

General Catalogue



Quality made in



D946E261



Contactors, Motor-Starter

| | |
|-------------------------------------|-----|
| | 3 |
| Micro Contactors | 11 |
| Mini Contactors | 25 |
| Contactor Relays | 39 |
| Contactors | 45 |
| Starters | 91 |
| D.O.L. Starters | 111 |
| Overload Relays | 119 |
| Modular Contactors | 133 |
| Contactors for DC-Switching (D911E) | 141 |
| Contactors RAST 5 (D778E) | 145 |



Circuit Breakers

| | |
|---|-----|
| | 165 |
| Circuit-Breakers M4 for motor protection | 166 |
| Auxiliary contacts, Signalling switch, Auxiliary releases | 167 |
| Insulated 3-pole busbar system, Terminal block | 168 |
| DIN-rail adapters, Busbar adapters | 169 |
| Link modules, Contactors for Circuit-Breakers M4 | 171 |



Manual Motor-Starters

| | |
|---|-----|
| | 187 |
| Manual Motor-Starters, Auxiliary Contact Blocks | 188 |
| Trip Alarm Aux. Switch, Shunt Release | 188 |
| Under-voltage Release, Accessories | 189 |
| Busbar Connectors, Enclosures | 189 |



Switches

| | |
|--------------------|-----|
| | 193 |
| Cam Switches | 198 |
| Mini-Cam Switches | 236 |
| Load switches | 240 |
| Handles and plates | 242 |
| Optional Extras | 249 |
| Special Switches | 257 |



AC-Main Switches

| | |
|---|-----|
| | 277 |
| Main Switches for Panel Mounting | 280 |
| Main Switches for Base Mounting with Door Clutch | 282 |
| Main Switches-Emergency-Stop for Panel Mounting | 286 |
| Changeover Switches for Panel Mounting | 287 |
| Main Switches-Emergency-Stop for Single Hole Mounting | 287 |
| Main Switches-Emergency-Stop for Base Mounting with Door Clutch | 288 |
| Main Switches-Emergency-Stop for Distribution Boards | 290 |
| Changeover Switches-Emergency-Stop for Panel Mounting | 290 |
| Maintenance and Safety Switches, in Plastic Enclosures | 291 |
| Changeover Switches, in Plastic Enclosures | 291 |
| Switch Disconnectors for Panel Mounting | 292 |
| Switch Disconnectors for Distribution Boards | 295 |
| Switch Disconnectors in Plastic Enclosures | 296 |
| Add-on modules | 297 |



DC Switch Disconnectors for Photovoltaic

| | |
|--|-----|
| | 303 |
| ON-OFF Switches for Panel Mounting | 306 |
| ON-OFF Switches for Single Hole Mounting | 307 |
| ON-OFF Switches for Base Mounting with Door Clutch | 308 |
| ON-OFF Switches for Distribution Boards | 309 |
| Main Switches for Panel Mounting | 310 |
| Main Switches for Single Hole Mounting | 311 |
| Main Switches for Base Mounting with Door Clutch | 312 |
| Main Switches for Distribution Boards | 313 |
| Main Switches in Plastic Enclosure | 314 |

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

Index

Page



General

| | |
|-----------------------|----|
| Approvals | 4 |
| Technical Information | 5 |
| Mounting Information | 9 |
| | 10 |



Micro Contactors

| | |
|----------------------------|----|
| Micro Contactors | 11 |
| Micro Contactor Relays | 12 |
| Micro Reversing Contactors | 14 |
| Technical Information | 18 |
| Dimensions | 20 |
| | 24 |



Mini Contactors

| | |
|---------------------------|----|
| Mini Contactors | 25 |
| Interface Contactors | 26 |
| Mini Reversing Contactors | 26 |
| Technical Information | 32 |
| Dimensions | 33 |
| | 36 |



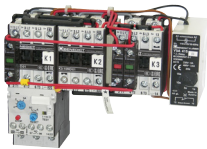
Contactor Relays

| | |
|-----------------------|----|
| Contactor Relays | 39 |
| Technical Information | 40 |
| Dimensions | 40 |
| | 44 |



Contactors

| | |
|--------------------------------|----|
| Contactors Overview | 45 |
| Contactors, 3-pole | 46 |
| Contactors, 4-pole | 48 |
| Capacitor Switching Contactors | 50 |
| Accessories | 51 |
| Technical Information | 52 |
| Dimensions | 62 |
| | 82 |



Starters

| | |
|------------------------|-----|
| Star-Delta Starters | 91 |
| Reversing Contactors | 92 |
| Pole Changing Starters | 96 |
| Technical Information | 98 |
| Dimensions | 100 |
| | 107 |



D.O.L. Starters

| | |
|-----------------------|-----|
| D.O.L. Starters | 111 |
| Enclosures | 112 |
| Accessories | 113 |
| Technical Information | 113 |
| Dimensions | 115 |
| | 116 |



Overload Relays

| | |
|-------------------------|-----|
| Thermal Overload Relays | 119 |
| Accessories | 121 |
| Technical Information | 123 |
| Dimensions | 125 |
| | 129 |



Modular Contactors

| | |
|-----------------------|-----|
| Contactors | 133 |
| Accessories | 134 |
| Technical Information | 135 |
| Dimensions | 138 |
| | 140 |



Contactors for DC-Switching Contactors RAST 5

| | |
|-----------------------------|-----|
| Contactors for DC-Switching | 141 |
| Contactors RAST 5 | 145 |

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 Canada, USA | EAC | CCC |
| Label marking of examination boards | Listed 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 EAC | China | CENELEC CB-Certificates |
|--|---|---|--|---|---|---|----------------------------|
| Type | UL  |  | SEV  |  |  |  | |
| Micro Contactor Relays, Micro Contactors K0, Micro Reversing Contactors and Accessories | | | | | | | |
| K0-04D.. | o | - | - | o | - | - | - |
| K0-05D.. | o | - | - | o | - | o | - |
| K0W05D.. | o | - | - | o | - | o | - |
| Mini Contactor Relays, Mini Contactors, Mini Reversing Contactors K1 and Accessories | | | | | | | |
| 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 | - | - |
| Contactor Relays, Contactors Series K3 | | | | | | | |
| 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 | - | - |
| Contactor Relays, Contactors DC operated Series KG3 | | | | | | | |
| 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 |
| Capacitor Contactors Series K3 | | | | | | | |
| 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 | - |
| Aux. Contacts | | | | | | | |
| 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 EAC | China | CENELEC CB-Certificates |
|--|---|---|---|---|---|---|----------------------------|
| Typ | UL | | SEV | | | | |
| |  |  |  |  |  |  | |
| Accessories | | | | | | | |
| 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 | - | - |
| Reversing Contactors Series K3NWU | | | | | | | |
| 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 | - | - |
| D.O.L Starters | | | | | | | |
| P1.. | 0 | - | - | 0 | 0 | - | - |
| Thermal Overload Relays | | | | | | | |
| 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 | - | - |
| Modular Contactors | | | | | | | |
| 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 |
| Push Buttons | | | | | | | |
| B(C,K,S)3/4/5D | 0 | - | - | 0 | 0 | - | 0 |
| Contactors Relays and Contactors Series K3 (RAST 5) | | | | | | | |
| K3-10/14/18/22NR | 0 | - | - | 0 | 0 | 0 | 0 |
| Contactors for DC-Loads | | | | | | | |
| 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 |
| Main Contactors Series K3 | | | | | | | |
| 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 EAC | China | CENELEC 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^{us} - and cRU^{us} - Guide- and File-No.

These data are important for UL-inspectors.
Devices

| Devices | Guide-No. | | | | File-No. |
|---|-------------------|------|-------------------|-------|----------|
| | cUL ^{us} | | cRU ^{us} | | |
| | Canada | USA | Canada | USA | |
| Contactors | NLDX7 | NLDX | NLDX8 | NLDX2 | E41502 |
| Reversing 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 |
| DC disconnectors as Industrial Control switches | NRNT7 | NRNT | NRNT8 | NRNT2 | E332938 |
| DC disconnectors as Photovoltaic Manual-disconnect switches | - | NMSJ | - | NMSJ2 | E2359344 |

Technical Information

Degree of protection acc. to IEC 60947-1

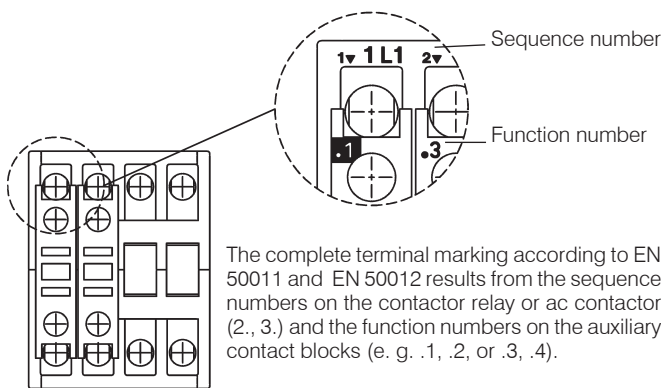
Protection ratings are prefixed by the internationally agreed letters IP followed by two digits.

1st digit: Pertains to solid objects
 2nd digit: Pertains to water.

| 1 st 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 nd 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.

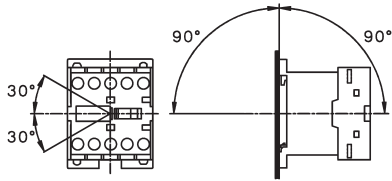
Short circuit protection

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!

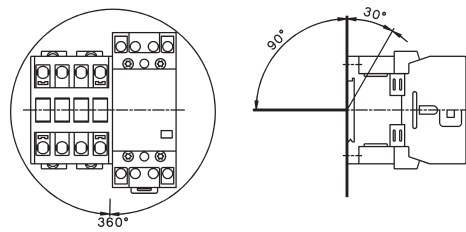
Technical Information

Mounting positions of contactors

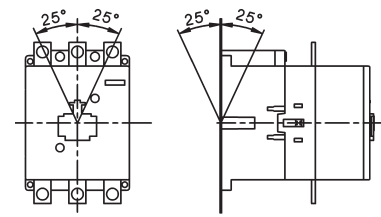
K0-.. / K1-..



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..



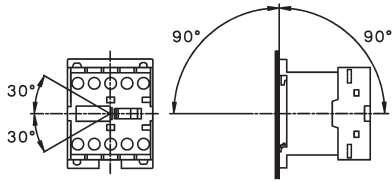
Terminal screws

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

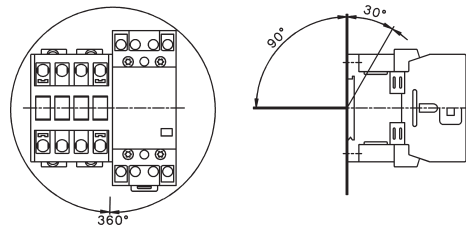
Technical Information

Mounting positions of contactors

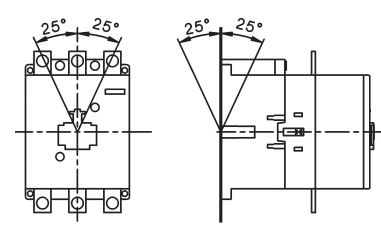
K0-.. / K1-..



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 Type | Kind of connection | | | Screw driver | Tightening torque | |
|---|-----------------------|-----------------------|--------------------------------|--|--|--------------------------------------|
| | Screw with washer | Screw with clamp box | Screw w. nut | | Nm | lb. inch |
| Micro Contactors , all conductors K0-.. | M2,5 | - | - | Pz1 | 0,6 - 0,8 | 5 - 7 |
| Mini Contactors , all conductors K1-.. | M3,5 | - | - | Pz2 | 0,8 - 1,4 | 7 - 12 |
| Contactors Relays , all conductors K(G)3-07.. | M3,5 | - | - | Pz2 | 0,8 - 1,4 | 7 - 12 |
| Contactors 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 K2-45, -60A00-40 | M4 - | - M6 | - - | Pz2 Pz3 | 1,2 - 1,8 3,5 - 4,5 | 11 - 16 31 - 40 |
| K3-90, K3-115 | - | - | M8 | 4mm hex socket | 4 - 6,5 | 35 - 57 |
| K3-116.. bis K3-176.. K3-210.. bis K3-316.. K3-450.. bis K3-700.. K3-860.. K3-1000.., K3-1200.. | - - - - - | - - - - - | M8 M10 M12 M14 M12 | | 17 35 60 75 60 | 150 315 540 675 540 |
| Auxiliary conductor K(G)3-10 bis K3-22 | M3,5 | - | - | Pz2 | 0,8 - 1,4 | 7 - 12 |
| Coil conductor K(G)3-10 bis K3-1200 | M3,5 | - | - | Pz2 | 0,8 - 1,4 | 7 - 12 |
| Accessories HK, HKM HA, HN, K2-..., HB.. | M3,5 M3,5 | - - | - - | Pz2 Pz2 | 0,8 - 1,4 0,8 - 1,4 | 7 - 12 7 - 12 |
| Thermal Overload Relays Main conductor | | | | | | |
| U12/16 | M4 | - | - | Pz2 | 1,2 - 1,8 | 11 - 16 |
| U3/32 U3/42 U3/74 | M3,5 M5 - | - - M6 | - - - | Pz2 Pz2 Pz3 | 0,8 - 1,4 2,5 - 3 3,5 - 4,5 | 7 - 12 22 - 26 31 - 40 |
| UAT21 UAT22 UAT23 | - - - | M4 M4 M5 | - - - | Size 3, 4 Size 3, 4 Size 3, 4, 5 | 1,2 - 1,8 1,2 - 1,8 2,5 - 3 | 11 - 16 11 - 16 22 - 26 |
| Auxiliary conductor All devices | M3,5 | - | - | Pz2 | 0,8 - 1,4 | 7 - 12 |
| Contactors for Distribution Boards Conductors | | | | | | |
| R20, R25 R40, R63 K1R | - - M3,5 | M3,5 M5 - | - - - | Pz1 Pz2 Pz2 | 0,8 - 1,4 2,5 - 3 0,8 - 1,4 | 7 - 12 22 - 26 7 - 12 |
| Coil conductor R20, R25 R40, R63 (2pole / 4 pole) K1R RH11 | - - M3,5 - | M3 M3 - M3 | - - - - | Pz1 Pz1 Pz2 Pz1 | 0,6 - 1,2 0,6 - 1,2 0,8 - 1,4 0,6 - 1,2 | 5 - 11 5 - 11 7 - 12 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. Number | Additional Contact | | |
| | 24 | | | 24V 50/60Hz |
| | 230 | | | 220-240V 50Hz/60Hz |

AC15

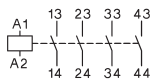
| Rated Current I_{th} A | 400V A | NO | NC | acc. to EN50011 | Blocks Type | ↓ | Pack pcs. | Weight kg/pc. |
|--------------------------|--------|----|----|-----------------|-------------|---|-----------|---------------|
|--------------------------|--------|----|----|-----------------|-------------|---|-----------|---------------|

4-pole, with Screw Terminals

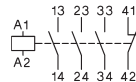
| | | | | | | | | | |
|----------|-----|---|---|---|-----|---|---------------------|----|------|
| 3 | 1,5 | 5 | 4 | - | 40E | - | K0-04D40 ... | 10 | 0,07 |
| 3 | 1,5 | 5 | 3 | 1 | 31E | - | K0-04D31 ... | 10 | 0,07 |
| 3 | 1,5 | 5 | 2 | 2 | 22E | - | K0-04D22 ... | 10 | 0,07 |



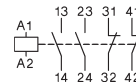
K0-04D40



K0-04D31



K0-04D22



1) Other coil voltages see page 16.

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

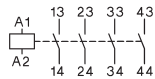
DC Operated

| Ratings Therm. | Contacts ²⁾ | Distinc. Number | Additional Contact | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|-------------------------------------|------------------------|-----------------|--------------------|-----------------|------------------------------|-----------|---------------|
| AC15 | Rated Current | | | | = 24 = 24VS | | |
| 230V A | 400V A | I_{th} A | NO NC | acc. to EN50011 | | | |
| 4-pole, with Screw Terminals | | | | | | | |

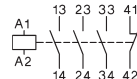


| | | | | | | | | | |
|----------|-----|---|---|---|-----|---|----------------------|----|------|
| 3 | 1,5 | 5 | 4 | - | 40E | - | K0-04D40= ... | 10 | 0,09 |
| 3 | 1,5 | 5 | 3 | 1 | 31E | - | K0-04D31= ... | 10 | 0,09 |
| 3 | 1,5 | 5 | 2 | 2 | 22E | - | K0-04D22= ... | 10 | 0,09 |

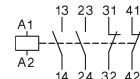
K0-04D40



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.
 3) with integrated coil suppressor (Transient Voltage Suppressor Diode)

Micro Contactors

AC Operated



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

3-pole, with Screw Terminals

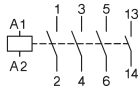
| | | | | | | | | |
|-----|---|----|---|---|---|---------------------|----|------|
| 2,2 | - | 12 | 1 | - | - | K0-05D10 ... | 10 | 0,07 |
|-----|---|----|---|---|---|---------------------|----|------|

| | | | | | | | | |
|-----|---|----|---|---|---|---------------------|----|------|
| 2,2 | - | 12 | - | 1 | - | K0-05D01 ... | 10 | 0,07 |
|-----|---|----|---|---|---|---------------------|----|------|

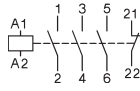
4-pole, With Screw Terminals

| | | | | | | | | |
|-----|---|----|---|---|---|------------------------|----|------|
| 2,2 | - | 12 | - | - | - | K0-05D00-40 ... | 10 | 0,07 |
|-----|---|----|---|---|---|------------------------|----|------|

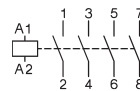
K0-05D10



K0-05D01



K0-05D00-40



1) Other coil voltages see page 16.

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 ²⁾ | | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|--|--------------------|-----------------------------|------------|----------------|--|-----------|---------------|
| | | Built-in | Additional | | | | |
| AC2, AC3 | AC1 | | | = 24 = 24VS | 24V= DC 24V= DC with protection ³⁾ | | |
| 380V 400V 415V kW | 660V 690V kW | 440V A | NO NC | Blocks Type | | | |



3-pole, with Screw Terminals

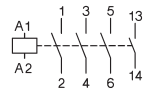
| | | | | | | | | |
|-----|---|----|---|---|---|----------------------|----|------|
| 2,2 | - | 12 | 1 | - | - | K0-05D10= ... | 10 | 0,09 |
|-----|---|----|---|---|---|----------------------|----|------|

| | | | | | | | | |
|-----|---|----|---|---|---|----------------------|----|------|
| 2,2 | - | 12 | - | 1 | - | K0-05D01= ... | 10 | 0,09 |
|-----|---|----|---|---|---|----------------------|----|------|

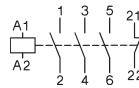
4-pole, With Screw Terminals

| | | | | | | | | |
|-----|---|----|---|---|---|-------------------------|----|------|
| 2,2 | - | 12 | - | - | - | K0-05D00-40= ... | 10 | 0,09 |
|-----|---|----|---|---|---|-------------------------|----|------|

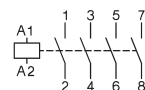
K0-05D10



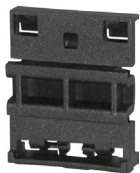
K0-05D01



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 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)

Micro Contactors

AC Operated

| Power Ratings | Rated Current | Aux. Contacts ²⁾ | | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|------------|------|----------------------------|-----------|---------------|
| | | Built in | Additional | | | | |
| AC2, AC3 | AC1 | | | | 24V 50/60Hz | | |
| 380V | | | | | 220-240V 50Hz/60Hz | | |
| 400V | 660V | | | | | | |
| 415V | 690V | 440V | | | | | |
| kW | kW | A | | | | | |



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

| | | | | | | | | |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | 1 | - | - | K0-05L10 ... | 10 | 0,07 |
|-----|---|---|---|---|---|---------------------|----|------|

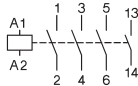
| | | | | | | | | |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | - | 1 | - | K0-05L01 ... | 10 | 0,07 |
|-----|---|---|---|---|---|---------------------|----|------|

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

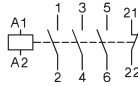
| | | | | | | | | |
|-----|---|---|---|---|---|------------------------|----|------|
| 2,2 | - | 9 | - | - | - | K0-05L00-40 ... | 10 | 0,07 |
|-----|---|---|---|---|---|------------------------|----|------|



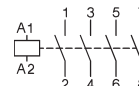
K0-05L10



K0-05L01



K0-05L00-40



Coil voltages for AC operated contactors

| Suffix to contactor type e.g. K0-05D10 24 | Voltage Marking at the coil for | | Rated Control Voltage U _s range for 50Hz | | | | for 60Hz | |
|---|---------------------------------|-----------|---|-----------|-----------|-----------|----------|------|
| | 50Hz | 60Hz | min. | max. | min. | max. | min. | max. |
| 12 | 12 | 12 | 11 | 12 | 12 | 12 | | |
| 24 | 24 | 24 | 22 | 24 | 24 | 24 | | |
| 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 e.g. K0-05D10 230 | Voltage Marking at the coil for | | Rated Control Voltage U _s 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 | | |
| 230 | 220-230 | 230-250 | 220 | 230 | 230 | 250 | | |
| 240 | 230-240 | | 230 | 240 | 250 | 260 | | |

Standard voltages in bold type letters
Operating range of magnet-coils: 0,85 x U_s
(min. value of rated control voltage)
up to 1,1 x U_s
(max. value of rated control voltage)

Coil not exchangeable

1) Other coil voltages see above table.

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 ²⁾ | | Type | Coil voltage ¹⁾ = 24 24V= DC = 24VS 24V= DC with protection ³⁾ | Pack pcs. | Weight kg/pc. |
|--|-------------------|-----------------------------|------------|------|--|-----------|---------------|
| | | Built in | Additional | | | | |
| AC2, AC3 380V 400V 415V kW | 660V 690V A | AC1 | | | | | |
| | | | NO NC | Type | | | |

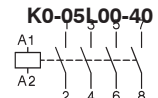
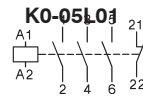
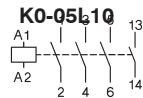


3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

| | | | | | | | | |
|-----|---|---|---|---|---|---------------------|----|------|
| 2,2 | - | 9 | 1 | - | - | K0-05L10 ... | 10 | 0,07 |
| 2,2 | - | 9 | - | 1 | - | K0-05L01 ... | 10 | 0,07 |

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

| | | | | | | | | |
|-----|---|---|---|---|---|------------------------|----|------|
| 2,2 | - | 9 | - | - | - | K0-05L00-40 ... | 10 | 0,07 |
|-----|---|---|---|---|---|------------------------|----|------|



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)

Micro Reversing Contactors, Mechanical Interlocked

AC Operated

| Power Ratings | Rated Current | Aux. Contacts ²⁾ | | Type | Coil voltage ¹⁾ 24V 50/60Hz 220-240V 50Hz/60Hz | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|------------|---------|---|-----------|---------------|
| | | Built-in | Additional | | | | |
| AC2, AC3 | AC1 | | | | | | |
| 380V | | | | | | | |
| 400V | 660V | | | | | | |
| 415V | 690V | 440V | | | | | |
| kW | kW | A | NO NC | K1 Type | K2 Type | | |

3-pole, with Screw Terminals



| | | | | | | | | | |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | - | 2 | - | - | K0W05D01MS ... | 1 | 0,14 |
|-----|---|----|---|---|---|---|-----------------------|---|------|

| | | | | | | | | | |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | 2 | - | - | - | K0W05D10MS ... | 1 | 0,14 |
|-----|---|----|---|---|---|---|-----------------------|---|------|

4-pole, with Screw Terminals



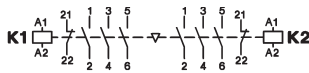
| | | | | | | | | | |
|-----|---|----|---|---|---|---|--------------------------|---|------|
| 2,2 | - | 12 | - | - | - | - | K0W05D00-40MS ... | 1 | 0,14 |
|-----|---|----|---|---|---|---|--------------------------|---|------|

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

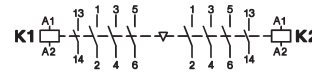
| | | | | | | | | | |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx ³⁾ | - | 2 | - | - | K0W05L01MS ... | 1 | 0,14 |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|

| | | | | | | | | | |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx ³⁾ | 2 | - | - | - | K0W05L10MS ... | 1 | 0,14 |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|

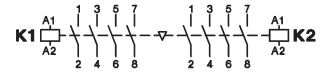
K0W05D01MS



K0W05D10MS



K0W05D00-40MS



Reversing Starter Connector



For Reversing Starter Types, incl. Coil Connector

| Type | Pack pcs. | Weight kg/pc. |
|-------------------|---------------|---------------|
| K0W05D..MS | K0W-VB | 1 0,01 |

1) Other coil voltages see page 16.
 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 ²⁾ | | Type | | Coil voltage ¹⁾ = 24 24V= DC = 24VS 24V= DC with protection ³⁾ | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|--------------------|----------|---------------------|--|-----------|---------------|
| | | Built-in | Additional on left | on right | hand side Contactor | | | |
| AC2, AC3 | AC1 | | | | | | | |
| 380V | | | | | | | | |
| 400V | 660V | | | | | | | |
| 415V | 690V | 440V | | | | | | |
| kW | kW | A | NO NC | K1 Type | K2 Type | | | |



3-pole, with Screw Terminals

| | | | | | | | | | |
|-----|---|----|---|---|---|---|-----------------------|---|------|
| 2,2 | - | 12 | - | 2 | - | - | K0W05D01MS ... | 1 | 0,14 |
| 2,2 | - | 12 | 2 | - | - | - | K0W05D10MS ... | 1 | 0,14 |

4-pole, with Screw Terminals

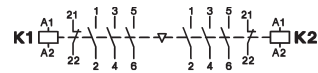
| | | | | | | | | | |
|-----|---|----|---|---|---|---|--------------------------|---|------|
| 2,2 | - | 12 | - | - | - | - | K0W05D00-40MS ... | 1 | 0,14 |
|-----|---|----|---|---|---|---|--------------------------|---|------|



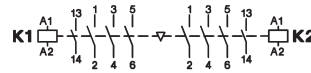
3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

| | | | | | | | | | |
|-----|---|-------------------|---|---|---|---|-----------------------|---|------|
| 2,2 | - | xxx ⁴⁾ | - | 2 | - | - | K0W05L01MS ... | 1 | 0,14 |
| 2,2 | - | xxx ⁴⁾ | 2 | - | - | - | K0W05L10MS ... | 1 | 0,14 |

K0W05D01MS



K0W05D10MS



K0W05D00-40MS



- 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) Data on request.

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

Micro Contactors

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

| Main Contacts | Type | K0-05D.. | K0-05L.. |
|---|--|--|-------------------|
| Rated insulation voltage U_i | V AC | 440 ¹⁾ | 440 ¹⁾ |
| Making capacity I_{eff} at $U_e = 440V$ AC | A | 65 | 65 |
| Breaking capacity I_{eff} $\cos\phi = 0,65$ | 400V AC A | 50 | 50 |
| Utilization category AC1 | | | |
| Switching of resistive load | | | |
| Rated operational current $I_e (=I_{th})$ at 40°C, open | A | 12 | 9 |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 230V kW | 4,7 | 3,5 |
| | 240V kW | 4,8 | 3,7 |
| | 400V kW | 8,3 | 3,3 |
| | 415V kW | 8,6 | 6,4 |
| | 440V kW | 9,0 | 6,8 |
| Rated operational current $I_e (=I_{th})$ at 60°C, enclosed | A | 8 | 6 |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 230V kW | 3,1 | 2,3 |
| | 240V kW | 3,3 | 2,4 |
| | 400V kW | 5,5 | 4,1 |
| | 415V kW | 5,7 | 4,3 |
| | 440V kW | 6,0 | 4,5 |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$ | mm ² | 1,5 | - |
| Utilization category AC2 and AC3 | | | |
| Switching of three-phase motors | | | |
| Rated operational current I_e open and enclosed | 220V A | 6,2 | 6,2 |
| | 230V A | 6,2 | 6,2 |
| | 240V A | 5,6 | 5,6 |
| 380-400V | A | 5 | 5 |
| | 415-440V A | 5 | 5 |
| Rated operational power of three-phase motors 50-60Hz | 220-240V kW | 1,5 | 1,5 |
| | 380-440V kW | 2,2 | 2,2 |
| Utilization category AC4 | | | |
| Switching of squirrel cage motors, inching | | | |
| Rated operational current I_e open and enclosed | 220V A | 4,9 | 4,9 |
| | 230V A | 4,9 | 4,9 |
| | 240V A | 4,1 | 4,1 |
| 380-400V | A | 3,5 | 3,5 |
| | 415-440V A | 3,5 | 3,5 |
| Rated operational power of three-phase motors 50-60Hz | 220-240V kW | 1,1 | 1,1 |
| | 380-440V kW | 1,5 | 1,5 |
| Utilization category AC5a | | | |
| Switching of gas discharge lamps | | | |
| Rated operational current I_e per pole at 220/230V | | | |
| Fluorescent lamps, uncompensated and serial compensated parallel compensated dual-connection | A | 6 | 6 |
| | A | 0,5 | 0,5 |
| | A | 9 | 9 |
| Metal halide lamps ²⁾ , uncompensated parallel compensated | A | 6 | 6 |
| | A | 0,5 | 0,5 |
| Mercury-vapour lamps ³⁾ , uncompensated parallel compensated | A | 9 | 9 |
| | A | 0,5 | 0,5 |
| Mixed light lamps ⁴⁾ | A | 9 | 9 |
| LED-Lamps | | | |
| consider the inrush current of the lamp ballast 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 |
| Utilization category AC5b | | | |
| Switching of incandescent lamps⁵⁾ | | | |
| Rated operational current I_e 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.. |
|---|-----------------------------------|--------------------|------|--------------------------------|------------------|
| Utilization category DC1 | | | | | |
| Switching of resistive load | 1 pole | 24V - 60V | A | 12 | 9 |
| Time constant L/R ≤1ms | | 110V | A | 2 | 2 |
| Rated operational current I _e | | 180V | A | 0,6 | 0,6 |
| | | 220V | A | 0,4 | 0,4 |
| | 2 poles in series | 24V - 110V | A | 12 | 9 |
| | | 180V - 220V | A | 2 | 2 |
| | 3 poles in series | 24V - 180V | A | 12 | 9 |
| | | 220V | A | 8 | 8 |
| Utilization category DC3 and DC5 | | | | | |
| Switching of shunt motors and series motors | 1 pole | 24V | A | 12 | 9 |
| Time constant L/R ≤15ms | | 60V | A | 4 | 4 |
| Rated operational current I _e | | 110V | A | 1 | 1 |
| | | 180V | A | 0,5 | 0,5 |
| | | 220V | A | 0,3 | 0,3 |
| | 2 poles in series | 24V - 60V | A | 12 | 9 |
| | | 110V | A | 4 | 4 |
| | | 180V - 220V | A | 1 | 1 |
| | 3 poles in series | 24V - 60V | A | 12 | 9 |
| | | 110V | A | 6 | 6 |
| | | 180V - 220V | A | 1 | 1 |
| Maximum ambient temperature | | | | | |
| Operation with thermal overload relay | open | °C | | -40 to +60 (+90) ¹⁾ | |
| | enclosed | °C | | -40 to +40 | |
| | open | °C | | -25 to +60 | |
| | enclosed | °C | | -25 to +40 | |
| Storage | | °C | | -50 to +90 | |
| Short circuit protection for contactors without thermal overload relay | | | | | |
| Rated short circuit current | "r" / "Iq" | kA | | 1 | 1 |
| Coordination-type "1" according to IEC 947-4-1 Contact welding without hazard of persons max. fuse size | gL (gG) | A | | 32 | 32 |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. | | | | | |
| Cable cross-sections for contactors | | | | | |
| main connector | solid or stranded | mm ² | | 0,5 - 1,5 | Solder Connector |
| | flexible | mm ² | | 0,5 - 1,5 | Ø 1,15 |
| Cables per clamp | flexible with multicore cable end | mm ² | | 0,5 - 1,5 | - |
| | solid or stranded | AWG | | 2 | - |
| | | | | 20 - 14 | - |
| Frequency of operation z contactors without thermal overload relay | | | | | |
| | without load | 1/h | | 10000 | 10000 |
| | AC3, I _e | 1/h | | 600 | 600 |
| | AC4, I _e | 1/h | | 120 | 120 |
| | DC3, I _e | 1/h | | 600 | 600 |
| Mechanical life | | | | | |
| | AC operated | S x10 ⁶ | | 3 | 3 |
| | DC operated | S x10 ⁶ | | 4 | 4 |
| Short time current | | | | | |
| | 10s-current | A | | 50 | 50 |
| Power loss per pole | | | | | |
| | at I _e /AC3 400V | W | | 0,2 | 0,2 |
| Resistance to shock according to IEC 68-2-27 | | | | | |
| 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_s and with reduced rated current I_e/AC1 according to I_e/AC3.

Micro Contactors

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

| Auxiliary Contacts | | | Type | K0-04D.. K0-05D.. | K0-04L.. K0-05L.. |
|--|-----------------------------------|-----------------|-----------|--------------------------------|----------------------|
| Rated insulation voltage | U_i | VAC | | 440 ¹⁾ | 440 ¹⁾ |
| Thermal rated current I_{th} to 440V | | | | | |
| Ambient temperature | 40°C | A | | 5 | 5 |
| | 60°C | A | | 3 | 3 |
| Power loss per pole | at I _{th} | W | | 0,25 | 0,25 |
| Utilization category AC15 | | | | | |
| Rated operational current I _e | 220-240V | A | | 3 | 3 |
| | 380-415V | A | | 1,5 | 1,5 |
| | 440V | A | | 1 | 1 |
| Utilization category DC13 | | | | | |
| Rated operational current I _e | 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 |
| Maximum ambient temperature | | | | | |
| Operation | open | °C | | -40 to +60 (+90) ²⁾ | |
| | enclosed | °C | | -40 to +40 | |
| Storage | | °C | | -40 to +90 | |
| Short circuit protection | | | | | |
| short-circuit current 1kA, contact welding not accepted 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. | | | | | |
| Power consumption of coils | | | | | |
| 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 |
| Operation range of coils | | | | | |
| in multiples of control voltage U _s | | AC | | 0,85 - 1,1 | 0,85 - 1,1 |
| | | DC | | 0,8 - 1,1 | 0,8 - 1,1 |
| Switching time at control voltage U _s ±10% ^{3) 4)} | | | | | |
| 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 |
| Cablecross-section | | | | | |
| all connectors | solid | mm ² | | 0,5 - 1,5 | Solder Connector |
| | flexible | mm ² | | 0,5 - 1,5 | Ø 1,15 |
| | flexible with multicore cable end | mm ² | | 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_{imp} = 4kV.
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} to I_e/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.

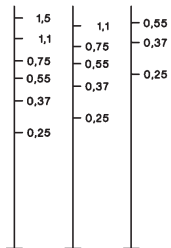
Micro Contactors for North America

Data according to UL508

| Main Contacts (cULus) | | Type | K0-05D.. 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 | - |
| | 440-480V | hp | 2 1/2 | - | 2 1/2 | - |
| Rated operational power of AC motors at 60Hz (1ph / 2-pole break) | 110-120V | hp | 1/6 | - | 1/6 | - |
| | 200-208V | hp | 1/3 | - | 1/3 | - |
| | 220-240V | hp | 1/2 | - | 1/2 | - |
| | 277V | hp | 3/4 | - | 3/4 | - |
| | 440-480V | hp | 1 | - | 1 | - |
| Fuse / Short-circuit current | | A/kA | 30/5 | - | 30/5 | - |
| Rated voltage | | VAC | 480 | 480 | 480 | 480 |
| Auxiliary Contacts (cULus) | | | | | | |
| | heavy pilot duty | AC | B300 | B300 | B300 | B300 |
| | standard pilot duty | DC | R300 | R300 | R300 | R300 |

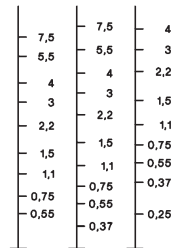
Motor Rating P_n = AC4

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

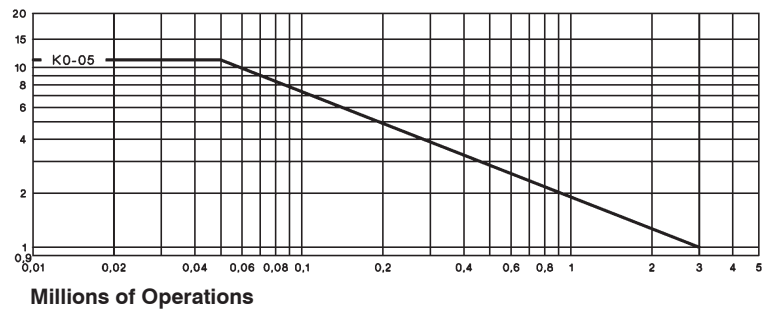


Motor Rating P_n = AC3

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



Breaking Current I_a (= I_e = AC1) A

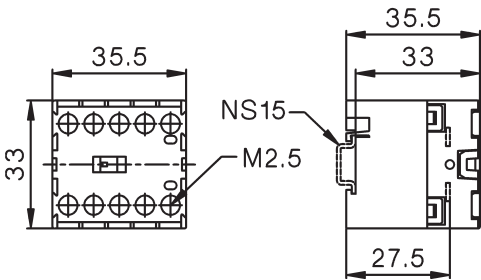


Micro Contactors

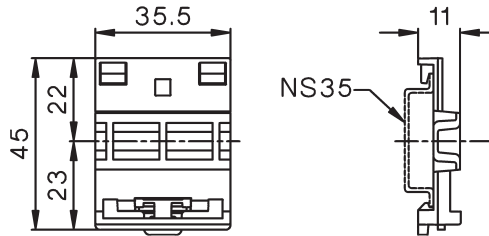
Dimensions

AC or DC operated
with screw terminals

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

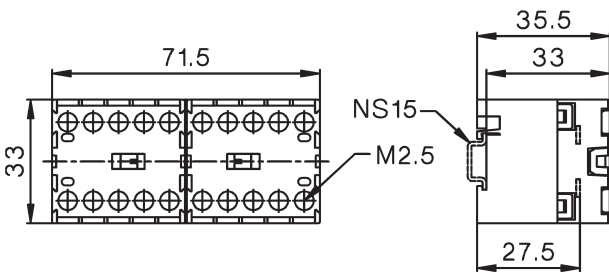


Snap-On Adapter P1039

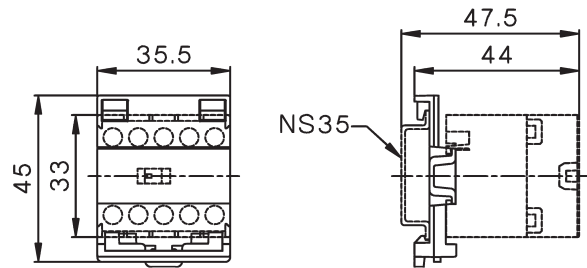


Reversing Contactors
with screw terminals

K0W05D..MS

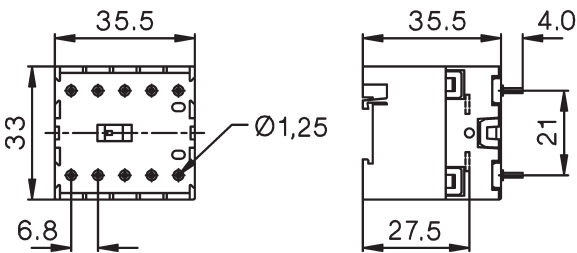


K0...D.. with Snap-On Adapter P1039



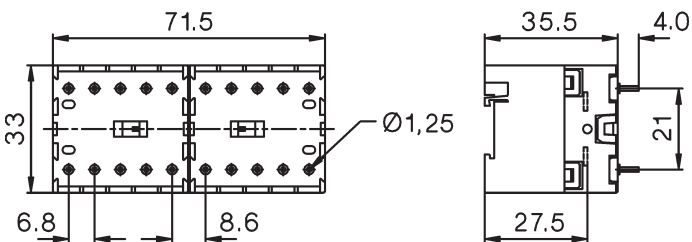
AC or DC operated
with solder connections






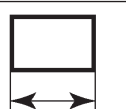
K0-04L.. (=)
K0-05L.. (=)



Reversing Contactors
with solder connections

K0W05L..MS



| | | |
|---|--|-----------|
|  | <p>Mini Contactor Relays 4-pole Auxiliary Contact Blocks</p> | <p>26</p> |
| | <p>Interface Contactor Relays</p> | <p>27</p> |
|  | <p>Mini Contactors 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>30</p> |
| | <p>Coil voltages</p> | <p>30</p> |
|  | <p>Mini Reversing Contactors 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 ²⁾ | | Type | Coil voltage ¹⁾ |
|---------------|------------------------|------------------------|-------------|------|----------------------------|
| | | Additional Contact | Blocks Type | | |
| AC15 | Rated Current I_{th} | NO | NC | | |
| 230V A | 400V A | acc. to EN50011 | | | |

| Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|--------------|---|-----------|---------------|
| 24 | 24V 50/60Hz | | |
| 230 | 220-230V 50Hz | | |
| 24VS | 24V 50/60Hz w. protection ³⁾ | | |
| 230VS | 220-230V 50Hz w. protection ³⁾ | | |
| 24VM | 24V 50/60Hz 24V= DC ³⁾ | | |
| 230VM | 220-240V 50/60Hz 220V= DC ³⁾ | | |

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 |

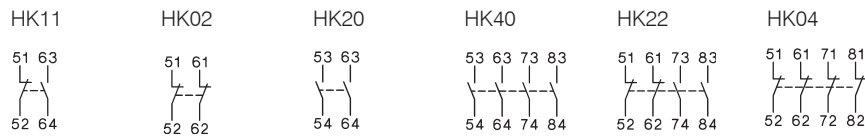
Auxiliary Contact Blocks For Contactor Relays ⁴⁾



| Ratings | Thermal Rated Current | Contacts ²⁾ | Type | Pack pcs. | Weight kg/pc. |
|---------------|-----------------------|------------------------|-------------|-----------|---------------|
| AC15 | | NO NC | | | |
| 230V A | 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 ⁴⁾

Wiring Diagrams



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

| | | | | | | |
|----------|------------|------------|------------|------------|------------|------------|
| K1-07D40 | 51E | 42E | 60E | 80E | 62E | 44E |
| 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)

4) Auxiliary Contact Blocks with NO and NC contacts for DC operated Contactor Relays have linked contacts.



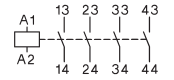
DC Solenoid Operated

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

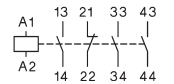
4-pole, With Screw Terminals, Coil 2,5W



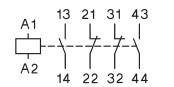
| | | | | | | |
|----------------------|---|---|-----|--------|----|------|
| K1-07D40= ... | 4 | - | 40E | 1 HK.. | 10 | 0,19 |
|----------------------|---|---|-----|--------|----|------|



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



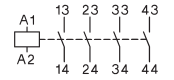
| | | | | | | |
|----------------------|---|---|-----|--------|----|------|
| K1-07D22= ... | 2 | 2 | 22E | 1 HK.. | 10 | 0,19 |
|----------------------|---|---|-----|--------|----|------|



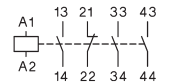
4-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor ³⁾



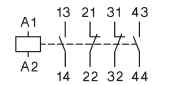
| | | | | | | |
|-----------------------|---|---|---|---|----|------|
| K1-07D40= 24VR | 4 | - | - | - | 10 | 0,20 |
|-----------------------|---|---|---|---|----|------|



| | | | | | | |
|-----------------------|---|---|---|---|----|------|
| K1-07D31= 24VR | 3 | 1 | - | - | 10 | 0,20 |
|-----------------------|---|---|---|---|----|------|



| | | | | | | |
|-----------------------|---|---|---|---|----|------|
| K1-07D22= 24VR | 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...

Linked contacts acc. IEC60947-5-1 Annex L...



3) with integrated coil suppressor (Transient Voltage Suppressor Diode)

Mini Contactors

AC Operated

| Power Ratings | Rated Current | Aux. Contacts ²⁾ | | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|---------------|---------------|-----------------------------|------------|------|---|-----------|---------------|
| | | Built-in | Additional | | | | |
| AC2, AC3 | AC1 | | | | 24V 50/60Hz | | |
| 380V | | | | | 220-230V 50Hz | | |
| 400V | 660V | | | | 24V 50/60Hz w. protection ³⁾ | | |
| 415V | 690V | 690V | | | 220-230V 50Hz w. protection ³⁾ | | |
| kW | kW | A | | | 24V = DC ³⁾ | | |
| | | | NO NC | Type | 220-240V 50/60Hz 220V = DC ³⁾ | | |



3-pole, With Screw Terminals

| | | | | | | | | |
|------------|-----|----|---|---|---------|---------------------|----|------|
| 4 | 4 | 20 | 1 | - | 1 HKM.. | K1-09D10 ... | 10 | 0,16 |
| 5,5 | 5,5 | 20 | 1 | - | 1 HKM.. | K1-12D10 ... | 10 | 0,16 |

| | | | | | | | | |
|------------|-----|----|---|---|-------|---------------------|----|------|
| 4 | 4 | 20 | - | 1 | 1HK.. | K1-09D01 ... | 10 | 0,16 |
| 5,5 | 5,5 | 20 | - | 1 | 1HK.. | K1-12D01 ... | 10 | 0,16 |

4-pole, With Screw Terminals

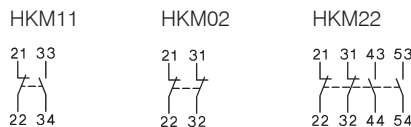
| | | | | | | | | |
|------------|-----|----|---|---|-------|------------------------|----|------|
| 4 | 4 | 20 | - | - | 1HK.. | K1-09D00-40 ... | 10 | 0,16 |
| 5,5 | 5,5 | 20 | - | - | 1HK.. | K1-12D00-40 ... | 10 | 0,16 |

Auxiliary Contact Blocks for Contactors K1-..⁴⁾

| Ratings | AC15 | 400V | Thermal Rated Current | Contacts ²⁾ | Type | Pack pcs. | Weight kg/pc. |
|----------|------|------|-----------------------|------------------------|--------------|-----------|---------------|
| | | | | | | | |
| 3 | 2 | 10 | 1 | 1 | HKM11 | 10 | 0,04 |
| 3 | 2 | 10 | - | 2 | HKM02 | 10 | 0,04 |
| 3 | 2 | 10 | 2 | 2 | HKM22 | 10 | 0,04 |

Aux. Contact Blocks ⁴⁾

Wiring Diagrams



Contactors with Auxiliary Contact Block

Contacts according to EN50012

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

Contacts according to DIN EN50005

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

Prefer combinations according to EN50012.

HK.. Aux. Contact Blocks (page 26) fit on Mini-Contactors but do not meet the terminal markings acc. to EN50012.

Suppressor Units for Contactors K1-..



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



4) Auxiliary Contact Blocks with NO and NC contacts for DC operated Mini-Contactors have linked contacts...

DC Solenoid Operated

Type

Coil voltage ¹⁾
24 24V= DC
24VS 24V= DC with protection ³⁾



Aux. Contacts ²⁾
 Built in Additional
 
 NO NC

Additional Overload Relay
 see page 114
 Type

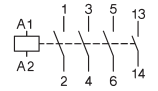
Pack pcs. Weight kg/pc.

