

General Catalogue



Quality made in



D946E231

**Contactors, Motor-Starters**

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**

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**

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

**Switches**

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

**AC-Main Switches**

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

**DC Switch Disconnectors for Photovoltaic**

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

**General**

Approvals
Technical Information
Mounting Information

4
5
9
10

**Micro Contactors**

Micro Contactors
Micro Contactor Relays
Micro Reversing Contactors
Technical Information
Dimensions

11
12
14
18
20
24

**Mini Contactors**

Mini Contactors
Interface Contactors
Mini Reversing Contactors
Technical Information
Dimensions

25
26
26
32
33
36

**Contactor Relays**

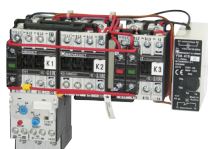
Contactor Relays
Technical Information
Dimensions

39
40
40
44

**Contactors**

Contactors Overview
Contactors, 3-pole
Contactors, 4-pole
Capacitor Switching Contactors
Accessories
Technical Information
Dimensions

45
46
48
50
51
52
62
82

**Starters**

Star-Delta Starters
Reversing Contactors
Pole Changing Starters
Technical Information
Dimensions

91
92
96
98
100
107

**D.O.L. Starters**

D.O.L. Starters
Enclosures
Accessories
Technical Information
Dimensions

111
112
113
113
115
116

**Overload Relays**

Thermal Overload Relays
Accessories
Technical Information
Dimensions

119
121
123
125
129

**Modular Contactors**

Contactors
Accessories
Technical Information
Dimensions

133
134
135
138
140


Contactors for DC-Switching
Contactors RAST 5

141
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				Contact Rating Code Designation
V	Voltage	Current Make A	Break A	Cont. Current A	
Heavy Duty (HD or HVY DTY)	AC 120	60	6	10	A150
	AC 240	30	3	10	A300
	AC 480	15	1,5	10	A600
	AC 600	12	1,2	10	A600
	DC 125	2,2	2,2	10	N150
	DC 250	1,1	1,1	10	N300
	DC 600	0,4	0,4	10	N600
Standard Duty (SD or STD DTY)	AC 120	30	3	5	B150
	AC 240	15	1,5	5	B300
	AC 480	7,5	0,75	5	B600
	AC 600	6	0,6	5	B600
	DC 125	1,1	1,1	5	P150
	DC 250	0,55	0,55	5	P300
	DC 600	0,2	0,2	5	P600
-	AC 120	15	1,5	2,5	C150
	AC 240	7,5	0,75	2,5	C300
	AC 480	3,75	0,375	2,5	C600
	AC 600	3	0,3	2,5	C600
	DC 125	0,55	0,55	2,5	Q150
	DC 250	0,27	0,27	2,5	Q300
	DC 600	0,1	0,1	2,5	Q600
-	AC 120	3,6	0,6	1	D150
	AC 240	1,8	0,3	1	D300
	DC 125	0,22	0,22	1	R150
	DC 250	0,11	0,11	1	R300
-	AC 120	1,8	0,3	0,5	E150

Discernment at UL-Standards

Recognized Component Industrial Control Equipment

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

Devices have permission to be marked with the label

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.

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

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 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" (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
	UL		SEV				
Type							
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
Contactor 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

0 approved in standard version

x pending

- not provided to be tested

Approvals

Country North America Switzerland Europe Russia China CENELEC
UL SEV EAC CB-Certificates

Typ      

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	-	-	-
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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

Guide-No.

File-No.

	cUL ^{us}		cRU ^{us}		
	Canada	USA	Canada	USA	
Contactors	NLDX7	NLDX	NLDX8	NLDX2	E41502
Reversing Contactors	NLDX7	NLDX	-	-	E41502
Contactor 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

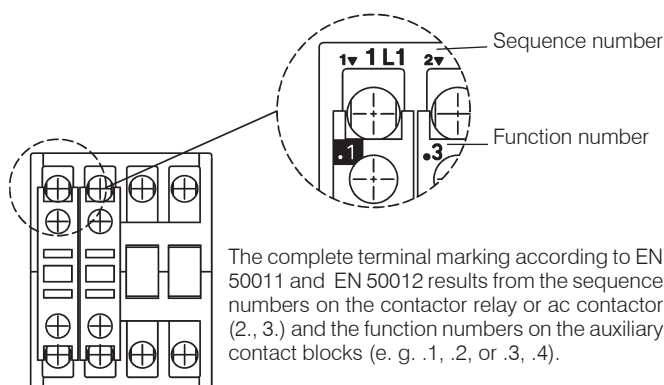
Protection ratings are prefixed by the internationally agreed letters IP followed by two digits.

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.
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

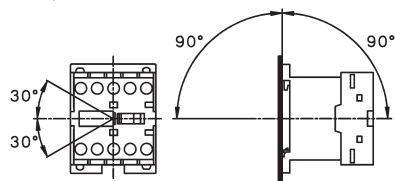
Back up fuses should be used to protect contactors and starters against short circuits. For starters the device with the smaller admissible fuse at the main and at the control circuit (contactor or thermal overload) determines the fuse size.

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

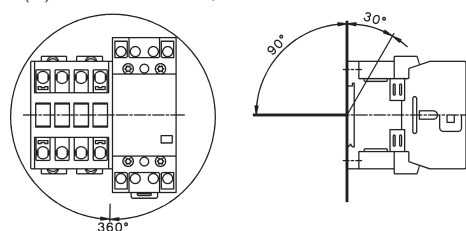
Technical Information

Mounting positions of contactors

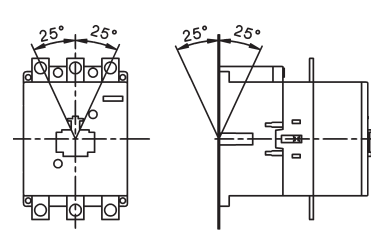
K0-.. / K1-..



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..



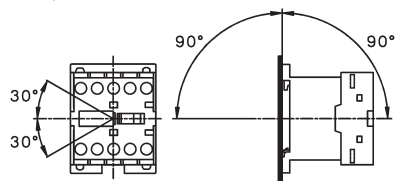
Terminal screws

Devices	Kind of connection				Screw driver	Tightening torque	
Type	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	-	-	-	Pz2	1,2 - 1,8	11 - 16
	-	M6	-	-	Pz3	3,5 - 4,5	31 - 40
K3-90, K3-115	-	-	M8	-	4mm hex socket	4 - 6,5	35 - 57
K3-116.. bis K3-176..	-	-	-	M8		17	150
K3-210.. bis K3-316..	-	-	-	M10		35	315
K3-450.. bis K3-700..	-	-	-	M12		60	540
K3-860..	-	-	-	M14		75	675
K3-1000.., K3-1200..	-	-	-	M12		60	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	M3,5	-	-	-	Pz2	0,8 - 1,4	7 - 12
U3/42	M5	-	-	-	Pz2	2,5 - 3	22 - 26
U3/74	-	M6	-	-	Pz3	3,5 - 4,5	31 - 40
UAT21	-	M4	-	-	Size 3, 4	1,2 - 1,8	11 - 16
UAT22	-	M4	-	-	Size 3, 4	1,2 - 1,8	11 - 16
UAT23	-	M5	-	-	Size 3, 4, 5	2,5 - 3	22 - 26
Auxiliary conductor All devices	M3,5	-	-	-	Pz2	0,8 - 1,4	7 - 12
Contactors for Distribution Boards Conductors							
R20, R25	-	M3,5	-	-	Pz1	0,8 - 1,4	7 - 12
R40, R63	-	M5	-	-	Pz2	2,5 - 3	22 - 26
K1R	M3,5	-	-	-	Pz2	0,8 - 1,4	7 - 12
Coil conductor							
R20, R25	-	M3	-	-	Pz1	0,6 - 1,2	5 - 11
R40, R63 (2pole / 4 pole)	-	M3	-	-	Pz1	0,6 - 1,2	5 - 11
K1R	M3,5	-	-	-	Pz2	0,8 - 1,4	7 - 12
RH11	-	M3	-	-	Pz1	0,6 - 1,2	5 - 11

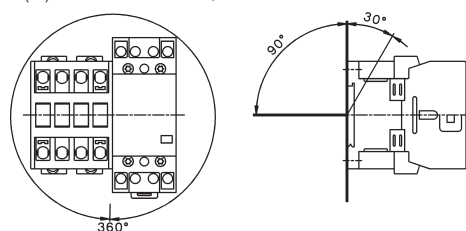
Technical Information

Mounting positions of contactors

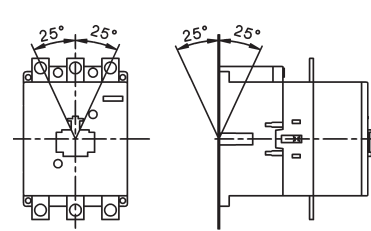
K0-.. / K1-..



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	Kind of connection				Screw driver	Tightening torque	
Type	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

	Micro Contactor Relays	12
	Micro Contactors	14
	Micro Contactors With Solder Pins	16
	Coil voltages	16
	Micro Reversing Contactor	18
	Technical Data	20
	Dimensions	24

Micro Contactor Relays 4-pole

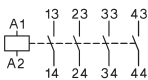
AC Operated

Ratings Therm.	Contacts 2)	Distinc. Number	Additional Contact	Type	Coil voltage 1)		Pack pcs.	Weight kg/pc.
					24	230		
AC15	Rated Current				24V 50/60Hz			
230V A	400V A	I _{th} A	NO NC	acc. to EN50011	220-240V 50Hz/60Hz			
				Blocks Type	↓			

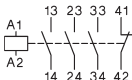
4-pole, with Screw Terminals

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

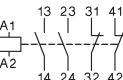
K0-04D40



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.
							= 24	24V= DC		
							= 24VS	24V= DC with protection ³⁾		

AC15

230V
A

400V
A

Rated
Current
 I_{th}
A

NO

NC

acc. to
EN50011

Blocks
Type

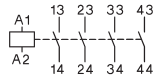


4-pole, with Screw Terminals

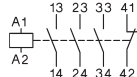
3	1,5	5	4	-	40E	-	K0-04D40= ...	10	0,09
3	1,5	5	3	1	31E	-	K0-04D31= ...	10	0,09
3	1,5	5	2	2	22E	-	K0-04D22= ...	10	0,09



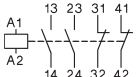
K0-04D40



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		24 230	24V 50/60Hz 220-240V 50Hz/60Hz		
			NO NC		↓		
			Blocks Type				

3-pole, with Screw Terminals

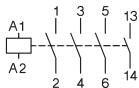
2,2	-	12	1	-	-	K0-05D10 ...	10	0,07
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2,2	-	12	-	1	-	K0-05D01 ...	10	0,07
-----	---	----	---	---	---	--------------	----	------

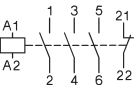
4-pole, With Screw Terminals

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

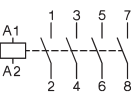
K0-05D10



K0-05D01



K0-05D00-40



Suppressor Units for Micro-Contactors K0-..D..



Votage Range V		Type	Pack pcs.	Weight kg/pc.
12 - 48V ~/=	1600nF / 22 Ohm	RC-K0 24	10	0,01
48 - 127V ~/=	680nF / 270 Ohm	RC-K0 110	10	0,01
110 - 250V ~/=	220nF / 2200 Ohm	RC-K0 230	10	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.

Micro Contactors

DC Operated



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

3-pole, with Screw Terminals

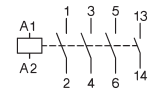
2,2	-	12	1	-	-	K0-05D10= ...	10	0,09
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2,2	-	12	-	1	-	K0-05D01= ...	10	0,09
-----	---	----	---	---	---	---------------	----	------

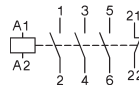
4-pole, With Screw Terminals

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

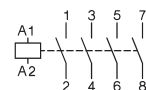
K0-05D10



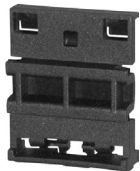
K0-05D01



K0-05D00-40



Snap-On Adapter



For Type	Specification	Type	Pack pcs..	Weight kg/pc.
K0	Snap on Adapter for K0 for snap-on mounting of contactor K0 on 35mm DIN-rail acc. DIN EN 50022	P1039	10	0,0061

- 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)

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

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

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

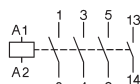
2,2	-	9	-	1	-	K0-05L01 ...	10	0,07
-----	---	---	---	---	---	---------------------	----	------

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

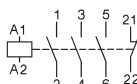
2,2	-	9	-	-	-	K0-05L00-40 ...	10	0,07
-----	---	---	---	---	---	------------------------	----	------



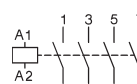
K0-05L10



K0-05L01



K0-05L00-40



Coil voltages for AC operated contactors

Suffix to contactor type e.g. K0-05D10 24	Voltage Marking		Rated Control Voltage U _s			
	at the coil for 50Hz V	for 60Hz V	range for 50Hz min. V max. V	for 60Hz min. V max. V	for 60Hz min. V max. V	for 60Hz min. V max. V
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		Rated Control Voltage U _s			
	at the coil for 50Hz V	for 60Hz V	range for 50Hz min. V max. V	for 60Hz min. V max. V	for 60Hz min. V max. V	for 60Hz min. V max. V
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⁾		Pack pcs.	Weight kg/pc.
			Built in	Additional		= 24	24V= DC		
						= 24VS	24V= DC with protection ³⁾		
AC2, AC3		AC1							
380V									
400V	660V								
415V	690V	440V							
kW	kW	A	NO	NC	Type				

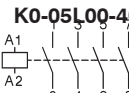
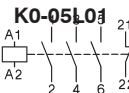
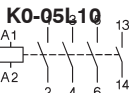
3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

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		24	Coil voltage ¹⁾	
			Built-in	Additional on left hand side Contactor	on right hand side Contactor		230	24V 50/60Hz 220-240V 50Hz/60Hz	
AC2, AC3		AC1							
380V									
400V	660V				K1	K2			
415V	690V	440V			Type	Type			
kW	kW	A	NO	NC				Pack pcs.	Weight kg/pc.

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



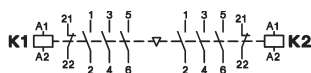
2,2	-	12	-	-	-	-	K0W05D00-40MS ...	1	0,14
-----	---	----	---	---	---	---	-------------------	---	------

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

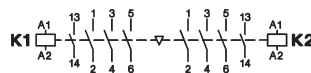
2,2	-	xxx ³⁾	-	2	-	-	K0W05L01MS ...	1	0,14
-----	---	-------------------	---	---	---	---	----------------	---	------

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

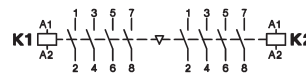
K0W05D01MS



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

Contactors, Motor-Starters

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnectors

Push Buttons

Representatives, Suppliers

Power Ratings	Rated Current	Aux. Contacts ²⁾		Type	Coil voltage ¹⁾	Pack pcs.	Weight kg/pc.
		Built-in	Additional on left	on right			
AC2, AC3	AC1		hand side Contactor	hand side Contactor			
380V	660V						
400V	690V						
415V	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

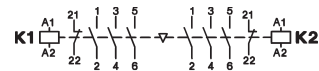
2,2	-	12	-	-	-	-	K0W05D00-40MS ...	1	0,14
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3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

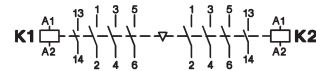
2,2	-	xxx ⁴⁾	-	2	-	-	K0W05L01MS ...	1	0,14
-----	---	-------------------	---	---	---	---	----------------	---	------

2,2	-	xxx ⁴⁾	2	-	-	-	K0W05L10MS ...	1	0,14
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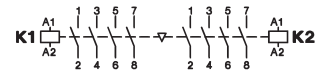
K0W05D01MS



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.

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 240V kW 400V kW 415V kW 440V kW	4,7 4,8 8,3 8,6 9,0	3,5 3,7 3,3 6,4 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 240V kW 400V kW 415V kW 440V kW	3,1 3,3 5,5 5,7 6,0	2,3 2,4 4,1 4,3 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 230V A 240V A	6,2 6,2 5,6	6,2 6,2 5,6
	380-400V A	5	5
	415-440V A	5	5
Rated operational power of three-phase motors 50-60Hz	220-240V kW 380-440V kW	1,5 2,2	1,5 2,2
Utilization category AC4			
Switching of squirrel cage motors, inching			
Rated operational current I_e open and enclosed	220V A 230V A 240V A	4,9 4,9 4,1	4,9 4,9 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 380-440V kW	1,1 1,5	1,1 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	A	6	6
parallel compensated	A	0,5	0,5
dual-connection	A	9	9
Metal halide lamps ²⁾ , uncompensated	A	6	6
parallel compensated	A	0,5	0,5
Mercury-vapour lamps ³⁾ , uncompensated	A	9	9
parallel compensated	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. $16 \times I_e$

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			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 thermal overload relay						
Rated short circuit current			"r" / "I _q "	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
			flexible with multicore cable end	mm ²	0,5 - 1,5	
Cables per clamp					2	-
			solid or stranded	AWG	20 - 14	-
Frequency of operation z						
contactors without thermal oberload 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⁾	-40 to +60 (+90) ²⁾
	enclosed	°C			
Storage		°C			
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 Ø 1,15
	flexible	mm ²		0,5 - 1,5	
	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).

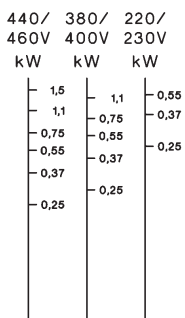
5) Data on request.

Micro Contactors for North America

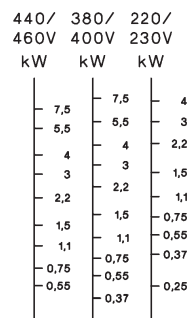
Data according to UL508

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)	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

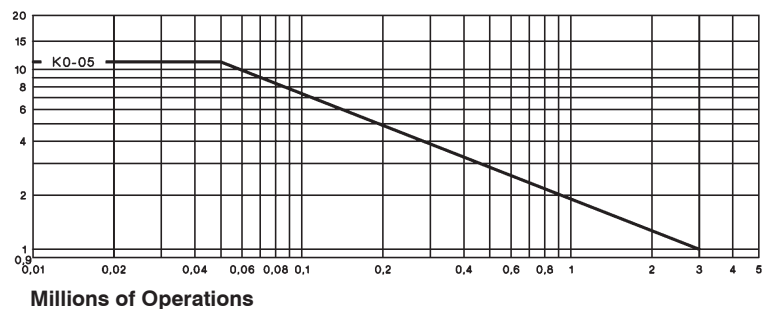
Motor Rating P_n = AC4



Motor Rating P_n = AC3



Breaking Current I_a (= I_e = AC1) A



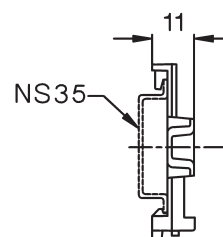
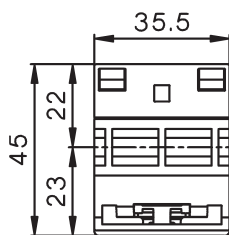
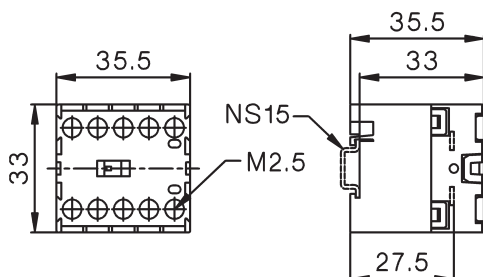
Micro Contactors

Dimensions

AC or DC operated
with screw terminals

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

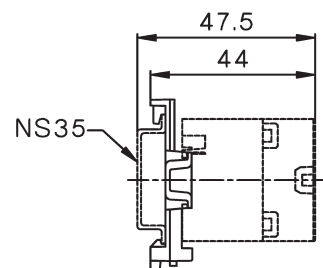
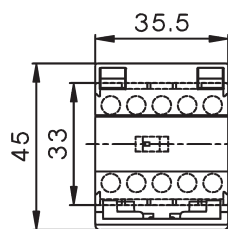
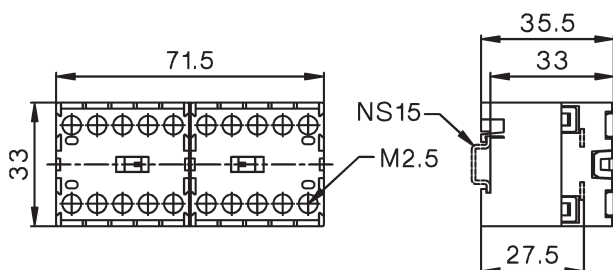
Snap-On Adapter P1039



Reversing Contactors
with screw terminals

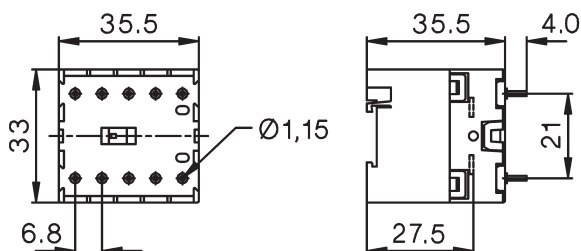
K0-..D.. with Snap-On Adapter P1039

K0W05D..MS



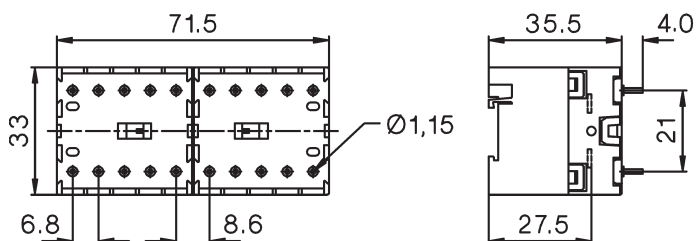
AC or DC operated
with solder connections

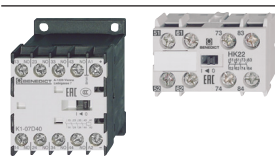
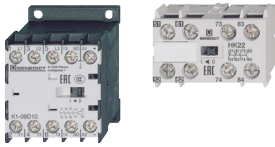
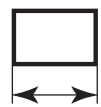
K0-04L.. (=)
K0-05L.. (=)



Reversing Contactors
with solder connections

K0W05L..MS



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

Mini Contactor Relays 4-pole

AC Operated



Ratings		Therm.	Contacts ²⁾		Type	Coil voltage ¹⁾	
			Distinc. Number	Additional Contact			
AC15		Rated Current				24	24V 50/60Hz
		I_{th}	NO NC	acc. to EN50011		230	220-230V 50Hz
230V	400V			Blocks Type		24VS	24V 50/60Hz w. protection ³⁾
A	A					230VS	220-230V 50Hz w. protection ³⁾
						24VM	24V 50/60Hz 24V= DC ³⁾
						230VM	220-240V 50/60Hz 220V= DC ³⁾
						↓	Pack Weight pcs. kg/pc.

4-pole, With Screw Terminals

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

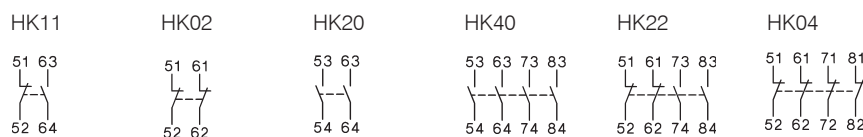
Auxiliary Contact Blocks For Contactor Relays ⁴⁾



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



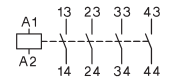
DC Solenoid Operated

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

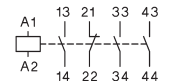
4-pole, With Screw Terminals, Coil 2,5W



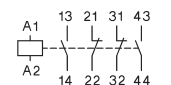
K1-07D40= ...	4	-	40E	1 HK..	10	0,19
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K1-07D31= ...	3	1	31E	1 HK..	10	0,19
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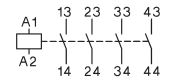
K1-07D22= ...	2	2	22E	1 HK..	10	0,19
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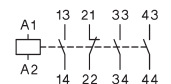
4-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor ³⁾



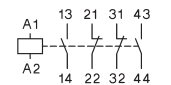
K1-07D40= 24VR	4	-	-	-	10	0,20
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K1-07D31= 24VR	3	1	-	-	10	0,20
-----------------------	---	---	---	---	----	------



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⁾	
			Built-in	Additional			
AC2, AC3		AC1				24	24V 50/60Hz
380V						230	220-230V 50Hz
400V	660V					24VS	24V 50/60Hz w. protection ³⁾
415V	690V	690V				230VS	220-230V 50Hz w. protection ³⁾
kW	kW	A	NO	NC	Type	24VM	24V 50/60Hz 24V= DC ³⁾
						230VM	220-240V 50/60Hz 220V= DC ³⁾
						↓	Pack Weight pcs. kg/pc.

