 + HN01      | K3-32A00 + HN01   | K3-24A00 + 2HN10 + HN01 | Y9A              | LG10889                                | K3Y-VB24                          | -  | -        | -       | 2   | 3        | 1       |
| K3-50A00 + HN01 + HN10      | K3-50A00 + HN01   | K3-32A00 + 2HN10 + HN01 | Y9A              | LG10890                                | -                                 | -  | -        | -       | 2   | 3        | 1       |
| K3-62A00 + HN01 + HN10      | K3-62A00 + HN01   | K3-50A00 + 2HN10 + HN01 | Y9A              | LG10890                                | -                                 | -  | -        | -       | 2   | 3        | 1       |
| K3-90A00 + HN01 + HN10      | K3-90A00 + HN01   | K3-90A00 + 2HN10 + HN01 | Y9AL             | LG11478                                | -                                 | -  | -        | -       | 5   | 6        | 4       |
| K3-115A00 + HN01 + HN10     | K3-115A00 + HN01  | K3-90A00 + 2HN10 + HN01 | Y9AL             | LG11478                                | -                                 | -  | -        | -       | 5   | 6        | 4       |
| K3-151A00 + HKT11           | K3-151A00 + HKT11 | K3-151A00 + HKT22       | Y9AL             | LG11223H                               | -                                 | -  | 1/-      | -/1     | 2   | 1        | 1       |
| K3-176A00 + HKT11           | K3-176A00 + HKT11 | K3-151A00 + HKT22       | Y9AL             | LG11223H                               | -                                 | -  | 1/-      | -/1     | 2   | 1        | 1       |

**Applications**

The star-delta starting method is only practicable in such cases where the motor windings are connected in delta configuration for normal operation and the torque which is needed during the starting period is not higher than approx. 30% of the rated torque. The starting current drawn from the line will be approx. 2 to 2,7 times the rated motor current.

**Time setting**

The transition from start (star configuration) to normal operation (delta configuration) should be after the motor achieves practically full rotational speed. The use of star-delta timer Y9A with a dwell period of approx. 25ms provides a careful operation of motor and drive equipment.

**Thermal Overload Relays**



**Rated Motor Current**  
A

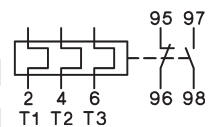
**Type**

Pack pcs. Weight kg/pc.

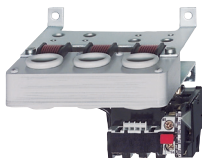
Wiring Diagram

For Star-Delta Starters K3Y80.., K3Y100..

|          |                 |   |      |
|----------|-----------------|---|------|
| 35 - 48  | <b>U3/74 28</b> | 1 | 0,40 |
| 48 - 73  | <b>U3/74 42</b> | 1 | 0,40 |
| 70 - 90  | <b>U3/74 52</b> | 1 | 0,40 |
| 90 - 112 | <b>U3/74 65</b> | 1 | 0,40 |

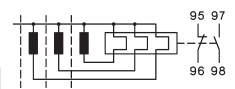


manual and auto reset

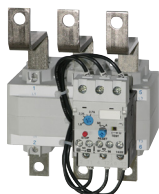


For Star-Delta Starters K3Y140.., K3Y200..

|           |                |   |      |
|-----------|----------------|---|------|
| 104 - 156 | <b>U85 90</b>  | 1 | 0,90 |
| 140 - 207 | <b>U85 120</b> | 1 | 0,90 |

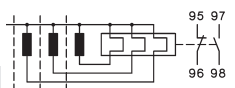


manual reset



For Star-Delta Starters K3Y240.., K3Y300..

|           |                 |   |     |
|-----------|-----------------|---|-----|
| 208 - 312 | <b>U180 180</b> | 1 | 1,5 |
|-----------|-----------------|---|-----|



manual and auto reset



# Star-Delta Starters Enclosed Type

AC Operated

| Ratings     |      | Rated Current | Optional Extras | Wired to accept Overload Relay | Type       | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|-------------|------|---------------|-----------------|--------------------------------|------------|----------------------------|-----------|---------------|
| AC3         |      |               |                 |                                |            | 220-240V 50Hz              |           |               |
| <b>380V</b> |      |               |                 |                                | <b>230</b> | 380-415V 50Hz              |           |               |
| <b>400V</b> | 660V | AC3           |                 |                                | <b>400</b> |                            |           |               |
| <b>415V</b> | 500V | 690V          | 400V            |                                | ↓          |                            |           |               |
| <b>kW</b>   | kW   | kW            | A               | Type                           |            |                            |           |               |



## Plastic Enclosed, protected to IP65

| Rated Current | Rated Power (kW) | Rated Voltage (V) | Rated Current (A) | Optional Extras | Wiring | Type               | Pack pcs. | Weight kg/pc. |
|---------------|------------------|-------------------|-------------------|-----------------|--------|--------------------|-----------|---------------|
| 7,5           | 7,5              | 11                | 16                | ST              | U3/32  | <b>K3NY15P ...</b> | 1         | 1,8           |
| 15            | 18,5             | 15                | 30                | ST              |        | <b>K3NY26P ...</b> | 1         | 1,8           |
| 22            | 30               | 22                | 45                | ST, H           | U3/42  | <b>K3Y40P ...</b>  | 1         | 3,8           |
| 30            | 37               | 30                | 60                | ST, H           |        | <b>K3Y52P ...</b>  | 1         | 4,2           |
| 45            | 55               | 45                | 85                | ST, H           | U3/74  | <b>K3Y80P ...</b>  | 1         | 5,9           |
| 55            | 75               | 55                | 109               | ST, H           |        | <b>K3Y100P ...</b> | 1         | 8,7           |



## Sheet Steel Enclosed, protected to IP54

| Rated Current | Rated Power (kW) | Rated Voltage (V) | Rated Current (A) | Optional Extras | Wiring | Type               | Pack pcs. | Weight kg/pc. |
|---------------|------------------|-------------------|-------------------|-----------------|--------|--------------------|-----------|---------------|
| 7,5           | 7,5              | 11                | 16                | ST, H           | U3/32  | <b>K3NY15B ...</b> | 1         | 2,8           |
| 15            | 18,5             | 15                | 30                | ST, H           |        | <b>K3NY26B ...</b> | 1         | 2,8           |
| 22            | 30               | 22                | 45                | ST, H           | U3/42  | <b>K3Y40B ...</b>  | 1         | 4,8           |
| 30            | 37               | 30                | 60                | ST, H           |        | <b>K3Y52B ...</b>  | 1         | 5,2           |
| 45            | 55               | 45                | 85                | ST, H           | U3/74  | <b>K3Y80B ...</b>  | 1         | 15            |
| 55            | 75               | 55                | 109               | ST, H           |        | <b>K3Y100B ...</b> | 1         | 15            |
| 75            | 90               | 90                | 150               | ST, H           | U85    | <b>K3Y140B ...</b> | 1         | 22            |
| 110           | 132              | 110               | 205               | ST, H           |        | <b>K3Y200B ...</b> | 1         | 22            |

1) Coil voltage range and other coil voltages see page 100

### Type-suffix for optional extras

|                                      |             |
|--------------------------------------|-------------|
| Start-Stop Push Buttons              | .....T ...  |
| Selector Switch                      | .....W ...  |
| Control Circuit Fuse <250V (1 piece) | .....ST ... |
| >250V (2 pieces)                     | .....ST ... |
| Run Hour Meter                       | .....H ...  |

**Ordering Example:** Star-Delta Starter, steel sheet enclosed, with selector switch and run hour meter rated AC3 at 400V 82A, rated control voltage 230V 50Hz - **Order Type: K3Y80BWH 230 + U3/74 52**

## Enclosures for Star Delta Starter



| for Starter             | accept Overload Relay | Type                | Pack pcs. | Weight kg/pc. |
|-------------------------|-----------------------|---------------------|-----------|---------------|
| <b>Plastic IP65</b>     |                       |                     |           |               |
| <b>K3NY15, K3NY26</b>   | U3/32                 | <b>K3Y26P-G3</b>    | 1         | 1,0           |
| <b>K3Y40, K3Y52</b>     | U3/42, U3/32          | <b>K3Y40/52P-G3</b> | 1         | 2,4           |
| <b>Sheet Steel IP54</b> |                       |                     |           |               |
| <b>K3NY15, K3NY26</b>   | U3/32                 | <b>K3Y26B-G3</b>    | 1         | 3,4           |
| <b>K3Y40, K3Y52</b>     | U3/42, U3/32          | <b>K3Y40/52B-G3</b> | 1         | 3,4           |

## Star-Delta Starter Connector



For Star-Delta Starter Types

|                | Type             | Pack pcs. | Weight kg/pc. |
|----------------|------------------|-----------|---------------|
| K3NY15, K3NY26 | <b>K3NY-VB10</b> | 1         | 0,02          |
| K3Y40, K3Y52   | <b>K3Y-VB24</b>  | 1         | 0,03          |

## Additional Terminals



For Star-Delta Starter Types  
Line Conn. Motor Conn.  
Line Contactor Overload Relay

Cable cross-section mm<sup>2</sup>

Type

Pack pcs. Weight kg/pc.

### Single pole with Fingertouch Protection

|                |        |                                   |               |   |       |
|----------------|--------|-----------------------------------|---------------|---|-------|
| K3NY15, K3NY26 | U12/16 | 0,75 - 10 solid<br>0,75 - 6 flex. | <b>LG9339</b> | 6 | 0,009 |
|----------------|--------|-----------------------------------|---------------|---|-------|

### Three-pole with Fingertouch Protection

|  |       |                                |               |   |       |
|--|-------|--------------------------------|---------------|---|-------|
|  | U3/42 | 4 - 35 strand.<br>4 - 25 flex. | <b>LG7559</b> | 1 | 0,052 |
|--|-------|--------------------------------|---------------|---|-------|

## Electronic Timers for Star-Delta Starters<sup>1)</sup>



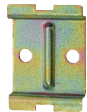
| Rated Control Voltage V | Time Range s         | Delay Time ms | Rated Current AC15 |        | Type            | Pack pcs. | Weight kg/pc. |
|-------------------------|----------------------|---------------|--------------------|--------|-----------------|-----------|---------------|
|                         |                      |               | 250V A             | 400V A |                 |           |               |
| 24 - 60V AC/DC          | 1 - 20 <sup>2)</sup> | 20 - 25       | 5                  | 5      | <b>Y9A 60</b>   | 1         | 0,075         |
| 110 - 415V AC/DC        | 1 - 20 <sup>2)</sup> | 20 - 25       | 5                  | 5      | <b>Y9A 415</b>  | 1         | 0,075         |
| 24 - 60V AC/DC          | 1 - 20 <sup>2)</sup> | 40 - 80       | 5                  | 5      | <b>Y9AL 60</b>  | 1         | 0,075         |
| 110 - 415V AC/DC        | 1 - 20 <sup>2)</sup> | 40 - 80       | 5                  | 5      | <b>Y9AL 415</b> | 1         | 0,075         |

|                                     |            |
|-------------------------------------|------------|
| Time repeat accuracy                | ± 1%       |
| Minimum interval between operations | 2s         |
| Short circuit protection            | 4A gl (gG) |

|                      |          |       |
|----------------------|----------|-------|
| Power consumption at | 24V      | 0,2VA |
|                      | 60V      | 5VA   |
|                      | 220-240V | 2VA   |
|                      | 380-415V | 7VA   |

1) not suitable for contactors K3-450 - K3-1200  
2) - 20% / + 30%

## Mounting Bar



| Specification                               | Type          | Pack pcs. | Weight kg/pc. |
|---|---------------|-----------|---------------|
| For screw mounting of electronic timer Y9.. | <b>LG7735</b> | 10        | 0,09          |

## Star-Delta Starters in Special Versions

### Starters for Longer Starting Time

For longer starting times the thermal overload relay is mounted on delta-contactor. The motor is not protected in Y-connection. The timer used for this starter-type is the type Y91A, time range is 10 to 60s. Principal wiring diagram see page 104.

**Ordering Example:** K3YL52 230

### Starters with two Thermal Overload Relays on request

Basic circuit diagram see page 104

## Reversing Contactors with Mechanical Interlock

AC Operated

| Ratings     | Rated Current | Vorbereitet für Einbau | Wired to accept Overload Relay | Type     | Coil voltage <sup>1)</sup> | Pack pcs. | Weight kg/pc. |
|-------------|---------------|------------------------|--------------------------------|----------|----------------------------|-----------|---------------|
| AC3         |               |                        |                                |          | 110V 50Hz                  |           |               |
| <b>380V</b> |               |                        |                                |          | 220-240V 50Hz              |           |               |
| <b>400V</b> |               | 660V                   | AC3                            |          | 380-415 50Hz               |           |               |
| <b>415V</b> | 500V          | 690V                   | 400V                           | page 120 |                            |           |               |
| <b>kW</b>   | kW            | kW                     | A                              | Type     |                            |           |               |

### Open Type

| Rated Current | Rated Power | Rated Voltage | Rated Current | Wired to accept Overload Relay | Type               | Pack pcs. | Weight kg/pc. |
|---------------|-------------|---------------|---------------|--------------------------------|--------------------|-----------|---------------|
| 4             | 5,5         | 5,5           | 10            | U3/32<br>U12/16E K3            | <b>K3NWU10 ...</b> | 1         | 0,6           |
| 7,5           | 10          | 7,5           | 18            |                                | <b>K3NWU18 ...</b> | 1         | 0,6           |
| 11            | 15          | 15            | 24            | U3/42                          | <b>K3WU24 ...</b>  | 1         | 1,2           |
| 15            | 18,5        | 18,5          | 32            |                                | <b>K3WU32 ...</b>  | 1         | 1,4           |
| 18,5          | 18,5        | 18,5          | 40            |                                | <b>K3WU40</b>      | 1         | 1,4           |
| 22            | 30          | 30            | 50            | U3/74                          | <b>K3WU50 ...</b>  | 1         | 2,5           |
| 30            | 37          | 37            | 62            |                                | <b>K3WU62 ...</b>  | 1         | 2,5           |
| 37            | 45          | 45            | 74            |                                | <b>K3WU74 ...</b>  | 1         | 2,5           |



### Sheet Steel Enclosed, protected to IP54

| Rated Current | Rated Power | Rated Voltage | Rated Current | Wired to accept Overload Relay | Type                | Pack pcs. | Weight kg/pc. |
|---------------|-------------|---------------|---------------|--------------------------------|---------------------|-----------|---------------|
| 4             | 5,5         | 5,5           | 10            | U3/32                          | <b>K3NWU10B ...</b> | 1         | 3,9           |
| 7,5           | 10          | 7,5           | 18            |                                | <b>K3NWU18B ...</b> | 1         | 4,1           |
| 11            | 15          | 15            | 24            | U3/42                          | <b>K3WU24B ...</b>  | 1         | 4,5           |
| 15            | 18,5        | 18,5          | 32            |                                | <b>K3WU32B ...</b>  | 1         | 4,7           |
| 22            | 30          | 30            | 50            | U3/74                          | <b>K3WU50B ...</b>  | 1         | 7,1           |
| 30            | 37          | 37            | 62            |                                | <b>K3WU62B ...</b>  | 1         | 7,1           |



## Reversing Starter Connector



For Reversing Starter Types

K3NWU10, K3NWU18  
K3WU24, K3WU32

Type

**K3NW-VB10**  
**K3W-VB24**

Pack pcs. Weight kg/pc.

1 0,02  
1 0,025

1) Other coil voltages see page 57

| Components for Combinations |                           | Mechanical Interlock | Reversing Starter Connector | Auxiliary Contacts Built-in for use on Contactor |          | Free Space for Aux. Contact Blocks on Contactor |    |
|-----------------------------|---------------------------|----------------------|-----------------------------|--|----------|---|----|
| Left Hand Side Contactor    | Right Hand Side Contactor |                      |                             | K1 NO/NC   | K2 NO/NC | K1 HN.. or HA..                                 | K2 |
| K1 Type                     | K2 Type                   | Type                 | Type                        |  |          |   |    |
| K3-10ND10 + HN01            | K3-10ND10 + HN01          | LG10889              | K3NW-VB10                   | -  | -        | 3   | 3  |
| K3-18ND10 + HN01            | K3-18ND10 + HN01          | LG10889              | K3NW-VB10                   | -  | -        | 3   | 3  |
| K3-24A00 + HN10 + HN01      | K3-24A00 + HN10 + HN01    | LG10889              | K3W-VB24                    | -  | -        | 2   | 2  |
| K3-32A00 + HN10 + HN01      | K3-32A00 + HN10 + HN01    | LG10889              | K3W-VB24                    | -  | -        | 2   | 2  |
| K3-40A00 + HN10 + HN01      | K3-40A00 + HN10 + HN01    | LG10889              | K3W-VB24                    | -  | -        | 2   | 2  |
| K3-50A00 + HN10 + HN01      | K3-50A00 + HN10 + HN01    | LG10890              | -                           | -  | -        | 2   | 2  |
| K3-62A00 + HN10 + HN01      | K3-62A00 + HN10 + HN01    | LG10890              | -                           | -  | -        | 2   | 2  |
| K3-74A00 + HN10 + HN01      | K3-74A00 + HN10 + HN01    | LG10890              | -                           | -  | -        | 2   | 2  |
| K3-10ND10 + HN01            | K3-10ND10 + HN01          | LG10889              | K3NW-VB10                   | -  | -        | 3   | 3  |
| K3-18ND10 + HN01            | K3-18ND10 + HN01          | LG10889              | K3NW-VB10                   | -  | -        | 3   | 3  |
| K3-24A00 + HN10 + HN01      | K3-24A00 + HN10 + HN01    | LG10889              | K3W-VB24                    | -  | -        | 2   | 2  |
| K3-32A00 + HN10 + HN01      | K3-32A00 + HN10 + HN01    | LG10889              | K3W-VB24                    | -  | -        | 2   | 2  |
| K3-50A00 + HN10 + HN01      | K3-50A00 + HN10 + HN01    | LG10890              | -                           | -  | -        | 2   | 2  |
| K3-62A00 + HN10 + HN01      | K3-62A00 + HN10 + HN01    | LG10890              | -                           | -  | -        | 2   | 2  |

Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnect

Push Buttons

Representatives, Suppliers

## Pole Changing Starters

AC Operated

| Ratings |      |      | Rated Current | Wired to accept Overload Relay page 120 Type | Type            | Coil voltage <sup>1)</sup><br>220-240V 50Hz<br>380-415 50Hz | Pack pcs. | Weight kg/pc. |
|---------|------|------|---------------|--|-----------------|---|-----------|---------------|
| AC3     | 380V | 400V |               |  |                 |   |           |               |
| 415V    | 500V | 660V | AC3           |  | 230<br>400<br>↓ |   |           |               |
| kW      | kW   | kW   | 400V<br>A     |  |                 |   |           |               |

### Open Type



|     |      |      |    |                             |             |   |     |
|-----|------|------|----|-----------------------------|-------------|---|-----|
| 7,5 | 10   | 10   | 18 | 2 x U3/32<br>2 x U12/16E K3 | K3NPU18 ... | 1 | 1,0 |
| 11  | 15   | 15   | 24 |                             | K3NPU24 ... | 1 | 1,5 |
| 15  | 18,5 | 18,5 | 32 | 2 x U3/32                   | K3PU32 ...  | 1 | 1,9 |
| 22  | 30   | 30   | 50 | 2 x U3/74                   | K3PU50 ...  | 1 | 3,9 |
| 30  | 37   | 37   | 62 |                             | K3PU62 ...  | 1 | 3,9 |

### Sheet Steel Enclosed, protected to IP54



|     |      |      |    |          |              |   |     |
|-----|------|------|----|----------|--------------|---|-----|
| 7,5 | 10   | 7,5  | 18 | 2x U3/32 | K3NPU18B ... | 1 | 1,0 |
| 11  | 15   | 15   | 24 |          | K3NPU24B ... | 1 | 1,5 |
| 15  | 18,5 | 18,5 | 32 |          | K3PU32B ...  | 1 | 1,9 |

**Ordering Example:** Pole Changing Starter, open version, rated AC3 at 400V 28A and 15A, control voltage 230V 50Hz  
**Order Type:** K3PU32 230 + U3/32 32 + U3/32 18

Pole Changing Starters for Star-Delta Operation on request

1) Other coil voltages see page 57

| Components for Combinations   |                           |                    | Free Space for                                    |              |         |
|-------------------------------|---------------------------|--------------------|---|--------------|---------|
| High Speed                    | Low Speed                 | Star Contactor     | Aux. Contact Blocks on High Speed K1 HN.. or HA.. | Low Speed K2 | Star K3 |
| K1 Type                       | K2 Type                   | K3 Type            |   |              |         |
| K3-18ND01<br>+ 2 x HN10       | K3-18ND01<br>+ HN10       | K3-14ND01          | 2   | 3            | 4       |
| K3-24A00<br>+ HN01 + 2 x HN10 | K3-24A00<br>+ HN01 + HN10 | K3-18ND01          | 1   | 2            | 4       |
| K3-32A00<br>+ HN01 + 2 x HN10 | K3-32A00<br>+ HN01 + HN10 | K3-24A00<br>+ HN01 | 1   | 2            | 3       |
| K3-50A00<br>+ HN01 + 2 x HN10 | K3-50A00<br>+ HN01 + HN10 | K3-32A00<br>+ HN01 | 1   | 2            | 3       |
| K3-62A00<br>+ HN01 + 2 x HN10 | K3-62A00<br>+ HN01 + HN10 | K3-50A00<br>+ HN01 | 1   | 2            | 3       |
| K3-18ND01<br>+ 2 x HN10       | K3-18ND01<br>+ HN10       | K3-14ND01          | 2   | 3            | 4       |
| K3-24A00<br>+ HN01 + 2 x HN10 | K3-24A00<br>+ HN01 + HN10 | K3-18ND01          | 1   | 2            | 4       |
| K3-32A00<br>+ HN01 + 2 x HN10 | K3-32A00<br>+ HN01 + HN10 | K3-24A00<br>+ HN01 | 1   | 2            | 3       |

# Star-Delta Starters

## Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Type  |                                   | K3NY15                | K3NY26                | K3Y40     | K3Y52     | K3Y80     | K3Y100                | K3Y140     | K3Y200     | K3Y240     | K3Y300     |            |
|---|-----------------------------------|-----------------------|-----------------------|-----------|-----------|-----------|-----------------------|------------|------------|------------|------------|------------|
| <b>Main Contacts</b>                                  |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| Rated insulation voltage $U_i^{(1)}$                  | V AC                              | 690                   | 690                   | 690       | 690       | 690       | 690                   | 690        | 690        | 690        | 690        |            |
| Frequency of operations $z_{AC3, I_e}$                | 1/h                               | 15                    |                       |           |           |           |                       |            |            |            |            |            |
| Change-over time max. (Y-step)                        | s                                 | 20 (Type K3YL ... 60) |                       |           |           |           |                       |            |            |            |            |            |
| <b>Utilization category AC3</b>                       |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| <b>Switching of three-phase motors</b>                |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| Rated operational current $I_e$                       | 220-230V                          | A                     | 16                    | 30        | 45        | 60        | 85                    | 109        | 150        | 205        | 240        | 300        |
|   | 240V                              | A                     | 16                    | 30        | 45        | 60        | 85                    | 109        | 150        | 205        | 240        | 300        |
|   | <b>380-400V</b>                   | <b>A</b>              | <b>16</b>             | <b>30</b> | <b>45</b> | <b>60</b> | <b>85</b>             | <b>109</b> | <b>150</b> | <b>205</b> | 240        | 300        |
| Rated operational power of three-phase motors 50-60Hz | 415-440V                          | A                     | 15                    | 30        | 45        | 60        | 85                    | 109        | 150        | 205        | 240        | 300        |
|   | 500V                              | A                     | 15                    | 30        | 45        | 60        | 85                    | 95         | 150        | 205        | 190        | 240        |
|   | 660-690V                          | A                     | 13                    | 17        | 30        | 36        | 57                    | 72         | 103        | 118        | 147        | 180        |
|   |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| Rated operational power of three-phase motors 50-60Hz | 220-230V                          | kW                    | 4                     | 7,5       | 11        | 15        | 22                    | 30         | 45         | 55         | 75         | 90         |
|   | 240V                              | kW                    | 5,5                   | 11        | 15        | 18,5      | 22                    | 30         | 45         | 55         | 75         | 90         |
|   | <b>380-400V</b>                   | <b>kW</b>             | <b>7,5</b>            | <b>15</b> | <b>22</b> | <b>30</b> | <b>45</b>             | <b>55</b>  | <b>75</b>  | <b>110</b> | <b>132</b> | <b>160</b> |
|   |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| Rated operational power of three-phase motors 50-60Hz | 415-440V                          | kW                    | 7,5                   | 15        | 22        | 30        | 45                    | 55         | 75         | 110        | 140        | 170        |
|   | 500V                              | kW                    | 7,5                   | 18,5      | 30        | 37        | 55                    | 75         | 90         | 132        | 132        | 180        |
|   | 660-690V                          | kW                    | 11                    | 15        | 22        | 30        | 45                    | 55         | 90         | 110        | 132        | 180        |
|   |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| <b>Cable cross-sections</b>                           |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| Line  | solid or stranded                 | mm <sup>2</sup>       | 1,5 - 6 <sup>2)</sup> |           | 1,5 - 16  |           | 10 - 70 <sup>3)</sup> |            | 10 - 120   |            | busbar     |            |
|   | flexible                          | mm <sup>2</sup>       | 1,5 - 4 <sup>2)</sup> |           | 1,5 - 16  |           | 16 - 50 <sup>3)</sup> |            | 10 - 95    |            | 18x5       |            |
|   | flexible with multicore cable end | mm <sup>2</sup>       | 1,5 - 4 <sup>2)</sup> |           | 1,5 - 16  |           | 10 - 35               |            | 10 - 95    |            | M8         |            |
| Motor   | solid or stranded                 | mm <sup>2</sup>       | 1,5 - 6               |           | 1,5 - 16  |           | 4 - 35 <sup>3)</sup>  |            | 10 - 120   |            | busbar     |            |
|   | flexible                          | mm <sup>2</sup>       | 1,5 - 4               |           | 1,5 - 16  |           | 6 - 25 <sup>3)</sup>  |            | 10 - 95    |            | 18x5       |            |
|   | flexible with multicore cable end | mm <sup>2</sup>       | 1,5 - 4               |           | 1,5 - 16  |           | 4 - 25                |            | 10 - 95    |            | M8         |            |
| <b>Power consumption of the combination</b>           |                                   |                       |                       |           |           |           |                       |            |            |            |            |            |
| inrush and change-over                                | VA                                |                       | 55                    |           | 130       |           | 183                   |            | 560        |            | 700        |            |
|   | sealed VA                         |                       | 20                    |           | 26        |           | 36                    |            | 10         |            | 10         |            |
|   | W                                 |                       | 6                     |           | 8         |           | 14                    |            | 10         |            | 10         |            |

## Coil Voltage Ranges and Non Standard Voltages for Star-Delta Starters

### K3NY15.. to K3Y100..

| Suffix to Star-Delta Starter type<br>e.g. K3Y80 <b>400</b> | Rated Control Voltage $U_s$ range for 50Hz |            | range for 60Hz |            |
|--|--|------------|----------------|------------|
|  | min. V                                     | max. V     | min. V         | max. V     |
| 24   | 24   | 24         | 24             | 27         |
| 42   | 42   | 47         | 47             | 52         |
| 110  | 100  | 110        | 110            | 122        |
| 180  | 180  | 210        | 200            | 240        |
| <b>230</b>   | <b>220</b>                                 | <b>240</b> | <b>230</b>     | <b>264</b> |
| <b>400</b>   | <b>380</b>                                 | <b>415</b> | <b>400</b>     | <b>415</b> |

### K3Y140, to K3Y300..

| Suffix to Star-Delta Starter type<br>e.g. K3Y300 <b>230</b> | Rated Control Voltage $U_s$ range for 50Hz |            | range for 60Hz |            | for DC V   |
|---|--|------------|----------------|------------|------------|
|   | min. V                                     | max. V     | min. V         | max. V     |            |
| 24  | 24   | 24         | 24             | 24         | 24         |
| 48  | 48   | 48         | 48             | 48         | 48         |
| 110   | 110  | 120        | 110            | 120        | 110        |
| <b>230</b>  | <b>220</b>                                 | <b>240</b> | <b>220</b>     | <b>240</b> | <b>220</b> |
| <b>400</b>  | <b>380</b>                                 | <b>415</b> | <b>380</b>     | <b>415</b> | -          |

### Standard voltages in bold type letters

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

2) Additional terminals see page 95

3) Maximum cable cross-section with prepared conductor

# Reversing Starters

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Type  |                                   | K3NWU10         | K3NWU18    | K3WU24    | K3WU32    | K3WU50    | K3WU62    | K3WU74    |
|---|-----------------------------------|-----------------|------------|-----------|-----------|-----------|-----------|-----------|
| <b>Main Contacts</b>                                  |                                   |                 |            |           |           |           |           |           |
| Rated insulation voltage $U_i^{(1)}$                  | V AC                              | 690             | 690        | 690       | 690       | 690       | 690       | 690       |
| <b>Utilization category AC3</b>                       |                                   |                 |            |           |           |           |           |           |
| <b>Switching of three-phase motors</b>                |                                   |                 |            |           |           |           |           |           |
| Rated operational current $I_e$                       | 220V A                            | 12              | 18         | 23        | 30        | 45        | 63        |           |
|   | 230V A                            | 11,5            | 18         | 24        | 32        | 50        | 62        | 74        |
|   | 240V A                            | 11              | 18         | 24        | 32        | 50        | 62        | 74        |
|   | <b>380-400V A</b>                 | <b>10</b>       | <b>18</b>  | <b>24</b> | <b>32</b> | <b>50</b> | <b>62</b> | <b>74</b> |
|   | 415-440V A                        | 9               | 18         | 23        | 30        | 50        | 62        | 74        |
|   | 500V A                            | 9               | 16         | 23        | 30        | 45        | 60        | 74        |
|   | 660-690V A                        | 6,5             | 8,5        | 17        | 20        | 31        | 40        | 40        |
| Rated operational power of three-phase motors 50-60Hz | 220-230V kW                       | 3               | 5          | 6         | 8,5       | 12,5      | 18,5      |           |
|   | 240V kW                           | 3               | 5          | 7         | 9         | 13,5      | 19        | 23        |
|   | <b>380-400V kW</b>                | <b>4</b>        | <b>7,5</b> | <b>11</b> | <b>15</b> | <b>22</b> | <b>30</b> | <b>37</b> |
|   | 415-440V kW                       | 4,5             | 8,5        | 12        | 16        | 24        | 33        | 40        |
|   | 500V kW                           | 5,5             | 10         | 15        | 18,5      | 30        | 37        | 45        |
|   | 660-690V kW                       | 5,5             | 10         | 15        | 18,5      | 30        | 37        | 45        |
| <b>Cable cross-sections</b>                           |                                   |                 |            |           |           |           |           |           |
| Line  | solid or stranded                 | mm <sup>2</sup> | 0,75 - 6   |           | 1,5 - 25  |           | 4 - 50    |           |
|   | flexible                          | mm <sup>2</sup> | 1 - 4      |           | 2,5 - 16  |           | 6 - 35    |           |
|   | flexible with multicore cable end | mm <sup>2</sup> | 0,75 - 4   |           | 1,5 - 16  |           | 6 - 35    |           |
| Cables per clamp                                      |                                   |                 | 1          |           | 1         |           | 1         |           |
| <b>Power consumption of the combination</b>           |                                   |                 |            |           |           |           |           |           |
| inrush and change-over                                | VA                                | 33 - 45         |            | 90 - 115  |           | 140 - 185 |           |           |
|   | sealed VA                         | 7 - 10          |            | 9 - 13    |           | 13 - 18   |           |           |
|   | W                                 | 2,6 - 3         |            | 2,7 - 4   |           | 5,4 - 7   |           |           |

## Technical Data according to UL508

| Main Contacts (cULus)                                       | Type        | KNW3-10 | KNW3-18 | KW3-24 | KW3-32  | KW3-40 |
|---|-------------|---------|---------|--------|---------|--------|
| Rated operational power of three-phase motors at 60Hz (3ph) | 110-120V hp | 1½      | 2       | 5      | 5       | 7½     |
|   | 200V hp     | 3       | 5       | 7½     | 10      | 10     |
|   | 220-240V hp | 3       | 7½      | 10     | 10      | 15     |
|   | 277V hp     | 3       | 7½      | 7½     | 10      | 15     |
|   | 380-415V hp | 5       | 10      | 10     | 15      | 20     |
|   | 440-480V hp | 5       | 10      | 15     | 20      | 25     |
|   | 550-600V hp | 7½      | 15      | 20     | 25      | 30     |
| Fuse / Short-circuit current                                | A/kA        | 30/5    | 50/5    | 90/5   | 125/5   | 175/5  |
| Rated voltage   | V           | 600     | 600     | 600    | 600     | 600    |
| <b>Auxiliary Contacts (cULus)</b>                           |             | A600    | A600    | A600   | A600    | A600   |
| <b>Cable cross-sections</b>                                 |             |         |         |        |         |        |
| for main connectors   | solid       | AWG     | 18 - 10 |        | 16 - 10 |        |
|   | flexible    | AWG     | 18 - 10 |        | 14 - 4  |        |
| Cables per clamp  |             |         | 1       |        | 1       |        |

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{mp} = 8kV$ . Data for other conditions on request.



# Pole Changing Starters

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Type  |   | K3NPU18    | K3NPU24   | K3PU32    | K3PU50    | K3PU62    |
|---|---|------------|-----------|-----------|-----------|-----------|
| <b>Main Contacts</b>                                  |   |            |           |           |           |           |
| Rated insulation voltage $U_i$ <sup>1)</sup>          | V AC  | 690        | 690       | 690       | 690       | 690       |
| <b>Utilization category AC3</b>                       |   |            |           |           |           |           |
| <b>Switching of three-phase motors</b>                |   |            |           |           |           |           |
| Rated operational current $I_e$                       | 220V A  | 18         | 23        | 30        | 45        | 63        |
|   | 230V A  | 17,5       | 23        | 30        | 45        | 60        |
|   | 240V A  | 17         | 23        | 30        | 45        | 60        |
|   | <b>380-400V A</b>                                 | <b>16</b>  | <b>23</b> | <b>30</b> | <b>45</b> | <b>60</b> |
|   | 415V A  | 16         | 23        | 30        | 45        | 60        |
|   | 440V A  | 16         | 23        | 30        | 45        | 60        |
|   | 500V A  | 16         | 23        | 30        | 45        | 55        |
|   | 660V A  | 9          | 17,5      | 21        | 33        | 42        |
|   | 690V A  | 8,5        | 17        | 20        | 31        | 40        |
| Rated operational power of three-phase motors 50-60Hz | 220-230V kW                                       | 5          | 6         | 8,5       | 12,5      | 18,5      |
|   | 240V kW   | 5          | 7         | 9         | 13,5      | 19        |
|   | <b>380-400V kW</b>                                | <b>7,5</b> | <b>11</b> | <b>15</b> | <b>22</b> | <b>30</b> |
|   | 415-440V kW                                       | 8,5        | 12        | 16        | 24        | 33        |
|   | 500V kW   | 10         | 15        | 18,5      | 30        | 37        |
|   | 660-690V kW                                       | 7,5        | 15        | 18,5      | 30        | 37        |
| <b>Cable cross-sections</b>                           |   |            |           |           |           |           |
| Line  | solid or stranded mm <sup>2</sup>                 | 0,75 - 6   | 1,5 - 25  |           | 4 - 50    |           |
|   | flexible mm <sup>2</sup>                          | 1 - 4      | 2,5 - 16  |           | 6 - 35    |           |
|   | flexible with multicore cable end mm <sup>2</sup> | 0,75 - 4   | 1,5 - 16  |           | 6 - 35    |           |
| Cables per clamp                                      |   | 1          | 1         |           | 1         |           |
| <b>Power consumption of the combination</b>           |   |            |           |           |           |           |
|   | inrush and change-over VA                         | 55         | 128       |           | 178       |           |
|   | sealed VA   | 20         | 26        |           | 31        |           |
|   | W   | 6          | 8         |           | 11        |           |

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request.

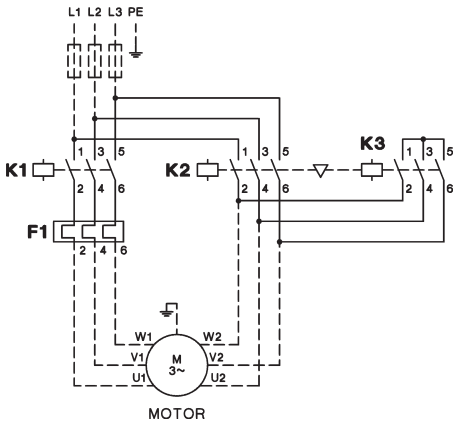
# Star-Delta Starters

## Wiring Diagrams Main Circuit

Terminal markings of contactors and relays according to DIN EN 50012  
Connections shown in main and circuits as broken lines are not included.

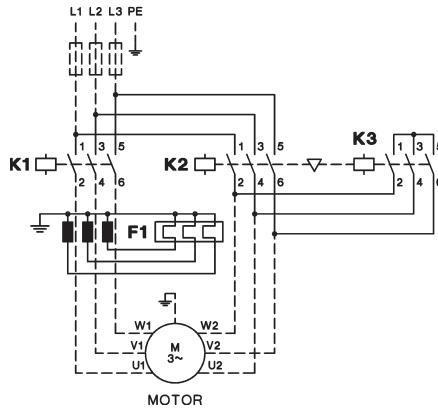
### K3NY15 to K3Y100

with thermal overload relay U3/.. or U12/16



### K3Y140 to K3Y300

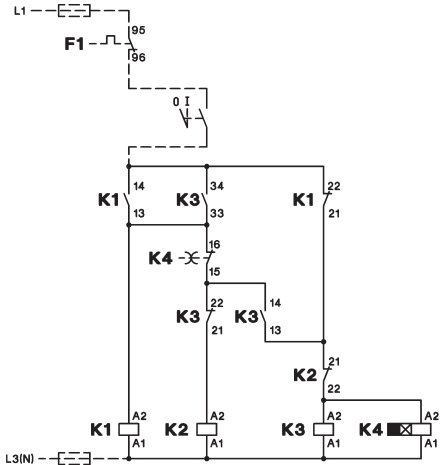
with thermal overload relay U85 or U180



## Wiring Diagrams Control Circuit

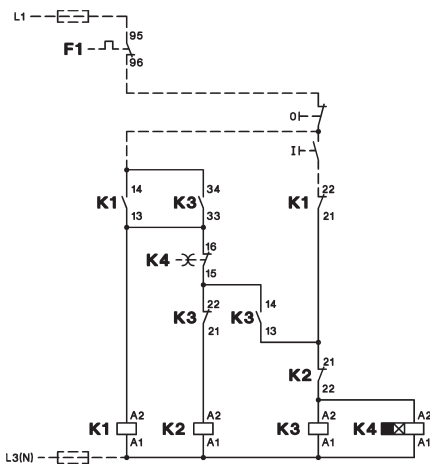
### K3NY15 to K3Y52

operating with control switch



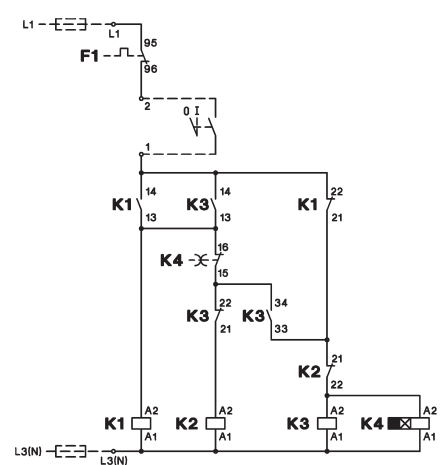
### K3NY15 to K3Y52

operating with push buttons



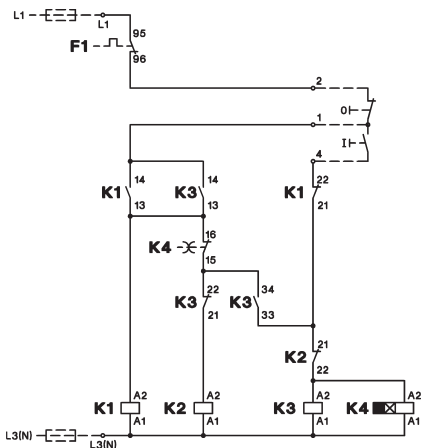
### K3Y80 to K3Y200

operating with control switch



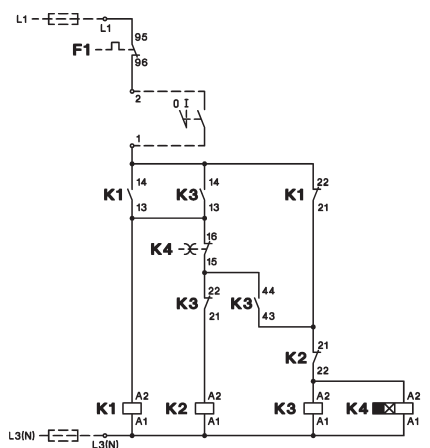
### K3Y80 to K3Y200

operating with push buttons



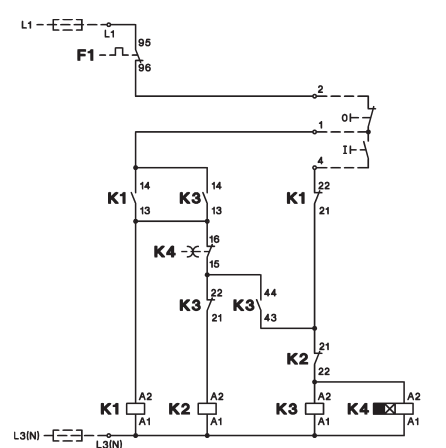
### K3Y240 to K3Y300

operating with control switch



### K3Y240 to K3Y300

operating with push buttons



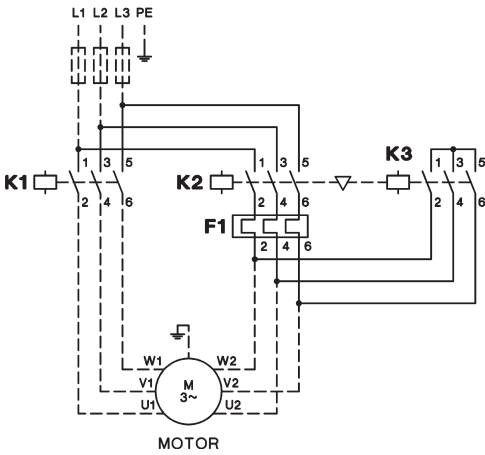
# Star-Delta Starters

## Wiring Diagrams Main Circuit

Terminal markings of contactors and relays according to DIN EN 50012  
 Connections shown in main and control circuits as broken lines are not included.

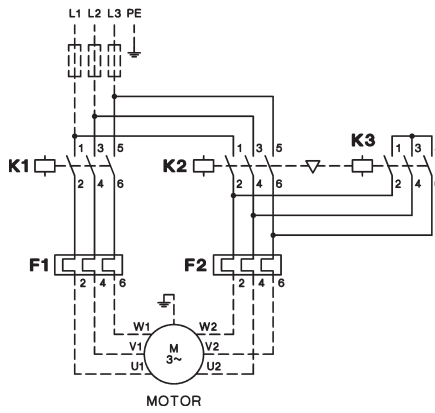
### K3YL..

Typical circuit diagram



### K3Y.. with 2 Thermal Overload Relays

Typical circuit diagram

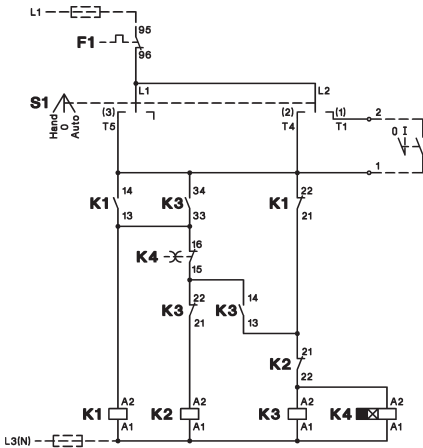


## Wiring Diagrams Control Circuit

### with selector switch

#### K3Y..W

Typical circuit diagram  
 operating with control switch

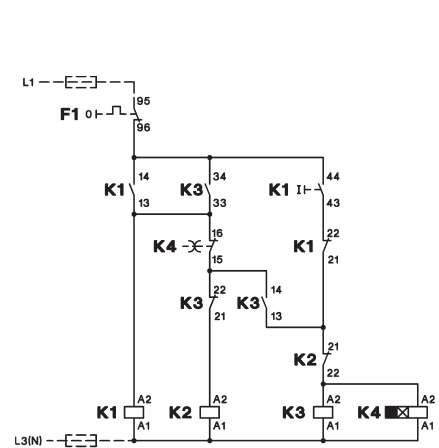
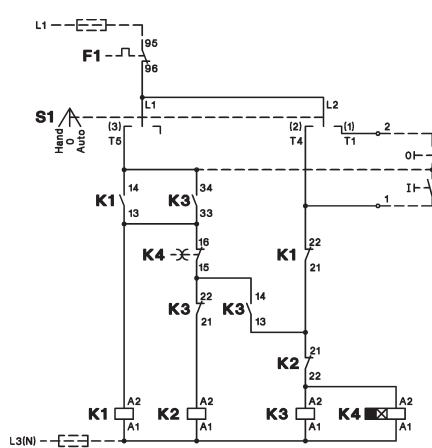


Typical circuit diagram  
 operating with push buttons

### with push buttons

#### K3Y..T

Typical circuit diagram



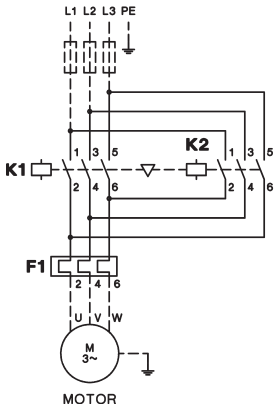
# Reversing Contactors

## Wiring Diagrams Main Circuit

Terminal markings of contactors and relays according to DIN EN 50012  
 Connections shown in main and control circuits as broken lines are not included.

### K3NWU10 to K3WU74

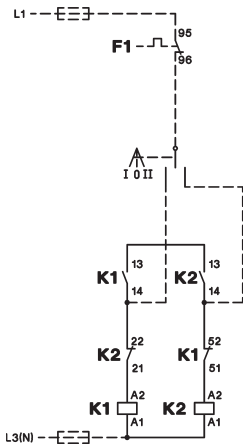
with thermal overload relay U3/32, U3/42 or U3/74



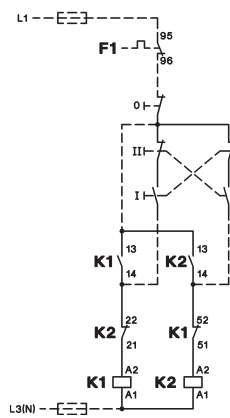
## Wiring Diagrams Control Circuit

### K3NWU10 to K3WU32

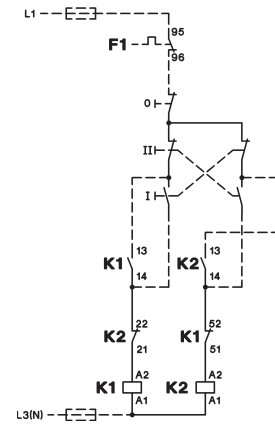
operating with control switch



operating with push buttons  
**Reversing over off-position**

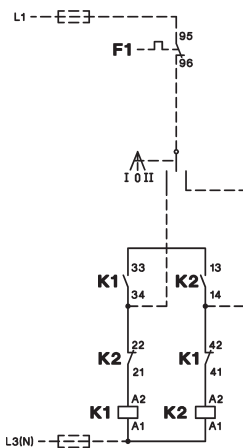


**Reversing direct**

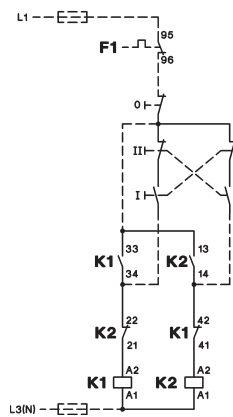


### K3WU50, K3WU62, K3WU74

operating with control switch



operating with push buttons

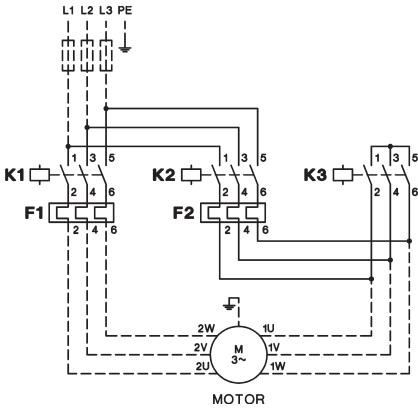


# Pole Changing Starters

## Wiring Diagrams

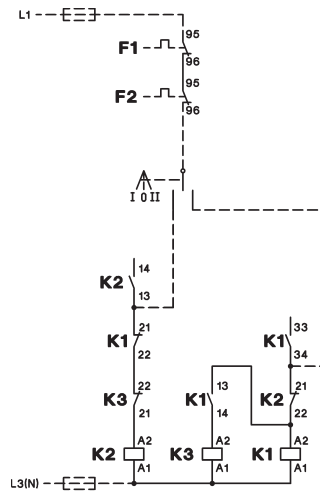
Terminal markings of contactors and relays according to DIN EN 50012  
 Connections shown in main and control circuits as broken lines are not included.

### Main Circuit

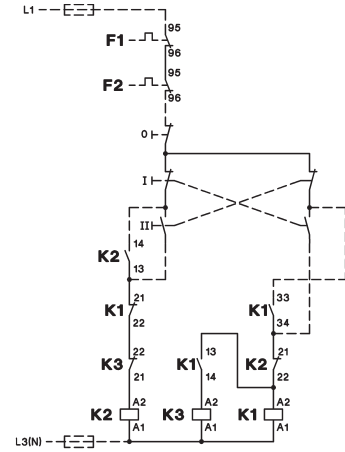


### Principal Control Circuit Wiring Diagram

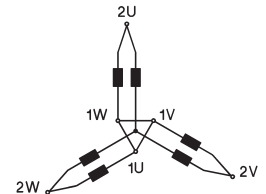
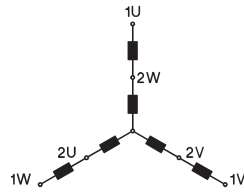
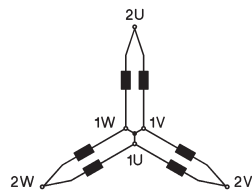
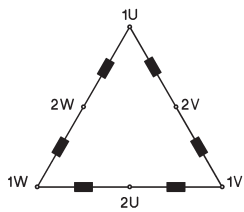
operating with control switch



operating with push buttons



|                | Low speed | High speed  | Low speed | High speed  |
|----------------|-----------|-------------|-----------|-------------|
| Operation      | Delta     | Double-Star | Star      | Double-Star |
| Speed relation | 1         | 2           | 1         | 2           |
| Power relation | 1         | 1,5 - 1,8   | 0,3       | 1           |

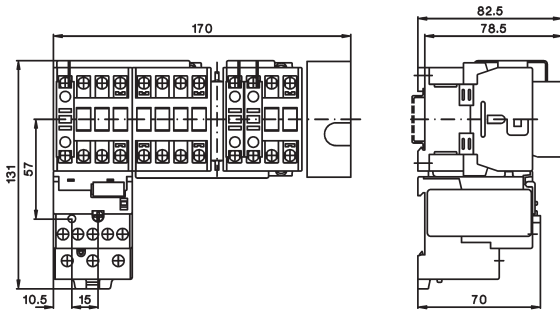


# Star-Delta Starters

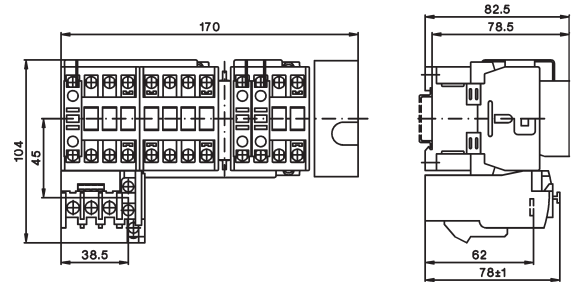
## Dimensions

Star-Delta Starters, AC operated, open type

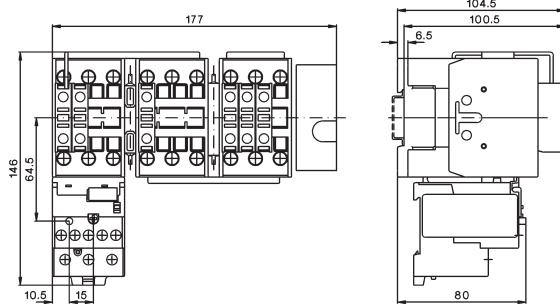
**K3NY15 + U3/32**  
**K3NY26**



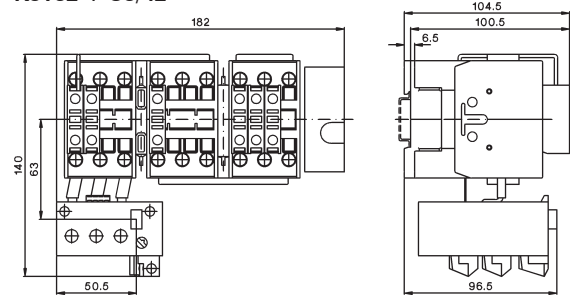
**K3NY15 + U12/16E G3**  
**K3NY26**



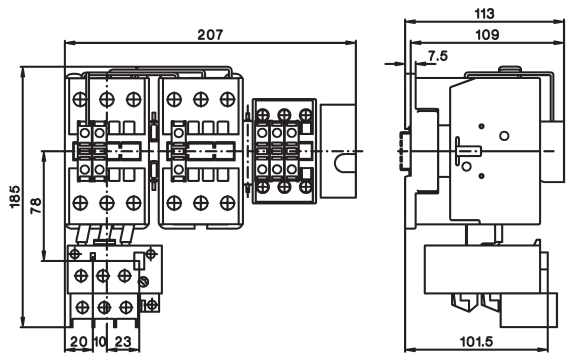
**K3Y40 + U3/32**  
**K3Y52 + U3/32**



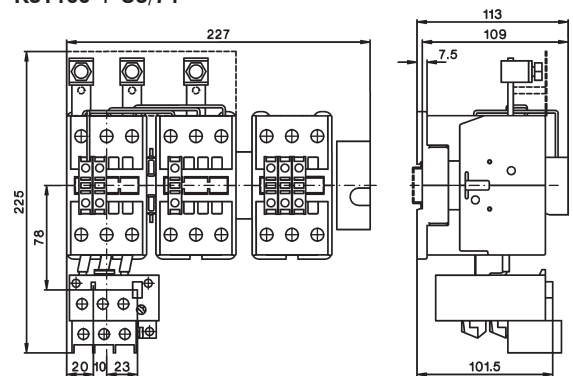
**K3Y40 + U3/42**  
**K3Y52 + U3/42**



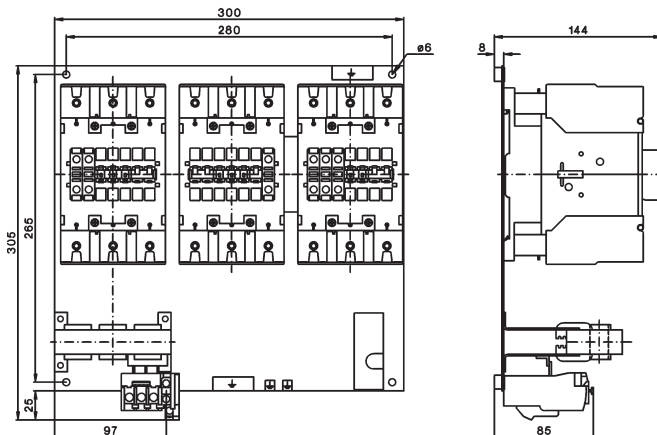
**K3Y80 + U3/74**



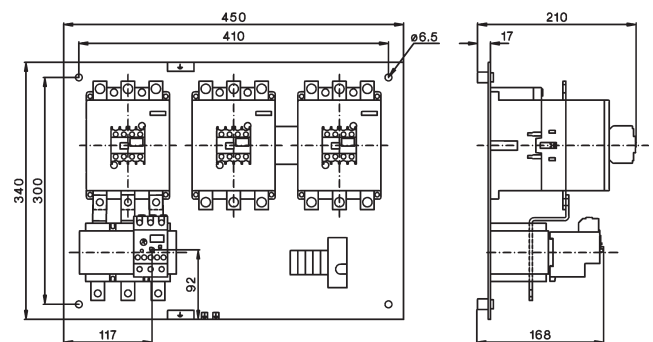
**K3Y100 + U3/74**



**K3Y140 + U85**  
**K3Y200**



**K3Y240 + U180 + SU180/176**  
**K3Y300**

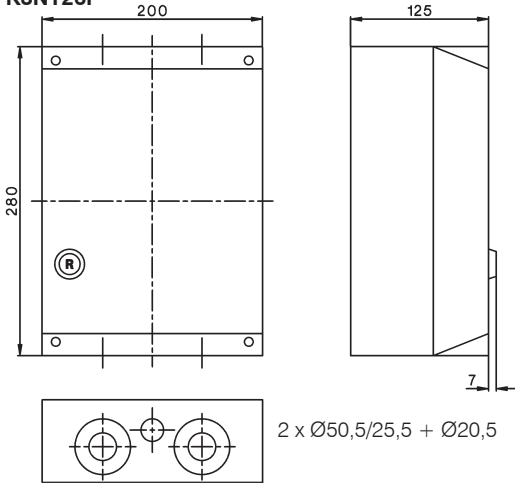


# Star-Delta Starters

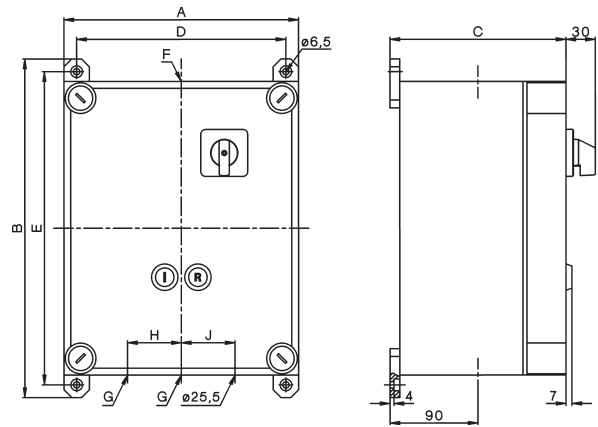
## Dimensions

Star-Delta Starters, plastic enclosed, protected to IP65

### K3NY26P



### K3Y40P to K2Y100P



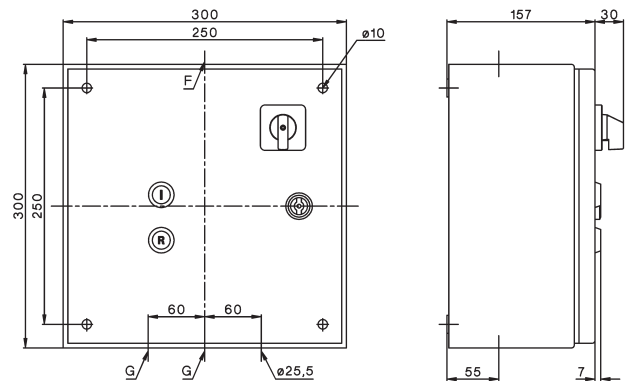
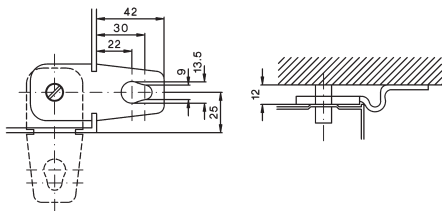
| Type           | A   | B   | C   | D   | E   | Ø F | Ø G  | H    | J  |    |
|----------------|-----|-----|-----|-----|-----|-----|------|------|----|----|
| <b>K3Y40P</b>  | 300 | 346 | 180 | 272 | 320 | 6,5 | 32,5 | 32,5 | 60 | 60 |
| <b>K3Y52P</b>  | 300 | 346 | 180 | 272 | 320 | 6,5 | 32,5 | 32,5 | 60 | 60 |
| <b>K3Y80P</b>  | 300 | 446 | 180 | 272 | 420 | 6,5 | 40,5 | 40,5 | 70 | 70 |
| <b>K3Y100P</b> | 300 | 446 | 180 | 272 | 420 | 6,5 | 50,5 | 40,5 | 70 | 70 |

Star-Delta Starters, sheet steel enclosed, protected to IP54

### K3Y26B to K3Y52B

| Type           | Ø F  | Ø G  |
|----------------|------|------|
| <b>K3NY26B</b> | 25,5 | 25,5 |
| <b>K3Y40B</b>  | 32,5 | 32,5 |
| <b>K3Y52B</b>  | 32,5 | 32,5 |

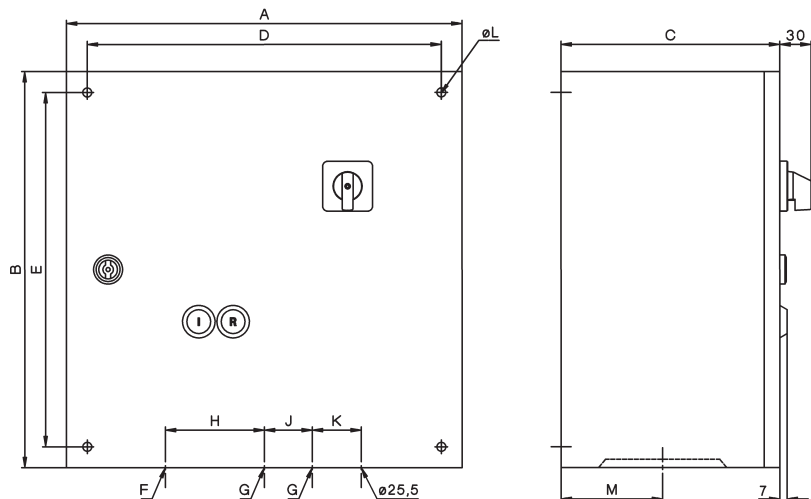
Mounting by included fixing link



### K3Y80B to K2Y200B

| Type           | A   | B   | C   | D   | E   | L   | M  |
|----------------|-----|-----|-----|-----|-----|-----|----|
| <b>K3Y80B</b>  | 380 | 380 | 210 | 340 | 340 | 8,7 | 65 |
| <b>K3Y100B</b> | 380 | 380 | 210 | 340 | 340 | 8,7 | 65 |
| <b>K3Y140B</b> | 380 | 600 | 210 | 560 | 340 | 8,7 | 65 |
| <b>K3Y200B</b> | 380 | 600 | 210 | 560 | 340 | 8,7 | 65 |

| Type           | Ø F  | Ø G  | H  | J  | K  |
|----------------|------|------|----|----|----|
| <b>K3Y80B</b>  | 40,5 | 40,5 | 70 | 70 | 60 |
| <b>K3Y100B</b> | 50,5 | 40,5 | 80 | 70 | 60 |
| <b>K3Y140B</b> | 50,5 | 50,5 | 80 | 80 | 70 |
| <b>K3Y200B</b> | 50,5 | 50,5 | 80 | 80 | 70 |

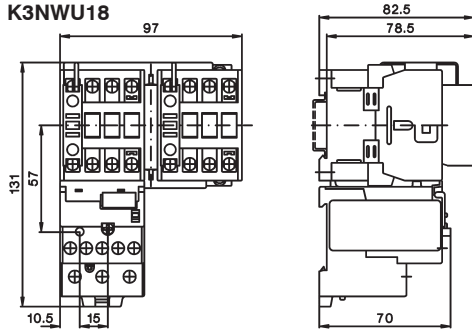


# Reversing Contactors

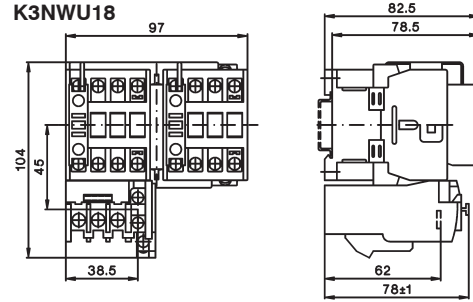
## Dimensions

Reversing Starters, AC operated, open type

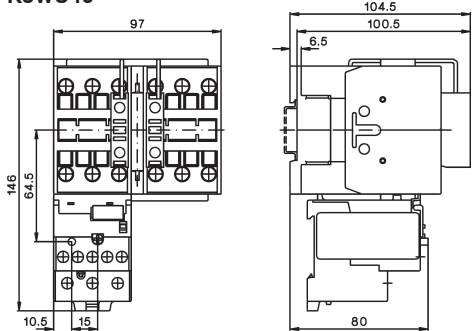
**K3NWU10 + U3/32**  
**K3NWU18**



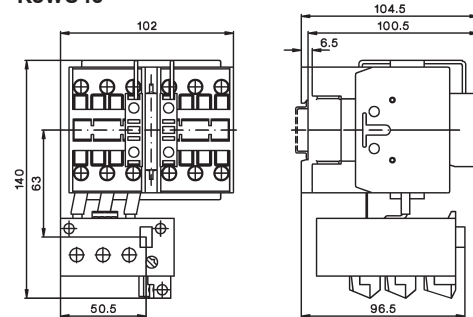
**K3NWU10 + U12/16E G3**  
**K3NWU18**



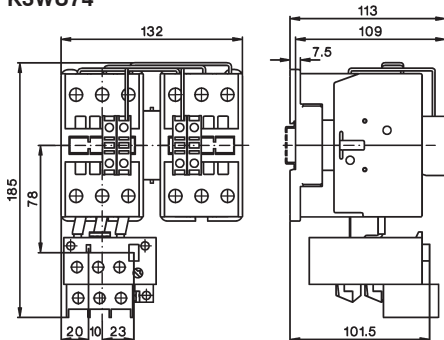
**K3WU24 + U3/32**  
**K3WU32**  
**K3WU40**



**K3WU24 + U3/42**  
**K3WU32**  
**K3WU40**



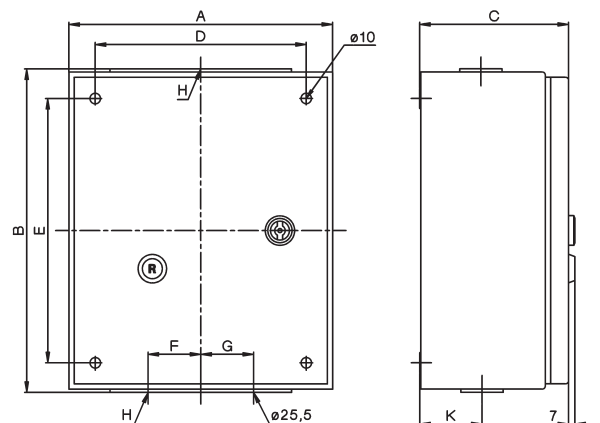
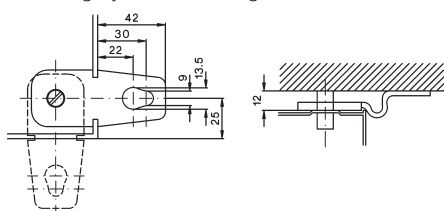
**K3WU50 + U3/74**  
**K3WU62**  
**K3WU74**



Reversing Contactors, sheet steel enclosed, protected to IP54

| Type            | A   | B   | C   | D   | E   | F  | G  | H     | K  |
|-----------------|-----|-----|-----|-----|-----|----|----|-------|----|
| <b>K3NWU18B</b> | 300 | 300 | 150 | 250 | 250 | 30 | 30 | Ø25,5 | 41 |
| <b>K3WU24B</b>  | 300 | 300 | 150 | 250 | 250 | 30 | 30 | Ø32,5 | 41 |
| <b>K3WU32B</b>  | 300 | 300 | 150 | 250 | 250 | 30 | 30 | Ø32,5 | 41 |
| <b>K3WU50B</b>  | 300 | 300 | 150 | 250 | 250 | 40 | 40 | Ø32,5 | 59 |
| <b>K3WU62B</b>  | 300 | 300 | 150 | 250 | 250 | 40 | 40 | Ø32,5 | 59 |

Mounting by included fixing link



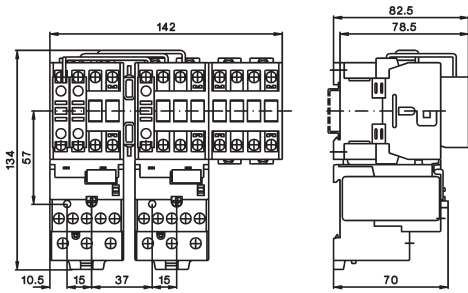


# Pole Changing Starters

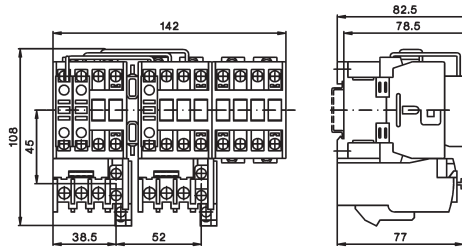
## Dimensions

Pole Changing Starters, AC operated, open type

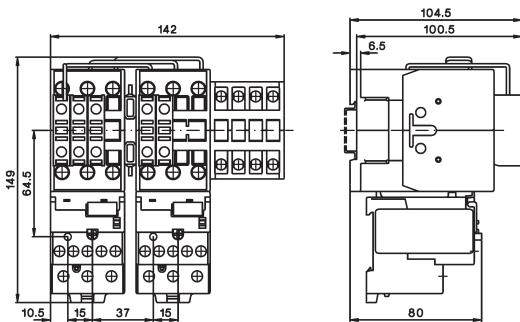
**K3NPU18 + 2x U3/32**



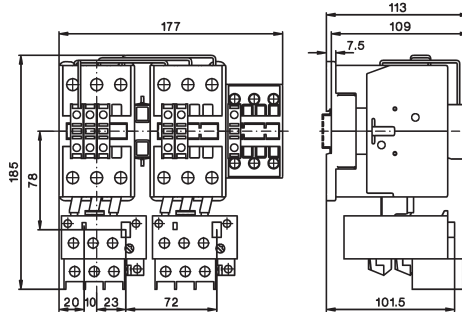
**K3NPU18 + 2x U12/16**



**K3PU24 + 2x U3/32  
K3PU32**



**K3PU50 + 2x U3/74  
K3PU62**

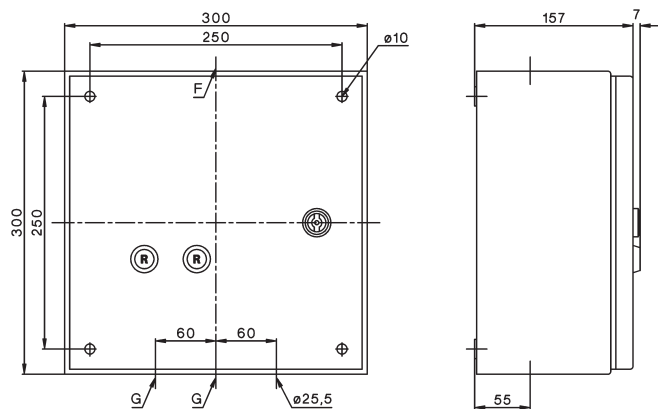
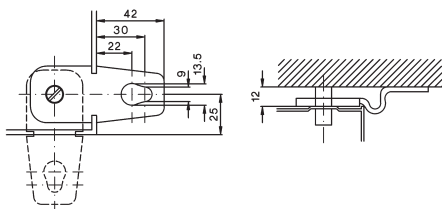


Pole Changing Starters, sheet steel enclosed, protected to IP54

**K3NPU18B to K3PU32B**

| Type            | Ø F  | Ø G  |
|-----------------|------|------|
| <b>K3NPU18B</b> | 25,5 | 25,5 |
| <b>K3PU24B</b>  | 32,3 | 32,5 |
| <b>K3PU32B</b>  | 32,3 | 32,5 |

Mounting by included fixing link





D.O.L. Starters With Start-Stop Buttons

112



D.O.L. Starters With Selector Switch

112



D.O.L. Starters With Selector Switch And Pneumatic Switch For Use In Moist Rooms

112



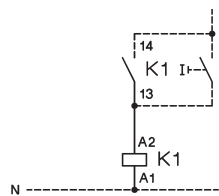
Enclosures

113



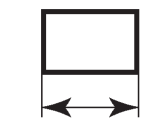
Accessories

113



Wiring Diagrams

115



Dimensions

116

## D.O.L. Starters In Plastic Enclosure

| Ratings     | Included | Free    | order    | Protec- | Conduit | Type | Coil voltage <sup>1)</sup> | Pack | Weight |
|-------------|----------|---------|----------|---------|---------|------|----------------------------|------|--------|
| AC3 at      | Contact  | Space   | extra    | tion    | Entries |      |                            | pcs. | kg/pc. |
| <b>380V</b> |          | f. Aux. |          | Degree  |         |      | <b>230</b> 220-240V 50Hz   |      |        |
| <b>400V</b> |          | Cont.   | Overload |         |         |      | <b>400</b> 380-415V 50Hz   |      |        |
| <b>415V</b> |          | HN..    | Relay    |         |         |      |                            |      |        |
| <b>kW</b>   | Type     | pcs.    | Type     |         |         |      |                            |      |        |

## D.O.L. Starters with Start-Stop/Reset Push Buttons



|            |           |   |           |      |          |                  |   |     |
|------------|-----------|---|-----------|------|----------|------------------|---|-----|
| <b>4</b>   | K3-10ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1T10</b> ... | 1 | 0,6 |
| <b>7,5</b> | K3-18ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1T18</b> ... | 1 | 0,6 |
| <b>11</b>  | K3-22ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1T22</b> ... | 1 | 0,6 |

## D.O.L. Starters with Selector Switch



|            |           |   |           |      |          |                  |   |     |
|------------|-----------|---|-----------|------|----------|------------------|---|-----|
| <b>4</b>   | K3-10ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1W10</b> ... | 1 | 0,6 |
| <b>7,5</b> | K3-18ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1W18</b> ... | 1 | 0,6 |
| <b>11</b>  | K3-22ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1W22</b> ... | 1 | 0,6 |

## D.O.L. Starters with Selector Switch and Pneumatic Switch for moist rooms



|            |           |   |           |      |          |                   |   |     |
|------------|-----------|---|-----------|------|----------|-------------------|---|-----|
| <b>7,5</b> | K3-18ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | <b>P1W18P</b> ... | 1 | 0,6 |
|------------|-----------|---|-----------|------|----------|-------------------|---|-----|

Push button and tube on request

**Ordering Example:** D.O.L. Starter with selector switch, plastic enclosed, rated AC3 at 400V 15,5A, rated control voltage 230V 50Hz - **Order Type: P1W18 230 + U12/16E 18 K3**

## Pneumatic Button



|  |  |  |  |  |  |             |   |  |
|--|--|--|--|--|--|-------------|---|--|
|  |  |  |  |  |  | <b>P1LT</b> | 1 |  |
|--|--|--|--|--|--|-------------|---|--|

## Air Pressure Hose



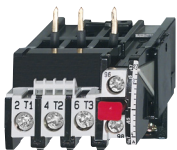
|           |  |  |  |  |  |               |   |  |
|-----------|--|--|--|--|--|---------------|---|--|
| Length 5m |  |  |  |  |  | <b>P1LS-5</b> | 1 |  |
|-----------|--|--|--|--|--|---------------|---|--|

## Pneumatic Switch

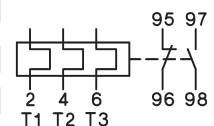


|  |  |  |  |  |  |               |   |      |
|--|--|--|--|--|--|---------------|---|------|
| for refill of D.O.L. Starter P1W.. to P1W..P |  |  |  |  |  | <b>P1-LDR</b> | 1 | 0,02 |
|--|--|--|--|--|--|---------------|---|------|

## Thermal Overload Relays



| Setting range<br>A | Type                   | Pack<br>pcs. | Weight<br>kg/pc. |
|--------------------|------------------------|--------------|------------------|
| 0,12 - <b>0,18</b> | <b>U12/16E 0,18 K3</b> | 1            | 0,10             |
| 0,18 - <b>0,27</b> | <b>U12/16E 0,27 K3</b> | 1            | 0,10             |
| 0,27 - <b>0,4</b>  | <b>U12/16E 0,4 K3</b>  | 1            | 0,10             |
| 0,4 - <b>0,6</b>   | <b>U12/16E 0,6 K3</b>  | 1            | 0,10             |
| 0,6 - <b>0,9</b>   | <b>U12/16E 0,9 K3</b>  | 1            | 0,10             |
| 0,8 - <b>1,2</b>   | <b>U12/16E 1,2 K3</b>  | 1            | 0,10             |
| 1,2 - <b>1,8</b>   | <b>U12/16E 1,8 K3</b>  | 1            | 0,10             |
| 1,8 - <b>2,7</b>   | <b>U12/16E 2,7 K3</b>  | 1            | 0,10             |
| 2,7 - <b>4</b>     | <b>U12/16E 4 K3</b>    | 1            | 0,10             |
| 4 - <b>6</b>       | <b>U12/16E 6 K3</b>    | 1            | 0,10             |
| 6 - <b>9</b>       | <b>U12/16E 9 K3</b>    | 1            | 0,10             |
| 8 - <b>11</b>      | <b>U12/16E 11 K3</b>   | 1            | 0,10             |
| 10 - <b>14</b>     | <b>U12/16E 14 K3</b>   | 1            | 0,10             |
| 13 - <b>18</b>     | <b>U12/16E 18 K3</b>   | 1            | 0,10             |
| 17 - <b>23</b>     | <b>U12/16E 23 K3</b>   | 1            | 0,10             |
| 22 - <b>30</b>     | <b>U12/16E 30 K3</b>   | 1            | 0,13             |



manual reset

## Overload Relays with Quick Tripping Characteristic see page 120,121

Technical data see contactors page 62 and thermal overload relays page 125  
1) Non-standard coil voltages see page 57

## Enclosures for Contactors



| Suitable for contactor   | Protection Degree | Conduit Entries Top | Conduit Entries Bottom | Type      | Pack pcs. | Weight kg/pc. |
|--|-------------------|---------------------|------------------------|-----------|-----------|---------------|
| <b>K3-07.. to K3-22..<br/>K3-24..<sup>1)</sup> to K3-40..<sup>1)</sup></b> | IP65              | 2 x Ø 20,5mm        | 2 x Ø 20,5mm           | <b>P1</b> | 1         | 0,35          |

with Reset Button



| Suitable for contactor                     | Protection Degree | Conduit Entries Top | Conduit Entries Bottom | Type       | Pack pcs. | Weight kg/pc. |
|--|-------------------|---------------------|------------------------|------------|-----------|---------------|
| <b>K3-10.. to K3-22..<br/>+U12/16.. K3</b> | IP65              | 2 x Ø 20,5mm        | 2 x Ø 20,5mm           | <b>P1R</b> | 1         | 0,35          |

with Selector Switch



| Suitable for contactor                     | Protection Degree | Conduit Entries Top | Conduit Entries Bottom | Type       | Pack pcs. | Weight kg/pc. |
|--|-------------------|---------------------|------------------------|------------|-----------|---------------|
| <b>K3-10.. to K3-22..<br/>+U12/16.. K3</b> | IP65              | 2 x Ø 20,5mm        | 2 x Ø 20,5mm           | <b>P1W</b> | 1         | 0,35          |

with Start-Stop Push Button



| Suitable for contactor                     | Protection Degree | Conduit Entries Top | Conduit Entries Bottom | Type       | Pack pcs. | Weight kg/pc. |
|--|-------------------|---------------------|------------------------|------------|-----------|---------------|
| <b>K3-10.. to K3-22..<br/>+U12/16.. K3</b> | IP65              | 2 x Ø 20,5mm        | 2 x Ø 20,5mm           | <b>P1T</b> | 1         | 0,35          |

## Indicator Units



| Specifications   | Voltage Range    | Type          | Pack pcs. | Weight kg/pc. |
|--|------------------|---------------|-----------|---------------|
| <b>Coil Current Indicator</b> , green (LED)  | 24 - 660V AC/DC  | <b>K2-ING</b> | 10        | 0,02          |
| <b>Coil Current Indicator</b> , red (LED)  | 24 - 660V AC/DC  | <b>K2-INR</b> | 10        | 0,02          |
| To be connected in series with the contactor coil. In case of coil interruption the indicator goes out. Voltage drop approx. 2 volts |                  |               |           |               |
| <b>Voltage Indicator</b> , clear (glow-disc. I.)   | 220 - 415V AC/DC | <b>K2-UN</b>  | 10        | 0,02          |
| <b>Voltage Indicator</b> , red (LED)   | 24 - 120V AC/DC  | <b>K2-UNR</b> | 10        | 0,02          |
| To be connected parallel to the contactor coil. In case of applied voltage the indicator also lights at coil interruption.           |                  |               |           |               |

### Lens Caps For Indicator Units



|                      |                 |    |       |
|----------------------|-----------------|----|-------|
| Lens cap transparent | <b>LG9743T</b>  | 10 | 0,005 |
| Lens cap red         | <b>LG9743R</b>  | 10 | 0,005 |
| Lens cap green       | <b>LG9743GR</b> | 10 | 0,005 |

Mounting instructions see page 118

## Heating Element



| Specifications   | Voltage Range | Power Consumption | Type             | Pack pcs. | Weight kg/pc. |
|--|---------------|-------------------|------------------|-----------|---------------|
| To avoid condensed water on places where high humidity is given together with alterations of ambient temperature | 380 - 415V    | 1,5W              | <b>K2-HR</b>     | 10        | 0,02          |
|  | 220 - 240V    | 1,5W              | <b>K2-HR 230</b> | 10        | 0,02          |

## Additional Terminals, Start Contact



| Specification           | Cable Cross-sections to clamp | solid or stranded | flexible    | flexib. w. multi-core cable end | Type          | Pack pcs. | Weight kg/pc. |
|-------------------------|-------------------------------|-------------------|-------------|---------------------------------|---------------|-----------|---------------|
| <b>Neutral Terminal</b> | 2 x 0,75-4                    | 2 x 0,75-2,5      | 2 x 0,5-2,5 |                                 | <b>LG9744</b> | 10        | 0,009         |



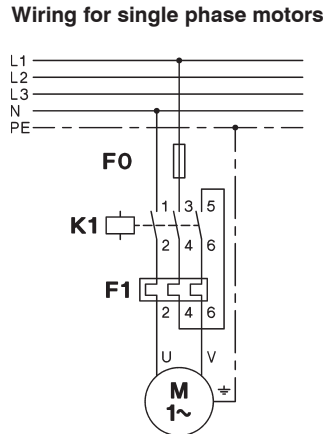
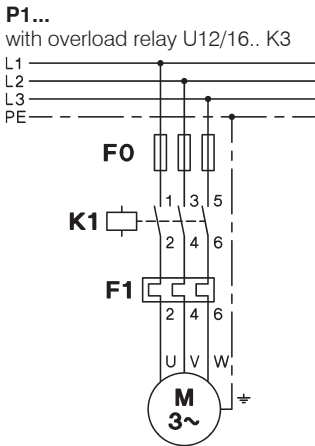
|                      |                              |   |  |  |                  |    |      |
|----------------------|------------------------------|---|--|--|------------------|----|------|
| <b>Start Contact</b> | for contactor K3-10 to K3-22 | to be snapped on top of the auxiliary contact |  |  | <b>LG9319-K3</b> | 10 | 0,03 |
|----------------------|------------------------------|---|--|--|------------------|----|------|

<sup>1)</sup> without auxiliary contact blocks

# D.O.L. Starters

## Wiring Diagrams Main Circuit

All fuses F0 shown in the main circuits are not included.  
Terminal markings according to EN 50012



## Wiring Diagrams Control Circuit

D.O.L. Starters P1 with standard coil voltages (see page 94) are supplied with connectors between main circuit and control circuit.

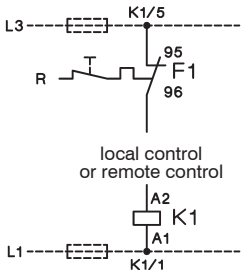
### Coil connectors

Coils for **380-415V 50Hz** and **400-440V 60Hz**: The starter is supplied with control circuit connectors between terminals 1 (L1) and 5 (L3).  
Coils for **220-240V 50Hz** and **230-264V 60Hz**: The starter is supplied with control circuit connectors between terminals 95 and 5 (L3). Connect neutral wire to terminal A1.  
Coils for **other voltages**: Without connectors between supply and control circuit. Connect supply to terminals A1 and 95.

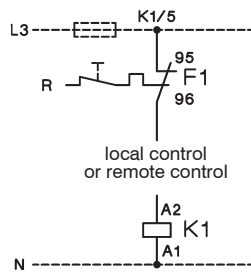
### Separate coil supply

Coils for **380-415V 50Hz** and **400-440V 60Hz**: Remove connectors A1-1 and 95-5, connect supply to terminals A1 and 95.  
Coils for **220-240V 50Hz** and **230-264V 60Hz**: Remove connectors 95-5 connect supply to terminals A1 and 95.  
Coils for **other voltages**: Connect supply to terminals A1 and 95.

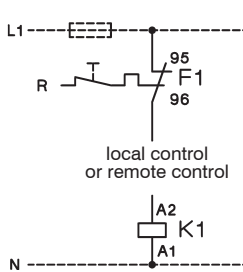
### Coil phase to phase (380-415V 50Hz)



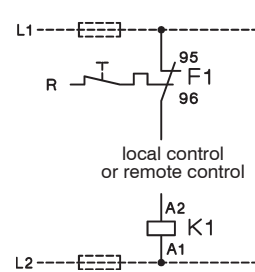
### Coil phase to neutral (220-240V 50Hz)



### Coil phase to phase

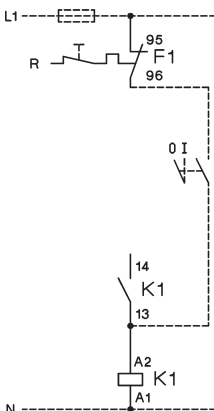


### Coil phase to neutral

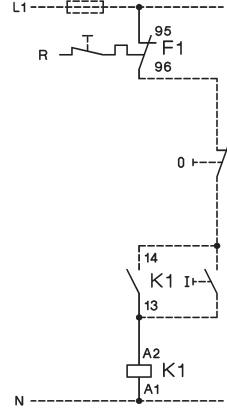


## D.O.L. Starters with remote control

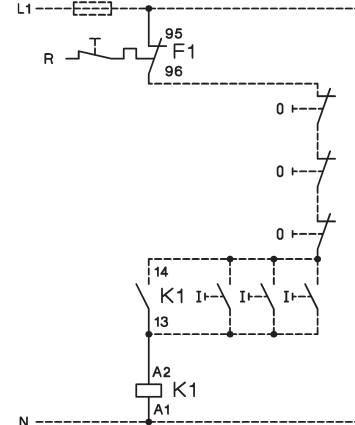
**P1..**  
Remote 2-wire (switch) control



Remote 3-wire (push button) control



Remote start-stop control  
(3 control stations)



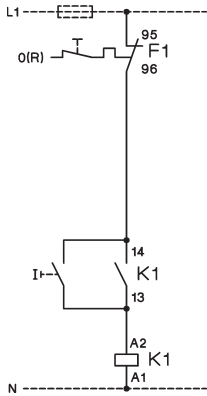
# D.O.L. Starters

## Wiring Diagrams Control Circuits

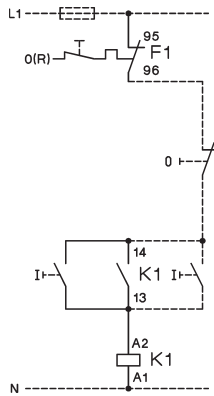
Typical circuit diagram (for separate coil supply, control circuit connected between L1 and N)  
Terminal markings according to EN 50012

### D.O.L. Starters with Start-Stop/Reset Push Buttons

**P1T10, P1T18, P1T22**  
with overload relay U12/16.. K3

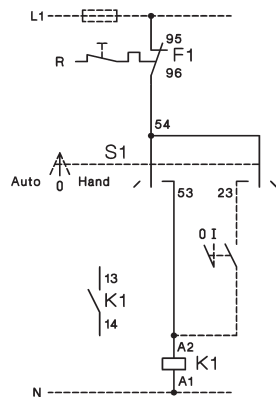


**P1T10, P1T18, P1T22**  
with external push buttons

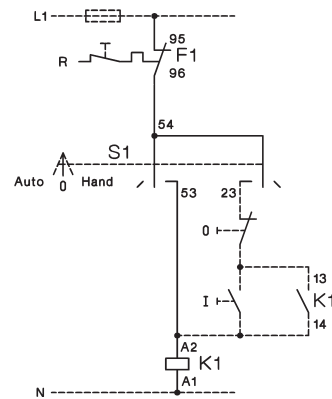


### D.O.L. Starters with Selector Switch

**P1W10, P1W18, P1W22**  
with external control switch

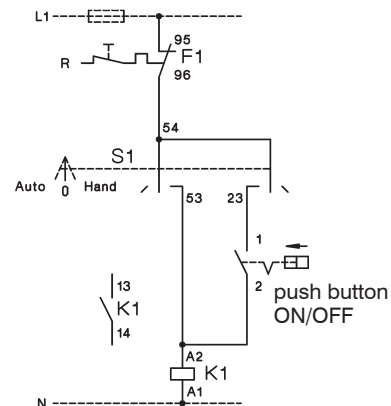


**P1W10, P1W18, P1W22**  
with external push buttons



### D.O.L. Starters with Selector Switch and Pneumatic Switch for Swimmingpool Control Gear and for use in Moist Rooms

**P1W18P**  
with overload relay U12/16.. K3

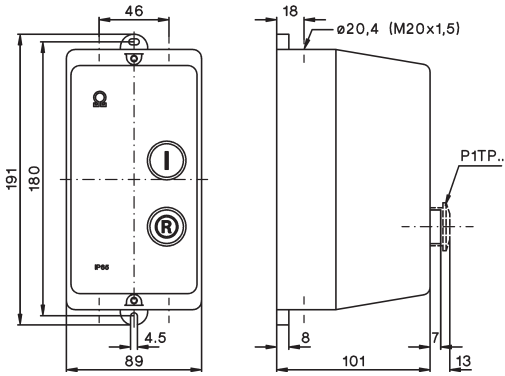


# D.O.L. Starters

## Dimensions

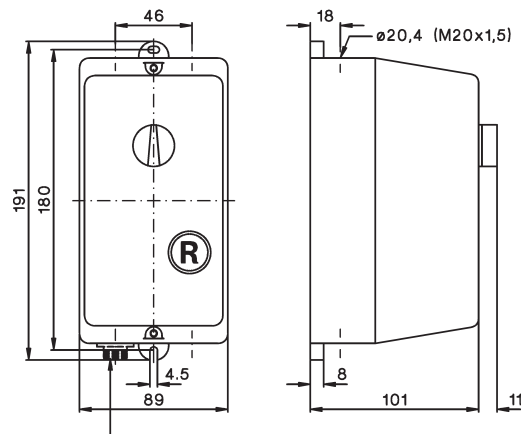
D.O.L. Starters with Start-Stop/Reset Push Buttons, Plastic Enclosed

P1T., P1TP.



D.O.L. Starters with Selector Switch, Plastic Enclosed

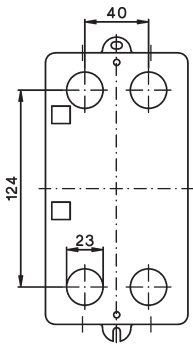
P1W., P1W18P



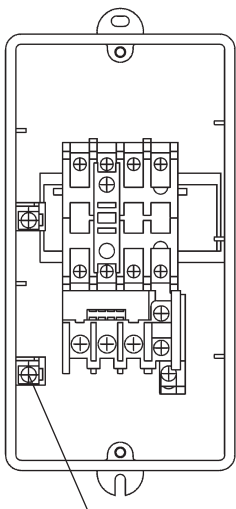
P1W18P: plug-in for air tube inside diameter 3mm

## Rear Conduit Entries

knockouts  
4 x  $\varnothing 23$



## Neutral Terminal LG9744



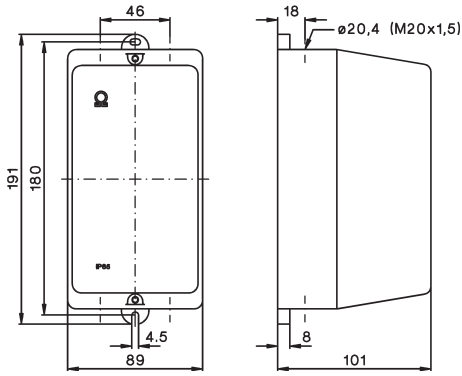
LG9744

# Enclosures

## Dimensions

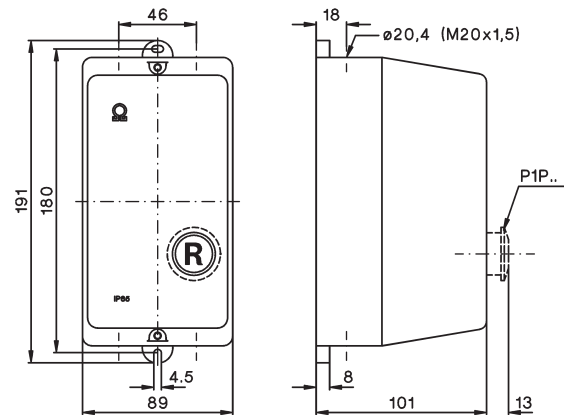
### Enclosures for Contactors

P1



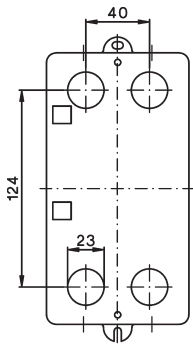
### Enclosures for D.O.L. Starters

P1R, P1P



### Rear Conduit Entries

knockouts  
4 x  $\phi 23$

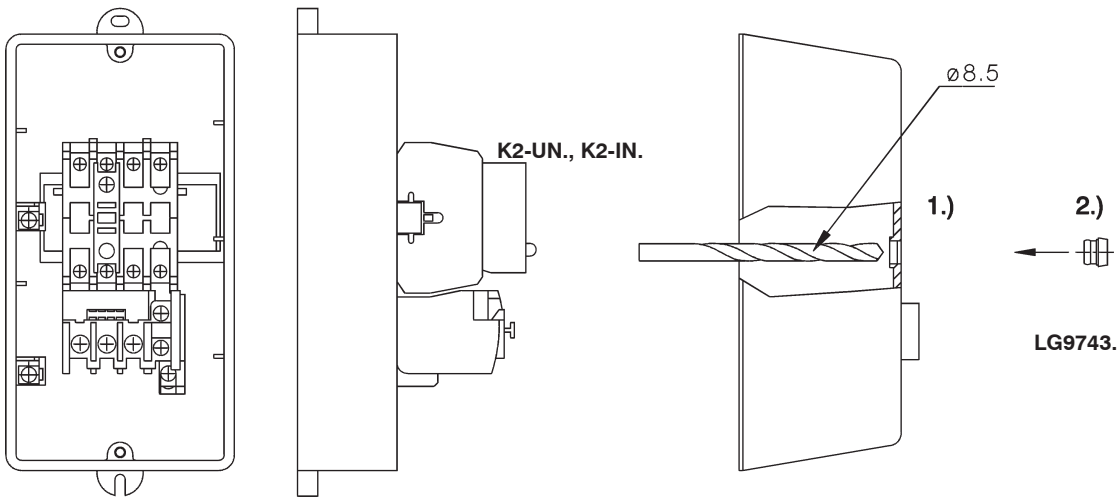




# D.O.L. Starters

## Mounting and Wiring Instructions

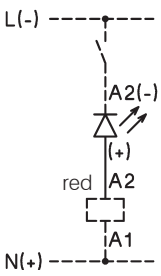
Indicators and Lens Caps for D.O.L. Starters P1



### Wiring Examples

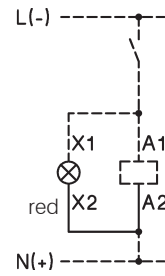
#### Coil Current Indicator

K2-ING  
K2-INR



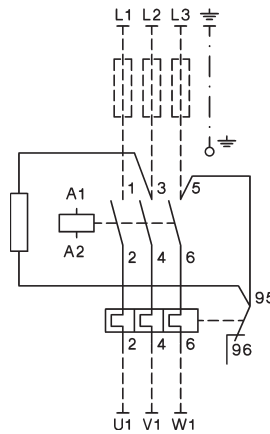
#### Voltage Indicator

K2-UN  
K2-UNR

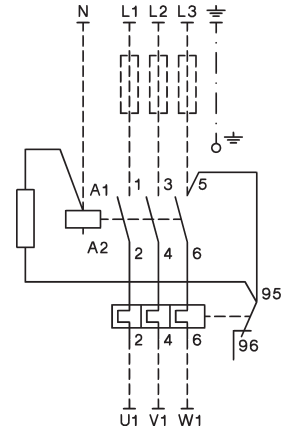


#### Heating Element

K2-HR

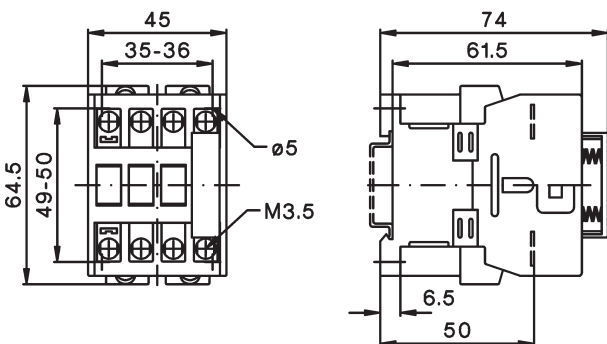


K2-HR 230



Colour mentioned in wiring diagrams refer to the outgoing connection wire of the device.

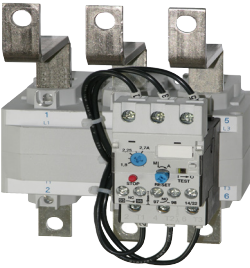
Start Contact LG9319-K3 for K3-10ND10 up to K3-22ND10





Thermal Overload Relays for Direct Mounting

120



Thermal Overload Relays for Separate Mounting

122



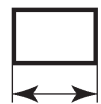
Accessories

123



Technical Data

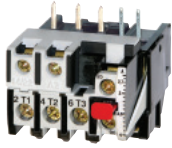
125



Dimensions

129

# Thermal Overload Relays for plug-in mounting



**Setting Range**  
D.O.L. (A)  $\Upsilon\Delta$  (A)

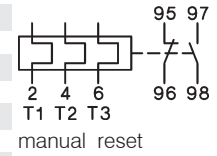
**Type**

Pack Weight  
pcs. kg/pc.

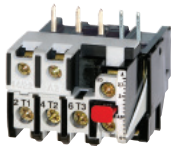
Wiring Diagram

## With Manual Reset, for contactors K1-..

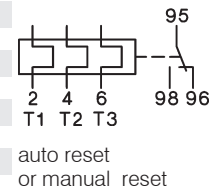
|                    |             |  |                        |   |      |
|--------------------|-------------|--|------------------------|---|------|
| 0,12 - <b>0,18</b> | -           |  | <b>U12/16E 0,18 K1</b> | 1 | 0,10 |
| 0,18 - <b>0,27</b> | -           |  | <b>U12/16E 0,27 K1</b> | 1 | 0,10 |
| 0,27 - <b>0,4</b>  | -           |  | <b>U12/16E 0,4 K1</b>  | 1 | 0,10 |
| 0,4 - <b>0,6</b>   | -           |  | <b>U12/16E 0,6 K1</b>  | 1 | 0,10 |
| 0,6 - <b>0,9</b>   | -           |  | <b>U12/16E 0,9 K1</b>  | 1 | 0,10 |
| 0,8 - <b>1,2</b>   | -           |  | <b>U12/16E 1,2 K1</b>  | 1 | 0,10 |
| 1,2 - <b>1,8</b>   | -           |  | <b>U12/16E 1,8 K1</b>  | 1 | 0,10 |
| 1,8 - <b>2,7</b>   | -           |  | <b>U12/16E 2,7 K1</b>  | 1 | 0,10 |
| 2,7 - <b>4</b>     | -           |  | <b>U12/16E 4 K1</b>    | 1 | 0,10 |
| 4 - <b>6</b>       | 7 - 10,5    |  | <b>U12/16E 6 K1</b>    | 1 | 0,10 |
| 6 - <b>9</b>       | 10,5 - 15,5 |  | <b>U12/16E 9 K1</b>    | 1 | 0,10 |
| 8 - <b>11</b>      | 14 - 19     |  | <b>U12/16E 11 K1</b>   | 1 | 0,10 |
| 10 - <b>14</b>     | 18 - 24     |  | <b>U12/16E 14 K1</b>   | 1 | 0,10 |



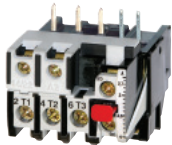
## With Auto Reset, for contactors K1-..



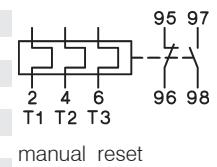
|                    |             |  |                        |   |      |
|--------------------|-------------|--|------------------------|---|------|
| 0,12 - <b>0,18</b> | -           |  | <b>U12/16A 0,18 K1</b> | 1 | 0,10 |
| 0,18 - <b>0,27</b> | -           |  | <b>U12/16A 0,27 K1</b> | 1 | 0,10 |
| 0,27 - <b>0,4</b>  | -           |  | <b>U12/16A 0,4 K1</b>  | 1 | 0,10 |
| 0,4 - <b>0,6</b>   | -           |  | <b>U12/16A 0,6 K1</b>  | 1 | 0,10 |
| 0,6 - <b>0,9</b>   | -           |  | <b>U12/16A 0,9 K1</b>  | 1 | 0,10 |
| 0,8 - <b>1,2</b>   | -           |  | <b>U12/16A 1,2 K1</b>  | 1 | 0,10 |
| 1,2 - <b>1,8</b>   | -           |  | <b>U12/16A 1,8 K1</b>  | 1 | 0,10 |
| 1,8 - <b>2,7</b>   | -           |  | <b>U12/16A 2,7 K1</b>  | 1 | 0,10 |
| 2,7 - <b>4</b>     | -           |  | <b>U12/16A 4 K1</b>    | 1 | 0,10 |
| 4 - <b>6</b>       | 7 - 10,5    |  | <b>U12/16A 6 K1</b>    | 1 | 0,10 |
| 6 - <b>9</b>       | 10,5 - 15,5 |  | <b>U12/16A 9 K1</b>    | 1 | 0,10 |
| 8 - <b>11</b>      | 14 - 19     |  | <b>U12/16A 11 K1</b>   | 1 | 0,10 |
| 10 - <b>14</b>     | 18 - 24     |  | <b>U12/16A 14 K1</b>   | 1 | 0,10 |



## With Quick Tripping Characteristic for EEx e motors and submersible pumps, f. contactors K1-..



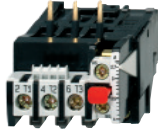
|                  |             |  |                        |   |      |
|------------------|-------------|--|------------------------|---|------|
| 0,4 - <b>0,6</b> | -           |  | <b>U12/16EQ 0,6 K1</b> | 1 | 0,10 |
| 0,6 - <b>0,9</b> | -           |  | <b>U12/16EQ 0,9 K1</b> | 1 | 0,10 |
| 0,8 - <b>1,2</b> | -           |  | <b>U12/16EQ 1,2 K1</b> | 1 | 0,10 |
| 1,2 - <b>1,8</b> | -           |  | <b>U12/16EQ 1,8 K1</b> | 1 | 0,10 |
| 1,8 - <b>2,7</b> | -           |  | <b>U12/16EQ 2,7 K1</b> | 1 | 0,10 |
| 2,7 - <b>4</b>   | -           |  | <b>U12/16EQ 4 K1</b>   | 1 | 0,10 |
| 4 - <b>6</b>     | 7 - 10,5    |  | <b>U12/16EQ 6 K1</b>   | 1 | 0,10 |
| 6 - <b>9</b>     | 10,5 - 15,5 |  | <b>U12/16EQ 9 K1</b>   | 1 | 0,10 |
| 8 - <b>11</b>    | 14 - 19     |  | <b>U12/16EQ 11 K1</b>  | 1 | 0,10 |



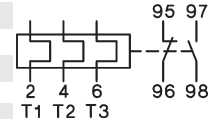
# Thermal Overload Relays for plug-in mounting

**Setting Range**  
D.O.L. (A)  $\Upsilon\Delta$  (A) **Type** Pack pcs. Weight kg/pc. Wiring Diagram

**With Manual Reset**, for contactors K(G)3-10.. to K(G)3-22.. ..

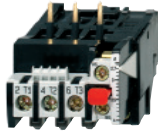


|                    |             |  |                        |   |      |
|--------------------|-------------|--|------------------------|---|------|
| 0,12 - <b>0,18</b> | -           |  | <b>U12/16E 0,18 K3</b> | 1 | 0,10 |
| 0,18 - <b>0,27</b> | -           |  | <b>U12/16E 0,27 K3</b> | 1 | 0,10 |
| 0,27 - <b>0,4</b>  | -           |  | <b>U12/16E 0,4 K3</b>  | 1 | 0,10 |
| 0,4 - <b>0,6</b>   | -           |  | <b>U12/16E 0,6 K3</b>  | 1 | 0,10 |
| 0,6 - <b>0,9</b>   | -           |  | <b>U12/16E 0,9 K3</b>  | 1 | 0,10 |
| 0,8 - <b>1,2</b>   | -           |  | <b>U12/16E 1,2 K3</b>  | 1 | 0,10 |
| 1,2 - <b>1,8</b>   | -           |  | <b>U12/16E 1,8 K3</b>  | 1 | 0,10 |
| 1,8 - <b>2,7</b>   | -           |  | <b>U12/16E 2,7 K3</b>  | 1 | 0,10 |
| 2,7 - <b>4</b>     | -           |  | <b>U12/16E 4 K3</b>    | 1 | 0,10 |
| 4 - <b>6</b>       | 7 - 10,5    |  | <b>U12/16E 6 K3</b>    | 1 | 0,10 |
| 6 - <b>9</b>       | 10,5 - 15,5 |  | <b>U12/16E 9 K3</b>    | 1 | 0,10 |
| 8 - <b>11</b>      | 14 - 19     |  | <b>U12/16E 11 K3</b>   | 1 | 0,10 |
| 10 - <b>14</b>     | 18 - 24     |  | <b>U12/16E 14 K3</b>   | 1 | 0,10 |
| 13 - <b>18</b>     | 23 - 31     |  | <b>U12/16E 18 K3</b>   | 1 | 0,10 |
| 17 - <b>23</b>     | 30 - 40     |  | <b>U12/16E 23 K3</b>   | 1 | 0,10 |
| 22 - <b>30</b>     | 38 - 52     |  | <b>U12/16E 30 K3</b>   | 1 | 0,13 |

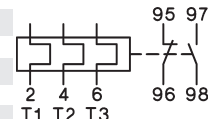


manual reset

**With quick Tripping Characteristic** for EEx e motors and under water pumps



|                  |             |  |                        |   |      |
|------------------|-------------|--|------------------------|---|------|
| 0,4 - <b>0,6</b> | -           |  | <b>U12/16EQ 0,6 K3</b> | 1 | 0,10 |
| 0,6 - <b>0,9</b> | -           |  | <b>U12/16EQ 0,9 K3</b> | 1 | 0,10 |
| 0,8 - <b>1,2</b> | -           |  | <b>U12/16EQ 1,2 K3</b> | 1 | 0,10 |
| 1,2 - <b>1,8</b> | -           |  | <b>U12/16EQ 1,8 K3</b> | 1 | 0,10 |
| 1,8 - <b>2,7</b> | -           |  | <b>U12/16EQ 2,7 K3</b> | 1 | 0,10 |
| 2,7 - <b>4</b>   | -           |  | <b>U12/16EQ 4 K3</b>   | 1 | 0,10 |
| 4 - <b>6</b>     | 7 - 10,5    |  | <b>U12/16EQ 6 K3</b>   | 1 | 0,10 |
| 6 - <b>9</b>     | 10,5 - 15,5 |  | <b>U12/16EQ 9 K3</b>   | 1 | 0,10 |
| 8 - <b>11</b>    | 14 - 19     |  | <b>U12/16EQ 11 K3</b>  | 1 | 0,10 |
| 10 - <b>14</b>   | 18 - 24     |  | <b>U12/16EQ 14 K3</b>  | 1 | 0,10 |

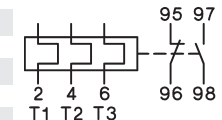


manual reset

For contactors K(G)3-10.. to K(G)3-40A..



|                    |             |  |                   |   |      |
|--------------------|-------------|--|-------------------|---|------|
| 0,12 - <b>0,18</b> | -           |  | <b>U3/32 0,18</b> | 1 | 0,14 |
| 0,18 - <b>0,27</b> | -           |  | <b>U3/32 0,27</b> | 1 | 0,14 |
| 0,27 - <b>0,4</b>  | -           |  | <b>U3/32 0,4</b>  | 1 | 0,14 |
| 0,4 - <b>0,6</b>   | -           |  | <b>U3/32 0,6</b>  | 1 | 0,14 |
| 0,6 - <b>0,9</b>   | -           |  | <b>U3/32 0,9</b>  | 1 | 0,14 |
| 0,8 - <b>1,2</b>   | -           |  | <b>U3/32 1,2</b>  | 1 | 0,14 |
| 1,2 - <b>1,8</b>   | -           |  | <b>U3/32 1,8</b>  | 1 | 0,14 |
| 1,8 - <b>2,7</b>   | -           |  | <b>U3/32 2,7</b>  | 1 | 0,14 |
| 2,7 - <b>4</b>     | -           |  | <b>U3/32 4</b>    | 1 | 0,14 |
| 4 - <b>6</b>       | 7 - 10,5    |  | <b>U3/32 6</b>    | 1 | 0,14 |
| 6 - <b>9</b>       | 10,5 - 15,5 |  | <b>U3/32 9</b>    | 1 | 0,14 |
| 8 - <b>11</b>      | 14 - 19     |  | <b>U3/32 11</b>   | 1 | 0,14 |
| 10 - <b>14</b>     | 18 - 24     |  | <b>U3/32 14</b>   | 1 | 0,14 |
| 13 - <b>18</b>     | 23 - 31     |  | <b>U3/32 18</b>   | 1 | 0,14 |
| 17 - <b>24</b>     | 30 - 41     |  | <b>U3/32 24</b>   | 1 | 0,14 |
| 23 - <b>32</b>     | 40 - 55     |  | <b>U3/32 32</b>   | 1 | 0,14 |

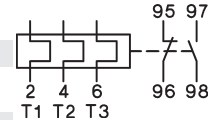


manual and auto reset

For contactors K(G)3-24A.. to K(G)3-40A ..



|                |         |  |                 |   |      |
|----------------|---------|--|-----------------|---|------|
| 10 - <b>14</b> | 18 - 24 |  | <b>U3/42 14</b> | 1 | 0,30 |
| 14 - <b>20</b> | 24 - 35 |  | <b>U3/42 20</b> | 1 | 0,30 |
| 20 - <b>28</b> | 35 - 48 |  | <b>U3/42 28</b> | 1 | 0,30 |
| 28 - <b>42</b> | 48 - 73 |  | <b>U3/42 42</b> | 1 | 0,30 |



manual and auto reset

## Thermal Overload Relays for plug-in mounting

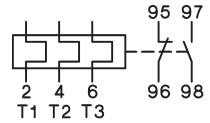


**Setting Range**  
D.O.L. (A)  $\Delta$  (A)

For contactors K3-50A.. to K3-74A..

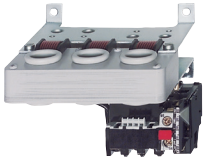
| Setting Range  | D.O.L. (A) | $\Delta$ (A) | Type            | Pack pcs. | Weight kg/pc. |
|----------------|------------|--------------|-----------------|-----------|---------------|
| 20 - <b>28</b> | 35         | 48           | <b>U3/74 28</b> | 1         | 0,40          |
| 28 - <b>42</b> | 48         | 73           | <b>U3/74 42</b> | 1         | 0,40          |
| 40 - <b>52</b> | 70         | 90           | <b>U3/74 52</b> | 1         | 0,40          |
| 52 - <b>65</b> | 90         | 112          | <b>U3/74 65</b> | 1         | 0,40          |
| 60 - <b>74</b> | 104        | 128          | <b>U3/74 74</b> | 1         | 0,40          |

Wiring Diagram



manual and auto reset

## Thermal Overload Relays for separate mounting

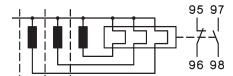


**Setting Range**  
D.O.L. (A)  $\Delta$  (A)

For contactors K3-90, K3-115, K85, K110

| Setting Range   | D.O.L. (A) | $\Delta$ (A) | Type           | Pack pcs. | Weight kg/pc. |
|-----------------|------------|--------------|----------------|-----------|---------------|
| 60 - <b>90</b>  | 104        | 156          | <b>U85 90</b>  | 1         | 0,90          |
| 80 - <b>120</b> | 140        | 207          | <b>U85 120</b> |           |               |

Wiring Diagram

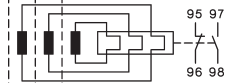


manual reset



For contactors K3-151.. and K3-176.., busbars included

| Setting Range    | D.O.L. (A) | $\Delta$ (A) | Type            | Pack pcs. | Weight kg/pc. |
|------------------|------------|--------------|-----------------|-----------|---------------|
| 120 - <b>180</b> | 208        | 312          | <b>U180 180</b> | 1         | 1,5           |



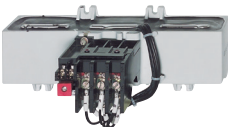
manual and auto reset



For contactors K3-210.. up to K3-316.., busbars included

| Setting Range    | D.O.L. (A) | $\Delta$ (A) | Type            | Pack pcs. | Weight kg/pc. |
|------------------|------------|--------------|-----------------|-----------|---------------|
| 144 - <b>216</b> | 250        | 374          | <b>U320 216</b> | 1         | 1,8           |
| 216 - <b>320</b> | 374        | 554          | <b>U320 320</b> |           |               |

manual and auto reset



For contactors K3-315.. , K3-450.. , K3-550.. , K3-700.. , K3-860..

| Setting Range    | D.O.L. (A) | $\Delta$ (A) | Type            | Pack pcs. | Weight kg/pc. |
|------------------|------------|--------------|-----------------|-----------|---------------|
| 240 - <b>360</b> | 416        | 623          | <b>U800 360</b> | 1         | 4,1           |
| 360 - <b>540</b> | 623        | 935          | <b>U800 540</b> | 1         | 4,1           |
| 540 - <b>800</b> | 935        | 1385         | <b>U800 800</b> | 1         | 4,1           |

## Accessories

for overload relays      for contactors

### Type

Pack set      Weight kg/set



### Busbar Sets

|      |                    |                  |   |     |
|------|--------------------|------------------|---|-----|
| U800 | K3-450.., K3-550.. | <b>SU840/550</b> | 1 | 1,7 |
| U800 | K3-700.., K3-860.. | <b>SU840/860</b> | 1 | 2,1 |

Cable Cross-section (mm<sup>2</sup>)      Type

overload relay      solid or stranded      flexible

Pack pcs.      Weight kg/pc.



### for Single Mounting U12/16..K3 Base for DIN-rail mounting plus terminals

|            |          |          |                 |   |       |
|------------|----------|----------|-----------------|---|-------|
| U12/16..K3 | 0,75 - 6 | 0,75 - 4 | <b>U12SM K3</b> | 1 | 0,035 |
|------------|----------|----------|-----------------|---|-------|

### for Single Mounting U3/32 Additional Terminals with fingertouch protection (U3/32 relays have base for DIN rail mounting integrated)



|       |          |          |                |   |       |
|-------|----------|----------|----------------|---|-------|
| U3/32 | 0,75 - 6 | 0,75 - 4 | <b>U3/32SM</b> | 1 | 0,035 |
|-------|----------|----------|----------------|---|-------|

### for Single Mounting U3/42 or U3/74 Base for DIN-rail mounting



|              |   |   |               |   |       |
|--------------|---|---|---------------|---|-------|
| U3/42, U3/74 | - | - | <b>U3/42G</b> | 1 | 0,030 |
|--------------|---|---|---------------|---|-------|

### for Single Mounting U3/42 or U3/74 Connecting Wire Set (3 pcs.)



|              |              |                   |                 |   |       |
|--------------|--------------|-------------------|-----------------|---|-------|
| U3/42, U3/74 | 150mm length | 10mm <sup>2</sup> | <b>LG5830-4</b> | 1 | 0,060 |
| U3/42, U3/74 | 250mm length | 10mm <sup>2</sup> | <b>LG5830-2</b> | 1 | 0,100 |

### Additional Terminals with fingertouch protection



|                         |           |          |               |   |       |
|-------------------------|-----------|----------|---------------|---|-------|
| 1-pole f. U12/16, U3/32 | 0,75 - 10 | 0,75 - 6 | <b>LG9339</b> | 1 | 0,009 |
|-------------------------|-----------|----------|---------------|---|-------|

|                  |        |        |               |   |       |
|------------------|--------|--------|---------------|---|-------|
| 3-pole for U3/42 | 4 - 35 | 6 - 25 | <b>LG7559</b> | 1 | 0,052 |
|------------------|--------|--------|---------------|---|-------|

# Thermal Overload Relays, tripping times for selection to motors of protection degree EEx e

## Relays With Standard Tripping Characteristic

**Setting Range** Tripping time depending on the multiple of the current setting from cold condition (tolerance  $\pm 20\%$  of the tripping time)

| A                    | A           | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|----------------------|-------------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U3/32 ..</b>      |             |                |                |                |                |                  |                |
| 0,12 -               | <b>0,18</b> | 16,1           | 9,6            | 6,8            | 5,3            | 4,2              | 3,7            |
| 0,18 -               | <b>0,27</b> | 16,6           | 9,7            | 6,7            | 5,2            | 4,1              | 3,6            |
| 0,27 -               | <b>0,4</b>  | 19,4           | 11,4           | 7,9            | 6,1            | 4,7              | 4,2            |
| 0,4 -                | <b>0,6</b>  | 18,7           | 10,9           | 7,6            | 5,9            | 4,6              | 4,0            |
| <b>U3/42</b>         |             |                |                |                |                |                  |                |
| 10 -                 | <b>14</b>   | 21,8           | 11,4           | 7,0            | 5,0            | 3,7              | 2,8            |
| 14 -                 | <b>20</b>   | 22,4           | 11,2           | 6,7            | 4,5            | 3,2              | 2,4            |
| 20 -                 | <b>28</b>   | 21,8           | 10,8           | 6,5            | 4,5            | 3,3              | 2,5            |
| 28 -                 | <b>42</b>   | 25,2           | 13,3           | 8,0            | 5,5            | 4,0              | 3,1            |
| <b>U3/74</b>         |             |                |                |                |                |                  |                |
| 20 -                 | <b>28</b>   | 21,8           | 10,8           | 6,5            | 4,5            | 3,3              | 2,5            |
| 28 -                 | <b>42</b>   | 25,2           | 13,3           | 8,0            | 5,5            | 4,0              | 3,1            |
| 40 -                 | <b>52</b>   | 18,3           | 9,2            | 5,6            | 3,9            | 2,8              | 2,2            |
| 52 -                 | <b>65</b>   | 17,8           | 8,7            | 5,2            | 3,4            | 2,5              | 1,9            |
| <b>U85 ..</b>        |             |                |                |                |                |                  |                |
| 60 -                 | <b>90</b>   | 19,5           | 13,5           | 11,0           | 10,0           | 9,5              | 8,5            |
| 80 -                 | <b>120</b>  | 18,0           | 11,0           | 10,0           | 9,0            | 8,5              | 8,0            |
| <b>U840 ..</b>       |             |                |                |                |                |                  |                |
| 260 -                | <b>360</b>  | 23,3           | 14,1           | 10,0           | 7,6            | 6,1              | 5,4            |
| 340 -                | <b>480</b>  | 23,0           | 13,8           | 9,6            | 7,6            | 6,1              | 5,4            |
| 440 -                | <b>620</b>  | 20,5           | 12,4           | 9,0            | 7,0            | 5,5              | 5,0            |
| 560 -                | <b>800</b>  | 21,0           | 12,5           | 9,0            | 7,0            | 5,6              | 5,2            |
| <b>U12/16E(A) ..</b> |             |                |                |                |                |                  |                |
| 0,12 -               | <b>0,18</b> | 18,5           | 10,4           | 7,2            | 5,5            | 4,3              | 3,6            |
| 0,18 -               | <b>0,27</b> | 16,7           | 9,8            | 6,5            | 5,0            | 4,1              | 3,5            |
| 0,27 -               | <b>0,4</b>  | 19,4           | 12,1           | 8,2            | 5,9            | 4,9              | 4,2            |
| 0,4 -                | <b>0,6</b>  | 18,7           | 11,2           | 8,0            | 6,0            | 4,9              | 4,1            |
| 0,6 -                | <b>0,9</b>  | 19,7           | 11,6           | 8,1            | 6,1            | 4,9              | 4,2            |
| 0,8 -                | <b>1,2</b>  | 22,9           | 13,6           | 10,0           | 7,3            | 6,0              | 5,2            |
| 1,2 -                | <b>1,8</b>  | 22,2           | 13,2           | 9,2            | 7,6            | 5,8              | 5,3            |
| 1,8 -                | <b>2,7</b>  | 23,0           | 13,7           | 9,3            | 7,6            | 5,7              | 5,1            |
| 2,7 -                | <b>4</b>    | 24,0           | 14,4           | 9,9            | 7,8            | 5,9              | 5,1            |
| 4 -                  | <b>6</b>    | 24,7           | 13,8           | 9,9            | 7,3            | 5,6              | 4,8            |
| 6 -                  | <b>9</b>    | 22,0           | 13,4           | 8              | 5,7            | 4,1              | 3,5            |
| 8 -                  | <b>11</b>   | 17,4           | 9,2            | 5,9            | 4,1            | 2,9              | 2,3            |
| 10 -                 | <b>14</b>   | 26,4           | 12,9           | 7,6            | 5,2            | 3,5              | 2,8            |
| 13 -                 | <b>18</b>   | 14,7           | 7,7            | 4,8            | 3,2            | 2,3              | 1,7            |
| 17 -                 | <b>23</b>   | 16,2           | 8,4            | 5,0            | 3,6            | 2,4              | 1,8            |
| 22 -                 | <b>30</b>   | 16,8           | 8,5            | 5,0            | 3,6            | 2,3              | 1,9            |

| A            | A         | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|--------------|-----------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U3/42</b> |           |                |                |                |                |                  |                |
| 10 -         | <b>14</b> | 21,8           | 11,4           | 7,0            | 5,0            | 3,7              | 2,8            |
| 14 -         | <b>20</b> | 22,4           | 11,2           | 6,7            | 4,5            | 3,2              | 2,4            |
| 20 -         | <b>28</b> | 21,8           | 10,8           | 6,5            | 4,5            | 3,3              | 2,5            |
| 28 -         | <b>42</b> | 25,2           | 13,3           | 8,0            | 5,5            | 4,0              | 3,1            |

| A            | A         | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|--------------|-----------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U3/74</b> |           |                |                |                |                |                  |                |
| 20 -         | <b>28</b> | 21,8           | 10,8           | 6,5            | 4,5            | 3,3              | 2,5            |
| 28 -         | <b>42</b> | 25,2           | 13,3           | 8,0            | 5,5            | 4,0              | 3,1            |
| 40 -         | <b>52</b> | 18,3           | 9,2            | 5,6            | 3,9            | 2,8              | 2,2            |
| 52 -         | <b>65</b> | 17,8           | 8,7            | 5,2            | 3,4            | 2,5              | 1,9            |

| A             | A          | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|---------------|------------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U85 ..</b> |            |                |                |                |                |                  |                |
| 60 -          | <b>90</b>  | 19,5           | 13,5           | 11,0           | 10,0           | 9,5              | 8,5            |
| 80 -          | <b>120</b> | 18,0           | 11,0           | 10,0           | 9,0            | 8,5              | 8,0            |

| A              | A          | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|----------------|------------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U840 ..</b> |            |                |                |                |                |                  |                |
| 260 -          | <b>360</b> | 23,3           | 14,1           | 10,0           | 7,6            | 6,1              | 5,4            |
| 340 -          | <b>480</b> | 23,0           | 13,8           | 9,6            | 7,6            | 6,1              | 5,4            |
| 440 -          | <b>620</b> | 20,5           | 12,4           | 9,0            | 7,0            | 5,5              | 5,0            |
| 560 -          | <b>800</b> | 21,0           | 12,5           | 9,0            | 7,0            | 5,6              | 5,2            |

| A                    | A           | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|----------------------|-------------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U12/16E(A) ..</b> |             |                |                |                |                |                  |                |
| 0,12 -               | <b>0,18</b> | 18,5           | 10,4           | 7,2            | 5,5            | 4,3              | 3,6            |
| 0,18 -               | <b>0,27</b> | 16,7           | 9,8            | 6,5            | 5,0            | 4,1              | 3,5            |
| 0,27 -               | <b>0,4</b>  | 19,4           | 12,1           | 8,2            | 5,9            | 4,9              | 4,2            |
| 0,4 -                | <b>0,6</b>  | 18,7           | 11,2           | 8,0            | 6,0            | 4,9              | 4,1            |
| 0,6 -                | <b>0,9</b>  | 19,7           | 11,6           | 8,1            | 6,1            | 4,9              | 4,2            |
| 0,8 -                | <b>1,2</b>  | 22,9           | 13,6           | 10,0           | 7,3            | 6,0              | 5,2            |
| 1,2 -                | <b>1,8</b>  | 22,2           | 13,2           | 9,2            | 7,6            | 5,8              | 5,3            |
| 1,8 -                | <b>2,7</b>  | 23,0           | 13,7           | 9,3            | 7,6            | 5,7              | 5,1            |
| 2,7 -                | <b>4</b>    | 24,0           | 14,4           | 9,9            | 7,8            | 5,9              | 5,1            |
| 4 -                  | <b>6</b>    | 24,7           | 13,8           | 9,9            | 7,3            | 5,6              | 4,8            |
| 6 -                  | <b>9</b>    | 22,0           | 13,4           | 8              | 5,7            | 4,1              | 3,5            |
| 8 -                  | <b>11</b>   | 17,4           | 9,2            | 5,9            | 4,1            | 2,9              | 2,3            |
| 10 -                 | <b>14</b>   | 26,4           | 12,9           | 7,6            | 5,2            | 3,5              | 2,8            |
| 13 -                 | <b>18</b>   | 14,7           | 7,7            | 4,8            | 3,2            | 2,3              | 1,7            |
| 17 -                 | <b>23</b>   | 16,2           | 8,4            | 5,0            | 3,6            | 2,4              | 1,8            |
| 22 -                 | <b>30</b>   | 16,8           | 8,5            | 5,0            | 3,6            | 2,3              | 1,9            |

## Relays With Quick Tripping Characteristic

preferably for motors with short  $t_E$  time and for submersible pumps

**Setting Range** Tripping time depending on the multiple of the current setting from cold condition (tolerance  $\pm 20\%$  of the tripping time)

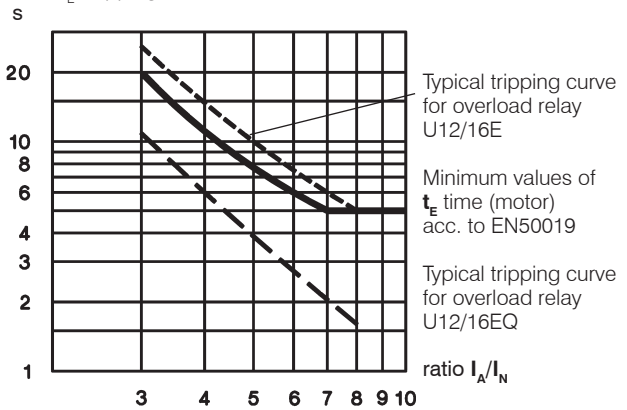
| A                  | A          | $I_A/I_N$<br>3 | $I_A/I_N$<br>4 | $I_A/I_N$<br>5 | $I_A/I_N$<br>6 | $I_A/I_N$<br>7,2 | $I_A/I_N$<br>8 |
|--------------------|------------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>U12/16EQ ..</b> |            |                |                |                |                |                  |                |
| 0,4 -              | <b>0,6</b> | 13,6           | 8,4            | 5,9            | 4,2            | 3,3              | 3,0            |
| 0,6 -              | <b>0,9</b> | 13,8           | 7,8            | 5,2            | 4,1            | 3,2              | 2,7            |
| 0,8 -              | <b>1,2</b> | 13,1           | 7,5            | 5,2            | 3,9            | 3,1              | 2,7            |
| 1,2 -              | <b>1,8</b> | 14,6           | 8,7            | 6,0            | 4,6            | 3,6              | 3,2            |
| 1,8 -              | <b>2,7</b> | 13,5           | 7,6            | 5,3            | 3,9            | 3,1              | 2,7            |
| 2,7 -              | <b>4</b>   | 11,0           | 6,0            | 4,1            | 2,6            | 1,7              | 1,4            |
| 4 -                | <b>6</b>   | 9,6            | 5,3            | 3,3            | 2,3            | 1,6              | 1,3            |
| 6 -                | <b>9</b>   | 10,2           | 5,4            | 3,4            | 2,3            | 1,6              | 1,3            |
| 8 -                | <b>11</b>  | 12,0           | 6,2            | 3,9            | 2,5            | 1,8              | 1,3            |
| 10 -               | <b>14</b>  | 12,8           | 6,6            | 4,0            | 2,6            | 1,8              | 1,4            |

All tripping times of overload relays U12/16EQ are shorter than the minimum values of the  $t_E$  time for motors of protection degree EEx e acc. to EN 50019 and therefore are suitable for all motors of protection degree EEx e. For these overload relays the selection on basis of tripping curves is thereby not necessary.

When selecting a standard overload, refer to the tripping curve. Determine the values of the starting current ratio  $I_A/I_N$  and the time  $t_E$  which is marked on the label of the motor. The overload must trip within the  $t_E$  time, which means that the tripping curve from cold condition must be (20% due to tolerance) below the co-ordination point  $I_A/I_N$  and the time  $t_E$ .

$I_A$  = Starting current of motor       $I_N$  = Rated current of motor  
 $t_E$  =  $t_E$ -time of motor

Time  $t_E$ /Tripping time



### Example of selection for thermal overload relay:

Technical data of a motor protection EEx e  
 $P_N = 1,5kW$      $I_N = 3,6A$      $I_A/I_N = 5$      $t_E$  time = 8s

1) U12/16E 4 (2,7 - 4A)  
 Tripping time at  $5 \times I_N = 9,9s$   
 $9,9s + 20\% \text{ tolerance} = 11,9s > t_{E \text{ Motor}} = 8s$   
 The device U12/16E 4 is **not suitable**.

2) U12/16EQ 4 (2,7 - 4A)  
 Tripping time at  $5 \times I_N = 4,1s$   
 $4,1s + 20\% \text{ tolerance} = 4,9s < t_{E \text{ Motor}} = 8s$   
**The device U12/16EQ 4 is therefore suitable for motor protection**

# Thermal Overload Relays

## Fuses for U3/32, U3/42, U3/74, U12/16E, U85, U180, U320 and U800

| Type                   | Setting Range            |             | Max. Fuse Size According to Coordination-type |                   |                   |                | Fuse UL        | SCCR |   |
|------------------------|--------------------------|-------------|---|-------------------|-------------------|----------------|----------------|------|---|
|                        | DOL                      | YΔ          | "2" <sup>1)</sup>                             |                   | "1" <sup>1)</sup> |                |                |      |   |
|                        |                          |             | A   | A                 | quick A           | slow, gL(gG) A | slow, gL(gG) A | aM A | A |
| U3/32<br>(U12/16E)     | 0,12 - <b>0,18</b>       | -           |   | 0,5 <sup>2)</sup> | 0,5 <sup>2)</sup> | 25             | -              | 15   | 5 |
|                        | 0,18 - <b>0,27</b>       | -           |   | 1,0 <sup>2)</sup> | 1,0 <sup>2)</sup> | 25             | -              | 15   | 5 |
|                        | 0,27 - <b>0,4</b>        | -           |   | 2                 | 2                 | 25             | -              | 15   | 5 |
|                        | 0,4 - <b>0,6</b>         | -           |   | 2                 | 2                 | 25             | -              | 15   | 5 |
|                        | 0,6 - <b>0,9</b>         | -           |   | 4                 | 4                 | 25             | -              | 15   | 5 |
|                        | 0,8 - <b>1,2</b>         | -           |   | 4                 | 4                 | 25             | 2              | 15   | 5 |
|                        | 1,2 - <b>1,8</b>         | -           |   | 6                 | 6                 | 25             | 2              | 15   | 5 |
|                        | 1,8 - <b>2,7</b>         | -           |   | 10                | 10                | 25             | 4              | 15   | 5 |
|                        | 2,7 - <b>4</b>           | -           |   | 16                | 10                | 25             | 4              | 15   | 5 |
|                        | 4 - <b>6</b>             | 7 - 10,5    |   | 20                | 16                | 25             | 6              | 15   | 5 |
|                        | 6 - <b>9</b>             | 10,5 - 15,5 |   | 35                | 25                | 35             | 10             | 25   | 5 |
|                        | 8 - <b>11</b>            | 14 - 19     |   | 35                | 25                | 35             | 16             | 30   | 5 |
|                        | 10 - <b>14</b>           | 18 - 24     |   | 50                | 35                | 63             | 16             | 40   | 5 |
| 13 - <b>18</b>         | 23 - 31                  |             | 50  | 35                | 63                | 20             | 50             | 5    |   |
| 17 - <b>(23)24</b>     | 30 - (40)41              |             | 63  | 50                | 63                | 25             | 60             | 5    |   |
| (22)23 - <b>(30)32</b> | (38)40 - (52)55          |             | 80  | 63                | 80                | 35             | 70             | 5    |   |
| U3/42                  | 10 - <b>14</b>           | 18 - 24     | 50  | 35                | 80                | 16             | 40             | 5    |   |
|                        | 14 - <b>20</b>           | 24 - 35     | 63  | 50                | 80                | 25             | 60             | 5    |   |
|                        | 20 - <b>28</b>           | 35 - 48     | 80  | 63                | 80                | 35             | 80             | 5    |   |
|                        | 28 - <b>42</b>           | 48 - 73     | 100   | 80                | 150               | 50             | 110            | 5    |   |
| U3/74                  | 20 - <b>28</b>           | 35 - 48     | 100   | 80                | 150               | 35             | 80             | 5    |   |
|                        | 28 - <b>42</b>           | 48 - 73     | 125   | 100               | 150               | 50             | 110            | 5    |   |
|                        | 40 - <b>52</b>           | 70 - 90     | 160   | 100               | 150               | 63             | 200            | 5    |   |
|                        | 52 - <b>65</b>           | 90 - 112    | 160   | 125               | 150               | 80             | 250            | 10   |   |
|                        | 60 - <b>74</b>           | 104 - 128   | 160   | 125               | 150               | 80             | 250            | 10   |   |
| U85                    | 60 - <b>90</b>           | 104 - 156   |   |                   |                   |                | 300            | 10   |   |
|                        | 80 - <b>120</b>          | 140 - 207   |   |                   |                   |                | -              | 10   |   |
| U180, U320<br>U800     | all ranges<br>all ranges |             |   |                   |                   |                | -              | -    |   |

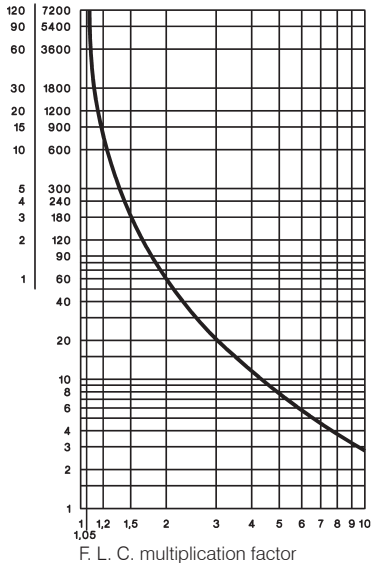
For short circuit protecting overload relays with current transformer use fuse according to the contactor of the combination.

### Tripping Characteristics for U3/32, U3/42, U3/74 and U12/16E

Detailed tripping times for each range see table page 124

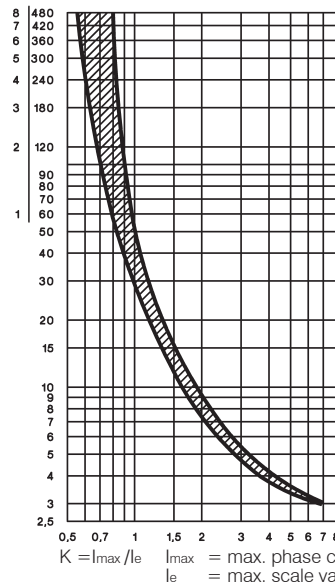
#### with three-phase load

Tripping time min. s (Average value of typical tolerance curves from cold condition)



#### with two-pole load

Tripping time min. s (Typical tolerance curve from cold condition)



1) Coordination-type according to IEC 947-4-1:  
 "2": Light contact welding accepted. Thermal overload relay must not be damaged.  
 "1": Welding of contactor and damage of the thermal overload relay allowed.  
 2) Miniature fuse

3) Suitable for use on a capability of delivering not more than



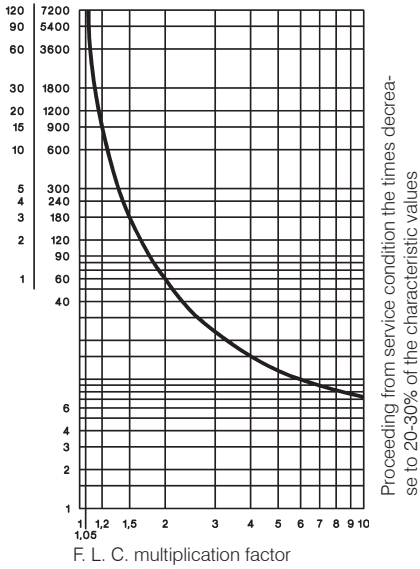
# Thermal Overload Relays

## Tripping Characteristics for U85, U180, U320, and U800

Detailed tripping times for each range of U85 see table page 124

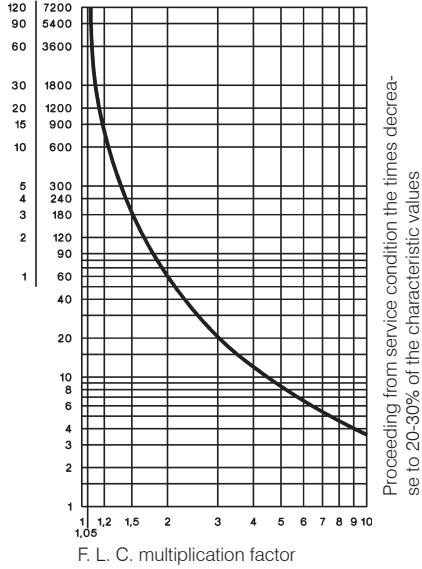
### U85 with three-phase load

Tripping time (Average value of typical tolerance curves from cold condition)



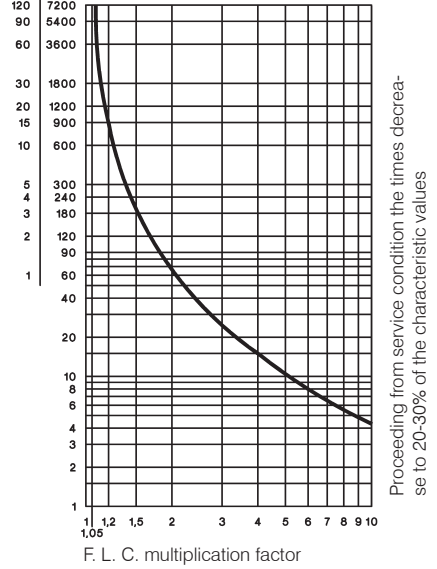
### U180, U320 with three-phase load

Tripping time (Average value of typical tolerance curves from cold condition)



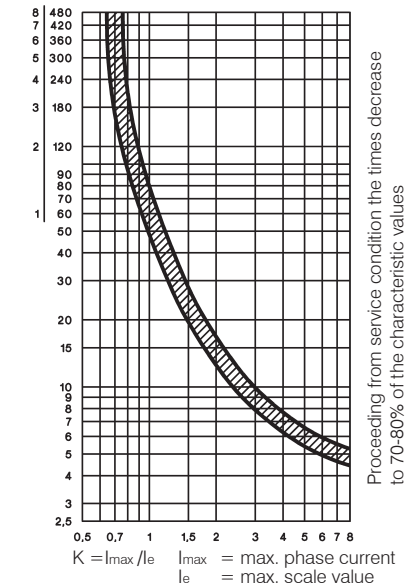
### U800 with three-phase load

Tripping time (Average value of typical tolerance curves from cold condition)



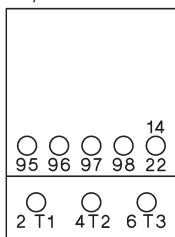
### U85 with two-pole load

Tripping time (Typical tolerance curve from cold condition)

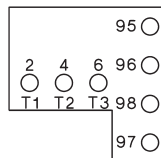


## Position of Terminals

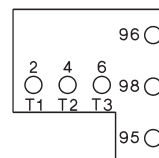
### U3/32



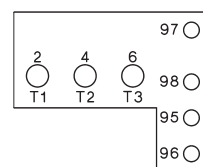
### U12/16E, U12/16EM, U12/16EQ



### U12/16A



### U3/42, U3/74



# Thermal Overload Relays in Special Version

## Fuse for U12/16EQ

| Setting Range    | Maximum Fuse Acc. to Coordination-type "2" <sup>1)</sup> |                |                                  |
|------------------|--|----------------|----------------------------------|
|                  | quick A  | slow, gL(gG) A | slow, gL(gG) "1" <sup>1)</sup> A |
| 0,4 - <b>0,6</b> | 2  | 2              | 25                               |
| 0,6 - <b>0,9</b> | 4  | 4              | 25                               |
| 0,8 - <b>1,2</b> | 4  | 4              | 25                               |
| 1,2 - <b>1,8</b> | 6  | 6              | 25                               |
| 1,8 - <b>2,7</b> | 10   | 10             | 25                               |
| 2,7 - <b>4</b>   | 16   | 10             | 25                               |
| 4 - <b>6</b>     | 20   | 16             | 25                               |
| 6 - <b>9</b>     | 35   | 25             | 35                               |
| 8 - <b>11</b>    | 35   | 25             | 35                               |
| 10 - <b>14</b>   | 50   | 35             | 63                               |

## Fuse for U12/16EM

| Setting Range      | Maximum Fuse Acc. to Coordination-type "2" <sup>1)</sup> |                     |                         |
|--------------------|--|---------------------|-------------------------|
|                    | 380-400V slow, gL(gG) A                                  | 500V slow, gL(gG) A | 660-690V slow, gL(gG) A |
| 0,12 - <b>0,18</b> | none   | none                | on request              |
| 0,18 - <b>0,27</b> | none   | none                | on request              |
| 0,27 - <b>0,4</b>  | none   | none                | on request              |
| 0,4 - <b>0,6</b>   | none   | none                | on request              |
| 0,6 - <b>0,9</b>   | none   | none                | on request              |
| 0,8 - <b>1,2</b>   | none   | 10                  | on request              |
| 1,2 - <b>1,8</b>   | none   | 16                  | on request              |
| 1,8 - <b>2,7</b>   | 20   | 20                  | on request              |
| 2,7 - <b>4</b>     | 35   | 35                  | on request              |

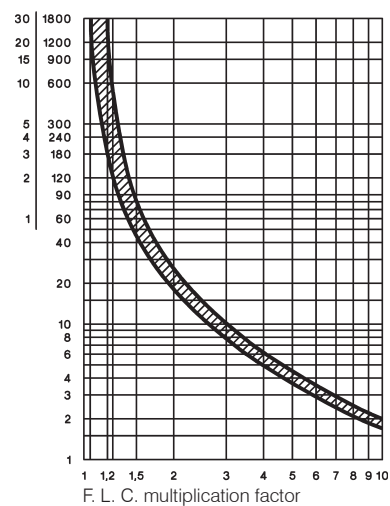
## Tripping Characteristic for U12/16EQ

Detailed tripping times for each range see table page 124

### with three-phase load

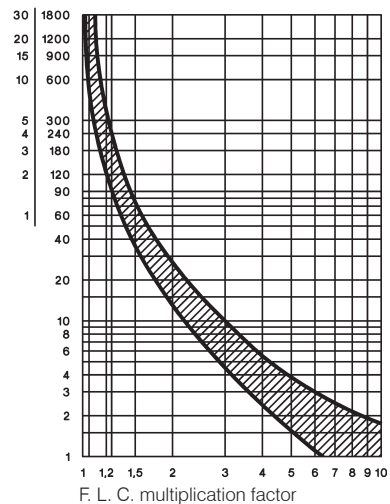
range 0,4-0,6 to 1,8-2,7A

Tripping time (Typical tolerance curve from cold condition)



range 2,7-4 to 10-14A

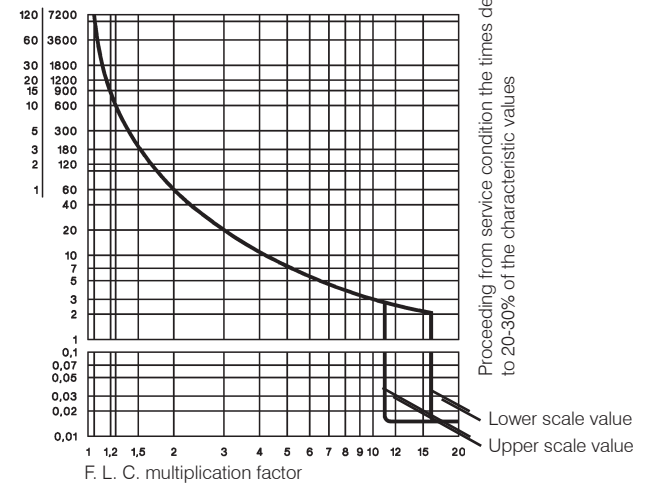
Tripping time (Typical tolerance curve from cold condition)



## Tripping Characteristic for U12/16EM

### with three-phase load

Tripping time (Average value of typical tolerance curves from cold condition)



1) Coordination-type according to IEC 947-4-1:  
 "2": Light contact welding accepted. Thermal overload relay must not be damaged.  
 "1": Welding of contactor and damage of the thermal overload relay allowed.

## Thermal Overload Relays

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

| Type   | U3/32                             | U12/16 <sup>6)</sup> | U3/42      | U3/74                         | U85     | U180               | U320 | U800                |   |
|--|-----------------------------------|----------------------|------------|-------------------------------|---------|--------------------|------|---------------------|---|
| <b>Rated insulation voltage U<sub>i</sub><sup>1)</sup></b> | V~                                | 690                  | 690        | 690                           | 690     | 750                | 1000 | 1000                |   |
| <b>Permissible ambient temperature</b>                     |                                   |                      |            |                               |         |                    |      |                     |   |
| operation  | open                              | °C                   | -25 to +60 |                               |         |                    |      | -25 to +55          |   |
| storage  |                                   | °C                   | -50 to +70 |                               |         |                    |      | -40 to +70          |   |
| <b>Trip class according to IEC 947-4-1</b>                 | 10A                               | 10A                  | 10A        | 10A                           | 20      | 10A                | 10A  | 10                  |   |
| <b>Cable cross-section</b>                                 |                                   |                      |            |                               |         |                    |      |                     |   |
| main connector   | solid or stranded                 | mm <sup>2</sup>      | 0,75-6     | 0,75-6+0,75-2,5 <sup>2)</sup> | 0,75-10 | 4-35 <sup>2)</sup> | 3)   | 7)                  | - |
|  | flexible                          | mm <sup>2</sup>      | 1-4        | 0,75-4+0,5-2,5 <sup>2)</sup>  | 0,75-6  | 6-25 <sup>2)</sup> |      |                     |   |
|  | flexible with multicore cable end | mm <sup>2</sup>      | 0,75-4     | 0,5-2,5+0,5-1,5               | 0,75-6  | 4-25               |      |                     |   |
| Cables per clamp   | number                            |                      | 2          | 1+1                           | 2       | 1                  |      |                     |   |
| auxiliary connector  | solid                             | mm <sup>2</sup>      |            | 0,75-2,5 <sup>2)</sup>        |         |                    |      | 1-2,5 <sup>2)</sup> |   |
|  | flexible                          | mm <sup>2</sup>      |            | 0,5-2,5 <sup>2)</sup>         |         |                    |      | 1-2,5 <sup>2)</sup> |   |
|  | flexible with multicore cable end | mm <sup>2</sup>      |            | 0,5-1,5                       |         |                    |      | 1-2,5 <sup>2)</sup> |   |
| Cables per clamp   | number                            |                      |            | 2                             |         |                    |      | 2                   |   |

| Type   | U3/32     | U12/16A | U12/16E  | U12/16EQ | U3/42 | U85  | U180 | U800 |                 |
|--|-----------|---------|----------|----------|-------|------|------|------|-----------------|
|  |           |         | U12/16EM |          | U3/74 |      | U320 |      |                 |
| <b>Auxiliary contacts</b>                                  |           |         |          |          |       |      |      |      |                 |
| <b>Rated insulation voltage U<sub>i</sub><sup>1)</sup></b> |           |         |          |          |       |      |      |      |                 |
| same potential   | V~        | 690     | 690      | 690      | 690   | 690  | 690  | 500  |                 |
| different potential  | V~        | 440     | -        | 440      | 440   | 250  | 440  | 500  |                 |
| <b>Utilization category AC15</b>                           |           |         |          |          |       |      |      |      |                 |
| Rated operational current I <sub>e</sub>                   | 24V A     | 3       | 4        | 5        | 5     | 4    | 5    | 3    | 4 <sup>5)</sup> |
|  | 230V A    | 2       | 2,5      | 3        | 3     | 2,5  | 3    | 2    | 2,5             |
|  | 400V A    | 1       | 1,5      | 2        | 2     | 1,5  | 2    | 1    | 1,5             |
|  | 690V A    | 0,5     | 0,6      | 0,6      | 0,6   | 0,6  | 0,6  | 0,5  | 0,6             |
| <b>Utilization category DC13</b>                           |           |         |          |          |       |      |      |      |                 |
| Rated operational current I <sub>e</sub>                   | 24V A     | 1       | 1,2      | 1,2      | 1,2   | 1,2  | 1,2  | 1    | 1,2             |
|  | 110V A    | 0,15    | 0,15     | 0,15     | 0,15  | 0,15 | 0,15 | 0,15 | 0,15            |
|  | 220V A    | 0,1     | 0,1      | 0,1      | 0,1   | 0,1  | 0,1  | 0,1  | 0,1             |
| <b>Short circuit prot.</b> (without welding 1kA)           |           |         |          |          |       |      |      |      |                 |
| highest fuse rating  | gL (gG) A | 4       | 4        | 6        | 6     | 6    | 6    | 4    | 6               |

| Type                                      | U3/32 | U12/16 | U12/16E  | U3/42  | U3/42    | U3/74  | U3/74    | U85 |     |
|---|-------|--------|----------|--------|----------|--------|----------|-----|-----|
| Setting range                             | all   | to 23A | 22 - 30A | to 28A | 28 - 42A | to 52A | 52 - 65A | all |     |
| <b>Power loss per current path (max.)</b> |       |        |          |        |          |        |          |     |     |
| minimum setting value                     | W     | 1,1    | 1,1      | 1,7    | 1,3      | 1,3    | 2,0      | 2,9 | 1,1 |
| maximum setting value                     | W     | 2,3    | 2,3      | 3,7    | 2,6      | 3,3    | 3,7      | 4,5 | 2,5 |

## Data according to cULus

| Type                            | U3/32 | U12/16A | U12/16E | U3/42 | U3/74 | U85 |    |
|---------------------------------|-------|---------|---------|-------|-------|-----|----|
| <b>Rated insulation voltage</b> | V~    | 600     | 600     | 600   | 600   | 600 |    |
| <b>Rated current</b>            | A     | 32      | 23      | 23    | 42    | 75  | 85 |
| <b>Auxiliary contacts</b>       |       |         |         |       |       |     |    |
| Rated voltage                   |       |         |         |       |       |     |    |
| same potential                  | V~    | 600     | 600     | 600   | 600   | 600 |    |
| different potential             | V~    | 150     | -       | 150   | 150   | 150 |    |
| <b>Switching capacity AC</b>    | VA    | 500     | 500     | 500   | 600   | 600 |    |
| of aux. contacts                | A     | 2       | 3       | 4     | 4     | 4   |    |

## Temperature Compensation

In case of higher ambient temperature use the following formula:  
**(Ambient temperature - 20) x 0,125 = correction factor in % of the full load motor current**

**Example: Ambient temperature 70°C, full load motor current 7A**  
**(70 - 20) x 0,125 = 6,25%**  
**Setting value: 7A + 6,25% = 7,44A**

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U<sub>imp</sub> = 4kV (at 440V), 6kV (at 690V).