Wiring Diagrams

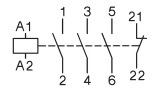


3-pole, With Screw Terminals, Coil 2,5W

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

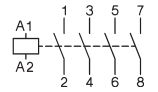


| | | | | | | |
|----------------------|---|---|--------|------------|----|------|
| K1-09D01= ... | - | 1 | 1 HK.. | U12/16..K1 | 10 | 0,19 |
| K1-12D01= ... | - | 1 | 1 HK.. | U12/16..K1 | 10 | 0,19 |



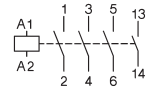
4-pole, With Screw Terminals, Coil 2,5W

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

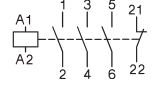


3-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor ³⁾

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



| | | | | | | |
|-------------------------|---|---|---|------------|----|------|
| K1-09D01= 24VR - | - | 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 ²⁾ | | Type | Coil voltage ¹⁾ |
|---------------|---------------|-----------------------------|------------|------|---|
| | | Built in | Additional | | |
| AC2, AC3 | AC1 | | | | 24V 50/60Hz |
| 380V | | | | | 220-230V 50Hz |
| 400V | 660V | | | | 24V 50/60Hz w. protection ³⁾ |
| 415V | 690V | 690V | | | 220-230V 50Hz w. protection ³⁾ |
| kW | kW | A | NO NC | Type | 24V DC |
| | | | | | 220-240V 50/60Hz 220V DC |
| | | | | | Pack Weight |
| | | | | | pcs. kg/pc. |

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



| | | | | | | | | |
|---|---|----|---|---|---------|---------------------|----|------|
| 4 | 4 | 16 | 1 | - | 1 HKM.. | K1-09F10 ... | 10 | 0,16 |
| 4 | 4 | 16 | - | 1 | 1 HK.. | K1-09F01 ... | 10 | 0,16 |

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



| | | | | | | | | |
|---|---|----|---|---|---|---------------------|----|------|
| 4 | 4 | 16 | 1 | - | - | K1-09L10 ... | 10 | 0,16 |
| 4 | 4 | 16 | - | 1 | - | K1-09L01 ... | 10 | 0,16 |

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

| | | | | | | | | |
|---|---|----|---|---|---|------------------------|----|------|
| 4 | 4 | 16 | - | - | - | K1-09L00-40 ... | 10 | 0,16 |
|---|---|----|---|---|---|------------------------|----|------|

Coil voltages for AC operated contactors

| Suffix to contactor type e.g. K1-09D10 24 | Voltage Marking | | Rated Control Voltage U _s | | | |
|---|----------------------|-----------|--------------------------------------|-----------|-----------|-----------|
| | at the coil for 50Hz | for 60Hz | range for 50Hz | | for 60Hz | |
| | V | V | min. | max. | min. | max. |
| 12 | 12 | 12 | 11 | 12 | 12 | 12 |
| 24 | 24 | 24 | 22 | 24 | 24 | 24 |
| 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 |
| 190R ⁴⁾ | 200-240 | 200-240 | 200 | 240 | 200 | 240 |

| Suffix to contactor type e.g. K1-09D10 230 | Voltage Marking | | Rated Control Voltage U _s | | | |
|--|----------------------|----------------|--------------------------------------|------------|------------|------------|
| | at the coil for 50Hz | for 60Hz | range for 50Hz | | for 60Hz | |
| | V | V | 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 |
| 230 | 220-230 | 230-250 | 220 | 230 | 230 | 250 |
| 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_s (min. value of rated control voltage) up to 1,1 x U_s (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)

4) Reduction of mechanical life to 25% of normal life. It is not admissible as a spare coil in a contactor with different coil voltages.

DC Solenoid Operated

Type

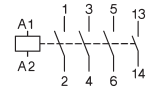
| Coil voltage ¹⁾ | Aux. Contacts ²⁾ | Additional | Pack | Weight |
|---|-----------------------------|--------------------------|------|--------|
| 24 24V= DC | Built | Overload | pcs. | kg/pc. |
| 24VS 24V= DC with protection ³⁾ | in | Relay see pages 115, 117 | | |
| ↓ | NO NC | Type | | |



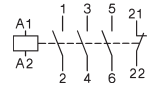
3-pole, with Fast On Tab Connectors 1 x 6,3mm or 2 x 2,8mm

| | | | | | |
|------------------------|---|---|-----------------------|----|------|
| K1-09F10= . . . | 1 | - | 1 HKM.. ⁴⁾ | 10 | 0,19 |
|------------------------|---|---|-----------------------|----|------|

Wiring Diagrams

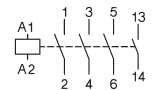


| | | | | | |
|------------------------|---|---|----------------------|----|------|
| K1-09F01= . . . | - | 1 | 1 HK.. ⁴⁾ | 10 | 0,19 |
|------------------------|---|---|----------------------|----|------|

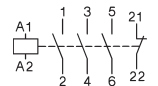


3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

| | | | | | |
|------------------------|---|---|---|----|------|
| K1-09L10= . . . | 1 | - | - | 10 | 0,19 |
|------------------------|---|---|---|----|------|

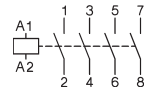


| | | | | | |
|------------------------|---|---|---|----|------|
| K1-09L01= . . . | - | 1 | - | 10 | 0,19 |
|------------------------|---|---|---|----|------|



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

| | | | | | |
|---------------------------|---|---|---|----|------|
| K1-09L00-40= . . . | - | - | - | 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 ²⁾ | | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|---------------|---------------|----------|-----------------------------|--|---------|---|-----------|---------------|
| | | | Built-in | Additional on left hand side Contactor | | | | |
| AC2, AC3 | | | | | | 24V 50/60Hz | | |
| 380V | | | | | | 220-230V 50Hz | | |
| 400V | 660V | | | | | 24V 50/60Hz w. protection ³⁾ | | |
| 415V | 690V | 690V | | | | 220-230V 50Hz w. prot. ³⁾ | | |
| kW | kW | A | | | | 24V 50/60Hz 24V DC | | |
| | | | NO NC | K1 Type | K2 Type | 220-240V 50/60Hz 220V DC | | |

3-pole, with Screw Terminals



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

4-pole, with Screw Terminals

| | | | | | | | | | |
|------------|-----|----|---|---|-------|--|-------------------------|---|------|
| 4 | 4 | 20 | - | - | HKM.. | | K1W09D00-40MC .. | 1 | 0,32 |
| 5,5 | 5,5 | 20 | - | - | HKM.. | | K1W12D00-40MC .. | 1 | 0,32 |

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



| | | | | | | | | | |
|----------|---|----|---|---|---|---|-----------------------|---|------|
| 4 | 4 | 16 | - | 2 | - | - | K1W09L01MC ... | 1 | 0,32 |
| 4 | 4 | 16 | 2 | - | - | - | K1W09L10MC ... | 1 | 0,32 |

Auxiliary Contact Blocks for Mini Reversing Contactors K1-..

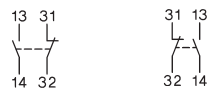
| Ratings | AC15 | 400V | Thermal Rated Current | Contacts ²⁾ | | Type | Pack pcs. | Weight kg/pc. |
|----------|------|------|-----------------------|------------------------|----|---------------|-----------|---------------|
| | | | | NO | NC | | | |
| 3 | 2 | | 10 | 1 | 1 | HKM11V | 10 | 0,04 |
| 3 | 2 | | 10 | 1 | 1 | HKM11X | 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. |
|-------------------------------|-----------|---------------|
| K1W09D..MC, K1W12D..MC | 1 | 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

24 Coil voltage ¹⁾
24VS 24V= DC
 ↓ 24V= DC with protection ²⁾

Additional
 Overload
 Relay
 see
 page 114
 Type

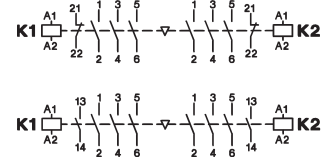
Pack
 pcs. Weight
 kg/pc.

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

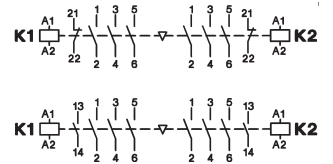
| | | | |
|-------------------|------------|---|------|
| K1W09D00-40MC= .. | U12/16..K1 | 1 | 0,32 |
| K1W12D00-40MC= .. | U12/16..K1 | 1 | 0,32 |



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.. |
|--|--|-------------------|-----------------------------|-------------------|-------------------|
| Rated insulation voltage U_i | V AC | 690 ¹⁾ | 690 ¹⁾ | 690 ²⁾ | 690 ¹⁾ |
| Making capacity I_{eff} | at $U_e = 690V$ AC | A | 165 | 165 | 165 |
| Breaking capacity I_{eff} | 400V AC | A | 100 | 100 | 100 |
| $\cos\varphi = 0,65$ | 500V AC | A | 90 | 90 | 90 |
| | 690V AC | A | 80 | 80 | 80 |
| Utilization category AC1 | | | | | |
| Switching of resistive load | | | | | |
| Rated operational current $I_e (=I_{th})$ at 40°C, open | A | 20 | 16 | 16 | 20 |
| 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 ² | 2,5 | 2,5 | - | 2,5 |
| Utilization category AC2 and AC3 | | | | | |
| Switching of three-phase motors | | | | | |
| 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 |
| | 380-400V A | 9 | 9 | 9 | 12 |
| | 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 |
| | 380-440V kW | 4 | 4 | 4 | 5,5 |
| | 500-690V kW | 4 | 4 | 4 | 5,5 |
| Utilization category AC4 | | | | | |
| Switching of squirrel cage motors, inching | | | | | |
| 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 |
| | 380-400V A | 9 | 9 | 9 | 12 |
| | 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 |
| | 380-440V kW | 4 | 4 | 4 | 5,5 |
| | 500-690V kW | 4 | 4 | 4 | 5,5 |
| Utilization category AC5a | | | | | |
| Switching of gas discharge lamps | | | | | |
| 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 ³⁾ , | | | | | |
| uncompensated | A | 10 | 10 | 10 | 10 |
| parallel compensated | A | 2 | 2 | 2 | 2 |
| Mercury-vapour lamps ⁴⁾ , | | | | | |
| uncompensated | A | 16 | 16 | 16 | 16 |
| parallel compensated | A | 2 | 2 | 2 | 2 |
| Mixed light lamps ⁵⁾ | A | 16 | 16 | 16 | 16 |
| LED-Lamps | | | | | |
| 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 ⁶⁾ | | | | | |
| Rated operational current I_e | | | | | |
| per pole at 220/230V | A | 8 | 8 | 8 | 8 |

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 ≥ 600
 Pollution degree 3 $U_i = 500V$ non-tracking of the printed circuit CTI ≥ 400
 Pollution degree 3 $U_i = 400V$ non-tracking of the printed circuit CTI ≥ 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.. | |
|---|-----------------------------------|-----------------|--------------------------------|--------------|------------------|-----------|
| Utilization category DC1 | | | | | | |
| Switching of resistive load | 1 pole 24V - 60V | A | 20 | 16 | 16 | 20 |
| Time constant L/R ≤1ms | 110V | A | 5 | 5 | 5 | 5 |
| Rated operational current I _e | 220V | A | 0,6 | 0,6 | 0,6 | 0,6 |
| | 2 poles in series 24V - 110V | A | 20 | 16 | 16 | 20 |
| | 220V | A | 5 | 5 | 5 | 5 |
| | 3 poles in series 24V - 110V | A | 20 | 20 | 20 | 20 |
| | 220V | A | 16 | 16 | 16 | 16 |
| Utilization category DC3 and DC5 | | | | | | |
| Switching of shunt motors and series motors | 1 pole 24V | A | 20 | 16 | 16 | 20 |
| | 60V | A | 5 | 5 | 5 | 5 |
| Time constant L/R ≤15ms | 110V | A | 1 | 1 | 1 | 1 |
| Rated operational current I _e | 220V | A | 0,15 | 0,15 | 0,15 | 0,15 |
| | 2 poles in series 24V - 60V | A | 20 | 16 | 16 | 20 |
| | 110V | A | 5 | 5 | 5 | 5 |
| | 220V | A | 1 | 1 | 1 | 1 |
| | 3 poles in series 24V - 110V | A | 20 | 16 | 16 | 20 |
| | 220V | A | 2 | 2 | 2 | 2 |
| Maximum ambient temperature | | | | | | |
| Operation | open | °C | -40 to +60 (+90) ¹⁾ | | | |
| | enclosed | °C | -40 to +40 | | | |
| with thermal overload relay | open | °C | -25 to +60 | | | |
| | enclosed | °C | -25 to +40 | | | |
| Storage | | °C | -50 to +90 | | | |
| Short circuit protection for contactors without O/L relay | | | | | | |
| Rated short circuit current | "r" / "Iq" | kA | 3 | 3 | 3 | 3 |
| Coordination-type "1" according to IEC 947-4-1 | | | | | | |
| Contact welding without hazard of persons | max. fuse size | gL (gG) | A | 40 | 40 | 40 |
| Coordination-type "2" according to IEC 947-4-1 | | | | | | |
| Light contact welding accepted | max. fuse size | gL (gG) | A | 25 | 25 | 25 |
| Contact welding not accepted | 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. | | | | | | |
| Cable cross-sections | | | | | | |
| for contactors without thermal overload relay | | | | | | |
| main connector | solid or stranded | mm ² | 0,5 - 2,5 | Fast on | Solder connector | 0,5 - 2,5 |
| | flexible | mm ² | 0,5 - 2,5 | 1x 6,3 x 0,8 | Ø 1,15 | 0,5 - 2,5 |
| | flexible with multicore cable end | mm ² | 0,5 - 1,5 | or | - | 0,5 - 1,5 |
| Cables per clamp | | | 2 | 2x 2,8 x 0,8 | | 2 |
| | solid or stranded | AWG | 18 - 14 | | | 18 - 14 |
| Frequency of operations z | | | | | | |
| without load | | | | | | |
| 1/h | | | 10000 | 10000 | 10000 | 10000 |
| Contactors without thermal overload relay | | | | | | |
| AC3, I _e | | 1/h | 600 | 600 | 600 | 700 |
| AC4, I _e | | 1/h | 120 | 120 | 120 | 150 |
| DC3, I _e | | 1/h | 600 | 600 | 600 | 700 |
| Mechanical life | | | | | | |
| AC operated | S x | 10 ⁶ | 5 | 5 | 5 | 5 |
| DC operated | S x | 10 ⁶ | 15 | 15 | 15 | 15 |
| Short time current | | | | | | |
| | 10s-current | A | 96 | 96 | 96 | 120 |
| Power loss per pole | | | | | | |
| | at I _e /AC3 400V | W | 0,15 | 0,15 | 0,15 | 0,25 |
| Resistance to shock according to IEC 68-2-27 | | | | | | |
| Shock time 20ms sine-wave | | | | | | |
| 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_s and with reduced rated current I_e/AC1 according to I_e/AC3

Mini Contactors

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

| Auxiliary Contacts | | | Type | K1-07D.. K1-09D.. K1-12D.. | K1-07D..=(VM) K1-09D..=(VM) K1-12D..=(VM) | K1-07D..= 24VR K1-09D..= 24VR | K1-09F..=(VM) | K1-07L..=(VM) K1-09L..=(VM) | HK.. |
|--|--|--|---|----------------------------------|---|----------------------------------|-------------------|--------------------------------|-------------------|
| Rated insulation voltage U_i | | | V AC | 690 ¹⁾ | 690 ¹⁾ | 690 ¹⁾ | 690 ¹⁾ | 690 ²⁾ | 690 ¹⁾ |
| Thermal rated current I_{th} to 690V | | | | | | | | | |
| Ambient temperature | | | 40°C A | 10 | 10 | 10 | 10 | 10 | 10 |
| | | | 60°C A | 6 | 6 | 6 | 6 | 6 | 6 |
| Power loss per pole | | | at I_{th} W | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Utilization category AC15 | | | | | | | | | |
| 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 |
| Utilization category DC13 | | | | | | | | | |
| 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 |
| Maximum ambient temperature | | | | | | | | | |
| Operation | | | open °C | -40 to +60 (+90) ³⁾ | | | | | |
| | | | enclosed °C | -40 to +40 | | | | | |
| Storage | | | °C | -40 to +90 | | | | | |
| Short circuit protection | | | | | | | | | |
| short-circuit current 1kA, contact welding not accepted 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. | | | | | | | | | |
| Power consumption of coils | | | | | | | | | |
| 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 | - |
| Operation range of coils | | | | | | | | | |
| 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 | - |
| Switching time at control voltage $U_s \pm 10\%$ ^{4) 5)} | | | | | | | | | |
| 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 | - |
| Cable cross-section | | | | | | | | | |
| all connectors | | | solid mm ² | 0,5 - 2,5 | 0,5 - 2,5 | 0,5 - 2,5 | Fast on | Solder connector | 0,5 - 2,5 |
| | | | flexible mm ² | 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 ² | 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 ≥ 600
Pollution degree 3 $U_i = 500V$ non-tracking of the printed circuit CTI ≥ 400
Pollution degree 3 $U_i = 400V$ non-tracking of the printed circuit CTI ≥ 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.. K1W09D01 | K1-09F.. | K1-09L.. | K1-07D.. | K1-12D.. 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 / 2-pole break) | 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 ¹⁾ | 600 | 600 | 600 |
| Auxiliary Contacts (cULus) | | heavy pilot duty standard pilot duty | AC DC | A600 Q600 | A600 Q600 | A600 Q600 | A600 Q600 | A600 Q600 |

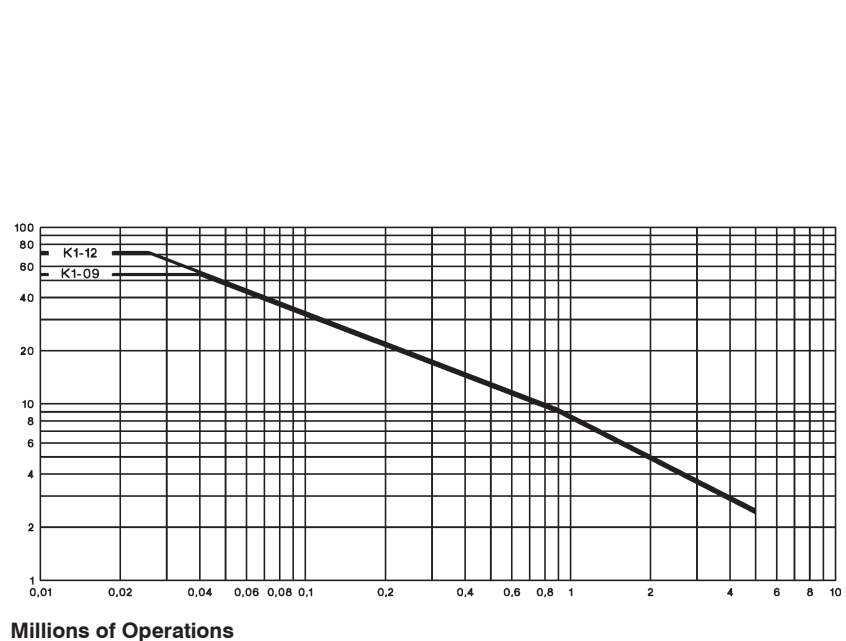
Motor Rating P_n = AC4

| 660/690V | 500V | 380/400V | 220/230V |
|----------|------|----------|----------|
| 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_n = AC3

| 660/690V | 500V | 380/400V | 220/230V |
|----------|------|----------|----------|
| 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_a (= I_e = AC1) A



| 1) Pollution degree | CTI - PWB | U _i |
|---------------------|-----------|----------------|
| 2 | ≥ 100 | 600V |
| 3 | ≥ 400 | 480V |
| 3 | 100 - 400 | 240V |

Mini Contactors

Dimensions

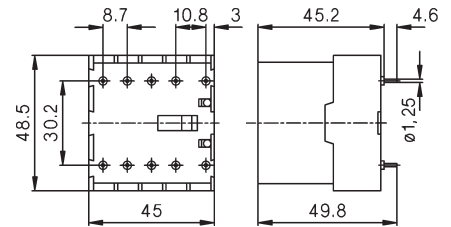
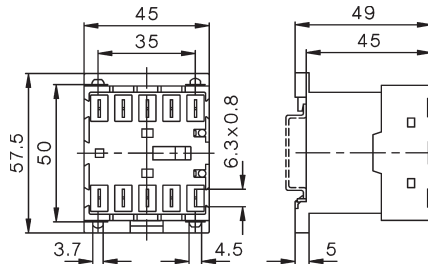
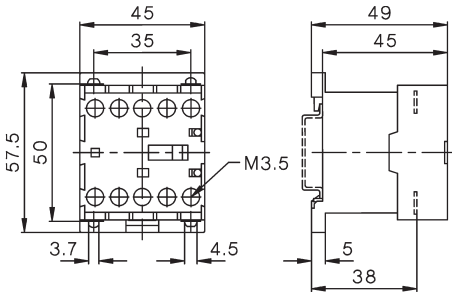
AC and DC operated
with screw terminals

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

with fast on terminals

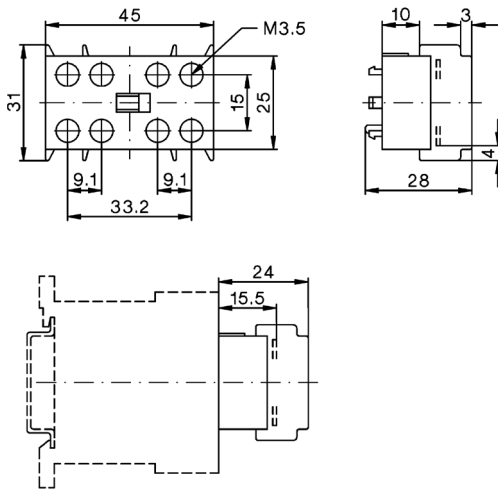
K1-07F..
K1-09F..

AC and DC operated
with solder connections
K1-07L..
K1-09L..



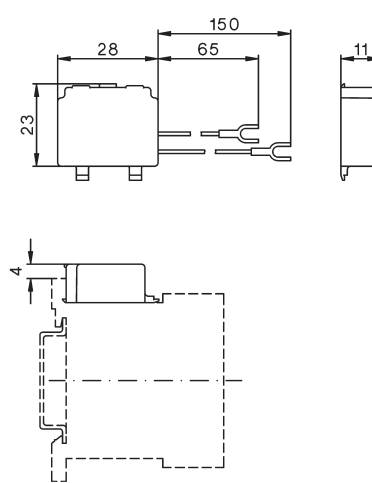
Auxiliary Contact Blocks

HK..



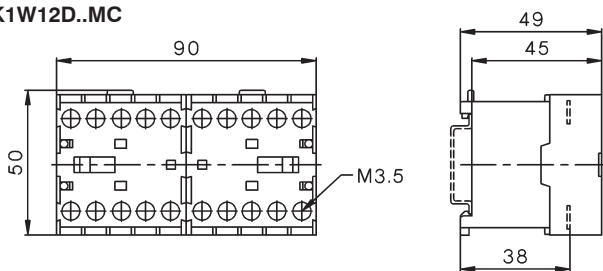
Suppressor Units

RC-K1



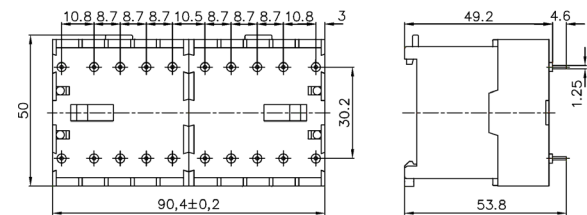
Reversing Contactors

K1W09D..MC
K1W12D..MC

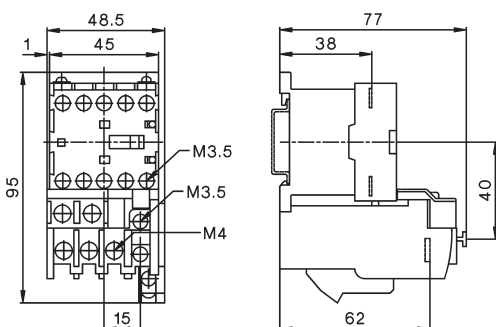


Reversing Contactors

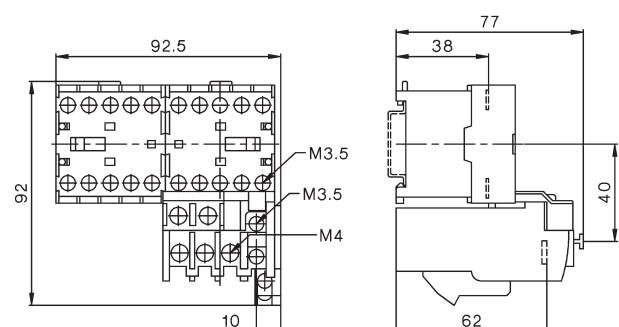
K1W09L..MC



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



K1W09D..MC + U12/16E K1
K1W12D..MC + U12/16E K1





Contactor Relays 4-pole, AC Operated

40



Auxiliary Contact Blocks 1-pole

40



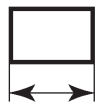
Contactor Relays 4-pole, DC Operated

41



Technical Data

42



Dimensions

44

Contactors Relays

AC Operated

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



4-pole, contacts suitable for electronic circuits according to EN947-5-4²⁾

| 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 ³⁾

| Ratings | | Thermal Rated Current | Contacts ²⁾ | | | | Type | Pack pcs. | Weight kg/pc. |
|---------|------|-----------------------|------------------------|----|----|----|------|-----------|---------------|
| AC15 | 230V | 400V | NO | NC | EM | LB | | | |
| A | A | A | | | | | | | |



1-pole, contacts suitable for electronic circuits according to EN947-5-4²⁾

| 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

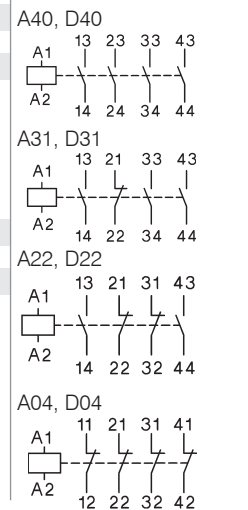
DC Operated

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



3W Coil power, for high switching capacity ³⁾

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

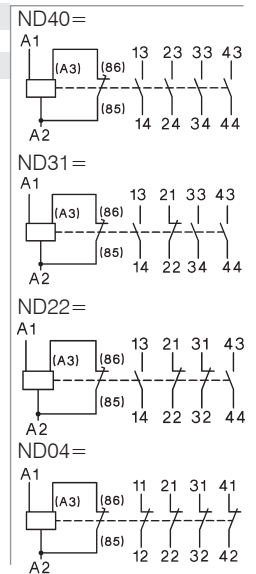


3W Coil power, for electronic circuits ²⁾³⁾

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

with double winding coil, for electronic circuits ²⁾

| | | | | | | |
|----------------|---|---|-----|--------|---|------|
| K3-07ND40= ... | 4 | - | 40E | max. 3 | 1 | 0,25 |
| K3-07ND31= ... | 3 | 1 | 31E | HN.. | 1 | 0,25 |
| K3-07ND22= ... | 2 | 2 | 22E | max. 2 | 1 | 0,25 |
| K3-07ND04= ... | - | 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 |
|---|--|--|---|--------------------------------|-----------|-----------------------|-----------------------|
| Rated insulation voltage U_i¹⁾ | | | V AC | 690 | 690 | 690 | 690 |
| Thermal rated current I_{th} to 690V | | | | | | | |
| Ambient temperature | | | 40°C A | 10 | 10 | 20 | 10 |
| | | | 60°C A | 6 | 6 | 16 | 6 |
| Frequency of operations z | | | 1/h | 10000 | 10000 | 10000 | 10000 |
| Mechanical life | | | S x 10 ⁶ | 10 | 10 | 10 | 50 |
| Utilization category AC15 | | | | | | | |
| 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 |
| Utilization category DC13 | | | | | | | |
| 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 |
| Power consumption of coils | | | | | | | |
| 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 |
| Operation range of coils | | | | | | | |
| in multiples of control voltage U_s | | | | 0,85 - 1,1 | 0,8 - 1,1 | 0,8 - 1,1 | 0,8 - 1,1 |
| Switching time 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 ³⁾ | 20 - 30 ³⁾ |
| Maximum ambient temperature | | | | | | | |
| Operation | | | open °C | -40 to +60 (+90) ²⁾ | | | |
| | | | enclosed °C | | | | |
| Storage | | | °C | -40 to +40 | | | |
| | | | | -40 to +90 | | | |
| Short circuit protection | | | | | | | |
| short-circuit current 1kA, contact welding not accepted | | | | | | | |
| max. fuse size | | | gL (gG) A | 20 | 20 | 25 | 20 |
| Cable cross-section | | | | | | | |
| Connector | | | solid mm ² | 0,75 - 6 | | | |
| | | | flexible mm ² | 1 - 4 | | | |
| | | | flexible with multicore cable end mm ² | 0,75 - 4 | | | |
| Magnet coil | | | solid mm ² | 0,75 - 2,5 | | | |
| | | | flexible mm ² | 0,75 - 2,5 | | | |
| | | | flexible with multicore cable end mm ² | 0,5 - 1,5 | | | |
| Clamps per pole | | | | 2 | | | |
| Connector | | | solid AWG | 18 - 10 | | | |
| | | | flexible AWG | 18 - 10 | | | |
| Clamps per pole | | | | 2 | | | |
| Magnet coil | | | solid AWG | 14 - 12 | | | |
| | | | flexible AWG | 18 - 12 | | | |
| 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 |
| Auxiliary Contacts | | | 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 $I_e/AC15$

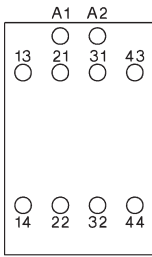
3) with built-in coil suppressor

Contactor Relays

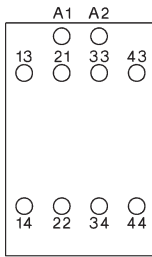
Position of Terminals

AC operated

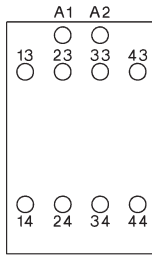
K3-07ND22



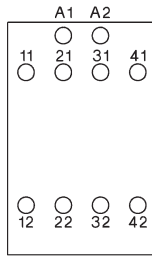
K3-07ND31



K3-07ND40

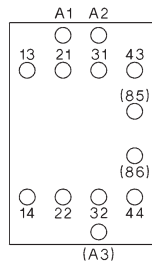


K3-07ND04

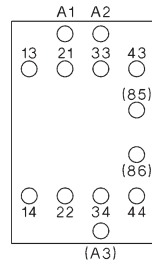


DC operated with double wound coil

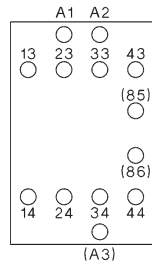
K3-07ND22=



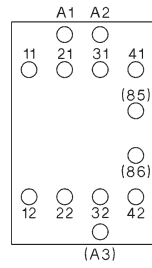
K3-07ND31=



K3-07ND40=

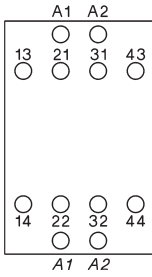


K3-07ND04=

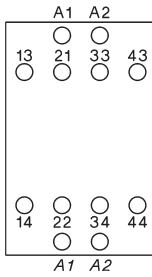


DC solenoid operated

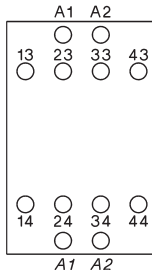
KG3-07A22
KG3-07D22



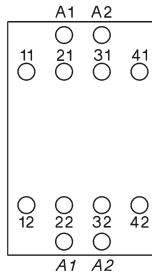
KG3-07A31
KG3-07D31



KG3-07A40
KG3-07D40



KG3-07A04
KG3-07D04

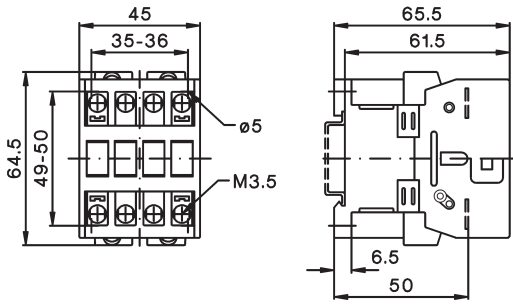


Contactors Relays

Dimensions

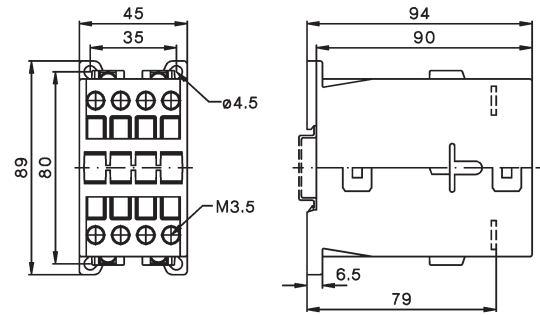
AC operated

K3-07ND..



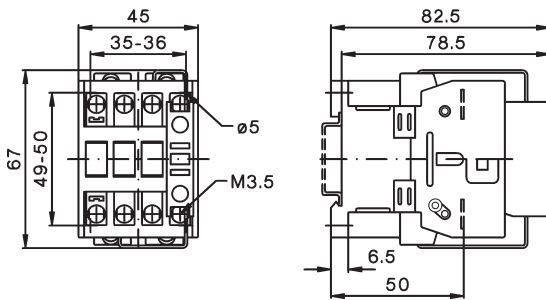
DC solenoid operated

KG3-07..



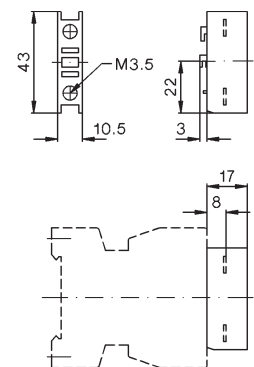
DC operated with double winding coil

K3-07ND.. =

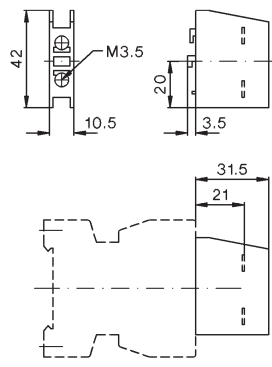















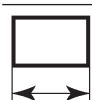
Auxiliary contact blocks

HN10, HN01



HA10, HA01



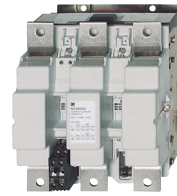
| | | |
|---|--|----|
|  | Contactor overview | 46 |
|  | Contactors 3-pole, AC Operated | 48 |
|  | Contactors 3-pole, DC Operated | 49 |
|  | Contactors 4-pole | 50 |
|  | Capacitor Switching Contactors | 51 |
|  | Auxiliary Contact Blocks Snap-on Momentary Contacts Additional Fourth Poles for Contactors | 52 |
|  | Electronic Timers On-delay | 53 |
|  | Mechanical Interlocks Mechanical Latches Additional Terminals, Parallel Connectors | 54 |
|  | Terminal Covers Mounting Parts | 55 |
|  | Control Voltages | 57 |
|  | Spare Coils AC-operated Feeder Groups | 58 |
|  | Spare Coils DC-operated Spare Contacts | 60 |
|  | Technical Data | 62 |
|  | Dimensions | 82 |

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 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 ² | 0,75 - 6 | | | | 1,5 - 25 | | 4 - 50 | | 10 - 120 | | | | | |
| Flexible | mm ² | 1 - 4 | | | | 2,5 - 16 | | 10 - 35 | | 10 - 95 | | | | | |
| Auxiliary contact | | | | | | | | | | | | | | | |
| I _{th} 40°C | A | 10 | | | | - | | - | | - | | - | | | |
| AC15 230V | A | 3 | | | | - | | - | | - | | - | | | |
| 400V | A | 2 | | | | - | | - | | - | | - | | | |
| Power consumption | | | | | | | | | | | | | | | |
| Inrush VA | | 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 | | | | | | | | | | | | | | | |
| Front mounting | Type | HN10 1NO f. low level switching | HN01 1NC f. low level switching | HA10 1NO 25A I _{th} | HA01 1NC 25A I _{th} | max. 4 HN.. or 4 HA.. | | max. 7 HN.. or 7 HA.. | | | | | | | |
| Side mounting | Type | HB11-1 1NO+1NC f. low level switching | max. 2 HB.. | HB11 1NO+1NC f. low level switching | HB02 2NC f. low level switching | max. 2 HB.. | | | | | | | | | |
| Overload Relay (thermal) | | | | | | | | | | | | | | | |
| Single phase protection | | | | | | | | | | | | | | | |
| Temperature compensation | | | | | | | | | | | | | | | |
| Trip and alarm contacts | | | | | | | | | | | | | | | |
| Type | | U3/32 | | | | | U3/74 | | | | | U85 | | | |
| | | U12/16..K3 | | U3/42 | | | | | | | | | | | |
| Number of Setting Ranges from | | 16 0,12 - 30A | | 16 0,12 - 32A | | | 4 10 - 42A | | | | | 5 20 - 74A | | 2 60 - 120A | |
| Busbar sets | | - | | | | | | | | | | - | | | |



Contactor, Motor-Starter

Circuit Breakers

Manual Motor-Starters








Switches

AC-Main Switches

DC-Switch Disconnect



Push Buttons

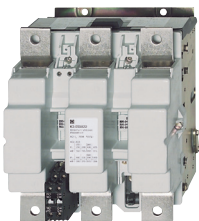
Representatives, Suppliers

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

Contactors 3-pole

AC Operated

| Ratings | | Rated Current | Aux. Contacts | | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|-------------|------|---------------|---|---|--------------------------|----------------------------|-----------|---------------|
| AC2, AC3 | | | Built-in | Additional see page 53 | | | | |
| 380V | | | | | | | | |
| 400V | 660V | AC1 |  |  | | 24V 50/60Hz | | |
| 415V | 690V | 690V | | | | 110V 50/60Hz | | |
| kW | kW | A | NO | NC | Typ | 220-240V 50Hz | | |
| | | | | | | 380-415V 50Hz | | |
| | | | | | | ↓ | | |
| 4 | 5,5 | 25 | 1 | - | max. 4 | | 1 | 0,23 |
| 4 | 5,5 | 25 | - | 1 | HN.. or HA.. | | 1 | 0,23 |
| 5,5 | 7,5 | 25 | 1 | - | and 2 HB.. | | 1 | 0,23 |
| 5,5 | 7,5 | 25 | - | 1 | | | 1 | 0,23 |
| 7,5 | 10 | 32 | 1 | - | | | 1 | 0,23 |
| 7,5 | 10 | 32 | - | 1 | | | 1 | 0,23 |
| 11 | 10 | 32 | 1 | - | | | 1 | 0,23 |
| 11 | 10 | 32 | - | 1 | | | 1 | 0,23 |
| 11 | 15 | 50 | - | - | max. 4 | | 1 | 0,48 |
| 15 | 18,5 | 65 | - | - | HN.. or HA.. | | 1 | 0,48 |
| 18,5 | 18,5 | 80 | - | - | and 2 HB.. | | 1 | 0,48 |
| 22 | 30 | 110 | - | - | max. 4 (3) ⁴⁾ | | 1 | 0,85 |
| 30 | 37 | 120 | - | - | HN.. or HA.. | | 1 | 0,85 |
| 37 | 45 | 130 | - | - | and 2 HB.. | | 1 | 0,85 |
| 45 | 55 | 160 | - | - | max. 7 | | 1 | 2,2 |
| 55 | 55 | 200 | - | - | HN.. or HA.. and 2 HB.. | | 1 | 2,2 |
| 75 | 110 | 250 | - | - | 1 HKT.. | | 1 | 4 |
| 90 | 132 | 300 | - | - | and 2 HKA11 | | 1 | 4 |
| 110 | 160 | 350 | - | - | | | 1 | 7,2 |
| 132 | 210 | 450 | - | - | | | 1 | 7,2 |
| 160 | 250 | 600 | - | - | | | 1 | 7,2 |
| 250 | 375 | 700 | 2 | 2 | 1 HKF22 | | 1 | 13 |
| 300 | 475 | 800 | 2 | 2 | | | 1 | 13,5 |
| 400 | 630 | 1000 | 2 | 2 | | | 1 | 26,5 |
| 500 | 700 | 1100 | 2 | 2 | | | 1 | 27,6 |
| 580 | 850 | 1200 | 1 | 2 | 2 HKB11 | | 1 | 49 |
| 680 | 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 ¹⁾
24 24V DC
48 48V DC
110 110V DC
220 220V DC

Coil power
 inrush/
 hold

Additional
 Overload
 Relay
 see
 page 114

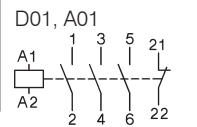
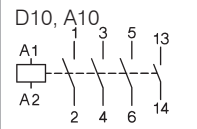
Wiring Diagram

Coil Circuits
 see page 59

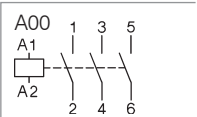
Terminal Markings



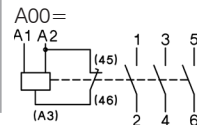
| Type | Coil power | Additional Overload Relay | Pack pcs. | Weight kg/pc. |
|------------------------------------|------------|---------------------------|-----------|---------------|
| KG3-10D10 ... ⁵⁾ | 3/3 | U3/32 | 1 | 0,53 |
| KG3-10D01 ... ⁵⁾ | 3/3 | U12/16E U12/16EQ | 1 | 0,53 |
| KG3-14D10 ... ⁵⁾ | 3/3 | UAT21 | 1 | 0,53 |
| KG3-14D01 ... ⁵⁾ | 3/3 | | 1 | 0,53 |
| KG3-18D10 ... ⁵⁾ | 3/3 | | 1 | 0,53 |
| KG3-18D01 ... ⁵⁾ | 3/3 | | 1 | 0,53 |
| KG3-22D10 ... ⁵⁾ | 3/3 | | 1 | 0,53 |
| KG3-22D01 ... ⁵⁾ | 3/3 | | 1 | 0,53 |



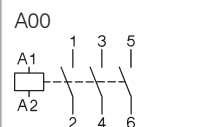
| | | | | |
|------------------------------------|-----|-------|---|------|
| KG3-24A00 ... ⁵⁾ | 4/4 | U3/32 | 1 | 0,57 |
| KG3-32A00 ... ⁵⁾ | 4/4 | U3/42 | 1 | 0,57 |
| KG3-40A00 ... ⁵⁾ | 4/4 | UAT.. | 1 | 0,57 |



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

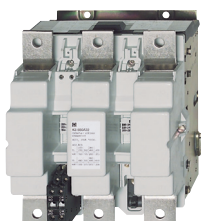


| | | | | |
|------------------------------------|-------|-----|---|-----|
| K3-90A00 ... ²⁾ | 280/5 | U85 | 1 | 2,2 |
| K3-115A00 ... ²⁾ | 280/5 | | 1 | 2,3 |

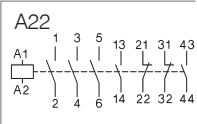


| | | | | |
|------------------------------------|-------|------|---|---|
| K3-151A00 ... ²⁾ | 350/5 | U180 | 1 | 4 |
| K3-176A00 ... ²⁾ | 350/5 | | 1 | 4 |

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

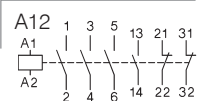


| | | | | |
|------------------------------------|--------|------------|---|------|
| K3-450A22 ... ²⁾ | 800/10 | U800 | 1 | 13 |
| K3-550A22 ... ²⁾ | 800/10 | +SU840/550 | 1 | 13,5 |



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

| | | | | |
|------------------------|---------|--|---|----|
| K3-1000A12= ... | 2100/60 | | 1 | 49 |
| K3-1200A12= ... | 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.

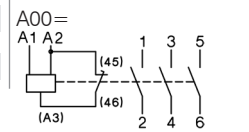
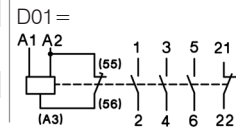
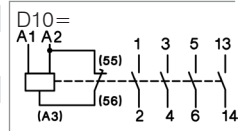
Contactors 3-pole

DC operated with dual-wound coil



| Ratings | Rated Current | Aux. Contacts Built-in | Additional see page 53 | Type | Coil voltage ¹⁾ | | Pack pcs. | Weight kg/pc. |
|-------------|---------------|------------------------|------------------------|-----------------|----------------------------|---------|-----------|---------------|
| | | | | | 24V= DC | 48V= DC | | |
| AC2 | | | | | 24 | 48 | | |
| AC3 | | | | | 110 | 220 | | |
| 380V | AC1 | | | | | | | |
| 400V | 660V | | | | | | | |
| 415V | 690V | 690V | | | | | | |
| kW | kW | A | | | | | | |
| | | | NO NC | Type | | | | |
| 4 | 5,5 | 25 | 1 - | max. 3 | K3-10ND10= | ... | 1 | 0,25 |
| 4 | 5,5 | 25 | - 1 | HN.. or HA.. | K3-10ND01= | ... | 1 | 0,25 |
| 5,5 | 7,5 | 25 | 1 - | and 2 HB.. | K3-14ND10= | ... | 1 | 0,25 |
| 5,5 | 7,5 | 25 | - 1 | | K3-14ND01= | ... | 1 | 0,25 |
| 7,5 | 10 | 32 | 1 - | | K3-18ND10= | ... | 1 | 0,25 |
| 7,5 | 10 | 32 | - 1 | | K3-18ND01= | ... | 1 | 0,25 |
| 11 | 10 | 32 | 1 - | | K3-22ND10= | ... | 1 | 0,25 |
| 11 | 10 | 32 | - 1 | | K3-22ND01= | ... | 1 | 0,25 |
| 11 | 15 | 50 | - - | max. 3 | K3-24A00= | ... | 1 | 0,55 |
| 15 | 18,5 | 65 | - - | HN.. or HA.. | K3-32A00= | ... | 1 | 0,55 |
| 18,5 | 18,5 | 80 | - - | HA.. and 2 HB.. | K3-40A00= | ... | 1 | 0,55 |

Wiring Diagram



1) Other coil voltages on request.

Capacitor Switching Contactors

for use with reactive or non-reactive capacitor banks



| Rated Operational Power at 50/60Hz Ambient Temperature | | | | | | Aux. Contacts Built-in Add. | | Type | Coil voltage ¹⁾ | Pack | Weight |
|--|----------------------|----------------------|---------------------|---------------------|----------------------|-----------------------------|----|-----------------|----------------------------------|------|--------|
| 50°C | | | 60°C | | | NO | NC | | 220-240V 50Hz | pcs. | kg/pc. |
| 380V | 415V | 660V | 380V | 415V | 660V | ↓ | ↓ | | 230 | | |
| 400V | 440V | 690V | 400V | 440V | 690V | | | | | | |
| kVAr | kVAr | kVAr | kVAr | kVAr | kVAr | | | | | | |
| 0-12,5 | 0-13 | 0-20 | 0-12,5 | 0-13 | 0-20 | 1 | - | 1 ²⁾ | K3-18NK10 ... | 1 | 0,34 |
| 0-12,5 | 0-13 | 0-20 | 0-12,5 | 0-13 | 0-20 | - | - | 1 ²⁾ | K3-18NK01 ... | 1 | 0,34 |
| 0-12,5 | 0-13 | 0-20 | 0-12,5 | 0-13 | 0-20 | 1 | - | 1 ²⁾ | K3-18NBK10 ... | 1 | 0,40 |
| 10-20 | 10,5-22 | 17-33 | 10-20 | 10,5-22 | 17-33 | - | - | 3 ³⁾ | K3-24K00 ... | 1 | 0,62 |
| 10-25 | 10,5-27 | 17-41 | 10-25 | 10,5-27 | 17-41 | - | - | 3 ³⁾ | K3-32K00 ... | 1 | 0,62 |
| 20-33,3 | 23-36 | 36-55 | 20-33,3 | 23-36 | 36-55 | - | - | 3 ³⁾ | K3-50K00 ... | 1 | 1,0 |
| 20-50 | 23-53 | 36-82 | 20-50 | 23-53 | 36-82 | - | - | 3 ³⁾ | K3-62K00 ... | 1 | 1,0 |
| 20-75 ⁴⁾ | 23-75 ⁴⁾ | 36-120 ⁴⁾ | 20-60 | 23-64 | 36-100 | - | - | 3 ³⁾ | K3-74K00 ... | 1 | 1,0 |
| 33-80 | 36-82 | 57-120 | 33-75 | 36-77 | 57-120 | - | - | 6 ⁵⁾ | K3-90K00 ... / VS ⁷⁾ | 1 | 2,3 |
| 33-100 ⁶⁾ | 36-103 ⁶⁾ | 57-148 ⁶⁾ | 33-90 ⁶⁾ | 36-93 ⁶⁾ | 57-148 ⁶⁾ | - | - | 6 ⁵⁾ | K3-115K00 ... / VS ⁷⁾ | 1 | 2,3 |

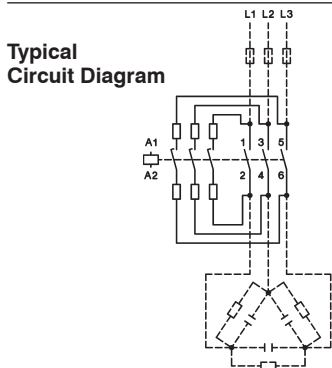
Specification: Contactors K3-..K are suitable for switching low-inductive and low loss capacitors in capacitor banks (IEC70 and 831, VDE 0560) without and with reactors.