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

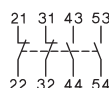
HKM11



HKM02



HKM22



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
 NO NC

Additional
 Overload
 Relay
 see
 page 114
 Type

Pack
 pcs.

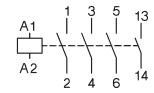
Weight
 kg/pc.

Wiring Diagrams

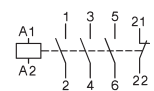


3-pole, With Screw Terminals, Coil 2,5W

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

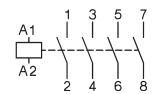


K1-09D01= ...	-	1	1 HK..	U12/16..K1	10	0,19
K1-12D01= ...	-	1	1 HK..	U12/16..K1	10	0,19



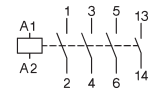
4-pole, With Screw Terminals, Coil 2,5W

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

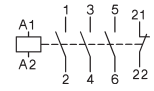


3-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor ³⁾

K1-09D10=24VR	1	-	-	U12/16..K1	10	0,20
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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				
380V				24	24V 50/60Hz
400V	660V			230	220-230V 50Hz
415V	690V			24VS	24V 50/60Hz w. protection ²⁾
kW	kW	A		230VS	220-230V 50Hz w. protection ²⁾
				24VM	24V 50/60Hz 24V DC
				230VM	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 min.	max.	for 60Hz min.	max.
	V	V	V	V	V	V
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. K1-09D10 230	Voltage Marking		Rated Control Voltage U _s			
	at the coil for 50Hz	for 60Hz	range for 50Hz min.	max.	for 60Hz min.	max.
	V	V	V	V	V	V
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)

DC Solenoid Operated

Type

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



Aux. Contacts ²⁾
Built Additional
in
NO NC

Additional
Overload
Relay see
pages
115, 117
Type

Pack
pcs. Weight
kg/pc.

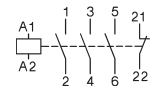
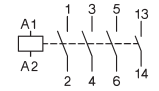
Wiring Diagrams



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
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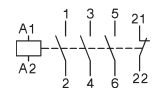
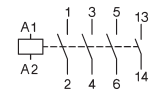
K1-09F01= ...	-	1	1 HK..	⁴⁾	10	0,19
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3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications

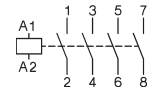
K1-09L10= ...	1	-	-	-	10	0,19
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K1-09L01= ...	-	1	-	-	10	0,19
----------------------	---	---	---	---	----	------



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

K1-09L00-40= ...	-	-	-	-	10	0,19
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- 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

AC Operated

[illegible]

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 230V A		Thermal Rated Current A	Contacts ²⁾  NO NC		Type	Pack pcs.	Weight kg/pc.
3	2	10	1	1	HKM11V	10	0,04
3	2	10	1	1	HKM11X	10	0,04



Aux. Contact BlocksAux. 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	K1W-VB	1	0.01
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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
24VS
↓
Coil voltage ¹⁾
24V= DC
24V= DC with
protection ²⁾

Additional
Overload
Relay
see
page 114
Type

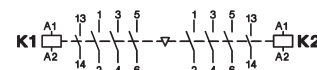
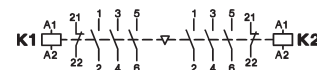
Pack
pcs. Weight
kg/pc.

Wiring Diagrams



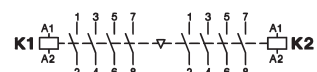
3-pole, with Screw Terminals

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

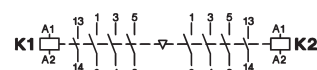
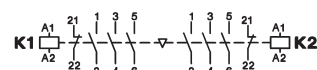
K1W09D00-40MC= ..	U12/16..K1	1	0,32
K1W12D00-40MC= ..	U12/16..K1	1	0,32



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	165	165	165	165
Breaking capacity I_{eff}	400V AC	100	100	100	100
$\cos\phi = 0,65$	500V AC	90	90	90	90
	690V AC	80	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, $\cos\phi = 1$	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, $\cos\phi = 1$	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	max. lamps per pole ($I_{nLED} \leq I_{th}$)	$= \frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$			
and $\cos\phi$ of the lamp					
max inrush current of contactor	A	233	233	233	233

Utilization category AC5b Switching of incandescent lamps ⁶⁾

Rated operational current I_e

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

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

Pollution degree 3 $U_i = 690V$ non-tracking of the printed circuit CTI ≥ 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								
Time constant L/R ≤1ms Rated operational current I _e	1 pole	24V - 60V	A	20	16	16	20	
		110V	A	5	5	5	5	
		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								
Time constant L/R ≤15ms Rated operational current I _e	1 pole	24V	A	20	16	16	20	
		60V	A	5	5	5	5	
		110V	A	1	1	1	1	
		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					
with thermal overload relay		open	°C					
		enclosed	°C					
Storage			°C	-25 to +60				
				-25 to +40				
				-50 to +90				
Short circuit protection for contactors without O/L relay								
Rated short circuit current		"r" / "I _q "	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	40	
Coordination-type "2" according to IEC 947-4-1								
Light contact welding accepted								
max. fuse size		gL (gG)	A	25	25	25	25	
Contact welding not accepted								
max. fuse size		gL (gG)	A	10	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	600	600	600	700		
		AC4, I _e	120	120	120	150		
		DC3, I _e	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 For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size.				20	20	20	20	20	20
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 and ...VM (AC/DC)	inrush	W		-	2,5	1,5	2,5	2,5	-
	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 2x 2,8 x 0,8		0,5 - 1,5
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 x 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.. K1W12D01	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 of AC motors at 60Hz (1ph)	110-120V	hp	½	½	½	-	¾	-	
	200-208V	hp	1	1	1	-	1½	-	
	220-240V	hp	1½	1½	1½	-	2	-	
Fuse / Short-circuit current			A/kA	30/5	30/5	30/5	-	30/5	-
Rated voltage			V AC	600	600	600 ¹⁾	600	600	600
Auxiliary Contacts (cULus)									
heavy pilot duty			AC	A600	A600	A600	A600	A600	A600
standard pilot duty			DC	Q600	Q600	Q600	Q600	Q600	Q600

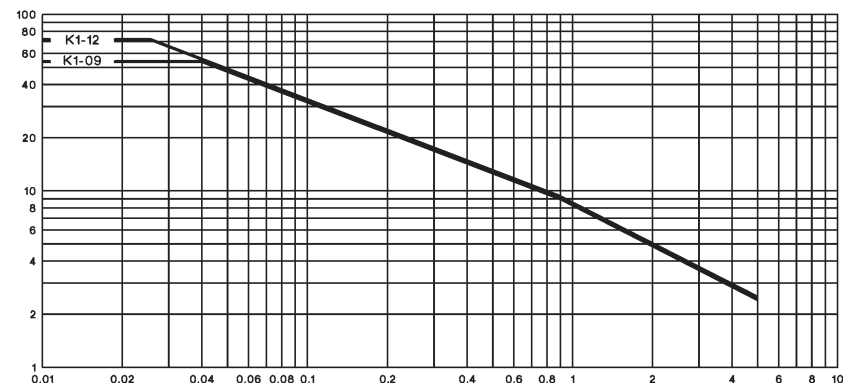
Motor Rating P_n = AC4

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

Motor Rating P_n = AC3

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

Breaking Current I_a (= I_e = AC1) A



Millions of Operations

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

Mini Contactors

Dimensions

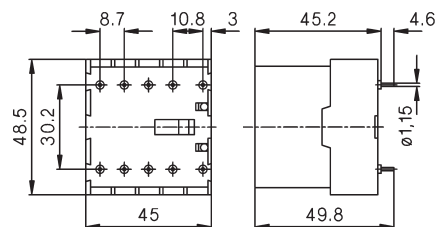
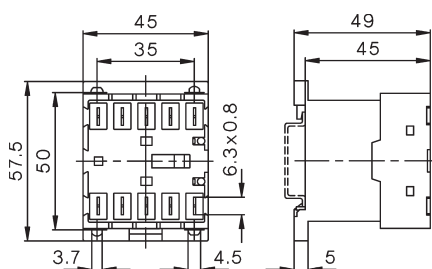
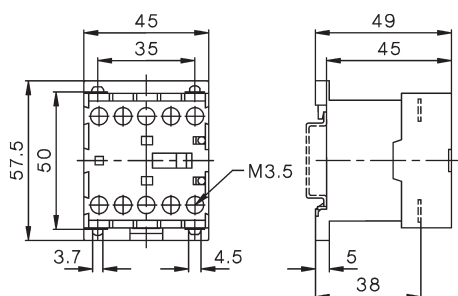
AC and DC operated
with screw terminals

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

with fast on terminals

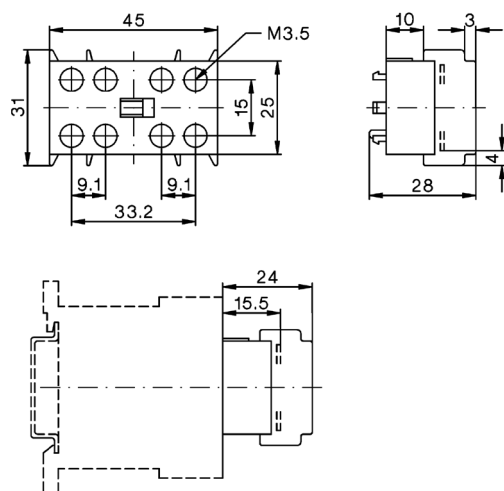
K1-07F..
K1-09F..

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



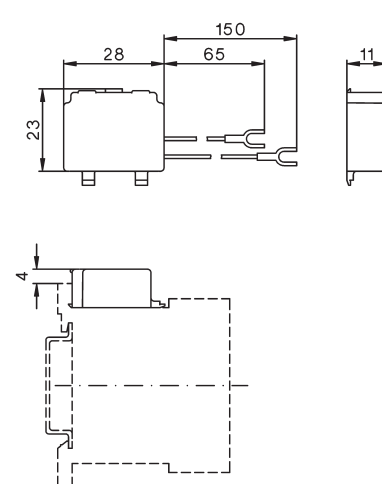
Auxiliary Contact Blocks

HK..



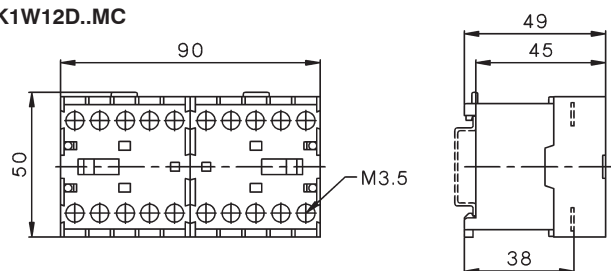
Suppressor Units

RC-K1



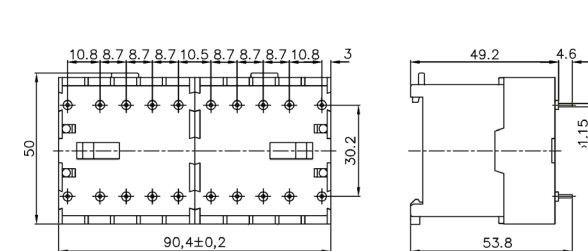
Reversing Contactors

K1W09D..MC
K1W12D..MC

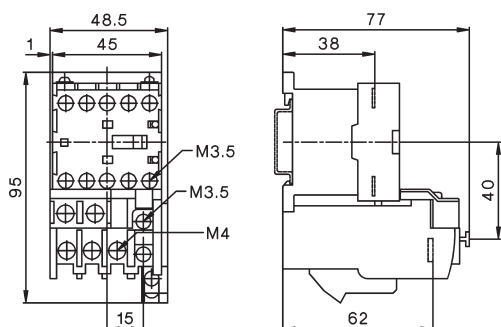


Reversing Contactors

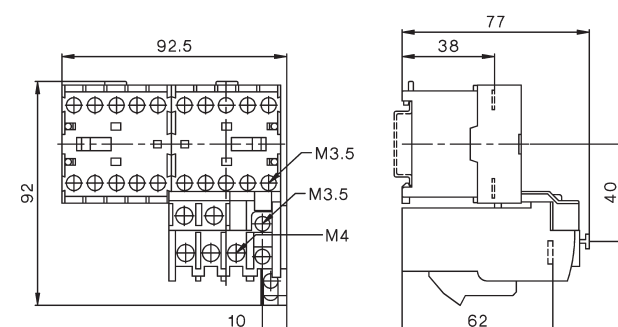
K1W09L..MC



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



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





Contactor Relays 4-pole, AC Operated	40
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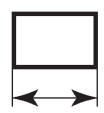
Auxiliary Contact Blocks 1-pole	40
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Contactor Relays 4-pole, DC Operated	41
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Technical Data	42
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Dimensions	44
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Contactor Relays

AC Operated



Ratings		Therm. Rated Current	Contacts		Distinc. Number acc. to	Additional Contact Blocks	Type	Coil voltage ¹⁾	Type	Pack pcs.	Weight kg/pc.
			Built-in								
AC15								24V 50/60Hz			
230V	400V							110V 50Hz	110-120V 60Hz		
A	A	A	NO	NC	EN50011			220-240V 50Hz	230-264V 60Hz		
								380-415V 50Hz	400-440V 60Hz		

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.
			NO	NC			
AC15							
230V	400V						
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⁾	
24	24V DC
48	48V DC
110	110V DC
220	220V DC



Contacts

Built-in



Distinc. Number acc. to

EN50011

Additional Contact Blocks

Type

Pack
pcs.

Weight
kg/pc.

Wiring Diagrams

3W Coil power, for high switching capacity ³⁾

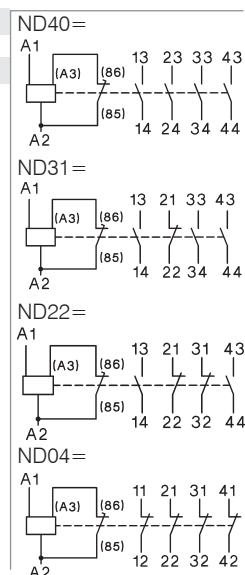
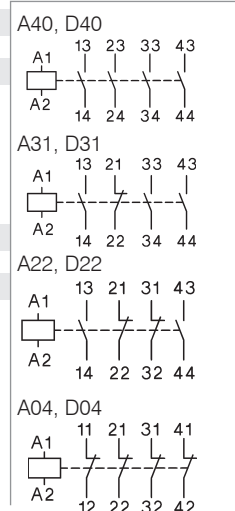
KG3-07A40 ...	4	-	40E	max. 4	1	0,53
KG3-07A31 ...	3	1	31E	HN..	1	0,53
KG3-07A22 ...	2	2	22E	or	1	0,53
KG3-07A04 ...	-	4	04E	HA..	1	0,53

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 $U_i^{1)}$			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			10000	10000	10000	10000
Mechanical life			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 per pole	24-60V	A	3,5	3,5	8	3,5
	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 +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	mm²	0,75 - 6			
	flexible	mm²				
	flexible with multicore cable end	mm²				
Magnet coil	solid	mm²	0,75 - 2,5			
	flexible	mm²				
	flexible with multicore cable end	mm²				
Clamps per pole			2			
Connector	solid	AWG	18 - 10			
	flexible	AWG				
Clamps per pole			2			
Magnet coil	solid	AWG	14 - 12			
	flexible	AWG				
Clamps per pole			2			

Data according to UL508

Rated operational current	A		10	10	20	10
"General Use"						
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

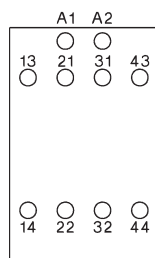
3) with built-in coil suppressor

Contactor Relays

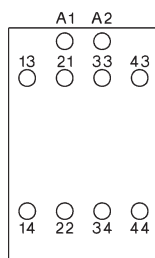
Position of Terminals

AC operated

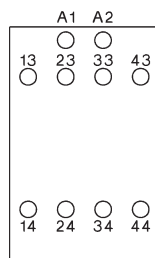
K3-07ND22



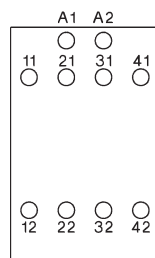
K3-07ND31



K3-07ND40

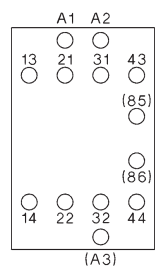


K3-07ND04

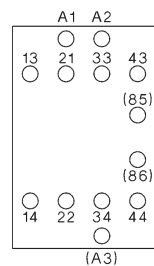


DC operated with double wound coil

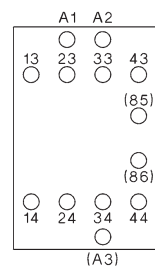
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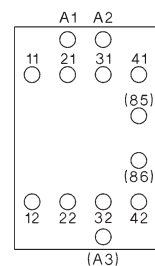
K3-07ND31=



K3-07ND40=

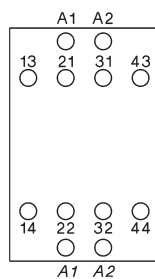


K3-07ND04=

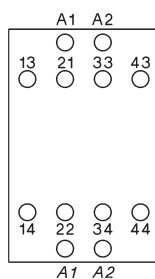


DC solenoid operated

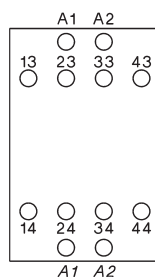
KG3-07A22
KG3-07D22



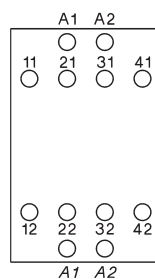
KG3-07A31
KG3-07D31



KG3-07A40
KG3-07D40



KG3-07A04
KG3-07D04

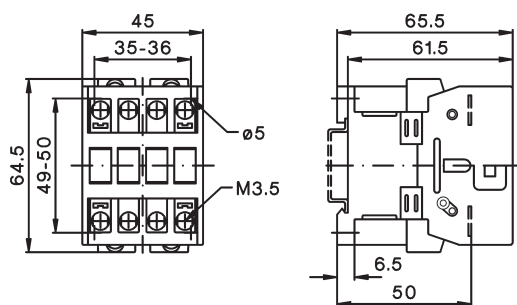


Contactor Relays

Dimensions

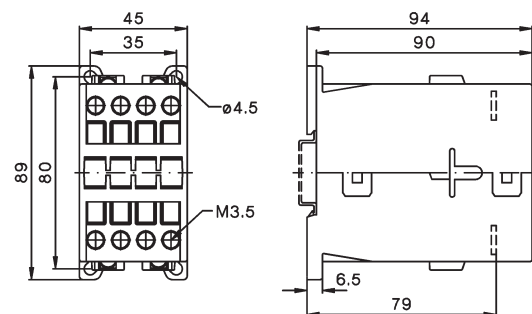
AC operated

K3-07ND..



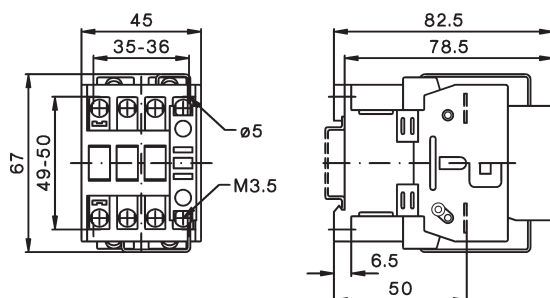
DC solenoid operated

KG3-07..



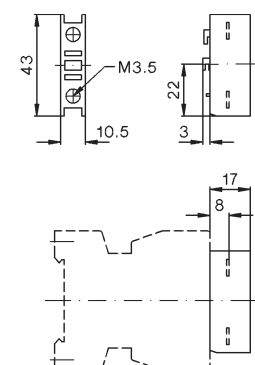
DC operated with double winding coil

K3-07ND.. =

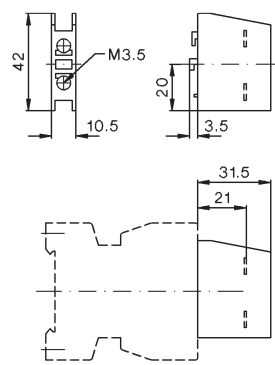


Auxiliary contact blocks

HN10, HN01



HA10, HA01

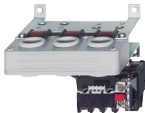


	Contactor overview	46
	Contactors 3-pole, AC Operated	48
	Contactors 3-pole, DC Operated	49
	Contactors 4-pole	50
	Capacitor Switching Contactors	51
	Auxiliary Contact Blocks Snap-on Momentary Contacts Additional Fourth Poles for Contactors	52
	Electronic Timers On-delay	53
	Mechanical Interlocks Mechanical 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



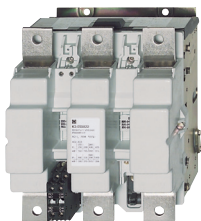
Ratings		10A				24A			50A			90A		115A	
AC3	400V	Motor													
	380-400V 660-690V	4kW 5,5kW	5,5kW 7,5kW	7,5kW 10kW	11kW 10kW	11kW 15kW	15kW 18,5kW	18,5kW	22kW 30kW	30kW 37kW	37kW 45kW	45kW 55kW	55kW		
AC1	690V at 40°C	25A	25A	32A	32A	50A	65A	80A	110A	120A	130A	160A	200A		
Type	K3-	10ND10	14ND10	18ND10	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	mm²	0,75 - 6				1,5 - 25			4 - 50			10 - 120			
Flexible	mm²	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 of coils	Inrush VA hold VA Operation range of coils	33 - 45 7 - 10 0,85 - 1,1				90 - 115 9 - 13 0,85 - 1,1			140 - 165 13 - 18 0,85 - 1,1			280 5 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..						
Additional aux. contact blocks	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		-		-		-		-			-				



150A 75kW 90kW 250A	175A 90kW 110kW 300A	210A 110kW 160kW 350A	260A 132kW 210kW 450A	315A 160kW 250kW 600A	450A 250kW 375kW 700A	550A 300kW 475kW 800A	700A 400kW 630kW 1000A	860A 500kW 700kW 1100A	1000A 580kW 850kW 1200A	1200A 680kW 1000kW 1350A	
151A00 -	176A00 -	210A00 -	260A00 -	316A00 -	450A22 2NO+2NC	550A22 2NO+2NC	700A22 2NO+2NC	860A22 2NO+2NC	1000A12 1NO+2NC	1200A12 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 0,85 - 1,1	1350-1600 21-25	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 1 120 - 180A integrated		 U320 2 144 - 320A integrated			 U800 3 240 - 800A SU840/550				SU840/860		

Contactors 3-pole

AC Operated



Ratings AC2, AC3 380V 400V 415V kW		Rated Current	Aux. Contacts Built-in Additional see page 53		Type	Coil voltage ¹⁾ 24V 50/60Hz 110V 50/60Hz 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight kg/pc.
			NO	NC	Typ			
4	5,5	25	1	-	max. 4	24 110 230 400	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		1	0,48
18,5	18,5	80	-	-	HA.. and 2 HB..		1	0,48
22	30	110	-	-	max. 4 (3) ⁴⁾		1	0,85
30	37	120	-	-	HN.. or		1	0,85
37	45	130	-	-	HA.. 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

W/W

Type

Pack
pcs.

Weight
kg/pc.