Data for other conditions on request.

2) Maximum cable cross-section with prepared conductor

3) Without terminals, suitable for bushing one connector 70mm<sup>2</sup> (stranded) per phase

4) Switching capacity of the start contact: AC15 300VA, max. 1,5A, DC13 (max. 220V) 30W, max. 1,5A

5) Switching capacity of the make contact: AC15 400VA, max. 1,7A, DC13 (max. 220V) 10W, max. 1A

6) U12/16E 30: Cable cross-section for main connector like type U3/42, one connector only

7) Busbar sets see accessories page 123

# Thermal Overload Relays

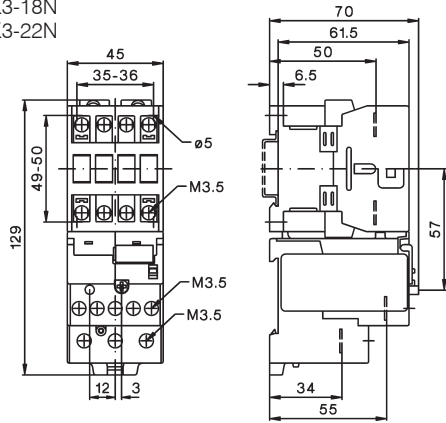
## Dimensions

K3-10N + U3/32

K3-14N

K3-18N

K3-22N

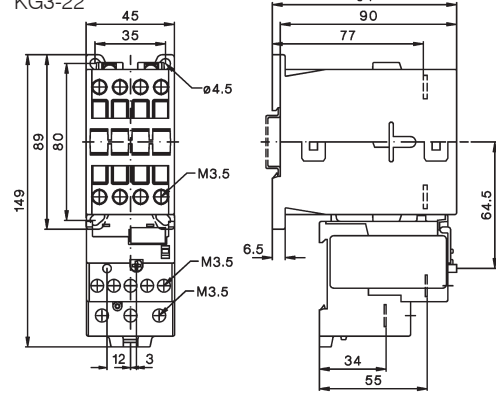


KG3-10 + U3/32

KG3-14

KG3-18

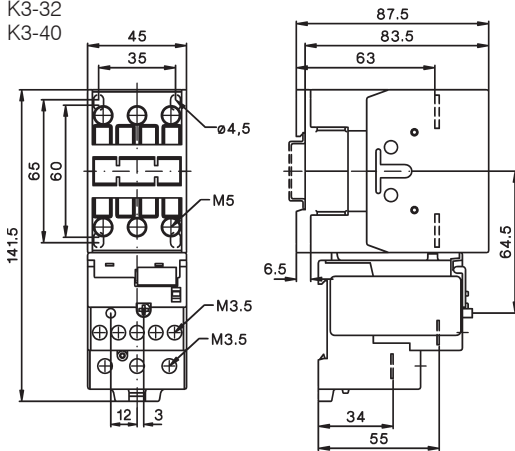
KG3-22



K3-24 + U3/32

K3-32

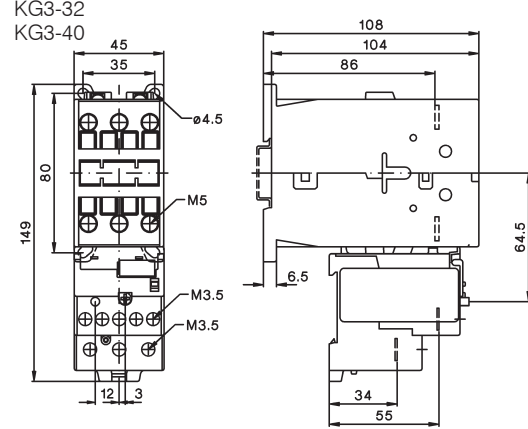
K3-40



KG3-24 + U3/32

KG3-32

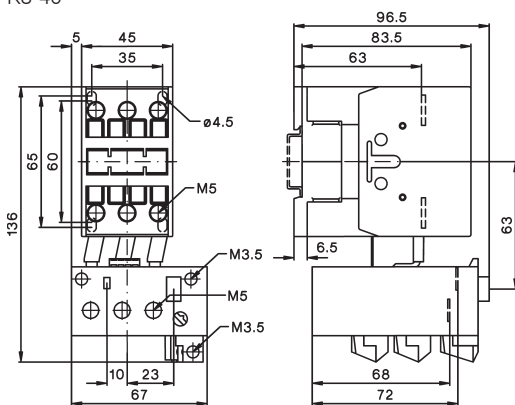
KG3-40



K3-24 + U3/42

K3-32

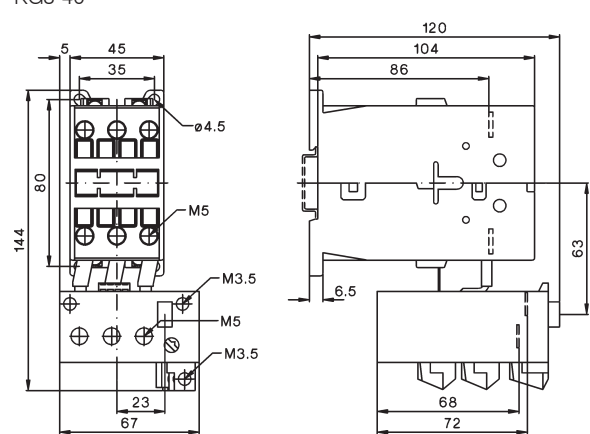
K3-40



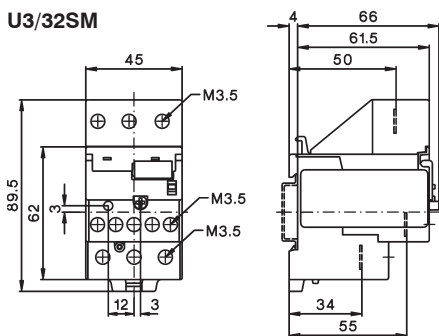
KG3-24 + U3/42

KG3-32

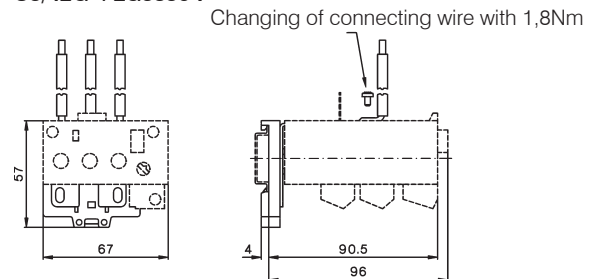
KG3-40



U3/32SM



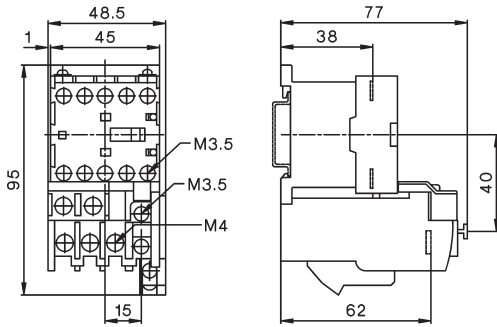
U3/42G + LG5830-



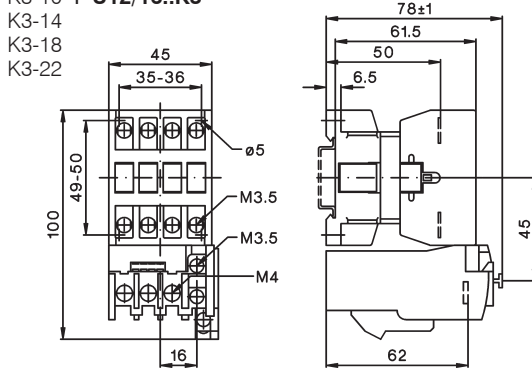
# Thermal Overload Relays

## Dimensions

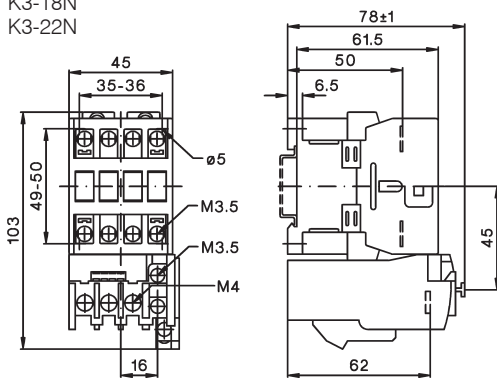
K1-09 + U12/16..K1  
K1-12



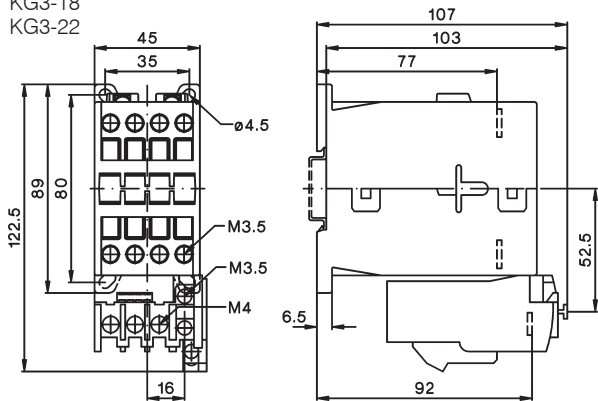
K3-10 + U12/16..K3  
K3-14  
K3-18  
K3-22



K3-10N + U12/16..K3  
K3-14N  
K3-18N  
K3-22N

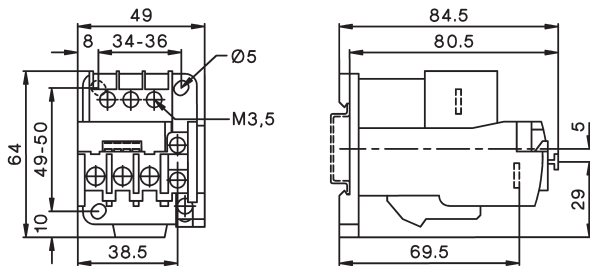


KG3-10 + U12/16..K3  
KG3-14  
KG3-18  
KG3-22

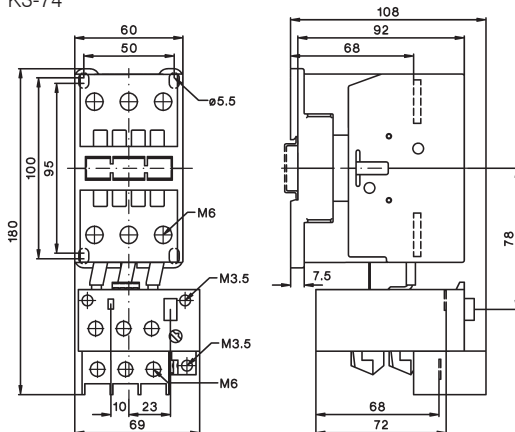


## U12SM K3

U12/16..K3 + U12SM K3 for snap-on 35mm DIN-rail according to DIN EN50022 and screw mounting (single mounting)



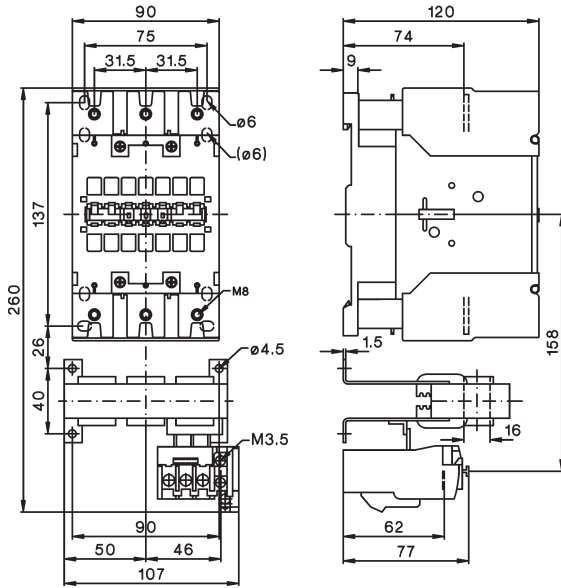
K3-50 + U3/74  
K3-62  
K3-74



# Thermal Overload Relays

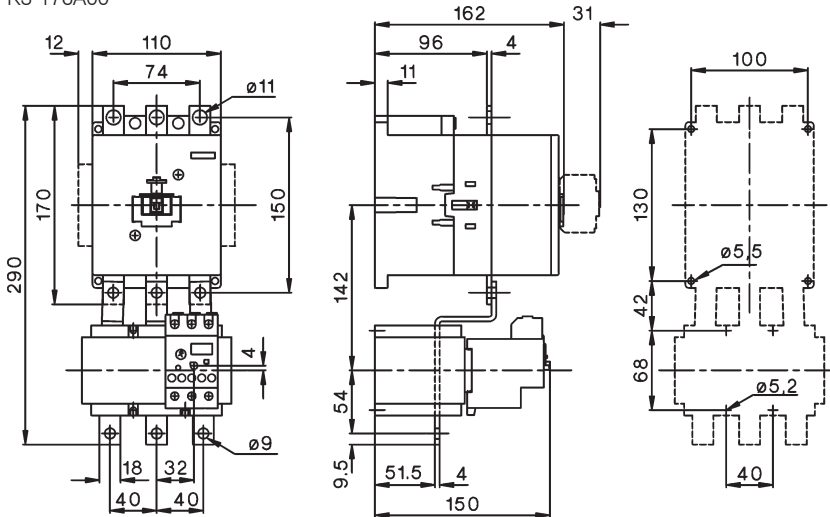
## Dimensions

K3-90A + U85  
K3-115A



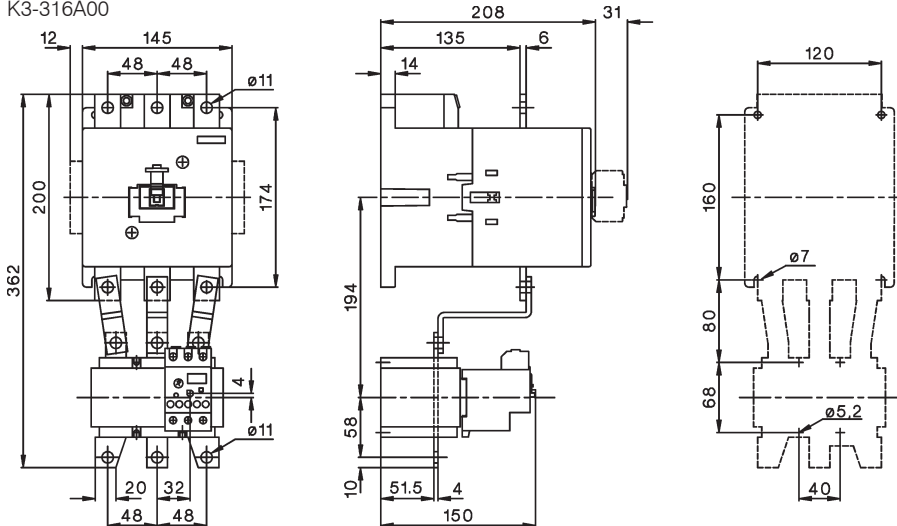
K3-151A00 + U180  
K3-176A00

Mounting holes



K3-210A00 + U320  
K3-260A00  
K3-316A00

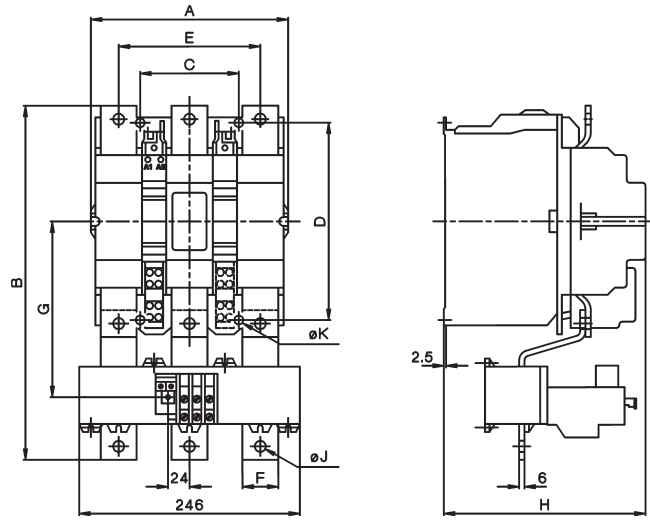
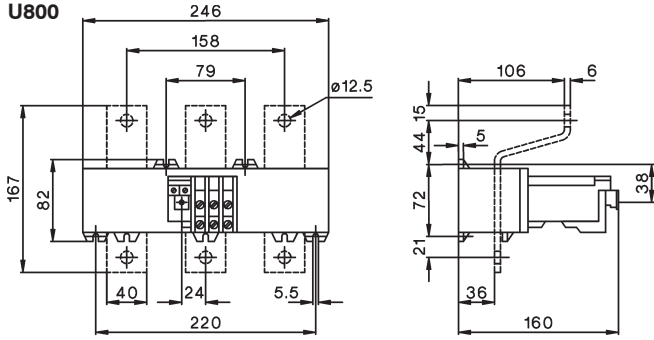
Mounting holes








# Thermal Overload Relays

## Dimensions

U800



| U800 with     | A   | B   | C   | D   | E   | F  | G   | H   | J    | K  |
|---------------|-----|-----|-----|-----|-----|----|-----|-----|------|----|
| <b>K3-450</b> | 220 | 372 | 110 | 220 | 158 | 40 | 185 | 225 | 12,5 | 9  |
| <b>K3-550</b> | 220 | 395 | 110 | 220 | 158 | 40 | 196 | 225 | 12,5 | 9  |
| <b>K3-700</b> | 280 | 487 | 175 | 280 | 202 | 50 | 257 | 291 | 14,5 | 11 |
| <b>K3-860</b> | 280 | 540 | 175 | 280 | 202 | 50 | 280 | 291 | 14,5 | 11 |

|   |  |                    |
|---|--|--------------------|
|    | <p>Modular Contactors</p>                      | <p>134</p>         |
|    | <p>Auxiliary Contact Block<br/>Accessories</p> | <p>136<br/>136</p> |
|   | <p>Switching Of Lamps</p>                      | <p>137</p>         |
|  | <p>Technical Data</p>                          | <p>139</p>         |
|  | <p>Dimensions</p>                              | <p>140</p>         |



# Modular Contactors, low noise

| Rated Current     | Heating Power AC1 at |         | Type | coil voltage |   | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|-------------------|----------------------|---------|------|--------------|---|-----------|---------------|----------------|
|                   | 1-phase              | 3-phase |      | 24           | 230   |           |               |                |
| <b>AC1 400V A</b> | 230V kW              | 400V kW |      |              | 24V 50/60Hz<br>220-240V 50Hz, 230-264V 60Hz |           |               |                |

## One-pole 1 module (17,5mm), AC-operated (low noise)



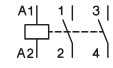
|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>20</b> | 4,6 | - | <b>R20-10 24</b>  | 12 | 0,12 |
| <b>20</b> | 4,6 | - | <b>R20-10 230</b> | 12 | 0,12 |



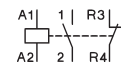
## Two-pole 1 module (17,5mm), AC-operated (low noise)



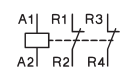
|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>20</b> | 4,6 | - | <b>R20-20 24</b>  | 12 | 0,12 |
| <b>20</b> | 4,6 | - | <b>R20-20 230</b> | 12 | 0,12 |



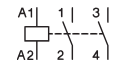
|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>20</b> | 4,6 | - | <b>R20-11 24</b>  | 12 | 0,12 |
| <b>20</b> | 4,6 | - | <b>R20-11 230</b> | 12 | 0,12 |



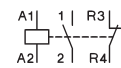
|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>20</b> | 4,6 | - | <b>R20-02 24</b>  | 12 | 0,12 |
| <b>20</b> | 4,6 | - | <b>R20-02 230</b> | 12 | 0,12 |



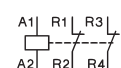
|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>25</b> | 5,5 | - | <b>R25-20 24</b>  | 12 | 0,14 |
| <b>25</b> | 5,5 | - | <b>R25-20 230</b> | 12 | 0,14 |



|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>25</b> | 5,5 | - | <b>R25-11 24</b>  | 12 | 0,14 |
| <b>25</b> | 5,5 | - | <b>R25-11 230</b> | 12 | 0,14 |



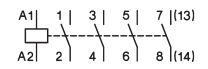
|           |     |   |                   |    |      |
|-----------|-----|---|-------------------|----|------|
| <b>25</b> | 5,5 | - | <b>R25-02 24</b>  | 12 | 0,14 |
| <b>25</b> | 5,5 | - | <b>R25-02 230</b> | 12 | 0,14 |



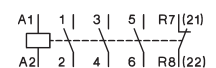
## Four-pole 2 modules (35mm)<sup>1)</sup>, AC-operated (low noise)



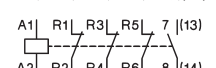
|           |     |    |                   |   |      |
|-----------|-----|----|-------------------|---|------|
| <b>25</b> | 5,7 | 17 | <b>R25-40 24</b>  | 6 | 0,21 |
| <b>25</b> | 5,7 | 17 | <b>R25-40 230</b> | 6 | 0,21 |



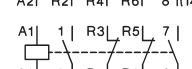
|           |     |    |                   |   |      |
|-----------|-----|----|-------------------|---|------|
| <b>25</b> | 5,7 | 17 | <b>R25-31 24</b>  | 6 | 0,21 |
| <b>25</b> | 5,7 | 17 | <b>R25-31 230</b> | 6 | 0,21 |



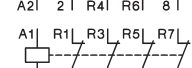
|           |     |    |                   |   |      |
|-----------|-----|----|-------------------|---|------|
| <b>25</b> | 5,7 | 17 | <b>R25-13 24</b>  | 6 | 0,21 |
| <b>25</b> | 5,7 | 17 | <b>R25-13 230</b> | 6 | 0,21 |



|           |     |   |                   |   |      |
|-----------|-----|---|-------------------|---|------|
| <b>25</b> | 5,7 | - | <b>R25-22 24</b>  | 6 | 0,21 |
| <b>25</b> | 5,7 | - | <b>R25-22 230</b> | 6 | 0,21 |



|           |     |    |                   |   |      |
|-----------|-----|----|-------------------|---|------|
| <b>25</b> | 5,7 | 17 | <b>R25-04 24</b>  | 6 | 0,21 |
| <b>25</b> | 5,7 | 17 | <b>R25-04 230</b> | 6 | 0,21 |



1) Sealable with Sealing Cover P721, available aux. contact block RH11(see page 136)

# Modular Contactors, hum free

| Rated Current | Heating Power AC1 at |         | Type | coil voltage |                           | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|---------------|----------------------|---------|------|--------------|---------------------------|-----------|---------------|----------------|
|               | 1-phase              | 3-phase |      | 24VM         | 230VM                     |           |               |                |
| <b>400V</b>   | 230V                 | 400V    |      |              | 24V 50/60Hz, 24V DC       |           |               |                |
| <b>A</b>      | kW                   | kW      |      | ↓            | 220-240V 50/60Hz, 220V DC |           |               |                |

## One-pole 1 module (17,5mm), AC-operated (hum free)

|           |     |   |                     |    |      |  |
|-----------|-----|---|---------------------|----|------|--|
| <b>20</b> | 4,6 | - | <b>R20-10 24VM</b>  | 12 | 0,12 |  |
| <b>20</b> | 4,6 | - | <b>R20-10 230VM</b> | 12 | 0,12 |  |

## Two-pole 1 module (17,5mm), AC-operated (hum free)

|           |     |   |                     |    |      |  |
|-----------|-----|---|---------------------|----|------|--|
| <b>20</b> | 4,6 | - | <b>R20-20 24VM</b>  | 12 | 0,12 |  |
| <b>20</b> | 4,6 | - | <b>R20-20 230VM</b> | 12 | 0,12 |  |
| <b>20</b> | 4,6 | - | <b>R20-11 24VM</b>  | 12 | 0,12 |  |
| <b>20</b> | 4,6 | - | <b>R20-11 230VM</b> | 12 | 0,12 |  |
| <b>20</b> | 4,6 | - | <b>R20-02 24VM</b>  | 12 | 0,12 |  |
| <b>20</b> | 4,6 | - | <b>R20-02 230VM</b> | 12 | 0,12 |  |

|           |     |   |                     |    |      |  |
|-----------|-----|---|---------------------|----|------|--|
| <b>25</b> | 5,5 | - | <b>R25-20 24VM</b>  | 12 | 0,14 |  |
| <b>25</b> | 5,5 | - | <b>R25-20 230VM</b> | 12 | 0,14 |  |
| <b>25</b> | 5,5 | - | <b>R25-11 24VM</b>  | 12 | 0,14 |  |
| <b>25</b> | 5,5 | - | <b>R25-11 230VM</b> | 12 | 0,14 |  |
| <b>25</b> | 5,5 | - | <b>R25-02 24VM</b>  | 12 | 0,14 |  |
| <b>25</b> | 5,5 | - | <b>R25-02 230VM</b> | 12 | 0,14 |  |

## Four-pole 2 modules (35mm) <sup>1)</sup>, AC-operated (hum free)

|           |     |    |                     |   |      |  |
|-----------|-----|----|---------------------|---|------|--|
| <b>25</b> | 5,7 | 17 | <b>R25-40 24VM</b>  | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-40 230VM</b> | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-31 24VM</b>  | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-31 230VM</b> | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-13 24VM</b>  | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-13 230VM</b> | 6 | 0,21 |  |
| <b>25</b> | 5,7 | -  | <b>R25-22 24VM</b>  | 6 | 0,21 |  |
| <b>25</b> | 5,7 | -  | <b>R25-22 230VM</b> | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-04 24VM</b>  | 6 | 0,21 |  |
| <b>25</b> | 5,7 | 17 | <b>R25-04 230VM</b> | 6 | 0,21 |  |



1) Sealable with Sealing Cover P721, available aux. contact block RH11(see page 136)

## Modular Contactors, low noise

| Rated Current | Heating Power AC1 at | Type | coil voltage                 | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|---------------|----------------------|------|------------------------------|-----------|---------------|----------------|
| AC1           | 1-phase 3-phase      | 24   | 24V 50/60Hz                  |           |               |                |
| 400V          | 230V 400V            | 230  | 220-240V 50Hz, 230-264V 60Hz |           |               |                |
| A             | kW kW                | ↓    |                              |           |               |                |

### Two-pole 2 modules (35mm), AC-operated (low noise)



|    |      |   |            |   |      |  |
|----|------|---|------------|---|------|--|
| 40 | 9    | - | R40-20 24  | 6 | 0,23 |  |
| 40 | 9    | - | R40-20 230 | 6 | 0,23 |  |
| 40 | 9    | - | R40-02 24  | 6 | 0,23 |  |
| 40 | 9    | - | R40-02 230 | 6 | 0,23 |  |
| 63 | 14,3 | - | R63-20 24  | 6 | 0,23 |  |
| 63 | 14,3 | - | R63-20 230 | 6 | 0,23 |  |
| 63 | 14,3 | - | R63-02 24  | 6 | 0,23 |  |
| 63 | 14,3 | - | R63-02 230 | 6 | 0,23 |  |

### Four-pole 3 modules (52,5mm)<sup>1)</sup>, AC-operated (low noise)



|    |      |      |            |   |      |  |
|----|------|------|------------|---|------|--|
| 40 | 9    | 27,5 | R40-40 24  | 4 | 0,35 |  |
| 40 | 9    | 27,5 | R40-40 230 | 4 | 0,35 |  |
| 40 | 9    | 27,5 | R40-31 24  | 4 | 0,35 |  |
| 40 | 9    | 27,5 | R40-31 230 | 4 | 0,35 |  |
| 40 | 9    | -    | R40-22 24  | 4 | 0,35 |  |
| 40 | 9    | -    | R40-22 230 | 4 | 0,35 |  |
| 40 | 9    | 27,5 | R40-04 24  | 4 | 0,35 |  |
| 40 | 9    | 27,5 | R40-04 230 | 4 | 0,35 |  |
| 63 | 14,3 | 43   | R63-40 24  | 4 | 0,36 |  |
| 63 | 14,3 | 43   | R63-40 230 | 4 | 0,36 |  |
| 63 | 14,3 | 43   | R63-31 24  | 4 | 0,36 |  |
| 63 | 14,3 | 43   | R63-31 230 | 4 | 0,36 |  |
| 63 | 14,3 | -    | R63-22 24  | 4 | 0,36 |  |
| 63 | 14,3 | -    | R63-22 230 | 4 | 0,36 |  |
| 63 | 14,3 | 43   | R63-04 24  | 4 | 0,36 |  |
| 63 | 14,3 | 43   | R63-04 230 | 4 | 0,36 |  |

### Auxiliary Contact Block 1/2 module (8,8mm)<sup>2)</sup> for contactor R25, R40, R63 (4p.) max. 1 piece for contactor R40 and R63 (2p.) max. 1 piece



| Rated current | AC15 | AC15 | AC1                          | Type   | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|---------------|------|------|------------------------------|--------|-----------|---------------|----------------|
| 230V          | 400V | 400V |                              |        |           |               |                |
| A             | A    | A    | for contactor                |        |           |               |                |
| 3             | 2    | 10   | R25 <sup>3)</sup> , R40, R63 | RH11   | 3         | 0,026         |                |
| 3             | 2    | 10   | R25-..VM (4p.)               | RH11-1 | 3         | 0,026         |                |

### Accessories



| Type   | Pack pcs. | Weight kg/pc. |
|--|-----------|---------------|
| RC-unit 2x for R20.. to R63.. for 12V to 250V AC 220nF / 100 Ohm not for R20-..., R25-..VM | RC-R 230  | 2 0,05        |
| Spacing piece 1/2 module (8,8mm) for R20.. to R63.. for ambient temperature >40°C          | P730      | 10 0,012      |
| Sealing cover for R25.. (4p.)  | P721      | 10 0,002      |
| Sealing cover for R40..., R63..  | P690      | 10 0,003      |

1) Sealable with Sealing Cover P690, available aux. contact block RH11

2) Contacts suitable for electronic circuits, according to IEC60947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

3) AC-operated R25-... 4-pole

## Modular Contactors

### Switching of lamps

| Lamp Type  | Power<br>W | Current<br>A | Capacitors<br>$\mu$ F | Max. lamps per pole at 230V 50Hz and max. 60°C |         |         |         |
|--|------------|--------------|-----------------------|--|---------|---------|---------|
|  |            |              |                       | R20..  | R25..   | R40..   | R63..   |
| <b>Incandescent lamps</b><br>(AC5b)  | 60         | 0,27         | -                     | 36   | 50      | 92      | 129     |
|  | 100        | 0,45         | -                     | 21   | 30      | 55      | 77      |
|  | 200        | 0,91         | -                     | 10   | 15      | 27      | 38      |
|  | 300        | 1,36         | -                     | 7  | 10      | 19      | 26      |
|  | 500        | 2,27         | -                     | 4  | 6       | 11      | 16      |
|  | 1000       | 4,5          | -                     | 2  | 3       | 6       | 8       |
| <b>Fluorescent lamps</b><br>uncompensated or<br>serial compensated<br>(AC5a)                       | 11         | 0,16         | 1,3                   | 60   | 75      | 210     | 310     |
|  | 18         | 0,37         | 2,7                   | 25   | 30      | 90      | 140     |
|  | 24         | 0,35         | 2,5                   | 25   | 30      | 90      | 140     |
|  | 36         | 0,43         | 3,4                   | 20   | 25      | 70      | 140     |
|  | 58         | 0,67         | 5,3                   | 14   | 17      | 45      | 70      |
|  | 65         | 0,67         | 5,3                   | 13   | 16      | 40      | 65      |
| <b>Fluorescent lamps</b><br>dual-connection<br>(AC5a)  | 11         | 0,07         | -                     | 2 x 100  | 2 x 110 | 2 x 220 | 2 x 250 |
|  | 18         | 0,11         | -                     | 2 x 50   | 2 x 55  | 2 x 130 | 2 x 200 |
|  | 24         | 0,14         | -                     | 2 x 40   | 2 x 44  | 2 x 110 | 2 x 160 |
|  | 36         | 0,22         | -                     | 2 x 30   | 2 x 33  | 2 x 70  | 2 x 100 |
|  | 58         | 0,35         | -                     | 2 x 20   | 2 x 22  | 2 x 45  | 2 x 70  |
|  | 65         | 0,35         | -                     | 2 x 15   | 2 x 16  | 2 x 40  | 2 x 60  |
| <b>Fluorescent lamps</b><br>parallel compensated<br>(AC5a)   | 11         | 0,09         | 2                     | 33   | 43      | 67      | 107     |
|  | 18         | 0,13         | 2                     | 25   | 32      | 50      | 80      |
|  | 24         | 0,16         | 3                     | 25   | 32      | 50      | 80      |
|  | 36         | 0,27         | 4                     | 22   | 32      | 50      | 80      |
|  | 58         | 0,45         | 7                     | 14   | 18      | 36      | 46      |
|  | 65         | 0,5          | 7                     | 14   | 18      | 36      | 46      |
| <b>Fluorescent lamps</b><br>with electronic fluorescent<br>lamp ballast<br>(AC5a)                  | 18         | 0,09         | -                     | 40   | 40      | 100     | 150     |
|  | 36         | 0,16         | -                     | 20   | 20      | 52      | 75      |
|  | 58         | 0,25         | -                     | 15   | 15      | 30      | 55      |
|  | 80         | 0,4          | -                     | 7  | 10      | 20      | 30      |
|  | 2 x 18     | 0,17         | -                     | 20   | 20      | 50      | 60      |
|  | 2 x 28     | 0,25         | -                     | 15   | 15      | 37      | 45      |
| 2 x 36   | 0,32       | -            | 10                    | 10   | 25      | 30      |         |
| 2 x 58   | 0,49       | -            | 7                     | 7  | 15      | 20      |         |
| 2 x 80   | 0,7        | -            | 4                     | 4  | 8       | 10      |         |
| <b>Transformers<br/>for metal halid<br/>low voltage lamps</b><br>(AC5a)                            | 20         | 0,09         | -                     | 40   | 52      | 110     | 174     |
|  | 50         | 0,22         | -                     | 20   | 24      | 50      | 80      |
|  | 75         | 0,33         | -                     | 13   | 16      | 35      | 54      |
|  | 100        | 0,43         | -                     | 10   | 12      | 27      | 43      |
|  | 150        | 0,65         | -                     | 7  | 9       | 19      | 29      |
|  | 200        | 0,87         | -                     | 5  | 5       | 14      | 23      |
| 300  | 1,3        | -            | 3                     | 4  | 9       | 14      |         |
| <b>Mercury-vapour lamps</b><br>(high-pressure lamps),<br>uncompensated<br>e. g. HQL, HPL<br>(AC5a) | 50         | 0,61         | -                     | 16   | 21      | 38      | 55      |
|  | 80         | 0,8          | -                     | 12   | 16      | 29      | 40      |
|  | 125        | 1,15         | -                     | 8  | 11      | 20      | 28      |
|  | 250        | 2,15         | -                     | 4  | 6       | 11      | 15      |
|  | 400        | 3,25         | -                     | 3  | 4       | 7       | 10      |
|  | 700        | 5,4          | -                     | 1  | 2       | 4       | 6       |
| 1000   | 7,5        | -            | 1                     | 1  | 3       | 4       |         |
| <b>Mercury-vapour lamps</b><br>(high-pressure lamps),<br>compensated<br>e. g. HQL, HPL<br>(AC5a)   | 50         | 0,28         | 7                     | 14   | 18      | 36      | 50      |
|  | 80         | 0,41         | 8                     | 12   | 16      | 31      | 44      |
|  | 125        | 0,65         | 10                    | 10   | 13      | 25      | 35      |
|  | 250        | 1,22         | 18                    | 5  | 7       | 14      | 19      |
|  | 400        | 1,95         | 25                    | 4  | 5       | 10      | 14      |
|  | 700        | 3,45         | 45                    | 2  | 3       | 6       | 8       |
| 1000   | 4,8        | 60           | 1                     | 2  | 4       | 6       |         |

# Modular Contactors

## Switching of lamps

| Lamp Type   | Power<br>W  | Current<br>A | Capacitors<br>$\mu\text{F}$ | Max. lamps per pole at 230V 50Hz and max. 60°C |       |       |       |    |
|---|---|--------------|-----------------------------|--|-------|-------|-------|----|
|   |   |              |                             | R20..  | R25.. | R40.. | R63.. |    |
| <b>Metal halide lamps</b><br>uncompensated<br>e. g. HQI, HPI, CDM<br>(AC5a)   | 35  | 0,53         | -                           | 22   | 24    | 57    | 65    |    |
|   | 70  | 1            | -                           | 12   | 14    | 30    | 35    |    |
|   | 150   | 1,8          | -                           | 6  | 8     | 17    | 18    |    |
|   | 250   | 3            | -                           | 4  | 5     | 10    | 12    |    |
|   | 400   | 3,5          | -                           | 3  | 4     | 8     | 10    |    |
|   | 1000  | 9,5          | -                           | 1  | 1     | 3     | 4     |    |
|   | 2000  | 16,5         | -                           | -  | -     | 2     | 2     |    |
|   | 400V per pole   | 2000         | 10,5                        | -  | -     | 2     | 2     |    |
|   |   | 3500         | 18                          | -  | -     | 1     | 1     |    |
|   | <b>Metal halide lamps</b><br>compensated<br>e. g. HQI, HPI, CDM<br>(AC5a) | 35           | 0,25                        | 6  | 16    | 21    | 42    | 58 |
| 70  |   | 0,45         | 12                          | 8  | 11    | 21    | 29    |    |
| 150   |   | 0,75         | 20                          | 5  | 7     | 13    | 18    |    |
| 250   |   | 1,5          | 33                          | 3  | 4     | 9     | 11    |    |
| 400   |   | 2,1          | 35                          | 2  | 4     | 9     | 10    |    |
| 1000  |   | 5,8          | 95                          | 1  | 1     | 3     | 4     |    |
| 2000  |   | 11,5         | 148                         | -  | -     | 2     | 2     |    |
| 400V per pole   |   | 2000         | 6,6                         | 58   | -     | -     | 3     | 4  |
|   |   | 3500         | 11,6                        | 100  | -     | -     | 2     | 3  |
| <b>Metal halide lamps</b><br>with electronic fluorescent<br>with electronic fluorescent<br>lamp ballast (e. g.: PCI)<br>50-125 x $I_{n,lamp}$ for 0,6ms<br>(AC5a) |   | 20           | 0,1                         | integrated                                     | 9     | 9     | 18    | 20 |
|   | 28  | 0,15         | integrated                  | -  | -     | -     | 18    |    |
|   | 35  | 0,2          | integrated                  | 6  | 6     | 11    | 13    |    |
|   | 70  | 0,36         | integrated                  | 5  | 5     | 10    | 12    |    |
|   | 150   | 0,7          | integrated                  | 4  | 4     | 8     | 10    |    |
| <b>Sodium-vapour lamps</b><br>(low pressure lamps),<br>uncompensated<br>(AC5a)  | 35  | 1,5          | -                           | 7  | 9     | 22    | 30    |    |
|   | 55  | 1,5          | -                           | 7  | 9     | 22    | 30    |    |
|   | 90  | 2,4          | -                           | 4  | 6     | 13    | 19    |    |
|   | 135   | 3,3          | -                           | 3  | 4     | 10    | 14    |    |
|   | 150   | 3,3          | -                           | 3  | 4     | 10    | 14    |    |
|   | 180   | 3,3          | -                           | 3  | 4     | 10    | 14    |    |
|   | 200   | 3,3          | -                           | 3  | 4     | 10    | 14    |    |
| <b>Sodium-vapour lamps</b><br>(low pressure lamps),<br>compensated<br>(AC5a)  | 35  | 0,31         | 20                          | 5  | 6     | 15    | 18    |    |
|   | 55  | 0,42         | 20                          | 5  | 6     | 15    | 18    |    |
|   | 90  | 0,63         | 30                          | 3  | 4     | 10    | 12    |    |
|   | 135   | 0,94         | 45                          | 2  | 3     | 7     | 8     |    |
|   | 150   | 1            | 40                          | 2  | 3     | 8     | 9     |    |
|   | 180   | 1,16         | 40                          | 2  | 3     | 8     | 9     |    |
| 200   | 1,32  | 25           | -                           | -  | 10    | 12    |       |    |
| <b>Sodium-vapour lamps</b><br>(high pressure lamps),<br>uncompensated<br>(AC5a)   | 150   | 1,8          | -                           | 5  | 8     | 17    | 22    |    |
|   | 250   | 3            | -                           | 4  | 5     | 10    | 13    |    |
|   | 330   | 3,7          | -                           | 3  | 4     | 8     | 10    |    |
|   | 400   | 4,7          | -                           | 2  | 3     | 6     | 8     |    |
| 1000  | 10,3  | -            | 1                           | 1  | 3     | 4     |       |    |
| <b>Sodium-vapour lamps</b><br>(high pressure lamps),<br>compensated<br>(AC5a)   | 150   | 0,83         | 20                          | 5  | 7     | 20    | 25    |    |
|   | 250   | 1,5          | 33                          | 3  | 4     | 12    | 15    |    |
|   | 330   | 2            | 40                          | 2  | 3     | 10    | 13    |    |
|   | 400   | 2,4          | 48                          | 2  | 2     | 8     | 12    |    |
| 1000  | 6,3   | 106          | 1                           | 1  | 4     | 6     |       |    |
| <b>Sodium-vapour lamps</b><br>(high pressure lamps)<br>with serial electronic<br>(e. g.: PCI)<br>50-125 x $I_{n,lamp}$ for 0,6ms<br>(AC5a)                        | 20  | 0,1          | integrated                  | 9  | 9     | 18    | 20    |    |
|   | 35  | 0,2          | integrated                  | 6  | 6     | 11    | 13    |    |
|   | 70  | 0,36         | integrated                  | 5  | 5     | 10    | 12    |    |
|   | 150   | 0,7          | integrated                  | 4  | 4     | 8     | 10    |    |

### LED-Lamps

consider the inrush current  
of the lamp ballast and  
the  $\cos\phi$  of the lamp

max. inrush current of contactor [A]

195A    233A    424A    565A

$$\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}} =$$

max. lamps per pole at 230V 50Hz and max. 60°C ( $I_{n,LED} \leq I_{th}$ )

# Modular Contactors

Data according to IEC60 947-4-1, IEC 60947-5-1, VDE 0660-5-1

| Type   | 2-pole  |                        |                      |            | 4-pole                 |                     |               | RH11                    |                             |
|--|---|------------------------|----------------------|------------|------------------------|---------------------|---------------|-------------------------|-----------------------------|
|  | R20 (VM) <sup>7)</sup>                            | R25 (VM) <sup>7)</sup> | R40                  | R63        | R25 (VM) <sup>7)</sup> | R40                 | R63           |                         |                             |
| <b>Main Contacts</b> <sup>4) 5) 6)</sup>                 |   |                        |                      |            |                        |                     |               |                         |                             |
| <b>Rated insulation voltage</b> $U_i$ <sup>1)</sup>      | V~  | <b>440</b>             | <b>440</b>           | <b>440</b> | <b>440</b>             | <b>440</b>          | <b>440</b>    | <b>440</b>              |                             |
| Rated operation voltage $U_e$                            | V~  | 440                    | 440                  | 440        | 440                    | 440                 | 440           | 440                     |                             |
| <b>Frequency of operations</b> z AC1, AC3                | 1/h   | 300                    | 300                  | 600        | 600                    | 300                 | 600           | 600                     |                             |
| <b>Mechanical life</b>                                   | S x 10 <sup>6</sup>                               | 1                      | 1                    | 1          | 1                      | 1                   | 1             | 1                       |                             |
| <b>Utilization category AC1 / AC7a</b>                   |   |                        |                      |            |                        |                     |               |                         |                             |
| <b>Switching of resistive load</b>                       |   |                        |                      |            |                        |                     |               |                         |                             |
| Rated operational current $I_e$ (=I <sub>th</sub> ) open | at 60°C A   | 20                     | 25                   | 40         | 63                     | 25                  | 40            | 63                      | -                           |
| <b>Contact life</b>                                      | S x 10 <sup>6</sup>                               | 0,1                    | 0,1                  | 0,1        | 0,1                    | 0,1                 | 0,1           | 0,1                     | -                           |
| <b>Minimum Switch Voltage</b>                            | V/mA  | 24/100                 | 24/100               | 24/100     | 24/100                 | 24/100              | 24/100        | 24/100                  | 17/5                        |
| <b>Short time current</b>                                | 10s-current A                                     | 72                     | 72                   | 216        | 240                    | 72                  | 216           | 240                     | -                           |
| <b>Power loss</b> per pole at I <sub>e</sub> /AC1        | W   | 2                      | 3                    | 3          | 7                      | 2                   | 3             | 7                       | 0,5                         |
| <b>Utilization category AC2 and AC3 / AC7b</b>           |   |                        |                      |            |                        |                     |               |                         |                             |
| <b>Switching of three-phase motors</b>                   |   |                        |                      |            |                        |                     |               |                         |                             |
| Rated operational current $I_e$                          | A   | -                      | -                    | -          | -                      | 9                   | 27            | 30                      | -                           |
| Rated operational power of three-phase motors            |   |                        |                      |            |                        |                     |               |                         |                             |
| 50-60Hz  | 220V kW   | -                      | -                    | -          | -                      | 2,2                 | 7,5           | 8                       | -                           |
|  | 230-240V kW                                       | -                      | -                    | -          | -                      | 2,5                 | 8             | 8,5                     | -                           |
|  | 380-415V kW                                       | -                      | -                    | -          | -                      | 4                   | 12,5          | 15                      | -                           |
| 2-pole motors  | 230V kW   | 1,1 <sup>2)</sup>      | 1,3                  | 2,6        | 5                      | -                   | -             | -                       | -                           |
| <b>Contact life</b>                                      | S x 10 <sup>6</sup>                               | 0,15                   | 0,15                 | 0,15       | 0,15                   | 0,15                | 0,15          | 0,15                    | -                           |
| <b>Power consumption of coils</b>                        |   |                        |                      |            |                        |                     |               |                         |                             |
| AC operated  | inrush VA   | 7 - 9                  | 7 - 9                | 20 - 25    | 20 - 25                | 20 - 25             | 33 - 45       | 33 - 45                 | -                           |
|  | sealed VA   | 2,2 - 4,2              | 2,2 - 4,2            | 4 - 6      | 4 - 6                  | 4 - 6               | 6 - 8         | 6 - 8                   | -                           |
|  | W   | 0,8 - 1,6              | 0,8 - 1,6            | 1,5 - 2,5  | 1,5 - 2,5              | 1,5 - 2,5           | 2 - 3,3       | 2 - 3,3                 | -                           |
| AC and DC-operated                                       | W   | 2 - 3                  | 2 - 3                | -          | -                      | 3 - 4               | -             | -                       | -                           |
| <b>Operation range of coils</b>                          |   |                        |                      |            |                        |                     |               |                         |                             |
| in multiples of control voltage $U_s$ (-40° - +40°C)     |   | 0,85 - 1,1             | 0,85 - 1,1           | 0,85 - 1,1 | 0,85 - 1,1             | 0,85 - 1,1          | 0,85 - 1,1    | 0,85 - 1,1              | -                           |
| <b>Noise level (operation) acc. to EN ISO 3744</b>       |   |                        |                      |            |                        |                     |               |                         |                             |
| from front, distance 0,5 m                               | dB  | 16 (0) <sup>7)</sup>   | 16 (0) <sup>7)</sup> | 8          | 8                      | 8 (0) <sup>7)</sup> | < 4           | < 4                     | -                           |
| Type   |   | R20                    | R25 (2p.)            | R25 (4p.)  | R25-..VM               | R40 (2p./4p.)       | R63 (2p./4p.) | RH11                    |                             |
| <b>Maximum ambient temperature</b>                       |   |                        |                      |            |                        |                     |               |                         |                             |
| Operation  | open °C   |                        |                      |            | -40 to + 60            |                     |               |                         | <p>40 - 60°C<br/>≤ 40°C</p> |
|  | enclosed °C                                       |                        |                      |            | -40 to + 40            |                     |               |                         |                             |
| Storage  | °C  |                        |                      |            | -50 to + 90            |                     |               |                         |                             |
| <b>Short circuit protection</b>                          |   |                        |                      |            |                        |                     |               |                         |                             |
| max. fuse Coordination-type "1" gL (gG)                  | A   | 35                     | 35                   | 35         | 35                     | 63                  | 80            | -                       |                             |
| Rated short circuit current                              | "I <sub>sc</sub> " kA                             | 3                      | 3                    | 3          | 3                      | 3                   | 3             | -                       |                             |
|  | "I <sub>sc</sub> " kA                             | 3                      | 3                    | 10         | 10                     | 10                  | 10            | -                       |                             |
| <b>Switching time</b> at control voltage $U_s \pm 10\%$  |   |                        |                      |            |                        |                     |               |                         |                             |
|  | make time ms                                      | 7 - 16                 | 7 - 16               | 9 - 15     | 17 - 50                | 11 - 15             | 11 - 15       | -                       |                             |
|  | release time ms                                   | 6 - 12                 | 6 - 12               | 4 - 8      | 17 - 23                | 6 - 13              | 6 - 13        | -                       |                             |
|  | arc duration ms                                   | 10 - 15                | 10 - 15              | 10 - 15    | 10 - 15                | 10 - 15             | 10 - 15       | -                       |                             |
| <b>Cable cross-sections</b>                              |   |                        |                      |            |                        |                     |               |                         |                             |
| Main connector   | solid or stranded mm <sup>2</sup>                 | 1,5 - 10               | 1,5 - 10             | 1,5 - 10   | 1,5 - 10               | 2,5 - 25            | 2,5 - 25      | 0,5 - 2,5 <sup>3)</sup> |                             |
|  | flexible mm <sup>2</sup>                          | 1,5 - 6                | 1,5 - 6              | 1,5 - 6    | 1,5 - 6                | 2,5 - 16            | 2,5 - 16      | 0,5 - 2,5 <sup>3)</sup> |                             |
|  | flexible with multicore cable end mm <sup>2</sup> | 1,5 - 6                | 1,5 - 6              | 1,5 - 6    | 1,5 - 6                | 2,5 - 16            | 2,5 - 16      | 0,5 - 1,5               |                             |
| Clamps per pole  |   | 1                      | 1                    | 1          | 1                      | 1                   | 1             | 2                       |                             |
| Magnetic coil  | solid or stranded mm <sup>2</sup>                 | 0,75 - 2,5             | 0,75 - 2,5           | 0,75 - 2,5 | 0,75 - 2,5             | 0,75 - 2,5          | 0,75 - 2,5    | -                       |                             |
|  | flexible mm <sup>2</sup>                          | 0,5 - 2,5              | 0,5 - 2,5            | 0,5 - 2,5  | 0,5 - 2,5              | 0,5 - 2,5           | 0,5 - 2,5     | -                       |                             |
|  | flexible with multicore cable end mm <sup>2</sup> | 0,5 - 1,5              | 0,5 - 2,5            | 0,5 - 1,5  | 0,5 - 1,5              | 0,5 - 1,5           | 0,5 - 1,5     | -                       |                             |
| Clamps per pole  |   | 1                      | 1                    | 1          | 1                      | 1                   | 1             | -                       |                             |
| <b>Auxiliary Contacts</b> <sup>4) 5) 6)</sup>            |   |                        |                      |            |                        |                     |               |                         |                             |
| <b>Rated insulation voltage</b> $U_i$ <sup>1)</sup>      | V AC  | -                      | -                    | 440        | 440                    | 440                 | 440           | 440                     |                             |
| <b>Thermal rated current</b> $I_{th}$                    | 40°C A  | -                      | -                    | 25         | 25                     | 40                  | 63            | 10                      |                             |
| Ambient temperature                                      | 60°C A  | -                      | -                    | 25         | 25                     | 40                  | 63            | 6                       |                             |

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 4kV$ .

2) AC7b motor 2-pole 230V 1,1kW

3) Maximum cable cross-section with prepared conductor

4) Rated frequency 50/60Hz

5) Max. occ. switching overvoltage < 4kV

6) Duty cycle: 100%

7) 0 dB for contactors type "VM" (AC/DC operated)

# Modular Contactors

Data according to IEC60 947-4-1, IEC 60947-5-1, VDE 0660-5-1

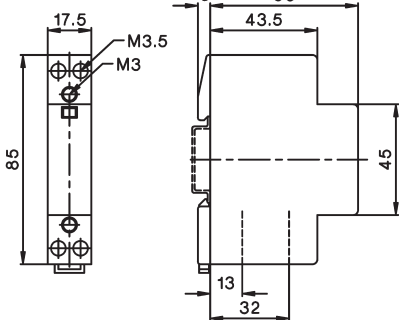
| Type  | R20        | R25 (2p.) | R25 (4p.) | R25-..VM | R40 (2p./4p.) | R63 (2p./4p.) | RH11 |
|---|------------|-----------|-----------|----------|---------------|---------------|------|
| <b>Utilization category AC15</b>                        |            |           |           |          |               |               |      |
| Rated operational current $I_e$                         | 220-240V A | -         | 3         | 3        | 3             | 3             | 3    |
|   | 380-415V A | -         | 2         | 2        | 2             | 2             | 2    |
|   | 440V A     | -         | 1,6       | 1,6      | 1,6           | 1,6           | 1,6  |
| <b>Utilization category DC13</b>                        |            |           |           |          |               |               |      |
| Rated operational current $I_e$                         | 24-60V A   | -         | 2         | 2        | 2             | 2             | 2    |
| per pole  | 110V A     | -         | 0,4       | 0,4      | 0,4           | 0,4           | 0,4  |
|   | 220V A     | -         | 0,1       | 0,1      | 0,1           | 0,1           | 0,1  |
| <b>Short circuit protection</b>                         |            |           |           |          |               |               |      |
| short-circuit current 1kA, contact welding not accepted |            |           |           |          |               |               |      |
| max. fuse size  | gL (gG) A  | -         | 10        | 10       | 10            | 10            | 10   |

## Data according to UL508

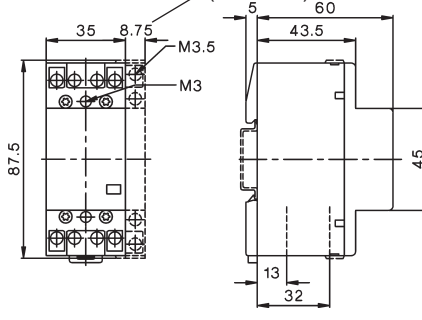
| Main Contacts (cULus)  | Type                | R20  | R25 (2p.) | R25 (4p.) | R40 (2p./4p.) | R63 (2p./4p.) | RH11 |
|--|---------------------|------|-----------|-----------|---------------|---------------|------|
| Rated operational current "General Use"                      | A                   | 20   | 25        | 25        | 40            | 63            | 10   |
| Rated operational power of three-phase motors at 60Hz (3ph)  | 110-120V hp         | -    | -         | 1         | 2             | 3             | -    |
|  | 200-208V hp         | -    | -         | 2         | 5             | 7½            | -    |
|  | 220-240V hp         | -    | -         | 3         | 7½            | 10            | -    |
|  | 265-277V hp         | -    | -         | 3         | 7½            | 10            | -    |
| Rated operational power of AC motors at 60Hz (1ph)           | 110-120V hp         | ½    | ½         | ½         | 1             | 1½            | -    |
|  | 200-208V hp         | 1    | 1         | 1         | 2             | 3             | -    |
|  | 220-240V hp         | 1½   | 1 ½       | 1½        | 3             | 5             | -    |
|  | 265-277V hp         | 1½   | 2         | 2         | 3             | 5             | -    |
| Fuses  | A                   | 40   | 40        | 40        | 80            | 80            | -    |
| Suitable for use on a capability of delivering not more than | rms A               | 5000 | 5000      | 5000      | 5000          | 5000          | -    |
|  | V                   | 300  | 300       | 300       | 300           | 300           | 300  |
| Rated operation voltage                                      | V~                  | 300  | 300       | 300       | 300           | 300           | 300  |
| <b>Auxiliary Contacts (cULus)</b>                            | heavy pilot duty AC | -    | -         | -         | -             | -             | C300 |

## Dimensions

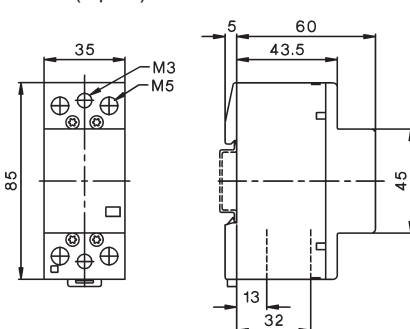
R20-.., R25-.. (2-pole)  
RC-R 230



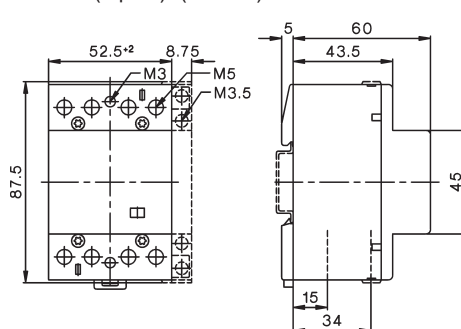
R25-.. (4-pole) (+RH11)  
R25-..VM (+RH11-1)



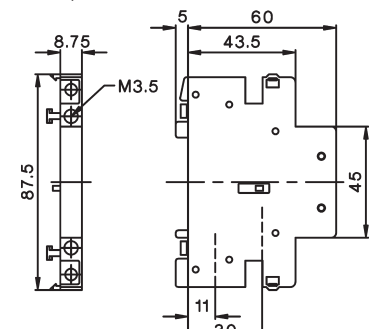
R40-.. (2-pole)  
R63-.. (2-pole)



R40-.. (4-pole) (+RH11)  
R63-.. (4-pole) (+RH11)



Aux. contact block  
RH11, RH11-1





# Contactors for DC-Switching

AC-operated

## Rated Operational Current

DC1

Additional  
Aux.  
Contacts

Coil voltage <sup>1)</sup>  
**230**  
220-230V 50Hz, 240V 60Hz

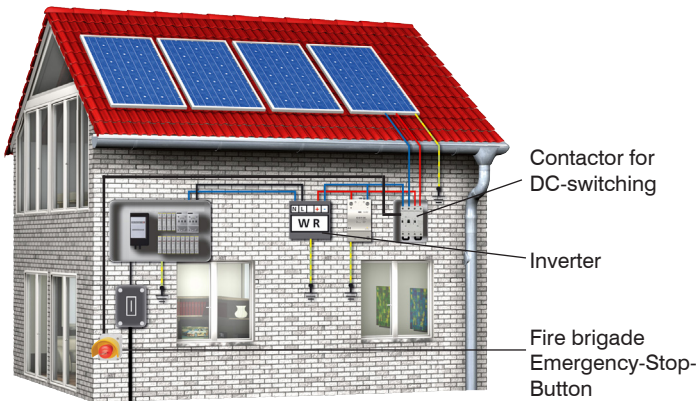
Pack Weight  
pcs. kg/pcs.

Wiring diagram



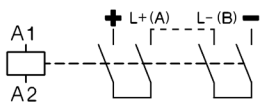
| 600V | 1000V | 1200V |                    | Type                                  |   |     |  |
|------|-------|-------|--------------------|---------------------------------------|---|-----|--|
| 20A  | -     | -     | 2 HKA11            | <b>K3DC-20A00 ...</b>                 | 1 | 0,5 |  |
| 50A  | -     | -     | +1 HKT.            | <b>K3DC-48A00 ...</b>                 | 1 | 0,5 |  |
| 60A  | 30A   | -     | 2 HKA11            | <b>K3DC-60A00 ...</b>                 | 1 | 1,2 |  |
| 80A  | 60A   | -     | +1 HKT.            | <b>K3DC-80A00 ...</b>                 | 1 | 1,2 |  |
| 100A | -     | -     |                    | <b>K3DC-100A00 ...</b>                | 1 | 1,8 |  |
| 12A  | 12A   | 6A    | 2 HKA11<br>+2 HKT. | <b>K3PV-12A00 ...</b>                 | 1 | 0,8 |  |
| 30A  | 30A   | -     | 2 HKA11            | <b>K3PV-30A00 ...</b>                 | 1 | 0,9 |  |
| 60A  | 60A   | -     | +2 HKT.            | <b>K3PV-60A00 ...</b>                 | 1 | 0,9 |  |
| 80A  | 80A   | -     | 2 HKA11            | <b>K3PV-80A00 ...</b>                 | 1 | 1,5 |  |
| 100A | 100A  | -     | +1 HKT.            | <b>K3PV-100A00 ...<sup>2)3)</sup></b> | 1 | 2,3 |  |
| 150A | 150A  | -     | 2 HKA11            | <b>K3PV-150A00 ...<sup>2)3)</sup></b> | 1 | 5   |  |
| 200A | 200A  | -     | +1 HKT.            | <b>K3PV-200A00 ...<sup>2)3)</sup></b> | 1 | 5   |  |
| 240A | 240A  | -     |                    | <b>K3PV-240A00 ...<sup>2)3)</sup></b> | 1 | 5   |  |
| 300A | 300A  | -     | 2 HKA11            | <b>K3PV-300A00 ...<sup>2)3)</sup></b> | 1 | 7,5 |  |
| 400A | 400A  | -     | +1 HKT.            | <b>K3PV-400A00 ...<sup>2)3)</sup></b> | 1 | 7,5 |  |
| 450A | 450A  | -     |                    | <b>K3PV-450A00 ...<sup>2)3)</sup></b> | 1 | 7,5 |  |

# Contactors for DC-Switching for PV-installations, as remote controlled fire protection defeat device

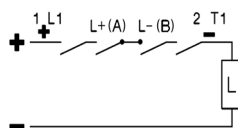


In most Photovoltaic-installations, the switch disconnectors according to IEC 60364-7-712 are integrated in the DC/AC-inverter. So the wires between solar-panels and inverter are continuously under voltage. According to ÖVE-R11-1: 2013, Photovoltaic-installations must have a fire protection defeat device. For this purpose, BENEDICT contactors for DC-switching, used as a fire protection defeat device, can switch off the Photovoltaic-installation with a remote controlled fire brigade Emergency-Stop-button.

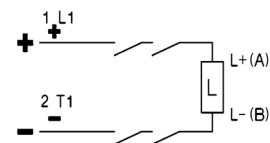
## Switch diagram (4 contacts)



Connection diagram 1-pole:  
connect L+(A) and L-(B) (jumper attached)



Connection diagram 2-pole:  
don't use attached jumper


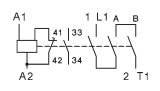

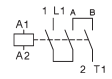

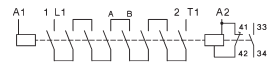

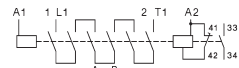

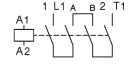

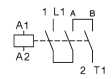

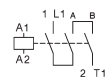


- 1) Other coil voltages from 24 to 600V AC, on request
- 2) Type for AC- and DC-operating: e.g.: 230: 220-240V 50/60Hz and 220V=
- 3) With integrated coil suppressor


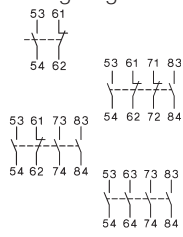



# Contactors for DC-Switching

DC-operated

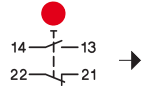
| Type  | Coil voltage <sup>1)</sup> | Aux. Contacts  |                 | Pack pcs.          | Weight kg/pcs. | Wiring diagram |   |
|---|----------------------------|----------------|-----------------|--------------------|----------------|----------------|---|
|   | 24 24V= DC                 | build in NO NC | additional Type |                    |                |                |   |
|    | ↓                          | 1              | -               | 1 HKA11            | 1              | 0,5            |    |
| <b>K3DC-48A10= ...<sup>5)</sup></b>   |                            | 1              | -               | +1 HKT.            | 1              | 0,5            |   |
|    | ↓                          | -              | -               | 1 HKA11            | 1              | 1,2            |    |
| <b>K3DC-80A00= ...<sup>5)</sup></b>   |                            | -              | -               | +1 HKT.            | 1              | 1,2            |   |
| <b>K3DC-100A00= ...<sup>5)</sup></b>  |                            | -              | -               |                    | 1              | 1,8            |   |
|    | ↓                          | 1              | -               | 1 HKA11<br>+2 HKT. | 1              | 0,85           |    |
| <b>K3PV-30A10= ...<sup>5)</sup></b>   |                            | 1              | -               | 1 HKA11            | 1              | 0,95           |   |
|    | ↓                          | 1              | -               | +2 HKT.            | 1              | 0,95           |    |
| <b>K3PV-80A00= ...<sup>5)</sup></b>   |                            | -              | -               | 2 HKA11            | 1              | 1,5            |   |
|    | ↓                          | -              | -               | +1 HKT.            | 1              | 2,3            |    |
| <b>K3PV-100A00 ...<sup>2) 5)</sup></b>  |                            | -              | -               |                    | 1              | 2,3            |   |
|   | ↓                          | -              | -               | 2 HKA11            | 1              | 5              |    |
| <b>K3PV-200A00 ...<sup>2) 5)</sup></b>  |                            | -              | -               | +1 HKT.            | 1              | 5              |   |
| <b>K3PV-240A00 ...<sup>2) 5)</sup></b>  |                            | -              | -               |                    | 1              | 5              |   |
|  | ↓                          | -              | -               | 2 HKA11            | 1              | 7,5            |  |
| <b>K3PV-400A00 ...<sup>2) 5)</sup></b>  |                            | -              | -               | +1 HKT.            | 1              | 7,5            |   |
| <b>K3PV-450A00 ...<sup>2) 5)</sup></b>  |                            | -              | -               |                    | 1              | 7,5            |   |

## Auxiliary Contact Blocks for contactors K3DC-.. and K3PV-.., for low level switching<sup>4)</sup>

| Type  | Rated Operational Current |      |      | for contactors     | Type         | Pack pcs. | Weight kg/pcs. | Wiring diagrams   |
|---|---------------------------|------|------|--------------------|--------------|-----------|----------------|---|
|   | AC15                      | AC15 | AC1  |                    |              |           |                |   |
|  | 230V                      | 400V | 690V |                    | <b>HKT11</b> | 1         | 0,04           |  |
| <b>3</b>  | 2                         | 10   |      | K3DC, K3PV-.. top  |              | 1         | 0,05           |   |
| <b>3</b>  | 2                         | 10   |      | K3DC, K3PV-.. top  | <b>HKT22</b> | 1         | 0,05           |   |
| <b>3</b>  | 2                         | 10   |      | K3DC, K3PV-.. top  | <b>HKT31</b> | 1         | 0,05           |   |
| <b>3</b>  | 2                         | 10   |      | K3DC, K3PV-.. top  | <b>HKT40</b> | 1         | 0,05           |  |
| <b>3</b>  | 2                         | 10   |      | K3DC, K3PV-.. side | <b>HKA11</b> | 1         | 0,05           |   |

## Accessories















|   |                         |   |      |   |    |
|---|-------------------------|---|------|---|----|
| <b>Fire Brigade-EMERGENCY STOP key operated button</b> Ø40mm, according to EN418, unlock by key | <b>BG10P44S3-11 +SK</b> | 1 | 0,22 |  | 3) |
|---|-------------------------|---|------|---|----|

1) Other coil voltages from 24 to 250V DC, on request  
 2) Type for AC- and DC-operating: e.g.: 24: 24V 50/60Hz and 24V=  
 3) → opener positive opening acc. IEC/EN60947-5-1  
 4) Contacts suitable for electronic circuits, according to IEC60947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F. Technical data see page 78  
 5) With integrated coil suppressor

# Technical Data

Data according to IEC 60947-4-1, VDE 0660

| Type                                     |                 | K3DC-20..   | K3DC-48..   | K3DC-60..   | K3DC-80..   | K3DC-100..  | K3PV-12..   | K3PV-30..   | K3PV-60..   | K3PV-80..   | K3PV-100..  | K3PV-150..  | K3PV-200..  | K3PV-240..  | K3PV-300..  | K3PV-400..  | K3PV-450..  |  |
|--|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Rated insulation voltage<br>$U_{imp}$    | V=<br>kV        | 600<br>8  | 600<br>8  | 1000<br>8   | 1000<br>8   | 600<br>8  | 1200<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   | 1000<br>8   |  |
| poles in series                          |                 | 3   | 3   | 3   | 3   | 3   | 8   | 6   | 6   | 4   | 4   | 3   | 3   | 3   | 3   | 3   | 3   |  |
| DC1 600V dc                              | $I_e$ A         | 20  | 50  | 60  | 80  | 100   | 12  | 30  | 60  | 80  | 100   | 150   | 200   | 240   | 300   | 400   | 450   |  |
| DC1 1000V dc                             | $I_e$ A         | -   | -   | 30  | 60  | -   | 12  | 30  | 60  | 80  | 100   | 150   | 200   | 240   | 300   | 400   | 450   |  |
| DC1 1200V dc                             | $I_e$ A         | -   | -   | -   | -   | -   | 6   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |  |
| DC3/5 310V dc                            | $I_e$ A         | -   | -   | -   | 40  | 60  | -   | 15  | 24  | 40  | 90  | 125   | 170   | 200   | 230   | 270   | 300   |  |
| DC3/5 460V dc                            | $I_e$ A         | -   | -   | -   | -   | -   | -   | 15  | 24  | 40  | 40  | 125   | 170   | 200   | 230   | 270   | 300   |  |
| DC3/5 600V dc                            | $I_e$ A         | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | 50  | 60  | 75  | 120   | 160   | 200   |  |
| Main pole resistance                     | mOhm            | 1,8   | 1,8   | 1,4   | 1,2   | 1   | 2,2   | 1,8   | 1,8   | 1,2   | 1   | 0,5   | 0,5   | 0,35  | 0,15  | 0,15  | 0,15  |  |
| poles in series resistance               | mOhm            | 5,4   | 5,4   | 4,2   | 3,6   | 3   | 17,6  | 10,8  | 10,8  | 4,8   | 4   | 1,5   | 1,5   | 1,1   | 0,5   | 0,5   | 0,5   |  |
| Mechanical life                          | $10^6$          | 10  |   |   |   |   |   |   |   |   |   | 10  |   |   | 8   |   |   |  |
| Protection degree                        |                 | IP20  |   |   |   |   |   |   |   |   |   | IP00 / IP20 <sup>1)</sup>   |   |   | IP00 / IP20 <sup>1)</sup>   |   |   |  |
| Main poles                               |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cable cross sections                     | mm <sup>2</sup> | 2 x 1,5 - 10  |   | 2,5 - 35  |   | 4 - 35<br>+4-50   |   | 2x<br>1,5-2,5   |   | 2 x 1,5 - 10  |   | 2,5-35  |   | 4 - 35<br>+4 - 50   |   | Busbar 18 x 4<br>Screw M8   |   |  |
| Tightening torque                        | Nm              | 2,3 - 2,7   |   | 5 - 6   |   | 8 - 9,6   |   | 1,4 - 1,6   |   | 2,3 - 2,7   |   | 5 - 6   |   | 8 - 9,6   |   | 17 - 20   |   |  |
| Mounting                                 |                 | DIN-rail or screw   |   |   |   | screws  |   | DIN-rail or screws  |   |   |   | Screws  |   | Screws  |   |   |   |  |
| Operating range of coils                 | Uc              | 0,85 - 1,1  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Power consumption of coils               |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| AC inrush sealed                         | VA<br>VA/W      | 90<br>9 / 3   |   | 250<br>18 / 4   |   | 180<br>18 / 6   |   | 250<br>18 / 4   |   | 350<br>5 / 5  |   | 360<br>6 / 6  |   |   |   |   |   |  |
| DC inrush sealed                         | W<br>W          | 120<br>2  |   | 230<br>4  |   | 230<br>5  |   | 230<br>4  |   | 350<br>5  |   | 360<br>6  |   |   |   |   |   |  |
| Switching time                           |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| AC make time                             | ms              | 10 - 25   |   | 12 - 30   |   | 12 - 30   |   | 10 - 25   |   | 12 - 30   |   | 15 - 50   |   | 30 - 60   |   |   |   |  |
| AC release time                          | ms              | 6 - 18  |   | 6 - 15  |   | 6 - 15  |   | 6 - 18  |   | 6 - 15  |   | 30 - 80   |   | 30 - 80   |   |   |   |  |
| DC make time                             | ms              | 15 - 25   |   | 15 - 25   |   | 20 - 30   |   | 15 - 25   |   | 15 - 25   |   | 15 - 50   |   | 30 - 60   |   |   |   |  |
| DC release time                          | ms              | 40 - 70   |   | 10 - 25   |   | 10 - 25   |   | 40 - 70   |   | 10 - 25   |   | 30 - 80   |   | 30 - 80   |   |   |   |  |
| Maximum ambient temperature              |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Operation °C                             |                 | -40 to +40 (+70) <sup>2)</sup>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Storage °C                               |                 | -40 to +70  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Short circuit protection for contactors  |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Coordination-type „1“ max. fuse size gPV |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 600VDC A                                 |                 | 63  | 80  | -   | -   | 160   | -   | -   | -   | -   | -   | 160   | 200   | 250   | -   | -   | -   |  |
| 1000VDC A                                |                 | -   | -   | -   | -   | -   | 12  | 63  | 100   | -   | 160   | 160   | 200   | 250   | 315   | 400   | 500   |  |
| Coordination-type „2“ max. fuse size gPV |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 600VDC A                                 |                 | 50  | 63  | 80  | 100   | 125   | -   | -   | -   | 100   | -   | -   | -   | -   | -   | -   | -   |  |
| 1000VDC A                                |                 | -   | -   | 80  | 100   | -   | -   | 50  | 80  | 100   | 125   | -   | -   | -   | -   | -   | -   |  |
| Short-circuit current                    | kA              | 3   | 3   | 3   | 3   | 5   | 3   | 3   | 3   | 5   | 5   | 10  | 10  | 10  | 10  | 10  | 10  |  |

Data according to UL60947-4-1 

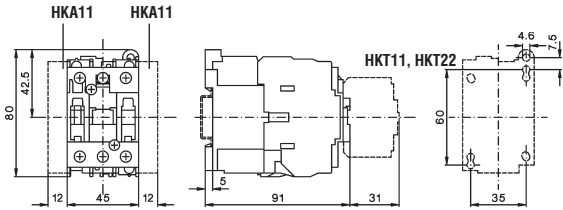
| Type                    |             | K3DC-20.. | K3DC-48.. | K3DC-60.. | K3DC-80.. | K3PV-80.. | K3PV-150.. | K3PV-200.. | K3PV-240.. | K3PV-300.. | K3PV-400.. | K3PV-450.. |
|-------------------------|-------------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|
| General Use $I_e$ [A]   | 600V DC     | 20        | 40        | 60        | 80        | 80        | 130        | 160        | 200        | 300        | 330        | 360        |
|                         | 1000V DC    | -         | -         | 30        | 60        | 80        | 130        | 160        | 200        | 300        | 330        | 360        |
| Motor Control $I_e$ [A] | 220-240V DC | 12        | 20        | 38        | 55        | 72        | 89         | 106        | 140        | 173        | 206        | 255        |
|                         | 500V DC     | 12        | 16        | 34        | 51        | 67        | 83         | 99         | 123        | 164        | 205        | 246        |
|                         | 550-600V DC | 12        | 16        | 38        | 46        | 61        | 90         | 111        | 148        | 185        | 222        | 294        |

1) IP20 w. terminal lug.

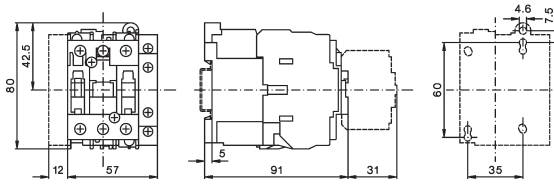
2) > 40° ... 1% / °C de-rating (eg. at 60°C 20% de-rating)

# Dimensions

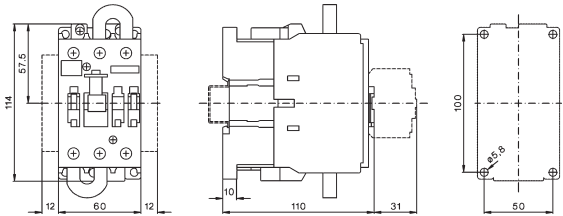
**K3DC-20A00, K3DC-48A00**



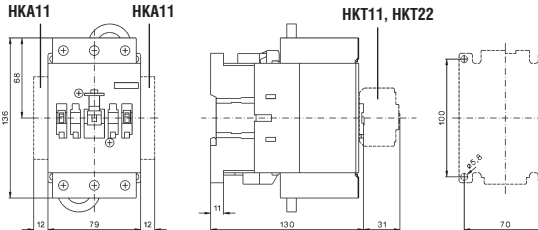
**K3DC-20A10=, K3DC-48A10=**



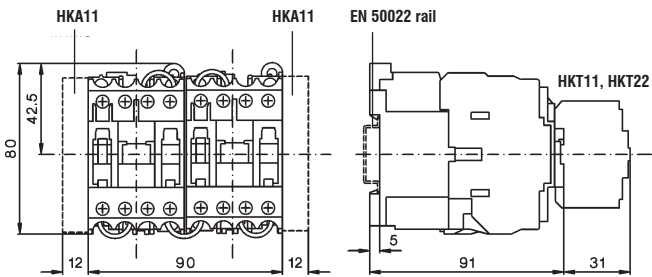
**K3DC-60A00(=), K3DC-80A00(=)**



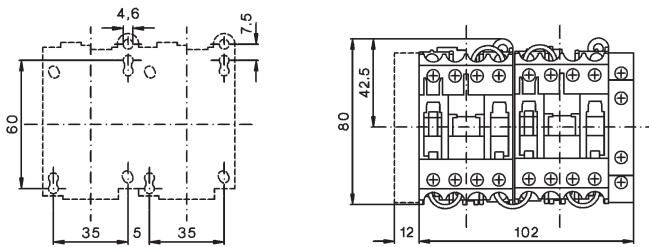
**K3DC-100A00(=)**



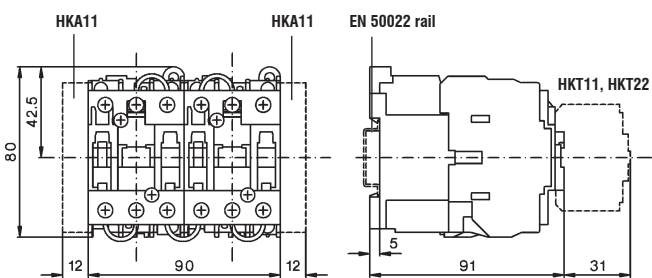
**K3PV-12A00**



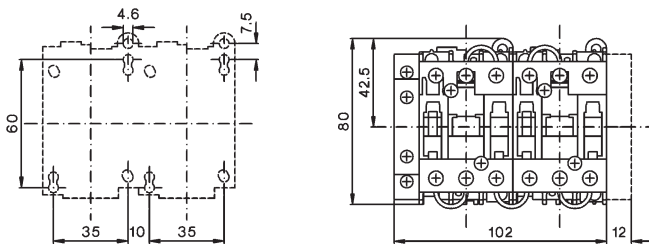
**K3PV-12A10=**



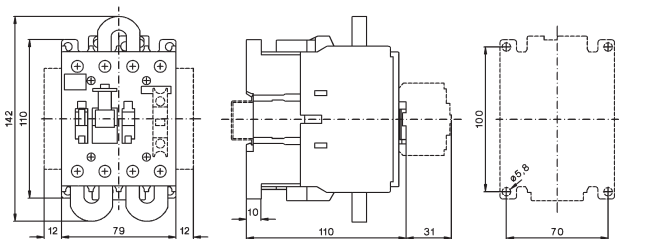
**K3PV-30A00, K3PV-60A00**



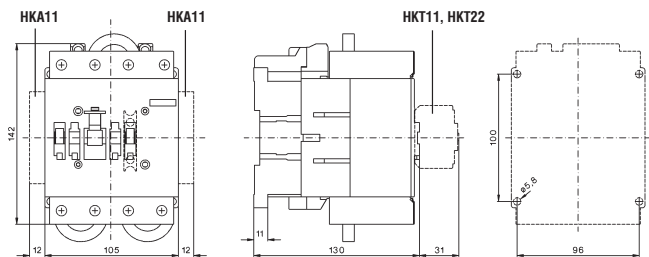
**K3PV-30A10=, K3PV-60A10=**



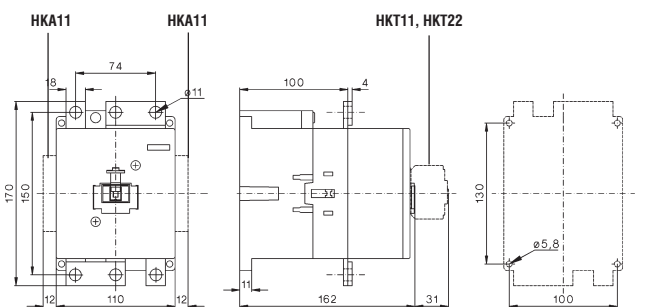
**K3PV-80A00(=)**



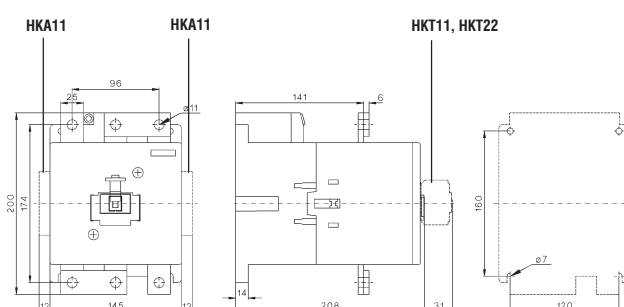
**K3PV-100A00(=)**



**K3PV-150A00(=), K3PV-200A00(=), K3PV-240A00(=)**



**K3PV-300A00(=), K3PV-400A00(=), K3PV-450A00(=)**



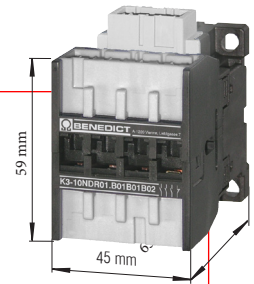
|                                  |                                     |     |
|----------------------------------|-------------------------------------|-----|
|                                  | <b>Contactors</b> RAST 5            | 147 |
|                                  | Contactor Relays                    | 147 |
|                                  | Contactors                          | 147 |
|                                  | <b>Accessories</b>                  | 147 |
|                                  | Auxilliary Contact Blocks           | 147 |
|                                  | <b>Combinations</b>                 | 148 |
|                                  | Contactors for Fuseless Load Feeder | 148 |
|                                  | Contactors for Overload Relays      | 148 |
|                                  | <b>Industry Standard RAST 5</b>     |     |
|                                  | Contactor-Housing                   | 149 |
|                                  | Coil-Housing                        | 150 |
|                                  | Auxilliary Contact Block-Housing    | 157 |
|                                  | <b>System Stocko RAST 5</b>         |     |
|                                  | Contactor-Housing                   | 151 |
| Coil-Housing                     | 152                                 |     |
| Auxilliary Contact Block-Housing | 158                                 |     |
| <b>System Tyco RAST 5</b>        |                                     |     |
| Contactor-Housing                | 153                                 |     |
| Coil-Housing                     | 154                                 |     |
| Auxilliary Contact Block-Housing | 159                                 |     |
| <b>System Lumberg RAST 5</b>     |                                     |     |
| Contactor-Housing                | 155                                 |     |
| Coil-Housing                     | 156                                 |     |
| Auxilliary Contact Block-Housing | 160                                 |     |
| <b>Dimensions / Color Codes</b>  | 161                                 |     |
| <b>Technical Information</b>     | 162                                 |     |

# RAST 5 - exclusiv for OEM-Partner

5 mm pitch connector system

## Advantages RAST 5 - Technology

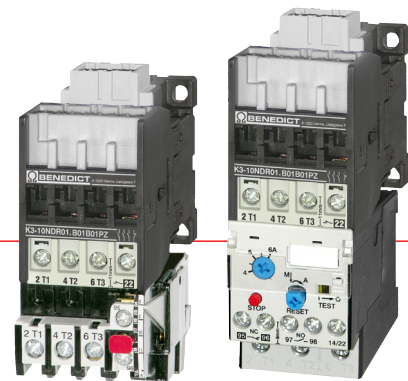
- Time saving installation
- Easy assembly without tools
- Tailor-made sockets, custom - designed codes
- Ambient temperatures up to +90°C/194°F
- Smallest sizes
- Plug technology up to 32 A / 415 V
- color coding for power ratings
- color coding for coil voltages



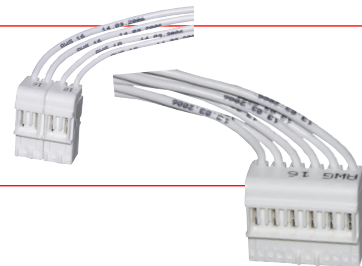
## RAST 5 - Accessories



Combining switchgears with plug-in connections and screw connections








Contactors are available for plugs of many different producers




# Contactors, RAST 5

AC operated

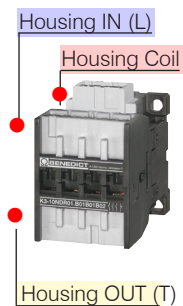
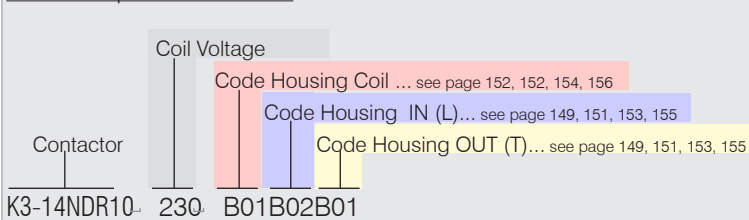
| Ratings<br>AC2, AC3<br>380V<br>400V<br>415V<br><b>kW</b>                            | 220V<br>230V<br>kW | 240V<br>kW | Rated-<br>Current<br>AC1<br>415V<br>A | Auxilliary<br>Contacts<br>built in |    | Auxilliary<br>Contacts<br>snap on<br>HN10R.. | Type              | Coil Voltage      | Code Housing Coil | Code Housing IN (L) | Code Housing OUT (T) | Pack<br>pcs. | Weight<br>kg/pc. |
|---|--------------------|------------|---------------------------------------|------------------------------------|----|--|-------------------|-------------------|-------------------|---------------------|----------------------|--------------|------------------|
|   |                    |            |                                       | NO                                 | NC |  |                   |                   |                   |                     |                      |              |                  |
| <b>● Contactor Relays</b>   |                    |            |                                       |                                    |    |  |                   |                   |                   |                     |                      |              |                  |
|    | -                  | -          | 10                                    | 4                                  | -  | 2  | <b>K3-07NDR40</b> |                   |                   |                     |                      | 1            | 0,23             |
|   | -                  | -          | 10                                    | 2                                  | 2  | 2  | <b>K3-07NDR22</b> |                   |                   |                     |                      | 1            | 0,23             |
| <b>● Contactors</b>   |                    |            |                                       |                                    |    |  |                   |                   |                   |                     |                      |              |                  |
|    | <b>4</b>           | 3          | 3                                     | 25                                 | 1  | -  | 2                 | <b>K3-10NDR10</b> |                   |                     |                      | 1            | 0,23             |
|   | <b>4</b>           | 3          | 3                                     | 25                                 | -  | 1  | 2                 | <b>K3-10NDR01</b> |                   |                     |                      | 1            | 0,23             |
|    | <b>5,5</b>         | 4          | 4                                     | 25                                 | 1  | -  | 2                 | <b>K3-14NDR10</b> |                   |                     |                      | 1            | 0,23             |
|   | <b>5,5</b>         | 4          | 4                                     | 25                                 | -  | 1  | 2                 | <b>K3-14NDR01</b> |                   |                     |                      | 1            | 0,23             |
|  | <b>7,5</b>         | 5          | 5                                     | 32                                 | 1  | -  | 2                 | <b>K3-18NDR10</b> |                   |                     |                      | 1            | 0,23             |
|   | <b>7,5</b>         | 5          | 5                                     | 32                                 | -  | 1  | 2                 | <b>K3-18NDR01</b> |                   |                     |                      | 1            | 0,23             |
|  | <b>11</b>          | 6          | 7                                     | 32                                 | 1  | -  | 2                 | <b>K3-22NDR10</b> |                   |                     |                      | 1            | 0,23             |
|   | <b>11</b>          | 6          | 7                                     | 32                                 | -  | 1  | 2                 | <b>K3-22NDR01</b> |                   |                     |                      | 1            | 0,23             |

## Auxilliary

### ● Auxilliary Contact Blocks

| for Contactors  | AC15<br>230V<br>A | I <sub>th</sub><br>A | Contacts |    | Type | Pack<br>pcs. | Weight<br>kg/pc. |
|---|-------------------|----------------------|----------|----|------|--------------|------------------|
|   |                   |                      | NO       | NC |      |              |                  |
|  | K3-..R..          | 3                    | 10       | 1  | -    | <b>HN10R</b> | 10 0,02          |
|   | K3-..R..          | 3                    | 10       | -  | 1    | <b>HN01R</b> | 10 0,02          |

Order Example for Contactors:



Technical data are subject to change without notice

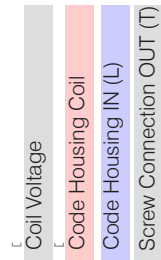
# Contactors, RAST 5 Combinations

AC operated

Motor  
 AC2, AC3  
 380V AC3  
 400V 400V  
 415V 415V  
**kW A**





for  
 Overload Relays  
 U12/16E.. and U3/32...

## Type



Pack Weight  
 pcs. kg/pcs.

● Contactors for Overload Relays

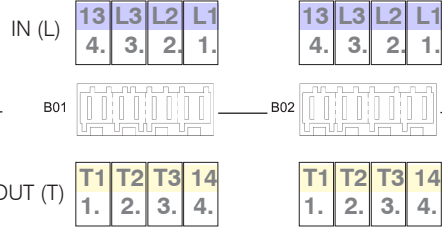
|  |     |    |  |                   |    |    |    |           |   |      |
|--|-----|----|--|-------------------|----|----|----|-----------|---|------|
|   | 4   | 10 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-10NDR10</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|  | 4   | 10 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-10NDR01</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|   | 5,5 | 14 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-14NDR10</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|  | 5,5 | 14 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-14NDR01</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|   | 7,5 | 18 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-18NDR10</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|  | 7,5 | 18 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-18NDR01</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|  | 11  | 22 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-22NDR10</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |
|  | 11  | 22 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | <b>K3-22NDR01</b> | .. | .. | .. | <b>PZ</b> | 1 | 0,23 |

Pozidriv ... PZ  
 Torx ..... TX

Selection of Contactor-Housings for Standard plugs acc. **Industry Standard RAST 5**



Contactor Housings



**Code Contactor-Housings** — **B01** — **B02** — **B03** — **B04** further housings on request →

Standard plugs acc. Industry Standard RAST 5



|                     |  |      |      |
|---------------------|--|------|------|
| 8-pole              |  |      |      |
| 6-pole left         |  |      |      |
| 6-pole right        |  |      |      |
| 4-pole left         |  | -0A- |      |
| 4-pole right        |  | -0B- |      |
| 2-pole left         |  |      |      |
|                     |  | -0I- | -0C- |
|                     |  | -0L- |      |
|                     |  |      |      |
|                     |  |      | -0A- |
|                     |  |      | -0Q- |
| 2-pole center left  |  | -0A- |      |
|                     |  | -0C- |      |
|                     |  |      |      |
|                     |  |      | -0K- |
|                     |  | -0O- |      |
|                     |  | -0Q- |      |
| 2-pole center right |  |      |      |
|                     |  |      | -0B- |
|                     |  | -0K- |      |
|                     |  |      |      |
|                     |  |      | -0F- |
|                     |  |      | -0L- |
| 2-pole right        |  |      |      |
|                     |  | -0B- |      |
|                     |  | -0F- |      |
|                     |  |      |      |
|                     |  |      | -0I- |
|                     |  | -0L- |      |
|                     |  | -0L- |      |

Order Example for Contactors:

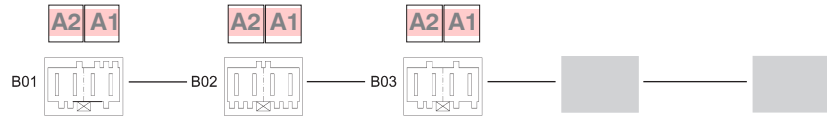
Contactor: K3-14NR10  
 Coil Voltage: U<sub>230</sub>  
 Code Housing Coil ...see page 150, 152, 154, 156: B01  
 Code Housing IN (L)... see page 149, 151, 153, 155: B02  
 Code Housing OUT (T)...see page 149, 151, 153, 155: B01



# Selection of Coil-Housings for Standard plugs acc. **Industry Standard RAST 5**



Coil-Housings



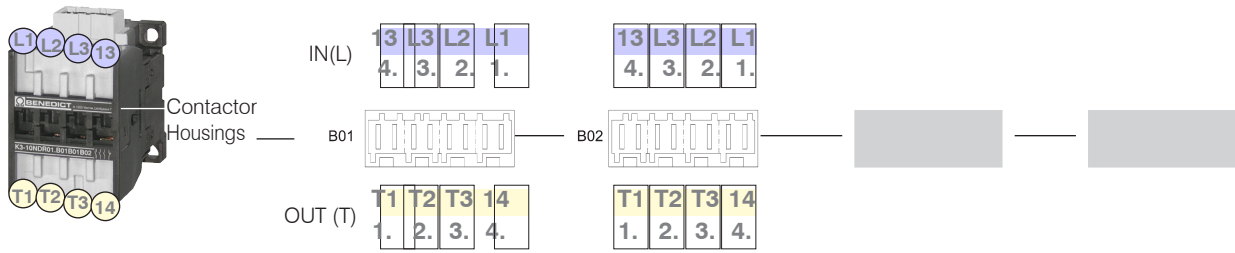
| Code Coil-Housings | B01          | B02                  | B03  | B04 | B05 |
|--------------------|--------------|----------------------|--|-----|-----|
| 4-pole             |              |                      |  |     |     |
| 3-pole left        | -0B-         | -0K-                 |  |     |     |
| 3-pole right       | -0C-         | -0A-                 | -0H-   |     |     |
| 2-pole center      | -0I-<br>-0L- | -0I-<br>-0A-<br>-0C- | -0B-<br>-0E-<br>-0L-<br>-0M-<br>-0O-<br>-0P-<br>-0Q- |     |     |

Standard plugs acc. Industry Standard RAST 5



further housings on request →

# Selection of Contactor-Housings for Standard plugs acc. **System Stocko RAST 5**



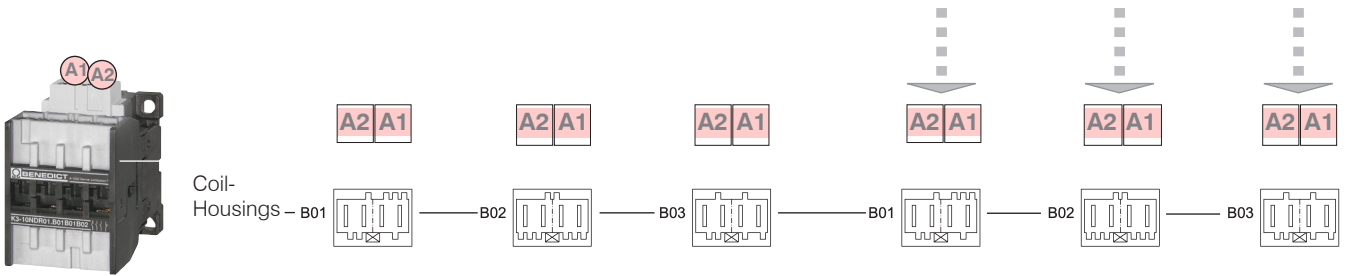
| Code                                     | Contactor-Housings | B01 | B02 | B03 | B04                             | further housings on request |
|--|--------------------|-----|-----|-----|---------------------------------|-----------------------------|
| Standard plugs acc. System Stocko RAST 5 | 8-pole             |     |     |     |                                 | -31-                        |
|  | 6-pole left        |     |     |     |                                 | -34-                        |
|  |                    |     |     |     |                                 | -35-                        |
|  |                    |     |     |     |                                 | -38-                        |
|  |                    |     |     |     |                                 | -50-                        |
|  |                    |     |     |     |                                 | -65-                        |
|  |                    |     |     |     |                                 | -1F-                        |
|  | 6-pole right       |     |     |     |                                 | -34-                        |
|  |                    |     |     |     |                                 | -35-                        |
|  |                    |     |     |     |                                 | -38-                        |
|  |                    |     |     |     |                                 | -50-                        |
|  |                    |     |     |     |                                 | -65-                        |
|  |                    |     |     |     | -1F-                            |                             |
| 4-pole left                              |                    |     |     |     | -14-                            |                             |
|  |                    |     |     |     | -16-                            |                             |
|  |                    |     |     |     | -53-                            |                             |
|  |                    |     |     |     | -60-                            |                             |
|  |                    |     |     |     | -73-                            |                             |
|  |                    |     |     |     | -75-                            |                             |
|  |                    |     |     |     |                                 |                             |
| 4-pole right                             |                    |     |     |     | -10-                            |                             |
|  |                    |     |     |     | -60-                            |                             |
| 2-pole                                   |                    |     |     |     | see... Industry Standard RAST 5 |                             |

**Order Example for Contactors:**

Contactor
Coil Voltage
Code Housing Coil ...see page 150, 152, 154, 156
Code Housing IN (L)... see page 149, 151, 153, 155
Code Housing OUT (T)...see page 149, 151, 153, 155

K3-14NR10\_230\_B01 B02 B01

Selection of Coil-Housings for Standard plugs acc. **System Stocko RAST 5**

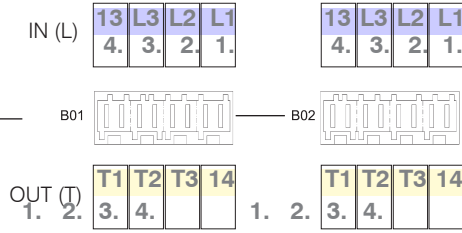


| Code Coil-Housings                             | B01    | B02  | B03  | B01                             | B02  | B03  |
|--|--------|------|------|---------------------------------|------|------|
| Standard plugs<br>acc.<br>System Stocko RAST 5 | 4-pole |      |      | 3-pole right                    |      |      |
|  | -42-   |      |      |                                 | -02- | -02- |
|  |        | -64- |      |                                 |      | -03- |
|  | -78-   | -78- | -78- |                                 | -04- |      |
|  | -79-   |      | -79- |                                 |      | -18- |
| 3-pole left                                    |        |      | -01- | -19-                            |      |      |
|  |        |      | -05- | -21-                            |      |      |
|  |        | -16- | -12- |                                 |      | -28- |
|  |        |      | -30- | -47-                            | -52- | -52- |
|  |        |      | -32- |                                 | -53- |      |
|  | -33-   |      |      |                                 | -66- | -64- |
|  | -36-   |      | -35- |                                 |      |      |
|  |        | -40- |      | -71-                            |      | -73- |
|  |        |      | -44- |                                 | -74- |      |
|  |        |      | -48- |                                 | -75- | -75- |
|  | -49-   |      |      | see... Industry Standard RAST 5 |      |      |
|  | -51-   |      |      |                                 |      |      |
|  | -72-   | -72- | -72- |                                 |      |      |
|  |        | -75- | -75- |                                 |      |      |
|  |        |      |      |                                 |      |      |
|  |        |      |      |                                 |      |      |

# Selection of Contactor-Housings for Standard plugs acc. **System Tyco RAST 5**



Contactor Housings



## Code Contactor-Housings — B01 — B02 — B03 — B04 further housings on request ▶

Standard plugs acc. System Tyco RAST 5



|                     | B01 | B02                    | B03 | B04                    |
|---------------------|-----|------------------------|-----|------------------------|
| 8-pole              |     |                        |     |                        |
| 6-pole left         |     | 928151-6<br>2-928344-6 |     |                        |
| 6-pole right        |     |                        |     |                        |
| 4-pole left         |     | 928344-4               |     |                        |
| 4-pole right        |     |                        |     | 4-928344-4             |
| 2-pole left         |     |                        |     | 928344-2<br>3-964951-2 |
| 2-pole center left  |     | 2-964951-2<br>928343-2 |     |                        |
| 2-pole center right |     |                        |     | 964951-2<br>4-928344-2 |
| 2-pole right        |     |                        |     |                        |
| 2-pole center left  |     | 928344-2               |     |                        |
| 2-pole center right |     |                        |     | 2-928344-2<br>928343-2 |
| 2-pole right        |     |                        |     |                        |
|                     |     |                        |     | 2-964951-2<br>928343-2 |

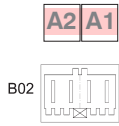
Order Example for Contactors:


















|           |              |  |  |  |
|-----------|--------------|--|--|--|
| Contactor | Coil Voltage | Code Housing Coil ...see page 150, 152, 154, 156 | Code Housing IN (L)... see page 149, 151, 153, 155 | Code Housing OUT (T)...see page 149, 151, 153, 155 |
| K3-14NR10 | 230          | B01  | B02  | B01  |

Selection of Coil-Housings for Standard plugs acc. **System Tyco RAST 5**



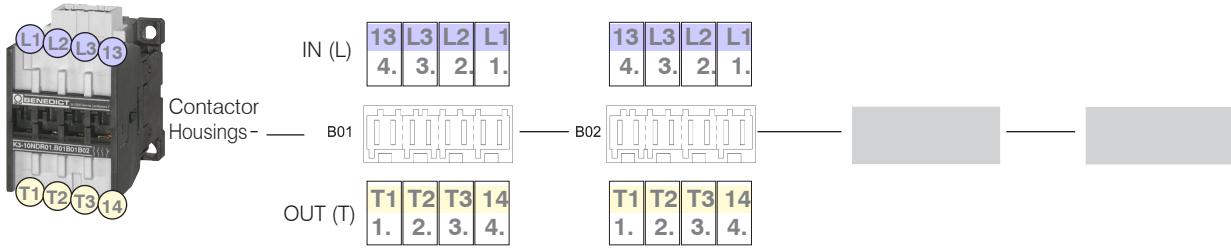
Coil Housings –



| Code Coil-Housings                               | B01   | B02   | B03   | B04   | B05                           |
|--|---|---|---|---|-------------------------------|
|  |   |   |   |   | further housings on request → |
| <b>Standard plugs acc. System Lumberg RAST 5</b> |   |   |   |   |                               |
| 4-pole   |   |   |   |   |                               |
| 3-pole left                                      |   |   |   |   |                               |
| 3-pole right                                     |   |    |    |   |                               |
|  |   | 928344-3  |   |   |                               |
| 2-pole center                                    |   |    |    |    |                               |
|  |   | 928344-2  |   | 2-928344-2  |                               |
|  |   |    |    |   |                               |
|  |   | 3-964951-2  |   |   |                               |
|  |   |   |   |  |                               |
|  |   | 6-928344-2  |   |   |                               |
|  |  | 2-964951-2  |   |   |                               |
|  |  | 928343-2  |   |  | 928343-2                      |
|  |   |  |  |   |                               |
|  |   | 964951-2  |   |   |                               |
|  |   |  |  |   |                               |
|  |   | 4-928344-2  |   |   |                               |



# Selection of Contactor-Housings for Standard plugs acc. **System Lumberg RAST 5**



## Code Contactor-Housings B01 B02 B03 B04 further housings on request

Standard plugs acc. System Lumberg RAST 5

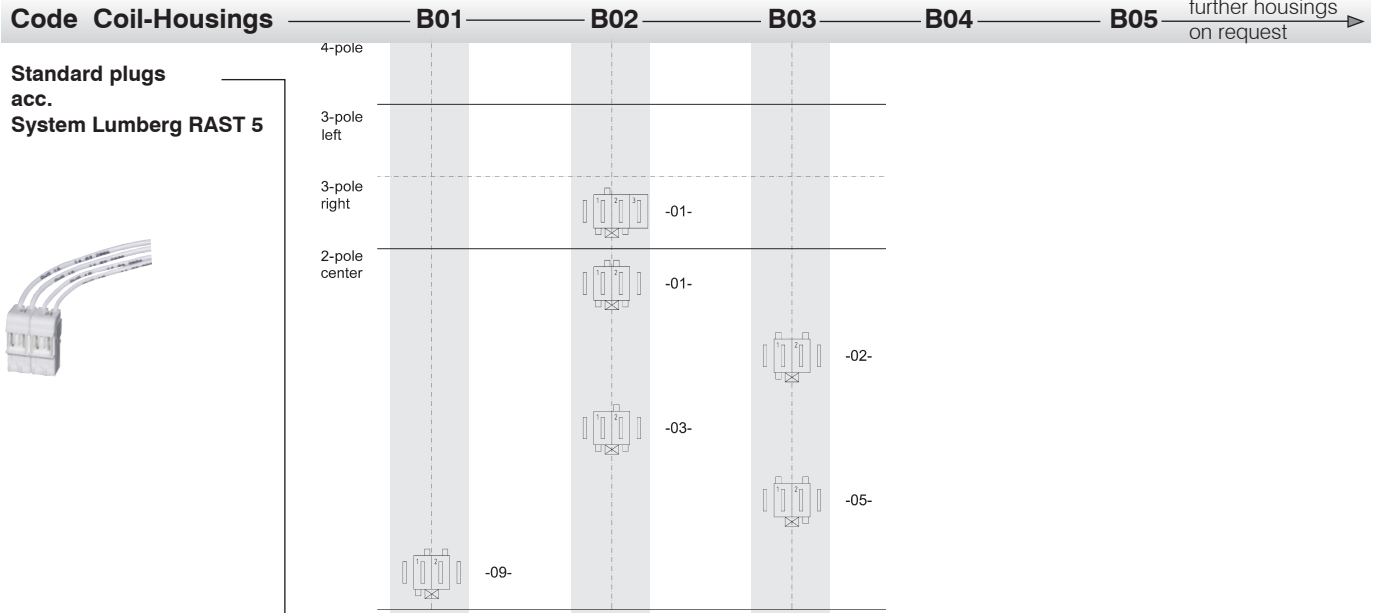
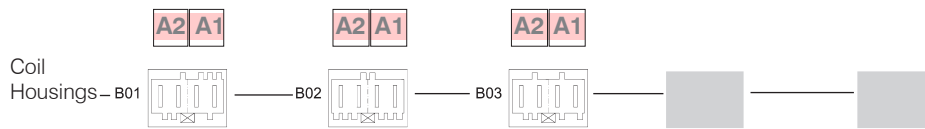
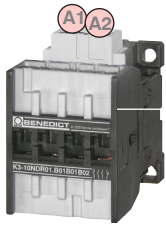


|                     | B01 | B02 | B03 | B04                  |
|---------------------|-----|-----|-----|----------------------|
| 8-pole              |     |     |     |                      |
| 6-pole left         |     |     |     | -10-                 |
| 6-pole right        |     |     |     |                      |
| 4-pole left         |     |     |     | -01-                 |
| 4-pole right        |     |     |     | -02-                 |
| 2-pole left         |     |     |     | -01-<br>-03-         |
| 2-pole center left  |     |     |     | -01-<br>-03-         |
| 2-pole center right |     |     |     | -10-<br>-02-<br>-06- |
| 2-pole right        |     |     |     | -02-<br>-06-<br>-09- |

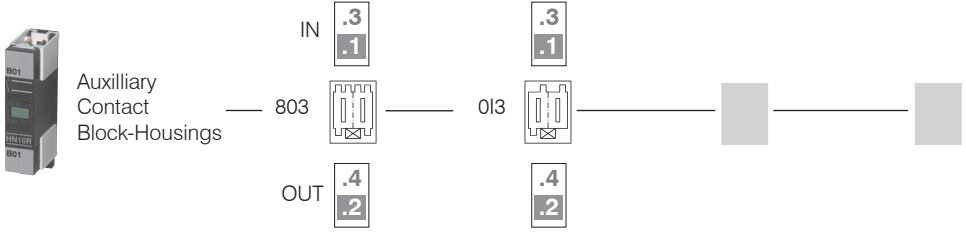
Order Example for Contactors:

|  |           |
|--|-----------|
| Contactor  | K3-14NR10 |
| Coil Voltage                                       | 230       |
| Code Housing Coil ...see page 150, 152, 154, 156   | B01       |
| Code Housing IN (L)... see page 149, 151, 153, 155 | B02       |
| Code Housing OUT (T)...see page 149, 151, 153, 155 | B01       |

Selection of Coil-Housings for Standard plugs acc. **System Lumberg RAST 5**

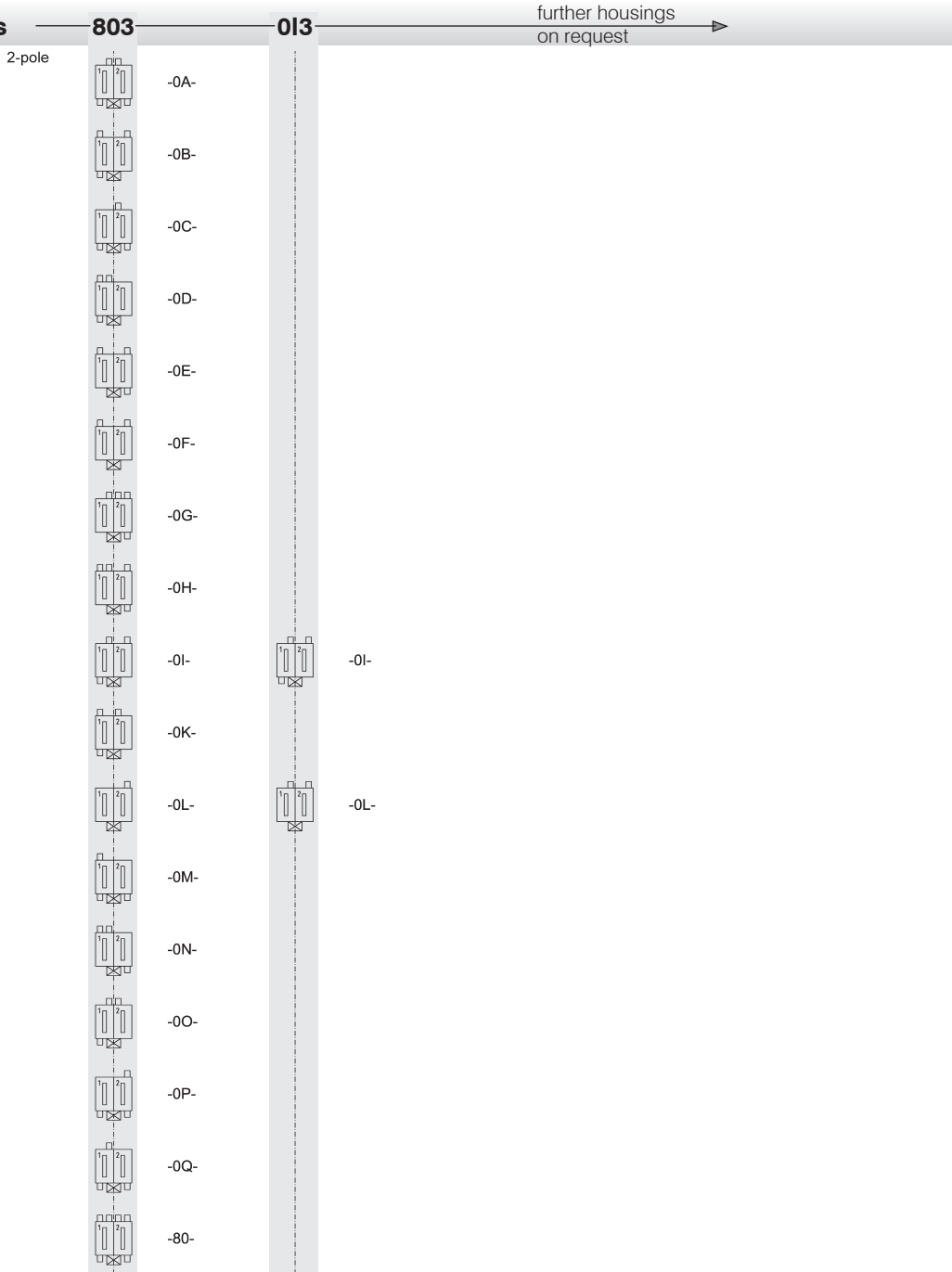


Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **Industry Standard RAST 5**



**Code Auxilliary-Contact Block-Housings**

Standard plugs acc. Industry Standard RAST 5

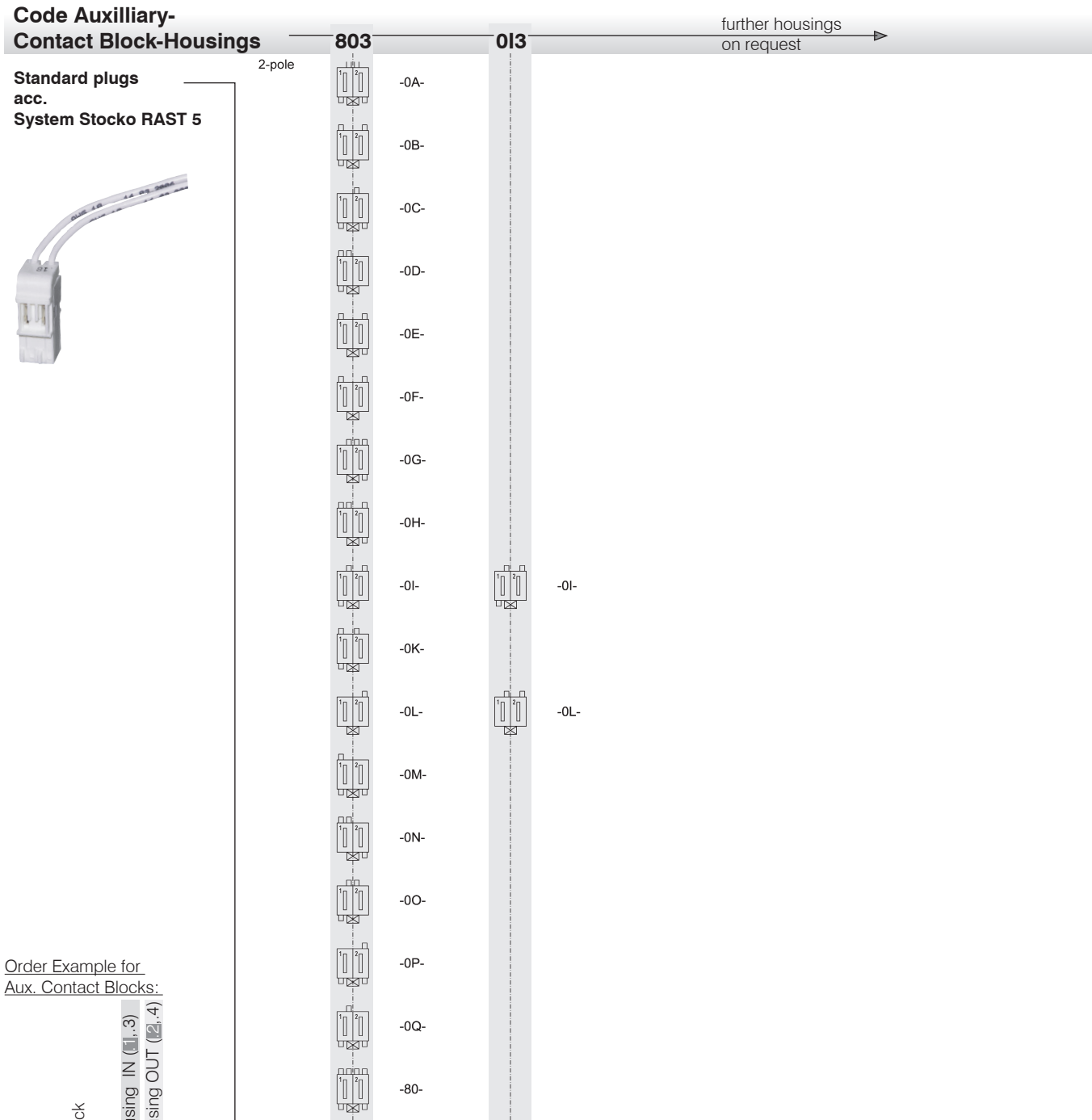
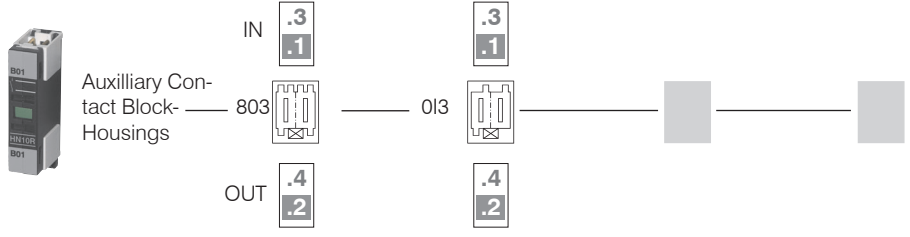


Order Example for Aux. Contact Blocks:

- Auxilliary Contact Block
  - Code Aux. Block Housing IN (1,3)
  - Code Aux. Block Housing OUT (2,4)
- HN10R-803013



Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **System Stocko RAST 5**

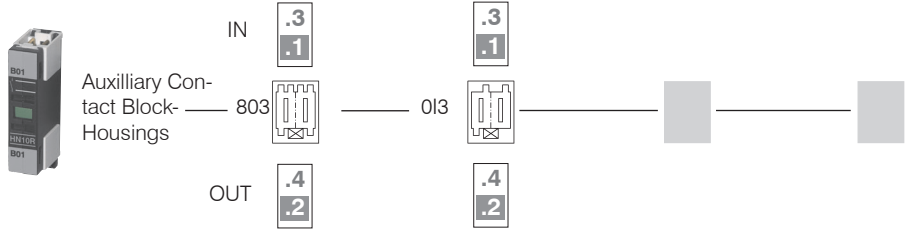


Order Example for  
Aux. Contact Blocks:

- Auxiliary Contact Block
- Code Aux. Block Housing IN (1,3)
- Code Aux. Block Housing OUT (2,4)

HN10R 803013

Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **System Tyco RAST 5**



**Code Auxilliary-Contact Block-Housings**

**803**      **013**      further housings on request →

**Standard plugs acc. System Tyco RAST 5**

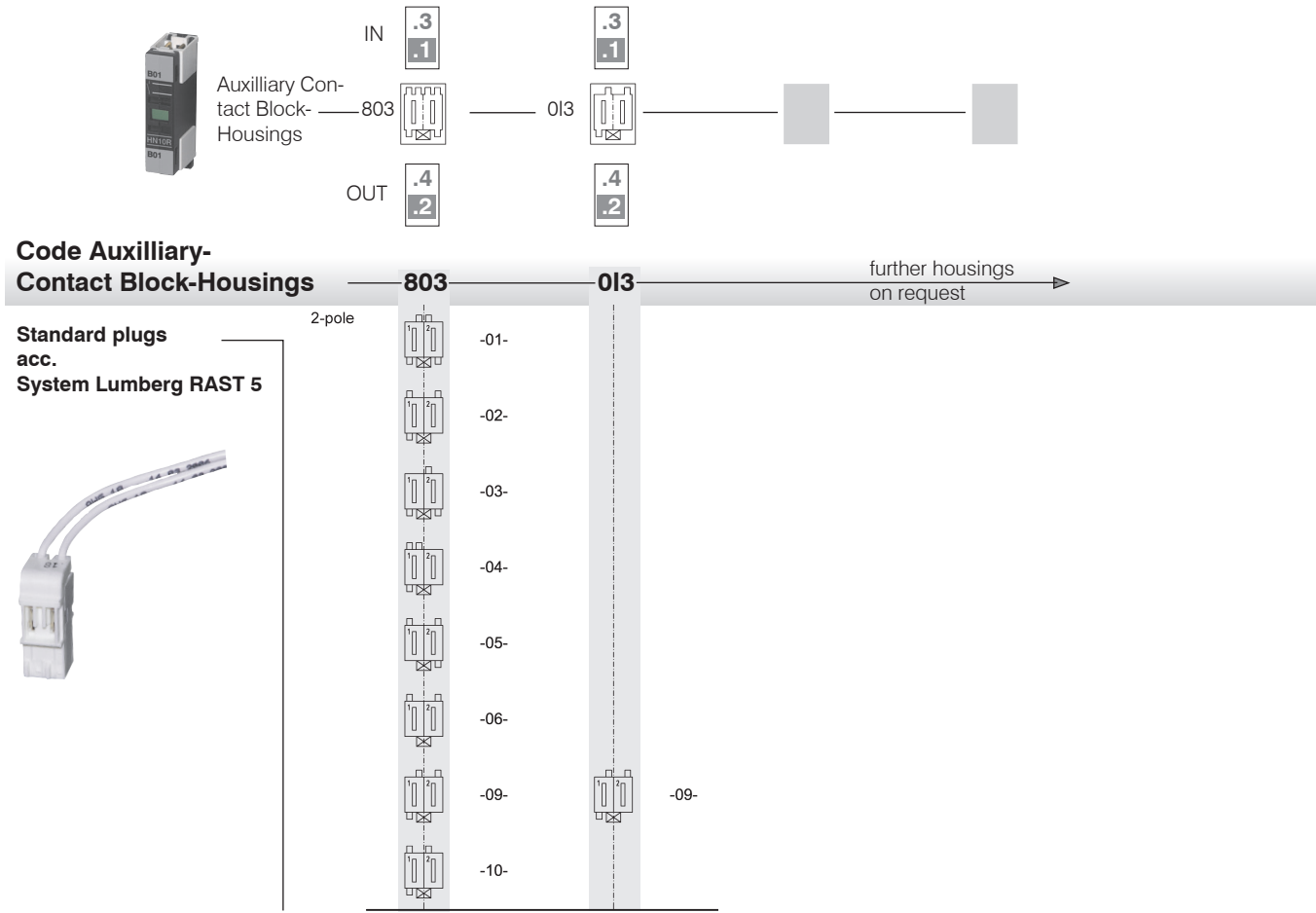


| 2-pole | 803        | 013        |
|--------|------------|------------|
|        | 928344-2   |            |
|        | 2-928344-2 |            |
|        | 3-964951-2 |            |
|        | 6-928344-2 |            |
|        | 5-928344-2 |            |
|        | 3-928344-2 |            |
|        | 2-964951-2 | 2-964951-2 |
|        | 928343-2   | 928343-2   |
|        | 964951-2   |            |
|        | 4-928344-2 |            |

Order Example for Aux. Contact Blocks:

—Auxiliary Contact Block  
 —Code Aux. Block Housing IN (1,3)  
 —Code Aux. Block Housing OUT (2,4)  
 HN10R-803013

Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **System Lumberg RAST 5**



Order Example for  
Aux. Contact Blocks:

- Auxiliary Contact Block
- Code Aux. Block Housing IN (1,3)
- Code Aux. Block Housing OUT (2,4)

HN10R 803013

Data acc. to IEC 60947-4-1, VDE 0660

| Main Contacts   | Type            |                 | K3-07NDR             | K3-10NDR             | K3-14NDR             | K3-18NDR             | K3-22NDR             |
|---|-----------------|-----------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>Rated insulation voltage <math>U_i</math></b> <sup>1)</sup>                            | V~              |                 | 415                  | 415                  | 415                  | 415                  | 415                  |
| <b>Making capacity <math>I_{eff}</math></b> at $U_e = 415V\sim$                           | A               |                 | -                    | 200                  | 200                  | 200                  | 200                  |
| <b>Breaking capacity <math>I_{eff}</math></b> at $U_e = 415V\sim$<br>$\cos\varphi = 0,65$ | A               |                 | -                    | 180                  | 180                  | 200                  | 200                  |
| <b>Utilization category AC1</b>   |                 |                 |                      |                      |                      |                      |                      |
| <b>Switching of resistive load</b>  |                 |                 |                      |                      |                      |                      |                      |
| Rated operational current $I_e (=I_{th})$   | 415V            | <b>A</b>        | <b>10</b>            | <b>25</b>            | <b>25</b>            | <b>32</b>            | <b>32</b>            |
| Rated operation power of three-phase resistive loads                                      | 220V            | kW              | -                    | 9,5                  | 9,5                  | 12,2                 | 12,2                 |
| 50-60Hz, $\cos\varphi = 1$  | 230V            | kW              | -                    | 9,9                  | 9,9                  | 12,7                 | 12,7                 |
|   | 240V            | kW              | -                    | 10,4                 | 10,4                 | 13,3                 | 13,3                 |
|   | 380V            | kW              | -                    | 16,4                 | 16,4                 | 21,0                 | 21,0                 |
|   | 400V            | kW              | -                    | 17,3                 | 17,3                 | 22,1                 | 22,1                 |
|   | 415V            | kW              | -                    | 17,9                 | 17,9                 | 23,0                 | 23,0                 |
| Rated operational current $I_e (=I_{th})$   | 415V            | A               | 6                    | 25                   | 25                   | 32                   | 32                   |
| Rated operation power of three-phase resistive loads                                      | 220V            | kW              | -                    | 9,5                  | 9,5                  | 12,2                 | 12,2                 |
| 50-60Hz, $\cos\varphi = 1$  | 230V            | kW              | -                    | 9,9                  | 9,9                  | 12,7                 | 12,7                 |
|   | 240V            | kW              | -                    | 10,4                 | 10,4                 | 13,3                 | 13,3                 |
|   | 380V            | kW              | -                    | 16,4                 | 16,4                 | 21,0                 | 21,0                 |
|   | 400V            | kW              | -                    | 17,3                 | 17,3                 | 22,1                 | 22,1                 |
|   | 415V            | kW              | -                    | 17,9                 | 17,9                 | 23,0                 | 23,0                 |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$                           |                 | mm <sup>2</sup> | 2 x 1,5 <sup>2</sup> | 2 x 1,5 <sup>2</sup> | 2 x 1,5 <sup>2</sup> | 2 x 2,5 <sup>2</sup> | 2 x 2,5 <sup>2</sup> |
| <b>Utilization category AC2 and AC3</b>   |                 |                 |                      |                      |                      |                      |                      |
| <b>Switching of three-phase motors</b>  |                 |                 |                      |                      |                      |                      |                      |
| Rated operational current $I_e$ open and enclosed   | 220V            | A               | -                    | 12                   | 15                   | 18                   | 22                   |
|   | 230V            | A               | -                    | 11,5                 | 14,5                 | 18                   | 22                   |
|   | 240V            | A               | -                    | 11                   | 14                   | 18                   | 22                   |
|   | <b>380-400V</b> | <b>A</b>        | -                    | <b>10</b>            | <b>14</b>            | <b>18</b>            | <b>22</b>            |
|   | 415V            | A               | -                    | 9                    | 14                   | 18                   | 22                   |
| Rated operational power of three-phase motors   | 220-230V        | kW              | -                    | 3                    | 4                    | 5                    | 6                    |
| 50-60Hz   | 240V            | kW              | -                    | 3                    | 4                    | 5                    | 7                    |
|   | <b>380-400V</b> | <b>kW</b>       | -                    | <b>4</b>             | <b>5,5</b>           | <b>7,5</b>           | <b>11</b>            |
|   | 415V            | kW              | -                    | 4,5                  | 6                    | 8,5                  | 12                   |
| <b>Auxilliary Contacts</b>  |                 |                 |                      |                      |                      |                      |                      |
| <b>Rated insulation voltage <math>U_i</math></b>  | V~              |                 | 415                  | 415                  | 415                  | 415                  | 415                  |
| <b>Thermal rated current <math>I_{th}</math></b> up to 415V                               |                 |                 |                      |                      |                      |                      |                      |
| Ambient temperature   | 40°C            | A               | 10                   | 10                   | 10                   | 10                   | 10                   |
|   | 60°C            | A               | 6                    | 6                    | 6                    | 6                    | 6                    |
| <b>Utilization category AC15</b>  |                 |                 |                      |                      |                      |                      |                      |
| Rated operational current $I_e$   | 220-240V        | A               | 3                    | 3                    | 3                    | 3                    | 3                    |
|   | 380-415V        | A               | 2                    | 2                    | 2                    | 2                    | 2                    |
| <b>Utilization category DC13</b>  |                 |                 |                      |                      |                      |                      |                      |
| Rated operational current $I_e$   | 60V             | A               | 3,5                  | 3,5                  | 3,5                  | 3,5                  | 3,5                  |
|   | 110V            | A               | 0,5                  | 0,5                  | 0,5                  | 0,5                  | 0,5                  |
|   | 220V            | A               | 0,1                  | 0,1                  | 0,1                  | 0,1                  | 0,1                  |
| <b>Short circuit protection</b>   | gL (gG)         | A               | 20                   | 20                   | 20                   | 20                   | 20                   |

1) Suitable for: earthed -neutral systems, overvoltage category I to III, pollution degree 3 (Industry-Standard):  $U_{imp} = 4kV$ .  
Data for other conditions on request.

Data acc. to IEC 60947-4-1, VDE 0660

| Main Contacts   |                             |                     | Type  | K3-07NDR | K3-10NDR | K3-14NDR                          | K3-18NDR | K3-22NDR |
|---|-----------------------------|---------------------|-------|----------|----------|-----------------------------------|----------|----------|
| <b>Maximum ambient temperature</b>  |                             |                     |       |          |          |                                   |          |          |
| Operation<br>with thermal overload relay  | open                        | °C                  |       |          |          | -40 up to +60 (+90) <sup>1)</sup> |          |          |
|   | enclosed                    | °C                  |       |          |          | -40 up to +40                     |          |          |
|   | open                        | °C                  |       |          |          | -25 up to +60                     |          |          |
|   | enclosed                    | °C                  |       |          |          | -25 up to +40                     |          |          |
| Storage   |                             | °C                  |       |          |          | -50 up to +90                     |          |          |
| <b>Short circuit protection</b> without thermal O/L relay   |                             |                     |       |          |          |                                   |          |          |
| Rated short circuit current   | „r“                         | kA                  | 1     | 3        | 3        | 3                                 | 3        | 3        |
|   | „Iq“                        | kA                  | -     | -        | -        | -                                 | -        | -        |
| Coordination-Type „1“ acc. to IEC 947-4-1,<br>Contact welding without hazard of persons   |                             |                     |       |          |          |                                   |          |          |
| max. fuse size  | gL (gG)                     | A                   | 20    | 63       | 63       | 63                                | 63       | 63       |
| Coordination-Type „2“ acc. to IEC 947-4-1,<br>light Contact welding accepted  |                             |                     |       |          |          |                                   |          |          |
| max. fuse size  | gL (gG)                     | A                   |       | 25       | 35       | 35                                | 35       | 35       |
| Contact welding not accepted  |                             |                     |       |          |          |                                   |          |          |
| max. fuse size  | gL (gG)                     | A                   |       | 16       | 16       | 16                                | 16       | 16       |
| for Contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |                             |                     |       |          |          |                                   |          |          |
| <b>Frequency of operations z</b>  |                             |                     |       |          |          |                                   |          |          |
| Contactors without thermal overload relay   |                             |                     |       |          |          |                                   |          |          |
|   | without load                | 1/h                 | 10000 | 10000    | 10000    | 10000                             | 10000    | 10000    |
|   | AC3, I <sub>e</sub>         | 1/h                 |       | 600      | 600      | 600                               | 600      | 600      |
|   | AC4, I <sub>e</sub>         | 1/h                 |       | 120      | 120      | 120                               | 120      | 120      |
|   | DC3, I <sub>e</sub>         | 1/h                 |       | 600      | 600      | 600                               | 600      | 600      |
| <b>Mechanical life</b>  |                             |                     |       |          |          |                                   |          |          |
| AC-operated   |                             | S x 10 <sup>6</sup> | 10    | 10       | 10       | 10                                | 10       | 10       |
| DC-operated   |                             | S x 10 <sup>6</sup> | 10    | 10       | 10       | 10                                | 10       | 10       |
| <b>Short time current</b>   | 10sec.-current              | A                   |       | 96       | 120      | 144                               | 176      |          |
| <b>Power loss</b> per pole  | at I <sub>e</sub> /AC3 400V | W                   |       | 0,21     | 0,35     | 0,5                               | 0,75     |          |
| <b>Resistance to shock acc. to IEC 68-2-27</b>  |                             |                     |       |          |          |                                   |          |          |
| Shock time 20ms sine-wave   | NO                          | g                   |       |          |          | 10                                |          |          |
|   | NC                          | g                   |       |          |          | 6                                 |          |          |
| Control Circuit   |                             |                     |       |          |          |                                   |          |          |
| <b>Power consumption of coils</b>   |                             |                     |       |          |          |                                   |          |          |
| AC operated   | inrush                      | VA                  |       |          |          | 33-45                             |          |          |
|   | sealed                      | VA                  |       |          |          | 7-10                              |          |          |
|   |                             | W                   |       |          |          | 2,6-3                             |          |          |
| DC operated   | inrush                      | W                   |       |          |          | 75                                |          |          |
|   | sealed                      | W                   |       |          |          | 2                                 |          |          |
| <b>Operating range of coils</b>   |                             |                     |       |          |          |                                   |          |          |
| in multiples of control voltage U <sub>s</sub>  |                             |                     |       |          |          |                                   |          |          |
|   | AC operated                 |                     |       |          |          | 0,85-1,1                          |          |          |
|   | DC operated                 |                     |       |          |          | 0,8-1,1                           |          |          |
| <b>Switching time</b> at control voltage U <sub>s</sub> ± 10% <sup>2) 3)</sup>  |                             |                     |       |          |          |                                   |          |          |
| AC operated   | make time                   | ms                  |       |          |          | 8-16                              |          |          |
|   | release time                | ms                  |       |          |          | 5-13                              |          |          |
|   | arc duration                | ms                  |       |          |          | 10-15                             |          |          |
| DC operated   | make time                   | ms                  |       |          |          | 8-12                              |          |          |
|   | release time                | ms                  |       |          |          | 8-13                              |          |          |
|   | arc duration                | ms                  |       |          |          | 10-15                             |          |          |

1) With reduced control voltage range 0,9 bis 1,0 x U<sub>s</sub> and with reduced rated current I<sub>e</sub> /AC1, no deratings for I<sub>e</sub> /AC3 values.

2) Total breaking time = release time + arc duration

3) Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected with coil suppressor (Varistor, RC-Unit, Diode-Unit).

Data acc. to UL508

| Main Contacts (cULus)  |          | Type | K3-10NDR | K3-14NDR | K3-18NDR | K3-22NDR |
|--|----------|------|----------|----------|----------|----------|
| Bemessungsbetriebsstrom<br>„General Use“                               |          | A    | 25       | 25       | 30       | 30       |
| <b>Motor DOL 3-phase at 60Hz</b>                                       |          |      |          |          |          |          |
| Rated operational current  | 415V     | A    | 10       | 14       | 18       | 22       |
| Rated operational power  | 110-120V | hp   | 1½       | 2        | 2        | 3        |
|  | 200-208V | hp   | 3        | 3        | 5        | 5        |
|  | 220-240V | hp   | 3        | 3        | 5        | 5        |
|  | 265-277V | hp   | 3        | 5        | 7½       | 7½       |
|  | 380-415V | hp   | 5        | 5        | 10       | 10       |
| <b>Motor DOL 1-phase at 60Hz</b>                                       |          |      |          |          |          |          |
| Rated operational current  | 415V     | A    | 10       | 14       | 18       | 22       |
| Rated operational power<br>of AC motor at 60Hz (1ph)                   | 110-120V | hp   | ½        | ¾        | 1        | 1½       |
|  | 200-208V | hp   | 1        | 1½       | 2        | 3        |
|  | 220-240V | hp   | 1½       | 2        | 3        | 3        |
|  | 265-277V | hp   | 2        | 3        | 3        | 3        |
|  | 380-415V | hp   | 3        | 3        | 5        | 5        |
| Fuses  |          | A    | 30       | 40       | 50       | 50       |
| Suitable for use on a capability<br>of delivering not more than (SCCR) | rms      | A    | 5000     | 5000     | 5000     | 5000     |
|  |          | V    | 415      | 415      | 415      | 415      |
| Auxilliary Contacts (cULus)  |          |      | A300     | A300     | A300     | A300     |

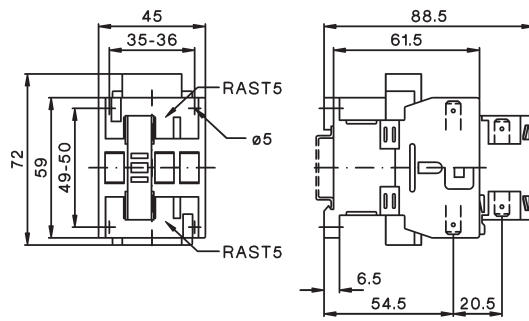
## Accessories

Data acc. to IEC 60947-5-1, VDE 0660

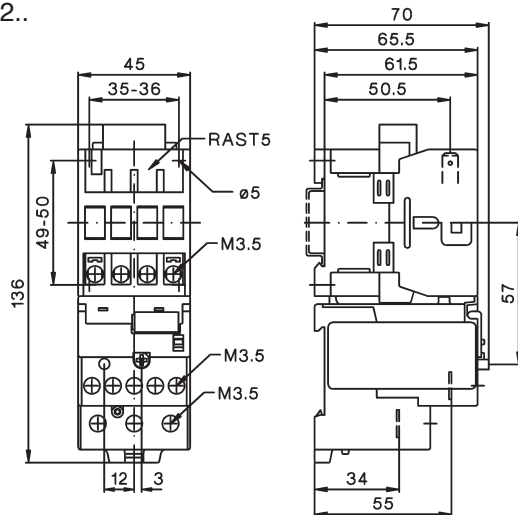
| Auxilliary Contacts   |           | Type                | HN10R | HN01R |
|---|-----------|---------------------|-------|-------|
| <b>Rated insulation voltage <math>U_i</math></b>            |           | V~                  | 415   | 415   |
| <b>Thermal rated current <math>I_{th}</math> up to 415V</b> |           |                     |       |       |
| Ambient temperature   | max. 40°C | A                   | 10    | 10    |
|   | max. 60°C | A                   | 6     | 6     |
| <b>Frequency of operations z</b>                            |           | 1/h                 | 3000  | 3000  |
| <b>Mechanical life</b>                                      |           | S x 10 <sup>6</sup> | 10    | 10    |
| <b>Power loss</b> per pole at $I_e/AC1$                     |           | W                   | 0,5   | 0,5   |
| <b>Utilization category AC15</b>                            |           |                     |       |       |
| Rated operational<br>betriebsstrom $I_e$                    | 220-240V  | A                   | 3     | 3     |
|   | 380-415V  | A                   | 2     | 2     |
| <b>Utilization category DC13</b>                            |           |                     |       |       |
| Bemessungs-<br>current $I_e$                                | 60V       | A                   | 2     | 2     |
|   | 110V      | A                   | 0,4   | 0,4   |
|   | 220V      | A                   | 0,1   | 0,1   |
| <b>Short circuit protection</b>                             |           |                     |       |       |
| short circuit current 1kA,<br>contact welding not accepted  |           |                     |       |       |
| max. fuse size  | gL (gG)   | A                   | 20    | 20    |
| Data acc. to UL508  |           |                     |       |       |
| Rated operational current<br>„General Use“                  |           | A                   | 10    | 10    |
| Rated operational voltage                                   | max.      | V~                  | 300   | 300   |
| <b>Auxiliary Contacts</b>                                   |           |                     | A300  | A300  |

# Dimensions

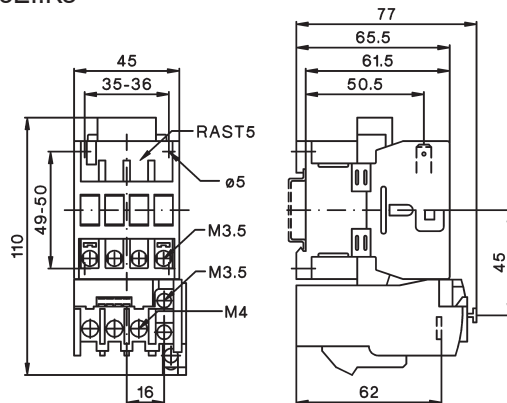
## K3-..NDR.. +HN..R





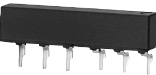


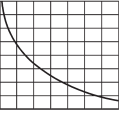

## K3-..NDR.....PZ + U3/32..



## K3-..NDR.....PZ + U12/16E..K3



Technical data are subject to change without notice

| Index   | Page   |
|---|--|
|    | <b>Circuit-Breakers M4</b><br>for motor protection 166                   |
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## Circuit Breakers M4 for Motor Control

| Rated Current<br>$I_n$<br>A | Suitable for motors <sup>1)</sup><br>3~400V<br>kW | Setting range<br>Thermal<br>Overload<br>Release<br>A | Instantaneous<br>Short Circuit<br>Release<br>A | Short Circuit<br>Breaking<br>Capacity at<br>3~400V<br>kA ( $I_{cu}$ ) | Type | Pack<br>pcs. | Weight<br>approx.<br>kg/pc. |
|-----------------------------|---|--|--|---|------|--------------|-----------------------------|
|-----------------------------|---|--|--|---|------|--------------|-----------------------------|

### Circuit Breaker M4-32T-..



switch type

|      |      |             |      |     |             |   |      |
|------|------|-------------|------|-----|-------------|---|------|
| 0,16 | -    | 0,10 – 0,16 | 2,1  | 100 | M4-32T-0,16 | 1 | 0,32 |
| 0,25 | 0,06 | 0,16 – 0,25 | 3,3  | 100 | M4-32T-0,25 | 1 | 0,32 |
| 0,4  | 0,09 | 0,25 – 0,4  | 5,2  | 100 | M4-32T-0,4  | 1 | 0,32 |
| 0,63 | 0,18 | 0,4 – 0,63  | 8,2  | 100 | M4-32T-0,63 | 1 | 0,32 |
| 1    | 0,25 | 0,63 – 1    | 13   | 100 | M4-32T-1    | 1 | 0,32 |
| 1,6  | 0,55 | 1 – 1,6     | 20,8 | 100 | M4-32T-1,6  | 1 | 0,32 |
| 2,5  | 0,75 | 1,6 – 2,5   | 32,5 | 100 | M4-32T-2,5  | 1 | 0,32 |
| 4    | 1,5  | 2,5 – 4     | 52   | 100 | M4-32T-4    | 1 | 0,32 |
| 6    | 2,2  | 4 – 6       | 78   | 100 | M4-32T-6    | 1 | 0,32 |
| 8    | 3    | 5 – 8       | 104  | 100 | M4-32T-8    | 1 | 0,32 |
| 10   | 4    | 6 – 10      | 130  | 50  | M4-32T-10   | 1 | 0,32 |
| 13   | 5,5  | 9 – 13      | 169  | 50  | M4-32T-13   | 1 | 0,32 |
| 17   | 7,5  | 11 – 17     | 221  | 20  | M4-32T-17   | 1 | 0,32 |
| 22   | 7,5  | 14 – 22     | 286  | 15  | M4-32T-22   | 1 | 0,32 |
| 26   | 11   | 18 – 26     | 338  | 15  | M4-32T-26   | 1 | 0,32 |
| 32   | 15   | 22 – 32     | 416  | 15  | M4-32T-32   | 1 | 0,32 |
| 40   | 18,5 | 28 – 40     | 520  | 10  | M4-32T-40   | 1 | 0,32 |

### Circuit Breaker M4-32R-..



rotary type

|      |      |             |      |     |             |   |      |
|------|------|-------------|------|-----|-------------|---|------|
| 0,16 | -    | 0,10 – 0,16 | 2,1  | 100 | M4-32R-0,16 | 1 | 0,36 |
| 0,25 | 0,06 | 0,16 – 0,25 | 3,3  | 100 | M4-32R-0,25 | 1 | 0,36 |
| 0,4  | 0,09 | 0,25 – 0,4  | 5,2  | 100 | M4-32R-0,4  | 1 | 0,36 |
| 0,63 | 0,18 | 0,4 – 0,63  | 8,2  | 100 | M4-32R-0,63 | 1 | 0,36 |
| 1    | 0,25 | 0,63 – 1    | 13   | 100 | M4-32R-1    | 1 | 0,36 |
| 1,6  | 0,55 | 1 – 1,6     | 20,8 | 100 | M4-32R-1,6  | 1 | 0,36 |
| 2,5  | 0,75 | 1,6 – 2,5   | 32,5 | 100 | M4-32R-2,5  | 1 | 0,36 |
| 4    | 1,5  | 2,5 – 4     | 52   | 100 | M4-32R-4    | 1 | 0,36 |
| 6    | 2,2  | 4 – 6       | 78   | 100 | M4-32R-6    | 1 | 0,36 |
| 8    | 3    | 5 – 8       | 104  | 100 | M4-32R-8    | 1 | 0,36 |
| 10   | 4    | 6 – 10      | 130  | 100 | M4-32R-10   | 1 | 0,36 |
| 13   | 5,5  | 9 – 13      | 169  | 100 | M4-32R-13   | 1 | 0,36 |
| 17   | 7,5  | 11 – 17     | 221  | 50  | M4-32R-17   | 1 | 0,36 |
| 22   | 7,5  | 14 – 22     | 286  | 50  | M4-32R-22   | 1 | 0,36 |
| 26   | 11   | 18 – 26     | 338  | 50  | M4-32R-26   | 1 | 0,36 |
| 32   | 15   | 22 – 32     | 416  | 50  | M4-32R-32   | 1 | 0,36 |
| 40   | 18,5 | 28 – 40     | 520  | 40  | M4-32R-40   | 1 | 0,36 |

### Circuit Breaker M4-63R-..



rotary type

|    |      |         |     |    |           |   |     |
|----|------|---------|-----|----|-----------|---|-----|
| 26 | 12,5 | 18 – 26 | 338 | 50 | M4-63R-26 | 1 | 1,0 |
| 32 | 15   | 22 – 32 | 416 | 50 | M4-63R-32 | 1 | 1,0 |
| 40 | 18,5 | 28 – 40 | 520 | 50 | M4-63R-40 | 1 | 1,0 |
| 50 | 22   | 34 – 50 | 650 | 50 | M4-63R-50 | 1 | 1,0 |
| 63 | 30   | 45 – 63 | 819 | 50 | M4-63R-63 | 1 | 1,0 |

### Circuit Breaker M4-100R-..



rotary type

|     |    |          |      |    |             |   |     |
|-----|----|----------|------|----|-------------|---|-----|
| 63  | 30 | 45 – 63  | 819  | 50 | M4-100R-63  | 1 | 2,2 |
| 75  | 37 | 55 – 75  | 975  | 50 | M4-100R-75  | 1 | 2,2 |
| 90  | 45 | 70 – 90  | 1170 | 50 | M4-100R-90  | 1 | 2,2 |
| 100 | -  | 80 – 100 | 1300 | 50 | M4-100R-100 | 1 | 2,2 |

1) Approximate values of standard motors

# Accessories

|  | Contacts |    | Rated Operational Current |           |                  | Type | Pack pcs. | Weight approx. kgpc |
|--|----------|----|---------------------------|-----------|------------------|------|-----------|---------------------|
|  | NO       | NC | AC15<br>24V<br>A          | 240V<br>A | AC1<br>240V<br>A |      |           |                     |

## Transverse Auxiliary Contact Block, max. 1 pc. per circuit-breaker <sup>1)</sup>



|   |   |  |   |   |   |         |   |      |
|---|---|--|---|---|---|---------|---|------|
| 1 | 1 |  | 3 | 2 | 5 | M4 HQ11 | 1 | 0,02 |
| 2 | - |  | 3 | 2 | 5 | M4 HQ20 | 1 | 0,02 |
| - | 2 |  | 3 | 2 | 5 | M4 HQ02 | 1 | 0,02 |

## Auxiliary Contact Block for left hand side mounting, 1 or 2 pcs. per circuit-breaker <sup>1)</sup>



|   |   |  |   |   |    |         |   |      |
|---|---|--|---|---|----|---------|---|------|
| 1 | 1 |  | 6 | 4 | 10 | M4 HS11 | 1 | 0,03 |
| 2 | - |  | 6 | 4 | 10 | M4 HS20 | 1 | 0,03 |
| - | 2 |  | 6 | 4 | 10 | M4 HS02 | 1 | 0,03 |

## Alarm Switch (any tripping) for left hand side mounting, max. 1 pc. per circuit-breaker <sup>1)</sup>



|   |   |                   |   |   |    |            |   |      |
|---|---|-------------------|---|---|----|------------|---|------|
| 1 | 1 | for M4-32T, -32R  | 6 | 4 | 10 | M4 MA11    | 1 | 0,04 |
| 1 | 1 | for M4-63R, -100R | 6 | 4 | 10 | M4 MA11 63 | 1 | 0,04 |

## Alarm Switch (short circuit) for left hand side mounting, max. 1 pc. per circuit-breaker <sup>1)</sup>



|   |   |  |   |   |    |        |   |      |
|---|---|--|---|---|----|--------|---|------|
| 1 | 1 |  | 6 | 4 | 10 | M4 M11 | 1 | 0,04 |
|---|---|--|---|---|----|--------|---|------|

Operates in case of short circuit accidents that is over 20 times of the rated current of the circuit breaker.