Capacitor switching contactors are fitted with early make contacts and damping resistors, to reduce the value of make current $70 \times I_e$.

Operating Conditions: Capacitor switching contactors are protected against contact welding for a prospective making current of $200 \times I_e$.

Technical Data acc. to IEC 947-4-1, IEC 947-5-1, EN 60947-4-1, EN 60947-5-1, VDE 0660 (further details page 64)

| Type | | K3-18NK | K3-18NBK ⁸⁾ | 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 | K3-..K non reactive banks Sx10 ³ | 250 | 250 | 150 | 150 | 150 | 150 | 120 | 120 | 120 |
| | K3-..K/BK/D/A ⁹⁾ reactive banks Sx10 ³ | 400 | 400 | 300 | 300 | 300 | 300 | 200 | 200 | 200 |
| Rated operational current AC6b | I_n at 50°C A | 0-18 | 0-18 | 14-28 | 14-36 | 30-48 | 30-72 | 30-108 | 50-115 | 50-144 |
| | at 60°C A | 0-18 | 0-18 | 14-28 | 14-36 | 30-48 | 30-72 | 30-87 | 50-108 | 50-130 |
| Rated operational current AC1 | I_n at 50°C A | 32 | 45 | 45 | 60 | 100 | 110 | 120 | 155 | 190 |
| | at 60°C A | 32 | 40 | 40 | 55 | 90 | 100 | 110 | 145 | 170 |
| Overload factor acc. to EN 61921: 30% min. | at 50°C % | 78 | 150 | 60 | 67 | 108 | 53 | 11 | 35 | 32 |
| | at 60°C % | 78 | 122 | 43 | 53 | 88 | 39 | 26 | 34 | 31 |
| Fuses gL (gG) | from / to A | 35 / 63 | 35 / 63 | 50 / 80 | 63 / 100 | 80 / 160 | 125 / 160 | 160/200 | 160/200 | 160/250 |

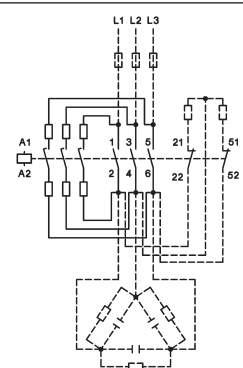


Wiring Diagram for Quick Discharge Resistors

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_n 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 - 16mm².
- 9) K3-..K.. / K3-..BK.. / K3-..D.. / K3-..A..

Contactors 4-pole

AC or DC operated

| Rated Current | Ratings | | | Aux. Contacts Additional see page 53 | Type | Coil voltage ²⁾ | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|------------------|------------|--------------------|--------------------|--------------------------------------|----------------------|--------------------------------------|-----------|---------------|----------------|
| | AC1 | AC2 | AC3 | | | | | | |
| AC1 | | 380V | 400V | | | 24V 50/60Hz | | | |
| max. 690V | | 400V | 415V | | | 110V 50/60Hz | | | |
| A | | kW | kW | | | 220-240V 50Hz | | | |
| NO | NC | NO | NC | | | 380-415V 50Hz | | | |
| | | | | | | 24V= DC ³⁾ | | | |
| | | | | | | | | | |
| 25 | - | 17,5 | - | 4 | max. 4 ³⁾ | K3-10NA00-40 .. ³⁾ | 1 | 0,23 | |
| 25 | 25 | 17,5 ⁶⁾ | 17,5 ⁶⁾ | 4 ⁶⁾ | HN.. or | K3-10NA00-22 .. ³⁾ | 1 | 0,23 | |
| - | 25 | - | 17,5 | 4 | HA.. and 2 HB.. | K3-10NA00-04 .. ³⁾ | 1 | 0,23 | |
| 25 | - | 17,5 | - | 5,5 | | K3-14NA00-40 .. ³⁾ | 1 | 0,23 | |
| 25 | 25 | 17,5 ⁶⁾ | 17,5 ⁶⁾ | 5,5 ⁶⁾ | | K3-14NA00-22 .. ³⁾ | 1 | 0,23 | |
| - | 25 | - | 17,5 | 5,5 | | K3-14NA00-04 .. ³⁾ | 1 | 0,23 | |
| 32 | - | 22 | - | 7,5 | | K3-18NA00-40 .. ³⁾ | 1 | 0,23 | |
| 32 | 32 | 22 ⁶⁾ | 22 ⁶⁾ | 7,5 ⁶⁾ | | K3-18NA00-22 .. ³⁾ | 1 | 0,23 | |
| - | 32 | - | 22 | 7,5 | | K3-18NA00-04 .. ³⁾ | 1 | 0,23 | |
| 32 | - | 22 | - | 11 | | K3-22NA00-40 .. ³⁾ | 1 | 0,23 | |
| 50 | - | 34,5 | - | 11 | max. 4 ³⁾ | K3-24A00-40 .. ³⁾ | 1 | 0,65 | |
| 50 | | 34,5 | 27,5 | 11 | HN.. or | K3-24A00-22 .. ³⁾ | 1 | 0,65 | |
| - | 40 | - | 27,5 | 11 | HA.. and 2 HB.. | K3-24A00-04 .. ³⁾ | 1 | 0,65 | |
| 65 | - | 45 | - | 15 | | K3-32A00-40 .. ³⁾ | 1 | 0,65 | |
| 65 | 50 | 45 | 34,5 | 15 | | K3-32A00-22 .. ³⁾ | 1 | 0,65 | |
| - | 50 | - | 34,5 | 15 | | K3-32A00-04 .. ³⁾ | 1 | 0,65 | |
| 80 | - | 55,4 | - | 18,5 | | K3-40A00-40 .. ³⁾ | 1 | 0,65 | |
| 80 | 65 | 55,4 | 45 | 18,5 | | K3-40A00-22 .. ³⁾ | 1 | 0,65 | |
| - | 65 | - | 45 | 18,5 | | K3-40A00-04 .. ³⁾ | 1 | 0,65 | |
| 110 | - | 62 | - | 22 | max. 6 ⁵⁾ | K3-50A00-40 .. ⁵⁾ | 1 | 1,1 | |
| 120 | - | 69 | - | 30 | HN.. or | K3-62A00-40 .. ⁵⁾ | 1 | 1,1 | |
| 130 | - | 78 | - | 37 | HA.. and 2 HB.. | K3-74A00-40 .. ⁵⁾ | 1 | 1,1 | |
| 135 | - | 94 | - | 45 | 1 HKT.. | K3-96A00-40 .. ⁴⁾ | 1 | 2,42 | |
| 125 | 125 | 85 ⁶⁾ | 85 ⁶⁾ | 30 | + | K3-96A00-22 .. ⁴⁾ | 1 | 2,42 | |
| - | 125 | - | 85 | 30 | 2 HKA11 | K3-96A00-04 .. ⁴⁾ | 1 | 2,42 | |
| 200 | - | 139 | - | 55 | | K3-116A00-40 .. ⁴⁾ | 1 | 4,7 | |
| 250 | - | 173 | - | 75 | | K3-151A00-40 .. ⁴⁾ | 1 | 4,7 | |
| 300 | - | 208 | - | 90 | | K3-176A00-40 .. ⁴⁾ | 1 | 4,7 | |
| 350 | - | 242 | - | 110 | | K3-210A00-40 .. ⁴⁾ | 1 | 8 | |
| 450 | - | 310 | - | 132 | | K3-260A00-40 .. ⁴⁾ | 1 | 8 | |
| 600 | - | 415 | - | 160 | | K3-316A00-40 .. ⁴⁾ | 1 | 8 | |



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



| Specification | Thermal Current I _{th} A | Type | Pack pcs. | Weight kg/pc. |
|----------------------------|--------------------------------------|--------------|-----------|---------------|
| 2 terminals interconnected | 26 | K2-DK | 10 | 0,02 |
| 2 terminals insulated | 26 | K2-SK | 10 | 0,02 |

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.
 6) Ratings for 3 poles in use.

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



| Rated Operational Current | | | Contacts | | | | Type | Pack pcs. | Weight kg/pc. |
|---------------------------|-------------------|------------------|----------|----|----|----|--------------|-----------|---------------|
| AC15 230V A | AC15 400V A | AC1 690V A | NO | NC | EM | LB | | | |
| 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 |
| 6 | 3 | 25 | 1 | - | - | - | HA10 | 10 | 0,03 |
| 6 | 3 | 25 | - | 1 | - | - | HA01 | 10 | 0,03 |

Auxiliary Contact Blocks for contactors K3-., for low level switching ^{1) 3)}



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

Auxiliary Contact Blocks for contactors K3-41., K3-96., K3-116.. to K3-1200., for low level switching ¹⁾



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

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



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

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, OFF-delay, Single shot trailing edge, Single shot leading edge, Single shot leading and trailing edge | 0,1 - 1,0 1,0 - 10 6 - 60 18 - 180 | 5 | K3-T180 240 | 1 | 0,085 |

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 K3-96A00..

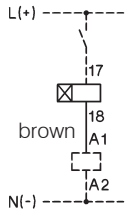
Electronic Timer On-delay for contactors K(G)3-07.. to K3-115..¹⁾

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

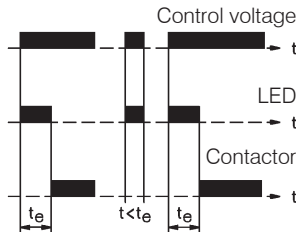


| Operational Voltage V | Time Range s | Rated Current AC15 A | Type | Pack pcs. | Weight kg/pc. |
|--------------------------|-----------------|----------------------------|---------------------|-----------|---------------|
| 24 - 60V AC/DC | 1 - 30 | 0,75 | K2-TE30 60 | 1 | 0,08 |
| 100 - 250V AC/DC | 1 - 30 | 0,75 | K2-TE30 250 | 1 | 0,08 |
| 24 - 60V AC/DC | 10 - 180 | 0,75 | K2-TE180 60 | 1 | 0,08 |
| 100 - 250V AC/DC | 10 - 180 | 0,75 | K2-TE180 250 | 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%
 $-40^\circ - +60^\circ C$
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

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

For Contactors

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

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



Snap-On Adapter

| For Type | Specification | Type | Pack pcs. | Weight kg/pc. |
|----------|---------------|------|-----------|---------------|
|----------|---------------|------|-----------|---------------|



| | | | | |
|---|--|--------------|----|-------|
| K2-DK, K2-SK, K2-TE, K2-TA K2-F, K2-RF K2-IN., K2-UN. | for snap-on mounting of accessories on 35mm DIN-rail acc. DIN EN 50022 | K2-SM | 10 | 0,009 |
|---|--|--------------|----|-------|

1) Do not fit on K3-24A00-40, K3-32A00-40 and K3-40A00-40 (4 pole contactors).

Additional 4th Poles for contactors K3-450.. to K3-1200



| For Contactors | Thermal Current I_{th} A | Type | Pack pcs. | Weight kg/pc. |
|------------------|-------------------------------|---------------|--------------|------------------|
| K3-450, K3-550 | 800 | NP800 | 1 | 1,4 |
| K3-700, K3-860 | 1000 | NP1000 | 1 | 1,6 |
| K3-1000, K3-1200 | 1000 | NP1001 | 1 | 1,6 |

Mechanical Interlocks



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

1) clamps for mounting incl.

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



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

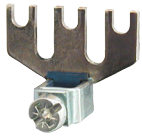
Additional Terminals



| For Contactors | Cable Cross-sections to clamp mm ² solid or stranded | flexible | flex. with multi- core cable end | Type | Pack pcs. | Weight kg/pc. |
|---|---|----------|-------------------------------------|----------------|--------------|------------------|
| Additional Terminal Single Pole, with fingertouch protection | | | | | | |
| K(G)3-10 to K(G)3-22 | 0,75 - 10 | 0,75 - 6 | 0,75 - 6 | LG9339N | 6 | 0,009 |
| K2-09 to K2-16 | | | | | | |
| K3-116 to K3-176 | | 16 - 120 | + 16 - 95 | LG11224 | 1 | 0,10 |

1) Inclusively mounting clamps

Parallel Connectors



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

Parallel Connectors, 3 Poles Parallel

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

| Description | Specification | Type | Pack pcs. | Weight kg/pc. |
|----------------------|--------------------------------|---------------|-----------|---------------|
| K(G)3-10 to K(G)3-22 | terminal hole for screw M5 | LG9241 | 50 | 0,004 |
| K2-09 to K2-16 | | | | |
| K2-23 to K2-37 | 4 - 35 6 - 25 4 - 25 | LG5587 | 10 | 0,022 |

Parallel Connectors, 4 Poles Parallel

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

| Description | Specification | Type | Pack pcs. | Weight kg/pc. |
|----------------------|----------------------------|---------------|-----------|---------------|
| K(G)3-10 to K(G)3-22 | terminal hole for screw M5 | LG7360 | 10 | 0,006 |
| K2-09 to K2-16 | | | | |

Suppressor Units



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

RC-units for contactors K3-07 - K3-74 and all types of contactor combinations

| | | | | | |
|------------------|-----------|------------------|------------------|----|------|
| 12 - 48V AC/DC | to snap | 1600nF / 22 Ohm | RC-K3 24 | 10 | 0,01 |
| 48 - 127V AC/DC | on the | 680nF / 270 Ohm | RC-K3 110 | 10 | 0,01 |
| 110 - 250V AC/DC | contactor | 220nF / 2200 Ohm | RC-K3 230 | 10 | 0,01 |
| 250 - 415V AC/DC | | 120nF / 620 Ohm | RC-K3 400 | 10 | 0,01 |

Mounting Parts



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

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



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

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

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



| | | | | | |
|------------------------|----------------|---------------------|-------------|--|--|
| Retention clamp | K3-10 to K3-74 | To close contactors | P725 | | |
|------------------------|----------------|---------------------|-------------|--|--|

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



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

| | | | | |
|----------------------|--------------------------------------|---------------|-----|-------|
| Marking Plate | 2-section without marking, divisible | P487-1 | 100 | 0,025 |
|----------------------|--------------------------------------|---------------|-----|-------|

| | | | | |
|----------------------|--------------------------------------|---------------|-----|-------|
| Marking Plate | 3-section without marking, divisible | P971-1 | 100 | 0,038 |
|----------------------|--------------------------------------|---------------|-----|-------|

| | | | | |
|----------------------|--------------------------------------|---------------|-----|-------|
| Marking Plate | 4-section without marking, divisible | P245-1 | 100 | 0,050 |
|----------------------|--------------------------------------|---------------|-----|-------|

| | | | | |
|----------------------|----------------------------|-----------------|-----|-------|
| Marking Plate | marked, choice of K1...K32 | P245-K.. | 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 _s 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 |
| 24 | 4.24 | 24 | 24 | 22 | 24 | 24 | 27 |
| 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 |
| 42 | 4.42 | 42 | 48 | 42 | 47 | 47 | 52 |
| 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 |
| 110 | 4.110 | 110 | 110-120 | 100 | 110 | 110 | 122 |
| 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 ¹⁾ | 200-240 ¹⁾ | 180 | 210 ¹⁾ | 200 | 240 ¹⁾ |
| 190R ²⁾ | 41.190 | 200-240 | 200-240 | 200 | 240 | 200 | 240 |
| 200 | 41.200 | 200-230 ¹⁾ | 220-240 | 200 | 230 ¹⁾ | 220 | 240 |
| 230 | 4.230 | 220-240 | 230-264 | 220 | 240 | 230 | 264 |
| 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 ¹⁾ | 380-440 ¹⁾ | 345 | 400 ¹⁾ | 380 | 440 ¹⁾ |
| 390R ²⁾ | 41.390 | 400-480 | 400-480 | 400 | 480 | 400 | 480 |
| 400 | 4.400 | 380-415 | 400-440 | 380 | 415 | 400 | 460 |
| 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_s (min. value of rated control voltage) up to 1,05 x U_s (max. value of rated control voltage).
2) Reduction of mechanical life to 25% 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 _s 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 |
| 230 | 4.230 | 220-240 | 277 | 220 | 240 | 264 | 288 |
| 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 |
| 230 | 4.230 | 220-230 | - | 220 | 230 | 220 | 230 |
| 400 | 4.400 | 380-400 | - | 380 | 400 | 380 | 400 |
| 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 _s 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 |
| 230 | 4.230 | 220-240 | 220 | 220 | 240 | 220 | 240 |
| 400 | 4.400 | 380-415 | - | 380 | 415 | 380 | 415 |

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 _s range | | | |
|--------------------------|----------------|-----------------------------|------------|--|------------|-----------------|------------|
| | | for 50Hz V | for 60Hz V | for 50Hz min. V | max. V | for 60Hz min. V | max. V |
| 110AC | 4.110AC | 110-122 | 132-146 | 110 | 122 | 132 | 146 |
| 230AC | 4.230AC | 220-240 | 277 | 220 | 240 | 264 | 288 |

Other coil voltages on request

Operating range of magnet-coils: 0,85 x U_s (min. value of rated control voltage) up to 1,1 x U_s (max. value of rated control voltage)

With reduced control voltage range 0,9 up to 1,0 x U_s at ambient temperature 60 - 90°C.

Spare Coils for AC operated contactors



For Contactors

| | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|---|--------------------|----------------------------|-----------|---------------|
| K3-07N.. up to K3-22N.. | K10N/...EUR | 24V 50Hz | 1 | 0,053 |
| K3-24.. up to K3-40.. 3 pole contactor | K24/... | 42V 50Hz | 1 | 0,085 |
| K3-24.. up to K3-40.. 4 pole contactor | K24-4/... | 110V 50Hz | 1 | 0,085 |
| K3-50.. up to K3-74.. 3 pole contactor | K45/... | 180V 50Hz, 220V 60Hz | 1 | 0,110 |
| K3-50.. up to K3-74.. 4 pole contactor | K50/... | 220-240V 50Hz | 1 | 0,110 |
| K3-90.., K3-115.. (AC/DC coil) | K3-115/... | 380-415V 50Hz | 1 | 0,230 |

| | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|--|--------------------|----------------------------|-----------|---------------|
| K3-1000..., K3-1200.. without feeder group ²⁾ | K3-1200/... | 110V 50Hz, 110-115V 60Hz | 1 | 3,12 |

Spare Coils for AC and DC operated contactors

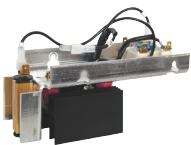


| | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|---|-------------------|----------------------------|-----------|---------------|
| K3-90.., K3-115.. with feeder group | K3-115/... | 24V 50/60Hz / 24V DC | 1 | 0,30 |
| K3-151.., K3-176.. with feeder group | K3-176/... | 110-120V 50/60Hz / 110V DC | 1 | 0,68 |
| K3-210.., K3-316.. with feeder group | K3-316/... | 220-240V 50/60Hz / 220V DC | 1 | 0,68 |
| K3-450.., K3-550.. without feeder group ²⁾ | K3-550/... | 380-415V 50/60Hz | 1 | 1,63 |
| K3-700.., K3-860.. without feeder group ²⁾ | K3-860/... | | 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 ¹⁾ | Pack pcs. | Weight kg/pc. |
|--------------------------------|----------------------|----------------------------|-----------|---------------|
| K3-450.., K3-550.. K3-550/4... | K3-550/FG ... | 110-120V 50/60Hz / 110V DC | 1 | 0,33 |
| K3-700.., K3-860.. K3-860/4... | K3-860/FG ... | 220-240V 50/60Hz / 220V DC | 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
47.24= 24V DC
48.48= 48V DC
47.110= 110V DC
47.220= 220V DC



For Contactors

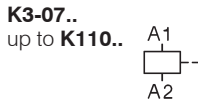
| For Contactors | Aux. Contact Block for dual-wound coil | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|--------------------------------|--|-------------------|----------------------------|-----------|---------------|
| K3-07N..= up to K3-22N..= | HN01U | K10N/ ... | 24V DC | 1 | 0,052 |
| K3-24..= up to K3-40..= | HN01U | K24/ ... | 48V DC | 1 | 0,090 |
| K3-24..= up to K3-40..= | HN01U | K24-4/ ... | 110V DC | 1 | 0,090 |
| K3-50..= up to K3-74..= | HN01Z | K45/ ... | 220V DC | 1 | 0,115 |
| K3-50..= up to K3-74..= | HN01Z | K50/ ... | | 1 | 0,115 |
| K3-90.., K3-115.. (AC/DC coil) | - | see page 58 | | 1 | 0,230 |

For Contactors

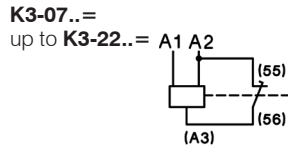
| For Contactors | Aux. Contact Block for dual-wound coil | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|-----------------------|--|---------------------|----------------------------|-----------|---------------|
| K3-1000.., K3-1200..= | without feeder group ²⁾ | K3-1200/ ... | 110V DC | 1 | 3,12 |
| | | | 220V DC | | |

Wiring Diagrams for Coil Circuit

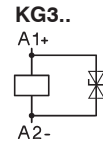
AC operated



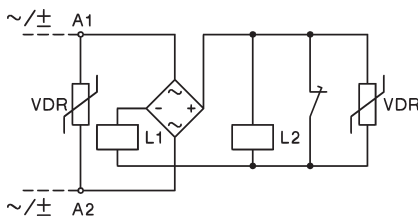
DC operated with dual-wound coil



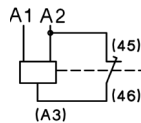
DC operated



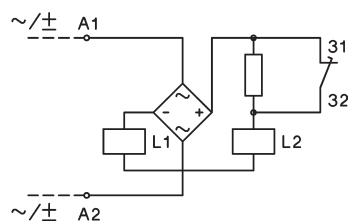
AC and DC operated with dual-wound coil
K3-90A00, K3-115A00
K3-151A00, K3-176A00
K3-210A00 to K3-316A00



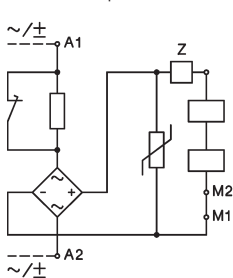
K3-24..
to
K3-74..=



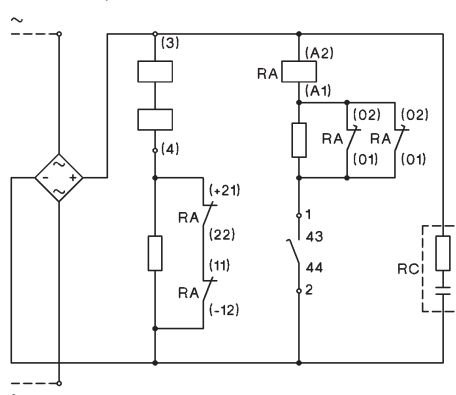
AC and DC operated with series resistor
K3-200A21
K3-315A21



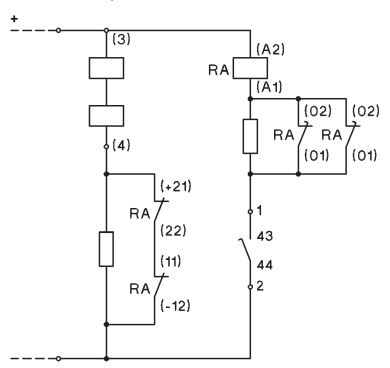
AC and DC operated with series resistor
K3-450.. up to **K3-860..**



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



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



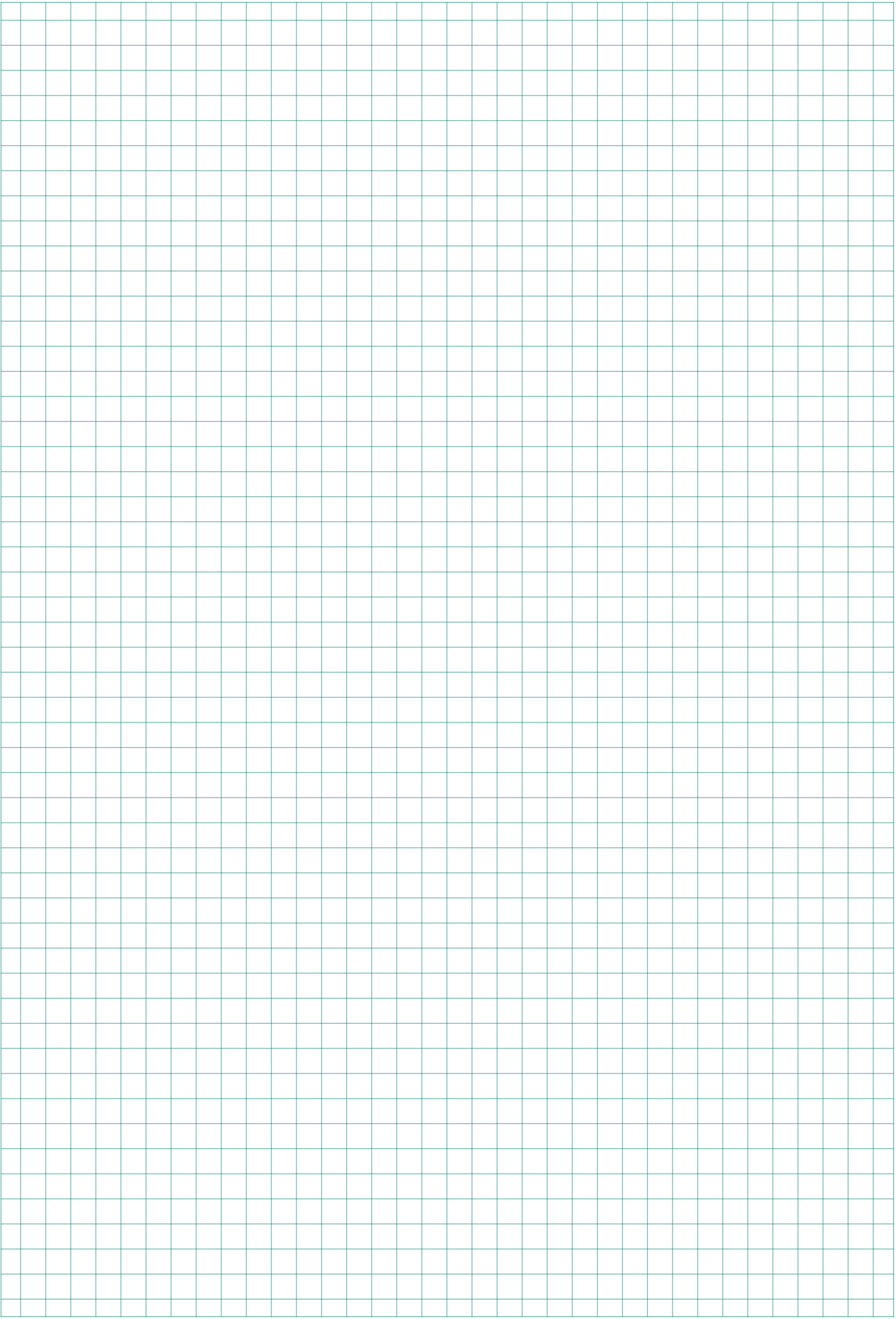
Adjustable dropout operating time for K3-450.. to K3-860..
 150-200ms: Wiring see above (delivery standard)
 500-1000ms: Jumper device "Z"
 approx. 20ms: Special wiring see package folder

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

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



Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

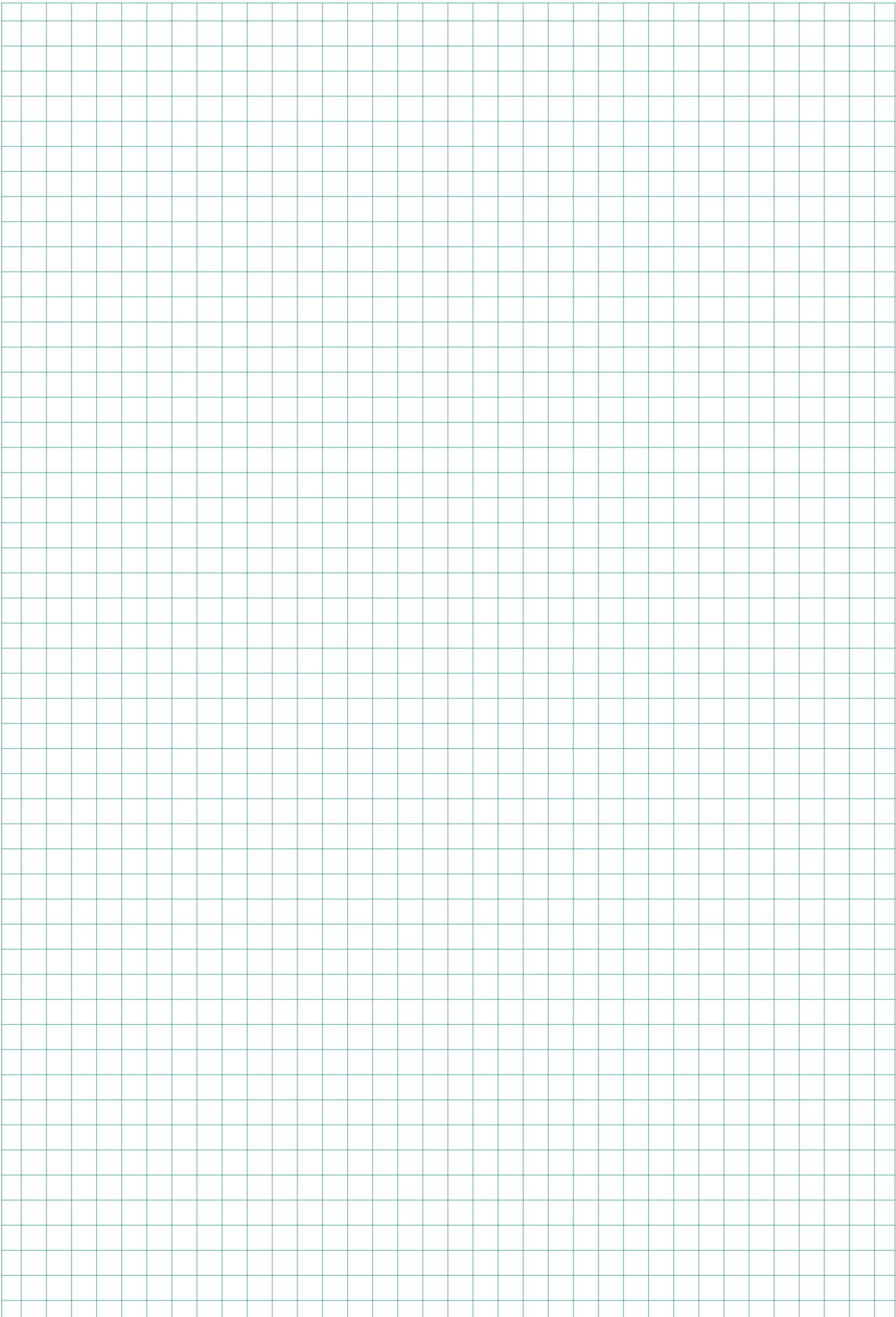
Switches

AC-Main Switches

DC-Switch Disconnect

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 |
|--|--------------------|-----------|------------|------------|-----------|-----------|-----------|-------------|------------|------------|------------|
| Rated insulation voltage U_i ¹⁾ | V AC | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 830 | 830 | 830 |
| Making capacity I_{eff} at $U_e = 690V$ AC | A | 200 | 200 | 200 | 200 | 400 | 500 | 500 | 700 | 900 | 900 |
| | 1000V AC | - | - | - | - | - | - | - | - | - | - |
| Breaking capacity I_{eff} 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 | - | - | - | - | - | - | - | - | - | - |
| Utilization category AC1 | | | | | | | | | | | |
| Switching of resistive load | | | | | | | | | | | |
| Rated operational current $I_e (=I_{th})$ at 40°C, open | 690V A | 25 | 25 | 32 | 32 | 50 | 65 | 80 | 110 | 120 | 130 |
| 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 ² | 4 | 4 | 6 | 6 | 10 | 16 | 25 | 35 | 50 | 50 |
| Utilization category AC2 and AC3 | | | | | | | | | | | |
| Switching of three-phase motors | | | | | | | | | | | |
| 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 |
| | 380-400V A | 10 | 14 | 18 | 22 | 24 | 32 | 40 | 50 | 62 | 74 |
| | 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 |
| | 380-400V kW | 4 | 5,5 | 7,5 | 11 | 11 | 15 | 18,5 | 22 | 30 | 37 |
| | 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 | - | - | - | - | - | - |
| A | 160 | 200 | 200 | 250 | 300 | 350 | 450 | 600 | 700 | 800 | 1000 | 1100 | 1200 | 1350 |
| 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 ² | 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 |
| 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 |
| 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 |
| kW | 45 | 55 | 55 | 75 | 90 | 110 | 132 | 160 | 250 | 300 | 400 | 500 | 580 | 680 |
| 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 |
|---|--------------------|-----------|------------|------------|------------|--|-----------|-------------|-----------|-----------|-----------|
| Utilization category AC4 | | | | | | | | | | | |
| Switching of squirrel cage motors, inching | | | | | | | | | | | |
| 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 |
| | 380-400V A | 10 | 14 | 18 | 18 | 24 | 32 | 40 | 50 | 62 | 62 |
| | 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 |
| | 380-400V kW | 4 | 5,5 | 7,5 | 7,5 | 11 | 15 | 18,5 | 22 | 30 | 30 |
| | 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 | - | - | - | - | - | - | - | - | - | - |
| Utilization category AC5a | | | | | | | | | | | |
| Switching of gas discharge lamps | | | | | | | | | | | |
| 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 |
| | A | 7 | 9 | 9 | 9 | 18 | 22 | 22 | 30 | 40 | 40 |
| | A | 22,5 | 22,5 | 28 | 28 | 45 | 58 | 72 | 98 | 108 | 117 |
| Metal halide lamps ¹⁾ , uncompensated | | | | | | | | | | | |
| | A | 12 | 15 | 19 | 19 | 30 | 39 | 48 | 66 | 72 | 78 |
| | A | 7 | 9 | 9 | 9 | 18 | 22 | 22 | 30 | 40 | 40 |
| Mercury-vapour lamps ²⁾ , uncompensated | | | | | | | | | | | |
| | A | 22,5 | 25 | 28 | 28 | 45 | 58 | 72 | 99 | 108 | 117 |
| | A | 7 | 9 | 9 | 9 | 18 | 22 | 22 | 30 | 40 | 40 |
| Mixed light lamps ³⁾ | | | | | | | | | | | |
| | A | 20 | 20 | 25 | 25 | 40 | 52 | 64 | 88 | 96 | 104 |
| LED-Lamps | | | | | | | | | | | |
| 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 |
| Utilization category AC5b | | | | | | | | | | | |
| Switching of incandescent lamps ⁴⁾ | | | | | | | | | | | |
| 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 |
| 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 | 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 |
| kW | 45 | 45 | 25 | 30 | 45 | 55 | 63 | 75 | 90 | 120 | 150 | 185 | 220 |
| 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 |
| | $\text{max. lamps per pole } (I_{rLED} \leq I_{rn}) = \frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$ | | | | | | | | | | | | |
| 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 |
|--|-------------------|------------|----------|----------|----------|----------|----------|----------|----------|-------|-------|-------------------|
| Utilization category AC6a | | | | | | | | | | | | |
| Transformer primary switching | | | | | | | | | | | | |
| 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 |
| Utilization category AC6b | | | | | | | | | | | | |
| Switching of three-phase capacitors | | | | | | | | | | | | |
| 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 |
| Switching of reactive capacitor banks | | | | | | | | | | | | |
| Rated operational current I_e | 690V | A | 8 | 13 | 18 | 20 | 28 | 36 | 42 | 48 | 72 | 108 ¹⁾ |
| 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 ¹⁾ |
| | 415-440V | kVAr | 5,5 | 9,5 | 13 | 14 | 22 | 27 | 30 | 36 | 53 | 75 ¹⁾ |
| | 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 | - | - | - | - | - | - | - | - | - | - |
| Utilization category DC1 | | | | | | | | | | | | |
| Switching of resistive load | | | | | | | | | | | | |
| Time constant $L/R \leq 1ms$ | | | | | | | | | | | | |
| Rated operational current I_e | 1 pole | 24V - 60V | A | 20 | 25 | 32 | 32 | 50 | 65 | 80 | 110 | 130 |
| | | 110V | A | 6 | 6 | 6 | 6 | 10 | 10 | 10 | 12 | 12 |
| | | 220V | A | 0,8 | 0,8 | 0,8 | 0,8 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| | 2 poles in series | 24V - 110V | A | 20 | 25 | 32 | 32 | 50 | 65 | 80 | 110 | 130 |
| | | 220V | A | 6 | 6 | 6 | 6 | 10 | 10 | 10 | 12 | 12 |
| | 3 poles in series | 24V - 110V | A | 20 | 25 | 32 | 32 | 50 | 65 | 80 | 110 | 130 |
| | | 220V | A | 16 | 20 | 20 | 20 | 30 | 35 | 35 | 63 | 80 |
| Utilization category DC3 and DC5 | | | | | | | | | | | | |
| Switching of shunt motors and series motors | | | | | | | | | | | | |
| 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 |
| | 2 poles in series | 24V - 60V | A | 20 | 25 | 32 | 32 | 50 | 65 | 80 | 110 | 130 |
| | | 110V | A | 6 | 6 | 6 | 6 | 30 | 30 | 30 | 60 | 60 |
| | | 220V | A | 1,2 | 1,2 | 1,2 | 1,2 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| | 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_{th}). 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 | 150 | 180 | 155 | 200 | 300 | 340 | 400 | 500 | 650 | - | - | - | - |
| A | 160 | 200 | - | - | - | - | - | - | - | - | - | - | - |
| A | 20 | 25 | - | - | - | - | - | - | - | - | - | - | - |
| A | 2 | 2,5 | - | - | - | - | - | - | - | - | - | - | - |
| A | 160 | 200 | - | - | - | - | - | - | - | - | - | - | - |
| A | 20 | 25 | - | - | - | - | - | - | - | - | - | - | - |
| 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 | 85 | 110 | - | - | - | - | - | - | - | - | - | - | - |
| A | 2 | 2,5 | - | - | - | - | - | - | - | - | - | - | - |
| A | 160 | 200 | - | - | - | - | - | - | - | - | - | - | - |
| A | 100 | 110 | - | - | - | - | - | - | - | - | - | - | - |
| A | 100 | 110 | - | - | - | - | - | - | - | - | - | - | - |
| A | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - |

Contactors

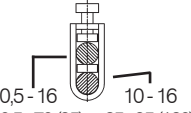




Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| 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 | | |
|---|-----------------------------|-----------------------------------|--|---------------------------------|----------|--|-------------------------|----------|--|-----------------------|-------|-------|-------|-----|-----|
| Maximum ambient temperature | | | | | | | | | | | | | | | |
| Operation | open | °C | -40 to +60 (+90) ¹⁾ | | | | | | | | | | | | |
| | enclosed | °C | -40 to +40 | | | | | | | | | | | | |
| with thermal overload relay | open | °C | -25 to +60 | | | | | | | | | | | | |
| enclosed | | °C | -25 to +40 | | | | | | | | | | | | |
| Storage | | °C | -50 to +90 | | | | | | | | | | | | |
| Short circuit protection without O/L relay | | | | | | | | | | | | | | | |
| Rated short circuit current | "r" / "I _c " | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | |
| 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. | | | | | | | | | | | | | | | |
| Cable cross-sections for contactors without thermal overload relay 1 cable per clamp | | | | | | | | | | | | | | | |
| main connector | solid or stranded | mm ² |  | | |  | | |  | | | | | | |
| | | flexible | mm ² | 0,75 - 6 | | | 1,5 - 25 | | | 4 - 50 | | | | | |
| | | flexible with multicore cable end | mm ² | 1 - 4 | | | 2,5 - 16 | | | 10 - 35 | | | | | |
| | | | 0,75 - 4 | | | 1,5 - 16 | | | 6 - 35 | | | | | | |
| 2 cables per clamp | solid or stranded | mm ² | 6+(1-6) / 4+(0,75-4) | | | 16+(2,5-16) / 10+(4-16) | | | 50+4 / 35+6 / 25+(6-16) | | | | | | |
| | | flexible | mm ² | 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) | | | | | |
| | | | 6+(1,5-4) / 4+(1-4) | | | 16+(2,5-6) / 10+(4-10) | | | 50+(4-10) / 35+(4-16) | | | | | | |
| | | | 2,5+(0,75-2,5) / 1,5+(0,75-1,5) | | | 6+(4-16) / 4+(2,5-16) | | | 25+(4-25) / 16+(4-16) | | | | | | |
| 1 cable per clamp main connector | solid | AWG | 18 - 10 | | | 16 - 10 | | | 12 - 10 | | | | | | |
| | | flexible | AWG | 18 - 10 | | | 14 - 4 | | | 10 - 0 | | | | | |
| 2 cables per clamp | solid | AWG | 10+(16-10) / 12+(18-12) | | | 10+(16-10) / 12+(18-12) | | | 10+(12-10) / 12+12 | | | | | | |
| | | flexible | AWG | 14+(18-14) / 16+(18-16) | | | 14+(18-14) / 16+(18-16) | | | 4+(18-12) / 6+(18-8) | | | | | |
| | | | 10+(14-10) / 12+(18-12) | | | 8+(18-8) / 10+(18-12) | | | 1+(12-10) / 2+(8-12) | | | | | | |
| | | | 14+(18-14) / 16+(18-16) | | | 3+(12-8) / 4+(10-6) | | | | | | | | | |
| Frequency of operations z Contactors without thermal overload relay | | | | | | | | | | | | | | | |
| | without load | 1/h | 10000 | | | | 7000 | | | | 7000 | | | | |
| | AC3, I _e | 1/h | 600 | | | | 600 | | | | 400 | | | | |
| | AC4, I _e | 1/h | 120 | | | | 120 | | | | 120 | | | | |
| | DC3, I _e | 1/h | 600 | | | | 600 | | | | 400 | | | | |
| Mechanical life | | | | | | | | | | | | | | | |
| AC operated | S x 10 ⁶ | | 10 | | | | 10 | | | | 10 | | | | |
| DC operated | S x 10 ⁶ | | 10 | | | | 10 | | | | 10 | | | | |
| DC-solenoid operated (KG3) | S x 10 ⁶ | | 50 | | | | 50 | | | | - | | | | |
| Short time current | | | | | | | | | | | | | | | |
| | 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 | | | |
| Power loss per pole | | | | | | | | | | | | | | | |
| contact resistance | at I _e /AC3 400V | W | 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 | | | |
| Resistance to shock acc. to IEC 60068-2-27 | | | | | | | | | | | | | | | |
| Shock time 20ms sine-wave | NO | g | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | | | |
| | NC | g | 6 | 6 | 6 | 6 | - | - | - | - | - | - | | | |

1) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced rated current I_e/AC1, no deratings for I_e/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) ¹⁾ | | | | | | | | | | | | | |
| °C | -40 to +40 | | | | | | | | | | | | | |
| °C | -25 to +60 | | | | | | | | | | | | | |
| °C | -25 to +40 | | | | | | | | | | | | | |
| °C | -50 to +90 | | | | | | | | | | | | | |
| °C | | | -25 to +55 (+70) ²⁾ | | | | | | | | | | | |
| °C | | | -25 to +40 | | | | | | | | | | | |
| °C | | | -25 to +55 | | | | | | | | | | | |
| °C | | | -25 to +40 | | | | | | | | | | | |
| °C | | | -55 to +80 | | | | | | | | | | | |
| kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 18 | 18 | 30 | 30 | 30 | 42 |
| 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 ² |  | |  busbar 18 x 4 screw M8 | | |  busbar 25 x 6 screw M10 | |  busbar 40 x 5 screw M10 busbar 50 x 5 screw M12 busbar 50 x 8 screw M12 busbar 50 x 8 screw M14 | | | |  busbar 50 x 10 screw 2 x M12 | | |
| mm ² | 0,5 - 16 10 - 16 | | | | | | | | | | | | | |
| mm ² | 0,5 - 70 (95) 25 - 95 (120) | | | | | | | | | | | | | |
| mm ² | 0,5 - 70 10 - 95 | | | | | | | | | | | | | |
| mm ² | 0,5 - 95 + 10 - 120 | | | | | | | | | | | | | |
| mm ² | 0,5 - 70 + 25 - 95 | | | | | | | | | | | | | |
| mm ² | | | | | | | | | | | | | | |
| 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 ⁶ | 5 | | 10 | | 5 | | 5 | | 5 | | 5 ³⁾ | | 5 ³⁾ | |
| S x 10 ⁶ | 5 | | 10 | | 5 | | 5 | | 5 | | 5 ³⁾ | | 5 ³⁾ | |
| S x 10 ⁶ | - | | - | | - | | - | | - | | - | | - | |
| 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_s and with reduced rated current I_b/AC1, no deratings for I_b/AC3 values.

2) With reduced control voltage range 1,0 x U_s and with reduced rated current I_b/AC1 no deratings for I_b/AC3 values.