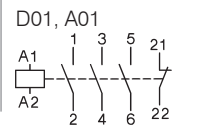
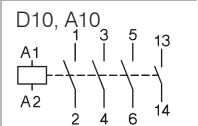
Wiring Diagram

Coil Circuits
see page 59

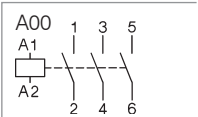
Terminal Markings



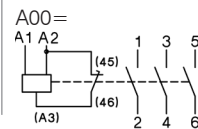
KG3-10D10 ... ⁵⁾	3/3	U3/32	1	0,53
KG3-10D01 ... ⁵⁾	3/3	U12/16E U12/16EQ	1	0,53
KG3-14D10 ... ⁵⁾	3/3	UAT21	1	0,53
KG3-14D01 ... ⁵⁾	3/3		1	0,53
KG3-18D10 ... ⁵⁾	3/3		1	0,53
KG3-18D01 ... ⁵⁾	3/3		1	0,53
KG3-22D10 ... ⁵⁾	3/3		1	0,53
KG3-22D01 ... ⁵⁾	3/3		1	0,53



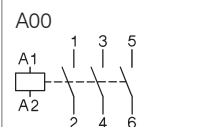
KG3-24A00 ... ⁵⁾	4/4	U3/32	1	0,57
KG3-32A00 ... ⁵⁾	4/4	U3/42	1	0,57
KG3-40A00 ... ⁵⁾	4/4	UAT..	1	0,57



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



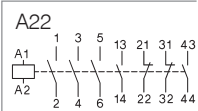
K3-151A00 ... ²⁾	350/5	U180	1	4
K3-176A00 ... ²⁾	350/5		1	4



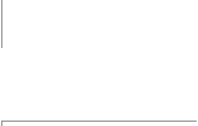
K3-210A00 ... ²⁾	360/5	U320	1	7,2
K3-260A00 ... ²⁾	360/5		1	7,2
K3-316A00 ... ²⁾	360/5		1	7,2



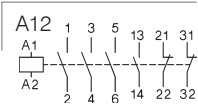
K3-450A22 ... ²⁾	800/10	U800	1	13
K3-550A22 ... ²⁾	800/10	+SU840/550	1	13,5



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.

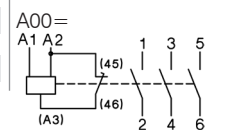
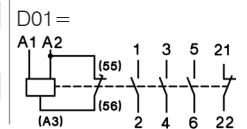
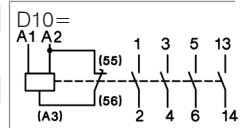
Contactors 3-pole

DC operated with dual-wound coil



Ratings		Rated	Aux. Contacts		Type	Coil voltage ¹⁾		Pack	Weight
AC2		Current	Built-in	Additional		24	24V= DC	pcs.	kg/pc.
AC3			see	page 53		48	48V= DC		
380V		AC1				110	110V= DC		
400V	660V					220	220V= DC		
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	K3-10ND01=	...		1	0,25
				HA..					
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	K3-32A00=	...		1	0,55
18,5	18,5	80	- -	HA..	K3-40A00=	...		1	0,55
				and 2 HB..					

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

50°C

380V

415V

660V

380V

415V

660V

400V

440V

690V

400V

440V

690V

kVAr

kVAr

kVAr

kVAr

kVAr

kVAr

Aux.

Contacts

Built-in Add.

NO

NC

pcs.

Type

230

Coil voltage ¹⁾

220-240V 50Hz

↓

Pack

pcs.

Weight

kg/pc.

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	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.

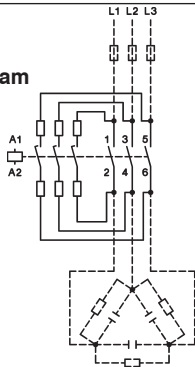
Capacitor switching contactors are fitted with early make contacts and damping resistors, to reduce the value of make current <70 x I_e.

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

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

Type		K3-18NK	K3-18NBK 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 non reactive cap. banks	S x 10 ³	250	250	150	150	150	150	120	120	120
reactive cap. banks	S x 10 ³	400	400	300	300	300	300	200	200	200
Rated operational current I _e	at 50°C A	0-18	0-18	14-28	14-36	30-48	30-72	30-108	50-115	50-144
AC6b	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 I _{th}	at 50°C A	32	45	45	60	100	110	120	155	190
AC1	at 60°C A	32	40	40	55	90	100	110	145	170
Overload factor	at 50°C %	78	150	60	67	108	53	11	35	32
acc. to EN 61921: 30% min.	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

Typical Circuit Diagram

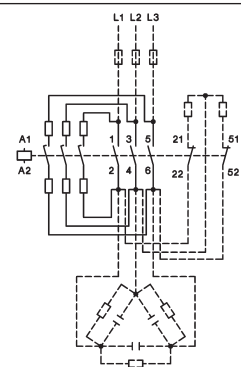


Wiring Diagram for Quick Discharge Resistors

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

Mounting instructions:

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



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

2) 1 HN.. or HA.. snap-on.

3) 2HB.. for side mounting and 1 HN.. or HA.. snap-on.

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

Contactors 4-pole

AC or DC operated

Rated Current	Ratings		Aux. Contacts	Type	Coil voltage ²⁾		Pack pcs.	Weight kg/pc.	Wiring Diagram
	AC1	AC2 AC3			24	110			
AC1		380V	see		230	220-240V 50Hz			
		400V	page 53		400	380-415V 50Hz			
	max. 690V	415V			= 24	24V= DC ³⁾			
A	NO NC	NO NC							

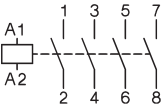


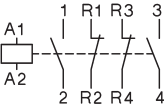
25	-	17,5	-	4	max. 4 ³⁾	K3-10NA00-40 ... ³⁾	1	0,23
25	25	17,5 ⁶⁾	17,5 ⁶⁾	4 ⁶⁾	HN.. or	K3-10NA00-22 ... ³⁾	1	0,23
-	25	-	17,5	4	HA..	K3-10NA00-04 ... ³⁾	1	0,23
and 2 HB..								
25	-	17,5	-	5,5		K3-14NA00-40 ... ³⁾	1	0,23
25	25	17,5 ⁶⁾	17,5 ⁶⁾	5,5 ⁶⁾		K3-14NA00-22 ... ³⁾	1	0,23
-	25	-	17,5	5,5		K3-14NA00-04 ... 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..	K3-24A00-22 ... ³⁾	1	0,65
-	40	-	27,5	11	or HA..	K3-24A00-04 ... ³⁾	1	0,65
and 2 HB..								
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..	K3-74A00-40 ... ⁵⁾	1	1,1
and 2 HB..								
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

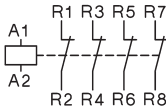












Terminal Blocks for contactors K(G)3-07.. to K3-115.. and K2-..



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			mounting: 1 HB.. on left side and 1 HB.. on right side	Contacts		Type	Pack pcs.	Weight kg/pc.
AC15 230V A	AC15 400V A	AC1 690V A		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			For contactors	Contacts		Type	Pack pcs.	Weight kg/pc.
AC15 230V A	AC15 400V A	AC1 690V A		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			Specification	Contacts		Type	Pack pcs.	Weight kg/pc.
AC15 230V A	AC15 400V A	AC1 690V A		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 leding 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..

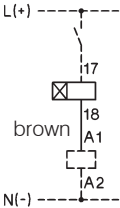
Electronic Timer On-delay for contactors K(G)3-07.. to K3-115..¹⁾

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

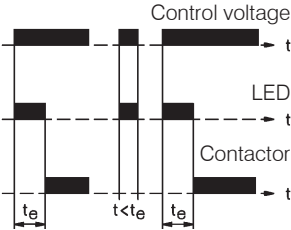


Operational Voltage V	Time Range s	Rated Current AC15 A	Type	Pack pcs.	Weight kg/pc.
24 - 60V AC/DC	1 - 30	0,75	K2-TE30 60	1	0,08
100 - 250V AC/DC	1 - 30	0,75	K2-TE30 250	1	0,08
24 - 60V AC/DC	10 - 180	0,75	K2-TE180 60	1	0,08
100 - 250V AC/DC	10 - 180	0,75	K2-TE180 250	1	0,08

Wiring Diagram



Timing Chart



Operation Range

Time repeat accuracy
Recovery time (typical)

0,8 - 1,1 x U_s
≤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° - +60°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	Coil voltage	Pack pcs.	Weight kg/pc.
24	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

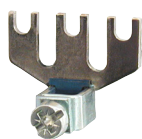
Additional Terminals



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 K2-09 to K2-16	0,75 - 10	0,75 - 6	0,75 - 6	LG9339N	6	0,009
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 mm ²			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

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

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

12 - 48V AC/DC	to snap	1600nF / 22 Ohm	RC-K3N 24	10	0,01
48 - 127V AC/DC	on the	680nF / 270 Ohm	RC-K3N 110	10	0,01
110 - 250V AC/DC	contactor	220nF / 2200 Ohm	RC-K3N 230	10	0,01
230 - 480V AC/DC		120nF / 620 Ohm	RC-K3N 400	10	0,01

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

12 - 48V AC/DC	to snap	1600nF / 22 Ohm	RC-K3NW 24	10	0,01
48 - 127V AC/DC	on the	680nF / 270 Ohm	RC-K3NW 110	10	0,01
110 - 250V AC/DC	contactor	220nF / 2200 Ohm	RC-K3NW 230	10	0,01
230 - 480V AC/DC		120nF / 620 Ohm	RC-K3NW 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		Rated Control Voltage U _s			
		at the coil for 50Hz V	for 60Hz V	range for 50Hz min. max. V V	for 60Hz min. max. V 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 10% of normal life. It is not admissible as a spare coil in a contactor for different coil voltages.

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

Suffix to contactor type	to coil type	Voltage Marking		Rated Control Voltage U _s			
		at the coil for 50Hz V	for 60Hz V	range for 50Hz min. max. V V	for 60Hz min. max. V 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		Rated Control Voltage U _s			
		at the coil for 50/60Hz V	for DC V	range for 50Hz min. max. V V	for 60Hz min. max. V 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		Rated Control Voltage U _s			
		at the coil for 50Hz V	for 60Hz V	range for 50Hz min. max. V V	for 60Hz min. max. V 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.
4.24	24V 50Hz		
4.42	42V 50Hz		
4.110	110V 50Hz		
41.180	180V 50Hz, 220V 60Hz		
4.230	220-240V 50Hz		
4.400	380-415V 50Hz		
↓			
K3-07N.. up to K3-22N..	K10N/...EUR	1	0,053
K3-24.. up to K3-40.. 3 pole contactor	K24/...	1	0,085
K3-24.. up to K3-40.. 4 pole contactor	K24-4/...	1	0,085
K3-50.. up to K3-74.. 3 pole contactor	K45/...	1	0,110
K3-50.. up to K3-74.. 4 pole contactor	K50/...	1	0,110
K3-90.., K3-115.. (AC/DC coil)	K3-115/...	1	0,230

For Contactors

Type	Coil voltage ¹⁾	Pack pcs.	Weight kg/pc.
4.110	110V 50Hz, 110-115V 60Hz		
4.230	220-230V 50Hz		
4.400	380-400V 50Hz		
↓			
K3-1000.., K3-1200.. without feeder group ²⁾	K3-1200/...	1	3,12

Spare Coils for AC and DC operated contactors

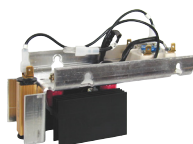


For Contactors

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



For Contactors

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

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

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

Spare Coils for DC operated contactors

Aux. Contact Block
for dual-wound coil

Type	Coil voltage ¹⁾
47.24=	24V DC
48.48=	48V DC
47.110=	110V DC
47.220=	220V DC



For Contactors

Pack
pcs. Weight
kg/pc.



K3-07N..= up to K3-22N..=	HN01U	K10N/ ...	1	0,052
K3-24..= up to K3-40..= 3 pole contactor	HN01U	K24/ ...	1	0,090
K3-24..= up to K3-40..= 4 pole contactor	HN01U	K24-4/ ...	1	0,090
K3-50..= up to K3-74..= 3 pole contactor	HN01Z	K45/ ...	1	0,115
K3-50..= up to K3-74..= 4 pole contactor	HN01Z	K50/ ...	1	0,115
K3-90.., K3-115.. (AC/DC coil)	-	see page 58	1	0,230

Type	Coil voltage ¹⁾
43.110	110V DC
43.220	220V DC



For Contactors

Pack
pcs. Weight
kg/pc.

K3-1000.., K3-1200..=	without feeder group ²⁾	K3-1200/ ...	1	3,12
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Wiring Diagrams for Coil Circuit

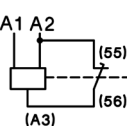
AC operated

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



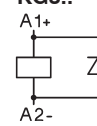
DC operated
with dual-wound coil

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

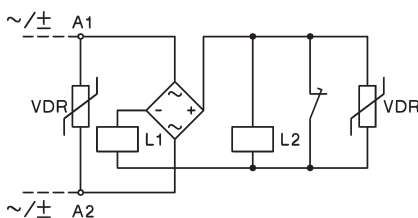


DC operated

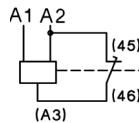
KG3..



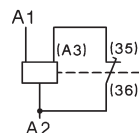
AC and DC operated
with dual-wound coil
K3-90A00, K3-115A00
K3-151A00, K3-176A00
K3-210A00 to K3-316A00



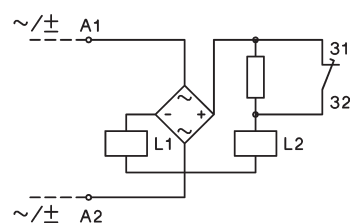
K3-24..
to
K3-74..



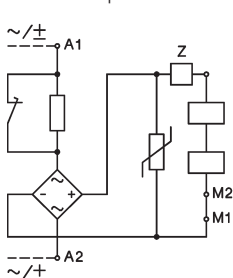
K85..
K110..



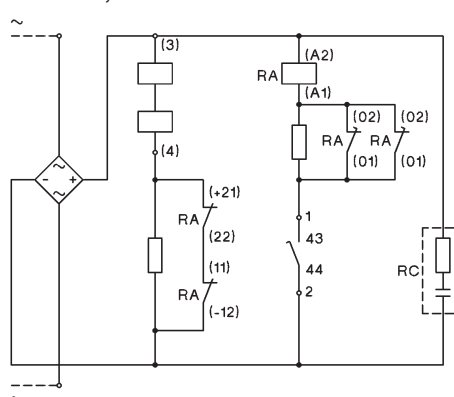
AC and DC operated
with series resistor
K3-200A21
K3-315A21



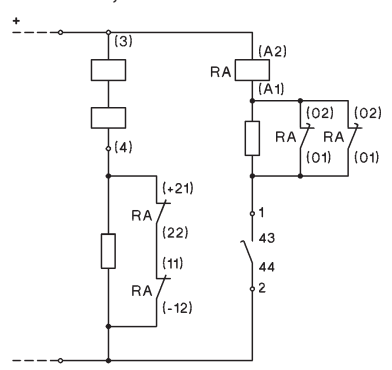
AC and DC operated
with series resistor
K3-450.. up to **K3-860..**



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

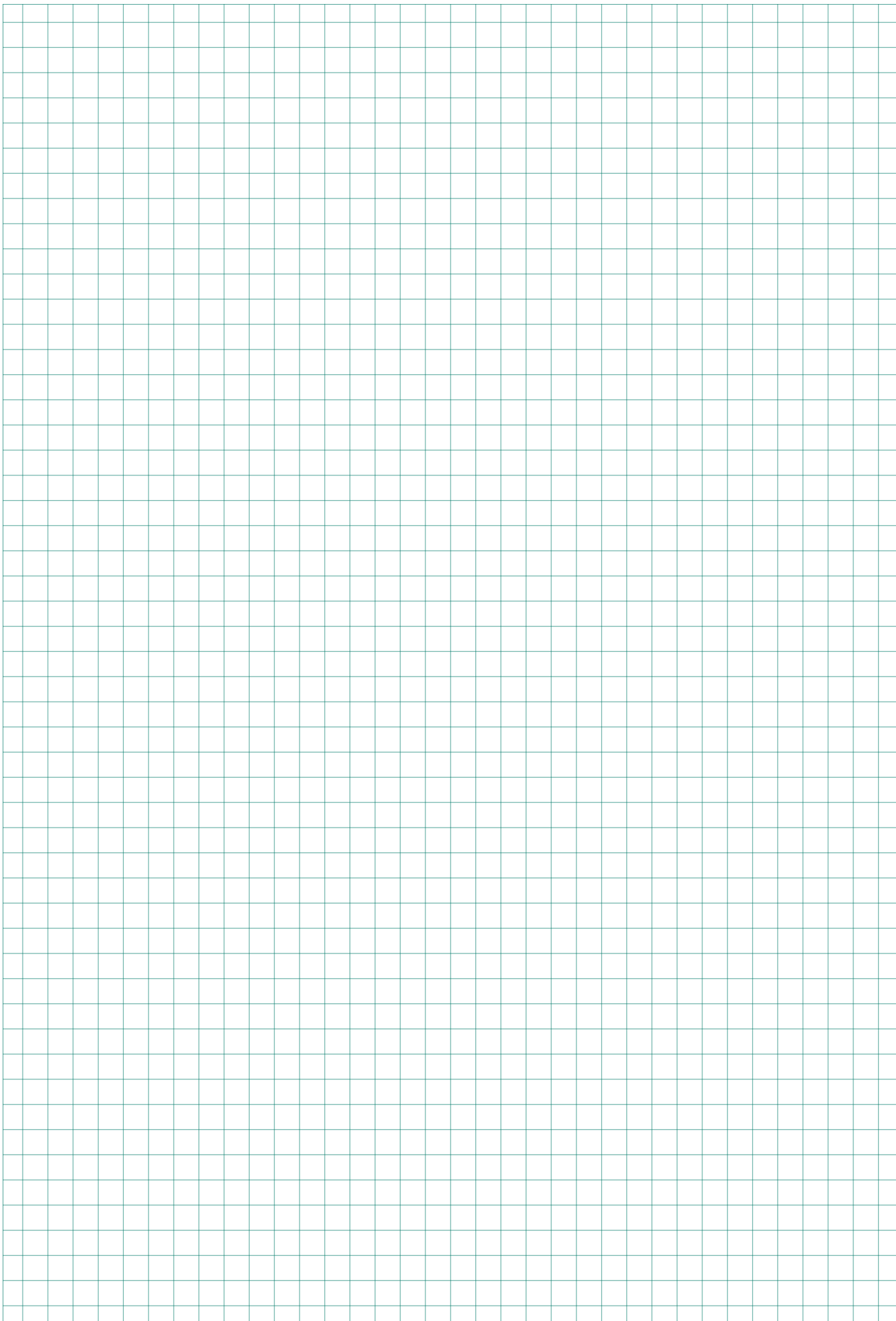
Contactor K3-1000.., K3-1200..
For control voltages up to 125V
NC contacts 21-22 and 11-12 are connected parallel,
for higher voltages contacts are connected in series (delivery standard).

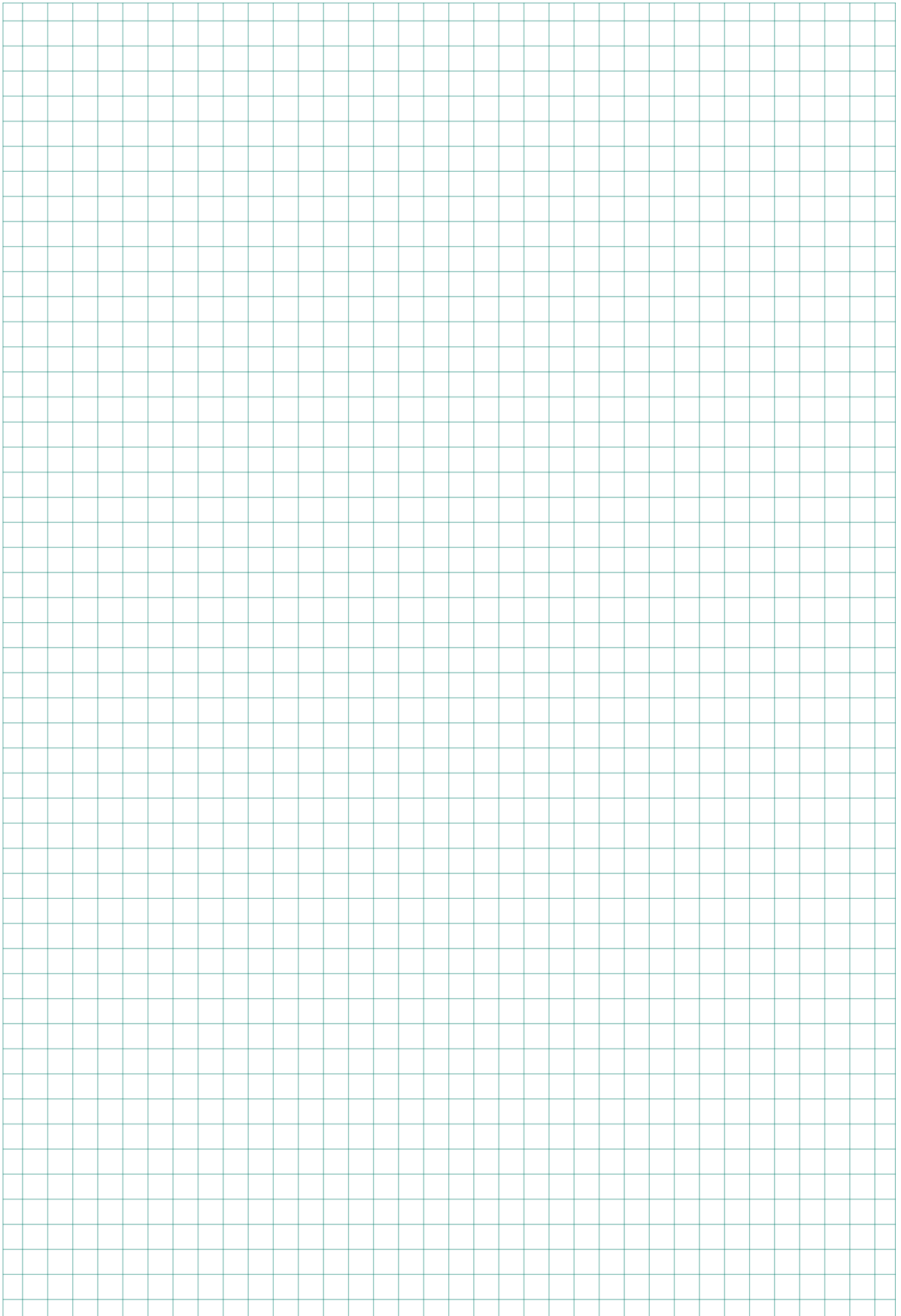
1) Other coil voltages on request.