## Undervoltage Releases for right hand side mounting, max. 1 pc. per circuit-breaker <sup>1)</sup>

Trips the circuit-breaker when the voltage is interrupted. Prevents the motor from being restarted accidentally when the voltage is restored, suitable for EMERGENCY STOP acc. to IEC 60204



|                              |  |         |   |      |
|------------------------------|--|---------|---|------|
| 24V 50Hz, 28V 60Hz           |  | M4 U24  | 1 | 0,11 |
| 110-127V 50Hz, 120V 60Hz     |  | M4 U110 | 1 | 0,11 |
| 220-230V 50Hz, 240-260V 60Hz |  | M4 U230 | 1 | 0,11 |
| 240V 50Hz, 277V 60Hz         |  | M4 U240 | 1 | 0,11 |
| 380-400V 50Hz, 440-460V 60Hz |  | M4 U400 | 1 | 0,11 |
| 415-440V 50Hz, 460-480V 60Hz |  | M4 U415 | 1 | 0,11 |

## Shunt Releases for right hand side mounting, max. 1 pc. per circuit-breaker <sup>1)</sup>

Trips the circuit-breaker when the release coil energized.  
**100% ON max. 5sec. ON**



|                              |                     |         |   |      |
|------------------------------|---------------------|---------|---|------|
| 20-24V 50Hz, 28V 60Hz        | 20-70V 50/60Hz DC   | M4 A24  | 1 | 0,12 |
| 75-127V 50Hz, 120V 60Hz      | 75-190V 50/60Hz DC  | M4 A110 | 1 | 0,12 |
| 190-230V 50Hz, 240-260V 60Hz | 190-330V 50/60Hz DC | M4 A230 | 1 | 0,12 |
| 200-240V 50Hz, 277V 60Hz     | 200-330V 50/60Hz DC | M4 A240 | 1 | 0,12 |
| 300-400V 50Hz, 440-460V 60Hz | 300-500V 50/60Hz DC | M4 A400 | 1 | 0,12 |
| 330-440V 50Hz, 460-480V 60Hz | 330-500V 50/60Hz DC | M4 A415 | 1 | 0,12 |



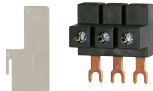


## Enclosure for circuit breaker M4 32R protection degree IP65



|   |              |   |      |
|---|--------------|---|------|
| Plastic enclose with rotary operating mechanism black-grey lockable, with N- and PE-terminal space for 1 transverse and side aux. contact + release | M4 32R PFH4  | 1 | 0,53 |
| Enclose with rotary operating mechanism yellow - red, lockable with N- and PE-terminal space for 1 transverse and side aux. contact + release       | M4 32R PFHN4 | 1 | 0,53 |

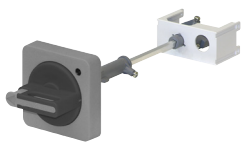

1) Number and position see page 179

## Accessories and Busbars

|   |                      |  | for<br>circuit-<br>breaker | Type      | Pack<br>pcs. | Weight<br>approx.<br>kg/pc. |
|---|----------------------|--|----------------------------|-----------|--------------|-----------------------------|
|   | Scale cover sealable | for covering the current setting scale   | M4-32...100                | M4 K      | 10           | 0,003                       |
|   | Push-in lugs         | for screwing the circuit-breaker onto mounting plates. 2 units required (1 bag with 10 units)                      | M4-32                      | M4 32 L   | 10           | 0,01                        |
|   | Spade terminal block | up to 600V acc.UL 489  | M4-32R                     | M4 32R E  |              | on request                  |
|  | Pin terminal block   | up to 600V acc.UL 489  | M4-32R                     | M4 32R EV |              | on request                  |
|   | Insulation barriers  | up to 600V acc.UL 489 for increased distances and clearances acc. to UL Type "E", 2 pcs per device (on input side) | M4-100                     | M4 100 E  | 2            | 0,01                        |

## Door-coupling rotary mechanisms IP65




The door locking device prevents accidental opening of the cubicle door in the ON position of the circuit-breaker. The OFF position can be locked with up to 3 padlocks.

|   |   |                       |         |                  |   |     |
|---|---|-----------------------|---------|------------------|---|-----|
|   | Door-coupling rotary mechanism black                      | extension shaft 115mm | M4-32R  | M4 32R EH1 115   | 1 | 0,1 |
|   |   | extension shaft 315mm | M4-32R  | M4 32R EH1 315   | 1 | 0,2 |
|   |   | extension shaft 115mm | M4-63R  | M4 63R EH1 115   | 1 | 0,1 |
|   |   | extension shaft 315mm | M4-63R  | M4 63R EH1 315   | 1 | 0,2 |
|   |   | extension shaft 115mm | M4-100R | M4 100R EH1 115  | 1 | 0,1 |
|   |   | extension shaft 315mm | M4-100R | M4 100R EH1 315  | 1 | 0,2 |
|  | Emergency-Stop Door-coupling rotary mechanism; red/yellow | extension shaft 115mm | M4-32R  | M4 32R EHN1 115  | 1 | 0,1 |
|   |   | extension shaft 315mm | M4-32R  | M4 32R EHN1 315  | 1 | 0,2 |
|   |   | extension shaft 115mm | M4-63R  | M4 63R EHN1 115  | 1 | 0,1 |
|   |   | extension shaft 315mm | M4-63R  | M4 63R EHN1 315  | 1 | 0,2 |
|   |   | extension shaft 115mm | M4-100R | M4 100R EHN1 115 | 1 | 0,1 |
|   |   | extension shaft 315mm | M4-100R | M4 100R EHN1 315 | 1 | 0,2 |




|  |  |  | Protection<br>degree | Type | Pack<br>pcs. | Weight<br>kg/pc. |
|--|--|--|----------------------|------|--------------|------------------|
|--|--|--|----------------------|------|--------------|------------------|

## Insulated 3-phase busbar system


For feeding several modular circuit-breakers M4-32. on standard mounting rails, insulated  
Rated operational voltage max. 690 V, rated current 63 A, with **spade connection**, modular spacing 45mm (54mm on request)

|  |                    |   |      |          |   |       |
|--|--------------------|---|------|----------|---|-------|
|  | 3-phase busbars    | for 2 circuit-breakers  | IP20 | M4 32 S2 | 1 | 0,03  |
|  |                    | for 3 circuit-breakers  | IP10 | M4 32 S3 | 1 | 0,05  |
|  |                    | for 4 circuit-breakers  | IP10 | M4 32 S4 | 1 | 0,07  |
|  |                    | for 5 circuit-breakers  | IP10 | M4 32 S5 | 1 | 0,10  |
|  | Line side terminal | Conductor cross-section solid or stranded 6-25mm <sup>2</sup> with end sleeve 4-16mm <sup>2</sup> | IP10 | M4 32 SE | 1 | 0,04  |
|  | Cover for tags     | Touch guard for emptyspaces   |      | M4 32 SF | 1 | 0,003 |


For feeding several modular circuit-breakers M4-32. on standard mounting rails, insulated  
Rated operational voltage max. 690 V, rated current 63 A, with **pin connection**, modular spacing 45mm (54mm on request)


|  |                    |   |      |           |   |       |
|--|--------------------|---|------|-----------|---|-------|
|  | 3-phase busbars    | for 2 circuit-breakers  | IP20 | M4 32 S2V | 1 | 0,03  |
|  |                    | for 3 circuit-breakers  | IP20 | M4 32 S3V | 1 | 0,05  |
|  |                    | for 4 circuit-breakers  | IP20 | M4 32 S4V | 1 | 0,07  |
|  |                    | for 5 circuit-breakers  | IP20 | M4 32 S5V | 1 | 0,10  |
|  | Line side terminal | Conductor cross-section solid or stranded 6-25mm <sup>2</sup> with end sleeve 4-16mm <sup>2</sup> | IP20 | M4 32 SEV | 1 | 0,04  |
|  | Cover for tags     | Touch guard for emptyspaces   |      | M4 32 SFV | 1 | 0,003 |


For feeding several modular circuit-breakers M4-63. on standard mounting rails, insulated  
Rated operational voltage max. 690 V, rated current 108 A, with **pin connection**, modular spacing 55mm

|  |                 |                        |      |          |   |      |
|--|-----------------|------------------------|------|----------|---|------|
|  | 3-phase busbars | for 2 circuit-breakers | IP20 | M4 63 S2 | 1 | 0,15 |
|--|-----------------|------------------------|------|----------|---|------|

# Mounting Parts for Fuseless Load Feeders

|   | Type   | Pack pcs.  | Weight approx. kg/pc. |
|---|--|------------|-----------------------|
| <b>DIN-rail adapters with DIN-rail for contactor</b>                              |  |            |                       |
|  | for M4-32..<br>DIN-rails moveable for easy mounting and replacing<br>can be connected on one 35 mm DIN-rail (high 15mm)<br>or two 35 mm-DIN-rails (125mm distance)<br>suitable for contactors K1-..., K(G)3-10 to K(G)3-40 | M4 32 HU1  | 1 0,1                 |
|   | Adapter, for M4-63..<br>can be connected on two 35 mm DIN-rails (125mm distance)<br>or one 75 mm DIN-rail, or screw mounting<br>suitable for contactors K(G)3-24 to K(G)3-40, K3-50 to K3-74                               | M4 63 HU1  | 1 0,2                 |
|   | Adapter, for M4-100..<br>can be connected on two 35 mm DIN-rails (125mm distance)<br>or one 75 mm DIN-rail, or screw mounting<br>suitable for contactors K3-50 to K3-74  | M4 100 HU1 | 1 0,2                 |

|  |   |            |        |
|--|---|------------|--------|
| <b>Busbar adapters for 60-mm-system, 3 copper busbars acc. to DIN 46433</b>        |   |            |        |
|  | for M4-32<br>up to 25A, 690V<br>45mm width, 182mm long<br>bar width: 12 und 15mm<br>bar thickness: 5 and 10mm | M4 32 SA60 | 1 0,18 |

|   |  |          |            |         |
|---|--|----------|------------|---------|
| <b>Link modules, for mechanical and electrical connection between circuit-breaker and contactor</b> |  |          |            |         |
|                  | for M4-32.. with contactors K1-..            | max. 32A | M4 32 VK1  | 1 0,015 |
|   | for M4-32.. with contactors K3-10 to K3-22   | max. 32A | M4 32 VK3  | 1 0,02  |
|   | for M4-32.. with contactors KG3-10 to KG3-22 | max. 32A | M4 32 VKG3 | 1 0,02  |

|  |   |           |           |        |
|--|---|-----------|-----------|--------|
| <b>Link modules, for electrical connection between circuit-breaker and contactor</b> |   |           |           |        |
|  | for M4-32.. with contactors K(G)3-24to K(G)3-40 | max. 32A  | M4 32 VD  | 1 0,01 |
|  | for M4-63R. with contactors K3-24 to K3-74      | max. 63A  | M4 63 VD  | 1 0,02 |
|  | for M4-63R. with contactors KG3-24 to KG3-40    | max. 63A  | M4 63 VDG | 1 0,02 |
|  | for M4-100R. with contactors K3-50 to K3-74     | max. 100A | M4 100 VD | 1 0,02 |

# Components for Fuseless Load Feeders, DIN-Rail Mounting

Type of coordination "1" 3x415V 10kA <sup>1)</sup>



| Motor<br>3~400V<br>kW | Setting range<br>A | Circuit-breaker<br>page 166<br>Type | Link<br>module<br>Type | Contactor <sup>2)</sup><br>220-230V 50Hz<br>Type | DIN-rail<br>adapter<br>Type |
|-----------------------|--------------------|-------------------------------------|------------------------|--|-----------------------------|
| -                     | 0,10 – 0,16        | M4-32T-0,16                         | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 0,06                  | 0,16 – 0,25        | M4-32T-0,25                         | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 0,09                  | 0,25 – 0,4         | M4-32T-0,4                          | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 0,18                  | 0,4 – 0,63         | M4-32T-0,63                         | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 0,25                  | 0,63 – 1           | M4-32T-1                            | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 0,55                  | 1,0 – 1,6          | M4-32T-1,6                          | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 0,75                  | 1,6 – 2,5          | M4-32T-2,5                          | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 1,5                   | 2,5 – 4            | M4-32T-4                            | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 2,2                   | 4 – 6              | M4-32T-6                            | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 3                     | 5 – 8              | M4-32T-8                            | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 4                     | 6 – 10             | M4-32T-10                           | M4 32 VK1              | K1-09D10 230                                     | -                           |
| 5,5                   | 9 – 13             | M4-32T-13                           | M4 32 VK1              | K1-12D10 230                                     | -                           |
| 7,5                   | 11 – 17            | M4-32T-17                           | M4 32 VK3              | K3-18ND10 230EUR                                 | -                           |
| 7,5                   | 14 – 22            | M4-32T-22                           | M4 32 VK3              | K3-22ND10 230EUR                                 | -                           |
| 11                    | 18 – 26            | M4-32T-26                           | M4 32 VK3              | K3-22ND10 230EUR                                 | -                           |
| 15                    | 22 – 32            | M4-32T-32                           | M4 32 VD               | K3-32A00 230                                     | M4 32 HU1                   |
| 18,5                  | 28 – 40            | M4-32T-40                           | M4 32 VD               | K3-40A00 230                                     | M4 32 HU1                   |
| -                     | 0,10 – 0,16        | M4-32R-0,16                         | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 0,06                  | 0,16 – 0,25        | M4-32R-0,25                         | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 0,09                  | 0,25 – 0,4         | M4-32R-0,4                          | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 0,18                  | 0,4 – 0,63         | M4-32R-0,63                         | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 0,25                  | 0,63 – 1           | M4-32R-1                            | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 0,55                  | 1,0 – 1,6          | M4-32R-1,6                          | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 0,75                  | 1,6 – 2,5          | M4-32R-2,5                          | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 1,5                   | 2,5 – 4            | M4-32R-4                            | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 2,2                   | 4 – 6              | M4-32R-6                            | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 3                     | 5 – 8              | M4-32R-8                            | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 4                     | 6 – 10             | M4-32R-10                           | M4 32 VK3              | K3-10ND10 230EUR                                 | -                           |
| 5,5                   | 9 – 13             | M4-32R-13                           | M4 32 VK3              | K3-14ND10 230EUR                                 | -                           |
| 7,5                   | 11 – 17            | M4-32R-17                           | M4 32 VK3              | K3-18ND10 230EUR                                 | -                           |
| 7,5                   | 14 – 22            | M4-32R-22                           | M4 32 VK3              | K3-22ND10 230EUR                                 | -                           |
| 11                    | 18 – 26            | M4-32R-26                           | M4 32 VK3              | K3-22ND10 230EUR                                 | -                           |
| 15                    | 22 – 32            | M4-32R-32                           | M4 32 VD               | K3-32A00 230                                     | M4 32 HU1                   |
| 18,5                  | 28 – 40            | M4-32R-40                           | M4 32 VD               | K3-40A00 230                                     | M4 32 HU1                   |
| 12,5                  | 18 – 26            | M4-63R-26                           | M4 63 VD               | K3-32A00 230                                     | M4 63 HU1                   |
| 15                    | 22 – 32            | M4-63R-32                           | M4 63 VD               | K3-32A00 230                                     | M4 63 HU1                   |
| 18,5                  | 28 – 40            | M4-63R-40                           | M4 63 VD               | K3-40A00 230                                     | M4 63 HU1                   |
| 22                    | 34 – 50            | M4-63R-50                           | M4 63 VD               | K3-50A00 230                                     | M4 63 HU1                   |
| 30                    | 45 – 63            | M4-63R-63                           | M4 63 VD               | K3-62A00 230                                     | M4 63 HU1                   |
| 30                    | 45 – 63            | M4-100R-63                          | M4 100 VD              | K3-62A00 230                                     | M4 100 HU1                  |
| 37                    | 55 – 75            | M4-100R-75                          | M4 100 VD              | K3-74A00 230                                     | M4 100 HU1                  |
| 45                    | 70 – 90            | M4-100R-90                          | -                      | K3-90A00 230                                     | -                           |
| -                     | 80 – 100           | M4-100R-100                         | -                      | K3-115A00 230                                    | -                           |

1) Other conditions on request

2) Contactors K1.. 220-230V 50Hz, Contactors K3.. 220-240V 50Hz, further technical data see Catalog D677..

# Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660

This table shows the rated ultimate short-circuit breaking capacity  $I_{cu}$  and the rated service short-circuit breaking capacity  $I_{cs}$  of the M4 circuit-breakers with different operational voltages as a function of the rated current  $I_n$  of the circuit-breakers. The circuit-breakers can be fed at the top or bottom supply terminals without any reduction of the rated data.

If the short-circuit current exceeds the rated short-circuit breaking capacity of the circuit-breaker specified in the tables at the installation point, a back-up fuse is to be used. The maximum rated current for the back-up fuse is specified in the tables. These fuses are only suitable for the short-circuit-currents as indicated on the fuses.

| Circuit-breaker | Rated-current $I_n$ | up to AC 240V <sup>2)</sup> |          |                                    | up to AC 400V <sup>2)</sup><br>up to AC 415V <sup>3)</sup> |          |                                    | up to AC 440V <sup>2)</sup><br>up to AC 460V <sup>3)</sup> |          |                                    | up to AC 500V <sup>2)</sup><br>up to AC 525V <sup>3)</sup> |          |                                    | up to AC 690V <sup>2)</sup> |          |                                    |
|-----------------|---------------------|-----------------------------|----------|------------------------------------|--|----------|------------------------------------|--|----------|------------------------------------|--|----------|------------------------------------|-----------------------------|----------|------------------------------------|
|                 |                     | $I_{cu}$                    | $I_{cs}$ | max. fuse <sup>1)</sup><br>(gL/gG) | $I_{cu}$   | $I_{cs}$ | max. fuse <sup>1)</sup><br>(gL/gG) | $I_{cu}$   | $I_{cs}$ | max. fuse <sup>1)</sup><br>(gL/gG) | $I_{cu}$   | $I_{cs}$ | max. fuse <sup>1)</sup><br>(gL/gG) | $I_{cu}$                    | $I_{cs}$ | max. fuse <sup>1)</sup><br>(gL/gG) |
| Type            | A                   | kA                          | kA       | A                                  | kA   | kA       | A                                  | kA   | kA       | A                                  | kA   | kA       | A                                  | kA                          | kA       | A                                  |
| M4-32T          | 0,16 ... 0,63       | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100                         | 100      | --                                 |
|                 | 1                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100                         | 100      | --                                 |
|                 | 1,6                 | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 3                           | 3        | 20                                 |
|                 | 2,5                 | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 50   | 38       | 50                                 | 3                           | 3        | 35                                 |
|                 | 4                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 50   | 38       | 50                                 | 15   | 11       | 40                                 | 3                           | 3        | 40                                 |
|                 | 6                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 15   | 11       | 50                                 | 10   | 8        | 50                                 | 3                           | 3        | 50                                 |
|                 | 8                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 15   | 11       | 63                                 | 10   | 8        | 63                                 | 3                           | 3        | 63                                 |
|                 | 10                  | 100                         | 100      | --                                 | 50   | 38       | 80                                 | 15   | 11       | 63                                 | 6  | 5        | 63                                 | 3                           | 3        | 63                                 |
|                 | 13                  | 100                         | 100      | --                                 | 50   | 38       | 80                                 | 10   | 8        | 80                                 | 6  | 5        | 80                                 | 3                           | 3        | 63                                 |
|                 | 17                  | 50                          | 38       | --                                 | 20   | 15       | 100                                | 10   | 8        | 80                                 | 6  | 5        | 80                                 | 3                           | 3        | 63                                 |
|                 | 22                  | 40                          | 30       | 125                                | 15   | 11       | 100                                | 8  | 6        | 100                                | 6  | 5        | 80                                 | 3                           | 3        | 63                                 |
|                 | 26                  | 40                          | 30       | 125                                | 15   | 11       | 100                                | 8  | 6        | 100                                | 6  | 5        | 80                                 | 3                           | 3        | 63                                 |
|                 | 32                  | 30                          | 22       | 125                                | 15   | 11       | 100                                | 6  | 4        | 100                                | 5  | 4        | 80                                 | 3                           | 3        | 63                                 |
|                 | 40                  | 20                          | 15       | 160                                | 10   | 8        | 125                                | 5  | 3        | 100                                | 4  | 3        | 80                                 | 2                           | 2        | 63                                 |
| M4-32R          | 0,16 ... 1,0        | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100                         | 100      | --                                 |
|                 | 1,6                 | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100                         | 100      | --                                 |
|                 | 2,5                 | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 8                           | 8        | 35                                 |
|                 | 4                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 8                           | 8        | 40                                 |
|                 | 6                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 100  | 100      | --                                 | 6                           | 6        | 50                                 |
|                 | 8                   | 100                         | 100      | --                                 | 100  | 100      | --                                 | 50   | 38       | 80                                 | 50   | 38       | 63                                 | 6                           | 6        | 63                                 |
|                 | 10                  | 100                         | 100      | --                                 | 100  | 100      | --                                 | 50   | 38       | 80                                 | 50   | 38       | 80                                 | 6                           | 6        | 63                                 |
|                 | 13                  | 100                         | 100      | --                                 | 100  | 100      | --                                 | 50   | 38       | 80                                 | 42   | 32       | 80                                 | 6                           | 6        | 63                                 |
|                 | 17                  | 100                         | 100      | --                                 | 50   | 38       | 100                                | 25   | 15       | 80                                 | 10   | 8        | 80                                 | 4                           | 4        | 63                                 |
|                 | 22                  | 100                         | 100      | --                                 | 50   | 38       | 125                                | 25   | 15       | 100                                | 10   | 8        | 80                                 | 4                           | 4        | 63                                 |
| 26              | 100                 | 100                         | --       | 50                                 | 38   | 125      | 25                                 | 15   | 100      | 10                                 | 8  | 80       | 4                                  | 4                           | 63       |                                    |
| 32              | 100                 | 100                         | --       | 50                                 | 38   | 125      | 25                                 | 15   | 100      | 10                                 | 8  | 80       | 4                                  | 4                           | 63       |                                    |
| 40              | 100                 | 100                         | --       | 40                                 | 30   | 160      | 15                                 | 11   | 125      | 8                                  | 6  | 160      | 3                                  | 3                           | 80       |                                    |
| M4-63R          | 26                  | 100                         | 100      | --                                 | 50   | 50       | 125                                | 35   | 27       | 125                                | 12   | 9        | 100                                | 5                           | 5        | 80                                 |
|                 | 32                  | 100                         | 100      | --                                 | 50   | 50       | 125                                | 35   | 27       | 125                                | 10   | 8        | 100                                | 5                           | 5        | 80                                 |
|                 | 40                  | 100                         | 100      | --                                 | 50   | 50       | 160                                | 35   | 27       | 125                                | 10   | 8        | 100                                | 5                           | 5        | 80                                 |
|                 | 50                  | 100                         | 100      | --                                 | 50   | 50       | 160                                | 35   | 27       | 125                                | 10   | 8        | 100                                | 5                           | 5        | 80                                 |
|                 | 63                  | 100                         | 100      | --                                 | 50   | 50       | 160                                | 35   | 27       | 160                                | 10   | 8        | 100                                | 5                           | 5        | 80                                 |
| M4-100R         | 63                  | 100                         | 100      | --                                 | 50   | 38       | 160                                | 40   | 30       | 160                                | 12   | 9        | 100                                | 6                           | 5        | 80                                 |
|                 | 75                  | 100                         | 100      | --                                 | 50   | 38       | 160                                | 40   | 30       | 160                                | 8  | 6        | 125                                | 5                           | 4        | 100                                |
|                 | 90                  | 100                         | 100      | --                                 | 50   | 38       | 160                                | 40   | 30       | 160                                | 8  | 6        | 125                                | 5                           | 4        | 125                                |
|                 | 100                 | 100                         | 100      | --                                 | 50   | 38       | 160                                | 40   | 30       | 160                                | 8  | 6        | 125                                | 5                           | 4        | 125                                |

-- No back-up fuse required

1) Back up fuse required if short-circuit current at installation point  $I_{cc} > I_{cu}$




2) 10 % overvoltage

3) 5 % overvoltage

## Main Circuit

| Type   |   | M4-32T            | M4-32R                    | M4-63R                    | M4-100R                   |
|--|---|-------------------|---------------------------|---------------------------|---------------------------|
| <b>Number of poles</b>   |   | 3                 | 3                         | 3                         | 3                         |
| <b>Max. rated current <math>I_{nmax}</math> (=max. rated operational current <math>I_n</math>)</b>                       | A   | 40                | 40                        | 63                        | 100                       |
| <b>Permissible ambient temperature</b>   |   |                   |                           |                           |                           |
| Storage/transport  | °C  | -50 to +80        | -50 to +80                | -50 to +80                | -50 to +80                |
| Operation  | °C  | -20 to +60        | -20 to +60                | -20 to +60                | -20 to +60                |
| Storage/transport  | °F  | -58 to +176       | -58 to +176               | -58 to +176               | -58 to +176               |
| Operation  | °F  | -4 to +140        | -4 to +140                | -4 to +140                | -4 to +140                |
| <b>Rated insulation voltage <math>U_i</math></b>   | V   | 690 <sup>1)</sup> | 690 <sup>1)</sup>         | 1000 <sup>2)</sup>        | 1000 <sup>2)</sup>        |
| <b>Rated impulse withstand voltage <math>U_{imp}</math></b>  | kV  | 6                 | 6                         | 8                         | 8                         |
| <b>Rated operational voltage <math>U_e</math></b>  | V   | 690               | 690                       | 690                       | 690                       |
| <b>Rated frequency</b>   | Hz  | 50/60             | 50/60                     | 50/60                     | 50/60                     |
| <b>Utilization category</b>  |   |                   |                           |                           |                           |
| IEC 60947-2 (circuit-breaker)  |   | A                 | A                         | A                         | A                         |
| IEC 60947-4-1 (motor starter)  |   | AC3               | AC3                       | AC3                       | AC3                       |
| <b>Class</b>   | acc. to IEC 60947-4-1   | 10                | 10                        | 10                        | 10                        |
| <b>Power loss <math>P_v</math> per circuit-breaker dependent on rated current <math>I_n</math> (upper setting range)</b> | $I_n \rightarrow 0,16$ up to 1,6 A<br>$I_n \rightarrow 2,5$ up to 26 A<br>$I_n \rightarrow 32$ A    | W<br>W<br>W       | 4,4<br>7,4<br>4           | 4,4<br>7,4<br>-           | -<br>-<br>-               |
| <b>R per conducting path = <math>P/I^2 \times 3</math></b>   | $I_n \rightarrow 26$ up to 63 A<br>$I_n \rightarrow$ up to 63 A<br>$I_n \rightarrow 75$ up to 100 A | W<br>W<br>W       | -<br>-<br>-               | -<br>-<br>-               | -<br>21,8<br>17,8         |
| <b>Shock resistance</b>  | acc. to IEC 60068 Part 2-27   | g                 | 25                        | 25                        | 25                        |
| <b>Degree of protection</b>  | acc. to IEC 60529   |                   | IP 20                     | IP 20                     | IP 20                     |
| <b>Shock hazard protection</b>   | acc. to DIN VDE 0106 Part 100   |                   | safe against finger touch | safe against finger touch | safe against finger touch |
| <b>Temperature compensation</b>  | acc. to IEC 60947-4-1   | °C                | -20 to +60                | -20 to +60                | -20 to +60                |
| <b>Mechanical endurance</b>  | operating cycles  |                   | 100 000                   | 100 000                   | 50 000                    |
| <b>Electrical endurance</b>  |   |                   | 100 000                   | 100 000                   | 25 000                    |
| <b>Max. operating frequency per hour (motor starts)</b>  | 1/h   |                   | 25                        | 25                        | 25                        |

## Approvals

| Country Type |  USA, Canada<br>UL |  Switzerland<br>SEV |  Europe<br>CE | CB/CCA-Certificates |
|--------------|---|--|--|---------------------|
| M4-32T       | o   | o  | /  | o                   |
| M4-32R       | o   | o  | /  | o                   |
| M4-63R       | o   | o  | /  | o                   |
| M4-100R      | o   | o  | /  | o                   |
| M4 H..       | o   | -  | /  | -                   |
| M4 M..       | o   | -  | /  | -                   |
| M4 U..       | o   | -  | /  | -                   |
| M4 A..       | o   | -  | /  | -                   |





o In standard version approved / No testing required CE x In test  
 - Not provided for test till now

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 6kV$ .

2) Suitable at 1000V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .

3) Data for other conditions on request.

Conductor cross-sections for main circuit

| Type  | Terminal type, screw type | Tightening torque |         | Conductor, cross-sections solid    |                                  | Conductor, cross-sections stranded |                                  | Conductor, cross-sections flexible |                                |
|---|---------------------------|-------------------|---------|------------------------------------|----------------------------------|------------------------------------|----------------------------------|------------------------------------|--------------------------------|
|   |                           | Nm                | lb - in | mm <sup>2</sup>                    | AWG                              | mm <sup>2</sup>                    | AWG                              | mm <sup>2</sup>                    | AWG                            |
| M4-32T   | Pz2                       | 0,8 - 2,5         | 7 - 22  | 1 x (1 - 10)<br>2 x (1 - 6)        | 1 x (18 - 8)<br>2 x (18 - 10)    | 1 x (1 - 6)<br>2 x (1 - 6)         | 1 x (18 - 10)<br>2 x (18 - 10)   | 1 x (1 - 6)<br>2 x (0,75 - 4)      | 1 x (18 - 10)<br>2 x (18 - 10) |
| M4-32R   | Pz2                       | 0,8 - 2,5         | 7 - 22  | 1 x (1 - 10)<br>2 x (1 - 6)        | 1 x (18 - 8)<br>2 x (18 - 10)    | 1 x (1 - 6)<br>2 x (1 - 6)         | 1 x (18 - 10)<br>2 x (18 - 10)   | 1 x (1 - 6)<br>2 x (0,75 - 4)      | 1 x (18 - 10)<br>2 x (18 - 10) |
| M4-63R   | Pz2                       | 3 - 4,5           | 26 - 39 | 1 x (0,75 - 35)<br>2 x (0,75 - 25) | 1 x (18 - 2)<br>2 x (18 - 4)     | 1 x (0,75 - 35)<br>2 x (0,75 - 25) | 1 x (18 - 2)<br>2 x (18 - 4)     | 1 x (0,75 - 25)<br>2 x (0,75 - 16) | 1 x (18 - 4)<br>2 x (18 - 6)   |
| M4-100R  | 4mm hexagon socket screw  | 4 - 6             | 35 - 53 | 1 x (2,5 - 70)<br>2 x (2,5 - 50)   | 1 x (12 - 2/0)<br>2 x (12 - 1/0) | 1 x (2,5 - 70)<br>2 x (2,5 - 50)   | 1 x (12 - 2/0)<br>2 x (12 - 1/0) | 1 x (2,5 - 50)<br>2 x (2,5 - 35)   | 1 x (12 - 1/0)<br>2 x (10 - 2) |

Auxiliary switches

| Type   | Rated operational voltage |    | Rated operational current |   | Rated operational voltage |    | Rated operational current |    |     |   |      |
|--|---------------------------|----|---------------------------|---|---------------------------|----|---------------------------|----|-----|---|------|
|  | U <sub>e</sub>            |    | I <sub>e</sub> /AC-15     |   | U <sub>e</sub>            |    | I <sub>e</sub> /DC-13     |    |     |   |      |
|  | AC                        |    |                           |   | DC L/R<br>200 ms          |    |                           |    |     |   |      |
|  | V                         |    | A                         | A |                           | V  | A                         |    |     |   |      |
| Front transverse auxiliary switch              | M4 HQ..                   | 24 | 240                       | 3 | 3                         | 5  | 5                         | 24 | 220 | 1 | 0,1  |
| Lateral auxiliary switch and signalling switch | M4 HS..                   |    |                           |   |                           |    |                           |    |     |   |      |
|  | M4 M..                    | 24 | 240                       | 6 | 4                         | 10 | 10                        | 24 | 220 | 2 | 0,25 |

| Type                 | Power consumption during pick-up |       | Response voltage trip | Response voltage pick-up | Response voltage acc. to IEC 60947-1 |
|----------------------|----------------------------------|-------|-----------------------|--------------------------|--------------------------------------|
|                      | VA/W                             | V     |                       |                          |                                      |
| Undervoltage release | M4 U..                           | 8,5/6 | 3/1,2                 | 0,7 - 0,35xUs            | 0,85 - 1,1xUs                        |
| Shunt release        | M4 A..                           | 8,5/6 | 3/1,2                 |                          | 0,7 - 1,1xUs                         |

| Short-circuit protection for auxiliary and control circuits | Fuse  | Miniature circuit breaker | solid  | flexible                          | AWG-wires, solid                             | flexible                       |
|---|-------|---------------------------|--|-----------------------------------|--|--------------------------------|
|   | gL/gG | C-characteristic          | mm <sup>2</sup>                                  | mm <sup>2</sup>                   | AWG  | AWG                            |
|   | A     | A                         |  |                                   |  |                                |
| Short-circuit protection for auxiliary and control circuits | 16    | 6                         |  |                                   |  |                                |
| Conductor cross-sections for auxiliary and control circuits |       |                           | 1 x (0,5 - 2,5)<br>2 x (0,5 - 2,5) <sup>1)</sup> | 1 x (0,5 - 4)<br>2 x (0,75 - 2,5) | 1 x (20 - 14)<br>2 x (20 - 14) <sup>1)</sup> | 1 x (20 - 10)<br>2 x (18 - 14) |

1) M4 HQ.. 1 solid conductor only



## Permissible ratings of devices approved for North America

### Circuit breakers M4 as „Manual Motor Starter“

If used as „Manual Motor Starter“ the circuit breaker is always operated in combination with a short circuit device. For use with approbated fuses or circuit breakers according to UL489 or CSA22.2 No. 5 only. The sizes are selected according to National Electrical Code (UL), or Canadian Electrical Code (CSA).

| Typ            | Rated operational current<br>le<br>A | Max. short-circuit current |            |            | Motor load<br>1-phase |            | Motor load<br>3-phase |            |            |            | Max.<br>rated<br>fuse<br>A | Max.<br>breaker<br>size<br>A |
|----------------|--------------------------------------|----------------------------|------------|------------|-----------------------|------------|-----------------------|------------|------------|------------|----------------------------|------------------------------|
|                |                                      | 240V<br>kA                 | 480V<br>kA | 600V<br>kA | 115V<br>HP            | 230V<br>HP | 200V<br>HP            | 230V<br>HP | 460V<br>HP | 600V<br>HP |                            |                              |
| <b>M4-32T</b>  | 0,16 ... 0,63                        | 100                        | 50         | 10         | -                     | -          | -                     | -          | -          | -          | 1                          | 15                           |
|                | 1                                    | 100                        | 50         | 10         | -                     | -          | -                     | -          | -          | 1/2        | 3                          | 15                           |
|                | 1,6                                  | 100                        | 50         | 10         | -                     | 1/10       | -                     | -          | 3/4        | 3/4        | 6                          | 15                           |
|                | 2,5                                  | 100                        | 50         | 10         | -                     | 1/6        | 1/2                   | 1/2        | 1          | 1 1/2      | 10                         | 15                           |
|                | 4                                    | 100                        | 50         | 5          | 1/8                   | 1/3        | 3/4                   | 3/4        | 2          | 3          | 15                         | 15                           |
|                | 6                                    | 100                        | 25         | 5          | 1/4                   | 1/2        | 1                     | 1 1/2      | 3          | 5          | 20                         | 20                           |
|                | 8                                    | 100                        | 25         | 5          | 1/3                   | 1          | 2                     | 2          | 5          | 5          | 30                         | 30                           |
|                | 10                                   | 50                         | 10         | 5          | 1/2                   | 1 1/2      | 2                     | 3          | 5          | 7 1/2      | 40                         | 40                           |
|                | 13                                   | 50                         | 10         | 5          | 1/2                   | 2          | 3                     | 3          | 7 1/2      | 10         | 50                         | 50                           |
|                | 17                                   | 40                         | 10         | 5          | 1                     | 3          | 3                     | 5          | 10         | 15         | 60                         | 60                           |
|                | 22                                   | 30                         | 10         | 5          | 1 1/2                 | 3          | 5                     | 7 1/2      | 15         | 20         | 80                         | 80                           |
|                | 26                                   | 30                         | 7,5        | 5          | 2                     | 3          | 7 1/2                 | 7 1/2      | 15         | 20         | 100                        | 100                          |
|                | 32                                   | 20                         | 7,5        | 5          | 2                     | 5          | 7 1/2                 | 10         | 20         | 30         | 125                        | 125                          |
|                | 40                                   | 20                         | 7,5        | 5          | 3                     | 7 1/2      | 10                    | 10         | 30         | 30         | 150                        | 150                          |
| <b>M4-32R</b>  | 0,16 ... 0,63                        | 100                        | 50         | 10         | -                     | -          | -                     | -          | -          | -          | 1                          | 15                           |
|                | 4                                    | 100                        | 50         | 10         | 1/8                   | 1/3        | 3/4                   | 3/4        | 2          | 3          | 15                         | 15                           |
|                | 6                                    | 100                        | 50         | 10         | 1/4                   | 1/2        | 1                     | 1 1/2      | 3          | 5          | 20                         | 20                           |
|                | 8                                    | 100                        | 50         | 10         | 1/3                   | 1          | 2                     | 2          | 5          | 5          | 30                         | 30                           |
|                | 10                                   | 100                        | 50         | 10         | 1/2                   | 1 1/2      | 2                     | 3          | 5          | 7 1/2      | 40                         | 40                           |
|                | 13                                   | 100                        | 50         | 10         | 1/2                   | 2          | 3                     | 3          | 7 1/2      | 10         | 50                         | 50                           |
|                | 17                                   | 100                        | 30         | 10         | 1                     | 3          | 3                     | 5          | 10         | 15         | 60                         | 60                           |
|                | 22                                   | 100                        | 30         | 10         | 1 1/2                 | 3          | 5                     | 7 1/2      | 15         | 20         | 80                         | 80                           |
|                | 26                                   | 100                        | 30         | 10         | 2                     | 3          | 7 1/2                 | 7 1/2      | 15         | 20         | 100                        | 100                          |
|                | 32                                   | 100                        | 30         | 10         | 2                     | 5          | 7 1/2                 | 10         | 20         | 30         | 125                        | 125                          |
|                | 40                                   | 100                        | 30         | 10         | 3                     | 7 1/2      | 10                    | 10         | 30         | 30         | 150                        | 150                          |
| <b>M4-63R</b>  |                                      | 100                        | 50         | 10         | 2                     | 3          | 7 1/2                 | 7 1/2      | 15         | 20         | 100                        | 100                          |
|                | 32                                   | 100                        | 50         | 10         | 2                     | 5          | 7 1/2                 | 10         | 20         | 30         | 125                        | 125                          |
|                | 40                                   | 100                        | 50         | 10         | 3                     | 7 1/2      | 10                    | 10         | 30         | 30         | 150                        | 150                          |
|                | 50                                   | 100                        | 50         | 10         | 5                     | 10         | 15                    | 15         | 30         | 40         | 200                        | 200                          |
|                | 63                                   | 100                        | 50         | 10         | 5                     | 10         | 20                    | 20         | 40         | 60         | 250                        | 250                          |
| <b>M4-100R</b> | 63                                   | 100                        | 25         | 10         | 5                     | 10         | 20                    | 20         | 40         | 60         | 250                        | 250                          |
|                | 75                                   | 100                        | 25         | 10         | 5                     | 15         | 20                    | 25         | 50         | 60         | 300                        | 300                          |
|                | 90                                   | 100                        | 25         | 10         | 7 1/2                 | 20         | 25                    | 30         | 60         | 75         | 350                        | 350                          |
|                | 100                                  | 100                        | 25         | 10         | 10                    | 20         | 30                    | 30         | 75         | 100        | 400                        | 400                          |

## Permissible ratings of devices approved for North America

Circuit breakers M4 as „Combination Motor Controller Type E“ and "Suitable for Group Installation"

Acc to UL 508 demands a line-side 1 inch air and 2 inch creepage distance for „Combination Motor Controller Type E“ is necessary. Therefore circuit-breaker M4-32R is approved to UL 508 in combination with the Terminal block M4 32R E. Circuit-breakers M4-100 are approved to UL 508 in combination with the insulation barriers M4 100 E. According to CSA these terminal blocks can be omitted when the device is used as „Combination Motor Controller Type E“.

| Type           | Rated operational current I <sub>e</sub><br>A | Max. short-circuit current |            |            | Motor load 1-phase |            | Motor load 3-phase |            |            |            | Max. rated fuse<br>A | Max. breaker<br>A |
|----------------|---|----------------------------|------------|------------|--------------------|------------|--------------------|------------|------------|------------|----------------------|-------------------|
|                |   | 240V<br>kA                 | 480V<br>kA | 600V<br>kA | 115V<br>HP         | 230V<br>HP | 200V<br>HP         | 230V<br>HP | 460V<br>HP | 600V<br>HP |                      |                   |
| <b>M4-32R</b>  | 0,16 ... 0,63                                 | 100                        | 65         | 25         | -                  | -          | -                  | -          | -          | -          | 500                  | 500               |
| (+M4 32R E)    | 1   | 100                        | 65         | 25         | -                  | -          | -                  | -          | -          | 1/2        | 500                  | 500               |
|                | 1,6   | 100                        | 65         | 25         | -                  | 1/10       | -                  | -          | 3/4        | 3/4        | 500                  | 500               |
|                | 2,5   | 100                        | 65         | 25         | -                  | 1/6        | 1/2                | 1/2        | 1          | 1 1/2      | 500                  | 500               |
|                | 4   | 100                        | 65         | 25         | 1/8                | 1/3        | 3/4                | 3/4        | 2          | 3          | 500                  | 500               |
|                | 6   | 100                        | 65         | 25         | 1/4                | 1/2        | 1                  | 1 1/2      | 3          | 5          | 500                  | 500               |
|                | 8   | 100                        | 65         | 25         | 1/3                | 1          | 2                  | 2          | 5          | 5          | 500                  | 500               |
|                | 10  | 100                        | 65         | 25         | 1/2                | 1 1/2      | 2                  | 3          | 5          | 7 1/2      | 500                  | 500               |
|                | 13  | 100                        | 65         | 25         | 1/2                | 2          | 3                  | 3          | 7 1/2      | 10         | 500                  | 500               |
|                | 17  | 100                        | 30         | 10         | 1                  | 3          | 3                  | 5          | 10         | 15         | 500                  | 500               |
|                | 22  | 100                        | 30         | 10         | 1 1/2              | 3          | 5                  | 7 1/2      | 15         | 20         | 500                  | 500               |
|                | 26  | 100                        | 30         | 10         | 2                  | 5          | 7 1/2              | 7 1/2      | 15         | 20         | 500                  | 500               |
|                | 32  | 100                        | 30         | 10         | 2                  | 5          | 7 1/2              | 10         | 20         | 30         | 500                  | 500               |
|                | 40  | 100                        | 30         | 10         | 3                  | 7 1/2      | 10                 | 10         | 30         | 30         | 500                  | 500               |
| <b>M4-63R</b>  | 26  | 100                        | 50         | 10         | 2                  | 3          | 7 1/2              | 7 1/2      | 15         | 20         | 600                  | 600               |
|                | 32  | 100                        | 50         | 10         | 2                  | 5          | 7 1/2              | 10         | 20         | 30         | 600                  | 600               |
|                | 40  | 100                        | 50         | 10         | 3                  | 7 1/2      | 10                 | 10         | 30         | 30         | 600                  | 600               |
|                | 50  | 100                        | 50         | 10         | 5                  | 10         | 15                 | 15         | 30         | 40         | 600                  | 600               |
|                | 63  | 100                        | 50         | 10         | 5                  | 10         | 20                 | 20         | 40         | 60         | 600                  | 600               |
| <b>M4-100R</b> | 63  | 100                        | 40         | 10         | 5                  | 10         | 20                 | 20         | 40         | 60         | 1000                 | 1000              |
| (+M4 100 E)    | 75  | 100                        | 40         | 10         | 5                  | 15         | 20                 | 25         | 50         | 60         | 1000                 | 1000              |
|                | 90  | 100                        | 40         | 10         | 7 1/2              | 20         | 25                 | 30         | 60         | 75         | 1000                 | 1000              |
|                | 100   | 100                        | 40         | 10         | 10                 | 20         | 30                 | 30         | 75         | 100        | 1000                 | 1000              |

## Ratings of auxiliary switches and alarm switches

|  | Breaking capacity |      | Rated operational voltage<br>max. V AC | Rated operational current<br>A |
|--|-------------------|------|--|--------------------------------|
|  | AC                | DC   |  |                                |
| Lateral auxiliary <b>M4 HS..</b> and signalling switch <b>M4 M..</b> | A600              | Q300 | 600                                    | 10                             |
| Transversal auxiliary switch <b>M4 HQ..</b>                          | A300              | R300 | 240                                    | 5                              |

# Description

## Releases

Circuit-breakers M4 are equipped with bimetallic-based, inverse-time delayed overload releases and with instantaneous overcurrent releases (electromagnetic short-circuit releases). The overload releases can be set in accordance with the load current. The overcurrent releases are permanently set to a value 13 times the rated current and thus enable trouble-free start-up of motors. The scale cover can be sealed to prevent unauthorized adjustments to the set current.

## Operating mechanisms

Circuit-breakers M4-32T are actuated via a rocker operating mechanism and circuit-breakers M4-32R, M4-63R and M4-100R via a rotary operating mechanism. An electrical signal can be output, at all Circuit-breakers, via a signalling switch to indicate that the Circuit-breaker has tripped. All operating mechanisms can be locked in the 0 position with a padlock (shackle diameter 3.5 to 4.5 mm). The M4 Circuit-breakers fulfil the isolation characteristics specified in IEC 60947-2.

## Operating conditions

Circuit-breakers M4 are suitable for use in any climate. To avoid error tripping we recommend to protect the Circuit Breakers M4 against fresh and cold air (caused by air condition etc.) They are designed for operation in enclosed rooms under normal conditions (e. g. no dust, corrosive vapours or harmful gases). Suitable enclosures must be provided for installation in dusty or damp rooms. Circuit-breakers M4 can also be fed from below. In order to prevent premature tripping due to phase failure sensitivity, the three conducting paths must always be uniformly loaded. The conducting paths must be connected in series in the case of single-phase loads.

## Short-circuit protection

The short-circuit releases of M4 circuit-breakers disconnect the faulty load feeder from the system in the event of a short circuit and thus prevent any further damage from being caused. Circuit-breakers with a short-circuit breaking capacity of 50 kA or 100 kA at a voltage of 400 V AC are practically short-circuit-proof at this voltage, as higher short-circuit currents are not usually encountered at the installation point. Back-up fuses are only necessary if the short-circuit current at the installation point exceeds the rated ultimate short-circuit breaking capacity of the circuit-breakers.

## Motor protection

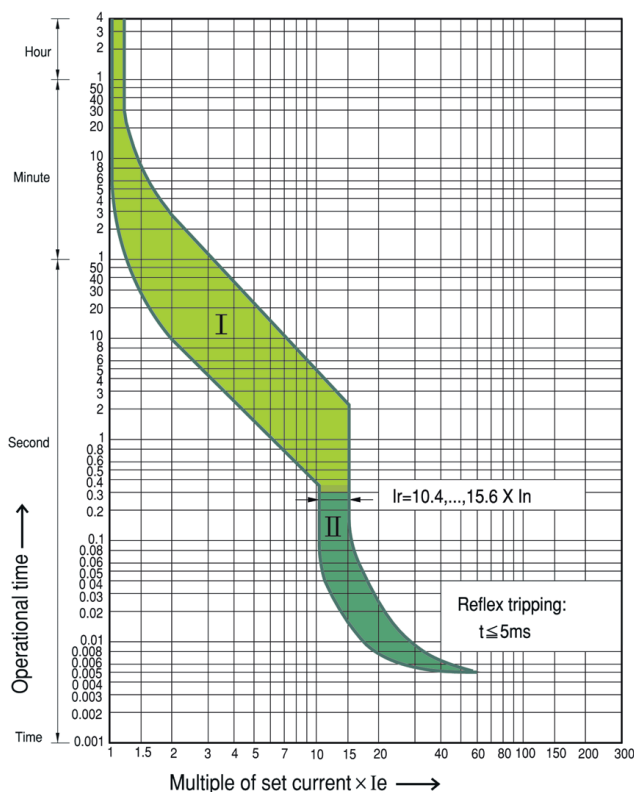
The tripping characteristics of M4 circuit-breakers are designed mainly to protect three-phase induction motors. The circuit-breakers are therefore also referred to as Manual Motor Starters. The current of the motor to be protected is set with the aid of the scale.

## Line protection

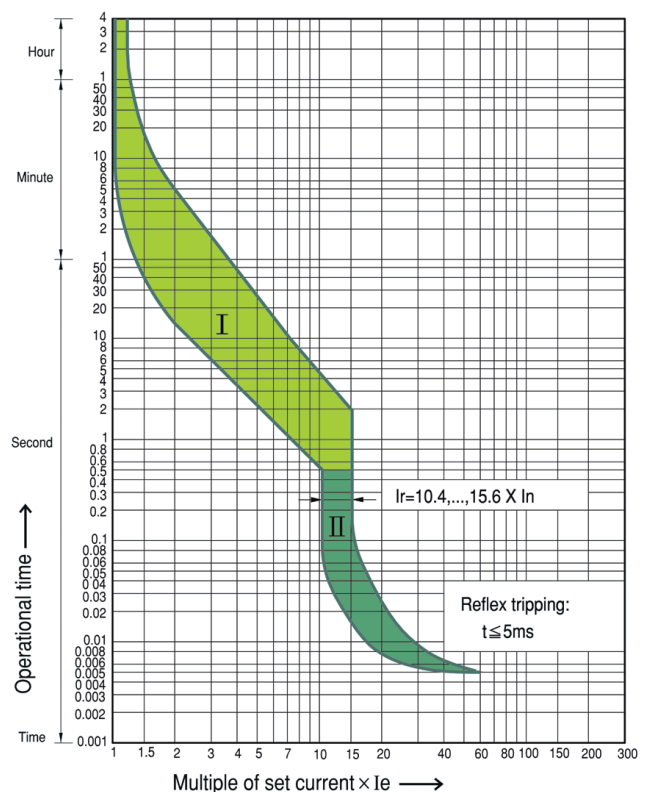
M4 Circuit-breakers for motor protection are also suitable for line protection. The M4 Circuit-breakers fulfil the isolation conditions of IEC 60 947-3 as well as the additional test conditions for circuit-breakers with isolation characteristics specified in IEC 60947-2. Taking IEC 60 204-1 into consideration, they can thus be implemented as main and EMERGENCY STOP switches. Door-coupling rotary operating mechanism do not fulfil the isolation characteristics.

# Tripping-Characteristics

M4-32



M4-63R, M4-100R



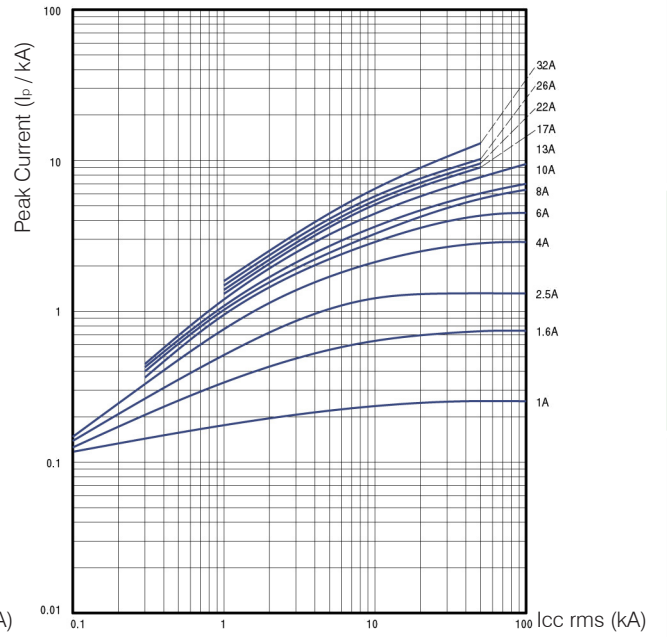
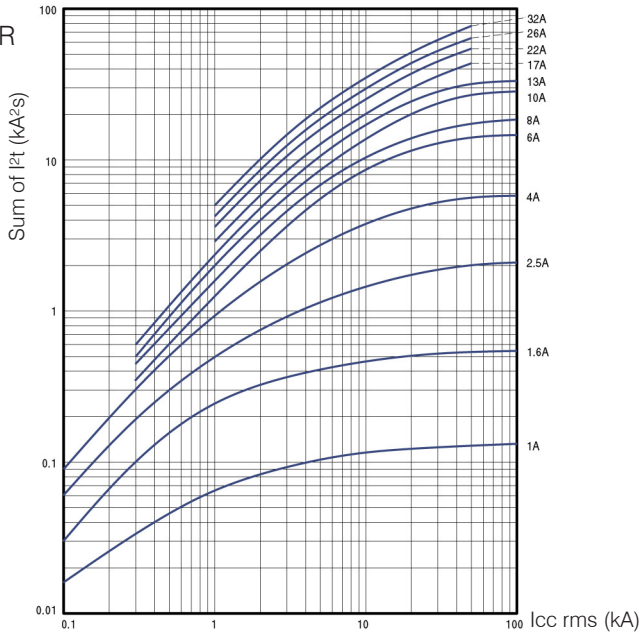
- I The curve shows the mean operating current at an ambient temperature of 20°C starting from cold.
- II The tripping characteristic of electromagnetic overcurrent releases (short-circuit releases)

The tripping characteristic of the inverse-time delayed overload releases apply for DC and AC with a frequency of 0 to 400 Hz. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

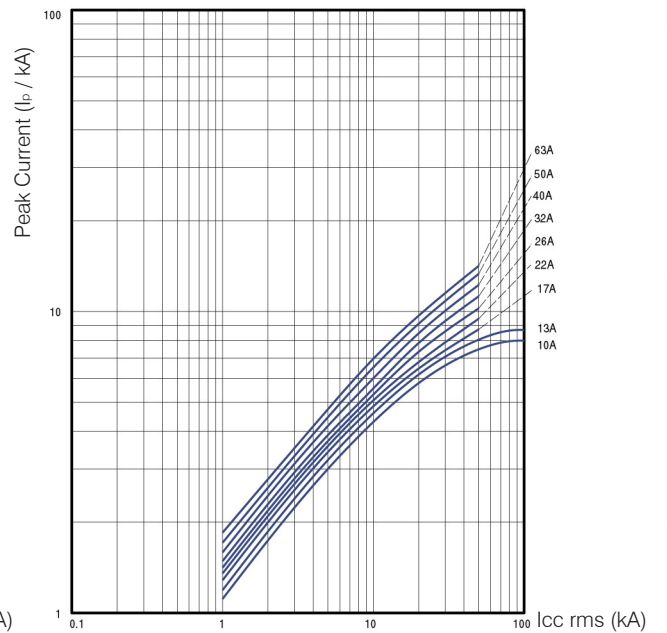
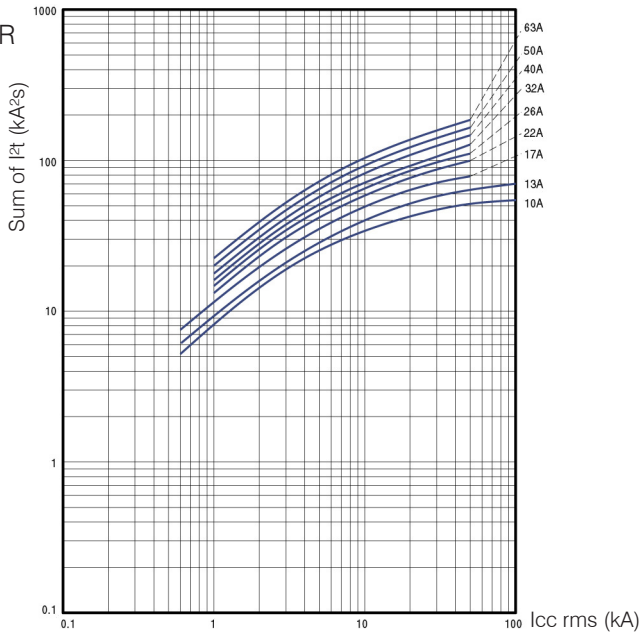
The characteristic shown here is a schematic representation of circuit-breakers for all ranges. Current limiting characteristics and I<sup>2</sup>t characteristics are available on request.

Let-through Energy ( $I^2t$  /  $\text{kA}^2\text{s}$ ) and Peak Current ( $I_p$  /  $\text{kA}$ ) at  $U_e=415\text{V}$

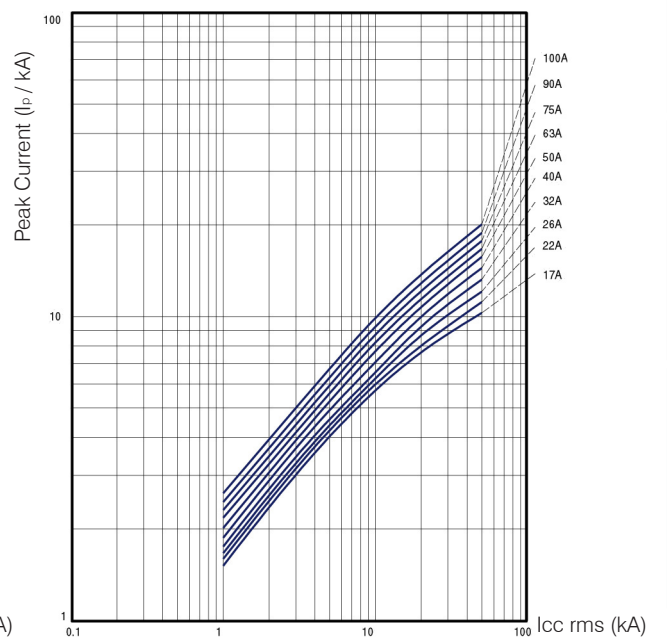
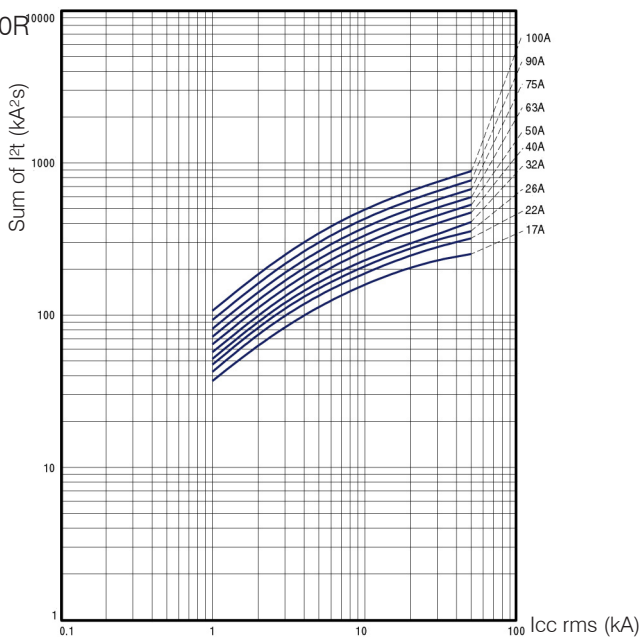
M4-32R



M4-63R



M4-100R



# Circuit Breakers M4 for Motor Control



## Technical Information IE3-Motor

| Rated Current In<br>A | Instantaneous Short Circuit Release<br>A | Setting range Thermal Overload Release<br>A |     | Instantaneous Short Circuit Release Ratio<br>A |     |
|-----------------------|--|---|-----|--|-----|
|                       |  | Min   | Max | Min  | Max |

### Circuit Breakers M4-32T-..., M4-32R-...



|      |      |      |      |    |    |
|------|------|------|------|----|----|
| 0,16 | 2,1  | 0,1  | 0,16 | 21 | 13 |
| 0,25 | 3,3  | 0,16 | 0,25 | 20 | 13 |
| 0,4  | 5,2  | 0,25 | 0,4  | 21 | 13 |
| 0,63 | 8,2  | 0,4  | 0,63 | 21 | 13 |
| 1    | 13   | 0,63 | 1    | 21 | 13 |
| 1,6  | 20,8 | 1    | 1,6  | 21 | 13 |
| 2,5  | 32,5 | 1,6  | 2,5  | 20 | 13 |
| 4    | 52   | 2,5  | 4    | 21 | 13 |
| 6    | 78   | 4    | 6    | 20 | 13 |
| 8    | 104  | 5    | 8    | 21 | 13 |
| 10   | 130  | 6    | 10   | 22 | 13 |
| 13   | 169  | 9    | 13   | 19 | 13 |
| 17   | 221  | 11   | 17   | 20 | 13 |
| 22   | 286  | 14   | 22   | 20 | 13 |
| 26   | 338  | 18   | 26   | 19 | 13 |
| 32   | 416  | 22   | 32   | 19 | 13 |
| 40   | 520  | 28   | 40   | 19 | 13 |

### Circuit Breakers M4-63R-...



|    |     |    |    |    |    |
|----|-----|----|----|----|----|
| 10 | 130 | 6  | 10 | 22 | 13 |
| 13 | 169 | 9  | 13 | 19 | 13 |
| 17 | 221 | 11 | 17 | 20 | 13 |
| 22 | 286 | 14 | 22 | 20 | 13 |
| 26 | 338 | 18 | 26 | 19 | 13 |
| 32 | 416 | 22 | 32 | 19 | 13 |
| 40 | 520 | 28 | 40 | 19 | 13 |
| 50 | 650 | 34 | 50 | 19 | 13 |
| 63 | 819 | 45 | 63 | 18 | 13 |
| 65 | 845 | 47 | 65 | 18 | 13 |

### Circuit Breakers M4-100R-...



|     |      |    |     |    |    |
|-----|------|----|-----|----|----|
| 17  | 221  | 11 | 17  | 20 | 13 |
| 22  | 286  | 14 | 22  | 20 | 13 |
| 26  | 338  | 18 | 26  | 19 | 13 |
| 32  | 416  | 22 | 32  | 19 | 13 |
| 40  | 520  | 28 | 40  | 19 | 13 |
| 50  | 650  | 34 | 50  | 19 | 13 |
| 63  | 819  | 45 | 63  | 18 | 13 |
| 75  | 975  | 55 | 75  | 18 | 13 |
| 90  | 1170 | 70 | 90  | 17 | 13 |
| 100 | 1300 | 80 | 100 | 16 | 13 |

- What is the IE3?  
Motor is rated from IE1 through IE4 depends on its energy efficiency which means IE3 is more efficient compared to IE1 and IE2-rated motors.

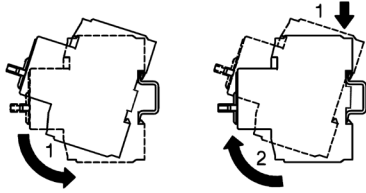
IEC 60034-30 standard specifies IE classes for motors in accordance with the above requirements. Therefore, consumers must comply with the standard when using Circuit Breaker products.

- IE1 Standard Efficiency
- IE2 High Efficiency
- IE3 Premium Efficiency
- IE4 Super Premium Efficiency Was bedeutet IE3?

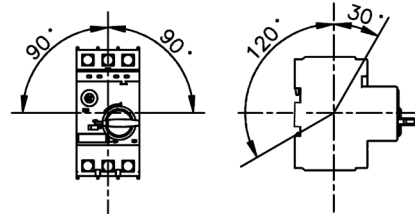
Pay attention that the ratio between inrush current and rated current of the motor is smaller than the instantaneous short circuit release ratio of the Circuit Breaker for Motor Control.

# Mounting

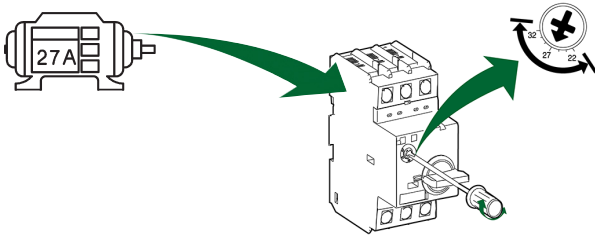
## DIN-rail mounting



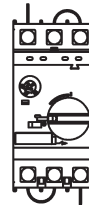
## Operating positions



## Current setting (dont rotate the dial out of the shown range)

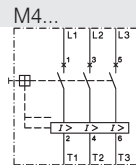


## Connection of 1-phase motor

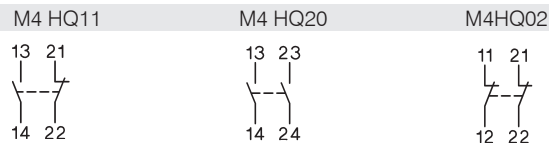


# Wiring diagrams

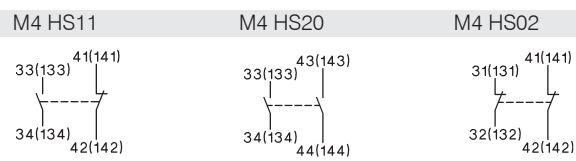
## Circuit breaker



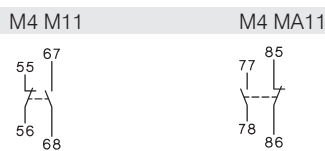
## Traverse Aux. Contact Block



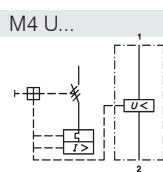
## Aux. Contact Block (side mounted)



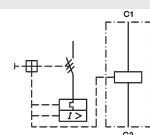
## Alarm Switch



## Undervoltage Release

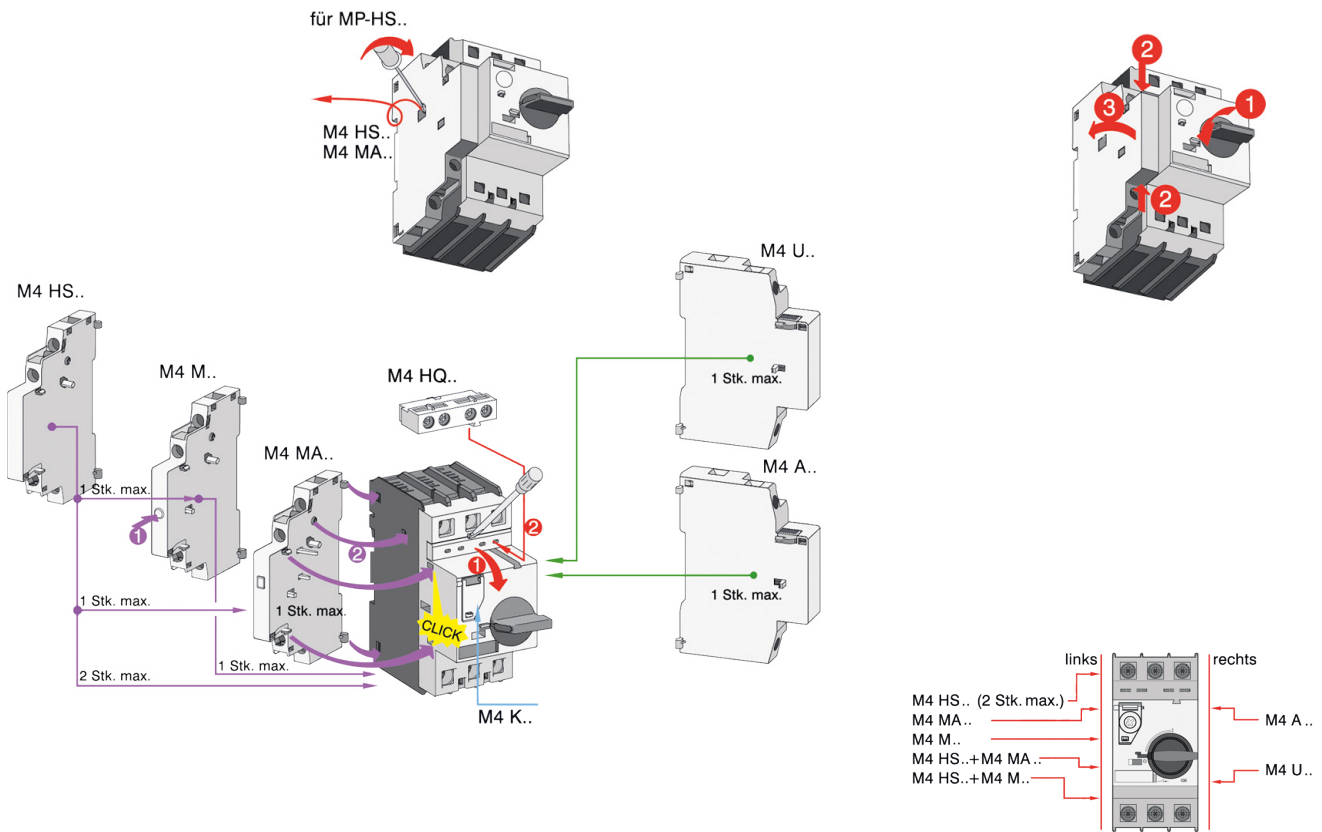


## Shunt Release

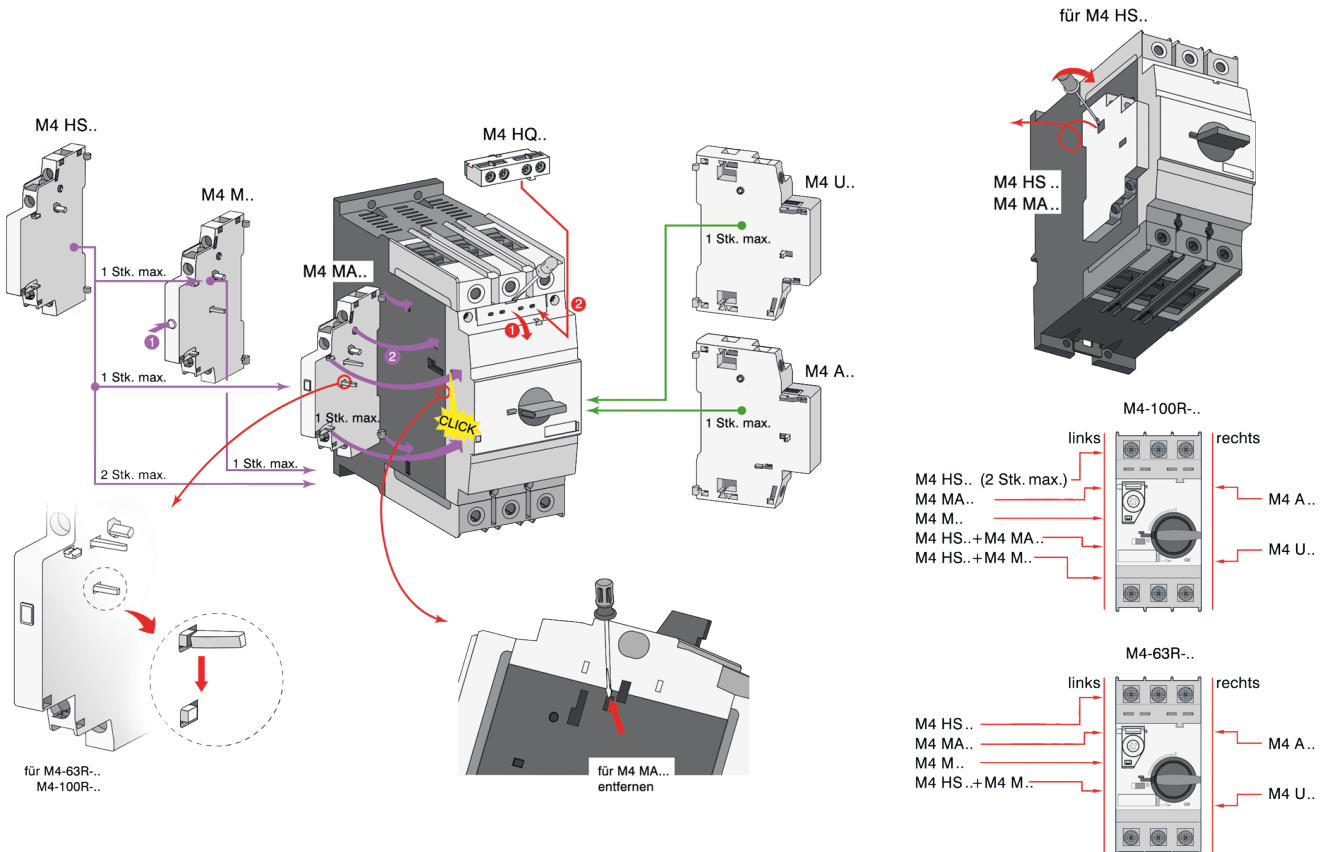


# Installation of accessories

M4-32T  
M4-32R



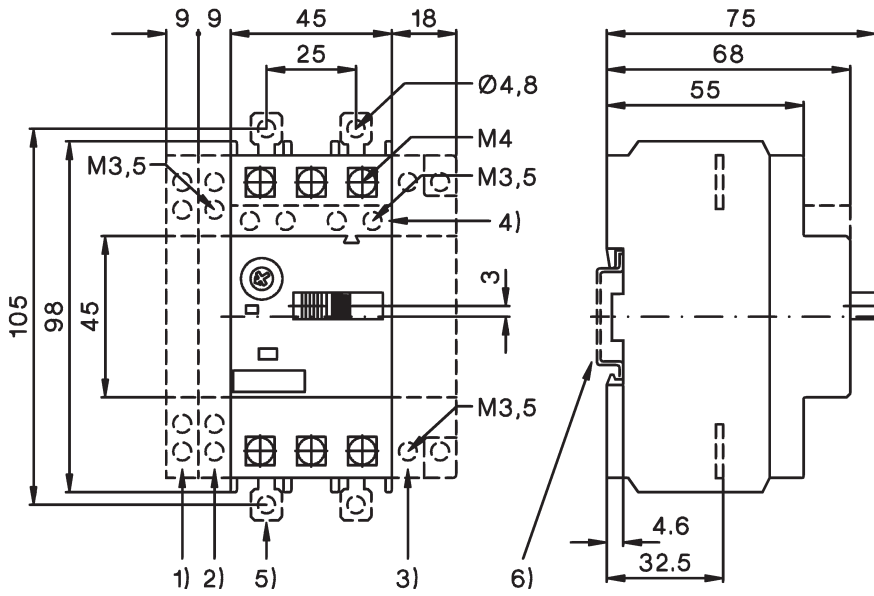
M4-63R  
M4-100R





# Dimensions

## Circuit-breaker M4-32T

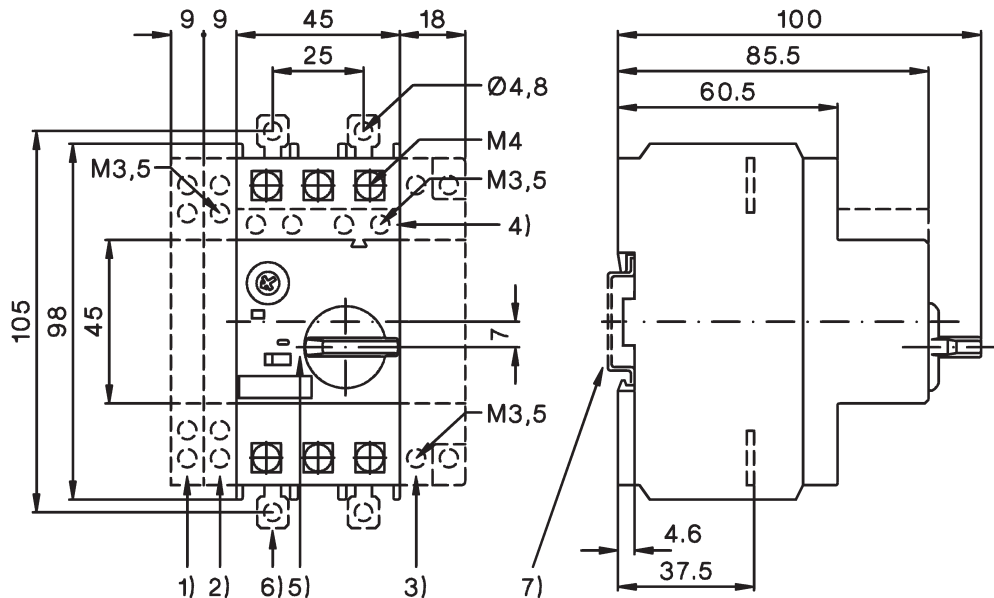


- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release of arcing
- 4) Transverse aux. contact
- 5) Push-in Lugs for screw mounting
- 6) 35mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts )

| at Ue (V) | 240 | 415 | 460 | 525 | 690 |
|-----------|-----|-----|-----|-----|-----|
| mm        | 20  | 20  | 20  | 20  | 20  |
| inch      | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |

## Circuit-breaker M4-32R



- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release of arcing
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) Push-in Lugs for screw mounting
- 7) 35mm DIN-rail acc. to EN 50022

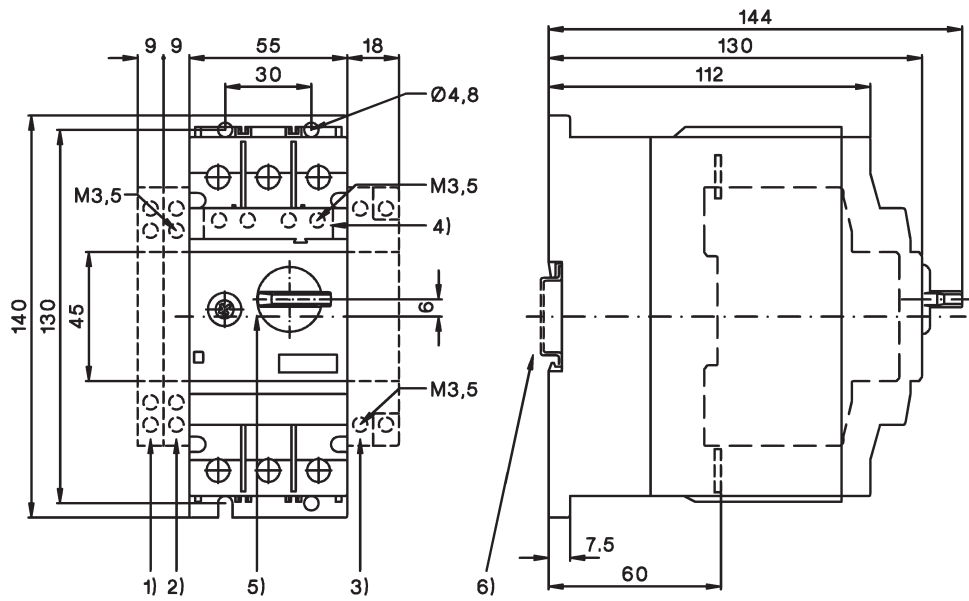
Height of arcing spaces (clearance from earthed parts )

| at Ue (V) | 240  | 415  | 460  | 525  | 690 |
|-----------|------|------|------|------|-----|
| mm        | 30   | 30   | 30   | 30   | 50  |
| inch      | 1,18 | 1,18 | 1,18 | 1,18 | 2   |



## Dimensions

### Circuit-breaker M4-63R

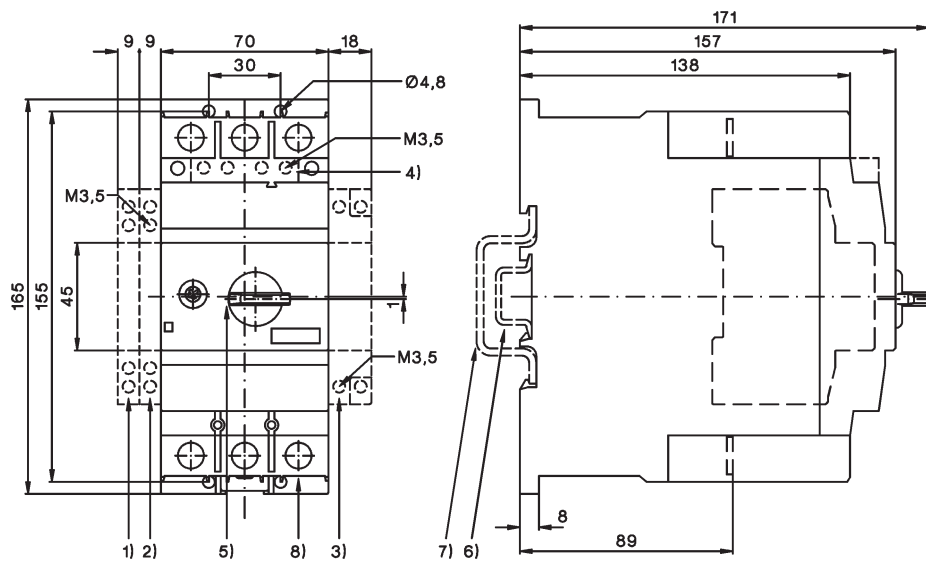


Height of arcing spaces (clearance from earthed parts )

| at U <sub>e</sub> (V) | 240 | 415 | 460 | 525 | 690 |
|-----------------------|-----|-----|-----|-----|-----|
| mm                    | 50  | 50  | 50  | 50  | 50  |
| inch                  | 2   | 2   | 2   | 2   | 2   |

- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) 35mm DIN-rail acc. to EN 50022

### Circuit-breaker M4-100R



Height of arcing spaces (clearance from earthed parts )

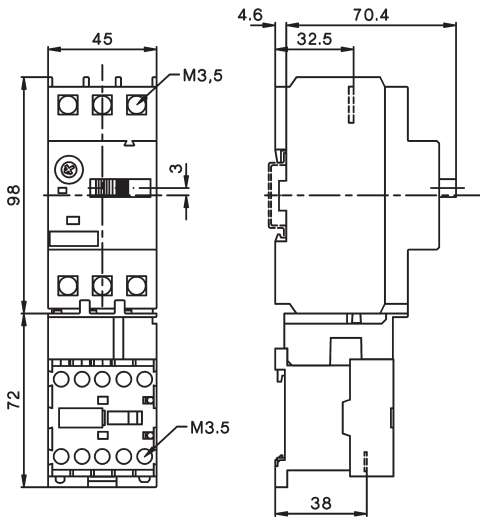
| at U <sub>e</sub> (V) | 240 | 415 | 460 | 525  | 690 |
|-----------------------|-----|-----|-----|------|-----|
| mm                    | 50  | 70  | 70  | 110  | 150 |
| inch                  | 2   | 2¾  | 2¾  | 4,33 | 6   |

- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) 35mm DIN-rail acc. to EN 50022
- 7) 70mm DIN-rail acc. to EN 50023
- 8) 4mm hexagon socket screw

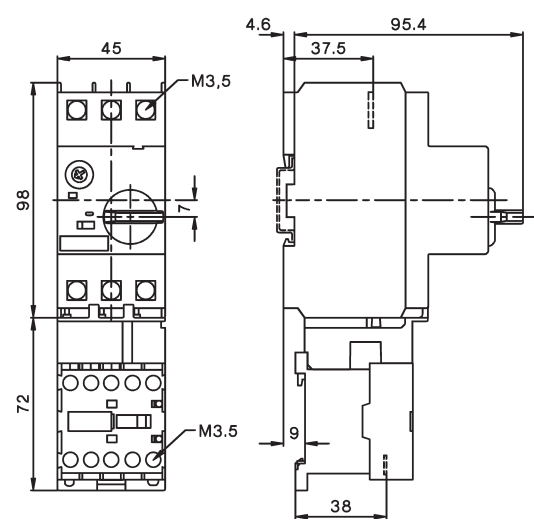
# Dimensions

## Link Module M4 32 VK1

M4-32T + K1- . .



M4-32R + K1- . .



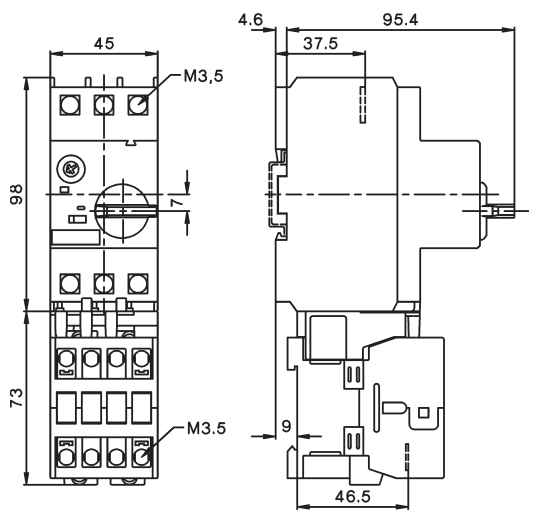
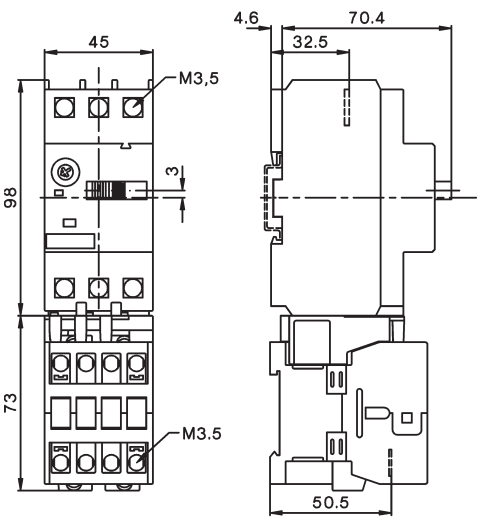
## Link Module M4 32 VK3

M4-32T + K3-10ND. .  
M4-32T + K3-18ND. .

M4-32T + K3-14ND. .  
M4-32T + K3-22ND. .

M4-32R + K3-10ND. .  
M4-32R + K3-18ND. .

M4-32R + K3-14ND. .  
M4-32R + K3-22ND. .



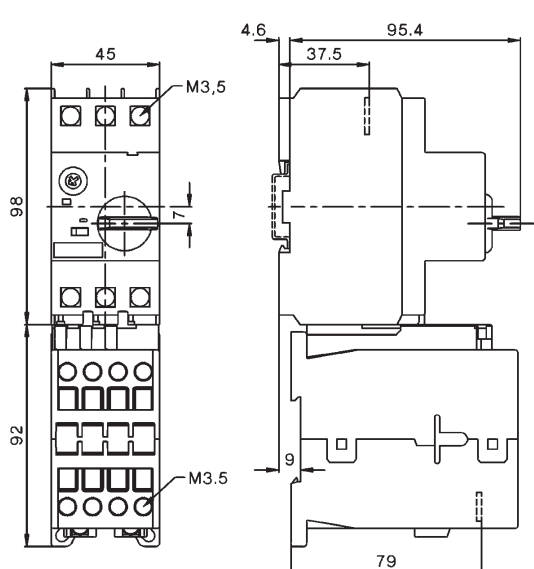
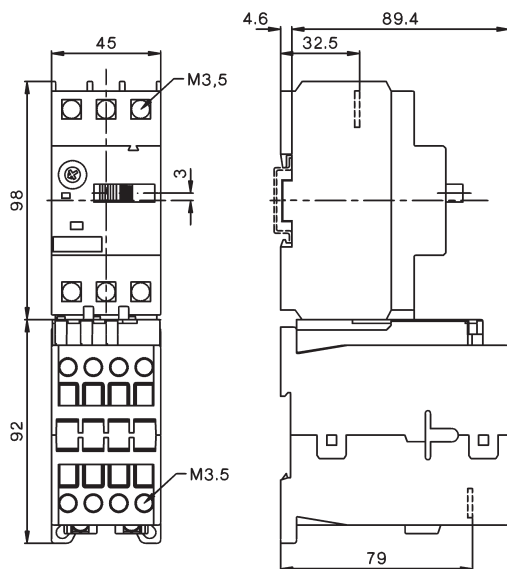
## Link Module M4 32 VKG3

M4-32T + KG3-10. .  
M4-32T + KG3-18. .

M4-32T + KG3-14. .  
M4-32T + KG3-22. .

M4-32R + KG3-10. .  
M4-32R + KG3-18. .

M4-32R + KG3-14. .  
M4-32R + KG3-22. .

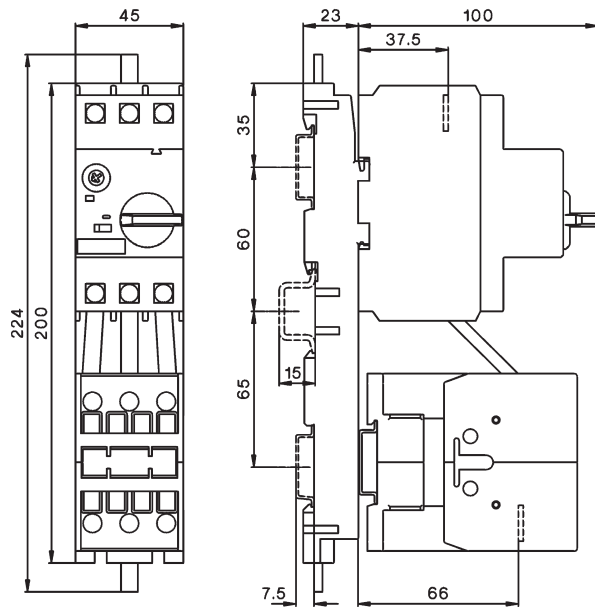
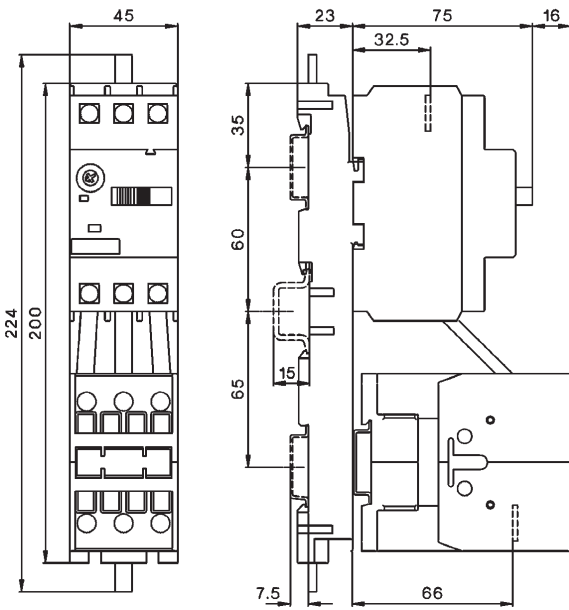


# Dimensions

## DIN-rail adapter M4 32 HU1

M4-32T + K3-24 + M4 32VD  
 M4-32T + K3-32 + M4 32VD

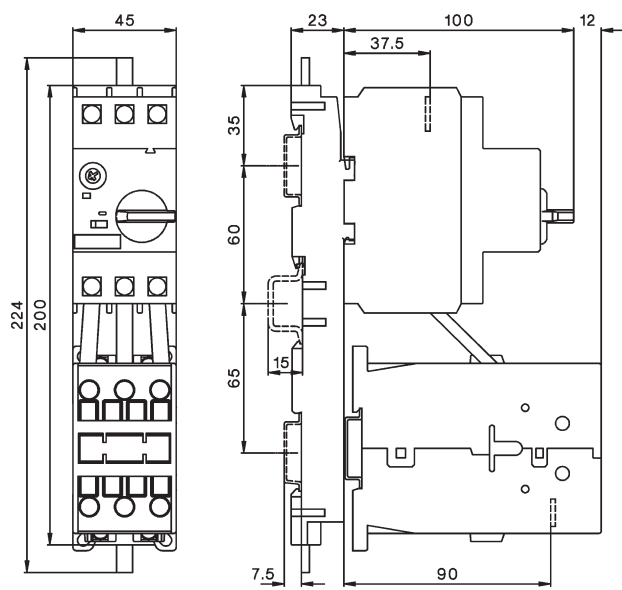
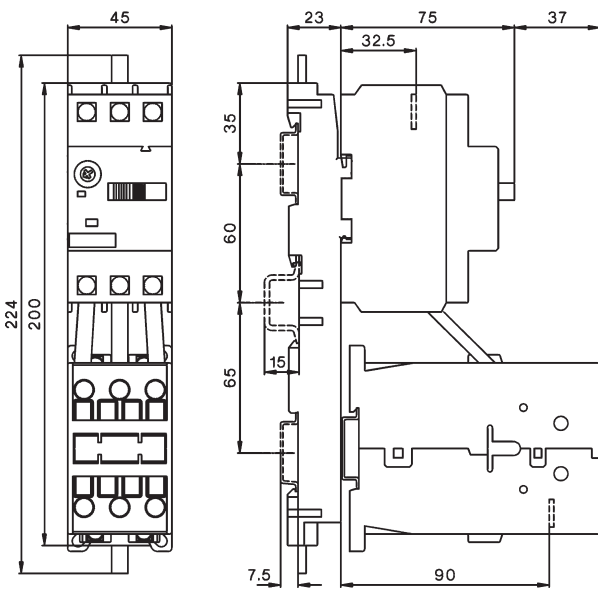
M4-32R + K3-24 + M4 32VD  
 M4-32R + K3-32 + M4 32VD



## DIN-rail adapter M4 32 HU1

M4-32T + KG3-24 + M4 32 VD  
 M4-32T + KG3-32 + M4 32 VD

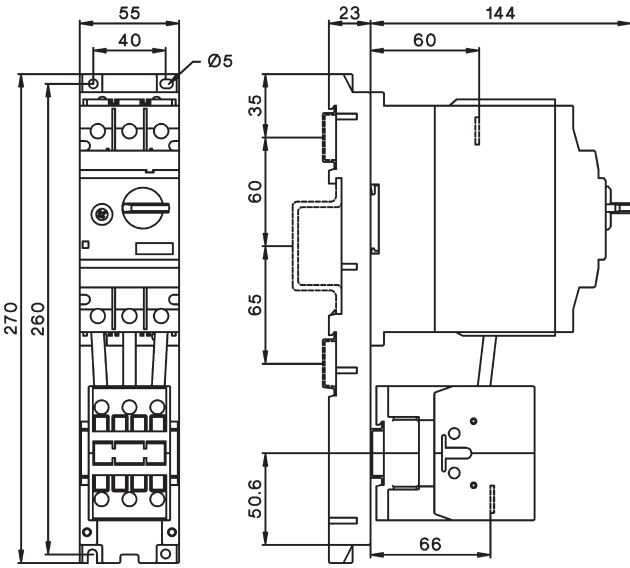
M4-32R + KG3-24 + M4 32 VD  
 M4-32R + KG3-32 + M4 32 VD



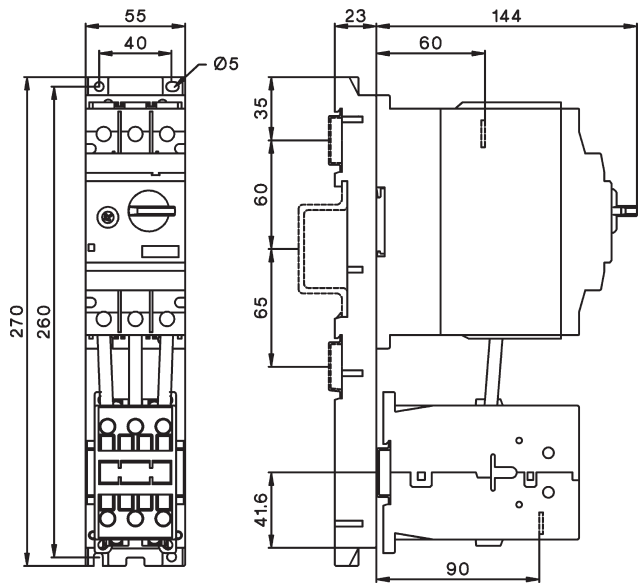
# Dimensions

## DIN-rail adapter M4 63 HU1

M4-63T + K3-32 + M4 63 VD  
 M4-63T + K3-40 + M4 63 VD

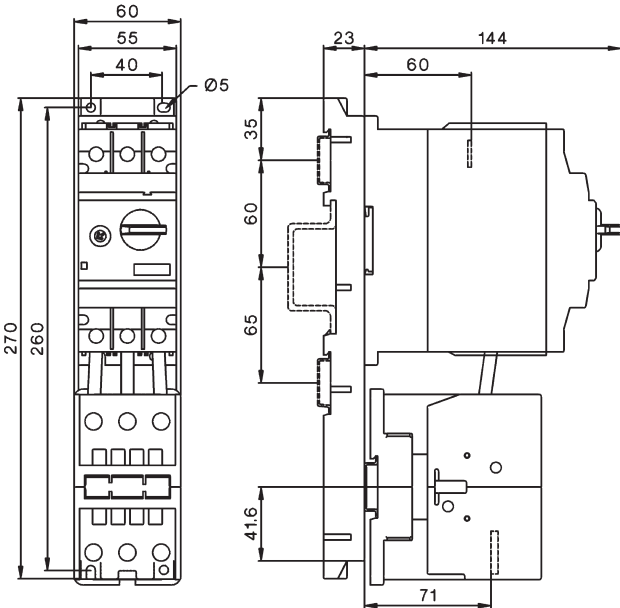


M4-63T + KG3-32 + M4 63 VDG  
 M4-63T + KG3-40 + M4 63 VDG



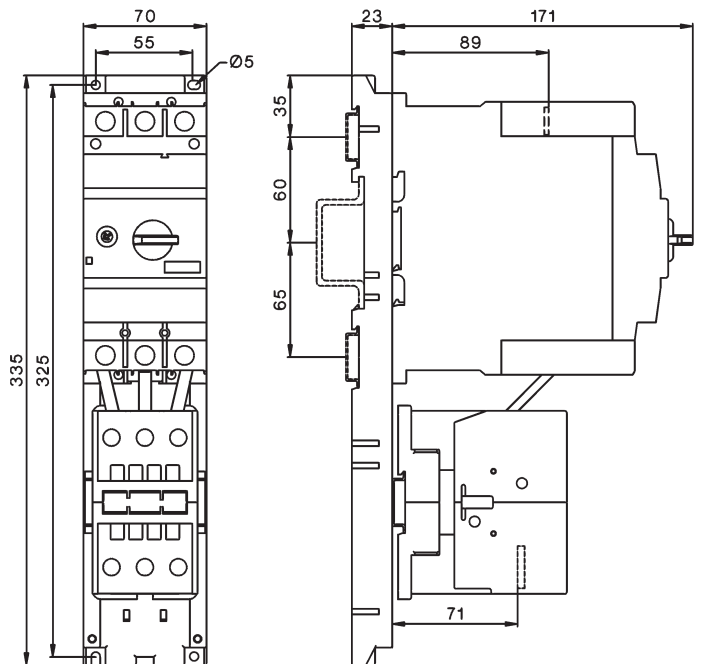
## DIN-rail adapter M4 63 HU1

M4-63T + K3-50 + M4 63 VD  
 M4-63T + K3-62 + M4 63 VD



## DIN-rail adapter M4 100 HU1

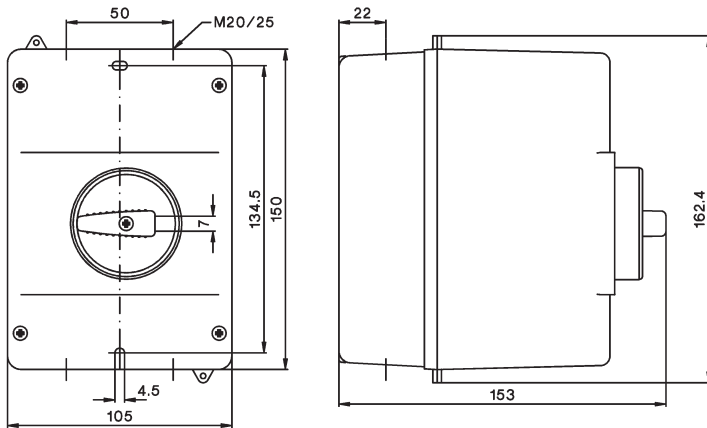
M4-100R + K3-62 + M4 100 VD  
 M4-100R + K3-74 + M4 100 VD



# Dimensions

## Enclosures

M4 32R PFH4  
M4 32R PFHN4



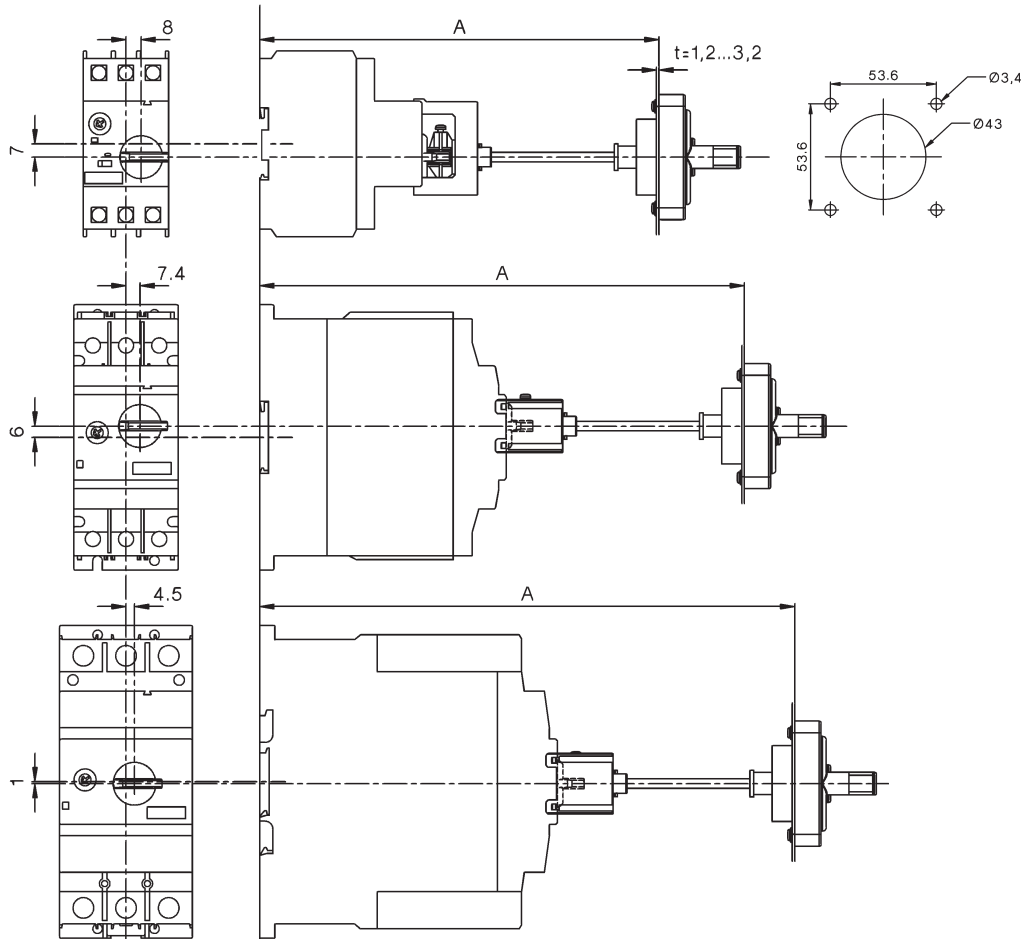
## Door-coupling rotary mechanisms

## Mounting holes

| Type            | A         |
|-----------------|-----------|
| M4 32R EH1 115  | 149 - 210 |
| M4 32R EHN1 115 | 149 - 210 |
| M4 32R EH1 315  | 149 - 410 |
| M4 32R EHN1 315 | 149 - 410 |

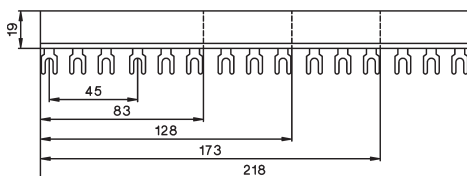
| Type            | A         |
|-----------------|-----------|
| M4 63R EH1 115  | 194 - 255 |
| M4 63R EHN1 115 | 194 - 255 |
| M4 63R EH1 315  | 194 - 455 |
| M4 63R EHN1 315 | 194 - 455 |

| Type             | A         |
|------------------|-----------|
| M4 100R EH1 115  | 220 - 282 |
| M4 100R EHN1 115 | 220 - 282 |
| M4 100R EH1 315  | 220 - 482 |
| M4 100R EHN1 315 | 220 - 482 |

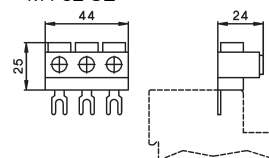


## Insulated 3-phase busbar system

M4 32 S..



M4 32 SE



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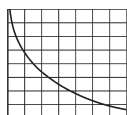
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Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnect

Push Buttons

Representatives, Suppliers

## Manual Motor Starters



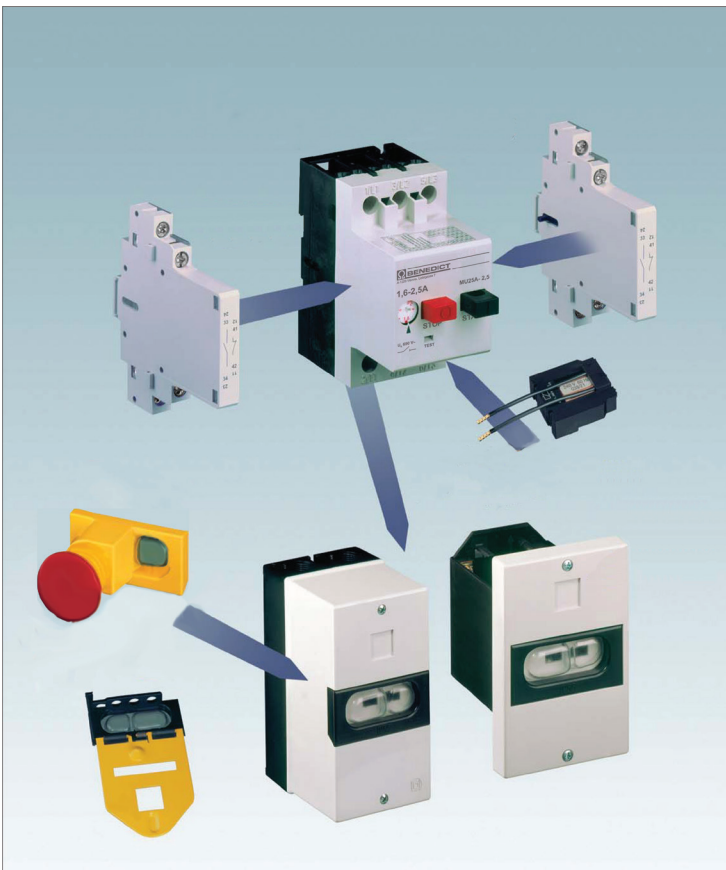
| Thermal Overload Release Setting Range A | Ratings AC3 at |         | Magnetic short circuit trip A | Type             | Pack pcs. | Weight kg/pc. |
|--|----------------|---------|-------------------------------|------------------|-----------|---------------|
|  | 400V kW        | 690V kW |                               |                  |           |               |
| 0,16 - <b>0,25</b>                       | <b>0,06</b>    | 0,12    | 3,75                          | <b>MU25-0,25</b> | 1         | 0,25          |
| 0,25 - <b>0,4</b>                        | <b>0,09</b>    | 0,18    | 6                             | <b>MU25-0,4</b>  | 1         | 0,25          |
| 0,4 - <b>0,63</b>                        | <b>0,12</b>    | 0,25    | 7,45                          | <b>MU25-0,63</b> | 1         | 0,25          |
| 0,63 - <b>1</b>                          | <b>0,25</b>    | 0,55    | 15                            | <b>MU25-1</b>    | 1         | 0,25          |
| 1 - <b>1,6</b>                           | <b>0,55</b>    | 1,1     | 24                            | <b>MU25-1,6</b>  | 1         | 0,25          |
| 1,6 - <b>2,5</b>                         | <b>0,75</b>    | 1,5     | 37,50                         | <b>MU25-2,5</b>  | 1         | 0,25          |
| 2,5 - <b>4</b>                           | <b>1,5</b>     | 3       | 60                            | <b>MU25-4</b>    | 1         | 0,25          |
| 4 - <b>6,3</b>                           | <b>2,5</b>     | 4       | 94,50                         | <b>MU25-6,3</b>  | 1         | 0,25          |
| 6,3 - <b>10</b>                          | <b>4</b>       | 7,5     | 150                           | <b>MU25-10</b>   | 1         | 0,25          |
| 10 - <b>16</b>                           | <b>7,5</b>     | 11      | 240                           | <b>MU25-16</b>   | 1         | 0,25          |
| 16 - <b>20</b>                           | <b>9</b>       | 12      | 300                           | <b>MU25-20</b>   | 1         | 0,25          |
| 20 - <b>25</b>                           | <b>12,5</b>    | 22      | 375                           | <b>MU25-25</b>   | 1         | 0,25          |
| 25 - <b>32</b>                           | <b>15</b>      |         | 480                           | <b>MU25-32</b>   | 1         | 0,25          |

## Auxiliary Contact Blocks, for side mounting, max. 2 pieces



| Contacts |    |                  |            | Rated Operational Current AC15 230V |            |                  | Type | Pack pcs. | Weight kg/pc. |
|----------|----|------------------|------------|-------------------------------------|------------|------------------|------|-----------|---------------|
| NO       | NC | EM <sup>1)</sup> | 400V A     | 500V A                              | AC1 500V A |                  |      |           |               |
| 1        | 1  | -                | <b>3,5</b> | 2                                   | 6          | <b>MU25-PS11</b> | 10   | 0,03      |               |

## System MU25



## Approvals

|         |                   |        |
|---------|-------------------|--------|
| Country | USA, Canada<br>UL | Europe |
| Type    |                   |        |

## Shunt Release for mounting under the cover



| Rated Control Voltage and Frequency<br>V | Power Consumption |     | Type             | Pack pcs. | Weight kg/pc. |
|--|-------------------|-----|------------------|-----------|---------------|
|  | VA                | W   |                  |           |               |
| 110V 50Hz, 110-120V 60Hz                 | 2,7               | 1,8 | <b>MU25-A110</b> | 10        | 0,06          |
| 220-230V 50Hz, 240V 60Hz                 | 2,7               | 1,8 | <b>MU25-A230</b> | 10        | 0,06          |

## Under-voltage Release for mounting under the cover



| Rated Control Voltage and Frequency<br>V | Power Consumption |     | Type             | Pack pcs. | Weight kg/pc. |
|--|-------------------|-----|------------------|-----------|---------------|
|  | VA                | W   |                  |           |               |
| 110V 50Hz, 110-120V 60Hz                 | 2,7               | 1,8 | <b>MU25-U110</b> | 10        | 0,06          |
| 220-230V 50Hz, 240V 60Hz                 | 2,7               | 1,8 | <b>MU25-U230</b> | 10        | 0,06          |
| 380-415V 50Hz, 440V 60Hz                 | 2,7               | 1,8 | <b>MU25-U400</b> | 10        | 0,06          |

## Accessories



| Description                                      | Specification  | Type              | Pack pcs. | Weight kg/pc. |
|--|--|-------------------|-----------|---------------|
| Busbar Connector Fully Isolated, Ui 690V, Iu 63A |  |                   |           |               |
| Busbar   | for 2 units, 99mm long   | <b>MU25A-D99</b>  | 10        | 0,036         |
| Busbar   | for 3 units, 154mm long  | <b>MU25A-D154</b> | 10        | 0,060         |
| Busbar   | for 4 units, 208mm long  | <b>MU25A-D208</b> | 10        | 0,084         |
| Busbar   | for 5 units, 262mm long  | <b>MU25A-D262</b> | 10        | 0,107         |
| Supply Block                                     | 3-pole for use with busbar connector   | <b>MU25A-DB</b>   | 10        | 0,034         |
| Spacing piece ½TE                                | for ambient temperature >40°C  | <b>P730</b>       | 10        | 0,013         |
| <b>Enclosures</b>                                |  |                   |           |               |
| Moulded Enclosure                                | Protection to IP55   | <b>MU25-O55</b>   | 1         | 0,24          |
| Moulded Front Plate                              | Protection to IP55   | <b>MU25-C55</b>   | 1         | 0,16          |
| Locking Bracket                                  | Suitable for 3 padlocks in "OFF"-position, stirrup diameter of the padlock max. 8 mm | <b>MU25-Z</b>     | 1         | 0,1           |
| Emergency Stop Button                            | latch, release by turning  | <b>MU25-NAV</b>   | 1         | 0,04          |



# Manual Motor Starters

Data according to IEC 947, IEC 204, EN 60947, EN 60204, VDE 0660, VDE 0113

| Type   | MU25  |                     |             |           |
|--|---|---------------------|-------------|-----------|
| <b>Main Contacts</b>   |   |                     |             |           |
| <b>Rated insulation voltage <math>U_i</math></b>   | V~ <sup>1)</sup>                                  | 690                 |             |           |
| Rated operational current $I_e$ (=Ith) open, at 50°C   | A   | 25 <sup>2)</sup>    |             |           |
| <b>Mechanical life</b>   | S x 10 <sup>6</sup>                               | 0,1                 |             |           |
| <b>Contact life at <math>I_e</math> /AC3</b>   | S x 10 <sup>6</sup>                               | 0,1                 |             |           |
| <b>Tripping class according to IEC 60947-4-1</b>   |   | 10A                 |             |           |
| <b>Rated ultimate short-circuit breaking capacity <math>I_{cu}</math></b>  |   | 220-240V~           | 380-415V~   | 500V~     |
| Values for open unit, when incoming supply on upper terminals  |   |                     |             | 660-690V~ |
| Setting range  | bis 1A kA   | 50                  | 50          | 50        |
|  | 1 - 1,6A kA                                       | 50                  | 50          | 50        |
|  | 1,6 - 2,5A kA                                     | 50                  | 50          | 3         |
|  |   |                     |             | 2,5       |
|  | 2,5 - 4A kA                                       | 50                  | 50          | 3         |
|  | 4 - 6,3A kA                                       | 50                  | 50          | 3         |
|  | 6,3 - 10A kA                                      | 50                  | 6           | 3         |
|  |   |                     |             | 2,5       |
|  | 10 - 16A kA                                       | 10                  | 6           | 2,5       |
|  | 16 - 20A kA                                       | 10                  | 6           | 2,5       |
|  | 20 - 25A kA                                       | 10                  | 6           | 2,5       |
|  | 25 - 32A kA                                       | 10                  | 6           | 2,5       |
|  |   |                     |             | 2         |
|  |   |                     |             | 2         |
|  |   |                     |             | 2         |
|  |   |                     |             | 2         |
| <b>Short circuit protection</b>  |   | 220-240V~           | 380-415V~   | 500V~     |
| Setting range  | bis 1A A  | -                   | -           | -         |
|  | 1 - 1,6A A  | -                   | -           | -         |
| Fuse gL(gG) only necessary if the short circuit current could be greater than the rated ultimate short-circuit breaking capacity | 1,6 - 2,5A A                                      | -                   | -           | 25        |
|  |   |                     |             | 20        |
|  | 2,5 - 4A A  | -                   | -           | 35        |
|  | 4 - 6,3A A  | -                   | -           | 50        |
|  | 6,3 - 10A A                                       | -                   | 80          | 50        |
|  |   |                     |             | 35        |
|  | 10 - 16A A  | 80                  | 80          | 63        |
|  | 16 - 20A A  | 80                  | 80          | 63        |
|  | 20 - 25A A  | 80                  | 80          | 63        |
|  | 25 - 32A A  | 80                  | 80          | 63        |
|  |   |                     |             | 35        |
|  |   |                     |             | 50        |
|  |   |                     |             | 50        |
|  |   |                     |             | 50        |
| <b>Maximum ambient temperature Operation</b>   | open °C   |                     | -25 bis +60 |           |
|  | enclose °C  |                     | -25 bis +40 |           |
| Temperature compensation   | °C  |                     | -5 bis +40  |           |
| Storage  | °C  |                     | -25 bis +70 |           |
| <b>Power loss at rated current, warm condition</b>   | W   | 6 - 8               |             |           |
| <b>Auxiliary Contacts</b>  |   |                     |             |           |
| <b>Rated insulation voltage <math>U_i</math></b>   | V~  | 500                 |             |           |
| <b>Thermal rated current Ith</b>   | Ambient temperature max. 50°C                     | A                   | 6           |           |
| <b>Utilization category AC15</b>   |   |                     |             |           |
| <b>Rated operational current <math>I_e</math></b>  | 220-240V A  | 3,5                 |             |           |
|  | 380-415V A  | 2                   |             |           |
|  | 500V A  | 1,5                 |             |           |
| <b>Short circuit protection max. fuse size</b>   | gL (gG) A   | 6                   |             |           |
| <b>Cable cross-section</b>   |   |                     |             |           |
| <b>Main connector</b>  | solid or stranded mm <sup>2</sup>                 | 1 - 6               |             |           |
|  | flexible mm <sup>2</sup>                          | 1 - 4               |             |           |
|  | flexible with multicore cable end mm <sup>2</sup> | 0,75 - 4            |             |           |
| Number of clampable conductors per terminal / Screw torque   |   | 2 / M3 - Pz2        | 1,8Nm       |           |
| <b>Auxiliary connector</b>   | solid or stranded mm <sup>2</sup>                 | 0,75 - 2,5          |             |           |
|  | flexible mm <sup>2</sup>                          | 0,75 - 1,5          |             |           |
|  | flexible with multicore cable end mm <sup>2</sup> | 0,75 - 1,5          |             |           |
| Number of clampable conductors per terminal / Screw torque   |   | 2 / M3,5 - Pz1      | 1Nm         |           |
| <b>Resistance to shock according to IEC 68-2-27</b>  | g   | 20                  |             |           |
| vibration resistance to IEC68-2-6  | g   | 5 (by f= 5...150Hz) |             |           |

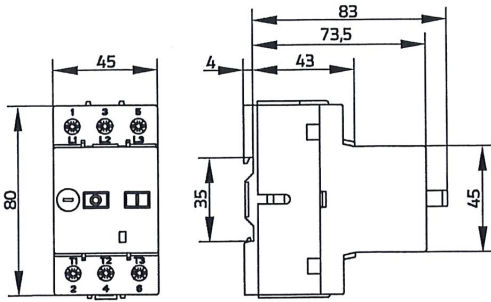
1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 6kV$ .

2) Maximum number without gap: 3

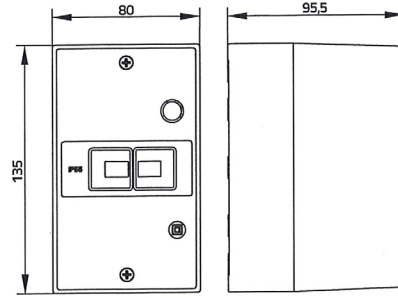
# Manual Motor Starters

## Maße

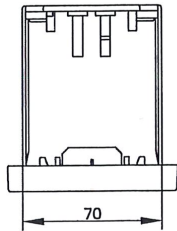
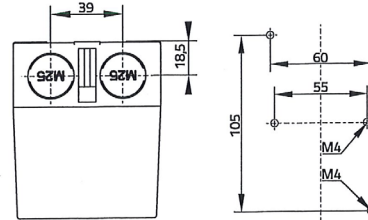
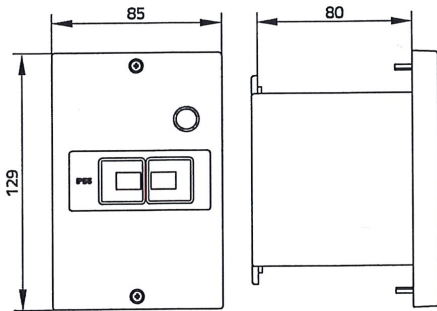
### Manual Motor Starter MU25



### Moulded Enclosure MU25-O55



### Moulded Front Plate MU25-C55



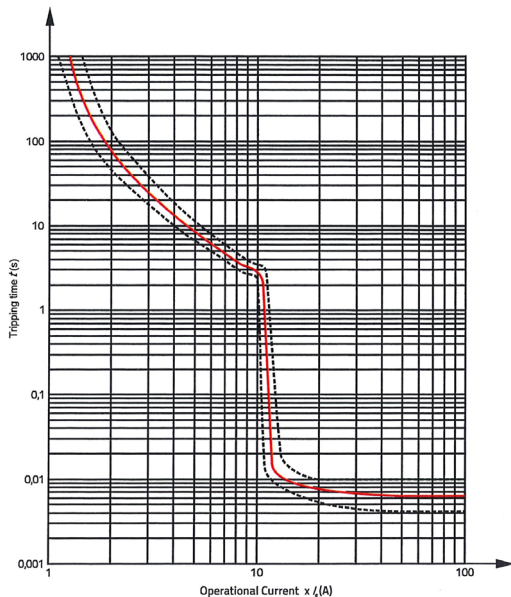
Mounting with clamps                      with screws

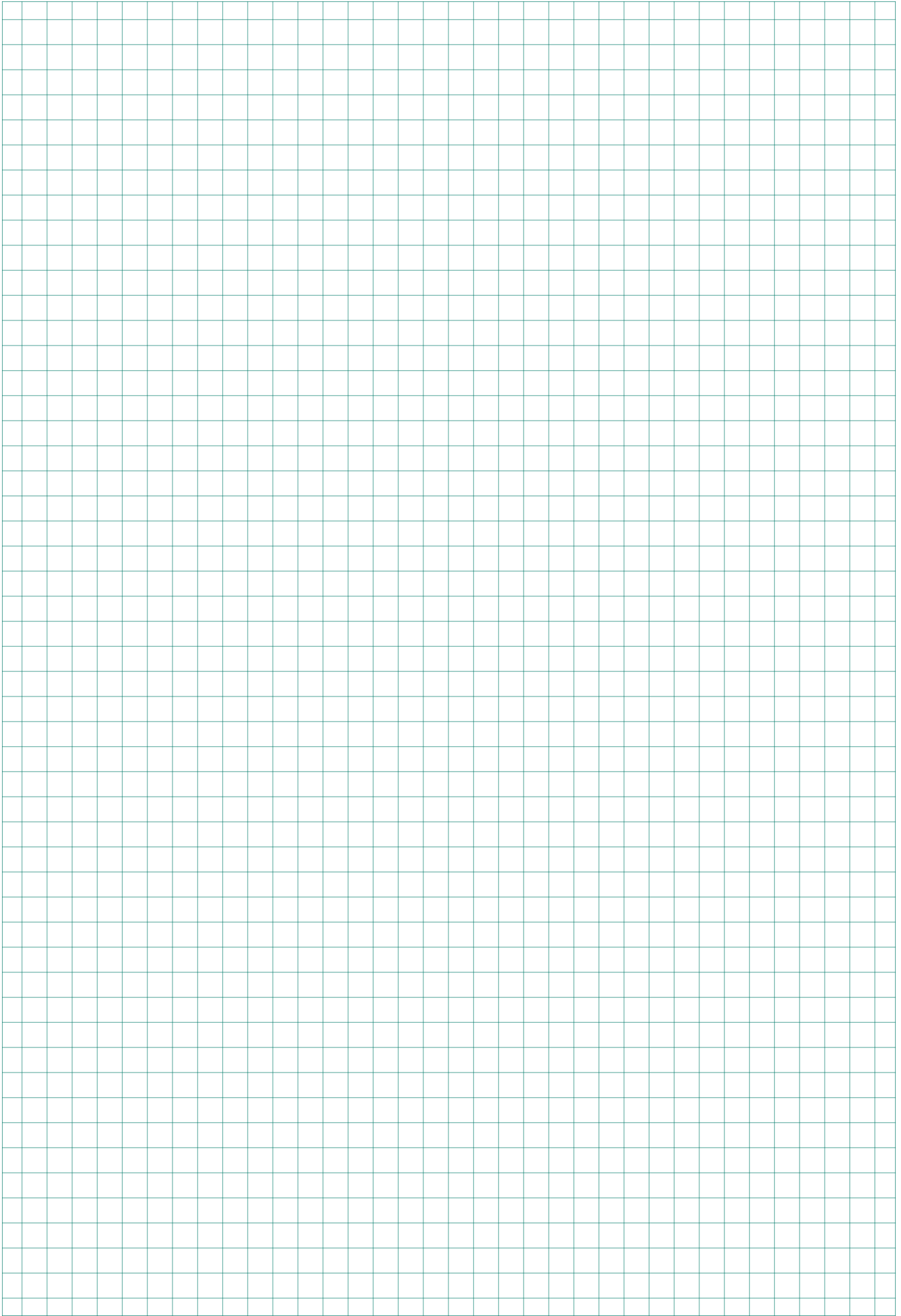
## Temperature Compensation

In case of higher ambient temperature use the following formula:  $(\text{Ambient temperature} - 20) \times 0,3 = \text{correction factor in \% of the full load motor current}$

Example:  
Ambient temperature 60°C, full load motor current 5A  
 $(60 - 20) \times 0,3 = 12\%$

## Tripping Characteristic





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## General

### Test Authorities, Registration Mark, Approvals

Low voltage switchgear from Benedict GmbH is built and tested to national and international specifications. All devices suit all important specifications without any test obligation, like VDE, BS and also relative to IEC Recommendations and to European Standards like IEC 947 and EN 60947. It is for this reason of our Low voltage switchgear is used all over the world. In order to provide special versions, limitations to the max. voltages, currents and power ratings or special markings are sometimes necessary.

### Quality Control System

Since November 1991 Benedict GmbH has been certified according to the quality control system **ÖNORM EN ISO 29001**. The target of the ISO-certification is, to grant the customer the quality of the performance of his supplier, who is audited in accordance with this standard.

### CE-Marking



The manufacturer has to sign his products with the CE-Marking. With the CE-Marking the manufacturer confirms the accordance with the different EEC Directives. The CE-Marking is absolutely necessary to sell the products in the EEC.

Below you find the EEC Directives concerning our products.

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC

RoHS + WEEE 2002/95/EC + "002/96/EC

| Country  | North America       | Russia         |
|--|---------------------|----------------|
| State deputy or private examination (state admitted) | UL<br>Canada, USA   | EAC            |
| Label marking of examination boards                  | Listed<br>Component |                |
| Duty of approvals                                    | all switchgear      | all switchgear |

### Explanations for choice and supply of low voltage switchgear in Canada and USA

#### Marking of auxiliary contacts

At several devices in UL-data are two voltages for auxiliary contacts mentioned (e. g.: 600 volts at same potential, 150 volts at different potentials). That means, if the voltage is higher than 150 volts, the control voltage applied to input terminals must be at the same potential.

Low voltage switchgear for auxiliary circuits (e. g. contactor relays, control units, auxiliary contacts in general) usually approved for "Heavy Duty" or "Standard Duty" UL and besides these marked with the admissible max. voltage or with short codes (see table).

| Marking of auxiliary contacts according to CSA and UL | Max. rated values per pole |                |         | Cont. Current A | Contact Rating Code Designation |
|---|----------------------------|----------------|---------|-----------------|---------------------------------|
|   | Voltage V                  | Current Make A | Break A |                 |                                 |
| Heavy Duty (HD or HVY DTY)                            | AC 120                     | 60             | 6       | 10              | A150                            |
|   | AC 240                     | 30             | 3       | 10              | A300                            |
|   | AC 480                     | 15             | 1,5     | 10              | A600                            |
|   | AC 600                     | 12             | 1,2     | 10              | A600                            |
|   | DC 125                     | 2,2            | 2,2     | 10              | N150                            |
|   | DC 250                     | 1,1            | 1,1     | 10              | N300                            |
|   | DC 600                     | 0,4            | 0,4     | 10              | N600                            |
| Standard Duty (SD or STD DTY)                         | AC 120                     | 30             | 3       | 5               | B150                            |
|   | AC 240                     | 15             | 1,5     | 5               | B300                            |
|   | AC 480                     | 7,5            | 0,75    | 5               | B600                            |
|   | AC 600                     | 6              | 0,6     | 5               | B600                            |
|   | DC 125                     | 1,1            | 1,1     | 5               | P150                            |
|   | DC 250                     | 0,55           | 0,55    | 5               | P300                            |
|   | DC 600                     | 0,2            | 0,2     | 5               | P600                            |
| -   | AC 120                     | 15             | 1,5     | 2,5             | C150                            |
|   | AC 240                     | 7,5            | 0,75    | 2,5             | C300                            |
|   | AC 480                     | 3,75           | 0,375   | 2,5             | C600                            |
|   | AC 600                     | 3              | 0,3     | 2,5             | C600                            |
|   | DC 125                     | 0,55           | 0,55    | 2,5             | Q150                            |
|   | DC 250                     | 0,27           | 0,27    | 2,5             | Q300                            |
|   | DC 600                     | 0,1            | 0,1     | 2,5             | Q600                            |
| -   | AC 120                     | 3,6            | 0,6     | 1               | D150                            |
|   | AC 240                     | 1,8            | 0,3     | 1               | D300                            |
|   | DC 125                     | 0,22           | 0,22    | 1               | R150                            |
|   | DC 250                     | 0,11           | 0,11    | 1               | R300                            |
| -   | AC 120                     | 1,8            | 0,3     | 0,5             | E150                            |

#### Discernment at UL-Standards

##### Recognized Component Industrial Control Equipment

UL issues yellow "Guide cards" with Guide- and File-No.

Devices have permission to be marked with the label



##### Listed Industrial Control Equipment

UL issues white "Guide cards" with Guide- and File-No.

Devices have to be marked with the "UL-Listing Mark"



Devices as components approved for "factory wiring": devices for employment in control panels, when they are selected, mounted and wired according to the charging conditions by skilled worker.

Devices approved for "field wiring",

- a) devices for employment in control panels, when they are mounted and wired by skilled worker.
- b) devices for retail in USA

Valid UL-Standards:  
UL 508 "Standard for Industrial Control Equipment" (partly limited)

Valid UL-Standards:  
UL 508 "Standard for Industrial Control Equipment" (unlimited)

Are devices approved as "Listed Equipment" the approval is also valid for using as "Recognized Component" .

# Approvals

| Country | USA, Canada<br>UL   | Europe  | Russia<br>EAC   | CB/CCA-<br>Certificates | China   |
|---------|---|---|---|-------------------------|---|
| Type    |  |  |  |                         |  |

**Cam Switches** (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)

|      |   |   |   |   |   |
|------|---|---|---|---|---|
| M10  | o | / | o | o | - |
| M10H | o | / | o | o | o |
| M20  | o | / | o | o | - |
| N20  | o | / | o | o | - |
| N33F | o | / | o | o | - |
| N40  | - | / | o | o | - |
| N61  | o | / | o | o | - |
| N80  | o | / | o | o | - |
| N100 | o | / | o | o | - |
| N200 | o | / | o | o | - |
| L400 | o | / | - | - | - |

o In standard version approved      / No testing required CE      x In test  
 - Not provided for test till now

## Technical Information

### Degree of protection acc. to IEC 60947-1

Protection ratings are prefixed by the internationally agreed letters IP followed by two digits.

1<sup>st</sup> digit: Pertains to solid objects  
2<sup>nd</sup> digit: Pertains to water.

| 1 <sup>st</sup> digit | Short description  | Definition   |
|-----------------------|--|--|
| 1                     | Protected against solid objects greater than 50 mm   | Excludes solid objects exceeding 50 mm in diameter and protects against contact with live and moving parts by a large surface such as a hand (but not against deliberate access).        |
| 2L                    | Protected against solid objects greater than 12,5 mm and against contact by standard test finger | Excludes solid objects exceeding 12,5 mm in diameter and protects against contact with live and moving parts by a standard test finger or similar objects not exceeding 80 mm in length. |
| 3                     | Protected against solid objects  | Excludes solid objects exceeding 2,5 mm in diameter or thickness. greater than 2,5mm   |
| 4                     | Protected against solid objects greater than 1 mm  | Excludes solid objects exceeding 1 mm in diameter or thickness.  |
| 5                     | Dust protected   | Prevents ingress of dust in quantities and locations that would interfere with the intended operation of the equipment.  |
| 6                     | Dust tight   | Prevents ingress of dust.  |

### Resistance to climatic conditions acc. to IEC60068

Open-type devices are climate-resistant in the constant climate according to IEC60068-2-3 (this is a climate with an ambient temperature of 40°C and an atmospheric humidity of 90 to 95%).

Enclosed devices are climate-resistant in an alternating climate according to IEC 68-2-30 (this is a moist alternating climate with a 24-hour cycle between climates with an ambient temperature of 25°C, and an atmospheric humidity of 95 to 100% and an ambient temperature of 40°C, and an atmospheric humidity of 90 to 96% in the presence of condensation during rises in temperature).

Data are valid up to an altitude of 2000m above sea level.

### Short circuit protection

Backup fuses should be used to protect contactors and starters against short circuits. For starters the device with the smaller admissible fuse at the main and at the control circuit (contactor or thermal overload) determines the fuse size.

After a short circuit devices have to be checked for correct operation. Disconnect power before proceeding with any work on the equipment!

### Mounting positions

No limitations, all kind of positions allowed.



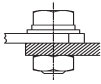












| 2 <sup>nd</sup> digit | Short description                                      | Definition   |
|-----------------------|--|--|
| 1                     | Protected against dripping water                       | Dripping water (vertically falling drops) shall have no harmful effect.  |
| 2                     | Protected against dripping water when tilted up to 15° | Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position.                 |
| 3                     | Protected against spraying water                       | Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.   |
| 4                     | Protected against splashing water                      | Water splashed against the enclosure from any direction shall have no harmful effect.  |
| 5                     | Protected against water jets                           | Water protected by a nozzle against the enclosure from any direction shall have no harmful effect.   |
| 6                     | Protected against heavy seas                           | Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.                                       |
| 7                     | Protected against the effects of immersion             | Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under standard conditions of pressure and time. |
| 8                     | Protected against submersion                           | No ingress of water.   |

### Suitable ambient temperatures:

|           |             |               |
|-----------|-------------|---------------|
| Operation | open °C     | -40 up to +60 |
|           | enclosed °C | -40 up to +40 |
| Storage   | °C          | -50 up to +90 |

# Technical Information

## Terminal screws

| Devices<br>Type     | Kind of connection<br>Screw with washer   | 2 Screw s   |   | Screw with w. nut  | Screw driver | Tightening torque |          |
|---------------------|---|---|---|--|--------------|-------------------|----------|
|                     |   |   |   |  |              | Nm                | lb. inch |
|                     |  |  |  |  |              |                   |          |
| <b>Cam Switches</b> |   |   |   |  |              |                   |          |
| M4H..               | M2,5  | -   | -   |  Pz1 | 0,6          | 5                 |          |
| M10                 | M3  | -   | -   |  Pz2 | 0,6 - 1,2    | 5 - 11            |          |
| M10H                | M3,5  | -   | -   |  Pz2 | 0,8 - 1,4    | 7 - 12            |          |
| M20, N20, N33F      | M4  | -   | -   |  Pz2 | 1,2 - 1,8    | 11 - 16           |          |
| N40                 | M5  | -   | -   |  Pz2 | 2,5 - 3      | 22 - 26           |          |
| N61, N80            | -   | 2 x M5  | -   |  Pz2 | 2,5 - 3      | 22 - 26           |          |
| N100                | -   | 2 x M6  | -   |  Pz3 | 3,5 - 4,5    | 31 - 40           |          |
| N200                | -   | -   | M10   |      | 10           | 88                |          |
| L400                | -   | -   | M12   |      | 16           | 140               |          |
| L600                | -   | -   | M16   |      | 24           | 210               |          |
| L800                | -   | -   | M16   |     | 24           | 210               |          |
| L1200               | -   | -   | M16   |    | 24           | 210               |          |

Contactor, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnector

Push Buttons

Representatives, Suppliers



| Ratings      |                                 |            |               |                     |                     |         |             | Designs                               |  |                       |                      |
|--------------|---------------------------------|------------|---------------|---------------------|---------------------|---------|-------------|---------------------------------------|--|-----------------------|----------------------|
| Typ          | Rated current                   |            |               | Motor               |                     |         | Plate<br>mm | Panel moun.<br>M10H, M20 IP65<br>IP40 | Single hole mount. Ø22,5mm<br>with Plate<br>IP65 | without Plate<br>IP65 | Flush mount.<br>IP40 |
|              | Therm.<br>$I_{th}$<br>open<br>A | AC21<br>A  | at $U_e$<br>V | AC3<br>3~400V<br>kW | AC23<br>3~400V<br>A | 3<br>kW |             | M4H E                                 | M4H Z  | M4H ZO                | -                    |
| <b>M4H</b>   | 10                              | <b>10</b>  | 440           | 2,2                 | 6                   | 3       | 30□         | M4H E                                 | M4H Z  | M4H ZO                | -                    |
| <b>M10H</b>  | 20                              | <b>20</b>  | 690           | 5,5                 | 16                  | 7,5     | 48□         | M10H E                                | M10H Z   | M10H ZO               | -                    |
| <b>M10</b>   | 20                              | <b>20</b>  | 440           | 5,5                 | 16                  | 7,5     | 48□         | -                                     | -  | -                     | M10 UP               |
| <b>M20</b>   | 32                              | <b>32</b>  | 690           | 11                  | 30                  | 15      | 48□         | M20 E                                 | M20 Z  | M20 ZO                | -                    |
| <b>N20</b>   | 32                              | <b>32</b>  | 690           | 11                  | 30                  | 15      | 64□         | N20 E                                 | -  | -                     | -                    |
| <b>N33F</b>  | 50                              | <b>50</b>  | 690           | 15                  | 45                  | 22      | 64□         | N33F E                                | N33F Z   | -                     | -                    |
| <b>N40</b>   | 63                              | <b>63</b>  | 690           | 15                  | 45                  | 22      | 88□         | N40 E                                 | -  | -                     | -                    |
| <b>N61</b>   | 90                              | <b>85</b>  | 690           | 25                  | 60                  | 30      | 88□         | N61 E                                 | -  | -                     | -                    |
| <b>N80</b>   | 115                             | <b>115</b> | 690           | 30                  | 85                  | 45      | 88□         | N80 E                                 | -  | -                     | -                    |
| <b>N100</b>  | 150                             | <b>150</b> | 690           | 40                  | 110                 | 55      | 132□        | N100 E                                | -  | -                     | -                    |
| <b>N200</b>  | 250                             | <b>250</b> | 690           | 70                  | 140                 | 70      | 132□        | N200 E                                | -  | -                     | -                    |
| <b>L400</b>  | <b>400</b>                      | <b>400</b> | 690           | 70                  | 140                 | 70      | 132□        | L400 E                                | -  | -                     | -                    |
| <b>L600</b>  | <b>600</b>                      | <b>400</b> | 690           | 70                  | 140                 | 70      | 132□        | L600 E                                | -  | -                     | -                    |
| <b>L800</b>  | <b>800</b>                      | <b>400</b> | 690           | 70                  | 140                 | 70      | 132□        | L800 E                                | -  | -                     | -                    |
| <b>L1200</b> | <b>1200</b>                     | <b>400</b> | 690           | 70                  | 140                 | 70      | 132□        | L1200 E                               | -  | -                     | -                    |

## Cam Switches 10 - 250A

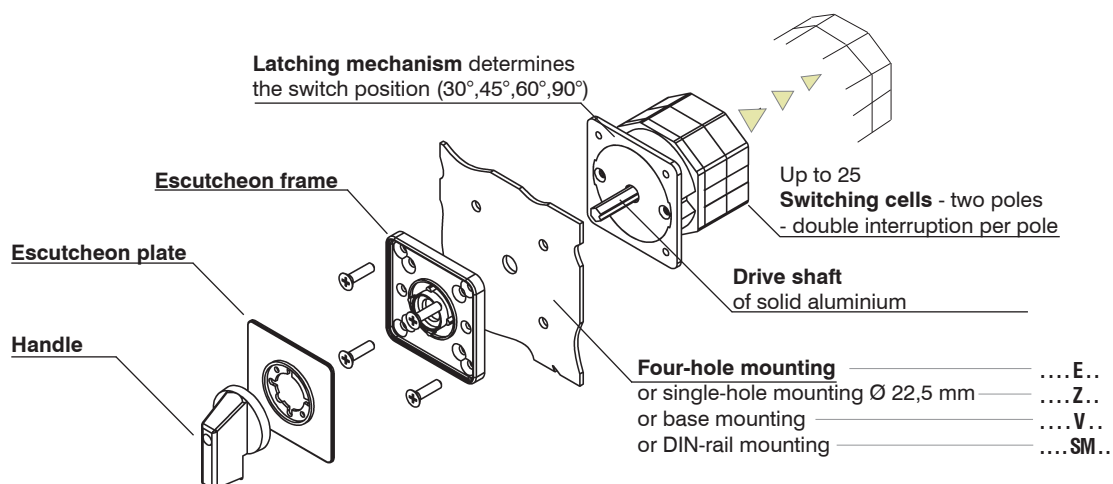
Cam switches can be used for virtually all purposes, e.g. as motor, main, control or instrument switches. Over and above the switching programs mentioned in the list, an effectively limitless number of special programs can be implemented.

## Load switch L.. 400 - 1200A

Load switches are primarily employed where resistive or slightly inductive current loads are to be switched on and off, or switching takes place without loading.

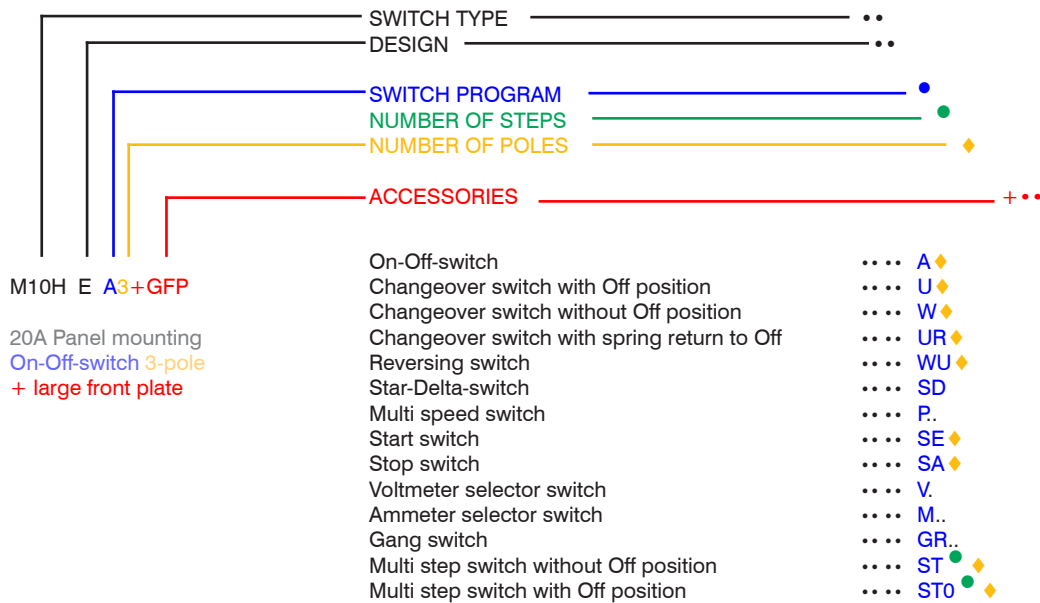
Load switches are assembled by parallel switching of two or more of cam switch contacts.

With customer built main terminal protection, load switch L.. can also be used as main switch.



| Designs   | Base mounting<br>M10H, M20 IP65<br>IP40 | DIN-rail<br>mounting<br>IP40 | Modular<br>IP40 | Plastic enclosed<br>..P.. IP40<br>..PF.. IP65 | horizontal, IP65 | Motor switch<br>enclosed<br>IP65 | Terminal box<br>mounting<br>IP65 |
|-----------|---|------------------------------|-----------------|---|------------------|----------------------------------|----------------------------------|
| -         | -                                       | -                            | -               | -   | -                | -                                | -                                |
| M10H V ♦  | M10H SM ♦                               | M10H SMA ♦                   | -               | M10 P(F) ♦                                    | -                | M10 PM ♦                         | -                                |
| M20 V ♦   | M20 SM ♦                                | M20 SMA ♦                    | -               | -   | -                | -                                | M10 KE ♦                         |
| N20 V ♦   | N20 SM ♦                                | -                            | N20 P(F) ♦      | -   | N20 PM ♦         | N20 KE ♦                         | -                                |
| N33F V ♦  | N33F SM ♦                               | -                            | N33F P(F) ♦     | -   | -                | -                                | -                                |
| N40 V ♦   | -                                       | -                            | N40 P(F) ♦      | N40 PLF ♦                                     | -                | -                                | -                                |
| N61 V ♦   | -                                       | -                            | N61 P(F) ♦      | N61 PLF ♦                                     | -                | -                                | -                                |
| N80 V ♦   | -                                       | -                            | N80 P(F) ♦      | N80 PLF ♦                                     | -                | -                                | -                                |
| N100 V ♦  | -                                       | -                            | -               | -   | -                | -                                | -                                |
| N200 V ♦  | -                                       | -                            | -               | -   | -                | -                                | -                                |
| L400 V ♦  | -                                       | -                            | -               | -   | -                | -                                | -                                |
| L600 V ♦  | -                                       | -                            | -               | -   | -                | -                                | -                                |
| L800 V ♦  | -                                       | -                            | -               | -   | -                | -                                | -                                |
| L1200 V ♦ | -                                       | -                            | -               | -   | -                | -                                | -                                |

**Ordering**



## Panel mounting designs

Switches of the panel mounting designs listed below have protection from front IP40. Where a shaft seal (appendix +WD) is used, the protection is increased to IP54. Use of a moisture proofing cap (appendix +FR) results in an increase in rear protection to IP54. In the standard version, the switches are delivered with a square escutcheon plate and black instrument knob. Forward mounting is possible for some of the design

E switches. The position of the terminals of the standard switches is left and right, at switch M10H the terminals are above and below. Where a knob insert is turned by 90° (can easily be performed after delivery), the position of the terminals can be changed.

**Dimensions** see page 262.



### Design

| Description   | Type appendix | Possible switch sizes |     |                 |                   |              |      |
|---|---------------|-----------------------|-----|-----------------|-------------------|--------------|------|
|   |               | M10H                  | M20 | N20<br>N33F     | N40<br>N61<br>N80 | N100<br>N200 | L... |
| <b>Panel mounting</b><br>For installation in control panels, machines and equipment.<br>For panel thickness of over 5mm, an extended switch shaft is required (appendix +VW).<br>Protection from front:<br>M10H, M20 IP65<br>all others IP40  | <b>E</b>      | X                     | X   | X               | X                 | X            | X    |
| <b>Central fixing 22,5mm</b><br>Switch for mounting with standard 22,5mm mounting holes and 1-4mm panel thickness.<br>Protection from front: IP65<br>Wrench J7049 necessary   | <b>Z</b>      | X                     | X   | X <sup>2)</sup> | -                 | -            | -    |
| <b>Central fixing 22,5mm</b><br>Switch <b>without escutcheon plate</b> , for installation with standard 22,5mm mounting holes and 1-4mm panel thickness. Protection from front: IP65<br>Wrench J7049 necessary  | <b>ZO</b>     | X                     | X   | -               | -                 | -            | -    |
| <b>Flush mounting version</b><br>Switch with white instrument knob, cream escutcheon plate with black markings, for installation in 65mm flush mounting boxes and use of Unitas plate. Supplied with flush mounting box: appendix +UP.<br>Maximum number of cells with: M10<br>FM box 45mm deep 2<br>FM box 65mm deep 4 | <b>UP</b>     | X <sup>1)</sup>       | -   | -               | -                 | -            | -    |

1) Switches are delivered with switch type M10

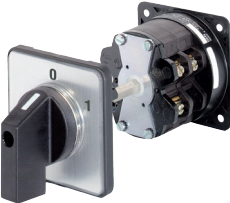
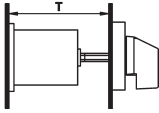

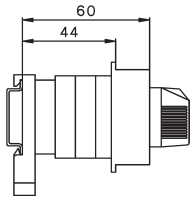
2) For switch types N33F only, max. 3 cells

## Base mounting designs

Switches of the designs listed below have protection from front IP40. When a shaft seal (appendix +WD) is used, the front protection type is increased to IP54. In the standard version, the switches are delivered with a square escutcheon plate and black instrument knob (design SMA with grey cover and grey toggle knob). Door couplings are advisable for switchgear cabinets with hinged doors.






The position of the terminals of the standard switches is left and right, at switch M10H the terminals are above and below. Where a knob insert is turned by 90° (can easily be performed after delivery), the position of the terminals can be changed.