3) After each 1x10⁶ 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 |
|---|--|--|---|-----------------------|--------------------|----------|----------|-----------------------|----------|----------|-------|----------|-------|
| Rated insulation voltage U_i ¹⁾ | | | V~ | 690 | | | | | - | | | - | |
| Thermal rated current I_{th} to 690V | | | | | | | | | | | | | |
| Ambient temperature | | | 40°C A | 10 | (16) ⁵⁾ | | | | - | | | - | |
| | | | 60°C A | 6 | (12) ⁵⁾ | | | | - | | | - | |
| Utilization category AC15 | | | | | | | | | | | | | |
| Rated operational current I_e | | | 220-240V A | 3 | (12) ⁵⁾ | | | | - | | | - | |
| | | | 380-415V A | 2 | (4) ⁵⁾ | | | | - | | | - | |
| | | | 440V A | 1,6 | (4) ⁵⁾ | | | | - | | | - | |
| | | | 500V A | 1,2 | (3) ⁵⁾ | | | | - | | | - | |
| | | | 660-690V A | 0,6 | (1) ⁵⁾ | | | | - | | | - | |
| Utilization category DC13 | | | | | | | | | | | | | |
| Rated operational current I_e | | | 60V A | 3,5 | (8) ⁵⁾ | | | | - | | | - | |
| | | | 110V A | 0,5 | (1) ⁵⁾ | | | | - | | | - | |
| | | | 220V A | 0,1 | | | | | - | | | - | |
| Short circuit protection short-circuit current 1kA, contact welding not accepted max. fuse size | | | gL (gG) A | 20 | (25) ⁵⁾ | | | | - | | | - | |
| For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse. | | | | | | | | | | | | | |
| Control Circuit | | | | | | | | | | | | | |
| Power consumption of coils | | | | | | | | | | | | | |
| 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 | | | | - | |
| Operation range of coils 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 | |
| Switching time at control voltage $U_c \pm 10\%$ ^{2) 3)} | | | | | | | | | | | | | |
| 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 ⁴⁾ | | | | 20 - 30 ⁴⁾ | | | | - | |
| | | | arc duration ms | 10-15 | | | | 10-15 | | | | - | |
| Cable cross-section | | | | | | | | | | | | | |
| Auxiliary connector | | | solid mm ² | 0,75-6 | | | | - | | | | - | |
| | | | flexible mm ² | 1-4 | | | | - | | | | - | |
| | | | flexible with multicore cable end mm ² | 0,75-4 | | | | - | | | | - | |
| Magnet coil | | | solid mm ² | 0,75-2,5 | | | | 0,75-2,5 | | | | 0,75-2,5 | |
| | | | flexible mm ² | 0,5-2,5 | | | | 0,5-2,5 | | | | 0,5-2,5 | |
| | | | flexible with multicore cable end mm ² | 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 ¹⁾ | K3-115 ¹⁾ | 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 0,8-1,1 | - | 0,85-1,1 0,85-1,1 | - | - | 0,85-1,1 0,85-1,1 | - | - | 0,85-1,1 0,85-1,1 | - | 0,85-1,1 0,85-1,1 | - | 0,85-1,1 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 ²⁾ | - | 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 ² | - | - | - | - | - | - | - | - | 0,75-2,5 | - | 0,75-2,5 | - | 0,75-2,5 | - |
| mm ² | - | - | - | - | - | - | - | - | 0,75-2,5 | - | 0,75-2,5 | - | 0,75-2,5 | - |
| mm ² | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| mm ² | 0,75-2,5 | - | 1-2,5 | - | - | 1-2,5 | - | - | 1-2,5 | - | 1-2,5 | - | 1-2,5 | - |
| mm ² | 0,5-2,5 | - | 1-2,5 | - | - | 1-2,5 | - | - | 1-2,5 | - | 1-2,5 | - | 1-2,5 | - |
| mm ² | 0,5-1,5 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| mm ² | 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 | - |
| AWG | 2 | - | 2 | - | - | 2 | - | - | 2 | - | 2 | - | 2 | - |

1) Coil ≤ 230/500 ... U_i=250/550V U_{inc} = 1,5kV

2) 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 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" | NO | A | 25 | 25 | 30 | 30 | 50 | 65 | 80 | 110 | 120 | 130 |
| | NC | A | 25 | 25 | 30 | 30 | 40 | 50 | 65 | - | - | - |
| Motor DOL 3-phase at 60Hz | | | | | | | | | | | | |
| 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 |
| Motor DOL 1-phase (2-pole break) at 60Hz | | | | | | | | | | | | |
| 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 |
| Motor DOL 3-phase according to ASME A17.5 | | | | | | | | | | | | |
| 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 | - | - | - | 20,5 | 22 | 27 | 34 | 44 | 52 | 60 |
| 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 |
| Auxiliary Contacts (cULus) | | | 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 |
| A | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 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 ³⁾ | 300/100 ³⁾ | - | - | - | - | - | - | - | - | - | - | - | - |
| V | 600 | 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 3-phase cap. banks 110-120V 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 ¹⁾ | 10-24 | 10-28 ²⁾ |
| | 220-240V | kVAr | 0-6 | 0-6 | 4,5-10 | 4,5-12,5 | 10-16,7 | 10-25 | 10-32 ¹⁾ | 17-40 | 17-46 ²⁾ |
| | | kVAr | 0-7 | 0-7 | 5,5-11 | 5,5-15 | 12,5-20 | 12,5-30 | 12,5-36 ¹⁾ | 20-47 | 20-56 ²⁾ |
| | 440-480V | kVAr | 0-15 | 0-15 | 11,5-25 | 11,5-30 | 25-40 | 25-60 | 25-72 ¹⁾ | 40-95 | 40-114 ²⁾ |
| 550-600V | kVAr | 0-18 | 0-18 | 14,5-30 | 14,5-35 | 31-50 | 31-75 | 31-90 ¹⁾ | 50-120 | 50-143 ²⁾ | |
| Fuse Class RK5 / 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 / Short-circuit current | A/kA | 80/100 | 80/100 | 110/100 | 150/100 | 175/100 | 175/100 | 175/100 | 300/100 ³⁾ | 300/100 ³⁾ | |
| Rated voltage | V | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | |
| Auxiliary Contacts (cULus) | | A600 | A600 | - | - | - | - | - | - | - | |

1) Consider the max. thermal current of the contactor K3-74A: I_{th} 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. ¹⁾

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

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

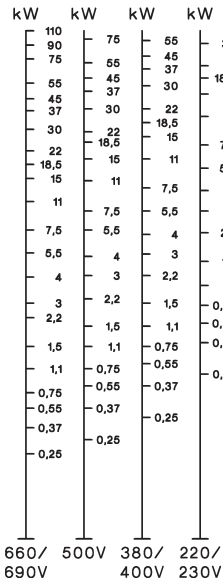
$$M = \frac{AC3}{1 + \frac{\%AC4}{100} \times \left(\frac{AC3}{AC4} - 1 \right)}$$

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

$P_n = AC4$

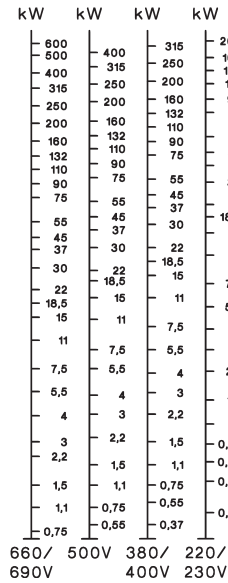
660/ 500V 380/ 220/
690V 400V 230V



Motor Rating

$P_n = AC3$

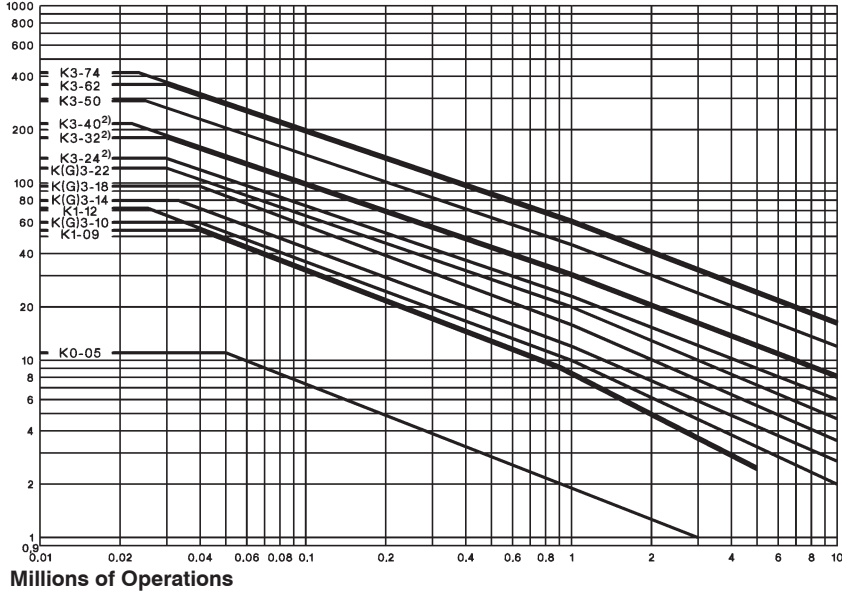
660/ 500V 380/ 220/
690V 400V 230V



Breaking Current

$I_a (= I_e = AC1)$

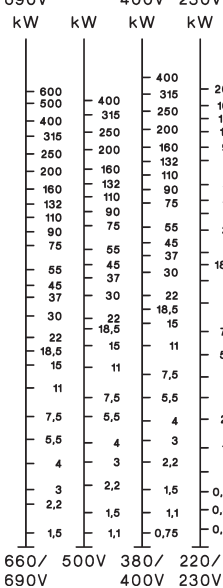
A



Motor Rating

$P_n = AC4$

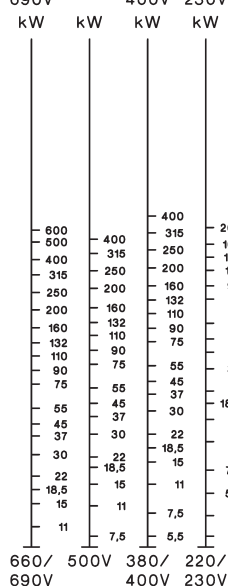
660/ 500V 380/ 220/
690V 400V 230V



Motor Rating

$P_n = AC3$

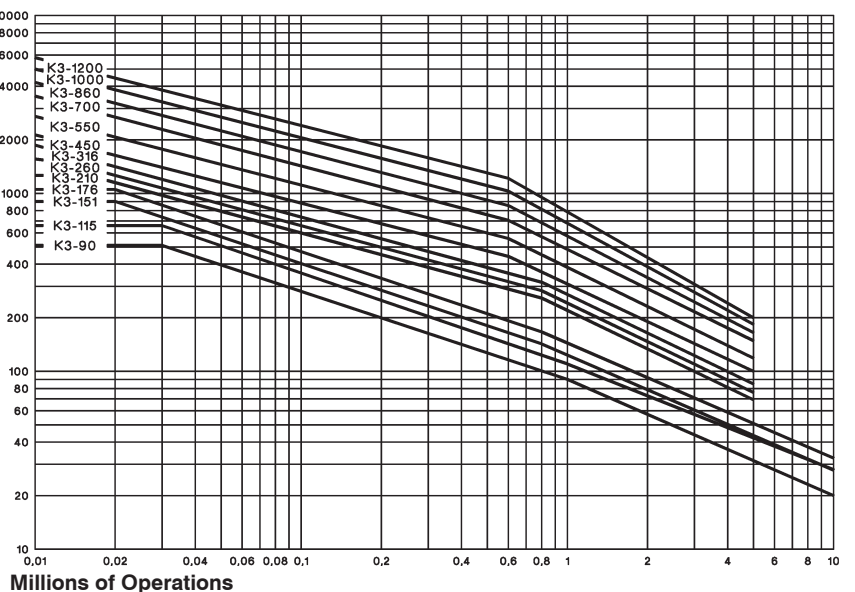
660/ 500V 380/ 220/
690V 400V 230V



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.

2) Valid for NO contacts. NC contacts minus 50 %.

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 | AC1 | 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 |
| | AC2 | 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 |
| | AC3 | Squirrel-cage motors: starting, switching off motors during running | $I_e < 17A$ $I_e > 17A$ $I_e > 100A$ | 6 6 6 | 1 1 1 | 0,65 0,35 0,35 | 1 1 1 | 0,17 0,17 0,17 | 0,65 0,35 0,35 | 10 10 10 | 1,05 1,05 1,05 | 0,45 0,45 0,35 | 8 8 8 | 1,05 1,05 1,05 | 0,45 0,45 0,35 |
| | AC4 | Squirrel-cage motors: starting, plugging, inching | $I_e < 17A$ $I_e > 17A$ $I_e > 100A$ | 6 6 6 | 1 1 1 | 0,65 0,35 0,35 | 6 6 6 | 1 1 1 | 0,65 0,35 0,35 | 12 12 12 | 1,05 1,05 1,05 | 0,45 0,45 0,35 | 10 10 10 | 1,05 1,05 1,05 | 0,45 0,45 0,35 |
| | AC5a | Switching of electric discharge lamp controls | all values | - | - | - | - | - | - | 3 | 1,05 | 0,45 | 3 | 1,05 | 0,45 |
| | AC5b | Switching of incandescent lamps | all values | - | - | - | - | - | - | 1,5 | 1,05 | ¹⁾ | 4 | 1,05 | ¹⁾ |
| | AC6a | Switching of transformers | $I_e < 100A$ $I_e > 100A$ | - | - | - | - | - | - | 4,5 4,5 | 1,05 1,05 | 0,45 0,35 | 3,6 3,6 | 1,05 1,05 | 0,45 0,35 |
| | AC6b | Switching of capacitors | - | - | - | - | - | - | - | ²⁾ | | | ²⁾ | | |
| | AC7a | Slightly inductive loads in household appliances and similar applications | all values | - | - | - | - | - | - | 1,5 | 1,05 | 0,8 | 1,5 | 1,05 | 0,8 |
| | AC7b | Motor loads for household applications | $I_e < 100A$ $I_e > 100A$ | - | - | - | - | - | - | 8 8 | 1,05 1,05 | 0,45 0,35 | 6 6 | 1,05 1,05 | 0,45 0,35 |
| | AC8a | Hermetic refrigerant compressor motor control with manual resetting of overload releases | $I_e < 100A$ $I_e > 100A$ | - | - | - | - | - | - | 6 6 | 1,05 1,05 | 0,45 0,35 | 6 6 | 1,05 1,05 | 0,45 0,35 |
| | AC8b | Hermetic refrigerant compressor motor control with automatic resetting of overload releases | $I_e < 100A$ $I_e > 100A$ | - | - | - | - | - | - | 6 6 | 1,05 1,05 | 0,45 0,35 | 6 6 | 1,05 1,05 | 0,45 0,35 |
| | AC12 | Control of resistive loads and solid state loads with isolation by opto couplers | all values | - | - | - | - | - | - | 1 | 1 | 0,9 | 1 | 1 | 0,9 |
| | AC13 | Control of solid state loads with transformer isolation | all values | - | - | - | - | - | - | 10 | 1,1 | 0,65 | 1,1 | 1,1 | 0,65 |
| | AC14 | Control of small electromagnetic loads ($\leq 72VA$) | - | - | - | - | - | - | - | 6 | 1,1 | 0,7 | 6 | 1,1 | 0,7 |
| AC15 | 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 | DC1 | 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 |
| | DC3 | 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 |
| | DC5 | 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 |
| | DC6 | Switching of incandescent lamps | all values | - | - | - | - | - | - | 1,5 | 1,05 | ¹⁾ | 4 | 1,05 | ¹⁾ |
| | DC12 | Control of resistive loads and solid state loads with isolation by opto couplers | all values | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| | DC13 | Control of electromagnets | all values | 1 | 1 | ≤ 300 | 1 | 1 | ≤ 300 | 1,1 | 1,1 | ≤ 300 | 1,1 | 1,1 | ≤ 300 |
| | DC14 | Control of electromagnetic loads having economy resistors in circuit | all values | - | - | - | - | - | - | 10 | 1,1 | 15 | 10 | 1,1 | 15 |

U_e Rated operational voltage, U Voltage before make, U_r Recovery voltage, I_e Rated operational current, I Current make, I_c Current broken

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

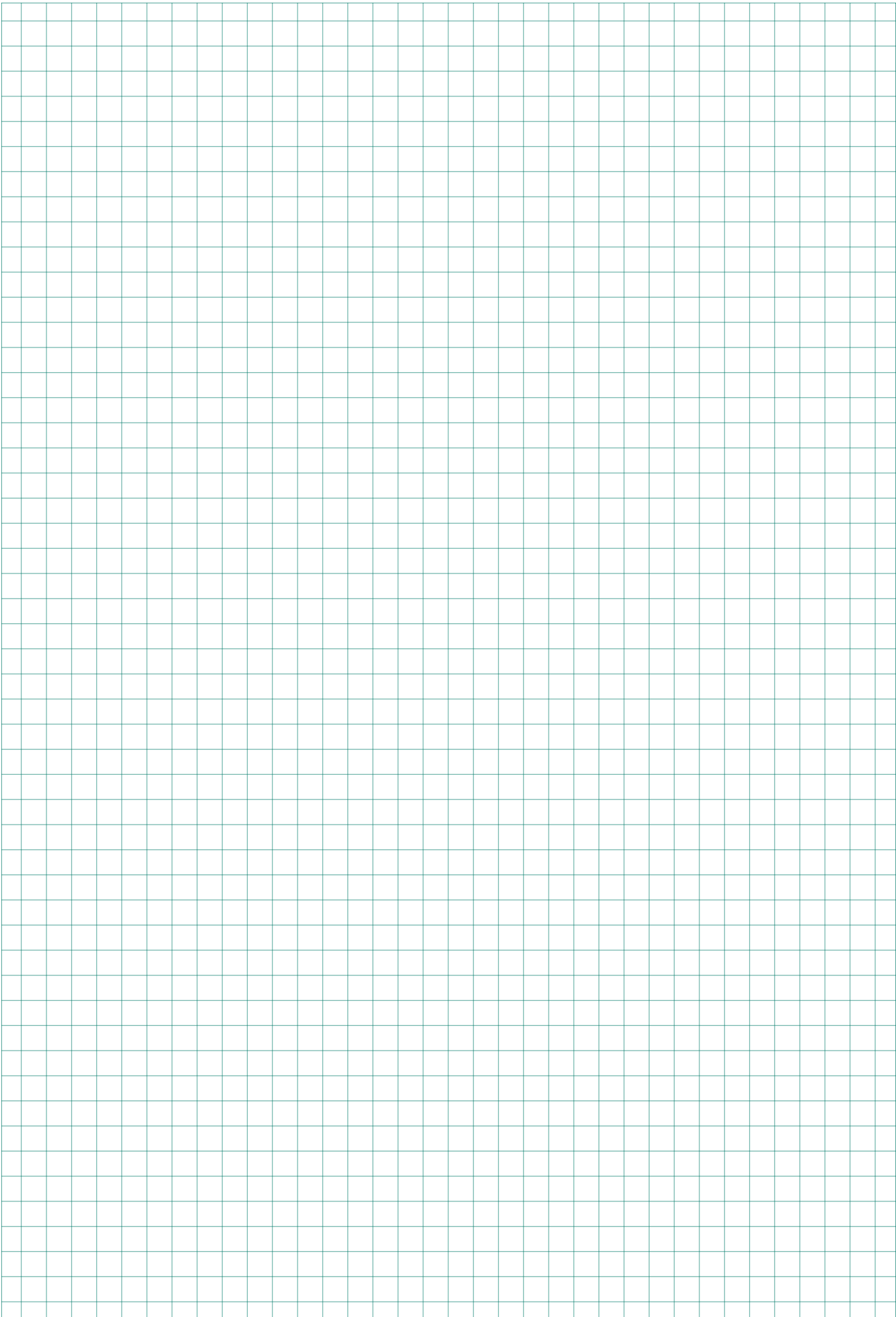
| Type | | HN | HTN | HA | HB | HKT | HKA | HKF HKB | K2-DK K2-SK | K2-L ²⁾ |
|--|-----------------|----------|----------|----------|----------|----------|----------|------------|----------------|--------------------|
| Rated insulation voltage U_i ¹⁾ | V AC | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 |
| Thermal rated current 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 |
| Frequency of operations z | 1/h | 3000 | - | 3000 | 3000 | - | - | - | - | 3000 |
| Mechanical life | $S \times 10^6$ | 10 | 10 | 10 | 10 | - | - | - | - | 10 |
| Power loss per pole at $I_n/AC1$ | W | 0,5 | 0,5 | 1,5 | 0,5 | - | - | - | - | - |
| Utilization category AC15 | | | | | | | | | | |
| 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 |
| Utilization category DC13 | | | | | | | | | | |
| 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 |
| Short circuit protection short-circuit current 1kA, contact welding not accepted 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. | | | | | | | | | | |
| Cable cross-sections | | | | | | | | | | |
| solid or stranded | mm ² | 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 ² | 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 ² | 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 HKF | K2-DK K2-SK | K2-L ²⁾ |
|--|-----------|------|------|------|------|-----------------|----------------|--------------------|
| Rated operational current "General Use" | A | 10 | 10 | 16 | 10 | 10 | - | - |
| Rated operational voltage | max. V AC | 600 | 600 | 600 | 600 | 600 | - | 600 |
| Auxiliary Contacts | | 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, Motor-Starters

Circuit Breakers

Manual Motor-Starters

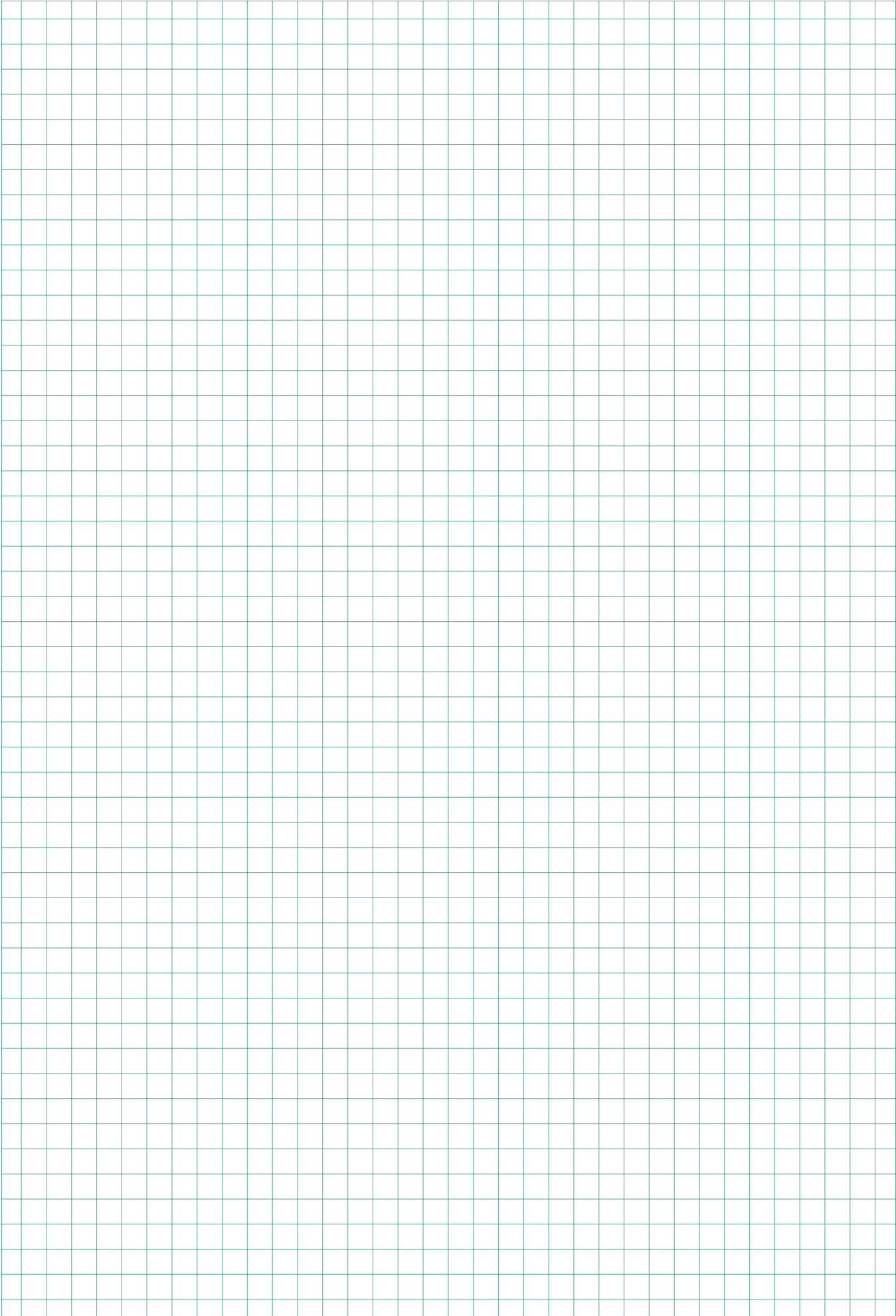
Switches

AC-Main Switches

DC-Switch Disconnector

Push Buttons

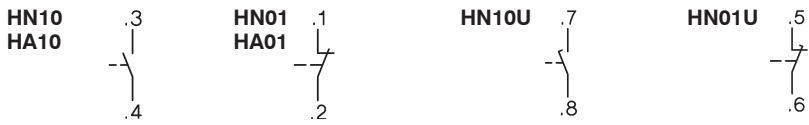
Representatives, Suppliers



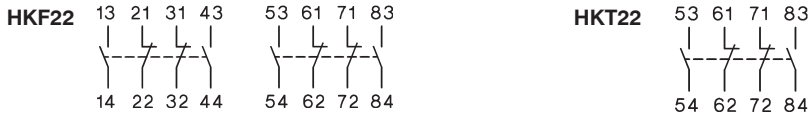
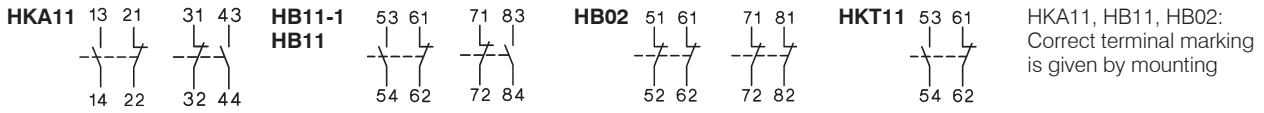
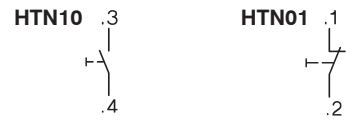
Contactors and Accessories

Wiring diagrams

Auxiliary contact blocks

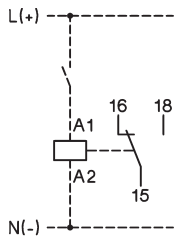


Snap-on momentary contact blocks



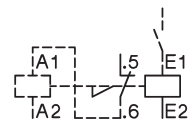
Electronic timer

K3-T180 240



Latch

K2-L..



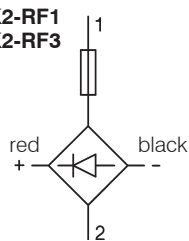
Fuse holder

K2-F



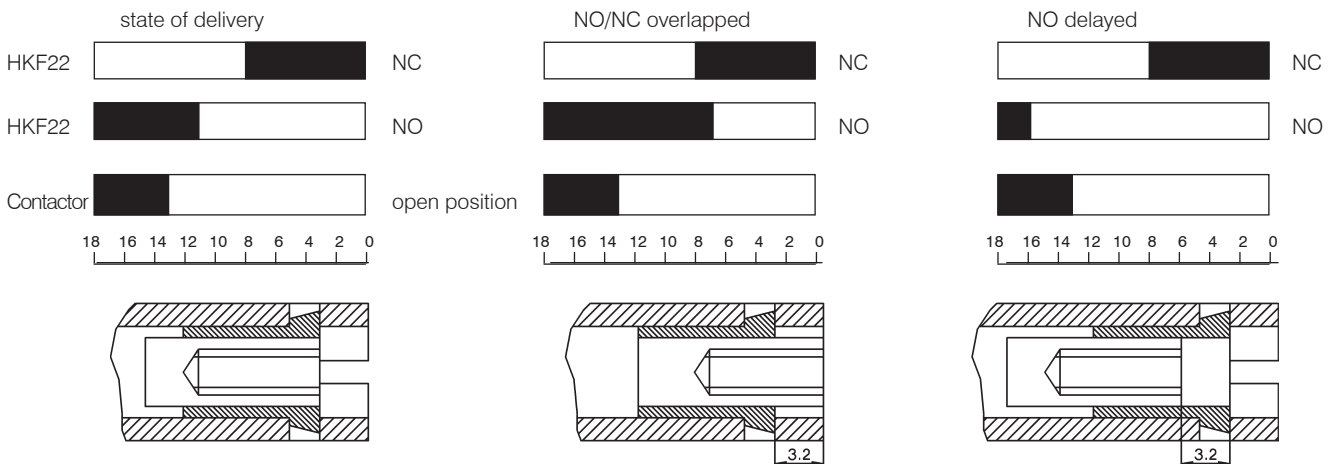
with rectifier

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



Stand position of regulation screw

Regulation screw position (unscrew by 4 turns)

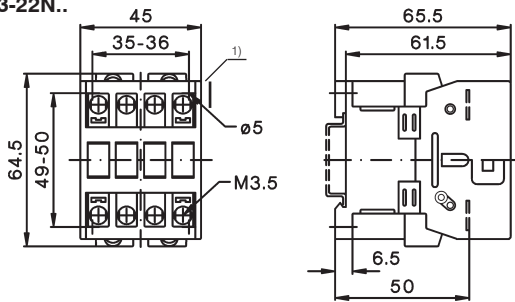
Regulation screw position (screw by 4 turns)

Contactors

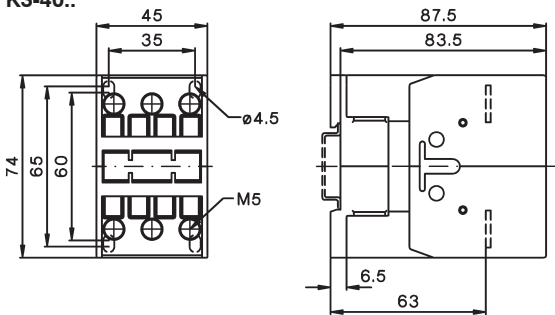
Dimensions

AC operated

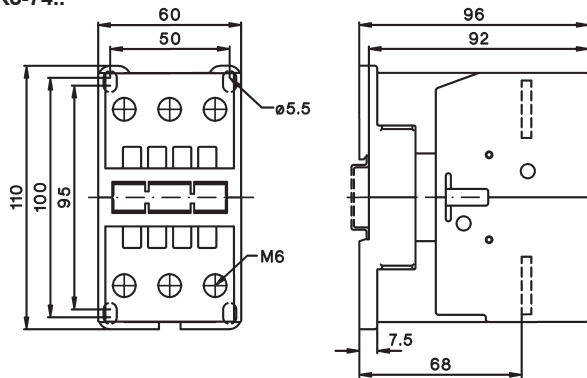
K3-10N..
K3-14N..
K3-18N..
K3-22N..



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

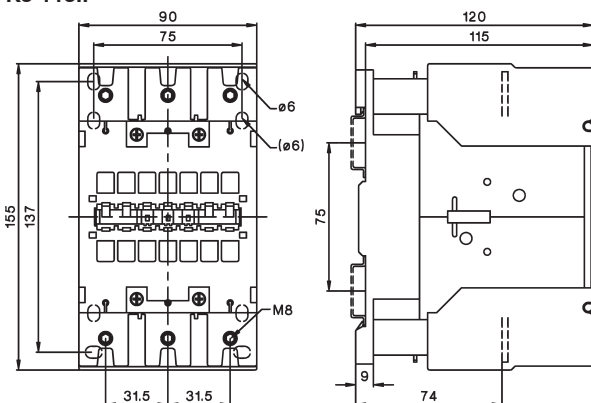


K3-50..
K3-62..
K3-74..



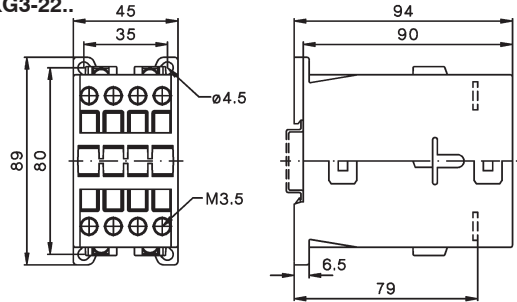
AC and DC operated

K3-90..
K3-115..

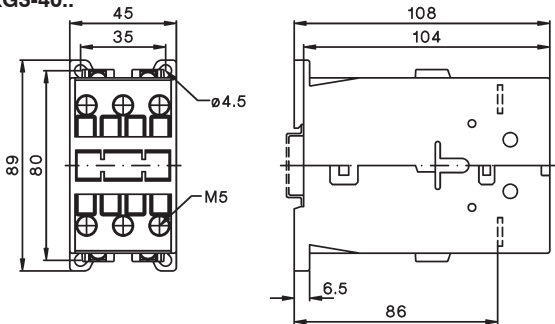


DC operated

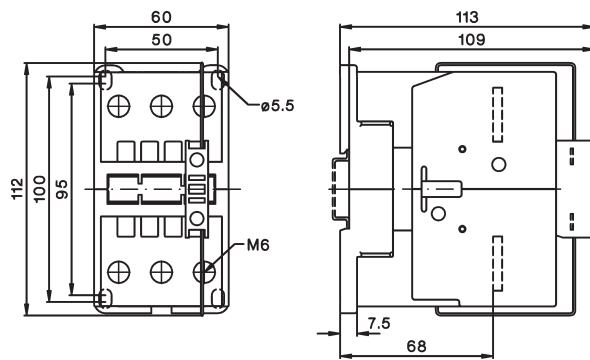
KG3-10..
KG3-14..
KG3-18..
KG3-22..



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



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

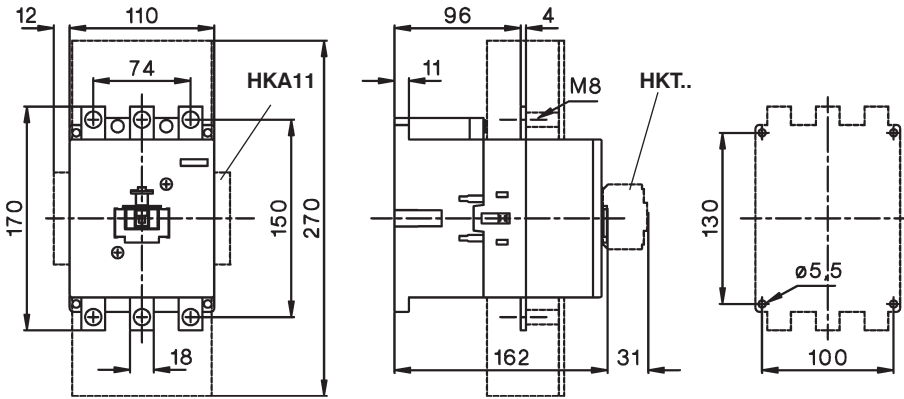


1) Minimum side distance to
conductive parts for coil voltage:
500V $U_{imp}=6kV$ 2mm
660-690V $U_{imp}=8kV$ 4,5mm

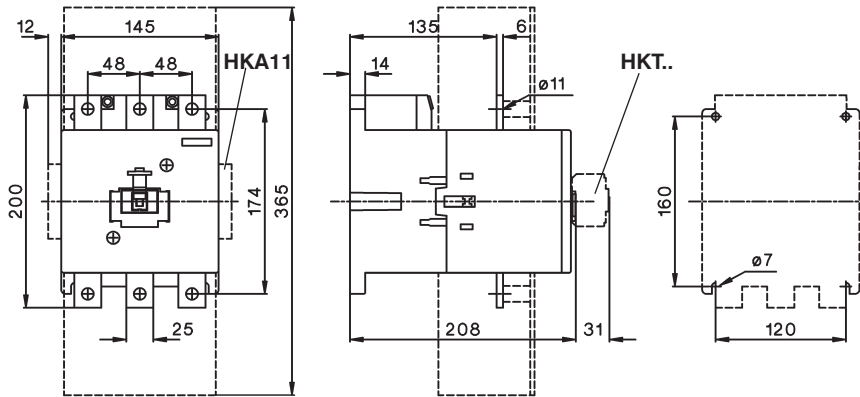
Contactors

Dimensions, AC operated, DC operated

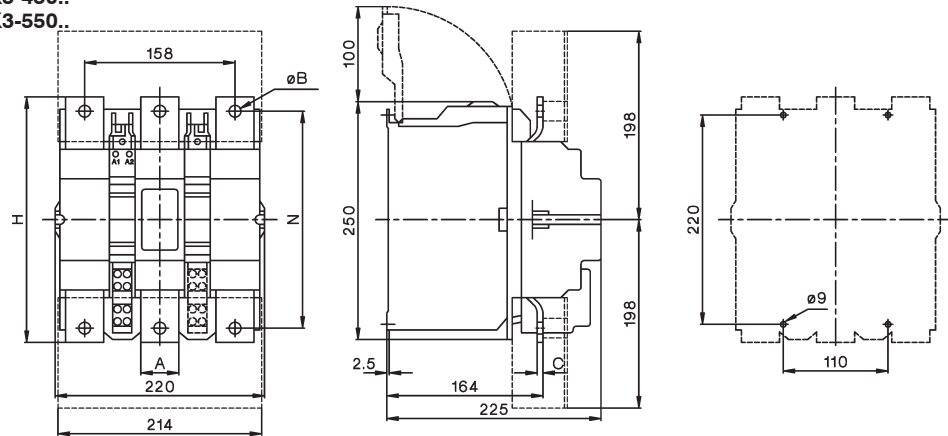
K3-151..
K3-176..



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

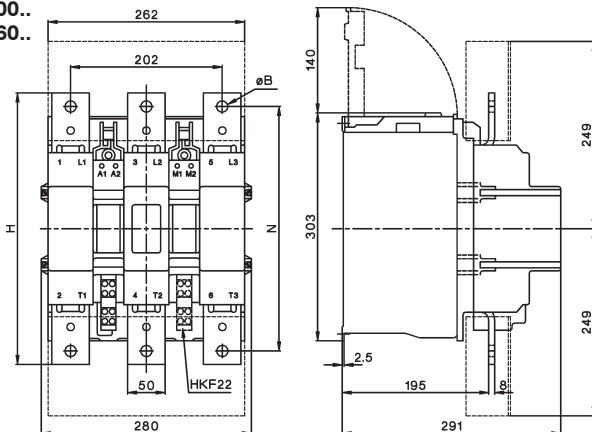


K3-450..
K3-550..



| 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 |

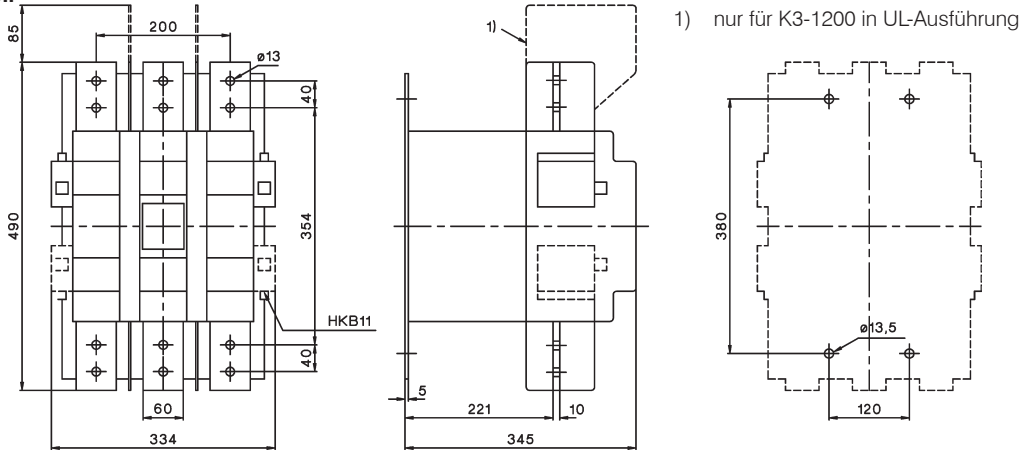
Contactors

Dimensions

AC operated, DC operated

K3-1000..

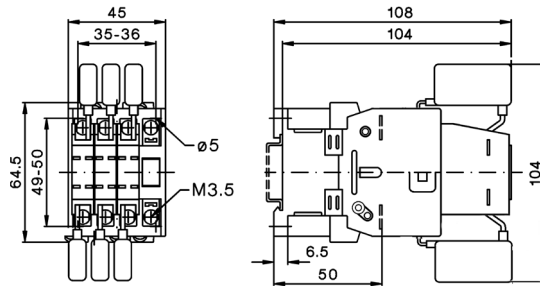
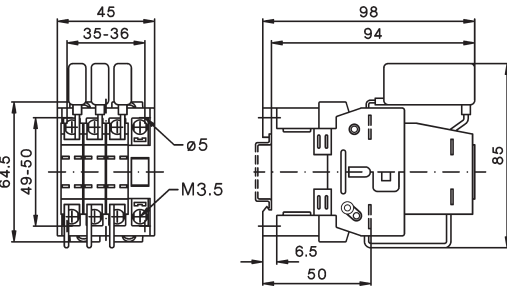
K3-1200..



Capacitor Switching Contactors, AC operated

K3-18NK..

K3-18NBK..



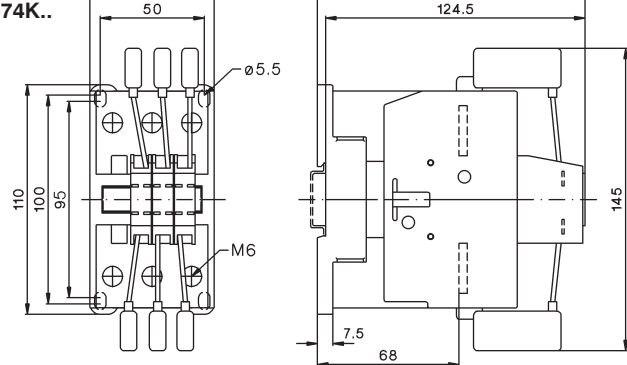
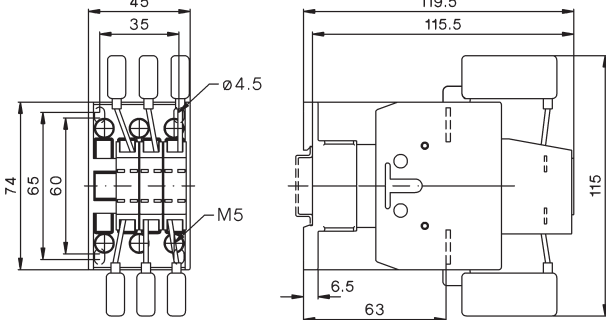
K3-24K..

K3-32K..

K3-50K..

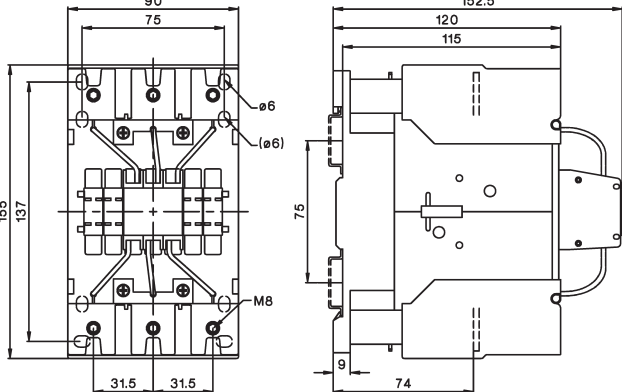
K3-62K..

K3-74K..



K3-90K..

K3-115K..

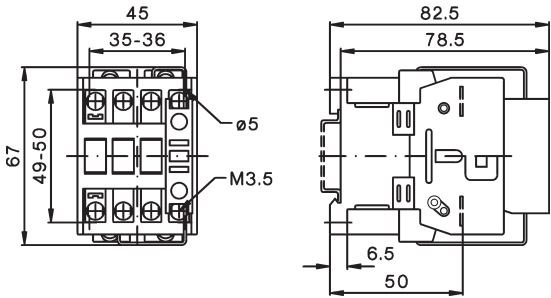


Contactors

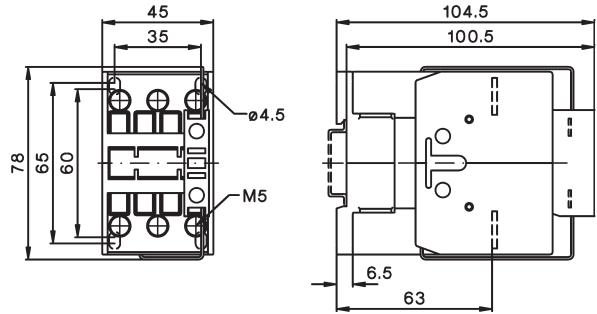
Dimensions

Contactors DC operated

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

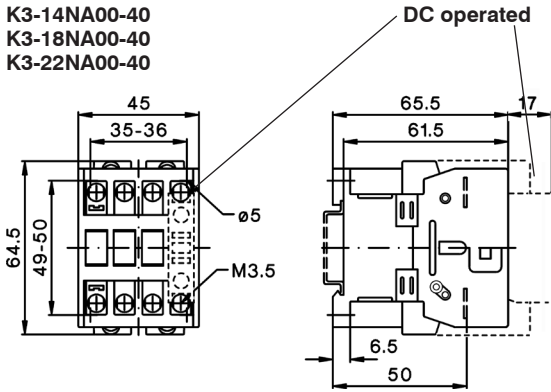


- K3-24..=
- K3-32..=
- K3-40..=

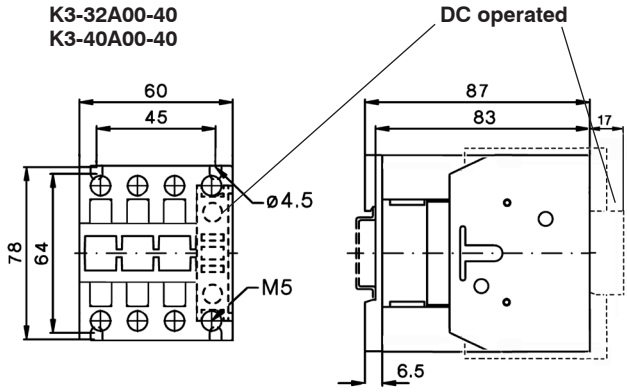


Contactors 4-pole, AC operated / DC operated

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

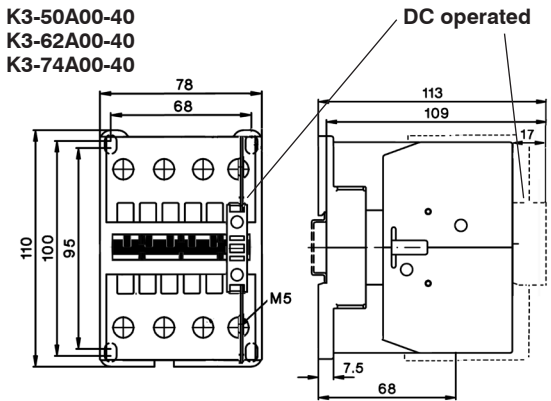


- K3-24A00-40
- K3-32A00-40
- K3-40A00-40

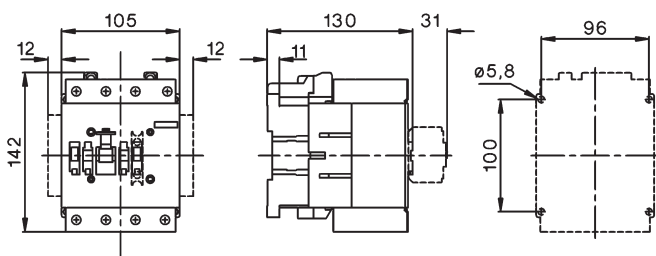


Contactors 4-pole, AC operated / DC operated

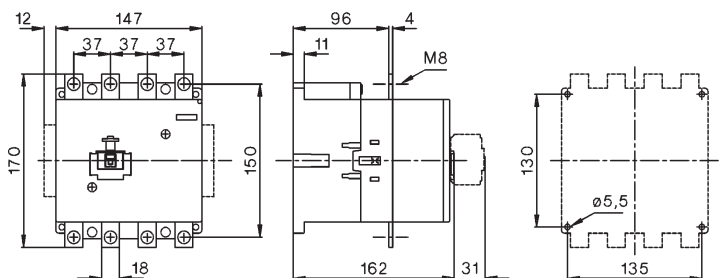
- K3-50A00-40
- K3-62A00-40
- K3-74A00-40



K3-96A00-40



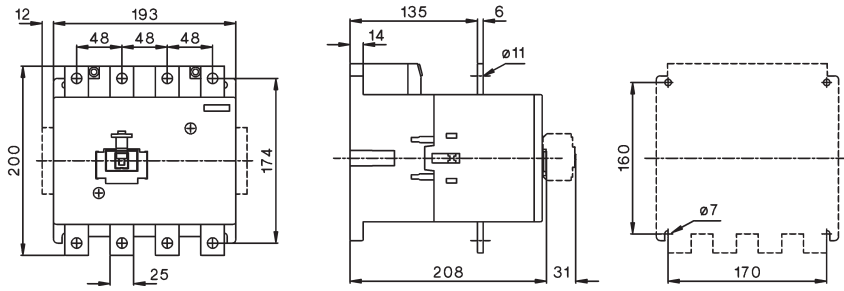
K3-116A00-40 K3-151A00-40 K3-176A00-40



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

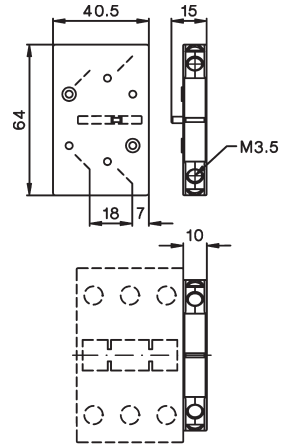
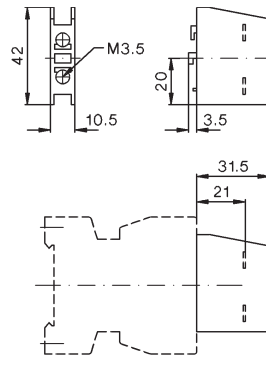
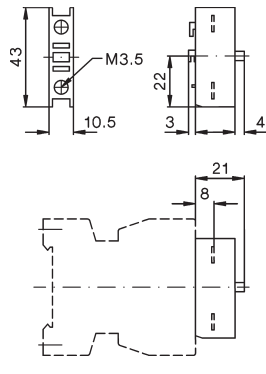
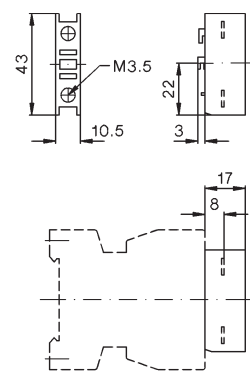
HN10, HN01

K2-SK, K2-DK

HTN10, HTN01

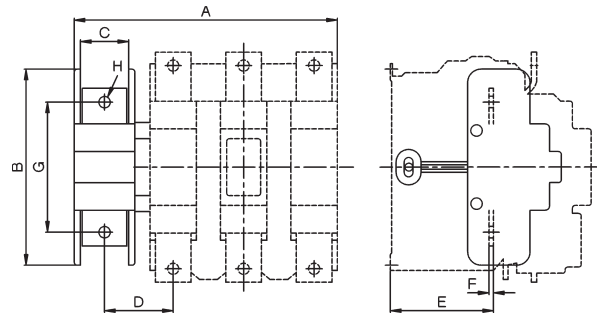
HA10, HA01

HB11-1, HB11, HB02



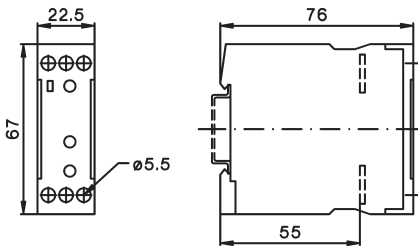
4. pole for contactors K3-200 to K3-1200

| 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 |



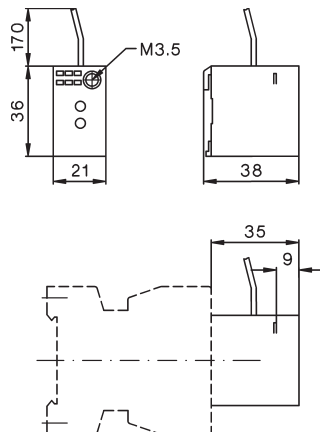
Electronic timer

K3-T180 240



Electronic timer on-delay

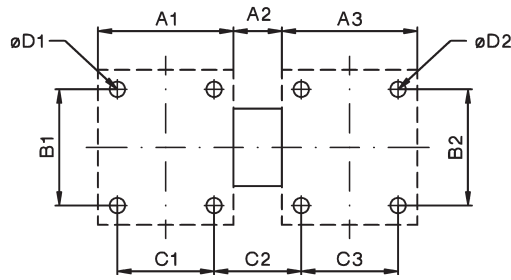
K2-TE..