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





Approximate Values for three-phase Motors

Motor Full Load Currents

Approximate values of motor F.L.C. and minimum "slow blow" respectively "gL" short-circuit fuse

Motor rating					220-230V			240V			380-400V			415V			500V			660-690V		
Range acc. to BS for 415V					Motor fuse size motor start			Motor fuse size motor start			Motor fuse size motor start			Motor fuse size motor start			Motor fuse size motor start			Motor fuse size motor start		
					I _n	D.O.L.	YD	I _n	D.O.L.	YD	I _n	D.O.L.	YD	I _n	D.O.L.	YD	I _n	D.O.L.	YD	I _n	D.O.L.	YD
kW PS~hp hp cosφ %					A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
0,06	0,08	-	0,7	59	0,38	1	1	0,35	1	1	0,22	1	1	-	-	-	0,16	1	1	-	-	-
	0,12	-	0,7	60	0,55	2	2	0,5	2	2	0,33	1	1	-	-	-	0,24	1	1	-	-	-
	0,16	-	0,7	61	0,76	2	2	0,68	2	2	0,42	2	2	-	-	-	0,33	1	1	-	-	-
	0,18	-	0,7	61	1,1	2	2	1	2	2	0,64	2	2	-	-	-	0,46	1	1	-	-	-
0,25	0,34	-	0,7	62	1,4	4	2	1,38	4	2	0,88	2	2	-	-	-	0,59	2	2	-	-	-
	0,5	-	0,72	64	2,1	4	4	1,93	4	4	1,22	4	2	-	-	-	0,85	2	2	0,7	2	2
	0,55	-	0,75	69	2,7	4	4	2,3	4	4	1,5	4	2	-	-	-	1,2	4	2	0,9	2	2
	0,75	1	0,8	74	3,3	6	4	3,1	6	4	2	4	4	2	4	4	1,48	4	2	1,1	2	2
1,1	1,5	1,5	0,83	77	4,9	10	6	4,1	6	6	2,6	4	4	2,5	4	4	2,1	4	4	1,5	4	2
	2	2	0,83	78	6,2	10	10	5,6	10	10	3,5	6	4	3,5	6	4	2,6	4	4	2	4	4
	2,2	3	0,83	81	8,7	16	10	7,9	16	10	5	10	6	5	10	6	3,8	6	6	2,9	6	4
	2,5	3,4	-	0,83	81	9,8	16	8,9	16	10	5,7	10	10	-	-	-	4,3	6	6	-	-	-
3	4	4	0,84	81	11,6	20	16	10,6	20	16	6,6	16	10	6,5	16	10	5,1	10	10	3,5	6	4
	3,7	5	0,84	82	14,2	25	20	13	25	16	8,2	16	10	7,5	16	10	6,2	16	10	-	-	-
	4	5,5	-	0,84	82	15,3	25	14	25	20	8,5	16	10	-	-	-	6,5	16	10	4,9	10	6
	5,5	7,5	0,85	83	20,6	35	25	18,9	35	25	11,5	20	16	11	20	16	8,9	16	10	6,7	16	10
7,5	10	10	0,86	85	27,4	50	35	24,8	50	35	15,5	25	20	14	25	16	11,9	20	16	9	16	10
	11	-	0,86	85	28,8	50	35	26,4	50	35	16,7	25	20	-	-	-	12,7	20	16	-	-	-
	11	15	0,86	87	39,2	63	50	35,3	50	50	22	35	25	21	35	25	16,7	25	20	13	25	16
	12,5	17	-	0,86	87	43,8	63	40,2	63	50	25	35	25	-	-	-	19	35	25	-	-	-
15	20	20	0,86	87	52,6	80	63	48,2	80	63	30	50	35	28	35	35	22,5	35	25	17,5	25	20
	18,5	25	0,86	88	64,9	100	80	58,7	80	63	37	63	50	35	50	50	28,5	50	35	21	35	25
	20	27	-	0,86	88	69,3	100	63,4	80	80	40	63	50	-	-	-	30,6	50	35	-	-	-
	22	30	0,87	89	75,2	100	80	68	100	80	44	63	50	40	63	50	33	50	50	25	35	35
25	34	-	0,87	89	84,4	125	100	77,2	100	100	50	80	63	-	-	-	38	63	50	-	-	-
	30	40	0,87	90	101	125	125	92,7	125	100	60	80	63	55	80	63	44	63	50	33	50	35
	37	50	0,87	90	124	160	160	114	160	125	72	100	80	66	100	80	54	80	63	42	63	50
	40	54	-	0,87	90	134	160	123	160	160	79	100	100	-	-	-	60	80	63	-	-	-
45	60	60	0,88	91	150	200	160	136	200	160	85	125	100	80	100	100	64,5	100	80	49	63	63
	51	70	-	0,88	91	168	200	154	200	200	97	125	100	-	-	-	73,7	100	80	-	-	-
	55	75	-	0,88	91	181	250	166	200	200	105	160	125	-	-	-	79	125	100	60	80	63
	59	80	0,88	91	194	250	250	178	250	200	112	160	125	105	160	125	85,3	125	100	-	-	-
75	100	100	0,88	91	245	315	250	226	315	250	140	200	160	135	200	160	106	160	125	82	125	100
	90	125	0,88	92	292	400	315	268	315	315	170	250	200	165	200	200	128	160	160	98	125	125
	110	150	0,88	92	358	500	400	327	400	400	205	250	250	200	250	250	156	200	200	118	160	125
	129	175	0,88	92	420	500	500	384	500	400	242	315	250	230	315	250	184	250	200	-	-	-
132	180	-	0,88	92	425	500	500	393	500	500	245	315	250	-	-	-	186	250	200	140	200	160
	147	200	0,88	93	472	630	630	432	630	500	273	315	315	260	315	315	207	250	250	-	-	-
	160	220	-	0,88	93	502	630	471	630	630	295	400	315	-	-	-	220	315	250	170	200	200
	184	250	0,88	93	590	800	630	541	630	630	340	400	400	325	400	400	259	315	315	-	-	-
200	270	-	0,88	93	626	800	800	589	800	630	370	500	400	-	-	-	278	315	315	215	250	250
	220	300	0,88	93	700	1000	800	647	800	800	408	500	500	385	500	400	310	400	400	-	-	-
	250	340	-	0,88	93	803	1000	736	1000	800	460	630	500	-	-	-	353	500	400	268	315	315
	257	350	0,88	93	826	1000	1000	756	1000	800	475	630	630	450	630	500	363	500	400	-	-	-
295	400	400	0,88	93	948	1250	1000	868	1000	1000	546	800	630	500	630	630	416	500	500	-	-	-
	315	430	-	0,88	93	990	1250	927	1250	1000	580	800	630	-	-	-	445	630	500	337	400	400
	355	483	-	0,89	95	-	-	-	-	-	636	800	800	-	-	-	483	630	630	366	500	400
	400	545	-	0,89	96	-	-	-	-	-	710	1000	800	-	-	-	538	630	630	410	500	500

The motor F.L.C. be valid for standard internal and surface cooled three-pole motors with 1500 min⁻¹. The fuses values be valid for the motor F.L.C. shown in the table and D.O.L.-start: starting current max. 6x motor F.L.C., starting time max. 5s; star-delta-start: starting current max. 2x motor F.L.C., starting time max. 15s

For motors with higher F.L.C., higher starting current and / or longer starting time, larger short-circuit fuses are required. The maximum admissible value is dependent on the switchgear respectively thermal overload relay.

Approximate values of motor F.L.C. according to CSA and UL

Motor rating hp	Motor F.L.C. at 110-120V			Motor F.L.C. at 220-240V ¹⁾			Motor F.L.C. at 440-480V			Motor F.L.C. at 550-600V		
	1-phase	2-phase	3-phase	1-phase	2-phase	3-phase	1-phase	2-phase	3-phase	1-phase	2-phase	3-phase
	A	A	A	A	A	A	A	A	A	A	A	A
1/2	9.8	4.0	4.4	4.9	2.0	2.2	2.5	1.0	1.1	2.0	0.8	0.9
3/4	13.8	4.8	6.4	6.9	2.4	3.2	3.5	1.2	1.6	2.8	1.0	1.3
1	16.0	6.4	8.4	8.0	3.2	4.2	4.0	1.6	2.1	3.2	1.3	1.7
1-1/2	20.0	9.0	12.0	10.0	4.5	6.0	5.0	2.3	3.0	4.0	1.8	2.4
2	24.0	11.8	13.6	12.0	5.9	6.8	6.0	3.0	3.4	4.8	2.4	2.7
3	34.0	16.6	19.2	17.0	8.3	9.6	8.5	4.2	4.8	6.8	3.3	3.9
5	56.0	26.4	30.4	28.0	13.2	15.2	14.0	6.6	7.6	11.2	5.3	6.1
7-1/2	80.0	38.0	44.0	40.0	19.0	22.0	21.0	9.0	11.0	16.0	8.0	9.0
10	100.0	48.0	56.0	50.0	24.0	28.0	26.0	12.0	14.0	20.0	10.0	11.0
15	135.0	72.0	84.0	68.0	36.0	42.0	34.0	18.0	21.0	27.0	14.0	17.0
20	-	94.0	108.0	88.0	47.0	54.0	44.0	23.0	27.0	35.0	19.0	22.0
25	-	118.0	136.0	110.0	59.0	68.0	55.0	29.0	34.0	44.0	24.0	27.0
30	-	138.0	160.0	136.0	69.0	80.0	68.0	35.0	40.0	54.0	28.0	32.0
40	-	180.0	208.0	176.0	90.0	104.0	88.0	45.0	52.0	70.0	36.0	41.0
50	-	226.0	260.0	216.0	113.0	130.0	108.0	56.0	65.0	86.0	45.0	52.0
60	-	-	-	-	133.0	145.0	-	67.0	77.0	-	53.0	62.0
75	-	-	-	-	166.0	192.0	-	83.0	96.0	-	66.0	77.0
100	-	-	-	-	218.0	248.0	-	109.0	124.0	-	87.0	99.0
125	-	-	-	-	-	312.0	-	135.0	156.0	-	108.0	125.0
150	-	-	-	-	-	360.0	-	156.0	180.0	-	125.0	144.0
200	-	-	-	-	-	480.0	-	208.0	240.0	-	167.0	192.0
250	-	-	-	-	-	602.0	-	-	302.0	-	-	242.0
300	-	-	-	-	-	-	-	-	361.0	-	-	289.0
350	-	-	-	-	-	-	-	-	414.0	-	-	336.0
400	-	-	-	-	-	-	-	-	477.0	-	-	382.0
500	-	-	-	-	-	-	-	-	590.0	-	-	472.0

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 $\cos\varphi = 0,65$	500V AC	150	150	180	180	300	370	370	500	700	700
K3-24 to K3-1200 $\cos\varphi = 0,35$	690V AC	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, $\cos\varphi = 1$	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, $\cos\varphi = 1$	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	-	-	-	-
mm²	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											
	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
parallel compensated	A	7	9	9	9	18	22	22	30	40	40
dual-connection	A	22,5	22,5	28	28	45	58	72	98	108	117
Metal halide lamps ¹⁾ , uncompensated	A	12	15	19	19	30	39	48	66	72	78
parallel compensated	A	7	9	9	9	18	22	22	30	40	40
Mercury-vapour lamps ²⁾ , uncompensated	A	22,5	25	28	28	45	58	72	99	108	117
parallel compensated	A	7	9	9	9	18	22	22	30	40	40
Mixed light lamps 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.		$\text{max. lamps per pole } (I_{nLED} \leq I_{th}) = \frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$									
max inrush current of contactor	A	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
	$\text{max. lamps per pole } (I_{nLED} \leq I_n) = \frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$												
A	1551	1692	2115	2820	2961	3666	4512	6345	7755	9870	12126	14100	16920
A	69	75	100	120	160	190	220	260	315	440	500	560	630

Contactors, Motor-Starters

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnectors

Push Buttons

Representatives, Suppliers

Contactors

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

Main Contacts		Type	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
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
$P_x = P_n \cdot (n/x)$	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	A	35	25	20	20	25	25	25	25	25	20
		k	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
$P_x = P_k \cdot (k/x)$	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 $L/R \leq 1\text{ms}$												
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	120	130
	220V	A	6	6	6	6	10	10	10	12	12	12
3 poles in series	24V - 110V	A	20	25	32	32	50	65	80	110	120	130
	220V	A	16	20	20	20	30	35	35	63	80	80
Utilization category DC3 and DC5												
Switching of shunt motors and series motors												
Time constant $L/R \leq 15\text{ms}$												
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	0,25	0,25	0,25
2 poles in series	24V - 60V	A	20	25	32	32	50	65	80	110	120	130
	110V	A	6	6	6	6	30	30	30	60	60	60
	220V	A	1,2	1,2	1,2	1,2	1,8	1,8	1,8	1,8	1,8	1,8
3 poles in series	24V	A	20	25	32	32	50	65	80	110	120	130
	60V	A	20	25	32	32	40	40	40	80	80	80
	110V	A	20	20	20	20	40	40	40	80	80	80
	220V	A	2,5	2,5	2,5	2,5	4	4	4	5	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, Motor-Starters

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnectors

Push Buttons

Representatives, Suppliers

Contactors

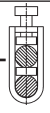
Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

Main Contacts			Type	K(G)3-10K(G)3-14K(G)3-18K(G)3-22K(G)3-24K(G)3-32K(G)3-40K3-50 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" / "Iq"	kA	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	 0,75 - 6			 1,5 - 25			 4 - 50			
	flexible	mm ²	1 - 4			2,5 - 16			10 - 35			
	flexible with multicore cable end	mm ²	0,75 - 4			1,5 - 16			6 - 35			
2 cables per clamp												
	solid or stranded	mm ²	6+(1-6) / 4+(0,75-4) 2,5+(0,75-2,5) / 1,5+(0,75-1,5)			16+(2,5-16) / 10+(4-16) 6+(4-16) / 4+(2,5-16)			50+4 / 35+6 / 25+(6-16) 16+(6-16) / 10+(6-16)			
	flexible	mm ²	6+(1,5-4) / 4+(1-4) 2,5+(0,75-2,5) / 1,5+(0,75-1,5)			16+(2,5-6) / 10+(4-10) 6+(4-16) / 4+(2,5-16)			50+(4-10) / 35+(4-16) 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) 14+(18-14) / 16+(18-16)			10+(16-10) / 12+(18-12) 14+(18-14) / 16+(18-16)			10+(12-10) / 12+12			
	flexible	AWG	10+(14-10) / 12+(18-12) 14+(18-14) / 16+(18-16)			4+(18-12) / 6+(18-8) 8+(18-8) / 10+(18-12)			1+(12-10) / 2+(8-12) 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 mOhm	0,21 2,1	0,35 1,8	0,5 1,5	0,75 1,5	0,7 1,2	1,3 1,2	2 1,2	2,2 1	3,9 1	5,5 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⁾		-25 to +55 (+70) ²⁾											
°C	-40 to +40		-25 to +40											
°C	-25 to +60		-25 to +55											
°C	-25 to +40		-25 to +40											
°C	-50 to +90		-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 mm ² mm ²	 0,5 - 16 0,5 - 70 (95) 0,5 - 70	 10 - 16 25 - 95 (120) 10 - 95	 busbar 18 x 4 screw M8		 busbar 25 x 6 screw M10			 busbar 30 x 5 screw M10	 busbar 40 x 6 screw M12	 busbar 50 x 8 screw M12	 busbar 50 x 8 screw M14	 busbar 50 x 10 screw 2 x M12		
mm ² mm ² mm ²	0,5 - 95 + 10 - 120 0,5 - 70 + 25 - 95													
AWG AWG	18 - 10 18 - 3/0	- 8 - 4/0												
AWG	-													
AWG	18 - 3/0 + 8 - 4/0													
1/h 1/h 1/h 1/h	3000 300 120 300		1200 240 - -	1200 150 - -			1200 50 25 -			300 20 - -				
S x 10 ⁶ S x 10 ⁶ S x 10 ⁶	5 5 -		10 10 -	5 5 -			5 5 -			5 ³⁾ 5 ³⁾ -				
A A	680 275	880 330	920 410	1200 500	1400 575	1800 800	2200 900	2600 1000	3600 1400	4400 1750	5600 2200	6900 2600	8000 3000	9600 3600
W mOhm	4,8 0,6	7,9 0,5	7,9 0,5	9 0,4	11 0,35	8 0,18	11 0,16	14,9 0,15	26,3	33,3	49	59,2	60	72
g g	7 5	7 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⁾				-		-			
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 double winding coil	inrush	W		75				140		200			
	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_s													
	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 $U_s \pm 10\%$ ^{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 double winding coil	make time	ms		8-12				10-20		12-23			
	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	K3-115	K3-116	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550	K3-700	K3-860	K3-1000	K3-1200
V~	-			-		-			690		690		690	
A	-			-		-			10		10		10	
A	-			-		-			-		-		-	
-	-			-		-			-		-		-	
A	-			-		-			3		3		3	
A	-			-		-			2		2		2	
A	-			-		-			1,5		1,5		1,5	
A	-			-		-			1,5		1,5		1,5	
A	-			-		-			1		1		1	
A	-			-		-			-		-		-	
A	-			-		-			1		1		1	
A	-			-		-			0,5		0,5		0,5	
A	-			-		-			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	
ms	20-35			30-60		40-60			50-100				50-100	
ms	35-50			30-80		15-45			150-200 / 500-1000 ¹⁾				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	
mm ²	-			-		-			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	
mm ²	0,5-2,5			1-2,5		1-2,5			1-2,5				1-2,5	
mm ²	0,5-1,5			-		-			-				-	
	2			2		2			2				2	
AWG	-			-		-			16 - 12				16 - 12	
AWG	-			-		-			16 - 12				16 - 12	
AWG	14 - 12			16 - 12		16 - 12			16 - 12				16 - 12	
AWG	18 - 12			16 - 12		16 - 12			16 - 12				16 - 12	
	2			2		2			2				2	

1) Normal or delayed drop is adjustable

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 NC	A		25	25	30	30	50	65	80	110	120	130
		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 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
	-	-	-	-	-	-	-	-	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)	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⁾
200V	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⁾
220-240V	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⁾

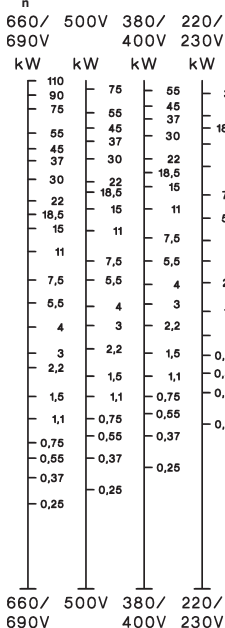
For contactors frequently used under AC3/AC4-mixed service conditions calculate contact life with the formula:

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

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.

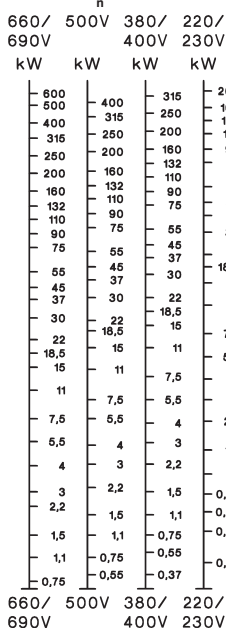
Motor Rating

$P_n = AC4$



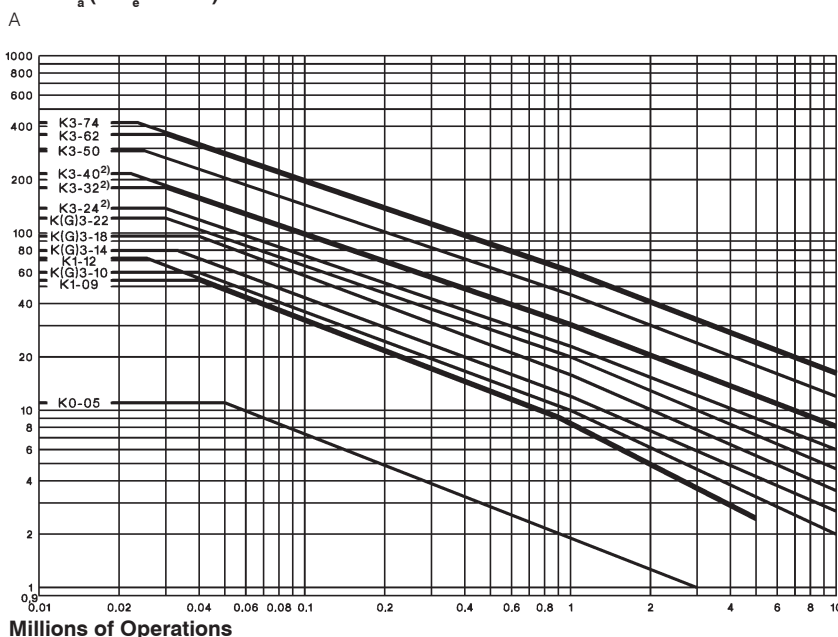
Motor Rating

$P_n = AC3$



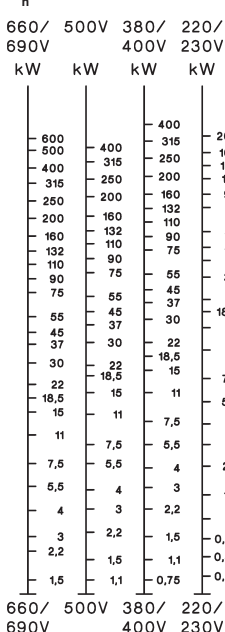
Breaking Current

$I_a (= I_e = AC1)$



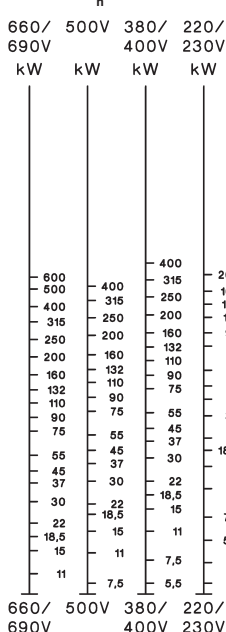
Motor Rating

$P_n = AC4$



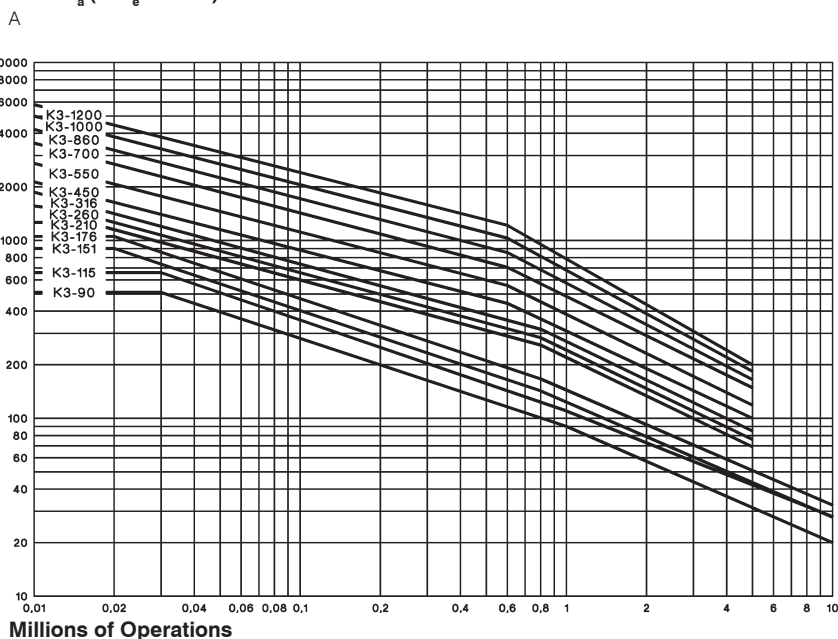
Motor Rating

$P_n = AC3$



Breaking Current

$I_a (= I_e = AC1)$



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	$\cos\varphi$	I_c/I_e	U_r/U_e	$\cos\varphi$	I/I_e	U/U_e	$\cos\varphi$	I_c/I_e	U_r/U_e	$\cos\varphi$
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	$17A < \begin{matrix} I_e \leq 17A \\ I_e > 100A \\ I_e > 100A \end{matrix}$	6	1	0,65	1	0,17	0,65	10	1,05	0,45	8	1,05	0,45
				6	1	0,35	1	0,17	0,35	10	1,05	0,45	8	1,05	0,45
				6	1	0,35	1	0,17	0,35	10	1,05	0,35	8	1,05	0,35
	AC4	Squirrel-cage motors: starting, plugging, inching	$17A < \begin{matrix} I_e \leq 17A \\ I_e > 100A \\ I_e > 100A \end{matrix}$	6	1	0,65	6	1	0,65	12	1,05	0,45	10	1,05	0,45
				6	1	0,35	6	1	0,35	12	1,05	0,45	10	1,05	0,45
				6	1	0,35	6	1	0,35	12	1,05	0,35	10	1,05	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	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	-	-	-	-	-	-	4,5	1,05	0,45	3,6	1,05	0,45
				-	-	-	-	-	-	4,5	1,05	0,35	3,6	1,05	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	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	-	-	-	-	-	-	8	1,05	0,45	6	1,05	0,45
				-	-	-	-	-	-	8	1,05	0,35	6	1,05	0,35
	AC8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	-	-	-	-	-	-	6	1,05	0,45	6	1,05	0,45
	AC8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	-	-	-	-	-	-	6	1,05	0,45	6	1,05	0,45
				-	-	-	-	-	-	6	1,05	0,35	6	1,05	0,35
Direct Current	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
				Make I/I_e	U/U_e	L/R [ms]	Break I_c/I_e	U_r/U_e	L/R [ms]	Make I/I_e	U/U_e	L/R [ms]	Break I_c/I_e	U_r/U_e	L/R [ms]
	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