**Dimensions** see page 263.

| Design  | Possible switch sizes | Possible switch sizes |      |     |          |             |           |
|---|-----------------------|-----------------------|------|-----|----------|-------------|-----------|
|   |                       | Type appendix         | M10H | M20 | N20 N33F | N40 N61 N80 | N100 N200 |
|  <p><b>Base mounting</b><br/>For screw mounting to the back wall or floor of distributor boxes, or of appliances with removable lids. Additional it is necessary to state the installation depth - that is the distance between mounting level of the switch and the inside edge of the door (dimension T).</p>  <p>Door couplings see page 250</p> | V ... +T/...          | X                     | X    | X   | X        | X           | X         |
|  <p><b>Snap-on mounting on DIN-rail</b><br/>with installation cover for standard opening and toggle knob. The lay-out of the terminals of the standard switches is above and below.<br/>Dimensions for Switch types<br/>M10H SMA .. with 1-3 cells<br/>M20 SMA .. with 1 or 2 cells</p>  <p>further dimensions see page 263</p>                 | SMA                   | X                     | X    | -   | -        | -           | -         |

## Plastic enclosed switches

The switches, which have durable plastic enclosures, are intended for wall mounting or attachment to machines. In the standard version, they are supplied with a light-grey enclosure, square escutcheon plate, black markings on a silver background, and a black instrument knob. Other colours and colour combinations are available for most enclosure types. It is not possible to mount an additional rectangular plate. The enclosure base is equipped with 4 entry glands with heavy-gauge conduit threads (see drawings). In all types of plastic enclosures, two terminals that are connected and insulated from switch column can be provided for a PE conductor (appendix +PE). **Dimensions** see page 264.

| Design   | Type appendix | Possible switch sizes |     |      |     |     |     |      |
|--|---------------|-----------------------|-----|------|-----|-----|-----|------|
|  |               | M10H                  | N20 | N33F | N40 | N61 | N80 | N100 |
|  <p><b>Plastic enclosure</b> light grey<br/>Protection class IP40<br/>Maximum number of cells</p>  | <b>P</b>      | X                     | X   | X    | X   | X   | X   | -    |
|  <p><b>Plastic enclosure</b> light grey<br/>Moisture protection<br/>Protection class IP65<br/>Maximum number of cells</p>   | <b>PF</b>     | X                     | X   | X    | X   | -   | -   | -    |
|  <p><b>Plastic enclosure horizontal</b><br/>light grey Moisture protection<br/>Protection class IP65<br/>Maximum number of cells</p>   | <b>PLF</b>    | -                     | -   | -    | X   | X   | X   | -    |
|  <p><b>Terminal box mounting</b><br/>Protection class IP65<br/>These switches are front mounted on a terminal box. The switch cells protrude through a hole into the terminal compartment.<br/>Maximum number of cells</p> | <b>KE</b>     | X                     | X   | -    | -   | -   | -   | -    |
|  <p><b>Plastic motor switch enclosure</b><br/>Moisture protection<br/>Protection class IP65<br/>Maximum number of cells</p>  | <b>PM</b>     | -                     | X   | -    | -   | -   | -   | -    |

## Switching programs

| Description                  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type     | Design |    |      |      |    | Switch pro-     | Escutcheon plate |  |
|------------------------------|----------------|-----------------|--|----------|--------|----|------|------|----|-----------------|------------------|--|
|                              |                |                 |  |          | E.     | Z. | V.   | SMA. | P. |                 |                  |  |
| <b>On-Off-switches A</b>     |                |                 |  |          |        |    |      |      |    |                 |                  |  |
| 1-pole                       |                | 60°             | 1  | 48 □ 20A | M10H . | x  | x    | x    | x  | x <sup>1)</sup> | . A1             |  |
|                              |                |                 |  | 32A      | M20 .  | x  | x    | x    | x  | -               | . A1             |  |
|                              |                |                 |  | 64 □ 32A | N20 .  | x  | -    | x    | -  | x               | . A1             |  |
|                              |                |                 |  | 50A      | N33F . | x  | x    | x    | -  | x               | . A1             |  |
|                              |                |                 |  | 88 □ 63A | N40 .  | x  | -    | x    | -  | x               | . A1             |  |
| 90A                          | N61 .          | x               | -  | x        | -      | x  | . A1 |      |    |                 |                  |  |
| 115A                         | N80 .          | x               | -  | x        | -      | -  | . A1 |      |    |                 |                  |  |
| 132 □ 150A                   | N100 .         | x               | -  | x        | -      | -  | . A1 |      |    |                 |                  |  |
| 250A                         | N200 .         | x               | -  | x        | -      | -  | . A1 |      |    |                 |                  |  |
| 2-pole                       |                | 60°             | 1  | 48 □ 20A | M10H . | x  | x    | x    | x  | x <sup>1)</sup> | . A2             |  |
|                              |                |                 |  | 32A      | M20 .  | x  | x    | x    | x  | -               | . A2             |  |
|                              |                |                 |  | 64 □ 32A | N20 .  | x  | -    | x    | -  | x               | . A2             |  |
|                              |                |                 |  | 50A      | N33F . | x  | x    | x    | -  | x               | . A2             |  |
|                              |                |                 |  | 88 □ 63A | N40 .  | x  | -    | x    | -  | x               | . A2             |  |
| 90A                          | N61 .          | x               | -  | x        | -      | x  | . A2 |      |    |                 |                  |  |
| 115A                         | N80 .          | x               | -  | x        | -      | -  | . A2 |      |    |                 |                  |  |
| 132 □ 150A                   | N100 .         | x               | -  | x        | -      | -  | . A2 |      |    |                 |                  |  |
| 250A                         | N200 .         | x               | -  | x        | -      | -  | . A2 |      |    |                 |                  |  |
| 3-pole                       |                | 60°             | 2  | 48 □ 20A | M10H . | x  | x    | x    | x  | x <sup>1)</sup> | . A3             |  |
|                              |                |                 |  | 32A      | M20 .  | x  | x    | x    | x  | -               | . A3             |  |
|                              |                |                 |  | 64 □ 32A | N20 .  | x  | -    | x    | -  | x               | . A3             |  |
|                              |                |                 |  | 50A      | N33F . | x  | x    | x    | -  | x               | . A3             |  |
|                              |                |                 |  | 88 □ 63A | N40 .  | x  | -    | x    | -  | x               | . A3             |  |
| 90A                          | N61 .          | x               | -  | x        | -      | x  | . A3 |      |    |                 |                  |  |
| 115A                         | N80 .          | x               | -  | x        | -      | -  | . A3 |      |    |                 |                  |  |
| 132 □ 150A                   | N100 .         | x               | -  | x        | -      | -  | . A3 |      |    |                 |                  |  |
| 250A                         | N200 .         | x               | -  | x        | -      | -  | . A3 |      |    |                 |                  |  |
| 4-pole<br>4. pole early make |                | 60°             | 2  | 48 □ 20A | M10H . | x  | x    | x    | x  | x <sup>1)</sup> | . A4             |  |
|                              |                |                 |  | 32A      | M20 .  | x  | x    | x    | x  | -               | . A4             |  |
|                              |                |                 |  | 64 □ 32A | N20 .  | x  | -    | x    | -  | x               | . A4             |  |
|                              |                |                 |  | 50A      | N33F . | x  | -    | x    | -  | x               | . A4             |  |
|                              |                |                 |  | 88 □ 63A | N40 .  | x  | -    | x    | -  | x               | . A4             |  |
| 90A                          | N61 .          | x               | -  | x        | -      | x  | . A4 |      |    |                 |                  |  |
| 115A                         | N80 .          | x               | -  | x        | -      | -  | . A4 |      |    |                 |                  |  |
| 132 □ 150A                   | N100 .         | x               | -  | x        | -      | -  | . A4 |      |    |                 |                  |  |
| 250A                         | N200 .         | x               | -  | x        | -      | -  | . A4 |      |    |                 |                  |  |
| 6-pole                       |                | 60°             | 3  | 48 □ 20A | M10H . | x  | x    | x    | x  | x <sup>1)</sup> | . A6             |  |
|                              |                |                 |  | 32A      | M20 .  | x  | x    | x    | x  | -               | . A6             |  |
|                              |                |                 |  | 64 □ 32A | N20 .  | x  | -    | x    | -  | x               | . A6             |  |
|                              |                |                 |  | 50A      | N33F . | x  | -    | x    | -  | x               | . A6             |  |
|                              |                |                 |  | 88 □ 63A | N40 .  | x  | -    | x    | -  | x               | . A6             |  |
| 90A                          | N61 .          | x               | -  | x        | -      | x  | . A6 |      |    |                 |                  |  |
| 115A                         | N80 .          | x               | -  | x        | -      | -  | . A6 |      |    |                 |                  |  |
| 132 □ 150A                   | N100 .         | x               | -  | x        | -      | -  | . A6 |      |    |                 |                  |  |
| 250A                         | N200 .         | x               | -  | x        | -      | -  | . A6 |      |    |                 |                  |  |

**Ordering example:** AC21 250A panel mounting, On-Off-switch 6-pole, Escutcheon plate OFF - ON **N200 E A6+003**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description                  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type   | Design |    |      |      | Switch pro-     | Escutcheon plate |    |
|------------------------------|----------------|-----------------|---|--------|--------|----|------|------|-----------------|------------------|----|
|                              |                |                 |   |        | E.     | Z. | V.   | SMA. |                 |                  | P. |
| <b>Changeover switches U</b> |                |                 |   |        |        |    |      |      |                 |                  |    |
| 1-pole                       |                | 60°             | 1 48 □ 20A                                | M10H . | x      | x  | x    | x    | x <sup>1)</sup> | . U1             |    |
|                              |                |                 | 32A                                       | M20 .  | x      | x  | x    | x    | -               | . U1             |    |
|                              |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x    | -    | x               | . U1             |    |
|                              |                |                 | 50A                                       | N33F . | x      | x  | x    | -    | x               | . U1             |    |
| 88 □ 63A                     | N40 .          | x               | -   | x      | -      | x  | . U1 | +007 |                 |                  |    |
| 90A                          | N61 .          | x               | -   | x      | -      | x  | . U1 |      |                 |                  |    |
| 115A                         | N80 .          | x               | -   | x      | -      | -  | . U1 |      |                 |                  |    |
| 132 □ 150A                   | N100 .         | x               | -   | x      | -      | -  | . U1 | . U1 | . U1            |                  |    |
| 250A                         | N200 .         | x               | -   | x      | -      | -  | . U1 |      |                 |                  |    |
| 2-pole                       |                | 60°             | 2 48 □ 20A                                | M10H . | x      | x  | x    | x    | x <sup>1)</sup> | . U2             |    |
|                              |                |                 | 32A                                       | M20 .  | x      | x  | x    | x    | -               | . U2             |    |
|                              |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x    | -    | x               | . U2             |    |
|                              |                |                 | 50A                                       | N33F . | x      | x  | x    | -    | x               | . U2             |    |
| 88 □ 63A                     | N40 .          | x               | -   | x      | -      | x  | . U2 | +007 |                 |                  |    |
| 90A                          | N61 .          | x               | -   | x      | -      | x  | . U2 |      |                 |                  |    |
| 115A                         | N80 .          | x               | -   | x      | -      | -  | . U2 |      |                 |                  |    |
| 132 □ 150A                   | N100 .         | x               | -   | x      | -      | -  | . U2 | . U2 | . U2            |                  |    |
| 250A                         | N200 .         | x               | -   | x      | -      | -  | . U2 |      |                 |                  |    |
| 3-pole                       |                | 60°             | 3 48 □ 20A                                | M10H . | x      | x  | x    | x    | x <sup>1)</sup> | . U3             |    |
|                              |                |                 | 32A                                       | M20 .  | x      | x  | x    | x    | -               | . U3             |    |
|                              |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x    | -    | x               | . U3             |    |
|                              |                |                 | 50A                                       | N33F . | x      | x  | x    | -    | x               | . U3             |    |
| 88 □ 63A                     | N40 .          | x               | -   | x      | -      | x  | . U3 | +007 |                 |                  |    |
| 90A                          | N61 .          | x               | -   | x      | -      | x  | . U3 |      |                 |                  |    |
| 115A                         | N80 .          | x               | -   | x      | -      | -  | . U3 |      |                 |                  |    |
| 132 □ 150A                   | N100 .         | x               | -   | x      | -      | -  | . U3 | . U3 | . U3            |                  |    |
| 250A                         | N200 .         | x               | -   | x      | -      | -  | . U3 |      |                 |                  |    |
| 4-pole<br>4. pole early make |                | 60°             | 4 48 □ 20A                                | M10H . | x      | x  | x    | x    | x <sup>1)</sup> | . U4             |    |
|                              |                |                 | 32A                                       | M20 .  | x      | x  | x    | x    | -               | . U4             |    |
|                              |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x    | -    | x               | . U4             |    |
|                              |                |                 | 50A                                       | N33F . | x      | -  | x    | -    | x               | . U4             |    |
| 88 □ 63A                     | N40 .          | x               | -   | x      | -      | x  | . U4 | +007 |                 |                  |    |
| 90A                          | N61 .          | x               | -   | x      | -      | x  | . U4 |      |                 |                  |    |
| 115A                         | N80 .          | x               | -   | x      | -      | -  | . U4 |      |                 |                  |    |
| 132 □ 150A                   | N100 .         | x               | -   | x      | -      | -  | . U4 | . U4 | . U4            |                  |    |
| 250A                         | N200 .         | x               | -   | x      | -      | -  | . U4 |      |                 |                  |    |
| 6-pole                       |                | 60°             | 6 48 □ 20A                                | M10H . | x      | x  | x    | -    | x <sup>1)</sup> | . U6             |    |
|                              |                |                 | 32A                                       | M20 .  | x      | x  | x    | -    | -               | . U6             |    |
|                              |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x    | -    | x               | . U6             |    |
|                              |                |                 | 50A                                       | N33F . | x      | -  | x    | -    | x               | . U6             |    |
| 88 □ 63A                     | N40 .          | x               | -   | x      | -      | x  | . U6 | +007 |                 |                  |    |
| 90A                          | N61 .          | x               | -   | x      | -      | x  | . U6 |      |                 |                  |    |
| 115A                         | N80 .          | x               | -   | x      | -      | -  | . U6 |      |                 |                  |    |
| 132 □ 150A                   | N100 .         | x               | -   | x      | -      | -  | . U6 | . U6 | . U6            |                  |    |
| 250A                         | N200 .         | x               | -   | x      | -      | -  | . U6 |      |                 |                  |    |

**Ordering example:** AC21 250A panel mounting, changeover switch 6-pole, Escutcheon plate 1 - OFF - 2 **N200 E U6+007**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

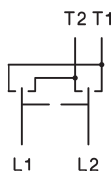
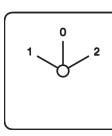
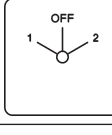
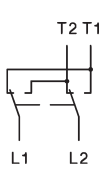
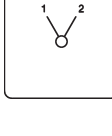
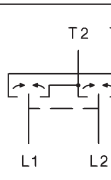
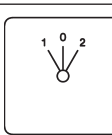
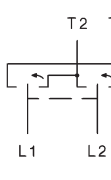
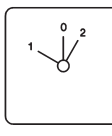
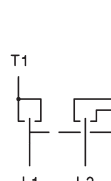
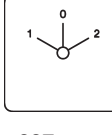
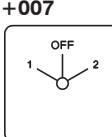
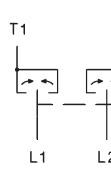
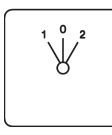
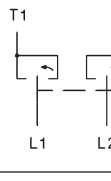
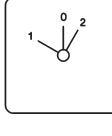
| Description                              | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type     | Design |    |      |      | Switch pro- | Escutcheon plate |      |  |
|--|----------------|-----------------|---|----------|--------|----|------|------|-------------|------------------|------|--|
|  |                |                 |   |          | E.     | Z. | V.   | SMA. |             |                  | P.   |  |
| <b>Changeover switches without off W</b> |                |                 |   |          |        |    |      |      |             |                  |      |  |
| 1-pole                                   |                | 60°             | 1   | 48 □ 20A | M10H . | x  | x    | x    | x           | x <sup>1)</sup>  | . W1 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x    | x    | x           | -                | . W1 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -    | x    | -           | x                | . W1 |  |
|  |                |                 |   | 50A      | N33F . | x  | x    | x    | -           | x                | . W1 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -    | x    | -           | x                | . W1 |  |
| 90A                                      | N61 .          | x               | -   | x        | -      | x  | . W1 |      |             |                  |      |  |
| 115A                                     | N80 .          | x               | -   | x        | -      | -  | . W1 |      |             |                  |      |  |
| 132 □ 150A                               | N100 .         | x               | -   | x        | -      | -  | . W1 |      |             |                  |      |  |
| 250A                                     | N200 .         | x               | -   | x        | -      | -  | . W1 |      |             |                  |      |  |
| 2-pole                                   |                | 60°             | 2   | 48 □ 20A | M10H . | x  | x    | x    | x           | x <sup>1)</sup>  | . W2 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x    | x    | x           | -                | . W2 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -    | x    | -           | x                | . W2 |  |
|  |                |                 |   | 50A      | N33F . | x  | x    | x    | -           | x                | . W2 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -    | x    | -           | x                | . W2 |  |
| 90A                                      | N61 .          | x               | -   | x        | -      | x  | . W2 |      |             |                  |      |  |
| 115A                                     | N80 .          | x               | -   | x        | -      | -  | . W2 |      |             |                  |      |  |
| 132 □ 150A                               | N100 .         | x               | -   | x        | -      | -  | . W2 |      |             |                  |      |  |
| 250A                                     | N200 .         | x               | -   | x        | -      | -  | . W2 |      |             |                  |      |  |
| 3-pole                                   |                | 60°             | 3   | 48 □ 20A | M10H . | x  | x    | x    | x           | x <sup>1)</sup>  | . W3 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x    | x    | x           | -                | . W3 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -    | x    | -           | x                | . W3 |  |
|  |                |                 |   | 50A      | N33F . | x  | x    | x    | -           | x                | . W3 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -    | x    | -           | x                | . W3 |  |
| 90A                                      | N61 .          | x               | -   | x        | -      | x  | . W3 |      |             |                  |      |  |
| 115A                                     | N80 .          | x               | -   | x        | -      | -  | . W3 |      |             |                  |      |  |
| 132 □ 150A                               | N100 .         | x               | -   | x        | -      | -  | . W3 |      |             |                  |      |  |
| 250A                                     | N200 .         | x               | -   | x        | -      | -  | . W3 |      |             |                  |      |  |
| 4-pole<br>4. pole early make             |                | 60°             | 4   | 48 □ 20A | M10H . | x  | x    | x    | x           | x <sup>1)</sup>  | . W4 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x    | x    | x           | -                | . W4 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -    | x    | -           | x                | . W4 |  |
|  |                |                 |   | 50A      | N33F . | x  | -    | x    | -           | x                | . W4 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -    | x    | -           | x                | . W4 |  |
| 90A                                      | N61 .          | x               | -   | x        | -      | x  | . W4 |      |             |                  |      |  |
| 115A                                     | N80 .          | x               | -   | x        | -      | -  | . W4 |      |             |                  |      |  |
| 132 □ 150A                               | N100 .         | x               | -   | x        | -      | -  | . W4 |      |             |                  |      |  |
| 250A                                     | N200 .         | x               | -   | x        | -      | -  | . W4 |      |             |                  |      |  |
| 6-pole                                   |                | 60°             | 6   | 48 □ 20A | M10H . | x  | x    | x    | -           | x <sup>1)</sup>  | . W6 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x    | x    | -           | -                | . W6 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -    | x    | -           | x                | . W6 |  |
|  |                |                 |   | 50A      | N33F . | x  | -    | x    | -           | x                | . W6 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -    | x    | -           | x                | . W6 |  |
| 90A                                      | N61 .          | x               | -   | x        | -      | x  | . W6 |      |             |                  |      |  |
| 115A                                     | N80 .          | x               | -   | x        | -      | -  | . W6 |      |             |                  |      |  |
| 132 □ 150A                               | N100 .         | x               | -   | x        | -      | -  | . W6 |      |             |                  |      |  |
| 250A                                     | N200 .         | x               | -   | x        | -      | -  | . W6 |      |             |                  |      |  |

**Ordering example:** AC21 250A panel mounting, changeover switch without off 6-pole, **N200 E W6**

1) Plastic enclosed switches are delivered with switch type M10.



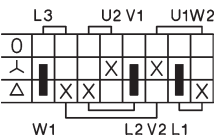
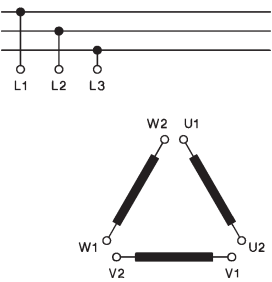
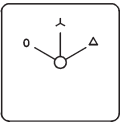
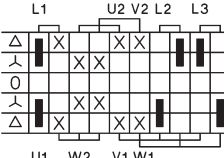
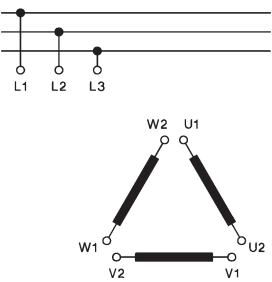
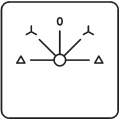
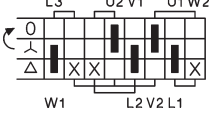
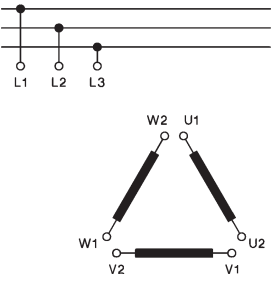
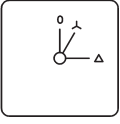
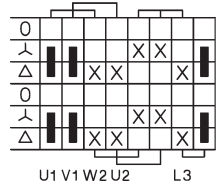
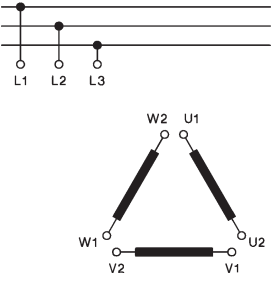
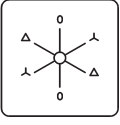
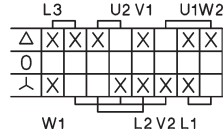
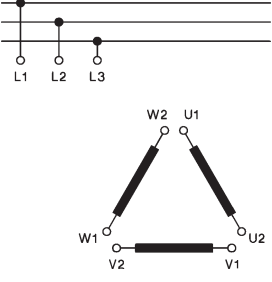
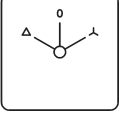
## Switching programs

| Description   | Wiring diagram  | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21   | Type     | Design<br>E. Z. V. SMA. P.<br>↓ ↓ ↓ ↓ ↓ | Switch<br>pro-                 | Escutcheon<br>plate   |   |
|---|---|-----------------|---|----------|---|--------------------------------|---|---|
| <b>Reversing switches WU</b>  |   |                 |   |          |   |                                |   |   |
| 2-pole  |    | 60°             | 2   | 48 □ 20A | M10H . x x x x x <sup>1)</sup>          | . WU2                          |    |   |
|   |   |                 |   | 32A      | M20 . x x x x -                         | . WU2                          |   |   |
|   |   |                 |   | 64 □ 32A | N20 . x - x - x                         | . WU2                          |   |   |
|   |   |                 |   | 50A      | N33F . x x x - x                        | . WU2                          |   |   |
|   |   |                 |   | 88 □ 63A | N40 . x - x - x                         | . WU2                          |   |   |
| 90A   | N61 . x - x - x   | . WU2           |   |          |   |                                |   |   |
| 115A  | N80 . x - x - -   | . WU2           |   |          |   |                                |   |   |
| 132 □ 150A  | N100 . x - x - -  | . WU2           | +007<br>   |          |   |                                |   |   |
| 250A  | N200 . x - x - -  | . WU2           |   |          |   |                                |   |   |
| 2-pole<br>without off<br>cross switch                                   |    | 60°             |   | 2        | 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> | . WK2   |    |
|   |   |                 |   |          | 32A                                     | M20 . x x x x -                | . WK2   |   |
|   |   |                 |   |          | 64 □ 32A                                | N20 . x - x - x                | . WK2   |   |
|   |   |                 | 50A   |          | N33F . x x x - x                        | . WK2                          |   |   |
|   |   |                 | 88 □ 63A  |          | N40 . x x - - x                         | . WK2                          |   |   |
| 90A   | N61 . x - x - x   | . WK2           |   |          |   |                                |   |   |
| 115A  | N80 . x - x - -   | . WK2           |   |          |   |                                |   |   |
| 132 □ 150A  | N100 . x - x - -  | . WK2           |   |          |   |                                |   |   |
| 250A  | N200 . x - x - -  | . WK2           |   |          |   |                                |   |   |
| 2-pole<br>with spring return from<br>both sides to off                  |   | 30°             | 2   | 48 □ 20A | M10H . x x x x x <sup>1)</sup>          | . WU2R2                        |   |   |
|   |   |                 |   | 32A      | M20 . x x x x -                         | . WU2R2                        |   |   |
|   |   |                 |   | 64 □ 32A | N20 . x - x - x                         | . WU2R2                        |   |   |
| 50A   | N33F . x x x - x  | . WU2R2         |   |          |   |                                |   |   |
| 88 □ 63A  | N40 . x - x - x   | . WU2R2         |   |          |   |                                |   |   |
| 2-pole<br>position 1 latched<br>position 2 with spring<br>return to off |  | 60°+30°         | 2   | 48 □ 20A | M10H . x x x x x <sup>1)</sup>          | . WU2R1                        |  |   |
|   |   |                 |   | 32A      | M20 . x x x x -                         | . WU2R1                        |   |   |
|   |   |                 |   | 64 □ 32A | N20 . x - x - x                         | . WU2R1                        |   |   |
| 50A   | N33F . x x x - x  | . WU2R1         |   |          |   |                                |   |   |
| 88 □ 63A  | N40 . x - x - x   | . WU2R1         |   |          |   |                                |   |   |
| 3-pole  |  | 60°             | 3   | 48 □ 20A | M10H . x x x x x <sup>1)</sup>          | . WU3                          |  |   |
|   |   |                 |   | 32A      | M20 . x x x x -                         | . WU3                          |   |   |
|   |   |                 |   | 64 □ 32A | N20 . x - x - x                         | . WU3                          |   |   |
|   |   |                 |   | 50A      | N33F . x x x - x                        | . WU3                          |   |   |
|   |   |                 |   | 88 □ 63A | N40 . x - x - x                         | . WU3                          |   |   |
| 90A   | N60 . x - x - x   | . WU3           |   |          |   |                                |   |   |
| 115A  | N80 . x - x - -   | . WU3           |   |          |   |                                |   |   |
| 132 □ 150A  | N100 . x - x - -  | . WU3           | +007<br> |          |   |                                |   |   |
| 250A  | N200 . x - x - -  | . WU3           |   |          |   |                                |   |   |
| 3-pole<br>with spring return from<br>both sides to off                  |  | 30°             |   | 3        | 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> | . WU3R2   |  |
|   |   |                 |   |          | 32A                                     | M20 . x x x x -                | . WU3R2   |   |
|   |   |                 |   |          | 64 □ 32A                                | N20 . x - x - x                | . WU3R2   |   |
| 50A   | N33F . x x x - x  | . WU3R2         |   |          |   |                                |   |   |
| 88 □ 63A  | N40 . x - x x   | . WU3R2         |   |          |   |                                |   |   |
| 3-pole<br>position 1 latched<br>position 2 with spring<br>return to off |  | 60°+30°         | 3   | 48 □ 20A | M10H . x x x x x <sup>1)</sup>          | . WU3R1                        |  |   |
|   |   |                 |   | 32A      | M20 . x x x x -                         | . WU3R1                        |   |   |
|   |   |                 |   | 64 □ 32A | N20 . x - x - x                         | . WU3R1                        |   |   |
| 50A   | N33F . x - x - x  | . WU3R1         |   |          |   |                                |   |   |
| 88 □ 63A  | N40 . x - x - x   | . WU3R1         |   |          |   |                                |   |   |

**Ordering example:** AC21 63A base mounting, reversing switch 3-pole, position 2 with spring to off **N40 V WU3R1**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description   | Wiring diagram  | Switching angle    | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type                    | Design                                |    |    |      | Switch pro- | Escutcheon plate |        |   |        |        |
|---|---|--------------------|--|-------------------------|---------------------------------------|----|----|------|-------------|------------------|--------|---|--------|--------|
|   |   |                    |  |                         | E.                                    | Z. | V. | SMA. |             |                  | P.     |   |        |        |
| <b>Star-Delta switches SD</b>   |   |                    |  |                         |                                       |    |    |      |             |                  |        |   |        |        |
| 1 rotary direction<br>   |    | 60°                | 4  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x x x <sup>1)</sup> | x  | x  | x    | x           | x <sup>1)</sup>  | . SD   |    |        |        |
|   |   |                    |  | 64 □ 32A<br>50A         | <b>M20</b> . x x x x -                | x  | x  | x    | x           | -                | -      |   | . SD   |        |
|   |   |                    |  | 88 □ 63A<br>90A<br>115A | <b>N20</b> . x - x - x                | x  | -  | x    | -           | x                | -      |   | -      | . SD   |
|   |   |                    |  |                         | <b>N33F</b> . x - x - x               | x  | -  | x    | -           | x                | -      |   | -      | . SD   |
| both rotary directions<br>   |    | 45°                | 5  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x x x <sup>1)</sup> | x  | x  | x    | x           | x <sup>1)</sup>  | . SDR  |    |        |        |
|   |   |                    |  | 64 □ 32A<br>50A         | <b>M20</b> . x x x x -                | x  | x  | x    | x           | -                | -      |   | . SDR  |        |
|   |   |                    |  | 88 □ 63A<br>90A<br>115A | <b>N20</b> . x - x - x                | x  | -  | x    | -           | x                | -      |   | -      | . SDR  |
|   |   |                    |  |                         | <b>N33F</b> . x - x - x               | x  | -  | x    | -           | x                | -      |   | -      | . SDR  |
| 1 rotary direction<br>spring return from Y<br>to off<br>                       |   | 60°                | 4  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x x x <sup>1)</sup> | x  | x  | x    | x           | x <sup>1)</sup>  | . SRD  |   |        |        |
|   |   |                    |  | 64 □ 32A<br>50A         | <b>M20</b> . x x x x -                | x  | x  | x    | x           | -                | -      |   | . SRD  |        |
|   |   |                    |  | 88 □ 63A<br>90A<br>115A | <b>N20</b> . x - x - x                | x  | -  | x    | -           | x                | -      |   | -      | . SRD  |
|   |   |                    |  |                         | <b>N33F</b> . x - x - x               | x  | -  | x    | -           | x                | -      |   | -      | . SRD  |
| 1 rotary direction<br>with clockwise operation<br>and backswitch interlock<br> |  | 60°                | 5  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x x x <sup>1)</sup> | x  | x  | x    | x           | x <sup>1)</sup>  | . SDRU |  |        |        |
|   |   |                    |  | 64 □ 32A<br>50A         | <b>M20</b> . x x x x -                | x  | x  | x    | x           | -                | -      |   | . SDRU |        |
|   |   |                    |  | 88 □ 63A<br>90A<br>115A | <b>N20</b> . x - x - x                | x  | -  | x    | -           | x                | -      |   | -      | . SDRU |
|   |   |                    |  |                         | <b>N33F</b> . x - x - x               | x  | -  | x    | -           | x                | -      |   | -      | . SDRU |
| Star-Delta selector<br>switch<br>  |  | 60°                | 4  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x x x <sup>1)</sup> | x  | x  | x    | x           | x <sup>1)</sup>  | . SDU  |  |        |        |
|   |   |                    |  | 64 □ 32A<br>50A         | <b>M20</b> . x x x x -                | x  | x  | x    | x           | -                | -      |   | . SDU  |        |
|   |   |                    |  | 88 □ 63A<br>90A<br>115A | <b>N20</b> . x - x - x                | x  | -  | x    | -           | x                | -      |   | -      | . SDU  |
|   |   |                    |  |                         | <b>N33F</b> . x - x - x               | x  | -  | x    | -           | x                | -      |   | -      | . SDU  |
|   |   | 132 □ 150A<br>250A |  | <b>N40</b> . x - x - x  | x                                     | -  | x  | -    | -           | . SDU            |        |   |        |        |
|   |   |                    |  | <b>N60</b> . x - x - x  | x                                     | -  | x  | -    | -           | . SDU            |        |   |        |        |
|   |   |                    |  | <b>N80</b> . x - x - -  | x                                     | -  | x  | -    | -           | . SDU            |        |   |        |        |
|   |   |                    |  | <b>N100</b> . x - x - - | x                                     | -  | x  | -    | -           | . SDU            |        |   |        |        |
|   |   |                    |  | <b>N200</b> . x - x - - | x                                     | -  | x  | -    | -           | . SDU            |        |   |        |        |

Ordering example: AC21 32A plastic enclosed, star-delta selector switch

**N20 P SDU**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                    | Design |    |    |         | Switch pro- | Escutcheon plate  |         |  |         |
|---|----------------|-----------------|---|-------------------------|--------|----|----|---------|-------------|-------------------|---------|--|---------|
|   |                |                 |   |                         | E.     | Z. | V. | SMA. P. |             |                   |         |  |         |
| with double outfeed phases for use with manual motor starter  |                | 60°             | 4   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . SDMO  |  |         |
|   |                |                 |   | 64 □ 32A<br>50A         | N20 .  | x  | x  | x       | x           | - -               | . SDMO  |  |         |
|   |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | x       |  | . SDMO  |
|   |                |                 |   |                         | N61 .  | x  | -  | x       | -           | x                 | -       |  | . SDMO  |
|   |                |                 |   |                         | N80 .  | x  | -  | x       | -           | -                 | -       |  | . SDMO  |
| with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break-down                   |                | 90°             | 4   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . SDJ1  |  |         |
|   |                |                 |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | x                 | x       |  | . SDJ1  |
|   |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -       |  | . SDJ1  |
|   |                |                 |   |                         | N61 .  | x  | -  | x       | -           | x                 | -       |  | . SDJ1  |
|   |                |                 |   |                         | N80 .  | x  | -  | x       | -           | -                 | -       |  | . SDJ1  |
| with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break-down, spring return to |                | 90°+30°         | 4   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . SDJ2  |  |         |
|   |                |                 |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | x                 | x       |  | . SDJ2  |
|   |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -       |  | . SDJ2  |
|   |                |                 |   |                         | N61 .  | x  | -  | x       | -           | x                 | -       |  | . SDJ2  |
|   |                |                 |   |                         | N80 .  | x  | -  | x       | -           | -                 | -       |  | . SDJ2  |
| as type SDJ1 but for both rotary directions   |                | 60°             | 7   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | -           | -                 | . SDRJ1 |  |         |
|   |                |                 |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | x                 | x       |  | . SDRJ1 |
|   |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -       |  | . SDRJ1 |
|   |                |                 |   |                         | N61 .  | x  | -  | x       | -           | -                 | -       |  | . SDRJ1 |
|   |                |                 |   |                         | N80 .  | x  | -  | x       | -           | -                 | -       |  | . SDRJ1 |
| with brake position (counter current braking) brake position is a momentary operation   |                | 45°+30°         | 5   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . SDB   |  |         |
|   |                |                 |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | x                 | x       |  | . SDB   |
|   |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -       |  | . SDB   |
|   |                |                 |   |                         | N61 .  | x  | -  | x       | -           | x                 | -       |  | . SDB   |
|   |                |                 |   |                         | N80 .  | x  | -  | x       | -           | -                 | -       |  | . SDB   |
|   |                | N100 .          | x   | -                       | x      | -  | -  | -       | . SDB       |                   |         |  |         |
|   |                | N200 .          | x   | -                       | x      | -  | -  | -       | . SDB       |                   |         |  |         |

Ordering example: AC21 250A panel mounting star-delta switch with brake position

N200 E SDB

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type  | Design  |    |    |         | Switch pro- | Escutcheon plate |   |  |             |
|---|----------------|-----------------|--|---|---|----|----|---------|-------------|------------------|---|--|-------------|
|   |                |                 |  |   | E.  | Z. | V. | SMA. P. |             |                  |   |  |             |
| for starting up single-phase motors with split-phase, spring return from START to Off |                | 30°+60°         | 2  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>HP1</b><br><b>M20</b> . x x x x - - . <b>HP1</b>   | x  | x  | x       | x           | x <sup>1)</sup>  | - |  |             |
|   |                |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>HP1</b><br><b>N33F</b> . x - x - x - . <b>HP1</b>   | x   | -  | x  | -       | x           | x                | . |  | <b>HP1</b>  |
|   |                |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>HP1</b>   | x   | -  | x  | -       | x           | -                | . |  | <b>HP1</b>  |
| for starting up single-phase motors with split-phase, spring return from START to 1   |                | 90°+30°         | 2  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>HP2</b><br><b>M20</b> . x x x x - - . <b>HP2</b>   | x  | x  | x       | x           | x <sup>1)</sup>  | - |  |             |
|   |                |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>HP2</b><br><b>N33F</b> . x - x - x - . <b>HP2</b>   | x   | -  | x  | -       | x           | x                | . |  | <b>HP2</b>  |
|   |                |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>HP2</b>   | x   | -  | x  | -       | x           | -                | . |  | <b>HP2</b>  |
| for starting up single-phase motors with split-phase, both rotary directions          |                | 60°+30°         | 3  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>HPR1</b><br><b>M20</b> . x x x x - - . <b>HPR1</b> | x  | x  | x       | x           | x <sup>1)</sup>  | - |  |             |
|   |                |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>HPR1</b><br><b>N33F</b> . x - x - x - . <b>HPR1</b> | x   | -  | x  | -       | x           | x                | . |  | <b>HPR1</b> |
|   |                |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>HPR1</b>  | x   | -  | x  | -       | x           | -                | . |  | <b>HPR1</b> |
| as type HPR1 with starting and phase-shifting capacitor                               |                | 60°+30°         | 4  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>HPR2</b><br><b>M20</b> . x x x x - - . <b>HPR2</b> | x  | x  | x       | x           | x <sup>1)</sup>  | - |  |             |
|   |                |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>HPR2</b><br><b>N33F</b> . x - x - x - . <b>HPR2</b> | x   | -  | x  | -       | x           | x                | . |  | <b>HPR2</b> |
|   |                |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>HPR2</b>  | x   | -  | x  | -       | x           | -                | . |  | <b>HPR2</b> |

**Ordering example:** AC21 63A panel mounting, split phase switch, both rotary directions **N40 E HPR1**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

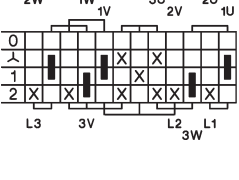
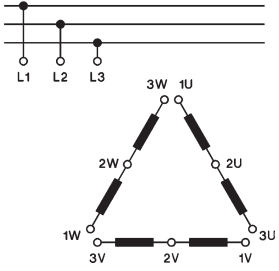
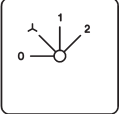
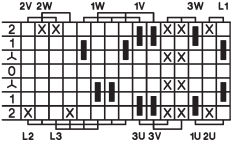
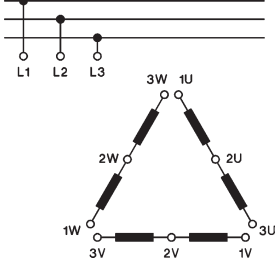
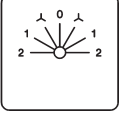
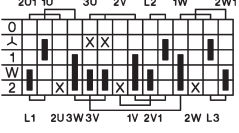
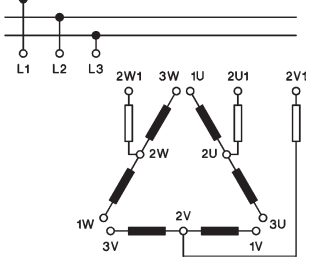
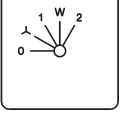
| Description  | Wiring diagram | Switching angle | Number of cells         |   | Type  | Design |    |    |      | Switch pro- | Escutcheon plate |
|--|----------------|-----------------|-------------------------|---|---|--------|----|----|------|-------------|------------------|
|  |                |                 | ↓ Size                  | ↓ AC21  |   | E.     | Z. | V. | SMA. |             |                  |
| 1 Dahlander winding<br>1 rotary direction  |                | 60°             | 4                       | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>P61</b><br><b>M20</b> . x x x x - - . <b>P61</b>     |        |    |    |      |             |                  |
|  |                |                 | 64 □ 32A<br>50A         | <b>N20</b> . x - x - x x . <b>P61</b><br><b>N33F</b> . x - x - x - . <b>P61</b>   |   |        |    |    |      |             |                  |
|  |                |                 | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - x - . <b>P61</b><br><b>N61</b> . x - x - x - . <b>P61</b><br><b>N80</b> . x - x - - - . <b>P61</b>       |   |        |    |    |      |             |                  |
|  |                |                 | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>P61</b><br><b>N200</b> . x - x - - - . <b>P61</b>  |   |        |    |    |      |             |                  |
|  |                |                 |                         |   |   |        |    |    |      |             |                  |
| 1 Dahlander winding<br>1 rotary direction  |                | 60°             | 4                       | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>P62</b><br><b>M20</b> . x x x x - - . <b>P62</b>     |        |    |    |      |             |                  |
|  |                |                 | 64 □ 32A<br>50A         | <b>N20</b> . x - x - x x . <b>P62</b><br><b>N33F</b> . x - x - x - . <b>P62</b>   |   |        |    |    |      |             |                  |
|  |                |                 | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - x - . <b>P62</b><br><b>N61</b> . x - x - x - . <b>P62</b><br><b>N80</b> . x - x - - - . <b>P62</b>       |   |        |    |    |      |             |                  |
|  |                |                 | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>P62</b><br><b>N200</b> . x - x - - - . <b>P62</b>  |   |        |    |    |      |             |                  |
|  |                |                 |                         |   |   |        |    |    |      |             |                  |
| 1 Dahlander winding<br>both rotary directions  |                | 60°             | 7                       | 48 □ 20A<br>32A   | <b>M10H</b> . x x x - - - . <b>P61R</b><br><b>M20</b> . x x x - - - . <b>P61R</b>                 |        |    |    |      |             |                  |
|  |                |                 | 64 □ 32A<br>50A         | <b>N20</b> . x - x - x - . <b>P61R</b><br><b>N33F</b> . x - x - - - . <b>P61R</b>   |   |        |    |    |      |             |                  |
|  |                |                 | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - x - . <b>P61R</b><br><b>N61</b> . x - x - - - . <b>P61R</b><br><b>N80</b> . x - x - - - . <b>P61R</b>    |   |        |    |    |      |             |                  |
|  |                |                 | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>P61R</b><br><b>N200</b> . x - x - - - . <b>P61R</b>  |   |        |    |    |      |             |                  |
|  |                |                 |                         |   |   |        |    |    |      |             |                  |
| 1 Dahlander winding<br>1 rotary direction,<br>clockwise operation                              |                | 60°             | 5                       | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>P61RU</b><br><b>M20</b> . x x x x - - . <b>P61RU</b> |        |    |    |      |             |                  |
|  |                |                 | 64 □ 32A<br>50A         | <b>N20</b> . x - x - x x . <b>P61RU</b><br><b>N33F</b> . x - x - x - . <b>P61RU</b>   |   |        |    |    |      |             |                  |
|  |                |                 | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - x - . <b>P61RU</b><br><b>N61</b> . x - x - x - . <b>P61RU</b><br><b>N80</b> . x - x - - - . <b>P61RU</b> |   |        |    |    |      |             |                  |
|  |                |                 | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>P61RU</b><br><b>N200</b> . x - x - - - . <b>P61RU</b>  |   |        |    |    |      |             |                  |
|  |                |                 |                         |   |   |        |    |    |      |             |                  |
| 1 Dahlander winding<br>1 rotary direction,<br>with auxiliary contacts<br>for contactor control |                | 60°             | 5                       | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>P61J</b><br><b>M20</b> . x x x x - - . <b>P61J</b>   |        |    |    |      |             |                  |
|  |                |                 | 64 □ 32A<br>50A         | <b>N20</b> . x - x - x x . <b>P61J</b><br><b>N33F</b> . x - x - x - . <b>P61J</b>   |   |        |    |    |      |             |                  |
|  |                |                 | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - x - . <b>P61J</b><br><b>N61</b> . x - x - x - . <b>P61J</b><br><b>N80</b> . x - x - - - . <b>P61J</b>    |   |        |    |    |      |             |                  |
|  |                |                 | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>P61J</b><br><b>N200</b> . x - x - - - . <b>P61J</b>  |   |        |    |    |      |             |                  |
|  |                |                 |                         |   |   |        |    |    |      |             |                  |

**Ordering example:** AC21 32A cast enclosed, multi speed switch, 1 Dahlander winding, 1 rotary direction

**N20 G P61**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

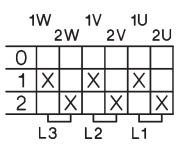
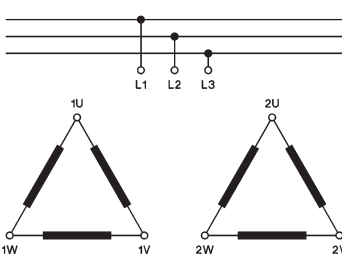
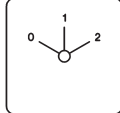
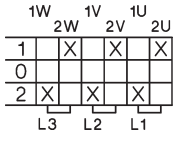
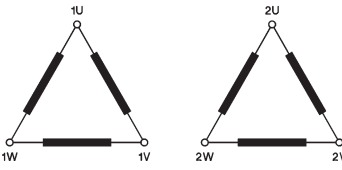
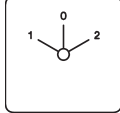
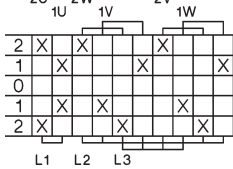
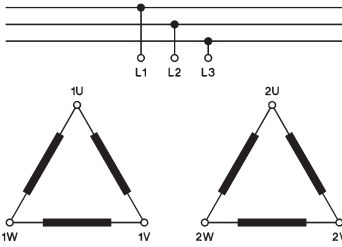
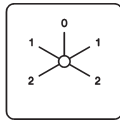
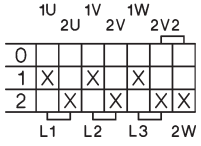
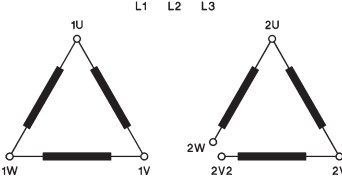
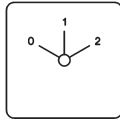
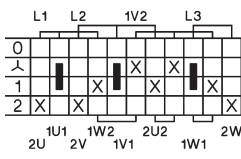
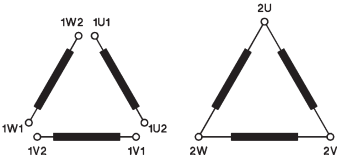
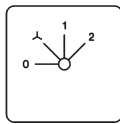
| Description  | Wiring diagram   | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type          | Design        |                             |               |               | Switch pro-           | Escutcheon plate  |               |   |  |
|--|--|-----------------|--|---------------|---------------|-----------------------------|---------------|---------------|-----------------------|-------------------|---------------|---|--|
|  |  |                 |  |               | E.            | Z.                          | V.            | SMA. P.       |                       |                   |               |   |  |
| open Dahlander winding<br>1 rotary direction<br>low speed with<br>star-delta-start<br>  |   | 45°             | 6  | 48 □ 20A      | <b>M10H</b> . | x                           | x             | x             | -                     | x <sup>1)</sup> - | . <b>P91</b>  |  |  |
|  |  |                 |  | 32A           | <b>M20</b> .  | x                           | x             | x             | -                     | -                 | -             |   | . <b>P91</b>   |
|  |  |                 |  | 64 □ 32A      | <b>N20</b> .  | x                           | -             | x             | -                     | x                 | x             |   | . <b>P91</b>   |
|  |  |                 |  | 50A           | <b>N33F</b> . | x                           | -             | x             | -                     | x                 | -             |   | . <b>P91</b>   |
|  |  |                 |  | 88 □ 63A      | <b>N40</b> .  | x                           | -             | x             | -                     | x                 | -             |   | . <b>P91</b>   |
| open Dahlander winding<br>both rotary directions<br>low speed with<br>star-delta-start<br>  |   | 30°             | 8  | 48 □ 20A      | <b>M10H</b> . | x                           | x             | x             | -                     | -                 | -             | . <b>P91R</b>   |   |
|  |  |                 |  | 32A           | <b>M20</b> .  | x                           | x             | x             | -                     | -                 | -             | . <b>P91R</b>   |  |
|  |  |                 |  | 64 □ 32A      | <b>N20</b> .  | x                           | -             | x             | -                     | x                 | -             | . <b>P91R</b>   |  |
|  |  |                 |  | 50A           | <b>N33F</b> . | x                           | -             | x             | -                     | x                 | -             | . <b>P91R</b>   |  |
|  |  |                 |  | 88 □ 63A      | <b>N40</b> .  | x                           | -             | x             | -                     | x                 | -             | . <b>P91R</b>   |  |
| open Dahlander winding<br>1 rotary direction,<br>low speed with<br>star-delta-start, with<br>additional start position<br>(starting resistor)<br> |  | 30°             | 7  | 48 □ 20A      | <b>M10H</b> . | x                           | x             | x             | -                     | -                 | -             | . <b>P91W</b>   |  |
|  |  |                 |  | 32A           | <b>M20</b> .  | x                           | x             | x             | -                     | -                 | -             | . <b>P91W</b>   |  |
|  |  |                 |  | 64 □ 32A      | <b>N20</b> .  | x                           | -             | x             | -                     | x                 | -             | . <b>P91W</b>   |  |
|  |  |                 |  | 50A           | <b>N33F</b> . | x                           | -             | x             | -                     | x                 | -             | . <b>P91W</b>   |  |
|  |  |                 |  | 88 □ 63A      | <b>N40</b> .  | x                           | -             | x             | -                     | x                 | -             | . <b>P91W</b>   |  |
| 90A<br><b>N61</b> .  | x - x - - - -  | . <b>P91W</b>   | 115A<br><b>N80</b> .                             | x - x - - - - | . <b>P91W</b> |                             |               |               |                       |                   |               |   |  |
|  |  |                 |  |               |               | 132 □ 150A<br><b>N100</b> . | x - x - - - - | . <b>P91W</b> |                       |                   |               |   |  |
|  |  |                 |  |               |               |                             |               |               | 250A<br><b>N200</b> . | x - x - - - -     | . <b>P91W</b> |   |  |

**Ordering example:** AC21 250A panel mounting, multi speed switch, 1 rotary direction, low speed with star-delta-start

**N200 E P91**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description   | Wiring diagram  | Switching angle | Number of cells |   | Type  | Design  |     |                 |   | Switch pro-   | Escutcheon plate  |
|---|---|-----------------|-----------------|---|---|---|-----|-----------------|---|---|---|
|   |   |                 | ↓ Size          | ↓ AC21  |   | E.  | Z.  | V.              | SMA.  |   |   |
| 2 separate windings<br>1 rotary direction<br><br>   |    | 60°             | 3               | 48 □ 20A<br>32A   | M10H . x x x x x <sup>1)</sup> - . P63<br>M20 . x x x x - - . P63                   |  |     |                 |   |   |   |
|   |   |                 |                 | 64 □ 32A<br>50A   | N20 . x - x - x x . P63<br>N33F . x - x - x - . P63                                 |   |     |                 |   |   |   |
|   |   |                 |                 | 88 □ 63A<br>90A<br>115A   | N40 . x - x - x - . P63<br>N61 . x - x - x - . P63<br>N80 . x - x - - - . P63       |   |     |                 |   |   |   |
|   |   |                 |                 | 132 □ 150A<br>250A  | N100 . x - x - - - . P63<br>N200 . x - x - - - . P63                                |   |     |                 |   |   |   |
|   |   |                 |                 | 2 separate windings<br>1 rotary direction<br><br>               |    |   | 60° | 3               | 48 □ 20A<br>32A   | M10H . x x x x x <sup>1)</sup> - . P64<br>M20 . x x x x - - . P64                     |    |
| 64 □ 32A<br>50A   | N20 . x - x - x x . P64<br>N33F . x - x - x - . P64                                 |                 |                 |   |   |   |     |                 |   |   |   |
| 88 □ 63A<br>90A<br>115A   | N40 . x - x - x - . P64<br>N61 . x - x - x - . P64<br>N80 . x - x - - - . P64       |                 |                 |   |   |   |     |                 |   |   |   |
| 132 □ 150A<br>250A  | N100 . x - x - - - . P64<br>N200 . x - x - - - . P64                                |                 |                 |   |   |   |     |                 |   |   |   |
| 2 separate windings<br>both rotary directions<br><br>                                   |   | 60°             | 5               |   |   | 48 □ 20A<br>32A   |     |                 | M10H . x x x x x <sup>1)</sup> - . P66<br>M20 . x x x x - - . P66 |   |   |
|   |   |                 |                 | 64 □ 32A<br>50A   | N20 . x - x - x x . P66<br>N33F . x - x - x - . P66                                 |   |     |                 |   |   |   |
|   |   |                 |                 | 88 □ 63A<br>90A<br>115A   | N40 . x - x - x - . P66<br>N61 . x - x - x - . P66<br>N80 . x - x - - - . P66       |   |     |                 |   |   |   |
|   |   |                 |                 | 132 □ 150A<br>250A  | N100 . x - x - - - . P66<br>N200 . x - x - - - . P66                                |   |     |                 |   |   |   |
|   |   |                 |                 | 2 separate windings<br>1 opened<br>1 rotary direction<br><br> |  | 60°   | 4   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . P71<br>M20 . x x x x - - . P71 |   |  |
| 64 □ 32A<br>50A   | N20 . x - x - x x . P71<br>N33F . x - x - x - . P71                                 |                 |                 |   |   |   |     |                 |   |   |   |
| 88 □ 63A<br>90A<br>115A   | N40 . x - x - x - . P71<br>N61 . x - x - x - . P71<br>N80 . x - x - - - . P71       |                 |                 |   |   |   |     |                 |   |   |   |
| 132 □ 150A<br>250A  | N100 . x - x - - - . P71<br>N200 . x - x - - - . P71                                |                 |                 |   |   |   |     |                 |   |   |   |
| 2 separate windings<br>1 rotary direction<br>low speed with<br>star-delta-start<br><br> |  | 45°             | 6               |   |   |   |     | 48 □ 20A<br>32A | M10H . x x x - x <sup>1)</sup> - . P96<br>M20 . x x x - - - . P96 |  |   |
|   |   |                 |                 | 64 □ 32A<br>50A   | N20 . x - x - x x . P96<br>N33F . x - x - x - . P96                                 |   |     |                 |   |   |   |
|   |   |                 |                 | 88 □ 63A<br>90A<br>115A   | N40 . x - x - x - . P96<br>N61 . x - x - x - . P96<br>N80 . x - x - - - . P96       |   |     |                 |   |   |   |
|   |   |                 |                 | 132 □ 150A<br>250A  | N100 . x - x - - - . P96<br>N200 . x - x - - - . P96                                |   |     |                 |   |   |   |

**Ordering example:** AC21 250A panel mounting, multi speed switch, 2 separate windings, low speed with star-delta-start N200 E P96

1) Plastic enclosed switches are delivered with switch type M10.

# Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type | Design      |             |    |         | Switch pro- | Escutcheon plate |                 |   |        |      |
|---|----------------|-----------------|--|------|-------------|-------------|----|---------|-------------|------------------|-----------------|---|--------|------|
|   |                |                 |  |      | E.          | Z.          | V. | SMA. P. |             |                  |                 |   |        |      |
| <b>Multi speed switches P</b>   |                |                 |  |      |             |             |    |         |             |                  |                 |   |        |      |
| 2 separate windings<br>1 rotary direction<br>both speeds with<br>star-delta-start                       |                | 45°             | 8  | 48 □ | 20A         | <b>M10H</b> | x  | x       | x           | -                | -               | - | . P122 |      |
|   |                |                 |  |      | 32A         | <b>M20</b>  | x  | x       | x           | -                | -               | - | . P122 |      |
|   |                |                 | 64   | □    | 32A         | <b>N20</b>  | x  | -       | x           | -                | x               | - | . P122 |      |
|   |                |                 |  |      | 50A         | <b>N33F</b> | x  | -       | x           | -                | -               | - | . P122 |      |
|   |                | 45°             | 88   | □    | 63A         | <b>N40</b>  | x  | -       | x           | -                | x               | - | . P122 |      |
|   |                |                 |  |      | 90A         | <b>N61</b>  | x  | -       | x           | -                | -               | - | . P122 |      |
|   |                |                 |  |      | 115A        | <b>N80</b>  | x  | -       | x           | -                | -               | - | . P122 |      |
|   |                |                 | 132  | □    | 150A        | <b>N100</b> | x  | -       | x           | -                | -               | - | . P122 |      |
|   |                |                 |  | 250A | <b>N200</b> | x           | -  | x       | -           | -                | . P122          |   |        |      |
| 1 Dahlander winding A<br>1 normal winding B<br>3 speeds<br>1 rotary direction<br><b>0-AΔ-BΔ or Δ-AΔ</b> |                | 45°             | 6  | 48 □ | 20A         | <b>M10H</b> | x  | x       | x           | -                | x <sup>1)</sup> | - | . P93  |      |
|   |                |                 |  |      | 32A         | <b>M20</b>  | x  | x       | x           | -                | -               | - | . P93  |      |
|   |                |                 | 64   | □    | 32A         | <b>N20</b>  | x  | -       | x           | -                | x               | x | . P93  |      |
|   |                |                 |  |      | 50A         | <b>N33F</b> | x  | -       | x           | -                | x               | - | . P93  |      |
|   |                | 45°             | 88   | □    | 63A         | <b>N40</b>  | x  | -       | x           | -                | x               | - | . P93  | +127 |
|   |                |                 |  |      | 90A         | <b>N61</b>  | x  | -       | x           | -                | x               | - | . P93  |      |
|   |                |                 |  |      | 115A        | <b>N80</b>  | x  | -       | x           | -                | -               | - | . P93  |      |
|   |                |                 | 132  | □    | 150A        | <b>N100</b> | x  | -       | x           | -                | -               | - | . P93  |      |
|   |                |                 |  | 250A | <b>N200</b> | x           | -  | x       | -           | -                | . P93           |   |        |      |
| 1 Dahlander winding A<br>1 normal winding B<br>3 speeds<br>1 rotary direction<br><b>0-BΔ or Δ-AΔ-AΔ</b> |                | 45°             | 6  | 48 □ | 20A         | <b>M10H</b> | x  | x       | x           | -                | x <sup>1)</sup> | - | . P94  |      |
|   |                |                 |  |      | 32A         | <b>M20</b>  | x  | x       | x           | -                | -               | - | . P94  |      |
|   |                |                 | 64   | □    | 32A         | <b>N20</b>  | x  | -       | x           | -                | x               | - | . P94  |      |
|   |                |                 |  |      | 50A         | <b>N33F</b> | x  | -       | x           | -                | x               | - | . P94  |      |
|   |                | 45°             | 88   | □    | 63A         | <b>N40</b>  | x  | -       | x           | -                | x               | - | . P94  | +127 |
|   |                |                 |  |      | 90A         | <b>N61</b>  | x  | -       | x           | -                | x               | - | . P94  |      |
|   |                |                 |  |      | 115A        | <b>N80</b>  | x  | -       | x           | -                | -               | - | . P94  |      |
|   |                |                 | 132  | □    | 150A        | <b>N100</b> | x  | -       | x           | -                | -               | - | . P94  |      |
|   |                |                 |  | 250A | <b>N200</b> | x           | -  | x       | -           | -                | . P94           |   |        |      |
| 1 Dahlander winding A<br>1 normal winding B<br>3 speeds<br>1 rotary direction<br><b>0-AΔ-AΔ-BΔ or Δ</b> |                | 45°             | 6  | 48 □ | 20A         | <b>M10H</b> | x  | x       | x           | -                | x <sup>1)</sup> | - | . P95  |      |
|   |                |                 |  |      | 32A         | <b>M20</b>  | x  | x       | x           | -                | -               | - | . P95  |      |
|   |                |                 | 64   | □    | 32A         | <b>N20</b>  | x  | -       | x           | -                | x               | x | . P95  |      |
|   |                |                 |  |      | 50A         | <b>N33F</b> | x  | -       | x           | -                | x               | - | . P95  |      |
|   |                | 45°             | 88   | □    | 63A         | <b>N40</b>  | x  | -       | x           | -                | x               | - | . P95  | +127 |
|   |                |                 |  |      | 90A         | <b>N61</b>  | x  | -       | x           | -                | x               | - | . P95  |      |
|   |                |                 |  |      | 115A        | <b>N80</b>  | x  | -       | x           | -                | -               | - | . P95  |      |
|   |                |                 | 132  | □    | 150A        | <b>N100</b> | x  | -       | x           | -                | -               | - | . P95  |      |
|   |                |                 |  | 250A | <b>N200</b> | x           | -  | x       | -           | -                | . P95           |   |        |      |
| 1 Dahlander winding A<br>1 normal winding B<br>3 speeds<br>both rotary directions                       |                | 45°             | 9  | 48 □ | 20A         | <b>M10H</b> | x  | x       | x           | -                | -               | - | . P93R |      |
|   |                |                 |  |      | 32A         | <b>M20</b>  | x  | x       | x           | -                | -               | - | . P93R |      |
|   |                |                 | 64   | □    | 32A         | <b>N20</b>  | x  | -       | x           | -                | -               | - | . P93R |      |
|   |                |                 |  |      | 50A         | <b>N33F</b> | x  | -       | x           | -                | -               | - | . P93R |      |
|   |                | 45°             | 88   | □    | 63A         | <b>N40</b>  | x  | -       | x           | -                | -               | - | . P93R |      |
|   |                |                 |  |      | 90A         | <b>N61</b>  | x  | -       | x           | -                | -               | - | . P93R |      |
|   |                |                 |  |      | 115A        | <b>N80</b>  | x  | -       | x           | -                | -               | - | . P93R |      |
|   |                |                 | 132  | □    | 150A        | <b>N100</b> | x  | -       | x           | -                | -               | - | . P93R |      |
|   |                |                 |  | 250A | <b>N200</b> | x           | -  | x       | -           | -                | . P93R          |   |        |      |

**Ordering example:** AC21 250A panel mounting, multi speed switch, 1 Dahlander winding A,  
1 normal winding B, 3 speeds, both rotary directions **N200 E P93R**

1) Plastic enclosed switches are delivered with switch type M10.



## Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells |          | Type          | Design       |    |    |      | Switch pro-    | Escutcheon plate |                |  |                |
|---|----------------|-----------------|-----------------|----------|---------------|--------------|----|----|------|----------------|------------------|----------------|--|----------------|
|   |                |                 | ↓ Size          | ↓ AC21   |               | E.           | Z. | V. | SMA. |                |                  | P.             |  |                |
| <b>1 Dahlander winding A</b><br><b>1 normal winding B</b><br><b>3 speeds</b><br><b>both rotary directions</b> |                | 45°             | 9               | 48 □ 20A | <b>M10H</b> . | x            | x  | x  | -    | -              | -                | <b>. P94R</b>  |  |                |
|   |                |                 |                 |          |               | <b>M20</b> . | x  | x  | x    | -              | -                | -              |  | <b>. P94R</b>  |
|   |                |                 |                 | 64 □ 32A | <b>N20</b> .  | x            | -  | x  | -    | -              | -                | -              |  | <b>. P94R</b>  |
|   |                |                 |                 |          | <b>N33F</b> . | x            | -  | x  | -    | -              | -                | -              |  | <b>. P94R</b>  |
|   |                |                 |                 | 88 □ 63A | <b>N40</b> .  | x            | -  | x  | -    | -              | -                | -              |  | <b>. P94R</b>  |
|   |                | <b>N61</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P94R</b>  |                  |                |  |                |
|   |                | <b>N80</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P94R</b>  |                  |                |  |                |
|   |                |                 | 132 □ 150A      |          | <b>N100</b> . | x            | -  | x  | -    | -              | -                | <b>. P94R</b>  |  |                |
|   |                |                 |                 |          | <b>N200</b> . | x            | -  | x  | -    | -              | -                | <b>. P94R</b>  |  |                |
| <b>1 Dahlander winding A</b><br><b>1 normal winding B</b><br><b>3 speeds</b><br><b>both rotary directions</b> |                | 45°             | 8               | 48 □ 20A | <b>M10H</b> . | x            | x  | x  | -    | -              | -                | <b>. P95R</b>  |  |                |
|   |                |                 |                 |          |               | <b>M20</b> . | x  | x  | x    | -              | -                | -              |  | <b>. P95R</b>  |
|   |                |                 |                 | 64 □ 32A | <b>N20</b> .  | x            | -  | x  | -    | -              | x                | -              |  | <b>. P95R</b>  |
|   |                |                 |                 |          | <b>N33F</b> . | x            | -  | x  | -    | -              | -                | -              |  | <b>. P95R</b>  |
|   |                |                 |                 | 88 □ 63A | <b>N40</b> .  | x            | -  | x  | -    | -              | x                | -              |  | <b>. P95R</b>  |
|   |                | <b>N61</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P95R</b>  |                  |                |  |                |
|   |                | <b>N80</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P95R</b>  |                  |                |  |                |
|   |                |                 | 132 □ 150A      |          | <b>N100</b> . | x            | -  | x  | -    | -              | -                | <b>. P95R</b>  |  |                |
|   |                |                 |                 |          | <b>N200</b> . | x            | -  | x  | -    | -              | -                | <b>. P95R</b>  |  |                |
| <b>2 Dahlander windings</b><br><b>4 speeds</b><br><b>1 rotary direction</b><br><b>0-AΔ-BΔ-AΔ-BΔ</b>           |                | 30°             | 8               | 48 □ 20A | <b>M10H</b> . | x            | x  | x  | -    | -              | -                | <b>. P124</b>  |  |                |
|   |                |                 |                 |          |               | <b>M20</b> . | x  | x  | x    | -              | -                | -              |  | <b>. P124</b>  |
|   |                |                 |                 | 64 □ 32A | <b>N20</b> .  | x            | -  | x  | -    | -              | x                | -              |  | <b>. P124</b>  |
|   |                |                 |                 |          | <b>N33F</b> . | x            | -  | x  | -    | -              | -                | -              |  | <b>. P124</b>  |
|   |                |                 |                 | 88 □ 63A | <b>N40</b> .  | x            | -  | x  | -    | -              | x                | -              |  | <b>. P124</b>  |
|   |                | <b>N61</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P124</b>  |                  |                |  |                |
|   |                | <b>N80</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P124</b>  |                  |                |  |                |
|   |                |                 | 132 □ 150A      |          | <b>N100</b> . | x            | -  | x  | -    | -              | -                | <b>. P124</b>  |  |                |
|   |                |                 |                 |          | <b>N200</b> . | x            | -  | x  | -    | -              | -                | <b>. P124</b>  |  |                |
| <b>2 Dahlander windings</b><br><b>4 speeds</b><br><b>both rotary directions</b>                               |                | 30°             | 12              | 48 □ 20A | <b>M10H</b> . | x            | x  | x  | -    | -              | -                | <b>. P124R</b> |  |                |
|   |                |                 |                 |          |               | <b>M20</b> . | x  | x  | x    | -              | -                | -              |  | <b>. P124R</b> |
|   |                |                 |                 | 64 □ 32A | <b>N20</b> .  | x            | -  | x  | -    | -              | -                | -              |  | <b>. P124R</b> |
|   |                |                 |                 |          | <b>N33F</b> . | x            | -  | x  | -    | -              | -                | -              |  | <b>. P124R</b> |
|   |                |                 |                 | 88 □ 63A | <b>N40</b> .  | x            | -  | x  | -    | -              | -                | -              |  | <b>. P124R</b> |
|   |                | <b>N61</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P124R</b> |                  |                |  |                |
|   |                | <b>N80</b> .    | x               | -        | x             | -            | -  | -  | -    | <b>. P124R</b> |                  |                |  |                |
|   |                |                 | 132 □ 150A      |          | <b>N100</b> . | x            | -  | x  | -    | -              | -                | <b>. P124R</b> |  |                |
|   |                |                 |                 |          | <b>N200</b> . | x            | -  | x  | -    | -              | -                | <b>. P124R</b> |  |                |

Ordering example: AC21 250A Base mounting, multi speed switch, 2 Dahlander windings, 4 speeds, 1 rotary direction

**N200 V P124**

## Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type            | Design  |    |    |      | Switch pro- | Escutcheon plate |
|---|----------------|-----------------|---|-----------------|---|----|----|------|-------------|------------------|
|   |                |                 |   |                 | E.  | Z. | V. | SMA. |             |                  |
| <b>Changeover switches with spring return to off UR</b>               |                |                 |   |                 |   |    |    |      |             |                  |
| 1-pole  |                | 30°             | 1   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . UR1<br>M20 . x x x x - - . UR1 |    |    |      |             |                  |
|   |                |                 |   | 64 □ 32A<br>50A | N20 . x - x - x x . UR1<br>N33F . x - x - x - . UR1               |    |    |      |             |                  |
|   |                |                 |   | 88 □ 63A        | N40 . x - x - x - . UR1   |    |    |      | +264<br>    |                  |
| 2-pole  |                | 30°             | 2   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . UR2<br>M20 . x x x x - - . UR2 |    |    |      |             |                  |
|   |                |                 |   | 64 □ 32A<br>50A | N20 . x - x - x x . UR2<br>N33F . x - x - x - . UR2               |    |    |      |             |                  |
|   |                |                 |   | 88 □ 63A        | N40 . x - x - x - . UR2   |    |    |      | +264<br>    |                  |
| 3-pole  |                | 30°             | 3   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . UR3<br>M20 . x x x x - - . UR3 |    |    |      |             |                  |
|   |                |                 |   | 64 □ 32A<br>50A | N20 . x - x - x x . UR3<br>N33F . x - x - x - . UR3               |    |    |      |             |                  |
|   |                |                 |   | 88 □ 63A        | N40 . x - x - x - . UR3   |    |    |      | +264<br>    |                  |
| <b>Changeover switches with 1 latched and 1 momentary position UK</b> |                |                 |   |                 |   |    |    |      |             |                  |
| 1-pole<br>position 1 latched<br>position 2 with spring<br>return      |                | 60°+30°         | 1   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . UK1<br>M20 . x x x x - - . UK1 |    |    |      |             |                  |
|   |                |                 |   | 64 □ 32A<br>50A | N20 . x - x - x x . UK1<br>N33F . x - x - x - . UK1               |    |    |      |             |                  |
|   |                |                 |   | 88 □ 63A        | N40 . x - x - x - . UK1   |    |    |      |             |                  |
| 2-pole<br>position 1 latched<br>position 2 with spring<br>return      |                | 60°+30°         | 2   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . UK2<br>M20 . x x x x - - . UK2 |    |    |      |             |                  |
|   |                |                 |   | 64 □ 32A<br>50A | N20 . x - x - x x . UK2<br>N33F . x - x - x - . UK2               |    |    |      |             |                  |
|   |                |                 |   | 88 □ 63A        | N40 . x - x - x - . UK2   |    |    |      |             |                  |
| 3-pole<br>position 1 latched<br>position 2 with spring<br>return      |                | 60°+30°         | 3   | 48 □ 20A<br>32A | M10H . x x x x x <sup>1)</sup> - . UK3<br>M20 . x x x x - - . UK3 |    |    |      |             |                  |
|   |                |                 |   | 64 □ 32A<br>50A | N20 . x - x - x x . UK3<br>N33F . x - x - x - . UK3               |    |    |      |             |                  |
|   |                |                 |   | 88 □ 63A        | N40 . x - x - x - . UK3   |    |    |      |             |                  |

**Ordering example:** AC21 63A panel mounting, changeover switch, position 1 latched, position 2 with spring return, 3-pole: **N40 E UK3**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type   | Design |    |    |         | Switch pro-     | Escutcheon plate |       |  |
|--|----------------|-----------------|---|--------|--------|----|----|---------|-----------------|------------------|-------|--|
|  |                |                 |   |        | E.     | Z. | V. | SMA. P. |                 |                  |       |  |
| Double throw switches with spring return to off WR |                |                 |   |        |        |    |    |         |                 |                  |       |  |
| 1-pole   |                | 30°             | 1 48 □ 20A                                | M10H . | x      | x  | x  | x       | x <sup>1)</sup> | -                | . W1R |  |
|  |                |                 |   | M20 .  | x      | x  | x  | x       | -               | -                | . W1R |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | x               | x                | . W1R |  |
|  |                |                 | 88 □ 63A                                  | N33F . | x      | -  | x  | -       | x               | -                | . W1R |  |
|  |                |                 |   | N40 .  | x      | -  | x  | -       | x               | -                | . W1R |  |
| 2-pole   |                | 30°             | 2 48 □ 20A                                | M10H . | x      | x  | x  | x       | x <sup>1)</sup> | -                | . W2R |  |
|  |                |                 |   | M20 .  | x      | x  | x  | x       | -               | -                | . W2R |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | x               | x                | . W2R |  |
|  |                |                 | 88 □ 63A                                  | N33F . | x      | -  | x  | -       | x               | -                | . W2R |  |
|  |                |                 |   | N40 .  | x      | -  | x  | -       | x               | -                | . W2R |  |
| 3-pole   |                | 30°             | 3 48 □ 20A                                | M10H . | x      | x  | x  | x       | x <sup>1)</sup> | -                | . W3R |  |
|  |                |                 |   | M20 .  | x      | x  | x  | x       | -               | -                | . W3R |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | x               | x                | . W3R |  |
|  |                |                 | 88 □ 63A                                  | N33F . | x      | -  | x  | -       | x               | -                | . W3R |  |
|  |                |                 |   | N40 .  | x      | -  | x  | -       | x               | -                | . W3R |  |

## Start-Stop switches S

|                      |  |     |            |        |   |   |   |   |                 |   |       |  |
|----------------------|--|-----|------------|--------|---|---|---|---|-----------------|---|-------|--|
| Start-switch, 1-pole |  | 30° | 1 48 □ 20A | M10H . | x | x | x | x | x <sup>1)</sup> | - | . SE  |  |
|                      |  |     |            | M20 .  | x | x | x | x | -               | - | . SE  |  |
|                      |  |     | 64 □ 32A   | N20 .  | x | - | x | - | x               | x | . SE  |  |
|                      |  |     | 88 □ 50A   | N33F . | x | - | x | - | x               | - | . SE  |  |
| Start-switch, 2-pole |  | 30° | 1 48 □ 20A | M10H . | x | x | x | x | x <sup>1)</sup> | - | . S2E |  |
|                      |  |     |            | M20 .  | x | x | x | x | -               | - | . S2E |  |
|                      |  |     | 64 □ 32A   | N20 .  | x | - | x | - | x               | x | . S2E |  |
|                      |  |     | 88 □ 50A   | N33F . | x | - | x | - | x               | - | . S2E |  |
| Start-switch, 3-pole |  | 30° | 2 48 □ 20A | M10H . | x | x | x | x | x <sup>1)</sup> | - | . S3E |  |
|                      |  |     |            | M20 .  | x | x | x | x | -               | - | . S3E |  |
|                      |  |     | 64 □ 32A   | N20 .  | x | - | x | - | x               | x | . S3E |  |
|                      |  |     | 88 □ 50A   | N33F . | x | - | x | - | x               | - | . S3E |  |

**Bestellbeispiel:** AC21 50A base mounting, Start-switch, 3-pole

**N33F V S3E**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

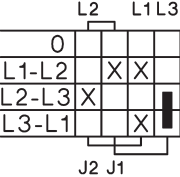
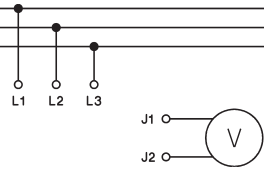
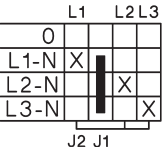
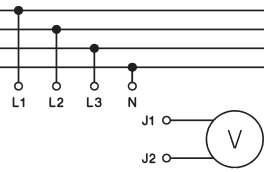
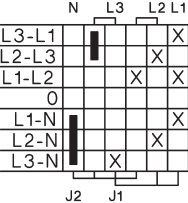
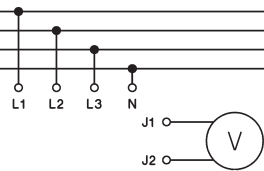
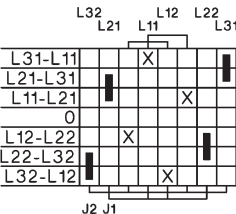
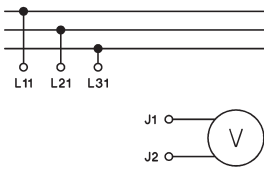
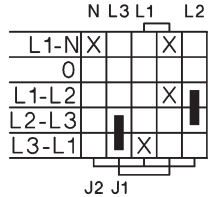
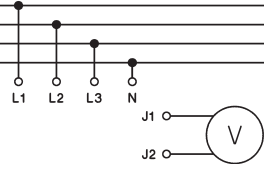
| Description  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                                    | Design |    |    |         | Switch pro-       | Escutcheon plate |  |
|--|----------------|-----------------|---|---|--------|----|----|---------|-------------------|------------------|--|
|  |                |                 |   |   | E.     | Z. | V. | SMA. P. |                   |                  |  |
| <b>Start-Stop switches S</b>   |                |                 |   |   |        |    |    |         |                   |                  |  |
| Stop-switch, 1-pole  |                | 30°             | 1 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . SA   | x      | x  | x  | x       | x <sup>1)</sup> - | . SA             |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . SA                  | x      | x  | x  | x       | - -               | . SA             |  |
|  |                |                 | 88 □ 63A                                  | N20 . x - x - x x . SA                  | x      | -  | x  | -       | x                 | x                |  |
| Stop-switch, 2-pole  |                | 30°             | 1 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . S2A  | x      | x  | x  | x       | x <sup>1)</sup> - | . S2A            |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . S2A                 | x      | x  | x  | x       | - -               | . S2A            |  |
|  |                |                 | 88 □ 63A                                  | N20 . x - x - x x . S2A                 | x      | -  | x  | -       | x                 | x                |  |
| Stop-switch, 3-pole  |                | 30°             | 2 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . S3A  | x      | x  | x  | x       | x <sup>1)</sup> - | . S3A            |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . S3A                 | x      | x  | x  | x       | - -               | . S3A            |  |
|  |                |                 | 88 □ 63A                                  | N20 . x - x - x x . S3A                 | x      | -  | x  | -       | x                 | x                |  |
| Start-Stop-switch, 1-pole  |                | 30°             | 1 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . SEA  | x      | x  | x  | x       | x <sup>1)</sup> - | . SEA            |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . SEA                 | x      | x  | x  | x       | - -               | . SEA            |  |
| Start-Stop-switch, 1-pole position START with spring return to 1       |                | 90° + 30°       | 1 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . S392 | x      | x  | x  | x       | x <sup>1)</sup> - | . S392           |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . S392                | x      | x  | x  | x       | - -               | . S392           |  |
| Start-Stop-switch, 1-pole for reversing contactors                     |                | 60° + 30°       | 2 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . S2EA | x      | x  | x  | x       | x <sup>1)</sup> - | . S2EA           |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . S2EA                | x      | x  | x  | x       | - -               | . S2EA           |  |
| Start-Stop-switch, 1-pole for reversing contactors with limit switches |                | 30°             | 2 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . S22  | x      | x  | x  | x       | x <sup>1)</sup> - | . S22            |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . S22                 | x      | x  | x  | x       | - -               | . S22            |  |
| Start-Stop-switch, 1-pole for reversing contactors with limit switches |                | 30°             | 2 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . S22  | x      | x  | x  | x       | x <sup>1)</sup> - | . S22            |  |
|  |                |                 | 64 □ 32A                                  | M20 . x x x x - - . S22                 | x      | x  | x  | x       | - -               | . S22            |  |

Ordering example: AC21 50A panel mounting, Start-Stop-switch, 1-pole for reversing contactors

N33F E S2EA

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

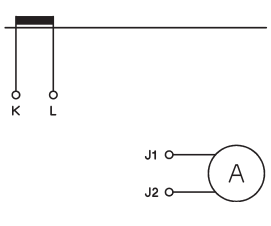
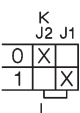
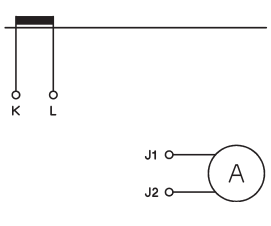
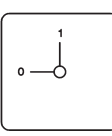
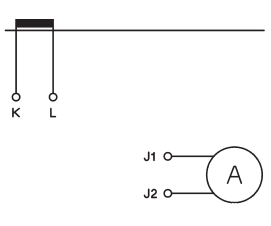
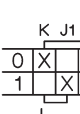
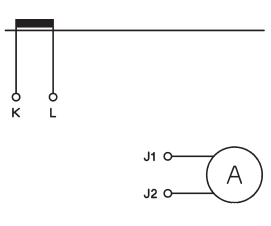
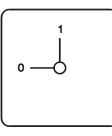
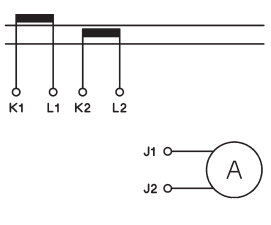
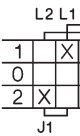
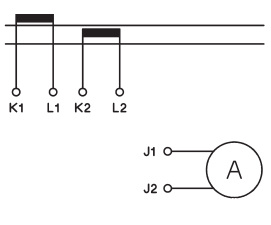
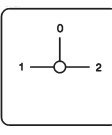
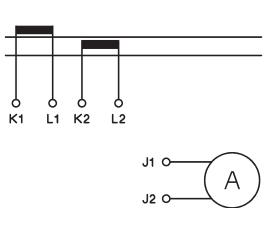
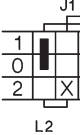
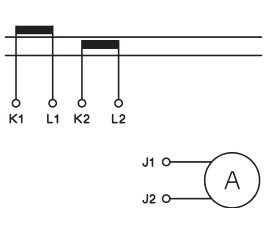
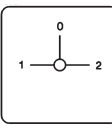
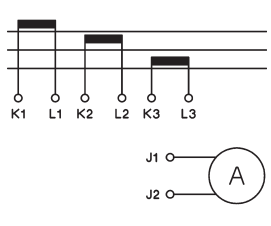
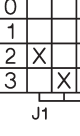
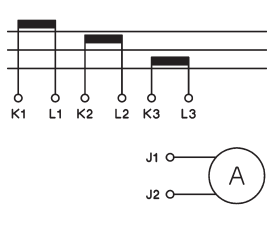
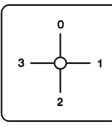
| Description  | Wiring diagram  | Switching angle | Number of cells |        | Type | Design        |    |    |      | Switch pro- | Escutcheon plate |    |       |
|--|---|-----------------|-----------------|--------|------|---------------|----|----|------|-------------|------------------|----|-------|
|  |   |                 | ↓ Size          | ↓ AC21 |      | E.            | Z. | V. | SMA. |             |                  | P. |       |
| <b>3 line voltages</b><br>                         |    | 45°             | 2               | 48 □   | 20A  | <b>M10H</b> . | x  | x  | x    | x           | x <sup>1)</sup>  | -  | . V3  |
|  |   |                 |                 | 64 □   | 32A  | <b>M20</b> .  | x  | x  | x    | x           | -                | -  | -     |
|  |   |                 |                 | 64 □   | 32A  | <b>N20</b> .  | x  | -  | x    | -           | x                | x  | . V3  |
|  |   |                 |                 |        | 50A  | <b>N33F</b> . | x  | x  | x    | -           | x                | -  | . V3  |
| <b>3 phase voltages</b><br>                        |    | 45°             | 2               | 48 □   | 20A  | <b>M10H</b> . | x  | x  | x    | x           | x <sup>1)</sup>  | -  | . V0  |
|  |   |                 |                 | 64 □   | 32A  | <b>M20</b> .  | x  | x  | x    | x           | -                | -  | -     |
|  |   |                 |                 | 64 □   | 32A  | <b>N20</b> .  | x  | -  | x    | -           | x                | x  | . V0  |
|  |   |                 |                 |        | 50A  | <b>N33F</b> . | x  | x  | x    | -           | x                | -  | . V0  |
| <b>3 line voltages and 3 phase voltages</b><br>  |   | 30°             | 3               | 48 □   | 20A  | <b>M10H</b> . | x  | x  | x    | x           | x <sup>1)</sup>  | -  | . V1  |
|  |   |                 |                 | 64 □   | 32A  | <b>M20</b> .  | x  | x  | x    | x           | -                | -  | -     |
|  |   |                 |                 | 64 □   | 32A  | <b>N20</b> .  | x  | -  | x    | -           | x                | x  | . V1  |
|  |   |                 |                 |        | 50A  | <b>N33F</b> . | x  | x  | x    | -           | x                | -  | . V1  |
| <b>2 3-phase systems 2 x 3 line voltages</b><br> |  | 45°             | 4               | 48 □   | 20A  | <b>M10H</b> . | x  | x  | x    | x           | x <sup>1)</sup>  | -  | . V32 |
|  |   |                 |                 | 64 □   | 32A  | <b>M20</b> .  | x  | x  | x    | x           | -                | -  | -     |
|  |   |                 |                 | 64 □   | 32A  | <b>N20</b> .  | x  | -  | x    | -           | x                | x  | . V32 |
|  |   |                 |                 |        | 50A  | <b>N33F</b> . | x  | -  | x    | -           | x                | -  | . V32 |
| <b>3 line voltages and 1 phase voltage</b><br>   |  | 45°             | 3               | 48 □   | 20A  | <b>M10H</b> . | x  | x  | x    | x           | x <sup>1)</sup>  | -  | . V13 |
|  |   |                 |                 | 64 □   | 32A  | <b>M20</b> .  | x  | x  | x    | x           | -                | -  | -     |
|  |   |                 |                 | 64 □   | 32A  | <b>N20</b> .  | x  | -  | x    | -           | x                | x  | . V13 |
|  |   |                 |                 |        | 50A  | <b>N33F</b> . | x  | x  | x    | -           | x                | -  | . V13 |

**Ordering example:** AC21 50A panel mounting, Voltmeter selector switch, 3 line voltages and 1 phase voltage

**N33F E V13**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

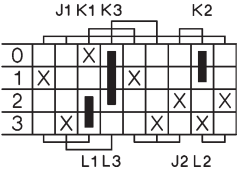
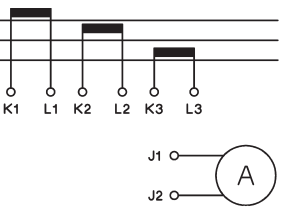
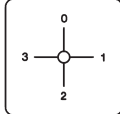
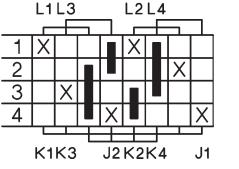
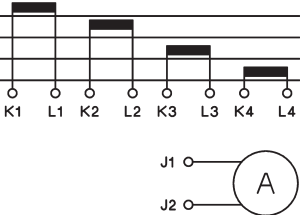
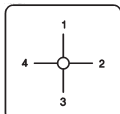
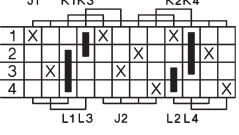
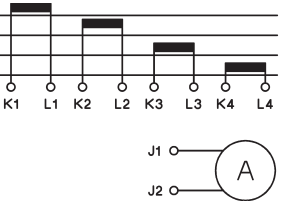
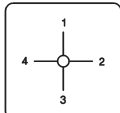
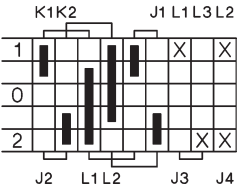
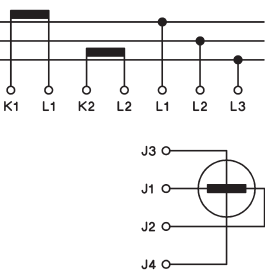
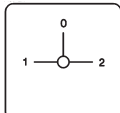
| Description   | Wiring diagram  | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type  | Design  |    |    |      | Switch pro- | Escutcheon plate  |              |   |
|---|---|-----------------|--|---|---|----|----|------|-------------|-------------------|--------------|---|
|   |   |                 |  |   | E.  | Z. | V. | SMA. |             |                   | P.           |   |
| <b>Ammeter selector switches M</b>  |   |                 |  |   |   |    |    |      |             |                   |              |   |
| <b>1-pole, for current transformer</b><br><br><br><br>  |    | 90°             | 1  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>M11</b><br><b>M20</b> . x x x x - - . <b>M11</b> | x  | x  | x    | x           | x <sup>1)</sup> - | . <b>M11</b> |    |
|   |   |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>M11</b><br><b>N33F</b> . x x x - x - . <b>M11</b>   | x   | -  | x  | -    | x           | x                 | . <b>M11</b> |   |
|   |   |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>M11</b>   | x   | -  | x  | -    | x           | -                 | . <b>M11</b> |   |
| <b>2-pole, for 1 current transformer or direct current measurement</b><br><br><br><br>                  |    | 90°             | 2  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>M12</b><br><b>M20</b> . x x x x - - . <b>M12</b> | x  | x  | x    | x           | x <sup>1)</sup> - | . <b>M12</b> |    |
|   |   |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>M12</b><br><b>N33F</b> . x x x - x - . <b>M12</b>   | x   | -  | x  | -    | x           | x                 | . <b>M12</b> |   |
|   |   |                 | 88 □ 63A<br>90A<br>115A                          | <b>N40</b> . x - x - x - . <b>M12</b><br><b>N60</b> . x - x - x - . <b>M12</b><br><b>N80</b> . x - x - - - . <b>M12</b> | x   | -  | x  | -    | x           | -                 | . <b>M12</b> |   |
|   |   |                 | 132 □ 150A<br>250A                               | <b>N100</b> . x - x - - - . <b>M12</b><br><b>N200</b> . x - x - - - . <b>M12</b>  | x   | -  | x  | -    | -           | -                 | . <b>M12</b> |   |
| <b>1-pole, for 2 current transformers</b><br><br><br><br>  |   | 90°             | 2  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>M21</b><br><b>M20</b> . x x x x - - . <b>M21</b> | x  | x  | x    | x           | x <sup>1)</sup> - | . <b>M21</b> |   |
|   |   |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>M21</b><br><b>N33F</b> . x x x - x - . <b>M21</b>   | x   | -  | x  | -    | x           | x                 | . <b>M21</b> |   |
|   |   |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>M21</b>   | x   | -  | x  | -    | x           | -                 | . <b>M21</b> |   |
| <b>2-pole, for 2 current transformers or direct current measurement in 2 phases</b><br><br><br><br> |  | 90°             | 3  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>M22</b><br><b>M20</b> . x x x x - - . <b>M22</b> | x  | x  | x    | x           | x <sup>1)</sup> - | . <b>M22</b> |  |
|   |   |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>M22</b><br><b>N33F</b> . x x x - x - . <b>M22</b>   | x   | -  | x  | -    | x           | x                 | . <b>M22</b> |   |
|   |   |                 | 88 □ 63A<br>90A<br>115A                          | <b>N40</b> . x - x - x - . <b>M22</b><br><b>N60</b> . x - x - x - . <b>M22</b><br><b>N80</b> . x - x - - - . <b>M22</b> | x   | -  | x  | -    | x           | -                 | . <b>M22</b> |   |
|   |   |                 | 132 □ 150A<br>250A                               | <b>N100</b> . x - x - - - . <b>M22</b><br><b>N200</b> . x - x - - - . <b>M22</b>  | x   | -  | x  | -    | -           | -                 | . <b>M22</b> |   |
| <b>1-pole, for 3 current transformers</b><br><br><br><br>   |  | 90°             | 3  | 48 □ 20A<br>32A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>M31</b><br><b>M20</b> . x x x x - - . <b>M31</b> | x  | x  | x    | x           | x <sup>1)</sup> - | . <b>M31</b> |  |
|   |   |                 | 64 □ 32A<br>50A                                  | <b>N20</b> . x - x - x x . <b>M31</b><br><b>N33F</b> . x - x - x - . <b>M31</b>   | x   | -  | x  | -    | x           | x                 | . <b>M31</b> |   |
|   |   |                 | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>M31</b>   | x   | -  | x  | -    | x           | -                 | . <b>M31</b> |   |

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 3 current transformers 1-pole

**N40 V M31**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

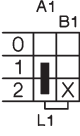
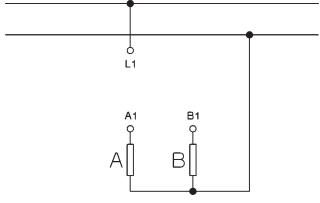


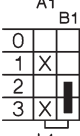
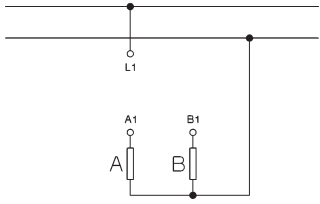

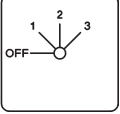
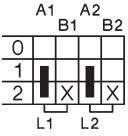
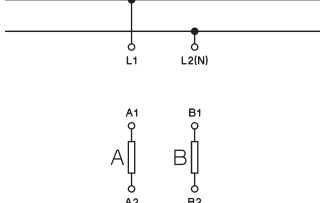
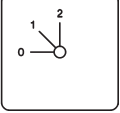

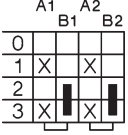
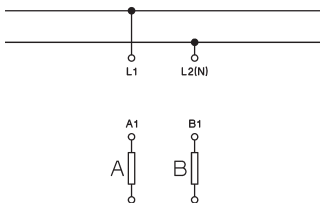
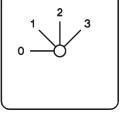
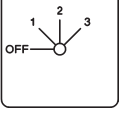
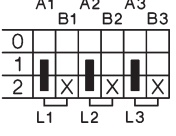
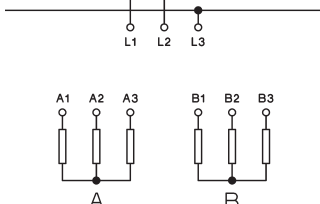
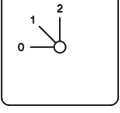
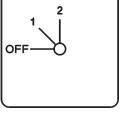
| Description   | Wiring diagram  | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type       | Design |    |    |         | Switch pro- | Escutcheon plate  |       |   |       |
|---|---|-----------------|---|------------|--------|----|----|---------|-------------|-------------------|-------|---|-------|
|   |   |                 |   |            | E.     | Z. | V. | SMA. P. |             |                   |       |   |       |
| <b>2-pole, for 3 current transformers or direct current measurement in 3 phases</b><br>   |    | 90°             | 6   | 48 □ 20A   | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . M32 |    |       |
|   |   |                 |   | 32A        | M20 .  | x  | x  | x       | -           | -                 | -     |   | . M32 |
|   |   |                 |   | 64 □ 32A   | N20 .  | x  | -  | x       | -           | x                 | x     |   | . M32 |
|   |   |                 |   | 50A        | N33F . | x  | -  | x       | -           | x                 | -     |   | . M32 |
|   |   |                 |   | 88 □ 63A   | N40 .  | x  | -  | x       | -           | x                 | -     |   | . M32 |
| <b>1-pole, for 4 current transformers</b><br>   |    | 90°             | 4   | 48 □ 20A   | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . M41 |    |       |
|   |   |                 |   | 32A        | M20 .  | x  | x  | x       | x           | -                 | -     |   | . M41 |
|   |   |                 |   | 64 □ 32A   | N20 .  | x  | -  | x       | -           | x                 | x     |   | . M41 |
|   |   |                 |   | 50A        | N33F . | x  | -  | x       | -           | x                 | -     |   | . M41 |
|   |   |                 |   | 88 □ 63A   | N40 .  | x  | -  | x       | -           | x                 | -     |   | . M41 |
| <b>2-pole, for 4 current transformers or direct current measurement in 4 phases</b><br> |   | 90°             | 6   | 48 □ 20A   | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . M42 |   |       |
|   |   |                 |   | 32A        | M20 .  | x  | x  | x       | -           | -                 | -     |   | . M42 |
|   |   |                 |   | 64 □ 32A   | N20 .  | x  | -  | x       | -           | x                 | x     |   | . M42 |
|   |   |                 |   | 50A        | N33F . | x  | -  | x       | -           | x                 | -     |   | . M42 |
|   |   |                 |   | 88 □ 63A   | N40 .  | x  | -  | x       | -           | x                 | -     |   | . M42 |
| <b>f. output measurement in 3-phase systems by 2-wattmeter method</b><br>               |  | 90°             | 5   | 48 □ 20A   | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . M2W |  |       |
|   |   |                 |   | 32A        | M20 .  | x  | x  | x       | x           | -                 | -     |   | . M2W |
|   |   |                 |   | 64 □ 32A   | N20 .  | x  | -  | x       | -           | x                 | x     |   | . M2W |
|   |   |                 |   | 50A        | N33F . | x  | -  | x       | -           | x                 | -     |   | . M2W |
|   |   |                 |   | 88 □ 63A   | N40 .  | x  | -  | x       | -           | x                 | -     |   | . M2W |
|   |   |                 |   | 90A        | N61 .  | x  | -  | x       | -           | x                 | -     | . M2W   |       |
|   |   |                 |   | 115A       | N80 .  | x  | -  | x       | -           | -                 | -     | . M2W   |       |
|   |   |                 |   | 132 □ 150A | N100 . | x  | -  | x       | -           | -                 | -     | . M2W   |       |
|   |   |                 |   | 250A       | N200 . | x  | -  | x       | -           | -                 | -     | . M2W   |       |

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 4 current transformers 1-pole

N40 V M41

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description   | Wiring diagram  | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type                     | Design                                  |    |    |        | Switch pro-  | Escutcheon plate         |   |   |        |
|---|---|-----------------|--|--------------------------|---|----|----|--------|--|--------------------------|---|---|--------|
|   |   |                 |  |                          | E.                                      | Z. | V. | SMA.   |  |                          | P.  |   |        |
| <b>Gang switches GR</b>   |   |                 |  |                          |   |    |    |        |  |                          |   |   |        |
| <b>2 circuits A and B</b><br><b>1-pole</b><br><b>0 - A - A+B</b><br><br>       |    | 45°             | 1  | 48 □ 20A                 | M10H . x x x x x <sup>1)</sup> - . GR11 | x  | x  | x      | x  | x <sup>1)</sup> - . GR11 |  |   |        |
|   |   |                 | 64 □ 32A   | N20 . x - x - x x . GR11 | x                                       | -  | x  | -      | x  | x                        |   | . GR11  |        |
|   |   |                 | 88 □ 63A   | N40 . x - x - x - . GR11 | x                                       | -  | x  | -      | x  | -                        |   | . GR11  |        |
|   |   |                 | 90A  | N61 . x - x - x - . GR11 | x                                       | -  | x  | -      | x  | -                        |   | . GR11  |        |
|   |   |                 | 115A   | N80 . x - x - - - . GR11 | x                                       | -  | x  | -      | -  | -                        |   | . GR11  |        |
| 132 □ 150A  | N100 . x - x - - - . GR11   | x               | -  | x                        | -                                       | -  | -  | . GR11 | <b>+126</b><br>   |                          |   |   |        |
| 250A  | N200 . x - x - - - . GR11   | x               | -  | x                        | -                                       | -  | -  | . GR11 |  |                          |   |   |        |
| <b>2 circuits A and B</b><br><b>1-pole</b><br><b>0 - A - B - A+B</b><br><br>   |    | 45°             | 1  | 48 □ 20A                 | M10H . x x x x x <sup>1)</sup> - . GR12 | x  | x  | x      |  | x                        | x <sup>1)</sup> - . GR12  |    |        |
|   |   |                 | 64 □ 32A   | N20 . x - x - x x . GR12 | x                                       | -  | x  | -      |  | x                        | x   |   | . GR12 |
|   |   |                 | 88 □ 63A   | N40 . x - x - x - . GR12 | x                                       | -  | x  | -      |  | x                        | -   |   | . GR12 |
|   |   |                 | 90A  | N61 . x - x - x - . GR12 | x                                       | -  | x  | -      | x  | -                        | . GR12  |   |        |
|   |   |                 | 115A   | N80 . x - x - - - . GR12 | x                                       | -  | x  | -      | -  | -                        | . GR12  |   |        |
| 132 □ 150A  | N100 . x - x - - - . GR12   | x               | -  | x                        | -                                       | -  | -  | . GR12 | <b>+127</b><br>   |                          |   |   |        |
| 250A  | N200 . x - x - - - . GR12   | x               | -  | x                        | -                                       | -  | -  | . GR12 |  |                          |   |   |        |
| <b>2 circuits A and B</b><br><b>2-pole</b><br><b>0 - A - A+B</b><br><br>     |   | 45°             | 2  | 48 □ 20A                 | M10H . x x x x x <sup>1)</sup> - . GR21 | x  | x  | x      |  | x                        | x <sup>1)</sup> - . GR21  |   |        |
|   |   |                 | 64 □ 32A   | N20 . x - x - x x . GR21 | x                                       | -  | x  | -      |  | x                        | x   |   | . GR21 |
|   |   |                 | 88 □ 63A   | N40 . x - x - x - . GR21 | x                                       | -  | x  | -      |  | x                        | -   |   | . GR21 |
|   |   |                 | 90A  | N61 . x - x - x - . GR21 | x                                       | -  | x  | -      | x  | -                        | . GR21  |   |        |
|   |   |                 | 115A   | N80 . x - x - - - . GR21 | x                                       | -  | x  | -      | -  | -                        | . GR21  |   |        |
| 132 □ 150A  | N100 . x - x - - - . GR21   | x               | -  | x                        | -                                       | -  | -  | . GR21 | <b>+126</b><br> |                          |   |   |        |
| 250A  | N200 . x - x - - - . GR21   | x               | -  | x                        | -                                       | -  | -  | . GR21 |  |                          |   |   |        |
| <b>2 circuits A and B</b><br><b>2-pole</b><br><b>0 - A - B - A+B</b><br><br> |  | 45°             | 2  | 48 □ 20A                 | M10H . x x x x x <sup>1)</sup> - . GR22 | x  | x  | x      |  | x                        | x <sup>1)</sup> - . GR22  |  |        |
|   |   |                 | 64 □ 32A   | N20 . x - x - x x . GR22 | x                                       | -  | x  | -      |  | x                        | x   |   | . GR22 |
|   |   |                 | 88 □ 63A   | N40 . x - x - x - . GR22 | x                                       | -  | x  | -      |  | x                        | -   |   | . GR22 |
|   |   |                 | 90A  | N61 . x - x - x - . GR22 | x                                       | -  | x  | -      | x  | -                        | . GR22  |   |        |
|   |   |                 | 115A   | N80 . x - x - - - . GR22 | x                                       | -  | x  | -      | -  | -                        | . GR22  |   |        |
| 132 □ 150A  | N100 . x - x - - - . GR22   | x               | -  | x                        | -                                       | -  | -  | . GR22 | <b>+127</b><br> |                          |   |   |        |
| 250A  | N200 . x - x - - - . GR22   | x               | -  | x                        | -                                       | -  | -  | . GR22 |  |                          |   |   |        |
| <b>2 circuits A and B</b><br><b>3-pole</b><br><b>0 - A - A+B</b><br><br>     |  | 45°             | 3  | 48 □ 20A                 | M10H . x x x x x <sup>1)</sup> - . GR31 | x  | x  | x      |  | x                        | x <sup>1)</sup> - . GR31  |  |        |
|   |   |                 | 64 □ 32A   | N20 . x - x - x x . GR31 | x                                       | -  | x  | -      |  | x                        | x   |   | . GR31 |
|   |   |                 | 88 □ 63A   | N40 . x - x - x x . GR31 | x                                       | -  | x  | -      |  | x                        | x   |   | . GR31 |
|   |   |                 | 90A  | N61 . x - x - x - . GR31 | x                                       | -  | x  | -      | x  | -                        | . GR31  |   |        |
|   |   |                 | 115A   | N80 . x - x - - - . GR31 | x                                       | -  | x  | -      | -  | -                        | . GR31  |   |        |
| 132 □ 150A  | N100 . x - x - - - . GR31   | x               | -  | x                        | -                                       | -  | -  | . GR31 | <b>+126</b><br> |                          |   |   |        |
| 250A  | N200 . x - x - - - . GR31   | x               | -  | x                        | -                                       | -  | -  | . GR31 |  |                          |   |   |        |

**Ordering example:** AC21 250A panel mounting, gang switch, 2 circuits A and B, 3-pole **N200 E GR31**

1) Plastic enclosed switches are delivered with switch type M10.



## Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells |          | Type   | Design |    |    |      | Switch pro-     | Escutcheon plate |        |  |
|---|----------------|-----------------|-----------------|----------|--------|--------|----|----|------|-----------------|------------------|--------|--|
|   |                |                 | ↓ Size          | ↓ AC21   |        | E.     | Z. | V. | SMA. |                 |                  | P.     |  |
| <b>2 circuits A and B</b><br><b>3-pole</b><br><b>0 - A - B - A+B</b><br><br>        |                | 45°             | 3               | 48 □ 20A | M10H . | x      | x  | x  | x    | x <sup>1)</sup> | -                | . GR32 |  |
|   |                |                 |                 | 32A      | M20 .  | x      | x  | x  | x    | -               | -                | . GR32 |  |
|   |                |                 |                 | 64 □ 32A | N20 .  | x      | -  | x  | -    | x               | x                | . GR32 |  |
|   |                |                 |                 | 50A      | N33F . | x      | -  | x  | -    | x               | -                | . GR32 |  |
|   |                |                 |                 | 88 □ 63A | N40 .  | x      | -  | x  | -    | x               | -                | . GR32 |  |
| <b>3 circuits A, B and C</b><br><b>1-pole</b><br><b>0 - A - A+B - A+B+C</b><br><br> |                | 45°             | 2               | 48 □ 20A | M10H . | x      | x  | x  | x    | x <sup>1)</sup> | -                | . GR14 |  |
|   |                |                 |                 | 32A      | M20 .  | x      | x  | x  | x    | -               | -                | . GR14 |  |
|   |                |                 |                 | 64 □ 32A | N20 .  | x      | -  | x  | -    | x               | x                | . GR14 |  |
|   |                |                 |                 | 50A      | N33F . | x      | -  | x  | -    | x               | -                | . GR14 |  |
|   |                |                 |                 | 88 □ 63A | N40 .  | x      | -  | x  | -    | x               | -                | . GR14 |  |
| <b>3 circuits A, B and C</b><br><b>2-pole</b><br><b>0 - A - A+B - A+B+C</b><br><br> |                | 45°             | 3               | 48 □ 20A | M10H . | x      | x  | x  | x    | x <sup>1)</sup> | -                | . GR23 |  |
|   |                |                 |                 | 32A      | M20 .  | x      | x  | x  | x    | -               | -                | . GR23 |  |
|   |                |                 |                 | 64 □ 32A | N20 .  | x      | -  | x  | -    | x               | x                | . GR23 |  |
|   |                |                 |                 | 50A      | N33F . | x      | -  | x  | -    | x               | -                | . GR23 |  |
|   |                |                 |                 | 88 □ 63A | N40 .  | x      | -  | x  | -    | x               | -                | . GR23 |  |
| <b>3 circuits A, B and C</b><br><b>3-pole</b><br><b>0 - A - A+B - A+B+C</b><br><br> |                | 45°             | 5               | 48 □ 20A | M10H . | x      | x  | x  | x    | x <sup>1)</sup> | -                | . GR33 |  |
|   |                |                 |                 | 32A      | M20 .  | x      | x  | x  | x    | -               | -                | . GR33 |  |
|   |                |                 |                 | 64 □ 32A | N20 .  | x      | -  | x  | -    | x               | x                | . GR33 |  |
|   |                |                 |                 | 50A      | N33F . | x      | -  | x  | -    | x               | -                | . GR33 |  |
|   |                |                 |                 | 88 □ 63A | N40 .  | x      | -  | x  | -    | x               | -                | . GR33 |  |

Ordering example: AC21 250A panel mounting, gang switch, 3 circuits A, B and C, 3-pole

N200 E GR33

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description   | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br><b>AC21</b> | Type       | Design   |    |    |         | Switch pro- | Escutcheon plate  |              |              |              |              |
|---|----------------|-----------------|--|------------|--|----|----|---------|-------------|-------------------|--------------|--------------|--------------|--------------|
|   |                |                 |  |            | E.   | Z. | V. | SMA. P. |             |                   |              |              |              |              |
| <b>Series-Parallel switches SP</b>  |                |                 |  |            |  |    |    |         |             |                   |              |              |              |              |
| <b>2 circuits A and B</b><br><b>2-pole</b><br><b>0 - A + B - A,B (parallel)</b><br>         |                | 45°             | 2  | 48 □ 20A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>SP1</b> | x  | x  | x       | x           | x <sup>1)</sup> - | . <b>SP1</b> |              |              |              |
|   |                |                 |  | 32A        | <b>M20</b> . x x x x - - . <b>SP1</b>                | x  | x  | x       | x           | -                 | -            |              | -            | . <b>SP1</b> |
|   |                |                 |  | 64 □ 32A   | <b>N20</b> . x - x - x x . <b>SP1</b>                | x  | -  | x       | -           | x                 | x            |              | . <b>SP1</b> |              |
|   |                |                 |  | 50A        | <b>N33F</b> . x x x - x - . <b>SP1</b>               | x  | x  | x       | -           | x                 | -            |              | . <b>SP1</b> |              |
|   |                |                 |  | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>SP1</b>                | x  | -  | x       | -           | x                 | -            |              | . <b>SP1</b> |              |
| <b>2 circuits A and B</b><br><b>2-pole</b><br><b>0 - A,B (parall.) - A - A+B</b><br>        |                | 90°             | 3  | 48 □ 20A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>SP4</b> | x  | x  | x       | x           | x <sup>1)</sup> - | . <b>SP4</b> |              |              |              |
|   |                |                 |  | 32A        | <b>M20</b> . x x x x - - . <b>SP4</b>                | x  | x  | x       | x           | -                 | -            |              | -            | . <b>SP4</b> |
|   |                |                 |  | 64 □ 32A   | <b>N20</b> . x - x - x x . <b>SP4</b>                | x  | -  | x       | -           | x                 | x            |              | . <b>SP4</b> |              |
|   |                |                 |  | 50A        | <b>N33F</b> . x x x - x - . <b>SP4</b>               | x  | x  | x       | -           | x                 | -            |              | . <b>SP4</b> |              |
|   |                |                 |  | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>SP4</b>                | x  | -  | x       | -           | x                 | -            |              | . <b>SP4</b> |              |
| <b>2 circuits A and B</b><br><b>for 3-phase systems</b><br><b>0 - A+B - A - B - A,B</b><br> |                | 30°             | 2  | 48 □ 20A   | <b>M10H</b> . x x x x x <sup>1)</sup> - . <b>SP3</b> | x  | x  | x       | x           | x <sup>1)</sup> - | . <b>SP3</b> |              |              |              |
|   |                |                 |  | 32A        | <b>M20</b> . x x x x - - . <b>SP3</b>                | x  | x  | x       | x           | -                 | -            |              | -            | . <b>SP3</b> |
|   |                |                 |  | 64 □ 32A   | <b>N20</b> . x - x - x x . <b>SP3</b>                | x  | -  | x       | -           | x                 | x            |              | . <b>SP3</b> |              |
|   |                |                 |  | 50A        | <b>N33F</b> . x x x - x - . <b>SP3</b>               | x  | x  | x       | -           | x                 | -            |              | . <b>SP3</b> |              |
|   |                |                 |  | 88 □ 63A   | <b>N40</b> . x - x - x - . <b>SP3</b>                | x  | -  | x       | -           | x                 | -            |              | . <b>SP3</b> |              |
| <b>2 circuits A and B</b><br><b>for 3-phase systems</b><br><b>0 - A+B - A - B - A,B</b><br> |                | 30°             | 2  | 90A        | <b>N61</b> . x - x - x - . <b>SP3</b>                | x  | -  | x       | -           | x                 | -            | . <b>SP3</b> |              |              |
|   |                |                 |  | 115A       | <b>N80</b> . x - x - - - . <b>SP3</b>                | x  | -  | x       | -           | -                 | -            | -            |              | . <b>SP3</b> |
|   |                |                 |  | 132 □ 150A | <b>N100</b> . x - x - - - . <b>SP3</b>               | x  | -  | x       | -           | -                 | -            | . <b>SP3</b> |              |              |
|   |                |                 |  | 250A       | <b>N200</b> . x - x - - - . <b>SP3</b>               | x  | -  | x       | -           | -                 | -            | . <b>SP3</b> |              |              |
|   |                |                 |  | 250A       | <b>N200</b> . x - x - - - . <b>SP3</b>               | x  | -  | x       | -           | -                 | -            | . <b>SP3</b> |              |              |

**Ordering example:** AC21 250A panel mounting, series-parallel switch, 2 circuits for 3-phase systems

**N200 E SP3**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description                                 | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type     | Design |    |    |         | Switch pro- | Escutcheon plate  |        |  |        |
|---|----------------|-----------------|---|----------|--------|----|----|---------|-------------|-------------------|--------|--|--------|
|   |                |                 |   |          | E.     | Z. | V. | SMA. P. |             |                   |        |  |        |
| Multi step switches 1-pole without Off ST.1 |                |                 |   |          |        |    |    |         |             |                   |        |  |        |
| 3 steps                                     |                | 60°             | 2   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST31 |  |        |
|   |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | - -               | . ST31 |  |        |
|   |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                 | x      |  | . ST31 |
|   |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -      |  | . ST31 |
|   |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST31 |
| 90A   | N61 .          | x               | -   | x        | -      | x  | -  | . ST31  |             |                   |        |  |        |
| 115A  | N80 .          | x               | -   | x        | -      | -  | -  | . ST31  |             |                   |        |  |        |
| 132 □ 150A                                  | N100 .         | x               | -   | x        | -      | -  | -  | . ST31  |             |                   |        |  |        |
| 250A  | N200 .         | x               | -   | x        | -      | -  | -  | . ST31  |             |                   |        |  |        |
| 4 steps                                     |                | 60°             | 2   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST41 |  |        |
|   |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | - -               | . ST41 |  |        |
|   |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                 | x      |  | . ST41 |
|   |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -      |  | . ST41 |
|   |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST41 |
| 90A   | N61 .          | x               | -   | x        | -      | x  | -  | . ST41  |             |                   |        |  |        |
| 115A  | N80 .          | x               | -   | x        | -      | -  | -  | . ST41  |             |                   |        |  |        |
| 132 □ 150A                                  | N100 .         | x               | -   | x        | -      | -  | -  | . ST41  |             |                   |        |  |        |
| 250A  | N200 .         | x               | -   | x        | -      | -  | -  | . ST41  |             |                   |        |  |        |
| 5 steps                                     |                | 60°             | 3   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST51 |  |        |
|   |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | - -               | . ST51 |  |        |
|   |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                 | x      |  | . ST51 |
|   |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -      |  | . ST51 |
|   |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST51 |
| 90A   | N61 .          | x               | -   | x        | -      | x  | -  | . ST51  |             |                   |        |  |        |
| 115A  | N80 .          | x               | -   | x        | -      | -  | -  | . ST51  |             |                   |        |  |        |
| 132 □ 150A                                  | N100 .         | x               | -   | x        | -      | -  | -  | . ST51  |             |                   |        |  |        |
| 250A  | N200 .         | x               | -   | x        | -      | -  | -  | . ST51  |             |                   |        |  |        |
| 6 steps                                     |                | 60°             | 3   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST61 |  |        |
|   |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | - -               | . ST61 |  |        |
|   |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                 | x      |  | . ST61 |
|   |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -      |  | . ST61 |
|   |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST61 |
| 90A   | N61 .          | x               | -   | x        | -      | x  | -  | . ST61  |             |                   |        |  |        |
| 115A  | N80 .          | x               | -   | x        | -      | -  | -  | . ST61  |             |                   |        |  |        |
| 132 □ 150A                                  | N100 .         | x               | -   | x        | -      | -  | -  | . ST61  |             |                   |        |  |        |
| 250A  | N200 .         | x               | -   | x        | -      | -  | -  | . ST61  |             |                   |        |  |        |
| 7 steps                                     |                | 45°             | 4   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST71 |  |        |
|   |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | - -               | . ST71 |  |        |
|   |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                 | x      |  | . ST71 |
|   |                |                 |   | 50A      | N33F . | x  | -  | x       | -           | x                 | -      |  | . ST71 |
|   |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST71 |
| 90A   | N61 .          | x               | -   | x        | -      | x  | -  | . ST71  |             |                   |        |  |        |
| 115A  | N80 .          | x               | -   | x        | -      | -  | -  | . ST71  |             |                   |        |  |        |
| 132 □ 150A                                  | N100 .         | x               | -   | x        | -      | -  | -  | . ST71  |             |                   |        |  |        |
| 250A  | N200 .         | x               | -   | x        | -      | -  | -  | . ST71  |             |                   |        |  |        |

Ordering example: AC21 250A panel mounting, multi step switch 1-pole without off, 7 steps

N200 E ST71

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type     | Design        |    |    |         | Switch pro- | Escutcheon plate  |         |         |
|--|----------------|-----------------|---|----------|---------------|----|----|---------|-------------|-------------------|---------|---------|
|  |                |                 |   |          | E.            | Z. | V. | SMA.    |             |                   | P.      |         |
| <b>Multi step switches 1-pole without Off ST.1</b> |                |                 |   |          |               |    |    |         |             |                   |         |         |
| <b>8 steps</b>                                     |                | 45°             | 4   | 48 □ 20A | <b>M10H</b> . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST81  |         |
|  |                |                 |   | 32A      | <b>M20</b> .  | x  | x  | x       | x           | - -               | . ST81  |         |
|  |                |                 |   | 64 □ 32A | <b>N20</b> .  | x  | -  | x       | -           | x                 | x       | . ST81  |
|  |                |                 |   | 50A      | <b>N33F</b> . | x  | -  | x       | -           | x                 | -       | . ST81  |
|  |                |                 |   | 88 □ 63A | <b>N40</b> .  | x  | -  | x       | -           | x                 | -       | . ST81  |
| 90A  | <b>N61</b> .   | x               | -   | x        | -             | x  | -  | . ST81  |             |                   |         |         |
| 115A   | <b>N80</b> .   | x               | -   | x        | -             | -  | -  | . ST81  |             |                   |         |         |
| 132 □ 150A   | <b>N100</b> .  | x               | -   | x        | -             | -  | -  | . ST81  |             |                   |         |         |
| 250A   | <b>N200</b> .  | x               | -   | x        | -             | -  | -  | . ST81  |             |                   |         |         |
| <b>9 steps</b>                                     |                | 30°             | 5   | 48 □ 20A | <b>M10H</b> . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST91  |         |
|  |                |                 |   | 32A      | <b>M20</b> .  | x  | x  | x       | x           | - -               | . ST91  |         |
|  |                |                 |   | 64 □ 32A | <b>N20</b> .  | x  | -  | x       | -           | x                 | x       | . ST91  |
|  |                |                 |   | 50A      | <b>N33F</b> . | x  | -  | x       | -           | x                 | -       | . ST91  |
|  |                |                 |   | 88 □ 63A | <b>N40</b> .  | x  | -  | x       | -           | x                 | -       | . ST91  |
| 90A  | <b>N61</b> .   | x               | -   | x        | -             | x  | -  | . ST91  |             |                   |         |         |
| 115A   | <b>N80</b> .   | x               | -   | x        | -             | -  | -  | . ST91  |             |                   |         |         |
| 132 □ 150A   | <b>N100</b> .  | x               | -   | x        | -             | -  | -  | . ST91  |             |                   |         |         |
| 250A   | <b>N200</b> .  | x               | -   | x        | -             | -  | -  | . ST91  |             |                   |         |         |
| <b>10 steps</b>                                    |                | 30°             | 5   | 48 □ 20A | <b>M10H</b> . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST101 |         |
|  |                |                 |   | 32A      | <b>M20</b> .  | x  | x  | x       | x           | - -               | . ST101 |         |
|  |                |                 |   | 64 □ 32A | <b>N20</b> .  | x  | -  | x       | -           | x                 | x       | . ST101 |
|  |                |                 |   | 50A      | <b>N33F</b> . | x  | -  | x       | -           | x                 | -       | . ST101 |
|  |                |                 |   | 88 □ 63A | <b>N40</b> .  | x  | -  | x       | -           | x                 | -       | . ST101 |
| 90A  | <b>N61</b> .   | x               | -   | x        | -             | x  | -  | . ST101 |             |                   |         |         |
| 115A   | <b>N80</b> .   | x               | -   | x        | -             | -  | -  | . ST101 |             |                   |         |         |
| 132 □ 150A   | <b>N100</b> .  | x               | -   | x        | -             | -  | -  | . ST101 |             |                   |         |         |
| 250A   | <b>N200</b> .  | x               | -   | x        | -             | -  | -  | . ST101 |             |                   |         |         |
| <b>11 steps</b>                                    |                | 30°             | 6   | 48 □ 20A | <b>M10H</b> . | x  | x  | x       | -           | x <sup>1)</sup> - | . ST111 |         |
|  |                |                 |   | 32A      | <b>M20</b> .  | x  | x  | x       | -           | - -               | . ST111 |         |
|  |                |                 |   | 64 □ 32A | <b>N20</b> .  | x  | -  | x       | -           | x                 | x       | . ST111 |
|  |                |                 |   | 50A      | <b>N33F</b> . | x  | -  | x       | -           | x                 | -       | . ST111 |
|  |                |                 |   | 88 □ 63A | <b>N40</b> .  | x  | -  | x       | -           | x                 | -       | . ST111 |
| 90A  | <b>N61</b> .   | x               | -   | x        | -             | x  | -  | . ST111 |             |                   |         |         |
| 115A   | <b>N80</b> .   | x               | -   | x        | -             | -  | -  | . ST111 |             |                   |         |         |
| 132 □ 150A   | <b>N100</b> .  | x               | -   | x        | -             | -  | -  | . ST111 |             |                   |         |         |
| 250A   | <b>N200</b> .  | x               | -   | x        | -             | -  | -  | . ST111 |             |                   |         |         |
| <b>12 steps</b>                                    |                | 30°             | 6   | 48 □ 20A | <b>M10H</b> . | x  | x  | x       | -           | x <sup>1)</sup> - | . ST121 |         |
|  |                |                 |   | 32A      | <b>M20</b> .  | x  | x  | x       | -           | - -               | . ST121 |         |
|  |                |                 |   | 64 □ 32A | <b>N20</b> .  | x  | -  | x       | -           | x                 | x       | . ST121 |
|  |                |                 |   | 50A      | <b>N33F</b> . | x  | -  | x       | -           | x                 | -       | . ST121 |
|  |                |                 |   | 88 □ 63A | <b>N40</b> .  | x  | -  | x       | -           | x                 | -       | . ST121 |
| 90A  | <b>N61</b> .   | x               | -   | x        | -             | x  | -  | . ST121 |             |                   |         |         |
| 115A   | <b>N80</b> .   | x               | -   | x        | -             | -  | -  | . ST121 |             |                   |         |         |
| 132 □ 150A   | <b>N100</b> .  | x               | -   | x        | -             | -  | -  | . ST121 |             |                   |         |         |
| 250A   | <b>N200</b> .  | x               | -   | x        | -             | -  | -  | . ST121 |             |                   |         |         |

**Ordering example:** AC21 250A panel mounting, multi step switch 1-pole without off, 12 steps

**N200 E ST121**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description                                      | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type     | Design |    |    |         | Switch pro- | Escutcheon plate  |                   |         |         |
|--|----------------|-----------------|---|----------|--------|----|----|---------|-------------|-------------------|-------------------|---------|---------|
|  |                |                 |   |          | E.     | Z. | V. | SMA. P. |             |                   |                   |         |         |
| <b>Multi step switches 1-pole with Off ST0.1</b> |                |                 |   |          |        |    |    |         |             |                   |                   |         |         |
| 2 steps  |                | 60°             | 1   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST021           |         |         |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | - -               | . ST021           |         |         |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                 | x                 |         | . ST021 |
|  |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -                 |         | . ST021 |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -                 |         | . ST021 |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST021 |             |                   |                   |         |         |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST021 |             |                   |                   |         |         |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST021 | +422<br>    |                   |                   |         |         |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST021 |             |                   |                   |         |         |
| 3 steps  |                | 45°             | 2   | 48 □ 20A | M10H . | x  | x  | x       |             | x                 | x <sup>1)</sup> - | . ST031 |         |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       |             | x                 | - -               | . ST031 |         |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       |             | -                 | x                 | x       |         |
|  |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -                 | . ST031 |         |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -                 | . ST031 |         |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST031 |             |                   |                   |         |         |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST031 |             |                   |                   |         |         |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST031 | +127<br>    |                   |                   |         |         |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST031 |             |                   |                   |         |         |
| 4 steps  |                | 30°             | 2   | 48 □ 20A | M10H . | x  | x  | x       |             | x                 | x <sup>1)</sup> - | . ST041 |         |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       |             | x                 | - -               | . ST041 |         |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       |             | -                 | x                 | x       |         |
|  |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -                 | . ST041 |         |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -                 | . ST041 |         |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST041 |             |                   |                   |         |         |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST041 |             |                   |                   |         |         |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST041 | +112<br>    |                   |                   |         |         |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST041 |             |                   |                   |         |         |
| 5 steps  |                | 45°             | 3   | 48 □ 20A | M10H . | x  | x  | x       |             | x                 | x <sup>1)</sup> - | . ST051 |         |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       |             | x                 | - -               | . ST051 |         |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       |             | -                 | x                 | x       |         |
|  |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                 | -                 | . ST051 |         |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -                 | . ST051 |         |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST051 |             |                   |                   |         |         |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST051 |             |                   |                   |         |         |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST051 | +423<br>    |                   |                   |         |         |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST051 |             |                   |                   |         |         |
| 6 steps  |                | 45°             | 4   | 48 □ 20A | M10H . | x  | x  | x       |             | x                 | x <sup>1)</sup> - | . ST061 |         |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       |             | x                 | - -               | . ST061 |         |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       |             | -                 | x                 | x       |         |
|  |                |                 |   | 50A      | N33F . | x  | -  | x       | -           | x                 | -                 | . ST061 |         |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                 | -                 | . ST061 |         |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST061 |             |                   |                   |         |         |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST061 |             |                   |                   |         |         |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST061 | +128<br>    |                   |                   |         |         |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST061 |             |                   |                   |         |         |

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 6 steps

N200 E ST061

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description                                      | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type     | Design |    |    |          | Switch pro- | Escutcheon plate  |          |  |          |
|--|----------------|-----------------|---|----------|--------|----|----|----------|-------------|-------------------|----------|--|----------|
|  |                |                 |   |          | E.     | Z. | V. | SMA.     |             |                   | P.       |  |          |
| <b>Multi step switches 1-pole with Off ST0.1</b> |                |                 |   |          |        |    |    |          |             |                   |          |  |          |
| <b>7 steps</b>                                   |                | 45°             | 4   | 48 □ 20A | M10H . | x  | x  | x        | x           | x <sup>1)</sup> - | . ST071  |  |          |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x        | x           | - -               | . ST071  |  |          |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x        | -           | x                 | x        |  | . ST071  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x        | -           | x                 | -        |  | . ST071  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x        | -           | x                 | -        |  | . ST071  |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST071  |             |                   |          |  |          |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST071  |             |                   |          |  |          |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST071  |             |                   |          |  |          |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST071  |             |                   |          |  |          |
| <b>+ 129</b>                                     |                |                 |   |          |        |    |    |          |             |                   |          |  |          |
| <b>8 steps</b>                                   |                | 30°             | 5   | 48 □ 20A | M10H . | x  | x  | x        | x           | x <sup>1)</sup> - | . ST081  |  |          |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x        | x           | - -               | . ST081  |  |          |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x        | -           | x                 | x        |  | . ST081  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x        | -           | x                 | -        |  | . ST081  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x        | -           | x                 | -        |  | . ST081  |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST081  |             |                   |          |  |          |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST081  |             |                   |          |  |          |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST081  |             |                   |          |  |          |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST081  |             |                   |          |  |          |
| <b>+ 114</b>                                     |                |                 |   |          |        |    |    |          |             |                   |          |  |          |
| <b>9 steps</b>                                   |                | 30°             | 5   | 48 □ 20A | M10H . | x  | x  | x        | x           | x <sup>1)</sup> - | . ST091  |  |          |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x        | x           | - -               | . ST091  |  |          |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x        | -           | x                 | x        |  | . ST091  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x        | -           | x                 | -        |  | . ST091  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x        | -           | x                 | -        |  | . ST091  |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST091  |             |                   |          |  |          |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST091  |             |                   |          |  |          |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST091  |             |                   |          |  |          |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST091  |             |                   |          |  |          |
| <b>+ 115</b>                                     |                |                 |   |          |        |    |    |          |             |                   |          |  |          |
| <b>10 steps</b>                                  |                | 30°             | 6   | 48 □ 20A | M10H . | x  | x  | x        | -           | x <sup>1)</sup> - | . ST0101 |  |          |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x        | -           | - -               | . ST0101 |  |          |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x        | -           | x                 | x        |  | . ST0101 |
|  |                |                 |   | 50A      | N33F . | x  | -  | x        | -           | x                 | -        |  | . ST0101 |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x        | -           | x                 | -        |  | . ST0101 |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST0101 |             |                   |          |  |          |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST0101 |             |                   |          |  |          |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST0101 |             |                   |          |  |          |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST0101 |             |                   |          |  |          |
| <b>+ 116</b>                                     |                |                 |   |          |        |    |    |          |             |                   |          |  |          |
| <b>11 steps</b>                                  |                | 30°             | 6   | 48 □ 20A | M10H . | x  | x  | x        | -           | x <sup>1)</sup> - | . ST0111 |  |          |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x        | -           | - -               | . ST0111 |  |          |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x        | -           | x                 | x        |  | . ST0111 |
|  |                |                 |   | 50A      | N33F . | x  | -  | x        | -           | x                 | -        |  | . ST0111 |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x        | -           | x                 | -        |  | . ST0111 |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST0111 |             |                   |          |  |          |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST0111 |             |                   |          |  |          |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST0111 |             |                   |          |  |          |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST0111 |             |                   |          |  |          |

**Ordering example:** AC21 250A panel mounting, multi step switch 1-pole with off, 11 steps

**N200 E ST0111**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                    | Design   |    |    |      | Switch pro- | Escutcheon plate |
|--|----------------|-----------------|---|-------------------------|--|----|----|------|-------------|------------------|
|  |                |                 |   |                         | E.   | Z. | V. | SMA. |             |                  |
| <b>Multi step switches 2-pole without Off ST.2</b> |                |                 |   |                         |  |    |    |      |             |                  |
| <b>3 steps</b>                                     |                | 60°             | 3   | 48 □ 20A<br>32A         | M10H . x x x x x <sup>1)</sup> - . ST32<br>M20 . x x x x - - . ST32              |    |    |      |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | N20 . x - x - x x . ST32<br>N33F . x x x - x - . ST32                            |    |    |      |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 . x - x - x - . ST32<br>N61 . x - x - x - . ST32<br>N80 . x - x - - - . ST32 |    |    |      |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | N100 . x - x - - - . ST32<br>N200 . x - x - - - . ST32                           |    |    |      |             |                  |
|  |                |                 |   |                         |  |    |    |      |             |                  |
| <b>4 steps</b>                                     |                | 60°             | 4   | 48 □ 20A<br>32A         | M10H . x x x x x <sup>1)</sup> - . ST42<br>M20 . x x x x - - . ST42              |    |    |      |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | N20 . x - x - x x . ST42<br>N33F . x - x - x - . ST42                            |    |    |      |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 . x - x - x - . ST42<br>N61 . x - x - x - . ST42<br>N80 . x - x - - - . ST42 |    |    |      |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | N100 . x - x - - - . ST42<br>N200 . x - x - - - . ST42                           |    |    |      |             |                  |
|  |                |                 |   |                         |  |    |    |      |             |                  |
| <b>5 steps</b>                                     |                | 60°             | 5   | 48 □ 20A<br>32A         | M10H . x x x x x <sup>1)</sup> - . ST52<br>M20 . x x x x - - . ST52              |    |    |      |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | N20 . x - x - x x . ST52<br>N33F . x - x - x - . ST52                            |    |    |      |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 . x - x - x - . ST52<br>N61 . x - x - x - . ST52<br>N80 . x - x - - - . ST52 |    |    |      |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | N100 . x - x - - - . ST52<br>N200 . x - x - - - . ST52                           |    |    |      |             |                  |
|  |                |                 |   |                         |  |    |    |      |             |                  |
| <b>6 steps</b>                                     |                | 60°             | 6   | 48 □ 20A<br>32A         | M10H . x x x - x <sup>1)</sup> - . ST62<br>M20 . x x x - - - . ST62              |    |    |      |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | N20 . x - x - x x . ST62<br>N33F . x - x - x - . ST62                            |    |    |      |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 . x - x - x - . ST62<br>N61 . x - x - x - . ST62<br>N80 . x - x - - - . ST62 |    |    |      |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | N100 . x - x - - - . ST62<br>N200 . x - x - - - . ST62                           |    |    |      |             |                  |
|  |                |                 |   |                         |  |    |    |      |             |                  |
| <b>7 steps</b>                                     |                | 45°             | 7   | 48 □ 20A<br>32A         | M10H . x x x - - - . ST72<br>M20 . x x x - - - . ST72                            |    |    |      |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | N20 . x - x - x - . ST72<br>N33F . x - x - - - . ST72                            |    |    |      |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | N40 . x - x - x - . ST72<br>N61 . x - x - - - . ST72<br>N80 . x - x - - - . ST72 |    |    |      |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | N100 . x - x - - - . ST72<br>N200 . x - x - - - . ST72                           |    |    |      |             |                  |
|  |                |                 |   |                         |  |    |    |      |             |                  |

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 7 steps

N200 E ST72

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description  | Wiring diagram                             | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                                       | Design |    |    |         | Switch pro- | Escutcheon plate |  |   |
|--|--|-----------------|---|--|--------|----|----|---------|-------------|------------------|--|---|
|  |  |                 |   |  | E.     | Z. | V. | SMA. P. |             |                  |  |   |
| <b>Multi step switches 2-pole without Off ST.2</b> |  |                 |   |  |        |    |    |         |             |                  |  |   |
| <b>8 steps</b>                                     |  | 45°             | 8 48 □ 20A                                | <b>M10H</b> . x x x - - - . <b>ST82</b>    | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 32A                                       | <b>M20</b> . x x x - - - . <b>ST82</b>     | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 64 □ 32A                                  | <b>N20</b> . x - x - - x - . <b>ST82</b>   | x      | -  | x  | -       | -           | x                |  | - |
|  |  |                 | 50A                                       | <b>N33F</b> . x - x - - - - . <b>ST82</b>  | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 88 □ 63A                                  | <b>N40</b> . x - x - - x - . <b>ST82</b>   | x      | -  | x  | -       | -           | x                |  | - |
| 90A  | <b>N61</b> . x - x - - - - . <b>ST82</b>   | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 115A   | <b>N80</b> . x - x - - - - . <b>ST82</b>   | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 132 □ 150A   | <b>N100</b> . x - x - - - - . <b>ST82</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 250A   | <b>N200</b> . x - x - - - - . <b>ST82</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| <b>9 steps</b>                                     |  | 30°             | 9 48 □ 20A                                | <b>M10H</b> . x x x - - - . <b>ST92</b>    | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 32A                                       | <b>M20</b> . x x x - - - . <b>ST92</b>     | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 64 □ 32A                                  | <b>N20</b> . x - x - - - - . <b>ST92</b>   | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 50A                                       | <b>N33F</b> . x - x - - - - . <b>ST92</b>  | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 88 □ 63A                                  | <b>N40</b> . x - x - - - - . <b>ST92</b>   | x      | -  | x  | -       | -           | -                |  | - |
| 90A  | <b>N61</b> . x - x - - - - . <b>ST92</b>   | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 115A   | <b>N80</b> . x - x - - - - . <b>ST92</b>   | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 132 □ 150A   | <b>N100</b> . x - x - - - - . <b>ST92</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 250A   | <b>N200</b> . x - x - - - - . <b>ST92</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| <b>10 steps</b>                                    |  | 30°             | 10 48 □ 20A                               | <b>M10H</b> . x x x - - - . <b>ST102</b>   | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 32A                                       | <b>M20</b> . x x x - - - . <b>ST102</b>    | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 64 □ 32A                                  | <b>N20</b> . x - x - - - - . <b>ST102</b>  | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 50A                                       | <b>N33F</b> . x - x - - - - . <b>ST102</b> | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 88 □ 63A                                  | <b>N40</b> . x - x - - - - . <b>ST102</b>  | x      | -  | x  | -       | -           | -                |  | - |
| 90A  | <b>N61</b> . x - x - - - - . <b>ST102</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 115A   | <b>N80</b> . x - x - - - - . <b>ST102</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 132 □ 150A   | <b>N100</b> . x - x - - - - . <b>ST102</b> | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 250A   | <b>N200</b> . x - x - - - - . <b>ST102</b> | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| <b>11 steps</b>                                    |  | 30°             | 11 48 □ 20A                               | <b>M10H</b> . x x x - - - . <b>ST112</b>   | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 32A                                       | <b>M20</b> . x x x - - - . <b>ST112</b>    | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 64 □ 32A                                  | <b>N20</b> . x - x - - - - . <b>ST112</b>  | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 50A                                       | <b>N33F</b> . x - x - - - - . <b>ST112</b> | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 88 □ 63A                                  | <b>N40</b> . x - x - - - - . <b>ST112</b>  | x      | -  | x  | -       | -           | -                |  | - |
| 90A  | <b>N61</b> . x - x - - - - . <b>ST112</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 115A   | <b>N80</b> . x - x - - - - . <b>ST112</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 132 □ 150A   | <b>N100</b> . x - x - - - - . <b>ST112</b> | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 250A   | <b>N200</b> . x - x - - - - . <b>ST112</b> | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| <b>12 steps</b>                                    |  | 30°             | 12 48 □ 20A                               | <b>M10H</b> . x x x - - - . <b>ST122</b>   | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 32A                                       | <b>M20</b> . x x x - - - . <b>ST122</b>    | x      | x  | x  | -       | -           | -                |  |   |
|  |  |                 | 64 □ 32A                                  | <b>N20</b> . x - x - - - - . <b>ST122</b>  | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 50A                                       | <b>N33F</b> . x - x - - - - . <b>ST122</b> | x      | -  | x  | -       | -           | -                |  | - |
|  |  |                 | 88 □ 63A                                  | <b>N40</b> . x - x - - - - . <b>ST122</b>  | x      | -  | x  | -       | -           | -                |  | - |
| 90A  | <b>N61</b> . x - x - - - - . <b>ST122</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 115A   | <b>N80</b> . x - x - - - - . <b>ST122</b>  | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 132 □ 150A   | <b>N100</b> . x - x - - - - . <b>ST122</b> | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |
| 250A   | <b>N200</b> . x - x - - - - . <b>ST122</b> | x               | -   | x  | -      | -  | -  | -       |             |                  |  |   |

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 12 steps

**N200 E ST122**



## Switching programs

| Description                                      | Wiring diagram             | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                                     | Design |    |    |         | Switch pro-       | Escutcheon plate |    |         |
|--|----------------------------|-----------------|---|--|--------|----|----|---------|-------------------|------------------|----|---------|
|  |                            |                 |   |  | E.     | Z. | V. | SMA.    |                   |                  | P. |         |
| <b>Multi step switches 2-pole with Off ST0.2</b> |                            |                 |   |  |        |    |    |         |                   |                  |    |         |
| <b>2 steps</b>                                   |                            | 60°             | 2 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . ST022 | x      | x  | x  | x       | x <sup>1)</sup> - | . ST022          |    |         |
|  |                            |                 | 32A                                       | M20 . x x x x - - . ST022                | x      | x  | x  | x       | - -               | . ST022          |    |         |
|  |                            |                 | 64 □ 32A                                  | N20 . x - x - x x . ST022                | x      | -  | x  | -       | x                 | x                |    | . ST022 |
|  |                            |                 | 50A                                       | N33F . x x x - x - . ST022               | x      | x  | x  | -       | x                 | -                |    | . ST022 |
|  |                            |                 | 88 □ 63A                                  | N40 . x - x - x - . ST022                | x      | -  | x  | -       | x                 | -                |    | . ST022 |
| 90A  | N61 . x - x - x - . ST022  | x               | -   | x  | -      | x  | -  | . ST022 | +422              |                  |    |         |
| 115A   | N80 . x - x - - - . ST022  | x               | -   | x  | -      | -  | -  | . ST022 |                   |                  |    |         |
| 132 □ 150A                                       | N100 . x - x - - - . ST022 | x               | -   | x  | -      | -  | -  | . ST022 | . ST022           |                  |    |         |
| 250A   | N200 . x - x - - - . ST022 | x               | -   | x  | -      | -  | -  | . ST022 |                   |                  |    |         |
| <b>3 steps</b>                                   |                            | 45°             | 3 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . ST032 | x      | x  | x  | x       | x <sup>1)</sup> - | . ST032          |    |         |
|  |                            |                 | 32A                                       | M20 . x x x x - - . ST032                | x      | x  | x  | x       | - -               | . ST032          |    |         |
|  |                            |                 | 64 □ 32A                                  | N20 . x - x - x x . ST032                | x      | -  | x  | -       | x                 | x                |    | . ST032 |
|  |                            |                 | 50A                                       | N33F . x x x - x - . ST032               | x      | x  | x  | -       | x                 | -                |    | . ST032 |
|  |                            |                 | 88 □ 63A                                  | N40 . x - x - x - . ST032                | x      | -  | x  | -       | x                 | -                |    | . ST032 |
| 90A  | N61 . x - x - x - . ST032  | x               | -   | x  | -      | x  | -  | . ST032 |                   |                  |    |         |
| 115A   | N80 . x - x - - - . ST032  | x               | -   | x  | -      | -  | -  | . ST032 |                   | . ST032          |    |         |
| 132 □ 150A                                       | N100 . x - x - - - . ST032 | x               | -   | x  | -      | -  | -  | . ST032 |                   |                  |    |         |
| 250A   | N200 . x - x - - - . ST032 | x               | -   | x  | -      | -  | -  | . ST032 |                   |                  |    |         |
| <b>4 steps</b>                                   |                            | 30°             | 4 48 □ 20A                                | M10H . x x x x x <sup>1)</sup> - . ST042 | x      | x  | x  | x       | x <sup>1)</sup> - | . ST042          |    |         |
|  |                            |                 | 32A                                       | M20 . x x x x - - . ST042                | x      | x  | x  | x       | - -               | . ST042          |    |         |
|  |                            |                 | 64 □ 32A                                  | N20 . x - x - x x . ST042                | x      | -  | x  | -       | x                 | x                |    | . ST042 |
|  |                            |                 | 50A                                       | N33F . x - x - x - . ST042               | x      | -  | x  | -       | x                 | -                |    | . ST042 |
|  |                            |                 | 88 □ 63A                                  | N40 . x - x - x - . ST042                | x      | -  | x  | -       | x                 | -                |    | . ST042 |
| 90A  | N61 . x - x - x - . ST042  | x               | -   | x  | -      | x  | -  | . ST042 |                   |                  |    |         |
| 115A   | N80 . x - x - - - . ST042  | x               | -   | x  | -      | -  | -  | . ST042 |                   | . ST042          |    |         |
| 132 □ 150A                                       | N100 . x - x - - - . ST042 | x               | -   | x  | -      | -  | -  | . ST042 |                   |                  |    |         |
| 250A   | N200 . x - x - - - . ST042 | x               | -   | x  | -      | -  | -  | . ST042 |                   |                  |    |         |
| <b>5 steps</b>                                   |                            | 45°             | 6 48 □ 20A                                | M10H . x x x - x <sup>1)</sup> - . ST052 | x      | x  | x  | -       | x <sup>1)</sup> - | . ST052          |    |         |
|  |                            |                 | 32A                                       | M20 . x x x - - - . ST052                | x      | x  | x  | -       | - -               | . ST052          |    |         |
|  |                            |                 | 64 □ 32A                                  | N20 . x - x - x x . ST052                | x      | -  | x  | -       | x                 | x                |    | . ST052 |
|  |                            |                 | 50A                                       | N33F . x - x - x - . ST052               | x      | -  | x  | -       | x                 | -                |    | . ST052 |
|  |                            |                 | 88 □ 63A                                  | N40 . x - x - x - . ST052                | x      | -  | x  | -       | x                 | -                |    | . ST052 |
| 90A  | N61 . x - x - x - . ST052  | x               | -   | x  | -      | x  | -  | . ST052 |                   |                  |    |         |
| 115A   | N80 . x - x - - - . ST052  | x               | -   | x  | -      | -  | -  | . ST052 |                   | . ST052          |    |         |
| 132 □ 150A                                       | N100 . x - x - - - . ST052 | x               | -   | x  | -      | -  | -  | . ST052 |                   |                  |    |         |
| 250A   | N200 . x - x - - - . ST052 | x               | -   | x  | -      | -  | -  | . ST052 |                   |                  |    |         |
| <b>6 steps</b>                                   |                            | 45°             | 7 48 □ 20A                                | M10H . x x x - x <sup>1)</sup> - . ST062 | x      | x  | x  | -       | x <sup>1)</sup> - | . ST062          |    |         |
|  |                            |                 | 32A                                       | M20 . x x x - - - . ST062                | x      | x  | x  | -       | - -               | . ST062          |    |         |
|  |                            |                 | 64 □ 32A                                  | N20 . x - x - x - . ST062                | x      | -  | x  | -       | x                 | -                |    | . ST062 |
|  |                            |                 | 50A                                       | N33F . x - x - - - . ST062               | x      | -  | x  | -       | -                 | -                |    | . ST062 |
|  |                            |                 | 88 □ 63A                                  | N40 . x - x - x - . ST062                | x      | -  | x  | -       | x                 | -                |    | . ST062 |
| 90A  | N61 . x - x - - - . ST062  | x               | -   | x  | -      | -  | -  | . ST062 |                   |                  |    |         |
| 115A   | N80 . x - x - - - . ST062  | x               | -   | x  | -      | -  | -  | . ST062 |                   | . ST062          |    |         |
| 132 □ 150A                                       | N100 . x - x - - - . ST062 | x               | -   | x  | -      | -  | -  | . ST062 |                   |                  |    |         |
| 250A   | N200 . x - x - - - . ST062 | x               | -   | x  | -      | -  | -  | . ST062 |                   |                  |    |         |

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 6 steps

N200 E ST062

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description                                      | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                    | Design   |    |    |         | Switch pro- | Escutcheon plate |
|--|----------------|-----------------|---|-------------------------|--|----|----|---------|-------------|------------------|
|  |                |                 |   |                         | E.   | Z. | V. | SMA. P. |             |                  |
| <b>Multi step switches 2-pole with Off ST0.2</b> |                |                 |   |                         |  |    |    |         |             |                  |
| <b>7 steps</b>                                   |                | 45°             | 8   | 48 □ 20A<br>32A         | <b>M10H</b> . x x x - - - . <b>ST072</b><br><b>M20</b> . x x x - - - . <b>ST072</b>  |    |    |         |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | <b>N20</b> . x - x - - - . <b>ST072</b><br><b>N33F</b> . x - x - - - . <b>ST072</b>  |    |    |         |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - - - . <b>ST072</b><br><b>N61</b> . x - x - - - . <b>ST072</b><br><b>N80</b> . x - x - - - . <b>ST072</b>    |    |    |         |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>ST072</b><br><b>N200</b> . x - x - - - . <b>ST072</b>   |    |    |         |             |                  |
|  |                |                 |   |                         |  |    |    |         |             |                  |
| <b>8 steps</b>                                   |                | 30°             | 9   | 48 □ 20A<br>32A         | <b>M10H</b> . x x x - - - . <b>ST082</b><br><b>M20</b> . x x x - - - . <b>ST082</b>  |    |    |         |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | <b>N20</b> . x - x - - - . <b>ST082</b><br><b>N33F</b> . x - x - - - . <b>ST082</b>  |    |    |         |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - - - . <b>ST082</b><br><b>N61</b> . x - x - - - . <b>ST082</b><br><b>N80</b> . x - x - - - . <b>ST082</b>    |    |    |         |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>ST082</b><br><b>N200</b> . x - x - - - . <b>ST082</b>   |    |    |         |             |                  |
|  |                |                 |   |                         |  |    |    |         |             |                  |
| <b>9 steps</b>                                   |                | 30°             | 10  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x - - - . <b>ST092</b><br><b>M20</b> . x x x - - - . <b>ST092</b>  |    |    |         |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | <b>N20</b> . x - x - - - . <b>ST092</b><br><b>N33F</b> . x - x - - - . <b>ST092</b>  |    |    |         |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - - - . <b>ST092</b><br><b>N61</b> . x - x - - - . <b>ST092</b><br><b>N80</b> . x - x - - - . <b>ST092</b>    |    |    |         |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>ST092</b><br><b>N200</b> . x - x - - - . <b>ST092</b>   |    |    |         |             |                  |
|  |                |                 |   |                         |  |    |    |         |             |                  |
| <b>10 steps</b>                                  |                | 30°             | 11  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x - - - . <b>ST0102</b><br><b>M20</b> . x x x - - - . <b>ST0102</b>  |    |    |         |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | <b>N20</b> . x - x - - - . <b>ST0102</b><br><b>N33F</b> . x - x - - - . <b>ST0102</b>  |    |    |         |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - - - . <b>ST0102</b><br><b>N61</b> . x - x - - - . <b>ST0102</b><br><b>N80</b> . x - x - - - . <b>ST0102</b> |    |    |         |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>ST0102</b><br><b>N200</b> . x - x - - - . <b>ST0102</b>   |    |    |         |             |                  |
|  |                |                 |   |                         |  |    |    |         |             |                  |
| <b>11 steps</b>                                  |                | 30°             | 12  | 48 □ 20A<br>32A         | <b>M10H</b> . x x x - - - . <b>ST0112</b><br><b>M20</b> . x x x - - - . <b>ST0112</b>  |    |    |         |             |                  |
|  |                |                 |   | 64 □ 32A<br>50A         | <b>N20</b> . x - x - - - . <b>ST0112</b><br><b>N33F</b> . x - x - - - . <b>ST0112</b>  |    |    |         |             |                  |
|  |                |                 |   | 88 □ 63A<br>90A<br>115A | <b>N40</b> . x - x - - - . <b>ST0112</b><br><b>N61</b> . x - x - - - . <b>ST0112</b><br><b>N80</b> . x - x - - - . <b>ST0112</b> |    |    |         |             |                  |
|  |                |                 |   | 132 □ 150A<br>250A      | <b>N100</b> . x - x - - - . <b>ST0112</b><br><b>N200</b> . x - x - - - . <b>ST0112</b>   |    |    |         |             |                  |
|  |                |                 |   |                         |  |    |    |         |             |                  |

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 11 steps **N200 E ST0112**

## Switching programs

| Description                                 | Wiring diagram | Switching angle    | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type                    | Design |    |    |         | Switch pro- | Escutcheon plate  |        |  |        |
|---|----------------|--------------------|---|-------------------------|--------|----|----|---------|-------------|-------------------|--------|--|--------|
|   |                |                    |   |                         | E.     | Z. | V. | SMA. P. |             |                   |        |  |        |
| Multi step switches 3-pole without Off ST.3 |                |                    |   |                         |        |    |    |         |             |                   |        |  |        |
| 3 steps                                     |                | 60°                | 5   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | x           | x <sup>1)</sup> - | . ST33 |  |        |
|   |                |                    |   | 64 □ 32A<br>50A         | N20 .  | x  | x  | x       | x           | - -               | . ST33 |  |        |
|   |                |                    |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST33 |
|   |                |                    |   |                         | N61 .  | x  | -  | x       | -           | x                 | -      |  | . ST33 |
|   |                |                    |   |                         | N80 .  | x  | -  | x       | -           | -                 | -      |  | . ST33 |
|   |                | 132 □ 150A<br>250A | N100 .                                    | x                       | -      | x  | -  | -       | -           | . ST33            |        |  |        |
|   |                |                    |   | N200 .                  | x      | -  | x  | -       | -           | -                 | . ST33 |  |        |
| 4 steps                                     |                | 60°                | 6   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | -           | x <sup>1)</sup> - | . ST43 |  |        |
|   |                |                    |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | x                 | x      |  | . ST43 |
|   |                |                    |   |                         | N33F . | x  | -  | x       | -           | x                 | -      |  | . ST43 |
|   |                |                    |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST43 |
|   |                |                    |   |                         | N61 .  | x  | -  | x       | -           | x                 | -      |  | . ST43 |
|   |                | 132 □ 150A<br>250A | N80 .                                     | x                       | -      | x  | -  | -       | -           | . ST43            |        |  |        |
|   |                |                    |   | N100 .                  | x      | -  | x  | -       | -           | -                 | . ST43 |  |        |
|   |                |                    |   | N200 .                  | x      | -  | x  | -       | -           | -                 | . ST43 |  |        |
| 5 steps                                     |                | 60°                | 8   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | -           | -                 | . ST53 |  |        |
|   |                |                    |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | x                 | -      |  | . ST53 |
|   |                |                    |   |                         | N33F . | x  | -  | x       | -           | -                 | -      |  | . ST53 |
|   |                |                    |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | x                 | -      |  | . ST53 |
|   |                |                    |   |                         | N61 .  | x  | -  | x       | -           | -                 | -      |  | . ST53 |
|   |                | 132 □ 150A<br>250A | N80 .                                     | x                       | -      | x  | -  | -       | -           | . ST53            |        |  |        |
|   |                |                    |   | N100 .                  | x      | -  | x  | -       | -           | -                 | . ST53 |  |        |
|   |                |                    |   | N200 .                  | x      | -  | x  | -       | -           | -                 | . ST53 |  |        |
| 6 steps                                     |                | 60°                | 9   | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | -           | -                 | . ST63 |  |        |
|   |                |                    |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | -                 | -      |  | . ST63 |
|   |                |                    |   |                         | N33F . | x  | -  | x       | -           | -                 | -      |  | . ST63 |
|   |                |                    |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | -                 | -      |  | . ST63 |
|   |                |                    |   |                         | N61 .  | x  | -  | x       | -           | -                 | -      |  | . ST63 |
|   |                | 132 □ 150A<br>250A | N80 .                                     | x                       | -      | x  | -  | -       | -           | . ST63            |        |  |        |
|   |                |                    |   | N100 .                  | x      | -  | x  | -       | -           | -                 | . ST63 |  |        |
|   |                |                    |   | N200 .                  | x      | -  | x  | -       | -           | -                 | . ST63 |  |        |
| 7 steps                                     |                | 45°                | 11  | 48 □ 20A<br>32A         | M10H . | x  | x  | x       | -           | -                 | . ST73 |  |        |
|   |                |                    |   | 64 □ 32A<br>50A         | N20 .  | x  | -  | x       | -           | -                 | -      |  | . ST73 |
|   |                |                    |   |                         | N33F . | x  | -  | x       | -           | -                 | -      |  | . ST73 |
|   |                |                    |   | 88 □ 63A<br>90A<br>115A | N40 .  | x  | -  | x       | -           | -                 | -      |  | . ST73 |
|   |                |                    |   |                         | N61 .  | x  | -  | x       | -           | -                 | -      |  | . ST73 |
|   |                | 132 □ 150A<br>250A | N80 .                                     | x                       | -      | x  | -  | -       | -           | . ST73            |        |  |        |
|   |                |                    |   | N100 .                  | x      | -  | x  | -       | -           | -                 | . ST73 |  |        |
|   |                |                    |   | N200 .                  | x      | -  | x  | -       | -           | -                 | . ST73 |  |        |

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 7 steps

N200 E ST73

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description  | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type   | Design |    |    |         | Switch pro- | Escutcheon plate |         |  |
|--|----------------|-----------------|---|--------|--------|----|----|---------|-------------|------------------|---------|--|
|  |                |                 |   |        | E.     | Z. | V. | SMA. P. |             |                  |         |  |
| <b>Multi step switches 3-pole without Off ST.3</b> |                |                 |   |        |        |    |    |         |             |                  |         |  |
| <b>8 steps</b>                                     |                | 45°             | 12 48 □ 20A                               | M10H . | x      | x  | x  | -       | -           | -                | . ST83  |  |
|  |                |                 | 32A                                       | M20 .  | x      | x  | x  | -       | -           | -                | . ST83  |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | -           | -                | . ST83  |  |
|  |                |                 | 50A                                       | N33F . | x      | -  | x  | -       | -           | -                | . ST83  |  |
|  |                |                 | 88 □ 63A                                  | N40 .  | x      | -  | x  | -       | -           | -                | . ST83  |  |
| 90A  | N61 .          | x               | -   | x      | -      | -  | -  | . ST83  |             |                  |         |  |
| 115A   | N80 .          | x               | -   | x      | -      | -  | -  | . ST83  |             |                  |         |  |
| 132 □ 150A   | N100 .         | x               | -   | x      | -      | -  | -  | . ST83  |             |                  |         |  |
| 250A   | N200 .         | x               | -   | x      | -      | -  | -  | . ST83  |             |                  |         |  |
| <b>9 steps</b>                                     |                | 30°             | 14 48 □ 20A                               | M10H . | x      | -  | x  | -       | -           | -                | . ST93  |  |
|  |                |                 | 32A                                       | M20 .  | x      | -  | x  | -       | -           | -                | . ST93  |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | -           | -                | . ST93  |  |
|  |                |                 | 50A                                       | N33F . | x      | -  | x  | -       | -           | -                | . ST93  |  |
|  |                |                 | 88 □ 63A                                  | N40 .  | x      | -  | x  | -       | -           | -                | . ST93  |  |
| 90A  | N61 .          | x               | -   | x      | -      | -  | -  | . ST93  |             |                  |         |  |
| 115A   | N80 .          | x               | -   | x      | -      | -  | -  | . ST93  |             |                  |         |  |
| 132 □ 150A   | N100 .         | x               | -   | x      | -      | -  | -  | . ST93  |             |                  |         |  |
| 250A   | N200 .         | x               | -   | x      | -      | -  | -  | . ST93  |             |                  |         |  |
| <b>10 steps</b>                                    |                | 30°             | 15 48 □ 20A                               | M10H . | x      | -  | x  | -       | -           | -                | . ST103 |  |
|  |                |                 | 32A                                       | M20 .  | x      | -  | x  | -       | -           | -                | . ST103 |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | -           | -                | . ST103 |  |
|  |                |                 | 50A                                       | N33F . | x      | -  | x  | -       | -           | -                | . ST103 |  |
|  |                |                 | 88 □ 63A                                  | N40 .  | x      | -  | x  | -       | -           | -                | . ST103 |  |
| 90A  | N61 .          | x               | -   | x      | -      | -  | -  | . ST103 |             |                  |         |  |
| 115A   | N80 .          | x               | -   | x      | -      | -  | -  | . ST103 |             |                  |         |  |
| 132 □ 150A   | N100 .         | x               | -   | x      | -      | -  | -  | . ST103 |             |                  |         |  |
| 250A   | N200 .         | x               | -   | x      | -      | -  | -  | . ST103 |             |                  |         |  |
| <b>11 steps</b>                                    |                | 30°             | 17 48 □ 20A                               | M10H . | x      | -  | x  | -       | -           | -                | . ST113 |  |
|  |                |                 | 32A                                       | M20 .  | x      | -  | x  | -       | -           | -                | . ST113 |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | -           | -                | . ST113 |  |
|  |                |                 | 50A                                       | N33F . | x      | -  | x  | -       | -           | -                | . ST113 |  |
|  |                |                 | 88 □ 63A                                  | N40 .  | x      | -  | x  | -       | -           | -                | . ST113 |  |
| 90A  | N61 .          | x               | -   | x      | -      | -  | -  | . ST113 |             |                  |         |  |
| 115A   | N80 .          | x               | -   | x      | -      | -  | -  | . ST113 |             |                  |         |  |
| 132 □ 150A   | N100 .         | x               | -   | x      | -      | -  | -  | . ST113 |             |                  |         |  |
| 250A   | N200 .         | x               | -   | x      | -      | -  | -  | . ST113 |             |                  |         |  |
| <b>12 steps</b>                                    |                | 30°             | 18 48 □ 20A                               | M10H . | x      | -  | x  | -       | -           | -                | . ST123 |  |
|  |                |                 | 32A                                       | M20 .  | x      | -  | x  | -       | -           | -                | . ST123 |  |
|  |                |                 | 64 □ 32A                                  | N20 .  | x      | -  | x  | -       | -           | -                | . ST123 |  |
|  |                |                 | 50A                                       | N33F . | x      | -  | x  | -       | -           | -                | . ST123 |  |
|  |                |                 | 88 □ 63A                                  | N40 .  | x      | -  | x  | -       | -           | -                | . ST123 |  |
| 90A  | N61 .          | x               | -   | x      | -      | -  | -  | . ST123 |             |                  |         |  |
| 115A   | N80 .          | x               | -   | x      | -      | -  | -  | . ST123 |             |                  |         |  |
| 132 □ 150A   | N100 .         | x               | -   | x      | -      | -  | -  | . ST123 |             |                  |         |  |
| 250A   | N200 .         | x               | -   | x      | -      | -  | -  | . ST123 |             |                  |         |  |

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 12 steps

N200 E ST123

## Switching programs

| Description                                      | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type     | Design |    |    |         | Switch pro- | Escutcheon plate |    |         |  |
|--|----------------|-----------------|---|----------|--------|----|----|---------|-------------|------------------|----|---------|--|
|  |                |                 |   |          | E.     | Z. | V. | SMA.    |             |                  | P. |         |  |
| <b>Multi step switches 3-pole with Off ST0.3</b> |                |                 |   |          |        |    |    |         |             |                  |    |         |  |
| 2 steps  |                | 60°             | 3   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup>  | -  | . ST023 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | -                | -  | . ST023 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                | x  | . ST023 |  |
|  |                |                 |   | 50A      | N33F . | x  | x  | x       | -           | x                | -  | . ST023 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                | -  | . ST023 |  |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST023 |             |                  |    |         |  |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST023 |             |                  |    |         |  |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST023 |             |                  |    |         |  |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST023 |             |                  |    |         |  |
| 3 steps  |                | 45°             | 5   | 48 □ 20A | M10H . | x  | x  | x       | x           | x <sup>1)</sup>  | -  | . ST033 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       | x           | -                | -  | . ST033 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                | x  | . ST033 |  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x       | -           | x                | -  | . ST033 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                | -  | . ST033 |  |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST033 |             |                  |    |         |  |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST033 |             |                  |    |         |  |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST033 |             |                  |    |         |  |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST033 |             |                  |    |         |  |
| 4 steps  |                | 30°             | 6   | 48 □ 20A | M10H . | x  | x  | x       | -           | x <sup>1)</sup>  | -  | . ST043 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       | -           | -                | -  | . ST043 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | x                | x  | . ST043 |  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x       | -           | x                | -  | . ST043 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | x                | -  | . ST043 |  |
| 90A  | N61 .          | x               | -   | x        | -      | x  | -  | . ST043 |             |                  |    |         |  |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST043 |             |                  |    |         |  |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST043 |             |                  |    |         |  |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST043 |             |                  |    |         |  |
| 5 steps  |                | 45°             | 9   | 48 □ 20A | M10H . | x  | x  | x       | -           | -                | -  | . ST053 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       | -           | -                | -  | . ST053 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | -                | -  | . ST053 |  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x       | -           | -                | -  | . ST053 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | -                | -  | . ST053 |  |
| 90A  | N61 .          | x               | -   | x        | -      | -  | -  | . ST053 |             |                  |    |         |  |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST053 |             |                  |    |         |  |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST053 |             |                  |    |         |  |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST053 |             |                  |    |         |  |
| 6 steps  |                | 45°             | 11  | 48 □ 20A | M10H . | x  | x  | x       | -           | -                | -  | . ST063 |  |
|  |                |                 |   | 32A      | M20 .  | x  | x  | x       | -           | -                | -  | . ST063 |  |
|  |                |                 |   | 64 □ 32A | N20 .  | x  | -  | x       | -           | -                | -  | . ST063 |  |
|  |                |                 |   | 50A      | N33F . | x  | -  | x       | -           | -                | -  | . ST063 |  |
|  |                |                 |   | 88 □ 63A | N40 .  | x  | -  | x       | -           | -                | -  | . ST063 |  |
| 90A  | N61 .          | x               | -   | x        | -      | -  | -  | . ST063 |             |                  |    |         |  |
| 115A   | N80 .          | x               | -   | x        | -      | -  | -  | . ST063 |             |                  |    |         |  |
| 132 □ 150A                                       | N100 .         | x               | -   | x        | -      | -  | -  | . ST063 |             |                  |    |         |  |
| 250A   | N200 .         | x               | -   | x        | -      | -  | -  | . ST063 |             |                  |    |         |  |

**Ordering example:** AC21 250A panel mounting, multi step switch 3-pole with off, 6 steps **N200 E ST063**

1) Plastic enclosed switches are delivered with switch type M10.