Contactors

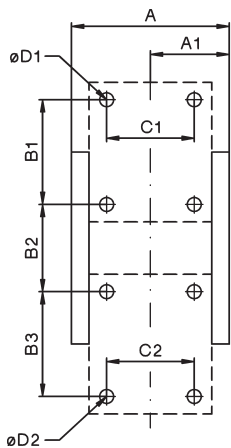
Dimensions Accessories

Mechanical interlocks

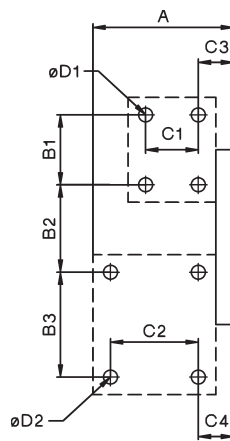


| Type | Contactor 1 | Contactor 2 | A1 | A2 | A3 | B1 | B2 | C1 | C2 | C3 | D1 | D2 | |
|-----------------|--------------------|--------------------|-----|----|-----|-----|-----|-----|-------|-----|------|------|------------------|
| LG10889 | K3-07 to K3-40 | K3-07 to K3-40 | 45 | 7 | 45 | 50 | 50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

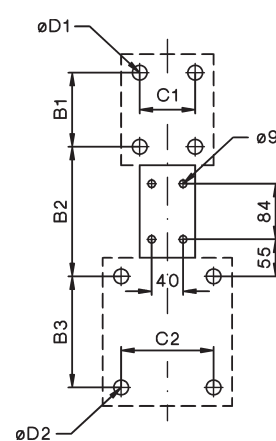
LG10400V, LG10402V



LG10399V



LG10403V, LG10401V



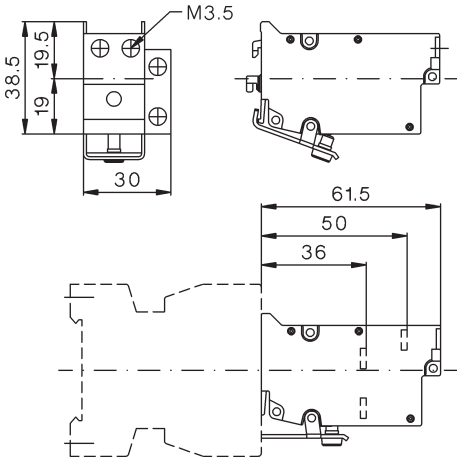
| Type | Contactor 1 | Contactor 2 | A | A1 | B1 | B2 | B3 | C1 | C2 | C3 | C4 | D1 | D2 |
|-----------------|-----------------|-----------------|-----|-----|-----|-----|-----|-----|-----|----|------|------|------|
| LG10400V | K3-315 - K3-550 | K3-315 - K3-550 | 250 | 134 | 220 | 94 | 220 | 110 | 110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

Contactors

Dimensions Accessories

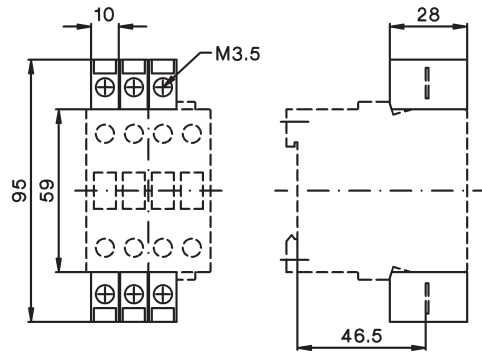
Latch

K2-L..



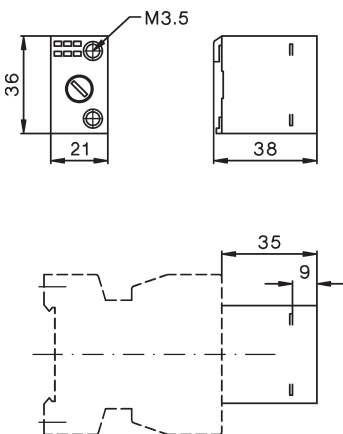
Contactors with additional terminals

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



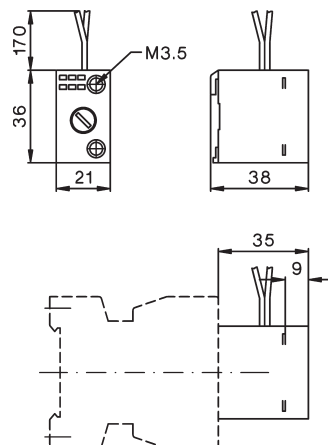
Fuse holder

K2-RF



Fuse holder with rectifier

K2-RF1 K2-RF3

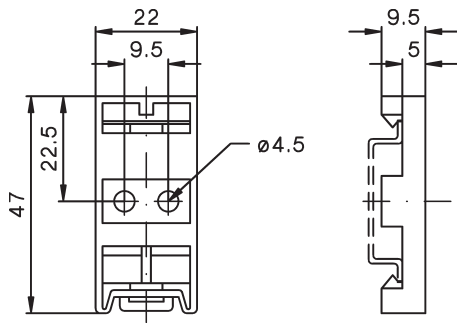


Contactors

Dimensions Accessories

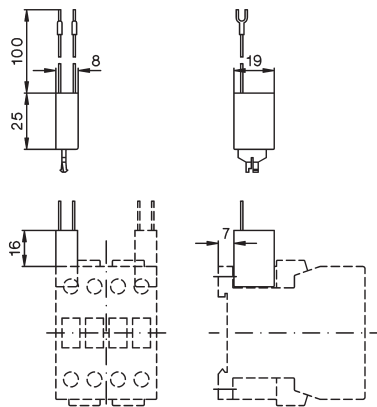
Snap-on adapter

K2-SM



Suppressor units

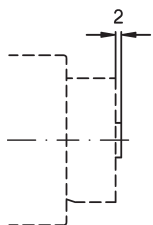
RC-K3 ..

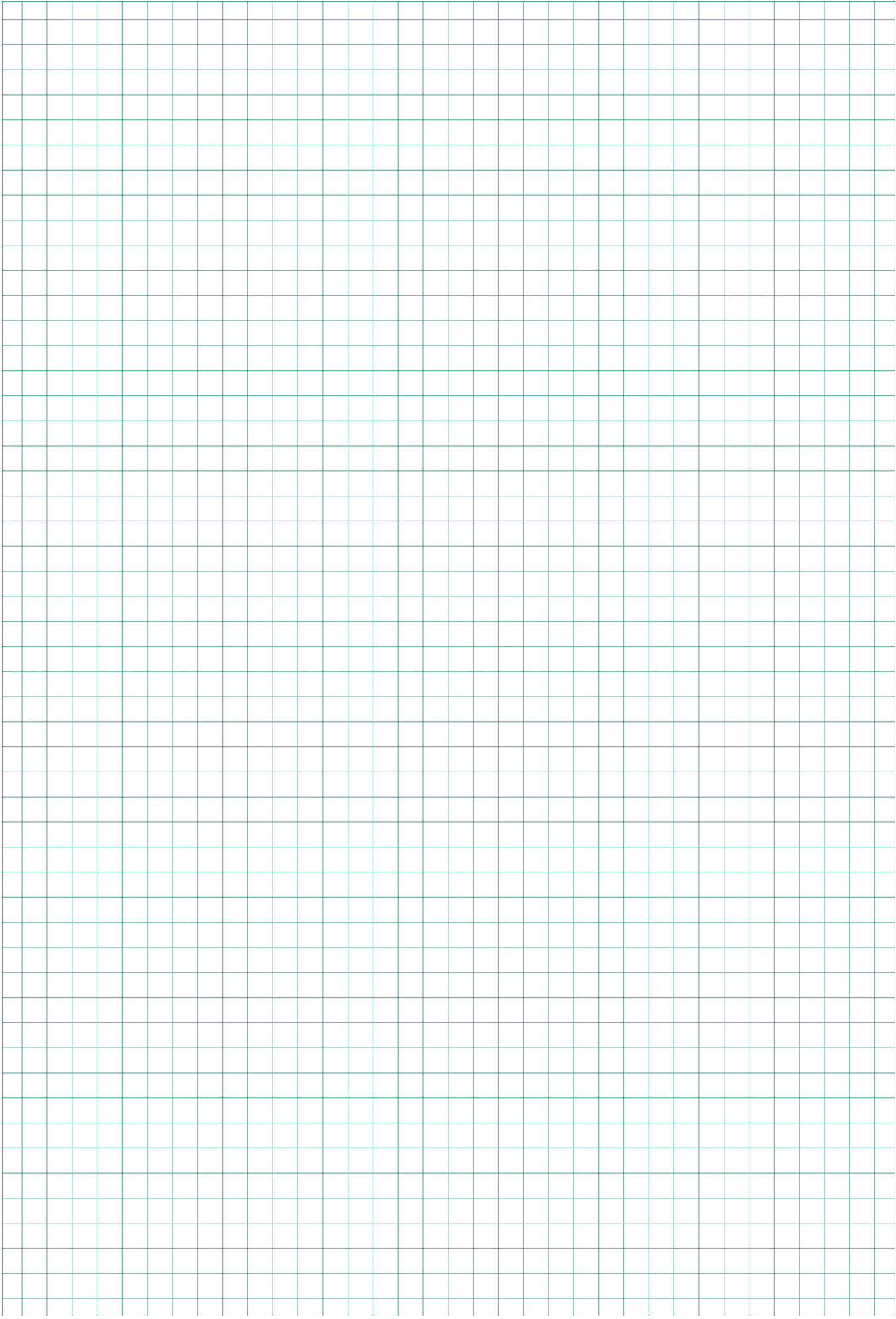


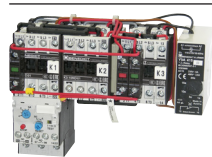
Marking systems

marking label

P487-1 or **P245-**







Star-Delta Starters Open Type

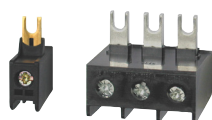
92



Star-Delta Starters Enclosed
Enclosure for Star-Delta Starters

94

94



Accessories

95



Reversing Contactors

96



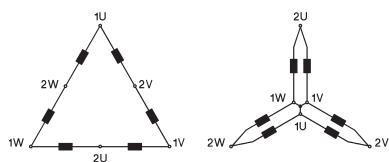
Pole Changing Starters

98



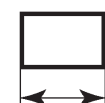
Technical Data

100



Wiring Diagrams

103

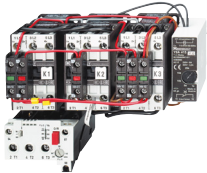


Dimensions

107

Star-Delta Starters Open Type

AC Operated



| Ratings | | Rated Current | | order separately | Type | Coil voltage ¹⁾ | 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 U12/16E K3 | K3NY15 ... | | 1 | 0,9 |
| 15 | 18,5 | 15 | 30 | | K3NY26 ... | | 1 | 0,9 |
| 22 | 30 | 22 | 45 | U3/42 | K3Y40 ... | | 1 | 1,4 |
| 30 | 37 | 30 | 60 | | K3Y52 ... | | 1 | 1,8 |
| 45 | 55 | 45 | 85 | U3/74 | K3Y80 ... | | 1 | 3,5 |
| 55 | 75 | 55 | 109 | | K3Y100 ... | | 1 | 3,7 |
| 75 | 90 | 90 | 150 | U85 | K3Y140 ... | | 1 | 6,6 |
| 110 | 132 | 110 | 205 | | K3Y200 ... | | 1 | 7 |
| 132 | 160 | 160 | 240 | U180 | K3Y240 ... | | 1 | 15 |
| 160 | 180 | 180 | 300 | | K3Y300 ... | | 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**

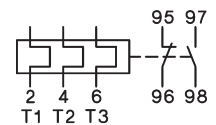
Thermal Overload Relays

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

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



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

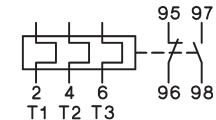


manual reset

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



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

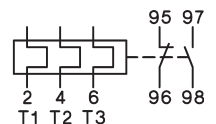


manual and auto reset

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



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

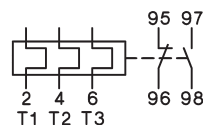
Type

Pack pcs. Weight kg/pc.

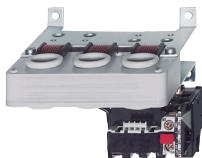
Wiring Diagram

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

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

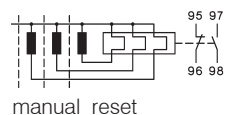


manual and auto reset

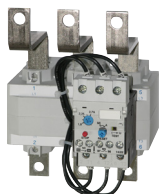


For Star-Delta Starters K3Y140.., K3Y200..

| | | | |
|-----------|----------------|---|------|
| 104 - 156 | U85 90 | 1 | 0,90 |
| 140 - 207 | U85 120 | 1 | 0,90 |

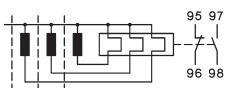


manual reset



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

| | | | |
|-----------|-----------------|---|-----|
| 208 - 312 | U180 180 | 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 ¹⁾ | Pack pcs. | Weight kg/pc. |
|-------------|------|---------------|-----------------|--------------------------------|------------|----------------------------|-----------|---------------|
| AC3 | | | | | | 220-240V 50Hz | | |
| 380V | | | | | 230 | 380-415V 50Hz | | |
| 400V | 660V | AC3 | | | 400 | | | |
| 415V | 500V | 690V | 400V | | ↓ | | | |
| kW | 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 | K3NY15P ... | 1 | 1,8 |
| 15 | 18,5 | 15 | 30 | ST | | K3NY26P ... | 1 | 1,8 |
| 22 | 30 | 22 | 45 | ST, H | U3/42 | K3Y40P ... | 1 | 3,8 |
| 30 | 37 | 30 | 60 | ST, H | | K3Y52P ... | 1 | 4,2 |
| 45 | 55 | 45 | 85 | ST, H | U3/74 | K3Y80P ... | 1 | 5,9 |
| 55 | 75 | 55 | 109 | ST, H | | K3Y100P ... | 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 | K3NY15B ... | 1 | 2,8 |
| 15 | 18,5 | 15 | 30 | ST, H | | K3NY26B ... | 1 | 2,8 |
| 22 | 30 | 22 | 45 | ST, H | U3/42 | K3Y40B ... | 1 | 4,8 |
| 30 | 37 | 30 | 60 | ST, H | | K3Y52B ... | 1 | 5,2 |
| 45 | 55 | 45 | 85 | ST, H | U3/74 | K3Y80B ... | 1 | 15 |
| 55 | 75 | 55 | 109 | ST, H | | K3Y100B ... | 1 | 15 |
| 75 | 90 | 90 | 150 | ST, H | U85 | K3Y140B ... | 1 | 22 |
| 110 | 132 | 110 | 205 | ST, H | | K3Y200B ... | 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. |
|-------------------------|-----------------------|---------------------|-----------|---------------|
| Plastic IP65 | | | | |
| K3NY15, K3NY26 | U3/32 | K3Y26P-G3 | 1 | 1,0 |
| K3Y40, K3Y52 | U3/42, U3/32 | K3Y40/52P-G3 | 1 | 2,4 |
| Sheet Steel IP54 | | | | |
| K3NY15, K3NY26 | U3/32 | K3Y26B-G3 | 1 | 3,4 |
| K3Y40, K3Y52 | U3/42, U3/32 | K3Y40/52B-G3 | 1 | 3,4 |

Star-Delta Starter Connector



For Star-Delta Starter Types

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

Additional Terminals



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

Cable cross-section mm²

| | Type | Pack pcs. | Weight kg/pc. |
|--|------|-----------|---------------|
|--|------|-----------|---------------|

Single pole with Fingertouch Protection

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

Three-pole with Fingertouch Protection

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

Electronic Timers for Star-Delta Starters¹⁾

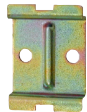


| Rated Control Voltage V | Time Range s | Delay Time ms | Rated Current AC15 | | Type | Pack pcs. | Weight kg/pc. |
|-------------------------|----------------------|---------------|--------------------|--------|-----------------|-----------|---------------|
| | | | 250V A | 400V A | | | |
| 24 - 60V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

| | | | | |
|-------------------------------------|------------|----------------------|----------|-------|
| Time repeat accuracy | ± 1% | Power consumption at | 24V | 0,2VA |
| Minimum interval between operations | 2s | | 60V | 5VA |
| Short circuit protection | 4A gl (gG) | | 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.. | LG7735 | 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 page 120 Type | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pc. |
|-------------|---------------|------------------------|--|------|----------------------------|-----------|---------------|
| AC3 | | | | | 110V 50Hz | | |
| 380V | | | | | 220-240V 50Hz | | |
| 400V | | 660V | AC3 | | 380-415 50Hz | | |
| 415V | 500V | 690V | 400V | | | | |
| kW | kW | kW | A | | | | |

Open Type

| | | | | | | | |
|-------------|------|------|----|---------------------|--------------------|---|-----|
| 4 | 5,5 | 5,5 | 10 | U3/32 U12/16E K3 | K3NWU10 ... | 1 | 0,6 |
| 7,5 | 10 | 7,5 | 18 | | K3NWU18 ... | 1 | 0,6 |
| 11 | 15 | 15 | 24 | U3/42 | K3WU24 ... | 1 | 1,2 |
| 15 | 18,5 | 18,5 | 32 | | K3WU32 ... | 1 | 1,4 |
| 18,5 | 18,5 | 18,5 | 40 | | K3WU40 | 1 | 1,4 |
| 22 | 30 | 30 | 50 | U3/74 | K3WU50 ... | 1 | 2,5 |
| 30 | 37 | 37 | 62 | | K3WU62 ... | 1 | 2,5 |
| 37 | 45 | 45 | 74 | | K3WU74 ... | 1 | 2,5 |

Sheet Steel Enclosed, protected to IP54

| | | | | | | | |
|------------|------|------|----|-------|---------------------|---|-----|
| 4 | 5,5 | 5,5 | 10 | U3/32 | K3NWU10B ... | 1 | 3,9 |
| 7,5 | 10 | 7,5 | 18 | | K3NWU18B ... | 1 | 4,1 |
| 11 | 15 | 15 | 24 | U3/42 | K3WU24B ... | 1 | 4,5 |
| 15 | 18,5 | 18,5 | 32 | | K3WU32B ... | 1 | 4,7 |
| 22 | 30 | 30 | 50 | U3/74 | K3WU50B ... | 1 | 7,1 |
| 30 | 37 | 37 | 62 | | K3WU62B ... | 1 | 7,1 |

Reversing Starter Connector



| For Reversing Starter Types | For Industrial Contactors | Type | Pack pcs. | Weight kg/pc. |
|-----------------------------|---------------------------|------------------|-----------|---------------|
| K3NWU10, K3NWU18 | K3-10 to K3-22 | K3NW-VB10 | 1 | 0,02 |
| K3WU24, K3WU32, K3WU40 | K3-24 to K3-40 | K3W-VB24 | 1 | 0,025 |

| 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 ¹⁾ 220-240V 50Hz 380-415 50Hz | Pack pcs. | Weight kg/pc. |
|---------|------|---------------|------|--|-----------------|---|-----------|---------------|
| AC3 | 380V | 660V | AC3 | | | | | |
| 400V | | | 400V | | 230 400 ↓ | | | |
| 415V | 500V | 690V | 400V | | | | | |
| kW | kW | kW | A | | | | | |

Open Type



| | | | | | | | |
|-----|------|------|----|-----------------------------|-------------|---|-----|
| 7,5 | 10 | 10 | 18 | 2 x U3/32 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 | Low Speed | Star |
| K1 Type | K2 Type | K3 Type | K1 HN.. or HA.. | K2 | K3 |
| K3-18ND01 + 2 x HN10 | K3-18ND01 + HN10 | K3-14ND01 | 2 | 3 | 4 |
| K3-24A00 + HN01 + 2 x HN10 | K3-24A00 + HN01 + HN10 | K3-18ND01 | 1 | 2 | 4 |
| K3-32A00 + HN01 + 2 x HN10 | K3-32A00 + HN01 + HN10 | K3-24A00 + HN01 | 1 | 2 | 3 |
| K3-50A00 + HN01 + 2 x HN10 | K3-50A00 + HN01 + HN10 | K3-32A00 + HN01 | 1 | 2 | 3 |
| K3-62A00 + HN01 + 2 x HN10 | K3-62A00 + HN01 + HN10 | K3-50A00 + HN01 | 1 | 2 | 3 |
| K3-18ND01 + 2 x HN10 | K3-18ND01 + HN10 | K3-14ND01 | 2 | 3 | 4 |
| K3-24A00 + HN01 + 2 x HN10 | K3-24A00 + HN01 + HN10 | K3-18ND01 | 1 | 2 | 4 |
| K3-32A00 + HN01 + 2 x HN10 | K3-32A00 + HN01 + HN10 | K3-24A00 + HN01 | 1 | 2 | 3 |

Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnect

Push Buttons

Representatives, Suppliers

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 | |
|---|-----------------------------------|-----------------------|-----------------------|-----------|-----------|-----------|-----------------------|------------|------------|------------|------------|------------|
| Main Contacts | | | | | | | | | | | | |
| 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) | | | | | | | | | | |
| Utilization category AC3 | | | | | | | | | | | | |
| Switching of three-phase motors | | | | | | | | | | | | |
| 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 |
| | 380-400V | A | 16 | 30 | 45 | 60 | 85 | 109 | 150 | 205 | 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 |
| | 380-400V | kW | 7,5 | 15 | 22 | 30 | 45 | 55 | 75 | 110 | 132 | 160 |
| | | | | | | | | | | | | |
| 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 |
| | | | | | | | | | | | | |
| Cable cross-sections | | | | | | | | | | | | |
| Line | solid or stranded | mm ² | 1,5 - 6 ²⁾ | | 1,5 - 16 | | 10 - 70 ³⁾ | | 10 - 120 | | busbar | |
| | flexible | mm ² | 1,5 - 4 ²⁾ | | 1,5 - 16 | | 16 - 50 ³⁾ | | 10 - 95 | | 18x5 | |
| | flexible with multicore cable end | mm ² | 1,5 - 4 ²⁾ | | 1,5 - 16 | | 10 - 35 | | 10 - 95 | | M8 | |
| Motor | solid or stranded | mm ² | 1,5 - 6 | | 1,5 - 16 | | 4 - 35 ³⁾ | | 10 - 120 | | busbar | |
| | flexible | mm ² | 1,5 - 4 | | 1,5 - 16 | | 6 - 25 ³⁾ | | 10 - 95 | | 18x5 | |
| | flexible with multicore cable end | mm ² | 1,5 - 4 | | 1,5 - 16 | | 4 - 25 | | 10 - 95 | | M8 | |
| Power consumption of the combination | | | | | | | | | | | | |
| 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 e.g. K3Y80 400 | 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 |
| 230 | 220 | 240 | 230 | 264 |
| 400 | 380 | 415 | 400 | 415 |

K3Y140, to K3Y300..

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

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 |
|---|-----------------------------------|-----------------|------------|-----------|-----------|-----------|-----------|-----------|
| Main Contacts | | | | | | | | |
| Rated insulation voltage $U_i^{(1)}$ | V AC | 690 | 690 | 690 | 690 | 690 | 690 | 690 |
| Utilization category AC3 | | | | | | | | |
| Switching of three-phase motors | | | | | | | | |
| 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 |
| | 380-400V A | 10 | 18 | 24 | 32 | 50 | 62 | 74 |
| | 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 |
| | 380-400V kW | 4 | 7,5 | 11 | 15 | 22 | 30 | 37 |
| | 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 |
| Cable cross-sections | | | | | | | | |
| Line | solid or stranded | mm ² | 0,75 - 6 | | 1,5 - 25 | | 4 - 50 | |
| | flexible | mm ² | 1 - 4 | | 2,5 - 16 | | 6 - 35 | |
| | flexible with multicore cable end | mm ² | 0,75 - 4 | | 1,5 - 16 | | 6 - 35 | |
| Cables per clamp | | | 1 | | 1 | | 1 | |
| Power consumption of the combination | | | | | | | | |
| 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 |
| Auxiliary Contacts (cULus) | | A600 | A600 | A600 | A600 | A600 |
| Cable cross-sections | | | | | | |
| 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 |
|---|---|------------|-----------|-----------|-----------|-----------|
| Main Contacts | | | | | | |
| Rated insulation voltage U_i ¹⁾ | V AC | 690 | 690 | 690 | 690 | 690 |
| Utilization category AC3 | | | | | | |
| Switching of three-phase motors | | | | | | |
| 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 |
| | 380-400V A | 16 | 23 | 30 | 45 | 60 |
| | 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 |
| | 380-400V kW | 7,5 | 11 | 15 | 22 | 30 |
| | 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 |
| Cable cross-sections | | | | | | |
| Line | solid or stranded mm ² | 0,75 - 6 | 1,5 - 25 | | 4 - 50 | |
| | flexible mm ² | 1 - 4 | 2,5 - 16 | | 6 - 35 | |
| | flexible with multicore cable end mm ² | 0,75 - 4 | 1,5 - 16 | | 6 - 35 | |
| Cables per clamp | | 1 | 1 | | 1 | |
| Power consumption of the combination | | | | | | |
| | 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.

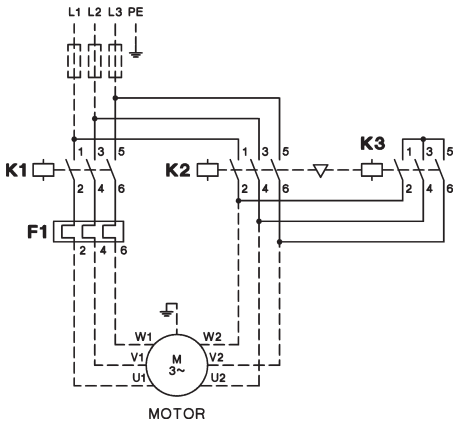
Star-Delta Starters

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.

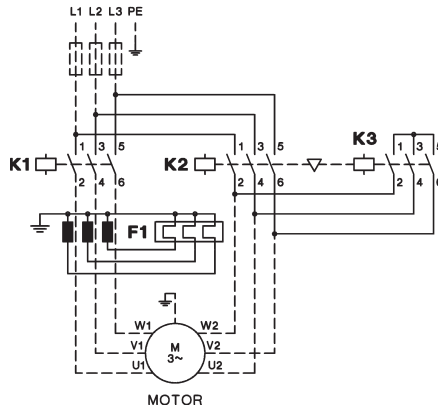
K3NY15 to K3Y100

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



K3Y140 to K3Y300

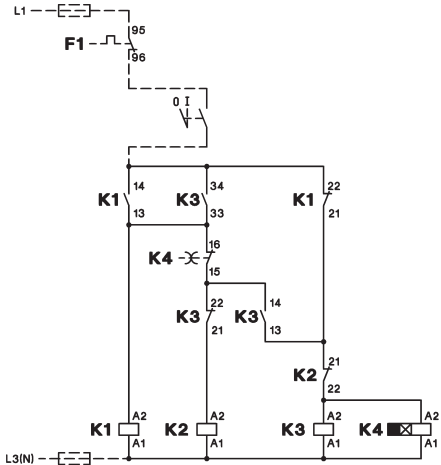
with thermal overload relay U85 or U180



Wiring Diagrams Control Circuit

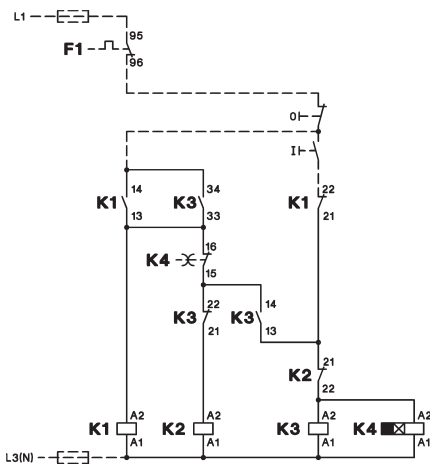
K3NY15 to K3Y52

operating with control switch



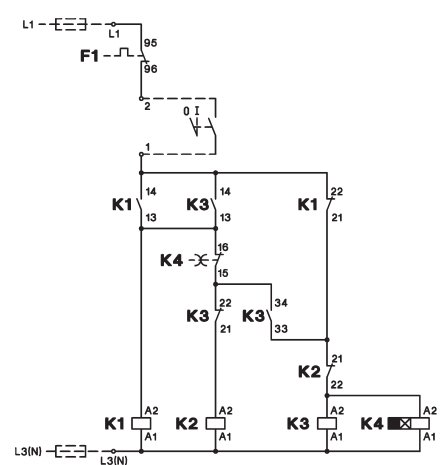
K3NY15 to K3Y52

operating with push buttons



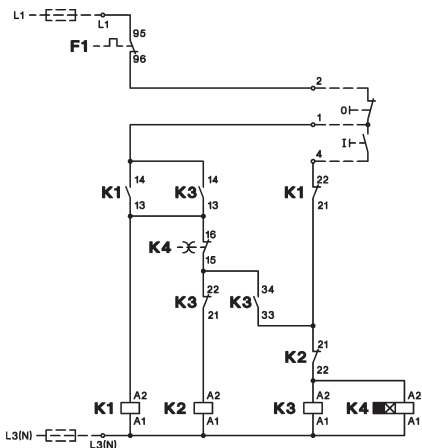
K3Y80 to K3Y200

operating with control switch



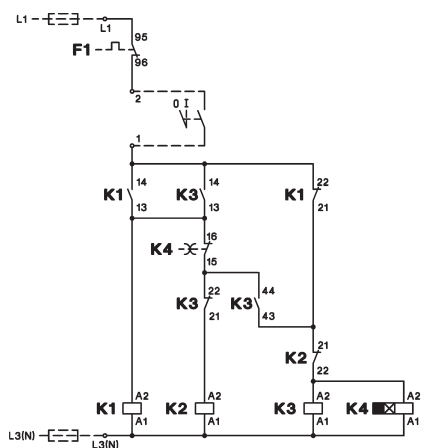
K3Y80 to K3Y200

operating with push buttons



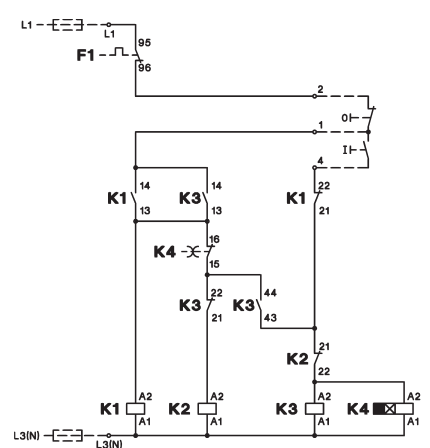
K3Y240 to K3Y300

operating with control switch



K3Y240 to K3Y300

operating with push buttons



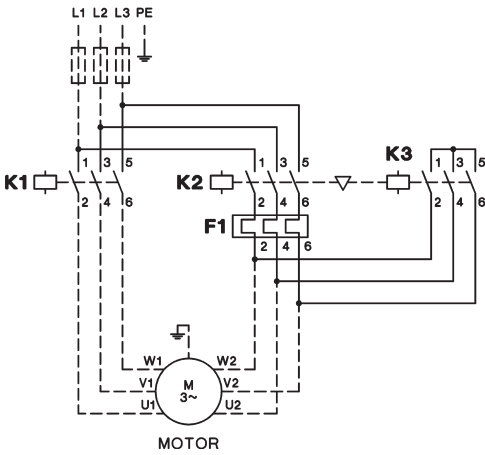
Star-Delta Starters

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.

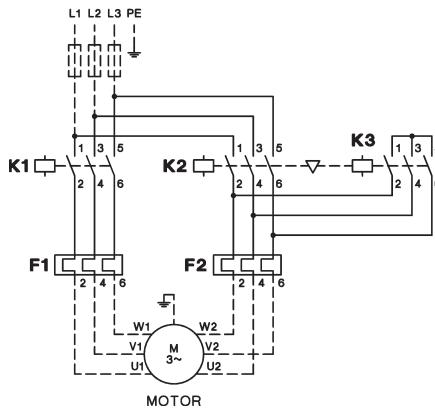
K3YL..

Typical circuit diagram



K3Y.. with 2 Thermal Overload Relays

Typical circuit diagram

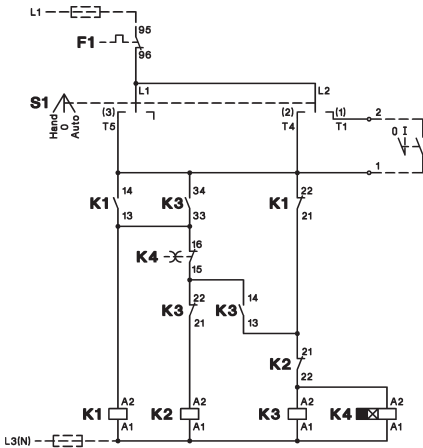


Wiring Diagrams Control Circuit

with selector switch

K3Y..W

Typical circuit diagram
 operating with control switch

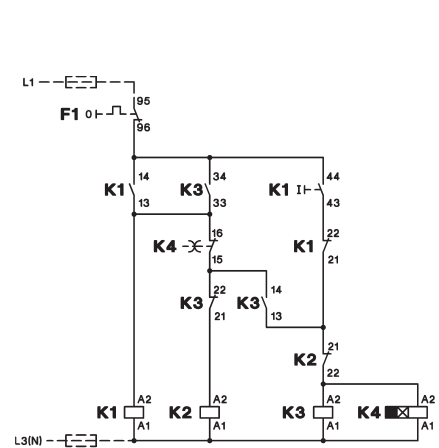
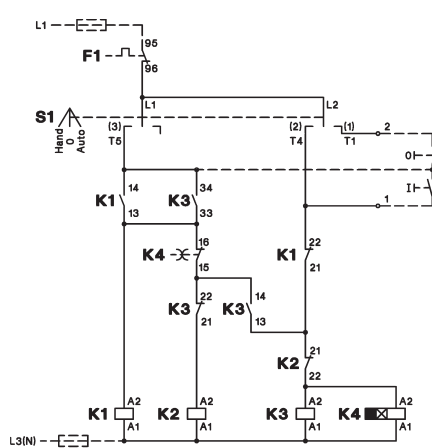


Typical circuit diagram
 operating with push buttons

with push buttons

K3Y..T

Typical circuit diagram



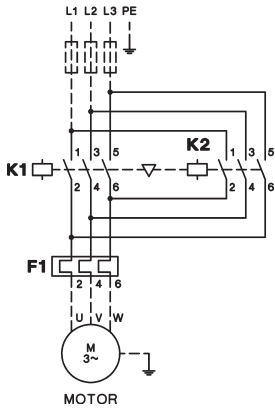
Reversing Contactors

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

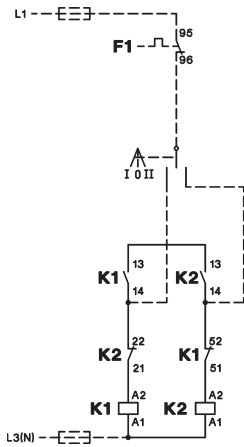
with thermal overload relay U3/32, U3/42 or U3/74



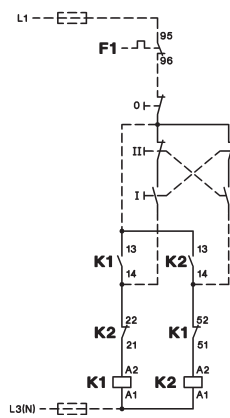
Wiring Diagrams Control Circuit

K3NWU10 to K3NWU18

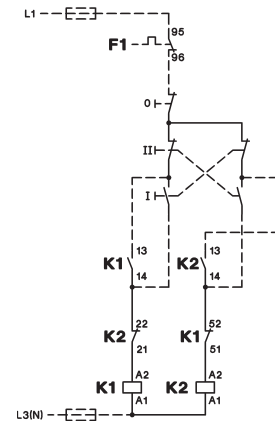
operating with control switch



operating with push buttons
Reversing over off-position

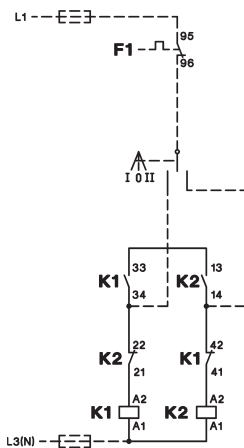


Reversing direct

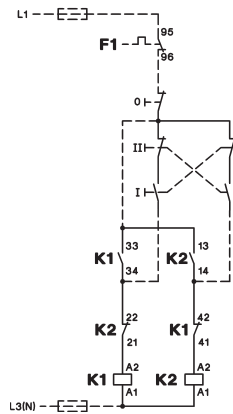


K3WU24 to K3WU74

operating with control switch



operating with push buttons

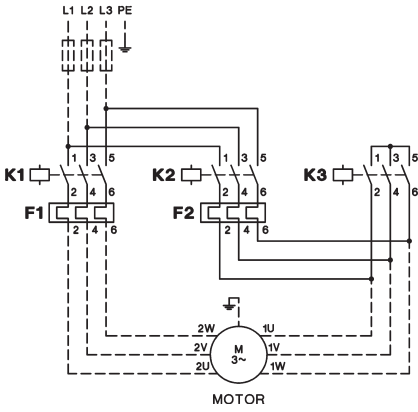


Pole Changing Starters

Wiring Diagrams

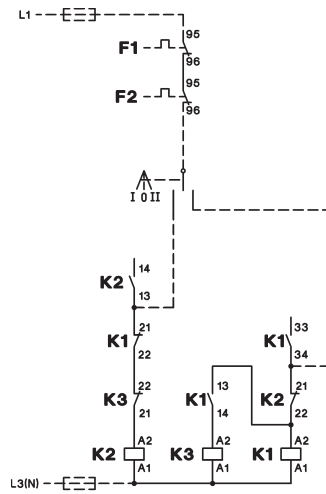
Terminal markings of contactors and relays according to DIN EN 50012
 Connections shown in main and control circuits as broken lines are not included.

Main Circuit

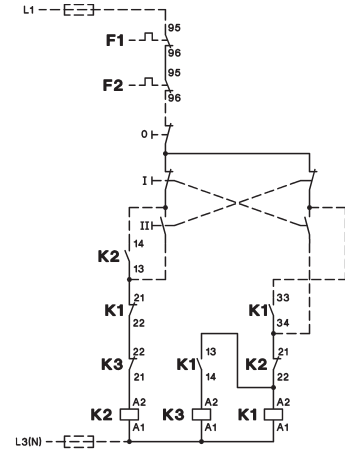


Principal Control Circuit Wiring Diagram

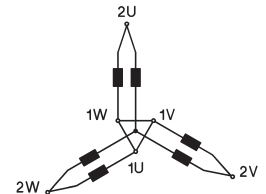
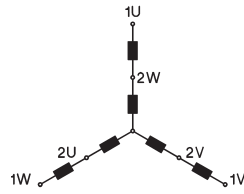
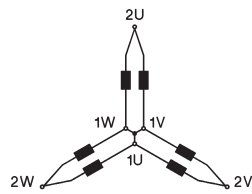
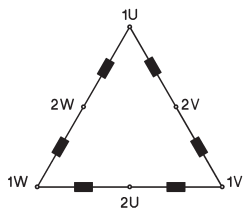
operating with control switch



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 |

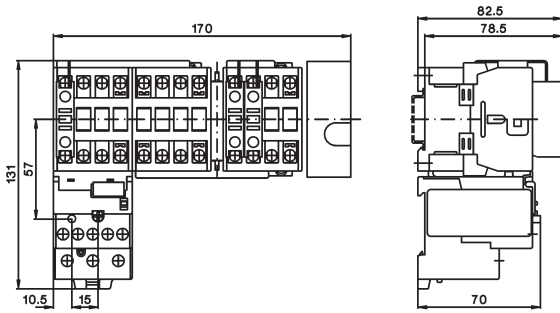


Star-Delta Starters

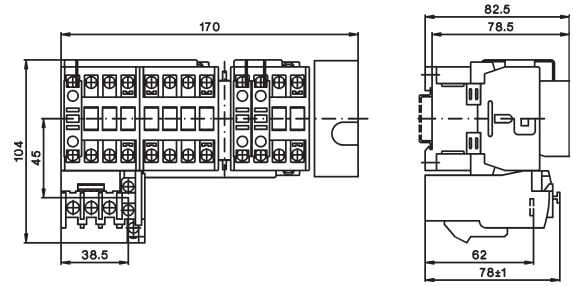
Dimensions

Star-Delta Starters, AC operated, open type

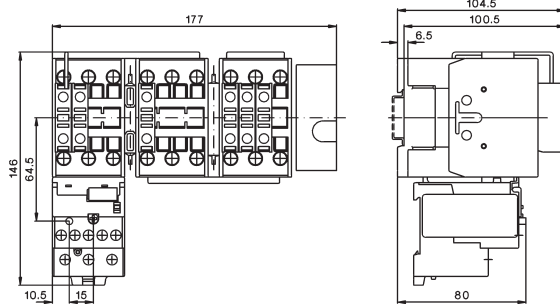
K3NY15 + U3/32
K3NY26



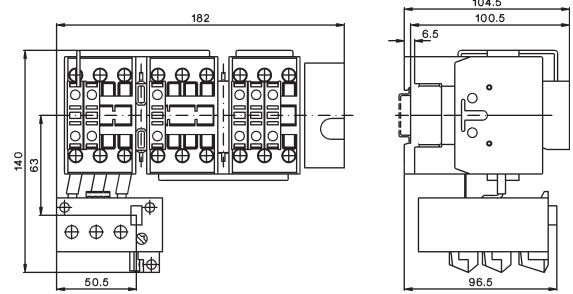
K3NY15 + U12/16E G3
K3NY26



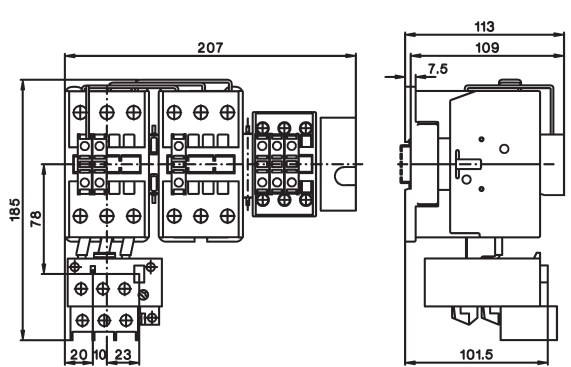
K3Y40 + U3/32
K3Y52 + U3/32



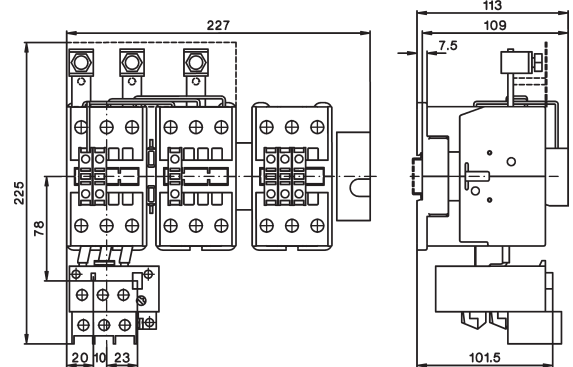
K3Y40 + U3/42
K3Y52 + U3/42



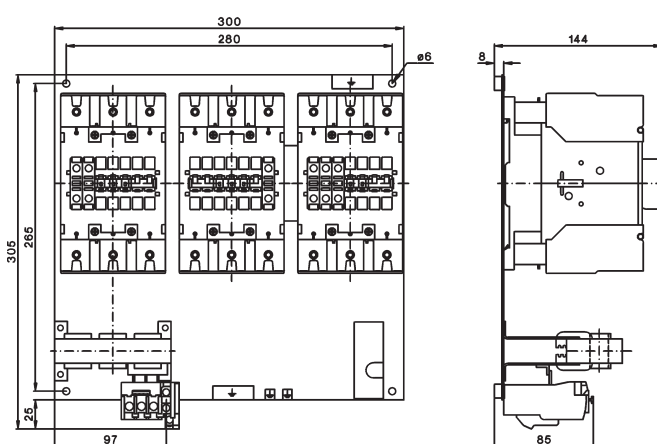
K3Y80 + U3/74



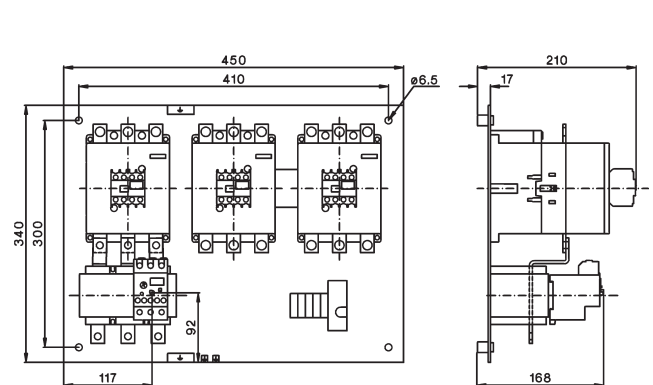
K3Y100 + U3/74



K3Y140 + U85
K3Y200



K3Y240 + U180 + SU180/176
K3Y300

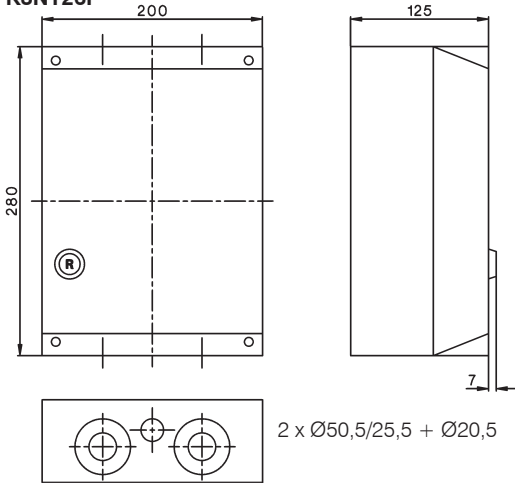


Star-Delta Starters

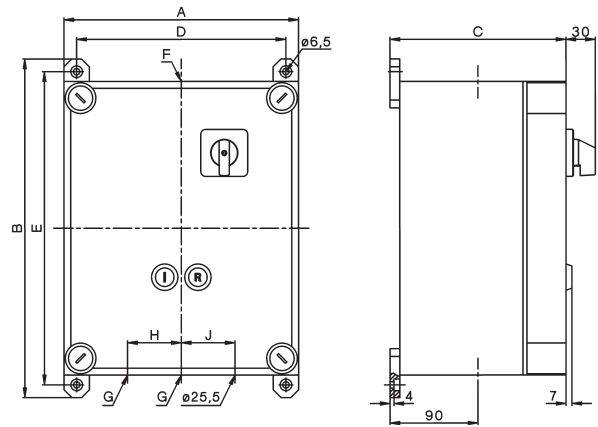
Dimensions

Star-Delta Starters, plastic enclosed, protected to IP65

K3NY26P



K3Y40P to K2Y100P



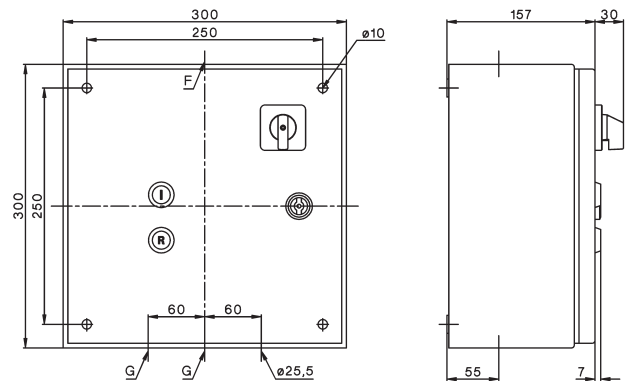
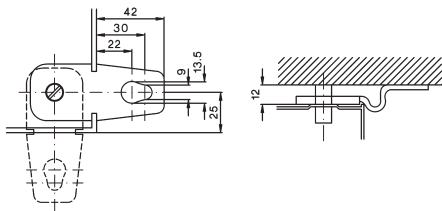
| Type | A | B | C | D | E | Ø F | Ø G | H | J | |
|----------------|-----|-----|-----|-----|-----|-----|------|------|----|----|
| K3Y40P | 300 | 346 | 180 | 272 | 320 | 6,5 | 32,5 | 32,5 | 60 | 60 |
| K3Y52P | 300 | 346 | 180 | 272 | 320 | 6,5 | 32,5 | 32,5 | 60 | 60 |
| K3Y80P | 300 | 446 | 180 | 272 | 420 | 6,5 | 40,5 | 40,5 | 70 | 70 |
| K3Y100P | 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 |
|----------------|------|------|
| K3NY26B | 25,5 | 25,5 |
| K3Y40B | 32,5 | 32,5 |
| K3Y52B | 32,5 | 32,5 |