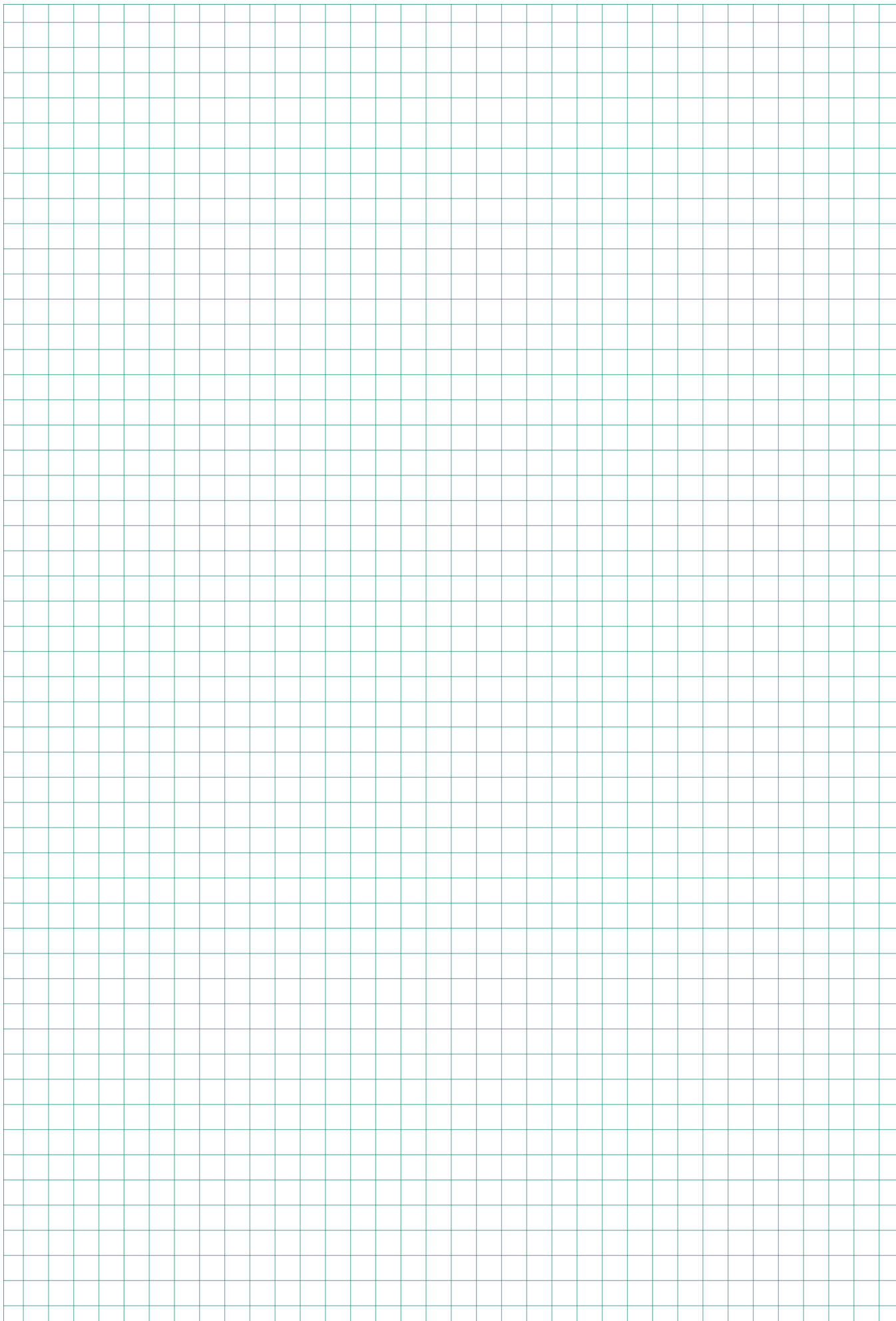
Type		HN	HTN	HA	HB	HKT	HKA	HKF HKB	K2-DK K2-SK	K2-L ²⁾
Rated insulation voltage U_i ¹⁾	V AC	690	690	690	690	690	690	690	690	690
Thermal rated current I_{th} to bis 690V										
Ambient temperature max. 40°C	A	10	10	25	10	10	10	16	26	10
max. 60°C	A	6	6	20	6	-	-	-	-	6
Frequency of operations z	1/h	3000	-	3000	3000	-	-	-	-	3000
Mechanical life	$S \times 10^6$	10	10	10	10	-	-	-	-	10
Power loss per pole at $I_g/AC1$	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

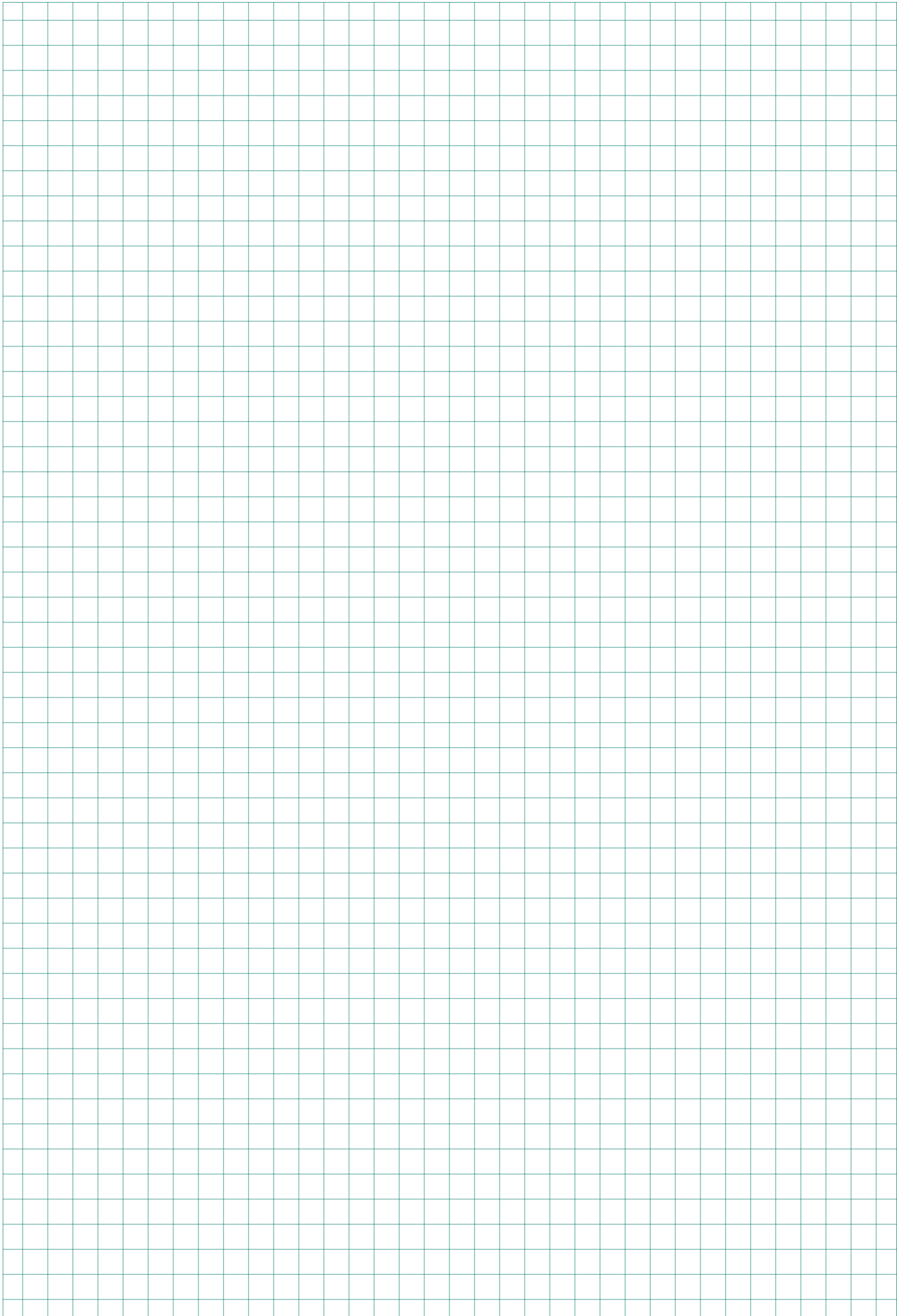
Data according to CSA, UL and CUL

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.

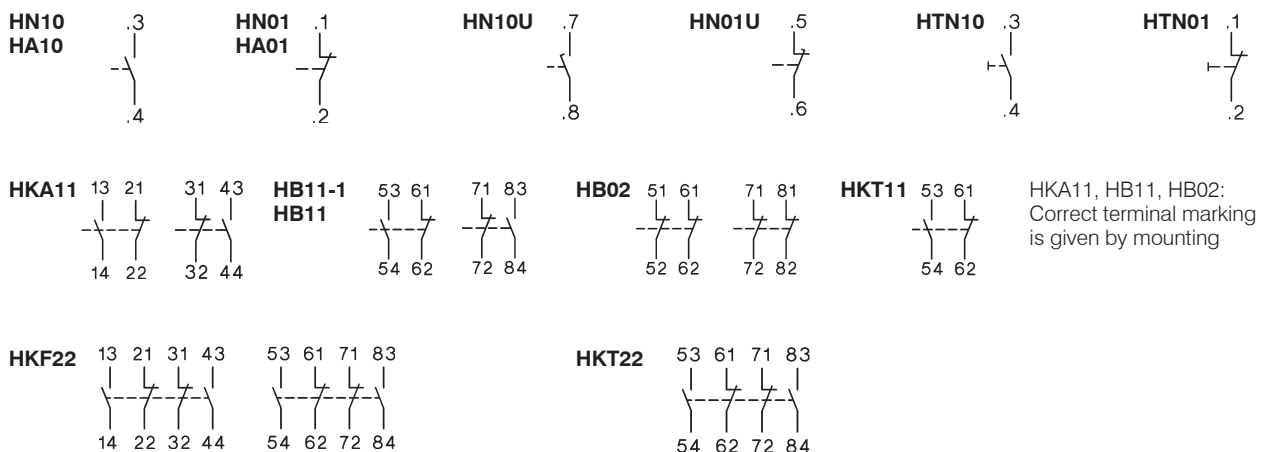




Contactors and Accessories

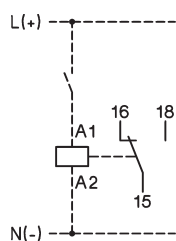
Wiring diagrams

Auxiliary contact blocks

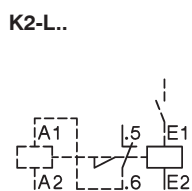


Electronic timer

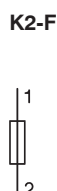
K3-T180 240



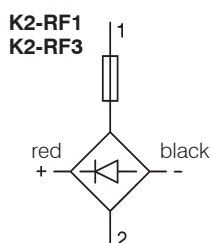
Latch



Fuse holder

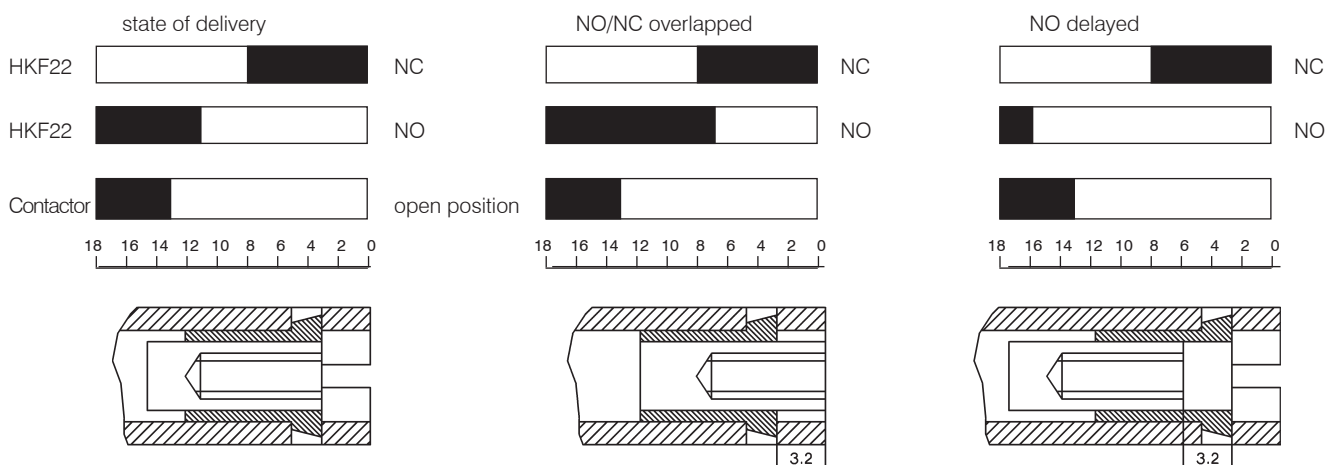


with rectifier



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)

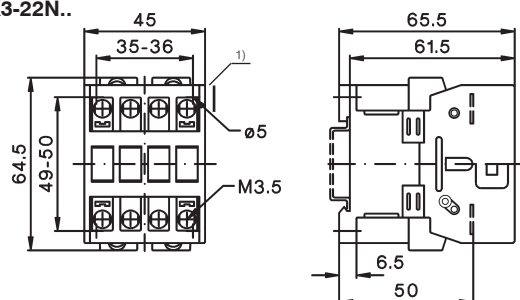
Regulation screw position (screw by 4 turns)

Contactors

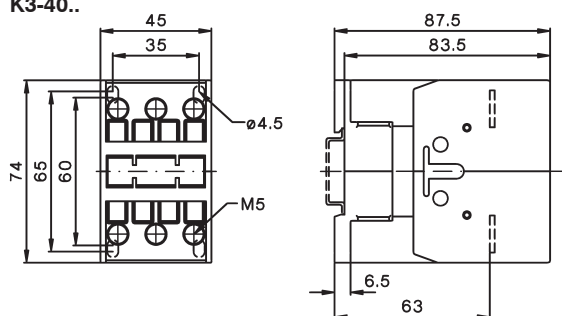
Dimensions

AC operated

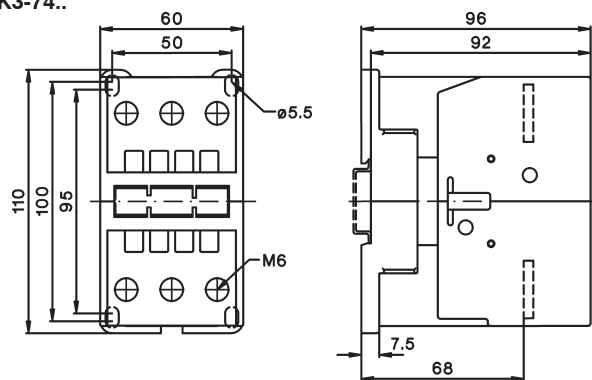
K3-10N..
K3-14N..
K3-18N..
K3-22N..



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

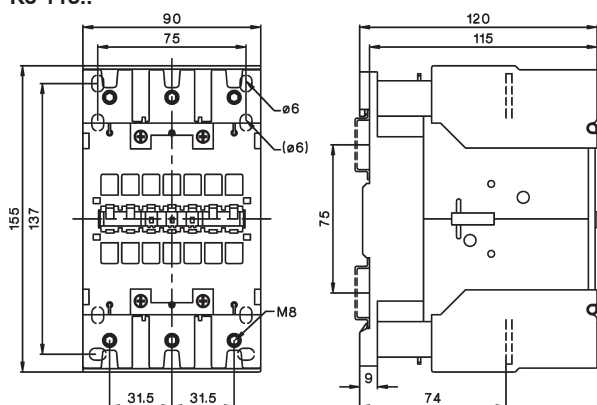


K3-50..
K3-62..
K3-74..



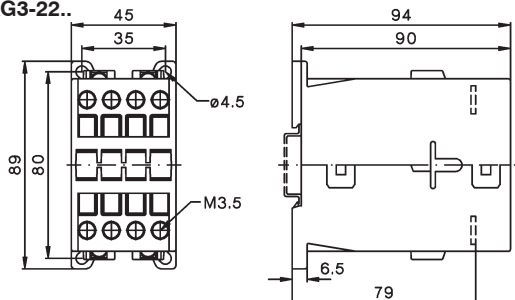
AC and DC operated

K3-90..
K3-115..

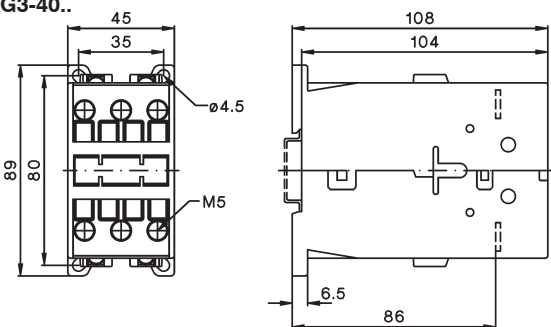


DC operated

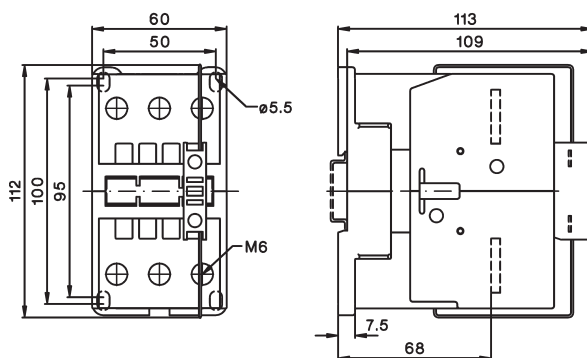
KG3-10..
KG3-14..
KG3-18..
KG3-22..



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



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

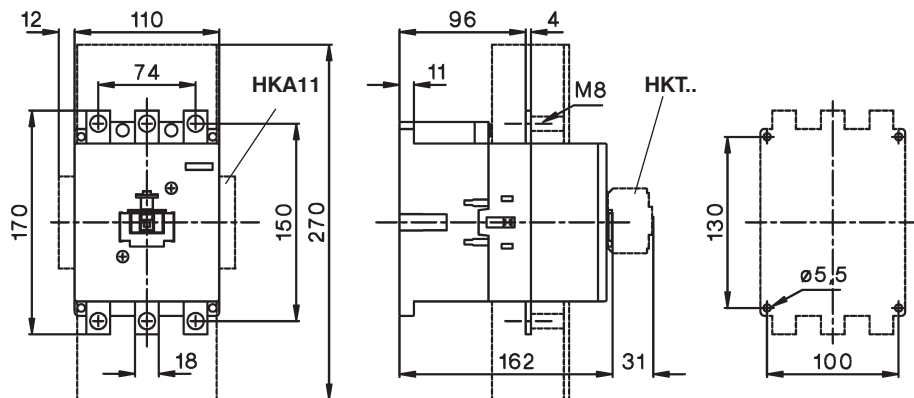


1) Minimum side distance to
conductive parts for coil voltage:
500V $U_{imp}=6kV$ 2mm
660-690V $U_{imp}=8kV$ 4,5mm

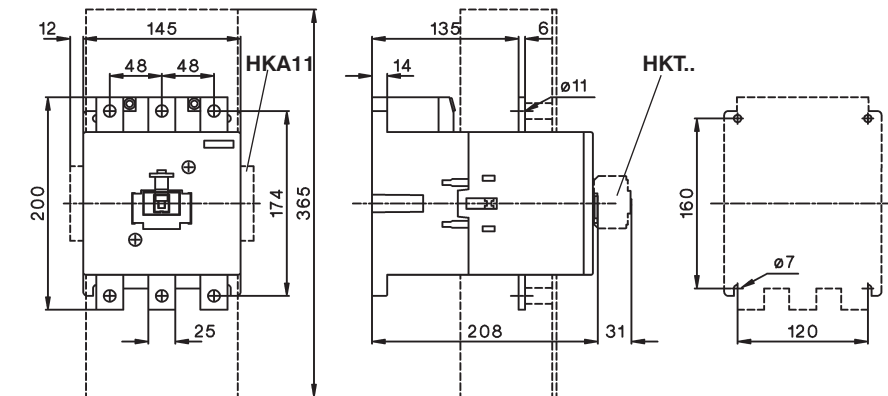
Contactors

Dimensions, AC operated, DC operated

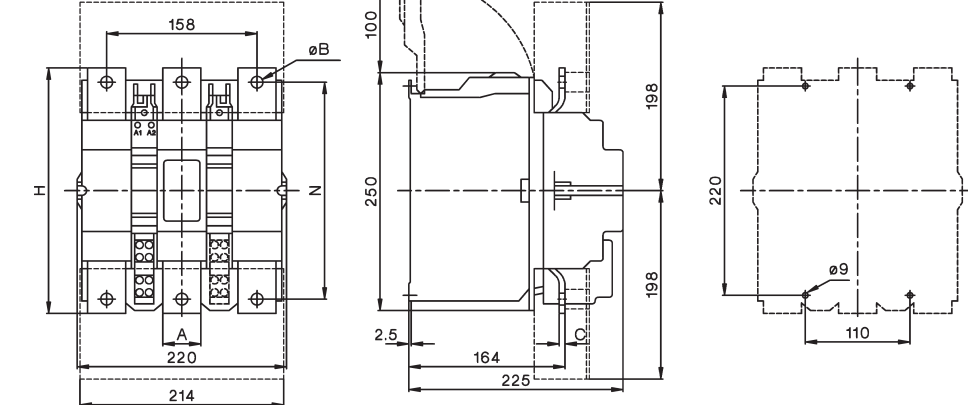
K3-151..
K3-176..



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

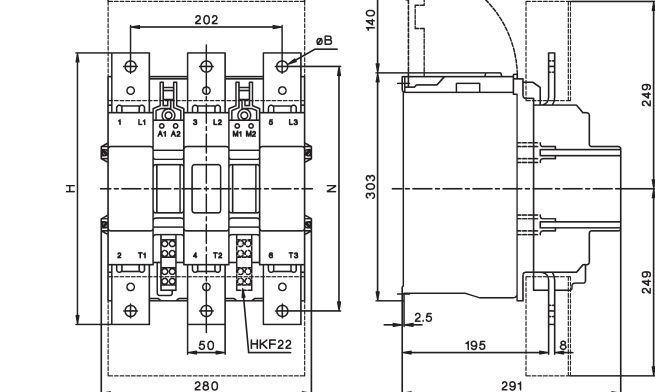


K3-450..
K3-550..



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

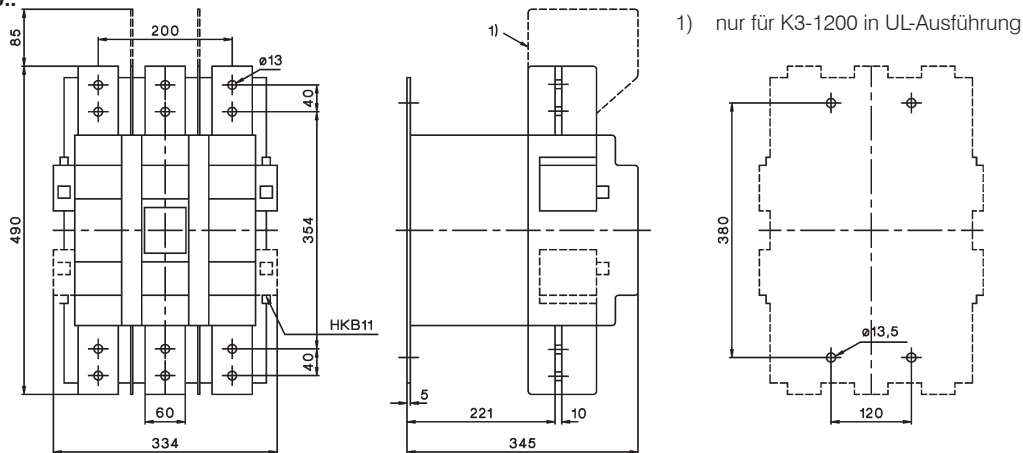
Contactors

Dimensions

AC operated, DC operated

K3-1000..

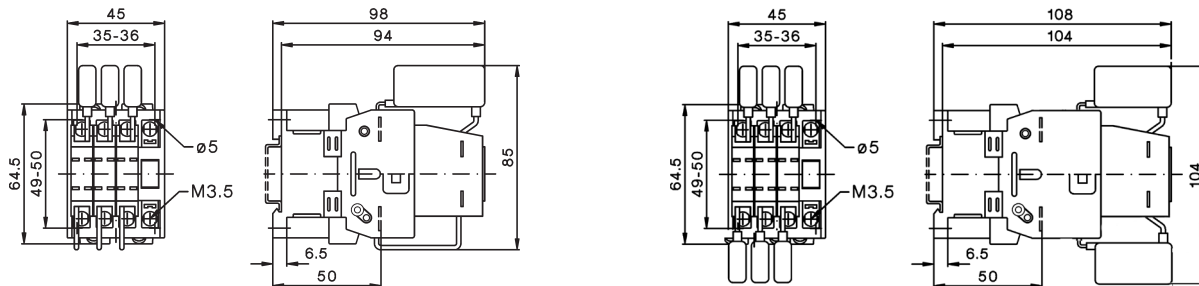
K3-1200..