## Switching programs

| Description                                      | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type  | Design |    |    |         | Switch pro- | Escutcheon plate |
|--|----------------|-----------------|---|---|--------|----|----|---------|-------------|------------------|
|  |                |                 |   |   | E.     | Z. | V. | SMA. P. |             |                  |
| <b>Multi step switches 3-pole with Off ST0.3</b> |                |                 |   |   |        |    |    |         |             |                  |
| 7 steps  |                | 45°             | 12 48 □ 20A                               | M10H . x x x - - - . ST073<br>M20 . x x x - - - . ST073   |        |    |    |         |             |                  |
|  |                |                 | 64 □ 32A                                  | N20 . x - x - - - . ST073<br>N33F . x - x - - - . ST073   |        |    |    |         |             |                  |
|  |                |                 | 88 □ 63A                                  | N40 . x - x - - - . ST073<br>90A N61 . x - x - - - . ST073<br>115A N80 . x - x - - - . ST073    |        |    |    |         |             |                  |
|  |                |                 | 132 □ 150A                                | N100 . x - x - - - . ST073<br>250A N200 . x - x - - - . ST073                                   |        |    |    |         |             |                  |
| 8 steps  |                | 30°             | 14 48 □ 20A                               | M10H . x - x - - - . ST083<br>M20 . x - x - - - . ST083   |        |    |    |         |             |                  |
|  |                |                 | 64 □ 32A                                  | N20 . x - x - - - . ST083<br>N33F . x - x - - - . ST083   |        |    |    |         |             |                  |
|  |                |                 | 88 □ 63A                                  | N40 . x - x - - - . ST083<br>90A N61 . x - x - - - . ST083<br>115A N80 . x - x - - - . ST083    |        |    |    |         |             |                  |
|  |                |                 | 132 □ 150A                                | N100 . x - x - - - . ST083<br>250A N200 . x - x - - - . ST083                                   |        |    |    |         |             |                  |
| 9 steps  |                | 30°             | 15 48 □ 20A                               | M10H . x - x - - - . ST093<br>M20 . x - x - - - . ST093   |        |    |    |         |             |                  |
|  |                |                 | 64 □ 32A                                  | N20 . x - x - - - . ST093<br>N33F . x - x - - - . ST093   |        |    |    |         |             |                  |
|  |                |                 | 88 □ 63A                                  | N40 . x - x - - - . ST093<br>90A N61 . x - x - - - . ST093<br>115A N80 . x - x - - - . ST093    |        |    |    |         |             |                  |
|  |                |                 | 132 □ 150A                                | N100 . x - x - - - . ST093<br>250A N200 . x - x - - - . ST093                                   |        |    |    |         |             |                  |
| 10 steps   |                | 30°             | 17 48 □ 20A                               | M10H . x - x - - - . ST0103<br>M20 . x - x - - - . ST0103                                       |        |    |    |         |             |                  |
|  |                |                 | 64 □ 32A                                  | N20 . x - x - - - . ST0103<br>N33F . x - x - - - . ST0103                                       |        |    |    |         |             |                  |
|  |                |                 | 88 □ 63A                                  | N40 . x - x - - - . ST0103<br>90A N61 . x - x - - - . ST0103<br>115A N80 . x - x - - - . ST0103 |        |    |    |         |             |                  |
|  |                |                 | 132 □ 150A                                | N100 . x - x - - - . ST0103<br>250A N200 . x - x - - - . ST0103                                 |        |    |    |         |             |                  |
| 11 steps   |                | 30°             | 18 48 □ 20A                               | M10H . x - x - - - . ST0113<br>M20 . x - x - - - . ST0113                                       |        |    |    |         |             |                  |
|  |                |                 | 64 □ 32A                                  | N20 . x - x - - - . ST0113<br>N33F . x - x - - - . ST0113                                       |        |    |    |         |             |                  |
|  |                |                 | 88 □ 63A                                  | N40 . x - x - - - . ST0113<br>90A N61 . x - x - - - . ST0113<br>115A N80 . x - x - - - . ST0113 |        |    |    |         |             |                  |
|  |                |                 | 132 □ 150A                                | N100 . x - x - - - . ST0113<br>250A N200 . x - x - - - . ST0113                                 |        |    |    |         |             |                  |

Ordering example: AC21 250A panel mounting, multi step switch 3-pole with off, 11 steps

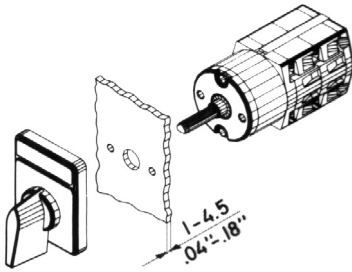
N200 E ST0113

# Mini-Cam Switches M4H

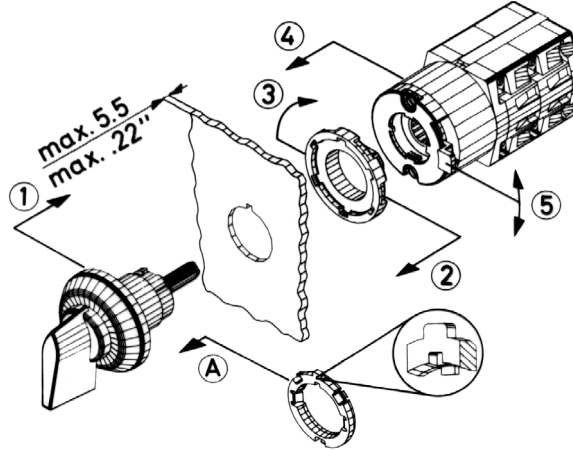
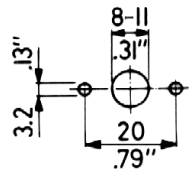
Panel mounting E, IP40

Central fixing Z

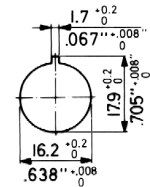
Central fixing without escutcheon plate ZO



Mounting holes

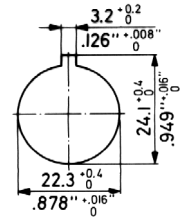


Central fixing 16mm



lock

unlock Central fixing 22mm

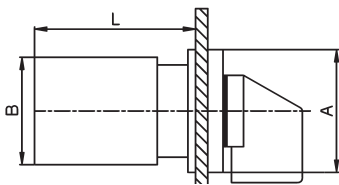


Single hole mountings are generally delivered for a 16mm (.64") mounting. Using the forwarded adapter ring, it is possible to alter the single hole mountings from 22mm (.88"). For that purpose the adapter ring has to be attached onto the threaded part of the body in such a manner, that  
 1. the flat side of the adapter ring shows towards the front seal and  
 2. the inner nose fits into the notch of the body.  
 The adapter ring has to be pushed towards the front seal.

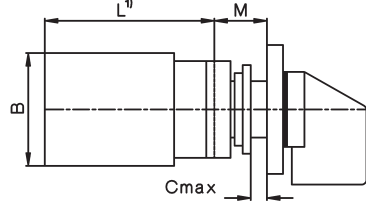
| Optional extras                    | ordering code | for design | M4H Z ... +SRE | M4H Z ... +SA. | M4H ZO ... +SA. | M4H Z ... +SRE+SA. |
|------------------------------------|---------------|------------|----------------|----------------|-----------------|--------------------|
| Additional escutcheon plate        | +SRE          | E, Z, ZO   |                |                |                 |                    |
| Additional escutcheon plate        | +SRE2         | E, Z, ZO   |                |                |                 |                    |
| Key operated switch with lock KABA | +SA1          | Z, ZO      |                |                |                 |                    |
| with lock Ronis                    | +SA2          | Z, ZO      |                |                |                 |                    |

**Wrench J7400**  
for switches M4H with central fixing is necessary

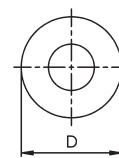
## Panel mounting E



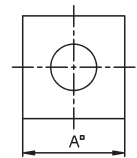
## Central fixing Z, ZO



## ZO



## Z



| Type | A  | B  | D  | M    | Dimension L for ... cells |      |      |      |      |      |      |       |       |
|------|----|----|----|------|---------------------------|------|------|------|------|------|------|-------|-------|
|      |    |    |    |      | 1                         | 2    | 3    | 4    | 5    | 6    | 7    | 8     |       |
| M4H  | mm | 30 | 28 | 29,5 | 12,5                      | 38,5 | 50,5 | 62,5 | 74,5 | 86,5 | 98,5 | 110,5 | 122,5 |

## Technical data

| Type | according to specifications  | AC21A                               | AC15 |      | Volt | Motor rating AC3 |     |     |                |      |   |      |
|------|------------------------------|-------------------------------------|------|------|------|------------------|-----|-----|----------------|------|---|------|
|      |                              |                                     | 110V | 380V |      | 3 phase 3-pole   |     |     | 1 phase 2-pole |      |   |      |
| M4H  | IEC, VDE, BS, SEV<br>UL, CSA | General use<br>10A/500V<br>10A/300V | 2,5A | 1,5A | kW   | 0,65             | 1,5 | 2,2 | 0,3            | 0,55 | - | 0,75 |
|      |                              |                                     | A300 | HP   |      |                  |     |     |                |      |   |      |

| Type | according to specifications  | Volt | Motor rating AC23 |     |     | 2-pole |      |     |
|------|------------------------------|------|-------------------|-----|-----|--------|------|-----|
|      |                              |      | 3-pole            | 110 | 220 | 380    | 110  | 220 |
| M4H  | IEC, VDE, BS, SEV<br>UL, CSA | kW   | 0,75              | 1,8 | 3   | 0,37   | 0,75 | 1,1 |
|      |                              |      | HP                | -   | -   | -      | -    | -   |

## additional data for wiring according to UL and CSA

| Type | type of wire     | temp. rating of wire | torque value for field wiring terminals |
|------|------------------|----------------------|---|
| M4H  | copper wire only | 60/75°C              | 0,4Nm / 3,5lb - inch                    |

# Mini-Cam Switches M4H

## Switch programs

| Description                             | Wiring diagram | AC21 500V 10A<br>AC15 230V 2,5A<br>AC3 4x400V 2,2kW | escutch.<br>30 x 30 | numb.<br>of<br>cells | Type | Design   |          |           | Switch<br>pro-<br>gram |
|---|----------------|---|---------------------|----------------------|------|----------|----------|-----------|------------------------|
|   |                |   |                     |                      |      | .E.<br>↓ | .Z.<br>↓ | .ZO.<br>↓ |                        |
| <b>On-Off-switch A</b>                  |                |   |                     |                      |      |          |          |           |                        |
| 1-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . A1                   |
| 2-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . A2                   |
| 3-pole                                  |                |   |                     | 2                    | M4H  | x        | x        | x         | . A3                   |
| 4-pole                                  |                |   |                     | 2                    | M4H  | x        | x        | x         | . A4                   |
| 6-pole                                  |                |   |                     | 3                    | M4H  | x        | x        | x         | . A6                   |
| <b>Changeover switch U</b>              |                |   |                     |                      |      |          |          |           |                        |
| 1-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . U1                   |
| 2-pole                                  |                |   |                     | 2                    | M4H  | x        | x        | x         | . U2                   |
| 3-pole                                  |                |   |                     | 3                    | M4H  | x        | x        | x         | . U3                   |
| 4-pole                                  |                |   |                     | 4                    | M4H  | x        | x        | x         | . U4                   |
| <b>Changeover switch without off W</b>  |                |   |                     |                      |      |          |          |           |                        |
| 1-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . W1                   |
| 2-pole                                  |                |   |                     | 2                    | M4H  | x        | x        | x         | . W2                   |
| 3-pole                                  |                |   |                     | 3                    | M4H  | x        | x        | x         | . W3                   |
| 4-pole                                  |                |   |                     | 4                    | M4H  | x        | x        | x         | . W4                   |
| 6-pole                                  |                |   |                     | 6                    | M4H  | x        | x        | x         | . W6                   |
| <b>Reversing switch WU</b>              |                |   |                     |                      |      |          |          |           |                        |
| 2-pole                                  |                |   |                     | 2                    | M4H  | x        | x        | x         | . WU2                  |
| 3-pole                                  |                |   |                     | 3                    | M4H  | x        | x        | x         | . WU3                  |
| 3-pole<br>with spring return to 0       |                |   |                     | 3                    | M4H  | x        | x        | x         | . WU3R2                |
| <b>Star-delta switch SD</b>             |                |   |                     |                      |      |          |          |           |                        |
| 1 rotary direction                      |                |   |                     | 4                    | M4H  | x        | x        | x         | . SD                   |
| both<br>rotary directions               |                |   |                     | 5                    | M4H  | x        | x        | x         | . SDR                  |
| <b>Changeover with spring return UR</b> |                |   |                     |                      |      |          |          |           |                        |
| 1-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . UR1                  |
| 2-pole                                  |                |   |                     | 2                    | M4H  | x        | x        | x         | . UR2                  |
| 3-pole                                  |                |   |                     | 3                    | M4H  | x        | x        | x         | . UR3                  |
| <b>Start switch</b>                     |                |   |                     |                      |      |          |          |           |                        |
| 1-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . SE                   |
| <b>Stop switch</b>                      |                |   |                     |                      |      |          |          |           |                        |
| 1-pole                                  |                |   |                     | 1                    | M4H  | x        | x        | x         | . SA                   |

Ordering example: Stop switch, 1-pole, Central fixing: **M4H Z SA**



# Mini-Cam Switches M4H

## Switch programs

| Description   | Wiring diagram | AC21 500V 10A<br>AC15 230V 2,5A<br>AC3 4x400V 2,2kW | escutch.<br>30 x 30 | numb.<br>of<br>cells | Type | Design   |          |           | Switch<br>program |
|---|----------------|---|---------------------|----------------------|------|----------|----------|-----------|-------------------|
|   |                |   |                     |                      |      | .E.<br>↓ | .Z.<br>↓ | .ZO.<br>↓ |                   |
| <b>Start-Stop switch</b>  |                |   |                     | 1                    | M4H  | x        | x        | x         | . SEA             |
| <b>Start-Stop switch position START with spring return to 1</b> |                |   |                     | 1                    | M4H  | x        | x        | x         | . S392            |
| <b>Start-Stop switch for reversing contactors</b>               |                |   |                     | 2                    | M4H  | x        | x        | x         | . S2EA            |
| <b>Voltmeter selector switch V</b>                              |                |   |                     |                      |      |          |          |           |                   |
| <b>3 line voltages</b>  |                |   |                     | 2                    | M4H  | x        | x        | x         | . V3              |
| <b>3 phase voltages</b>   |                |   |                     | 2                    | M4H  | x        | x        | x         | . V0              |
| <b>3 line voltages<br/>3 phase voltages</b>                     |                |   |                     | 3                    | M4H  | x        | x        | x         | . V1              |
| <b>Ammeter selector switch A</b>                                |                |   |                     |                      |      |          |          |           |                   |
| <b>1-pole, 3 current transformer</b>                            |                |   |                     | 4                    | M4H  | x        | x        | x         | . M31             |
| <b>Gang switch GR</b>   |                |   |                     |                      |      |          |          |           |                   |
| <b>2 circuits A and B<br/>1-pole<br/>0 - A - A+B</b>            |                |   |                     | 1                    | M4H  | x        | x        | x         | . GR11            |
| <b>2 circuits A and B<br/>1-pole<br/>0 - A - B - A+B</b>        |                |   |                     | 1                    | M4H  | x        | x        | x         | . GR12            |
| <b>3 circuits A, B and C<br/>1-pole</b>                         |                |   |                     | 2                    | M4H  | x        | x        | x         | . GR14            |
| <b>Multi step switch without 0 ST</b>                           |                |   |                     |                      |      |          |          |           |                   |
| <b>3 steps, 1-pole</b>  |                |   |                     | 2                    | M4H  | x        | x        | x         | . ST31            |
| <b>3 steps, 2-pole</b>  |                |   |                     | 3                    | M4H  | x        | x        | x         | . ST32            |
| <b>3 steps, 3-pole</b>  |                |   |                     | 5                    | M4H  | x        | x        | x         | . ST33            |

Ordering example: Multi step switch without 0, 3 steps, 3-pole, panel mounting: **M4H E ST33**

# Mini-Cam Switches M4H

## Switch programs

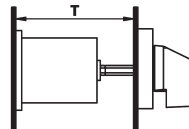
| Description                           | Wiring diagram | AC21 500V 10A<br>AC15 230V 2,5A<br>AC3 4x400V 2,2kW | escutch.<br>30 x 30 | numb.<br>of<br>cells | Type | Design  |         |          | Switch<br>pro-<br>gram |
|---------------------------------------|----------------|---|---------------------|----------------------|------|---------|---------|----------|------------------------|
|                                       |                |   |                     |                      |      | E.<br>↓ | Z.<br>↓ | ZO.<br>↓ |                        |
| <b>Multi step switch without 0 ST</b> |                |   |                     |                      |      |         |         |          |                        |
| 4 steps, 1-pole                       |                |   |                     | 2                    | M4H  | x       | x       | x        | .ST41                  |
| 4 steps, 2-pole                       |                |   |                     | 4                    | M4H  | x       | x       | x        | .ST42                  |
| 4 steps, 3-pole                       |                |   |                     | 6                    | M4H  | x       | x       | x        | .ST43                  |
| 5 steps, 1-pole                       |                |   |                     | 3                    | M4H  | x       | x       | x        | .ST51                  |
| 5 steps, 2-pole                       |                |   |                     | 5                    | M4H  | x       | x       | x        | .ST52                  |
| 6 steps, 1-pole                       |                |   |                     | 3                    | M4H  | x       | x       | x        | .ST61                  |
| 6 steps, 2-pole                       |                |   |                     | 6                    | M4H  | x       | x       | x        | .ST62                  |
| <b>Multi step switch with 0 ST0.</b>  |                |   |                     |                      |      |         |         |          |                        |
| 2 steps, 1-pole                       |                |   |                     | 1                    | M4H  | x       | x       | x        | .ST021                 |
| 2 steps, 2-pole                       |                |   |                     | 2                    | M4H  | x       | x       | x        | .ST022                 |
| 2 steps, 3-pole                       |                |   |                     | 3                    | M4H  | x       | x       | x        | .ST023                 |
| 3 steps, 1-pole                       |                |   |                     | 2                    | M4H  | x       | x       | x        | .ST031                 |
| 3 steps, 2-pole                       |                |   |                     | 3                    | M4H  | x       | x       | x        | .ST032                 |
| 3 steps, 3-pole                       |                |   |                     | 5                    | M4H  | x       | x       | x        | .ST033                 |
| 4 steps, 1-pole                       |                |   |                     | 2                    | M4H  | x       | x       | x        | .ST041                 |
| 4 steps, 2-pole                       |                |   |                     | 4                    | M4H  | x       | x       | x        | .ST042                 |
| 4 steps, 3-pole                       |                |   |                     | 6                    | M4H  | x       | x       | x        | .ST043                 |
| 5 steps, 1-pole                       |                |   |                     | 3                    | M4H  | x       | x       | x        | .ST051                 |
| 5 steps, 2-pole                       |                |   |                     | 5                    | M4H  | x       | x       | x        | .ST052                 |
| 6 steps, 1-pole                       |                |   |                     | 4                    | M4H  | x       | x       | x        | .ST061                 |
| 7 steps, 1-pole                       |                |   |                     | 4                    | M4H  | x       | x       | x        | .ST071                 |
| 8 steps, 1-pole                       |                |   |                     | 5                    | M4H  | x       | x       | x        | .ST081                 |
| 9 steps, 1-pole                       |                |   |                     | 5                    | M4H  | x       | x       | x        | .ST091                 |
| 10 steps, 1-pole                      |                |   |                     | 6                    | M4H  | x       | x       | x        | .ST0101                |

Ordering example: Multi step switch with 0, 10 steps, 1-pole, Central fixing without escutcheon plate: **M4H ZO ST0101**

## Load Switches for resistive or slightly inductive loads or switching without load

| Description                                | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type         | Design |     | Switch program | Escutcheon plate |
|--|----------------|-----------------|---|--------------|--------|-----|----------------|------------------|
|  |                |                 |   |              | .E.    | .V. |                |                  |
| <b>On-Off-switches A</b>                   |                |                 |   |              |        |     |                |                  |
| <b>1-pole</b>                              |                | 60°             | 2 88 □ 125A                               | <b>L100</b>  | x      | x   | . A1           |                  |
|  |                |                 | 1 180A                                    |              |        |     |                |                  |
|  |                |                 | 1 132 □ 400A                              | <b>L400</b>  | x      | x   | . A1           |                  |
|  |                |                 | 3 600A                                    | <b>L600</b>  | x      | x   | . A1           |                  |
|  |                |                 | 2 800A                                    | <b>L800</b>  | x      | x   | . A1           |                  |
| 3 1200A                                    | <b>L1200</b>   | x               | x   | . A1         |        |     |                |                  |
| <b>2-pole</b>                              |                | 60°             | 2 88 □ 125A                               | <b>L100</b>  | x      | x   | . A2           |                  |
|  |                |                 | 2 180A                                    |              |        |     |                |                  |
|  |                |                 | 2 132 □ 400A                              | <b>L400</b>  | x      | x   | . A2           |                  |
|  |                |                 | 3 600A                                    | <b>L600</b>  | x      | x   | . A2           |                  |
|  |                |                 | 4 800A                                    | <b>L800</b>  | x      | x   | . A2           |                  |
|  |                |                 | 6 1200A                                   | <b>L1200</b> | x      | x   | . A2           |                  |
| <b>3-pole</b>                              |                | 60°             | 4 88 □ 125A                               | <b>L100</b>  | x      | x   | . A3           |                  |
|  |                |                 | 3 180A                                    |              |        |     |                |                  |
|  |                |                 | 3 132 □ 400A                              | <b>L400</b>  | x      | x   | . A3           |                  |
|  |                |                 | 6 600A                                    | <b>L600</b>  | x      | x   | . A3           |                  |
|  |                |                 | 6 800A                                    | <b>L800</b>  | x      | x   | . A3           |                  |
|  |                |                 | 9 1200A                                   | <b>L1200</b> | x      | x   | . A3           |                  |
| <b>4-pole</b><br><b>4. pole early make</b> |                | 60°             | 4 88 □ 125A                               | <b>L100</b>  | x      | x   | . A4           |                  |
|  |                |                 | 4 180A                                    |              |        |     |                |                  |
|  |                |                 | 4 132 □ 400A                              | <b>L400</b>  | x      | x   | . A4           |                  |
|  |                |                 | 6 600A                                    | <b>L600</b>  | x      | x   | . A4           |                  |
|  |                |                 | 8 800A                                    | <b>L800</b>  | x      | x   | . A4           |                  |
| 12 1200A                                   | <b>L1200</b>   | x               | x   | . A4         |        |     |                |                  |
| <b>6-pole</b>                              |                | 60°             | 6 88 □ 125A                               | <b>L100</b>  | x      | x   | . A6           |                  |
|  |                |                 | 6 180A                                    |              |        |     |                |                  |
|  |                |                 | 6 132 □ 400A                              | <b>L400</b>  | x      | x   | . A6           |                  |
|  |                |                 | 9 600A                                    | <b>L600</b>  | x      | x   | . A6           |                  |
|  |                |                 | 12 800A                                   | <b>L800</b>  | x      | x   | . A6           |                  |
|  |                |                 | 18 1200A                                  | <b>L1200</b> | x      | x   | . A6           |                  |

For switches with the design **V.** it is necessary to state the installation depth - that is, the distance between mounting level of the switch and the inside edge of the door (dimension T).



Further informations page  
 Technical Data 261  
 Dimensions 266

**Load Switches** for resistive or slightly inductive loads or switching without load

| Description                              | Wiring diagram | Switching angle | Number of cells<br>↓<br>Size<br>↓<br>AC21 | Type   | Design<br>.E. .V.<br>↓ ↓ | Switch<br>pro-<br>gram | Escutcheon<br>plate |
|--|----------------|-----------------|---|--------|--------------------------|------------------------|---------------------|
| <b>Changeover switches U</b>             |                |                 |   |        |                          |                        |                     |
| <b>1-pole</b>                            |                | 60°             | 2 88 □ 125A                               | L100 . | x x                      | . U1                   |                     |
|  |                |                 | 2 180A                                    | L160 . | x x                      | . U1                   |                     |
|  |                |                 | 2 132 □ 400A                              | L400 . | x x                      | . U1                   |                     |
|  |                |                 | 3 600A                                    | L600 . | x x                      | . U1                   |                     |
|  |                |                 | 4 800A                                    | L800 . | x x                      | . U1                   |                     |
| 6 1200A                                  | L1200 .        | x x             | . U1                                      |        |                          |                        |                     |
| <b>2-pole</b>                            |                | 60°             | 4 88 □ 125A                               | L100 . | x x                      | . U2                   |                     |
|  |                |                 | 4 180A                                    | L160 . | x x                      | . U2                   |                     |
|  |                |                 | 4 132 □ 400A                              | L400 . | x x                      | . U2                   |                     |
|  |                |                 | 6 600A                                    | L600 . | x x                      | . U2                   |                     |
|  |                |                 | 8 800A                                    | L800 . | x x                      | . U2                   |                     |
| 12 1200A                                 | L1200 .        | x x             | . U2                                      |        |                          |                        |                     |
| <b>3-pole</b>                            |                | 60°             | 6 88 □ 125A                               | L100 . | x x                      | . U3                   |                     |
|  |                |                 | 6 180A                                    | L160 . | x x                      | . U3                   |                     |
|  |                |                 | 6 132 □ 400A                              | L400 . | x x                      | . U3                   |                     |
|  |                |                 | 9 600A                                    | L600 . | x x                      | . U3                   |                     |
|  |                |                 | 12 800A                                   | L800 . | x x                      | . U3                   |                     |
| 18 1200A                                 | L1200 .        | x x             | . U3                                      |        |                          |                        |                     |
| <b>4-pole<br/>4. pole early make</b>     |                | 60°             | 8 88 □ 125A                               | L100 . | x x                      | . U4                   |                     |
|  |                |                 | 8 180A                                    | L160 . | x x                      | . U4                   |                     |
|  |                |                 | 8 132 □ 400A                              | L400 . | x x                      | . U4                   |                     |
|  |                |                 | 12 600A                                   | L600 . | x x                      | . U4                   |                     |
|  |                |                 | 16 800A                                   | L800 . | x x                      | . U4                   |                     |
| 24 1200A                                 | L1200 .        | x x             | . U4                                      |        |                          |                        |                     |
| <b>Changeover switches without off W</b> |                |                 |   |        |                          |                        |                     |
| <b>1-pole</b>                            |                | 60°             | 2 88 □ 125A                               | L100 . | x x                      | . W1                   |                     |
|  |                |                 | 2 180A                                    | L160 . | x x                      | . W1                   |                     |
|  |                |                 | 2 132 □ 400A                              | L400 . | x x                      | . W1                   |                     |
|  |                |                 | 3 600A                                    | L600 . | x x                      | . W1                   |                     |
|  |                |                 | 4 800A                                    | L800 . | x x                      | . W1                   |                     |
| 6 1200A                                  | L1200 .        | x x             | . W1                                      |        |                          |                        |                     |
| <b>2-pole</b>                            |                | 60°             | 4 88 □ 125A                               | L100 . | x x                      | . W2                   |                     |
|  |                |                 | 4 180A                                    | L160 . | x x                      | . W2                   |                     |
|  |                |                 | 4 132 □ 400A                              | L400 . | x x                      | . W2                   |                     |
|  |                |                 | 6 600A                                    | L600 . | x x                      | . W2                   |                     |
|  |                |                 | 8 800A                                    | L800 . | x x                      | . W2                   |                     |
| 12 1200A                                 | L1200 .        | x x             | . W2                                      |        |                          |                        |                     |
| <b>3-pole</b>                            |                | 60°             | 6 88 □ 125A                               | L100 . | x x                      | . W3                   |                     |
|  |                |                 | 6 180A                                    | L160 . | x x                      | . W3                   |                     |
|  |                |                 | 6 132 □ 400A                              | L400 . | x x                      | . W3                   |                     |
|  |                |                 | 9 600A                                    | L600 . | x x                      | . W3                   |                     |
|  |                |                 | 12 800A                                   | L800 . | x x                      | . W3                   |                     |
| 18 1200A                                 | L1200 .        | x x             | . W3                                      |        |                          |                        |                     |
| <b>4-pole<br/>4. pole early make</b>     |                | 60°             | 8 88 □ 125A                               | L100 . | x x                      | . W4                   |                     |
|  |                |                 | 8 180A                                    | L160 . | x x                      | . W4                   |                     |
|  |                |                 | 8 132 □ 400A                              | L400 . | x x                      | . W4                   |                     |
|  |                |                 | 12 600A                                   | L600 . | x x                      | . W4                   |                     |
|  |                |                 | 16 800A                                   | L800 . | x x                      | . W4                   |                     |
| 24 1200A                                 | L1200 .        | x x             | . W4                                      |        |                          |                        |                     |

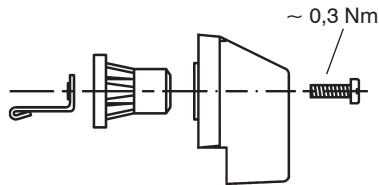
**Ordering example:** AC1 1200A panel mounting, changeover switch without off 4-pole **L1200 E W4**

## Operating Knobs and Handles

### Types of handles

In the standard version, the switches are supplied with a black twist knob or instrument knob (M10H - N33F), except for design SMA, which has a grey toggle knob. Switches of size L, which consist of 2 or 3 switch columns, come with a black hand wheel. If required, the switch can be supplied with other knobs, which can later easily be exchanged. All operating knobs have an insert, which sets the position of the knob in relation to the switch shaft. This insert can be mounted in 8 different positions (at intervals of 45°), causing the angle of each individual switch setting to be rotated by 45°.

In the standard version, the switch terminals are positioned left and right (except M10H). When the knob insert is turned by 90°, the lay-out of the terminals changes to top and bottom.



All operating knobs can be moved on the hexagonal shaft, to permit adaptation to different sheet thicknesses, etc.

| Type                         | M10<br>M10H<br>M20 | N20<br>N33F | N40<br>N61<br>N80<br>L100<br>L160 | N100<br>N200<br>L400<br>L600<br>L800<br>L1200 |
|------------------------------|--------------------|-------------|-----------------------------------|---|
| Knob movement mm             | 5                  | 5           | 7                                 | 9   |
| Hexagonal shaft dimension mm | 5                  | 7           | 9                                 | 12  |

**Ordering example:** Cam switch N61 V U3 with Instrument knob red  
 Order type: **N61 V U3 +G3**  
**Dimensions** see page 267

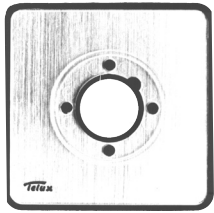


| Knobs and handles<br>Description                   | Colour                                | Ordering<br>Code   | M10<br>M10H<br>M20                                       | N20<br>N33F                                  | N40<br>N61<br>N80<br>L100<br>L160 | N100<br>N200<br>L400<br>L600<br>L800<br>L1200 |
|--|---------------------------------------|--|--|--|-----------------------------------|---|
| <b>Instrument knob</b><br>Standard for M10 to N200 | grey<br>black<br>red<br>white         | <b>+G1</b><br><b>+G2</b><br><b>+G3</b><br><b>+G5</b>               | <b>X</b><br><b>X</b><br><b>X</b><br><b>X</b>             | <b>X</b><br><b>X</b><br><b>X</b><br><b>X</b> | <b>X</b>                          | <b>X</b>                                      |
| <b>Toggle knob</b>                                 | grey<br>black<br>red<br>white<br>blue | <b>+K1</b><br><b>+K2</b><br><b>+K3</b><br><b>+K5</b><br><b>+K6</b> | <b>X</b><br><b>X</b><br><b>X</b><br><b>X</b><br><b>X</b> | <b>X</b><br><b>X</b><br><b>X</b><br><b>X</b> |                                   |   |
| <b>Hand wheel</b>                                  | black                                 | <b>+HR</b>   |  |  |                                   | <b>X</b>                                      |

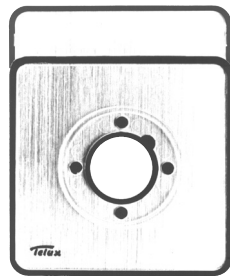
## Escutcheon Plates

**TELUX-Cam Switches** in designs E, V, P, PF, SM, UP, Z and KE are supplied with a square escutcheon plate consisting of a black frame and plexi insert plate. The markings are printed in black on the back of the insert plate. To protect the markings so that they remain easy to read, the back of the insert plate is lined with silver foil. In addition, rectangular plates can be provided for all switch sizes, which can be fitted on all switches after mounting.

Square plate



Rectangular plate  
(with square plate)  
Slot on the cover plate  
upper side



Preferred position of the slot  
on bottom of  
the cover plate

Slot for additional plate

**TELUX-Cam Switches** in design SMA, for distribution boards with 45mm inside edge of installation cover, is supplied with a grey cover and black markings.



**Special engraved markings** on escutcheon plates are limited by the available space. In the case of relatively large production runs or frequent use of the text, we recommend ordering of a printing block. This will be invoiced at cost price, and the engraving will not be charged for. This investment generally pays with batches from 50 pieces upwards.

The "escutcheon plate" column of the selection and ordering tables for switch programs indicates the standard plate and, in some cases, an additional plate that is often used for the programs in question. If such a plate, listed in the selection table, is desired, the appropriate code number should be stated when ordering a switch and switch program.

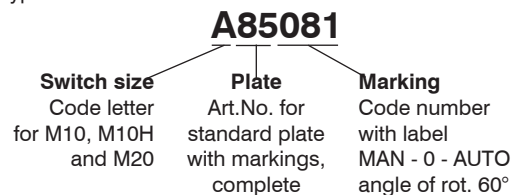
Should only **plates** or **parts** of the latter be ordered, the order type is assembled as shown by the following example.

**Code letter** of switch sizes

|                                     |          |
|-------------------------------------|----------|
| M10, M10H, M20                      | <b>A</b> |
| N20, N33F                           | <b>E</b> |
| N40, N61, N80, L100, L160           | <b>H</b> |
| N100, N200, L400, L600, L800, L1200 | <b>L</b> |

**Ordering example:** Escutcheon plate silver, complete, for cam switch M10, marked with MAN OFF AUTO, angle of rotation 60°

Order type:



However, if a **switch** with non-standard lettering is required, only three-digit code number for the marking need be added to the order type (see next page).

**Dimensions** see page 267

| Description   | Order type<br>Switch size<br>Code letter | Plate<br>Art.No. | Marking<br>Code number |
|---|--|------------------|------------------------|
| <b>Escutcheon plate for designs E, V, P, Z, SM, KE and UP</b><br>Escutcheon frame black, plexi insert plate silver, markings black  |  |                  |                        |
| Plexi insert plate silver   | A E H L                                  | .85...           | ... (see pp. 244-248)  |
| Plexi insert plate yellow   | A E H L                                  | .80...           | ... (see pp. 244-248)  |
| Escutcheon frame black  | A E H L                                  | .8203            | -                      |
| <b>Rectangular escutcheon plate for designs E, V, Z and SM</b><br>Escutcheon frame black, plexi insert plate silver, markings black |  |                  |                        |
| Plexi insert plate silver   | A E H L                                  | .885..           | ... (see pp. 244-248)  |
| Plexi insert plate yellow   | A E H L                                  | .895..           | ... (see pp. 244-248)  |
| Escutcheon frame black  | A E H L                                  | .8503            | -                      |
| <b>Installation cover for design SMA</b><br>grey cover, markings black  | A - - -                                  | .69...           | ... (see page 246)     |

## Escutcheon Plates

### Selected standard markings

The markings that are most commonly required are shown below, together with code letters for the switch size and the code number.

**Ordering example:** Switch type M10H E A3 with escutcheon plate "OFF ON" and additional rectangular escutcheon plate "PUMP"

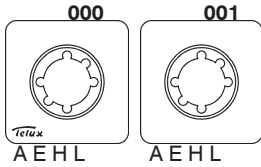
Order type: **M10H E A3 +003 +516**

### Code letter of switch sizes

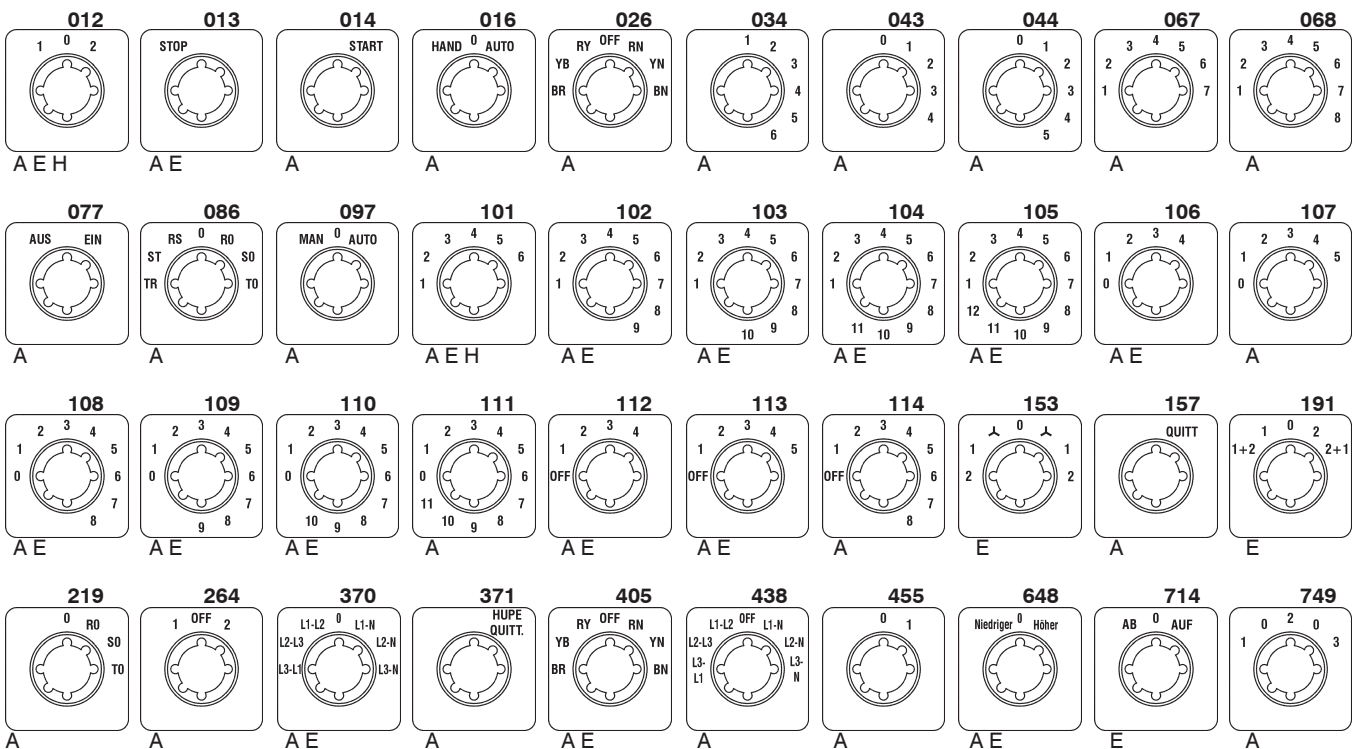
M10, M10H, M20  
N20, N33F  
N40, N61, N80, L100, L160  
N100, N200, L400, L600, L800, L1200

A  
E  
H  
L

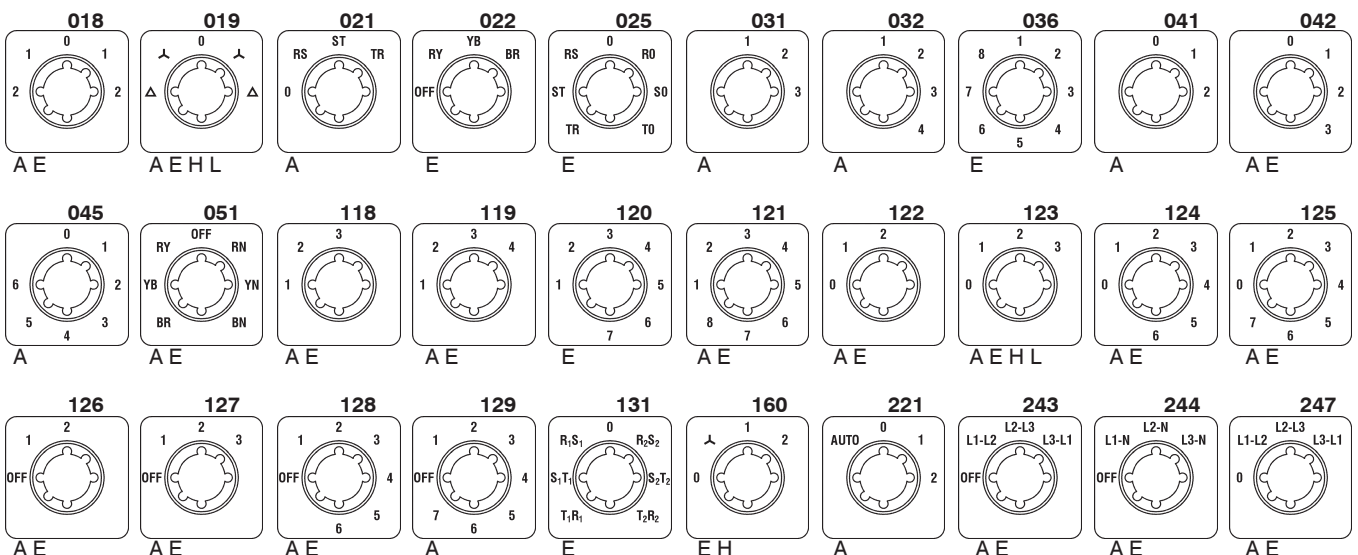
### Blank escutcheon plates



### Switching angle 30°

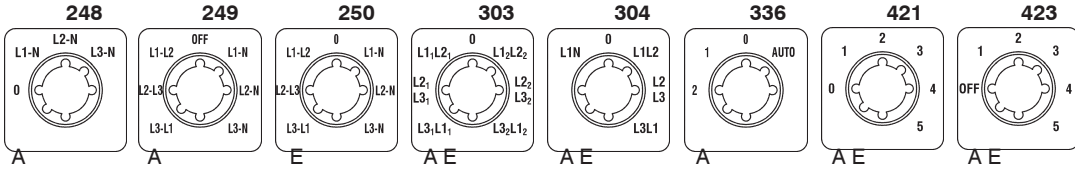


### Switching angle 45°

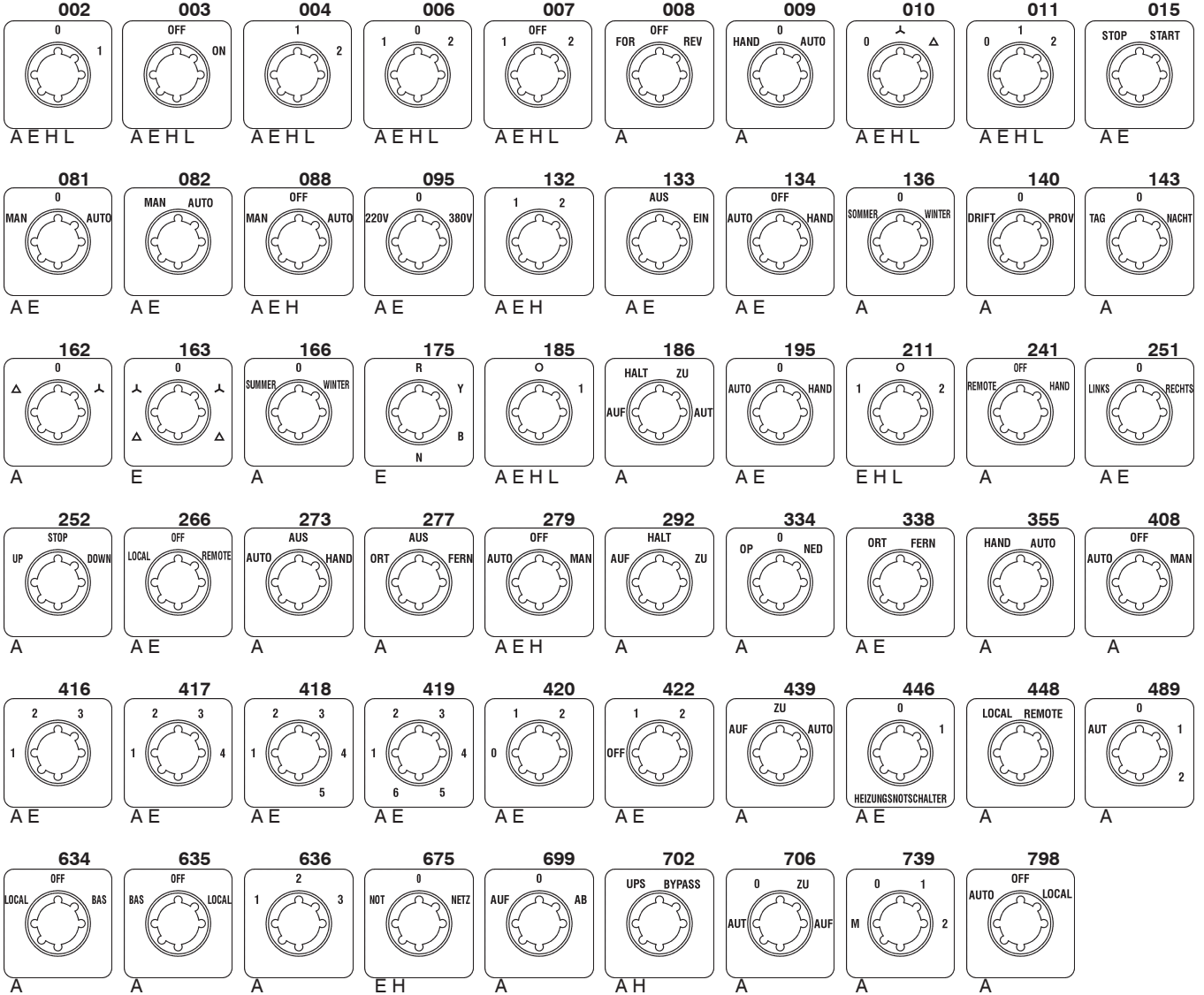


# Escutcheon Plates

## Switching angle 45°



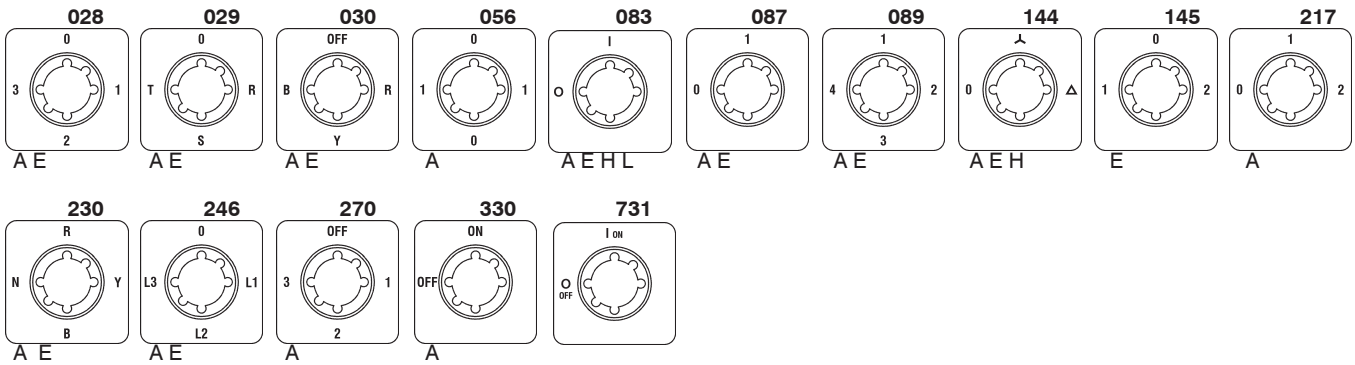
## Switching angle 60°



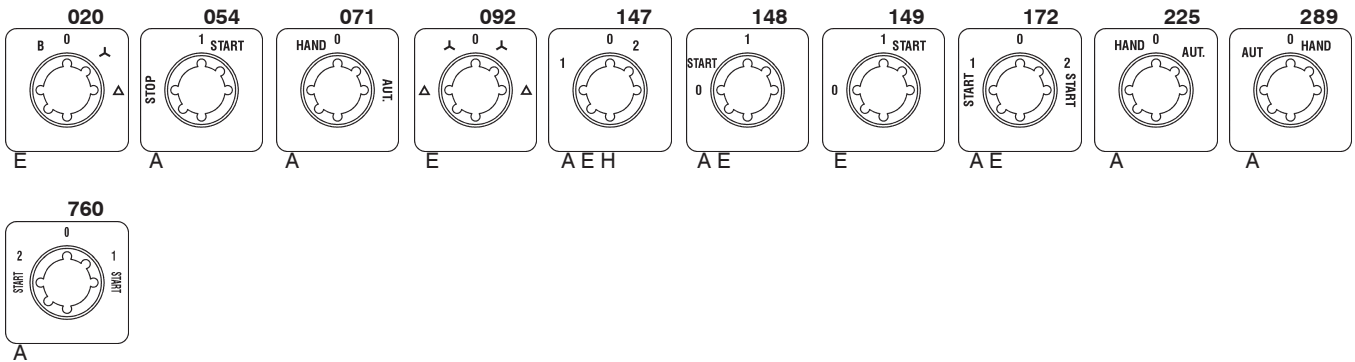


## Escutcheon Plates

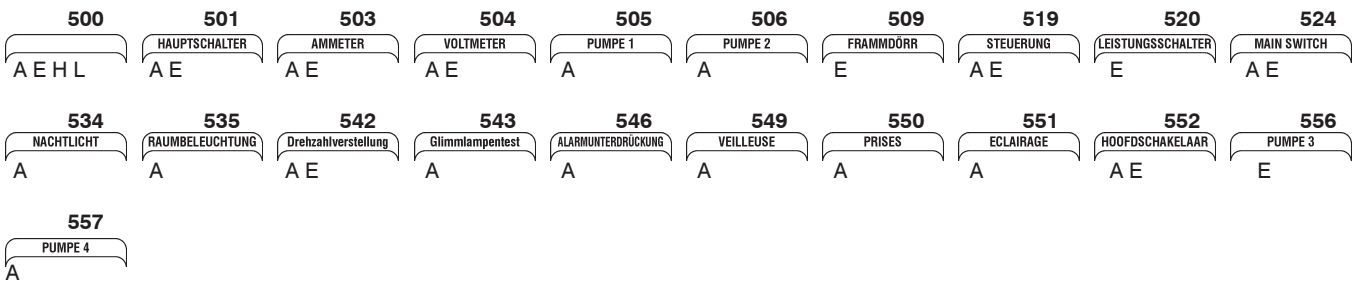
Switching angle 90°



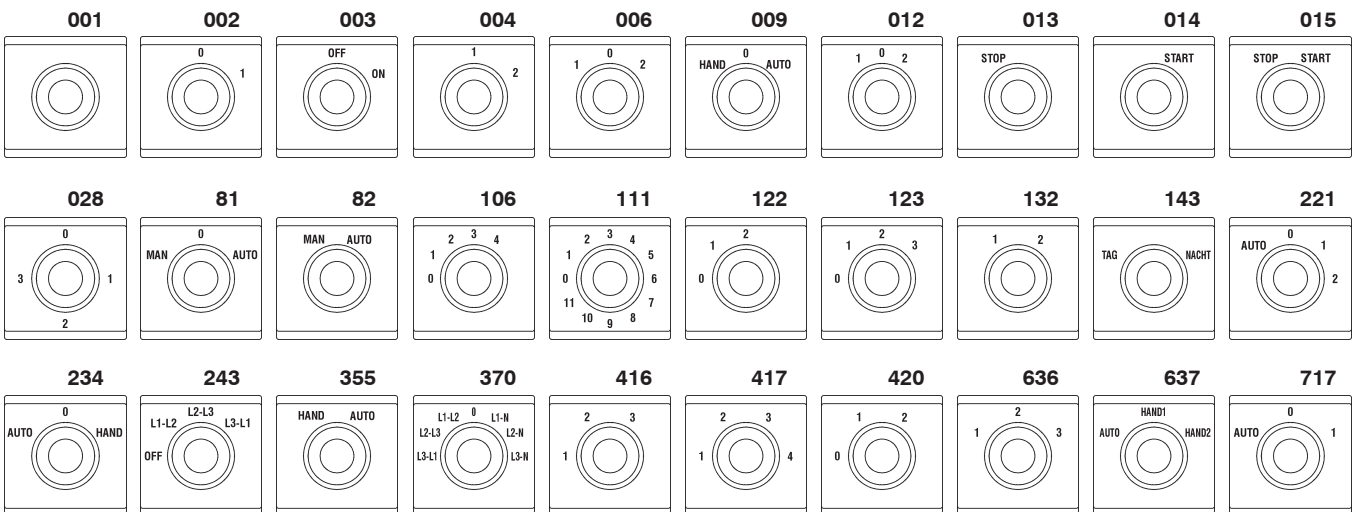
## Miscellaneous



## Rectangular additional escutcheon plates



## Covers for design SMA



## Switching angles

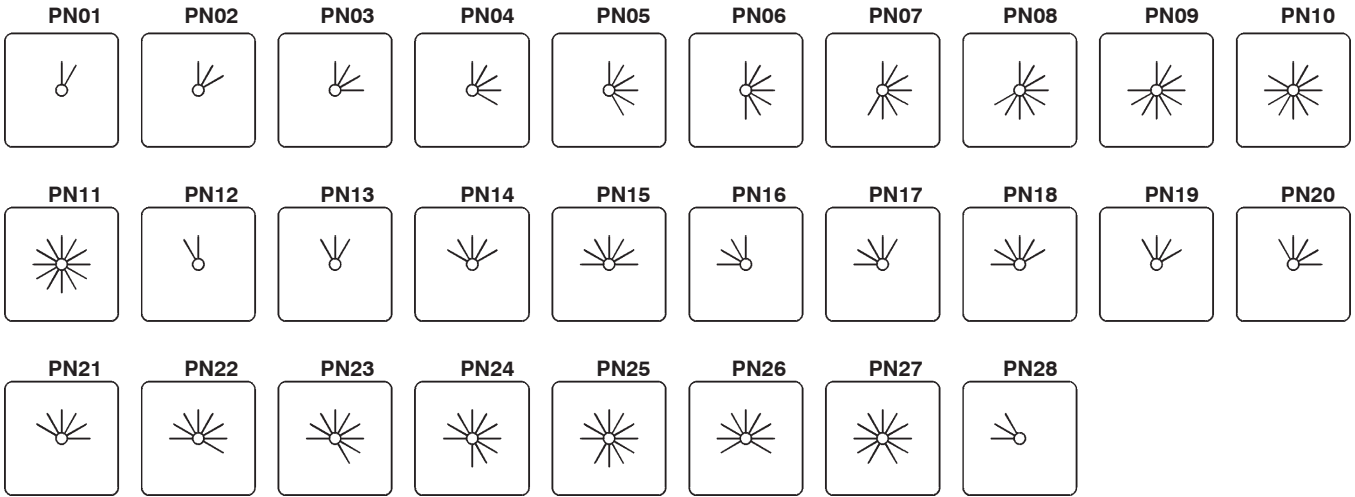
### Arrangement of switch settings

All feasible arrangements of switch settings are shown, and defined by position numbers, in the following tables. Not only the switching angles, but also switches with latched or momentary settings, or combinations of the two, are distinguished from one another.

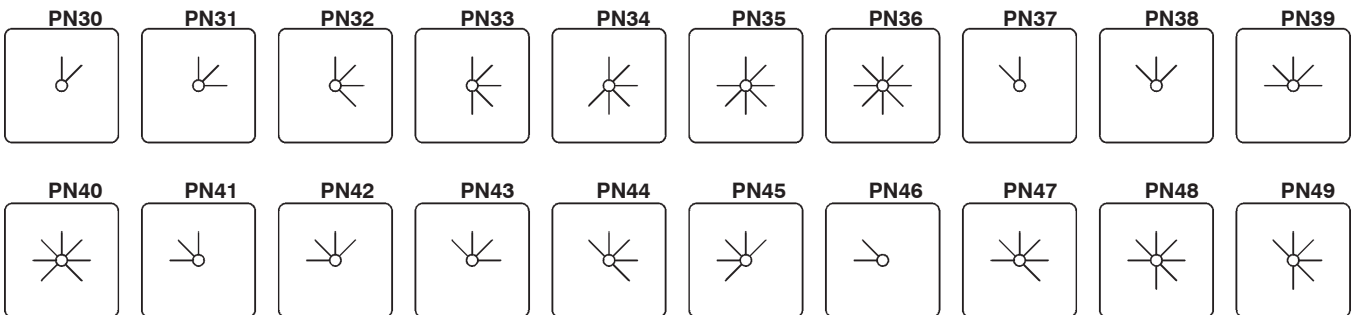
Knowledge of the following variations is particularly important when planning special switches. It is necessary to state the position number when ordering special switches, as the cheapest version will otherwise be selected.

All the switches types listed can be supplied with switching angles other than those indicated, provided that they are permitted by the switch program (additional charge).

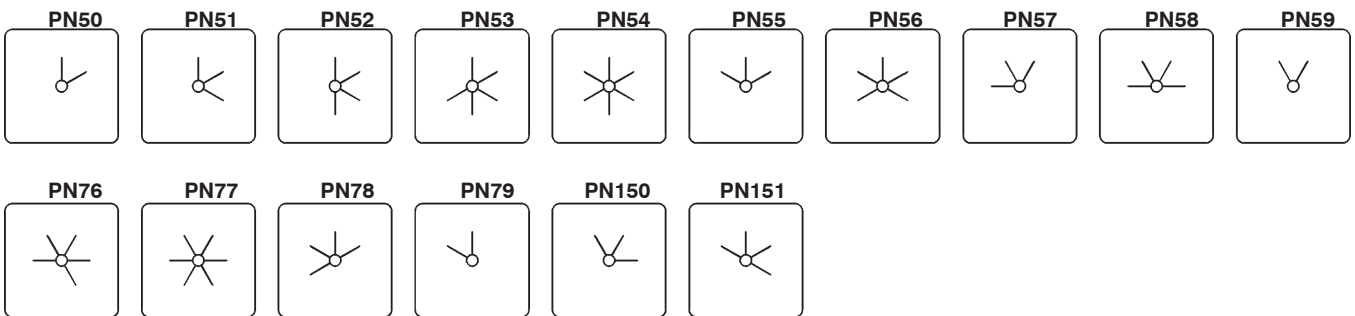
#### Switching angle 30°



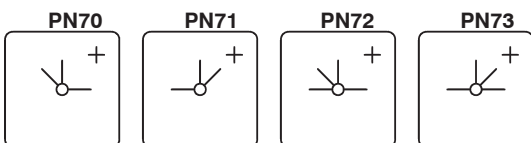
#### Switching angle 45°



#### Switching angle 60°



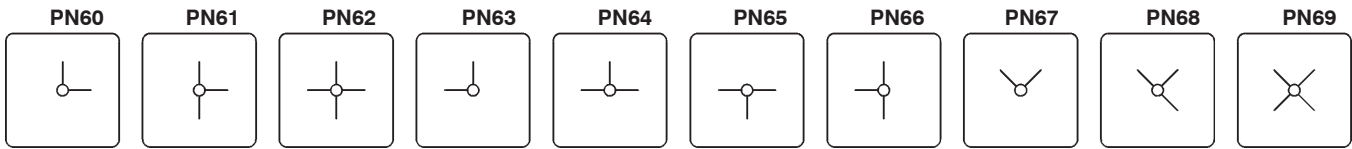
#### Switching angle 45/90°



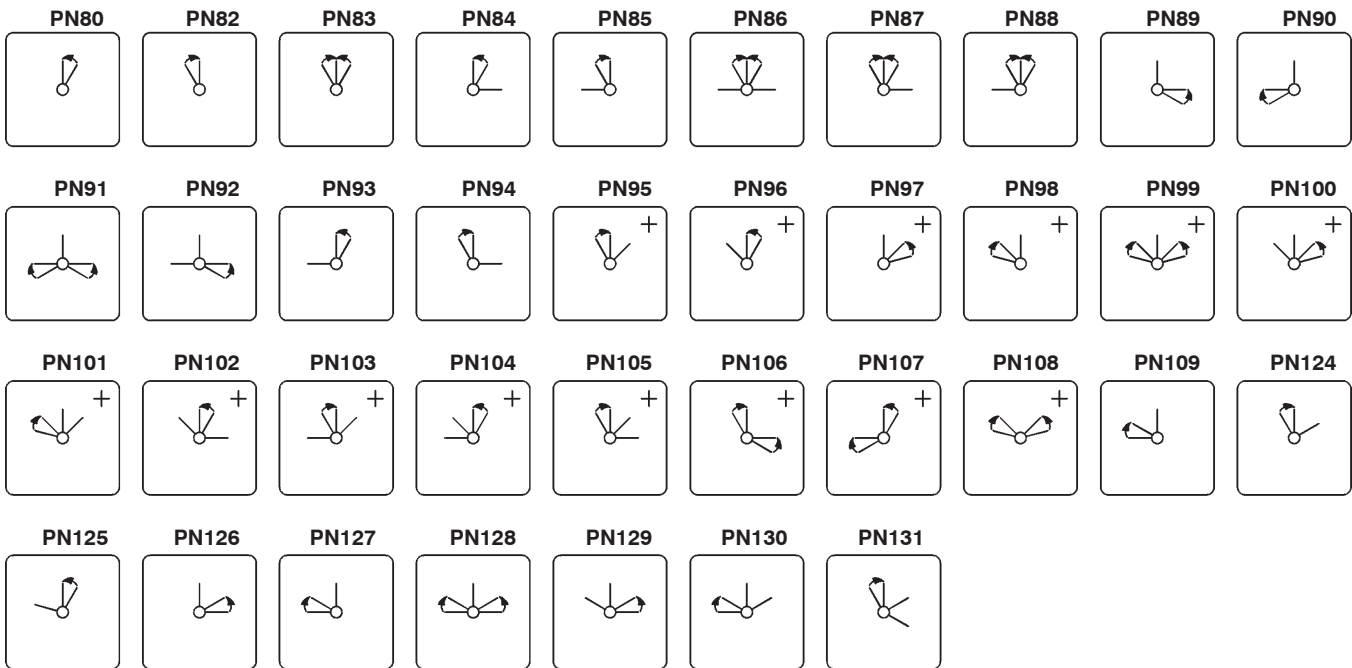
+) Not available for switch types M10, M10H and M20

## Switching angles

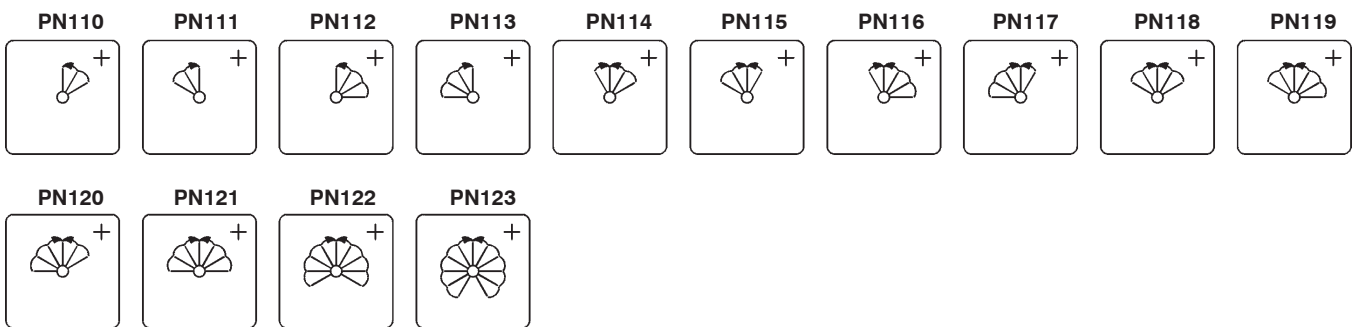
### Switching angle 90°



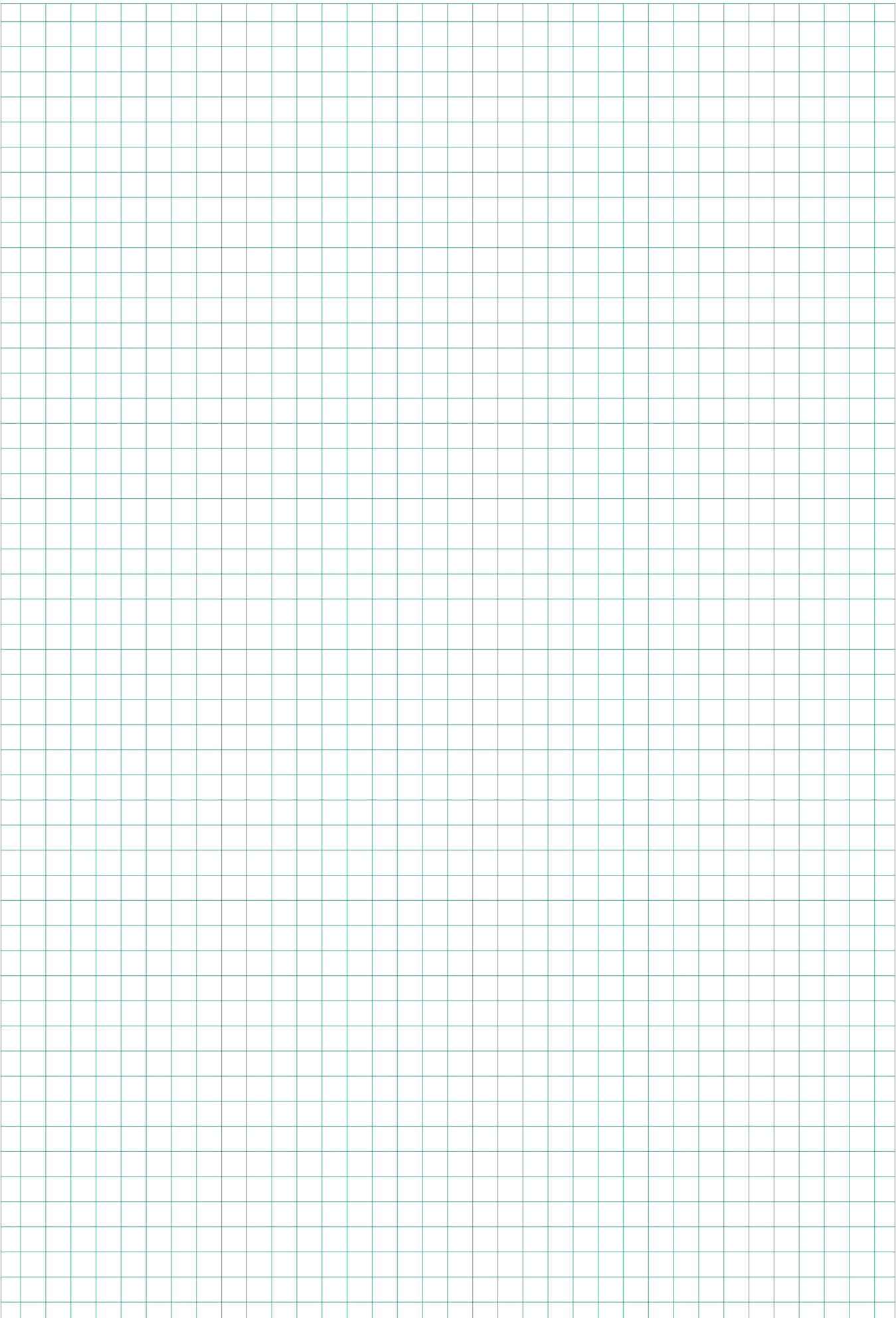
### Momentary settings and special combinations



### Spring return over several settings



+) Not available for switch types M10, M10H and M20



Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

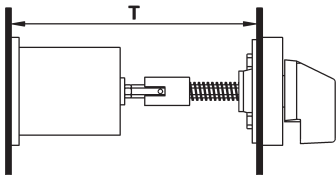
DC-Switch Disconnector

Push Buttons

Representatives, Suppliers

## Door couplings

For switches with door couplings it is necessary to state the installation depth - that is, the distance between mounting level of the switch and the inside edge of the door (dimension T).



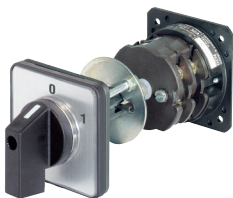
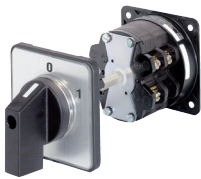
Door couplings are available for switches to be installed in switchgear cabinets or distribution boards with hinged doors. These permit the doors to be opened without removal of the operating knobs.

**Ordering example:** Cam switch N100 V A3 with lockable door coupling, moisture protected IP65, dimension T=580mm  
Order type: **N100 V A3 +TK2FR/580**

**Dimensions** see page 269



|  | Ordering Code | Suitable for designs | Suitable for switch type                                    |
|--|---------------|----------------------|---|
| <b>Door coupling</b><br>Protection class from front: IP65<br>5-hole mounting   | +TKE/...      | V, SM                | M10H, M20, N20, N33F  |
| <b>Door coupling locked</b><br>Protection class from front: IP65<br>5-hole mounting<br>Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.      | +TK2E/...     | V, SM                | M10H, M20, N20, N33F  |
| <b>Door coupling locked</b><br>Protection class from front: IP65<br>Central fixing Ø22mm<br>Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting. | +TK2Z/...     | V, SM                | M10H, M20, N20, N33F  |
| <b>Door coupling</b><br>Protection class from front: IP40<br>5-hole mounting   | +TK/...       | V                    | N40, N61, N80, N100, N200<br>L100, L160, L400, L600<br>L800 |
| <b>Door coupling</b><br>Protection class from front: IP54<br>5-hole mounting   | +TKFR/...     | V                    | N40, N60, N80, N100, N200<br>L100, L160, L400, L600<br>L800 |
| <b>Door coupling locked</b><br>Protection class from front: IP40<br>5-hole mounting<br>Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.      | +TK2/...      | V                    | N40, N61, N80, N100, N200<br>L100, L160, L400, L600<br>L800 |
| <b>Door coupling locked</b><br>Protection class from front: IP54<br>5-hole mounting<br>Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.      | +TK2FR/...    | V                    | N40, N61, N80, N100, N200<br>L100, L160, L400, L600<br>L800 |



## Lockable switches

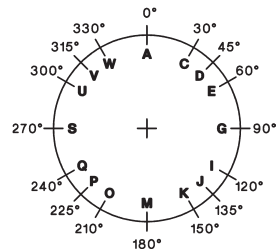
Key-operated and lockable switches are supplied with two keys. Additional keys or other types of lock on request.

**Ordering example:** Cam switch N20 E A3 key operated  
Order type: **N20 E A3 +SA**

**Dimensions** see page 270 and 271

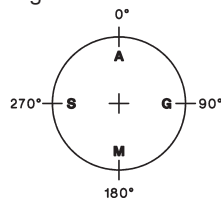


**Key operated switch**  
Lock Willenthal FT101, key removable in all lockable settings.  
Other types of lock on request.  
Maximum number of cells  
M10 - N33F: 6 N40, N61: 2  
**Key operated switch**, key removable only in some settings. Add letter of setting where key is removable to ordering code according to the scetch below.



**Key operated switch IP65**  
Lock Ronis R455, key removable in all lockable settings.  
**Key operated switch**, key removable only in some settings. Add letter of setting where key is removable to ordering code according to the scetch above.

**Key operated switch**  
Lock KABA8, key removable in all lockable settings.  
**Key operated switch**, key removable only in some settings. Add letter of setting where key is removable to ordering code according the scetch below.






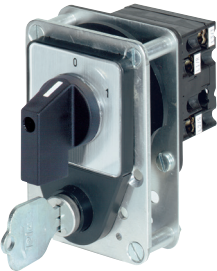
| Ordering Code      | Suitable for designs               | Suitable for switch type                                     |
|--------------------|------------------------------------|--|
| +SA<br><br>+SA/.   | E, V, SM<br>E, V<br>P<br>SMA<br>UP | M10H, M20<br>N20, N33F<br>M10, N20, N33F<br>M10H, M20<br>M10 |
| +SA<br><br>+SA/.   | Z, ZO                              | M10H, M20  |
| +SAK<br><br>+SAK/. | E                                  | M10H, M20  |

## Padlock devices

A range of padlock devices designed to prevent from being turned on by unauthorized personnel, or during maintenance and repair work, can be supplied.

**Dimensions** see page 272

**Ordering example:** Cam switch N33F E A3 with interlocking device SV3 suitable for 3 padlocks  
Order type: **N33F E A3 +SV3**

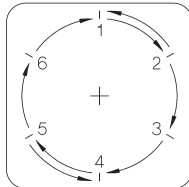
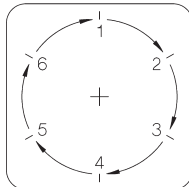
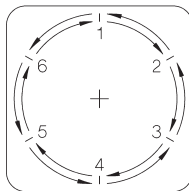
|   | escut. plate [mm] | Ordering Code                   | Suitable for designs       | Suitable for switch type   |
|---|-------------------|---------------------------------|----------------------------|--|
|    | 48x48             | <b>+SV1</b><br><b>+SV1R</b>     | E, V, SM<br>P, PF          | M10H, M20<br>M10   |
|   | 64x64             | <b>+SV164</b><br><b>+SV164R</b> | E, V<br>P, PF              | M10H, N20, N33F<br>N20, N33F   |
|    | 88x88             | <b>+SV3</b><br><b>+SV3R</b>     | E, V<br>E, V<br>E, V<br>PF | N40, N61, N80<br>N100, N200, L400, L600,<br>L800, L1200<br>N40, N61, N80 |
|   | 132x132           | <b>+SV3</b><br><b>+SV3R</b>     | E, V<br>E, V<br>E, V<br>PF | N40, N61, N80<br>N100, N200, L400, L600,<br>L800, L1200<br>N40, N61, N80 |
|   | 64x64             | <b>+SV4</b><br><b>+SV4R</b>     | E, V<br>SM<br>P, PF        | M10H, N20, N33F<br>M10H, N20, N33F<br>N20, N33F                          |
|   | 88x88             | <b>+SV488</b><br><b>+SV488R</b> | E, V<br>E, V<br>P, PF      | N20, N33F<br>N40, N61, N80<br>N40, N61, N80                              |
|  |                   | <b>+SZ</b>                      | E, V<br>SM                 | all<br>M10H, M20, N20, N33F  |
|   |                   | <b>+SZ2</b>                     | E, V<br>SM                 | all<br>M10H, M20, N20, N33F  |

## Switch interlocks

A wide range of locks and interlocking devices, designed to prevent accidental or hazardous switching, can be supplied.

**Ordering example:** Cam switch N20 E A3 with push button switch lock  
Order type: **N20 E A3 +DV**

**Dimensions** see page 273



| Description  | Ordering Code | Suitable for designs | Suitable for switch type             |
|--|---------------|----------------------|--------------------------------------|
| <b>Push button interlock</b><br>The switch can only be actuated when the pushbutton is simultaneously depressed (two-handed operation).  | <b>+DV</b>    | E, V                 | all                                  |
| <b>Interlock with electrical contact</b><br>The switch can only be actuated when the pushbutton, which also operates a make and break contact, is actuated (for external interlocking devices or safety measures). | <b>+ET</b>    | E, V                 | all                                  |
| <b>Magnetic interlock</b><br>The switch can only be actuated when an electromagnet is simultaneously excited. When ordering, voltage and percentage duty cycle of the magnet coil should be stated.                | <b>+MV</b>    | E                    | N20, N33F, N40, N61, N80, N100, N200 |
| <b>Circular switch</b><br>Switches that have the maximum number of settings for a given switching angle can be made without a stop position, permitting direct switching from the last to the first setting.       | <b>+RU</b>    | all                  | all                                  |
| <b>Backswitch 1</b><br>Special version of the circular switch, in which the switch can only be turned in one direction.  | <b>+RS1</b>   | all                  | all                                  |
| <b>Backswitch 2</b><br>Special version of the circular switch, in which, in given positions, the switch can only be operated in one direction.   | <b>+RS2</b>   | all                  | all                                  |



## Couplings and stop mechanism

A range of couplings and stop mechanisms for trouble-free operation of switches with a very large number of contacts can be supplied.

**Dimension** see page 274

**Ordering example:** Cam switch N200 V ST0113 spread over three columns interconnected by gears

Order type: **N200 V ST0113 +ZK3**

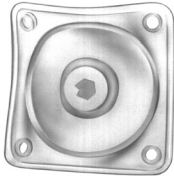


| Description  | Ordering Code | Suitable for designs | Suitable for switch type  |
|--|---------------|----------------------|---|
| <p><b>Coupling of different switch sizes</b><br/>For attachment of control switches (auxiliary contacts) to larger switches. M10H, M20 in sizes E and H. N20 to N80 in size L.</p>   | <b>+ZWK</b>   | E                    | N40, N61, N80, L100, L160<br>N100, N200, L400, L600,<br>L800, L1200 |
| <p><b>Second stop mechanism</b><br/>With switches in which a large number of contacts is simultaneously operated, use of a second stop mechanism is sometimes necessary, in order to ensure precise switching to the next setting.</p> | <b>+RW2</b>   | all                  | all   |

## Special versions

A number of special versions can be supplied for adaptation of switches to various conditions of use.

**Ordering example:** Cam switch M10H E U3 with large front plate  
Order type: **M10H E U3 +GFP**




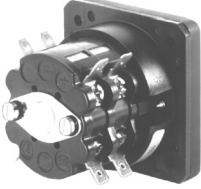
| Description  | Ordering Code | Suitable for designs | Suitable for switch type    |
|--|---------------|----------------------|-----------------------------|
| <b>Switch shaft sealing</b><br>For increased front protection class on IP54.   | +WD           | E, V<br>SM           | N20 to L1200<br>N20, N33F   |
| <b>Front plate/switch shaft sealing</b><br>For increased front protection class on IP65. In this version, a wider hole is required for the shaft.<br>Dimensions see page 272 | +FPWD         | E, V, SM             | N20, N33F                   |
| <b>Extended switch shaft</b><br>For adaptation of switch designs V and SM to the enclosure depth. State additional shaft length when ordering.                               | +VW/...       | E, V<br>SM           | all<br>M10H, M20, N20, N33F |
| <b>Large front plate</b><br>Switch with front plate and operating knob of the next size (for replacement of older, larger switches or aesthetic reasons).                    | +GFP          | E, V, SM             | M10H, N20, N33F             |
| <b>Neon safety switch</b><br>For all-pole switching off of neon advertisement circuits by the Fire Brigade.<br>Dimensions see page 274                                       | +FEU          | E                    | N20, N33F                   |

## Accessories

A number of special versions can be supplied for adaptation of switches to various conditions of use.

**Dimensions** see page 273

**Ordering example:** Cam switch N20 E A3 with terminal cover plate  
Order type: **N20 E A3 +KLAD**

| Description   | Ordering Code  | Suitable for designs          | Suitable for switch type                      |
|---|----------------|-------------------------------|---|
| <b>Terminal cover plate</b><br>Prevents accidental touching of live terminals (requirement for main switches according to VDE 0113) only for 2 cells for all cells  | <b>+KLAD</b>   | E, V                          | N20, N40, N61, N80<br>N100, N200              |
|   | <b>+KLAD</b>   | E, V                          | N33F  |
| <b>Moisture proofing caps</b><br>Protection class from rear: IP54.<br>For protection of the switch from dust and moisture (e.g. when installed in machine pedestals). For switch mounting from the front and rear. Conical cable entry glands.<br>Maximum number of cells:<br>M10H      7<br>N20        5<br>N40        4<br>N61        2   | <b>+FR</b>     | E                             | M10H, N20, N40, N61                           |
| <br><b>Angled terminals</b><br>For easy connection of inaccessible switches.<br>Unless otherwise stated, all terminals specified with markings are equipped in this manner.<br>A distinction is drawn between left and right angled terminals. Seen from the switch end, the left terminals are located above left and below right; conversely, right terminals are above right and below left. | <b>+WK</b>     | E, V                          | M20, N20, N40, N61, N80, N100                 |
| <br><b>Fast-on connectors</b><br>For 6,3 x 0,8mm plugs.  | <b>+AMPZ</b>   | E, V                          | M20, N20                                      |
| <b>Earth terminals</b><br>2 terminals, connected with one another, insulated from switch column: for earth conductors.  | <b>+PE</b>     | E, V,<br>P, PF<br>PF<br>G, GF | all<br>M10, N20, N33F, N40, N61<br>N80<br>N20 |
| <b>Additional rectangular escutcheon plate 1 line</b><br>Dimensions see page 267  | <b>SRE</b>     | E, Z, V, SM                   | all   |
| <b>Big additional rectangular escutcheon plate for 2 lines</b><br>Dimensions see page 267   | <b>SRE2</b>    | E, V                          | M10H, M20, N20, N33F                          |
| <b>Spare key</b> for key operated switches with Lock Willenhal FT101  | <b>J7101</b>   | E, V, P<br>SMA                | M10H, M20, N20, N33F, N40<br>M10H, M20        |
| <b>Spare key</b> for key operated switches with Lock Ronis R455   | <b>B4-R455</b> | Z, ZO                         | M10H, M20                                     |
| <b>Wrench</b><br>for switches with central fixing   | <b>J7049</b>   | Z, ZO                         | M10H, M20                                     |

## Switching Programs according to Customer Requirements

As a result of their modular construction, TELUX cam switches are particularly suitable for manufacturing of special variants. According to its function, each pair of contacts in the switch is adapted to the desired program by appropriate design of the cam plate. In the case of switches with an overall switching angle of more than 180°, provision must be made for a cam plate in each switching cell, controlling two opposite, independent contact pairs with matching programs (does not apply to M10, M10H, M20 and N20).

Depending on the desired contact program for the special switch, it may often be impossible to make full use of all switching cells, that is, to include the maximum possible number of contacts. In determining the number of cells or switch length, one-contact cells will sometimes be resorted to.

Switch sizes M10, M10H, M20 and N20 are exceptions to this rule. Here, two cam plates can be built into each cell, so that both contacts are independently controlled (full use of the cells with special programs).

In all special switches with overall switching angles of less than 180°, the number of cells required is calculated by having the total number of contacts in the switching program.

When planning for switches with special programs, choice of the optimum switching angle thus plays an important part. The listing of all the options for lay-out of switch settings, on pages 247 and 248, should be an aid to planning (position numbers PN).

If special markings are to be engraved on the escutcheon plates, it is vital to take account of the available space. It is advisable to use abbreviations.

We provide forms (see page 275) on request, free of charge, to give a clear overview when special programs are being defined. Switch size, design, type of operating knob and desired switching angle, as well as the function of the contacts, are entered on these forms. Provision has also been made in them for entry of details as to escutcheon plate engravings or other special requirements.

## Ordering Example

| Order sheet D399E  |  | Cam switches with special switching program   |   | Customer:  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
|--|--|---|---|--|--------|--|--|-----|-----|--|--|---|---|-------------------------------------|-------------------------------------|---|----|-------------------------------------|-------------------------------------|--|----|-------------------------------------|-------------------------------------|-------|-----|-------------------------------------|-------------------------------------|--|--|----------|-----------|----------|-----------|--|--|--|---|
| <b>Switch Type</b><br>M4H<br>M10<br>M10H <input checked="" type="checkbox"/><br>M10HD<br>M20<br>N20<br>N33F<br>N40 L400<br>N61 L600<br>N80 L800<br>N100 L1200<br>N200          |  | <b>Benedict GmbH</b><br>A-1220 Vienna, Liebgasse 7<br>Phone: 251 51-0 Fax: 251 51-88  |   |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| <b>Design</b><br>Panel mounting E<br>Central fixing Z <input checked="" type="checkbox"/><br>Z<br>Base mounting V<br>Snap-on mount SM<br>SMA<br>Plastic enclosure P<br>IP65 PF |  | <b>Explanations:</b><br>Contact closed over several positions <input checked="" type="checkbox"/><br>Spring return from pos. <input checked="" type="checkbox"/>  |   | <b>Handles</b><br>Twist knob R (standard) <input checked="" type="checkbox"/><br>Instrument knob G (standard M4H) <input checked="" type="checkbox"/><br>Toggle knob K (standard SMA)<br>Pointer knob Z<br>Ball type handle B<br>Lever handle H<br>Hand wheel HR |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
|  |  |   |   | <b>Handle colour</b><br>black (standard) <input checked="" type="checkbox"/><br>red<br>grey (standard SMA)<br>white<br>cream-coloured<br>yellow<br>blue  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| <b>Optional extras</b><br>Circular switch<br>Key removeable  |  | <table border="1"> <thead> <tr> <th>Marking for switch position</th> <th>Degree</th> <th colspan="2"></th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>270</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>2</td> <td>45</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>90</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>START</td> <td>120</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table> |   | Marking for switch position  | Degree |  |  | OFF | 270 |  |  | 1 | 0 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 2 | 45 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |  | 90 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | START | 120 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <table border="1"> <thead> <tr> <th>Connect.</th> <th>Terminals</th> <th>Connect.</th> <th>Terminals</th> </tr> </thead> <tbody> <tr> <td></td> <td>1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47</td> <td></td> <td>2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48</td> </tr> </tbody> </table> |  | Connect. | Terminals | Connect. | Terminals |  | 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 |  | 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 |
| Marking for switch position  | Degree   |   |   |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| OFF  | 270  |   |   |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| 1  | 0  | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/>                                 |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| 2  | 45   | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/>                                 |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
|  | 90   | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/>                                 |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| START  | 120  | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/>                                 |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
| Connect.   | Terminals  | Connect.  | Terminals   |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |
|  | 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 |   | 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 |  |        |  |  |     |     |  |  |   |   |                                     |                                     |   |    |                                     |                                     |  |    |                                     |                                     |       |     |                                     |                                     |  |  |          |           |          |           |  |  |  |   |

Order sheet A4 see page 275

## Utilization Categories

For easier choice of devices and in order to make the comparison of different products simpler are utilization categories for cam switches according to IEC 947-3, VDE 0660 Part 107 and

auxiliary contacts according to IEC 947-5-1 and VDE 0660 Part 200 determined. The Table below offers diverse utilization categories and assorted test conditions.

| Kind of current     | Category            |                       | Typical applications  | Rated operational current  | Test conditions for the number of on-load operating cycles (normal service) |                  |  |                                |                                |                   | Test conditions for making and breaking capacities (operation in fault case) |                  |                   |                                |                                |                   |
|---------------------|---------------------|-----------------------|---|--|---|------------------|--|--------------------------------|--------------------------------|-------------------|--|------------------|-------------------|--------------------------------|--------------------------------|-------------------|
|                     | fre-quent operation | infre-quent operation |   |  | Make  |                  |  | Break                          |                                |                   | Make   |                  |                   | Break                          |                                |                   |
|                     |                     |                       |   |  | I/I <sub>e</sub>  | U/U <sub>e</sub> | cosφ   | I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | cosφ              | I/I <sub>e</sub>   | U/U <sub>e</sub> | cosφ              | I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | cosφ              |
| Alternating Current | AC20A               | AC20B                 | No-load conditions  | all values   | -   | -                | -  | -                              | -                              | -                 | -  | -                | -                 | -                              | -                              | -                 |
|                     | AC21A               | AC21B                 | Switching of resistive loads including moderate overloads                             | all values   | 1   | 1                | 0,95   | 1                              | 1                              | 0,95              | 1,5  | 1,05             | 0,95              | 1,5                            | 1,05                           | 0,95              |
|                     | AC22A               | AC22B                 | Switching of mixed resistive and inductive loads including moderate overloads         | all values   | 1   | 1                | 0,8  | 1                              | 1                              | 0,8               | 3  | 1,05             | 0,65              | 3                              | 1,05                           | 0,65              |
|                     | AC23A               | AC23B                 | Switching of motor loads or other highly inductive loads                              | 0 < I <sub>e</sub> ≤ 100A<br>all values<br>100A < I <sub>e</sub> | 1   | 1                | 0,65   | 1                              | 1                              | 0,65              | 10   | 1,05             | 0,45              | 8                              | 1,05                           | 0,45              |
|                     | AC2                 |                       | Slip-ring motors:<br>Starting, plugging   | all values   | 2,5   | 1                | 0,65   | 2,5                            | 1                              | 0,65              | 4  | 1,05             | 0,65              | 4                              | 1,05                           | 0,65              |
|                     | AC3                 |                       | Squirrel-cage motors:<br>Starting, switching off motors during running                | 0 < I <sub>e</sub> ≤ 100A<br>all values<br>100A < I <sub>e</sub> | I <sub>e</sub> ≤ 17A<br>6 1<br>I <sub>e</sub> > 17A                         | 0,65             | I <sub>e</sub> ≤ 17A<br>1 0,17<br>I <sub>e</sub> > 17A | 0,65                           | 10                             | 1,05              | 0,45   | 8                | 1,05              | 0,35                           | 0,45                           | 0,35              |
|                     | AC4                 |                       | Squirrel-cage motors:<br>Starting, plugging, inching                                  | 0 < I <sub>e</sub> ≤ 100A<br>all values<br>100A < I <sub>e</sub> | I <sub>e</sub> ≤ 17A<br>6 1<br>I <sub>e</sub> > 17A                         | 0,65             | I <sub>e</sub> ≤ 17A<br>6 1<br>I <sub>e</sub> > 17A    | 0,65                           | 12                             | 1,05              | 0,35   | 10               | 1,05              | 0,35                           | 0,45                           | 0,35              |
|                     | AC15                |                       | Control of electromagnetic loads (> 72VA)   | -  | 10  | 1                | 0,7  | 1                              | 1                              | 0,4               | 10   | 1,1              | 0,3               | 10                             | 1,1                            | 0,3               |
|                     |                     |                       |   |  | I/I <sub>e</sub>  | U/U <sub>e</sub> | L/R <sup>1)</sup>                                      | I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | L/R <sup>1)</sup> | I/I <sub>e</sub>   | U/U <sub>e</sub> | L/R <sup>1)</sup> | I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | L/R <sup>1)</sup> |
| Direct current      | DC20A               | DC20B                 | No-load conditions  | all values   | -   | -                | -  | -                              | -                              | -                 | -  | -                | -                 | -                              | -                              | -                 |
|                     | DC21A               | DC21B                 | Switching of resistive loads including moderate overloads                             | all values   | 1   | 1                | 1  | 1                              | 1                              | 1                 | 1,5  | 1,05             | 1                 | 1,5                            | 1,05                           | 1                 |
|                     | DC22A               | DC22B                 | Switching of mixed resistive a. induct. loads incl. moderate overloads (shunt motors) | all values   | 1   | 1                | 2  | 1                              | 1                              | 2                 | 4  | 1,05             | 2,5               | 4                              | 1,05                           | 2,5               |
|                     | DC23A               | DC23B                 | Switching of highly inductive loads (e.g. series motors)                              | all values   | 1   | 1                | 7,5  | 1                              | 1                              | 7,5               | 4  | 1,05             | 15                | 4                              | 1,05                           | 15                |
|                     | DC3                 |                       | Shunt-motors:<br>Starting, plugging, inching  | all values   | 2,5   | 1                | 2  | 2,5                            | 1                              | 2                 | 4  | 1,05             | 2,5               | 4                              | 1,05                           | 2,5               |
|                     | DC5                 |                       | Series-motors:<br>Starting, plugging, inching   | all values   | 2,5   | 1                | 7,5  | 2,5                            | 1                              | 7,5               | 4  | 1,05             | 15                | 4                              | 1,05                           | 15                |

U<sub>e</sub> Rated operational voltage, U Voltage before make, U<sub>r</sub> Recovery voltage, I<sub>e</sub> Rated operational current, I Current made, I<sub>c</sub> Current broken  
1) Time in milliseconds (ms)

Note:  
By plugging, is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.  
By inching (jogging), is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

## Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

| Type  | M10 P | M10H              | M10HD             | M20               | N20               | N33F              | N40               | N61               | N80               | N100              | N200              |
|---|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Rated therm. current $I_{th}$ open A  | 20    | 20                | 10                | 32                | 32                | 50                | 63                | 90                | 115               | 150               | 250               |
| Rated therm. current $I_{the}$ encl. A  | 20    | 20                | 10                | 32                | 32                | 50                | 63                | 90                | 115               | 150               | 250               |
| Rated operational voltage $U_e$ V   | 440   | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> | 690 <sup>1)</sup> |
| Disconnection property <sup>2)</sup> acc. to VDE, IEC up to V                                       | 440   | 440               | - <sup>4)</sup>   | 440               | 440               | 440               | 690               | 440               | 440               | 690               | 690               |
| <b>Breaking capacity <math>I_{eff}</math></b>   |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| 3 x 220-440V A  | 160   | 160               | 35                | 220               | 220               | 260               | 380               | 520               | 740               | 900               | 1100              |
| 3 x 500V A  | -     | 100               | -                 | 160               | 160               | 200               | 290               | 380               | 560               | 680               | 850               |
| 3 x 660-690V A  | -     | 80                | -                 | 120               | 120               | 150               | 200               | 290               | 520               | 450               | -                 |
| <b>Utilization categ. AC21A, AC21B</b><br>Switching of resistive loads including moderate overloads |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Rated operational current $I_e$ A   | 20    | 20                | 10                | 32                | 32                | 50                | 63                | 90                | 115               | 150               | 250               |
| <b>Utilization categ. AC23A, AC23B</b><br>Switching of motor loads or other highly inductive loads  |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Rated current $I_e$ 400V A  | 16    | 16                | 3,5               | 30                | 30                | 45                | 45                | 60                | 85                | 105               | 135               |
| Power rating 220-240V kW  | 4     | 4                 | 0,75              | 7,5               | 7,5               | 11                | 15                | 22                | 30                | 40                | 40                |
| 3-phase 3-pole 380-440V kW  | 7,5   | 7,5               | 1,5               | 15                | 15                | 22                | 22                | 30                | 45                | 55                | 70                |
| 500V kW   | -     | 7,5               | 1,5               | 15                | 15                | 22                | 22                | 30                | 45                | 55                | 70                |
| 660-690V kW   | -     | 7,5               | 1,5               | 15                | 15                | 22                | 18,5              | 30                | 45                | 45                | -                 |
| <b>Star-Delta-Switches</b><br>for squirrel cage motors  |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Power rating 3-phase 3-pole 220-240V kW   | 3,7   | 3,7               | -                 | 7,5               | 7,5               | 8                 | 11                | 15                | 18,5              | 37                | 40                |
| 380-415V kW   | 7,5   | 7,5               | -                 | 15                | 15                | 18,5              | 18,5              | 25                | 30                | 40                | 70                |
| <b>Utilization category AC3</b><br>Switching of three-phase motors                                  |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Rated current $I_e$ 400V A  | 12    | 12                | 2                 | 22                | 22                | 30                | 30                | 50                | 60                | 80                | 135               |
| Power rating 220-240V kW  | 3     | 3                 | 0,37              | 5,5               | 5,5               | 7,5               | 7,5               | 15                | 18,5              | 25                | 40                |
| 3-phase 3-pole 380-440V kW  | 5,5   | 5,5               | 0,75              | 11                | 11                | 15                | 15                | 25                | 30                | 40                | 70                |
| 500V kW   | -     | 5,5               | 0,75              | 11                | 11                | 15                | 15                | 25                | 30                | 40                | 70                |
| 660-690V kW   | -     | 5,5               | 0,75              | 11                | 11                | 15                | 15                | 25                | 30                | 40                | 70                |
| <b>Utilization category AC4</b><br>squirrel cage motors, inching                                    |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Power rating 220-240V kW  | 0,55  | 0,55              | -                 | 2,2               | 2,2               | 3,7               | 4                 | 5,5               | 6                 | 11                | 18,5              |
| 3-phase 3-pole 380-440V kW  | 1,5   | 1,5               | -                 | 4                 | 4                 | 5,5               | 7,5               | 11                | 15                | 18,5              | 35                |
| 500V kW   | -     | 1,5               | -                 | 4                 | 4                 | 5,5               | 7,5               | 11                | 15                | 22                | 35                |
| 660-690V kW   | -     | 1,5               | -                 | 4                 | 4                 | 5,5               | 7,5               | 11                | 15                | 22                | -                 |
| <b>Utilization category AC15</b><br>Control of electromagnetic loads, contactors,                   |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Rated current $I_e$ up to 240V A  | 6     | 6                 | 2,5               | 12                | 12                | 16                | -                 | -                 | -                 | -                 | -                 |
| 380 - 440V A  | 4     | 4                 | 1,5               | 6                 | 6                 | 7                 | -                 | -                 | -                 | -                 | -                 |
| 2-pole in series 500V A   | -     | 5                 | -                 | 8                 | 8                 | 10                | -                 | -                 | -                 | -                 | -                 |
| <b>Utilization categ. DC21A, DC21B</b><br>Switching of resistive loads                              |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Time constant $L/R \leq 1ms$  |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Rated current $I_e$ 1-pole 30V A  | 20    | 20                | 10                | 32                | 32                | 40                | 63                | 80                | 100               | 150               | 250               |
| 60V A   | 4     | 4                 | -                 | 6                 | 6                 | 20                | 30                | 30                | 30                | -                 | -                 |
| 110V A  | 0,6   | 0,6               | -                 | 3                 | 3                 | 4                 | 6                 | 6                 | 6                 | -                 | -                 |
| 220V A  | 0,5   | 0,5               | -                 | 0,8               | 0,8               | 0,8               | 1,3               | 1,3               | 1,3               | 2,5               | 2,5               |
| 440V A  | -     | -                 | -                 | 0,4               | 0,4               | 0,4               | 0,6               | 0,6               | 0,6               | 0,7               | 0,7               |
| <b>Utilization category DC3 - DC5</b><br>Switching of shunt motors and series motors                |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Time constant $L/R \leq 15ms$   |       |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Rated current $I_e$ 1-pole 30V A  | 8     | 8                 | -                 | 13                | 13                | 16                | 25                | 32                | 40                | 60                | 100               |
| 60V A   | 1     | 1                 | -                 | 2,4               | 2,4               | 4                 | 12                | 12                | 12                | -                 | -                 |
| 110V A  | 0,3   | 0,3               | -                 | 0,5               | 0,5               | 1,6               | 2,4               | 2,4               | 2,4               | -                 | -                 |
| Protection class of terminals <sup>1)</sup>   | IP00  | IP20              | IP20              | IP00              | IP00              | IP20              | IP00              | IP00              | IP00              | IP00              | IP00              |

1) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 6kV$ . Data for other conditions on request

2) valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3.

3) Protection degree of the terminals with connected insulated conductor. Additional protection with terminal cover (KLAD).

4) Fulfil the requirements acc. to load switches.

## Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

| Type   |                   | M10 P           | M10H                   | M10HD                  | M20              | N20              | N33F             | N40                  | N61                | N80            | N100                | N200      |
|--|-------------------|-----------------|------------------------|------------------------|------------------|------------------|------------------|----------------------|--------------------|----------------|---------------------|-----------|
| <b>Cable cross-sections</b>                        |                   |                 |                        |                        |                  |                  |                  |                      |                    |                |                     |           |
| solid  | mm <sup>2</sup>   | 1-2,5           | 1-2,5 <sup>1)</sup>    | 1-2,5 <sup>1)</sup>    | 1,5-6            | 1,5-6            | 2,5-10           | 2,5-16 <sup>1)</sup> | 6-25 <sup>1)</sup> | 6-35           | 10-50 <sup>1)</sup> | 50-150    |
| flexible   | mm <sup>2</sup>   | 0,75-2,5        | 0,75-2,5 <sup>1)</sup> | 0,75-2,5 <sup>1)</sup> | 1-4              | 1-4              | 1,5- 6           | 2,5-10 <sup>1)</sup> | 6-25 <sup>1)</sup> | 6-35           | 10-35 <sup>1)</sup> | 35-120    |
| flexible w. multicore cable end                    | mm <sup>2</sup>   | 0,75-2,5        | 0,75-1,5               | 0,75-1,5               | 1-4              | 1-4              | 1,5- 6           | 2,5-6                | 6-16               | 6-35           | 10-25               | -         |
| Conductors to clamp per pole                       |                   | 2               | 2                      | 2                      | 2                | 2                | 2                | 2                    | 1                  | 1              | 1                   | 1         |
| Size of terminal screw                             |                   | M3              | M3,5                   | M3,5                   | M4               | M4               | M4               | M5                   | 2xM5               | 2xM5           | 2xM6                | M10       |
| Tightening torque                                  | Nm<br>lb.inch     | 0,6-1,2<br>5-11 | 0,8-1,4<br>7-12        | 0,8-1,4<br>7-12        | 1,2-1,8<br>11-16 | 1,2-1,8<br>11-16 | 1,2-1,8<br>11-16 | 2,5-3<br>22-26       | 2,5-3<br>22-26     | 2,5-3<br>22-26 | 3,5-4,5<br>31-40    | 23<br>202 |
| <b>Short circuit protection</b>                    |                   |                 |                        |                        |                  |                  |                  |                      |                    |                |                     |           |
| Max. fuse size                                     | gL (gG) A         | 20              | 20                     | 20                     | 35               | 35               | 50               | 63                   | 100                | 125            | 160                 | 250       |
| Rated short-time withstand current (1sec. current) | A                 | 250             | 250                    | -                      | 400              | 400              | 500              | 800                  | 1000               | 1400           | 1800                | 3000      |
| Rated conditional short-circuit current            | kA <sub>eff</sub> | 10              | 10                     | 1                      | 10               | 10               | 10               | 10                   | 10                 | 10             | 10                  | 10        |
| <b>Short-time capacity</b>                         |                   |                 |                        |                        |                  |                  |                  |                      |                    |                |                     |           |
| Load duration                                      | 3s A              | 100             | 100                    | -                      | 200              | 200              | 350              | 400                  | 600                | 720            | 1000                | 2000      |
|  | 10s A             | 60              | 60                     | -                      | 130              | 130              | 230              | 250                  | 400                | 480            | 600                 | 1200      |
| Note: Ratings applies to contacts already closed   | 30s A             | 35              | 35                     | -                      | 85               | 85               | 110              | 160                  | 250                | 300            | 500                 | 600       |
|  | 60s A             | 25              | 25                     | -                      | 65               | 65               | 80               | 110                  | 200                | 250            | 370                 | 480       |
| <b>Power loss at AC21A</b>                         |                   |                 |                        |                        |                  |                  |                  |                      |                    |                |                     |           |
| per pole   | A<br>W            | 20<br>0,6       | 20<br>0,5              | 10<br>0,5              | 32<br>0,9        | 32<br>1,1        | 50<br>1,9        | 63<br>2              | 85<br>2,8          | 115<br>4,4     | 150<br>5,7          | 250<br>21 |
| <b>Switching of capacitive loads</b>               |                   |                 |                        |                        |                  |                  |                  |                      |                    |                |                     |           |
| maximum making capacity up to 500V                 | A                 | 140             | 140                    | -                      | 300              | 300              | 350              | 400                  | 600                | 700            | 900                 | 1800      |

## Data according to UL and cUL

| Type  |   | M10 P            | M10H          | M10HD         | M20              | N20              | N33F             | N61             | N80   | N100           | N200           | L400           |
|---|---|------------------|---------------|---------------|------------------|------------------|------------------|-----------------|---|----------------|----------------|----------------|
| Rated voltage   | V~  | 300              | 600           | 600           | 600              | 600              | 600              | 600             | 600   | 600            | 600            | 600            |
| Rated operational current "General Use" with jumper                   | A<br>A                                    | 20<br>15         | 20<br>-       | 5<br>-        | 35<br>25         | 35<br>25         | 60<br>40         | 90<br>80        | 115/125 <sup>3)</sup><br>80/125 <sup>3)</sup> | 130<br>-       | 250<br>-       | 350<br>-       |
| DOL-Rating 3-phase  | 110-120V hp<br>200-208V hp<br>220-240V hp | 1½<br>2<br>3     | 1½<br>2<br>3  | -<br>-<br>-   | 5<br>5<br>5      | 5<br>5<br>5      | 7½<br>10<br>15   | 8½<br>12½<br>17 | 10<br>15<br>20                                | 15<br>25<br>30 | 15<br>25<br>30 | 15<br>25<br>30 |
|   | 440-480V hp<br>550-600V hp                | -<br>-           | 5<br>7½       | -<br>-        | 10<br>15         | 10<br>15         | 25<br>30         | 35<br>40        | 40<br>50                                      | 40<br>50       | 60<br>75       | 60<br>75       |
| DOL-Rating 1-phase  | 110-120V hp<br>200-208V hp<br>220-240V hp | ½<br>1<br>1½     | ½<br>1<br>1½  | -<br>-<br>-   | 1½<br>3<br>5     | 1½<br>3<br>5     | 3<br>5<br>7½     | 4<br>6½<br>8    | 5<br>7½<br>10                                 | 7½<br>15<br>15 | 7½<br>15<br>20 | 7½<br>15<br>20 |
| Fuse size (RK5) Man. Motor Controller 5kA / 600V and Motor Disconnect | A   | 40 <sup>2)</sup> | 40            | -             | 80               | 80               | 150              | 150             | 200   | 300            | 350            | 350            |
| Heavy pilot duty  | AC  | A300             | A600          | B600          | A600             | A600             | A600             | A600            | A600  | A600           | A600           | A600           |
| <b>Cable cross sections</b>   |   |                  |               |               |                  |                  |                  |                 |   |                |                |                |
| solid   | AWG                                       | 12 - 20          | 12 - 20       | 12 - 20       | 10 - 18          | 10 - 18          | 10 - 12          | 10 - 12         | 10 - 12                                       | 10 - 14        | -              | -              |
| flexible  | AWG                                       | 14 - 20          | 14 - 20       | 14 - 20       | 8 - 18           | 8 - 18           | 6 - 12           | 2 - 12          | 2/1 <sup>3)</sup> - 12                        | 1 - 14         | 250kcmil       | 500kcmil       |
| Tightening torque   | Nm<br>lb.inch                             | 1-1.2<br>9-11    | 1-1.4<br>9-13 | 1-1.4<br>9-13 | 1.7-1.8<br>15-16 | 1.7-1.8<br>15-16 | 1.2-1.8<br>11-16 | 2.8<br>25       | 2.8<br>25                                     | 4.5<br>40      | 23<br>202      | 40<br>352      |

1) Maximum cable cross-section with prepared conductor

2) 5kA / 300V

3) Increased rated operational current 125A "General Use" and "with jumper" with AWG 1. Add suffix + WK.

## Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

| Type  |                 | L100                | L160              | L400              | L600              | L800              | L1200             |
|---|-----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Rated insulation voltage $U_i$                                | V               | 690 <sup>2)</sup>   | 690 <sup>2)</sup> | 690 <sup>2)</sup> | 690 <sup>2)</sup> | 690 <sup>2)</sup> | 690 <sup>2)</sup> |
| Rated thermal current $I_{th}$ openA                          | 125             | 180                 | 400               | 600               | 800               | 1200              |                   |
| Rated thermal current $I_{the}$ encl. A                       | 125             | 180                 | 400               | 600               | 800               | 1200              |                   |
| with conductor  | mm <sup>2</sup> | 50                  | 70                | 40x5              | 40x10             | busbar<br>2x40x10 | busbar<br>2x50x10 |
| <b>Utilization category AC21A, AC21B</b>                      |                 |                     |                   |                   |                   |                   |                   |
| Switching of resistive loads,<br>including moderate overloads |                 |                     |                   |                   |                   |                   |                   |
| Rated operational current $I_o$                               | A               | 125                 | 180               | 400               | 400               | 400               | 400               |
| <b>Shot-time current-carrying capacity</b>                    |                 |                     |                   |                   |                   |                   |                   |
| Load duration   | 1s              | -                   | -                 | 4800              | 6500              | 8500              | 10000             |
|   | 3s              | 800                 | 1200              | 3600              | 5000              | 6500              | 8000              |
|   | 10s             | 500                 | 800               | 2000              | 3200              | 4000              | 5800              |
| Note: Ratings applies to<br>contacts already closed           | 30s             | 320                 | 480               | 1200              | 1700              | 2200              | 3200              |
|   | 60s             | 180                 | 380               | 960               | 1300              | 1700              | 2300              |
| <b>Cable cross-sections</b>                                   |                 |                     |                   |                   |                   |                   |                   |
| solid or stranded   | mm <sup>2</sup> | 25-50 <sup>1)</sup> | cable lug         | busbar            | busbar            | busbar            | busbar            |
| flexible  | mm <sup>2</sup> | 25-50 <sup>1)</sup> | 70                | 40x5              | 40x10             | 2x40x10           | 2x50x10           |
| flexible with multicore cable end                             | mm <sup>2</sup> | 25-35               | -                 | -                 | -                 | -                 | -                 |
| Number of conductors to clamp per pole                        |                 | 1                   | 1                 | 1                 | 2                 | 1                 | 1                 |
| Size of terminal screw  |                 | 2xM5                | M8                | M12               | M16               | M16               | M16               |
| Tightening torque   | Nm              | 3                   | 12                | 40                | 98                | 98                | 98                |
|   | lb.inch         | 26                  | 105               | 352               | 862               | 862               | 862               |
| <b>Short circuit protection</b>                               |                 |                     |                   |                   |                   |                   |                   |
| Max. fuse size  | slow, gL (gG) A | 125                 | 200               | 400               | 630               | 800               | 1250              |

1) Maximum cable cross-section with prepared conductor

2) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 6kV$ .  
Data for other conditions on request

## Mechanical Life

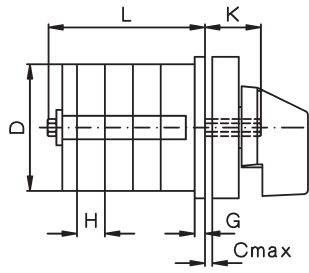
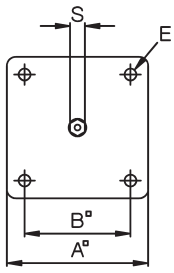
| Schwitich type |                  | M10, M10H | M20, N20, N33F | N40, N60, N80 | N100, N200 |
|----------------|------------------|-----------|----------------|---------------|------------|
| Operations     | x10 <sup>3</sup> | 300       | 250            | 200           | 150        |

Note: The minimum mechanical and electrical life is defined according to IEC/EN60946-3 (approx. 10.000 operations).

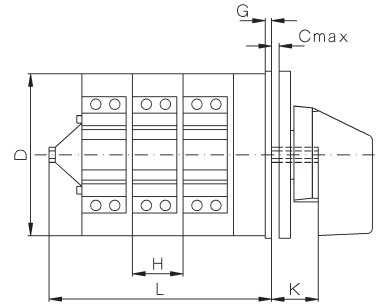
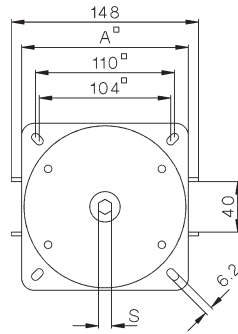


## Dimensions (mm)

### Panel mounting E M10 - N100



### N200

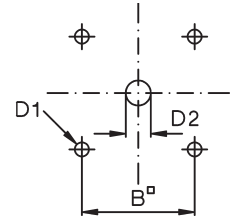


| Type        | A   | B   | C | D                | D1 | D2 | D3  | E   | G   | H    | K    | S    |
|-------------|-----|-----|---|------------------|----|----|-----|-----|-----|------|------|------|
| <b>M10H</b> | 48  | 36  | 5 | 44 <sup>1)</sup> | 5  | 8  | -   | 4   | 3,5 | 9,5  | 19   | SW5  |
| <b>M20</b>  | 48  | 36  | 5 | 56               | 5  | 8  | -   | 4   | 3,5 | 12,5 | 19   | SW5  |
| <b>N20</b>  | 64  | 48  | 5 | 56               | 5  | 12 | 57  | 4,2 | 3   | 12,5 | 20   | SW7  |
| <b>N33F</b> | 64  | 48  | 5 | 58 <sup>2)</sup> | 5  | 12 | -   | 4,2 | 3   | 15,5 | 20   | SW7  |
| <b>N40</b>  | 86  | 68  | 7 | 80               | 6  | 12 | 82  | 5,2 | 3,5 | 18   | 24,5 | SW9  |
| <b>N61</b>  | 86  | 68  | 7 | 80               | 6  | 12 | 82  | 5,2 | 3,5 | 29,5 | 24,5 | SW9  |
| <b>N80</b>  | 86  | 68  | 7 | 80               | 6  | 12 | 82  | 5,2 | 3,5 | 29,5 | 24,5 | SW9  |
| <b>N100</b> | 132 | 110 | 9 | 128              | 7  | 16 | 129 | 6,2 | 5   | 30   | 37   | SW12 |
| <b>N200</b> | 132 | 110 | 9 | 128              | 7  | 16 | -   | 6,2 | 5   | 40   | 37   | SW12 |

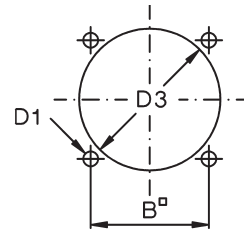
1) 44,5 x 42

2) 58 x 58

**Mounting holes:** built in from rear  
Mounting screw: J3631N M=1,2-1,4 Nm

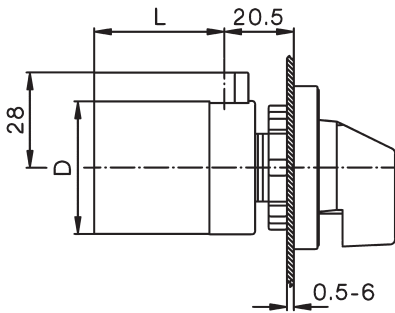


**Mounting holes:** built in from front

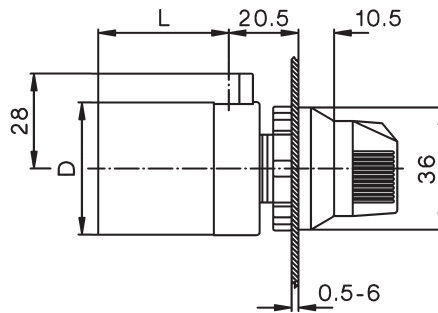


| Type        | Dimension L with .. cells |      |      |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------|---------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|             | 1                         | 2    | 3    | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |
| <b>M10H</b> | 36,5                      | 46   | 55,5 | 65    | 74,5  | 84    | 93,5  | 103   | 112,5 | 122   | 131,5 | 141   | -     | -     | -     |
| <b>M20</b>  | 38,5                      | 51   | 63,5 | 76    | 88,5  | 101   | 113,5 | 126   | 138,5 | 151   | 163,5 | 176   | -     | -     | -     |
| <b>N20</b>  | 40,5                      | 53   | 65,5 | 78    | 90,5  | 103   | 115,5 | 128   | 140,5 | 153   | 165,5 | 178   | 190,5 | 203   | 215,5 |
| <b>N33F</b> | 44                        | 59,5 | 75   | 90,5  | 106   | 121,5 | 137   | 152,5 | 168   | 183,5 | 199   | 214,5 | 230   | 245,5 | 261   |
| <b>N40</b>  | 52,5                      | 70,5 | 88,5 | 106,5 | 124,5 | 142,5 | 160,5 | 178,5 | 196,5 | 214,5 | 232,5 | 250,5 | 268,5 | 286,5 | 304,5 |
| <b>N61</b>  | 64                        | 93,5 | 123  | 152,5 | 182   | 211,5 | 241   | 270,5 | 300   | 329,5 | 359   | 388,5 | -     | -     | -     |
| <b>N80</b>  | 64                        | 93,5 | 123  | 152,5 | 182   | 211,5 | 241   | 270,5 | 300   | 329,5 | 359   | 388,5 | -     | -     | -     |
| <b>N100</b> | 88                        | 118  | 148  | 178   | 208   | 238   | 268   | 298   | 328   | 358   | 388   | 418   | -     | -     | -     |
| <b>N200</b> | 96                        | 136  | 176  | 216   | 256   | 296   | 336   | 376   | 416   | 456   | 496   | 536   | -     | -     | -     |

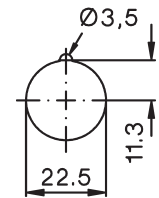
### Central fixing Z M10H, M20, N33F



### Central fixing without escutcheon plate ZO M10H, M20



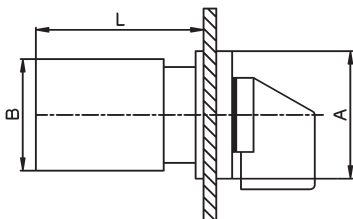
**Mounting hole:**



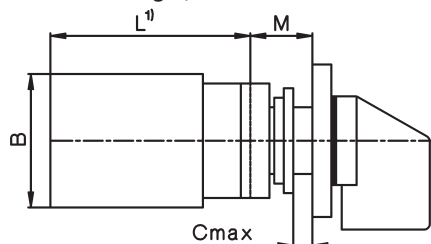
Further dimensions see tables above

### Mini-Cam Switches M4H

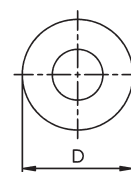
#### Panel mounting E



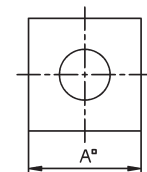
#### Central fixing Z, ZO



#### ZO



#### Z

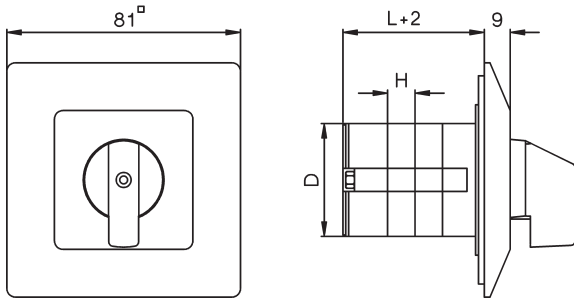


| Typ        | mm | Dimension L with .. cells |    |      |      |      |      |      |      |      |      |       |       |
|------------|----|---------------------------|----|------|------|------|------|------|------|------|------|-------|-------|
|            |    | A                         | B  | D    | M    | 1    | 2    | 3    | 4    | 5    | 6    | 7     | 8     |
| <b>M4H</b> |    | 30                        | 28 | 29,5 | 12,5 | 38,5 | 50,5 | 62,5 | 74,5 | 86,5 | 98,5 | 110,5 | 122,5 |

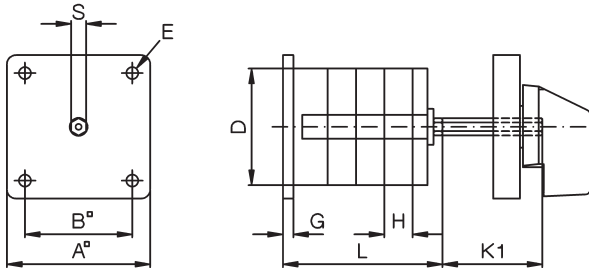
Mounting holes see page 236

## Dimensions (mm)

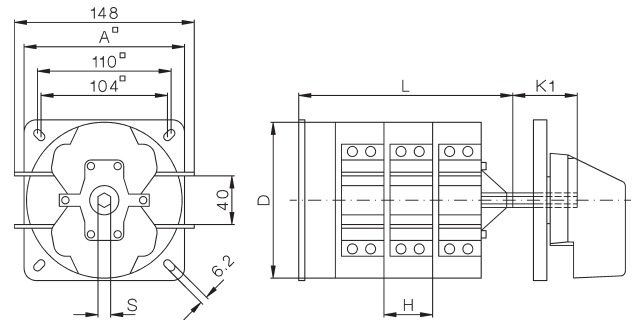
### Flush mounting UP M10



### Base mounting V M10H - N100



### N200

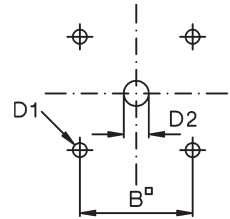


| Type | A   | B   | D                | D1 | D2 | E   | G   | H    | I | K  | K1   |      |
|------|-----|-----|------------------|----|----|-----|-----|------|---|----|------|------|
| M10  | 48  | 36  | 39               | 5  | 8  | 4   | 3,5 | 9,5  | 6 | 19 | 41   | SW5  |
| M10H | 48  | 36  | 44 <sup>1)</sup> | 5  | 8  | 4,2 | 3   | 9,5  | 6 | 19 | 41   | SW5  |
| M20  | 48  | 36  | 56               | 5  | 8  | 4,2 | 3   | 12,5 | 6 | 19 | 47   | SW5  |
| N20  | 64  | 48  | 56               | 5  | 12 | 4,2 | 3   | 12,5 | 0 | 20 | 29   | SW7  |
| N33F | 64  | 48  | 58 <sup>2)</sup> | 5  | 12 | 4,2 | 3   | 15,5 | 0 | 20 | 31,5 | SW7  |
| N40  | 86  | 68  | 80               | 6  | 12 | 5,2 | 3,5 | 18   | - | -  | 38,5 | SW9  |
| N61  | 86  | 68  | 80               | 6  | 12 | 5,2 | 3,5 | 29,5 | - | -  | 49,5 | SW9  |
| N80  | 86  | 68  | 80               | 6  | 12 | 5,2 | 3,5 | 29,5 | - | -  | 49,5 | SW9  |
| N100 | 132 | 110 | 128              | 7  | 16 | 6,2 | 5   | 30   | - | -  | 79,5 | SW12 |
| N200 | 132 | 110 | 128              | 7  | 16 | 6,2 | 5   | 40   | - | -  | 104  | SW12 |

Mounting holes: for escutcheon plate

1) 42 x 44,5

2) 58 x 58

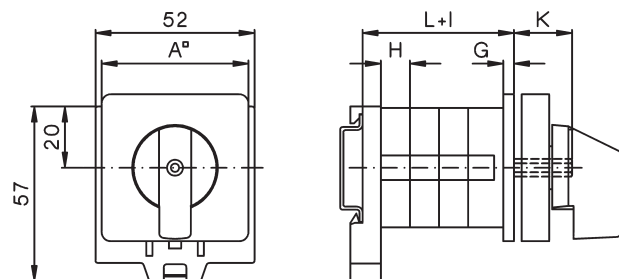


| Type | Dimensions L with .. cells |      |      |       |       |       |       |       |       |       |       |       |       |       |       |
|------|----------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | 1                          | 2    | 3    | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |
| M10  | 34,5                       | 44   | 53,5 | 63    | 72,5  | 82    | 91,5  | 101   | 110,5 | 120   | 129,5 | 139   | -     | -     | -     |
| M10H | 36,5                       | 46   | 55,5 | 65    | 74,5  | 84    | 93,5  | 103   | 112,5 | 122   | 131,5 | 141   | -     | -     | -     |
| M20  | 38,5                       | 51   | 63,5 | 76    | 88,5  | 101   | 113,5 | 126   | 138,5 | 151   | 163,5 | 176   | -     | -     | -     |
| N20  | 40,5                       | 53   | 65,5 | 78    | 90,5  | 103   | 115,5 | 128   | 140,5 | 153   | 165,5 | 178   | 190,5 | 203   | 215,5 |
| N33F | 44                         | 59,5 | 75   | 90,5  | 106   | 121,5 | 137   | 152,5 | 168   | 183,5 | 199   | 214,5 | 230   | 245,5 | 261   |
| N40  | 52,5                       | 70,5 | 88,5 | 106,5 | 124,5 | 142,5 | 160,5 | 178,5 | 196,5 | 214,5 | 232,5 | 250,5 | 268,5 | 286,5 | 304,5 |
| N61  | 64                         | 93,5 | 123  | 152,5 | 182   | 211,5 | 241   | 270,5 | 300   | 329,5 | 359   | 388,5 | -     | -     | -     |
| N80  | 64                         | 93,5 | 123  | 152,5 | 182   | 211,5 | 241   | 270,5 | 300   | 329,5 | 359   | 388,5 | -     | -     | -     |
| N100 | 88                         | 118  | 148  | 178   | 208   | 238   | 268   | 298   | 328   | 358   | 388   | 418   | -     | -     | -     |
| N200 | 96                         | 136  | 176  | 216   | 256   | 296   | 336   | 376   | 416   | 456   | 496   | 536   | -     | -     | -     |

### Snap-on mounting SM

M10H - N33F for 35mm DIN-rail mounting according to DIN EN 50022

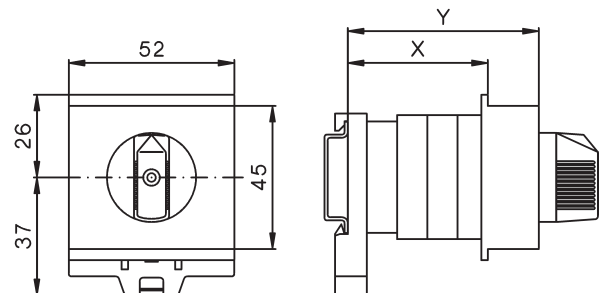
Dimensions see tables above



### Switch with installation cover SMA

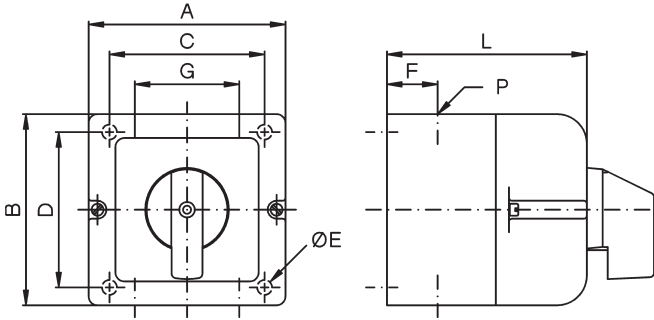
M10H, M20 for 35mm DIN-rail mounting according to DIN EN 50022

| Type | Dimension X with .. cells |    |      |      |      |  | Dimension Y with .. cells |    |      |      |      |  |
|------|---------------------------|----|------|------|------|--|---------------------------|----|------|------|------|--|
|      | 1, 2                      | 3  | 4    | 5    | 6    |  | 1, 2                      | 3  | 4    | 5    | 6    |  |
| M10H | 44                        | 44 | 72,5 | 72,5 | 72,5 |  | 60                        | 60 | 88,5 | 88,5 | 88,5 |  |
| M20  | 44                        | 61 | 76   | 76   | 76   |  | 60                        | 75 | 90   | 90   | 90   |  |

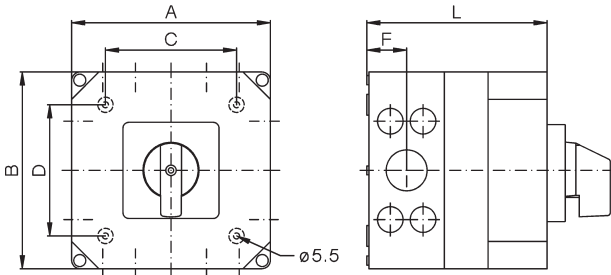


## Dimensions (mm)

### Plastic enclosed switches P, PF M10 - N61



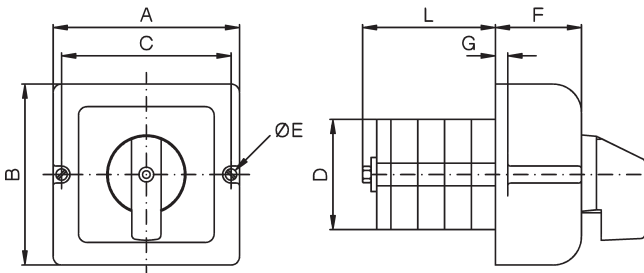
### N61, N80



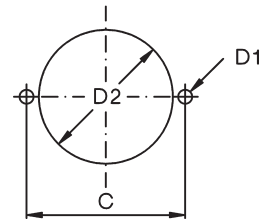
| Type | A   | B   | C   | D   | E   | F    | G  | P   | Dimension L with .. cells |     |     |     |     |     |
|------|-----|-----|-----|-----|-----|------|----|-----|---------------------------|-----|-----|-----|-----|-----|
|      |     |     |     |     |     |      |    |     | 1                         | 2   | 3   | 4   | 5   | 6   |
| M10  | 66  | 64  | 50  | 36  | 5   | 15,5 | 26 | M20 | 43                        | 52  | 62  | 71  | 81  | 90  |
| N20  | 82  | 78  | 57  | 53  | 4,5 | 17   | 29 | M20 | 66                        | 66  | 80  | 94  | 108 | 122 |
| N33F | 112 | 108 | 85  | 50  | 5   | 20   | 50 | M25 | 92                        | 92  | 110 | 128 | 146 | 164 |
| N40  | 112 | 108 | 85  | 50  | 5   | 20   | 50 | M25 | 92                        | 92  | 110 | 128 | 146 | 164 |
| N61  | 112 | 108 | 85  | 50  | 5   | 20   | 50 | M25 | 92                        | 110 | -   | -   | -   | -   |
| N61  | 182 | 180 | 120 | 120 | 5,5 | 36,5 | -  | 1)  | -                         | -   | 165 | 215 | 215 | -   |
| N80  | 182 | 180 | 120 | 120 | 5,5 | 36,5 | -  | 1)  | 110                       | 110 | 165 | 215 | 215 | -   |

1) Knock outs for M40/M32 + 4x M20 at top and bottom M32/M25 + 4x M20 at the right and left hand side.