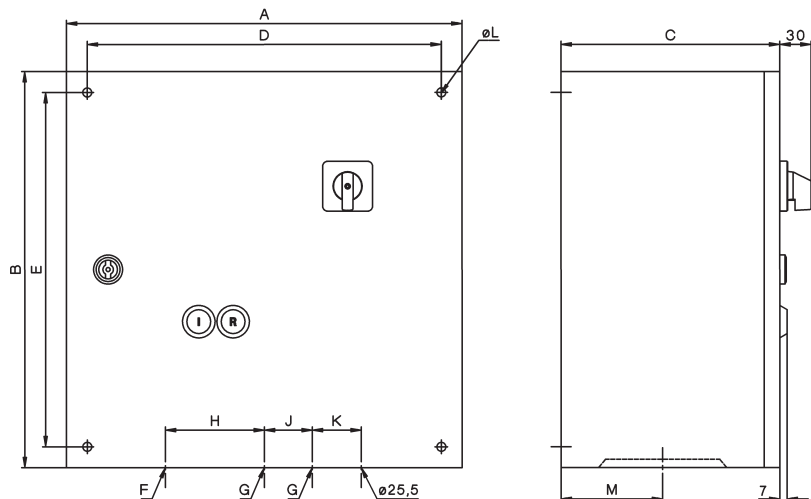
Mounting by included fixing link



K3Y80B to K2Y200B

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

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

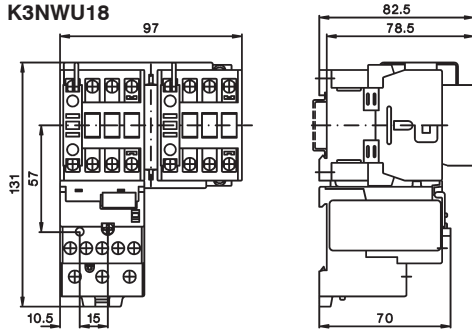


Reversing Contactors

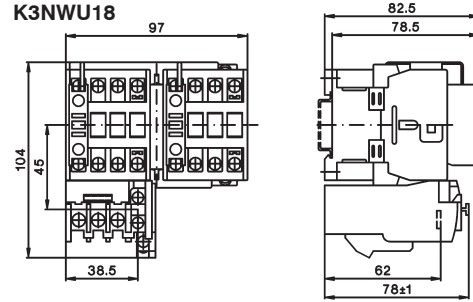
Dimensions

Reversing Starters, AC operated, open type

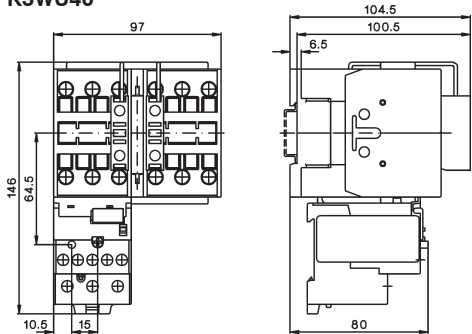
K3NWU10 + U3/32
K3NWU18



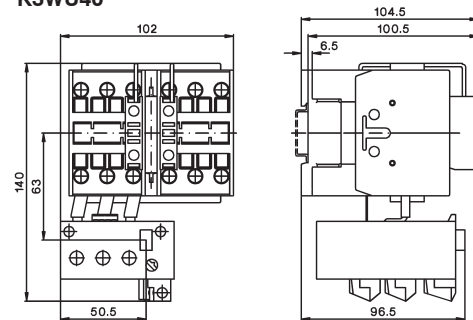
K3NWU10 + U12/16E G3
K3NWU18



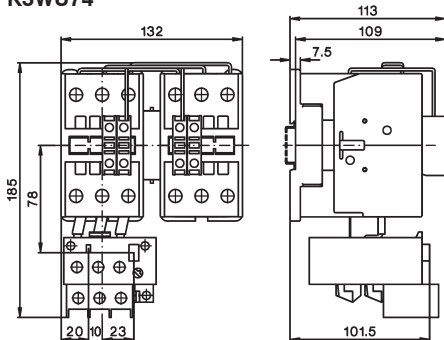
K3WU24 + U3/32
K3WU32
K3WU40



K3WU24 + U3/42
K3WU32
K3WU40



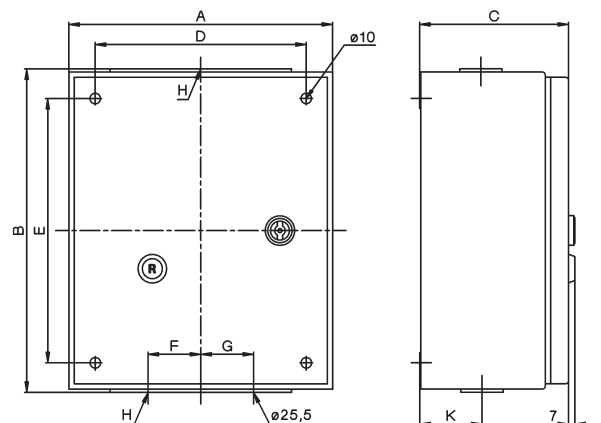
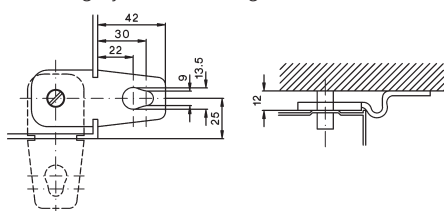
K3WU50 + U3/74
K3WU62
K3WU74



Reversing Contactors, sheet steel enclosed, protected to IP54

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

Mounting by included fixing link

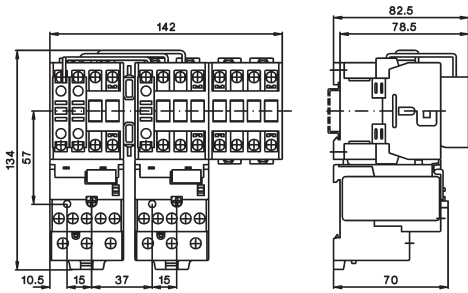


Pole Changing Starters

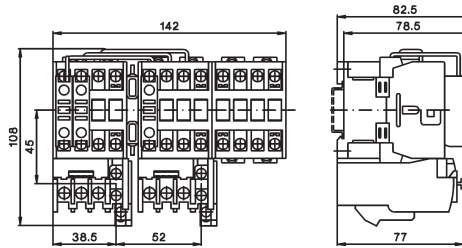
Dimensions

Pole Changing Starters, AC operated, open type

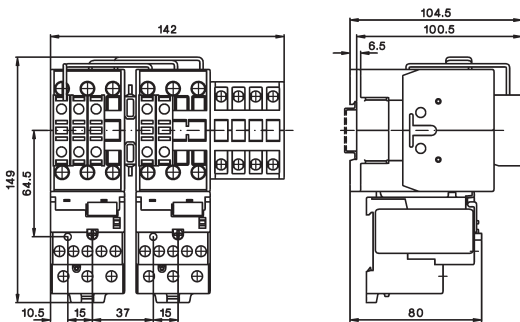
K3NPU18 + 2x U3/32



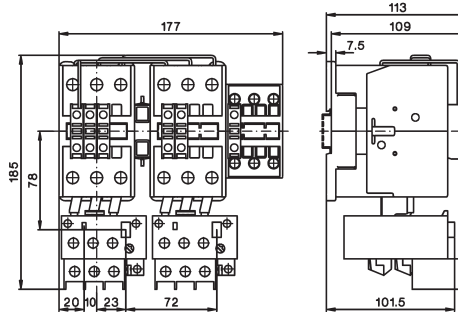
K3NPU18 + 2x U12/16



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



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

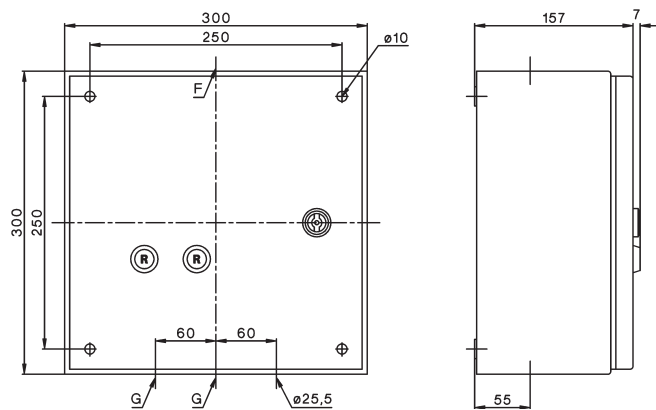
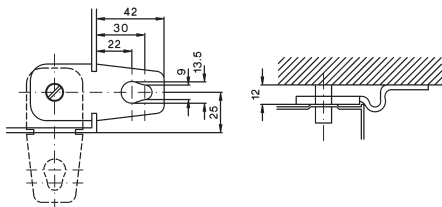


Pole Changing Starters, sheet steel enclosed, protected to IP54

K3NPU18B to K3PU32B

| Type | Ø F | Ø G |
|-----------------|------|------|
| K3NPU18B | 25,5 | 25,5 |
| K3PU24B | 32,3 | 32,5 |
| K3PU32B | 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

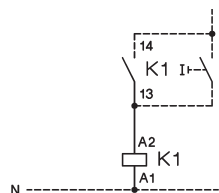
Accessories

113



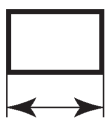
Wiring Diagrams

115



Dimensions

116



D.O.L. Starters In Plastic Enclosure

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

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



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

D.O.L. Starters with Selector Switch



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

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



| | | | | | | | | |
|------------|-----------|---|-----------|------|----------|-------------------|---|-----|
| 7,5 | K3-18ND10 | 2 | U12/16 K3 | IP65 | Ø 20,5mm | P1W18P ... | 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



| | | | | | | | | |
|--|--|--|--|--|--|-------------|---|--|
| | | | | | | P1LT | 1 | |
|--|--|--|--|--|--|-------------|---|--|

Air Pressure Hose



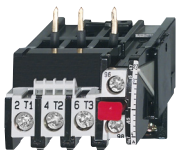
| | | | | | | | | |
|-----------|--|--|--|--|--|---------------|---|--|
| Length 5m | | | | | | P1LS-5 | 1 | |
|-----------|--|--|--|--|--|---------------|---|--|

Pneumatic Switch

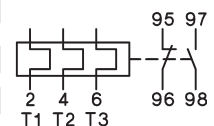


| | | | | | | | | |
|--|--|--|--|--|--|---------------|---|------|
| for refill of D.O.L. Starter P1W.. to P1W..P | | | | | | P1-LDR | 1 | 0,02 |
|--|--|--|--|--|--|---------------|---|------|

Thermal Overload Relays



| Setting range A | Type | Pack pcs. | Weight kg/pc. |
|--------------------|------------------------|--------------|------------------|
| 0,12 - 0,18 | U12/16E 0,18 K3 | 1 | 0,10 |
| 0,18 - 0,27 | U12/16E 0,27 K3 | 1 | 0,10 |
| 0,27 - 0,4 | U12/16E 0,4 K3 | 1 | 0,10 |
| 0,4 - 0,6 | U12/16E 0,6 K3 | 1 | 0,10 |
| 0,6 - 0,9 | U12/16E 0,9 K3 | 1 | 0,10 |
| 0,8 - 1,2 | U12/16E 1,2 K3 | 1 | 0,10 |
| 1,2 - 1,8 | U12/16E 1,8 K3 | 1 | 0,10 |
| 1,8 - 2,7 | U12/16E 2,7 K3 | 1 | 0,10 |
| 2,7 - 4 | U12/16E 4 K3 | 1 | 0,10 |
| 4 - 6 | U12/16E 6 K3 | 1 | 0,10 |
| 6 - 9 | U12/16E 9 K3 | 1 | 0,10 |
| 8 - 11 | U12/16E 11 K3 | 1 | 0,10 |
| 10 - 14 | U12/16E 14 K3 | 1 | 0,10 |
| 13 - 18 | U12/16E 18 K3 | 1 | 0,10 |
| 17 - 23 | U12/16E 23 K3 | 1 | 0,10 |
| 22 - 30 | U12/16E 30 K3 | 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. |
|--|-------------------|---------------------|------------------------|-----------|-----------|---------------|
| K3-07.. to K3-22.. K3-24..¹⁾ to K3-40..¹⁾ | IP65 | 2 x Ø 20,5mm | 2 x Ø 20,5mm | P1 | 1 | 0,35 |

with Reset Button



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

with Selector Switch



| Suitable for contactor | Protection Degree | Conduit Entries Top | Conduit Entries Bottom | Type | Pack pcs. | Weight kg/pc. |
|--|-------------------|---------------------|------------------------|------------|-----------|---------------|
| K3-10.. to K3-22.. +U12/16.. K3 | IP65 | 2 x Ø 20,5mm | 2 x Ø 20,5mm | P1W | 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. |
|--|-------------------|---------------------|------------------------|------------|-----------|---------------|
| K3-10.. to K3-22.. +U12/16.. K3 | IP65 | 2 x Ø 20,5mm | 2 x Ø 20,5mm | P1T | 1 | 0,35 |

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 | K2-HR | 10 | 0,02 |
| | 220 - 240V, | 1,5W | K2-HR 230 | 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. |
|-------------------------|---|--------------|---------------------------------|---------------|-----------|---------------|
| Neutral Terminal | 2 x 0,75-4 | 2 x 0,75-2,5 | 2 x 0,5-2,5 | LG9744 | 10 | 0,009 |



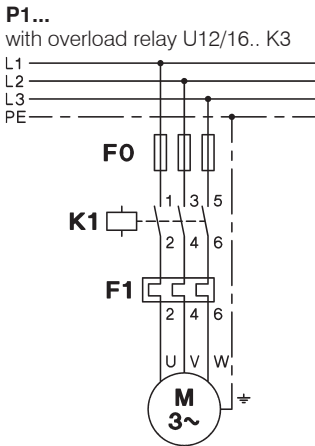
| | | | | | |
|----------------------|------------------------------|---|------------------|----|------|
| Start Contact | for contactor K3-10 to K3-22 | to be snapped on top of the auxiliary contact | LG9319-K3 | 10 | 0,03 |
|----------------------|------------------------------|---|------------------|----|------|

1) without auxiliary contact blocks

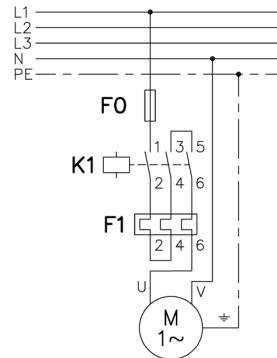
D.O.L. Starters

Wiring Diagrams Main Circuit

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



Wiring for single phase motors



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.

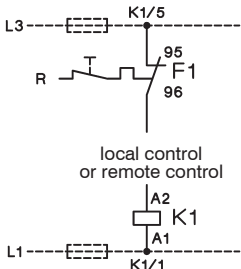
Coil connectors

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.

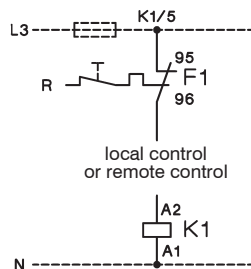
Separate coil supply

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.

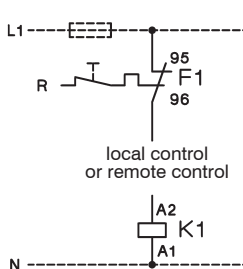
Coil phase to phase (380-415V 50Hz)



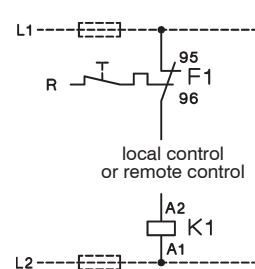
Coil phase to neutral (220-240V 50Hz)



Coil phase to phase

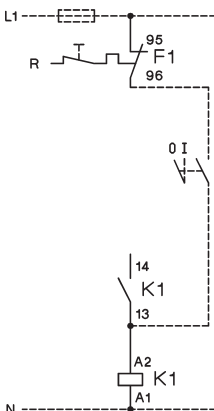


Coil phase to neutral

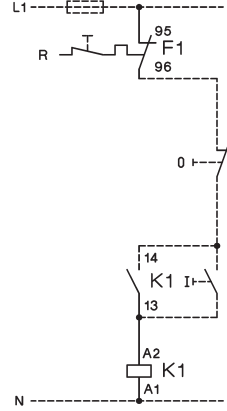


D.O.L. Starters with remote control

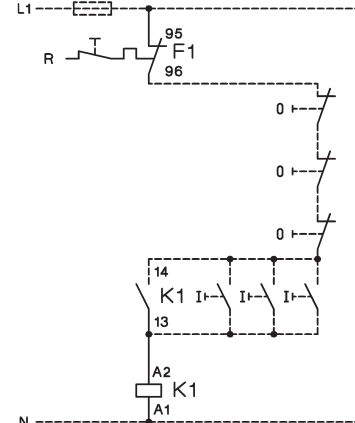
P1..
Remote 2-wire (switch) control



Remote 3-wire (push button) control



Remote start-stop control
(3 control stations)



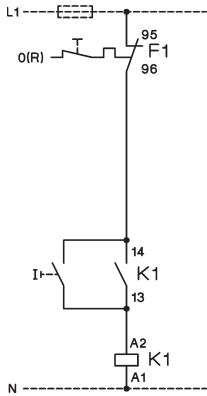
D.O.L. Starters

Wiring Diagrams Control Circuits

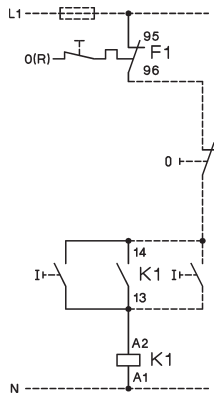
Typical circuit diagram (for separate coil supply, control circuit connected between L1 and N)
Terminal markings according to EN 50012

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

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

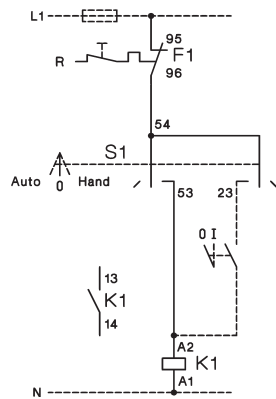


P1T10, P1T18, P1T22
with external push buttons

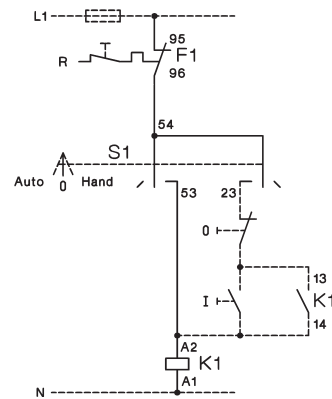


D.O.L. Starters with Selector Switch

P1W10, P1W18, P1W22
with external control switch

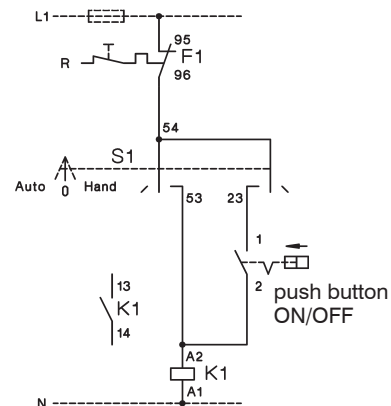


P1W10, P1W18, P1W22
with external push buttons



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

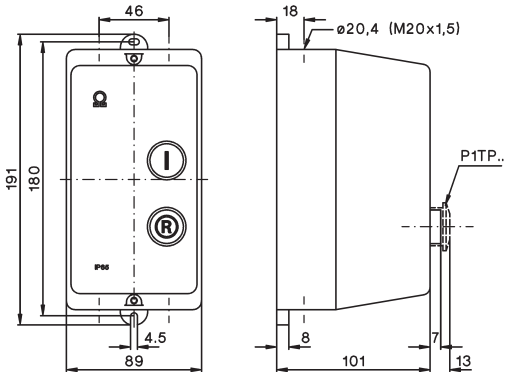


D.O.L. Starters

Dimensions

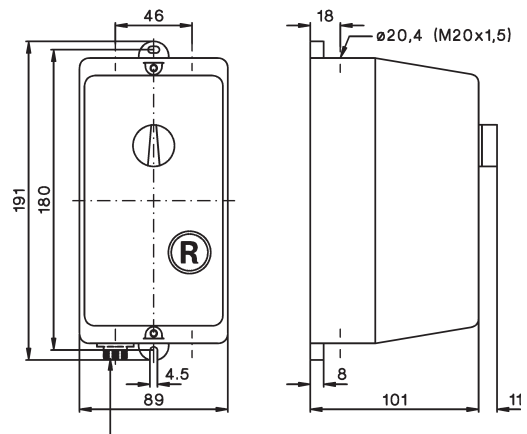
D.O.L. Starters with Start-Stop/Reset Push Buttons, Plastic Enclosed

P1T., P1TP.



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

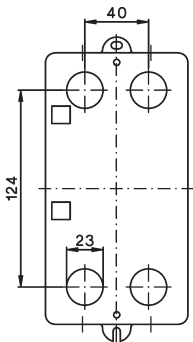
P1W., P1W18P



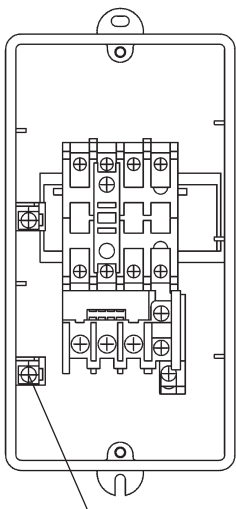
P1W18P: plug-in for air tube inside diameter 3mm

Rear Conduit Entries

knockouts
4 x $\varnothing 23$



Neutral Terminal LG9744



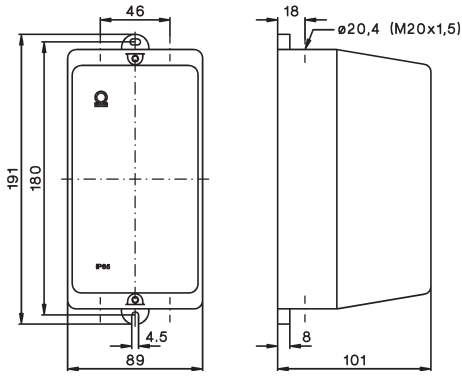
LG9744

Enclosures

Dimensions

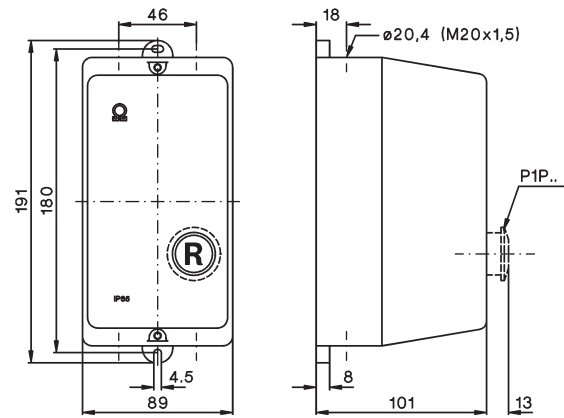
Enclosures for Contactors

P1



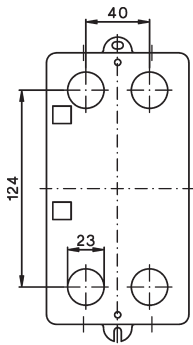
Enclosures for D.O.L. Starters

P1R, P1P



Rear Conduit Entries

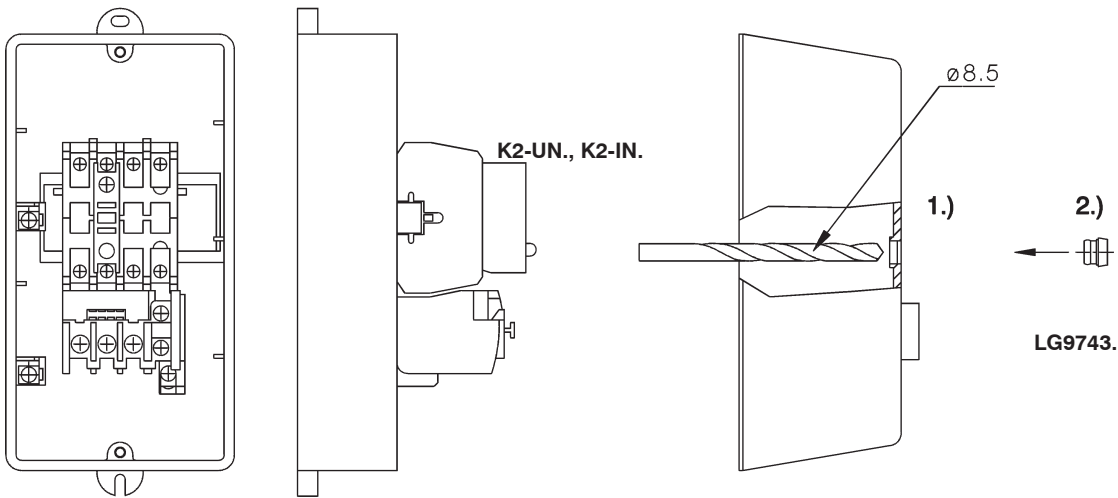
knockouts
4 x $\phi 23$



D.O.L. Starters

Mounting and Wiring Instructions

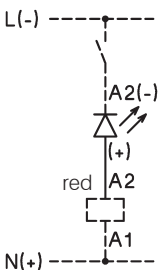
Indicators and Lens Caps for D.O.L. Starters P1



Wiring Examples

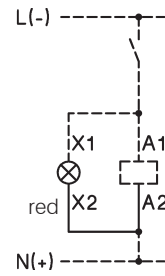
Coil Current Indicator

K2-ING
K2-INR



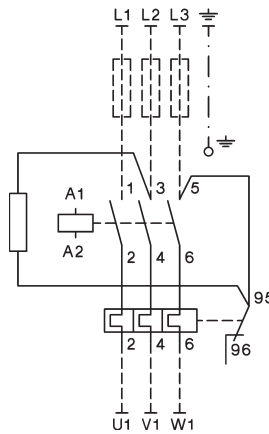
Voltage Indicator

K2-UN
K2-UNR

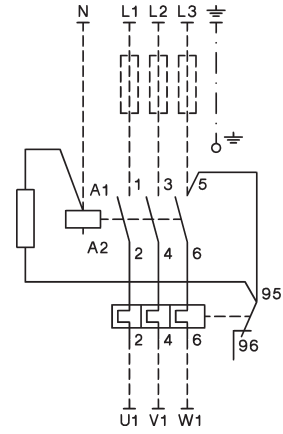


Heating Element

K2-HR

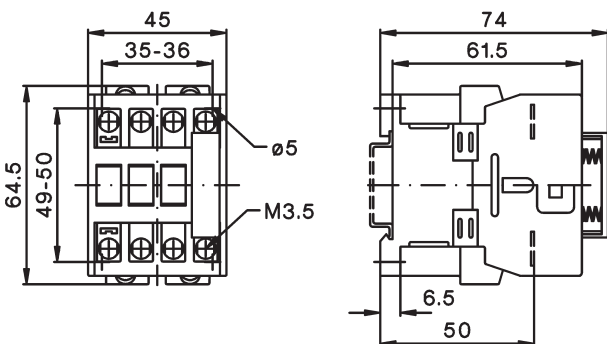


K2-HR 230



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

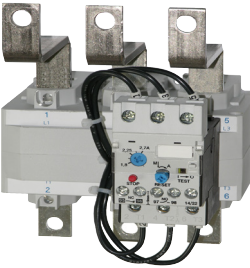
Start Contact LG9319-K3 for K3-10ND10 up to K3-22ND10





Thermal Overload Relays for Direct Mounting

120



Thermal Overload Relays for Separate Mounting

122



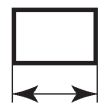
Accessories

123



Technical Data

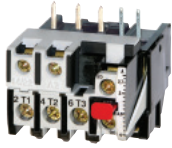
125



Dimensions

129

Thermal Overload Relays for plug-in mounting



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

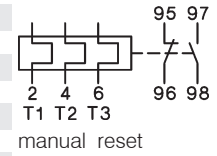
Type

Pack Weight
pcs. kg/pc.

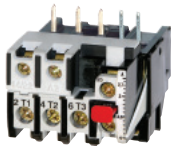
Wiring Diagram

With Manual Reset, for contactors K1-..

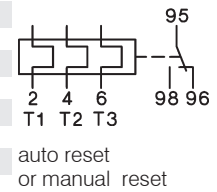
| | | | | | | |
|------|---|-------------|-------------|------------------------|---|------|
| 0,12 | - | 0,18 | - | U12/16E 0,18 K1 | 1 | 0,10 |
| 0,18 | - | 0,27 | - | U12/16E 0,27 K1 | 1 | 0,10 |
| 0,27 | - | 0,4 | - | U12/16E 0,4 K1 | 1 | 0,10 |
| 0,4 | - | 0,6 | - | U12/16E 0,6 K1 | 1 | 0,10 |
|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



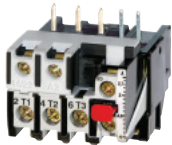
With Auto Reset, for contactors K1-..



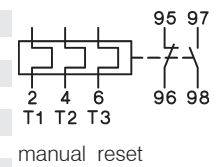
| | | | | | | |
|------|---|-------------|-------------|------------------------|---|------|
| 0,12 | - | 0,18 | - | U12/16A 0,18 K1 | 1 | 0,10 |
| 0,18 | - | 0,27 | - | U12/16A 0,27 K1 | 1 | 0,10 |
| 0,27 | - | 0,4 | - | U12/16A 0,4 K1 | 1 | 0,10 |
| 0,4 | - | 0,6 | - | U12/16A 0,6 K1 | 1 | 0,10 |
|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



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



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

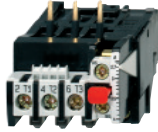


Thermal Overload Relays for plug-in mounting

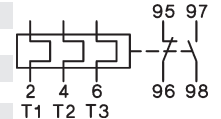
Contactors, Motor-Starters
 Circuit Breakers
 Manual Motor-Starters
 Switches
 AC-Main Switches
 DC-Switch Disconnectors
 Push Buttons
 Representatives, Suppliers

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.. ..

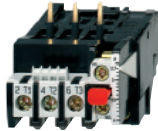


| | | | | | |
|--------------------|-------------|--|------------------------|---|------|
| 0,12 - 0,18 | - | | U12/16E 0,18 K3 | 1 | 0,10 |
| 0,18 - 0,27 | - | | U12/16E 0,27 K3 | 1 | 0,10 |
| 0,27 - 0,4 | - | | U12/16E 0,4 K3 | 1 | 0,10 |
| 0,4 - 0,6 | - | | U12/16E 0,6 K3 | 1 | 0,10 |
| 0,6 - 0,9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

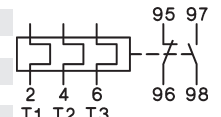


manual reset

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



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

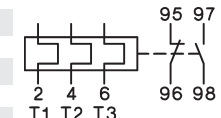


manual reset

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



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

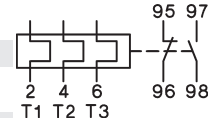


manual and auto reset

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



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



manual and auto reset

Thermal Overload Relays for plug-in mounting



Setting Range
D.O.L. (A) Δ (A)

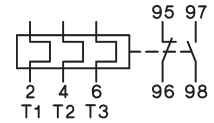
Type

Pack Weight
pcs. kg/pc.

Wiring Diagram

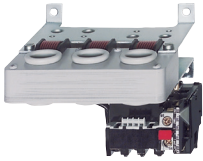
For contactors K3-50A.. to K3-74A..

| | | | | |
|----------------|-----------|-----------------|---|------|
| 20 - 28 | 35 - 48 | U3/74 28 | 1 | 0,40 |
| 28 - 42 | 48 - 73 | U3/74 42 | 1 | 0,40 |
| 40 - 52 | 70 - 90 | U3/74 52 | 1 | 0,40 |
| 52 - 65 | 90 - 112 | U3/74 65 | 1 | 0,40 |
| 60 - 74 | 104 - 128 | U3/74 74 | 1 | 0,40 |



manual and auto reset

Thermal Overload Relays for separate mounting



Setting Range
D.O.L. (A) Δ (A)

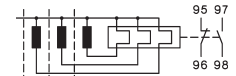
Type

Pack Weight
pcs. kg/pc.

Wiring Diagram

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

| | | | | |
|-----------------|-----------|----------------|---|------|
| 60 - 90 | 104 - 156 | U85 90 | 1 | 0,90 |
| 80 - 120 | 140 - 207 | U85 120 | | |

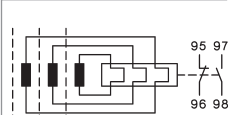


manual reset



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

| | | | | |
|------------------|-----------|-----------------|---|-----|
| 120 - 180 | 208 - 312 | U180 180 | 1 | 1,5 |
|------------------|-----------|-----------------|---|-----|



manual and auto reset

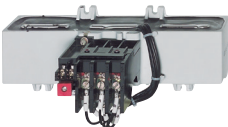


For contactors K3-210.. up to K3-316.., busbars included

| | | | | |
|------------------|-----------|-----------------|---|-----|
| 144 - 216 | 250 - 374 | U320 216 | 1 | 1,8 |
| 216 - 320 | 374 - 554 | U320 320 | | |

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

| | | | | |
|------------------|------------|-----------------|---|-----|
| 240 - 360 | 416 - 623 | U800 360 | 1 | 4,1 |
| 360 - 540 | 623 - 935 | U800 540 | 1 | 4,1 |
| 540 - 800 | 935 - 1385 | U800 800 | 1 | 4,1 |



Accessories



for overload relays for contactors **Type** Pack set Weight kg/set

Busbar Sets

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



Cable Cross-section (mm²) **Type** Pack pcs. Weight kg/pc.

overload relay solid or stranded flexible

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

| | | | | | |
|------------|----------|----------|-----------------|---|-------|
| U12/16..K3 | 0,75 - 6 | 0,75 - 4 | U12SM K3 | 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 | U3/32SM | 1 | 0,035 |
|-------|----------|----------|----------------|---|-------|



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

| | | | | | |
|--------------|---|---|---------------|---|-------|
| U3/42, U3/74 | - | - | U3/42G | 1 | 0,030 |
|--------------|---|---|---------------|---|-------|



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

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



Additional Terminals with fingertouch protection

| | | | | | |
|-------------------------|-----------|----------|---------------|---|-------|
| 1-pole f. U12/16, U3/32 | 0,75 - 10 | 0,75 - 6 | LG9339 | 1 | 0,009 |
| 3-pole for U3/42 | 4 - 35 | 6 - 25 | LG7559 | 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 3 | I_A/I_N 4 | I_A/I_N 5 | I_A/I_N 6 | I_A/I_N 7,2 | I_A/I_N 8 |
|-----------------|-------------|----------------|----------------|----------------|----------------|------------------|----------------|
| U3/32 .. | | | | | | | |
| 0,12 - | 0,18 | 16,1 | 9,6 | 6,8 | 5,3 | 4,2 | 3,7 |
| 0,18 - | 0,27 | 16,6 | 9,7 | 6,7 | 5,2 | 4,1 | 3,6 |
| 0,27 - | 0,4 | 19,4 | 11,4 | 7,9 | 6,1 | 4,7 | 4,2 |
| 0,4 - | 0,6 | 18,7 | 10,9 | 7,6 | 5,9 | 4,6 | 4,0 |
| 0,6 - | 0,9 | 19,2 | 11,2 | 7,7 | 5,9 | 4,6 | 4,1 |
| 0,8 - | 1,2 | 20,8 | 12,3 | 8,5 | 6,6 | 5,2 | 4,6 |
| 1,2 - | 1,8 | 25,5 | 14,1 | 9,8 | 7,6 | 5,9 | 5,2 |
| 1,8 - | 2,7 | 26,6 | 15,6 | 10,9 | 8,3 | 6,5 | 5,7 |
| 2,7 - | 4 | 22,7 | 13,6 | 9,5 | 7,4 | 5,8 | 5,1 |
| 4 - | 6 | 22,2 | 13,3 | 9,3 | 7,1 | 5,6 | 4,9 |
| 6 - | 9 | 20,4 | 11,9 | 8,2 | 6,1 | 4,7 | 4,0 |
| 8 - | 11 | 20,9 | 11,8 | 7,9 | 5,7 | 4,3 | 3,5 |
| 10 - | 14 | 21,3 | 11,7 | 7,4 | 5,1 | 3,7 | 3,0 |
| 13 - | 18 | 21,2 | 12,1 | 8,0 | 6,2 | 4,6 | 4,1 |
| 17 - | 24 | 20,4 | 12,0 | 8,6 | 6,3 | 4,5 | 3,7 |
| 23 - | 32 | 20,2 | 10,2 | 6,7 | 4,7 | 3,4 | 2,8 |

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

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

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

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

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

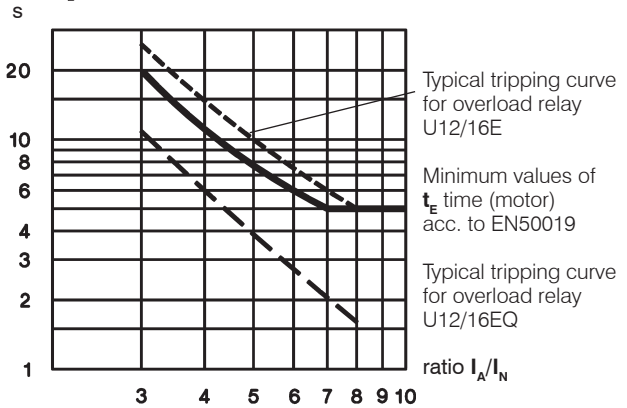
| A | A | I_A/I_N 3 | I_A/I_N 4 | I_A/I_N 5 | I_A/I_N 6 | I_A/I_N 7,2 | I_A/I_N 8 |
|--------------------|------------|----------------|----------------|----------------|----------------|------------------|----------------|
| U12/16EQ .. | | | | | | | |
| 0,4 - | 0,6 | 13,6 | 8,4 | 5,9 | 4,2 | 3,3 | 3,0 |
| 0,6 - | 0,9 | 13,8 | 7,8 | 5,2 | 4,1 | 3,2 | 2,7 |
| 0,8 - | 1,2 | 13,1 | 7,5 | 5,2 | 3,9 | 3,1 | 2,7 |
| 1,2 - | 1,8 | 14,6 | 8,7 | 6,0 | 4,6 | 3,6 | 3,2 |
| 1,8 - | 2,7 | 13,5 | 7,6 | 5,3 | 3,9 | 3,1 | 2,7 |
| 2,7 - | 4 | 11,0 | 6,0 | 4,1 | 2,6 | 1,7 | 1,4 |
| 4 - | 6 | 9,6 | 5,3 | 3,3 | 2,3 | 1,6 | 1,3 |
| 6 - | 9 | 10,2 | 5,4 | 3,4 | 2,3 | 1,6 | 1,3 |
| 8 - | 11 | 12,0 | 6,2 | 3,9 | 2,5 | 1,8 | 1,3 |
| 10 - | 14 | 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" ¹⁾ | | "1" ¹⁾ | | | | |
| | | | A | A | quick A | slow, gL(gG) A | slow, gL(gG) A | aM A | A |
| U3/32 (U12/16E) | 0,12 - 0,18 | - | | 0,5 ²⁾ | 0,5 ²⁾ | 25 | - | 15 | 5 |
| | 0,18 - 0,27 | - | | 1,0 ²⁾ | 1,0 ²⁾ | 25 | - | 15 | 5 |
| | 0,27 - 0,4 | - | | 2 | 2 | 25 | - | 15 | 5 |
| | 0,4 - 0,6 | - | | 2 | 2 | 25 | - | 15 | 5 |
| | 0,6 - 0,9 | - | | 4 | 4 | 25 | - | 15 | 5 |
| | 0,8 - 1,2 | - | | 4 | 4 | 25 | 2 | 15 | 5 |
| | 1,2 - 1,8 | - | | 6 | 6 | 25 | 2 | 15 | 5 |
| | 1,8 - 2,7 | - | | 10 | 10 | 25 | 4 | 15 | 5 |
| | 2,7 - 4 | - | | 16 | 10 | 25 | 4 | 15 | 5 |
| | 4 - 6 | 7 - 10,5 | | 20 | 16 | 25 | 6 | 15 | 5 |
| | 6 - 9 | 10,5 - 15,5 | | 35 | 25 | 35 | 10 | 25 | 5 |
| | 8 - 11 | 14 - 19 | | 35 | 25 | 35 | 16 | 30 | 5 |
| | 10 - 14 | 18 - 24 | | 50 | 35 | 63 | 16 | 40 | 5 |
| 13 - 18 | 23 - 31 | | 50 | 35 | 63 | 20 | 50 | 5 | |
| 17 - (23)24 | 30 - (40)41 | | 63 | 50 | 63 | 25 | 60 | 5 | |
| (22)23 - (30)32 | (38)40 - (52)55 | | 80 | 63 | 80 | 35 | 70 | 5 | |
| U3/42 | 10 - 14 | 18 - 24 | 50 | 35 | 80 | 16 | 40 | 5 | |
| | 14 - 20 | 24 - 35 | 63 | 50 | 80 | 25 | 60 | 5 | |
| | 20 - 28 | 35 - 48 | 80 | 63 | 80 | 35 | 80 | 5 | |
| | 28 - 42 | 48 - 73 | 100 | 80 | 150 | 50 | 110 | 5 | |
| U3/74 | 20 - 28 | 35 - 48 | 100 | 80 | 150 | 35 | 80 | 5 | |
| | 28 - 42 | 48 - 73 | 125 | 100 | 150 | 50 | 110 | 5 | |
| | 40 - 52 | 70 - 90 | 160 | 100 | 150 | 63 | 200 | 5 | |
| | 52 - 65 | 90 - 112 | 160 | 125 | 150 | 80 | 250 | 10 | |
| | 60 - 74 | 104 - 128 | 160 | 125 | 150 | 80 | 250 | 10 | |
| U85 | 60 - 90 | 104 - 156 | | | | | 300 | 10 | |
| | 80 - 120 | 140 - 207 | | | | | - | 10 | |
| U180, U320 U800 | all ranges | | | | | | - | - | |
| | all ranges | | | | | | - | - | |

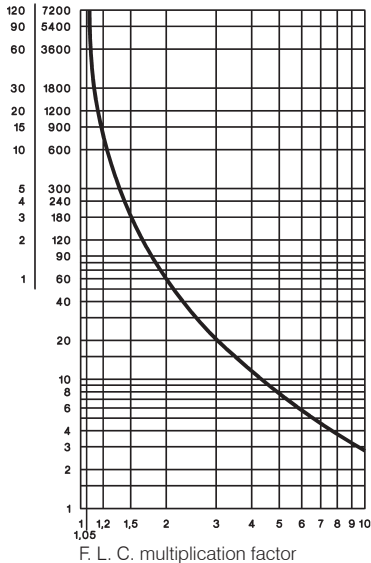
For short circuit protecting overload relays with current transformer use fuse according to the contactor of the combination.