Capacitor Switching Contactors, AC operated

K3-18NK..

K3-18NBK..



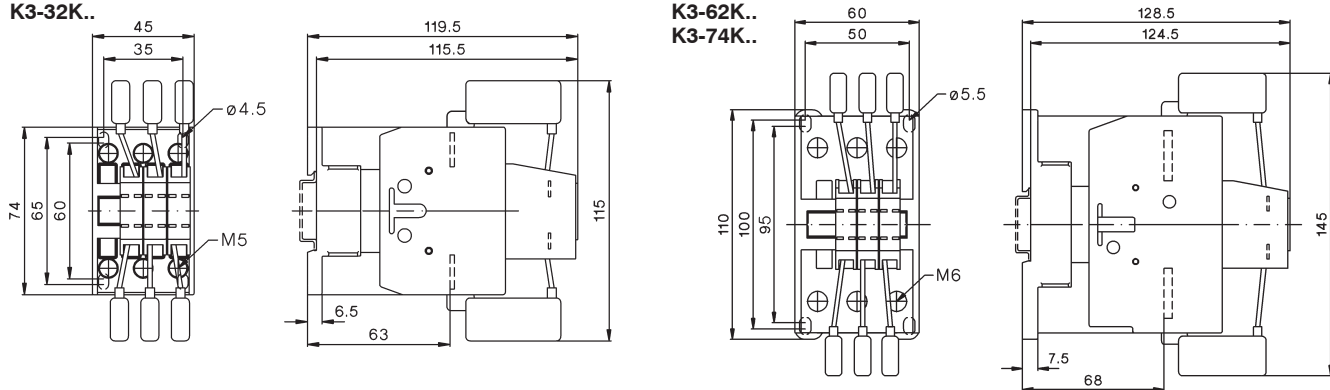
K3-24K..

K3-32K..

K3-50K..

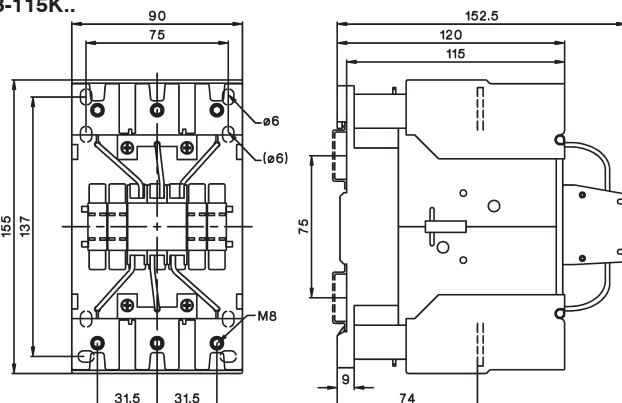
K3-62K..

K3-74K..



K3-90K..

K3-115K..

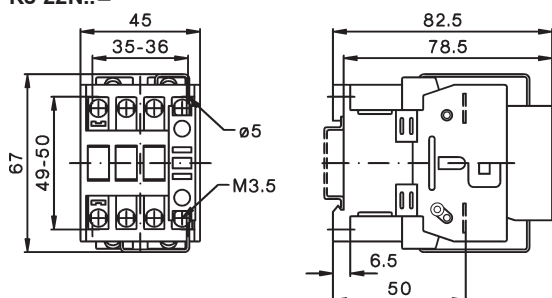


Contactor

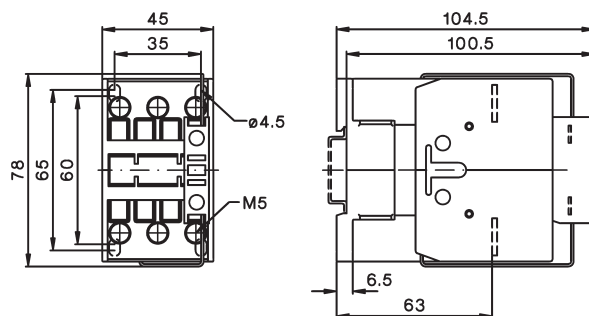
Dimensions

Contactor DC operated

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

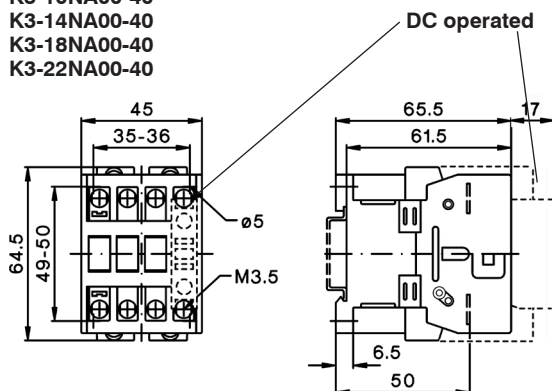


K3-24..
K3-32..
K3-40..=

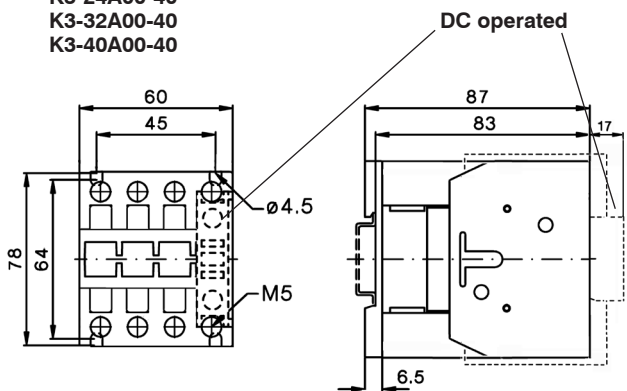


Contactor 4-pole, AC operated / DC operated

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

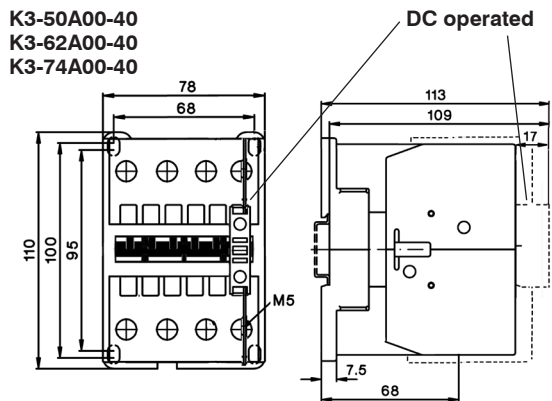


K3-24A00-40
K3-32A00-40
K3-40A00-40

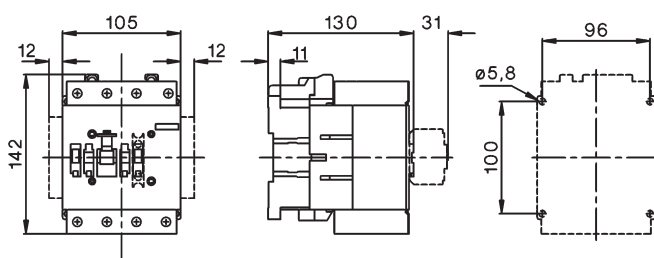


Contactor 4-pole, AC operated / DC operated

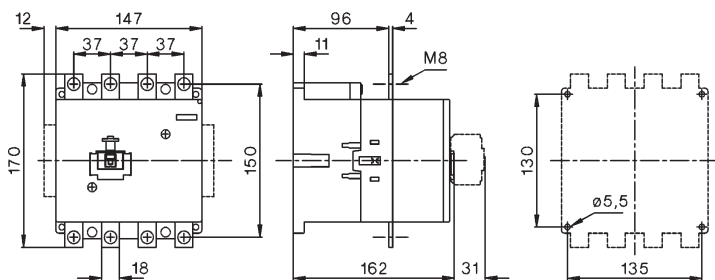
K3-50A00-40
K3-62A00-40
K3-74A00-40



K3-96A00-40



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



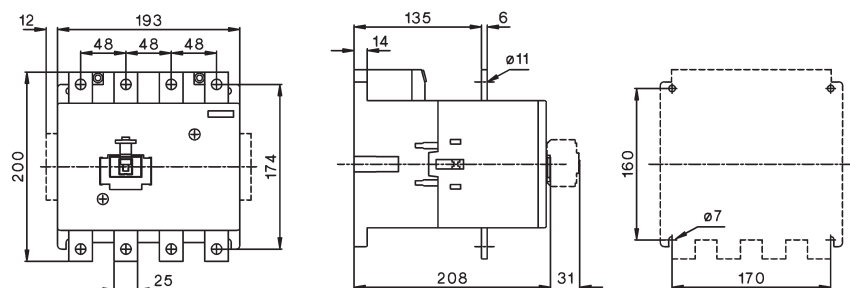
Contactors

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

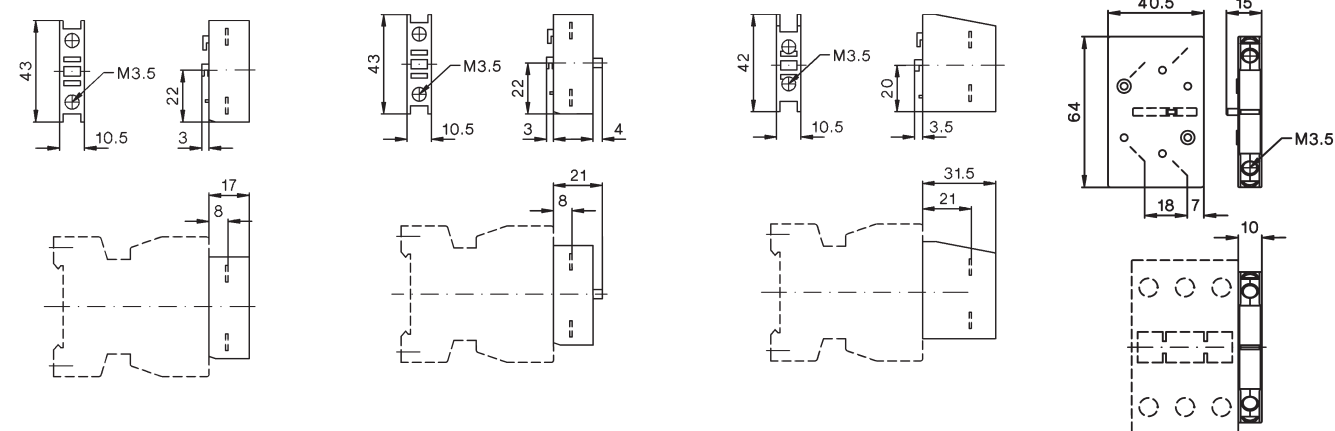
HN10, HN01

K2-SK, K2-DK

HTN10, HTN01

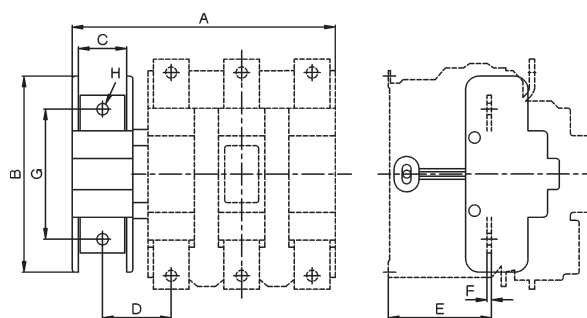
HA10, HA01

HB11-1, HB11, HB02



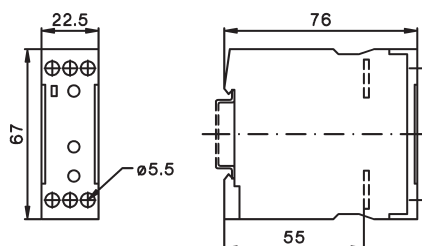
4. pole for contactors K3-200 to K3-1200

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



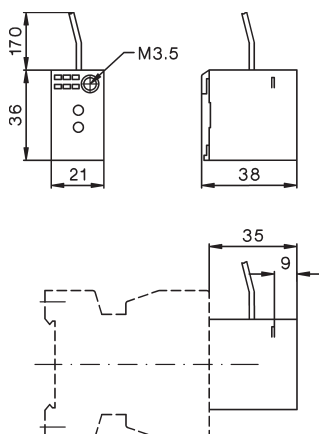
Electronic timer

K3-T180 240



Electronic timer on-delay

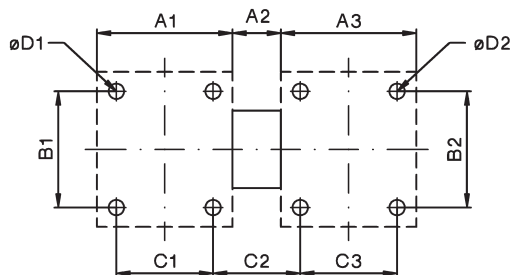
K2-TE..



Contactor

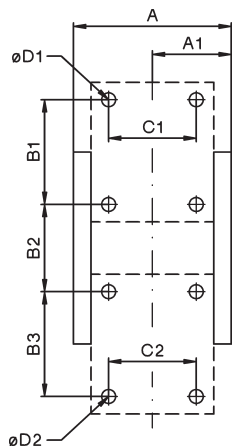
Dimensions Accessories

Mechanical interlocks

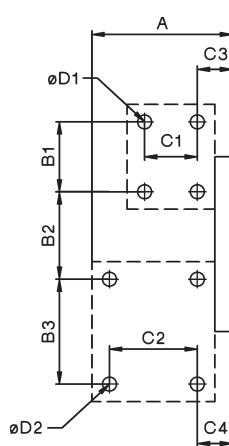


Type	Contactor 1	Contactor 2	A1	A2	A3	B1	B2	C1	C2	C3	D1	D2	
LG10889	K3-07 to K3-40	K3-07 to K3-40	45	7	45	50	50	35	17	35	4,5	4,5	
LG10889	KG3-07 to KG3-22	KG3-07 to KG3-22	45	7	45	80	50	35	17	35	4,5	4,5	
LG10889	KG3-24 to KG3-40	KG3-22 to KG3-40	45	7	45	80	50	35	17	35	4,5	4,5	
LG10890	K3-50 to K3-74	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	

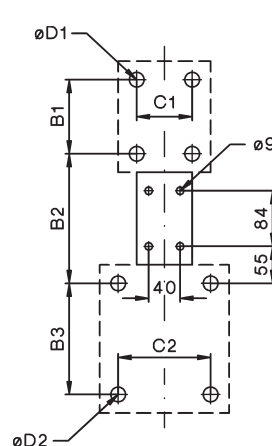
LG10400V, LG10402V



LG10399V



LG10403V, LG10401V



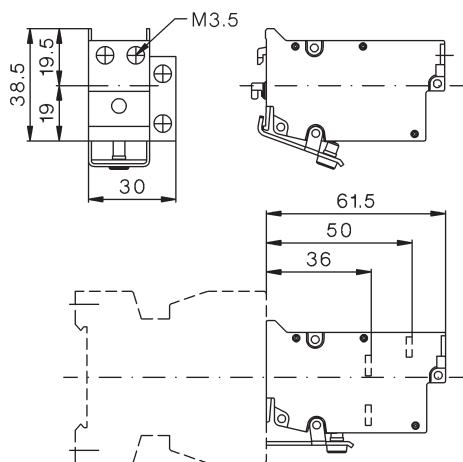
Type	Contactor 1	Contactor 2	A	A1	B1	B2	B3	C1	C2	C3	C4	D1	D2
LG10400V	K3-315 - K3-550	K3-315 - K3-550	250	134	220	94	220	110	110	-	-	9	9
LG10402V	K3-700, -860	K3-700, -860	302	162	280	200	280	175	175	-	-	11	11
LG10403V	K3-1000, -1200	K3-1000, -1200	-	-	380	280	380	120	120	-	-	13,5	13,5
LG10399V	K3-450,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

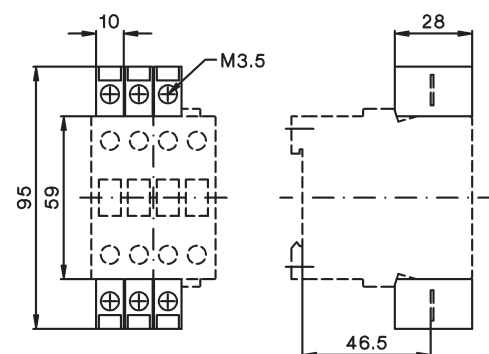
Latch

K2-L...



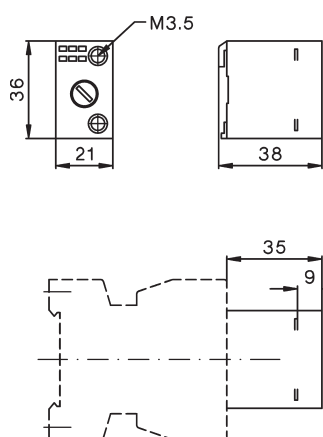
Contactors with additional terminals

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



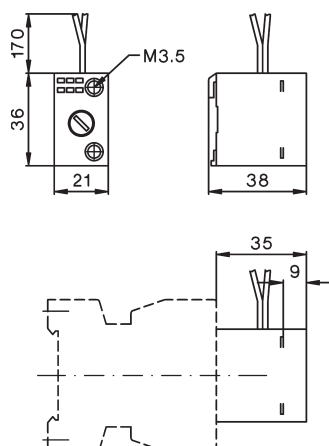
Fuse holder

K2-RF



Fuse holder with rectifier

K2-RF1 K2-RF3

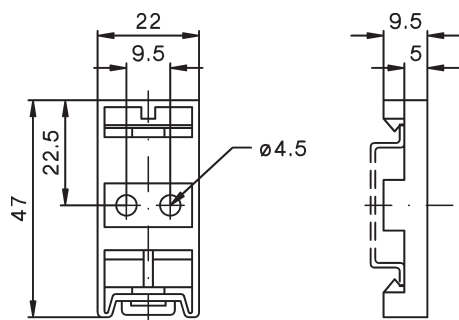


Contactors

Dimensions Accessories

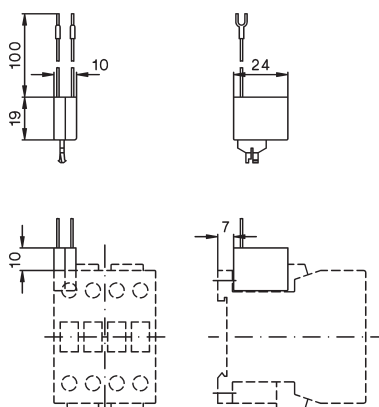
Snap-on adapter

K2-SM

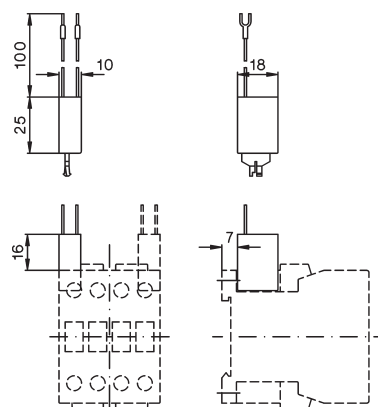


Suppressor units

RC-K3N ..



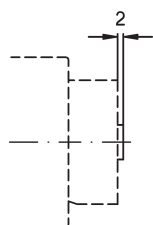
RC-K3NW ..

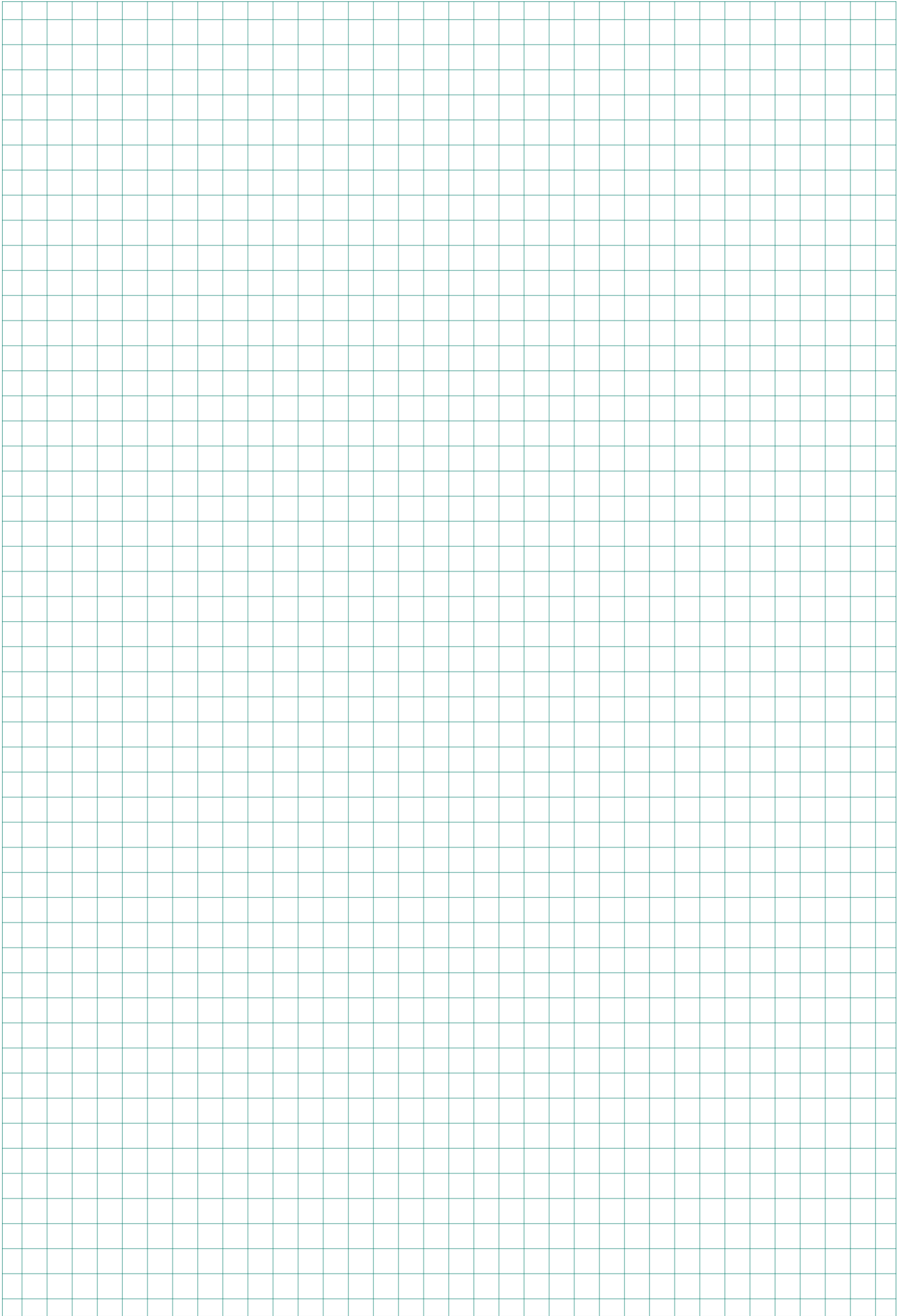


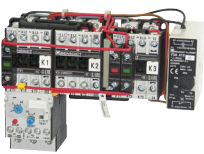
Marking systems

marking label

P487-1 or **P245-.**



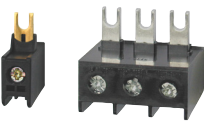




Star-Delta Starters Open Type	92
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Star-Delta Starters Enclosed	94
Enclosure for Star-Delta Starters	94



Accessories	95
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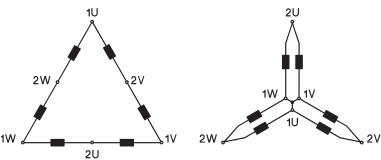
Reversing Contactors	96
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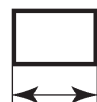
Pole Changing Starters	98
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Technical Data	100
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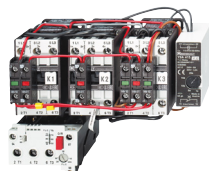
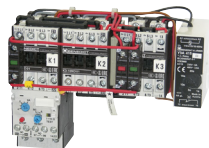
Wiring Diagrams	103
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Dimensions	107
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Star-Delta Starters Open Type

AC Operated



Ratings			Rated Current	order separately	Type	Coil voltage ¹⁾ 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight kg/pc.
AC3 380V 400V 415V kW	500V kW	660V 690V kW						
			AC3 400V A	Overload Relay Type	230 400 ↓			
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.