### Motor terminal box mounting KE M10 - N33F



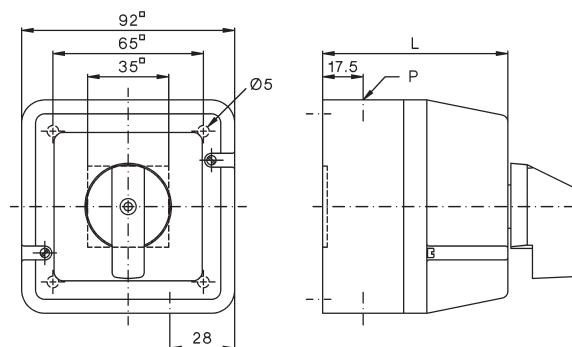
### Mounting holes



| Type | A   | B   | C   | D  | D1 | D2 | E   | F  | G  | Dimension L with .. cells |      |      |      |      |  |
|------|-----|-----|-----|----|----|----|-----|----|----|---------------------------|------|------|------|------|--|
|      |     |     |     |    |    |    |     |    |    | 2                         | 3    | 4    | 5    | 6    |  |
| M10  | 66  | 64  | 58  | 39 | 4  | 48 | 3,2 | 24 | 6  | 22                        | 31,5 | 41   | 50,5 | 60   |  |
| N20  | 82  | 78  | 71  | 48 | 5  | 57 | 4,2 | 34 | 5  | 24,5                      | 37   | 49,5 | 62   | 74,5 |  |
| N33F | 112 | 108 | 100 | 56 | 5  | 70 | 4,2 | 49 | 11 | 32,5                      | 48   | 63,5 | 79   | 94,5 |  |

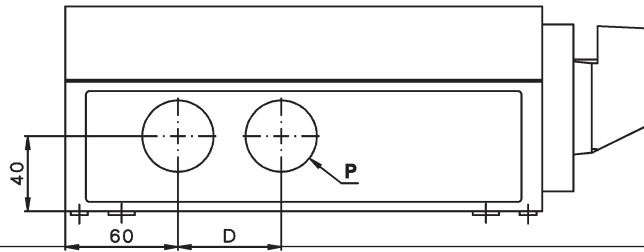
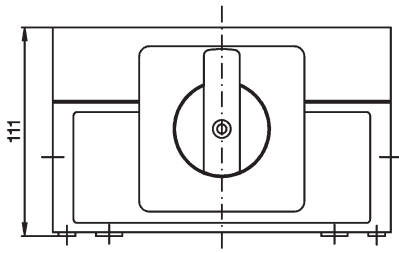
### Plastic enclosed motor starter PM N20

| Typ | P   | Dimension L with .. cells |    |    |      |     |       |
|-----|-----|---------------------------|----|----|------|-----|-------|
|     |     | 1                         | 2  | 3  | 4    | 5   | 6     |
| N20 | M25 | 80                        | 80 | 80 | 92,5 | 105 | 117,5 |

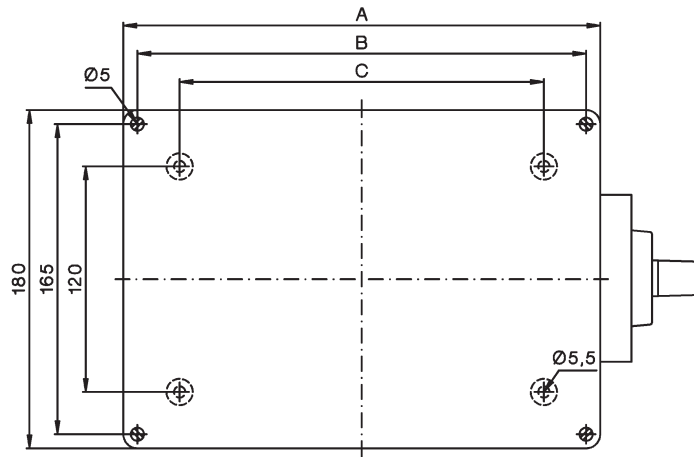


## Dimensions (mm)

Plastic enclosure horizontal PLF (Replacement for cast aluminium enclosure G, GF)  
N40, N61, N80



| Type | N40 1 - 6 cells<br>N61 1 - 3 cells<br>N80 1 - 3 cells | N40 7 - 10 cells<br>N61 4 - 6 cells<br>N80 4 - 6 cells |
|------|---|--|
| A    | 182   | 254  |
| B    | 167   | 239  |
| C    | 120   | 190  |
| D    | -   | 65   |
| P    | 2 x Ø40,5 (M40)                                       | 4 x Ø40,5 (M40)  |



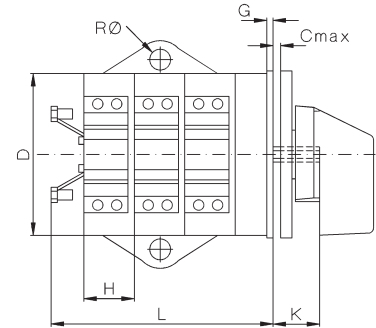
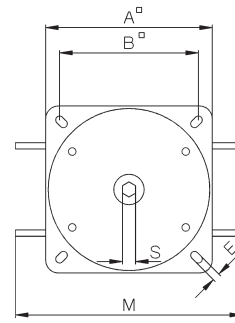
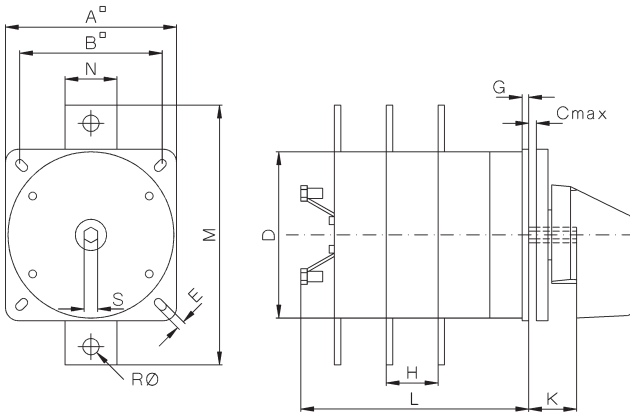
## Dimensions (mm)

### Load Switches

#### Panel mounting E

L100 - 400, L800, L1200

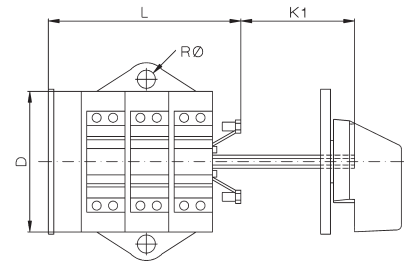
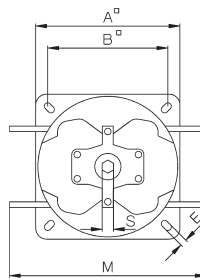
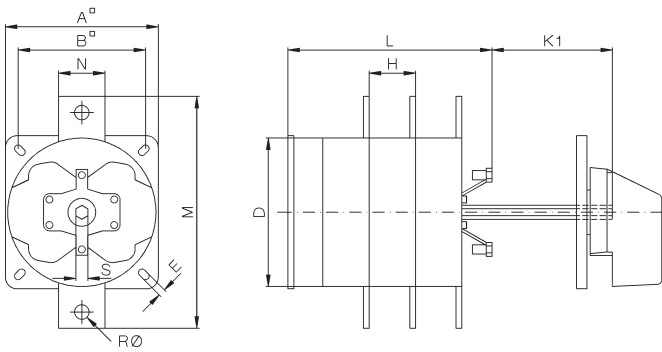
L600



#### Base mounting V

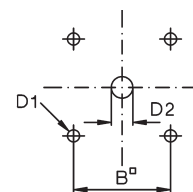
L100 - 400, L800, L1200

L600



| Type  | A   | B   | C | D   | D1 | D2 | E   | G   | H    | K    | K1   | M   | N  | R    | S    |
|-------|-----|-----|---|-----|----|----|-----|-----|------|------|------|-----|----|------|------|
| L100  | 86  | 68  | 7 | 80  | 6  | 12 | 5,2 | 3,5 | 18   | 24,5 | 38,5 | 103 | 27 | -    | SW9  |
| L160  | 86  | 68  | 7 | 80  | 6  | 12 | 5,2 | 3,5 | 29,5 | 24,5 | 38,5 | 115 | -  | 8,5  | SW9  |
| L400  | 132 | 110 | 9 | 128 | 7  | 16 | 6,2 | 5   | 40   | 37   | 104  | 200 | 40 | 12,5 | SW12 |
| L600  | 132 | 110 | 9 | 128 | 7  | 16 | 6,2 | 5   | 40   | 37   | 104  | 180 | -  | 16,5 | SW12 |
| L800  | 132 | 110 | 9 | 128 | 7  | 16 | 6,2 | 5   | 40   | 37   | 104  | 240 | 40 | 16,5 | SW12 |
| L1200 | 132 | 110 | 9 | 128 | 7  | 16 | 6,2 | 5   | 40   | 37   | 104  | 240 | 40 | 16,5 | SW12 |

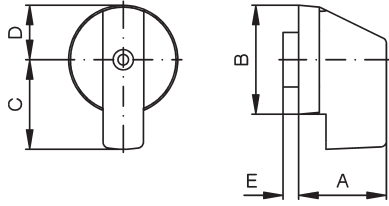
#### Mounting holes:



| Type  | Dimension L with .. cells |      |      |       |       |       |       |       |       |       |       |       |
|-------|---------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       | 1                         | 2    | 3    | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    |
| L100  | 52,5                      | 70,5 | 88,5 | 106,5 | 124,5 | 142,5 | 160,5 | 178,5 | 196,5 | 214,5 | 232,5 | 250,5 |
| L160  | 64                        | 93,5 | 123  | 152,5 | 182   | 211,5 | 241   | 270,5 | 300   | 329,5 | 359   | 388,5 |
| L400  | 96                        | 136  | 176  | 216   | 256   | 296   | 336   | 376   | 416   | 456   | 496   | 536   |
| L600  | 96                        | 136  | 176  | 216   | 256   | 296   | 336   | 376   | 416   | 456   | 496   | 536   |
| L800  | 96                        | 136  | 176  | 216   | 256   | 296   | 336   | 376   | 416   | 456   | 496   | 536   |
| L1200 | 96                        | 136  | 176  | 216   | 256   | 296   | 336   | 376   | 416   | 456   | 496   | 536   |

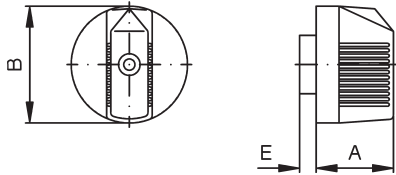
## Operating Knobs and Handles

### Instrument knob G.



| Type                      | A     | B  | C  | D    | E   |
|---------------------------|-------|----|----|------|-----|
| M10, M10H, M20            | 23    | 28 | 24 | 14   | 4   |
| N20, N33F                 | 27    | 36 | 32 | 18   | 3   |
| N40, N61, N80, L100, L160 | 36    | 47 | 42 | 24   | 3,5 |
| N100, N200                | 48,10 | 75 | 63 | 37,5 | -   |

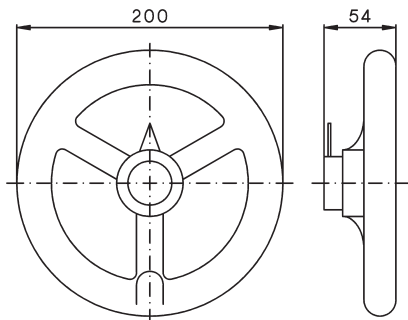
### Toggle knob K.



| Type           | A    | B  | E |
|----------------|------|----|---|
| M10, M10H, M20 | 18,5 | 28 | 4 |
| N20, N33F      | 24   | 36 | 3 |

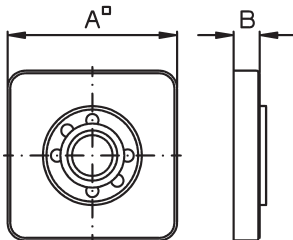
### Hand wheel HR

N100, N200,  
L400, L600, L800, L1200



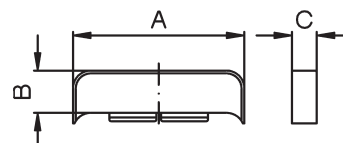
## Escutcheon plates

### Escutcheon plate

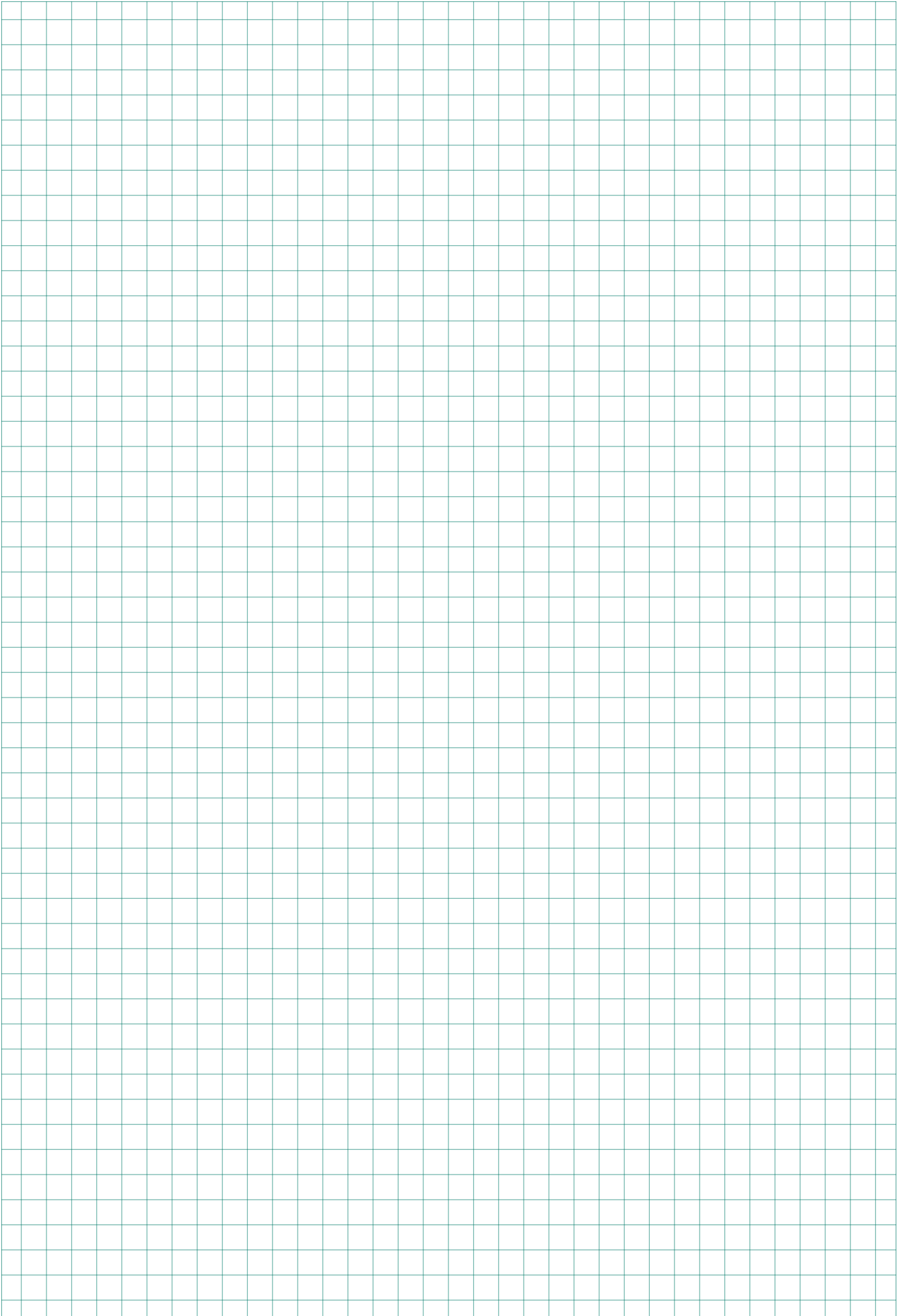


| Type                                | A   | B   |
|-------------------------------------|-----|-----|
| M10, M10H, M20                      | 48  | 7,5 |
| N20, N33F                           | 64  | 7,5 |
| N40, N61, N80, L100, L160           | 88  | 8   |
| N100, N200, L400, L600, L800, L1200 | 132 | 9   |

### Rectangular additional plate SRE



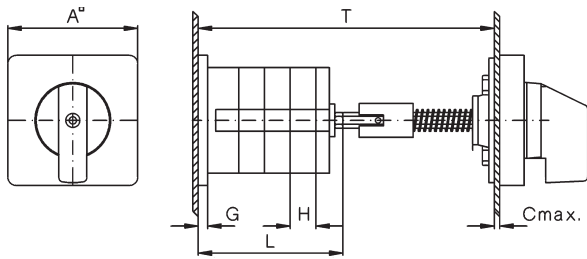
| Type                                | A   | B  | C   |
|-------------------------------------|-----|----|-----|
| M10, M10H, M20                      | 48  | 12 | 7,5 |
| N20, N33F                           | 64  | 14 | 7,5 |
| N40, N61, N80, L100, L160           | 88  | 22 | 8   |
| N100, N200, L400, L600, L800, L1200 | 132 | 31 | 9   |



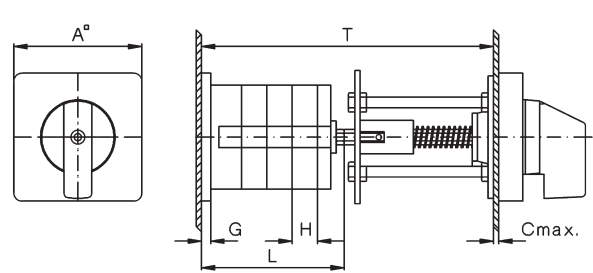
## Door couplings

Dimension T is a minimum value. In case of order the dimension T is necessary.

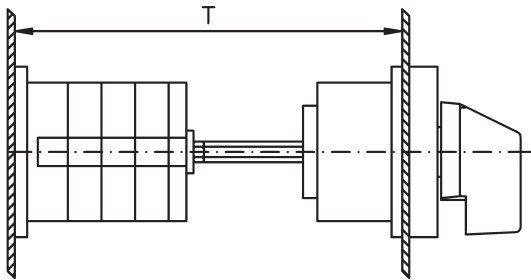
### Door coupling TK, TKFR N40 - L1200



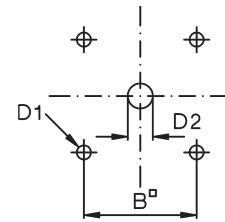
### Door coupling, lockable TK2, TK2FR N40 - L1200



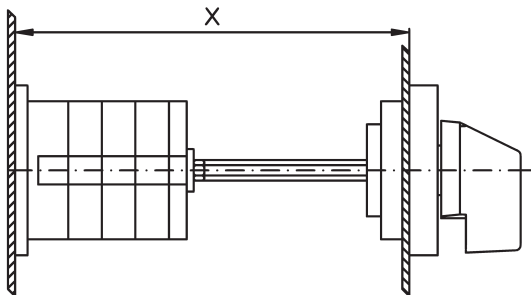
### Door coupling TKE, TK2E M10H, M20, N20, N33F



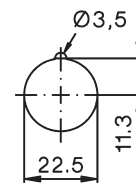
Mounting holes:  
TK, TKFR, TK2, TK2FR  
TKE, TK2E



### Door coupling, lockable TK2Z M10H, M20, N20, N33F



Mounting holes:  
TKZ



Further dimensions see pages 262 and 263.

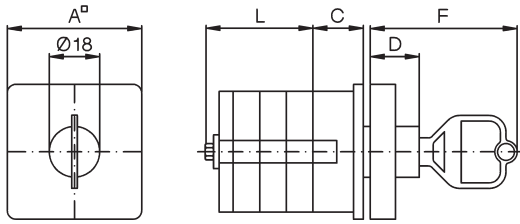
Dimension T is a minimum value dependent on switch Type and number of cells. For ordering dimension T is necessary

| Type         | A   | B   | C | D1 | D2 | Minimum dimension T with .. cells |       |       |       |       |       |       |       |
|--------------|-----|-----|---|----|----|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
|              |     |     |   |    |    | 1                                 | 2     | 3     | 4     | 5     | 6     | 7     | 8     |
| <b>M10H</b>  | 48  | 36  | 5 | 5  | 8  | 108                               | 117,5 | 127   | 136,5 | 146   | 155,5 | 165   | 174,5 |
| <b>M20</b>   | 48  | 36  | 5 | 5  | 8  | 100                               | 112,5 | 125   | 137,5 | 150   | 162,5 | 175   | 187,5 |
| <b>N20</b>   | 64  | 48  | 5 | 5  | 10 | 100                               | 112,5 | 125   | 137,5 | 150   | 162,5 | 175   | 187,5 |
| <b>N33F</b>  | 64  | 48  | 5 | 5  | 10 | 103                               | 118,5 | 134   | 149,5 | 165   | 180,5 | 196   | 211,5 |
| <b>N40</b>   | 88  | 48  | 7 | 6  | 12 | 134                               | 152   | 170   | 188   | 206   | 224   | 242   | 260   |
| <b>N61</b>   | 88  | 48  | 7 | 6  | 12 | 145,5                             | 175   | 245,5 | 234   | 263,5 | 293   | 322,5 | 352   |
| <b>N80</b>   | 88  | 48  | 7 | 6  | 12 | 145,5                             | 175   | 245,5 | 234   | 263,5 | 293   | 322,5 | 352   |
| <b>N100</b>  | 132 | 110 | 9 | 7  | 15 | 202                               | 232   | 262   | 292   | 322   | 352   | 382   | 412   |
| <b>N200</b>  | 132 | 110 | 9 | 7  | 15 | 212                               | 252   | 292   | 332   | 372   | 412   | 452   | 492   |
| <b>L100</b>  | 88  | 48  | 7 | 6  | 12 | -                                 | 152   | -     | 188   | -     | 224   | -     | 260   |
| <b>L160</b>  | 88  | 48  | 7 | 6  | 12 | 145,5                             | 175   | 245,5 | 234   | 263,5 | 293   | 322,5 | 352   |
| <b>L400</b>  | 132 | 110 | 9 | 7  | 15 | 212                               | 252   | 292   | 332   | 372   | 412   | 452   | 492   |
| <b>L600</b>  | 132 | 110 | 9 | 7  | 15 | -                                 | -     | 292   | -     | -     | 412   | -     | -     |
| <b>L800</b>  | 132 | 110 | 9 | 7  | 15 | -                                 | 252   | -     | 332   | -     | 412   | 452   | 492   |
| <b>L1200</b> | 132 | 110 | 9 | 7  | 15 | -                                 | -     | 292   | -     | -     | 412   | -     | -     |



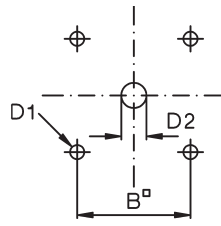
## Key operated switches SA

### Panel mounting E M10 - N61



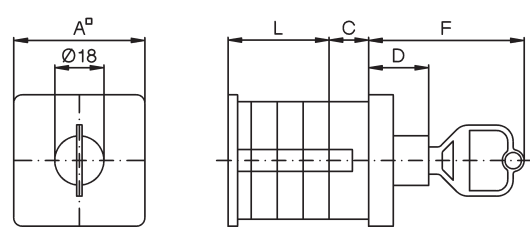
| Type      | A  | B  | C    | D    | D1 | D2   | F    |
|-----------|----|----|------|------|----|------|------|
| M10H, M20 | 48 | 36 | 18   | 17,5 | 5  | 18,5 | 52,5 |
| N20, N33F | 64 | 48 | 10   | 17,5 | 5  | 18,5 | 52,5 |
| N40, N61  | 88 | 68 | 23,5 | 15   | 6  | 18,5 | 50   |

### Mounting holes



Dimension L see page 262

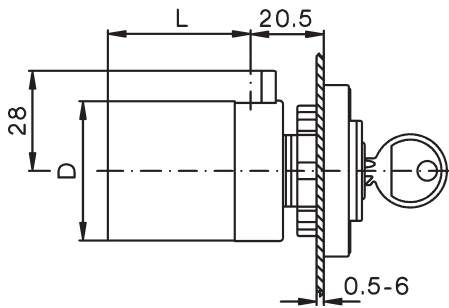
### Base mounting V M10 - N61



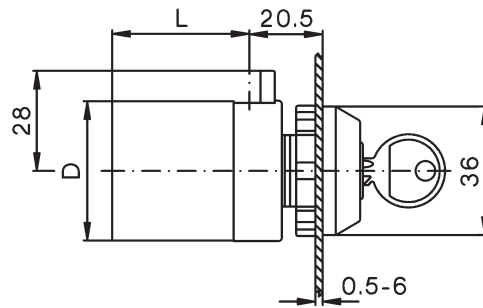
| Type      | A  | C  | D  | F  |
|-----------|----|----|----|----|
| M10H, M20 | 48 | 18 | 22 | 57 |
| N20, N33F | 64 | 8  | 22 | 57 |
| N40, N61  | 88 | 15 | 15 | 50 |

Dimension L see page 263

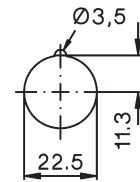
### Central fixing Z M10H Z ... + SA M20 Z ... + SA



### Central fixing without escutcheon plate ZO M10H ZO ... + SA M20 ZO ... + SA

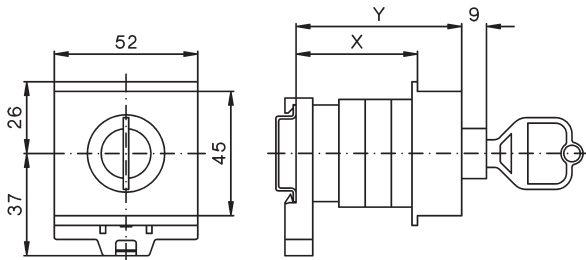


### Mounting holes:



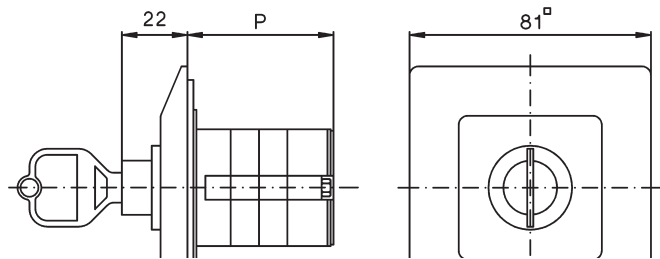
Further dimensions see page 262

### DIN rail mounting SMA M10H, M20



| Type | Dimension X with .. cells |    |    |    | Dimension Y with .. cells |    |    |     |
|------|---------------------------|----|----|----|---------------------------|----|----|-----|
|      | 1                         | 2  | 3  | 4  | 1                         | 2  | 3  | 4   |
| M10H | 44                        | 75 | 75 | 91 | 60                        | 90 | 90 | 107 |
| M20  | 59                        | 75 | 75 | 91 | 75                        | 90 | 90 | 107 |

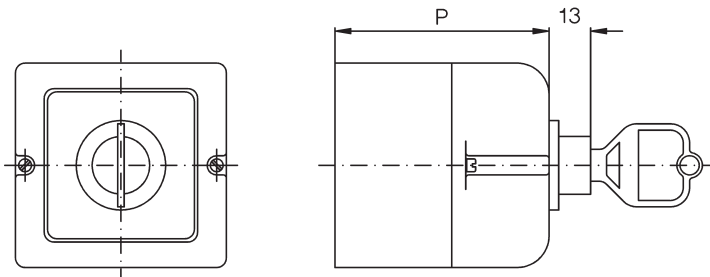
### Flush mounting UP M10 Plot 1:1,414



### Plastic enclosed switches P, PF M10, N20, N33F, N40, N61

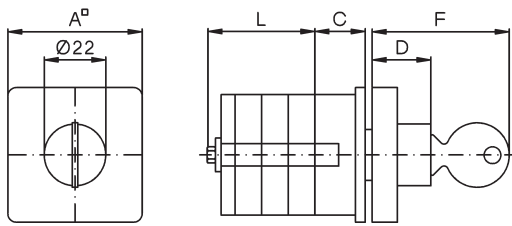
| Type | Dimension P with .. cells |     |     |     |
|------|---------------------------|-----|-----|-----|
|      | 1                         | 2   | 3   | 4   |
| M10  | 62                        | 71  | 81  | 90  |
| N20  | 66                        | 80  | 94  | 108 |
| N33F | 92                        | 110 | 110 | 128 |
| N40  | 92                        | 110 | -   | -   |
| N61  | 110                       | -   | -   | -   |

Further dimensions see page 264



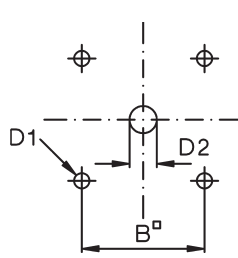
## Key operated switches

### Key operated switch SAK Panel mounting E M10H, M20

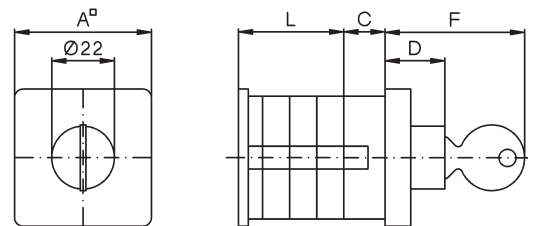


| Type      | A  | B  | C  | D  | D1 | D2   | F  |
|-----------|----|----|----|----|----|------|----|
| M10H, M20 | 48 | 36 | 25 | 21 | 5  | 22,5 | 49 |

### Mounting holes

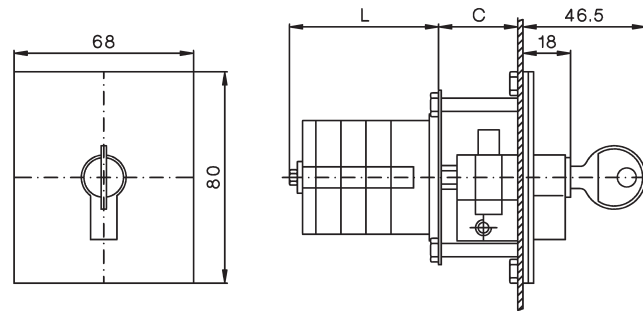


### Key operated switch SAK Base mounting V M10H, M20



| Type      | A  | C  | D  | F  |
|-----------|----|----|----|----|
| M10H, M20 | 48 | 25 | 21 | 49 |

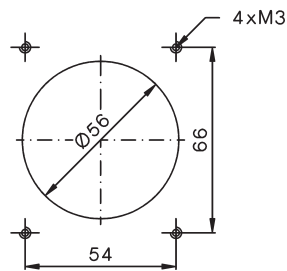
### Key operated switch SASI Panel mounting E M10, M20



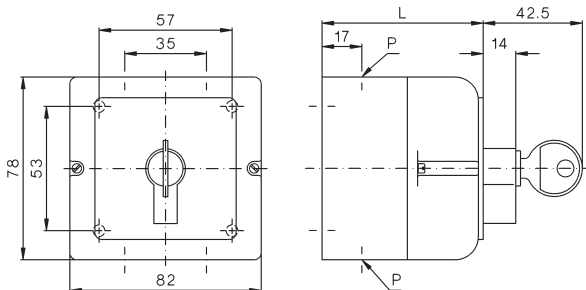
| Type | M10 | M20 |
|------|-----|-----|
| C    | 20  | 20  |

Dimension L see page 263

### Mounting holes M10, M20

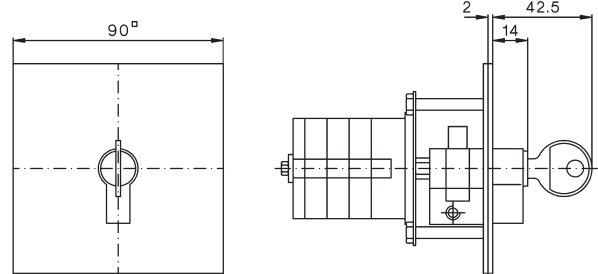


### Key operated switch SASI Plastic enclosed P M10, M20



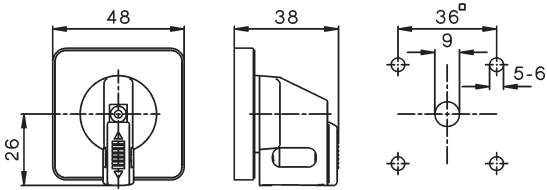
| Typ | Dimension P with .. cells |      |       |       | P     |
|-----|---------------------------|------|-------|-------|-------|
|     | 1                         | 2    | 3     | 4     |       |
| M10 | 67                        | 79,5 | 92    | 104,5 | 2xM20 |
| M20 | 79,5                      | 92   | 104,5 | 117   | 2xM20 |

### Key operated switch SASI Flush mounting UP M10, M20

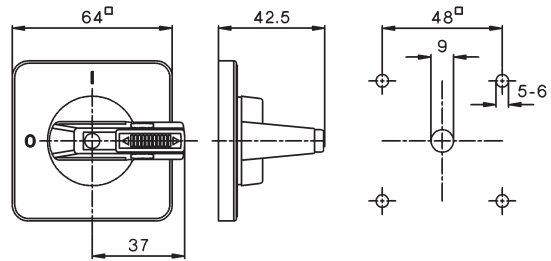


## Padlock devices

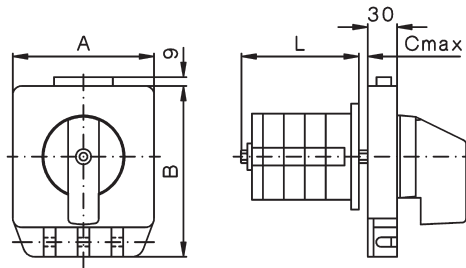
**Padlock device SV1** (max. 2 padlocks with stirrup  $\varnothing 6\text{mm}$ )  
**M10H, M20**  
**Mounting holes design E, V**



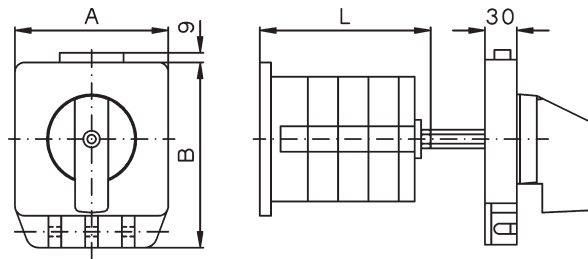
**Padlock device SV164**  
**M10H - N33F**  
**Mounting holes design E, V**



**Padlock device SV3** (max. 3 padlocks with stirrup  $\varnothing 8,5\text{mm}$ )  
**Panel mounting E**  
**N20 - N200, L100 - L1200**



**Base mounting V**  
**N20 - N200, L100 - L1200**

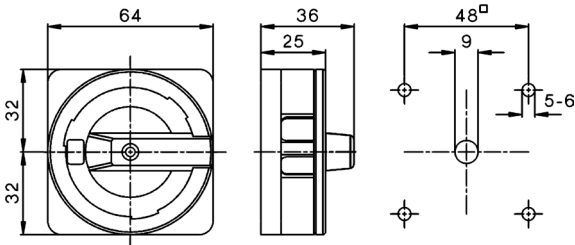


Further dimensions see page 263

| Type                                | A   | B   | C |
|-------------------------------------|-----|-----|---|
| N20, N33F                           | 102 | 128 | 5 |
| N40, N61, N80, L100, L160           | 102 | 128 | 7 |
| N100, N200, L400, L600, L800, L1200 | 132 | 159 | 9 |

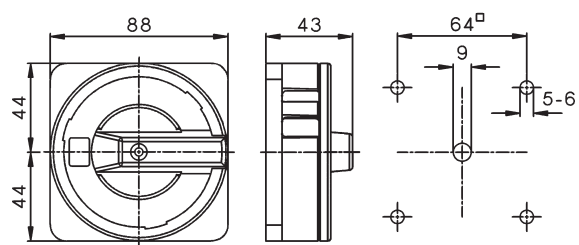
**Padlock device SV4** (max. 3 padlocks with stirrup  $\varnothing 6\text{mm}$ )  
**M10H - N33F**

**Mounting holes design E, V**

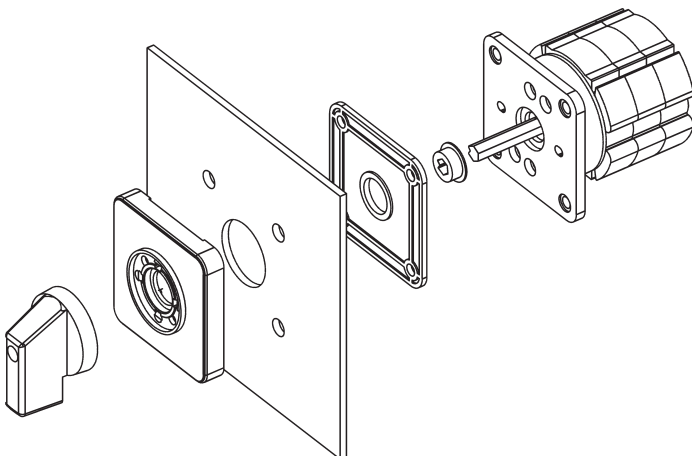


**Padlock device SV4** (max. 3 padlocks with stirrup  $\varnothing 6\text{mm}$ )  
**N40 - N80, L100 - L160**  
**Padlock device SV488**  
**N20, N33F**

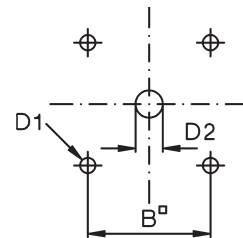
**Mounting holes design E, V**



**Front plate/switch shaft sealing FPWD**  
**N20, N33F**



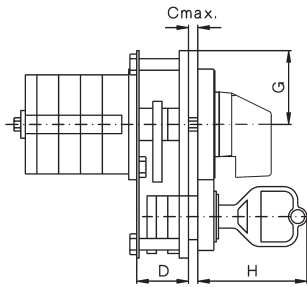
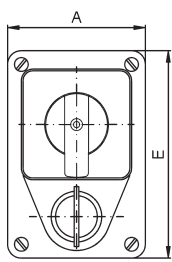
**Mounting holes**



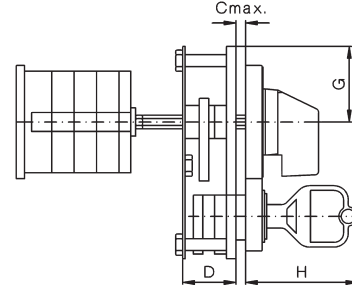
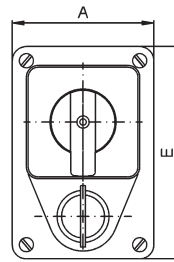
| Typ       | B  | D1 | D2 |
|-----------|----|----|----|
| N20, N33F | 48 | 5  | 17 |

## Interlocks, Moisture caps

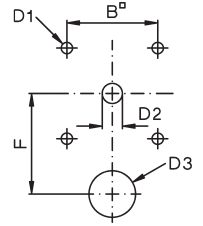
### Lock switch SZ, SZ2 Panel mounting E



### Base mounting V

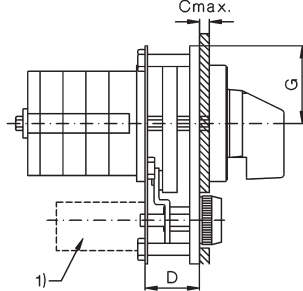
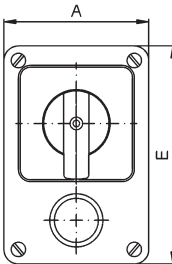


### Mounting holes

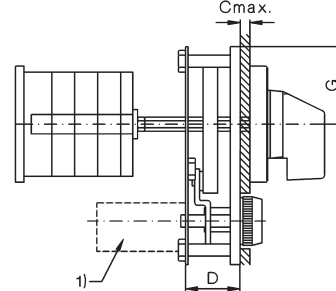
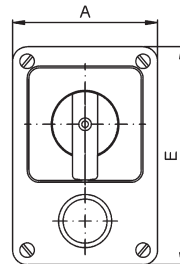


| Type                                | A   | B   | C | D    | D1 | D2 | D3   | E   | F  | G    | H    |
|-------------------------------------|-----|-----|---|------|----|----|------|-----|----|------|------|
| M10H, M20                           | 60  | 36  | 3 | 22,5 | 5  | 8  | 18,5 | 90  | 40 | 32   | 47,5 |
| N20, N33F                           | 60  | 36  | 3 | 22,5 | 5  | 12 | 18,5 | 90  | 45 | 32   | 47,5 |
| N40, N61, N80, L100, L160           | 90  | 68  | 4 | 24   | 6  | 12 | 18,5 | 142 | 61 | 61,5 | 48   |
| N100, N200, L400, L600, L800, L1200 | 140 | 110 | 4 | 27   | 7  | 15 | 18,5 | 180 | 83 | 90,5 | 49   |

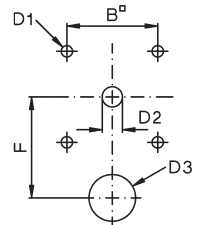
### Push-button switch lock DV Switch interlock with electrical contact ET Panel mounting E



### Base mounting V



### Mounting holes

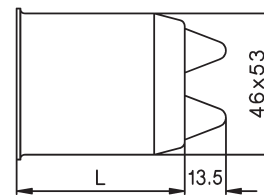
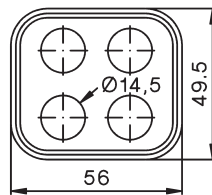


| Type                                | A   | B   | C | D    | D1 | D2 | D3 | E   | F  | G    |
|-------------------------------------|-----|-----|---|------|----|----|----|-----|----|------|
| M10H, M20                           | 60  | 36  | 3 | 22,5 | 5  | 8  | 26 | 90  | 45 | 32   |
| N20, N33F                           | 60  | 36  | 3 | 22,5 | 5  | 10 | 26 | 90  | 45 | 32   |
| N40, N601, N80, L100, L160          | 90  | 68  | 4 | 25   | 6  | 12 | 29 | 142 | 61 | 61,5 |
| N100, N200, L400, L600, L800, L1200 | 140 | 110 | 4 | 41   | 7  | 15 | 29 | 180 | 83 | 90,5 |

1) only at +ET

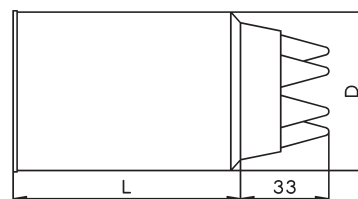
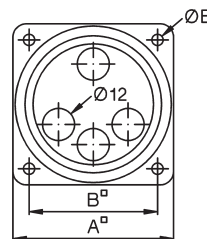
### Moisture proofing caps for panel switches FR M10H

| Type | Dimension L with .. cells |    |    |    |    |     |     |
|------|---------------------------|----|----|----|----|-----|-----|
|      | 1                         | 2  | 3  | 4  | 5  | 6   | 7   |
| M10H | 55                        | 55 | 75 | 75 | 88 | 106 | 106 |



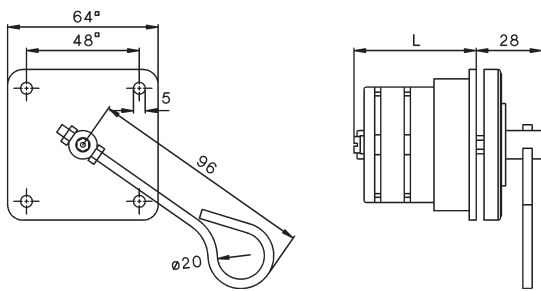
### Moisture proofing caps for panel switches FR N20, N40, N61

| Type | A  | B  | D  | E   | Dimension L with .. cells |    |     |     |    |
|------|----|----|----|-----|---------------------------|----|-----|-----|----|
|      |    |    |    |     | 1                         | 2  | 3   | 4   | 5  |
| N20  | 60 | 48 | 59 | 5,5 | 68                        | 68 | 68  | 91  | 91 |
| N40  | 87 | 68 | 83 | 5,5 | 82                        | 82 | 117 | 117 | -  |



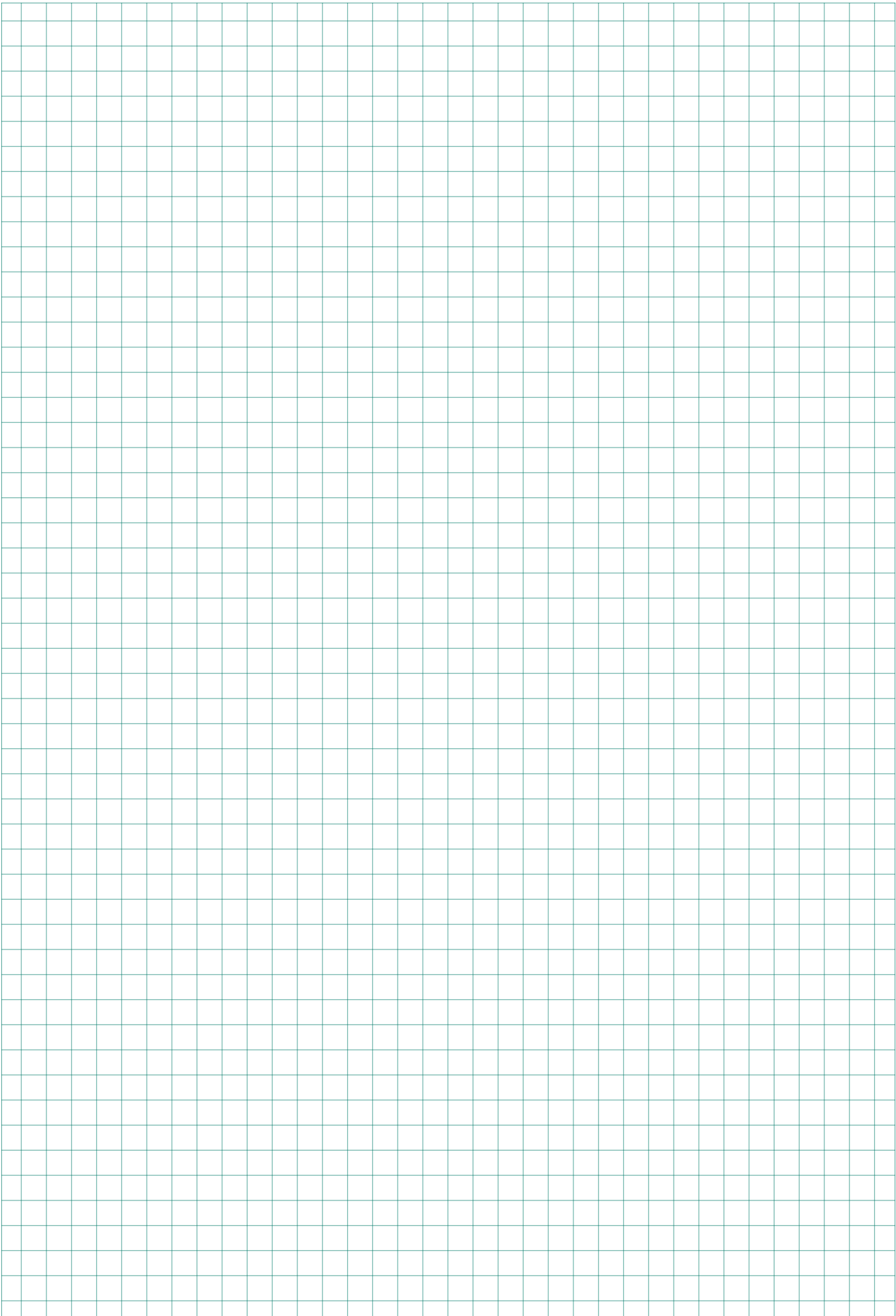
## Fire Brigade Switch




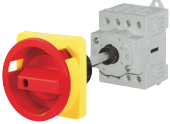










Neon safety switch N20 E .. +FEU, N33F E .. +FEU



Further dimensions see pages 262

|  |       |   |                  |
|--|-------|---|------------------|
| <b>Order sheet</b>   | D399E | <b>Cam switches with special switching program</b>  | <b>Customer:</b> |
| <b>Switch Type</b><br>M4H<br>M10<br>M10H<br>M10HD<br>M20<br>N20<br>N33F<br>N40<br>N61<br>N80<br>N100<br>N200   |       | <b>Handles</b><br>Instrument knob <b>G</b> (standard )<br>Twist knob <b>R</b> (standard N40 ->)<br>Toggle knob <b>K</b> (standard SMA)<br>Ball type handle <b>B</b><br>Hand wheel <b>HR</b> |                  |
| <b>Explanations:</b><br><b>Contact closed over several positions</b><br><b>Spring return from pos.</b>   |       | <b>Handle colour</b><br>black (standard)<br>red<br>grey (standard SMA)<br>white<br>cream-coloured<br>yellow<br>blue   |                  |
|  |       |   |                  |
| Connect. Terminals<br>Terminals Connect.   |       |   |                  |
| <b>Design</b><br>Panel mounting <b>E</b><br>Central fixing <b>Z</b><br>ZO<br>Base mounting <b>V</b><br>Snap-on mount. <b>SM</b><br>SMA<br>Plastic enclosure <b>P</b><br>IP54<br>PF |       | Degree  |                  |
| <b>Optional extras</b>   |       | Marking for switch positions  |                  |
| <b>Circular switch</b><br><b>Key removeable</b>  |       |   |                  |



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| Ratings |                                     |           |                        |                     |                     |                      |                       | Panel mounting<br>4 hole mount.<br>IP66 | Single hole mount.<br>Ø22,5mm<br>IP66 |      |                          |      |     |
|---------|-------------------------------------|-----------|------------------------|---------------------|---------------------|----------------------|-----------------------|---|---------------------------------------|------|--------------------------|------|-----|
| Type    | Rated current                       |           |                        | Motor               |                     |                      | Plate<br>Switch<br>mm | EH4                                     | EHN4                                  | EHN1 | Z                        | ZHN1 | ZH1 |
|         | Therm.<br>I <sub>th open</sub><br>A | AC21<br>A | at U <sub>e</sub><br>V | AC3<br>3~400V<br>kW | AC23<br>3~400V<br>A | AC23<br>3~400V<br>kW |                       |   |                                       |      |                          |      |     |
| LTS20   | 20                                  | 20        | 690                    | 5,5                 | 16                  | 7,5                  | 48□                   | LTS20 E <sup>1)</sup> ..                |                                       |      | LTS20 Z <sup>1)</sup> .. |      |     |
| LTS25   | 25                                  | 25        | 690                    | 7,5                 | 20                  | 10                   | 48□                   | LTS25 E <sup>1)</sup> ..                |                                       |      | LTS25 Z <sup>1)</sup> .. |      |     |
| LTS32   | 32                                  | 32        | 690                    | 11                  | 25                  | 12,5                 | 48□                   | LTS32 E <sup>1)</sup> ..                |                                       |      | LTS32 Z <sup>1)</sup> .. |      |     |
| LTS40   | 40                                  | 40        | 690                    | 15                  | 32                  | 16                   | 48□                   | LTS40 E <sup>1)</sup> ..                |                                       |      | LTS40 Z <sup>1)</sup> .. |      |     |
| LTS63   | 63                                  | 63        | 690                    | 18,5                | 45                  | 22                   | 48□                   | LTS63 E <sup>1)</sup> ..                |                                       |      | -                        |      |     |
| LTS80   | 80                                  | 80        | 690                    | 18,5                | 45                  | 22                   | 48□                   | LTS80 E <sup>1)</sup> ..                |                                       |      | -                        |      |     |
| LTS85   | 85                                  | 85        | 690                    | 22                  | 60                  | 30                   | 64□                   | LTS85 E <sup>1)</sup> ..                |                                       |      | -                        |      |     |
| LTS100  | 100                                 | 100       | 690                    | 30                  | 72                  | 37                   | 64□                   | LTS100 E <sup>1)</sup> ..               |                                       |      | -                        |      |     |
| LTS125  | 125                                 | 125       | 690                    | 37                  | 85                  | 45                   | 64□                   | LTS125 E <sup>1)</sup> ..               |                                       |      | -                        |      |     |
| LT160   | 160                                 | 160       | 690                    | 45                  | 110                 | 55                   | 88□                   | LT160 E <sup>1)</sup> ..                |                                       |      | -                        |      |     |

### Switch disconnecter LT.. 20 - 160A

Switch disconnectors are to be used as an ON-OFF-switch where a high breaking capacity with high contact pressure and in fact better short circuit behavior is necessary. These applications are:

**Main switches** according to IEC/EN 60204 respectively VDE0113 with interlocking device, terminal protection and restrictive contacts.

**Switch disconnectors** according to IEC/EN 60947-3 and VDE 0660 part 107 with break distance for 690V.

**Motor switches** 3-pole or 4-pole; according to IEC/EN 60947-3 respectively VDE 0660 part 107, motor switches series LT are dimensioned for switching high rated current AC3 and AC23A.

### Switch program

|                            |        |                  |
|----------------------------|--------|------------------|
| On-Off Switch 3-pole       | .. ... | A3               |
| On-Off Switch 4-pole       | .. ... | A4               |
| On-Off Switch 6-pole       | .. ... | A6               |
| On-Off Switch 8-pole       | .. ... | A8               |
| Changeover Switches 3-pole | .. ... | U3               |
| Changeover Switches 4-pole | .. ... | U4               |
| On-Off Switch 3-pole       | .. ... | T300 (for LT160) |
| On-Off Switch 4-pole       | .. ... | T400 (for LT160) |

### Mounting positions:

No limitations, all kind of positions allowed.

### Main switches and Main switches with Emergency-Stop function

According to standards IEC/EN60204 or VDE0113, all electrical equipment of industrial machines must be equipped with a main switch. This must permit disconnection of all the electrical equipment during cleaning, maintenance and repair work, and other extended periods when it is stationary. In case of two or more main switches, an interlock system must be used. It is recommended to use a multiple-pole main switch (cam switch).

**Main switches** have to correspond to:

- Switch disconnecter according to IEC/EN 60947-3 and VDE 0660 part 107 for utilization category AC23-B or DC-23B.
- Disconnectors are selected according to thermal rated current. They must possess a contact that ensures load switching via the contactors (see switching program A3-10). This contact must have a sufficient AC15 switching capacity.
- The interruption capacity of the switch must equal or exceed the locked rotor current of the largest motor plus the total current of all other electrical equipment in the circuit.

Requirements:

Interruption of the electrical equipment, with only on and off positions clearly marked with O and I.

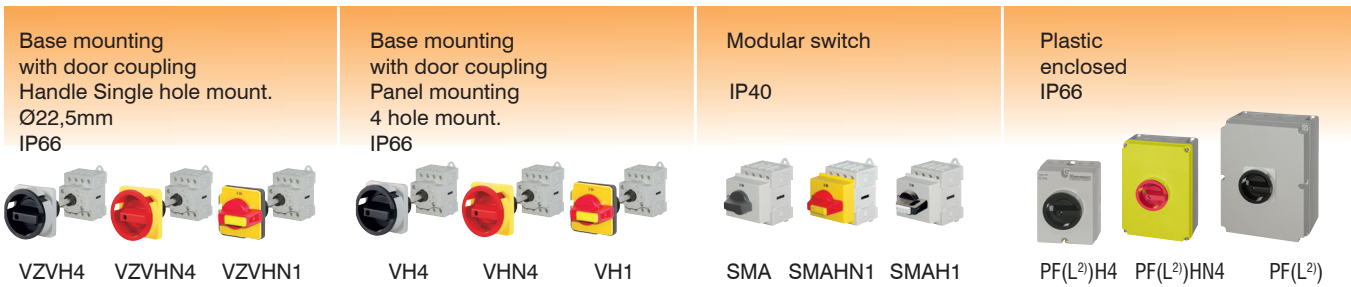
It must be lockable in the off setting.

The line terminals of the main switch must be protected according to utilization category IP2X.

Colour of handle black or grey.

**Main switches with Emergency-Off function** are additional supplied with red handles and contrasting yellow escutcheon plates.

1) Main Switches (H1/H4 Main Switches-Emergency-Stop (HN1/HN4))  
Switch Disconnectors (without H(N)1/4)



| VZVH4                       | VZVHN4 | VZVHN1 | VH4                       | VHN4 | VH1 | SMA                         | SMAHN1 | SMAH1 | PF(L <sup>2</sup> )H4                      | PF(L <sup>2</sup> )HN4 | PF(L <sup>2</sup> ) |
|-----------------------------|--------|--------|---------------------------|------|-----|-----------------------------|--------|-------|--|------------------------|---------------------|
| LTS20 VZV <sup>1)</sup> ..  |        |        | LTS20 V <sup>1)</sup> ..  |      |     | LTS20 SMA <sup>1)</sup> ..  |        |       | LTS20 PF(L <sup>2</sup> ) <sup>1)</sup> .. |                        |                     |
| LTS25 VZV <sup>1)</sup> ..  |        |        | LTS25 V <sup>1)</sup> ..  |      |     | LTS25 SMA <sup>1)</sup> ..  |        |       | LTS25 PF(L <sup>2</sup> ) <sup>1)</sup> .. |                        |                     |
| LTS32 VZV <sup>1)</sup> ..  |        |        | LTS32 V <sup>1)</sup> ..  |      |     | LTS32 SMA <sup>1)</sup> ..  |        |       | LTS32 PF(L <sup>2</sup> ) <sup>1)</sup> .. |                        |                     |
| LTS40 VZV <sup>1)</sup> ..  |        |        | LTS40 V <sup>1)</sup> ..  |      |     | LTS40 SMA <sup>1)</sup> ..  |        |       | LTS40 PF(L <sup>2</sup> ) <sup>1)</sup> .. |                        |                     |
| LTS63 VZV <sup>1)</sup> ..  |        |        | LTS63 V <sup>1)</sup> ..  |      |     | LTS63 SMA <sup>1)</sup> ..  |        |       | LTS63 PFL <sup>1)</sup> ..                 |                        |                     |
| LTS80 VZV <sup>1)</sup> ..  |        |        | LTS80 V <sup>1)</sup> ..  |      |     | LTS80 SMA <sup>1)</sup> ..  |        |       | LTS80 PFL <sup>1)</sup> ..                 |                        |                     |
| LTS85 VZV <sup>1)</sup> ..  |        |        | LTS85 V <sup>1)</sup> ..  |      |     | LTS85 SMA <sup>1)</sup> ..  |        |       | LTS85 PFL <sup>1)</sup> ..                 |                        |                     |
| LTS100 VZV <sup>1)</sup> .. |        |        | LTS100 V <sup>1)</sup> .. |      |     | LTS100 SMA <sup>1)</sup> .. |        |       | LTS100 PFL <sup>1)</sup> ..                |                        |                     |
| LTS125 VZV <sup>1)</sup> .. |        |        | LTS125 V <sup>1)</sup> .. |      |     | LTS125 SMA <sup>1)</sup> .. |        |       | LTS125 PFL <sup>1)</sup> ..                |                        |                     |
| -                           |        |        | LT160 V <sup>1)</sup> ..  |      |     | -                           |        |       | LT160 PF <sup>1)</sup> .. <sup>3)</sup>    |                        |                     |

### Approvals

| Area | USA, Canada / UL | Europe | Russia / EAC | CB/CCA-Certificates |
|------|------------------|--------|--------------|---------------------|
| Type |                  |        |              |                     |

**Switch disconnecter** (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)

| Model  | USA, Canada / UL | Europe | Russia / EAC | CB/CCA-Certificates | Notes  |
|--------|------------------|--------|--------------|---------------------|--|
| LTS20  | o                | /      | o            | o                   |  |
| LTS25  | o                | /      | o            | o                   |  |
| LTS32  | o                | /      | o            | o                   |  |
| LTS40  | o                | /      | o            | o                   |  |
| LTS63  | o                | /      | o            | o                   |  |
| LTS80  | o                | /      | o            | o                   |  |
| LTS85  | o                | /      | -            | -                   |  |
| LTS100 | o                | /      | -            | -                   | o in standard version approved<br>/ No testing required CE |
| LTS125 | o                | /      | -            | -                   | x in test  |
| LT160  | o                | /      | -            | o                   | - Not provided for test till now                           |









### Terminal screws

| Devices                     | Kind of connection   |             | Tightening torque |          | Protection class of terminals <sup>4)</sup> |
|-----------------------------|----------------------|-------------|-------------------|----------|---|
|                             | screw with clamp box | Screwdriver | Nm                | lb. inch |   |
| <b>Switch Disconnectors</b> |                      |             |                   |          |   |
| LTS20, LTS25                | M3,5                 | Pz2         | 1,7 - 2,3         | 15 - 20  | IP20  |
| LTS32, LTS40                | M5                   | Pz2         | 2,8 - 4           | 25 - 35  | IP20  |
| LTS63, LTS80                | M6                   | Pz2         | 1,7 - 4,5         | 15 - 40  | IP20  |
| LTS85, LTS100, LTS125       |                      |             |                   |          |   |
| LT160                       | M10                  |             | 14                | 124      | IP20  |

1) Main Switches (H1/H4 Main Switches-Emergency-Stop (HN1/HN4)) and Switch Disconnectors (without H(N)1/4)  
 2) PFL... larger enclosure  
 3) IP. Type..  
 4) Protection degree of the terminals with connected insulated conductor. Additional protection with terminal cover (KLAD).

Contactors, Motor-Starters  
 Circuit Breakers  
 Manual Motor-Starters  
 Switches  
 AC-Main Switches  
 DC-Switch Disconnecter  
 Push Buttons  
 Representatives, Suppliers

## Main Switches for Panel Mounting, lockable IP66, Type 3R

|   | max. padlocks   | AC21 690V | AC23 3x400V   | Plate              | Type            | Pack pcs. | Weight kg/pcs. |
|---|---|-----------|---------------|--------------------|-----------------|-----------|----------------|
| <b>3-pole, padlock device SV1</b>        |   |           |               |                    |                 |           |                |
|   |    | 20A       | <b>7,5kW</b>  | 48 □ <sup>1)</sup> | LTS20 EH1 A3    | 1         | 0,15           |
|   |   | 25A       | <b>10kW</b>   | 48 □ <sup>1)</sup> | LTS25 EH1 A3    | 1         | 0,15           |
|   |   | 32A       | <b>12,5kW</b> | 48 □ <sup>1)</sup> | LTS32 EH1 A3    | 1         | 0,15           |
|   |   | 40A       | <b>16kW</b>   | 48 □ <sup>1)</sup> | LTS40 EH1 A3    | 1         | 0,15           |
|   |   | 63A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS63 EH1 A3    | 1         | 0,17           |
|   |   | 80A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS80 EH1 A3    | 1         | 0,17           |
|   |   |           |               |                    |                 |           |                |
|   |   |           |               |                    |                 |           |                |
| <b>4-pole, padlock device SV1</b>        |   |           |               |                    |                 |           |                |
|   |    | 20A       | <b>7,5kW</b>  | 48 □ <sup>1)</sup> | LTS20 EH1 A4    | 1         | 0,19           |
|   |   | 25A       | <b>10kW</b>   | 48 □ <sup>1)</sup> | LTS25 EH1 A4    | 1         | 0,19           |
|   |   | 32A       | <b>12,5kW</b> | 48 □ <sup>1)</sup> | LTS32 EH1 A4    | 1         | 0,19           |
|   |   | 40A       | <b>16kW</b>   | 48 □ <sup>1)</sup> | LTS40 EH1 A4    | 1         | 0,19           |
|   |   | 63A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS63 EH1 A4    | 1         | 0,21           |
|   |   | 80A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS80 EH1 A4    | 1         | 0,21           |
|   |   |           |               |                    |                 |           |                |
|   |   |           |               |                    |                 |           |                |
| <b>3-pole, padlock device SV4(34)</b>   |   |           |               |                    |                 |           |                |
|   |    | 20A       | <b>7,5kW</b>  | 64 □ <sup>2)</sup> | LTS20 EH4 A3    | 1         | 0,17           |
|   |   | 25A       | <b>10kW</b>   | 64 □ <sup>2)</sup> | LTS25 EH4 A3    | 1         | 0,17           |
|   |   | 32A       | <b>12,5kW</b> | 64 □ <sup>2)</sup> | LTS32 EH4 A3    | 1         | 0,17           |
|   |   | 40A       | <b>16kW</b>   | 64 □ <sup>2)</sup> | LTS40 EH4 A3    | 1         | 0,17           |
|   |   | 63A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS63 EH4 A3    | 1         | 0,19           |
|   |   | 80A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS80 EH4 A3    | 1         | 0,19           |
|   |   | 80A       | <b>30kW</b>   | 64 □ <sup>2)</sup> | LTS85 EH4 A3    | 1         | 0,39           |
|   |   | 100A      | <b>37kW</b>   | 64 □ <sup>2)</sup> | LTS100 EH4 A3   | 1         | 0,39           |
|   |   | 125A      | <b>45kW</b>   | 64 □ <sup>2)</sup> | LTS125 EH4 A3   | 1         | 0,39           |
|   |   | 160A      | <b>55kW</b>   | 88 □               | LT160 EH34 T300 | 1         | 1,16           |
|   |   |           |               |                    |                 |           |                |
|   |   |           |               |                    |                 |           |                |
| <b>4-pole, padlock device SV4(34)</b>  |   |           |               |                    |                 |           |                |
|   |  | 20A       | <b>7,5kW</b>  | 64 □ <sup>2)</sup> | LTS20 EH4 A4    | 1         | 0,20           |
|   |   | 25A       | <b>10kW</b>   | 64 □ <sup>2)</sup> | LTS25 EH4 A4    | 1         | 0,20           |
|   |   | 32A       | <b>12,5kW</b> | 64 □ <sup>2)</sup> | LTS32 EH4 A4    | 1         | 0,20           |
|   |   | 40A       | <b>16kW</b>   | 64 □ <sup>2)</sup> | LTS40 EH4 A4    | 1         | 0,20           |
|   |   | 63A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS63 EH4 A4    | 1         | 0,23           |
|   |   | 80A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS80 EH4 A4    | 1         | 0,23           |
|   |   | 80A       | <b>30kW</b>   | 64 □ <sup>2)</sup> | LTS85 EH4 A4    | 1         | 0,44           |
|   |   | 100A      | <b>37kW</b>   | 64 □ <sup>2)</sup> | LTS100 EH4 A4   | 1         | 0,44           |
|   |   | 125A      | <b>45kW</b>   | 64 □ <sup>2)</sup> | LTS125 EH4 A4   | 1         | 0,44           |
|   |   | 160A      | <b>55kW</b>   | 88 □               | LT160 EH34 T400 | 1         | 1,55           |

**Add-on modules** see page 297



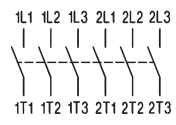


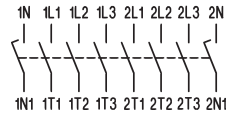

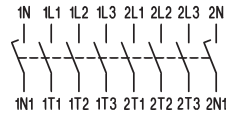
**Extended Switch Shaft for switches for panel mounting** type suffix **+VW"x"**

x = panel thickness



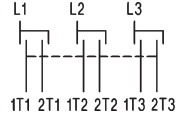


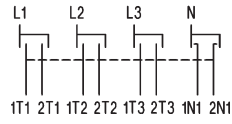

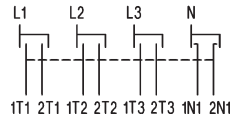
1) Types with padlock device 64 □ type suffix **64**, ordering example: LTS32 EH1**64** A3, on request

2) Types with padlock device 88 □ type suffix **88**, ordering example: LTS32 EH4**88** A3, on request



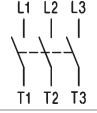


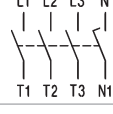

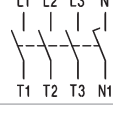
## Main Switches for Panel Mounting, lockable IP66, Type 3R

|   |   | max.<br>padlocks  | AC21<br>690V | AC23<br>3x400V | Plate | Type         | Pack<br>pcs. | Weigh<br>kg/pcs. |
|---|---|---|--------------|----------------|-------|--------------|--------------|------------------|
| <b>6-pole, padlock device SV4</b>  |   |  |              |                |       |              |              |                  |
|                                    |  |   | 20A          | <b>7,5kW</b>   | 64 □  | LTS20 EH4 A6 | 1            | 0,30             |
|   |   |   | 25A          | <b>10kW</b>    | 64 □  | LTS25 EH4 A6 | 1            | 0,30             |
|   |   |   | 32A          | <b>12,5kW</b>  | 64 □  | LTS32 EH4 A6 | 1            | 0,30             |
|   |   |   | 40A          | <b>16kW</b>    | 64 □  | LTS40 EH4 A6 | 1            | 0,30             |
|   |   |   | 63A          | <b>22kW</b>    | 64 □  | LTS63 EH4 A6 | 1            | 0,34             |
|   |   |   | 80A          | <b>22kW</b>    | 64 □  | LTS80 EH4 A6 | 1            | 0,34             |
| <b>8-pole, padlock device SV4</b>  |   |  |              |                |       |              |              |                  |
|                                    |  |   | 20A          | <b>7,5kW</b>   | 64 □  | LTS20 EH4 A8 | 1            | 0,38             |
|   |   |   | 25A          | <b>10kW</b>    | 64 □  | LTS25 EH4 A8 | 1            | 0,38             |
|   |   |   | 32A          | <b>12,5kW</b>  | 64 □  | LTS32 EH4 A8 | 1            | 0,38             |
|   |   |   | 40A          | <b>16kW</b>    | 64 □  | LTS40 EH4 A8 | 1            | 0,38             |
|   |   |   | 63A          | <b>22kW</b>    | 64 □  | LTS63 EH4 A8 | 1            | 0,42             |
|   |   |   | 80A          | <b>22kW</b>    | 64 □  | LTS80 EH4 A8 | 1            | 0,42             |

## Changeover Switches with padlockdevice for Panel Mounting, lockable IP66





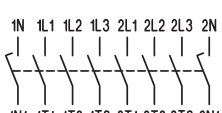
|   |   |   |     |               |      |              |   |      |
|---|---|---|-----|---------------|------|--------------|---|------|
| <b>3-pole, padlock device SV4</b>    |   |    |     |               |      |              |   |      |
|                                      |   |   | 20A | <b>7,5kW</b>  | 64 □ | LTS20 EH4 U3 | 1 | 0,30 |
|   |   |   | 25A | <b>10kW</b>   | 64 □ | LTS25 EH4 U3 | 1 | 0,30 |
|   |   |   | 32A | <b>12,5kW</b> | 64 □ | LTS32 EH4 U3 | 1 | 0,30 |
|   |   |   | 40A | <b>16kW</b>   | 64 □ | LTS40 EH4 U3 | 1 | 0,30 |
|   |   |   | 63A | <b>22kW</b>   | 64 □ | LTS63 EH4 U3 | 1 | 0,34 |
| <b>4-pole, padlock device SV4</b>  |   |  |     |               |      |              |   |      |
|                                    |  |   | 20A | <b>7,5kW</b>  | 64 □ | LTS20 EH4 U4 | 1 | 0,38 |
|   |   |   | 25A | <b>10kW</b>   | 64 □ | LTS25 EH4 U4 | 1 | 0,38 |
|   |   |   | 32A | <b>12,5kW</b> | 64 □ | LTS32 EH4 U4 | 1 | 0,38 |
|   |   |   | 40A | <b>16kW</b>   | 64 □ | LTS40 EH4 U4 | 1 | 0,38 |
|   |   |   | 63A | <b>22kW</b>   | 64 □ | LTS63 EH4 U4 | 1 | 0,42 |

## Main Switches for Single Hole Mounting IP66, Type 4X

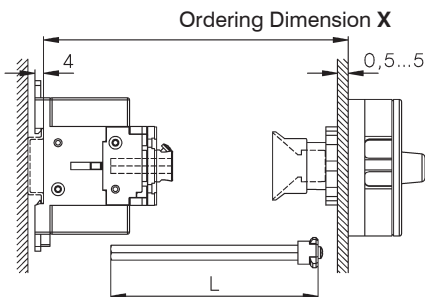
|   |   | max.<br>padlocks  | AC21<br>690V | AC23<br>3x400V | Plate | Type         | Pack<br>pcs. | Weigh<br>kg/pcs. |
|---|---|---|--------------|----------------|-------|--------------|--------------|------------------|
| <b>3-pole, padlock device SV1</b>  |   |  |              |                |       |              |              |                  |
|                                    |  |   | 20A          | <b>7,5kW</b>   | 48 □  | LTS20 ZH1 A3 | 1            | 0,16             |
|   |   |   | 25A          | <b>10kW</b>    | 48 □  | LTS25 ZH1 A3 | 1            | 0,16             |
|   |   |   | 32A          | <b>12,5kW</b>  | 48 □  | LTS32 ZH1 A3 | 1            | 0,16             |
|   |   |   | 40A          | <b>16kW</b>    | 48 □  | LTS40 ZH1 A3 | 1            | 0,16             |
| <b>4-pole, padlock device SV1</b>  |   |  |              |                |       |              |              |                  |
|                                    |  |   | 20A          | <b>7,5kW</b>   | 48 □  | LTS20 ZH1 A4 | 1            | 0,20             |
|   |   |   | 25A          | <b>10kW</b>    | 48 □  | LTS25 ZH1 A4 | 1            | 0,20             |
|   |   |   | 32A          | <b>12,5kW</b>  | 48 □  | LTS32 ZH1 A4 | 1            | 0,20             |
|   |   |   | 40A          | <b>16kW</b>    | 48 □  | LTS40 ZH1 A4 | 1            | 0,20             |

Add-on modules see page 297

Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting  
 Depth X is adjustable (delivered with X<sub>max</sub> see below), IP66,  Type 4X

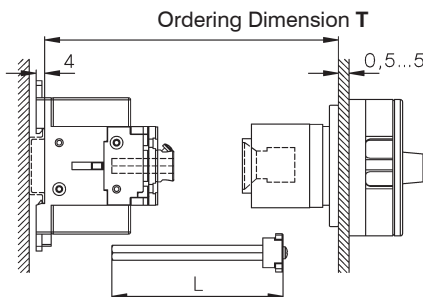
|   | max. padlocks | AC21 690V | AC23 3x400V   | Plate | Type  | Pack pcs. | Weight kg/pcs. |
|---|---------------|-----------|---------------|-------|---|-----------|----------------|
| <b>3-pole, padlock device SV4</b>    |               |           |               |       |   |           |                |
|   |               |           |               |       |    |           |                |
|   |               | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 VZVH4 A3  | 1         | 0,19           |
|   |               | 25A       | <b>10kW</b>   | 64 □  | LTS25 VZVH4 A3  | 1         | 0,19           |
|   |               | 32A       | <b>12,5kW</b> | 64 □  | LTS32 VZVH4 A3  | 1         | 0,19           |
|   |               | 40A       | <b>16kW</b>   | 64 □  | LTS40 VZVH4 A3  | 1         | 0,19           |
|   |               | 63A       | <b>22kW</b>   | 64 □  | LTS63 VZVH4 A3  | 1         | 0,22           |
|   |               | 80A       | <b>22kW</b>   | 64 □  | LTS80 VZVH4 A3  | 1         | 0,22           |
|   |               | 85A       | <b>30kW</b>   | 64 □  | LTS85 VZVH4 A3  | 1         | 0,40           |
|   |               | 100A      | <b>37kW</b>   | 64 □  | LTS100 VZVH4 A3   | 1         | 0,40           |
|   |               | 125A      | <b>45kW</b>   | 64 □  | LTS125 VZVH4 A3   | 1         | 0,40           |
| <b>4-pole, padlock device SV4</b>    |               |           |               |       |   |           |                |
|   |               |           |               |       |    |           |                |
|   |               | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 VZVH4 A4  | 1         | 0,20           |
|   |               | 25A       | <b>10kW</b>   | 64 □  | LTS25 VZVH4 A4  | 1         | 0,20           |
|   |               | 32A       | <b>12,5kW</b> | 64 □  | LTS32 VZVH4 A4  | 1         | 0,20           |
|   |               | 40A       | <b>16kW</b>   | 64 □  | LTS40 VZVH4 A4  | 1         | 0,20           |
|   |               | 63A       | <b>22kW</b>   | 64 □  | LTS63 VZVH4 A4  | 1         | 0,26           |
|   |               | 80A       | <b>22kW</b>   | 64 □  | LTS80 VZVH4 A4  | 1         | 0,26           |
|   |               | 85A       | <b>30kW</b>   | 64 □  | LTS85 VZVH4 A4  | 1         | 0,45           |
|   |               | 100A      | <b>37kW</b>   | 64 □  | LTS100 VZVH4 A4   | 1         | 0,45           |
|   |               | 125A      | <b>45kW</b>   | 64 □  | LTS125 VZVH4 A4   | 1         | 0,45           |
| <b>6-pole, padlock device SV4</b>  |               |           |               |       |   |           |                |
|   |               |           |               |       |  |           |                |
|   |               | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 VZVH4 A6  | 1         | 0,32           |
|   |               | 25A       | <b>10kW</b>   | 64 □  | LTS25 VZVH4 A6  | 1         | 0,32           |
|   |               | 32A       | <b>12,5kW</b> | 64 □  | LTS32 VZVH4 A6  | 1         | 0,32           |
|   |               | 40A       | <b>16kW</b>   | 64 □  | LTS40 VZVH4 A6  | 1         | 0,32           |
|   |               | 63A       | <b>22kW</b>   | 64 □  | LTS63 VZVH4 A6  | 1         | 0,37           |
|   |               | 80A       | <b>22kW</b>   | 64 □  | LTS80 VZVH4 A6  | 1         | 0,37           |
| <b>8-pole, padlock device SV4</b>  |               |           |               |       |   |           |                |
|   |               |           |               |       |  |           |                |
|   |               | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 VZVH4 A8  | 1         | 0,34           |
|   |               | 25A       | <b>10kW</b>   | 64 □  | LTS25 VZVH4 A8  | 1         | 0,34           |
|   |               | 32A       | <b>12,5kW</b> | 64 □  | LTS32 VZVH4 A8  | 1         | 0,34           |
|   |               | 40A       | <b>16kW</b>   | 64 □  | LTS40 VZVH4 A8  | 1         | 0,34           |
|   |               | 63A       | <b>22kW</b>   | 64 □  | LTS63 VZVH4 A8  | 1         | 0,45           |
|   |               | 80A       | <b>22kW</b>   | 64 □  | LTS80 VZVH4 A8  | 1         | 0,45           |

**Depth**  
 Single Hole Mounting Ø22mm  
 LTS.. VZV..



| Type            |           | X min | X max | L               |
|-----------------|-----------|-------|-------|-----------------|
| LTS20-80 VZV..  | 3, 4-pole | 91    | 190   | <b>X - 40±3</b> |
| LTS20-80 VZV..  | 6, 8-pole | 111   | 190   | <b>X - 60±3</b> |
| LTS85-125 VZV.. | 3, 4-pole | 95    | 190   | <b>X - 44±3</b> |



**4-Hole Mounting**  
 LTS.. V(H).. (3, 4-pole)


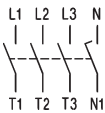


| Type           |  | T min | T max | L               | Type        | T min | T max |
|----------------|--|-------|-------|-----------------|-------------|-------|-------|
| LTS20-80 VH..  |  | 111   | 190   | <b>T - 60±3</b> | LTS160 VH.. | 120   | 450   |
| LTS85-125 VH.. |  | 115   | 190   | <b>T - 64±3</b> |             |       |       |


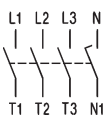
greater X- and T-Dimensions (max. 380mm for LTS..) on request

Main Switches, Base Mounting with Door Clutch, Padlock Device for 4-Hole Mounting  
 Depth T is adjustable (delivered with T<sub>max</sub> see page 282), IP66, cUL<sub>us</sub> Type 4X

|   | max. padlocks | AC21 690V | AC23 3x400V   | Plate              | Type            | Pack pcs. | Weight kg/pcs. |
|---|---------------|-----------|---------------|--------------------|-----------------|-----------|----------------|
| <b>3-pole, padlock device SV4(34)</b>   |               |           |               |                    |                 |           |                |
|   |               | 20A       | <b>7,5kW</b>  | 64 □ <sup>1)</sup> | LTS20 VH4 A3    | 1         | 0,20           |
|   |               | 25A       | <b>10kW</b>   | 64 □ <sup>1)</sup> | LTS25 VH4 A3    | 1         | 0,20           |
|   |               | 32A       | <b>12,5kW</b> | 64 □ <sup>1)</sup> | LTS32 VH4 A3    | 1         | 0,20           |
|   |               | 40A       | <b>16kW</b>   | 64 □ <sup>1)</sup> | LTS40 VH4 A3    | 1         | 0,20           |
|   |               | 63A       | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS63 VH4 A3    | 1         | 0,24           |
|   |               | 80A       | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS80 VH4 A3    | 1         | 0,24           |
|   |               | 85A       | <b>30kW</b>   | 64 □ <sup>1)</sup> | LTS85 VH4 A3    | 1         | 0,40           |
|   |               | 100A      | <b>37kW</b>   | 64 □ <sup>1)</sup> | LTS100 VH4 A3   | 1         | 0,40           |
|   |               | 125A      | <b>45kW</b>   | 64 □ <sup>1)</sup> | LTS125 VH4 A3   | 1         | 0,40           |
|   |               | 160A      | <b>55kW</b>   | 88 □               | LT160 VH34 T300 | 1         | 1,38           |

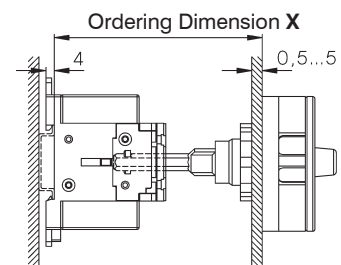
|   |  |      |               |                    |                 |   |      |
|---|--|------|---------------|--------------------|-----------------|---|------|
| <b>4-pole, padlock device SV4(34)</b>   |  |      |               |                    |                 |   |      |
|   |  | 20A  | <b>7,5kW</b>  | 64 □ <sup>1)</sup> | LTS20 VH4 A4    | 1 | 0,21 |
|   |  | 25A  | <b>10kW</b>   | 64 □ <sup>1)</sup> | LTS25 VH4 A4    | 1 | 0,21 |
|   |  | 32A  | <b>12,5kW</b> | 64 □ <sup>1)</sup> | LTS32 VH4 A4    | 1 | 0,21 |
|   |  | 40A  | <b>16kW</b>   | 64 □ <sup>1)</sup> | LTS40 VH4 A4    | 1 | 0,21 |
|   |  | 63A  | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS63 VH4 A4    | 1 | 0,28 |
|   |  | 80A  | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS80 VH4 A4    | 1 | 0,28 |
|   |  | 85A  | <b>30kW</b>   | 64 □ <sup>1)</sup> | LTS85 VH4 A4    | 1 | 0,45 |
|   |  | 100A | <b>37kW</b>   | 64 □ <sup>1)</sup> | LTS100 VH4 A4   | 1 | 0,45 |
|   |  | 125A | <b>45kW</b>   | 64 □ <sup>1)</sup> | LTS125 VH4 A4   | 1 | 0,45 |
|   |  | 160A | <b>55kW</b>   | 88 □               | LT160 VH34 T400 | 1 | 1,77 |

Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting  
 Depth X is not adjustable, declare depth X when ordering, IP66, cUL<sub>us</sub> Type 4X

|   |  |     |               |      |                   |   |      |
|---|--|-----|---------------|------|-------------------|---|------|
| <b>4-pole, padlock device SV4</b>   |  |     |               |      |                   |   |      |
|   |  | 20A | <b>7,5kW</b>  | 64 □ | LTS20 VZH4 A4 X.. | 1 | 0,18 |
|   |  | 25A | <b>10kW</b>   | 64 □ | LTS25 VZH4 A4 X.. | 1 | 0,18 |
|   |  | 32A | <b>12,5kW</b> | 64 □ | LTS32 VZH4 A4 X.. | 1 | 0,18 |
|   |  | 40A | <b>16kW</b>   | 64 □ | LTS40 VZH4 A4 X.. | 1 | 0,18 |
|   |  | 63A | <b>22kW</b>   | 64 □ | LTS63 VZH4 A4 X.. | 1 | 0,25 |
|   |  | 80A | <b>22kW</b>   | 64 □ | LTS80 VZH4 A4 X.. | 1 | 0,25 |

Declare depth X when ordering

| Type       | Preference values for X               |
|------------|---------------------------------------|
| LT.. VZH.. | 80, 85, 104, 129 (tolerance -3, +1,5) |



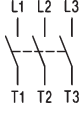




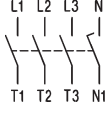
Add-on modules see page 297



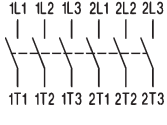
1) Types with padlock device 88 'type suffix **88**, ordering example: LTS32 VHN**488** A3, on request



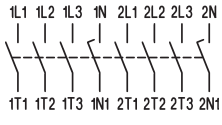


# Main Switches for Distribution Boards, lockable IP40, Open Type


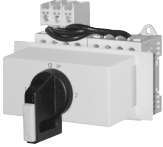
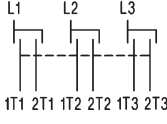
|   |   | max. padlocks | AC21 690V | AC23 3x400V     | Plate | Type                         | Pack pcs. | Weight kg/pcs. |
|---|---|---------------|-----------|-----------------|-------|------------------------------|-----------|----------------|
| <b>3-pole, padlock device SV1</b>  |   |               |           |                 |       |                              |           |                |
|                                    |  |               | 20A       | <b>7,5kW</b>    | 52x45 | LTS20 SMAH1 A3 <sup>2)</sup> | 1         | 0,15           |
|   |   |               | 25A       | <b>10kW</b>     | 52x45 | LTS25 SMAH1 A3 <sup>2)</sup> | 1         | 0,15           |
|   |   |               | 32A       | <b>12,5kW</b>   | 52x45 | LTS32 SMAH1 A3 <sup>2)</sup> | 1         | 0,15           |
|   |   |               | 40A       | <b>16kW</b>     | 52x45 | LTS40 SMAH1 A3 <sup>2)</sup> | 1         | 0,15           |
|   |   |               | 63A       | <b>22kW</b>     | 52x45 | LTS63 SMAH1 A3 <sup>2)</sup> | 1         | 0,18           |
|   |   |               | 80A       | <b>22kW</b>     | 52x45 | LTS80 SMAH1 A3 <sup>2)</sup> | 1         | 0,18           |
|   |   |               | 85A       | <b>30kW</b>     | 78x45 | LTS85 SMAH1 A3               | 1         | 0,37           |
|   |   |               | 100A      | <b>37kW</b>     | 78x45 | LTS100 SMAH1 A3              | 1         | 0,37           |
|   | 125A  | <b>45kW</b>   | 78x45     | LTS125 SMAH1 A3 | 1     | 0,37                         |           |                |



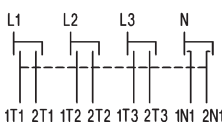
|   |   |             |       |                 |       |                              |   |      |
|---|---|-------------|-------|-----------------|-------|------------------------------|---|------|
| <b>4-pole, padlock device SV1</b>  |   |             |       |                 |       |                              |   |      |
|                                    |  |             | 20A   | <b>7,5kW</b>    | 52x45 | LTS20 SMAH1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 25A   | <b>10kW</b>     | 52x45 | LTS25 SMAH1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 32A   | <b>12,5kW</b>   | 52x45 | LTS32 SMAH1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 40A   | <b>16kW</b>     | 52x45 | LTS40 SMAH1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 63A   | <b>22kW</b>     | 52x45 | LTS63 SMAH1 A4 <sup>2)</sup> | 1 | 0,21 |
|   |   |             | 80A   | <b>22kW</b>     | 52x45 | LTS80 SMAH1 A4 <sup>2)</sup> | 1 | 0,21 |
|   |   |             | 85A   | <b>30kW</b>     | 78x45 | LTS85 SMAH1 A4               | 1 | 0,42 |
|   |   |             | 100A  | <b>37kW</b>     | 78x45 | LTS100 SMAH1 A4              | 1 | 0,42 |
|   | 125A  | <b>45kW</b> | 78x45 | LTS125 SMAH1 A4 | 1     | 0,42                         |   |      |

|   |   |  |     |               |       |                              |   |      |
|---|---|--|-----|---------------|-------|------------------------------|---|------|
| <b>6-pole, padlock device SV1 (64)</b>  |   |  |     |               |       |                              |   |      |
|                                        |  |  | 20A | <b>7,5kW</b>  | 52x45 | LTS20 SMAH1 A6               | 1 | 0,29 |
|   |   |  | 25A | <b>10kW</b>   | 52x45 | LTS25 SMAH1 A6               | 1 | 0,29 |
|   |   |  | 32A | <b>12,5kW</b> | 52x45 | LTS32 SMAH1 A6               | 1 | 0,29 |
|   |   |  | 40A | <b>16kW</b>   | 52x45 | LTS40 SMAH1 A6               | 1 | 0,29 |
|   |   |  | 63A | <b>22kW</b>   | 97x45 | LTS63 SMAH1 A6 <sup>1)</sup> | 1 | 0,34 |
|   |   |  | 80A | <b>22kW</b>   | 97x45 | LTS80 SMAH1 A6 <sup>1)</sup> | 1 | 0,34 |

|   |   |  |     |               |        |                |   |      |
|---|---|--|-----|---------------|--------|----------------|---|------|
| <b>8-pole, padlock device SV164</b>  |   |  |     |               |        |                |   |      |
|                                      |  |  | 20A | <b>7,5kW</b>  | 97x45  | LTS20 SMAH1 A8 | 1 | 0,31 |
|   |   |  | 25A | <b>10kW</b>   | 97x45  | LTS25 SMAH1 A8 | 1 | 0,31 |
|   |   |  | 32A | <b>12,5kW</b> | 97x45  | LTS32 SMAH1 A8 | 1 | 0,31 |
|   |   |  | 40A | <b>16kW</b>   | 97x45  | LTS40 SMAH1 A8 | 1 | 0,31 |
|   |   |  | 63A | <b>22kW</b>   | 126x45 | LTS63 SMAH1 A8 | 1 | 0,42 |
|   |   |  | 80A | <b>22kW</b>   | 126x45 | LTS80 SMAH1 A8 | 1 | 0,42 |

## Changeover Switch with Padlock Device for Distribution Boards, lockable



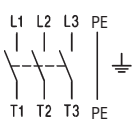


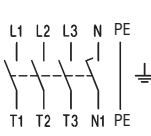


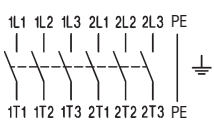


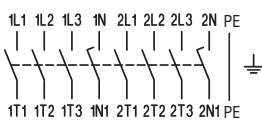


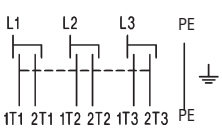


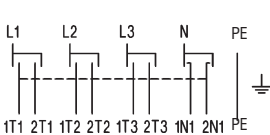
|   |   |  |     |               |       |                |   |      |
|---|---|--|-----|---------------|-------|----------------|---|------|
| <b>3-pole, padlock device SV164</b>  |   |  |     |               |       |                |   |      |
|                                      |  |  | 20A | <b>7,5kW</b>  | 97x45 | LTS20 SMAH1 U3 | 1 | 0,29 |
|   |   |  | 25A | <b>10kW</b>   | 97x45 | LTS25 SMAH1 U3 | 1 | 0,29 |
|   |   |  | 32A | <b>12,5kW</b> | 97x45 | LTS32 SMAH1 U3 | 1 | 0,29 |
|   |   |  | 40A | <b>16kW</b>   | 97x45 | LTS40 SMAH1 U3 | 1 | 0,29 |
|   |   |  | 63A | <b>22kW</b>   | 97x45 | LTS63 SMAH1 U3 | 1 | 0,34 |

|   |   |  |     |               |        |                |   |      |
|---|---|--|-----|---------------|--------|----------------|---|------|
| <b>4-pole, padlock device SV164</b>  |   |  |     |               |        |                |   |      |
|                                      |  |  | 20A | <b>7,5kW</b>  | 97x45  | LTS20 SMAH1 U4 | 1 | 0,31 |
|   |   |  | 25A | <b>10kW</b>   | 97x45  | LTS25 SMAH1 U4 | 1 | 0,31 |
|   |   |  | 32A | <b>12,5kW</b> | 97x45  | LTS32 SMAH1 U4 | 1 | 0,31 |
|   |   |  | 40A | <b>16kW</b>   | 97x45  | LTS40 SMAH1 U4 | 1 | 0,31 |
|   |   |  | 63A | <b>22kW</b>   | 126x45 | LTS63 SMAH1 U4 | 1 | 0,42 |

1) With padlock device SV164

2) Emergency-Stop-Main Switches for Distribution Boards, lockable with low height handle, IP40  
Type with Type-suffix „+SV1N“ e.g.: **LTS40 SMAHN1 A3 +SV1N**






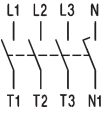





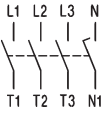
# Maintenance and Safety Switches, in Plastic Enclosure, lockable IP66, Type 4X

|   | max. padlocks   | AC21 690V                       | AC23 3x400V   | Plate | Type                           | Pack pcs. | Weight kg/pcs. |
|---|---|---------------------------------|---------------|-------|--------------------------------|-----------|----------------|
| <b>3-pole, padlock device SV4(34)</b>  |   |                                 |               |       |                                |           |                |
|                                        |    | 20A                             | <b>7,5kW</b>  | 64 □  | LTS20 PF(L <sup>1</sup> )H4 A3 | 1         | 0,32           |
|   |   | 25A                             | <b>10kW</b>   | 64 □  | LTS25 PF(L <sup>1</sup> )H4 A3 | 1         | 0,32           |
|   |   | 32A                             | <b>12,5kW</b> | 64 □  | LTS32 PF(L <sup>1</sup> )H4 A3 | 1         | 0,32           |
|   |   | 40A                             | <b>16kW</b>   | 64 □  | LTS40 PF(L <sup>1</sup> )H4 A3 | 1         | 0,32           |
|   |   | 63A                             | <b>22kW</b>   | 64 □  | LTS63 PFLH4 A3                 | 1         | 0,60           |
|   |   | 80A                             | <b>22kW</b>   | 64 □  | LTS80 PFLH4 A3                 | 1         | 0,60           |
|   |   | 85A                             | <b>30kW</b>   | 64 □  | LTS85 PFLH4 A3                 | 1         | 0,78           |
|   |   | 100A                            | <b>37kW</b>   | 64 □  | LTS100 PFLH4 A3                | 1         | 0,78           |
|   |   | 125A                            | <b>45kW</b>   | 64 □  | LTS125 PFLH4 A3                | 1         | 0,78           |
|   |   | 160A                            | <b>55kW</b>   | 88 □  | LT160 PFH34 T300               | 1         | 2,09           |
| Larger enclosure<br>Type: ..PFL..   | on request  |                                 |               |       |                                |           |                |
| <b>4-pole, padlock device SV4(34)</b>  |   |                                 |               |       |                                |           |                |
|                                        |    | 20A                             | <b>7,5kW</b>  | 64 □  | LTS20 PF(L <sup>1</sup> )H4 A4 | 1         | 0,33           |
|   |   | 25A                             | <b>10kW</b>   | 64 □  | LTS25 PF(L <sup>1</sup> )H4 A4 | 1         | 0,33           |
|   |   | 32A                             | <b>12,5kW</b> | 64 □  | LTS32 PF(L <sup>1</sup> )H4 A4 | 1         | 0,33           |
|   |   | 40A                             | <b>16kW</b>   | 64 □  | LTS40 PF(L <sup>1</sup> )H4 A4 | 1         | 0,33           |
|   |   | 63A                             | <b>22kW</b>   | 64 □  | LTS63 PFLH4 A4                 | 1         | 0,64           |
|   |   | 80A                             | <b>22kW</b>   | 64 □  | LTS80 PFLH4 A4                 | 1         | 0,64           |
|   |   | 85A                             | <b>30kW</b>   | 64 □  | LTS85 PFLH4 A4                 | 1         | 0,83           |
|   |   | 100A                            | <b>37kW</b>   | 64 □  | LTS100 PFLH4 A4                | 1         | 0,83           |
|   |   | 125A                            | <b>45kW</b>   | 64 □  | LTS125 PFLH4 A4                | 1         | 0,83           |
|   |   | 160A                            | <b>55kW</b>   | 88 □  | LT160 PFH34 T400               | 1         | 2,47           |
| Larger enclosure<br>Type appendix +PF3<br>+PF3/M50  | on request<br>on request  |                                 |               |       |                                |           |                |
| <b>6-pole, padlock device SV4</b>     |   |                                 |               |       |                                |           |                |
|                                      |  | 20A                             | <b>7,5kW</b>  | 64 □  | LTS20 PFLH4 A6                 | 1         | 1,39           |
|   |   | 25A                             | <b>10kW</b>   | 64 □  | LTS25 PFLH4 A6                 | 1         | 1,39           |
|   |   | 32A                             | <b>12,5kW</b> | 64 □  | LTS32 PFLH4 A6                 | 1         | 1,39           |
|   |   | 40A                             | <b>16kW</b>   | 64 □  | LTS40 PFLH4 A6                 | 1         | 1,39           |
|   |   | 63A                             | <b>22kW</b>   | 64 □  | LTS63 PFLH4 A6                 | 1         | 1,42           |
|   |   | 80A                             | <b>22kW</b>   | 64 □  | LTS80 PFLH4 A6                 | 1         | 1,42           |
|   |   | knockoutlets M50/40<br>+PF3/M50 | on request    |       |                                |           |                |
| <b>8-pole, padlock device SV4</b>    |   |                                 |               |       |                                |           |                |
|                                      |  | 20A                             | <b>7,5kW</b>  | 64 □  | LTS20 PFLH4 A8                 | 1         | 1,44           |
|   |   | 25A                             | <b>10kW</b>   | 64 □  | LTS25 PFLH4 A8                 | 1         | 1,44           |
|   |   | 32A                             | <b>12,5kW</b> | 64 □  | LTS32 PFLH4 A8                 | 1         | 1,44           |
|   |   | 40A                             | <b>16kW</b>   | 64 □  | LTS40 PFLH4 A8                 | 1         | 1,44           |
|   |   | 63A                             | <b>22kW</b>   | 64 □  | LTS63 PFLH4 A8                 | 1         | 1,50           |
|   |   | 80A                             | <b>22kW</b>   | 64 □  | LTS80 PFLH4 A8                 | 1         | 1,50           |
|   |   | knockoutlets M50/40<br>+PF3/M50 | on request    |       |                                |           |                |
| <b>Changeover Switch with Padlock Device, lockable</b>  |   |                                 |               |       |                                |           |                |
| <b>3-pole, padlock device SV4</b>    |   |                                 |               |       |                                |           |                |
|                                      |  | 20A                             | <b>7,5kW</b>  | 64 □  | LTS20 PFLH4 U3                 | 1         | 1,39           |
|   |   | 25A                             | <b>10kW</b>   | 64 □  | LTS25 PFLH4 U3                 | 1         | 1,39           |
|   |   | 32A                             | <b>12,5kW</b> | 64 □  | LTS32 PFLH4 U3                 | 1         | 1,39           |
|   |   | 40A                             | <b>16kW</b>   | 64 □  | LTS40 PFLH4 U3                 | 1         | 1,39           |
|   |   | 63A                             | <b>22kW</b>   | 64 □  | LTS63 PFLH4 U3                 | 1         | 1,42           |
| <b>4-pole, padlock device SV4</b>    |   |                                 |               |       |                                |           |                |
|                                      |  | 20A                             | <b>7,5kW</b>  | 64 □  | LTS20 PFLH4 U4                 | 1         | 1,44           |
|   |   | 25A                             | <b>10kW</b>   | 64 □  | LTS25 PFLH4 U4                 | 1         | 1,44           |
|   |   | 32A                             | <b>12,5kW</b> | 64 □  | LTS32 PFLH4 U4                 | 1         | 1,44           |
|   |   | 40A                             | <b>16kW</b>   | 64 □  | LTS40 PFLH4 U4                 | 1         | 1,44           |
|   |   | 63A                             | <b>22kW</b>   | 64 □  | LTS63 PFLH4 U4                 | 1         | 1,50           |

1) PFL.... larger enclosure



## Emergency-Stop-Main Switches for Panel Mounting, lockable IP66, Type 3R

|   | max. padlocks   | AC21 690V | AC23 3x400V   | Plate              | Type  | Pack pcs. | Weighth kg/pcs. |
|---|---|-----------|---------------|--------------------|---|-----------|-----------------|
| <b>3-pole, padlock device SV1</b>        |   |           |               |                    |   |           |                 |
|   |    | 20A       | <b>7,5kW</b>  | 48 □ <sup>1)</sup> | LTS20 EHN1 A3   | 1         | 0,15            |
|   |   | 25A       | <b>10kW</b>   | 48 □ <sup>1)</sup> | LTS25 EHN1 A3   | 1         | 0,15            |
|   |   | 32A       | <b>12,5kW</b> | 48 □ <sup>1)</sup> | LTS32 EHN1 A3   | 1         | 0,15            |
|   |   | 40A       | <b>16kW</b>   | 48 □ <sup>1)</sup> | LTS40 EHN1 A3   | 1         | 0,15            |
|   |   | 63A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS63 EHN1 A3   | 1         | 0,17            |
|   |   | 80A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS80 EHN1 A3   | 1         | 0,17            |
|   |   |           |               |                    |    |           |                 |
| <b>4-pole, padlock device SV1</b>        |   |           |               |                    |   |           |                 |
|   |    | 20A       | <b>7,5kW</b>  | 48 □ <sup>1)</sup> | LTS20 EHN1 A4   | 1         | 0,19            |
|   |   | 25A       | <b>10kW</b>   | 48 □ <sup>1)</sup> | LTS25 EHN1 A4   | 1         | 0,19            |
|   |   | 32A       | <b>12,5kW</b> | 48 □ <sup>1)</sup> | LTS32 EHN1 A4   | 1         | 0,19            |
|   |   | 40A       | <b>16kW</b>   | 48 □ <sup>1)</sup> | LTS40 EHN1 A4   | 1         | 0,19            |
|   |   | 63A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS63 EHN1 A4   | 1         | 0,21            |
|   |   | 80A       | <b>22kW</b>   | 48 □ <sup>1)</sup> | LTS80 EHN1 A4   | 1         | 0,21            |
|   |   |           |               |                    |    |           |                 |
| <b>3-pole, padlock device SV4(34)</b>   |   |           |               |                    |   |           |                 |
|   |    | 20A       | <b>7,5kW</b>  | 64 □ <sup>2)</sup> | LTS20 EHN4 A3   | 1         | 0,17            |
|   |   | 25A       | <b>10kW</b>   | 64 □ <sup>2)</sup> | LTS25 EHN4 A3   | 1         | 0,17            |
|   |   | 32A       | <b>12,5kW</b> | 64 □ <sup>2)</sup> | LTS32 EHN4 A3   | 1         | 0,17            |
|   |   | 40A       | <b>16kW</b>   | 64 □ <sup>2)</sup> | LTS40 EHN4 A3   | 1         | 0,17            |
|   |   | 63A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS63 EHN4 A3   | 1         | 0,19            |
|   |   | 80A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS80 EHN4 A3   | 1         | 0,19            |
|   |   | 85A       | <b>30kW</b>   | 64 □ <sup>2)</sup> | LTS85 EHN4 A3   | 1         | 0,39            |
|   |   | 100A      | <b>37kW</b>   | 64 □ <sup>2)</sup> | LTS100 EHN4 A3  | 1         | 0,39            |
|   |   | 125A      | <b>45kW</b>   | 64 □ <sup>2)</sup> | LTS125 EHN4 A3  | 1         | 0,39            |
|   |   | 160A      | <b>55kW</b>   | 88 □               | LT160 EHN34 T300  | 1         | 1,16            |
|   |   |           |               |                    |   |           |                 |
| <b>4-pole, padlock device SV4(34)</b>  |   |           |               |                    |   |           |                 |
|   |  | 20A       | <b>7,5kW</b>  | 64 □ <sup>2)</sup> | LTS20 EHN4 A4   | 1         | 0,20            |
|   |   | 25A       | <b>10kW</b>   | 64 □ <sup>2)</sup> | LTS25 EHN4 A4   | 1         | 0,20            |
|   |   | 32A       | <b>12,5kW</b> | 64 □ <sup>2)</sup> | LTS32 EHN4 A4   | 1         | 0,20            |
|   |   | 40A       | <b>16kW</b>   | 64 □ <sup>2)</sup> | LTS40 EHN4 A4   | 1         | 0,20            |
|   |   | 63A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS63 EHN4 A4   | 1         | 0,23            |
|   |   | 80A       | <b>22kW</b>   | 64 □ <sup>2)</sup> | LTS80 EHN4 A4   | 1         | 0,23            |
|   |   | 85A       | <b>30kW</b>   | 64 □ <sup>2)</sup> | LTS85 EHN4 A4   | 1         | 0,44            |
|   |   | 100A      | <b>37kW</b>   | 64 □ <sup>2)</sup> | LTS100 EHN4 A4  | 1         | 0,44            |
|   |   | 125A      | <b>45kW</b>   | 64 □ <sup>2)</sup> | LTS125 EHN4 A4  | 1         | 0,44            |
|   |   | 160A      | <b>55kW</b>   | 88 □               | LT160 EHN34 T400  | 1         | 1,55            |
|   |   |           |               |                    |  |           |                 |

**Add-on modules** see page 297

**Extended Switch Shaft for switches for panel mounting**


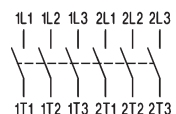

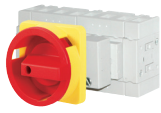
type suffix +VW"x"

x = panel thickness

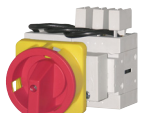
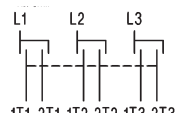

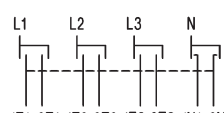
1) Types with padlock device 64 type suffix **64**, ordering example: LTS32 EHN1**64** A3, on request

2) Types with padlock device 88 type suffix **88**, ordering example: LTS32 EHN**88** A3, on request


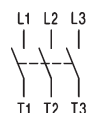


## Emergency-Stop-Main Switches for Panel Mounting, lockable IP66, Type 3R

|   | max. padlocks   | AC21<br>690V | AC23<br>3x400V | Plate | Type          | Pack pcs. | Weight kg/pcs. |
|---|---|--------------|----------------|-------|---------------|-----------|----------------|
| <b>6-pole, padlock device SV4</b>  |   |              |                |       |               |           |                |
|   |  | 20A          | <b>7,5kW</b>   | 64 □  | LTS20 EHN4 A6 | 1         | 0,30           |
|   |   | 25A          | <b>10kW</b>    | 64 □  | LTS25 EHN4 A6 | 1         | 0,30           |
|   |   | 32A          | <b>12,5kW</b>  | 64 □  | LTS32 EHN4 A6 | 1         | 0,30           |
|   |   | 40A          | <b>16kW</b>    | 64 □  | LTS40 EHN4 A6 | 1         | 0,30           |
|   |   | 63A          | <b>22kW</b>    | 64 □  | LTS63 EHN4 A6 | 1         | 0,34           |
|   |   | 80A          | <b>22kW</b>    | 64 □  | LTS80 EHN4 A6 | 1         | 0,34           |
| <b>8-pole, padlock device SV4</b>  |   |              |                |       |               |           |                |
|   |  | 20A          | <b>7,5kW</b>   | 64 □  | LTS20 EHN4 A8 | 1         | 0,38           |
|   |   | 25A          | <b>10kW</b>    | 64 □  | LTS25 EHN4 A8 | 1         | 0,38           |
|   |   | 32A          | <b>12,5kW</b>  | 64 □  | LTS32 EHN4 A8 | 1         | 0,38           |
|   |   | 40A          | <b>16kW</b>    | 64 □  | LTS40 EHN4 A8 | 1         | 0,38           |
|   |   | 63A          | <b>22kW</b>    | 64 □  | LTS63 EHN4 A8 | 1         | 0,42           |
|   |   | 80A          | <b>22kW</b>    | 64 □  | LTS80 EHN4 A8 | 1         | 0,42           |

## Changeover Switch with Padlock Device for Panel Mounting, lockable IP66

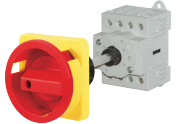
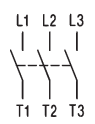
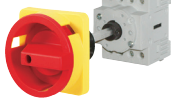
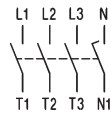

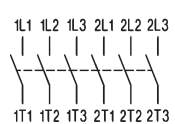
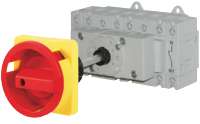
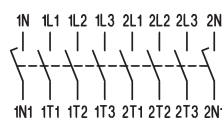
|   |   |     |               |      |               |   |      |
|---|---|-----|---------------|------|---------------|---|------|
| <b>3-pole, padlock device SV4</b>    |   |     |               |      |               |   |      |
|   |    | 20A | <b>7,5kW</b>  | 64 □ | LTS20 EHN4 U3 | 1 | 0,30 |
|   |   | 25A | <b>10kW</b>   | 64 □ | LTS25 EHN4 U3 | 1 | 0,30 |
|   |   | 32A | <b>12,5kW</b> | 64 □ | LTS32 EHN4 U3 | 1 | 0,30 |
|   |   | 40A | <b>16kW</b>   | 64 □ | LTS40 EHN4 U3 | 1 | 0,30 |
|   |   | 63A | <b>22kW</b>   | 64 □ | LTS63 EHN4 U3 | 1 | 0,34 |
| <b>4-pole, padlock device SV4</b>  |   |     |               |      |               |   |      |
|   |  | 20A | <b>7,5kW</b>  | 64 □ | LTS20 EHN4 U4 | 1 | 0,38 |
|   |   | 25A | <b>10kW</b>   | 64 □ | LTS25 EHN4 U4 | 1 | 0,38 |
|   |   | 32A | <b>12,5kW</b> | 64 □ | LTS32 EHN4 U4 | 1 | 0,38 |
|   |   | 40A | <b>16kW</b>   | 64 □ | LTS40 EHN4 U4 | 1 | 0,38 |
|   |   | 63A | <b>22kW</b>   | 64 □ | LTS63 EHN4 U4 | 1 | 0,42 |

## Main Switches Emergency-Stop for Single Hole Mounting, lockable IP66 Type 4X

|   | max. padlocks   | AC21<br>690V | AC23<br>3x400V | Plate | Type          | Pack pcs. | Weight kg/pcs. |
|---|---|--------------|----------------|-------|---------------|-----------|----------------|
| <b>3-pole, padlock device SV1</b>  |   |              |                |       |               |           |                |
|   |  | 20A          | <b>7,5kW</b>   | 48 □  | LTS20 ZHN1 A3 | 1         | 0,16           |
|   |   | 25A          | <b>10kW</b>    | 48 □  | LTS25 ZHN1 A3 | 1         | 0,16           |
|   |   | 32A          | <b>12,5kW</b>  | 48 □  | LTS32 ZHN1 A3 | 1         | 0,16           |
|   |   | 40A          | <b>16kW</b>    | 48 □  | LTS40 ZHN1 A3 | 1         | 0,16           |
| <b>4-pole, padlock device SV1</b>  |   |              |                |       |               |           |                |
|   |  | 20A          | <b>7,5kW</b>   | 48 □  | LTS20 ZHN1 A4 | 1         | 0,20           |
|   |   | 25A          | <b>10kW</b>    | 48 □  | LTS25 ZHN1 A4 | 1         | 0,20           |
|   |   | 32A          | <b>12,5kW</b>  | 48 □  | LTS32 ZHN1 A4 | 1         | 0,20           |
|   |   | 40A          | <b>16kW</b>    | 48 □  | LTS40 ZHN1 A4 | 1         | 0,20           |

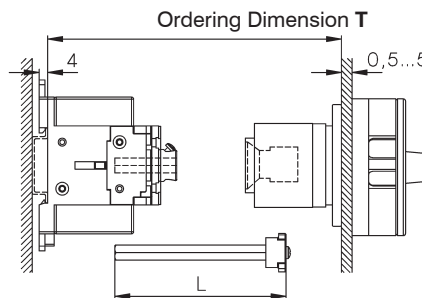
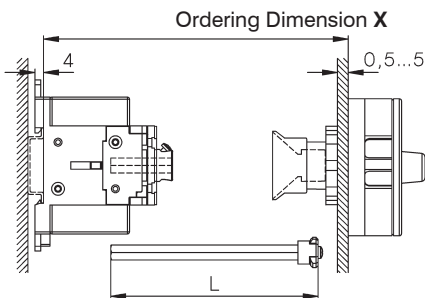
Add-on modules see page 295

Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting  
 Depth X is adjustable (delivered with X<sub>max</sub> see below), IP66, cUL<sub>us</sub> Type 4X

|   | max. padlocks | AC21 690V   | AC23 3x400V   | Plate            | Type            | Pack pcs. | Weight kg/pcs. |
|---|---------------|-------------|---------------|------------------|-----------------|-----------|----------------|
| <b>3-pole, padlock device SV4</b>   |               |             |               |                  |                 |           |                |
|       | 3             | 20A         | <b>7,5kW</b>  | 64 □             | LTS20 VZVHN4 A3 | 1         | 0,19           |
|   |               | 25A         | <b>10kW</b>   | 64 □             | LTS25 VZVHN4 A3 | 1         | 0,19           |
|   |               | 32A         | <b>12,5kW</b> | 64 □             | LTS32 VZVHN4 A3 | 1         | 0,19           |
|   |               | 40A         | <b>16kW</b>   | 64 □             | LTS40 VZVHN4 A3 | 1         | 0,19           |
|   |               | 63A         | <b>22kW</b>   | 64 □             | LTS63 VZVHN4 A3 | 1         | 0,22           |
|   |               | 80A         | <b>22kW</b>   | 64 □             | LTS80 VZVHN4 A3 | 1         | 0,22           |
|   |               | 85A         | <b>30kW</b>   | 64 □             | LTS85 VZVHN4 A3 | 1         | 0,40           |
|   | 100A          | <b>37kW</b> | 64 □          | LTS100 VZVHN4 A3 | 1               | 0,40      |                |
|   | 125A          | <b>45kW</b> | 64 □          | LTS125 VZVHN4 A3 | 1               | 0,40      |                |
| <b>4-pole, padlock device SV4</b>   |               |             |               |                  |                 |           |                |
|       | 3             | 20A         | <b>7,5kW</b>  | 64 □             | LTS20 VZVHN4 A4 | 1         | 0,20           |
|   |               | 25A         | <b>10kW</b>   | 64 □             | LTS25 VZVHN4 A4 | 1         | 0,20           |
|   |               | 32A         | <b>12,5kW</b> | 64 □             | LTS32 VZVHN4 A4 | 1         | 0,20           |
|   |               | 40A         | <b>16kW</b>   | 64 □             | LTS40 VZVHN4 A4 | 1         | 0,20           |
|   |               | 63A         | <b>22kW</b>   | 64 □             | LTS63 VZVHN4 A4 | 1         | 0,26           |
|   |               | 80A         | <b>22kW</b>   | 64 □             | LTS80 VZVHN4 A4 | 1         | 0,26           |
|   |               | 85A         | <b>30kW</b>   | 64 □             | LTS85 VZVHN4 A4 | 1         | 0,45           |
|   | 100A          | <b>37kW</b> | 64 □          | LTS100 VZVHN4 A4 | 1               | 0,45      |                |
|   | 125A          | <b>45kW</b> | 64 □          | LTS125 VZVHN4 A4 | 1               | 0,45      |                |
| <b>6-pole, padlock device SV4</b>   |               |             |               |                  |                 |           |                |
|   | 3             | 20A         | <b>7,5kW</b>  | 64 □             | LTS20 VZVHN4 A6 | 1         | 0,32           |
|   |               | 25A         | <b>10kW</b>   | 64 □             | LTS25 VZVHN4 A6 | 1         | 0,32           |
|   |               | 32A         | <b>12,5kW</b> | 64 □             | LTS32 VZVHN4 A6 | 1         | 0,32           |
|   |               | 40A         | <b>16kW</b>   | 64 □             | LTS40 VZVHN4 A6 | 1         | 0,32           |
|   |               | 63A         | <b>22kW</b>   | 64 □             | LTS63 VZVHN4 A6 | 1         | 0,37           |
|   |               | 80A         | <b>22kW</b>   | 64 □             | LTS80 VZVHN4 A6 | 1         | 0,37           |
| <b>8-pole, padlock device SV4</b>   |               |             |               |                  |                 |           |                |
|   | 3             | 20A         | <b>7,5kW</b>  | 64 □             | LTS20 VZVHN4 A8 | 1         | 0,34           |
|   |               | 25A         | <b>10kW</b>   | 64 □             | LTS25 VZVHN4 A8 | 1         | 0,34           |
|   |               | 32A         | <b>12,5kW</b> | 64 □             | LTS32 VZVHN4 A8 | 1         | 0,34           |
|   |               | 40A         | <b>16kW</b>   | 64 □             | LTS40 VZVHN4 A8 | 1         | 0,34           |
|   |               | 63A         | <b>22kW</b>   | 64 □             | LTS63 VZVHN4 A8 | 1         | 0,45           |
|   | 80A           | <b>22kW</b> | 64 □          | LTS80 VZVHN4 A8  | 1               | 0,45      |                |

**Depth**  
 Single Hole Mounting Ø22mm  
 LTS.. VZV..

**4-Hole Mounting**  
 LTS.. V(HN).. (3, 4-pole)

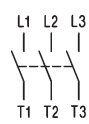


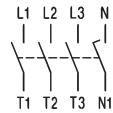
| Type            |            | X min | X max | L               |
|-----------------|------------|-------|-------|-----------------|
| LTS20-80 VZV..  | 3, 4-polig | 91 -  | 190   | <b>X - 40±3</b> |
| LTS20-80 VZV..  | 6, 8-polig | 111 - | 190   | <b>X - 60±3</b> |
| LTS85-125 VZV.. | 3, 4-polig | 95-   | 190   | <b>X - 44±3</b> |


| Type           | T min | T max | L               | Type       | T min | T max |
|----------------|-------|-------|-----------------|------------|-------|-------|
| LTS20-80 VH..  | 111 - | 190   | <b>T - 60±3</b> | LT160 VH.. | 120 - | 450   |
| LTS85-125 VH.. | 115 - | 190   | <b>T - 64±3</b> |            |       |       |

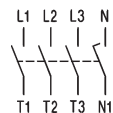
Greater X- and T-Dimensions (max. 380mm for LTS..) on request

Emergency-Stop-Main Switches, Base Mounting with Door Clutch, Padlock Device for 4-Hole Mounting, Depth T is adjustable (delivered with T<sub>max</sub> see page 282), IP66,  Type 4X

|   | max. padlocks | AC21 690V   | AC23 3x400V   | Schild             | Type           | Pack pcs. | Weight kg/pcs. |
|---|---------------|-------------|---------------|--------------------|----------------|-----------|----------------|
| <b>3-pole, padlock device SV4(34)</b>  |               |             |               |                    |                |           |                |
|   |               | 20A         | <b>7,5kW</b>  | 64 □ <sup>1)</sup> | LTS20 VHN4 A3  | 1         | 0,20           |
|   |               | 25A         | <b>10kW</b>   | 64 □ <sup>1)</sup> | LTS25 VHN4 A3  | 1         | 0,20           |
|   |               | 32A         | <b>12,5kW</b> | 64 □ <sup>1)</sup> | LTS32 VHN4 A3  | 1         | 0,20           |
|   |               | 40A         | <b>16kW</b>   | 64 □ <sup>1)</sup> | LTS40 VHN4 A3  | 1         | 0,20           |
|   |               | 63A         | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS63 VHN4 A3  | 1         | 0,24           |
|   |               | 80A         | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS80 VHN4 A3  | 1         | 0,24           |
|   |               | 85A         | <b>30kW</b>   | 64 □ <sup>1)</sup> | LTS85 VHN4 A3  | 1         | 0,40           |
|   |               | 100A        | <b>37kW</b>   | 64 □ <sup>1)</sup> | LTS100 VHN4 A3 | 1         | 0,40           |
|   |               | 125A        | <b>45kW</b>   | 64 □ <sup>1)</sup> | LTS125 VHN4 A3 | 1         | 0,40           |
|   | 160A          | <b>55kW</b> | 88 □          | LT160 VHN34 T300   | 1              | 1,38      |                |

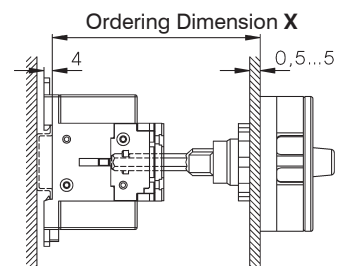
|   |  |      |               |                    |                  |   |      |
|---|--|------|---------------|--------------------|------------------|---|------|
| <b>4-pole, padlock device SV4(34)</b>  |  | 20A  | <b>7,5kW</b>  | 64 □ <sup>1)</sup> | LTS20 VHN4 A4    | 1 | 0,21 |
|   |  | 25A  | <b>10kW</b>   | 64 □ <sup>1)</sup> | LTS25 VHN4 A4    | 1 | 0,21 |
|   |  | 32A  | <b>12,5kW</b> | 64 □ <sup>1)</sup> | LTS32 VHN4 A4    | 1 | 0,21 |
|   |  | 40A  | <b>16kW</b>   | 64 □ <sup>1)</sup> | LTS40 VHN4 A4    | 1 | 0,21 |
|   |  | 63A  | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS63 VHN4 A4    | 1 | 0,28 |
|   |  | 80A  | <b>22kW</b>   | 64 □ <sup>1)</sup> | LTS80 VHN4 A4    | 1 | 0,28 |
|   |  | 85A  | <b>30kW</b>   | 64 □ <sup>1)</sup> | LTS85 VHN4 A4    | 1 | 0,45 |
|   |  | 100A | <b>37kW</b>   | 64 □ <sup>1)</sup> | LTS100 VHN4 A4   | 1 | 0,45 |
|   |  | 125A | <b>45kW</b>   | 64 □ <sup>1)</sup> | LTS125 VHN4 A4   | 1 | 0,45 |
|   |  | 160A | <b>55kW</b>   | 88 □               | LT160 VHN34 T400 | 1 | 1,77 |

Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting Depth X is not adjustable, declare depth X when ordering, IP66,  Type 4x

|   |  |     |               |      |                    |   |      |
|---|--|-----|---------------|------|--------------------|---|------|
| <b>4-pole, padlock device SV4</b>  |  | 20A | <b>7,5kW</b>  | 64 □ | LTS20 VZHN4 A4 X.. | 1 | 0,18 |
|   |  | 25A | <b>10kW</b>   | 64 □ | LTS25 VZHN4 A4 X.. | 1 | 0,18 |
|   |  | 32A | <b>12,5kW</b> | 64 □ | LTS32 VZHN4 A4 X.. | 1 | 0,18 |
|   |  | 40A | <b>16kW</b>   | 64 □ | LTS40 VZHN4 A4 X.. | 1 | 0,18 |
|   |  | 63A | <b>22kW</b>   | 64 □ | LTS63 VZHN4 A4 X.. | 1 | 0,25 |
|   |  | 80A | <b>22kW</b>   | 64 □ | LTS80 VZHN4 A4 X.. | 1 | 0,25 |

Declare depth X when ordering



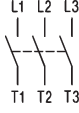
| Type        | Preference values for X               |
|-------------|---------------------------------------|
| LTS.. VZH.. | 80, 85, 104, 129 (tolerance -3, +1,5) |



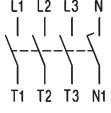



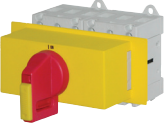
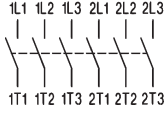
Add-on modules see page 297



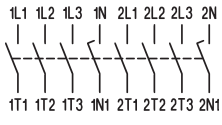
1) Types with padlock device 88 'type suffix **88**, ordering example: LTS32 VHN**488** A3, on request

# Emergency-Stop-Main Switches for Distribution Boards, lockable IP40, Open Type


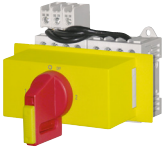
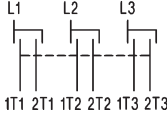
|   |   | max.<br>padlocks | AC21<br>690V | AC23<br>3x400V   | Plate | Type                          | Pack<br>pcs. | Weight<br>kg/pcs. |
|---|---|------------------|--------------|------------------|-------|-------------------------------|--------------|-------------------|
| <b>3-pole, padlock device SV1</b>  |   |                  |              |                  |       |                               |              |                   |
|                                    |  |                  | 20A          | <b>7,5kW</b>     | 52x45 | LTS20 SMAHN1 A3 <sup>2)</sup> | 1            | 0,15              |
|   |   |                  | 25A          | <b>10kW</b>      | 52x45 | LTS25 SMAHN1 A3 <sup>2)</sup> | 1            | 0,15              |
|   |   |                  | 32A          | <b>12,5kW</b>    | 52x45 | LTS32 SMAHN1 A3 <sup>2)</sup> | 1            | 0,15              |
|   |   |                  | 40A          | <b>16kW</b>      | 52x45 | LTS40 SMAHN1 A3 <sup>2)</sup> | 1            | 0,15              |
|   |   |                  | 63A          | <b>22kW</b>      | 52x45 | LTS63 SMAHN1 A3 <sup>2)</sup> | 1            | 0,18              |
|   |   |                  | 80A          | <b>22kW</b>      | 52x45 | LTS80 SMAHN1 A3 <sup>2)</sup> | 1            | 0,18              |
|   |   |                  | 85A          | <b>30kW</b>      | 78x45 | LTS85 SMAHN1 A3               | 1            | 0,37              |
|   |   |                  | 100A         | <b>37kW</b>      | 78x45 | LTS100 SMAHN1 A3              | 1            | 0,37              |
|   | 125A  | <b>45kW</b>      | 78x45        | LTS125 SMAHN1 A3 | 1     | 0,37                          |              |                   |


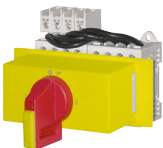
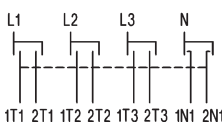
|   |   |             |       |                  |       |                               |   |      |
|---|---|-------------|-------|------------------|-------|-------------------------------|---|------|
| <b>4-pole, padlock device SV1</b>  |   |             |       |                  |       |                               |   |      |
|                                    |  |             | 20A   | <b>7,5kW</b>     | 52x45 | LTS20 SMAHN1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 25A   | <b>10kW</b>      | 52x45 | LTS25 SMAHN1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 32A   | <b>12,5kW</b>    | 52x45 | LTS32 SMAHN1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 40A   | <b>16kW</b>      | 52x45 | LTS40 SMAHN1 A4 <sup>2)</sup> | 1 | 0,16 |
|   |   |             | 63A   | <b>22kW</b>      | 52x45 | LTS63 SMAHN1 A4 <sup>2)</sup> | 1 | 0,21 |
|   |   |             | 80A   | <b>22kW</b>      | 52x45 | LTS80 SMAHN1 A4 <sup>2)</sup> | 1 | 0,21 |
|   |   |             | 85A   | <b>30kW</b>      | 78x45 | LTS85 SMAHN1 A4               | 1 | 0,42 |
|   |   |             | 100A  | <b>37kW</b>      | 78x45 | LTS100 SMAHN1 A4              | 1 | 0,42 |
|   | 125A  | <b>45kW</b> | 78x45 | LTS125 SMAHN1 A4 | 1     | 0,42                          |   |      |

|   |   |  |     |               |       |                               |   |      |
|---|---|--|-----|---------------|-------|-------------------------------|---|------|
| <b>6-pole, padlock device SV1 (64)</b>  |   |  |     |               |       |                               |   |      |
|                                        |  |  | 20A | <b>7,5kW</b>  | 52x45 | LTS20 SMAHN1 A6               | 1 | 0,29 |
|   |   |  | 25A | <b>10kW</b>   | 52x45 | LTS25 SMAHN1 A6               | 1 | 0,29 |
|   |   |  | 32A | <b>12,5kW</b> | 52x45 | LTS32 SMAHN1 A6               | 1 | 0,29 |
|   |   |  | 40A | <b>16kW</b>   | 52x45 | LTS40 SMAHN1 A6               | 1 | 0,29 |
|   |   |  | 63A | <b>22kW</b>   | 97x45 | LTS63 SMAHN1 A6 <sup>1)</sup> | 1 | 0,34 |
|   |   |  | 80A | <b>22kW</b>   | 97x45 | LTS80 SMAHN1 A6 <sup>1)</sup> | 1 | 0,34 |

|   |   |  |     |               |        |                 |   |      |
|---|---|--|-----|---------------|--------|-----------------|---|------|
| <b>8-pole, padlock device SV164</b>  |   |  |     |               |        |                 |   |      |
|                                      |  |  | 20A | <b>7,5kW</b>  | 97x45  | LTS20 SMAHN1 A8 | 1 | 0,31 |
|   |   |  | 25A | <b>10kW</b>   | 97x45  | LTS25 SMAHN1 A8 | 1 | 0,31 |
|   |   |  | 32A | <b>12,5kW</b> | 97x45  | LTS32 SMAHN1 A8 | 1 | 0,31 |
|   |   |  | 40A | <b>16kW</b>   | 97x45  | LTS40 SMAHN1 A8 | 1 | 0,31 |
|   |   |  | 63A | <b>22kW</b>   | 126x45 | LTS63 SMAHN1 A8 | 1 | 0,42 |
|   |   |  | 80A | <b>22kW</b>   | 126x45 | LTS80 SMAHN1 A8 | 1 | 0,42 |

## Changeover Switch with Padlock Device for Distribution Boards, lockable

|   |   |  |     |               |       |                 |   |      |
|---|---|--|-----|---------------|-------|-----------------|---|------|
| <b>3-pole, padlock device SV164</b>  |   |  |     |               |       |                 |   |      |
|                                      |  |  | 20A | <b>7,5kW</b>  | 97x45 | LTS20 SMAHN1 U3 | 1 | 0,29 |
|   |   |  | 25A | <b>10kW</b>   | 97x45 | LTS25 SMAHN1 U3 | 1 | 0,29 |
|   |   |  | 32A | <b>12,5kW</b> | 97x45 | LTS32 SMAHN1 U3 | 1 | 0,29 |
|   |   |  | 40A | <b>16kW</b>   | 97x45 | LTS40 SMAHN1 U3 | 1 | 0,29 |
|   |   |  | 63A | <b>22kW</b>   | 97x45 | LTS63 SMAHN1 U3 | 1 | 0,34 |



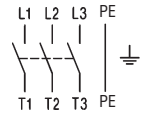


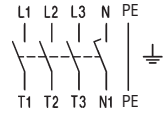


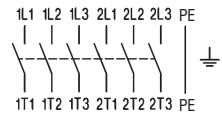


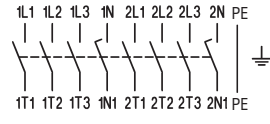


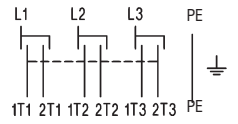


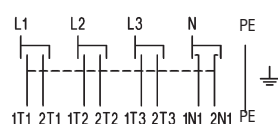
|   |   |  |     |               |        |                 |   |      |
|---|---|--|-----|---------------|--------|-----------------|---|------|
| <b>4-pole, padlock device SV164</b>  |   |  |     |               |        |                 |   |      |
|                                      |  |  | 20A | <b>7,5kW</b>  | 97x45  | LTS20 SMAHN1 U4 | 1 | 0,31 |
|   |   |  | 25A | <b>10kW</b>   | 97x45  | LTS25 SMAHN1 U4 | 1 | 0,31 |
|   |   |  | 32A | <b>12,5kW</b> | 97x45  | LTS32 SMAHN1 U4 | 1 | 0,31 |
|   |   |  | 40A | <b>16kW</b>   | 97x45  | LTS40 SMAHN1 U4 | 1 | 0,31 |
|   |   |  | 63A | <b>22kW</b>   | 126x45 | LTS63 SMAHN1 U4 | 1 | 0,42 |

1) With padlock device SV164

2) Emergency-Stop-Main Switches for Distribution Boards, lockable with low height handle, IP40  
Type with Type-suffix „+SV1N“ e.g.: **LTS40 SMAHN1 A3 +SV1N**


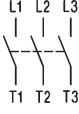

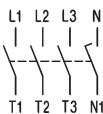
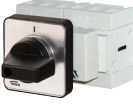
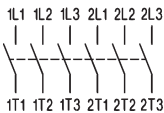

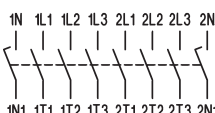

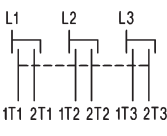

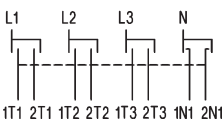


Maintenance and Safety Emergency-Stop-Main Switches, in Plastic Enclosure, lockable IP66,  us Type 4X


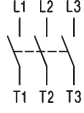

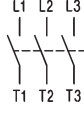
|   | max. padlocks            | AC21 690V | AC23 3x400V   | Plate | Type                            | Pack pcs. | Weight kg/pcs. |
|---|--------------------------|-----------|---------------|-------|---------------------------------|-----------|----------------|
| <b>3-pole, padlock device SV4(34)</b>    |                          |           |               |       |                                 |           |                |
|       |                          | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 PF(L <sup>1</sup> )HN4 A3 | 1         | 0,32           |
|   |                          | 25A       | <b>10kW</b>   | 64 □  | LTS25 PF(L <sup>1</sup> )HN4 A3 | 1         | 0,32           |
|   |                          | 32A       | <b>12,5kW</b> | 64 □  | LTS32 PF(L <sup>1</sup> )HN4 A3 | 1         | 0,32           |
|   |                          | 40A       | <b>16kW</b>   | 64 □  | LTS40 PF(L <sup>1</sup> )HN4 A3 | 1         | 0,32           |
|   |                          | 63A       | <b>22kW</b>   | 64 □  | LTS63 PFLHN4 A3                 | 1         | 0,60           |
|   |                          | 80A       | <b>22kW</b>   | 64 □  | LTS80 PFLHN4 A3                 | 1         | 0,60           |
|   |                          | 85A       | <b>30kW</b>   | 64 □  | LTS85 PFLHN4 A3                 | 1         | 0,78           |
|   |                          | 100A      | <b>37kW</b>   | 64 □  | LTS100 PFLHN4 A3                | 1         | 0,78           |
|   |                          | 125A      | <b>45kW</b>   | 64 □  | LTS125 PFLHN4 A3                | 1         | 0,78           |
|   |                          | 160A      | <b>55kW</b>   | 88 □  | LT160 PFHN34 T300               | 1         | 2,09           |
| Larger enclosure<br>Type: ..PFL..   | on request               |           |               |       |                                 |           |                |
| <b>4-pole, padlock device SV4(34)</b>    |                          |           |               |       |                                 |           |                |
|       |                          | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 PF(L <sup>1</sup> )HN4 A4 | 1         | 0,33           |
|   |                          | 25A       | <b>10kW</b>   | 64 □  | LTS25 PF(L <sup>1</sup> )HN4 A4 | 1         | 0,33           |
|   |                          | 32A       | <b>12,5kW</b> | 64 □  | LTS32 PF(L <sup>1</sup> )HN4 A4 | 1         | 0,33           |
|   |                          | 40A       | <b>16kW</b>   | 64 □  | LTS40 PF(L <sup>1</sup> )HN4 A4 | 1         | 0,33           |
|   |                          | 63A       | <b>22kW</b>   | 64 □  | LTS63 PFLHN4 A4                 | 1         | 0,64           |
|   |                          | 80A       | <b>22kW</b>   | 64 □  | LTS80 PFLHN4 A4                 | 1         | 0,64           |
|   |                          | 85A       | <b>30kW</b>   | 64 □  | LTS85 PFLHN4 A4                 | 1         | 0,83           |
|   |                          | 100A      | <b>37kW</b>   | 64 □  | LTS100 PFLHN4 A4                | 1         | 0,83           |
|   |                          | 125A      | <b>45kW</b>   | 64 □  | LTS125 PFLHN4 A4                | 1         | 0,83           |
|   |                          | 160A      | <b>55kW</b>   | 88 □  | LT160 PFHN34 T400               | 1         | 2,47           |
| Larger enclosure<br>Type appendix +PF3<br>+PF3/M50  | on request<br>on request |           |               |       |                                 |           |                |
| <b>6-pole, padlock device SV4</b>    |                          |           |               |       |                                 |           |                |
|   |                          | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 PFLHN4 A6                 | 1         | 1,39           |
|   |                          | 25A       | <b>10kW</b>   | 64 □  | LTS25 PFLHN4 A6                 | 1         | 1,39           |
|   |                          | 32A       | <b>12,5kW</b> | 64 □  | LTS32 PFLHN4 A6                 | 1         | 1,39           |
|   |                          | 40A       | <b>16kW</b>   | 64 □  | LTS40 PFLHN4 A6                 | 1         | 1,39           |
|   |                          | 63A       | <b>22kW</b>   | 64 □  | LTS63 PFLHN4 A6                 | 1         | 1,42           |
|   |                          | 80A       | <b>22kW</b>   | 64 □  | LTS80 PFLHN4 A6                 | 1         | 1,42           |
|   |                          |           |               |       |                                 |           |                |
| knockoutlets M50/40<br>+PF3/M50   | on request               |           |               |       |                                 |           |                |
| <b>8-pole, padlock device SV4</b>    |                          |           |               |       |                                 |           |                |
|   |                          | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 PFLHN4 A8                 | 1         | 1,44           |
|   |                          | 25A       | <b>10kW</b>   | 64 □  | LTS25 PFLHN4 A8                 | 1         | 1,44           |
|   |                          | 32A       | <b>12,5kW</b> | 64 □  | LTS32 PFLHN4 A8                 | 1         | 1,44           |
|   |                          | 40A       | <b>16kW</b>   | 64 □  | LTS40 PFLHN4 A8                 | 1         | 1,44           |
|   |                          | 63A       | <b>22kW</b>   | 64 □  | LTS63 PFLHN4 A8                 | 1         | 1,50           |
|   |                          | 80A       | <b>22kW</b>   | 64 □  | LTS80 PFLHN4 A8                 | 1         | 1,50           |
|   |                          |           |               |       |                                 |           |                |
| knockoutlets M50/40<br>+PF3/M50   | on request               |           |               |       |                                 |           |                |
| <b>Changeover Switch with Padlock Device, lockable</b>  |                          |           |               |       |                                 |           |                |
| <b>3-pole, padlock device SV4</b>    |                          |           |               |       |                                 |           |                |
|   |                          | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 PFLHN4 U3                 | 1         | 1,39           |
|   |                          | 25A       | <b>10kW</b>   | 64 □  | LTS25 PFLHN4 U3                 | 1         | 1,39           |
|   |                          | 32A       | <b>12,5kW</b> | 64 □  | LTS32 PFLHN4 U3                 | 1         | 1,39           |
|   |                          | 40A       | <b>16kW</b>   | 64 □  | LTS40 PFLHN4 U3                 | 1         | 1,39           |
|   |                          | 63A       | <b>22kW</b>   | 64 □  | LTS63 PFLHN4 U3                 | 1         | 1,42           |
| <b>4-pole, padlock device SV4</b>    |                          |           |               |       |                                 |           |                |
|   |                          | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 PFLHN4 U4                 | 1         | 1,44           |
|   |                          | 25A       | <b>10kW</b>   | 64 □  | LTS25 PFLHN4 U4                 | 1         | 1,44           |
|   |                          | 32A       | <b>12,5kW</b> | 64 □  | LTS32 PFLHN4 U4                 | 1         | 1,44           |
|   |                          | 40A       | <b>16kW</b>   | 64 □  | LTS40 PFLHN4 U4                 | 1         | 1,44           |
|   |                          | 63A       | <b>22kW</b>   | 64 □  | LTS63 PFLHN4 U4                 | 1         | 1,50           |

1) PFL.... larger enclosure




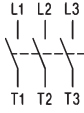

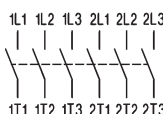

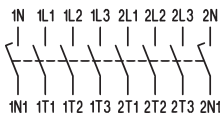
Switch Disconnectors for Panel Mounting, IP66,  Type 3R

|   |      | AC21<br>690V  | AC23<br>3x400V | Plate        | Type | Pack<br>pcs. | Weight<br>kg/pcs. |
|---|------|---------------|----------------|--------------|------|--------------|-------------------|
| <b>On-Off Switches 3-pole</b>   |      |               |                |              |      |              |                   |
|       | 20A  | <b>7,5kW</b>  | 48 □           | LTS20 E A3   | 1    | 0,15         |                   |
|   | 25A  | <b>10kW</b>   | 48 □           | LTS25 E A3   | 1    | 0,15         |                   |
|   | 32A  | <b>12,5kW</b> | 48 □           | LTS32 E A3   | 1    | 0,15         |                   |
|   | 40A  | <b>16kW</b>   | 48 □           | LTS40 E A3   | 1    | 0,15         |                   |
|   | 63A  | <b>22kW</b>   | 48 □           | LTS63 E A3   | 1    | 0,17         |                   |
|   | 80A  | <b>22kW</b>   | 48 □           | LTS80 E A3   | 1    | 0,17         |                   |
|   | 85A  | <b>30kW</b>   | 64 □           | LTS85 E A3   | 1    | 0,39         |                   |
|   | 100A | <b>37kW</b>   | 64 □           | LTS100 E A3  | 1    | 0,39         |                   |
|   | 125A | <b>45kW</b>   | 64 □           | LTS125 E A3  | 1    | 0,39         |                   |
|   | 160A | <b>55kW</b>   | 88 □           | LT160 E T300 | 1    | 1,10         |                   |
| <b>On-Off Switches 4-pole</b>   |      |               |                |              |      |              |                   |
|       | 20A  | <b>7,5kW</b>  | 48 □           | LTS20 E A4   | 1    | 0,18         |                   |
|   | 25A  | <b>10kW</b>   | 48 □           | LTS25 E A4   | 1    | 0,18         |                   |
|   | 32A  | <b>12,5kW</b> | 48 □           | LTS32 E A4   | 1    | 0,18         |                   |
|   | 40A  | <b>16kW</b>   | 48 □           | LTS40 E A4   | 1    | 0,18         |                   |
|   | 63A  | <b>22kW</b>   | 48 □           | LTS63 E A4   | 1    | 0,21         |                   |
|   | 80A  | <b>22kW</b>   | 48 □           | LTS80 E A4   | 1    | 0,21         |                   |
|   | 85A  | <b>30kW</b>   | 64 □           | LTS85 E A4   | 1    | 0,44         |                   |
|   | 100A | <b>37kW</b>   | 64 □           | LTS100 E A4  | 1    | 0,44         |                   |
|   | 125A | <b>45kW</b>   | 64 □           | LTS125 E A4  | 1    | 0,44         |                   |
|   | 160A | <b>55kW</b>   | 88 □           | LT160 E T400 | 1    | 1,50         |                   |
| <b>On-Off Switches 6-pole</b>   |      |               |                |              |      |              |                   |
|   | 20A  | <b>7,5kW</b>  | 64 □           | LTS20 E A6   | 1    | 0,30         |                   |
|   | 25A  | <b>10kW</b>   | 64 □           | LTS25 E A6   | 1    | 0,30         |                   |
|   | 32A  | <b>12,5kW</b> | 64 □           | LTS32 E A6   | 1    | 0,30         |                   |
|   | 40A  | <b>16kW</b>   | 64 □           | LTS40 E A6   | 1    | 0,30         |                   |
|   | 63A  | <b>22kW</b>   | 64 □           | LTS63 E A6   | 1    | 0,36         |                   |
|   | 80A  | <b>22kW</b>   | 64 □           | LTS80 E A6   | 1    | 0,36         |                   |
| <b>On-Off Switches 8-pole</b>   |      |               |                |              |      |              |                   |
|   | 20A  | <b>7,5kW</b>  | 64 □           | LTS20 E A8   | 1    | 0,32         |                   |
|   | 25A  | <b>10kW</b>   | 64 □           | LTS25 E A8   | 1    | 0,32         |                   |
|   | 32A  | <b>12,5kW</b> | 64 □           | LTS32 E A8   | 1    | 0,32         |                   |
|   | 40A  | <b>16kW</b>   | 64 □           | LTS40 E A8   | 1    | 0,32         |                   |
|   | 63A  | <b>22kW</b>   | 64 □           | LTS63 E A8   | 1    | 0,43         |                   |
|   | 80A  | <b>22kW</b>   | 64 □           | LTS80 E A8   | 1    | 0,43         |                   |
| <b>Changeover Switches 3-pole</b>   |      |               |                |              |      |              |                   |
|   | 20A  | <b>7,5kW</b>  | 64 □           | LTS20 E U3   | 1    | 0,31         |                   |
|   | 25A  | <b>10kW</b>   | 64 □           | LTS25 E U3   | 1    | 0,31         |                   |
|   | 32A  | <b>12,5kW</b> | 64 □           | LTS32 E U3   | 1    | 0,31         |                   |
|   | 40A  | <b>16kW</b>   | 64 □           | LTS40 E U3   | 1    | 0,31         |                   |
|   | 63A  | <b>22kW</b>   | 64 □           | LTS63 E U3   | 1    | 0,37         |                   |
| <b>Changeover Switches 4-pole</b>   |      |               |                |              |      |              |                   |
|   | 20A  | <b>7,5kW</b>  | 64 □           | LTS20 E U4   | 1    | 0,33         |                   |
|   | 25A  | <b>10kW</b>   | 64 □           | LTS25 E U4   | 1    | 0,33         |                   |
|   | 32A  | <b>12,5kW</b> | 64 □           | LTS32 E U4   | 1    | 0,33         |                   |
|   | 40A  | <b>16kW</b>   | 64 □           | LTS40 E U4   | 1    | 0,33         |                   |
|   | 63A  | <b>22kW</b>   | 64 □           | LTS63 E U4   | 1    | 0,44         |                   |

Switch Disconnectors for Single Hole Mounting, lockable IP66, c(UL)us Type 4X


|   | AC21<br>690V | AC23<br>3x400V | Plate | Type       | Pack<br>pcs. | Weight<br>kg/pcs. |
|---|--------------|----------------|-------|------------|--------------|-------------------|
| <b>On-Off Switches 3-pole</b>   |              |                |       |            |              |                   |
|   | 20A          | <b>7,5kW</b>   | 48 □  | LTS20 Z A3 | 1            | 0,16              |
|   | 25A          | <b>10kW</b>    | 48 □  | LTS25 Z A3 | 1            | 0,16              |
|   | 32A          | <b>12,5kW</b>  | 48 □  | LTS32 Z A3 | 1            | 0,16              |
|   | 40A          | <b>16kW</b>    | 48 □  | LTS40 Z A3 | 1            | 0,16              |
| <b>On-Off Switches 4-pole</b>   |              |                |       |            |              |                   |
|   | 20A          | <b>7,5kW</b>   | 48 □  | LTS20 Z A4 | 1            | 0,20              |
|   | 25A          | <b>10kW</b>    | 48 □  | LTS25 Z A4 | 1            | 0,20              |
|   | 32A          | <b>12,5kW</b>  | 48 □  | LTS32 Z A4 | 1            | 0,20              |
|   | 40A          | <b>16kW</b>    | 48 □  | LTS40 Z A4 | 1            | 0,20              |

Switch Disconnectors, Base Mounting with Door Clutch for Single-Hole Mounting  
Depth X is adjustable (delivered with X<sub>max</sub> see page 294), IP66, c(UL)us Type 4X

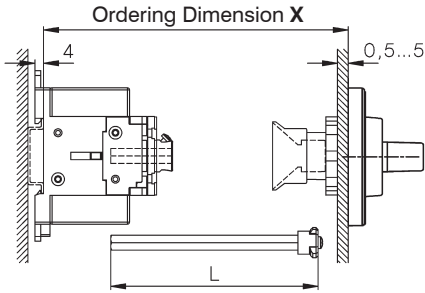
|   | AC21<br>690V | AC23<br>3x400V | Plate         | Type          | Pack<br>pcs. | Weight<br>kg/pcs. |
|---|--------------|----------------|---------------|---------------|--------------|-------------------|
| <b>On-Off Switches 3-pole</b>   |              |                |               |               |              |                   |
|     | 20A          | <b>7,5kW</b>   | 64 □          | LTS20 VZV A3  | 1            | 0,19              |
|   | 25A          | <b>10kW</b>    | 64 □          | LTS25 VZV A3  | 1            | 0,19              |
|   | 32A          | <b>12,5kW</b>  | 64 □          | LTS32 VZV A3  | 1            | 0,19              |
|   | 40A          | <b>16kW</b>    | 64 □          | LTS40 VZV A3  | 1            | 0,19              |
|   | 63A          | <b>22kW</b>    | 64 □          | LTS63 VZV A3  | 1            | 0,22              |
|   | 80A          | <b>22kW</b>    | 64 □          | LTS80 VZV A3  | 1            | 0,22              |
|   | 85A          | <b>30kW</b>    | 64 □          | LTS85 VZV A3  | 1            | 0,40              |
|   | 100A         | <b>37kW</b>    | 64 □          | LTS100 VZV A3 | 1            | 0,40              |
| 125A  | <b>45kW</b>  | 64 □           | LTS125 VZV A3 | 1             | 0,40         |                   |
| <b>On-Off Switches 4-pole</b>   |              |                |               |               |              |                   |
|   | 20A          | <b>7,5kW</b>   | 64 □          | LTS20 VZV A4  | 1            | 0,20              |
|   | 25A          | <b>10kW</b>    | 64 □          | LTS25 VZV A4  | 1            | 0,20              |
|   | 32A          | <b>12,5kW</b>  | 64 □          | LTS32 VZV A4  | 1            | 0,20              |
|   | 40A          | <b>16kW</b>    | 64 □          | LTS40 VZV A4  | 1            | 0,20              |
|   | 63A          | <b>22kW</b>    | 64 □          | LTS63 VZV A4  | 1            | 0,26              |
|   | 80A          | <b>22kW</b>    | 64 □          | LTS80 VZV A4  | 1            | 0,26              |
|   | 85A          | <b>30kW</b>    | 64 □          | LTS85 VZV A4  | 1            | 0,45              |
|   | 100A         | <b>37kW</b>    | 64 □          | LTS100 VZV A4 | 1            | 0,45              |
| 125A  | <b>45kW</b>  | 64 □           | LTS125 VZV A4 | 1             | 0,45         |                   |
| <b>On-Off Switches 6-pole</b>   |              |                |               |               |              |                   |
|   | 20A          | <b>7,5kW</b>   | 64 □          | LTS20 VZV A6  | 1            | 0,32              |
|   | 25A          | <b>10kW</b>    | 64 □          | LTS25 VZV A6  | 1            | 0,32              |
|   | 32A          | <b>12,5kW</b>  | 64 □          | LTS32 VZV A6  | 1            | 0,32              |
|   | 40A          | <b>16kW</b>    | 64 □          | LTS40 VZV A6  | 1            | 0,32              |
|   | 63A          | <b>22kW</b>    | 64 □          | LTS63 VZV A6  | 1            | 0,37              |
|   | 80A          | <b>22kW</b>    | 64 □          | LTS80 VZV A6  | 1            | 0,37              |
| <b>On-Off Switches 8-pole</b>   |              |                |               |               |              |                   |
|   | 20A          | <b>7,5kW</b>   | 64 □          | LTS20 VZV A8  | 1            | 0,34              |
|   | 25A          | <b>10kW</b>    | 64 □          | LTS25 VZV A8  | 1            | 0,34              |
|   | 32A          | <b>12,5kW</b>  | 64 □          | LTS32 VZV A8  | 1            | 0,34              |
|   | 40A          | <b>16kW</b>    | 64 □          | LTS40 VZV A8  | 1            | 0,34              |
|   | 63A          | <b>22kW</b>    | 64 □          | LTS63 VZV A8  | 1            | 0,45              |
|   | 80A          | <b>22kW</b>    | 64 □          | LTS80 VZV A8  | 1            | 0,45              |



## Switch Disconnecter, Base Mounting with Door Clutch for Single-Hole Mounting

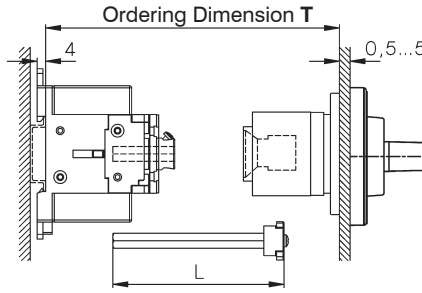
Depth X is adjustable (delivered with  $X_{max}$  see below), IP66,  Type 4X

### Depth Single Hole Mounting Ø22mm LTS.. VZV..



| Type            |            | X min | X max | L        |
|-----------------|------------|-------|-------|----------|
| LTS20-80 VZV..  | 3, 4-polig | 91 -  | 190   | X - 40±3 |
| LTS20-80 VZV..  | 6, 8-polig | 111 - | 190   | X - 60±3 |
| LTS85-125 VZV.. | 3, 4-polig | 95 -  | 190   | X - 44±3 |

### 4-Hole Mounting LTS.. V(HN).. (3, 4-pole)


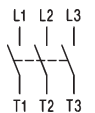

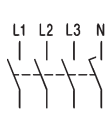


| Type          |  | T min | T max | L        | Type      | T min | T max     |
|---------------|--|-------|-------|----------|-----------|-------|-----------|
| LTS20-80 V..  |  | 111 - | 190   | T - 60±3 | LT160 V.. |       | 120 - 450 |
| LTS85-125 V.. |  | 115 - | 190   | T - 64±3 |           |       |           |

greater X- and T-Dimensions (max. 380mm for LTS..) on request


## Switch Disconnecter, Base Mounting with Door Clutch for Hole Mounting


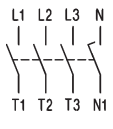
Depth X is adjustable (delivered with  $T_{max}$  see above), IP66,  Type 4X

|   | max.<br>padlocks | AC21<br>690V | AC23<br>3x400V     | Plate              | Type         | Pack<br>pcs. | Weight<br>kg/pcs. |
|---|------------------|--------------|--------------------|--------------------|--------------|--------------|-------------------|
| <b>On-Off Switches 3-pole</b>   |                  |              |                    |                    |              |              |                   |
|   |                  | 20A          | <b>7,5kW</b>       | 64 □ <sup>1)</sup> | LTS20 V A3   | 1            | 0,20              |
|   |                  | 25A          | <b>10kW</b>        | 64 □ <sup>1)</sup> | LTS25 V A3   | 1            | 0,20              |
|   |                  | 32A          | <b>12,5kW</b>      | 64 □ <sup>1)</sup> | LTS32 V A3   | 1            | 0,20              |
|   |                  | 40A          | <b>16kW</b>        | 64 □ <sup>1)</sup> | LTS40 V A3   | 1            | 0,20              |
|   |                  | 63A          | <b>22kW</b>        | 64 □ <sup>1)</sup> | LTS63 V A3   | 1            | 0,24              |
|   |                  | 80A          | <b>22kW</b>        | 64 □ <sup>1)</sup> | LTS80 V A3   | 1            | 0,24              |
|   |                  | 85A          | <b>30kW</b>        | 64 □ <sup>1)</sup> | LTS85 V A3   | 1            | 0,40              |
|   |                  | 100A         | <b>37kW</b>        | 64 □ <sup>1)</sup> | LTS100 V A3  | 1            | 0,40              |
|   |                  | 125A         | <b>45kW</b>        | 64 □ <sup>1)</sup> | LTS125 V A3  | 1            | 0,40              |
|   |                  | 160A         | <b>55kW</b>        | 88 □               | LT160 V T300 | 1            | 1,38              |
| <b>On-Off Switches 4-pole</b>   |                  |              |                    |                    |              |              |                   |
|   |                  | 20A          | <b>7,5kW</b>       | 64 □ <sup>1)</sup> | LTS20 V A4   | 1            | 0,21              |
|   |                  | 25A          | <b>10kW</b>        | 64 □ <sup>1)</sup> | LTS25 V A4   | 1            | 0,21              |
|   |                  | 32A          | <b>12,5kW</b>      | 64 □ <sup>1)</sup> | LTS32 V A4   | 1            | 0,21              |
|   |                  | 40A          | <b>16kW</b>        | 64 □ <sup>1)</sup> | LTS40 V A4   | 1            | 0,21              |
|   |                  | 63A          | <b>22kW</b>        | 64 □ <sup>1)</sup> | LTS63 V A4   | 1            | 0,28              |
|   |                  | 80A          | <b>22kW</b>        | 64 □ <sup>1)</sup> | LTS80 V A4   | 1            | 0,28              |
|   |                  | 85A          | <b>30kW</b>        | 64 □ <sup>1)</sup> | LTS85 V A4   | 1            | 0,45              |
|   |                  | 100A         | <b>37kW</b>        | 64 □ <sup>1)</sup> | LTS100 V A4  | 1            | 0,45              |
|   | 125A             | <b>45kW</b>  | 64 □ <sup>1)</sup> | LTS125 V A4        | 1            | 0,45         |                   |
|   | 160A             | <b>55kW</b>  | 88 □               | LT160 V T400       | 1            | 1,77         |                   |