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

Detailed tripping times for each range see table page 124

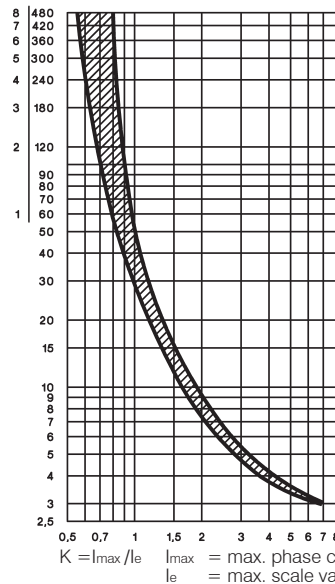
with three-phase load

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

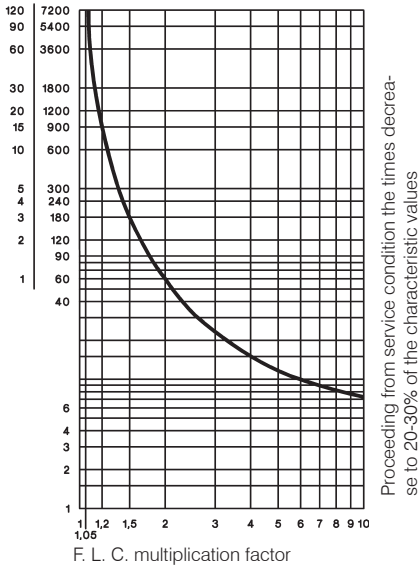
Thermal Overload Relays

Tripping Characteristics for U85, U180, U320, and U800

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

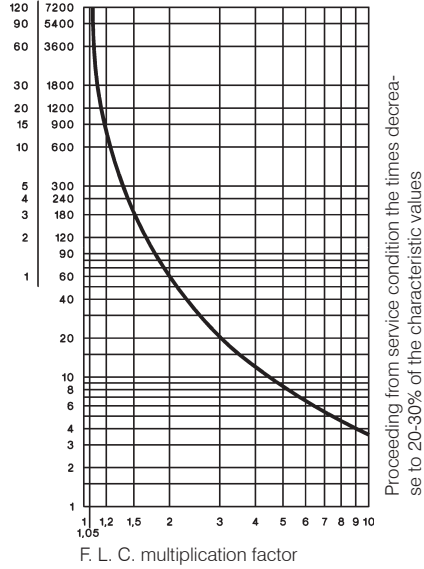
U85 with three-phase load

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



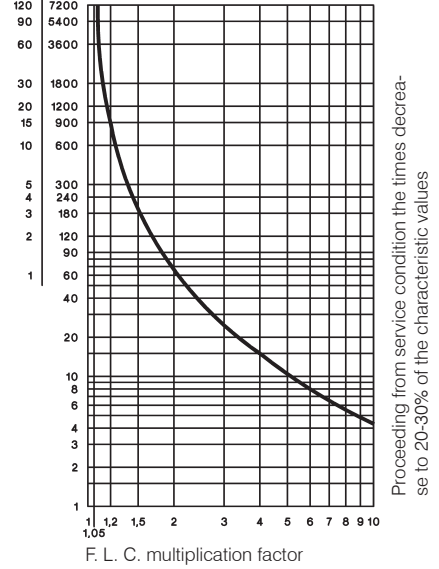
U180, U320 with three-phase load

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



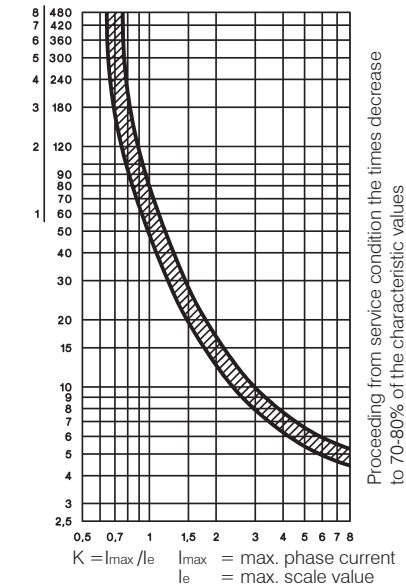
U800 with three-phase load

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



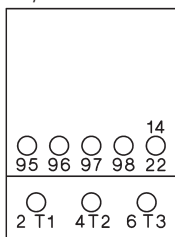
U85 with two-pole load

Tripping time (Typical tolerance curve from cold condition)

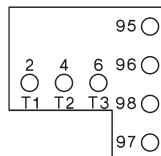


Position of Terminals

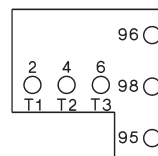
U3/32



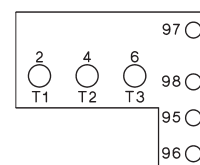
U12/16E, U12/16EM, U12/16EQ



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" ¹⁾ | | |
|------------------|--|----------------|----------------------------------|
| | quick A | slow, gL(gG) A | slow, gL(gG) "1" ¹⁾ A |
| 0,4 - 0,6 | 2 | 2 | 25 |
| 0,6 - 0,9 | 4 | 4 | 25 |
| 0,8 - 1,2 | 4 | 4 | 25 |
| 1,2 - 1,8 | 6 | 6 | 25 |
| 1,8 - 2,7 | 10 | 10 | 25 |
| 2,7 - 4 | 16 | 10 | 25 |
| 4 - 6 | 20 | 16 | 25 |
| 6 - 9 | 35 | 25 | 35 |
| 8 - 11 | 35 | 25 | 35 |
| 10 - 14 | 50 | 35 | 63 |

Fuse for U12/16EM

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

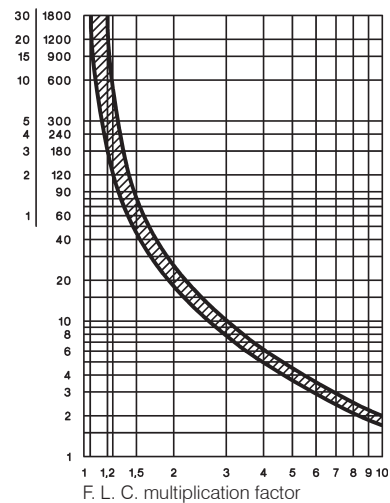
Tripping Characteristic for U12/16EQ

Detailed tripping times for each range see table page 124

with three-phase load

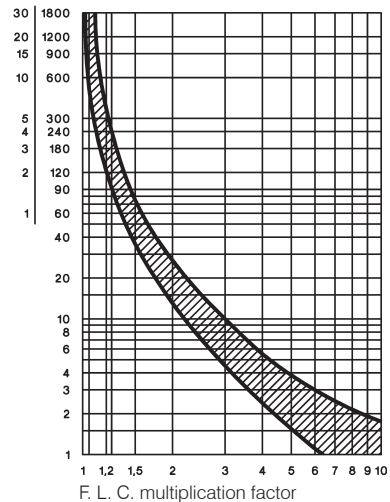
range 0,4-0,6 to 1,8-2,7A

Tripping time (Typical tolerance curve from cold condition)



range 2,7-4 to 10-14A

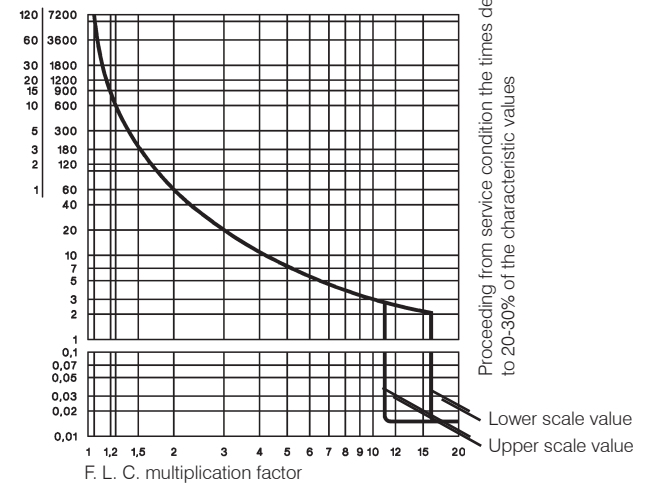
Tripping time (Typical tolerance curve from cold condition)



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 ⁶⁾ | U3/42 | U3/74 | U85 | U180 | U320 | U800 |
|--|-----------------------------------|----------------------|------------|-------------------------------|---------|--------------------|---------------|---------------------|
| Rated insulation voltage U_i¹⁾ | V~ | 690 | 690 | 690 | 690 | 750 | 1000 | 1000 |
| Permissible ambient temperature | | | | | | | | |
| operation | open | | -25 to +60 | | | | | -25 to +55 |
| storage | | | -50 to +70 | | | | | -40 to +70 |
| Trip class according to IEC 947-4-1 | | 10A | 10A | 10A | 10A | 20 | 10A | 10A |
| Cable cross-section | | | | | | | | |
| main connector | solid or stranded | mm ² | 0,75-6 | 0,75-6+0,75-2,5 ²⁾ | 0,75-10 | 4-35 ²⁾ | ³⁾ | 7) |
| | flexible | mm ² | 1-4 | 0,75-4+0,5-2,5 ²⁾ | 0,75-6 | 6-25 ²⁾ | | |
| | flexible with multicore cable end | mm ² | 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 ² | | 0,75-2,5 ²⁾ | | | | 1-2,5 ²⁾ |
| | flexible | mm ² | | 0,5-2,5 ²⁾ | | | | 1-2,5 ²⁾ |
| | flexible with multicore cable end | mm ² | | 0,5-1,5 | | | | 1-2,5 ²⁾ |
| Cables per clamp | number | | | 2 | | | | 2 |

| Type | U3/32 | U12/16A | U12/16E | U12/16EQ | U3/42 | U85 | U180 | U800 |
|--|-----------|---------|---------|----------|-------|------|------|------|
| Auxiliary contacts | | | | | | | | |
| Rated insulation voltage U_i¹⁾ | | | | | | | | |
| same potential | V~ | 690 | 690 | 690 | 690 | 690 | 690 | 500 |
| different potential | V~ | 440 | - | 440 | 440 | 250 | 440 | 500 |
| Utilization category AC15 | | | | | | | | |
| Rated operational current I _e | 24V A | 3 | 4 | 5 | 5 | 4 | 5 | 3 |
| | 230V A | 2 | 2,5 | 3 | 3 | 2,5 | 3 | 2 |
| | 400V A | 1 | 1,5 | 2 | 2 | 1,5 | 2 | 1 |
| | 690V A | 0,5 | 0,6 | 0,6 | 0,6 | 0,6 | 0,5 | 0,6 |
| Utilization category DC13 | | | | | | | | |
| Rated operational current I _e | 24V A | 1 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1 |
| | 110V A | 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 |
| Short circuit prot. (without welding 1kA) | | | | | | | | |
| highest fuse rating | gL (gG) A | 4 | 4 | 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 |
| Power loss per current path (max.) | | | | | | | | |
| minimum setting value | W | 1,1 | 1,1 | 1,7 | 1,3 | 1,3 | 2,0 | 1,1 |
| maximum setting value | W | 2,3 | 2,3 | 3,7 | 2,6 | 3,3 | 3,7 | 2,5 |

Data according to cULus

| Type | U3/32 | U12/16A | U12/16E | U3/42 | U3/74 | U85 |
|---------------------------------|-------|---------|---------|-------|-------|-----|
| Rated insulation voltage | V~ | 600 | 600 | 600 | 600 | 600 |
| Rated current | A | 32 | 23 | 23 | 42 | 75 |
| Auxiliary contacts | | | | | | |
| Rated voltage | | | | | | |
| same potential | V~ | 600 | 600 | 600 | 600 | 600 |
| different potential | V~ | 150 | - | 150 | 150 | 150 |
| Switching capacity AC | 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 x 1,0625 = 7,44A

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} = 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 70mm² (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

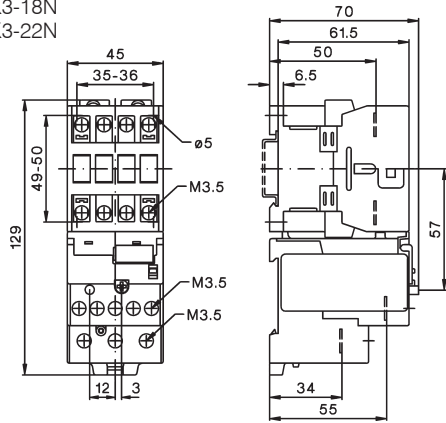
Dimensions

K3-10N + U3/32

K3-14N

K3-18N

K3-22N

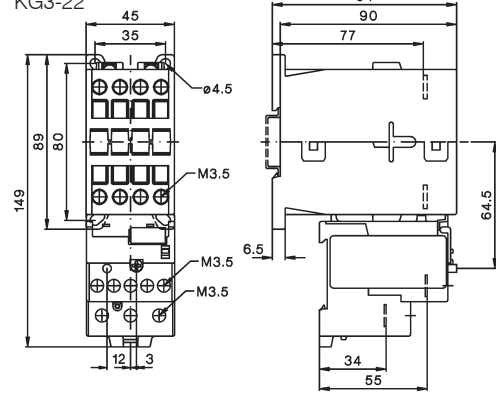


KG3-10 + U3/32

KG3-14

KG3-18

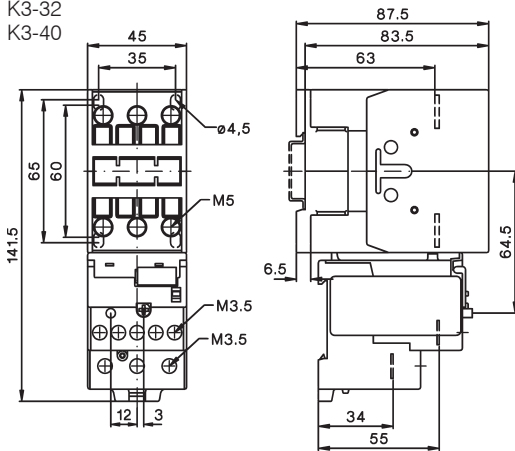
KG3-22



K3-24 + U3/32

K3-32

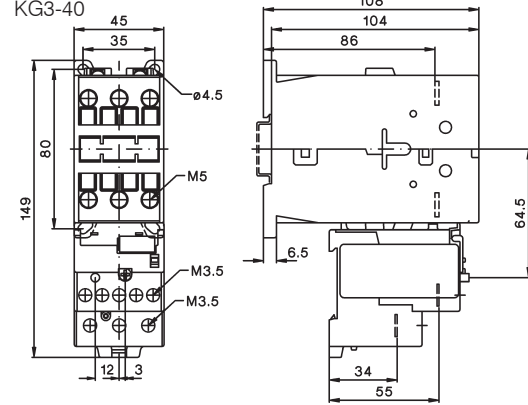
K3-40



KG3-24 + U3/32

KG3-32

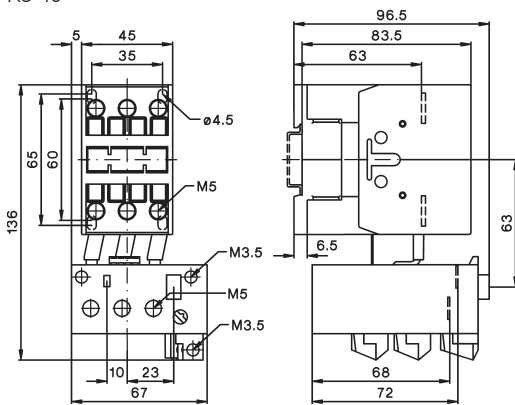
KG3-40



K3-24 + U3/42

K3-32

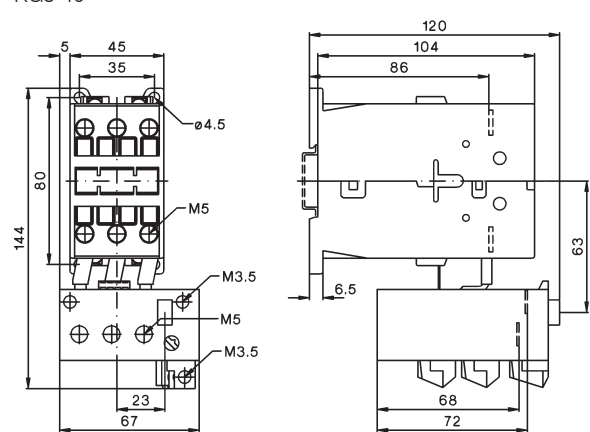
K3-40



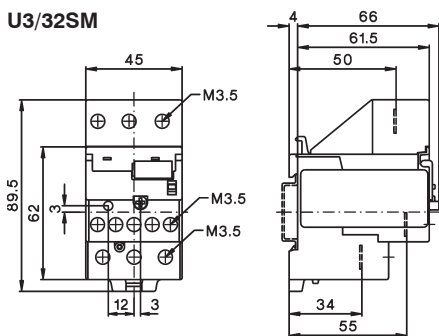
KG3-24 + U3/42

KG3-32

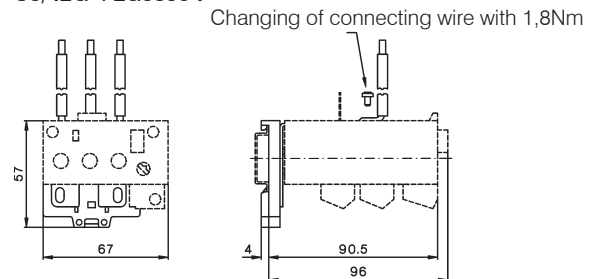
KG3-40



U3/32SM



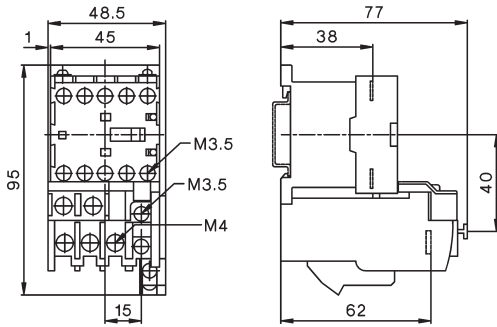
U3/42G + LG5830-



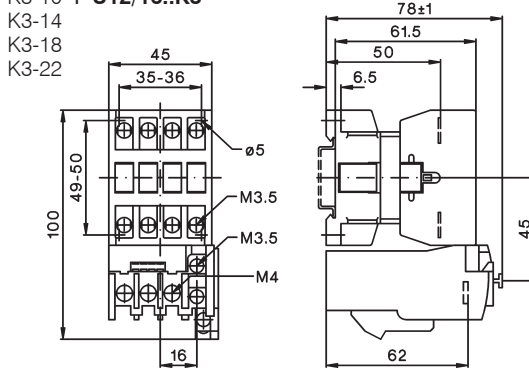
Thermal Overload Relays

Dimensions

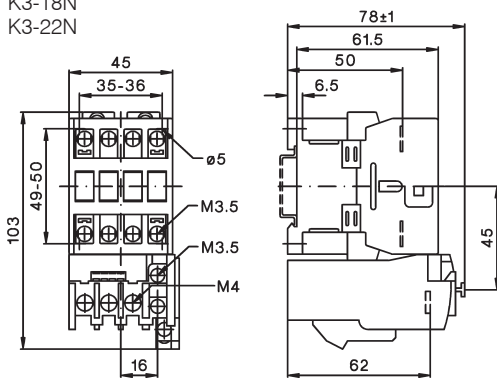
K1-09 + U12/16..K1
K1-12



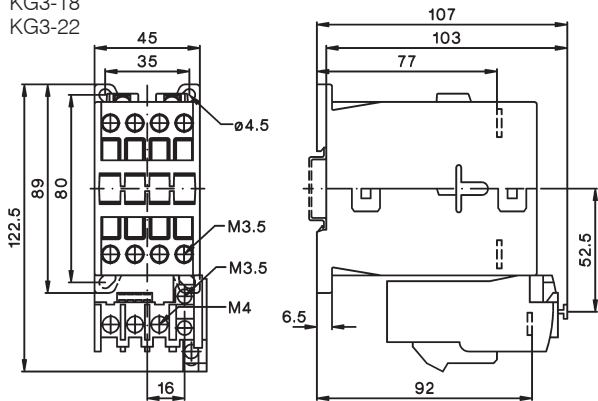
K3-10 + U12/16..K3
K3-14
K3-18
K3-22



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

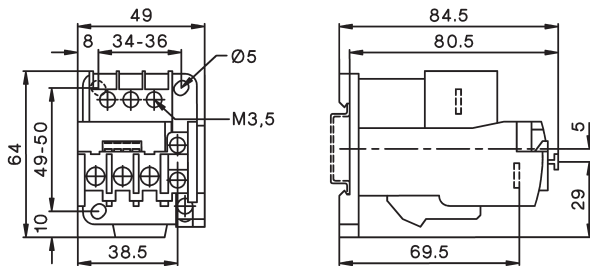


KG3-10 + U12/16..K3
KG3-14
KG3-18
KG3-22

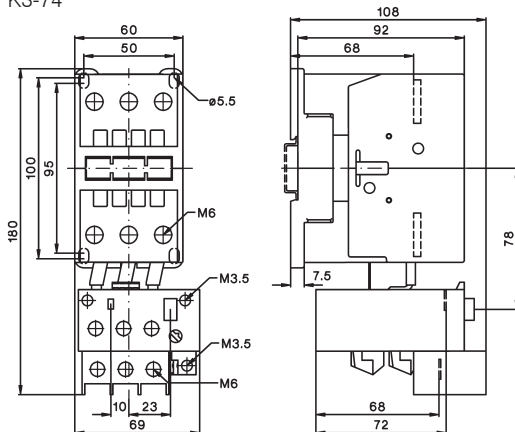


U12SM K3

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



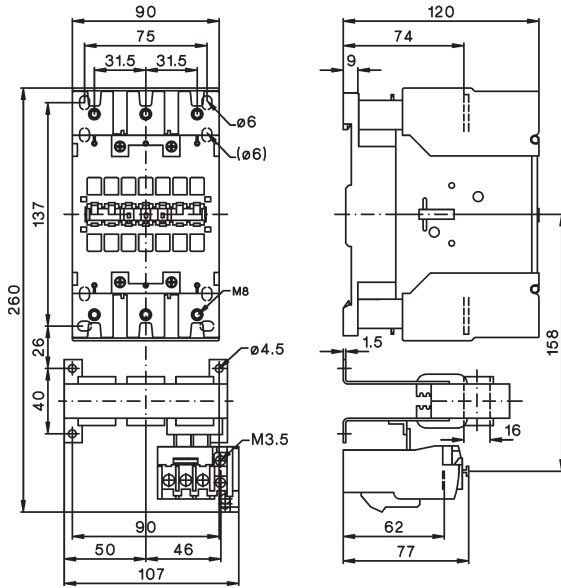
K3-50 + U3/74
K3-62
K3-74



Thermal Overload Relays

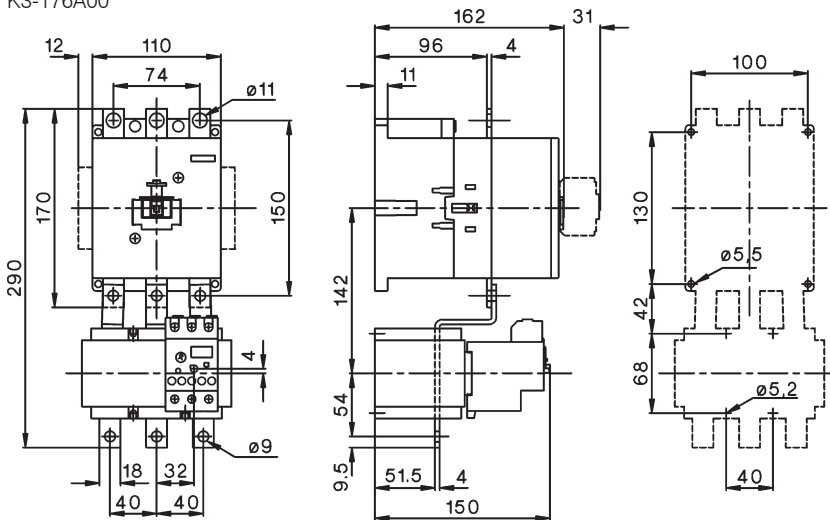
Dimensions

K3-90A + U85
K3-115A



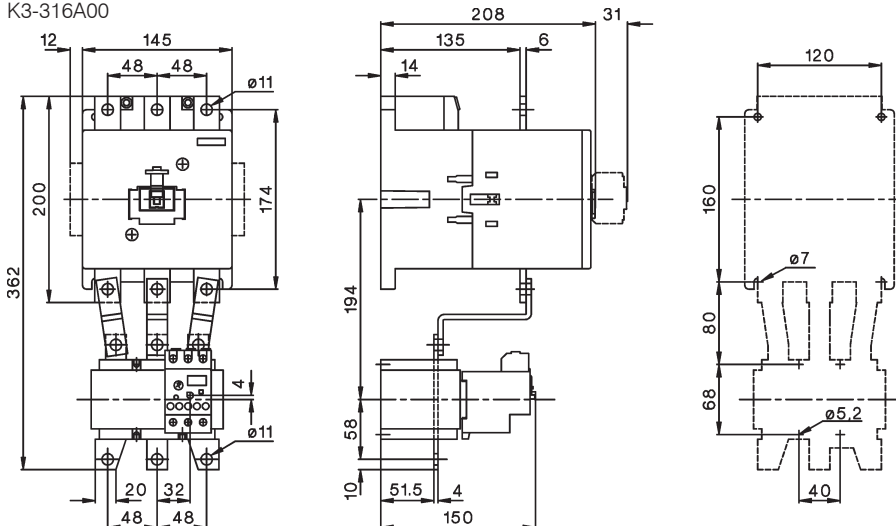
K3-151A00 + U180
K3-176A00

Mounting holes



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

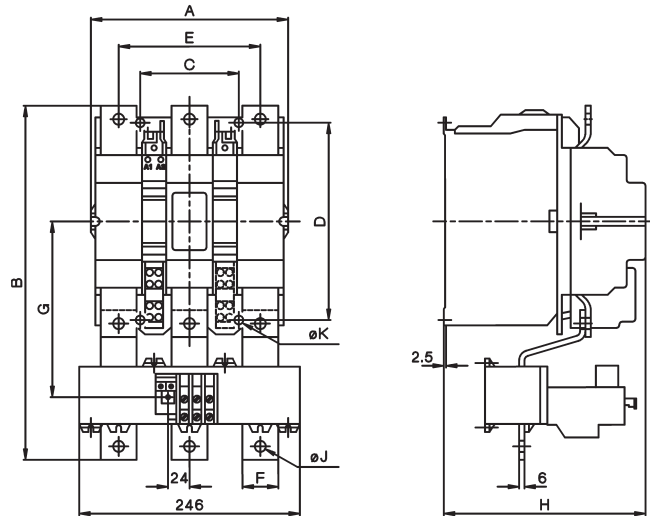
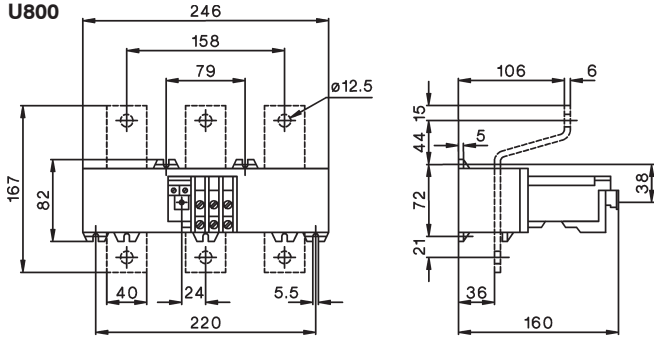
Mounting holes





Thermal Overload Relays

Dimensions

U800



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

| | | |
|---|--|--------------------|
|  | <p>Modular Contactors</p> | <p>134</p> |
|  | <p>Auxiliary Contact Block Accessories</p> | <p>136 136</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 | | | |
| AC1 400V A | 230V kW | 400V kW | | | 24V 50/60Hz 220-240V 50Hz, 230-264V 60Hz | | | |

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



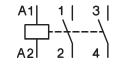
| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 20 | 4,6 | - | R20-10 24 | 12 | 0,12 |
| 20 | 4,6 | - | R20-10 230 | 12 | 0,12 |



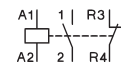
Two-pole 1 module (17,5mm), AC-operated (low noise)



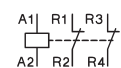
| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 20 | 4,6 | - | R20-20 24 | 12 | 0,12 |
| 20 | 4,6 | - | R20-20 230 | 12 | 0,12 |



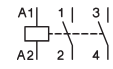
| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 20 | 4,6 | - | R20-11 24 | 12 | 0,12 |
| 20 | 4,6 | - | R20-11 230 | 12 | 0,12 |



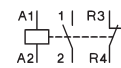
| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 20 | 4,6 | - | R20-02 24 | 12 | 0,12 |
| 20 | 4,6 | - | R20-02 230 | 12 | 0,12 |



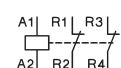
| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 25 | 5,5 | - | R25-20 24 | 12 | 0,14 |
| 25 | 5,5 | - | R25-20 230 | 12 | 0,14 |



| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 25 | 5,5 | - | R25-11 24 | 12 | 0,14 |
| 25 | 5,5 | - | R25-11 230 | 12 | 0,14 |



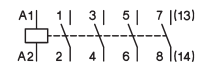
| | | | | | |
|-----------|-----|---|-------------------|----|------|
| 25 | 5,5 | - | R25-02 24 | 12 | 0,14 |
| 25 | 5,5 | - | R25-02 230 | 12 | 0,14 |



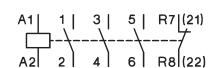
Four-pole 2 modules (35mm)¹⁾, AC-operated (low noise)



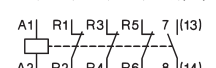
| | | | | | |
|-----------|-----|----|-------------------|---|------|
| 25 | 5,7 | 17 | R25-40 24 | 6 | 0,21 |
| 25 | 5,7 | 17 | R25-40 230 | 6 | 0,21 |



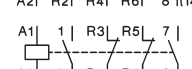
| | | | | | |
|-----------|-----|----|-------------------|---|------|
| 25 | 5,7 | 17 | R25-31 24 | 6 | 0,21 |
| 25 | 5,7 | 17 | R25-31 230 | 6 | 0,21 |



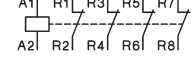
| | | | | | |
|-----------|-----|----|-------------------|---|------|
| 25 | 5,7 | 17 | R25-13 24 | 6 | 0,21 |
| 25 | 5,7 | 17 | R25-13 230 | 6 | 0,21 |



| | | | | | |
|-----------|-----|---|-------------------|---|------|
| 25 | 5,7 | - | R25-22 24 | 6 | 0,21 |
| 25 | 5,7 | - | R25-22 230 | 6 | 0,21 |



| | | | | | |
|-----------|-----|----|-------------------|---|------|
| 25 | 5,7 | 17 | R25-04 24 | 6 | 0,21 |
| 25 | 5,7 | 17 | R25-04 230 | 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 | | | |
| 400V | 230V | 400V | | | 24V 50/60Hz, 24V DC | | | |
| A | kW | kW | | ↓ | 220-240V 50/60Hz, 220V DC | | | |

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



| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 20 | 4,6 | - | R20-10 24VM | 12 | 0,12 | |
| 20 | 4,6 | - | R20-10 230VM | 12 | 0,12 | |

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



| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 20 | 4,6 | - | R20-20 24VM | 12 | 0,12 | |
| 20 | 4,6 | - | R20-20 230VM | 12 | 0,12 | |

| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 20 | 4,6 | - | R20-11 24VM | 12 | 0,12 | |
| 20 | 4,6 | - | R20-11 230VM | 12 | 0,12 | |

| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 20 | 4,6 | - | R20-02 24VM | 12 | 0,12 | |
| 20 | 4,6 | - | R20-02 230VM | 12 | 0,12 | |

| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 25 | 5,5 | - | R25-20 24VM | 12 | 0,14 | |
| 25 | 5,5 | - | R25-20 230VM | 12 | 0,14 | |

| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 25 | 5,5 | - | R25-11 24VM | 12 | 0,14 | |
| 25 | 5,5 | - | R25-11 230VM | 12 | 0,14 | |

| | | | | | | |
|-----------|-----|---|---------------------|----|------|--|
| 25 | 5,5 | - | R25-02 24VM | 12 | 0,14 | |
| 25 | 5,5 | - | R25-02 230VM | 12 | 0,14 | |

Four-pole 2 modules (35mm)¹⁾, AC/DC-operated (hum free)



| | | | | | | |
|-----------|-----|----|---------------------|---|------|--|
| 25 | 5,7 | 17 | R25-40 24VM | 6 | 0,21 | |
| 25 | 5,7 | 17 | R25-40 230VM | 6 | 0,21 | |

| | | | | | | |
|-----------|-----|----|---------------------|---|------|--|
| 25 | 5,7 | 17 | R25-31 24VM | 6 | 0,21 | |
| 25 | 5,7 | 17 | R25-31 230VM | 6 | 0,21 | |

| | | | | | | |
|-----------|-----|----|---------------------|---|------|--|
| 25 | 5,7 | 17 | R25-13 24VM | 6 | 0,21 | |
| 25 | 5,7 | 17 | R25-13 230VM | 6 | 0,21 | |

| | | | | | | |
|-----------|-----|---|---------------------|---|------|--|
| 25 | 5,7 | - | R25-22 24VM | 6 | 0,21 | |
| 25 | 5,7 | - | R25-22 230VM | 6 | 0,21 | |

| | | | | | | |
|-----------|-----|----|---------------------|---|------|--|
| 25 | 5,7 | 17 | R25-04 24VM | 6 | 0,21 | |
| 25 | 5,7 | 17 | R25-04 230VM | 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)¹⁾, 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)²⁾ for contactor R25, R40, R63 (4p.) max. 1 piece for contactor R40 and R63 (2p.) max. 1 piece



| Rated current | AC15 | AC1 | Type | Pack pcs. | Weight kg/pc. | Wiring Diagram | |
|---------------|------|------|------------------------------|-----------|---------------|----------------|--|
| AC15 | 400V | 400V | | | | | |
| 230V | A | A | for contactor | | | | |
| A | A | A | | | | | |
| 3 | 2 | 10 | R25 ³⁾ , 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 W | Current A | Capacitors µF | Max. lamps per pole at 230V 50Hz and max. 60°C | | | |
|--|------------|--------------|------------------|--|---------|---------|---------|
| | | | | R20.. | R25.. | R40.. | R63.. |
| Incandescent lamps (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 |
| Fluorescent lamps uncompensated or serial compensated (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 |
| Fluorescent lamps dual-connection (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 |
| Fluorescent lamps parallel compensated (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 |
| Fluorescent lamps with electronic fluorescent lamp ballast (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 | |
| Transformers for metal halid low voltage lamps (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 | |
| Mercury-vapour lamps (high-pressure lamps), uncompensated e. g. HQL, HPL (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 | |
| Mercury-vapour lamps (high-pressure lamps), compensated e. g. HQL, HPL (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 W | Current A | Capacitors μF | Max. lamps per pole at 230V 50Hz and max. 60°C | | | | |
|---|---|--------------|-----------------------------|--|-------|-------|-------|----|
| | | | | R20.. | R25.. | R40.. | R63.. | |
| Metal halide lamps uncompensated e. g. HQI, HPI, CDM (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 | |
| | Metal halide lamps compensated e. g. HQI, HPI, CDM (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 |
| Metal halide lamps with electronic fluorescent with electronic fluorescent lamp ballast (e. g.: PCI) 50-125 x $I_{n,lamp}$ for 0,6ms (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 | |
| Sodium-vapour lamps (low pressure lamps), uncompensated (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 | |
| Sodium-vapour lamps (low pressure lamps), compensated (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 | |
| Sodium-vapour lamps (high pressure lamps), uncompensated (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 | |
| Sodium-vapour lamps (high pressure lamps), compensated (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 | |
| Sodium-vapour lamps (high pressure lamps) with serial electronic (e. g.: PCI) 50-125 x $I_{n,lamp}$ for 0,6ms (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) ⁷⁾ | R25 (VM) ⁷⁾ | R40 | R63 | R25 (VM) ⁷⁾ | R40 | R63 | | |
| Main Contacts ^{4) 5) 6)} | | | | | | | | | |
| Rated insulation voltage U_i ¹⁾ | V~ | 440 | 440 | 440 | 440 | 440 | 440 | 440 | |
| Rated operation voltage U_e | V~ | 440 | 440 | 440 | 440 | 440 | 440 | 440 | |
| Frequency of operations z AC1, AC3 | 1/h | 300 | 300 | 600 | 600 | 300 | 600 | 600 | |
| Mechanical life | S x 10 ⁶ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Utilization category AC1 / AC7a | | | | | | | | | |
| Switching of resistive load | | | | | | | | | |
| Rated operational current I_e (=I _{th}) open | at 60°C | A | 20 | 25 | 40 | 63 | 25 | 40 | 63 |
| Contact life | S x 10 ⁶ | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | |
| Minimum Switch Voltage | V/mA | 24/100 | 24/100 | 24/100 | 24/100 | 24/100 | 24/100 | 24/100 | |
| Short time current | 10s-current | A | 72 | 72 | 216 | 240 | 72 | 216 | 240 |
| Power loss per pole at I _e /AC1 | W | 2 | 3 | 3 | 7 | 2 | 3 | 7 | |
| Utilization category AC2 and AC3 / AC7b | | | | | | | | | |
| Switching of three-phase motors | | | | | | | | | |
| 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 ²⁾ | 1,3 | 2,6 | 5 | - | - | - | - |
| Contact life | S x 10 ⁶ | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | - |
| Power consumption of coils | | | | | | | | | |
| 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 | - | - | - |
| Operation range of coils | | | | | | | | | |
| 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 | - |
| Noise level (operation) acc. to EN ISO 3744 | | | | | | | | | |
| from front, distance 0,5 m | dB | 16 (0) ⁷⁾ | 16 (0) ⁷⁾ | 8 | 8 | 8 (0) ⁷⁾ | < 4 | < 4 | - |
| Type | | R20 | R25 (2p.) | R25 (4p.) | R25-..VM | R40 (2p./4p.) | R63 (2p./4p.) | RH11 | |
| Maximum ambient temperature | | | | | | | | | |
| Operation | open °C | | | | -40 to + 60 | | | | |
| | enclosed °C | | | | -40 to + 40 | | | | |
| Storage | °C | | | | -50 to + 90 | | | | ≤ 40°C |
| Short circuit protection | | | | | | | | | |
| max. fuse Coordination-type "1" gL (gG) | A | 35 | 35 | 35 | 35 | 63 | 80 | - | |
| Rated short circuit current | "I _m " kA | 3 | 3 | 3 | 3 | 3 | 3 | - | |
| | "I _q " kA | 3 | 3 | 10 | 10 | 10 | 10 | - | |
| Switching time 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 | - | |
| Cable cross-sections | | | | | | | | | |
| Main connector | solid or stranded mm ² | 1,5 - 10 | 1,5 - 10 | 1,5 - 10 | 1,5 - 10 | 2,5 - 25 | 2,5 - 25 | 0,5 - 2,5 ³⁾ | |
| | flexible mm ² | 1,5 - 6 | 1,5 - 6 | 1,5 - 6 | 1,5 - 6 | 2,5 - 16 | 2,5 - 16 | 0,5 - 2,5 ³⁾ | |
| | flexible with multicore cable end mm ² | 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 ² | 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 ² | 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 ² | 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 | - | |
| Auxiliary Contacts ^{4) 5) 6)} | | | | | | | | | |
| Rated insulation voltage U_i ¹⁾ | V AC | - | - | 440 | 440 | 440 | 440 | 440 | |
| Thermal rated current 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

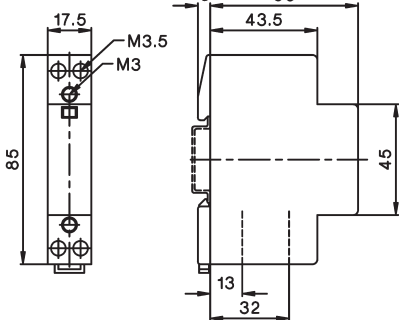
| Type | R20 | R25 (2p.) | R25 (4p.) | R25-..VM | R40 (2p./4p.) | R63 (2p./4p.) | RH11 |
|--|------------|-----------|-----------|----------|---------------|---------------|------|
| Utilization category AC15 | | | | | | | |
| Rated operational current I_e | 220-240V A | - | 3 | 3 | 3 | 3 | 3 |
| | 380-415V A | - | 2 | 2 | 2 | 2 | 2 |
| | 440V A | - | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 |
| Utilization category DC13 | | | | | | | |
| Rated operational current I_e per pole | 24-60V A | - | 2 | 2 | 2 | 2 | 2 |
| | 110V A | - | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| | 220V A | - | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Short circuit protection | | | | | | | |
| short-circuit current 1kA, contact welding not accepted max. fuse size | gL (gG) A | - | 10 | 10 | 10 | 10 | 10 |

Data according to UL508

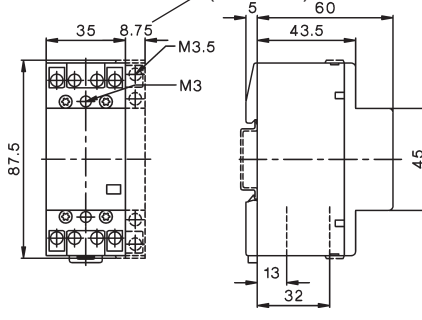
| Main Contacts (cULus) | Type | R20 | R25 (2p.) | R25 (4p.) | R40 (2p./4p.) | R63 (2p./4p.) | RH11 |
|---|---------------------|------|-----------|-----------|---------------|---------------|------|
| Rated operational current "General Use" | A | 20 | 25 | 25 | 40 | 63 | 10 |
| Rated operational power 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 / 2-pole break) | 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 |
| Auxiliary Contacts (cULus) | heavy pilot duty AC | - | - | - | - | - | C300 |

Dimensions

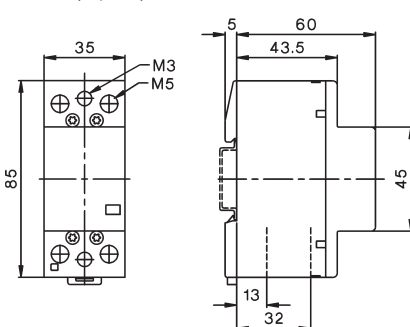
R20-..., R25-... (2-pole)
RC-R 230



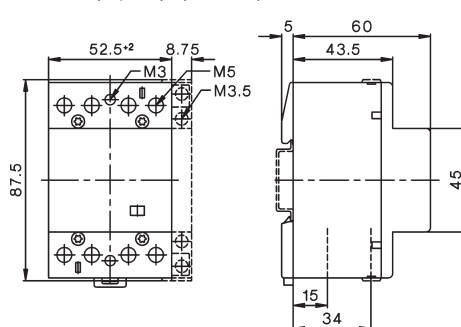
R25-... (4-pole) (+RH11)
R25-..VM (+RH11-1)



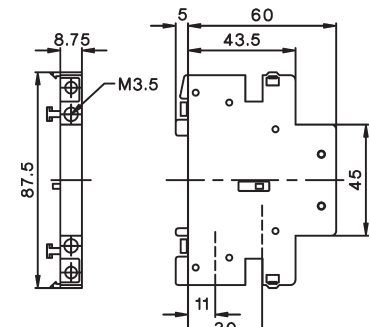
R40-... (2-pole)
R63-... (2-pole)



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 ¹⁾
230 220-230V 50Hz, 240V 60Hz
 Pack pcs. Weight kg/pcs.

600V 1000V 1200V

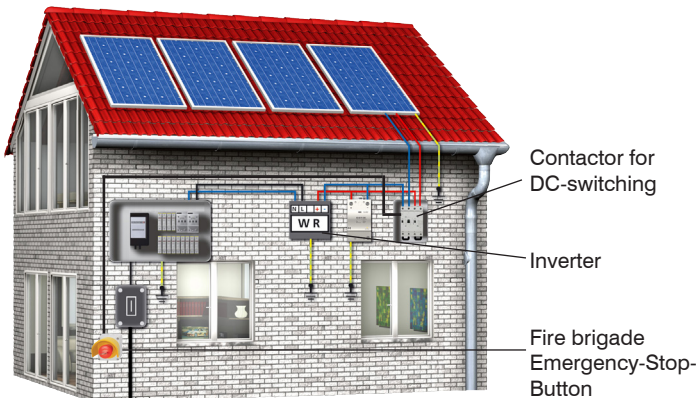
Type

Wiring diagram



| Rated Operational Current (DC1) | Additional Aux. Contacts | Type | Coil voltage ¹⁾ | Pack pcs. | Weight kg/pcs. | Wiring diagram |
|---------------------------------|--------------------------|---------------------------------------|----------------------------|-----------|----------------|----------------|
| 20A | 2 HKA11 | K3DC-20A00 ... | 220-230V 50Hz, 240V 60Hz | 1 | 0,5 | |
| 50A | +1 HKT. | K3DC-48A00 ... | | 1 | 0,5 | |
| 60A | 2 HKA11 | K3DC-60A00 ... | | 1 | 1,2 | |
| 80A | +1 HKT. | K3DC-80A00 ... | | 1 | 1,2 | |
| 100A | | K3DC-100A00 ... | | 1 | 1,8 | |
| 12A | 2 HKA11 +2 HKT. | K3PV-12A00 ... | | 1 | 0,8 | |
| 30A | 2 HKA11 | K3PV-30A00 ... | | 1 | 1,55 | |
| 60A | +2 HKT. | K3PV-60A00 ... | | 1 | 1,55 | |
| 80A | 2 HKA11 | K3PV-80A00 ... | | 1 | 1,5 | |
| 100A | +1 HKT. | K3PV-100A00 ...²⁾³⁾ | | 1 | 2,3 | |
| 150A | 2 HKA11 | K3PV-150A00 ...²⁾³⁾ | | 1 | 5 | |
| 200A | +1 HKT. | K3PV-200A00 ...²⁾³⁾ | | 1 | 5 | |
| 240A | | K3PV-240A00 ...²⁾³⁾ | | 1 | 5 | |
| 300A | 2 HKA11 | K3PV-300A00 ...²⁾³⁾ | | 1 | 7,5 | |
| 400A | +1 HKT. | K3PV-400A00 ...²⁾³⁾ | | 1 | 7,5 | |
| 450A | | K3PV-450A00 ...²⁾³⁾ | | 1 | 7,5 | |

Contactors for DC-Switching for PV-installations, as remote controlled fire protection defeat device

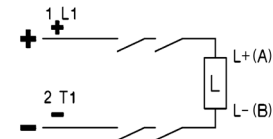
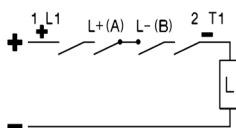
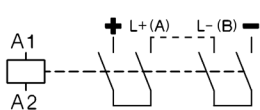


In most Photovoltaic-installations, the switch disconnectors according to IEC 60364-7-712 are integrated in the DC/AC-inverter. So the wires between solar-panels and inverter are continuously under voltage. According to ÖVE-R11-1: 2013, Photovoltaic-installations must have a fire protection defeat device. 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 ¹⁾ | Aux. Contacts | Pack pcs. | Weight kg/pcs. | Wiring diagram | |
|------|---|--------------------|-----------|----------------|----------------|--|
| | 24 24V= DC | additional | | | | |
| | KG3DC-12A00 ... ⁵⁾ | 1 HKA11 | 1 | 0,5 | | |
| | KG3DC-20A00 ... ⁵⁾ | +1 HKT. | 1 | 0,5 | | |
| | KG3DC-48A00 ... ⁵⁾ | +1 HKT. | 1 | 0,5 | | |
| | K3DC-60A00= ... ⁵⁾ | 1 HKA11 | 1 | 1,2 | | |
| | K3DC-80A00= ... ⁵⁾ | +1 HKT. | 1 | 1,2 | | |
| | K3DC-100A00= ... | | 1 | 1,8 | | |
| | KG3PV-12A00 ... | 1 HKA11 +2 HKT. | 1 | 0,85 | | |
| | KG3PV-30A00 ... ⁵⁾ | 1 HKA11 +2 HKT. | 1 | 1,55 | | |
| | KG3PV-60A00 ... ⁵⁾ | | 1 | 1,55 | | |
| | K3PV-80A00= ... ⁵⁾ | 2 HKA11 +1 HKT. | 1 | 1,5 | | |
| | K3PV-100A00 ... ^{2) 5)} | | 1 | 2,3 | | |
| | K3PV-150A00 ... ^{2) 5)} | 2 HKA11 +1 HKT. | 1 | 5 | | |
| | K3PV-200A00 ... ^{2) 5)} | | 1 | 5 | | |
| | K3PV-240A00 ... ^{2) 5)} | | 1 | 5 | | |
| | K3PV-300A00 ... ^{2) 5)} | - - | 2 HKA11 | 1 | 7,5 | |
| | K3PV-400A00 ... ^{2) 5)} | - - | +1 HKT. | 1 | 7,5 | |
| | K3PV-450A00 ... ^{2) 5)} | - - | | 1 | 7,5 | |

Auxiliary Contact Blocks for contactors K(G)3DC-.. and K(G)3PV-.., for low level switching⁴⁾

| Type | Rated Operational Current | | | for contactors | Type | Pack pcs. | Weight kg/pcs. | Wiring diagrams |
|------|---------------------------|------|------|--------------------------|--------------|-----------|----------------|-----------------|
| | AC15 | AC15 | AC1 | | | | | |
| | 230V | 400V | 690V | | | | | |
| | A | A | A | | | | | |
| | 3 | 2 | 10 | K(G)3DC, K(G)3PV-.. top | HKT11 | 1 | 0,04 | |
| | 3 | 2 | 10 | K(G)3DC, K(G)3PV-.. top | HKT22 | 1 | 0,05 | |
| | 3 | 2 | 10 | K(G)3DC, K(G)3PV-.. top | HKT31 | 1 | 0,05 | |
| | 3 | 2 | 10 | K(G)3DC, K(G)3PV-.. top | HKT40 | 1 | 0,05 | |
| | 3 | 2 | 10 | K(G)3DC, K(G)3PV-.. side | HKA11 | 1 | 0,05 | |

Accessories



| | | | | | |
|---|-------------------------|---|------|--|----|
| Fire Brigade-EMERGENCY STOP key operated button Ø40mm, according to EN418, unlock by key | BG10P44S3-11 +SK | 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 | K(G)3DC- 12.. 20.. 48.. | | | K3DC- 60.. 80.. | | K3DC- 100.. | K(G)3PV- 12.. 30.. 60.. | | | K3PV- 80.. | K3PV- 100.. | K3PV- 150.. 200.. 240.. | | | K3PV- 300.. 400.. 450.. | | | |
|---|---------------------------------|-----------|------|--------------------|------|----------------|----------------------------|-------------------|--------------|---------------|----------------|----------------------------|---------|---------|----------------------------|------|---------|--|
| Rated insulation Voltage V= U _{imp} kV | 600 | 600 | 600 | 1000 | 1000 | 600 | 1200 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | |
| Poles in series | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 6 | 6 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | |
| DC1 600V dc I _b A | 12 | 20 | 50 | 60 | 80 | 100 | 12 | 30 | 60 | 80 | 100 | 150 | 200 | 240 | 300 | 400 | 450 | |
| DC1 1000V dc I _b A | 1 | - | - | 30 | 60 | - | 12 | 30 | 60 | 80 | 100 | 150 | 200 | 240 | 300 | 400 | 450 | |
| DC1 1200V dc I _b A | - | - | - | - | - | - | 6 | - | - | - | - | - | - | - | - | - | - | |
| DC3/5 310V dc I _b A | - | - | - | - | 40 | 60 | - | 15 | 24 | 40 | 90 | 125 | 170 | 200 | 230 | 270 | 300 | |
| DC3/5 460V dc I _b A | - | - | - | - | - | - | - | 15 | 24 | 40 | 40 | 125 | 170 | 200 | 230 | 270 | 300 | |
| DC3/5 600V dc I _b A | - | - | - | - | - | - | - | - | - | - | - | 50 | 60 | 75 | 120 | 160 | 200 | |
| Main pole resistance mΩ | 2 | 2 | 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 mΩ | 5,4 | 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 | |
| electrical life | 100 k | 100 k | 90 k | 90 k | 90 k | 60 k | 100 k | 100 k | 90 k | 90 k | 60 k | 60 k | 60 k | 60 k | 50 k | 50 k | 50 k | |
| mechanical life | 10 Mio. | | | | | | | | | | | | | | | | | |
| Protection degree | IP20 | | | | | | | | | | | | | | | | | |
| Main poles | | | | | | | | | | | | | | | | | | |
| Cable cross AC mm ² | 2 x 1,5 - 10 | | | 2,5 - 35 | | 4 - 35 | 2x1-2,5 | | 2 x 1,5 - 10 | | 2,5-35 | 4 - 55 | | | Busbar 18 x 4 | | | |
| sections DC mm ² | 2 x 1,5 - 6 | | | 2,5 - 35 | | 4 - 50 | 2x1-2,5 | | 2 x 1,5 - 6 | | 2,5-35 | 4 - 35 | | | Screw M8 | | | |
| Tightening torque Nm | 1,4 | 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 / screws | | | | | Screws | | DIN-rail / Screws | | | | Screws | | Screws | | | | |
| Operation range coils U _c | 0,85 - 1,1 | | | | | | | | | | | | | | | | | |
| Power consumption of coils | | | | | | | | | | | | | | | | | | |
| AC inrush VA | 90 | | | 250 | | 180 | | | 250 | | 350 | | | 360 | | | | |
| sealed VAW | 9 / 3 | | | 18 / 4 | | 18 / 6 | | | 18 / 4 | | 5 / 5 | | | 6 / 6 | | | | |
| DC inrush W | 5,5 | 5 | 5 | 230 | | 11 | | | 230 | | 350 | | | 360 | | | | |
| sealed W | 5,5 | 5 | 5 | 4 | | 11 | | | 4 | | 5 | | | 6 | | | | |
| Switching time | | | | | | | | | | | | | | | | | | |
| AC make time ms | 10 - 25 | | | 12 - 30 | | 12 - 30 | | 10 - 25 | | 12 - 30 | | 15 - 50 | | 30 - 60 | | | 40 - 60 | |
| release time ms | 6 - 18 | | | 6 - 15 | | 6 - 15 | | 6 - 18 | | 6 - 15 | | 30 - 80 | | 30 - 80 | | | 40 - 60 | |
| DC make time ms | 15 - 25 | | | 15 - 25 | | 20 - 30 | | 15 - 25 | | 15 - 25 | | 15 - 50 | | 30 - 60 | | | 40 - 60 | |
| realise time ms | 60 - 80 | | | 10 - 25 | | 10 - 25 | | 60 - 80 | | 10 - 25 | | 30 - 80 | | 30 - 80 | | | 40 - 60 | |
| Maximum ambient temperature | | | | | | | | | | | | | | | | | | |
| Operation °C | -40 bis +40 (+70) ²⁾ | | | | | | | | | | | | | | | | | |
| Storage °C | -40 bis +70 | | | | | | | | | | | | | | | | | |
| Short circuit protection | | | | | | | | | | | | | | | | | | |
| Coordination-Type „1“ max. fuse size gPV | | | | | | | | | | | | | | | | | | |
| 600VDC A | 63 | 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 | 50 | 63 | 80 | 100 | 125 | - | - | - | 100 | - | - | - | - | - | - | - | |
| 1000VDC A | - | - | - | 80 | 100 | - | - | 50 | 80 | 100 | 125 | - | - | - | - | - | - | |
| Short circuit current kA | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 5 | 5 | 10 | 10 | 10 | 10 | 10 | 10 | |