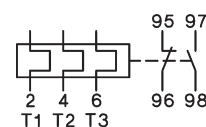
Ordering Example: Star-Delta Starter, open type, rated AC3 at 400V 205A
rated control voltage 230V 50Hz - **Order Type: K3Y200 230 + U85 120**

Thermal Overload Relays

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

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

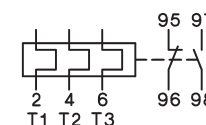
7 - 10,5	U12/16E 6 K3	1	0,10
10,5 - 15,5	U12/16E 9 K3	1	0,10
14 - 19	U12/16E 11 K3	1	0,10
18 - 24	U12/16E 14 K3	1	0,10
23 - 31	U12/16E 18 K3	1	0,10



manual reset

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

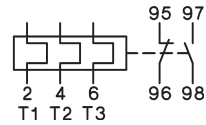
7 - 10,5	U3/32 6	1	0,14
10,5 - 15,5	U3/32 9	1	0,14
14 - 19	U3/32 11	1	0,14
18 - 24	U3/32 14	1	0,14
23 - 31	U3/32 18	1	0,14
30 - 41	U3/32 24	1	0,14
40 - 55	U3/32 32	1	0,14



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	Type	NO/NC	NO/NC	NO/NC	HN..	HA..	HN..
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		
	For Star-Delta Starters K3Y140.., K3Y200..					
	104 -156	U85 90	1	0,90		
	140 -207	U85 120	1	0,90		
		For Star-Delta Starters K3Y240.., K3Y300..				
		208 - 312	U180 180	1	1,5	

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							380-415V 50Hz		
400V		660V	AC3						
415V	500V	690V	400V						
kW	kW	kW	A		Type				

Plastic Enclosed, protected to IP65

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

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

Selector Switch

Typical wiring diagrams see page 103-106

Control Circuit Fuse

<250V (1 piece)

>250V (2 pieces)

Run Hour Meter

.....T ...

.....W ...

.....ST ...

.....ST ...

.....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.
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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

K3NY15, K3NY26
K3Y40, K3Y52

Type

K3NY-VB10
K3Y-VB24

Pack pcs. Weight kg/pc.

1 0,02
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
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Three-pole with Fingertouch Protection

U3/42	4 - 35 strand. 4 - 25 flex.	LG7559	1	0,052
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Electronic Timers for Star-Delta Starters¹⁾



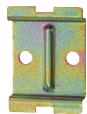
Rated Control Voltage V	Time Range s	Delay Time ms	Rated Current AC15 250V A	400V A	Type	Pack pcs.	Weight kg/pc.
24 - 60V AC/DC	1 - 20 ²⁾	20 - 25	5	5	Y9A 60	1	0,075
110 - 415V AC/DC	1 - 20 ²⁾	20 - 25	5	5	Y9A 415	1	0,075
24 - 60V AC/DC	1 - 20 ²⁾	40 - 80	5	5	Y9AL 60	1	0,075
110 - 415V AC/DC	1 - 20 ²⁾	40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

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

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

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 400V 415V kW	500V kW	660V 690V kW						
			AC3 400V A					

230
400
↓

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		Star Contactor	Free Space for Aux. Contact Blocks on Contactor		
High Speed	Low Speed		High Speed K1 HN.. or HA..	Low Speed K2	Star 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										
Change-over time max. (Y-step)	s					15 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
	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
	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
		380-400V kW	4	7,5	11	15	22	30
	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): $U_{imp} = 8kV$. 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.

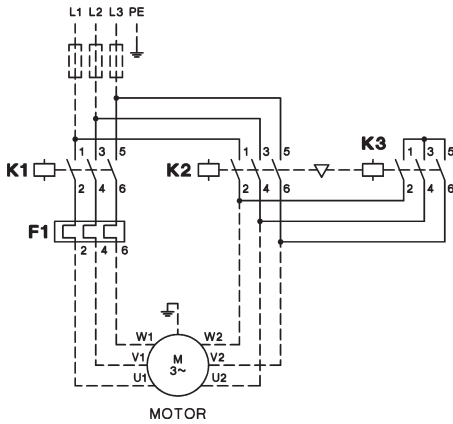
Star-Delta Starters

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.

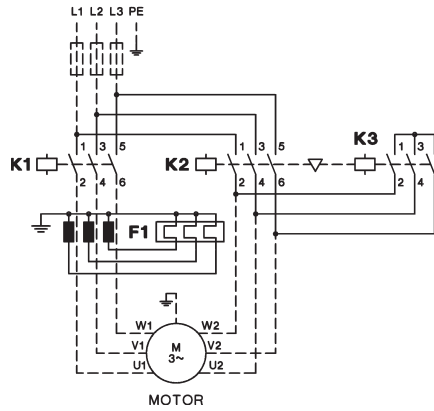
K3NY15 to K3Y100

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



K3Y140 to K3Y300

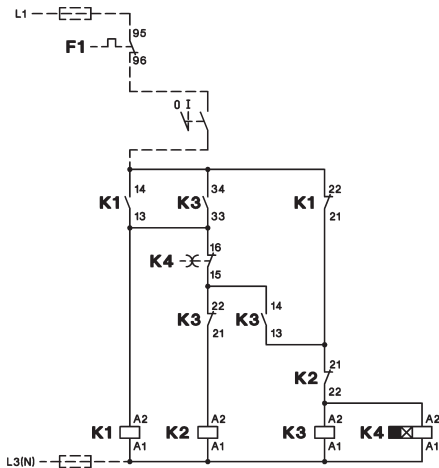
with thermal overload relay U85 or U180



Wiring Diagrams Control Circuit

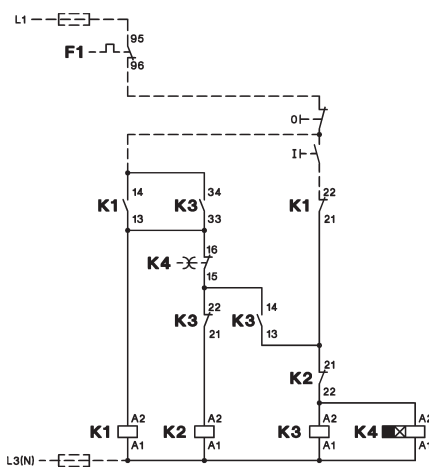
K3NY15 to K3Y52

operating with control switch



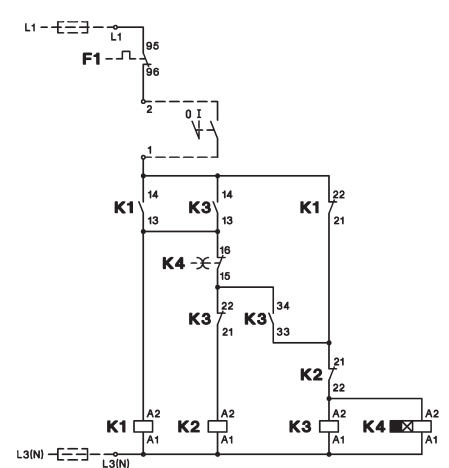
K3NY15 to K3Y52

operating with push buttons



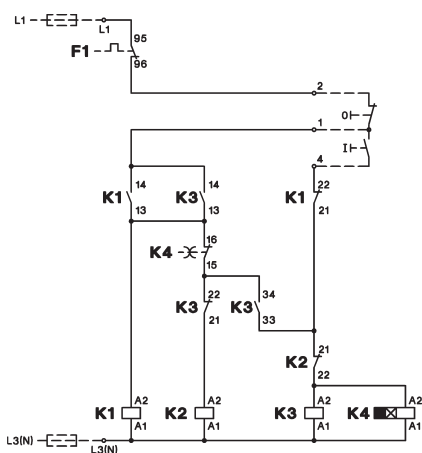
K3Y80 to K3Y200

operating with control switch



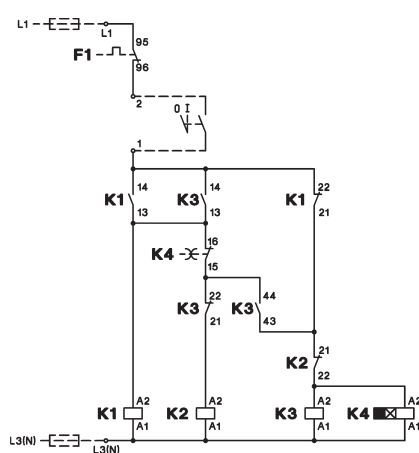
K3Y80 to K3Y200

operating with push buttons



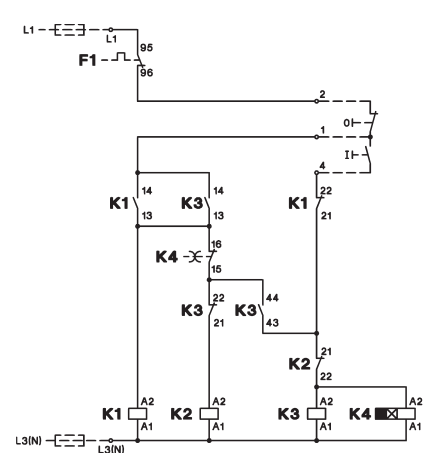
K3Y240 to K3Y300

operating with control switch



K3Y240 to K3Y300

operating with push buttons



Star-Delta Starters

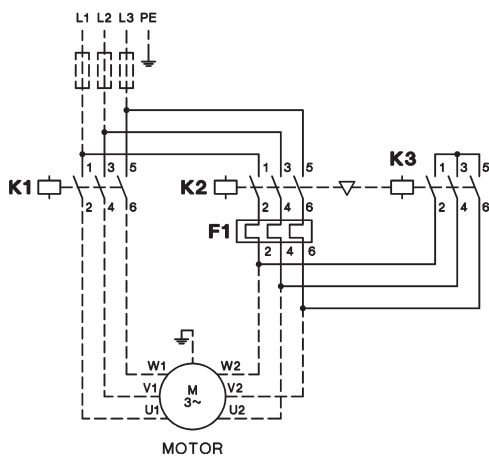
Wiring Diagrams Main Circuit

Terminal markings of contactors and relays according to DIN EN 50012

Connections shown in main and control circuits as broken lines are not included.

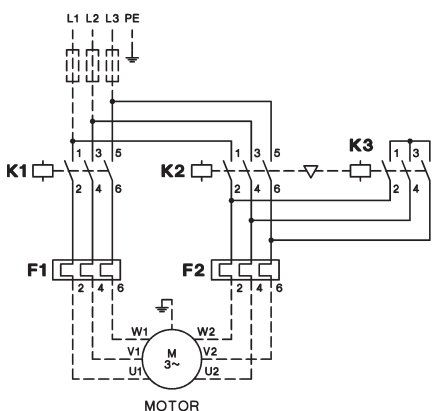
K3YL..

Typical circuit diagram



K3Y.. with 2 Thermal Overload Relays

Typical circuit diagram



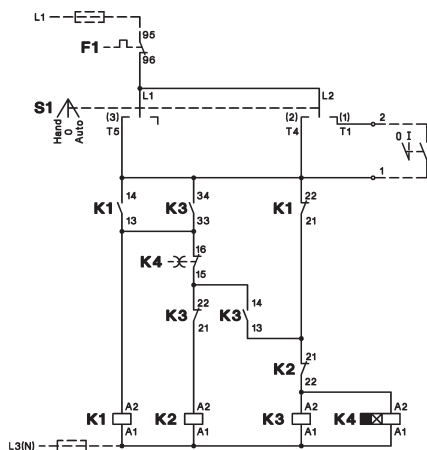
Wiring Diagrams Control Circuit

with selector switch

K3Y..W

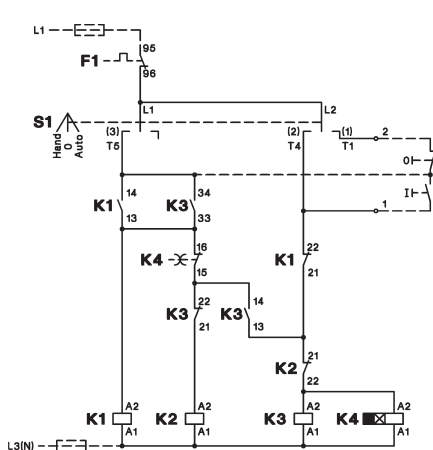
Typical circuit diagram

operating with control switch



Typical circuit diagram

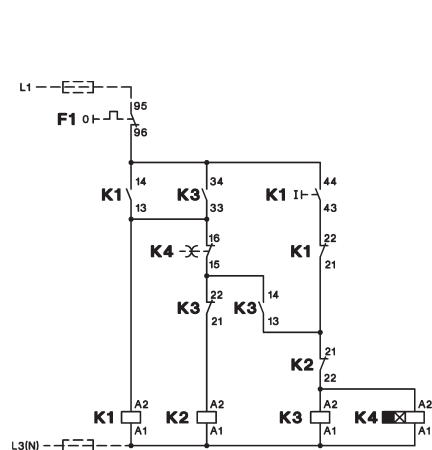
operating with push buttons



with push buttons

K3Y..T

Typical circuit diagram



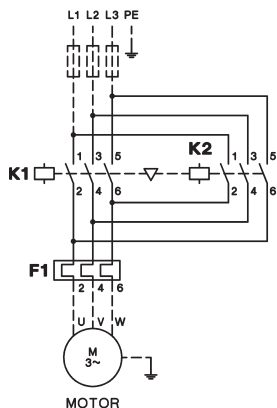
Reversing Contactors

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

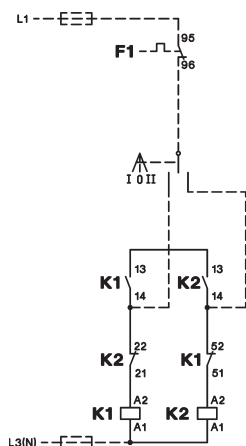
with thermal overload relay U3/32, U3/42 or U3/74



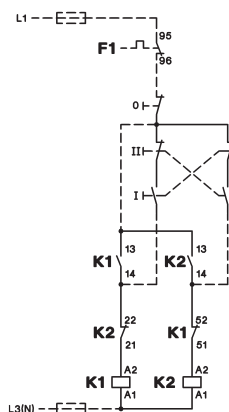
Wiring Diagrams Control Circuit

K3NWU10 to K3NWU18

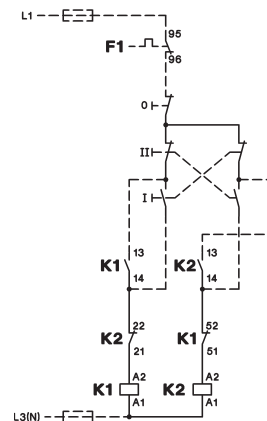
operating with control switch



operating with push buttons
Reversing over off-position

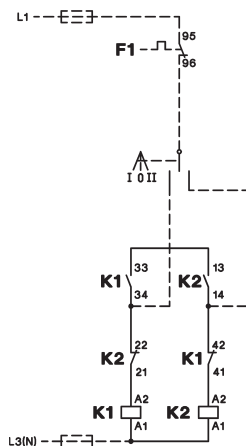


Reversing direct

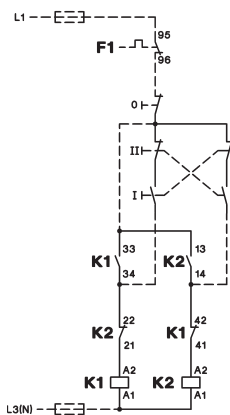


K3WU24 to K3WU74

operating with control switch



operating with push buttons

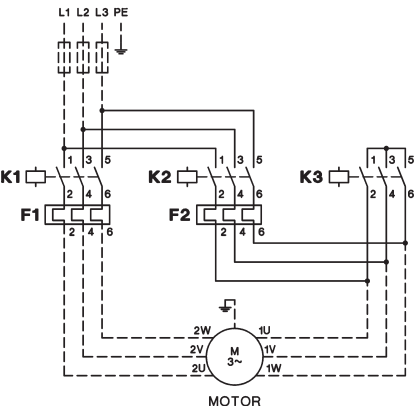


Pole Changing Starters

Wiring Diagrams

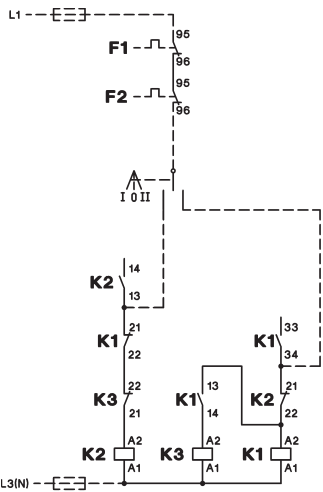
Terminal markings of contactors and relays according to DIN EN 50012
Connections shown in main and control circuits as broken lines are not included.

Main Circuit

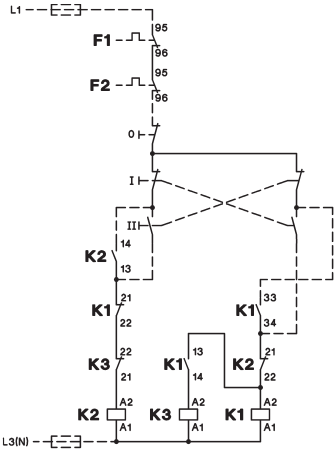


Principal Control Circuit Wiring Diagram

operating with control switch

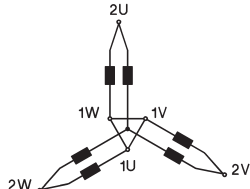
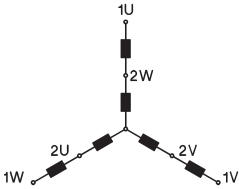
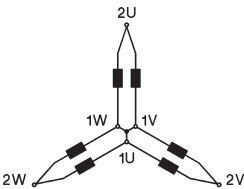
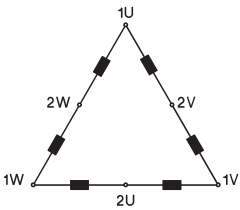


operating with push buttons



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

	Low speed	High speed
Operation	Star	Double-Star
Speed relation	1	2
Power relation	0,3	1

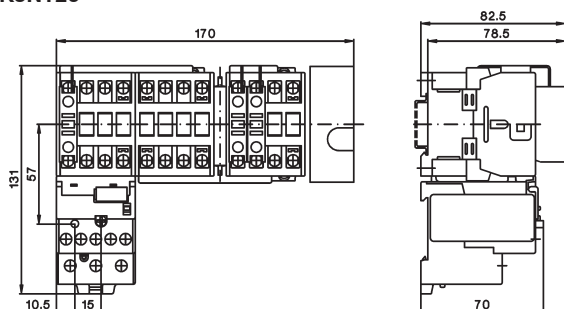


Star-Delta Starters

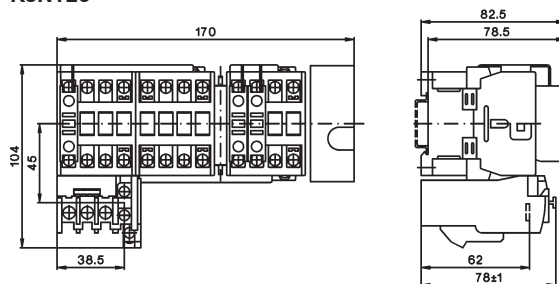
Dimensions

Star-Delta Starters, AC operated, open type

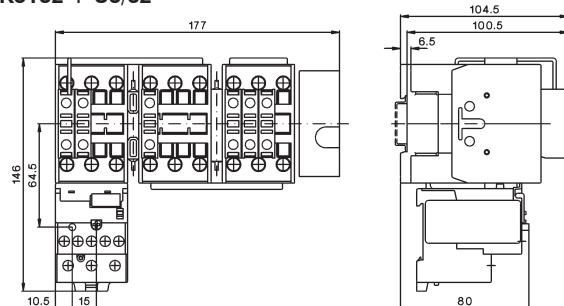
K3NY15 + U3/32
K3NY26



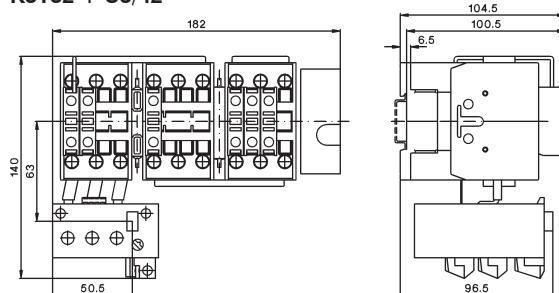
K3NY15 + U12/16E G3
K3NY26



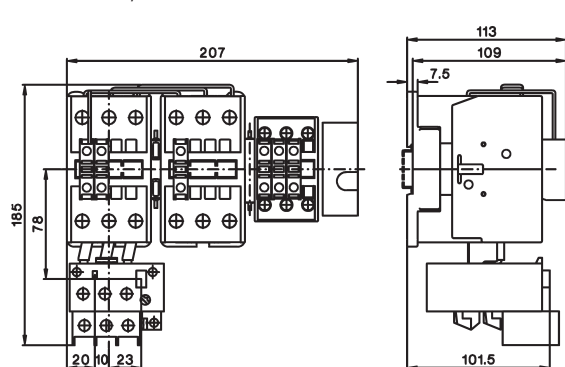
K3Y40 + U3/32
K3Y52 + U3/32



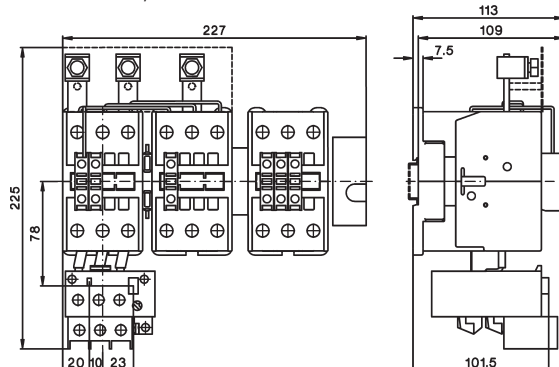
K3Y40 + U3/42
K3Y52 + U3/42



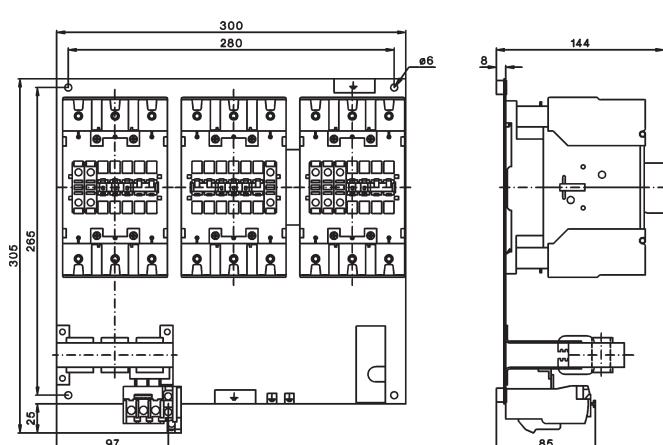
K3Y80 + U3/74



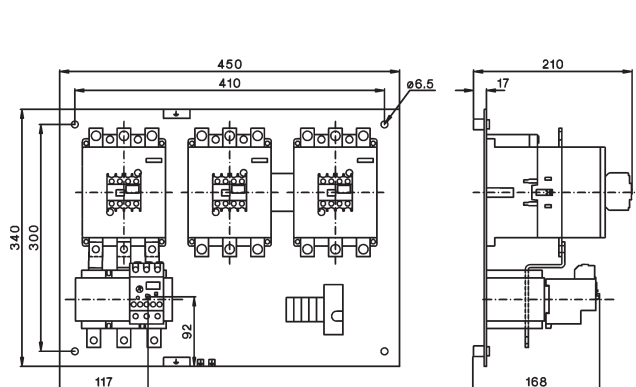
K3Y100 + U3/74



K3Y140 + U85
K3Y200



K3Y240 + U180 + SU180/176
K3Y300

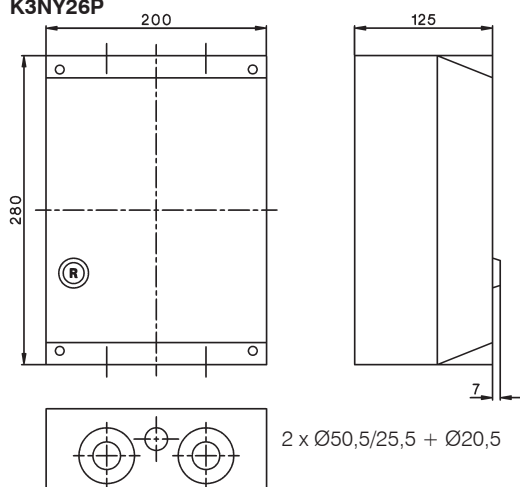


Star-Delta Starters

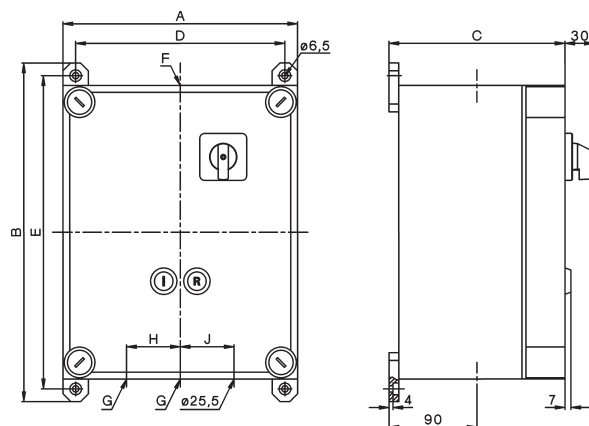
Dimensions

Star-Delta Starters, plastic enclosed, protected to IP65

K3NY26P



K3Y40P to K2Y100P



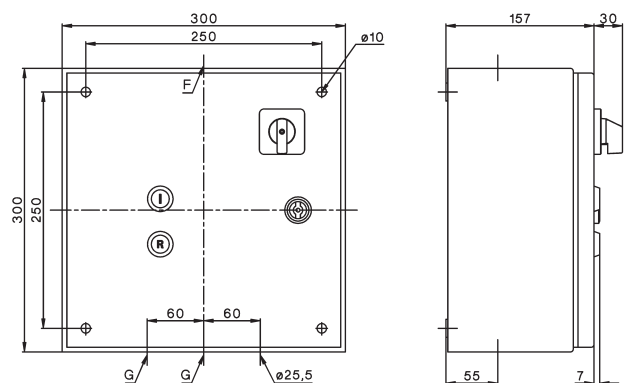
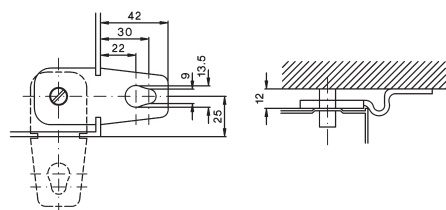
Type	A	B	C	D	E	Ø F	Ø G	H	J	
K3Y40P	300	346	180	272	320	6,5	32,5	32,5	60	60
K3Y52P	300	346	180	272	320	6,5	32,5	32,5	60	60
K3Y80P	300	446	180	272	420	6,5	40,5	40,5	70	70
K3Y100P	300	446	180	272	420	6,5	50,5	40,5	70	70