Add-on modules see page 297

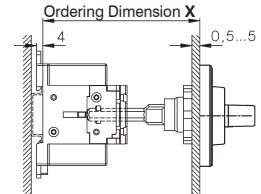
1) Types with padlock device 88<sup>1)</sup> type suffix **88**, ordering example: LTS32 VHN**488** A3, on request

Switch Disconnecter, Base Mounting with Door Clutch for Single-Hole Mounting  
 Depth X is not adjustable, declare depth X when ordering, IP66,  Type 4X

|   | max. padlocks | AC21 690V | AC23 3x400V   | Plate | Type            | Pack pcs. | Weight kg/pcs. |
|---|---------------|-----------|---------------|-------|-----------------|-----------|----------------|
| <b>On-Off Switches 4-pole</b>   |               |           |               |       |                 |           |                |
|   |               | 20A       | <b>7,5kW</b>  | 64 □  | LTS20 VZ A4 X.. | 1         | 0,18           |
|   |               | 25A       | <b>10kW</b>   | 64 □  | LTS25 VZ A4 X.. | 1         | 0,18           |
|   |               | 32A       | <b>12,5kW</b> | 64 □  | LTS32 VZ A4 X.. | 1         | 0,18           |
|   |               | 40A       | <b>16kW</b>   | 64 □  | LTS40 VZ A4 X.. | 1         | 0,18           |
|   |               | 63A       | <b>22kW</b>   | 64 □  | LTS63 VZ A4 X.. | 1         | 0,25           |
|   |               | 80A       | <b>22kW</b>   | 64 □  | LTS80 VZ A4 X.. | 1         | 0,25           |


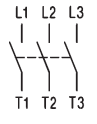
Declare depth X when ordering


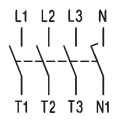
| Type       | Preference values for X               |
|------------|---------------------------------------|
| LTS.. VZ.. | 80, 85, 104, 129 (tolerance -3, +1,5) |


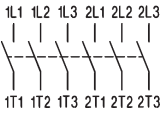



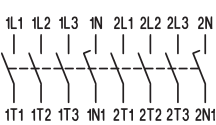
Add-on modules see page 297


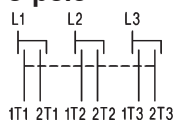
Switch Disconnectors for Distribution Boards, IP40,  Open Type


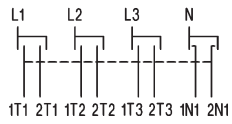
|   |      |             |               |               |              |      |      |
|---|------|-------------|---------------|---------------|--------------|------|------|
| <b>On-Off Switches 3-pole</b>   |      |             |               |               |              |      |      |
|   |      | 20A         | <b>7,5kW</b>  | 52x45         | LTS20 SMA A3 | 1    | 0,15 |
|   |      | 25A         | <b>10kW</b>   | 52x45         | LTS25 SMA A3 | 1    | 0,15 |
|   |      | 32A         | <b>12,5kW</b> | 52x45         | LTS32 SMA A3 | 1    | 0,15 |
|   |      | 40A         | <b>16kW</b>   | 52x45         | LTS40 SMA A3 | 1    | 0,15 |
|   |      | 63A         | <b>22kW</b>   | 52x45         | LTS63 SMA A3 | 1    | 0,17 |
|   |      | 80A         | <b>22kW</b>   | 52x45         | LTS80 SMA A3 | 1    | 0,17 |
|   | 85A  | <b>30kW</b> | 78x45         | LTS85 SMA A3  | 1            | 0,37 |      |
|   | 100A | <b>37kW</b> | 78x45         | LTS100 SMA A3 | 1            | 0,37 |      |
|   | 125A | <b>45kW</b> | 78x45         | LTS125 SMA A3 | 1            | 0,37 |      |

|   |      |             |               |               |              |      |      |
|---|------|-------------|---------------|---------------|--------------|------|------|
| <b>On-Off Switches 4-pole</b>   |      |             |               |               |              |      |      |
|   |      | 20A         | <b>7,5kW</b>  | 52x45         | LTS20 SMA A4 | 1    | 0,16 |
|   |      | 25A         | <b>10kW</b>   | 52x45         | LTS25 SMA A4 | 1    | 0,16 |
|   |      | 32A         | <b>12,5kW</b> | 52x45         | LTS32 SMA A4 | 1    | 0,16 |
|   |      | 40A         | <b>16kW</b>   | 52x45         | LTS40 SMA A4 | 1    | 0,16 |
|   |      | 63A         | <b>22kW</b>   | 52x45         | LTS63 SMA A4 | 1    | 0,21 |
|   |      | 80A         | <b>22kW</b>   | 52x45         | LTS80 SMA A4 | 1    | 0,21 |
|   | 85A  | <b>30kW</b> | 78x45         | LTS85 SMA A4  | 1            | 0,42 |      |
|   | 100A | <b>37kW</b> | 78x45         | LTS100 SMA A4 | 1            | 0,42 |      |
|   | 125A | <b>45kW</b> | 78x45         | LTS125 SMA A4 | 1            | 0,42 |      |


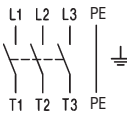

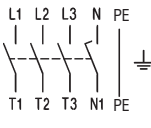

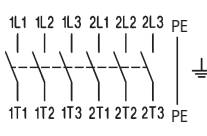

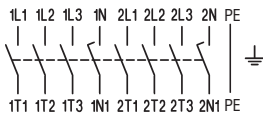

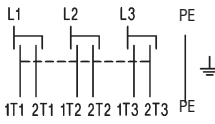

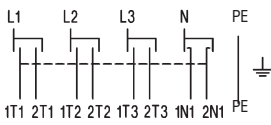
|   |  |     |               |       |              |   |      |
|---|--|-----|---------------|-------|--------------|---|------|
| <b>On-Off Switches 6-pole</b>   |  |     |               |       |              |   |      |
|   |  | 20A | <b>7,5kW</b>  | 52x45 | LTS20 SMA A6 | 1 | 0,29 |
|   |  | 25A | <b>10kW</b>   | 52x45 | LTS25 SMA A6 | 1 | 0,29 |
|   |  | 32A | <b>12,5kW</b> | 52x45 | LTS32 SMA A6 | 1 | 0,29 |
|   |  | 40A | <b>16kW</b>   | 52x45 | LTS40 SMA A6 | 1 | 0,29 |
|   |  | 63A | <b>22kW</b>   | 97x45 | LTS63 SMA A6 | 1 | 0,34 |
|   |  | 80A | <b>22kW</b>   | 97x45 | LTS80 SMA A6 | 1 | 0,34 |

|   |  |     |               |        |              |   |      |
|---|--|-----|---------------|--------|--------------|---|------|
| <b>On-Off Switches 8-pole</b>   |  |     |               |        |              |   |      |
|   |  | 20A | <b>7,5kW</b>  | 97x45  | LTS20 SMA A8 | 1 | 0,31 |
|   |  | 25A | <b>10kW</b>   | 97x45  | LTS25 SMA A8 | 1 | 0,31 |
|   |  | 32A | <b>12,5kW</b> | 97x45  | LTS32 SMA A8 | 1 | 0,31 |
|   |  | 40A | <b>16kW</b>   | 97x45  | LTS40 SMA A8 | 1 | 0,31 |
|   |  | 63A | <b>22kW</b>   | 126x45 | LTS63 SMA A8 | 1 | 0,42 |
|   |  | 80A | <b>22kW</b>   | 126x45 | LTS80 SMA A8 | 1 | 0,42 |

|   |  |     |               |       |              |   |      |
|---|--|-----|---------------|-------|--------------|---|------|
| <b>Changeover Switches 3-pole</b>   |  |     |               |       |              |   |      |
|   |  | 20A | <b>7,5kW</b>  | 97x45 | LTS20 SMA U3 | 1 | 0,30 |
|   |  | 25A | <b>10kW</b>   | 97x45 | LTS25 SMA U3 | 1 | 0,30 |
|   |  | 32A | <b>12,5kW</b> | 97x45 | LTS32 SMA U3 | 1 | 0,30 |
|   |  | 40A | <b>16kW</b>   | 97x45 | LTS40 SMA U3 | 1 | 0,30 |
|   |  | 63A | <b>22kW</b>   | 97x45 | LTS63 SMA U3 | 1 | 0,35 |









|   |  |     |               |        |              |   |      |
|---|--|-----|---------------|--------|--------------|---|------|
| <b>Changeover Switches 4-pole</b>   |  |     |               |        |              |   |      |
|   |  | 20A | <b>7,5kW</b>  | 97x45  | LTS20 SMA U4 | 1 | 0,32 |
|   |  | 25A | <b>10kW</b>   | 97x45  | LTS25 SMA U4 | 1 | 0,32 |
|   |  | 32A | <b>12,5kW</b> | 97x45  | LTS32 SMA U4 | 1 | 0,32 |
|   |  | 40A | <b>16kW</b>   | 97x45  | LTS40 SMA U4 | 1 | 0,32 |
|   |  | 63A | <b>22kW</b>   | 126x45 | LTS63 SMA U4 | 1 | 0,43 |

# Switch Disconnectors in Plastic Enclosure IP66, Type 4X




|   | AC21<br>690V                      | AC23<br>3x400V | Plate | Type                          | Pack<br>pcs. | Weighth<br>kg/pcs. |
|---|-----------------------------------|----------------|-------|-------------------------------|--------------|--------------------|
| <b>On-Off Switches 3-pole</b>   |                                   |                |       |                               |              |                    |
|       | 20A                               | <b>7,5kW</b>   | 64 □  | LTS20 PF(L <sup>1)</sup> ) A3 | 1            | 0,30               |
|   | 25A                               | <b>10kW</b>    | 64 □  | LTS25 PF(L <sup>1)</sup> ) A3 | 1            | 0,30               |
|   | 32A                               | <b>12,5kW</b>  | 64 □  | LTS32 PF(L <sup>1)</sup> ) A3 | 1            | 0,30               |
|   | 40A                               | <b>16kW</b>    | 64 □  | LTS40 PF(L <sup>1)</sup> ) A3 | 1            | 0,30               |
|   | 63A                               | <b>22kW</b>    | 64 □  | LTS63 PFL A3                  | 1            | 0,58               |
|   | 80A                               | <b>22kW</b>    | 64 □  | LTS80 PFL A3                  | 1            | 0,58               |
| <b>On-Off Switches 4-pole</b>   |                                   |                |       |                               |              |                    |
|       | 20A                               | <b>7,5kW</b>   | 64 □  | LTS20 PF(L <sup>1)</sup> ) A4 | 1            | 0,31               |
|   | 25A                               | <b>10kW</b>    | 64 □  | LTS25 PF(L <sup>1)</sup> ) A4 | 1            | 0,31               |
|   | 32A                               | <b>12,5kW</b>  | 64 □  | LTS32 PF(L <sup>1)</sup> ) A4 | 1            | 0,31               |
|   | 40A                               | <b>16kW</b>    | 64 □  | LTS40 PF(L <sup>1)</sup> ) A4 | 1            | 0,31               |
|   | 63A                               | <b>22kW</b>    | 64 □  | LTS63 PFL A4                  | 1            | 0,62               |
|   | 80A                               | <b>22kW</b>    | 64 □  | LTS80 PFL A4                  | 1            | 0,62               |
| <b>On-Off Switches 6-pole</b>   |                                   |                |       |                               |              |                    |
|       | 20A                               | <b>7,5kW</b>   | 64 □  | LTS20 PFL A6                  | 1            | 1,39               |
|   | 25A                               | <b>10kW</b>    | 64 □  | LTS25 PFL A6                  | 1            | 1,39               |
|   | 32A                               | <b>12,5kW</b>  | 64 □  | LTS32 PFL A6                  | 1            | 1,39               |
|   | 40A                               | <b>16kW</b>    | 64 □  | LTS40 PFL A6                  | 1            | 1,39               |
|   | 63A                               | <b>22kW</b>    | 64 □  | LTS63 PFL A6                  | 1            | 1,42               |
|   | 80A                               | <b>22kW</b>    | 64 □  | LTS80 PFL A6                  | 1            | 1,42               |
| knockoutlets M50/40<br>+PF3/M50 on request  |                                   |                |       |                               |              |                    |
| <b>On-Off Switches 8-pole</b>   |                                   |                |       |                               |              |                    |
|   | 20A                               | <b>7,5kW</b>   | 64 □  | LTS20 PFL A8                  | 1            | 1,44               |
|   | 25A                               | <b>10kW</b>    | 64 □  | LTS25 PFL A8                  | 1            | 1,44               |
|   | 32A                               | <b>12,5kW</b>  | 64 □  | LTS32 PFL A8                  | 1            | 1,44               |
|   | 40A                               | <b>16kW</b>    | 64 □  | LTS40 PFL A8                  | 1            | 1,44               |
|   | 63A                               | <b>22kW</b>    | 64 □  | LTS63 PFL A8                  | 1            | 1,50               |
|   | 80A                               | <b>22kW</b>    | 64 □  | LTS80 PFL A8                  | 1            | 1,50               |
| knockoutlets M50/40<br>+PF3/M50 on request  |                                   |                |       |                               |              |                    |
| <b>Changeover Switches 3-pole</b>   |                                   |                |       |                               |              |                    |
|   | 20A                               | <b>7,5kW</b>   | 64 □  | LTS20 PFL U3                  | 1            | 1,39               |
|   | 25A                               | <b>10kW</b>    | 64 □  | LTS25 PFL U3                  | 1            | 1,39               |
|   | 32A                               | <b>12,5kW</b>  | 64 □  | LTS32 PFL U3                  | 1            | 1,39               |
|   | 40A                               | <b>16kW</b>    | 64 □  | LTS40 PFL U3                  | 1            | 1,39               |
|   | 63A                               | <b>22kW</b>    | 64 □  | LTS63 PFL U3                  | 1            | 1,42               |
|   | <b>Changeover Switches 4-pole</b> |                |       |                               |              |                    |
|   | 20A                               | <b>7,5kW</b>   | 64 □  | LTS20 PFL U4                  | 1            | 1,44               |
|   | 25A                               | <b>10kW</b>    | 64 □  | LTS25 PFL U4                  | 1            | 1,44               |
|   | 32A                               | <b>12,5kW</b>  | 64 □  | LTS32 PFL U4                  | 1            | 1,44               |
|   | 40A                               | <b>16kW</b>    | 64 □  | LTS40 PFL U4                  | 1            | 1,44               |
|   | 63A                               | <b>22kW</b>    | 64 □  | LTS63 PFL U4                  | 1            | 1,50               |

1) PFL.... larger enclosure



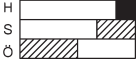

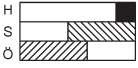










## Add-on Modules for Main Switches, Panel Mounting and Single Hole Mounting

|   | for switch   | Type   | Pack pcs.   | Weight kg/pcs. |                       |
|---|--|--|---|----------------|-----------------------|
|    | <b>4<sup>th</sup> Add-on Neutral Switching Pole</b><br>N  <br>N1                       | LTS20 ... to LTS40 ...<br>LTS63 ... , LTS80 ...                    | N40E<br>N80E  | 1<br>1         | 0,035<br>0,042        |
|    | <b>Aux. Contact Block 1NO + 1NC</b><br>H   13   21  <br>S   14   22  <br>Ö             | LTS20 ... to LTS125 ...  | LH11  | 1              | 0,02                  |
|    | <b>Aux. Contact Block 1NO + 1NC Overlapping</b><br>H   47   35  <br>S   48   36  <br>Ö | LTS20 ... to LTS125 ...  | LH11X   | 1              | 0,02                  |
|    | <b>Aux. Contact Block 2NC</b><br>H   11   21  <br>Ö   12   22  <br>Ö                   | LTS20 ... to LTS125 ...  | LH20V/02E   | 1              | 0,02                  |
|    | <b>PE-Terminal</b><br>PE  <br>PE   | LTS20 ... to LTS80 ...<br>LT125 E.. to LT160 E..                   | PE80E<br>LTXX-E/E   | 1<br>1         | 0,04<br>0,2           |
|   | <b>N-Terminal</b><br>N  <br>N  | LTS20 ... to LTS80 ...<br>LT125 E.. to LT160 E..                   | PEN80E<br>LTXX-N/E  | 1<br>1         | 0,04<br>0,2           |
|  | <b>Terminal Cover 3-pole</b>   | LTS20 ... to LTS80 ...<br>LTS85.. to LTS125.<br>LT125.. to LT160.. | KLAD70<br>KLAD125<br>XX-KLAD3                                       | 1<br>1<br>1    | 0,005<br>0,01<br>0,02 |
|  | <b>Terminal Cover for 4<sup>th</sup> pole</b>  | Mains<br>Load circuit  | LTS20 ... to LTS80..<br>LTS20 ... to LTS80..<br>KLAD70N<br>KLAD70NI | 1<br>1         | 0,002<br>0,002        |
|   | <b>Terminal Cover 4-pole</b>   | LTS85.. to LTS125.<br>LT125.. to LT160..                           | KLAD125<br>XX-KLAD4   | 1<br>1         | 0,01<br>0,02          |

## Accessories for Main Switches, Panel Mounting, Single Hole and Base Mounting

|   | for switch  | Type   | Pack pcs.                    | Weight kg/pcs.   |        |                |
|---|---|--|------------------------------|------------------|--------|----------------|
|  | <b>Additional Escutcheon Plate Yellow, Marked with: HAUPTSCHALTER</b> | for plate 48 <sup>r</sup><br>for plate 64 <sup>r</sup> | LTS.. .HN1..<br>LTS.. .HN4.. | A91501<br>E91501 | 1<br>1 | 0,003<br>0,005 |
|  | <b>Additional Escutcheon Plate Yellow, Marked with: MAIN SWITCH</b>   | for plate 48 <sup>r</sup><br>for plate 64 <sup>r</sup> | LTS.. .HN1..<br>LTS.. .HN4.. | A91524<br>E91524 | 1<br>1 | 0,003<br>0,005 |
|  | <b>Tab Terminal 6,3 x 0,8mm</b>                                       | LTS20 ... bis LTS40 ...                                | LG11073                      | 10               | 0,001  |                |

## Add-on Modules for Main Switches, Base and Rail Mounting

|   |   | for switch                                     | Type                | Pack pcs. | Weight kg/pcs. |       |
|---|---|--|---------------------|-----------|----------------|-------|
|    | <b>4<sup>th</sup> Add-on Neutral Switching Pole</b>                                 |  |                     |           |                |       |
|   |   | LTS20 ... , LTS40 ...<br>LTS63 ... , LTS80 ... | N40V<br>N80V        | 1<br>1    | 0,035<br>0,042 |       |
|    | <b>Aux. Contact Block 1NO + 1NC</b>   |  |                     |           |                |       |
|   |    | LTS20 ... to LTS125 ...                        | LH11                | 1         | 0,02           |       |
|    | <b>Aux. Contact Block 1NO + 1NC Overlapping</b>                                     |  |                     |           |                |       |
|   |    | LTS20 ... to LTS125 ...                        | LH11X               | 1         | 0,02           |       |
|    | <b>Aux. Contact Block 2NO</b>   |  |                     |           |                |       |
|   |    | LTS20 ... to LTS80 ...                         | LH20V/02E           | 1         | 0,02           |       |
|    | <b>PE-Terminal</b>  |  |                     |           |                |       |
|   |    | LTS20 ... to LTS80 ...<br>LT125 .. to LT160 .. | PE80V<br>LTXX-E/V   | 1<br>1    | 0,04<br>0,2    |       |
|   | <b>N-Terminal</b>   |  |                     |           |                |       |
|   |  | LTS20 ... to LTS80 ...<br>LT125 .. to LT160 .. | PEN80V<br>LTXX-N/V  | 1<br>1    | 0,04<br>0,2    |       |
|  | <b>Terminal Cover 3-pole</b>  |  |                     |           |                |       |
|   |   | LTS20 ... to LTS40 ...                         | KLAD40              | 1         | 0,005          |       |
|   |   | LTS63 ... to LTS80 ...                         | KLAD70              | 1         | 0,005          |       |
|   |   | LTS85.. to LTS125.                             | KLAD125             | 1         | 0,01           |       |
|   |   | LT125.. to LT160..                             | XX-KLAD3            | 1         | 0,02           |       |
|  | <b>Terminal Cover for 4<sup>th</sup> pole</b>                                       |  |                     |           |                |       |
|   | Mains<br>Load circuit   | LTS63.., LTS80..<br>LTS63.., LTS80..           | KLAD70N<br>KLAD70NI | 1<br>1    | 0,002<br>0,002 |       |
|  | <b>Terminal Cover 4-pole</b>  |  |                     |           |                |       |
|   |   | LTS20 ... to LTS40 ...                         | KLAD40              | 1         | 0,005          |       |
|   |   | LTS85.. to LTS125.                             | KLAD125             | 1         | 0,01           |       |
|   |   | LT125.. to LT160..                             | XX-KLAD4            | 1         | 0,02           |       |
|  | <b>Additional Cover SMA for</b>   |  |                     |           |                |       |
|   | 4. Pole   | N40V, N80V                                     | grey                | LG8628-2  | 1              | 0,047 |
|   | Aux. Contacts   | LH..   | yellow              | LG8628-7  | 1              | 0,047 |
|   | PE and N-Terminal   | PE80V, PEN80V                                  |                     |           |                |       |

# Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

| Type   | LTS20             | LTS25                               | LTS32   | LTS40   | LTS63                   | LTS80 | LTS85 | LTS100             | LTS125             | LT160              |                     |   |
|--|-------------------|-------------------------------------|---------|---------|-------------------------|-------|-------|--------------------|--------------------|--------------------|---------------------|---|
| <b>Main contacts</b>                               |                   |                                     |         |         |                         |       |       |                    |                    |                    |                     |   |
| Rated thermal current $I_{th}$ open                | A                 | 20                                  | 25      | 32      | 40                      | 63    | 80    | 85                 | 100                | 125                | 160                 |   |
| Rated thermal current $I_{the}$ enclosed           | A                 | 20                                  | 25      | 32      | 40                      | 63    | 80    | 85                 | 100                | 110                | 160                 |   |
| Rated insulation voltage $U_i$ <sup>1)</sup>       | V                 | 690                                 | 690     | 690     | 690                     | 690   | 690   | 1000 <sup>3)</sup> | 1000 <sup>3)</sup> | 1000 <sup>3)</sup> | 1000 <sup>3)</sup>  |   |
| Rated operational current $I_g$ AC21A              | A                 | 20                                  | 25      | 32      | 40                      | 63    | 80    | 85                 | 100                | 125                | 160                 |   |
| Rated operational voltage $U_e$ max. AC21A         | V                 | 690                                 | 690     | 690     | 690                     | 690   | 690   | 1000               | 1000               | 1000               | 690                 |   |
| Making capacity $I_{eff}$ 3x380-440V               | A                 | 160                                 | 190     | 220     | 300                     | 370   | 440   | 600                | 725                | 850                | 1050                |   |
| Breaking capacity 3x220-240V                       | A                 | 160                                 | 180     | 200     | 250                     | 330   | 380   | 480                | 580                | 680                | 900                 |   |
| 3x380-440V   | A                 | 160                                 | 180     | 200     | 250                     | 330   | 380   | 480                | 580                | 680                | 850                 |   |
| 3x660-690V   | A                 | 80                                  | 110     | 140     | 170                     | 190   | 220   | 250                | 330                | 420                | 340                 |   |
| Disconnection property performed up to             | V                 | 690                                 | 690     | 690     | 690                     | 690   | 690   | 1000               | 1000               | 1000               | 1000                |   |
| Motor Switch AC3 3x400V                            | A                 | 12                                  | 16      | 23      | 30                      | 37    | 37    | 45                 | 60                 | 72                 | 85                  |   |
| Motor Switch AC3 3x220-240V                        | kW                | 3                                   | 4       | 5,5     | 7,5                     | 11    | 11    | 15                 | 18,5               | 22                 | 30                  |   |
| Direct switching of single motors 3x380-440V       | kW                | 5,5                                 | 7,5     | 11      | 15                      | 18,5  | 18,5  | 22                 | 30                 | 37                 | 45                  |   |
| 3x660-690V   | kW                | 5,5                                 | 7,5     | 11      | 15                      | 18,5  | 18,5  | 22                 | 30                 | 37                 | 37                  |   |
| Main Switch AC23 3x400V                            | A                 | 16                                  | 20      | 25      | 32                      | 45    | 45    | 60                 | 72                 | 85                 | 110                 |   |
| Motor Switch, AC23A, 3x220-240V                    | kW                | 4                                   | 5,5     | 7,5     | 9                       | 15    | 15    | 18,5               | 22                 | 30                 | 30                  |   |
| Main Switch, AC23B 3x380-440V                      | kW                | 7,5                                 | 10      | 12,5    | 16                      | 22    | 22    | 30                 | 37                 | 45                 | 55                  |   |
| Safety Switch 3x660-690V                           | kW                | 5,5                                 | 7,5     | 11      | 15                      | 18,5  | 18,5  | 22                 | 30                 | 37                 | 37                  |   |
| Rated conditional short-circuit current 400V       | kA <sub>eff</sub> | 10                                  | 10      | 10      | 10                      | 10    | 10    | 10                 | 10                 | 5                  | 30                  |   |
| Max. fuse size gL (gG) 400V                        | A                 | 25                                  | 35      | 40      | 40                      | 63    | 80    | 100                | 100                | 125                | 160                 |   |
| Rated conditional short-circuit current 690V       | kA <sub>eff</sub> | 10                                  | 5       | 3       | 1                       | 5     | 1,5   | 10                 | 10                 | 5                  | 30                  |   |
| Max. fuse size gL (gG) 690V                        | A                 | 20                                  | 25      | 32      | 40                      | 63    | 80    | 85                 | 100                | 125                | -                   |   |
| Mechanical life $\times 10^3$                      |                   | 200                                 | 200     | 200     | 200                     | 100   | 100   | 100                | 100                | 100                | 100                 |   |
| Electrical life $\times 10^3$                      |                   | 5                                   | 5       | 5       | 5                       | 4     | 4     | 3                  | 3                  | 3                  | 2                   |   |
| Rated short-time withstand current (1sec. current) | A                 | 250                                 | 300     | 400     | 500                     | 600   | 850   | 1000               | 1200               | 1500               | 3000                |   |
| Power loss per pole AC21 = $I_{th}$                | P/pole [W]        | E, Z                                | 0,322   | 0,503   | 0,824                   | 1,288 | 2,739 | 4,416              | 3,851              | 5,330              | 8,328               | - |
|  | V, SMA, PF        |                                     | 0,364   | 0,569   | 0,933                   | 1,458 | 2,739 | 4,416              | 3,851              | 5,330              | 8,328               | - |
|  | R/pole [mOhm]     | E, Z                                | 0,805   | 0,805   | 0,805                   | 0,805 | 0,690 | 0,690              | 0,533              | 0,533              | 0,533               | - |
|  | V, SMA, PF        |                                     | 0,911   | 0,911   | 0,911                   | 0,911 | 0,690 | 0,690              | 0,533              | 0,533              | 0,533               | - |
| <b>Maximum ambient temperature</b> Operation open  |                   | -40°C to +60°C (90°C) <sup>5)</sup> |         |         |                         |       |       |                    |                    |                    | +60°C               |   |
|  | enclosed          | -40°C to +40°C                      |         |         |                         |       |       |                    |                    |                    | +40°C               |   |
|  | Storage           | -50°C to +90°C <sup>6)</sup>        |         |         |                         |       |       |                    |                    |                    | +90°C <sup>6)</sup> |   |
| <b>Cable cross sections</b>                        | mm <sup>2</sup>   | 0,5 - 10                            |         |         | 1 - 25 <sup>4)</sup>    |       |       | 4 - 50             |                    |                    | max.95              |   |
| solid or stranded                                  | AWG               | 20 - 8 (10)                         |         |         | 16 - 3 (10)             |       |       | 10 - 00 (10)       |                    |                    | max.3/0             |   |
| flexible   | mm <sup>2</sup>   | 0,5 - 6                             |         |         | 4 - 16 <sup>4)</sup>    |       |       | 10 - 35            |                    |                    | max.70              |   |
|  | AWG               | 20 - 10                             |         |         | 16 - 6                  |       |       | 8 - 2              |                    |                    | max.2/0             |   |
| flexible (+ multicore cable end)                   | mm <sup>2</sup>   | 0,5 - 6                             |         |         | 0,75 - 16 <sup>4)</sup> |       |       | 6 - 35             |                    |                    | max.50              |   |
|  | AWG               | 20 - 10                             |         |         | 16 - 6                  |       |       | 8 - 2              |                    |                    | max.1/0             |   |
| Size of terminal screw                             |                   | M3,5                                |         |         | M5                      |       |       | M6                 |                    |                    | M10                 |   |
| Tightening torque                                  | Nm                | 1,7 - 2,3                           |         |         | 2,8 - 4                 |       |       | 1,7 - 4,5          |                    |                    | 14                  |   |
| <b>Auxiliary contacts</b>                          |                   |                                     |         |         |                         |       |       |                    |                    |                    |                     |   |
| Rated insulation voltage $U_i$ <sup>1)</sup>       | V                 | 690                                 |         |         | 690                     |       |       | 690                |                    |                    | 690                 |   |
| Rated thermal current $I_{th}$ , $I_{the}$         | A                 | 10                                  |         |         | 10                      |       |       | 10                 |                    |                    | 16                  |   |
| Switching capacity AC15 380-450V                   | A                 | 2,5/1,5                             |         |         | 2,5/1,5                 |       |       | 2,5/1,5            |                    |                    | 6/4                 |   |
| DC13 60-110V                                       | A                 | 2/0,4                               |         |         | 2/0,4                   |       |       | 2/0,4              |                    |                    | -                   |   |
| Rated conditional short-circuit current            | kA <sub>eff</sub> | 3                                   |         |         | 3                       |       |       | 3                  |                    |                    | 3                   |   |
| Max. short circuit protection gL (gG)              | A                 | 10                                  |         |         | 10                      |       |       | 10                 |                    |                    | 16                  |   |
| <b>Cable cross sections</b>                        | mm <sup>2</sup>   | 0,75 - 2,5                          |         |         | 0,75 - 2,5              |       |       | 0,75 - 2,5         |                    |                    | max.4               |   |
| solid or stranded                                  | AWG               | 14 - 12                             |         |         | 14 - 12                 |       |       | 14 - 12            |                    |                    | max.12              |   |
| flexible (+ multicore cable end)                   | mm <sup>2</sup>   | 0,75 - 2,5 (1,5)                    |         |         | 0,75 - 2,5 (1,5)        |       |       | 0,75 - 2,5 (1,5)   |                    |                    | max.2,5             |   |
|  | AWG               | 18 - 14                             |         |         | 18 - 14                 |       |       | 18 - 14            |                    |                    | max.14              |   |
| <b>Data according to UL and cUL</b>                |                   |                                     |         |         |                         |       |       |                    |                    |                    |                     |   |
| Type   | LTS20             | LTS25                               | LTS32   | LTS40   | LTS63                   | LTS80 | LTS85 | LTS100             | LTS125             | LT160              |                     |   |
| Rated voltage                                      | V                 | 600                                 | 600     | 600     | 600                     | 600   | 600   | 600                | 600                | 600                |                     |   |
| Ampere-Rating "General use"                        | A                 | 20                                  | 25      | 32      | 40                      | 63    | 80    | 85                 | 100                | 125                |                     |   |
| DOL-Rating 3-phase 110-120V                        | HP                | 1                                   | 1,5     | 2       | 2                       | 3     | 5     | 7,5                | 10                 | 15                 |                     |   |
| 220-240V   | HP                | 3                                   | 5       | 5       | 5                       | 10    | 10    | 20                 | 25                 | 30                 |                     |   |
| 440-480V   | HP                | 7,5                                 | 10      | 10      | 10                      | 20    | 20    | 40                 | 50                 | 60                 |                     |   |
| 550-600V   | HP                | 10                                  | 10      | 15      | 15                      | 25    | 25    | 50                 | 60                 | 60                 |                     |   |
| DOL-Rating 1-phase 110-120V                        | HP                | 1                                   | 1       | 1       | 1                       | 2     | 2     | 3                  | 5                  | 7,5                |                     |   |
| 200-208V   | HP                | 1                                   | 2       | 2       | 2                       | 3     | 3     | 7,5                | 10                 | 10                 |                     |   |
| 220-240V   | HP                | 2                                   | 2       | 3       | 3                       | 5     | 5     | 10                 | 15                 | 15                 |                     |   |
| Fuse size (RK5) Manual Motor Controller            | A                 | 40                                  | 50      | 50      | 70                      | 90    | 110   | 125                | 125                | 125                |                     |   |
| 5kA / 600V Motor Disconnect                        | A                 | 40                                  | 50      | 50      | 50                      | 70    | 70    | 125                | 125                | 125                |                     |   |
| Tightening torque                                  | Nm                | 1,7-2,3                             | 1,7-2,3 | 1,7-2,3 | 1,7-2,3                 | 2,8-4 | 2,8-4 | 1,7-4,5            | 1,7-4,5            | 1,7-4,5            |                     |   |
|  | lb.inch           | 15-20                               | 15-20   | 15-20   | 15-20                   | 24-35 | 24-35 | 15-40              | 15-40              | 15-40              |                     |   |

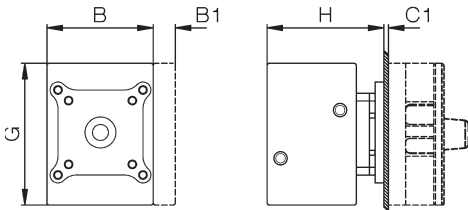
1) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 6kV$ .  
 2) Fuse RK1 / 10kA / 600V  
 3)  $U_{imp} = 8kV$   
 4) LTS63..U. stranded 16mm<sup>2</sup>, flexible 10mm<sup>2</sup>  
 5) Derating acc. to cable cross sections  
 6) for switches with transparent plates 48 □ max. +65°C



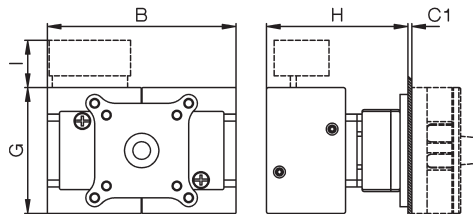
# Dimensions (mm)

## Main Switches, Switch Disconnectors LT(S)..

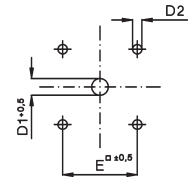
**Panel mounting LT(S).. E(HN)..**  
ON-OFF Switches 3-pole, 4-pole



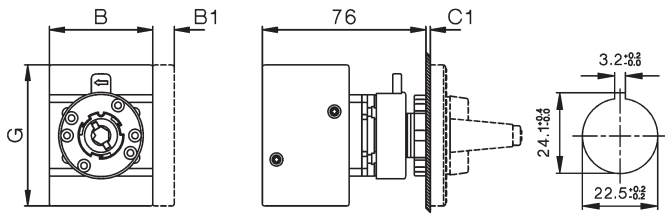
ON-OFF Switches 6-pole, 8-pole  
Changeover Switches 3-pole, 4-pole



Mounting holes  
Mounting screw: J3631N M=1,2-1,4 Nm

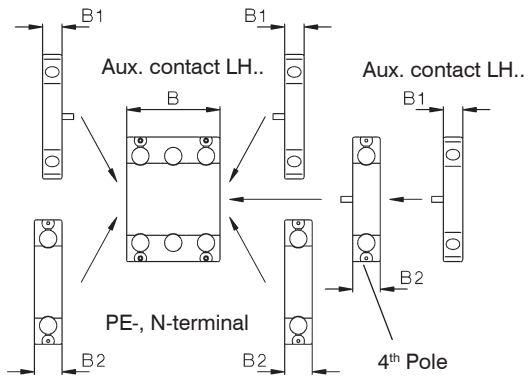


**Single hole mounting LTS.. Z(HN)..**  
ON-OFF Switches 3-pole, 4-pole



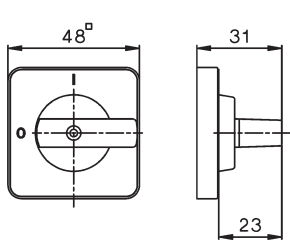
Mounting holes

**Mounting of add-on modules LTS20 - LTS80**  
Panel mounting, Single hole mounting

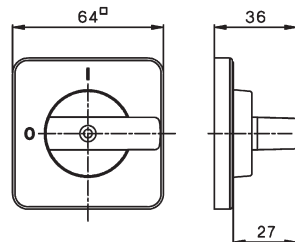


| Type        | Esc. plate       | Changeover ON-OFF padlock device | Changeover ON-OFF |        |               |               |              | 4. Pole PE |      |     |       | 3,4-pole 3,4-pole 6,8-pole 6,8-pole |    |      |     |    |    |    |
|-------------|------------------|----------------------------------|-------------------|--------|---------------|---------------|--------------|------------|------|-----|-------|-------------------------------------|----|------|-----|----|----|----|
|             |                  |                                  | 3-pole            | 4-pole | 3-pole 6-pole | 4-pole 8-pole | aux. contact | B2         | C1   | D1  | D2    | E                                   | F  | G    | H   | H  | I  |    |
| LTS20-80..  | 48 □, SV1        |                                  | A                 | B      | B             | B             | B            | B1         | B2   | C1  | D1    | D2                                  | E  | F    | G   | H  | H  | I  |
| LTS20-80..  | 64 □, SV4, SV164 |                                  | 48                | 48     | 62,5          | -             | -            | 10         | 14,5 | 1-5 | 9     | 5                                   | 36 | -    | 64  | 49 | 74 | 24 |
| LTS85-125.. | 64 □, SV4        |                                  | 64                | 48     | 62,5          | 97            | 126          | 10         | 14,5 | 1-5 | 9     | 5                                   | 48 | -    | 64  | 49 | 74 | 24 |
| LTS85-125.. | 88 □, SV488      |                                  | 64                | 78     | 78            | -             | -            | 10         | -    | 1-5 | 9     | 5                                   | 48 | -    | 85  | 55 | -  | -  |
| LTS85-125.. | 88 □, SV488      |                                  | 88                | 78     | 78            | -             | -            | 10         | -    | 1-5 | 9     | 6                                   | 68 | -    | 85  | 55 | -  | -  |
| LT160       | 88 □, SV34       |                                  | 88                | 112    | 150           | 224           | -            | -          | -    | 1-4 | 13-17 | 6                                   | 68 | 49,3 | 108 | 96 | 98 | -  |

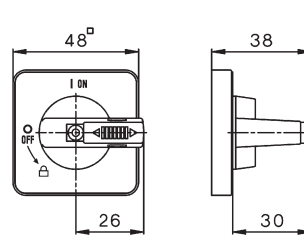
**Escutcheon plate**  
48 □



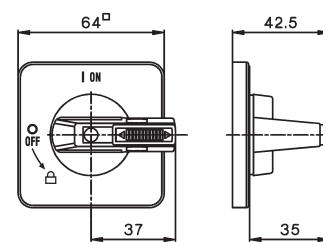
64 □



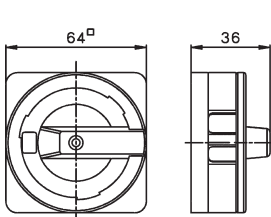
**Padlock devices**  
SV1



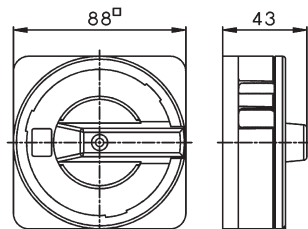
SV164



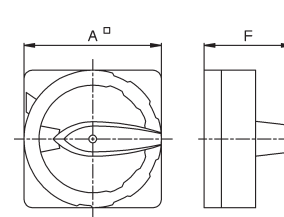
**Padlock devices**  
SV4



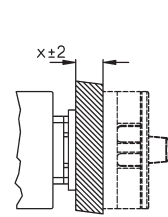
SV488



SV34



**Extended Switch Shaft**  
+ VW"x"

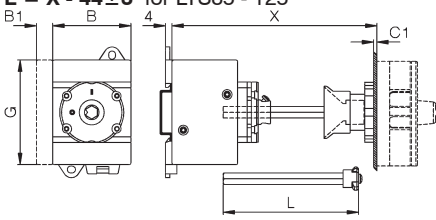


# Dimensions (mm)

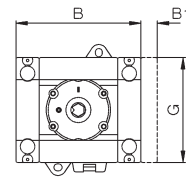
## Main Switches, Switch Disconnectors LT(S)..

**Base mounting LTS.. VZV(HN)..**  
ON-OFF Switches 3-pole, 4-pole

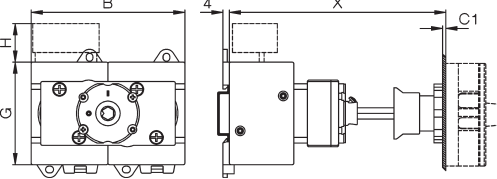
**L = X - 40 ± 3** for LTS20 - 80  
**L = X - 44 ± 3** for LTS85 - 125



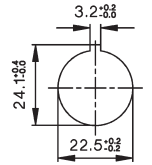
6-pole  
for LTS20 - 40 only  
**L = X - 40 ± 3**



ON-OFF Switches 6-pole, 8-pole  
Changeover Switches 3-pole, 4-pole  
**L = X - 60 ± 3**

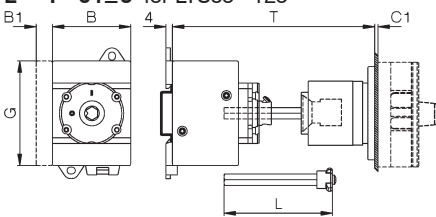


Mounting holes

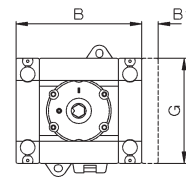


**Base mounting LT(S).. V(HN)..**  
ON-OFF Switches 3-pole, 4-pole

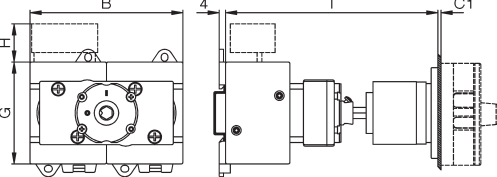
**L = T - 60 ± 3** for LTS20 - 80  
**L = T - 64 ± 3** for LTS85 - 125



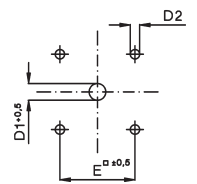
6-pole  
for LTS20 - 40 only  
**L = T - 60 ± 3**



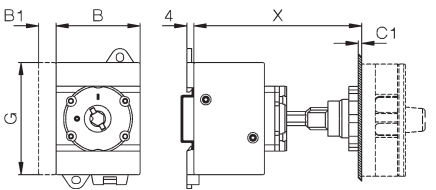
ON-OFF Switches 6-pole, 8-pole  
Changeover Switches 3-pole, 4-pole  
**L = T - 80 ± 3** for LTS20 - 80 only



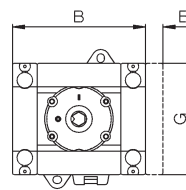
Mounting holes



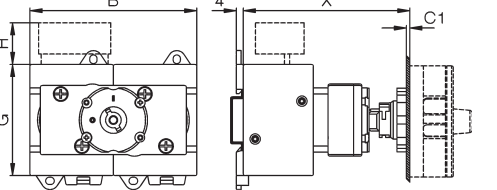
**Base mounting LTS.. VZ(HN)..**  
ON-OFF Switches 3-pole, 4-pole  
Preference values for X: 80, 85, 104, 129



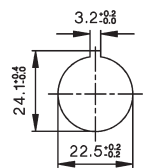
6-pole  
for LTS20 - 40 only



ON-OFF Switches 6-pole, 8-pole  
Changeover Switches 3-pole, 4-pole

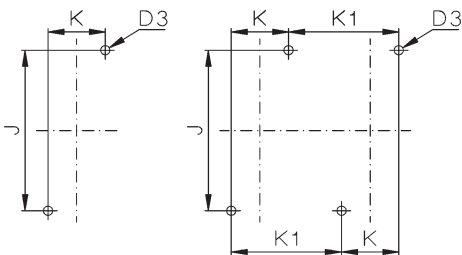


Mounting holes

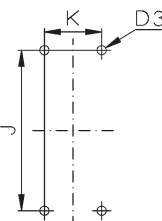


| Type        | Changeover ON-OFF Escutch. plate or padlock device | 3,4-pole |     |      |     |     | aux. contact B1 | 4 Pole PE |    | C1  | D1                  | D2 | D3 | E  | G   | K  | K1 | J   |
|-------------|--|----------|-----|------|-----|-----|-----------------|-----------|----|-----|---------------------|----|----|----|-----|----|----|-----|
|             |  | A        | B   | B    | B   | B   |                 | B2        | H  |     |                     |    |    |    |     |    |    |     |
| LTS20 - 40  | 64 □, SV4, SV164                                   | 64       | 48  | 48   | 77  | 97  | 10              | 14,5      | 24 | 1-5 | 9                   | 5  | M4 | 48 | 64  | 25 | 48 | 70  |
| LTS63, 80   | 64 □, SV4, SV164                                   | 64       | 48  | 62,5 | 97  | 126 | 10              | 14,5      | 24 | 1-5 | 9                   | 5  | M4 | 48 | 64  | 25 | 48 | 70  |
| LTS85-125.. | 64 □, SV4  | 64       | 78  | 78   | -   | -   | 10              | -         | -  | 1-5 | 9                   | 5  | M4 | 48 | 85  | 38 | -  | 90  |
| LT125/160   | 88 □, SV34   | 88       | 112 | 150  | 224 | -   | -               | -         | -  | 1-4 | 13/27 <sup>2)</sup> | 6  | M6 | 68 | 108 | 36 | -  | 120 |

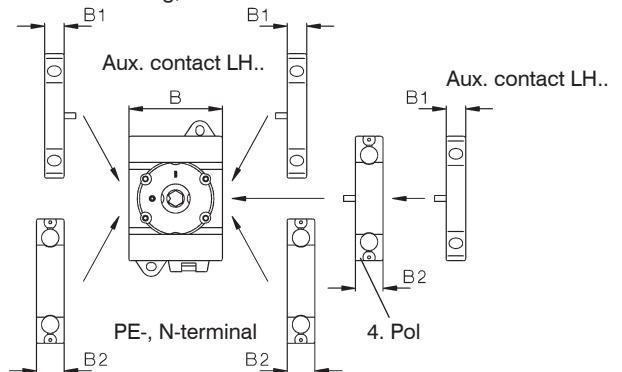
**Base mounting**  
ON-OFF Switches LTS20 - LTS80  
3-pole, 4-pole  
6-pole LTS20 - 40



**LTS85-125, LT160**  
3-pole, 4-pole



**Mounting of Accessories LTS20 - LTS80**  
Base mounting, for distribution boards



1) Ø 22-25 for LT80(100) VH(N)34 .. only  
2) Ø 26-30 for LT125(160) VH(N)34 .. only

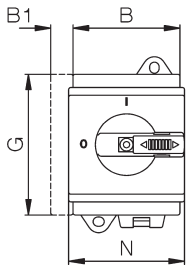


## Dimensions (mm)

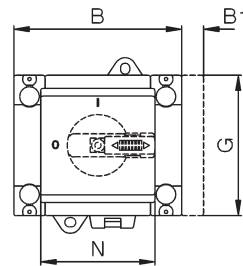
### Main Switches, Switch Disconnectors LT(S)..

#### Installation cover LT(S).. SMA(HN)..

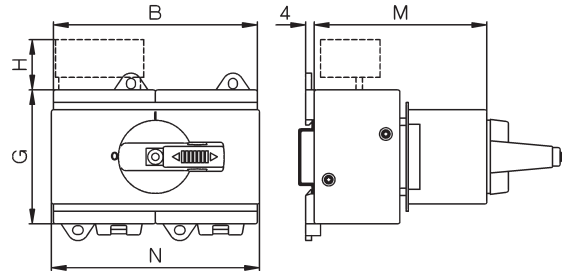
ON-OFF Switches 3-pole, 4-pole



ON-OFF Switches 6-pole  
for LTS20 - 40 only



ON-OFF Switches 6-pole, 8-pole  
Changeover Switches 3-pole, 4-pole



| Type        | padlock device | Changeover ON-OFF |        |        |        |              |           | G  | 3,4-pole      |        |        | 3,4-pole      |                  |                   | H  |
|-------------|----------------|-------------------|--------|--------|--------|--------------|-----------|----|---------------|--------|--------|---------------|------------------|-------------------|----|
|             |                | 3-pole            | 4-pole | 6-pole | 8-pole | aux. contact | 4.pole PE |    | 3-pole 4-pole | 6-pole | 8-pole | 3-pole 4-pole | 6-pole           | 8-pole            |    |
|             |                | B                 | B      | B      | B      | B1           | B2        | M  |               | M      | M      | N             | N                | N                 |    |
| LTS20 - 40  | SV1, SV164     | 48                | 48     | 77     | 96     | 10           | 14,5      | 64 | 60            | 60     | 74     | 52            | 52               | 97 <sup>2)</sup>  | 24 |
| LTS63, 80   | SV1, SV164     | 48                | 62,5   | 96     | 125    | 10           | 14,5      | 64 | 60            | 79     | 79     | 52            | 97 <sup>2)</sup> | 126 <sup>1)</sup> | -  |
| LTS85-125.. | SV164          | 78                | 78     | -      | -      | 10           | -         | 85 | 60            | -      | -      | 78            | -                | -                 | -  |

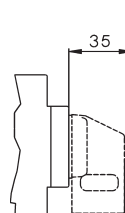
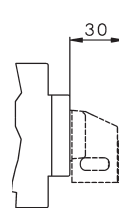
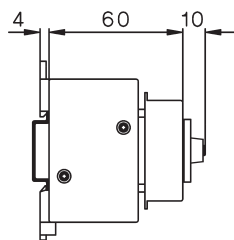
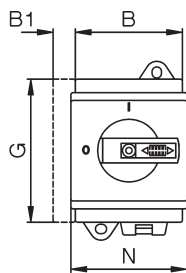
#### Installation cover with low height handle LTS SMAHN1.. +SV1N

Main switch 3-pole, 4-pole

LTS20 - LTS80

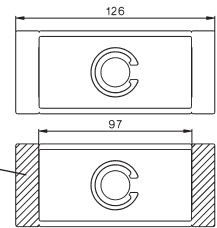
Padlock device SV1

Padlock device SV164



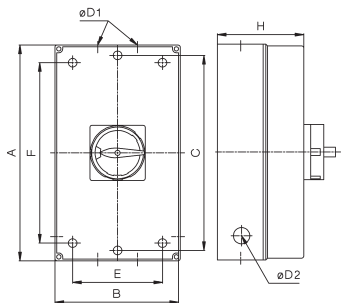
1) Original cover

2) Remove cover parts



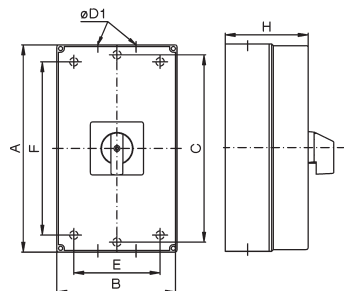
### Maintenance and Safety Switches LT(S)..PF..

| Type   | pole | size | A   | B   | C     | D1                       | D2   | E   | F   | H   |
|--|------|------|-----|-----|-------|--------------------------|------|-----|-----|-----|
| LTS20 PFH.. A. - LTS40 PFH.. A. <sup>3)</sup>    | 3, 4 | PF1  | 130 | 98  | 120   | 2x25,5/20,5              | -    | 75  | 100 | 76  |
| LTS20 PFLH.. A., LTS40 PFLH A. <sup>3)</sup>     | 3, 4 | PFL  | 180 | 98  | 170   | 2x25,5/20,5 / 16,5/12,5- | -    | 75  | 150 | 76  |
| LTS20 PFLH.. A. - LTS40 PFLH.. A. <sup>4)</sup>  | 6    | PFL2 | 200 | 140 | 188,5 | 40,5/32,5+16,5+12,5 -    | -    | 100 | 160 | 86  |
| LTS63 PFLH.. A. - LTS80 PFLH.. A. <sup>4)</sup>  | 3, 4 | PFL2 | 200 | 140 | 188,5 | 40,5/32,5+16,5+12,5 -    | -    | 100 | 160 | 86  |
| LTS85 PFLH.. A. - LTS125 PFLH.. A. <sup>5)</sup> | 3, 4 | PFL2 | 200 | 140 | 188,5 | 40,5/32,5+16,5+12,5 -    | -    | 100 | 160 | 86  |
| suffix + PF3                                     | 3, 4 | PFL3 | 240 | 176 | 228,5 | 2x40,5/32,5              | -    | 120 | 200 | 120 |
| suffix + PF3/M50                                 | 3, 4 | PFL3 | 240 | 176 | 228,5 | 50,5/40,5                | -    | 120 | 200 | 120 |
| LTS20 PFLH.. A. - LTS40 PFLH.. A. <sup>5)</sup>  | 8    | PFL3 | 240 | 176 | 228,5 | 2x40,5/32,5              | -    | 120 | 200 | 120 |
| LTS63 PFLH.. A. - LTS80 PFLH.. A. <sup>5)</sup>  | 6, 8 | PFL3 | 240 | 176 | 228,5 | 2x40,5/32,5              | -    | 120 | 200 | 120 |
| suffix + M50                                     | 6, 8 | PFL3 | 240 | 176 | 228,5 | 50,5/40,5                | -    | 120 | 200 | 120 |
| LT160 PF..                                       | 3    | PF4  | 300 | 200 | -     | 2x50,5                   | 25,5 | 172 | 272 | 172 |
| LT160 PF..                                       | 4    | PF5  | 300 | 280 | -     | 2x50,5                   | -    | 254 | 254 | 180 |



### Switch Disconnectors in Plastic Enclosure LTS..PF..

| Type                                     | pole | size | A   | B   | C     | D1                      | E   | F   | H   |
|--|------|------|-----|-----|-------|-------------------------|-----|-----|-----|
| LTS20 PF A., LTS40 PF A. <sup>3)</sup>   | 3, 4 | PF1  | 130 | 98  | 121   | 2x25,5/20,5             | 75  | 100 | 76  |
| LTS20 PFL A., LTS40 PFL A. <sup>3)</sup> | 3, 4 | PFL  | 180 | 98  | 170   | 2x25,5/20,5 / 16,5/12,5 | 75  | 150 | 76  |
| LTS63 PFL A., LTS80 PFL A. <sup>4)</sup> | 3, 4 | PFL2 | 200 | 140 | 188,5 | 40,5/32,5+16,5+12,5     | 100 | 160 | 86  |
| suffix + PF3                             | 3, 4 | PFL3 | 240 | 176 | 228,5 | 2x40,5/32,5             | 120 | 200 | 120 |
| suffix + PF3/M50                         | 3, 4 | PFL3 | 240 | 176 | 228,5 | 50,5/40,5               | 120 | 200 | 120 |



Max. quantity of poles + aux. contacts in enclosure:

3) LTS40 PF. A5 + LH11

4) LTS40 PFL.. A6, LTS80 PFL.. A5 + LH11, LTS125 PFL.. A4 + LH11

5) LTS40 PFL.. A10, LTS40 PFL.. U4 + LH11, LTS80 PFL.. A8, LTS80 PFL.. A6 + LH11,

LTS40 PFL.. U3 + LH11, LTS125 PFL.. A4+LH11

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ON-OFF Switches for Single Hole Mounting

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ON-OFF Switches for Base Mounting with Door Clutch

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ON-OFF Switches for Distribution Boards

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Main Switches for Panel Mounting

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Main Switches for Single Hole Mounting

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Main Switches for Base Mounting with Door Clutch

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Main Switches for Distribution Boards

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Main Switches in Plastic Enclosure

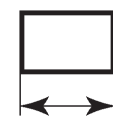
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Technical Datas  
Approvals

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Dimensions

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Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnectors

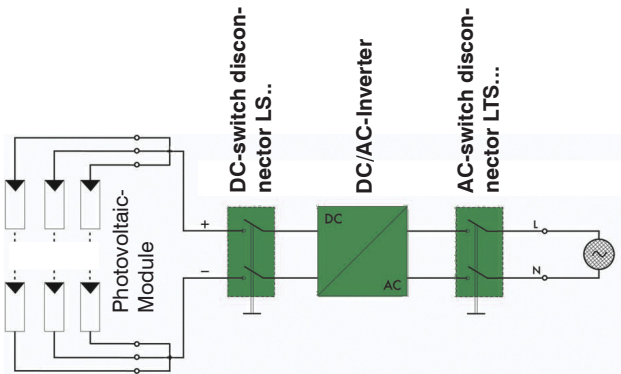
Push Buttons

Representatives, Suppliers

| Ratings |                           |  |      | DC-Switch Disconnectors   |   |   |   |
|---------|---------------------------|--|------|---|---|---|---|
| Type    | I <sub>th</sub> open<br>A | DC21B(DC-PV1) at U <sub>e</sub><br>4 poles in series |      | Design  |   |   |   |
|         |                           | A  | V    | Panel mounting<br>4-hole mounting<br>IP66 <sup>1)</sup> cULus Type 3R | Single hole<br>mounting Ø22,5mm<br>IP66 <sup>1)</sup> cULus Type 4X | Base mounting w.<br>door coupling IP66 <sup>1)</sup><br>cULus Type 4X | Modular<br>switch IP40 <sup>1)</sup><br>cULus Open Type |
| LS16    | 16                        | 16   | 1500 | .. E ..   | .. Z(O) ..  | .. VZV ..   | .. SMA ..   |
| LS25    | 25                        | 25   | 1500 | .. E ..   | .. Z(O) ..  | .. VZV ..   | .. SMA ..   |
| LS32    | 32                        | 32   | 1500 | .. E ..   | .. Z(O) ..  | .. VZV ..   | .. SMA ..   |
| LS38    | 38                        | 38   | 1500 | .. E ..   | .. Z(O) ..  | .. VZV ..   | .. SMA ..   |
| LS40    | 40                        | 40   | 1500 | .. E ..   | -   | .. VZV ..   | .. SMA ..   |
| LS55    | 55                        | 55   | 1500 | .. E ..   | -   | .. VZV ..   | .. SMA ..   |
| LS65    | 65                        | 65   | 1500 | .. E ..   | -   | .. VZV ..   | .. SMA ..   |

### Switch Disconnectors for Photovoltaic

Switch disconnectors „LS..“ are switch gears for interrupting the DC/AC-Inverter from the solar-panels. Photovoltaic-installations have to be equipped with DC-isolators according to IEC 60364-7-712.



Switch disconnectors „LS..“ ensures a reliable switching up to 85A with 1500V in the category DC21B (DC-PV1).

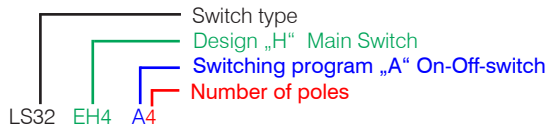
The construction of the contacts and the material selection guarantee that no oxidation (small switching frequency) develops, and is thus prevented inadmissible heating-up.

The switch disconnector has 2, 4, 6 or 8 contacts, by serial or parallel wiring of the contacts the contact rating will be increased. The switching speed at the manually operated handle does not have an effect on the switching attitude of the contacts.

#### Mounting positions:

No limitations, all kind of positions allowed.

### Ordering



### Switching programs

| Type                       | 2-pole | 2+2-pole<br>2 poles in series<br>+2 poles parallel | 4-pole        | 4-pole<br>with jumpers<br>Input on top<br>Output bottom | 4-pole<br>with jumpers<br>Input and<br>Output bottom | 4-pole<br>with jumpers<br>Input and<br>Output on top |
|----------------------------|--------|--|---------------|---|--|--|
| LS16 ... LS55              | .. A2  | .. A2+2  | .. A4(2 x A2) | .. A4B  | .. A4O   | .. A4U   |
| Contacts<br>Wiring diagram |        |  |               |   |  |  |
| Switching example          |        |  |               |   |  |  |

1) Protection in front and built in.

## DC-Main Switches

Panel mounting  
Four-hole mounting  
IP66<sup>1)</sup> Type 3R



Single hole mounting  
Ø22,5mm IP66<sup>1)</sup> Type 4X



Base mounting  
with door coupling  
IP66<sup>1)</sup> Type 4X



Modular  
switch IP40<sup>1)</sup> Open Type



Plastic enclosed  
PFL..IP66/67 Type 4X



|            |              |             |             |             |
|------------|--------------|-------------|-------------|-------------|
| .. EH4. .. | .. Z(O)H1 .. | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |
| .. EH4. .. | .. Z(O)H1 .. | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |
| .. EH4. .. | .. Z(O)H1 .. | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |
| .. EH4. .. | .. Z(O)H1 .. | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |
| .. EH4. .. | -            | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |
| .. EH4. .. | -            | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |
| .. EH4. .. | -            | .. VZVH4 .. | .. SMAH1 .. | .. PFLH4 .. |

### Technical Data for DC, according to IEC 60947-3, VDE0660, more data find on page 315.

| Type                             | DC-PV1 (=DC21B) |      |      |      |      |       |       |       |     |
|----------------------------------|-----------------|------|------|------|------|-------|-------|-------|-----|
|                                  | 500V            | 600V | 700V | 800V | 900V | 1000V | 1200V | 1500V |     |
| 2 Poles in series<br>            | <b>LS16..</b> A | 16   | 16   | 16   | 16   | 16    | 10    | 7     | 3   |
|                                  | <b>LS25..</b> A | 25   | 25   | 25   | 20   | 17    | 11,5  | 8,5   | 5   |
|                                  | <b>LS32..</b> A | 32   | 32   | 32   | 23   | 20    | 13    | 10    | 6   |
|                                  | <b>LS38..</b> A | 45   | 45   | -    | 30   | -     | 20    | -     | -   |
|                                  | <b>LS40..</b> A | 48   | 48   | 37   | 35   | 31    | 29    | 11    | 7,5 |
|                                  | <b>LS55..</b> A | 55   | 55   | 55   | 55   | 43    | 36    | 17    | 10  |
|                                  | <b>LS65..</b> A | 65   | 65   | 65   | 65   | 55    | 40    | 17    | 10  |
| 2 Poles in series+2 parallel<br> | <b>LS16..</b> A | 29   | 29   | 22   | 17   | 16    | 10    | 7     | 3   |
|                                  | <b>LS25..</b> A | 45   | 36   | 27   | 19   | 17    | 11,5  | 8,5   | 5   |
|                                  | <b>LS32..</b> A | 58   | 55   | 32   | 23   | 20    | 13    | 10    | 6   |
|                                  | <b>LS38..</b> A | -    | -    | -    | 30   | -     | 20    | -     | -   |
|                                  | <b>LS40..</b> A | 72   | 68   | 49   | 42   | 31    | 29    | 11    | 7,5 |
|                                  | <b>LS55..</b> A | 85   | 85   | 77   | 63   | 43    | 36    | 17    | 10  |
|                                  | <b>LS65..</b> A | 85   | 85   | 80   | 65   | 55    | 40    | 17    | 10  |
| 4 Poles in series<br>            | <b>LS16..</b> A | 16   | 16   | 16   | 16   | 16    | 16    | 16    | 16  |
|                                  | <b>LS25..</b> A | 25   | 25   | 25   | 25   | 25    | 25    | 25    | 25  |
|                                  | <b>LS32..</b> A | 32   | 32   | 32   | 32   | 32    | 32    | 32    | 32  |
|                                  | <b>LS38..</b> A | 45   | 45   | -    | -    | -     | -     | -     | -   |
|                                  | <b>LS40..</b> A | 48   | 48   | 40   | 40   | 40    | 40    | 40    | 40  |
|                                  | <b>LS55..</b> A | 55   | 55   | 55   | 55   | 55    | 55    | 55    | 55  |
|                                  | <b>LS65..</b> A | 65   | 65   | 65   | 65   | 65    | 65    | 65    | 65  |
| 4 Poles in series+2 parallel<br> | <b>LS16..</b> A | 29   | 29   | 29   | 29   | 29    | 29    | 29    | 20  |
|                                  | <b>LS25..</b> A | 45   | 45   | 45   | 45   | 45    | 45    | 45    | 26  |
|                                  | <b>LS32..</b> A | 58   | 58   | 58   | 58   | 58    | 58    | 50    | 32  |
|                                  | <b>LS38..</b> A | -    | -    | -    | -    | -     | -     | -     | -   |
|                                  | <b>LS40..</b> A | 72   | 72   | 72   | 72   | 72    | 72    | 56    | 42  |
|                                  | <b>LS55..</b> A | 85   | 85   | 85   | 85   | 85    | 85    | 65    | 55  |
|                                  | <b>LS65..</b> A | 85   | 85   | 85   | 85   | 85    | 85    | 65    | 55  |

| Type                       | 6-pole | 3+2-pole<br>3 poles in series<br>+2 poles parallel | 8-pole | 4+2-pole<br>4 poles in series<br>+2 poles parallel |
|----------------------------|--------|--|--------|--|
| <b>LS16 ... LS55</b>       | ...A6  | .. A3+2  | ...A8  | .. A4+2  |
| Contacts<br>Wiring diagram |        |  |        |  |
| Switching example          |        |  |        |  |

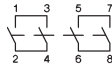
Insulated jumpers LSV.. for series and parallel switching of contacts see page 325.



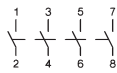
# ON-OFF Switches for Panel Mounting, Escutcheon plate 64°, IP66, US Type 3R



| DC21B / DC-PV1<br>600V DC 1000V DC |       | Poles<br>in series | Number<br>of strings | Type             | Pack<br>pcs. | Weight<br>kg/pcs. |
|------------------------------------|-------|--------------------|----------------------|------------------|--------------|-------------------|
| 16A                                | 10A   | 2                  | 1                    | <b>LS16 E A2</b> | 1            | 0,20              |
| 25A                                | 11,5A | 2                  | 1                    | <b>LS25 E A2</b> | 1            | 0,20              |
| 32A                                | 13A   | 2                  | 1                    | <b>LS32 E A2</b> | 1            | 0,20              |
| 45A                                | 20A   | 2                  | 1                    | <b>LS38 E A2</b> | 1            | 0,20              |
| 48A                                | 29A   | 2                  | 1                    | <b>LS40 E A2</b> | 1            | 0,41              |
| 55A                                | 36A   | 2                  | 1                    | <b>LS55 E A2</b> | 1            | 0,41              |
| 65A                                | 40A   | 2                  | 1                    | <b>LS65 E A2</b> | 1            | 0,41              |



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 29A | 10A   | 2 | 1 | <b>LS16 E A2+2</b> | 1 | 0,25 |
| 36A | 11,5A | 2 | 1 | <b>LS25 E A2+2</b> | 1 | 0,25 |
| 55A | 13A   | 2 | 1 | <b>LS32 E A2+2</b> | 1 | 0,25 |
| -   | 20A   | 2 | 1 | <b>LS38 E A2+2</b> | 1 | 0,25 |
| 68A | 29A   | 2 | 1 | <b>LS40 E A2+2</b> | 1 | 0,54 |
| 85A | 36A   | 2 | 1 | <b>LS55 E A2+2</b> | 1 | 0,54 |
| 85A | 40A   | 2 | 1 | <b>LS65 E A2+2</b> | 1 | 0,54 |

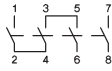


|     |       |   |   |                  |   |      |
|-----|-------|---|---|------------------|---|------|
| 16A | 10A   | 2 | 2 | <b>LS16 E A4</b> | 1 | 0,23 |
| 25A | 11,5A | 2 | 2 | <b>LS25 E A4</b> | 1 | 0,23 |
| 32A | 13A   | 2 | 2 | <b>LS32 E A4</b> | 1 | 0,23 |
| 45A | 20A   | 2 | 2 | <b>LS38 E A4</b> | 1 | 0,23 |
| 48A | 29A   | 2 | 2 | <b>LS40 E A4</b> | 1 | 0,49 |
| 55A | 36A   | 2 | 2 | <b>LS55 E A4</b> | 1 | 0,49 |
| 65A | 40A   | 2 | 2 | <b>LS65 E A4</b> | 1 | 0,49 |

Type suffix

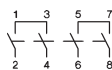


**B** ..A4B

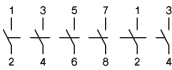
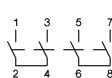


|     |     |   |   |                   |   |      |
|-----|-----|---|---|-------------------|---|------|
| 16A | 16A | 4 | 1 | <b>LS16 E A4.</b> | 1 | 0,24 |
| 25A | 25A | 4 | 1 | <b>LS25 E A4.</b> | 1 | 0,24 |
| 32A | 32A | 4 | 1 | <b>LS32 E A4.</b> | 1 | 0,24 |
| 45A | -   | 4 | 1 | <b>LS38 E A4.</b> | 1 | 0,24 |
| 48A | 40A | 4 | 1 | <b>LS40 E A4.</b> | 1 | 0,52 |
| 55A | 55A | 4 | 1 | <b>LS55 E A4.</b> | 1 | 0,52 |
| -   | -   | 4 | 1 | <b>LS65 E A4.</b> | 1 | 0,52 |

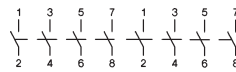
**O** ..A4O



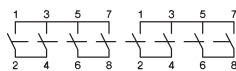
**U** ..A4U



|     |       |   |   |                  |   |      |
|-----|-------|---|---|------------------|---|------|
| 16A | 10A   | 2 | 3 | <b>LS16 E A6</b> | 1 | 0,36 |
| 25A | 11,5A | 2 | 3 | <b>LS25 E A6</b> | 1 | 0,36 |
| 32A | 13A   | 2 | 3 | <b>LS32 E A6</b> | 1 | 0,36 |
| 45A | 20A   | 2 | 3 | <b>LS38 E A6</b> | 1 | 0,36 |
| 48A | 29A   | 2 | 3 | <b>LS40 E A6</b> | 1 | 0,99 |
| 55A | 36A   | 2 | 3 | <b>LS55 E A6</b> | 1 | 0,99 |
| -   | -     | 2 | 3 | <b>LS65 E A6</b> | 1 | 0,99 |



|     |       |   |   |                  |   |      |
|-----|-------|---|---|------------------|---|------|
| 16A | 10A   | 2 | 4 | <b>LS16 E A8</b> | 1 | 0,41 |
| 25A | 11,5A | 2 | 4 | <b>LS25 E A8</b> | 1 | 0,41 |
| 32A | 13A   | 2 | 4 | <b>LS32 E A8</b> | 1 | 0,41 |
| 45A | 20A   | 2 | 4 | <b>LS38 E A8</b> | 1 | 0,41 |
| 48A | 29A   | 2 | 4 | <b>LS40 E A8</b> | 1 | 1,09 |
| 55A | 36A   | 2 | 4 | <b>LS55 E A8</b> | 1 | 1,09 |
| -   | -     | 2 | 4 | <b>LS65 E A8</b> | 1 | 1,09 |



|     |     |   |   |                    |   |      |
|-----|-----|---|---|--------------------|---|------|
| 29A | 29A | 4 | 1 | <b>LS16 E A4+2</b> | 1 | 0,46 |
| 45A | 45A | 4 | 1 | <b>LS25 E A4+2</b> | 1 | 0,46 |
| 58A | 58A | 4 | 1 | <b>LS32 E A4+2</b> | 1 | 0,46 |
| -   | -   | 4 | 1 | <b>LS38 E A4+2</b> | 1 | 0,46 |
| 72A | 72A | 4 | 1 | <b>LS40 E A4+2</b> | 1 | 1,20 |
| 85A | 85A | 4 | 1 | <b>LS55 E A4+2</b> | 1 | 1,20 |
| 85A | 85A | 4 | 1 | <b>LS65 E A4+2</b> | 1 | 1,20 |




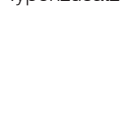




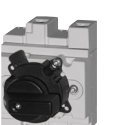



## Extended Switch Shaft for all switches for Panel Mounting

Type suffix

+VW"x"

x = panel thickness

## ON-OFF Switches for Single Hole Mounting Ø22mm, Escutcheon plate 48<sup>2</sup>, IP66, c(UL)us Type 4X

|   | DC21B / DC-PV1 |          | Anzahl Pole<br>in Serie | Anzahl<br>Strings | Typ                | VPE<br>Stk. | Gewicht<br>kg/Stk. |
|---|----------------|----------|-------------------------|-------------------|--------------------|-------------|--------------------|
|   | 600V DC        | 1000V DC |                         |                   |                    |             |                    |
|    |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 16A            | 10A      | 2                       | 1                 | <b>LS16 Z A2</b>   | 1           | 0,21               |
|   | 25A            | 11,5A    | 2                       | 1                 | <b>LS25 Z A2</b>   | 1           | 0,21               |
|    |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 32A            | 13A      | 2                       | 1                 | <b>LS32 Z A2</b>   | 1           | 0,21               |
|   | 45A            | 20A      | 2                       | 1                 | <b>LS38 Z A2</b>   | 1           | 0,21               |
|    |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 29A            | 10A      | 2                       | 1                 | <b>LS16 Z A2+2</b> | 1           | 0,26               |
|   | 36A            | 11,5A    | 2                       | 1                 | <b>LS25 Z A2+2</b> | 1           | 0,26               |
|   | 55A            | 13A      | 2                       | 1                 | <b>LS32 Z A2+2</b> | 1           | 0,26               |
|    |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | -              | 20A      | 2                       | 1                 | <b>LS38 Z A2+2</b> | 1           | 0,26               |
|   | 16A            | 10A      | 2                       | 2                 | <b>LS16 Z A4</b>   | 1           | 0,23               |
|   | 25A            | 11,5A    | 2                       | 2                 | <b>LS25 Z A4</b>   | 1           | 0,23               |
| Typenzusatz<br>↓  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | <b>B ..A4B</b> |          |                         |                   |                    |             |                    |
|   | <b>O ..A4O</b> |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 16A            | 16A      | 4                       | 1                 | <b>LS16 Z A4.</b>  | 1           | 0,25               |
|   | 25A            | 25A      | 4                       | 1                 | <b>LS25 Z A4.</b>  | 1           | 0,25               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 32A            | 32A      | 4                       | 1                 | <b>LS32 Z A4.</b>  | 1           | 0,25               |
|   | 45A            | -        | 4                       | 1                 | <b>LS38 Z A4.</b>  | 1           | 0,25               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 16A            | 10A      | 2                       | 3                 | <b>LS16 Z A6</b>   | 1           | 0,38               |
|   | 25A            | 11,5A    | 2                       | 3                 | <b>LS25 Z A6</b>   | 1           | 0,38               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 32A            | 13A      | 2                       | 3                 | <b>LS32 Z A6</b>   | 1           | 0,38               |
|   | 45A            | 20A      | 2                       | 3                 | <b>LS38 Z A6</b>   | 1           | 0,38               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 16A            | 10A      | 2                       | 4                 | <b>LS16 Z A8</b>   | 1           | 0,43               |
|   | 25A            | 11,5A    | 2                       | 4                 | <b>LS25 Z A8</b>   | 1           | 0,43               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 32A            | 13A      | 2                       | 4                 | <b>LS32 Z A8</b>   | 1           | 0,43               |
|   | 45A            | 20A      | 2                       | 4                 | <b>LS38 Z A8</b>   | 1           | 0,43               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 29A            | 29A      | 4                       | 1                 | <b>LS16 Z A4+2</b> | 1           | 0,48               |
|   | 45A            | 45A      | 4                       | 1                 | <b>LS25 Z A4+2</b> | 1           | 0,48               |
|  |                |          |                         |                   |                    |             |                    |
|   |                |          |                         |                   |                    |             |                    |
|   | 58A            | 58A      | 4                       | 1                 | <b>LS32 Z A4+2</b> | 1           | 0,48               |
|   | -              | -        | 4                       | 1                 | <b>LS38 Z A4+2</b> | 1           | 0,48               |

## ON-OFF Switches for Single Hole Mounting Ø22mm, without Escutcheon plate, IP66, c(UL)us Type 4X



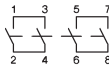
Replace the Type „Z“ with „ZO“ **LS.. ZO A.**

# ON-OFF Switches f. Base Mounting w. Door Clutch f. Single Hole, Plate 64<sup>□</sup>, IP66, cUL<sup>us</sup> Type 4X

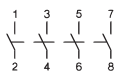


| DC21B / DC-PV1<br>600V DC | DC<br>1000V DC | Poles<br>in series | Number<br>of strings | Type               | Pack<br>pcs. | Weight<br>kg/pcs. |
|---------------------------|----------------|--------------------|----------------------|--------------------|--------------|-------------------|
| 16A                       | 10A            | 2                  | 1                    | <b>LS16 VZV A2</b> | 1            | 0,22              |
| 25A                       | 11,5A          | 2                  | 1                    | <b>LS25 VZV A2</b> | 1            | 0,22              |
| 32A                       | 13A            | 2                  | 1                    | <b>LS32 VZV A2</b> | 1            | 0,22              |
| 45A                       | 20A            | 2                  | 1                    | <b>LS38 VZV A2</b> | 1            | 0,22              |
| 48A                       | 29A            | 2                  | 1                    | <b>LS40 VZV A2</b> | 1            | 0,51              |
| 55A                       | 36A            | 2                  | 1                    | <b>LS55 VZV A2</b> | 1            | 0,51              |
| 65A                       | 40A            | 2                  | 1                    | <b>LS65 VZV A2</b> | 1            | 0,51              |

Depth is adjustable



|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 29A | 10A   | 2 | 1 | <b>LS16 VZV A2+2</b> | 1 | 0,27 |
| 36A | 11,5A | 2 | 1 | <b>LS25 VZV A2+2</b> | 1 | 0,27 |
| 55A | 13A   | 2 | 1 | <b>LS32 VZV A2+2</b> | 1 | 0,27 |
| -   | 20A   | 2 | 1 | <b>LS38 VZV A2+2</b> | 1 | 0,27 |
| 68A | 29A   | 2 | 1 | <b>LS40 VZV A2+2</b> | 1 | 0,55 |
| 85A | 36A   | 2 | 1 | <b>LS55 VZV A2+2</b> | 1 | 0,55 |
| 85A | 40A   | 2 | 1 | <b>LS65 VZV A2+2</b> | 1 | 0,55 |

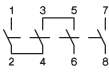


|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 2 | <b>LS16 VZV A4</b> | 1 | 0,25 |
| 25A | 11,5A | 2 | 2 | <b>LS25 VZV A4</b> | 1 | 0,25 |
| 32A | 13A   | 2 | 2 | <b>LS32 VZV A4</b> | 1 | 0,25 |
| 45A | 20A   | 2 | 2 | <b>LS38 VZV A4</b> | 1 | 0,25 |
| 48A | 29A   | 2 | 2 | <b>LS40 VZV A4</b> | 1 | 0,56 |
| 55A | 36A   | 2 | 2 | <b>LS55 VZV A4</b> | 1 | 0,56 |
| 65A | 40A   | 2 | 2 | <b>LS65 VZV A4</b> | 1 | 0,56 |

Type suffix

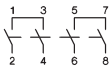


**B ..A4B**

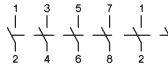
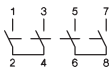


|     |     |   |   |                     |   |      |
|-----|-----|---|---|---------------------|---|------|
| 16A | 16A | 4 | 1 | <b>LS16 VZV A4.</b> | 1 | 0,26 |
| 25A | 25A | 4 | 1 | <b>LS25 VZV A4.</b> | 1 | 0,26 |
| 32A | 32A | 4 | 1 | <b>LS32 VZV A4.</b> | 1 | 0,26 |
| 45A | -   | 4 | 1 | <b>LS38 VZV A4.</b> | 1 | 0,26 |
| 48A | 40A | 4 | 1 | <b>LS40 VZV A4.</b> | 1 | 0,58 |
| 55A | 55A | 4 | 1 | <b>LS55 VZV A4.</b> | 1 | 0,58 |
| -   | -   | 4 | 1 | <b>LS65 VZV A4.</b> | 1 | 0,58 |

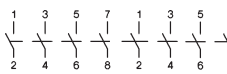
**O ..A4O**



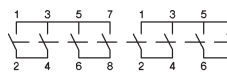
**U ..A4U**



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 3 | <b>LS16 VZV A6</b> | 1 | 0,38 |
| 25A | 11,5A | 2 | 3 | <b>LS25 VZV A6</b> | 1 | 0,38 |
| 32A | 13A   | 2 | 3 | <b>LS32 VZV A6</b> | 1 | 0,38 |
| 45A | 20A   | 2 | 3 | <b>LS38 VZV A6</b> | 1 | 0,38 |
| 48A | 29A   | 2 | 3 | <b>LS40 VZV A6</b> | 1 | 1,00 |
| 55A | 36A   | 2 | 3 | <b>LS55 VZV A6</b> | 1 | 1,00 |
| -   | -     | 2 | 3 | <b>LS65 VZV A6</b> | 1 | 1,00 |



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 4 | <b>LS16 VZV A8</b> | 1 | 0,43 |
| 25A | 11,5A | 2 | 4 | <b>LS25 VZV A8</b> | 1 | 0,43 |
| 32A | 13A   | 2 | 4 | <b>LS32 VZV A8</b> | 1 | 0,43 |
| 45A | 20A   | 2 | 4 | <b>LS38 VZV A8</b> | 1 | 0,43 |
| 48A | 29A   | 2 | 4 | <b>LS40 VZV A8</b> | 1 | 1,10 |
| 55A | 36A   | 2 | 4 | <b>LS55 VZV A8</b> | 1 | 1,10 |
| -   | -     | 2 | 4 | <b>LS65 VZV A8</b> | 1 | 1,10 |

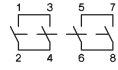


|     |     |   |   |                      |   |      |
|-----|-----|---|---|----------------------|---|------|
| 29A | 29A | 4 | 1 | <b>LS16 VZV A4+2</b> | 1 | 0,48 |
| 45A | 45A | 4 | 1 | <b>LS25 VZV A4+2</b> | 1 | 0,48 |
| 58A | 58A | 4 | 1 | <b>LS32 VZV A4+2</b> | 1 | 0,48 |
| -   | -   | 4 | 1 | <b>LS38 VZV A4+2</b> | 1 | 0,48 |
| 72A | 72A | 4 | 1 | <b>LS40 VZV A4+2</b> | 1 | 1,21 |
| 85A | 85A | 4 | 1 | <b>LS55 VZV A4+2</b> | 1 | 1,21 |
| 85A | 85A | 4 | 1 | <b>LS65 VZV A4+2</b> | 1 | 1,21 |

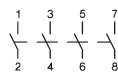
# ON-OFF Switches for Distribution Boards, IP40, Open Type



| DDC21B / DC-PV1<br>600V DC 1000V DC |       | Poles<br>in series | Number<br>of strings | Type               | Pack<br>pcs. | Weight<br>kg/pcs. |
|-------------------------------------|-------|--------------------|----------------------|--------------------|--------------|-------------------|
| 16A                                 | 10A   | 2                  | 1                    | <b>LS16 SMA A2</b> | 1            | 0,19              |
| 25A                                 | 11,5A | 2                  | 1                    | <b>LS25 SMA A2</b> | 1            | 0,19              |
| 32A                                 | 13A   | 2                  | 1                    | <b>LS32 SMA A2</b> | 1            | 0,19              |
| 45A                                 | 20A   | 2                  | 1                    | <b>LS38 SMA A2</b> | 1            | 0,19              |
| 48A                                 | 29A   | 2                  | 1                    | <b>LS40 SMA A2</b> | 1            | 0,41              |
| 55A                                 | 36A   | 2                  | 1                    | <b>LS55 SMA A2</b> | 1            | 0,41              |
| 65A                                 | 40A   | 2                  | 1                    | <b>LS65 SMA A2</b> | 1            | 0,41              |

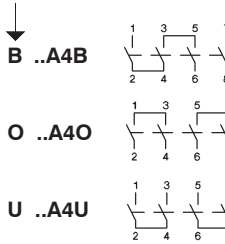


|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 29A | 10A   | 2 | 1 | <b>LS16 SMA A2+2</b> | 1 | 0,24 |
| 36A | 11,5A | 2 | 1 | <b>LS25 SMA A2+2</b> | 1 | 0,24 |
| 55A | 13A   | 2 | 1 | <b>LS32 SMA A2+2</b> | 1 | 0,24 |
| -   | 20A   | 2 | 1 | <b>LS38 SMA A2+2</b> | 1 | 0,24 |
| 68A | 29A   | 2 | 1 | <b>LS40 SMA A2+2</b> | 1 | 0,52 |
| 85A | 36A   | 2 | 1 | <b>LS55 SMA A2+2</b> | 1 | 0,52 |
| 85A | 40A   | 2 | 1 | <b>LS65 SMA A2+2</b> | 1 | 0,52 |



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 2 | <b>LS16 SMA A4</b> | 1 | 0,22 |
| 25A | 11,5A | 2 | 2 | <b>LS25 SMA A4</b> | 1 | 0,22 |
| 32A | 13A   | 2 | 2 | <b>LS32 SMA A4</b> | 1 | 0,22 |
| 45A | 20A   | 2 | 2 | <b>LS38 SMA A4</b> | 1 | 0,22 |
| 48A | 29A   | 2 | 2 | <b>LS40 SMA A4</b> | 1 | 0,45 |
| 55A | 36A   | 2 | 2 | <b>LS55 SMA A4</b> | 1 | 0,45 |
| 65A | 40A   | 2 | 2 | <b>LS65 SMA A4</b> | 1 | 0,45 |

Type suffix

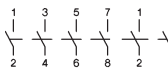


**B ..A4B**

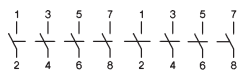
**O ..A4O**

**U ..A4U**

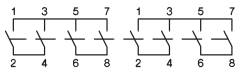
|     |     |   |   |                     |   |      |
|-----|-----|---|---|---------------------|---|------|
| 16A | 16A | 4 | 1 | <b>LS16 SMA A4.</b> | 1 | 0,23 |
| 25A | 25A | 4 | 1 | <b>LS25 SMA A4.</b> | 1 | 0,23 |
| 32A | 32A | 4 | 1 | <b>LS32 SMA A4.</b> | 1 | 0,23 |
| 45A | -   | 4 | 1 | <b>LS32 SMA A4.</b> | 1 | 0,23 |
| 48A | 40A | 4 | 1 | <b>LS40 SMA A4.</b> | 1 | 0,49 |
| 55A | 55A | 4 | 1 | <b>LS55 SMA A4.</b> | 1 | 0,49 |
| -   | -   | 4 | 1 | <b>LS65 SMA A4.</b> | 1 | 0,49 |



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 3 | <b>LS16 SMA A6</b> | 1 | 0,35 |
| 25A | 11,5A | 2 | 3 | <b>LS25 SMA A6</b> | 1 | 0,35 |
| 32A | 13A   | 2 | 3 | <b>LS32 SMA A6</b> | 1 | 0,35 |
| 45A | 20A   | 2 | 3 | <b>LS38 SMA A6</b> | 1 | 0,35 |
| 48A | 29A   | 2 | 3 | <b>LS40 SMA A6</b> | 1 | 0,89 |
| 55A | 36A   | 2 | 3 | <b>LS55 SMA A6</b> | 1 | 0,89 |
| -   | -     | 2 | 3 | <b>LS65 SMA A6</b> | 1 | 0,89 |



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 4 | <b>LS16 SMA A8</b> | 1 | 0,40 |
| 25A | 11,5A | 2 | 4 | <b>LS25 SMA A8</b> | 1 | 0,40 |
| 32A | 13A   | 2 | 4 | <b>LS32 SMA A8</b> | 1 | 0,40 |
| 45A | 20A   | 2 | 4 | <b>LS38 SMA A8</b> | 1 | 0,40 |
| 48A | 29A   | 2 | 4 | <b>LS40 SMA A8</b> | 1 | 0,99 |
| 55A | 36A   | 2 | 4 | <b>LS55 SMA A8</b> | 1 | 0,99 |
| -   | -     | 2 | 4 | <b>LS65 SMA A8</b> | 1 | 0,99 |



|     |     |   |   |                      |   |      |
|-----|-----|---|---|----------------------|---|------|
| 29A | 29A | 4 | 1 | <b>LS16 SMA A4+2</b> | 1 | 0,43 |
| 45A | 45A | 4 | 1 | <b>LS25 SMA A4+2</b> | 1 | 0,43 |
| 58A | 58A | 4 | 1 | <b>LS32 SMA A4+2</b> | 1 | 0,43 |
| -   | -   | 4 | 1 | <b>LS38 SMA A4+2</b> | 1 | 0,43 |
| 72A | 72A | 4 | 1 | <b>LS40 SMA A4+2</b> | 1 | 1,01 |
| 85A | 85A | 4 | 1 | <b>LS55 SMA A4+2</b> | 1 | 1,01 |
| 85A | 85A | 4 | 1 | <b>LS65 SMA A4+2</b> | 1 | 1,01 |



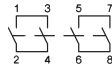
# Main Switches for Panel Mounting, Escutcheon plate 64<sup>2</sup>, IP66, Type 3R



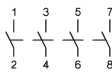
padlock device SV4



| DC21B / DC-PV1<br>600V DC 1000V DC |       | Poles<br>in series | Number<br>of strings | Type               | Pack<br>pcs. | Weight<br>kg/pcs. |
|------------------------------------|-------|--------------------|----------------------|--------------------|--------------|-------------------|
| 16A                                | 10A   | 2                  | 1                    | <b>LS16 EH4 A2</b> | 1            | 0,21              |
| 25A                                | 11,5A | 2                  | 1                    | <b>LS25 EH4 A2</b> | 1            | 0,21              |
| 32A                                | 13A   | 2                  | 1                    | <b>LS32 EH4 A2</b> | 1            | 0,21              |
| 45A                                | 20A   | 2                  | 1                    | <b>LS38 EH4 A2</b> | 1            | 0,21              |
| 48A                                | 29A   | 2                  | 1                    | <b>LS40 EH4 A2</b> | 1            | 0,43              |
| 55A                                | 36A   | 2                  | 1                    | <b>LS55 EH4 A2</b> | 1            | 0,43              |
| 65A                                | 40A   | 2                  | 1                    | <b>LS65 EH4 A2</b> | 1            | 0,43              |



|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 29A | 10A   | 2 | 1 | <b>LS16 EH4 A2+2</b> | 1 | 0,26 |
| 36A | 11,5A | 2 | 1 | <b>LS25 EH4 A2+2</b> | 1 | 0,26 |
| 55A | 13A   | 2 | 1 | <b>LS32 EH4 A2+2</b> | 1 | 0,26 |
| -   | 20A   | 2 | 1 | <b>LS38 EH4 A2+2</b> | 1 | 0,26 |
| 68A | 29A   | 2 | 1 | <b>LS40 EH4 A2+2</b> | 1 | 0,57 |
| 85A | 36A   | 2 | 1 | <b>LS55 EH4 A2+2</b> | 1 | 0,57 |
| 85A | 40A   | 2 | 1 | <b>LS65 EH4 A2+2</b> | 1 | 0,57 |

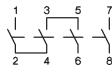


|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 2 | <b>LS16 EH4 A4</b> | 1 | 0,24 |
| 25A | 11,5A | 2 | 2 | <b>LS25 EH4 A4</b> | 1 | 0,24 |
| 32A | 13A   | 2 | 2 | <b>LS32 EH4 A4</b> | 1 | 0,24 |
| 45A | 20A   | 2 | 2 | <b>LS38 EH4 A4</b> | 1 | 0,24 |
| 48A | 29A   | 2 | 2 | <b>LS40 EH4 A4</b> | 1 | 0,50 |
| 55A | 36A   | 2 | 2 | <b>LS55 EH4 A4</b> | 1 | 0,50 |
| 65A | 40A   | 2 | 2 | <b>LS65 EH4 A4</b> | 1 | 0,50 |

Type suffix

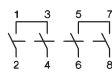


**B ..A4B**

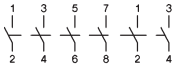
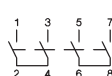


|     |     |   |   |                     |   |      |
|-----|-----|---|---|---------------------|---|------|
| 16A | 16A | 4 | 1 | <b>LS16 EH4 A4.</b> | 1 | 0,25 |
| 25A | 25A | 4 | 1 | <b>LS25 EH4 A4.</b> | 1 | 0,25 |
| 32A | 32A | 4 | 1 | <b>LS32 EH4 A4.</b> | 1 | 0,25 |
| 45A | -   | 4 | 1 | <b>LS38 EH4 A4.</b> | 1 | 0,25 |
| 48A | 40A | 4 | 1 | <b>LS40 EH4 A4.</b> | 1 | 0,53 |
| 55A | 55A | 4 | 1 | <b>LS55 EH4 A4.</b> | 1 | 0,53 |
| -   | -   | 4 | 1 | <b>LS65 EH4 A4.</b> | 1 | 0,53 |

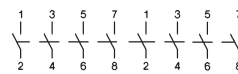
**O ..A4O**



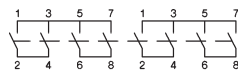
**U ..A4U**



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 3 | <b>LS16 EH4 A6</b> | 1 | 0,37 |
| 25A | 11,5A | 2 | 3 | <b>LS25 EH4 A6</b> | 1 | 0,37 |
| 32A | 13A   | 2 | 3 | <b>LS32 EH4 A6</b> | 1 | 0,37 |
| 45A | 20A   | 2 | 3 | <b>LS38 EH4 A6</b> | 1 | 0,37 |
| 48A | 29A   | 2 | 3 | <b>LS40 EH4 A6</b> | 1 | 0,53 |
| 55A | 36A   | 2 | 3 | <b>LS55 EH4 A6</b> | 1 | 0,53 |
| -   | -     | 2 | 3 | <b>LS65 EH4 A6</b> | 1 | 0,53 |



|     |       |   |   |                    |   |      |
|-----|-------|---|---|--------------------|---|------|
| 16A | 10A   | 2 | 4 | <b>LS16 EH4 A8</b> | 1 | 0,42 |
| 25A | 11,5A | 2 | 4 | <b>LS25 EH4 A8</b> | 1 | 0,42 |
| 32A | 13A   | 2 | 4 | <b>LS32 EH4 A8</b> | 1 | 0,42 |
| 45A | 20A   | 2 | 4 | <b>LS38 EH4 A8</b> | 1 | 0,42 |
| 48A | 29A   | 2 | 4 | <b>LS40 EH4 A8</b> | 1 | 1,10 |
| 55A | 36A   | 2 | 4 | <b>LS55 EH4 A8</b> | 1 | 1,10 |
| -   | -     | 2 | 4 | <b>LS65 EH4 A8</b> | 1 | 1,10 |



|     |     |   |   |                      |   |      |
|-----|-----|---|---|----------------------|---|------|
| 29A | 29A | 4 | 1 | <b>LS16 EH4 A4+2</b> | 1 | 0,47 |
| 45A | 45A | 4 | 1 | <b>LS25 EH4 A4+2</b> | 1 | 0,47 |
| 58A | 58A | 4 | 1 | <b>LS32 EH4 A4+2</b> | 1 | 0,47 |
| -   | -   | 4 | 1 | <b>LS38 EH4 A4+2</b> | 1 | 0,47 |
| 72A | 72A | 4 | 1 | <b>LS40 EH4 A4+2</b> | 1 | 1,21 |
| 85A | 85A | 4 | 1 | <b>LS55 EH4 A4+2</b> | 1 | 1,21 |
| 85A | 85A | 4 | 1 | <b>LS65 EH4 A4+2</b> | 1 | 1,21 |




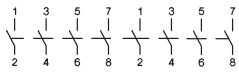
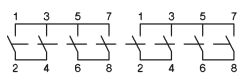
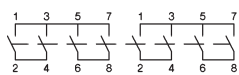
## Extended Switch Shaft for all switches for panel mounting

Type suffix

+VW"x"

x = panel thickness

# Main Switches for Single Hole Mounting Ø22mm, Escutcheon plate 48<sup>o</sup>, IP66, Type 4X

|   | DC21B / DC-PV1 |          | Poles in series | Number of strings | Type                 | Pack pcs. | Weight kg/pcs. |
|---|----------------|----------|-----------------|-------------------|----------------------|-----------|----------------|
|   | 600V DC        | 1000V DC |                 |                   |                      |           |                |
| <br>Sperrvorrichtung SV1 | 16A            | 10A      | 2               | 1                 | <b>LS16 ZH1 A2</b>   | 1         | 0,21           |
|   | 25A            | 11,5A    | 2               | 1                 | <b>LS25 ZH1 A2</b>   | 1         | 0,21           |
|   | 32A            | 13A      | 2               | 1                 | <b>LS32 ZH1 A2</b>   | 1         | 0,21           |
|   | 45A            | 20A      | 2               | 1                 | <b>LS38 ZH1 A2</b>   | 1         | 0,21           |
|   | 29A            | 10A      | 2               | 1                 | <b>LS16 ZH1 A2+2</b> | 1         | 0,27           |
| <br>Typenzusatz          | 36A            | 11,5A    | 2               | 1                 | <b>LS25 ZH1 A2+2</b> | 1         | 0,27           |
|   | 55A            | 13A      | 2               | 1                 | <b>LS32 ZH1 A2+2</b> | 1         | 0,27           |
|   | -              | 20A      | 2               | 1                 | <b>LS38 ZH1 A2+2</b> | 1         | 0,27           |
|   | 16A            | 10A      | 2               | 2                 | <b>LS16 ZH1 A4</b>   | 1         | 0,24           |
| B ..A4B<br>O ..A4O<br>U ..A4U   | 25A            | 11,5A    | 2               | 2                 | <b>LS25 ZH1 A4</b>   | 1         | 0,24           |
|   | 32A            | 13A      | 2               | 2                 | <b>LS32 ZH1 A4</b>   | 1         | 0,24           |
|   | 45A            | 20A      | 2               | 2                 | <b>LS38 ZH1 A4</b>   | 1         | 0,24           |
|   | 16A            | 16A      | 4               | 1                 | <b>LS16 ZH1 A4.</b>  | 1         | 0,25           |
| <br>Typenzusatz         | 25A            | 25A      | 4               | 1                 | <b>LS25 ZH1 A4.</b>  | 1         | 0,25           |
|   | 32A            | 32A      | 4               | 1                 | <b>LS32 ZH1 A4.</b>  | 1         | 0,25           |
|   | 45A            | -        | 4               | 1                 | <b>LS38 ZH1 A4.</b>  | 1         | 0,25           |
|   | 16A            | 10A      | 2               | 3                 | <b>LS16 ZH1 A6</b>   | 1         | 0,39           |
| <br>Typenzusatz        | 25A            | 11,5A    | 2               | 3                 | <b>LS25 ZH1 A6</b>   | 1         | 0,39           |
|   | 32A            | 13A      | 2               | 3                 | <b>LS32 ZH1 A6</b>   | 1         | 0,39           |
|   | 45A            | 20A      | 2               | 3                 | <b>LS38 ZH1 A6</b>   | 1         | 0,39           |
|   | 16A            | 10A      | 2               | 4                 | <b>LS16 ZH1 A8</b>   | 1         | 0,44           |
| <br>Typenzusatz        | 25A            | 11,5A    | 2               | 4                 | <b>LS25 ZH1 A8</b>   | 1         | 0,44           |
|   | 32A            | 13A      | 2               | 4                 | <b>LS32 ZH1 A8</b>   | 1         | 0,44           |
|   | 45A            | 20A      | 2               | 4                 | <b>LS38 ZH1 A8</b>   | 1         | 0,44           |
|   | 29A            | 29A      | 4               | 1                 | <b>LS16 ZH1 A4+2</b> | 1         | 0,49           |
| <br>Typenzusatz        | 45A            | 45A      | 4               | 1                 | <b>LS25 ZH1 A4+2</b> | 1         | 0,49           |
|   | 58A            | 58A      | 4               | 1                 | <b>LS32 ZH1 A4+2</b> | 1         | 0,49           |
|   | -              | -        | 4               | 1                 | <b>LS38 ZH1 A4+2</b> | 1         | 0,49           |

# Main Switches, Single Hole Mounting Ø22mm, without Escutcheon plate, IP66, Type 4X

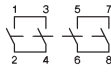
Replace the Type „ZH1“ with „ZOH1“ **LS.. ZOH1 A.**

# Main Switches f. Base Mounting, Door Clutch f. Single Hole, Plate 64<sup>□</sup>, IP66, Type 4X

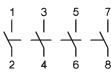


| DC21B / DC-PV1<br>600V DC 1000V DC | Poles<br>in series | Number<br>of strings | Type                 | Pack<br>pcs. | Weight<br>kg/pcs. |
|------------------------------------|--------------------|----------------------|----------------------|--------------|-------------------|
| 16A 10A                            | 2                  | 1                    | <b>LS16 VZVH4 A2</b> | 1            | 0,23              |
| 25A 11,5A                          | 2                  | 1                    | <b>LS25 VZVH4 A2</b> | 1            | 0,23              |
| 32A 13A                            | 2                  | 1                    | <b>LS32 VZVH4 A2</b> | 1            | 0,23              |
| 45A 20A                            | 2                  | 1                    | <b>LS38 VZVH4 A2</b> | 1            | 0,23              |
| 48A 29A                            | 2                  | 1                    | <b>LS40 VZVH4 A2</b> | 1            | 0,51              |
| 55A 36A                            | 2                  | 1                    | <b>LS55 VZVH4 A2</b> | 1            | 0,51              |
| 65A 40A                            | 2                  | 1                    | <b>LS65 VZVH4 A2</b> | 1            | 0,51              |

Depth is adjustable  
see page 322  
padlock device SV4



|           |   |   |                        |   |      |
|-----------|---|---|------------------------|---|------|
| 29A 10A   | 2 | 1 | <b>LS16 VZVH4 A2+2</b> | 1 | 0,28 |
| 36A 11,5A | 2 | 1 | <b>LS25 VZVH4 A2+2</b> | 1 | 0,28 |
| 55A 13A   | 2 | 1 | <b>LS32 VZVH4 A2+2</b> | 1 | 0,28 |
| - 20A     | 2 | 1 | <b>LS38 VZVH4 A2+2</b> | 1 | 0,28 |
| 68A 29A   | 2 | 1 | <b>LS40 VZVH4 A2+2</b> | 1 | 0,65 |
| 85A 36A   | 2 | 1 | <b>LS55 VZVH4 A2+2</b> | 1 | 0,65 |
| 85A 40A   | 2 | 1 | <b>LS65 VZVH4 A2+2</b> | 1 | 0,65 |

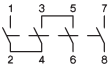


|           |   |   |                      |   |      |
|-----------|---|---|----------------------|---|------|
| 16A 10A   | 2 | 2 | <b>LS16 VZVH4 A4</b> | 1 | 0,26 |
| 25A 11,5A | 2 | 2 | <b>LS25 VZVH4 A4</b> | 1 | 0,26 |
| 32A 13A   | 2 | 2 | <b>LS32 VZVH4 A4</b> | 1 | 0,26 |
| 45A 20A   | 2 | 2 | <b>LS38 VZVH4 A4</b> | 1 | 0,26 |
| 48A 29A   | 2 | 2 | <b>LS40 VZVH4 A4</b> | 1 | 0,58 |
| 55A 36A   | 2 | 2 | <b>LS55 VZVH4 A4</b> | 1 | 0,58 |
| 65A 40A   | 2 | 2 | <b>LS65 VZVH4 A4</b> | 1 | 0,58 |

Type suffix

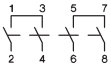


**B ..A4B**

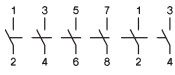
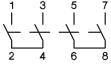


|         |   |   |                       |   |      |
|---------|---|---|-----------------------|---|------|
| 16A 16A | 4 | 1 | <b>LS16 VZVH4 A4.</b> | 1 | 0,27 |
| 25A 25A | 4 | 1 | <b>LS25 VZVH4 A4.</b> | 1 | 0,27 |
| 32A 32A | 4 | 1 | <b>LS32 VZVH4 A4.</b> | 1 | 0,27 |
| 45A -   | 4 | 1 | <b>LS38 VZVH4 A4.</b> | 1 | 0,27 |
| 48A 40A | 4 | 1 | <b>LS40 VZVH4 A4.</b> | 1 | 0,62 |
| 55A 55A | 4 | 1 | <b>LS55 VZVH4 A4.</b> | 1 | 0,62 |
| - -     | 4 | 1 | <b>LS65 VZVH4 A4.</b> | 1 | 0,62 |

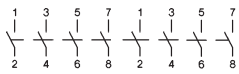
**O ..A4O**



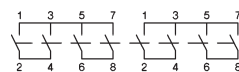
**U ..A4U**



|           |   |   |                      |   |      |
|-----------|---|---|----------------------|---|------|
| 16A 10A   | 2 | 3 | <b>LS16 VZVH4 A6</b> | 1 | 0,39 |
| 25A 11,5A | 2 | 3 | <b>LS25 VZVH4 A6</b> | 1 | 0,39 |
| 32A 13A   | 2 | 3 | <b>LS32 VZVH4 A6</b> | 1 | 0,39 |
| 45A 20A   | 2 | 3 | <b>LS38 VZVH4 A6</b> | 1 | 0,39 |
| 48A 29A   | 2 | 3 | <b>LS40 VZVH4 A6</b> | 1 | 1,00 |
| 55A 36A   | 2 | 3 | <b>LS55 VZVH4 A6</b> | 1 | 1,00 |
| - -       | 2 | 3 | <b>LS65 VZVH4 A6</b> | 1 | 1,00 |



|           |   |   |                      |   |      |
|-----------|---|---|----------------------|---|------|
| 16A 10A   | 2 | 4 | <b>LS16 VZVH4 A8</b> | 1 | 0,44 |
| 25A 11,5A | 2 | 4 | <b>LS25 VZVH4 A8</b> | 1 | 0,44 |
| 32A 13A   | 2 | 4 | <b>LS32 VZVH4 A8</b> | 1 | 0,44 |
| 45A 20A   | 2 | 4 | <b>LS38 VZVH4 A8</b> | 1 | 0,44 |
| 48A 29A   | 2 | 4 | <b>LS40 VZVH4 A8</b> | 1 | 1,11 |
| 55A 36A   | 2 | 4 | <b>LS55 VZVH4 A8</b> | 1 | 1,11 |
| - -       | 2 | 4 | <b>LS65 VZVH4 A8</b> | 1 | 1,11 |



|         |   |   |                        |   |      |
|---------|---|---|------------------------|---|------|
| 29A 29A | 4 | 1 | <b>LS16 VZVH4 A4+2</b> | 1 | 0,49 |
| 45A 45A | 4 | 1 | <b>LS25 VZVH4 A4+2</b> | 1 | 0,49 |
| 58A 58A | 4 | 1 | <b>LS32 VZVH4 A4+2</b> | 1 | 0,49 |
| - -     | 4 | 1 | <b>LS38 VZVH4 A4+2</b> | 1 | 0,49 |
| 72A 72A | 4 | 1 | <b>LS40 VZVH4 A4+2</b> | 1 | 1,22 |
| 85A 85A | 4 | 1 | <b>LS55 VZVH4 A4+2</b> | 1 | 1,22 |
| 85A 85A | 4 | 1 | <b>LS65 VZVH4 A4+2</b> | 1 | 1,22 |

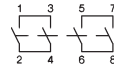
# Main Switches for Distribution Boards, lockable, IP40, Open Type



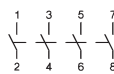
Padlock device SV1



| DC21B / DC-PV1<br>600V DC 1000V DC |       | Poles<br>in series | Number<br>of strings | Type                 | Pack<br>pcs. | Weight<br>kg/pcs. |
|------------------------------------|-------|--------------------|----------------------|----------------------|--------------|-------------------|
| 16A                                | 10A   | 2                  | 1                    | <b>LS16 SMAH1 A2</b> | 1            | 0,19              |
| 25A                                | 11,5A | 2                  | 1                    | <b>LS25 SMAH1 A2</b> | 1            | 0,19              |
| 32A                                | 13A   | 2                  | 1                    | <b>LS32 SMAH1 A2</b> | 1            | 0,19              |
| 45A                                | 20A   | 2                  | 1                    | <b>LS38 SMAH1 A2</b> | 1            | 0,19              |
| 48A                                | 29A   | 2                  | 1                    | <b>LS40 SMAH1 A2</b> | 1            | 0,40              |
| 55A                                | 36A   | 2                  | 1                    | <b>LS55 SMAH1 A2</b> | 1            | 0,40              |
| 65A                                | 40A   | 2                  | 1                    | <b>LS65 SMAH1 A2</b> | 1            | 0,40              |



|     |       |   |   |                                      |   |      |
|-----|-------|---|---|--------------------------------------|---|------|
| 29A | 10A   | 2 | 1 | <b>LS16 SMAH1 A2+2</b> <sup>1)</sup> | 1 | 0,25 |
| 36A | 11,5A | 2 | 1 | <b>LS25 SMAH1 A2+2</b> <sup>1)</sup> | 1 | 0,25 |
| 55A | 13A   | 2 | 1 | <b>LS32 SMAH1 A2+2</b> <sup>1)</sup> | 1 | 0,25 |
| -   | 20A   | 2 | 1 | <b>LS38 SMAH1 A2+2</b> <sup>1)</sup> | 1 | 0,25 |
| 68A | 29A   | 2 | 1 | <b>LS40 SMAH1 A2+2</b>               | 1 | 0,54 |
| 85A | 36A   | 2 | 1 | <b>LS55 SMAH1 A2+2</b>               | 1 | 0,54 |
| 85A | 40A   | 2 | 1 | <b>LS65 SMAH1 A2+2</b>               | 1 | 0,54 |

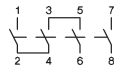


|     |       |   |   |                                    |   |      |
|-----|-------|---|---|------------------------------------|---|------|
| 16A | 10A   | 2 | 2 | <b>LS16 SMAH1 A4</b> <sup>1)</sup> | 1 | 0,22 |
| 25A | 11,5A | 2 | 2 | <b>LS25 SMAH1 A4</b> <sup>1)</sup> | 1 | 0,22 |
| 32A | 13A   | 2 | 2 | <b>LS32 SMAH1 A4</b> <sup>1)</sup> | 1 | 0,22 |
| 45A | 20A   | 2 | 2 | <b>LS38 SMAH1 A4</b> <sup>1)</sup> | 1 | 0,22 |
| 48A | 29A   | 2 | 2 | <b>LS40 SMAH1 A4</b>               | 1 | 0,47 |
| 55A | 36A   | 2 | 2 | <b>LS55 SMAH1 A4</b>               | 1 | 0,47 |
| 65A | 40A   | 2 | 2 | <b>LS65 SMAH1 A4</b>               | 1 | 0,47 |

Type suffix

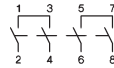


**B ..A4B**

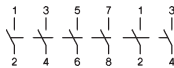
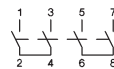


|     |     |   |   |                                     |   |      |
|-----|-----|---|---|-------------------------------------|---|------|
| 16A | 16A | 4 | 1 | <b>LS16 SMAH1 A4.</b> <sup>1)</sup> | 1 | 0,23 |
| 25A | 25A | 4 | 1 | <b>LS25 SMAH1 A4.</b> <sup>1)</sup> | 1 | 0,23 |
| 32A | 32A | 4 | 1 | <b>LS32 SMAH1 A4.</b> <sup>1)</sup> | 1 | 0,23 |
| 45A | -   | 4 | 1 | <b>LS38 SMAH1 A4.</b> <sup>1)</sup> | 1 | 0,23 |
| 48A | 40A | 4 | 1 | <b>LS40 SMAH1 A4.</b>               | 1 | 0,50 |
| 55A | 55A | 4 | 1 | <b>LS55 SMAH1 A4.</b>               | 1 | 0,50 |
| -   | -   | 4 | 1 | <b>LS65 SMAH1 A4.</b>               | 1 | 0,50 |

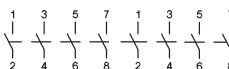
**O ..A4O**



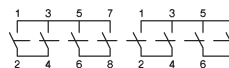
**U ..A4U**



|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 16A | 10A   | 2 | 3 | <b>LS16 SMAH1 A6</b> | 1 | 0,36 |
| 25A | 11,5A | 2 | 3 | <b>LS25 SMAH1 A6</b> | 1 | 0,36 |
| 32A | 13A   | 2 | 3 | <b>LS32 SMAH1 A6</b> | 1 | 0,36 |
| 45A | 20A   | 2 | 3 | <b>LS38 SMAH1 A6</b> | 1 | 0,36 |
| 48A | 29A   | 2 | 3 | <b>LS40 SMAH1 A6</b> | 1 | 0,90 |
| 55A | 36A   | 2 | 3 | <b>LS55 SMAH1 A6</b> | 1 | 0,90 |
| -   | -     | 2 | 3 | <b>LS65 SMAH1 A6</b> | 1 | 0,90 |



|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 16A | 10A   | 2 | 4 | <b>LS16 SMAH1 A8</b> | 1 | 0,41 |
| 25A | 11,5A | 2 | 4 | <b>LS25 SMAH1 A8</b> | 1 | 0,41 |
| 32A | 13A   | 2 | 4 | <b>LS32 SMAH1 A8</b> | 1 | 0,41 |
| 45A | 20A   | 2 | 4 | <b>LS38 SMAH1 A8</b> | 1 | 0,41 |
| 48A | 29A   | 2 | 4 | <b>LS40 SMAH1 A8</b> | 1 | 0,41 |
| 55A | 36A   | 2 | 4 | <b>LS55 SMAH1 A8</b> | 1 | 0,41 |
| -   | -     | 2 | 4 | <b>LS65 SMAH1 A8</b> | 1 | 0,41 |



|     |     |   |   |                        |   |      |
|-----|-----|---|---|------------------------|---|------|
| 29A | 29A | 4 | 1 | <b>LS16 SMAH1 A4+2</b> | 1 | 0,46 |
| 45A | 45A | 4 | 1 | <b>LS25 SMAH1 A4+2</b> | 1 | 0,46 |
| 58A | 58A | 4 | 1 | <b>LS32 SMAH1 A4+2</b> | 1 | 0,46 |
| -   | -   | 4 | 1 | <b>LS38 SMAH1 A4+2</b> | 1 | 0,46 |
| 72A | 72A | 4 | 1 | <b>LS40 SMAH1 A4+2</b> | 1 | 1,12 |
| 85A | 85A | 4 | 1 | <b>LS55 SMAH1 A4+2</b> | 1 | 1,12 |
| 85A | 85A | 4 | 1 | <b>LS65 SMAH1 A4+2</b> | 1 | 1,12 |

## 1) Main Switches for Distribution Boards with low height handle, IP40, Open Type

With type suffix „+SV1N“, e.g.: **LS.. SMAH1 A2+2 +SV1N**

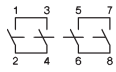
# Main Switches in Plastic Enclosure, Escutcheon plate 64<sup>0</sup>, IP66/67, Type 4X



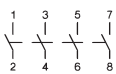
Padlock device SV4



| DC21B / DC-PV1<br>600V DC | DC 1000V DC | Poles<br>in series | Number<br>of strings | Type                               | Pack<br>pcs. | Weight<br>kg/pcs. |
|---------------------------|-------------|--------------------|----------------------|------------------------------------|--------------|-------------------|
| 16A                       | 10A         | 2                  | 1                    | <b>LS16 PFLH4 A2</b>               | 1            | 0,43              |
| 25A                       | 11,5A       | 2                  | 1                    | <b>LS25 PFLH4 A2</b>               | 1            | 0,43              |
| 32A                       | 13A         | 2                  | 1                    | <b>LS32 PFLH4 A2</b>               | 1            | 0,43              |
| 45A                       | 20A         | 2                  | 1                    | <b>LS38 PFLH4 A2</b>               | 1            | 0,43              |
| 48A                       | 29A         | 2                  | 1                    | <b>LS40 PFLH4 A2</b> <sup>1)</sup> | 1            | 1,59              |
| 55A                       | 36A         | 2                  | 1                    | <b>LS55 PFLH4 A2</b> <sup>1)</sup> | 1            | 1,59              |
| 65A                       | 40A         | 2                  | 1                    | <b>LS65 PFLH4 A2</b> <sup>1)</sup> | 1            | 1,59              |



|     |       |   |   |                                      |   |      |
|-----|-------|---|---|--------------------------------------|---|------|
| 29A | 10A   | 2 | 1 | <b>LS16 PFLH4 A2+2</b>               | 1 | 0,49 |
| 36A | 11,5A | 2 | 1 | <b>LS25 PFLH4 A2+2</b>               | 1 | 0,49 |
| 55A | 13A   | 2 | 1 | <b>LS32 PFLH4 A2+2</b>               | 1 | 0,49 |
| -   | 20A   | 2 | 1 | <b>LS38 PFLH4 A2+2</b>               | 1 | 0,49 |
| 68A | 29A   | 2 | 1 | <b>LS40 PFLH4 A2+2</b> <sup>1)</sup> | 1 | 1,74 |
| 85A | 36A   | 2 | 1 | <b>LS55 PFLH4 A2+2</b> <sup>1)</sup> | 1 | 1,74 |
| 85A | 40A   | 2 | 1 | <b>LS65 PFLH4 A2+2</b> <sup>1)</sup> | 1 | 1,74 |

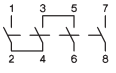


|     |       |   |   |                                    |   |      |
|-----|-------|---|---|------------------------------------|---|------|
| 16A | 10A   | 2 | 2 | <b>LS16 PFLH4 A4</b>               | 1 | 0,46 |
| 25A | 11,5A | 2 | 2 | <b>LS25 PFLH4 A4</b>               | 1 | 0,46 |
| 32A | 13A   | 2 | 2 | <b>LS32 PFLH4 A4</b>               | 1 | 0,46 |
| 45A | 20A   | 2 | 2 | <b>LS38 PFLH4 A4</b>               | 1 | 0,46 |
| 48A | 29A   | 2 | 2 | <b>LS40 PFLH4 A4</b> <sup>1)</sup> | 1 | 1,67 |
| 55A | 36A   | 2 | 2 | <b>LS55 PFLH4 A4</b> <sup>1)</sup> | 1 | 1,67 |
| 65A | 40A   | 2 | 2 | <b>LS65 PFLH4 A4</b> <sup>1)</sup> | 1 | 1,67 |

Type suffix

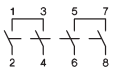


**B ..A4B**

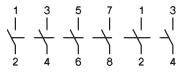
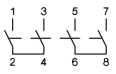


|     |     |   |   |                                     |   |      |
|-----|-----|---|---|-------------------------------------|---|------|
| 16A | 16A | 4 | 1 | <b>LS16 PFLH4 A4.</b>               | 1 | 0,47 |
| 25A | 25A | 4 | 1 | <b>LS25 PFLH4 A4.</b>               | 1 | 0,47 |
| 32A | 32A | 4 | 1 | <b>LS32 PFLH4 A4.</b>               | 1 | 0,47 |
| 45A | -   | 4 | 1 | <b>LS38 PFLH4 A4.</b>               | 1 | 0,47 |
| 48A | 40A | 4 | 1 | <b>LS40 PFLH4 A4.</b> <sup>1)</sup> | 1 | 1,70 |
| 55A | 55A | 4 | 1 | <b>LS55 PFLH4 A4.</b> <sup>1)</sup> | 1 | 1,70 |
| -   | -   | 4 | 1 | <b>LS65 PFLH4 A4.</b> <sup>1)</sup> | 1 | 1,70 |

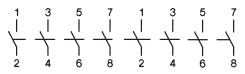
**O ..A4O**



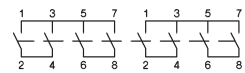
**U ..A4U**



|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 16A | 10A   | 2 | 3 | <b>LS16 PFLH4 A6</b> | 1 | 1,53 |
| 25A | 11,5A | 2 | 3 | <b>LS25 PFLH4 A6</b> | 1 | 1,53 |
| 32A | 13A   | 2 | 3 | <b>LS32 PFLH4 A6</b> | 1 | 1,53 |
| 45A | 20A   | 2 | 3 | <b>LS38 PFLH4 A6</b> | 1 | 1,53 |
| 48A | 29A   | 2 | 3 | <b>LS40 PFLH4 A6</b> | 1 | 1,87 |
| 55A | 36A   | 2 | 3 | <b>LS55 PFLH4 A6</b> | 1 | 1,87 |
| -   | -     | 2 | 3 | <b>LS65 PFLH4 A6</b> | 1 | 1,87 |



|     |       |   |   |                      |   |      |
|-----|-------|---|---|----------------------|---|------|
| 16A | 10A   | 2 | 4 | <b>LS16 PFLH4 A8</b> | 1 | 1,58 |
| 25A | 11,5A | 2 | 4 | <b>LS25 PFLH4 A8</b> | 1 | 1,58 |
| 32A | 13A   | 2 | 4 | <b>LS32 PFLH4 A8</b> | 1 | 1,58 |
| 45A | 20A   | 2 | 4 | <b>LS38 PFLH4 A8</b> | 1 | 1,58 |
| 48A | 29A   | 2 | 4 | <b>LS40 PFLH4 A8</b> | 1 | 1,94 |
| 55A | 36A   | 2 | 4 | <b>LS55 PFLH4 A8</b> | 1 | 1,94 |
| -   | -     | 2 | 4 | <b>LS65 PFLH4 A8</b> | 1 | 1,94 |



|     |     |   |   |                        |   |      |
|-----|-----|---|---|------------------------|---|------|
| 29A | 29A | 4 | 1 | <b>LS16 PFLH4 A4+2</b> | 1 | 1,63 |
| 45A | 45A | 4 | 1 | <b>LS25 PFLH4 A4+2</b> | 1 | 1,63 |
| 58A | 58A | 4 | 1 | <b>LS32 PFLH4 A4+2</b> | 1 | 1,63 |
| -   | -   | 4 | 1 | <b>LS38 PFLH4 A4+2</b> | 1 | 1,63 |
| 72A | 72A | 4 | 1 | <b>LS40 PFLH4 A4+2</b> | 1 | 2,07 |
| 85A | 85A | 4 | 1 | <b>LS55 PFLH4 A4+2</b> | 1 | 2,07 |
| 85A | 85A | 4 | 1 | <b>LS65 PFLH4 A4+2</b> | 1 | 2,07 |

<sup>1)</sup> **Small Plastic Enclosure:** Type plus Type-suffix „+PF2“

z.B.: **LS.. PFLH4 A2+2 +PF2** (Dimensions see page 325)

# Technical Data

| Kind of current | Category                           | Typical applications                 | Test conditions for the number of on-load operating cycles (normal service)          |      |     |       |       |     | Test conditions for making and breaking capacities (operation in fault case) |      |     |       |       |     |     |      |       |     |      |       |
|-----------------|------------------------------------|--------------------------------------|--|------|-----|-------|-------|-----|--|------|-----|-------|-------|-----|-----|------|-------|-----|------|-------|
|                 |                                    |                                      | Make   |      |     | Break |       |     | Make   |      |     | Break |       |     |     |      |       |     |      |       |
|                 |                                    |                                      | I/le   | U/Ue | L/R | Ic/le | Ur/Ue | L/R | I/le   | U/Ue | L/R | Ic/le | Ur/Ue | L/R |     |      |       |     |      |       |
| Direct current  | <b>DC21A</b><br>frequent operation | <b>DC21B</b><br>infrequent operation | Switching of resistive loads including moderate overloads                            |      |     |       |       |     | 1  | 1    | 1ms | 1     | 1     | 1ms | 1,5 | 1,05 | 1ms   | 1,5 | 1,05 | 1ms   |
|                 | <b>DC22A</b><br>frequent operation | <b>DC22B</b><br>infrequent operation | Switching of mixed resistive a.induct. loads incl. moderate overloads (shunt motors) |      |     |       |       |     | 1  | 1    | 2ms | 1     | 1     | 2ms | 4   | 1,05 | 2,5ms | 4   | 1,05 | 2,5ms |
|                 | <b>DC-PV1</b>                      |                                      | Switching of single PV string(s) without reverse- and overcurrents.                  |      |     |       |       |     | 1  | 1    | 1ms | 1     | 1     | 1ms | 1,5 | 1,05 | 1ms   | 1,5 | 1,05 | 1ms   |
|                 | <b>DC-PV2</b>                      |                                      | Switching of several PV strings with reverse- and overcurrents.                      |      |     |       |       |     | 1  | 1    | 1ms | 1     | 1     | 1ms | 4   | 1,05 | 1ms   | 4   | 1,05 | 1ms   |

## Data according to IEC 60947-3, VDE 0660, GB/T14048.3 (CCC China)




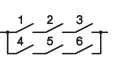
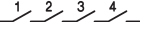
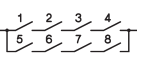
| Main contacts                                     |                                      | Typ             | LS16    | LS25    | LS32  | LS38  | LS40   | LS55   |    |
|---|--------------------------------------|-----------------|---------|---------|-------|-------|--------|--------|----|
| Rated thermal current $I_{th}$                    |                                      | A               | 16      | 25      | 32    | 45    | 48     | 55     |    |
| Rated insulation voltage $U_i^{(1)}$              |                                      | V               | 1000    | 1000    | 1000  | 1000  | 1500   | 1500   |    |
| Rated insulation voltage $U_i^{(2)}$              |                                      | V               | 1500    | 1500    | 1500  | 1500  | 1500   | 1500   |    |
| Distance of contacts (per pole)                   |                                      | mm              | 8       | 8       | 8     | 8     | 8      | 8      |    |
| <b>DC21A and DC21B</b>                            | 1 pole                               | 300V A          | 16      | 23      | 27    | 27    | 40     | 55     |    |
|   |                                      | 400V A          | 12/14   | 14/22   | 16/25 | 16/25 | 30/33  | 40/44  |    |
|   | A1                                   | 500V A          | 9/10    | 11/17   | 13/20 | 13/20 | 19/24  | 25/32  |    |
|   |                                      | 600V A          | 6/7     | 8/12    | 10/15 | 10/15 | 15/19  | 20/25  |    |
|   | 1                                    | 700V A          | 4,5/5   | 6       | 7,5   | 7,5   | 10/12  | 15/18  |    |
|   |                                      | 800V A          | 3       | 4       | 5     | 5     | 8/10   | 10/13  |    |
|   | only DC21B                           | 900V A          | 2,5/3   | 3       | 4     | 4     | 6/8    | 8/10   |    |
|   |                                      | 1000V A         | 1,5/2   | 2       | 2,5/3 | 2,5/3 | 4/5    | 6/8    |    |
|   | 2 poles in series                    | 500V A          | 16      | 25      | 32    | -/45  | 48     | 55     |    |
|   |                                      | 600V A          | 16      | 25      | 32    | -/45  | 48     | 55     |    |
|   | A2                                   | 700V A          | 16      | 23/25   | 27/32 | -/36  | 35/37  | 55     |    |
|   |                                      | 800V A          | 16/16   | 20      | -/23  | -/30  | 35     | 45/55  |    |
|   | 1 2                                  | 900V A          | 13/16   | 16/17   | -/20  | -/25  | 25/31  | 35/43  |    |
|   |                                      | 1000V A         | 9/10    | 11/11,5 | 13    | -/20  | 25/29  | -/36   |    |
|   | 1200V A                              | 6/7             | 8/8,5   | 10      | 10    | 10/11 | 15/17  |        |    |
|   |                                      | 1500V A         | 3       | 4/5     | 5/6   | -/6   | 6/7,5  | 7,5/10 |    |
|   | 2 poles in series + 2 poles parallel | 500V A          | 29      | 45      | 58    | -/65  | 72     | 85     |    |
|   |                                      | 600V A          | 29      | 45      | 50/55 |       | 64/68  | 80/85  |    |
|   | A2+2                                 | 700V A          | 16/22   | 23/27   | 27/32 |       | 35/49  | 55/77  |    |
|   |                                      | 800V A          | 16/17   | 20      | -/23  | -/30  | 35/42  | 45/63  |    |
| 1 2 3 4   | 900V A                               | 13/16           | 16/17   | -/20    |       | 25/31 | 35/43  |        |    |
|   | 1000V A                              | 9/10            | 11/11,5 | 13      | -/20  | 23/29 | 25/36  |        |    |
| 1200V A   | 6/7                                  | 8/8,5           | 10      | 10      | 10/11 | 15/17 |        |        |    |
|   | 1500V A                              | 3               | 4/5     | 5/6     | -/6   | 6/7,5 | 7,5/10 |        |    |
| 3 poles in series + 2 poles parallel              | 500V A                               | 29              | 45      | 58      |       | 72    | 85     |        |    |
|   | 600V A                               | 29              | 45      | 50/58   |       | 72    | 85     |        |    |
| A3+2  | 700V A                               | 29              | 38/43   | 45/55   |       | 72    | 85     |        |    |
|   | 800V A                               | 29              | 38/40   | -/51    |       | 68    | 85     |        |    |
| 1 2 3 4 5 6                                       | 900V A                               | 29              | -/38    | -/47    |       | 62    | 78     |        |    |
|   | 1000V A                              | 29              | -/38    | -/45    |       | 58    | 70     |        |    |
| 1200V A   | 12                                   | 14/25           | 16/28   |         |       |       |        |        |    |
|   | 1500V A                              | 9               | 11/14   | 13/20   |       |       |        |        |    |
| 4 poles in series                                 | 500V A                               | 16              | 25      | 32      | -/45  | 48    | 55     |        |    |
|   | 600V A                               | 16              | 25      | 32      | -/45  | 48    | 55     |        |    |
| A4  | 700V A                               | 16              | 25      | 32      |       | 40    | 55     |        |    |
|   | 800V A                               | 16              | 25      | 32      |       | 40    | 55     |        |    |
| 1 2 3 4   | 900V A                               | 16              | 25      | 32      |       | 40    | 55     |        |    |
|   | 1000V A                              | 16              | 25      | 32      | -/38  | 40    | 55     |        |    |
| 1200V A   | 16                                   | 25              | 32      |         | 40    | 55    |        |        |    |
|   | 1500V A                              | 16              | 20/25   | 23/32   | -/32  | 30/40 | 40/55  |        |    |
| 4 poles in series + 2 poles parallel              | 500V A                               | 29              | 45      | 58      | -/65  | 72    | 85     |        |    |
|   | 600V A                               | 29              | 45      | 58      |       | 72    | 85     |        |    |
| A4+2  | 700V A                               | 29              | 45      | -/58    |       | 72    | 85     |        |    |
|   | 800V A                               | 29              | 45      | -/58    |       | 72    | 85     |        |    |
| 1 2 3 4 5 6 7 8                                   | 900V A                               | 29              | 45      | -/58    |       | 72    | 85     |        |    |
|   | 1000V A                              | 29              | -/45    | -/58    | -/65  | -/72  | -/85   |        |    |
| 1200V A   | 29                                   | -/45            | 50      | -/50    | -/56  | -/65  |        |        |    |
|   | 1500V A                              | 16              | 20/26   | 23/32   | -/32  | -/42  | -/55   |        |    |
| <b>Rated operational current <math>I_e</math></b> |                                      |                 |         |         |       |       |        |        |    |
| <b>AC21B</b>                                      | A2, A4                               | $U_e$ max. 440V | A       | 16      | 25    | 32    | 45     | 48     | 55 |
|   | A2+2                                 | $U_e$ max. 440V | A       | 29      | 45    | 58    |        | 72     | 85 |

1) Suitable at overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .

2) Suitable at overvoltage category I to III, pollution degree 2 (min. IP55):  $U_{imp} = 8kV$ .

# Technical Data




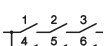
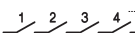
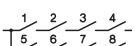
Data according to IEC 60947-3, VDE 0660

| Main contacts   | Type   |      | LS16 | LS25 | LS32 | LS38 | LS40 | LS55 | LS65 |    |
|---|--|------|------|------|------|------|------|------|------|----|
| <b>Rated operational current I<sub>e</sub></b>  |  |      |      |      |      |      |      |      |      |    |
| <b>DC-PV1</b><br>1 Pole<br>A1<br>                  | 300V   | A    | 16   | 23   | 27   | 27   | 40   | 55   | 65   |    |
|   | 400V   | A    | 14   | 22   | 25   | 25   | 33   | 44   | 50   |    |
|   | 500V   | A    | 10   | 17   | 20   | 20   | 24   | 32   | 40   |    |
|   | 600V   | A    | 7    | 12   | 15   | 15   | 19   | 25   | 30   |    |
|   | 700V   | A    | 5    | 6    | 7,5  | 7,5  | 12   | 18   | 21   |    |
|   | 800V   | A    | 3    | 4    | 5    | 5    | 10   | 13   | 15   |    |
|   | 900V   | A    | 3    | 3    | 4    | 4    | 8    | 10   | 10   |    |
|   | 1000V  | A    | 2    | 2    | 3    | 3    | 5    | 8    | 8    |    |
|   | 2 Poles in series<br>A2<br>                           | 500V | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
|   |  | 600V | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
| 700V  |  | A    | 16   | 25   | 32   | 36   | 37   | 55   | 65   |    |
| 800V  |  | A    | 16   | 20   | 23   | 30   | 35   | 55   | 65   |    |
| 900V  |  | A    | 16   | 17   | 20   | 25   | 31   | 43   | 55   |    |
| 1000V   |  | A    | 10   | 11,5 | 13   | 20   | 29   | 36   | 40   |    |
| 1100V   |  | A    | 8    | 10   | 11,5 | -    | 19   | 25   | -    |    |
| 1200V   |  | A    | 7    | 8,5  | 10   | 10   | 11   | 17   | 17   |    |
| 1300V   |  | A    | 6    | 7    | 8    | -    | 10   | 14   | -    |    |
| 1400V   |  | A    | 5    | 6    | 7    | -    | 9    | 12   | -    |    |
| 1500V   |  | A    | 3    | 5    | 6    | 6    | 8    | 10   | 10   |    |
| 2 Poles in series<br>+ 2 Pole parallel<br>A2+2<br> |  | 500V | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85 |
|   |  | 600V | A    | 29   | 45   | 55   | 58   | 68   | 85   | 85 |
|   |  | 700V | A    | 22   | 27   | 32   | 36   | 49   | 77   | 80 |
|   | 800V   | A    | 17   | 20   | 23   | 30   | 42   | 63   | 65   |    |
|   | 900V   | A    | 16   | 17   | 20   | 25   | 31   | 43   | 55   |    |
|   | 1000V  | A    | 10   | 11,5 | 13   | 20   | 29   | 36   | 40   |    |
|   | 1100V  | A    | 8    | 10   | 11,5 | -    | 19   | 25   | -    |    |
|   | 1200V  | A    | 7    | 8,5  | 10   | 10   | 11   | 17   | 17   |    |
|   | 1300V  | A    | 6    | 7    | 8    | -    | 10   | 14   | -    |    |
|   | 1400V  | A    | 5    | 6    | 7    | -    | 9    | 12   | -    |    |
|   | 1500V  | A    | 3    | 5    | 6    | 6    | 8    | 10   | 10   |    |
|   | 3 Poles in series<br>+ 2 Poles parallel<br>A3+2<br> | 500V | A    | 29   | 45   | 58   | -    | 72   | 85   | -  |
|   |  | 600V | A    | 29   | 45   | 58   | -    | 72   | 85   | -  |
|   |  | 700V | A    | 29   | 43   | 55   | -    | 72   | 85   | -  |
| 800V  |  | A    | 29   | 40   | 51   | -    | 68   | 85   | -    |    |
| 900V  |  | A    | 29   | 38   | 47   | -    | 62   | 78   | -    |    |
| 1000V   |  | A    | 29   | 38   | 45   | -    | 58   | 70   | -    |    |
| 1100V   |  | A    | 19   | 27   | 37   | -    | -    | -    | -    |    |
| 1200V   |  | A    | 17   | 25   | 28   | -    | -    | -    | -    |    |
| 1300V   |  | A    | 15   | 21   | 25   | -    | -    | -    | -    |    |
| 1400V   |  | A    | 12   | 18   | 22   | -    | -    | -    | -    |    |
| 1500V   |  | A    | 10   | 14   | 20   | -    | -    | -    | -    |    |
| 4 Poles in series<br>A4<br>                      |  | 500V | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
|   |  | 600V | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
|   |  | 700V | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
|   | 800V   | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65   |    |
|   | 900V   | A    | 16   | 25   | 32   | 45   | 48   | 55   | 65   |    |
|   | 1000V  | A    | 16   | 25   | 32   | 38   | 40   | 55   | 65   |    |
|   | 1100V  | A    | 16   | 25   | 32   | -    | 40   | 55   | 65   |    |
|   | 1200V  | A    | 16   | 25   | 32   | 32   | 40   | 55   | 65   |    |
|   | 1300V  | A    | 16   | 25   | 32   | -    | 40   | 55   | 65   |    |
|   | 1400V  | A    | 16   | 25   | 32   | -    | 40   | 55   | 65   |    |
|   | 1500V  | A    | 16   | 25   | 32   | 32   | 40   | 55   | 65   |    |
|   | 4 Poles in series<br>+ 2 Poles parallel<br>A4+2<br> | 500V | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85 |
|   |  | 600V | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85 |
|   |  | 700V | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85 |
| 800V  |  | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85   |    |
| 900V  |  | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85   |    |
| 1000V   |  | A    | 29   | 45   | 58   | 65   | 72   | 85   | 85   |    |
| 1100V   |  | A    | 29   | 45   | 54   | -    | 60   | 68   | -    |    |
| 1200V   |  | A    | 29   | 45   | 50   | 50   | 56   | 65   | 65   |    |
| 1300V   |  | A    | 26   | 39   | 44   | -    | 50   | 61   | -    |    |
| 1400V   |  | A    | 23   | 33   | 38   | -    | 46   | -    | -    |    |
| 1500V   |  | A    | 20   | 26   | 32   | 32   | 42   | 55   | 55   |    |



# Technical Data



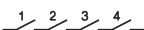
Data according to IEC 60947-3, VDE 0660

| Main contacts  | Type   |        | LS16 | LS25 | LS32 | LS38 | LS40 | LS55 | LS65 |    |
|--|--|--------|------|------|------|------|------|------|------|----|
| <b>Rated operational current I<sub>e</sub></b>   |  |        |      |      |      |      |      |      |      |    |
| <b>DC-PV2</b><br>1 Pole<br>A1<br>                   | 300V A   |        | 16   | 23   | 27   | 27   | 40   | 55   | -    |    |
|  | 400V A   |        | 14   | 18   | 20   | 20   | 30   | 40   | -    |    |
|  | 500V A   |        | 10   | 12   | 14   | 14   | 19   | 25   | -    |    |
|  | 600V A   |        | 5    | 6    | 8    | 8    | 10   | 13   | -    |    |
|  | 700V A   |        | 1,5  | 2    | 3    | 3    | 7    | 10   | -    |    |
|  | 800V A   |        | 1,5  | 2    | 3    | 3    | 6    | 8    | -    |    |
|  | 900V A   |        | 1    | 1,5  | 2    | 2    | 5    | 6    | -    |    |
|  | 1000V A  |        | 1    | 1,5  | 2    | 2    | 3    | 4    | -    |    |
|  | 2 Poles in series<br>A2<br>                           | 500V A |      | 16   | 25   | 32   | 38   | 40   | 55   | 65 |
|  |  | 600V A |      | 14   | 21   | 27   | 31   | 40   | 55   | 65 |
| 700V A   |  |        | 13   | 19   | 22   | 25   | 35   | 55   | 65   |    |
| 800V A   |  |        | 12   | 15   | 17   | 19   | 33   | 49   | 52   |    |
| 900V A   |  |        | 8    | 10   | 12   | 14   | 25   | 35   | 38   |    |
| 1000V A  |  |        | 4    | 5    | 6    | 7    | 16   | 20   | 20   |    |
| 1100V A  |  |        | 3    | 4    | 5    | -    | 11   | 15   | -    |    |
| 1200V A  |  |        | 2    | 3    | 4    | 4    | 8    | 12   | 12   |    |
| 1300V A  |  |        | 1,5  | 2    | 3    | -    | 7    | 10   | -    |    |
| 1400V A  |  |        | 1    | 2    | 3    | -    | 7    | 9    | -    |    |
| 1500V A  |  |        | 1    | 1,5  | 2    | 2    | 6    | 8    | 8    |    |
| 2 Poles in series<br>+ 2 Poles parallel<br>A2+2<br> |  | 500V A |      | 25   | 39   | 50   | 58   | 72   | 85   | 85 |
|  |  | 600V A |      | 20   | 32   | 35   | 38   | 60   | 75   | 75 |
|  | 700V A   |        | 13   | 19   | 22   | 25   | 38   | 60   | 65   |    |
|  | 800V A   |        | 12   | 15   | 17   | 19   | 33   | 49   | 52   |    |
|  | 900V A   |        | 8    | 10   | 12   | 14   | 25   | 35   | 38   |    |
|  | 1000V A  |        | 4    | 5    | 6    | 7    | 16   | 20   | 20   |    |
|  | 1100V A  |        | 3    | 4    | 5    | -    | 11   | 15   | -    |    |
|  | 1200V A  |        | 2    | 3    | 4    | 4    | 8    | 12   | 12   |    |
|  | 1300V A  |        | 1,5  | 2    | 3    | -    | 7    | 10   | -    |    |
|  | 1400V A  |        | 1    | 2    | 3    | -    | 7    | 9    | -    |    |
|  | 1500V A  |        | 1    | 1,5  | 2    | 2    | 6    | 8    | 8    |    |
|  | 3 Poles in series<br>+ 2 Poles parallel<br>A3+2<br> | 500V A |      | 24   | 45   | 58   | 65   | 72   | 85   | -  |
|  |  | 600V A |      | 22   | 34   | 44   | 48   | 78   | -    | -  |
| 700V A   |  |        | 20   | 28   | 34   | 35   | 62   | 69   | -    |    |
| 800V A   |  |        | 18   | 24   | 29   | 31   | 53   | 61   | -    |    |
| 900V A   |  |        | 16   | 20   | 24   | 24   | 55   | -    | -    |    |
| 1000V A  |  |        | 14   | 18   | 20   | 20   | 35   | 50   | -    |    |
| 1100V A  |  |        | -    | -    | -    | -    | -    | -    | -    |    |
| 1200V A  |  |        | 11   | 13   | 15   | 15   | -    | -    | -    |    |
| 1300V A  |  |        | -    | -    | -    | -    | -    | -    | -    |    |
| 1400V A  |  |        | -    | -    | -    | -    | -    | -    | -    |    |
| 1500V A  |  |        | 4    | 6    | 8    | 8    | -    | -    | -    |    |
| 4 Poles in series<br>A4<br>                       |  | 500V A |      | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
|  |  | 600V A |      | 16   | 25   | 32   | 45   | 48   | 55   | 65 |
|  | 700V A   |        | 16   | 25   | 32   | 45   | 48   | 55   | 65   |    |
|  | 800V A   |        | 16   | 25   | 32   | 38   | 40   | 55   | 65   |    |
|  | 900V A   |        | 16   | 25   | 32   | 38   | 40   | 55   | 65   |    |
|  | 1000V A  |        | 16   | 25   | 32   | 38   | 40   | 55   | 65   |    |
|  | 1100V A  |        | 15   | 25   | 32   | -    | -    | 55   | -    |    |
|  | 1200V A  |        | 13,5 | 21   | 27   | 27   | 40   | 55   | 55   |    |
|  | 1300V A  |        | 12   | 19   | 24   | -    | -    | 50   | -    |    |
|  | 1400V A  |        | 10,5 | 16   | 21   | -    | -    | 45   | -    |    |
|  | 1500V A  |        | 9    | 14   | 18   | 18   | 30   | 40   | 40   |    |
|  | 4 Poles in series<br>+ 2 Poles parallel<br>A4+2<br> | 500V A |      | 29   | 45   | 58   | 65   | 72   | 85   | -  |
|  |  | 600V A |      | 29   | 45   | 58   | 65   | 72   | 85   | -  |
| 700V A   |  |        | 25   | 40   | 53   | 65   | 72   | 80   | -    |    |
| 800V A   |  |        | 21   | 35   | 45   | 60   | 67   | 75   | -    |    |
| 900V A   |  |        | 18   | 30   | 37   | 55   | 59   | 70   | -    |    |
| 1000V A  |  |        | 16   | 25   | 32   | 50   | 52   | 64   | -    |    |
| 1100V A  |  |        | -    | -    | -    | -    | 44   | 59   | -    |    |
| 1200V A  |  |        | 13,5 | 21   | 27   | 27   | 40   | 55   | -    |    |
| 1300V A  |  |        | -    | -    | -    | -    | 36   | 50   | -    |    |
| 1400V A  |  |        | -    | -    | -    | -    | 33   | 45   | -    |    |
| 1500V A  |  |        | 9    | 14   | 18   | 18   | 30   | 40   | -    |    |



# Technical Data




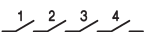
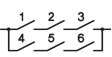
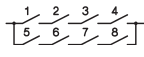



Data according to IEC 60947-3, VDE 0660

| Main contacts   | Type   | LS16  | LS25        | LS32         | LS38         | LS40   | LS55/LS65                  |
|---|--|---|-------------|--------------|--------------|--|----------------------------|
| <b>Rated operational current I<sub>e</sub></b>                                    | 500V A   | 1   | 1,25        | 1,5          | x            | x  | 2,5                        |
| <b>DC22B</b>  | 600V A   | 0,5   | 0,75        | 1            | x            | x  | 2,0                        |
| 1 pole  | 800V A   | 0,3   | 0,4         | 0,5          | x            | x  | 1,5                        |
| A1  | 1000V A  | 0,15  | 0,2         | 0,25         | x            | x  | 1,0                        |
|  | 1200V A  | -   | -           | -            | x            | x  | x                          |
|   | 1500V A  | -   | -           | -            | x            | x  | x                          |
| 2 poles in series   | 500V A   | 7   | 8           | 9            | x            | x  | x                          |
| A2  | 600V A   | 5,5   | 6           | 6,5          | x            | x  | x                          |
|   | 800V A   | 2   | 2,5         | 3            | x            | x  | x                          |
|  | 1000V A  | 1   | 1,5         | 2            | x            | x  | x                          |
|   | 1200V A  | -   | -           | -            | x            | x  | x                          |
|   | 1500V A  | -   | -           | -            | x            | x  | x                          |
| 4 poles in series   | 500V A   | 16  | 25          | 32           | x            | x  | x                          |
| A4  | 600V A   | 16  | 25          | 27,5         | x            | x  | x                          |
|   | 800V A   | 11,5  | 12          | 12,5         | x            | x  | x                          |
|  | 1000V A  | 8   | 9           | 10           | x            | x  | x                          |
|   | 1200V A  | -   | -           | -            | x            | x  | x                          |
|   | 1500V A  | -   | -           | -            | x            | x  | x                          |
| <b>Rated conditional short-circuit current</b>                                    | kA <sub>eff</sub>                                  | 5   | 5           | 5            | 5            | 10   | 10                         |
| Max. fuse size  | gL (gG)  | A 40  | 63          | 80           | 80           | 125  | 160                        |
| Mechanical life   | x10 <sup>3</sup>                                   | 10  | 10          | 10           | 10           | 10   | 10                         |
| Rated short-time withstand current (1s)   | I <sub>cw</sub> A2, A4, A6, A8<br>A2+2, A3+2, A4+2 | A 800<br>A 1300                                     | 900<br>1500 | 1000<br>1700 | 1000<br>1700 | A2, A4: 1200<br>A2+2: 2000                                 | A2, A4: 1400<br>A2+2: 2400 |
| Short circuit making capacity   | I <sub>cm</sub> A2, A4, A6, A8<br>A2+2, A3+2, A4+2 | A 800<br>A 1300                                     | 900<br>1500 | 1000<br>1700 | 1000<br>1700 | A2, A4: 1200<br>A2+2: 2000                                 | A2, A4: 1400<br>A2+2: 2400 |
| <b>Maximum cable cross sections</b> (incl. jumper)                                |  | LSV-B1  | LSV-B1      | LSV-B1       | LSV-B1       | LSV-B2   | LSV-B2                     |
| solid or stranded   | mm <sup>2</sup>                                    | 4 - 16  | 4 - 16      | 4 - 16       | 4-16         | 2,5 - 25   | 2,5 - 25                   |
| flexible  | mm <sup>2</sup>                                    | 4 - 10  | 4 - 10      | 4 - 10       | 4-10         | 2,5 - 16   | 2,5 - 16                   |
| flexible (+ multicore cable end)  | mm <sup>2</sup>                                    | 4 - 10  | 4 - 10      | 4 - 10       | 4-10         | 1,5 - 16   | 1,5 - 16                   |
| Size of terminal screw  |  | M4 Pz2  | M4 Pz2      | M4 Pz2       | M4 Pz2       | M5 Pz2   | M5 Pz2                     |
| Tightening torque   | Nm   | 1,8 - 2   | 1,8 - 2     | 1,8 - 2      | 1,8 - 2      | 2,5 - 2,8  | 2,5 - 2,8                  |
| 2 cables per terminal without jumper LSV-B1 / LSV-B2                              |  |   |             |              |              |  |                            |
| solid or stranded   | mm <sup>2</sup>                                    | 16+(1,5-2,5) / 10+(1,5-6) / 6+(1,5-10) / 4+(1,5-10) |             |              |              | 16+(1,5-2,5) / 10+(1,5-10) / 6+(1,5-10) / 4+(1,5-10)       |                            |
| flexible & flexible + multicore cable end   | mm <sup>2</sup>                                    | 16+(1,5-2,5) / 10+(1,5-4) / 6+(1,5-6)               |             |              |              | 16+(1,5-6) / 10+(1,5-10) / 6+(1,5-16) / 4+(1,5-16)         |                            |
| stranded  | AWG  | 8+(16-12) / 10+(16-10) / 12+(16-8) 14+(16-8)        |             |              |              | 3+(18-10) / 4+(18-10) / 6+(18-8) 8+(18-8)                  |                            |
| solid   | AWG  | 10+(16-12) / 12+(16-10) 14+(16-10)                  |             |              |              | 10+(16-10) / 12+(16-10) / 14+(16-10) 12+(16-10)/14+(16-10) |                            |
| <b>Maximum ambient temperature</b>  |  |   |             |              |              |  |                            |
| Operation   | open °C  | -40 to +65  |             |              |              |  |                            |
|   | enclosed °C  | -40 to +45  |             |              |              |  |                            |
| Storage   | °C   | -50 to +90  |             |              |              |  |                            |
| <b>Power loss</b> per switch at I <sub>e</sub> max.                               |  | A   | A           | A            |              | A  | A                          |
| A2  | (A)/W  | (16)/ 1   | (25)/ 2,3   | (32)/ 3,7    |              | (40)/ 4  | (55)/ 7,5                  |
| A4  | (A)/W  | (16)/ 2   | (25)/ 4,6   | (32)/ 7,4    |              | (40)/ 8  | (55)/ 15                   |
| A6  | (A)/W  | (16)/ 3   | (25)/ 6,9   | (32)/ 11,1   |              | (40)/ 12   | (55)/ 22,5                 |
| A8  | (A)/W  | (16)/ 4   | (25)/ 9,2   | (32)/ 14,8   |              | (40)/ 16   | (55)/ 30                   |
| A2+2  | (A)/W  | (29)/1,5  | (45)/ 3,7   | (58)/ 6      |              | (72)/ 6,5  | (85)/ 9                    |
| A3+2  | (A)/W  | (29)/2,3  | (45)/ 5,6   | (58)/ 9      |              | (72)/ 9,8  | (85)/ 14                   |
| A4+2  | (A)/W  | (29)/3  | (45)/ 7,4   | (58)/ 12     |              | (72)/ 13   | (85)/ 18                   |
| <b>Contact resistance</b> per pole  | mΩ   | 1,75  | 1,75        | 1,75         |              | 1,25   | 1,25                       |

x pending






# Technical Data

Daten according to UL5081  File E359344 Category np.: NMSJ and UL508  File E332938, Category no.: NRNT2, NRNT8

| Typ   |   |   |   | LS16    | LS25    | LS32    | LS38      | LS40      | LS55 | LS65 |    |   |
|---|---|---|---|---------|---------|---------|-----------|-----------|------|------|----|---|
| Ampere-Rating "General use"<br> 1 Pole             | DC  | 350V  | A   | 4       | 5       | 6       | 6         | 7,1       | 10,0 | 10,0 |    |   |
|   |   | 500V  | A   | 4       | 5       | 6       | 6         | 5,7       | 7,0  | 7,0  |    |   |
|   |   | 600V  | A   | 4       | 5       | 6       | 6         | 5,0       | 5,8  | 5,8  |    |   |
|   |   | 700V  | A   | -       | -       | -       | -         | 3,9       | 5,0  | 5,0  |    |   |
|   |   | 800V  | A   | -       | -       | -       | -         | 3,2       | 4,4  | 4,4  |    |   |
|   |   | 900V  | A   | -       | -       | -       | -         | 2,5       | 3,5  | 3,5  |    |   |
|   |   | 1000V   | A   | -       | -       | -       | -         | 1,5       | 2,0  | 2,0  |    |   |
|   |   |  2 Poles in series<br>A2 | 350V  | A       | 16      | 25      | 32        | 45        | 48   | 55   | 65 |   |
|   |   |   | 500V  | A       | 16      | 25      | 32        | 45        | 48   | 55   | 65 |   |
|   |   |   | 600V  | A       | 16      | 25      | 32        | 36        | 40   | 55   | 65 |   |
| 700V  | A   |   | -   | -       | -       | -       | 32        | 46        | 50   |      |    |   |
| 800V  | A   |   | -   | -       | -       | -       | 26        | 37        | 40   |      |    |   |
| 900V  | A   |   | -   | -       | -       | -       | 20        | 28        | 32   |      |    |   |
| 1000V   | A   |   | -   | -       | -       | -       | 16        | 20        | 25   |      |    |   |
|  2 Poles in series<br>+ 2 Poles parallel<br>A2+2   | 350V  |   | A   | 29      | 45      | 58      | 58        | 72        | 85   | 85   |    |   |
|   | 500V  |   | A   | 29      | 41      | 43      | 45        | 53        | 66   | 73   |    |   |
|   | 600V  |   | A   | 21      | 30      | 33      | 36        | 42        | 55   | 65   |    |   |
|   | 700V  | A   | -   | -       | -       | -       | 35        | 47        | 50   |      |    |   |
|   | 800V  | A   | -   | -       | -       | -       | 30        | 40        | 40   |      |    |   |
|   | 900V  | A   | -   | -       | -       | -       | 26        | 32        | 32   |      |    |   |
|   | 1000V   | A   | -   | -       | -       | -       | 22        | 25        | 25   |      |    |   |
|   |  4 Poles in series<br>A4                           | 350V  | A   | 16      | 25      | 32      | 45        | 48        | 55   | 65   |    |   |
|   |   | 500V  | A   | 16      | 25      | 32      | 45        | 48        | 55   | 65   |    |   |
|   |   | 600V  | A   | 16      | 25      | 32      | 36        | 40        | 55   | 65   |    |   |
| 700V  |   | A   | -   | -       | -       | -       | 40        | 55        | 65   |      |    |   |
| 800V  |   | A   | -   | -       | -       | -       | 40        | 55        | 65   |      |    |   |
| 900V  |   | A   | -   | -       | -       | -       | 40        | 55        | 65   |      |    |   |
| 1000V   |   | A   | -   | -       | -       | -       | 40        | 55        | 65   |      |    |   |
|  3 Poles in series<br>+ 2 Poles parallel<br>A3+2 |   | 350V  | A   | 29      | 45      | 58      | 58        | 72        | 85   | 85   |    |   |
|   |   | 500V  | A   | 29      | 41      | 50      | 50        | 56        | 80   | 85   |    |   |
|   |   | 600V  | A   | 21      | 38      | 45      | 45        | 52        | 65   | 72   |    |   |
|   | 700V  | A   | -   | -       | -       | -       | 46        | 58        | 66   |      |    |   |
|   | 800V  | A   | -   | -       | -       | -       | 40        | 51        | 60   |      |    |   |
|   | 900V  | A   | -   | -       | -       | -       | 36        | 45        | 54   |      |    |   |
|   | 1000V   | A   | -   | -       | -       | -       | 33        | 42        | 48   |      |    |   |
|   |  4 Poles in series<br>+ 2 Poles parallel<br>A4+2 | 350V  | A   | 29      | 45      | 58      | 58        | 80        | 85   | 85   |    |   |
|   |   | 500V  | A   | 29      | 45      | 58      | 58        | 71        | 85   | 85   |    |   |
|   |   | 600V  | A   | 29      | 45      | 50      | 50        | 65        | 85   | 85   |    |   |
| 700V  |   | A   | -   | -       | -       | -       | 58        | 76        | 85   |      |    |   |
| 800V  |   | A   | -   | -       | -       | -       | 51        | 71        | 76   |      |    |   |
| 900V  |   | A   | -   | -       | -       | -       | 45        | 67        | 73   |      |    |   |
| 1000V   |   | A   | -   | -       | -       | -       | 42        | 64        | 70   |      |    |   |
| AC-Rating "General use"   |   | 2 Poles in series<br>+ 2 Poles parallel   |  1 phase | 600V    | A       | 16      | 25        | 32        | -    | 40   | 55 | - |
|   |   |   |  1 phase | 277V    | A       | -       | -         | 50        | -    | 72   | 85 | - |
|   |   |   |  3 phase | 480V    | A       | -       | -         | 32        | -    | 40   | 55 | - |
|   |   |   |   |         |         |         |           |           |      |      |    |   |
| Fuse size (RK5) Industrial Control Switch   | 5kA / 600V  | A   | 40  | 60      | 80      | 80      | -         | -         | -    | -    |    |   |
|   | 5kA/1000V   | A   | -   | -       | -       | -       | 160       | 160       | 160  |      |    |   |
| <b>Max. cable cross sections</b> incl. jumpers LSV-B1 / LSV-B2  | solid   | AWG   | 12 - 10   | 12 - 10 | 12 - 10 | 12 - 10 | 16 - 10   | 16 - 10   |      |      |    |   |
|   | flexible or stranded  | AWG   | 12 - 6  | 12 - 6  | 12 - 6  | 12 - 6  | 14 - 3    | 14 - 3    |      |      |    |   |
|   | flexible (+ multicore cable end)  | AWG   | 12 - 6  | 12 - 6  | 12 - 6  | 12 - 6  | 16 - 4    | 16 - 4    |      |      |    |   |
|   | Size of terminal screw  |   | M4 Pz2  | M4 Pz2  | M4 Pz2  | M4 Pz2  | M5 Pz2    | M5 Pz2    |      |      |    |   |
|   | Tightening torque   | Nm  | 1,8 - 2   | 1,8 - 2 | 1,8 - 2 | 1,8 - 2 | 2,5 - 2,8 | 2,5 - 2,8 |      |      |    |   |
| Protection class of terminals <sup>1)</sup>   |   |   | IP20  | IP20    | IP20    | IP20    | IP20      | IP20      |      |      |    |   |

1) Protection class of the terminals with connected, insulated conductors.