Data acc. to UL60947-4-1



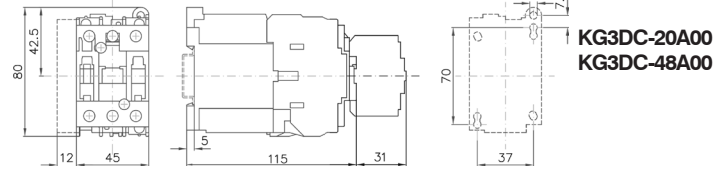
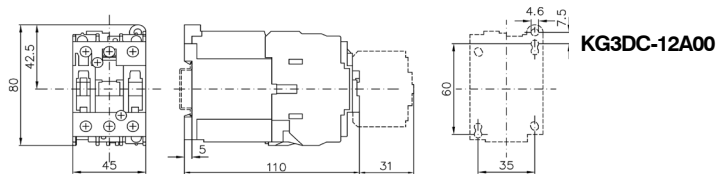
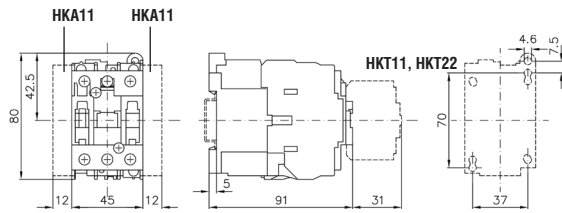
| Type | | K(G)3DC- 12.. 20.. 48.. | | | K3DC- 60.. 80.. | | K3PV- 80.. | K3PV- 150.. | 200.. | 240.. | K3PV- 300.. | 400.. | 450.. |
|----------------------------------|---------------------------------|----------------------------|-----|-----|--------------------|-----|---------------|----------------|-------|-------|----------------|-------|-------|
| General Use I _b [A] | 600V DC | 12 | 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 _b [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 |
| | Fuse PK5 | - | 12 | 12 | 75 | 90 | 90 | 125 | 150 | 175 | 300 | 350 | 400 |
| | max. short circuit current [kA] | - | 5 | 5 | 5 | 5 | 5 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Voltage DC [V] | - | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |

1) IP20 with terminal lugs

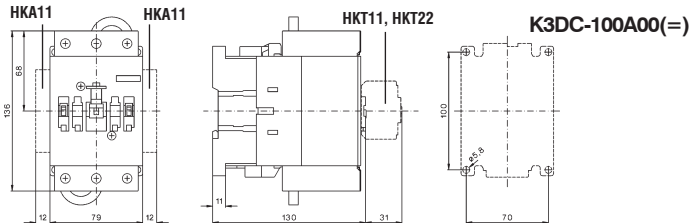
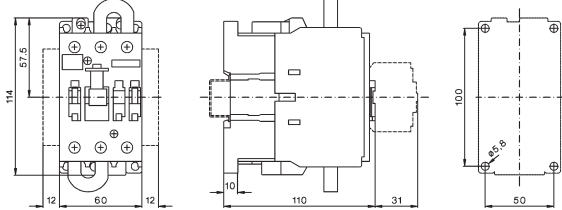
2) > 40° ... 1% / °C de-rating (eg. at 60°C 20% de-rating)

Dimensions

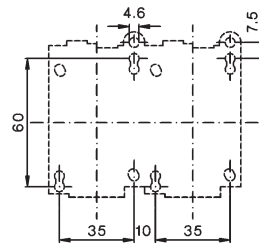
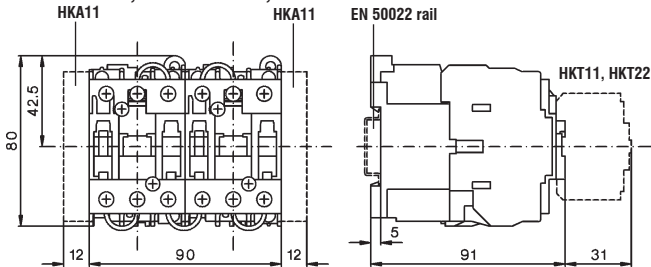
K3DC-20A00, K3DC-48A00



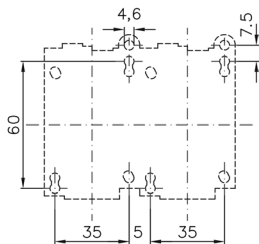
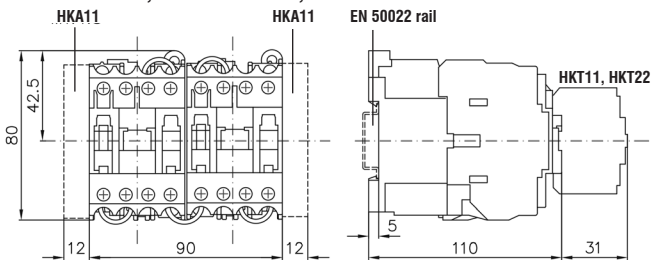
K3DC-60A00(=), K3DC-80A00(=)



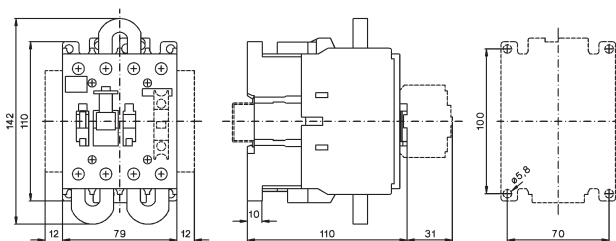
K3PV-12A00, K3PV-30A00, K3PV-60A00



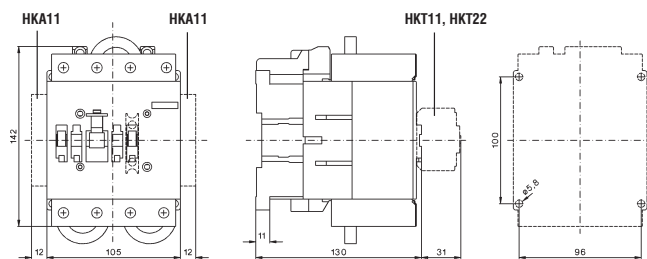
KG3PV-12A00, KG3PV-30A00, KG3PV-60A00



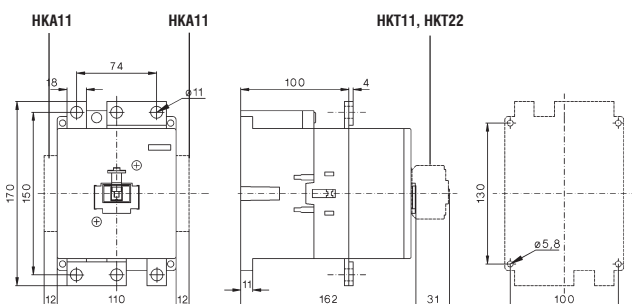
K3PV-80A00(=)



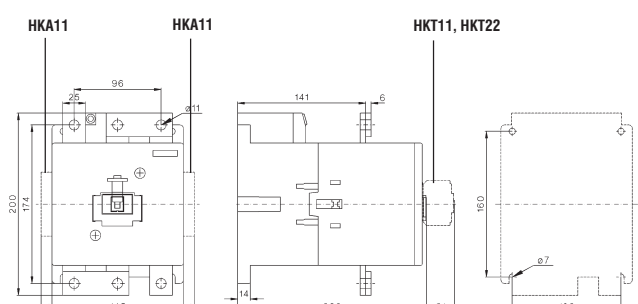
K3PV-100A00(=)



K3PV-150A00(=), K3PV-200A00(=), K3PV-240A00(=)



K3PV-300A00(=), K3PV-400A00(=), K3PV-450A00(=)



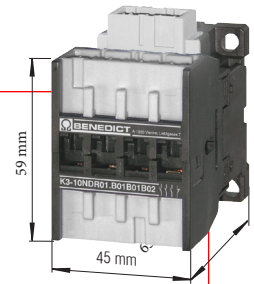
| | | |
|--|--|-------------------|
| | Contactors RAST 5 Contactor Relays Contactors | 147 147 147 |
| | Accessories Auxilliary Contact Blocks | 147 147 |
| | Combinations Contactors for Fuseless Load Feeder Contactors for Overload Relays | 148 148 148 |
| | Industry Standard RAST 5 Contactor-Housing Coil-Housing Auxilliary Contact Block-Housing | 149 150 157 |
| | System Stocko RAST 5 Contactor-Housing Coil-Housing Auxilliary Contact Block-Housing | 151 152 158 |
| | System Tyco RAST 5 Contactor-Housing Coil-Housing Auxilliary Contact Block-Housing | 153 154 159 |
| | System Lumberg RAST 5 Contactor-Housing Coil-Housing Auxilliary Contact Block-Housing | 155 156 160 |
| | Dimensions / Color Codes | 161 |
| | Technical Information | 162 |

RAST 5 - exclusiv for OEM-Partner

5 mm pitch connector system

Advantages RAST 5 - Technology

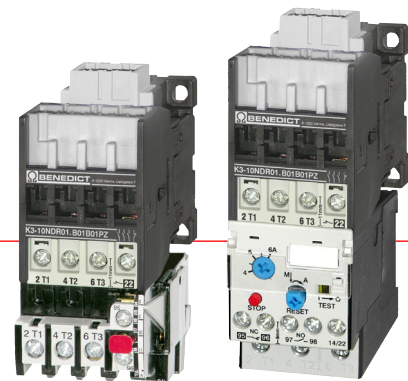
- Time saving installation
- Easy assembly without tools
- Tailor-made sockets, custom - designed codes
- Ambient temperatures up to +90°C/194°F
- Smallest sizes
- Plug technology up to 32 A / 415 V
- color coding for power ratings
- color coding for coil voltages



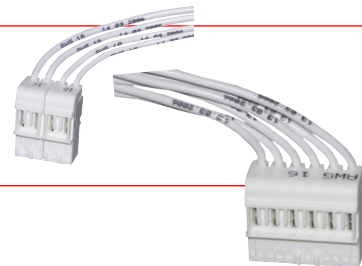
RAST 5 - Accessories



Combining switchgears with plug-in connections and screw connections








Contactors are available for plugs of many different producers




Contactors, RAST 5

AC operated

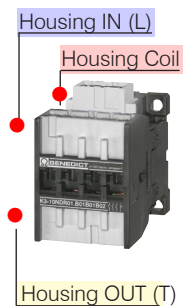
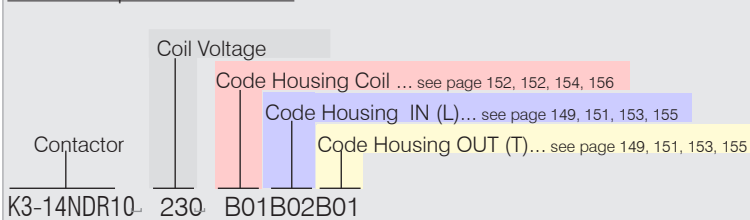
| Ratings AC2, AC3 380V 400V 415V kW | 220V 230V kW | 240V kW | Rated- Current AC1 415V A | Auxilliary Contacts built in | | Auxilliary Contacts snap on HN10R.. | Type | Coil Voltage | Code Housing Coil | Code Housing IN (L) | Code Housing OUT (T) | Pack pcs. | Weight kg/pc. |
|---|--------------------|------------|---------------------------------------|------------------------------------|----|--|-------------------|-------------------|-------------------|---------------------|----------------------|--------------|------------------|
| | | | | NO | NC | | | | | | | | |
| ● Contactor Relays | | | | | | | | | | | | | |
|  | - | - | 10 | 4 | - | 2 | K3-07NDR40 | | | | | 1 | 0,23 |
| | - | - | 10 | 2 | 2 | 2 | K3-07NDR22 | | | | | 1 | 0,23 |
| ● Contactors | | | | | | | | | | | | | |
|  | 4 | 3 | 3 | 25 | 1 | - | 2 | K3-10NDR10 | | | | 1 | 0,23 |
| | 4 | 3 | 3 | 25 | - | 1 | 2 | K3-10NDR01 | | | | 1 | 0,23 |
|  | 5,5 | 4 | 4 | 25 | 1 | - | 2 | K3-14NDR10 | | | | 1 | 0,23 |
| | 5,5 | 4 | 4 | 25 | - | 1 | 2 | K3-14NDR01 | | | | 1 | 0,23 |
|  | 7,5 | 5 | 5 | 32 | 1 | - | 2 | K3-18NDR10 | | | | 1 | 0,23 |
| | 7,5 | 5 | 5 | 32 | - | 1 | 2 | K3-18NDR01 | | | | 1 | 0,23 |
|  | 11 | 6 | 7 | 32 | 1 | - | 2 | K3-22NDR10 | | | | 1 | 0,23 |
| | 11 | 6 | 7 | 32 | - | 1 | 2 | K3-22NDR01 | | | | 1 | 0,23 |

Auxilliary

● Auxilliary Contact Blocks

| for Contactors | AC15 230V A | I _{th} A | Contacts | | Type | Pack pcs. | Weight kg/pc. | |
|---|-------------------|----------------------|----------|----|------|--------------|------------------|------|
| | | | NO | NC | | | | |
|  | K3-..R.. | 3 | 10 | 1 | - | HN10R | 10 | 0,02 |
| | K3-..R.. | 3 | 10 | - | 1 | HN01R | 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

Coil Voltage
 Code Housing Coil
 Code Housing IN (L)
 Screw Connection OUT (T)

Pack Weight
 pcs. kg/pcs.

● Contactors for Overload Relays

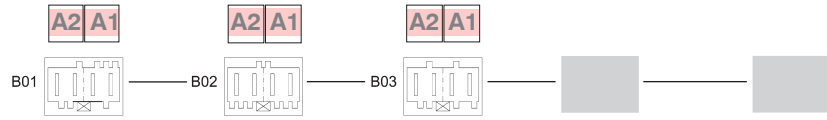
| | | | | | | | | | | |
|--|-----|----|--|-------------------|----|----|----|-----------|---|------|
|  | 4 | 10 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-10NDR10 | .. | .. | .. | PZ | 1 | 0,23 |
| | 4 | 10 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-10NDR01 | .. | .. | .. | PZ | 1 | 0,23 |
|  | 5,5 | 14 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-14NDR10 | .. | .. | .. | PZ | 1 | 0,23 |
| | 5,5 | 14 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-14NDR01 | .. | .. | .. | PZ | 1 | 0,23 |
|  | 7,5 | 18 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-18NDR10 | .. | .. | .. | PZ | 1 | 0,23 |
| | 7,5 | 18 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-18NDR01 | .. | .. | .. | PZ | 1 | 0,23 |
|  | 11 | 22 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-22NDR10 | .. | .. | .. | PZ | 1 | 0,23 |
| | 11 | 22 | U12/16E 0,18-..23 K3 and U3/32 0,18-..32 | K3-22NDR01 | .. | .. | .. | PZ | 1 | 0,23 |

Pozidriv ... PZ
 Torx TX

Selection of Coil-Housings for Standard plugs acc. **Industry Standard RAST 5**



Coil-Housings



Code Coil-Housings

Standard plugs acc. Industry Standard RAST 5

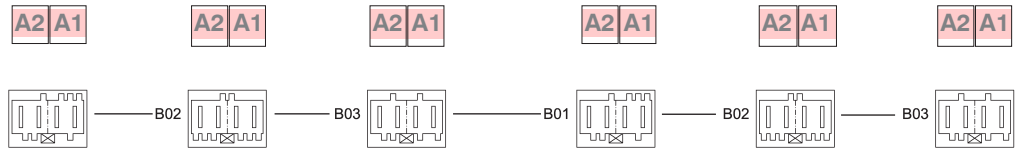


| Code | Coil-Housings | B01 | B02 | B03 | B04 | B05 | further housings on request |
|---------------|---------------|------|------|------|-----|-----|-----------------------------|
| 4-pole | | | | | | | |
| 3-pole left | | -0B- | -0K- | | | | |
| 3-pole right | | -0C- | -0A- | | | | |
| 2-pole center | | | -0I- | -0H- | | | |
| | | | -0A- | -0B- | | | |
| | | | -0C- | -0E- | | | |
| | | -0I- | | -0L- | | | |
| | | -0L- | | -0M- | | | |
| | | | -0O- | -0P- | | | |
| | | | -0Q- | | | | |

Selection of Coil-Housings for Standard plugs acc. **System Stocko RAST 5**



Coil-Housings –

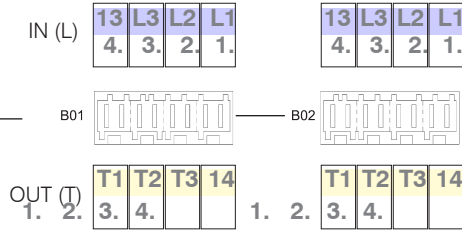


| Code Coil-Housings | B01 | B02 | B03 | B01 | B02 | B03 |
|--|--------|------|------|--|------|------|
| Standard plugs acc. System Stocko RAST 5 | 4-pole | -42- | -64- | 3-pole right | -02- | -02- |
| | | -78- | -78- | | -04- | -03- |
| | -79- | | -78- | | | -18- |
| 3-pole left | | | -79- | | | |
| | | | -01- | -19- | | |
| | | -05- | | -21- | | |
| | | -12- | | | | -28- |
| | | -16- | | -47- | | |
| | | | -30- | | -52- | -52- |
| | | | -32- | | -53- | |
| | -33- | | | | | -64- |
| | -36- | | -35- | | -66- | |
| | | -40- | | -71- | | |
| | | | -44- | | -74- | |
| | | | -48- | | -75- | |
| | -49- | | | 2-pole center 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 2-928344-6 | | |
| 6-pole right | | | | |
| 4-pole left | | 928344-4 | | |
| 4-pole right | | | | 4-928344-4 |
| 2-pole left | | | | 928344-2 3-964951-2 |
| | | 2-964951-2 928343-2 | | |
| | | | | 964951-2 4-928344-2 |
| 2-pole center left | | 928344-2 | | |
| | | 3-964951-2 4-928344-2 | | |
| 2-pole center right | | | | 2-928344-2 928343-2 |
| 2-pole right | | | | 2-928344-2 2-964951-2 928343-2 |

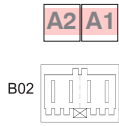
Order Example for Contactors:











| | |
|--|-----------|
| 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 Tyco RAST 5**



Coil
Housings –

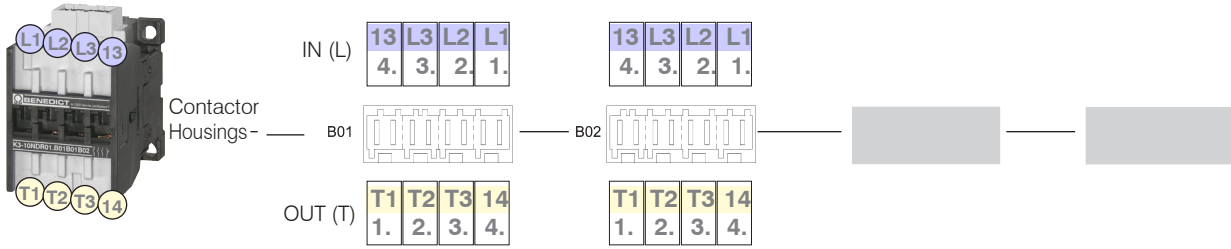


| Code Coil-Housings | B01 | B02 | B03 | B04 | B05 |
|--------------------|--|--|---|-----|-----|
| 4-pole | | | | | |
| 3-pole left | | | | | |
| 3-pole right | |  928344-3 | | | |
| 2-pole center | |  928344-2 |  2-928344-2 | | |
| | |  3-964951-2 | | | |
| | | |  6-928344-2 | | |
| |  2-964951-2 | | | | |
| |  928343-2 | | | | |
| | |  964951-2 | | | |
| | |  4-928344-2 | | | |
| | | |  928343-2 | | |

Standard plugs
acc.
System Lumberg RAST 5



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

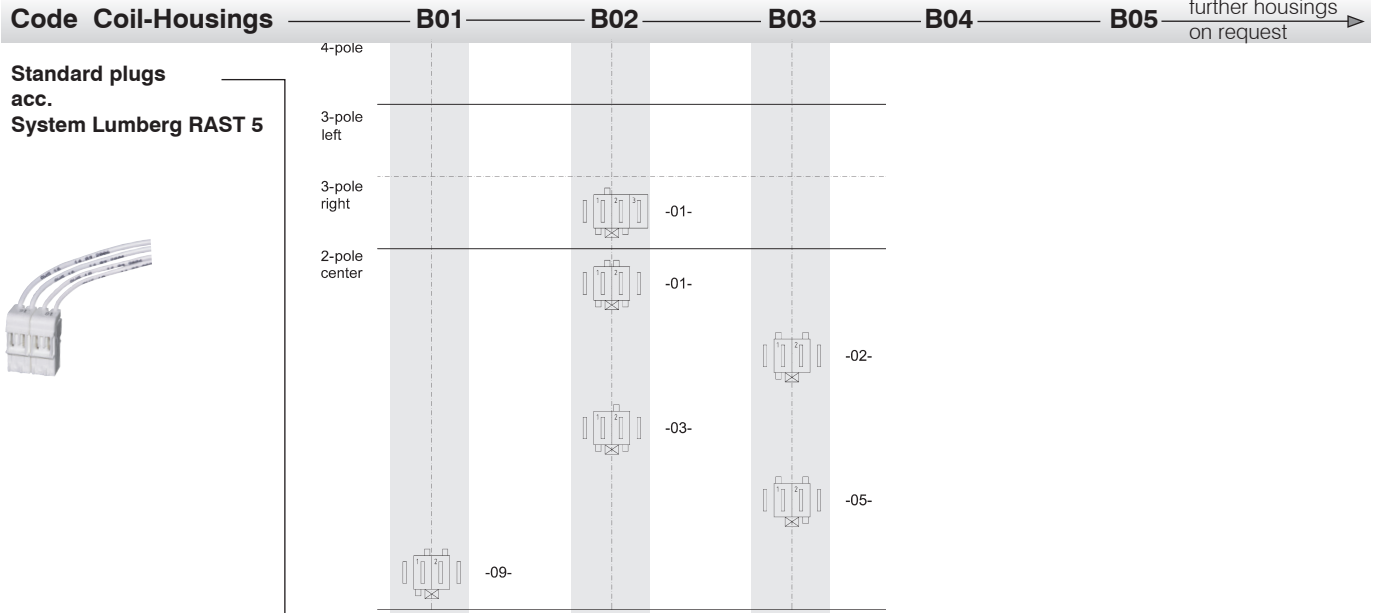
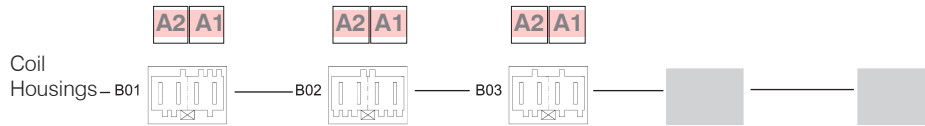


| | B01 | B02 | B03 | B04 |
|---------------------|-----|-----|-----|----------------------|
| 8-pole | | | | |
| 6-pole left | | | | -10- |
| 6-pole right | | | | |
| 4-pole left | | | | -01- |
| 4-pole right | | | | -02- |
| 2-pole left | | | | -01- -03- |
| 2-pole center left | | | | -01- -03- |
| 2-pole center right | | | | -10- -02- -06- |
| 2-pole right | | | | -02- -06- -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 |

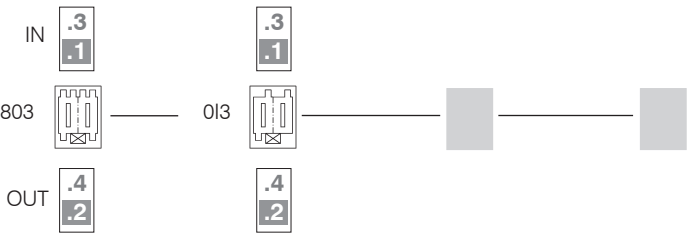
Selection of Coil-Housings for Standard plugs acc. **System Lumberg RAST 5**



Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **Industry Standard RAST 5**

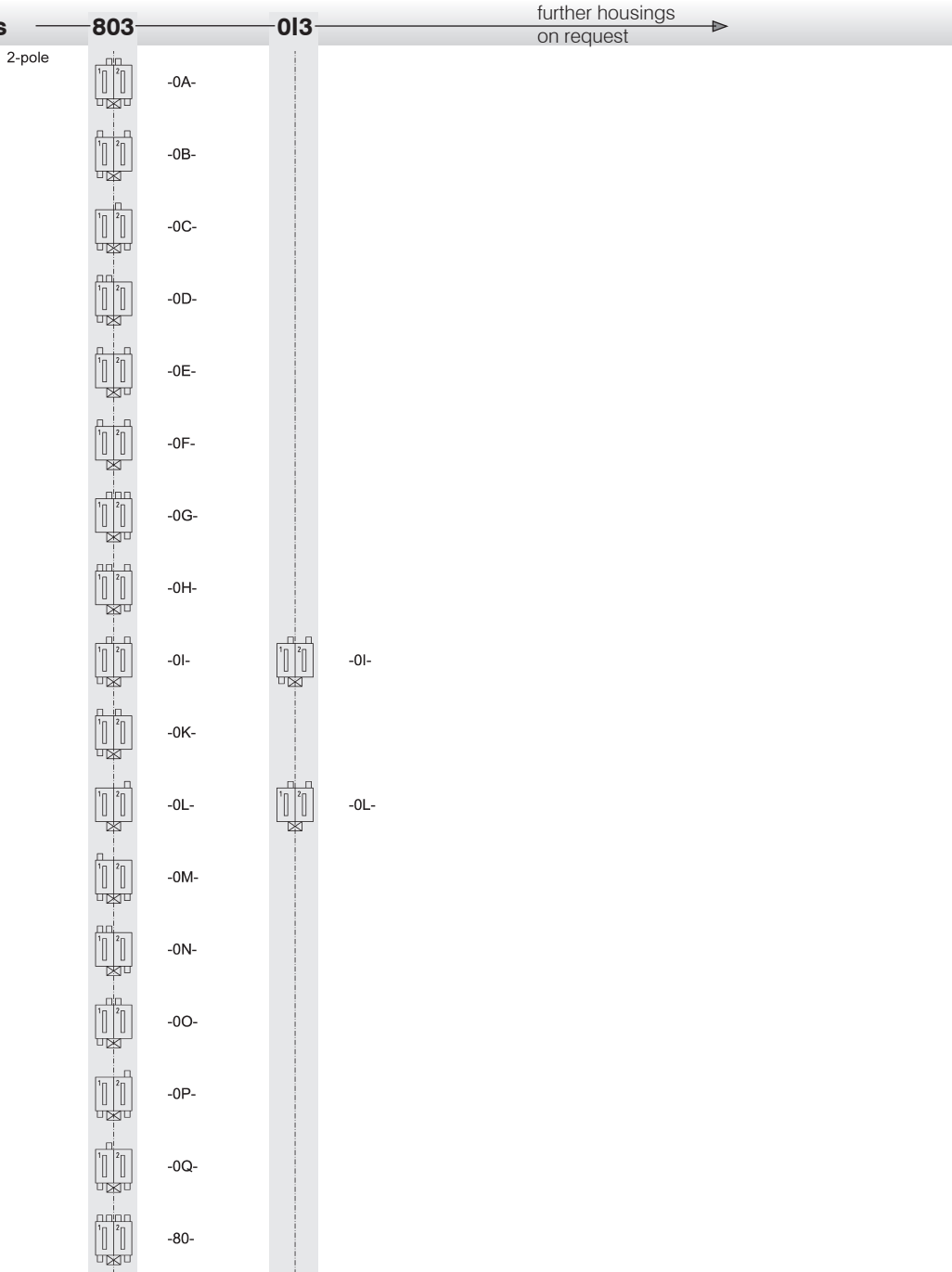


Auxiliary Contact Block-Housings



Code Auxilliary-Contact Block-Housings

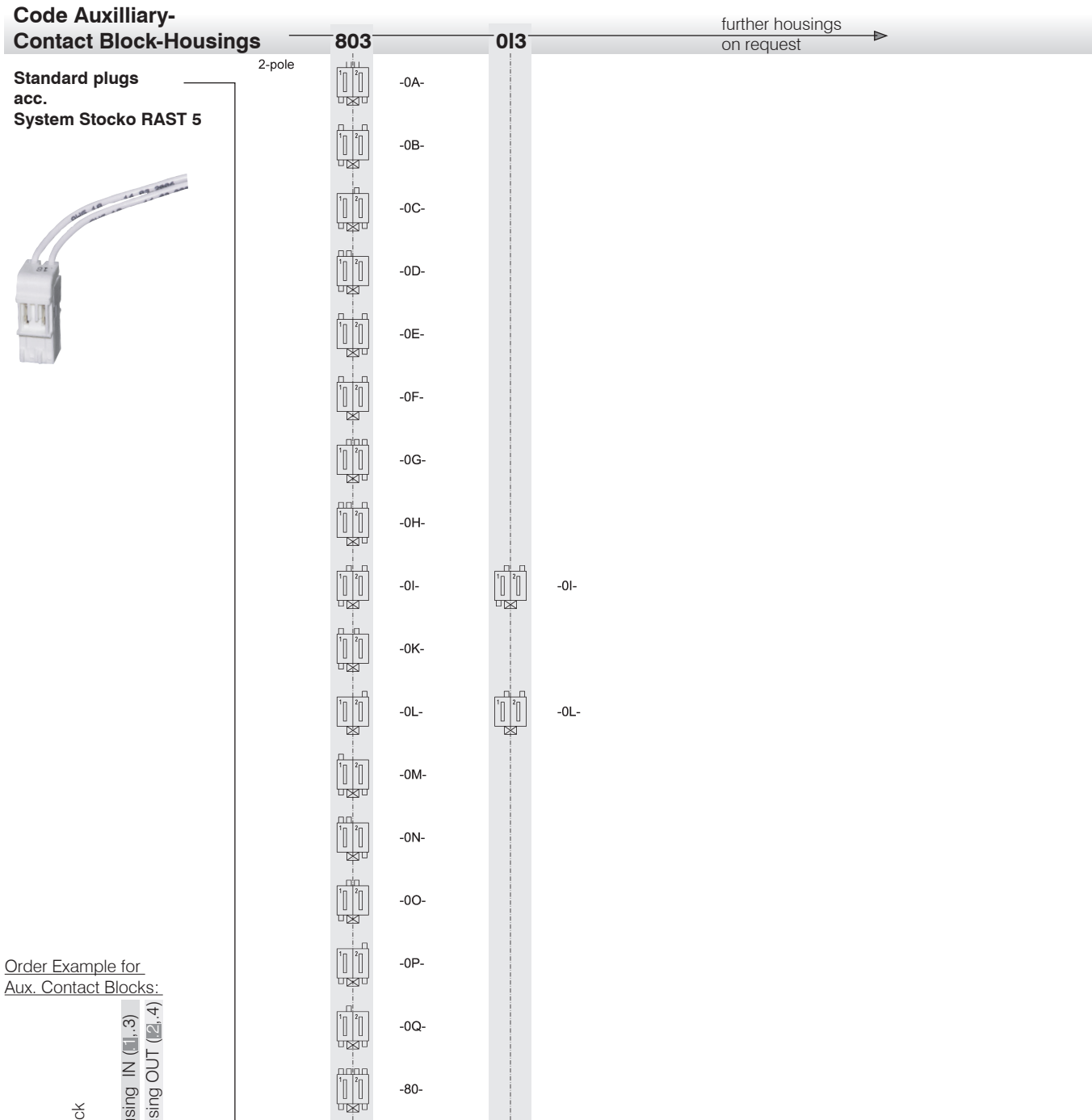
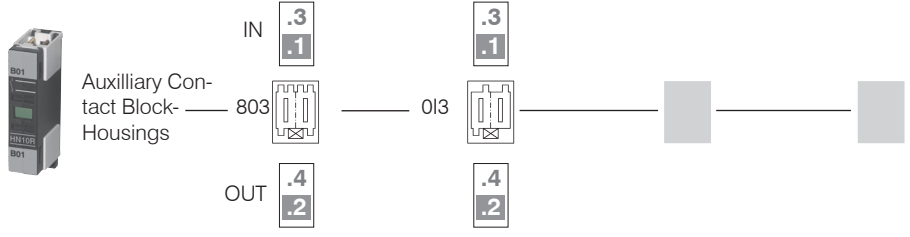
Standard plugs acc. Industry Standard RAST 5



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**

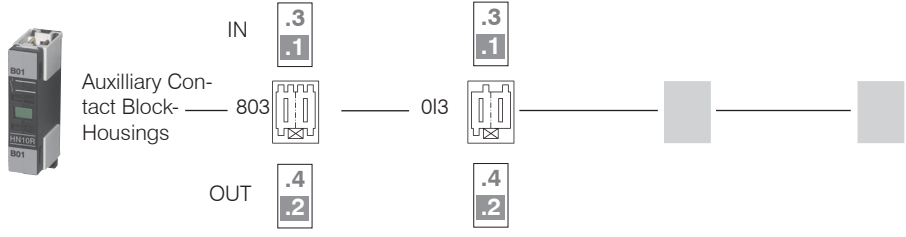


Order Example for
Aux. Contact Blocks:

- 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



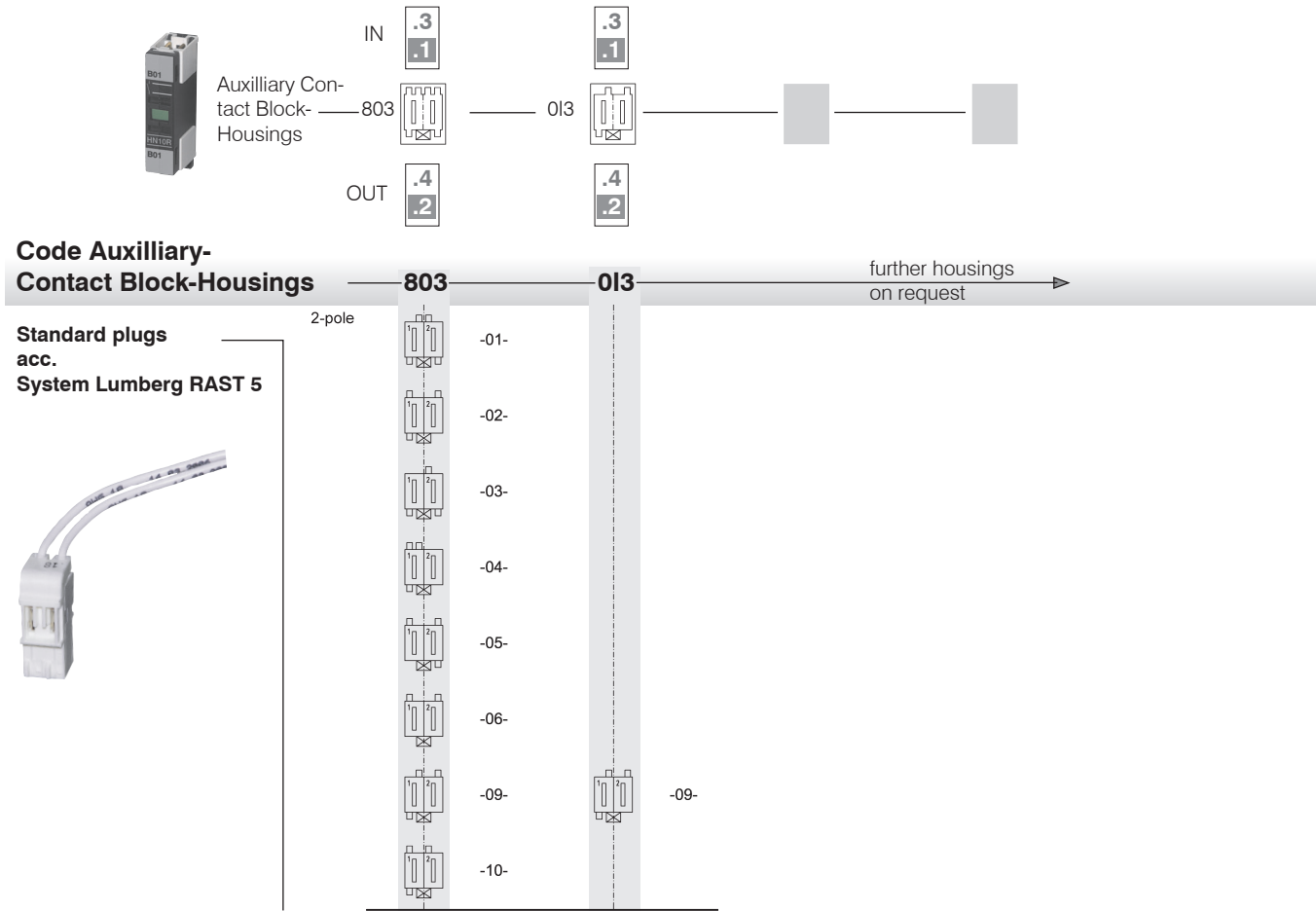
| 2-pole | 803 | 013 |
|--------|------------|------------|
| | 928344-2 | |
| | 2-928344-2 | |
| | 3-964951-2 | |
| | 6-928344-2 | |
| | 5-928344-2 | |
| | 3-928344-2 | |
| | 2-964951-2 | 2-964951-2 |
| | 928343-2 | 928343-2 |
| | 964951-2 | |
| | 4-928344-2 | |

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

- Contactor, Motor-Starter
- Circuit Breakers
- Manual Motor-Starters
- Switches
- AC-Main Switches
- DC-Switch Disconnect
- Push Buttons
- Representatives, Suppliers

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 |
|---|-----------------|-----------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Rated insulation voltage U_i ¹⁾ | V~ | | 415 | 415 | 415 | 415 | 415 |
| Making capacity I_{eff} at $U_e = 415V\sim$ | A | | - | 200 | 200 | 200 | 200 |
| Breaking capacity I_{eff} at $U_e = 415V\sim$ $\cos\varphi = 0,65$ | A | | - | 180 | 180 | 200 | 200 |
| Utilization category AC1 | | | | | | | |
| Switching of resistive load | | | | | | | |
| Rated operational current $I_e (=I_{th})$ | 415V | A | 10 | 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 |
| 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 ² | 2 x 1,5 ² | 2 x 1,5 ² | 2 x 1,5 ² | 2 x 2,5 ² | 2 x 2,5 ² |
| Utilization category AC2 and AC3 | | | | | | | |
| Switching of three-phase motors | | | | | | | |
| 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 |
| | 380-400V | A | - | 10 | 14 | 18 | 22 |
| | 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 |
| | 380-400V | kW | - | 4 | 5,5 | 7,5 | 11 |
| | 415V | kW | - | 4,5 | 6 | 8,5 | 12 |
| Auxilliary Contacts | | | | | | | |
| Rated insulation voltage U_i | | V~ | 415 | 415 | 415 | 415 | 415 |
| Thermal rated current I_{th} up to 415V | | | | | | | |
| Ambient temperature | 40°C | A | 10 | 10 | 10 | 10 | 10 |
| | 60°C | A | 6 | 6 | 6 | 6 | 6 |
| Utilization category AC15 | | | | | | | |
| Rated operational current I_e | 220-240V | A | 3 | 3 | 3 | 3 | 3 |
| | 380-415V | A | 2 | 2 | 2 | 2 | 2 |
| Utilization category DC13 | | | | | | | |
| 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 |
| Short circuit protection | 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 |
|---|-----------------------------|---------------------|-------|----------|---------------|-----------------------------------|----------|----------|
| Maximum ambient temperature | | | | | | | | |
| Operation | open | °C | | | | -40 up to +60 (+90) ¹⁾ | | |
| | enclosed | °C | | | | -40 up to +40 | | |
| | with thermal overload relay | °C | | | | -25 up to +60 | | |
| | enclosed | °C | | | | -25 up to +40 | | |
| Storage | °C | | | | -50 up to +90 | | | |
| Short circuit protection 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, 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, 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. | | | | | | | | |
| Frequency of operations z | | | | | | | | |
| Contactors without thermal overload relay | | | | | | | | |
| | without load | 1/h | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| | AC3, I _e | 1/h | | 600 | 600 | 600 | 600 | 600 |
| | AC4, I _e | 1/h | | 120 | 120 | 120 | 120 | 120 |
| | DC3, I _e | 1/h | | 600 | 600 | 600 | 600 | 600 |
| Mechanical life | | | | | | | | |
| AC-operated | | S x 10 ⁶ | 10 | 10 | 10 | 10 | 10 | 10 |
| DC-operated | | S x 10 ⁶ | 10 | 10 | 10 | 10 | 10 | 10 |
| Short time current | 10sec.-current | A | | 96 | 120 | 144 | 176 | |
| Power loss per pole | at I _e /AC3 400V | W | | 0,21 | 0,35 | 0,5 | 0,75 | |
| Resistance to shock acc. to IEC 68-2-27 | | | | | | | | |
| Shock time 20ms sine-wave | NO | g | | | 10 | | | |
| | NC | g | | | 6 | | | |
| Control Circuit | | | | | | | | |
| Power consumption of coils | | | | | | | | |
| AC operated | inrush | VA | | | 33-45 | | | |
| | sealed | VA | | | 7-10 | | | |
| | | W | | | 2,6-3 | | | |
| DC operated | inrush | W | | | 75 | | | |
| | sealed | W | | | 2 | | | |
| Operating range of coils | | | | | | | | |
| in multiples of control voltage U _s | | | | | | | | |
| | AC operated | | | | 0,85-1,1 | | | |
| | DC operated | | | | 0,8-1,1 | | | |
| Switching time at control voltage U _s ± 10% ^{2) 3)} | | | | | | | | |
| 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_s and with reduced rated current I_e /AC1, no deratings for I_e /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 „General Use“ | | A | 25 | 25 | 30 | 30 |
| Motor DOL 3-phase at 60Hz | | | | | | |
| 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 |
| Motor DOL 1-phase (2-pole break) at 60Hz | | | | | | |
| Rated operational current | 415V | A | 10 | 14 | 18 | 22 |
| Rated operational power 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 of delivering not more than (SCCR) | rms | A | 5000 | 5000 | 5000 | 5000 |
| | | V | 415 | 415 | 415 | 415 |
| Auxilliary Contacts (cULus) | | | A300 | A300 | A300 | A300 |

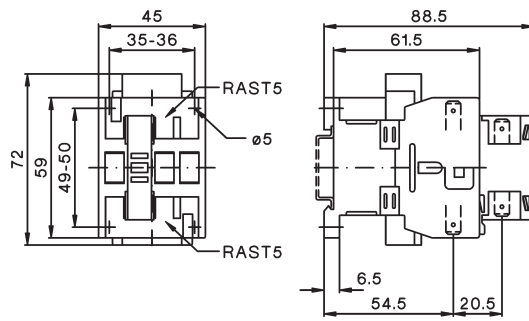
Accessories

Data acc. to IEC 60947-5-1, VDE 0660

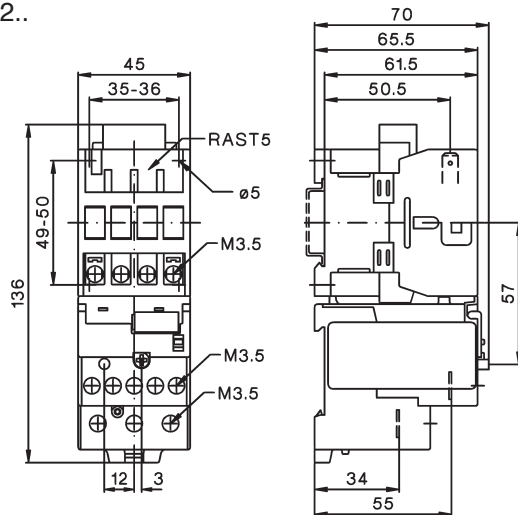
| Auxilliary Contacts | | Type | HN10R | HN01R |
|--|-----------|---------------------|-------|-------|
| Rated insulation voltage U_i | | V~ | 415 | 415 |
| Thermal rated current I_{th} up to 415V | | | | |
| Ambient temperature | max. 40°C | A | 10 | 10 |
| | max. 60°C | A | 6 | 6 |
| Frequency of operations z | | 1/h | 3000 | 3000 |
| Mechanical life | | S x 10 ⁶ | 10 | 10 |
| Power loss per pole at I _e /AC1 | | W | 0,5 | 0,5 |
| Utilization category AC15 | | | | |
| Rated operational betriebsstrom I _e | 220-240V | A | 3 | 3 |
| | 380-415V | A | 2 | 2 |
| Utilization category DC13 | | | | |
| Bemessungs- current I _e | 60V | A | 2 | 2 |
| | 110V | A | 0,4 | 0,4 |
| | 220V | A | 0,1 | 0,1 |
| Short circuit protection | | | | |
| short circuit current 1kA, contact welding not accepted | | | | |
| max. fuse size | gL (gG) | A | 20 | 20 |
| Data acc. to UL508 | | | | |
| Rated operational current „General Use“ | | A | 10 | 10 |
| Rated operational voltage | max. | V~ | 300 | 300 |
| Auxiliary Contacts | | | A300 | A300 |

Dimensions

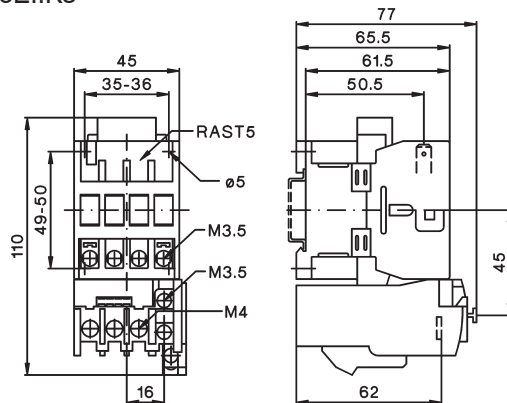
K3-..NDR.. +HN..R



K3-..NDR.....PZ + U3/32..



K3-..NDR.....PZ + U12/16E..K3



Technical data are subject to change without notice