## Approvals

| Country    | USA,<br>UL5081  | US, Canada<br>UL508   | Europe  | China<br>CCC  | CB-<br>Certificates | EAC   |
|------------|---|---|---|---|---------------------|---|
| Type       |  |  |  |  |                     |  |
| LS16       | o   | o   | /   | o   | o                   | o   |
| LS25       | o   | o   | /   | o   | o                   | o   |
| LS32       | o   | o   | /   | o   | o                   | o   |
| LS38       | o   | o   | /   | o   | o                   | o   |
| LS40, LS55 | o   | o   | /   | o   | o                   | o   |
| LS65       | o   | o   | /   | -   | o                   | o   |

o In standard version approved

/ No testing required CE

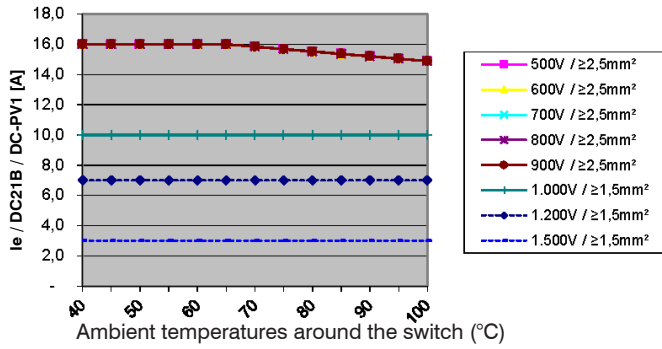
x In test

- Not provided for test

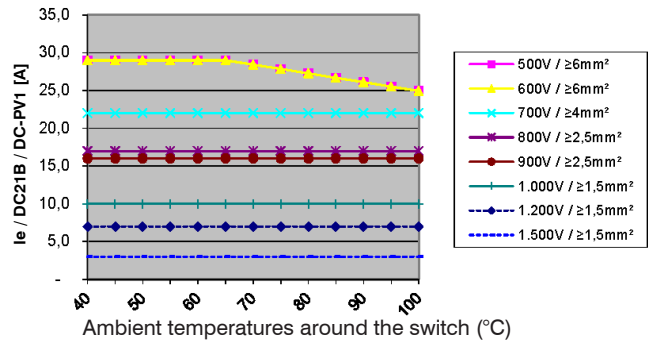
## Technical Data

Example for maximum currents according to ambient temperatures and cable cross sections:

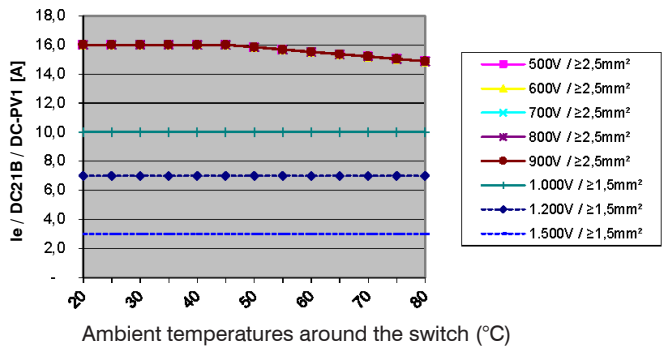
Switch **open** LS16..., 2 contacts in series (A2)



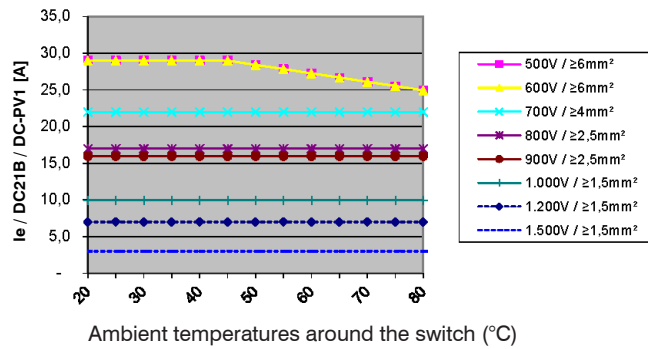
Switch **open** LS16 ..., 2 contacts in series + 2 parallel (A2+2)



Switch **enclosed** LS16 PFL..., 2 contacts in series (A2)



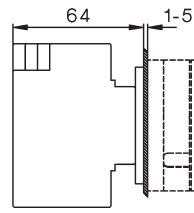
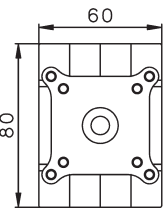
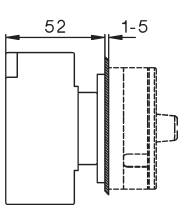
Switch **enclosed** LS16 PFL..., 2 contacts in series + 2 parallel (A2+2)



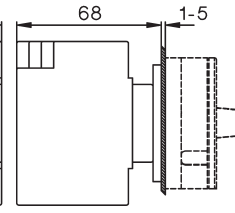
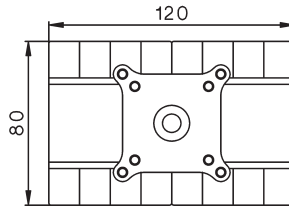
All data about maximum currents according to ambient temperatures and cable cross sections for switches LS16.. to LS65.. (open or enclosed) please find under ➡ [www.benedict.at](http://www.benedict.at) (Button "Customers").

## Dimensions

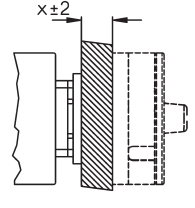
**LS16 E.., LS25 E.., LS32 E.., LS38E..**  
..A2



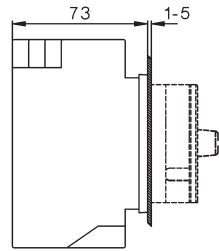
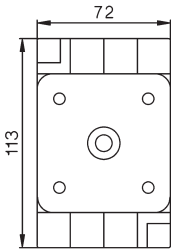
**LS16 E.., LS25 E.., LS32 E.., LS38 E**  
..A6, ..A8, ..A3+2, ..A4+2



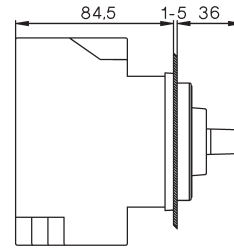
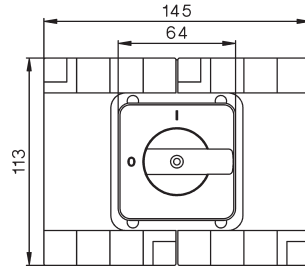
**LS... +VW"x"**  
Extended Switch Shaft



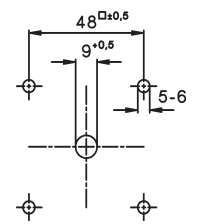
**LS40 E.., LS55 E.., LS65E..**  
..A2, ..A2+2, ..A4.



**LS40 E.., LS55 E.., LS65E..**  
..A6, ..A8, ..A3+2, ..A4+2

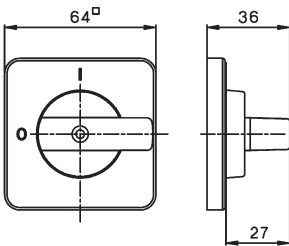


Mounting hole  
Mounting screw:  
S3631N M=1,2-1,4 Nm

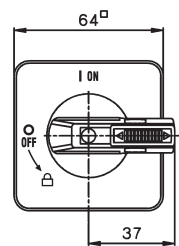


### Escutcheon plate 64<sup>□</sup>

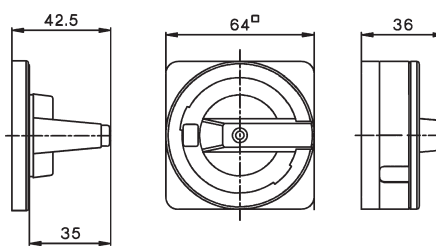
Handle



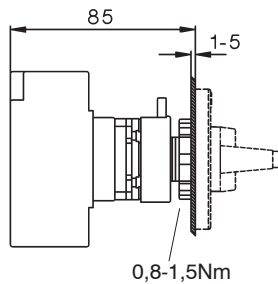
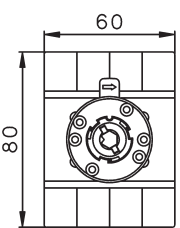
Padlock device SV1.



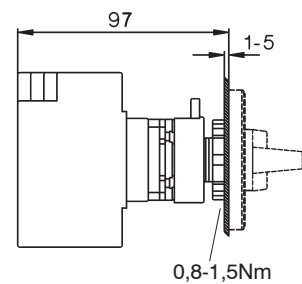
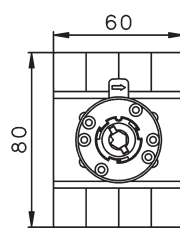
Padlock device SV4.



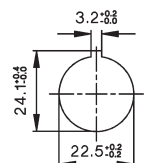
**LS16 Z.., LS25 Z.., LS32 Z.., LS38 Z..**  
..A2



..A2+2, ..A4.

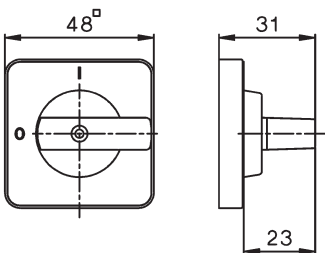


Mounting hole

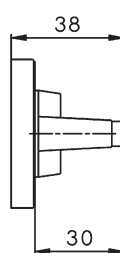
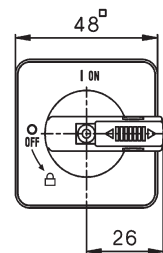


### Escutcheon plate 48<sup>□</sup>

Handle



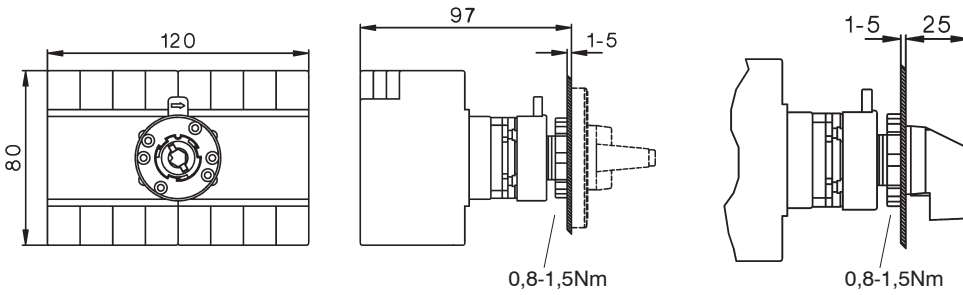
Padlock device SV1.



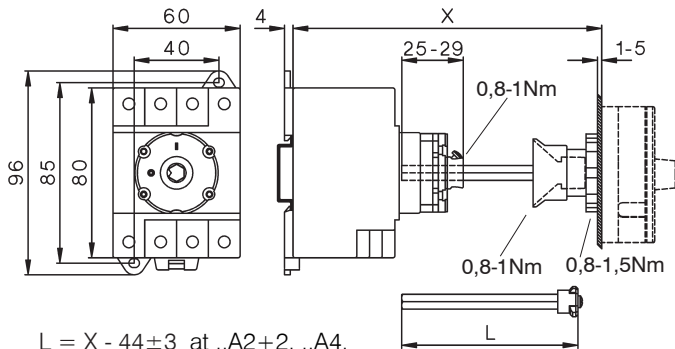
## Dimensions

**LS16 Z., LS25 Z., LS32 Z., LS38 Z.**  
**..A6, ..A8, ..A3+2, ..A4+2**

**LS.. ZO..**



**LS16 VZV., LS25 VZV., LS32 VZV., LS38 VZV.**  
**..A2, ..A2+2, ..A4**



delivered with: ..A2+2, ..A4.

$X_{max.} = 194, L = 150$

( $X_{min.} = 89$ )

delivered with: ..A2

$X_{max.} = 182, L = 150$

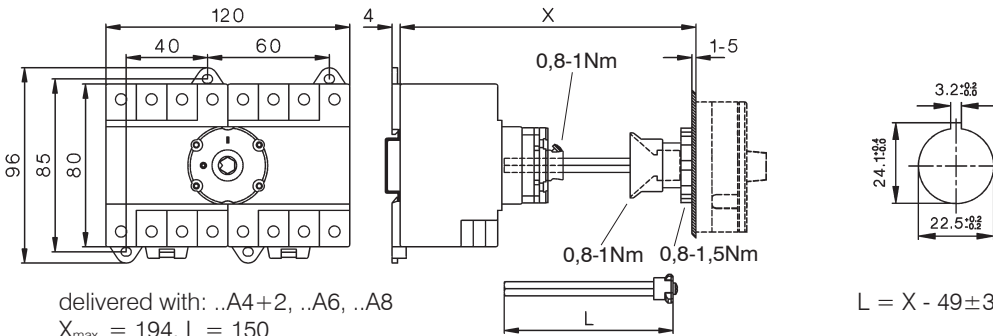
( $X_{min.} = 77$ )

Bigger X-Dimensions on request

$L = X - 44 \pm 3$  at ..A2+2, ..A4.  
 $L = X - 32 \pm 3$  at ..A2

**LS16 VZV., LS25 VZV., LS32 VZV., LS38 VZV.**  
**..A6, ..A8, ..A3+2, ..A4+2**

Mounting hole

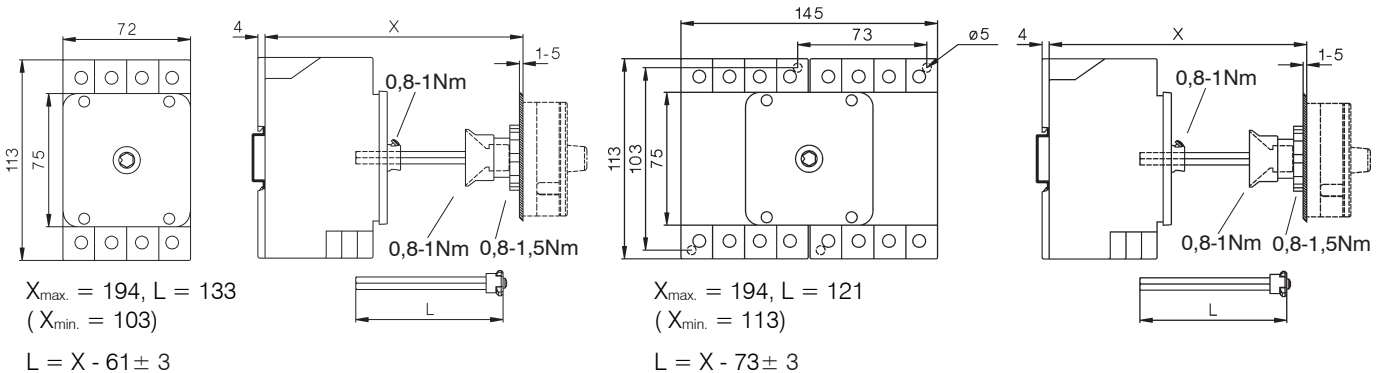


delivered with: ..A4+2, ..A6, ..A8  
 $X_{max.} = 194, L = 150$   
( $X_{min.} = 95$ )

$L = X - 49 \pm 3$

**LS40 VZV., LS55 VZV., LS65 VZV.**  
**..A2, ..A2+2, ..A4.**

**LS40 VZV., LS55 VZV., LS65 VZV.**  
**..A6, ..A8, ..A3+2, ..A4+2**



$X_{max.} = 194, L = 133$   
( $X_{min.} = 103$ )

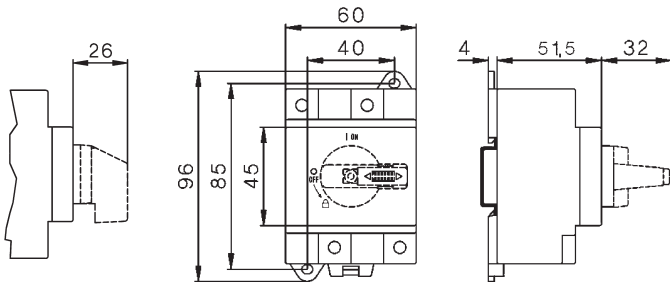
$L = X - 61 \pm 3$

$X_{max.} = 194, L = 121$   
( $X_{min.} = 113$ )

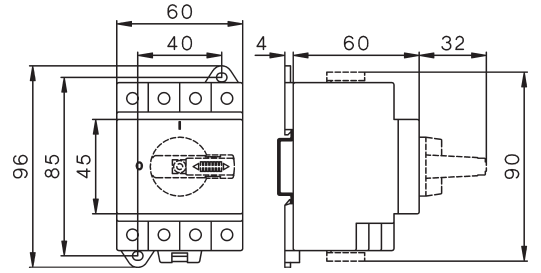
$L = X - 73 \pm 3$

# Dimensions

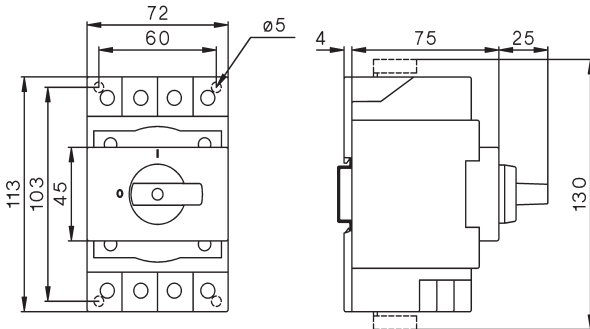
**LS16 SMA..., LS25 SMA..., LS32 SMA..., LS38 SMA..  
..A2**



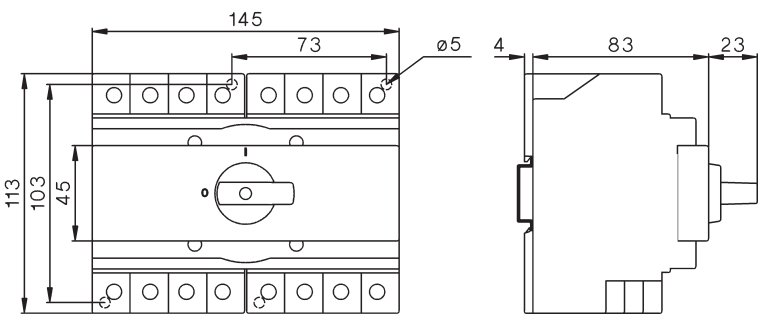
**..A2+2, ..A4**



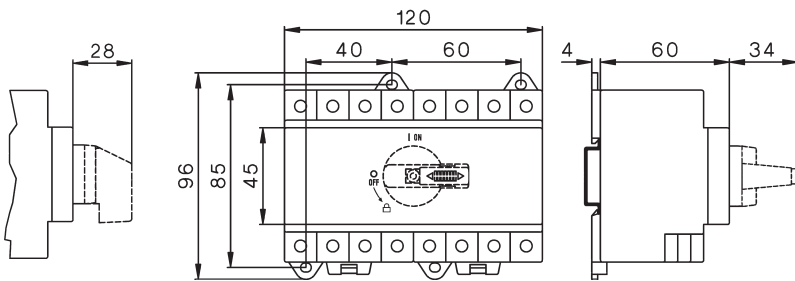
**LS40 SMA..., LS55 SMA..., LS65 SMA..  
..A2, ..A2+2, ..A4**



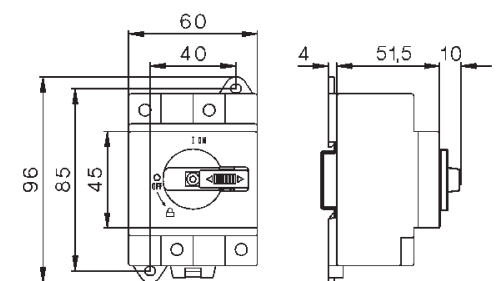
**LS40 SMA..., LS55 SMA..., LS65 SMA..  
..A6, ..A8, ..A3+2, ..A4+2**



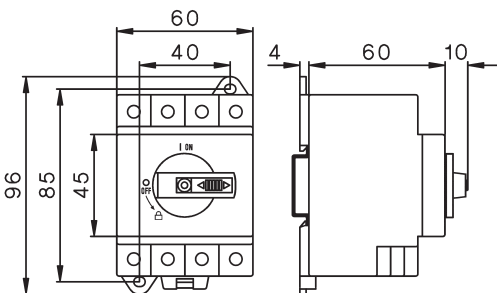
**LS16 SMA..., LS25 SMA..., LS32 SMA..., LS38 SMA..  
..A6, ..A8, ..A3+2, ..A4+2**



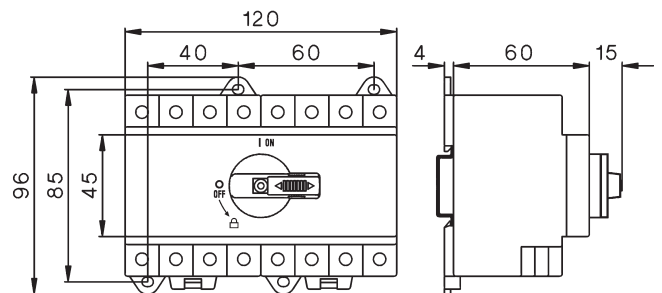
**LS.. SMAH1.. with low height handle  
A2 +SV1N**



**LS16 SMAH1..., LS25 SMAH1..., LS32 SMAH1..., LS38 SMAH1.. with low height handle  
A2+2 +SV1N, A4 +SV1N**



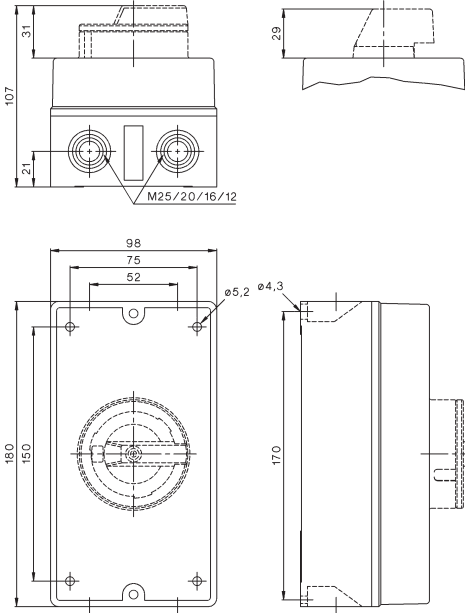
**A4+2 +SV1N, A6 +SV1N, A8 +SV1N**



## Dimensions

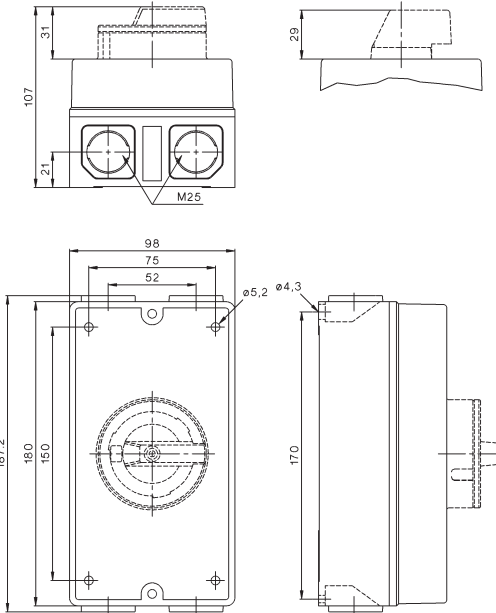
LS16 PFL..., LS25 PFL..., LS32 PFL..., LS38 PFL..  
..A2, ..A2+2, ..A4.

Main-Switch (lockable)  
LS..PFLH4 A..



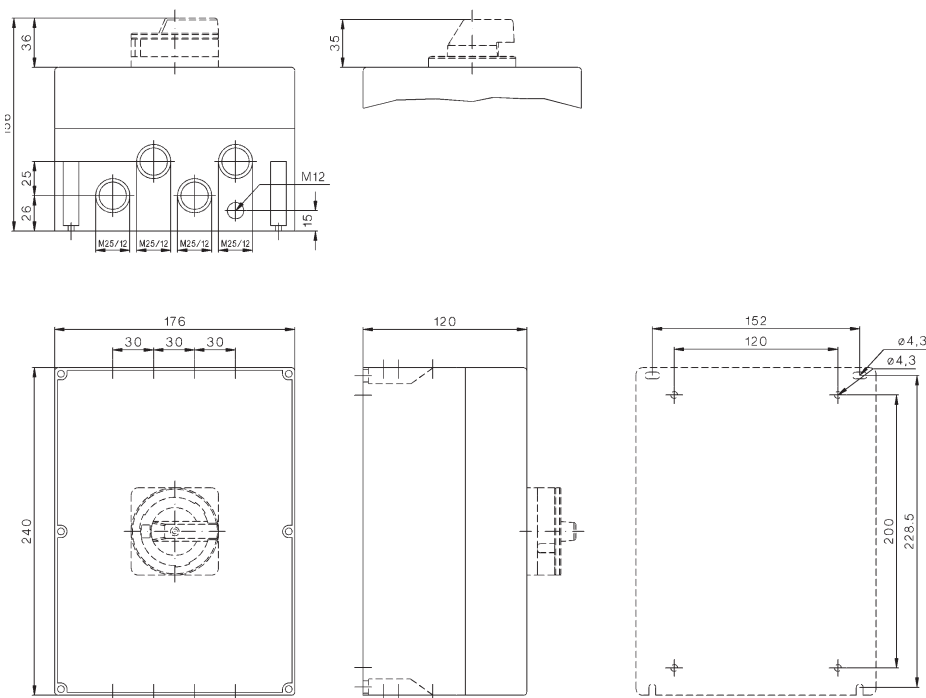
LS16 PFL..., LS25 PFL..., LS32 PFL..., LS38 PFL..  
..A2, ..A2+2, ..A4.  
+ M25

Main-Switch (lockable)  
LS..PFLH4 A..



LS16 PFL..., LS25 PFL..., LS32 PFL..., LS38 PFL...,  
..A2, ..A4, ..A6, ..A8, ..A2+2, ..A3+2, ..A4+2  
LS40 PFL..., LS55 PFL..., LS65 PFL..  
..A6, ..A8, ..A3+2, ..A4+2

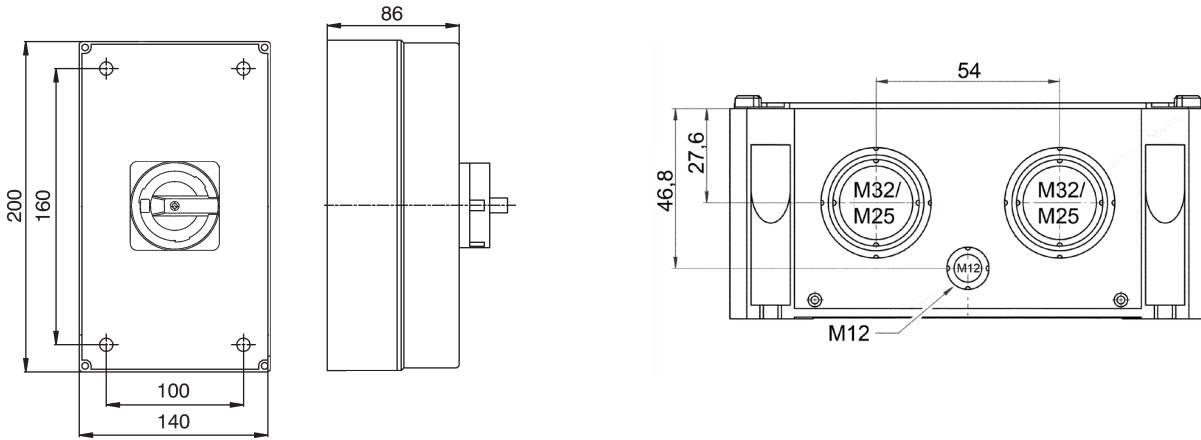
Main-Switch (lockable)  
LS..PFLH4 A..



## Dimensions










LS40 PFL..., LS55 PFL..., LS65 PFL..  
..A2, ..A4, ..A2+2

Main switch (lockable)  
LS..PFLH4 A.. +PF2 (small enclosure)



## Insulated jumpers LSV-.. for series- and parallel switching of contacts:

| for switches           | Type     | Pack | Weight      |
|------------------------|----------|------|-------------|
| LS16, LS25, LS32, LS38 | LSV-B1-1 | 100  | 7,0 g/pcs.  |
| LS16, LS25, LS32, LS38 | LSV-B1-2 | 100  | 12,0 g/pcs. |
| LS40, LS55, LS65       | LSV-B2-1 | 100  | 9,0 g/pcs.  |
| LS40, LS55, LS65       | LSV-B2-2 | 100  | 17,0 g/pcs. |

| Typ               | LS16  | LS25 | LS32  | LS38 | LS40  | LS55 | LS65 |
|-------------------|---|------|---|------|---|------|------|
| A40<br>A4U<br>A4B | 2 x <br>LSV-B1-1 N |      | 2 x <br>LSV-B1-2 N |      | 2 x <br>LSV-B2-2 N |      |      |
| A2+2              | 4 x <br>LSV-B1-1 N |      |   |      | 4 x <br>LSV-B2-1 N |      |      |
| A4+2              | 8 x <br>LSV-B1-1 N |      |   |      | 8 x <br>LSV-B2-1 N |      |      |
|                   | 2 x <br>LSV-B1-2 N |      |   |      | 2 x <br>LSV-B2-2 N |      |      |



Applications:

LS16-38 VZV.. A2+2

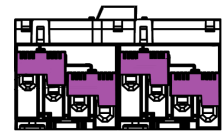
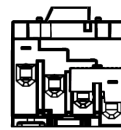
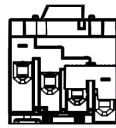
LS16-32 VZV.. A40

LS38 VZV.. A40

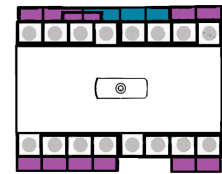
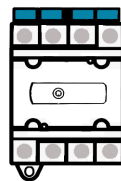
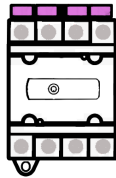
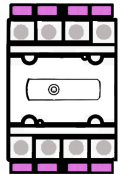
LS16-38 VZV.. A4+2



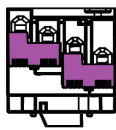
2x LSV-B1-1



4x LSV-B1-1



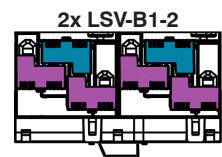
2x LSV-B1-1



2x LSV-B1-1



2x LSV-B1-2



2x LSV-B1-2

4x LSV-B1-1

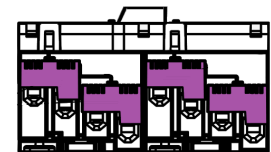
LS40-65 VZV.. A2+2

LS40-65 VZV.. A40

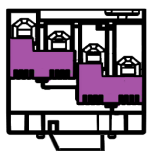
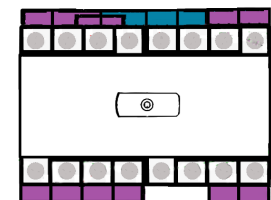
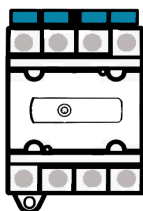
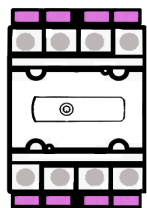
LS40-65 VZV.. A4+2



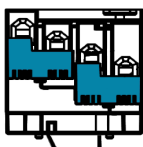
2x LSV-B2-1



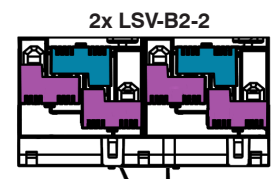
4x LSV-B2-1



2x LSV-B2-1






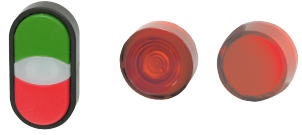











2x LSV-B2-2




2x LSV-B2-2

4x LSV-B2-1

Further applications for switches LS16.. up to LS65.. please find under [www.benedict.at](http://www.benedict.at) (Button "Customers").

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Actuators and Lens Caps 22mm IP67 (IP65),  Type 12

Push Buttons



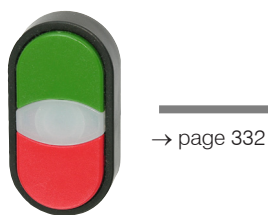
EMERGENCY STOP Buttons



Illuminated Operators



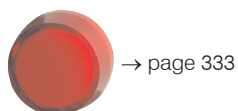
Double Push Buttons with Indicator Lamp, IP65



Lens Caps

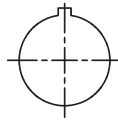


Mono Block Multi Chip LED IP65, IEC 60947, EN 60947

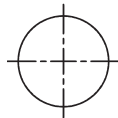


Mounting hole  
Ø 22,5mm

with key way



without key way



→ page 330



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Wrech for Actuators  
Lens Caps and  
Mono Block Multi Chip LED  
J7049



Connectors



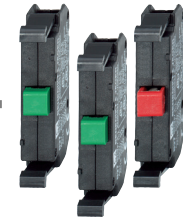
Thickness  
**0,5 - 4 mm**  
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or

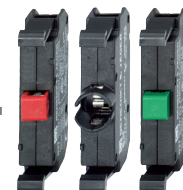


Thickness  
**1 - 6 mm**  
→ page 336

Contacts  
Lamp Holders



Actuator insert  
→ page 336



→ page 336



LED  
24-230V



Filament  
6-130V



Glow-discharge  
230V  
→ page 337

## Actuators 22mm IP67, Type 12

Ring



Colour Symbol

Alu

Black

Chrome

Pack pcs. Weight kg/pc.

Push Buttons, Actuator Caps markable see page 337



|        |    |           |            |            |    |       |
|--------|----|-----------|------------|------------|----|-------|
| red    |    | B3D RT    | BS3D RT    | BC3D RT    | 10 | 0,014 |
| red    | 0  | B3D RT-0  | BS3D RT-0  | BC3D RT-0  | 10 | 0,014 |
| green  |    | B3D GN    | BS3D GN    | BC3D GN    | 10 | 0,014 |
| grün   | I  | B3D GN-I  | BS3D GN-I  | BC3D GN-I  | 10 | 0,014 |
| grün   | II | B3D GN-II | BS3D GN-II | BC3D GN-II | 10 | 0,014 |
| grün   | →  | B3D GN-PF | BS3D GN-PF | BC3D GN-PF | 10 | 0,014 |
| yellow |    | B3D GE    | BS3D GE    | BC3D GE    | 10 | 0,014 |
| blue   |    | B3D BL    | BS3D BL    | BC3D BL    | 10 | 0,014 |
| white  |    | B3D WS    | BS3D WS    | BC3D WS    | 10 | 0,014 |
| black  |    | B3D SW    | BS3D SW    | BC3D SW    | 10 | 0,014 |
| black  | →  | B3D SW-PF | BS3D SW-PF | BC3D SW-PF | 10 | 0,014 |

Push Buttons, Maintained, Actuator Caps markable see page 339



|        |  |         |          |          |    |       |
|--------|--|---------|----------|----------|----|-------|
| red    |  | B3DR RT | BS3DR RT | BC3DR RT | 10 | 0,014 |
| green  |  | B3DR GN | BS3DR GN | BC3DR GN | 10 | 0,014 |
| yellow |  | B3DR GE | BS3DR GE | BC3DR GE | 10 | 0,014 |
| blue   |  | B3DR BL | BS3DR BL | BC3DR BL | 10 | 0,014 |
| white  |  | B3DR WS | BS3DR WS | BC3DR WS | 10 | 0,014 |
| black  |  | B3DR SW | BS3DR SW | BC3DR SW | 10 | 0,014 |

Mushroom Head Ø28mm



|        |   |           |            |            |    |       |
|--------|---|-----------|------------|------------|----|-------|
| red    |   | B3P1 RT   | BS3P1 RT   | BC3P1 RT   | 10 | 0,017 |
| red    | 0 | B3P1 RT-0 | BS3P1 RT-0 | BC3P1 RT-0 | 10 | 0,017 |
| green  |   | B3P1 GN   | BS3P1 GN   | BC3P1 GN   | 10 | 0,017 |
| yellow |   | B3P1 GE   | BS3P1 GE   | BC3P1 GE   | 10 | 0,017 |
| blue   |   | B3P1 BL   | BS3P1 BL   | BC3P1 BL   | 10 | 0,017 |
| black  |   | B3P1 SW   | BS3P1 SW   | BC3P1 SW   | 10 | 0,017 |

Mushroom Head Ø40mm



|     |   |            |             |             |    |       |
|-----|---|------------|-------------|-------------|----|-------|
| red | 0 | B3P14 RT-0 | BS3P14 RT-0 | BC3P14 RT-0 | 10 | 0,020 |
|-----|---|------------|-------------|-------------|----|-------|

Mushroom Head Ø40mm






|     |  |            |            |            |    |       |
|-----|--|------------|------------|------------|----|-------|
| red |  | BS3P44T RT | BS3P44T RT | BS3P44T RT | 10 | 0,028 |
|-----|--|------------|------------|------------|----|-------|

Foot and Palm switch Ø70mm



|      |  |            |            |            |   |       |
|------|--|------------|------------|------------|---|-------|
| red  |  | BS3P14P RT | BS3P14P RT | BS3P14P RT | 1 | 0,062 |
| grey |  | BS3P14P GR | BS3P14P GR | BS3P14P GR | 1 | 0,062 |

## Actuators 22mm IP67, Type 12

| Ring | Colour | Symbol/<br>high |  Alu |  Black |  Chrome | Pack<br>pcs. | Weight<br>kg/pc |
|------|--------|-----------------|---|---|--|--------------|-----------------|
|------|--------|-----------------|---|---|--|--------------|-----------------|

**EMERGENCY STOP Push Buttons**, according to EN ISO 13850, push to trip, pull to release Ø40mm



|     |      |           |           |           |    |       |
|-----|------|-----------|-----------|-----------|----|-------|
| red | 30mm | BS3P44 RT | BS3P44 RT | BS3P44 RT | 10 | 0,028 |
| red | 38mm | BS3P45 RT | BS3P45 RT | BS3P45 RT | 10 | 0,028 |

**EMERGENCY STOP Push Buttons**, according to EN ISO 13850, release by key, Ø40mm



|           |                 |          |          |          |   |       |
|-----------|-----------------|----------|----------|----------|---|-------|
| red       | 38mm            | BS3P44S3 | BS3P44S3 | BS3P44S3 | 1 | 0,050 |
| Spare Key | lock Ronis R455 |          |          | B4-R455  | 1 | 0,007 |

**EMERGENCY STOP Push Buttons**, release by turning, Ø28mm



|     |   |                             |                              |                              |    |       |
|-----|---|-----------------------------|------------------------------|------------------------------|----|-------|
| red |   | B3P3 RT                     | BS3P3 RT                     | BC3P3 RT                     | 10 | 0,017 |
| red | 0 | B3P3 RT-0                   | BS3P3 RT-0                   | BC3P3 RT-0                   | 10 | 0,017 |
| red | 0 | B3P3 RT-0-RGE <sup>2)</sup> | BS3P3 RT-0-RGE <sup>2)</sup> | BC3P3 RT-0-RGE <sup>2)</sup> | 10 | 0,017 |

**EMERGENCY STOP Push Buttons**, release by turning, Ø40mm



|                    |        |             |              |              |    |       |
|--------------------|--------|-------------|--------------|--------------|----|-------|
| red                | 0      | B3P34 RT-0  | BS3P34 RT-0  | BC3P34 RT-0  | 10 | 0,020 |
| red                | Pfeile | B3P34 RT-PF | BS3P34 RT-PF | BC3P34 RT-PF | 10 | 0,020 |
| red<br>illuminated |        | B3P34L RT   | BS3P34L RT   | BC3P34L RT   | 10 | 0,020 |

**EMERGENCY STOP Push Buttons**, release by turning, Ø70mm



|     |  |            |            |            |   |       |
|-----|--|------------|------------|------------|---|-------|
| red |  | BS3P34P RT | BS3P34P RT | BS3P34P RT | 1 | 0,062 |
|-----|--|------------|------------|------------|---|-------|

**Yellow Disk Ø70mm, Thickness 1mm <sup>1)</sup>**



|   |  |            |   |       |
|---|--|------------|---|-------|
| neutral                                     |  | B3-7603    | 1 | 0,004 |
| with marking NOT-HALT-symbol                |  | B3-7603-S  | 1 | 0,004 |
| with marking NOT-AUS                        |  | B3-7603-1  | 1 | 0,004 |
| with marking EMERGENCY STOP                 |  | B3-7603-2  | 1 | 0,004 |
| 2-side markings: NOT-AUS / EMERGENCY STOP   |  | B3-7603-12 | 1 | 0,004 |
| 2-side markings: ARRET D`URGENCE / NØDSTOP  |  | B3-7603-34 | 1 | 0,004 |
| 2-side markings: ARRET D`URGENCE / NOODSTOP |  | B3-7603-35 | 1 | 0,004 |

**Protection cover against unintentional manipulation, Thickness 1mm**



|                                  |        |          |   |      |
|----------------------------------|--------|----------|---|------|
| for Push Buttons Ø28mm and Ø40mm | yellow | B3-SK GE | 1 | 0,04 |
|----------------------------------|--------|----------|---|------|

**Sealing cap**

|  |             |          |   |      |
|--|-------------|----------|---|------|
| for Push Buttons BS3P45RT and BS3P44S3 | transparent | B3-PH GE | 1 | 0,03 |
|--|-------------|----------|---|------|

1) Not for enclosure BG.. 2) Front ring yellow

# Actuators 22mm Type 12

Ring

| Knob | Alu | Black | Chrome | Pack pcs. | Weight kg/pc. |
|------|-----|-------|--------|-----------|---------------|
|------|-----|-------|--------|-----------|---------------|

## Rotary Knobs and Swing Knobs, black IP65



Rotary



Swing

| maintained 60°                   |        |        |         |         |    |       |
|----------------------------------|--------|--------|---------|---------|----|-------|
|                                  | Rotary | B3KN2  | BS3KN2  | BC3KN2  | 10 | 0,020 |
|                                  | Swing  | B3KRN2 | BS3KRN2 | BC3KRN2 | 10 | 0,020 |
| maintained 60°                   |        |        |         |         |    |       |
|                                  | Rotary | B3KN29 | BS3KN29 | BC3KN29 | 10 | 0,020 |
| spring return 60°                |        |        |         |         |    |       |
|                                  | Rotary | B3KN8  | BS3KN8  | BC3KN8  | 10 | 0,020 |
|                                  | Swing  | B3KRN8 | BS3KRN8 | BC3KRN8 | 10 | 0,020 |
| spring return 60°                |        |        |         |         |    |       |
|                                  | Rotary | B3KN1  | BS3KN1  | BC3KN1  | 10 | 0,020 |
|                                  | Swing  | B3KRN1 | BS3KRN1 | BC3KRN1 | 10 | 0,020 |
| maintained 60°                   |        |        |         |         |    |       |
|                                  | Rotary | B3KN3  | BS3KN3  | BC3KN3  | 10 | 0,020 |
|                                  | Swing  | B3KRN3 | BS3KRN3 | BC3KRN3 | 10 | 0,020 |
| maintained/spring return 60°     |        |        |         |         |    |       |
|                                  | Rotary | B3KN6  | BS3KN6  | BC3KN6  | 10 | 0,020 |
| spring return/maintained 60°     |        |        |         |         |    |       |
|                                  | Rotary | B3KN7  | BS3KN7  | BC3KN7  | 10 | 0,020 |
| maintained 120°                  |        |        |         |         |    |       |
|                                  | Rotary | B3KN9  | BS3KN9  | BC3KN9  | 10 | 0,020 |
| maintained 90° according to EN81 |        |        |         |         |    |       |
|                                  | Rotary | B3KN10 | BS3KN10 | BC3KN10 | 10 | 0,020 |
| maintained 90°                   |        |        |         |         |    |       |
|                                  | Rotary | B3KN11 | BS3KN11 | BC3KN11 | 10 | 0,020 |

## Illuminated Rotary Knobs and Swing Knobs, clear IP67, lamp max. 1,2W, lamps see page 339



Rotary



Swing

Toggle IP65



| maintained 90°               |        |        |         |         |    |       |
|------------------------------|--------|--------|---------|---------|----|-------|
|                              | Rotary | B3KL2  | BS3KL2  | BC3KL2  | 10 | 0,016 |
| spring return 60°            |        |        |         |         |    |       |
|                              | Rotary | B3KL1  | BS3KL1  | BC3KL1  | 10 | 0,016 |
|                              | Swing  | B3KRL1 | BS3KRL1 | BC3KRL1 | 10 | 0,016 |
| maintained 60°               |        |        |         |         |    |       |
|                              | Rotary | B3KL3  | BS3KL3  | BC3KL3  | 10 | 0,016 |
|                              | Swing  | B3KRL3 | BS3KRL3 | BC3KRL3 | 10 | 0,016 |
| maintained/spring return 60° |        |        |         |         |    |       |
|                              | Rotary | B3KL6  | BS3KL6  | BC3KL6  | 10 | 0,016 |
|                              |        | B3E    | BS3E    | BC3E    | 10 | 0,017 |

# Actuators 22mm IP65, Type 12

Ring

Key  
removeable in



Alu



Black



Chrome

Pack  
pcs.

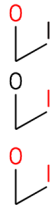
Weight  
kg/pc.

## Key Operated Rotary Switches with lock Ronis 455



B3SAR 0

maintained 60°



B3SAR 0

BS3SAR 0

BC3SAR 0

1

0,044

B3SAR 1

BS3SAR 1

BC3SAR 1

1

0,044

B3SAR 01

BS3SAR 01

BC3SAR 01

1

0,044

spring return 60°



B3SAT 0

BS3SAT 0

BC3SAT 0

1

0,044

maintained 60°



B3SARR 0

BS3SARR 0

BC3SARR 0

1

0,044

B3SARR 102

BS3SARR 102

BC3SARR 102

1

0,044

spring return/maintained 60°



B3SATR 02

BS3SATR 02

BC3SATR 02

1

0,044

spring return 60°



B3SATT 0

BS3SATT 0

BC3SATT 0

1

0,044

Spare Key lock Ronis R455

B4-R455

1

0,007



B3SARR 0

Colour Symbol

Pack  
pcs.

Weight  
kg/pc.

## Illuminated Push Buttons IP67, lamp max. 1,9W, lamps see page 339



red

B3DL RT

BS3DL RT

BC3DL RT

10

0,014

green

B3DL GN

BS3DL GN

BC3DL GN

10

0,014

yellow

B3DL GE

BS3DL GE

BC3DL GE

10

0,014

blue

B3DL BL

BS3DL BL

BC3DL BL

10

0,014

white

B3DL WS

BS3DL WS

BC3DL WS

10

0,014

## Illuminated Push Buttons, Maintained IP67, lamp max. 1,9W, lamps see page 339



red

B3DLR RT

BS3DLR RT

BC3DLR RT

10

0,014

green

B3DLR GN

BS3DLR GN

BC3DLR GN

10

0,014

yellow

B3DLR GE

BS3DLR GE

BC3DLR GE

10

0,014

blue

B3DLR BL

BS3DLR BL

BC3DLR BL

10

0,014

white

B3DLR WS

BS3DLR WS

BC3DLR WS

10

0,014

## Double Push Buttons, with indicator lamp white, lamp max. 1,9W, lamps see page 339



green

B3DT G/R <sup>1)</sup>

BS3DT G/R

BC3DT G/R

10

0,016

red

white

B3DT W/S <sup>1)</sup>

BS3DT W/S

BC3DT W/S

10

0,016

black

green

I

B3DT GI/RO <sup>1)</sup>

BS3DT GI/RO

BC3DT GI/RO

10

0,016

red

0

white

I

B3DT WI/SO <sup>1)</sup>

BS3DT WI/SO

BC3DT WI/SO

10

0,016

black

0

with non-standard marking on request

1) Plastic ring in alu design.



# Lens Caps 22mm Type 12

suitable for Alu, Black and Chrome

| Colour | Type | Pack pcs. | Weight kg/pc. |
|--------|------|-----------|---------------|
|--------|------|-----------|---------------|

Lens Caps IP67 with fresnel lens, lamp max. 1,9W, lamps see page 339, laser marking on request



|        |        |    |       |
|--------|--------|----|-------|
| red    | B3R RT | 10 | 0,009 |
| green  | B3R GN | 10 | 0,009 |
| yellow | B3R GE | 10 | 0,009 |
| blue   | B3R BL | 10 | 0,009 |
| clear  | B3R KL | 10 | 0,009 |
| white  | B3R WS | 10 | 0,009 |

Lens Caps Low IP67 with fresnel lens, lamp max. 1,9W, lamps see page 339, laser marking on request



|        |         |    |       |
|--------|---------|----|-------|
| red    | B3RN RT | 10 | 0,008 |
| green  | B3RN GN | 10 | 0,008 |
| yellow | B3RN GE | 10 | 0,008 |
| blue   | B3RN BL | 10 | 0,008 |
| clear  | B3RN KL | 10 | 0,008 |
| white  | B3RN WS | 10 | 0,008 |

Lens Caps IP67, lamp max. 1,9W, lamps see page 337, laser marking on request



|        |         |    |       |
|--------|---------|----|-------|
| red    | B3RF RT | 10 | 0,009 |
| green  | B3RF GN | 10 | 0,009 |
| yellow | B3RF GE | 10 | 0,009 |
| blue   | B3RF BL | 10 | 0,009 |
| white  | B3RF WS | 10 | 0,009 |

| Colour | Voltage | Power VA | W | Type | Pack pcs. | Weight kg/pc |
|--------|---------|----------|---|------|-----------|--------------|
|--------|---------|----------|---|------|-----------|--------------|

Monoblock LEDs IP65, IEC 60947, EN 60947 (6 years middle lifetime) <sup>1)</sup>


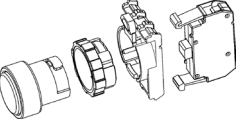




|        |                     |     |     |              |    |       |
|--------|---------------------|-----|-----|--------------|----|-------|
| red    | 20-30V AC/DC        | 0,4 | 0,4 | B3-MB24 RTB  | 10 | 0,022 |
| green  | 20-30V AC/DC        | 0,4 | 0,4 | B3-MB24 GNB  | 10 | 0,022 |
| yellow | 20-30V AC/DC        | 0,4 | 0,4 | B3-MB24 GEB  | 10 | 0,022 |
| blue   | 20-30V AC/DC        | 0,4 | 0,4 | B3-MB24 BLB  | 10 | 0,022 |
| white  | 20-30V AC/DC        | 0,4 | 0,4 | B3-MB24 WSB  | 10 | 0,022 |
| red    | 110-130V AC 110V DC | 1,2 | 1,2 | B3-MB110 RTB | 10 | 0,022 |
| green  | 110-130V AC 110V DC | 1,2 | 1,2 | B3-MB110 GNB | 10 | 0,022 |
| yellow | 110-130V AC 110V DC | 1,2 | 1,2 | B3-MB110 GEB | 10 | 0,022 |
| blue   | 110-130V AC 110V DC | 1,2 | 1,2 | B3-MB110 BLB | 10 | 0,022 |
| white  | 110-130V AC 110V DC | 1,2 | 1,2 | B3-MB110 WSB | 10 | 0,022 |
| red    | 170-250V AC         | 4,0 | 1,0 | B3-MB230 RTB | 10 | 0,022 |
| green  | 170-250V AC         | 4,0 | 1,0 | B3-MB230 GNB | 10 | 0,022 |
| yellow | 170-250V AC         | 4,0 | 1,0 | B3-MB230 GEB | 10 | 0,022 |
| blue   | 170-250V AC         | 4,0 | 1,0 | B3-MB230 BLB | 10 | 0,022 |
| white  | 170-250V AC         | 4,0 | 1,0 | B3-MB230 WSB | 10 | 0,022 |
| red    | 400V AC             |     | 0,5 | B3-MB400 RTB | 10 | 0,022 |
| green  | 400V AC             |     | 0,5 | B3-MB400 GNB | 10 | 0,022 |
| yellow | 400V AC             |     | 0,5 | B3-MB400 GEB | 10 | 0,022 |
| blue   | 400V AC             |     | 0,5 | B3-MB400 BLB | 10 | 0,022 |
| white  | 400V AC             |     | 0,5 | B3-MB400 WSB | 10 | 0,022 |


1) Ambient temperatures on request.




## Push Button 22mm-Sets, with Contact Block and Connector

| Actuator Colour  | Symbol | with  | Type         | Pack pcs. | Weight kg/pc. |
|--|--------|---|--------------|-----------|---------------|
| <b>Push Buttons, IP67</b>  |        |   |              |           |               |
|  | black  | +connector +1NO   | BS3D SW/10   | 1         | 0,037         |
|  | green  | +connector +1NO   | BS3D GN/10   | 1         |               |
|  | yellow | +connector +1NO   | BS3D GE/10   | 1         | 0,037         |
|  | blue   | +connector +1NO   | BS3D BL/10   | 1         | 0,037         |
|  | red    | +connector +1NC   | BS3D RT/01   | 1         |               |
|  | green  |  +connector +1NO | BS3D GN-I/10 | 1         | 0,037         |
|  | red    |  +connector +1NC | BS3D RT-0/01 | 1         | 0,037         |






## Double Push Buttons, IP65

|  |            |                      |              |   |       |
|--|------------|----------------------|--------------|---|-------|
|  | green/ red | +connector +1NO +1NC | BS3DT G/R/11 | 1 | 0,049 |
|--|------------|----------------------|--------------|---|-------|








## EMERGENCY STOP Push Buttons, IP67 Ø40mm

|   |                                   |                      |                |   |       |
|---|-----------------------------------|----------------------|----------------|---|-------|
|  | pull to release acc. EN ISO 13850 | +connector +1NO +1NC | BS3P44 RT/11   | 1 | 0,061 |
|   | key release acc. EN ISO 13850     | +connector +1NO +1NC | BS3P44S3 RT/11 | 1 | 0,083 |
|   | twist release                     | +connector +1NO +1NC | BS3P34 RT-0/11 | 1 | 0,053 |

## Rotary Knobs, IP65

|  |   |                      |           |   |       |
|--|---|----------------------|-----------|---|-------|
|  |  | +connector +1NO      | BS3KN2/10 | 1 | 0,043 |
|  |  | +connector +1NO +1NC | BS3KN2/11 | 1 | 0,053 |
|  |  | +connector +2NO      | BS3KN3/20 | 1 | 0,053 |
|  |  | +connector +2NO      | BS3KN1/20 | 1 | 0,053 |

## Key Operated Rotary Switch with lock Ronis 455, IP65

|  |   |  |                |   |       |
|--|---|--|----------------|---|-------|
|  |  | key removeable in 0-position<br>+connector +1NO    | BS3SAR 0/10    | 1 | 0,057 |
|  |  | key removeable in all positions<br>+connector +1NO | BS3SAR 01/10   | 1 | 0,057 |
|  |  | key removeable in 0-position<br>+connector +1NO    | BS3SAT 0/10    | 1 | 0,057 |
|  |  | key removeable in all positions<br>+connector +2NO | BS3SARR 102/20 | 1 | 0,067 |
|  |  | key removeable in 0-position<br>+connector +2NO    | BS3SARR 0/20   | 1 | 0,067 |

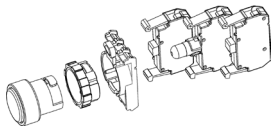
# Illuminated Push Button 22mm-Sets, with Contact Block, Connector and LED

| Actuator Colour | with | LED | Type | Pack pcs. | Weight kg/pc. |
|-----------------|------|-----|------|-----------|---------------|
|-----------------|------|-----|------|-----------|---------------|

## Illuminated Push Buttons, IP67



|        |                           |              |                 |   |       |
|--------|---------------------------|--------------|-----------------|---|-------|
| white  | +connector +1NO +1NC +LED | 20-30V AC/DC | BS3DL WS/11/L24 | 1 | 0,054 |
| green  | +connector +1NO +1NC +LED | 20-30V AC/DC | BS3DL GN/11/L24 | 1 | 0,054 |
| red    | +connector +1NO +1NC +LED | 20-30V AC/DC | BS3DL RT/11/L24 | 1 | 0,054 |
| yellow | +connector +1NO +1NC +LED | 20-30V AC/DC | BS3DL GE/11/L24 | 1 | 0,054 |
| blue   | +connector +1NO +1NC +LED | 20-30V AC/DC | BS3DL BL/11/L24 | 1 | 0,054 |



|        |                           |               |                  |   |       |
|--------|---------------------------|---------------|------------------|---|-------|
| white  | +connector +1NO +1NC +LED | 90-120V AC/DC | BS3DL WS/11/L110 | 1 | 0,054 |
| green  | +connector +1NO +1NC +LED | 90-120V AC/DC | BS3DL GN/11/L110 | 1 | 0,054 |
| red    | +connector +1NO +1NC +LED | 90-120V AC/DC | BS3DL RT/11/L110 | 1 | 0,054 |
| yellow | +connector +1NO +1NC +LED | 90-120V AC/DC | BS3DL GE/11/L110 | 1 | 0,054 |
| blue   | +connector +1NO +1NC +LED | 90-120V AC/DC | BS3DL BL/11/L110 | 1 | 0,054 |

|        |                           |                |                  |   |       |
|--------|---------------------------|----------------|------------------|---|-------|
| white  | +connector +1NO +1NC +LED | 200-250V AC/DC | BS3DL WS/11/L230 | 1 | 0,054 |
| green  | +connector +1NO +1NC +LED | 200-250V AC/DC | BS3DL GN/11/L230 | 1 | 0,054 |
| red    | +connector +1NO +1NC +LED | 200-250V AC/DC | BS3DL RT/11/L230 | 1 | 0,054 |
| yellow | +connector +1NO +1NC +LED | 200-250V AC/DC | BS3DL GE/11/L230 | 1 | 0,054 |
| blue   | +connector +1NO +1NC +LED | 200-250V AC/DC | BS3DL BL/11/L230 | 1 | 0,054 |

## Double Push Buttons with Pilot Light, IP65



|            |                           |                |                   |   |       |
|------------|---------------------------|----------------|-------------------|---|-------|
| green/ red | +connector +1NO +1NC +LED | 20-30V AC/DC   | BS3DT G/R/11/L24  | 1 | 0,066 |
| green/ red | +connector +1NO +1NC +LED | 90-120V AC/DC  | BS3DT G/R/11/L110 | 1 | 0,066 |
| green/ red | +connector +1NO +1NC +LED | 200-250V AC/DC | BS3DT G/R/11/L230 | 1 | 0,066 |

## Pilot Lights, IP67 with socket BA9S (without lamp)



|        |                         |   |          |   |       |
|--------|-------------------------|---|----------|---|-------|
| white  | +connector +socket BA9S | - | B3R WS/0 | 1 | 0,037 |
| green  | +connector +socket BA9S | - | B3R GN/0 | 1 | 0,037 |
| red    | +connector +socket BA9S | - | B3R RT/0 | 1 | 0,037 |
| yellow | +connector +socket BA9S | - | B3R GE/0 | 1 | 0,037 |

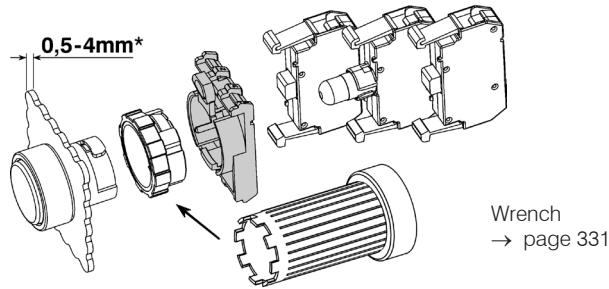
## Pilot Lights with LEDs, IP67



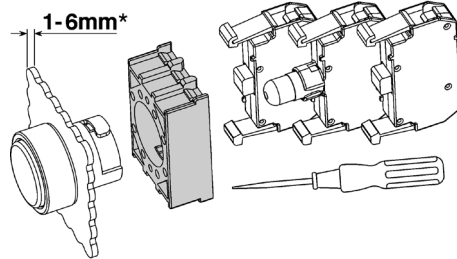
|        |                         |                |             |   |       |
|--------|-------------------------|----------------|-------------|---|-------|
| white  | +connector +socket BA9S | 20-30V AC/DC   | B3R WS/L24  | 1 | 0,042 |
| green  | +connector +socket BA9S | 20-30V AC/DC   | B3R GN/L24  | 1 | 0,042 |
| red    | +connector +socket BA9S | 20-30V AC/DC   | B3R RT/L24  | 1 | 0,042 |
| yellow | +connector +socket BA9S | 20-30V AC/DC   | B3R GE/L24  | 1 | 0,042 |
| white  | +connector +socket BA9S | 90-120V AC/DC  | B3R WS/L110 | 1 | 0,042 |
| green  | +connector +socket BA9S | 90-120V AC/DC  | B3R GN/L110 | 1 | 0,042 |
| red    | +connector +socket BA9S | 90-120V AC/DC  | B3R RT/L110 | 1 | 0,042 |
| yellow | +connector +socket BA9S | 90-120V AC/DC  | B3R GE/L110 | 1 | 0,042 |
| white  | +connector +socket BA9S | 200-250V AC/DC | B3R WS/L230 | 1 | 0,042 |
| green  | +connector +socket BA9S | 200-250V AC/DC | B3R GN/L230 | 1 | 0,042 |
| red    | +connector +socket BA9S | 200-250V AC/DC | B3R RT/L230 | 1 | 0,042 |
| yellow | +connector +socket BA9S | 200-250V AC/DC | B3R GE/L230 | 1 | 0,042 |

## Connectors

| Specification | Description | Type | Pack pcs. | Weight kg/pc. |
|---------------|-------------|------|-----------|---------------|
| Connector B3S |             | B3S  | 10        | 0,013         |



|               |  |     |    |       |
|---------------|--|-----|----|-------|
| Connector B3M |  | B3M | 10 | 0,013 |
|---------------|--|-----|----|-------|



\*) inclusive Thickness from Label Holder and Yellow Disk

## Contact Blocks and Lamp Holders for Panel Mounting

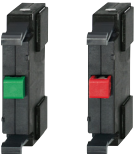
| for voltage | Description | Type | Pack pcs. | Weight kg/pc. |
|-------------|-------------|------|-----------|---------------|
|-------------|-------------|------|-----------|---------------|

### Contact blocks, screw terminals

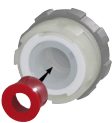


|              |                    |  |  |                     |    |       |
|--------------|--------------------|--|--|---------------------|----|-------|
| max. 690V AC | 1 NC <sup>1)</sup> |  |  | B3T01 <sup>2)</sup> | 10 | 0,010 |
| max. 690V AC | 1 NO <sup>1)</sup> |  |  | B3T10 <sup>2)</sup> | 10 | 0,010 |

### Contact blocks, RAST 5 terminals (note coding)



|            |      |  |  |        |    |       |
|------------|------|--|--|--------|----|-------|
| max. 690V~ | 1 NC |  |  | B3RT01 | 10 | 0,010 |
| max. 690V~ | 1 NO |  |  | B3RT10 | 10 | 0,010 |



|                 |                                     |  |  |      |    |       |
|-----------------|-------------------------------------|--|--|------|----|-------|
| Actuator insert | to actuate the center contact block |  |  | P642 | 10 | 0,001 |
|-----------------|-------------------------------------|--|--|------|----|-------|

### Lamp holders, socket BA9s



|                 |   |  |  |     |    |       |
|-----------------|---|--|--|-----|----|-------|
| max. 440V AC/DC | direct connection, for lamps max. 1,9W (active power consumption) |  |  | B3F | 10 | 0,012 |
|-----------------|---|--|--|-----|----|-------|

### Lamp holders for lamp test circuits, socket BA9s



|              |   |  |  |       |    |       |
|--------------|---|--|--|-------|----|-------|
| max. 440V AC | direct connection, for filament and glow-discharge lamps max. 1,7W (active power consumption) |  |  | B3FT  | 10 | 0,020 |
| max. 250V    | direct connection of LED  |  |  | B3FTD | 10 | 0,020 |

1) NC contact has a positive opening according to IEC/EN 60947-5-1.

2) Contact blocks with gold contacts (B3T..G) on request, suitable for 17V= / 1 mA and for difficult ambient conditions.

## Lamps

Socket BA9s  
Lamp voltage

Type

Pack  
pcs.

Weight  
kg/pc.

### LED lamps<sup>2) 3)</sup> (6 years middle lifetime, for equivalent lens caps only)



|                        |                      |             |    |       |
|------------------------|----------------------|-------------|----|-------|
| 24V 10mA AC/DC +-10%   | for red lens caps    | B3-L24 RTB  | 50 | 0,005 |
| 24V 10mA AC/DC +-10%   | for green lens caps  | B3-L24 GNB  | 50 | 0,005 |
| 24V 10mA AC/DC +-10%   | for yellow lens caps | B3-L24 GEB  | 50 | 0,005 |
| 24V 10mA AC/DC +-10%   | for blue lens caps   | B3-L24 BLB  | 50 | 0,005 |
| 24V 10mA AC/DC +-10%   | for white lens caps  | B3-L24 WSB  | 50 | 0,005 |
| 110V 3,2mA AC/DC +-10% | for red lens caps    | B3-L110 RTB | 50 | 0,005 |
| 110V 3,2mA AC/DC +-10% | for green lens caps  | B3-L110 GNB | 50 | 0,005 |
| 110V 3,2mA AC/DC +-10% | for yellow lens caps | B3-L110 GEB | 50 | 0,005 |
| 110V 3,2mA AC/DC +-10% | for blue lens caps   | B3-L110 BLB | 50 | 0,005 |
| 110V 3,2mA AC/DC +-10% | for white lens caps  | B3-L110 WSB | 50 | 0,005 |
| 220V 1,7mA AC/DC +-10% | for red lens caps    | B3-L230 RTB | 50 | 0,005 |
| 220V 1,7mA AC/DC +-10% | for green lens caps  | B3-L230 GNB | 50 | 0,005 |
| 220V 1,7mA AC/DC +-10% | for yellow lens caps | B3-L230 GEB | 50 | 0,005 |
| 220V 1,7mA AC/DC +-10% | for blue lens caps   | B3-L230 BLB | 50 | 0,005 |
| 220V 1,7mA AC/DC +-10% | for white lens caps  | B3-L230 WSB | 50 | 0,005 |

### Filament lamps<sup>3)</sup>



| Power consumption |      |                   |        |     |       |
|-------------------|------|-------------------|--------|-----|-------|
| 24V               | 1,2W | for all lens caps | B4-G24 | 100 | 0,005 |
| 42V               | 1W   | for all lens caps | B4-G42 | 100 | 0,005 |
| 48V               | 1,2W | for all lens caps | B4-G48 | 100 | 0,005 |
| 60V               | 1,2W | for all lens caps | B4-G60 | 100 | 0,005 |

### Glow-discharge lamps<sup>3)</sup>



|             |      |                                  |           |     |       |
|-------------|------|----------------------------------|-----------|-----|-------|
| 220-250V AC | 0,3W | for clear, red, yellow lens caps | B4-GL230K | 100 | 0,005 |
| 220-250V AC | 0,3W | for green, blue lens caps        | B4-GL230G | 100 | 0,005 |

## Accessories



|                                |   | Type                   | Pack<br>pcs.               | Weight<br>kg/pc. |                         |
|--------------------------------|---|------------------------|----------------------------|------------------|-------------------------|
| Wrench                         | for mounting of actuators<br>and lens caps B(S)3..  | J7049                  | 1                          | 0,018            |                         |
| Marking plate                  | for marking of contact blocks B3T.<br>and lamp holders B3F  | P672-1                 | 10                         | 0,001            |                         |
| Lamp Installer                 | used to install or replace lamps BA9s   | B4-7408                | 1                          | 0,010            |                         |
| Spare Key                      | for B(S)3SA.. and BS3P44S3, Ronis R455<br>for B(S)3SB.., Ronis R786   | B4-R455<br>B4-R786     | 1<br>1                     | 0,007<br>0,007   |                         |
| Hole Plug                      | black, for fixing holes<br>grey   | B3-DU SW<br>B3-DU GR   | 10<br>10                   | 0,007<br>0,007   |                         |
| Sealing Cover                  | for single and double push buttons,<br>except B3D..R..(maintained)<br>petrol-resistant, ambient temp. 0°... +50°C | P279-1                 | 1                          | 0,003            |                         |
|                                | for all single push buttons<br>silicone, ambient temp. -25°... +60 °C   | P279-5                 | 1                          | 0,003            |                         |
|                                | for double push buttons<br>silicone, ambient temp. -25°... +60 °C   | P279-DT                | 1                          | 0,003            |                         |
| Protection cover               | against unintentional manipulation  |                        |                            |                  |                         |
|                                | Thickness 1mm yellow  | B3-SK GE               | 1                          | 0,04             |                         |
|                                | Thickness 1mm grey  | B3-SK GR               | 1                          | 0,04             |                         |
| Protection ring<br>with thread | against unintentional manipulation<br>has to be mounted instead<br>of the existing ring                           | black<br>chrome<br>alu | P921-1<br>P921-2<br>P921-3 | 1<br>1<br>1      | 0,012<br>0,012<br>0,012 |

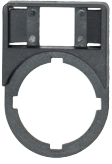
1) Voltage marking 130V / 2W max. rated voltage 120V / 1,8W.

2) Suitable for B3FT lamp test holders.

3) Ambient temperatures on request.

## Label Holders and Legend Plates for Push Buttons B3, 22mm

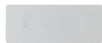
### Marking 1 or 2 lines



|  | Type   | Pack pcs. | Weight kg/pc. |
|--|--------|-----------|---------------|
| Label holder for legend plate BK4, black, Thickness 0,8mm  | P751   | 100       | 0,001         |
| Label holder for legend plate BK4, yellow, Thickness 0,8mm | P751-3 | 10        | 0,001         |

| marking | Type | marking | Type | Pack pcs. | Weight kg/pc. |
|---------|------|---------|------|-----------|---------------|
|---------|------|---------|------|-----------|---------------|

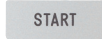
#### Legend plate alu, for label holder P751



|       |          |    |        |     |        |
|-------|----------|----|--------|-----|--------|
| blank | BK4-9736 |    |        | 100 | 0,0002 |
| I     | BK4-I    | II | BK4-II | 10  | 0,0002 |
| III   | BK4-III  | IV | BK4-IV | 10  | 0,0002 |
| V     | BK4-V    |    |        | 10  | 0,0002 |



|     |          |       |           |    |        |
|-----|----------|-------|-----------|----|--------|
| →   | BK4--->  | ←     | BK4-<--   | 10 | 0,0002 |
| 0 I | BK4-0-I  | H 0 A | BK4-H 0 A | 10 | 0,0002 |
| 0 I | BK4-0__I | 1 0 2 | BK4-1 0 2 | 10 | 0,0002 |



|         |             |         |             |    |        |
|---------|-------------|---------|-------------|----|--------|
| START   | BK4-START   | STOP    | BK4-STOP    | 10 | 0,0002 |
| EIN     | BK4-EIN     | AUS     | BK4-AUS     | 10 | 0,0002 |
| BETRIEB | BK4-BETRIEB | STÖRUNG | BK4-STÖRUNG | 10 | 0,0002 |



|       |           |        |            |    |        |
|-------|-----------|--------|------------|----|--------|
| VOR   | BK4-VOR   | ZURÜCK | BK4-ZURÜCK | 10 | 0,0002 |
| HEBEN | BK4-HEBEN | SENKEN | BK4-SENKEN | 10 | 0,0002 |
| LINKS | BK4-LINKS | RECHTS | BK4-RECHTS | 10 | 0,0002 |

|         |             |         |             |    |        |
|---------|-------------|---------|-------------|----|--------|
| MEHR    | BK4-MEHR    | WENIGER | BK4-WENIGER | 10 | 0,0002 |
| SCHNELL | BK4-SCHNELL | LANGSAM | BK4-LANGSAM | 10 | 0,0002 |
| HELLER  | BK4-HELLER  | DUNKLER | BK4-DUNKLER | 10 | 0,0002 |

|         |             |        |            |    |        |
|---------|-------------|--------|------------|----|--------|
| AUF     | BK4-AUF     | ZU     | BK4-ZU     | 10 | 0,0002 |
| AB      | BK4-AB      | HALT   | BK4-HALT   | 10 | 0,0002 |
| EILGANG | BK4-EILGANG | TIPPEN | BK4-TIPPEN | 10 | 0,0002 |

#### Legend plate with non-standard marking (e. g.: BK4-MOTOR-START)

|  |             |   |        |
|--|-------------|---|--------|
| Text 1 line, max. 11 letters, letter height 3mm      | BK4-...     | 1 | 0,0002 |
| Text 2 lines, max. 2 x 11 letters, letter height 3mm | BK4-...-... | 1 | 0,0002 |

#### Legend plate yellow, for label holder P751-3

|  |             |    |        |
|--|-------------|----|--------|
| Legend plate yellow without marking              | BK4-10827   | 10 | 0,0002 |
| Legend plate yellow with marking NOT-AUS         | BK4-10827-1 | 10 | 0,0002 |
| Legend plate yellow with marking EMERGENCY STOP  | BK4-10827-2 | 10 | 0,0002 |
| Legend plate yellow with marking ARRET D`URGENCE | BK4-10827-3 | 10 | 0,0002 |



### Marking 3 or 4 lines



|  |         |    |        |
|--|---------|----|--------|
| Label holder for legend plate BK8, black, Thickness 0,8mm  | P761    | 10 | 0,0013 |
| Label holder for legend plate BK8, yellow, Thickness 0,8mm | P761-3  | 10 | 0,0013 |
| Label holder for BK8, for double push buttons only         | P761-DT | 10 | 0,0013 |

#### Legend plate BK8 for label holder P761 (with marking e. g.: BK8-WATER-PUMP-START)



|  |                 |    |        |
|--|-----------------|----|--------|
| Legend plate without marking                         | BK8-9736        | 10 | 0,0004 |
| Text 3 lines, max. 3 x 11 letters, letter height 3mm | BK8-...-...-... | 10 | 0,0004 |
| Text 4 lines, max. 4 x 11 letters, letter height 3mm | BK8-...-...-... | 10 | 0,0004 |

# Actuator Caps with Laser Markings

## Codes for colours

| Colour | for buttons |         | for illuminated buttons |          |
|--------|-------------|---------|-------------------------|----------|
|        | B3D(R)      | B5D(R)  | B3DL(R)                 | B5DL(R)  |
| red    | DK RT..     | BS5D(R) | DKL RT..                | BS5DL(R) |
| green  | DK GN..     | BS5D(R) | DKL GN..                | BS5DL(R) |
| yellow | DK GE..     | BC5D(R) | DKL GE..                | BC5DL(R) |
| blue   | DK BL..     |         | DKL BL..                |          |
| white  | DK WS..     |         | DKL WS..                |          |
| black  | DK SW..     |         | -                       |          |

## Actuator Caps with text, the Suffix must be completed with the colour code



| Marking | Suffix for Marking | Marking | Suffix for Marking | Pack pcs. | Weight kg/pc. |
|---------|--------------------|---------|--------------------|-----------|---------------|
| START   | ...-START          | NOT AUS | ...-NOT-AUS        | 10        | 0,001         |
| EIN     | ...-EIN            | STOP    | ...-STOP           | 10        | 0,001         |
|         |                    | AUS     | ...-AUS            | 10        | 0,001         |
| BETRIEB | ...-BETRIEB        | STÖRUNG | ...-STÖRUNG        | 10        | 0,001         |
| ANLAUF  | ...-ANLAUF         | HALT    | ...-HALT           | 10        | 0,001         |
| VOR     | ...-VOR            | ZURÜCK  | ...-ZURÜCK         | 10        | 0,001         |
| HEBEN   | ...-HEBEN          | SENKEN  | ...-SENKEN         | 10        | 0,001         |
| LINKS   | ...-LINKS          | RECHTS  | ...-RECHTS         | 10        | 0,001         |
| MEHR    | ...-MEHR           | WENIGER | ...-WENIGER        | 10        | 0,001         |
| SCHNELL | ...-SCHNELL        | LANGSAM | ...-LANGSAM        | 10        | 0,001         |
| HELLER  | ...-HELLER         | DUNKLER | ...-DUNKLER        | 10        | 0,001         |
| AUF     | ...-AUF            | ZU      | ...-ZU             | 10        | 0,001         |
| AB      | ...-AB             | LAUF    | ...-LAUF           | 10        | 0,001         |
| EILGANG | ...-EILGANG        | TIPPEN  | ...-TIPPEN         | 10        | 0,001         |

## Actuator Caps with symbols according to ISO 7000, the Suffix must be completed with the colour code

| Symbol | Suffix for Marking | ISO 7000 reference no. | Symbol | Suffix for Marking | ISO 7000 reference no. | Pack pcs. | Weight kg/pc. |
|--------|--------------------|------------------------|--------|--------------------|------------------------|-----------|---------------|
|        | ...-100            | -                      |        | ...-101            | -                      | 10        | 0,001         |
|        | ...-102            | -                      |        | ...-103            | -                      | 10        | 0,001         |
|        | ...-200            | 0011                   |        | ...-201            | 0244                   | 10        | 0,001         |
|        | ...-202            | -                      |        | ...-203            | -                      | 10        | 0,001         |
|        | ...-204            | 0355                   |        | ...-205            | -                      | 10        | 0,001         |
|        | ...-300            | -                      |        | ...-301            | -                      | 10        | 0,001         |
|        | ...-302            | -                      |        | ...-303            | -                      | 10        | 0,001         |
|        | ...-304            | -                      |        | ...-305            | 0259                   | 10        | 0,001         |
|        | ...-306            | -                      |        | ...-307            | -                      | 10        | 0,001         |
|        | ...-400            | -                      |        | ...-401            | 0018                   | 10        | 0,001         |
|        | ...-402            | 0019                   |        | ...-403            | 0020                   | 10        | 0,001         |
|        | ...-404            | 0021                   |        | ...-405            | 0022                   | 10        | 0,001         |
|        | ...-406            | 0023                   |        | ...-407            | 0910                   | 10        | 0,001         |
|        | ...-408            | -                      |        | ...-409            | 0096                   | 10        | 0,001         |
|        | ...-410            | 0017                   |        | ...-411            | 0033                   | 10        | 0,001         |
|        | ...-412            | 0032                   |        | ...-413            | -                      | 10        | 0,001         |

# Actuators and Lens Caps 30mm IP67 (IP65)

## Push Buttons

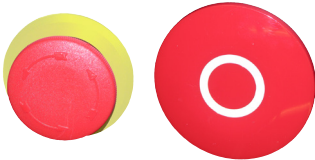


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IP65  
→ page 342,  
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## EMERGENCY STOP Buttons



→ page 341



→ page 341

## Illuminated Operators



→ page 342



→ page 345

## Lens Caps

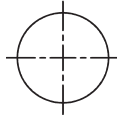


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Wrench  
J7049

Mounting hole  
Ø 30,5mm

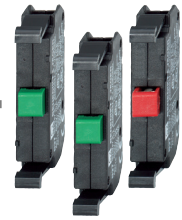


## Connectors

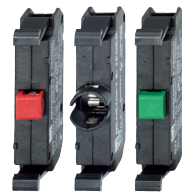


Tthickness  
**0,5 - 3 mm**  
→ page 344

## Contacts Lamp Holder



Actuator insert  
→ page 344



→ page 344



LED  
24-230V



Filament  
6-130V



Glow-discharge  
230V

→ page 345



## Actuators 30mm IP67

| Ring | Colour | Symbol | Alu | Black | Chrome | Pack pcs. | Weight kg/pc. |
|------|--------|--------|-----|-------|--------|-----------|---------------|
|------|--------|--------|-----|-------|--------|-----------|---------------|

### Push Buttons, Actuator Caps markable



|       |    |  |           |            |             |    |       |
|-------|----|--|-----------|------------|-------------|----|-------|
| red   |    |  | B5D RT    | BS5D RT    | BC5D RT     | 10 | 0,029 |
| red   | 0  |  | B5D RT-0  | BS5D RT-0  | BC5D RT-0   | 10 | 0,029 |
| green |    |  | B5D GN    | BS5D GN    | BC5D GN     | 10 | 0,029 |
| green | I  |  | B5D GN-I  | BS5D GN-I  | BC5D GN-I   | 10 | 0,029 |
| green | II |  | B5D GN-II | BS5D GN-II | BC 5D GN-II | 10 | 0,029 |
| green | →  |  | B5D GN-PF | BS5D GN-PF | BC5D GN-PF  | 10 | 0,029 |



|        |   |  |           |            |            |    |       |
|--------|---|--|-----------|------------|------------|----|-------|
| yellow |   |  | B5D GE    | BS5D GE    | BC5D GE    | 10 | 0,029 |
| blue   |   |  | B5D BL    | BS5D BL    | BC5D BL    | 10 | 0,029 |
| white  |   |  | B5D WS    | BS5D WS    | BC 5D WS   | 10 | 0,029 |
| black  |   |  | B5D SW    | BS5D SW    | BC5D SW    | 10 | 0,029 |
| black  | → |  | B5D SW-PF | BS5D SW-PF | BC5D SW-PF | 10 | 0,029 |

### Push Buttons, Maintained, Actuator Caps markable



|        |  |  |         |          |          |    |       |
|--------|--|--|---------|----------|----------|----|-------|
| red    |  |  | B5DR RT | BS5DR RT | BC5DR RT | 10 | 0,029 |
| green  |  |  | B5DR GN | BS5DR GN | BC5DR GN | 10 | 0,029 |
| yellow |  |  | B5DR GE | BS5DR GE | BC5DR GE | 10 | 0,029 |
| blue   |  |  | B5DR BL | BS5DR BL | BC5DR BL | 10 | 0,029 |
| white  |  |  | B5DR WS | BS5DR WS | BC5DR WS | 10 | 0,029 |
| black  |  |  | B5DR SW | BS5DR SW | BC5DR SW | 10 | 0,029 |

### Mushroom Heads, Ø28mm



|        |   |  |           |            |            |    |       |
|--------|---|--|-----------|------------|------------|----|-------|
| red    |   |  | B5P1 RT   | BS5P1 RT   | BC5P1 RT   | 10 | 0,032 |
| red    | 0 |  | B5P1 RT-0 | BS5P1 RT-0 | BC5P1 RT-0 | 10 | 0,032 |
| green  |   |  | B5P1 GN   | BS5P1 GN   | BC5P1 GN   | 10 | 0,032 |
| yellow |   |  | B5P1 GE   | BS5P1 GE   | BC5P1 GE   | 10 | 0,032 |
| blue   |   |  | B5P1 BL   | BS5P1 BL   | BC5P1 BL   | 10 | 0,032 |
| black  |   |  | B5P1 SW   | BS5P1 SW   | BC5P1 SW   | 10 | 0,032 |

### Mushroom Heads, Ø40mm



|     |   |  |            |             |             |    |       |
|-----|---|--|------------|-------------|-------------|----|-------|
| red | 0 |  | B5P14 RT-0 | BS5P14 RT-0 | BC5P14 RT-0 | 10 | 0,035 |
|-----|---|--|------------|-------------|-------------|----|-------|

### EMERGENCY STOP Push Buttons, Ø 28mm, release by turning, with yellow ring



|     |   |  |               |  |  |    |       |
|-----|---|--|---------------|--|--|----|-------|
| red |   |  | B5P3 RT-RGE   |  |  | 10 | 0,032 |
| red | 0 |  | B5P3 RT-0-RGE |  |  | 10 | 0,032 |

### EMERGENCY STOP Push Buttons, Ø 40mm, release by turning



|     |   |  |            |             |             |    |       |
|-----|---|--|------------|-------------|-------------|----|-------|
| red | 0 |  | B5P34 RT-0 | BS5P34 RT-0 | BC5P34 RT-0 | 10 | 0,035 |
|-----|---|--|------------|-------------|-------------|----|-------|

### Yellow Disk for EMERGENCY-STOP Push Buttons, Ø70mm, Thickness 1mm



|                              |  |  |  |           |  |   |       |
|------------------------------|--|--|--|-----------|--|---|-------|
| neutral                      |  |  |  | B5-7603   |  | 1 | 0,004 |
| with marking NOT-HALT-symbol |  |  |  | B5-7603-S |  | 1 | 0,004 |



|                             |  |  |  |           |  |   |       |
|-----------------------------|--|--|--|-----------|--|---|-------|
| with marking NOT-AUS        |  |  |  | B5-7603-1 |  | 1 | 0,004 |
| with marking EMERGENCY STOP |  |  |  | B5-7603-2 |  | 1 | 0,004 |



## Actuators 30mm

Ring



Knob

Alu

Black

Chrome

Pack  
pcs.

Weight  
kg/pc.

### Rotary Knobs and Swing Knobs, black IP65



Rotary

maintained 60°



Rotary  
Swing

**B5KN2**  
**B5KRN2**

**BS5KN2**  
**BS5KRN2**

**BC5KN2**  
**BC5KRN2**

10  
10

0,035  
0,035

spring return 60°



Rotary  
Swing

**B5KN8**  
**B5KRN8**

**BS5KN8**  
**BS5KRN8**

**BC5KN8**  
**BC5KRN8**

10  
10

0,035  
0,035

spring return 60°



Rotary  
Swing

**B5KN1**  
**B5KRN1**

**BS5KN1**  
**BS5KRN1**

**BC5KN1**  
**BC5KRN1**

10  
10

0,035  
0,035

spring return 60°



Rotary  
Swing

**B5KN3**  
**B5KRN3**

**BS5KN3**  
**BS5KRN3**

**BC5KN3**  
**BC5KRN3**

10  
10

0,035  
0,035

maintained/spring return 60°



Rotary

**B5KN6**

**BS5KN6**

**BC5KN6**

10

0,035

spring return/maintained 60°



Rotary

**B5KN7**

**BS5KN7**

**BC5KN7**

10

0,035

maintained 120°



Rotary

**B5KN9**

**BS5KN9**

**BC5KN9**

10

0,035

maintained 90°  
according to EN81



Rotary

**B5KN10**

**BS5KN10**

**BC5KN10**

10

0,035

### Illuminated Rotary Knobs and Swing Knobs IP67, clear, lamp max. 1,2W, lamps see page 347



Rotary

maintained 90°



Rotary

**B5KL2**

**BS5KL2**

**BC5KL2**

10

0,031

spring return 60°



Rotary  
Swing

**B5KL1**  
**B5KRL1**

**BS5KL1**  
**BS5KRL1**

**BC5KL1**  
**BC5KRL1**

10  
10

0,031  
0,031

maintained 60°



Rotary  
Swing

**B5KL3**  
**B5KRL3**

**BS5KL3**  
**BS5KRL3**

**BC5KL3**  
**BC5KRL3**

10  
10

0,031  
0,031

maintained/spring return 60°



Rotary

**B5KL6**

**BS5KL6**

**BC5KL6**

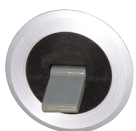
10

0,031



Swing

### Toggle IP65



O - I

**B5E**

**BS5E**

**BC5E**

10

0,032

# Actuators and Lens Caps 30mm IP65

Ring

key  
removeable in



Alu



Black



Chrome

Pack  
pcs.

Weight  
kg/pc.

## Key Operated Rotary Switch with lock Ronis 455



B3SAR 0

maintained 60°



B5SAR 0

BS5SAR 0

BC5SAR 0

1

0,059

B5SAR 1

BS5SAR 1

BC5SAR 1

1

0,059

B5SAR 01

BS5SAR 01

BC5SAR 01

1

0,059



B3SARR 0

spring return 60°



B5SAT 0

BS5SAT 0

BC5SAT 0

1

0,059

maintained 60°



B5SARR 0

BS5SARR 0

BC5SARR 0

1

0,059

B5SARR 102

BS5SARR 102

BC5SARR 102

1

0,059

spring return/maintained 60°



B5SATR 02

BS5SATR 02

BC5SATR 02

1

0,059

spring return 60°



B5SATT 0

BS5SATT 0

BC5SATT 0

1

0,059

Spare Keylock Ronis R455

B4-R455

1

0,007

Colour

Pack  
pcs.

Weight  
kg/pc.

## Illuminated Push Buttons IP67, lamp max. 1,9W, lamps see page 347



red  
green  
yellow

B5DL RT  
B5DL GN  
B5DL GE

BS5DL RT  
BS5DL GN  
BS5DL GE

BC5DL RT  
BC5DL GN  
BC5DL GE

10  
10  
10

0,029  
0,029  
0,029

blue  
white

B5DL BL  
B5DL WS

BS5DL BL  
BS5DL WS

BC5DL BL  
BC5DL WS

10  
10

0,029  
0,029

## Illuminated Push Buttons IP67, Maintained, lamp max. 1,9W, lamps see page 347



red  
green  
yellow

B5DLR RT  
B5DLR GN  
B5DLR GE

BS5DLR RT  
BS5DLR GN  
BS5DLR GE

BC5DLR RT  
BC5DLR GN  
BC5DLR GE

10  
10  
10

0,029  
0,029  
0,029

blue  
white

B5DLR BL  
B5DLR WS

BS5DLR BL  
BS5DLR WS

BC5DLR BL  
BC5DLR WS

10  
10

0,029  
0,029

## Lens Caps with fresnel lens IP67, lamp max. 1,9W, lamps see page 347



red  
green  
yellow

B5R RT  
B5R GN  
B5R GE

BS5R RT  
BS5R GN  
BS5R GE

BC5R RT  
BC5R GN  
BC5R GE

10  
10  
10

0,029  
0,029  
0,029

blue  
clear  
white

B5R BL  
B5R KL  
B5R WS

BS5R BL  
BS5R KL  
BS5R WS

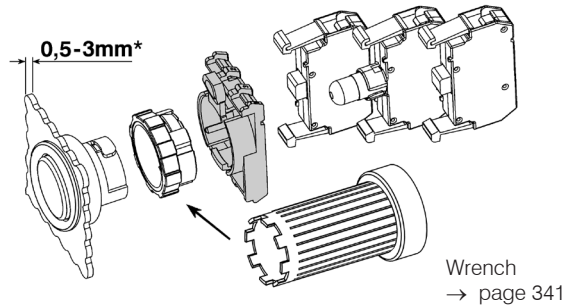
BC5R BL  
BC5R KL  
BC5R WS

10  
10  
10

0,029  
0,029  
0,029

## Connectors

| Specification | Description | Type | Pack pcs. | Weight kg/pc. |
|---------------|-------------|------|-----------|---------------|
| Connector B3S |             | B3S  | 10        | 0,013         |

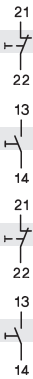


\*) inclusive Thickness from Label Holder and Yellow Disk

## Contact Blocks and Lamp Holders for Panel Mounting

| for voltage     | Description                         | Type                 | Pack pcs. | Weight kg/pc. |
|-----------------|-------------------------------------|----------------------|-----------|---------------|
| max. 690V AC    | 1 NC                                | B3T01 <sup>2)</sup>  | 10        | 0,010         |
| max. 690V AC    | 1 NO                                | B3T10 <sup>2)</sup>  | 10        | 0,010         |
| max. 690V~      | 1 NC <sup>1)</sup>                  | B3RT01 <sup>2)</sup> | 10        | 0,010         |
| max. 690V~      | 1 NO                                | B3RT10 <sup>2)</sup> | 10        | 0,010         |
| Actuator insert | to actuate the center contact block | P642                 | 10        | 0,001         |

### Contact blocks



### Lamp holders, socket BA9s



|                 |   |  |  |     |    |       |
|-----------------|---|--|--|-----|----|-------|
| max. 440V AC/DC | direct connection, for lamps max. 1,9W (active power consumption) |  |  | B3F | 10 | 0,012 |
|-----------------|---|--|--|-----|----|-------|

### Lamp holders for lamp test circuits, socket BA9s



|              |   |  |  |       |    |       |
|--------------|---|--|--|-------|----|-------|
| max. 440V AC | direct connection, for filament and glow-discharge lamps max. 1,7W (active power consumption) |  |  | B3FT  | 10 | 0,020 |
| max. 250V    | direct connection of LED  |  |  | B3FTD | 10 | 0,020 |

1) NC contact has a positive opening according to IEC/EN 60947-5-1

2) Contact blocks with gold contacts ( B3T..G) on request, suitable for 17V= /1mA and for difficult ambient conditions.

## Lamps

| Socket BA9s<br>Lamp voltage | Power<br>consumption | Type | Pack<br>pcs. | Weight<br>kg/pc. |
|-----------------------------|----------------------|------|--------------|------------------|
|-----------------------------|----------------------|------|--------------|------------------|

### LED lamps <sup>2) 3)</sup> (6 years middle lifetime, for equivalent lens caps only)



|                |             |                      |             |    |       |
|----------------|-------------|----------------------|-------------|----|-------|
| 20-30V AC/DC   | 17mA / 0,4W | for red lens caps    | B3-L24 RTB  | 50 | 0,005 |
| 20-30V AC/DC   | 17mA / 0,4W | for green lens caps  | B3-L24 GNB  | 50 | 0,005 |
| 20-30V AC/DC   | 17mA / 0,4W | for yellow lens caps | B3-L24 GEB  | 50 | 0,005 |
| 20-30V AC/DC   | 17mA / 0,4W | for blue lens caps   | B3-L24 BLB  | 50 | 0,005 |
| 20-30V AC/DC   | 17mA / 0,4W | for white lens caps  | B3-L24 WSB  | 50 | 0,005 |
| 90-120V AC/DC  | 7mA / 0,8W  | for red lens caps    | B3-L110 RTB | 50 | 0,005 |
| 90-120V AC/DC  | 7mA / 0,8W  | for green lens caps  | B3-L110 GNB | 50 | 0,005 |
| 90-120V AC/DC  | 7mA / 0,8W  | for yellow lens caps | B3-L110 GEB | 50 | 0,005 |
| 90-120V AC/DC  | 7mA / 0,8W  | for blue lens caps   | B3-L110 BLB | 50 | 0,005 |
| 90-120V AC/DC  | 7mA / 0,8W  | for white lens caps  | B3-L110 WSB | 50 | 0,005 |
| 200-250V AC/DC | 4mA / 0,9W  | for red lens caps    | B3-L230 RTB | 50 | 0,005 |
| 200-250V AC/DC | 4mA / 0,9W  | for green lens caps  | B3-L230 GNB | 50 | 0,005 |
| 200-250V AC/DC | 4mA / 0,9W  | for yellow lens caps | B3-L230 GEB | 50 | 0,005 |
| 200-250V AC/DC | 4mA / 0,9W  | for blue lens caps   | B3-L230 BLB | 50 | 0,005 |
| 200-250V AC/DC | 4mA / 0,9W  | for white lens caps  | B3-L230 WSB | 50 | 0,005 |

### Filament lamps <sup>3)</sup>



|     |      |                   |        |     |       |
|-----|------|-------------------|--------|-----|-------|
| 24V | 1,2W | for all lens caps | B4-G24 | 100 | 0,005 |
| 42V | 1W   | for all lens caps | B4-G42 | 100 | 0,005 |
| 48V | 1,2W | for all lens caps | B4-G48 | 100 | 0,005 |
| 60V | 1,2W | for all lens caps | B4-G60 | 100 | 0,005 |

### Glow-discharge lamps <sup>3)</sup>



|             |      |                                  |           |     |       |
|-------------|------|----------------------------------|-----------|-----|-------|
| 220-250V AC | 0,3W | for clear, red, yellow lens caps | B4-GL230K | 100 | 0,005 |
| 220-250V AC | 0,3W | for green, blue lens caps        | B4-GL230G | 100 | 0,005 |

1) Voltage marking 130V / 2W max. rated voltage 120V / 1,8W.

2) Suitable for B3FT lamp test holders.

3) Ambient temperatures on request.

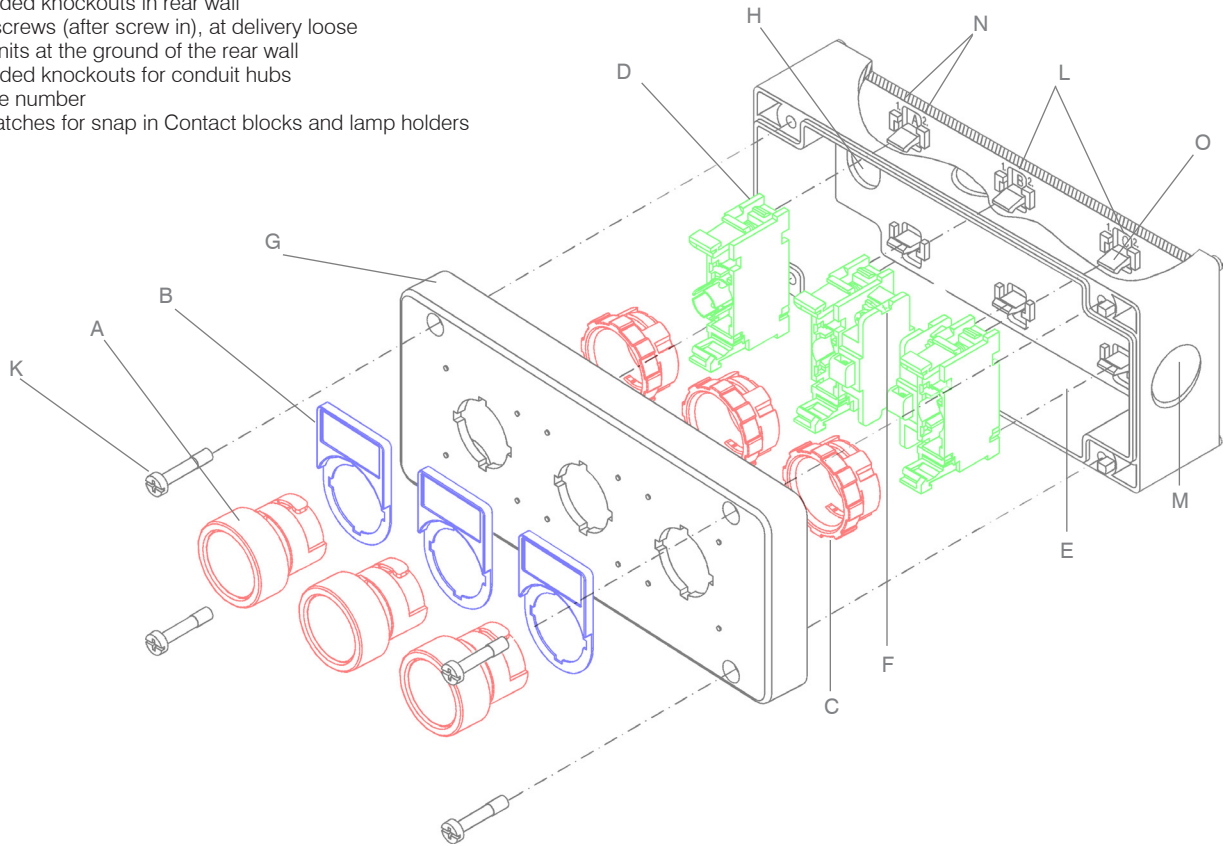
## Accessories



|  | Type   | Pack<br>pcs.       | Weight<br>kg/pc.   |
|--|--|--------------------|--------------------|
| <b>Wrench</b>  | for mounting of actuators and lens caps B(S)3..  | J7049              | 1 0,018            |
| <b>Marking plate</b>   | for marking of contact blocks B3T. and lamp holders B3F  | P672-1             | 10 0,001           |
| <b>Lamp Installer</b>  | used to install or replace lamps BA9s  | B4-7408            | 1 0,010            |
| <b>Spare Key</b>   | for B(S)3SA.. and BS3P44S3, Ronis R455<br>for B(S)3SB.., Ronis R786                                | B4-R455<br>B4-R786 | 1 0,007<br>1 0,007 |
| <b>Protectiv cover sealable</b>  | against unintentional manipulation of buttons B5, (not for mushroom heads, rotary and swing knobs) | B5-SAP             | 1 0,008            |
| <b>Label holder for legend plate BK5, black, 1 or 2 lines</b>                                    |  | P942-1             | 10 0,0013          |
| <b>Legend plate BK5 with for label holder P942-1 (with marking e. g.: BK5-MOTOR-START)</b>       |  | BK5-11374          | 10 0,0003          |
| <b>Legend plate alu without marking for label holder P42-1</b>                                   | Text 1 or 2 lines, max. 2 x 13 letters, letter height 3mm  |                    |                    |
| <b>Label holder for legend plate BK10, black, 3 or 4 lines</b>                                   |  | P1043              | 10 0,0015          |
| <b>Legend plate BK10 with for label holder P1043 (with marking e. g.: BK10-WATER-PUMP-START)</b> |  | BK10-11724         | 10 0,0005          |
| <b>Legend plate alu without marking for label holder P1043</b>                                   | Text 3 or 4 lines, max. 4 x 13 letters, letter height 3mm  |                    |                    |
| <b>Adapter to convert Actuators 22mm to 30mm</b>   |  |                    |                    |
|  | alu  | B5                 | 10 0,017           |
|  | black  | BS5                | 10 0,017           |
|  | chrome   | BC5                | 10 0,017           |

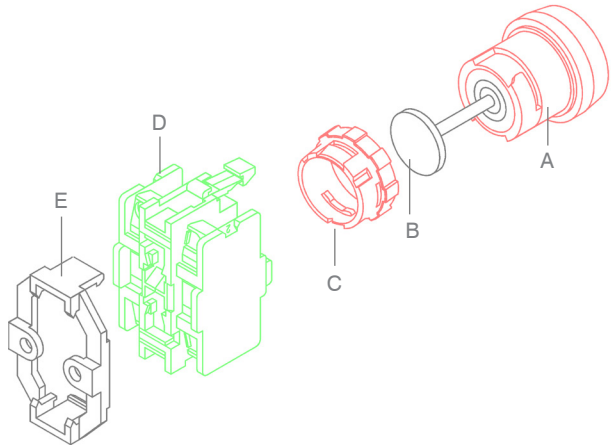
# Assembled Stations BG.. IP67 Type 12

- A Actuators or Lens caps, see page 325 – 328
- B Legend plates with label holder
- C Ring and nut (included with actuator or lens cap)
- D Contact blocks and lamp holders, see page 344
- E Rear shroud
- F Function number
- G Cover
- H Pre-moulded knockouts in rear wall
- K Captive screws (after screw in), at delivery loose
- L Sign of units at the ground of the rear wall
- M Pre-moulded knockouts for conduit hubs
- N Sequence number
- O Spring-catches for snap in Contact blocks and lamp holders




## Buttons for base mounting

- A Actuator Ø 22mm see page 325 – 328, Ø 30mm see page 337 – 339
- B Extension B4V...
- C Ring and nut (included with actuator or lens cap)
- D Contact block B4.. see page 344
- E Base B4U for base and DIN-rail mounting of contact blocks














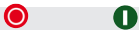
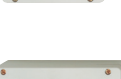
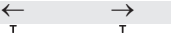
















## Mounting Plate for base and DIN-rail mounting of contact blocks



|   |                | Type  | Pack pcs. | Weight kg/pc. |       |
|---|----------------|---|-----------|---------------|-------|
|  | Mounting Plate | for base and DIN-rail mounting of contact blocks and lamp holders | B4U       | 10            | 0,010 |
|   |                |   | B4.U...   |               |       |
|  | Ring and Nut   | for mounting former actuators and lens caps B4...                 | B3UP      | 10            | 0,004 |

# Assembled Stations IP67 (IP65) Type 12

For conduit entries are in top and both small sides only one knockouts for conduit hubs Ø20,5mm, for M20 or PG13,5 provided.



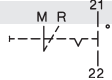


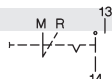


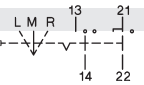


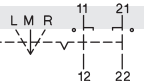


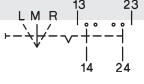
| Type  | Diagram   | Diagram  | Pack pcs.    | Weight kg/pc. |
|---|---|--|--------------|---------------|
| <b>Plastic enclosed buttons and Pilot Lights</b>                                    |   |  |              |               |
|    | ON push button green  | <br>14 — 13                                       | BG10 GN      | 1 0,135       |
|    | OFF push button red   | <br>22 — 21                                       | BG10 RT      | 1 0,135       |
|    | Pilot light green   | x2 — ⊗ — x1  | BG01 GN      | 1 0,135       |
|    | Pilot light red   |  | BG01 RT      | 1 0,135       |
|    | Key operated 0 - I <sup>1)</sup><br>lock Ronis R455<br>60° maintained                     | <br>14 — 13                                       | BG10SAR 0    | 1 0,165       |
|    | Key operated I - 0 - II <sup>1)</sup><br>lock Ronis R455<br>60° maintained                | <br>14 — 13<br>24 — 23                            | BG10SARR 0   | 1 0,172       |
|   | 2 push buttons 0 - I  | <br>22 — 21 14 — 13                               | BG20         | 1 0,200       |
|  | 2 push buttons ← →  | <br>14 — 13 14 — 13<br>22 — 21 22 — 21          | BG20PF       | 1 0,200       |
|  | 3 push buttons ← 0 →  | <br>14 — 13 22 — 21 14 — 13<br>22 — 21 22 — 21 | BG30PF       | 1 0,283       |
|  | 3 push buttons I - 0 - II   | <br>14 — 13 22 — 21 14 — 13<br>22 — 21 22 — 21 | BG30         | 1 0,283       |
|  | 2 push buttons 0 - I<br>with pilot light green  | <br>x2 — ⊗ — x1 22 — 21 14 — 13                | BG21 GN      | 1 0,270       |
|  | Foot and palm button<br>mushroom Ø70mm  | <br>14 — 13<br>22 — 21                          | BG10P14P GR  | 1 0,187       |
| <b>Plastic enclosed EMERGENCY STOP buttons</b>                                      |   |  |              |               |
|  | EMERGENCY STOP button<br>head Ø40mm<br>unlock by turning                                  | <br>14 — 13<br>22 — 21                          | BG10P34-11   | 1 0,145       |
|  | EMERGENCY STOP<br>mushroom button Ø40mm<br>according to EN ISO 13850<br>unlock by pull    | <br>14 — 13<br>22 — 21                          | BG10P44-11   | 1 0,145       |
|  | EMERGENCY STOP key<br>operated button Ø40mm<br>according to EN ISO 13850<br>unlock by key | <br>14 — 13<br>22 — 21                          | BG10P44S3-11 | 1 0,178       |
|  | EMERGENCY STOP<br>mushroom button Ø70mm<br>unlock by turning                              | <br>14 — 13<br>22 — 21                          | BG10P34P-11  | 1 0,187       |

1) IP65



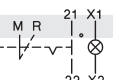


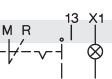





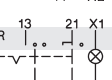


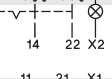
## Enclosures BG.. IP67, Type 12

| Number of units   |          | Description                         | Type   | Pack pcs. | Weight kg/pc. |
|---|----------|-------------------------------------|--------|-----------|---------------|
|  | 1        | 3 knockouts Ø20,5mm (M20 or PG13,5) | BG1    | 1         | 0,108         |
|  | 1 yellow | 3 knockouts Ø20,5mm (M20 or PG13,5) | BG1 GE | 1         | 0,108         |
|  | 2        | 3 knockouts Ø20,5mm (M20 or PG13,5) | BG2    | 1         | 0,145         |
|  | 3        | 3 knockouts Ø20,5mm (M20 or PG13,5) | BG3    | 1         | 0,188         |


## Buttons and Lens Caps B3.. see page 331 -334

| Contacts   | Lamp voltage | Wiring diagram  | actuators with 2 or 3 switch positions  | Type   | Pack pcs. | Weight kg/pc. |
|--|--------------|---|---|--------|-----------|---------------|
| <br>1NC <sup>1)</sup>       |              |    |    | B4TU01 | 10        | 0,015         |
| <br>1NO                     |              |   |   | B4TU10 | 10        | 0,015         |
| <br>1NO+1NC <sup>1)</sup> |              |  |  | B4TU11 | 10        | 0,022         |
| <br>2NC <sup>1)</sup>     |              |  |  | B4TU02 | 10        | 0,022         |
| <br>2NO                   |              |  |  | B4TU20 | 10        | 0,022         |

## Contact blocks with lamp holder, socket BA9s for LED or lamps, for enclosures BG.., lamps see page 347

|  |                 |   |   |         |    |       |
|--|-----------------|---|---|---------|----|-------|
| <br>1NC <sup>1)</sup>     | max. 440V AC/DC |  |  | B4TU01F | 10 | 0,020 |
| <br>1NO                   | max. 440V AC/DC |  |  | B4TU10F | 10 | 0,020 |
| <br>1NO+1NC <sup>1)</sup> | max. 440V AC/DC |  |  | B4TU11F | 10 | 0,027 |
| <br>2NC <sup>1)</sup>     | max. 440V AC/DC |  |  | B4TU02F | 10 | 0,027 |
| <br>2NO                   | max. 440V AC/DC |  |  | B4TU20F | 10 | 0,027 |

## Lamp holder, socket BA9s for LED or lamps, lamps see page 345

|                 |   |   |      |    |       |
|-----------------|---|---|------|----|-------|
| max. 440V AC/DC | direct connection,<br>for lamps max. 1,9W (take care<br>for active power consumption) |  | B4FU | 10 | 0,013 |
|-----------------|---|---|------|----|-------|

1)  NC contact has a positive opening according to IEC/EN 60947-5-1



## Accessories for Plastic enclosed buttons



|                    |  | Type           | Pack pcs. | Weight kg/pc. |
|--------------------|--|----------------|-----------|---------------|
| <b>Wrench</b>      | for mounting of actuators and lens caps B(S)3..      | <b>J7049</b>   | 1         | 0,018         |
| <b>Couple Part</b> | to couple enclosures BKLG or assembled stations BG.. | <b>B4-8852</b> | 1         | 0,018         |

## Push Buttons for Enclosures 22mm IP65



### Push buttons grey RAL7035

| Specification                               | Colour | Symbol | Length mm | Type            | Pack pcs. | Weight kg/pc. |
|---|--------|--------|-----------|-----------------|-----------|---------------|
| <b>Reset push button</b>                    | blue   | R      | 8-22      | <b>B2GRB-22</b> | 10        | 0,005         |
|   | blue   | R      | 22-60     | <b>B2GRB-60</b> | 10        | 0,016         |
| <b>Reset push button with stop function</b> | red    | 0/R    | 8-22      | <b>B2GR-22</b>  | 10        | 0,005         |
|   | red    | 0/R    | 22-60     | <b>B2GR-60</b>  | 10        | 0,016         |
| <b>Start push button</b>                    | green  | I      | 8-22      | <b>B2GI-22</b>  | 10        | 0,005         |
|   | green  | I      | 22-60     | <b>B2GI-60</b>  | 10        | 0,016         |
| <b>Stop push button</b>                     | red    | 0      | 8-22      | <b>B2G0-22</b>  | 10        | 0,005         |
|   | red    | 0      | 22-60     | <b>B2G0-60</b>  | 10        | 0,016         |
| <b>Mushroom head lockable Ø28mm</b>         | red    | 0      | 8-22      | <b>B2GP-22</b>  | 10        | 0,005         |
|   | red    | 0      | 22-60     | <b>B2GP-60</b>  | 10        | 0,016         |

### Push buttons with metal ring and self adjusting extension pin



|   |       |     |           |                   |    |       |
|---|-------|-----|-----------|-------------------|----|-------|
| <b>Reset push button</b>                    | blue  | R   | 19,5-38,5 | <b>B3GRB-31,5</b> | 10 | 0,023 |
|   | blue  | R   | 38,5-60   | <b>B3GRB-60</b>   | 10 | 0,026 |
| <b>Reset push button with stop function</b> | red   | 0/R | 19,5-38,5 | <b>B3GR-31,5</b>  | 10 | 0,023 |
|   | red   | 0/R | 38,5-60   | <b>B3GR-60</b>    | 10 | 0,026 |
| <b>Start push button</b>                    | green | I   | 19,5-38,5 | <b>B3GI-31,5</b>  | 10 | 0,023 |
|   | green | I   | 38,5-60   | <b>B3GI-60</b>    | 10 | 0,026 |
| <b>Stop push button</b>                     | red   | 0   | 19,5-38,5 | <b>B3G0-31,5</b>  | 10 | 0,023 |
|   | red   | 0   | 38,5-60   | <b>B3G0-60</b>    | 10 | 0,026 |

| Specification | Diameter Ø mm | Length mm | Type | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------|------|-----------|---------------|
|---------------|---------------|-----------|------|-----------|---------------|

### Extensions for push buttons

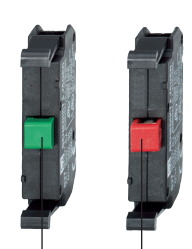


|  |      |             |                |    |       |
|--|------|-------------|----------------|----|-------|
| self adjusting pin, for B(S, C)3D.. and B(S, C)3P. | 15   | 19,5 - 38,5 | <b>B4V31,5</b> | 10 | 0,001 |
|  | 18,5 | 38,5 - 60   | <b>B4V60</b>   | 10 | 0,004 |




# Technical Data

Terminal markings for control units according to DIN EN 50013

| Distinc. number | Contact elements           | Distinc. number | Contact elements           | Distinc. number | Contact elements           | Distinc. number | Contact elements           | Distinc. number | Contact elements           | Colour code   |
|-----------------|----------------------------|-----------------|----------------------------|-----------------|----------------------------|-----------------|----------------------------|-----------------|----------------------------|---|
| 10              | 13<br>14                   |                 |                            |                 |                            |                 |                            | 01              | 21<br>22                   | <br>NO Green      NC Red |
| 20              | 13 23<br>14 24             | 11              | 13 21<br>14 22             |                 |                            |                 |                            | 02              | 11 21<br>12 22             |   |
| 30              | 13 23 33<br>14 24 34       | 21              | 13 21 33<br>14 22 34       | 12              | 13 21 31<br>14 22 32       |                 |                            | 03              | 12 22 32<br>12 22 32       |   |
| 40              | 13 23 33 43<br>14 24 34 44 | 31              | 13 21 33 43<br>14 22 34 44 | 22              | 13 21 31 43<br>14 22 32 44 | 13              | 13 21 31 41<br>14 22 32 42 | 04              | 11 21 31 41<br>12 22 32 42 |   |

## Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1



| Type   | B3T  | B4T                   |
|--|--|-----------------------|
| Rated insulation voltage $U_i$   | V AC 690 <sup>1)</sup>                                   | 500                   |
| Utilization category AC12<br>Control of resistive loads and solid stateloads with isolation by opto couplers           |  |                       |
| Rated current $I_e$  | 220-240V A 10<br>380-415V A 10<br>500V A 10<br>690V A 10 | 10<br>10<br>10<br>-   |
| Utilization category AC15<br>Control of electromagnetic load (>72VA)   |  |                       |
| Rated current $I_e$  | 220-240V A 6<br>380-415V A 5<br>500V A 3<br>690V A 2     | 6<br>5<br>3<br>-      |
| Utilization category DC12 L/R = 1ms<br>Control of resistive loads and solid stateloads with isolation by opto couplers |  |                       |
| Rated current $I_e$  | 24V A 10<br>60V A 6<br>110V A 2,5<br>220V A 0,8          | 10<br>6<br>2,5<br>0,8 |
| Utilization category DC14 L/R = 15ms<br>Control of electromagnetic loads having economy resistors in circuit           |  |                       |
| Rated current $I_e$  | 24V A 8<br>60V A 1<br>110V A 2<br>220V A 0,5             | 8<br>1<br>2<br>0,5    |
| Utilization category DC13 L/R = 300ms<br>Control of electromagnets   |  |                       |
| Rated current $I_e$  | 24V A 2<br>60V A 5<br>110V A 0,5<br>220V A 0,2           | 2<br>5<br>0,5<br>0,2  |
| Making capacity  | A 60   | 60                    |
| Breaking capacity $\cos\phi = 0,7-1$   | 40-60Hz A 50   | 50                    |
| Mechanical life  | millions of operations 10                                | 10                    |
| Contact life (AC15)  |  |                       |
| 100VA  | millions of operations 10                                | 10                    |
| 300VA  | millions of operations 3                                 | 3                     |
| 800VA  | millions of operations 1                                 | 1                     |
| 1200VA   | millions of operations 0,5                               | 0,5                   |
| Maximum frequency of operations  | ops. per hour 600  | 600                   |
| Short circuit protection   | slow, gL (gG) A 25                                       | 25                    |
| Type   | B3F  | B4F                   |
| Rated insulation voltage $U_i$   | V AC 440 <sup>2)</sup>                                   | 440 <sup>2)</sup>     |
| Lamp base  | BA9s   |                       |

| Type  | B3., B4., B5.   |
|---|---|
| Protection degree (according to IEC 947-1) in assembled state, from the front from rear | IP67/IP65<br>IP20/IP00  |
| Ambient temperature   | °C -40 to +60 <sup>3)</sup>   |
| Cable cross-section   | <br>solid, mm <sup>2</sup> 0,5 - 2,5<br>flexible, mm <sup>2</sup> 0,5 - 2,5<br>flexible with multicore cable end, mm <sup>2</sup> number 0,5 - 1,5 |
| Cables per clamp  | 2   |
| Mounting hole (according to IEC 947-1)  | Ø mm 22,5<br>Ø mm 30,5  |
| Mounting position   | optional  |
| Terminal screws   | Pozidriv No. 2 screws M3,5  |

## Data according to cULus

| Type                                  | B3.                 | B4.                 |
|---------------------------------------|---------------------|---------------------|
| Contact Block for NO and NC           | 600 V AC max.       | 600 V AC max.       |
| General use                           | 10A                 | 10A                 |
| Heavy pilot duty                      | A600                | A600                |
| Lamp Holder with socket BA9s          | 240V 2,6W max.      | 240V 2,6W max.      |
| Wire (Contact and lamp holder) Torque | 14 - 18AWG 9 lb/in. | 14 - 18AWG 9 lb/in. |

## Approvals

| Country | USA, Canada<br>UL   | Europe<br>CE  | Register of Shipping<br>Great Britain<br>LRS | CENELEC<br>CB-<br>Certificates |
|---------|---|---|--|--------------------------------|
| Type    |  |  |  |                                |
| B3T..   | o   | o   | -  | o                              |
| B3F..   | o   | o   | -  | o                              |
| B4TU..  | o   | o   | o  | o                              |
| B4T..UF | o   | o   | o  | o                              |
| B4FU..  | o   | o   | o  | o                              |
| B3-MB.. | -   | o   | -  | -                              |

o In standard version approved

- Not provided for test till now

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{mp} = 6kV$ .

Data for other conditions on request.

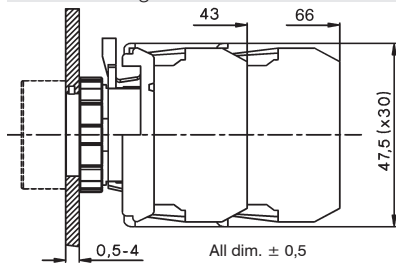
2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry):  $U_{mp} = 4kV$

3) Ambient temperatures for lamps find on pages 337, 341, 349.

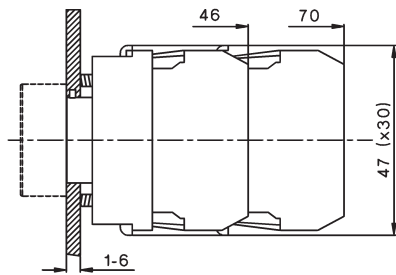
# Dimensions

## Actuators and Lens Caps 22mm

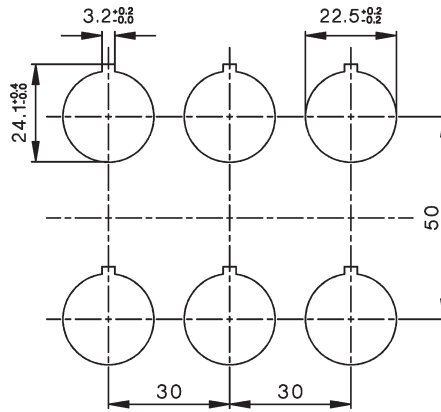
Panel mounting B3S



Panel mounting B3M

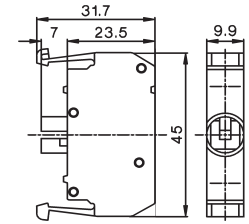


Mounting holes



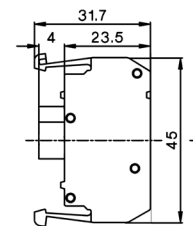
Dimensions of minimum space requirements according to IEC. Take to consideration the field of traverse of swing knobs (27mm) and the diameter of mushroom heads.

Contact blocks and Lamp Holder B3...



All dim. ± 0,2

Contact block B3T...

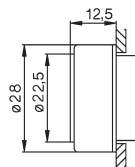


All dim. ± 0,2

### Actuators and Lens caps

Flush Head  
Illuminated Flush Head

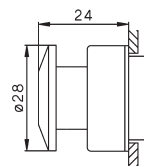
B3D(R), B3DL(R)  
BS3D(R), BS3DL(R)  
BC3D(R), BC3DL(R)



All dim. ± 0,5

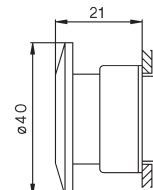
Mushroom Head Ø28mm  
Emergency Stop Ø28mm

B3P1 bis B3P3  
BS3P1 bis BS3P3  
BC3P1 bis BC3P3



Mushroom Head Ø40mm  
Emergency Stop Ø40mm

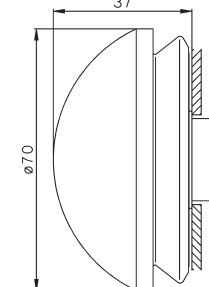
B3P14, B3P34  
BS3P14, BS3P34  
BC3P14, BC3P34



All dim. ± 0,5

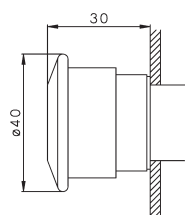
Mushroom Head Ø70mm  
Emergency Stop Ø70mm

BS3P14P  
BS3P34P



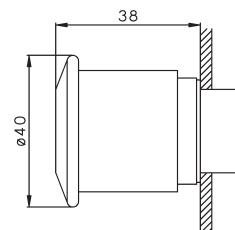
Push-and pull button Ø40mm

BS3P44

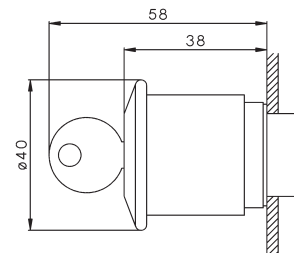


Push-and pull button Ø40mm

BS3P45

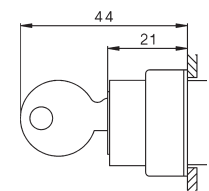


Push-and pull button Ø40mm  
with key  
BS3P44S3



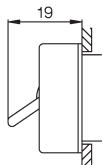
Lockable Push button

B3SAR., B3SAT.  
BS3SAR., BS3SAT.  
BC3SAR., BC3SAT.



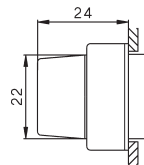
Toggle

B3E  
BS3E  
BC3E



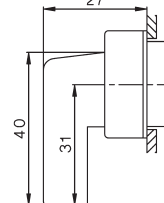
Rotary Knob

B3KN, B3KL  
BS3KN, BS3KL  
BC3KN, BC3KL



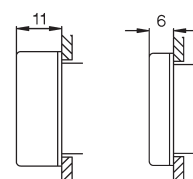
Swing Knob

B3KRL, B3KRN  
BS3KRL, BS3KRN  
BC3KRL, BC3KRN



Lens Cap

B3R(F) B3RN

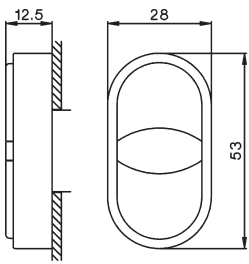


# Dimensions

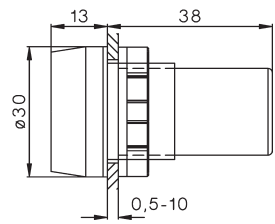
## Actuators and Lens Caps 22mm

Double push button      Monoblock Multi-LED      Protection cover      Protection ring w. thread

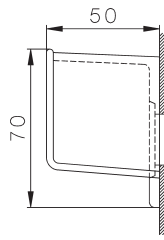
B3DT



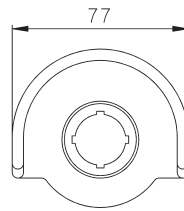
B3-MB...



B3-SK ..

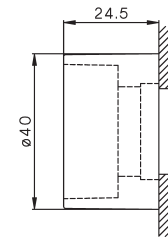


All dim. ± 0,5



All dim. ± 0,5

P921-.



Label holder

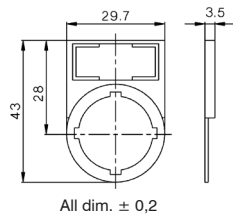
Legend plate

Label holder

Label holder

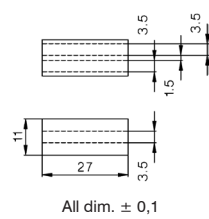
Legend plate

P751



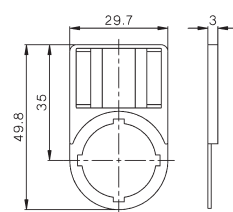
All dim. ± 0,2

BK4-...

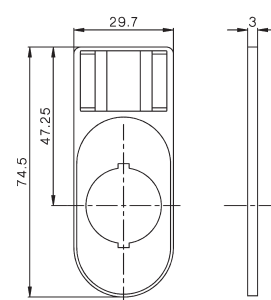


All dim. ± 0,1

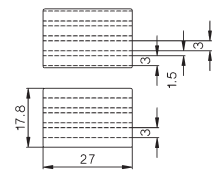
P761



P761-DT



BK8-...

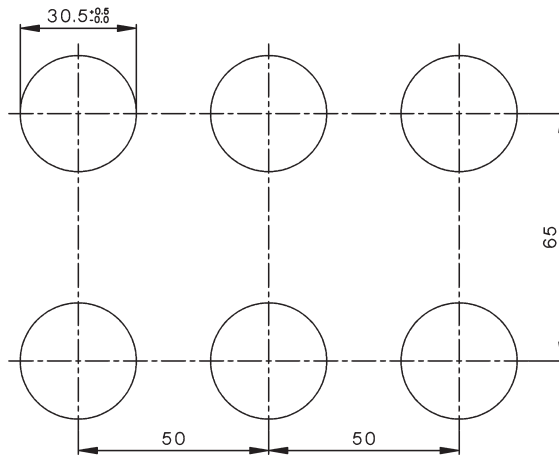
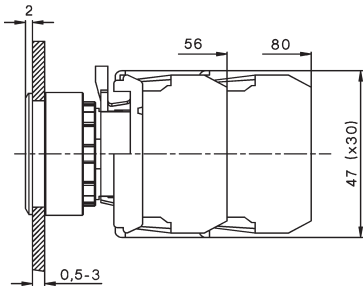


# Dimensions

## Actuators and Lens Caps 30mm

Panel mounting B3S

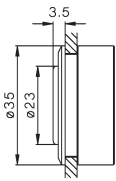
Mounting holes



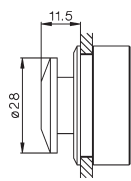
## Actuators and Lens caps

| Flush Head<br>Illuminated Flush Head | Mushroom Head Ø28mm<br>Emergency Stop Ø28mm | Mushroom Head Ø40mm<br>Emergency Stop Ø40mm | Lens Cap |
|--------------------------------------|---|---|----------|
|--------------------------------------|---|---|----------|

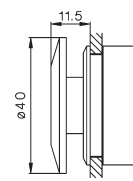
B5D(R), B5DL(R)  
BS5D(R), BS5DL(R)



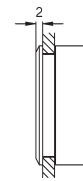
B5P1 to B5P3  
BS5P1 to BS5P3



B5P14, B5P34  
BS5P14, BS5P34



B5RF



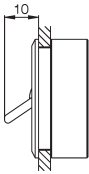
Toggle

Rotary Knob

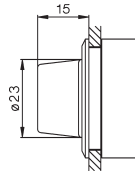
Swing Knob

Lockable Push button

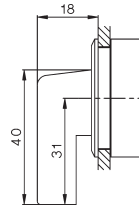
B5E  
BS5E



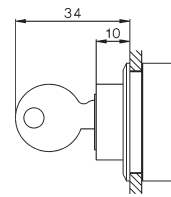
B5KN, B5KL  
BS5KN, BS5KL



B5KRL, B5KRN  
BS5KRL, BS5KRN



B5SAR., B5SAT.  
BS5SAR., BS5SAT.



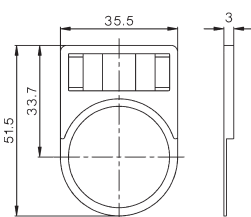
Label holder

Legend plate

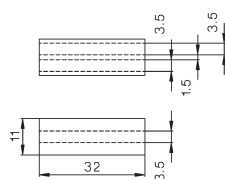
Label holder

Legend plate

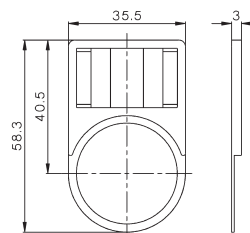
P942-1



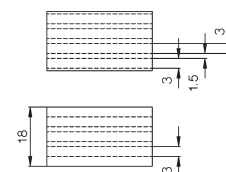
BK5-...



P1043

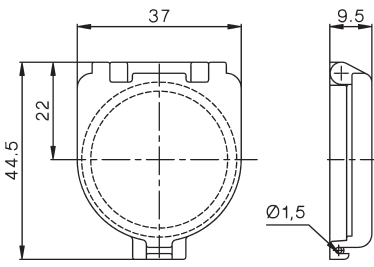


BK10-..

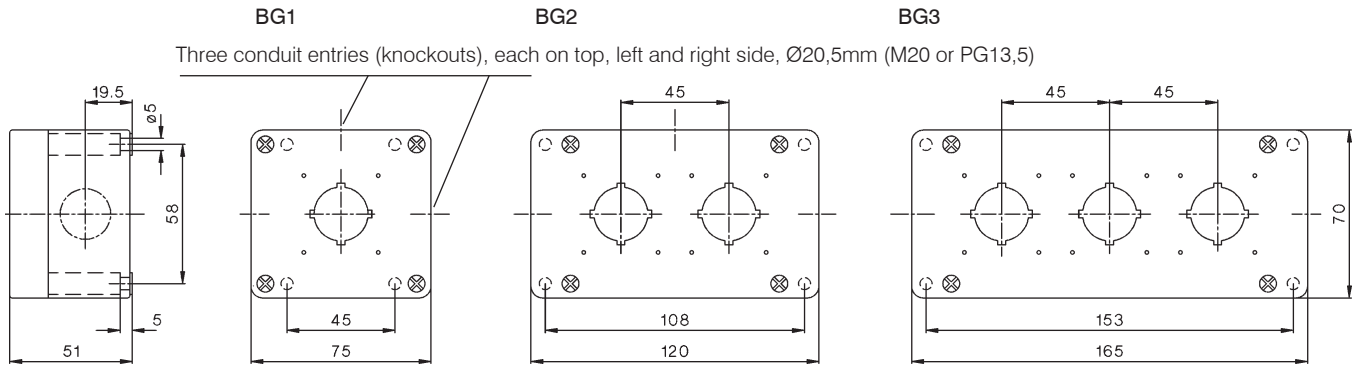


# Dimensions

Protective Cover  
B5-SAP

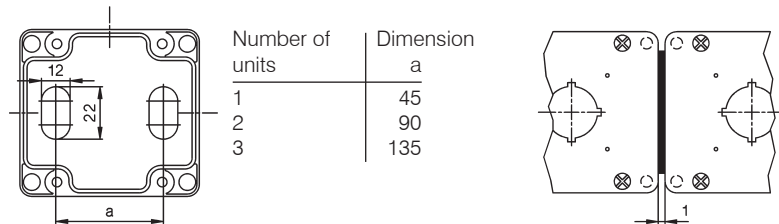


## Enclosures for Custom Built Stations



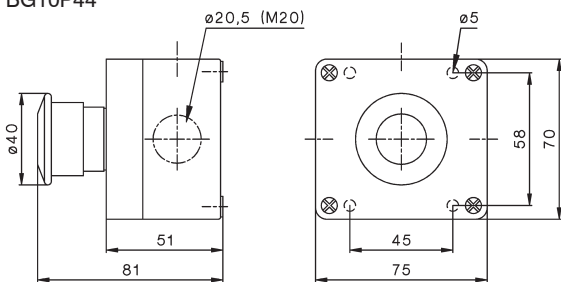
Conduit entries in the bottom  
(knockouts)

Coupled Enclosures  
B4-8852



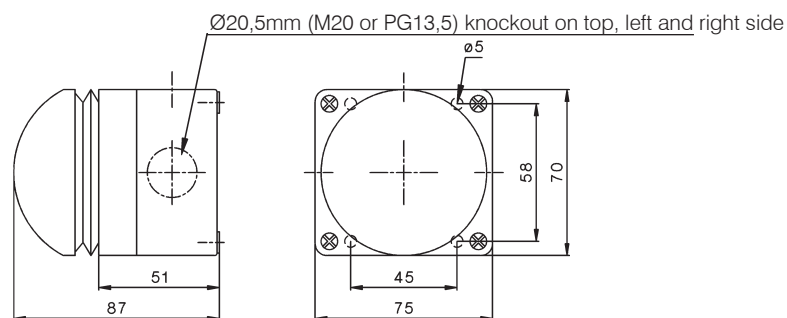
## EMERGENCY STOP Push Button Ø40 mm

BG10P44



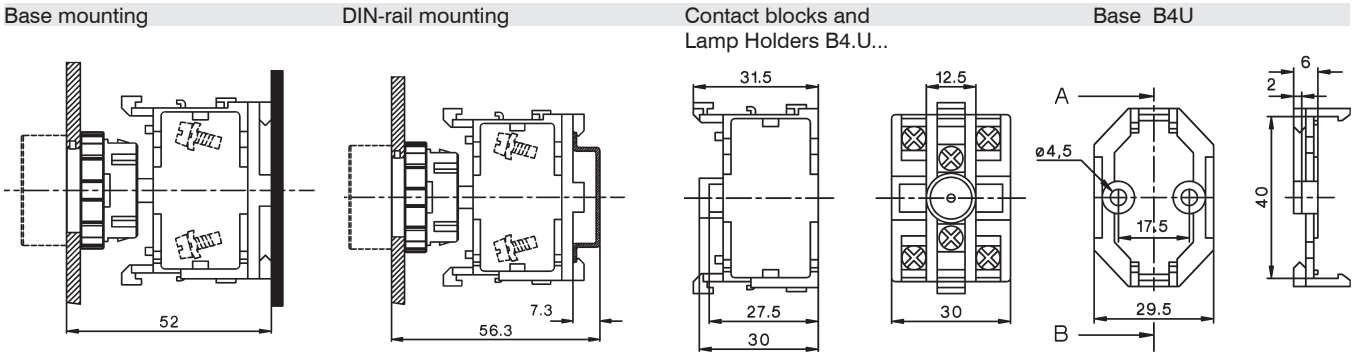
## EMERGENCY STOP Push Button Ø70 mm, Foot switch

BG10P34P, BG10P14P



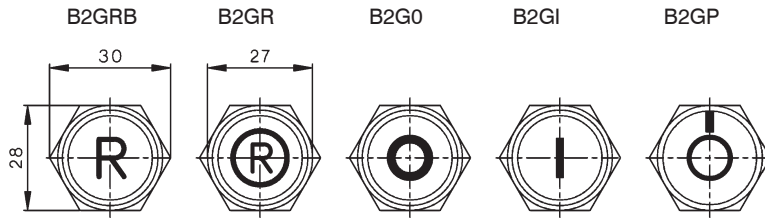
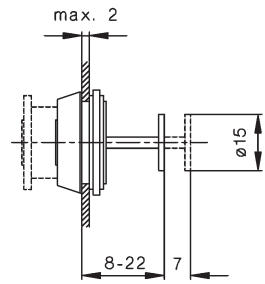
# Dimensions

## Actuators 22mm

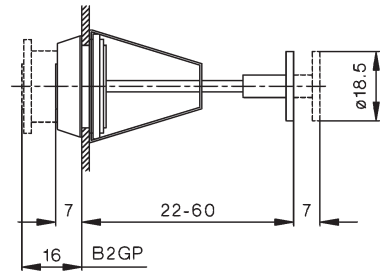


## Push buttons for enclosures

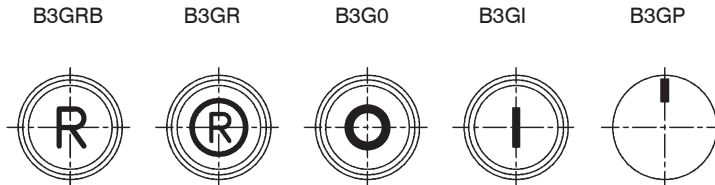
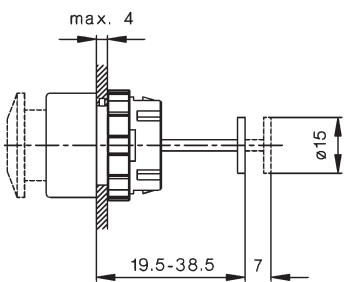
### B2G..-22



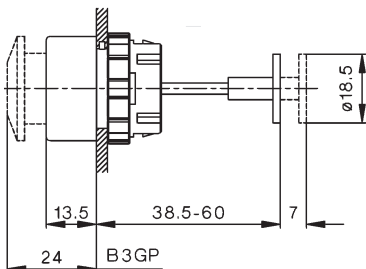
### B2G..-60

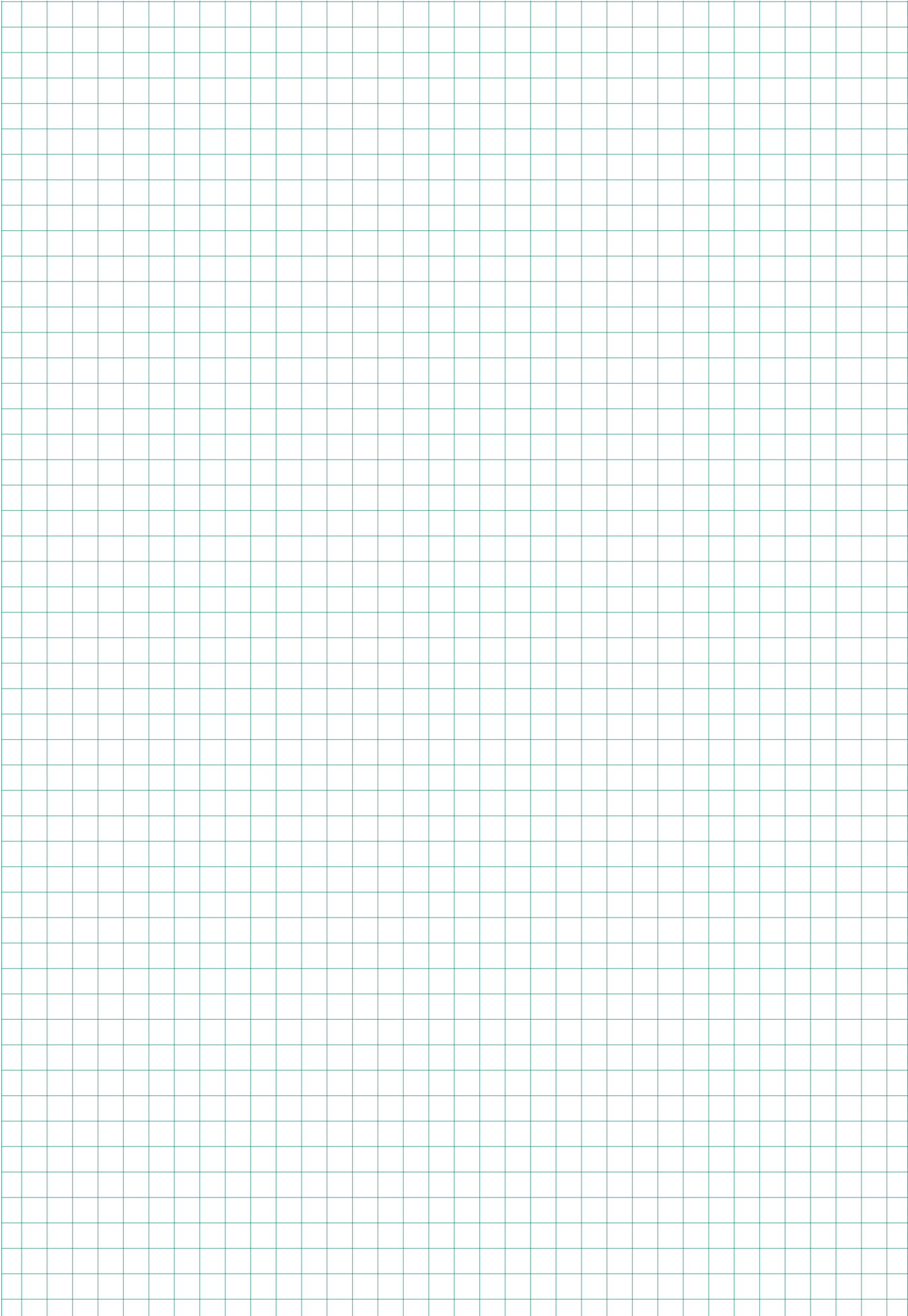


### B3G..-31,5



### B3G..-60





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**ELWATEG Elektrohandel GmbH & Co KG**  
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Fax: +254 / 20 / 856 19 74  
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## Lebanon

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## Mexico

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sales@bnj-usa.com  
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## New Zealand

**Eurotec Instruments Ltd.**  
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Fax: +64 / 9 / 525 3334  
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www.eurotec.co.nz

## Peru

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## Singapore

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## South Africa

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