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

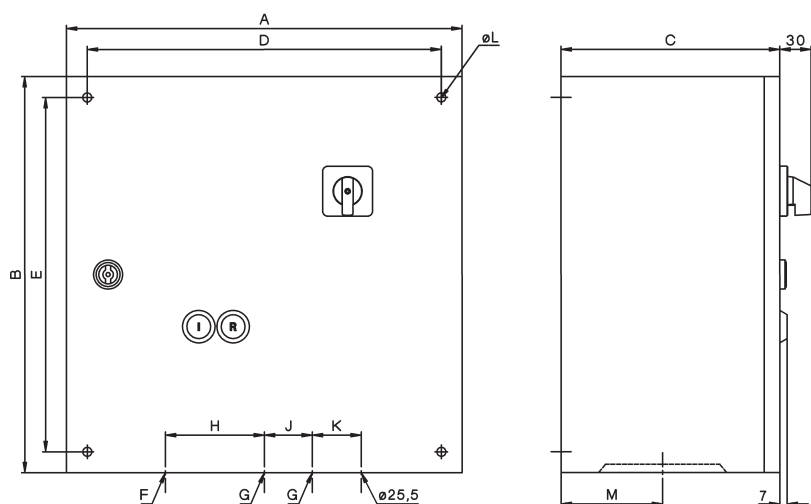
Mounting by included fixing link



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

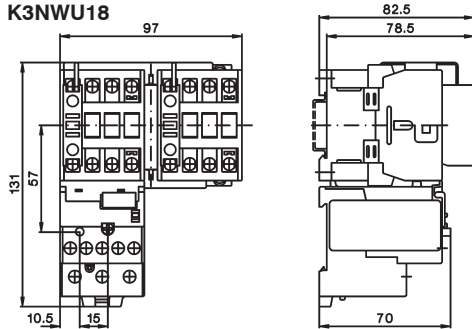


Reversing Contactors

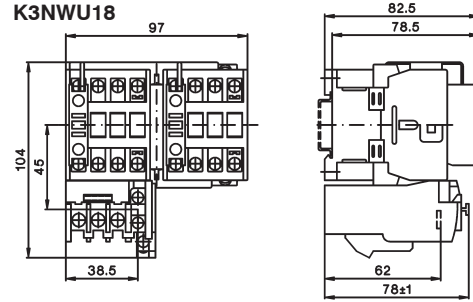
Dimensions

Reversing Starters, AC operated, open type

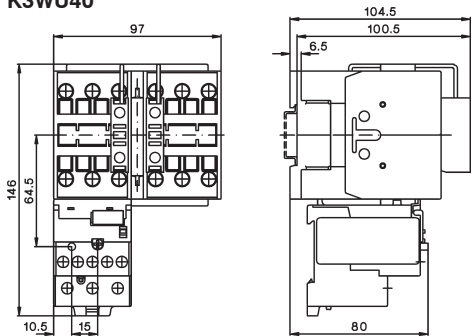
K3NWU10 + U3/32
K3NWU18



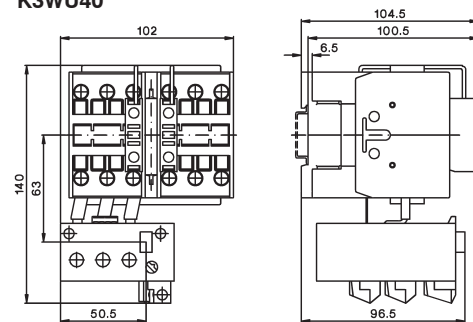
K3NWU10 + U12/16E G3
K3NWU18



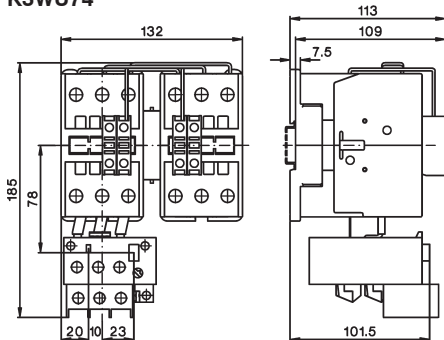
K3WU24 + U3/32
K3WU32
K3WU40



K3WU24 + U3/42
K3WU32
K3WU40



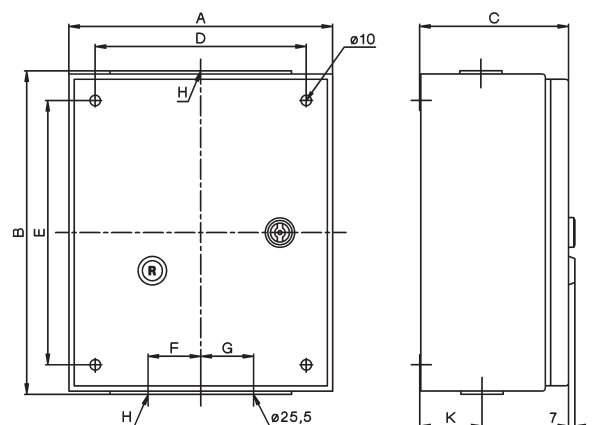
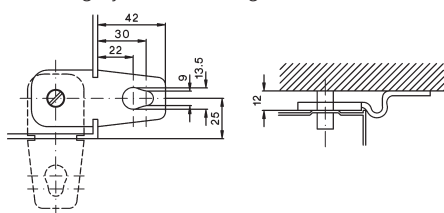
K3WU50 + U3/74
K3WU62
K3WU74



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

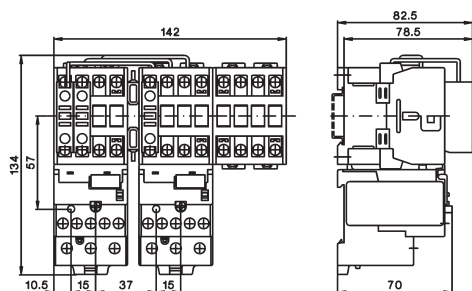


Pole Changing Starters

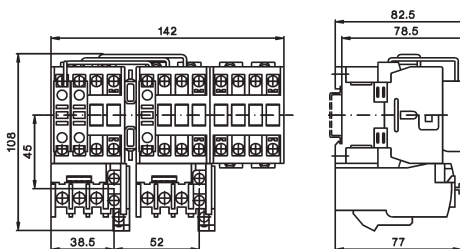
Dimensions

Pole Changing Starters, AC operated, open type

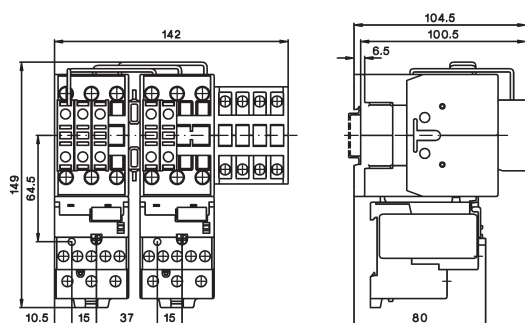
K3NPU18 + 2x U3/32



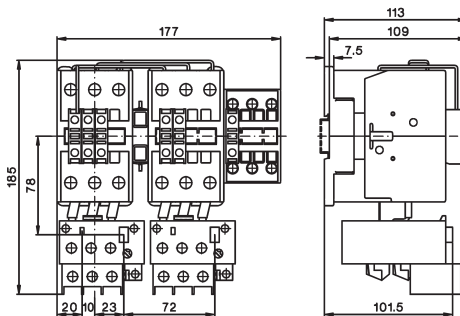
K3NPU18 + 2x U12/16



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



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

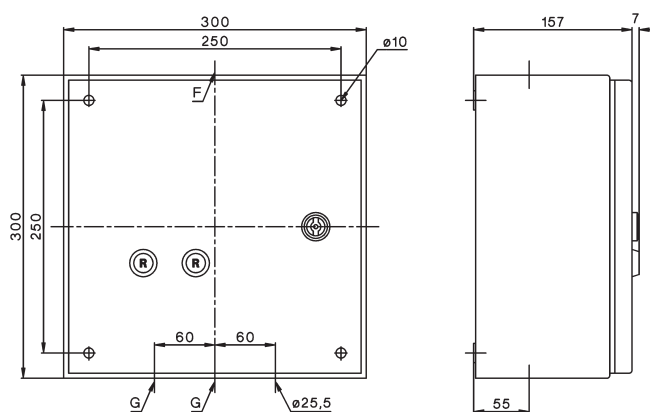
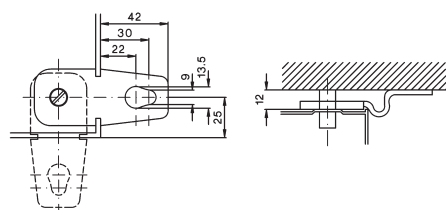


Pole Changing Starters, sheet steel enclosed, protected to IP54

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



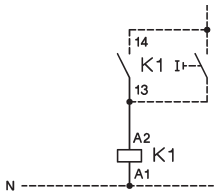
D.O.L. Starters With Selector Switch And Pneumatic Switch For Use In Moist Rooms 112



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⁾		
AC3 at	Contact	Space	extra	tion	Entries		230 220-240V 50Hz	230-264V 60Hz	
380V		f. Aux.		Degree			400 380-415V 50Hz	400-440V 60Hz	
400V		Cont.	Overload						
415V		HN..	Relay						
kW	Type	pcs.	Type						Pack
									Weight
									pcs. kg/pc.

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

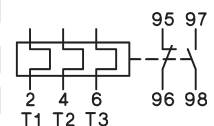


for refill of D.O.L. Starter P1W.. to P1W..P						P1-LDR	1	0,02
--	--	--	--	--	--	--------	---	------

Thermal Overload Relays



Setting range	Type	Pack	Weight
A		pcs.	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	Bottom	Type	Pack pcs.	Weight kg/pc.
K3-07.. to K3-22.. K3-24..¹⁾ to K3-40..¹⁾	IP65 Type 4X	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	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	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	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

Indicator Units



Specifications	Voltage Range	Type	Pack pcs.	Weight kg/pc.
Coil Current Indicator , green (LED)	24 - 660V AC/DC	K2-ING	10	0,02
Coil Current Indicator , red (LED)	24 - 660V AC/DC	K2-INR	10	0,02
To be connected in series with the contactor coil. In case of coil interruption the indicator goes out. Voltage drop approx. 2 volts				
Voltage Indicator , clear (glow-disc. I.)	220 - 415V AC/DC	K2-UN	10	0,02
Voltage Indicator , red (LED)	24 - 120V AC/DC	K2-UNR	10	0,02
To be connected parallel to the contactor coil. In case of applied voltage the indicator also lights at coil interruption.				
Lens Caps For Indicator Units				
Lens cap transparent		LG9743T	10	0,005
Lens cap red		LG9743R	10	0,005
Lens cap green		LG9743GR	10	0,005
Mounting instructions see page 118				

Heating Element



Specifications	Voltage Range	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 mm²			Type	Pack pcs.	Weight kg/pc.
	solid or stranded	flexible	flexib. w. multi-core cable end			
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
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¹⁾ without auxiliary contact blocks

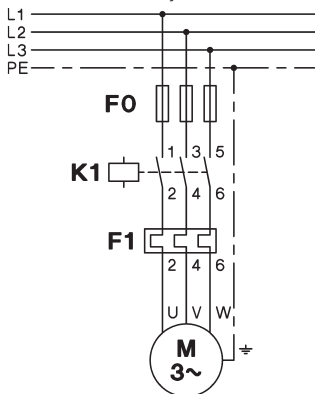
D.O.L. Starters

Wiring Diagrams Main Circuit

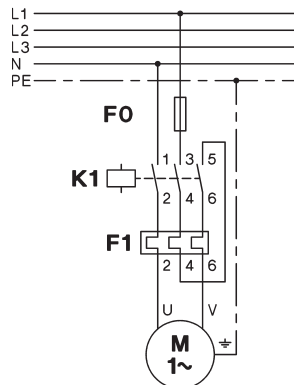
All fuses F0 shown in the main circuits are not included.
Terminal markings according to EN 50012

P1...

with overload relay U12/16.. K3



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.

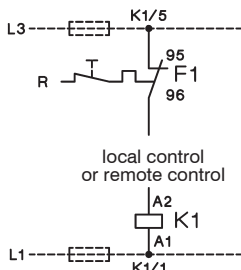
Separate coil supply

Coils for **380-415V 50Hz** and **400-440V 60Hz**: Remove connectors A1-1 and 95-5, connect supply to terminals A1 and 95.

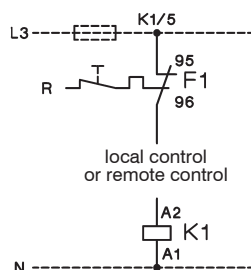
Coils for **220-240V 50Hz** and **230-264V 60Hz**: Remove connectors 95-5 connect supply to terminals A1 and 95.

Coils for **other voltages**: Connect supply to terminals A1 and 95.

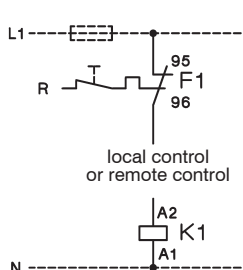
Coil phase to phase (380-415V 50Hz)



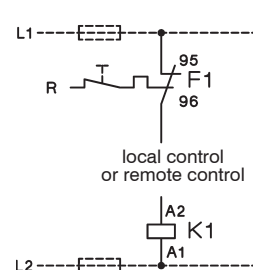
Coil phase to neutral (220-240V 50Hz)



Coil phase to phase



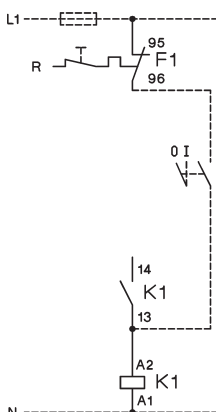
Coil phase to neutral



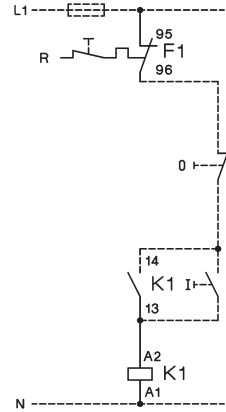
D.O.L. Starters with remote control

P1..

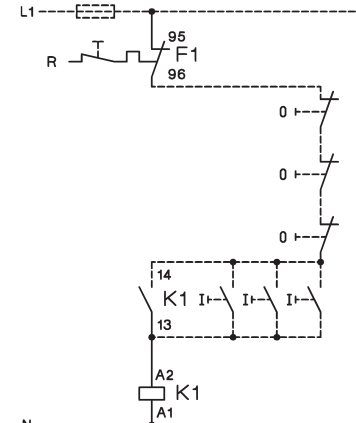
Remote 2-wire (switch) control



Remote 3-wire (push button) control



Remote start-stop control
(3 control stations)



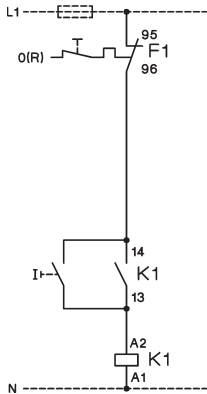
D.O.L. Starters

Wiring Diagrams Control Circuits

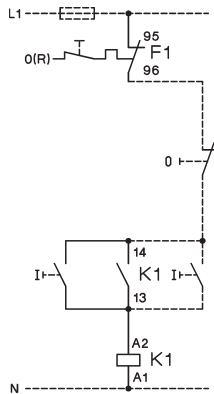
Typical circuit diagram (for separate coil supply, control circuit connected between L1 and N)
Terminal markings according to EN 50012

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

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

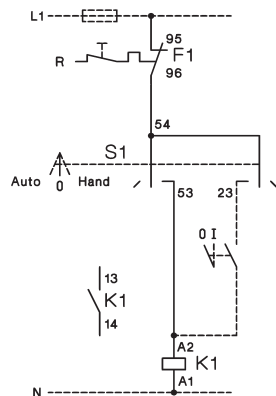


P1T10, P1T18, P1T22
with external push buttons

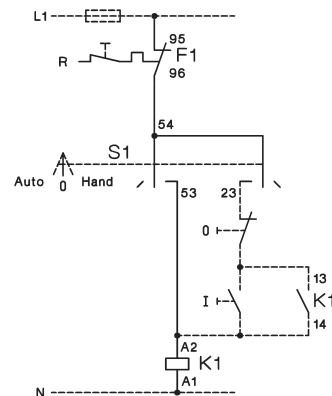


D.O.L. Starters with Selector Switch

P1W10, P1W18, P1W22
with external control switch

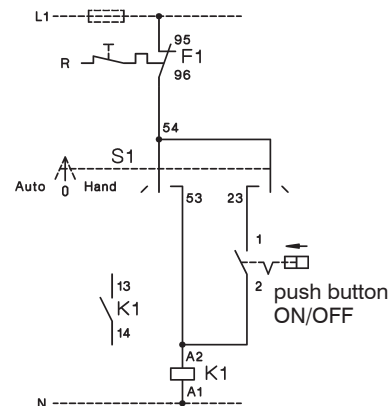


P1W10, P1W18, P1W22
with external push buttons



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

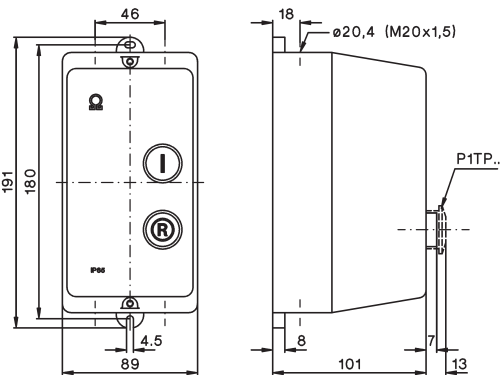


D.O.L. Starters

Dimensions

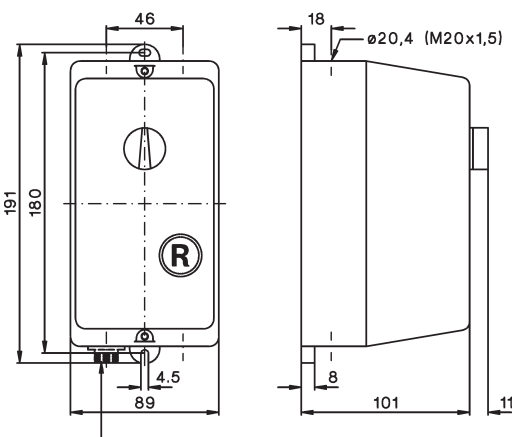
D.O.L. Starters with Start-Stop/Reset Push Buttons, Plastic Enclosed

P1T.., P1TP..



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

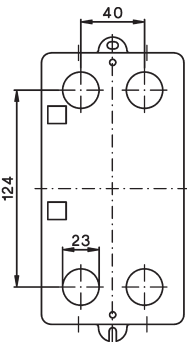
P1W.., P1W18P



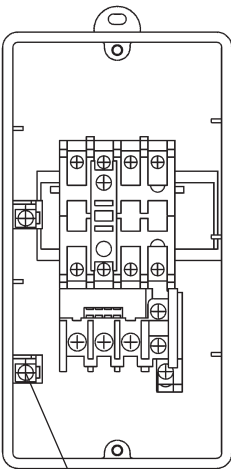
P1W18P: plug-in for air tube inside diameter 3mm

Rear Conduit Entries

knockouts
4 x $\varnothing 23$



Neutral Terminal LG9744



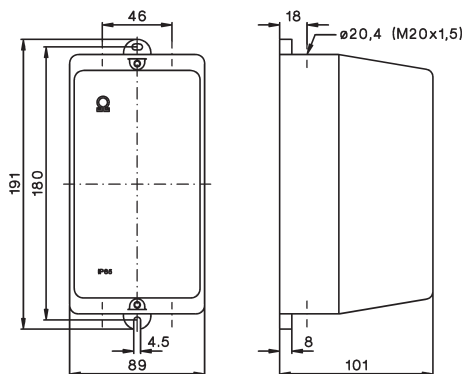
LG9744

Enclosures

Dimensions

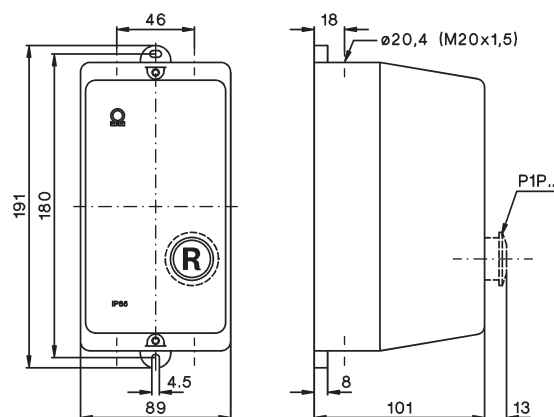
Enclosures for Contactors

P1



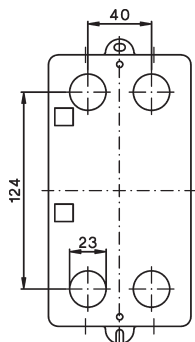
Enclosures for D.O.L. Starters

P1R, P1P



Rear Conduit Entries

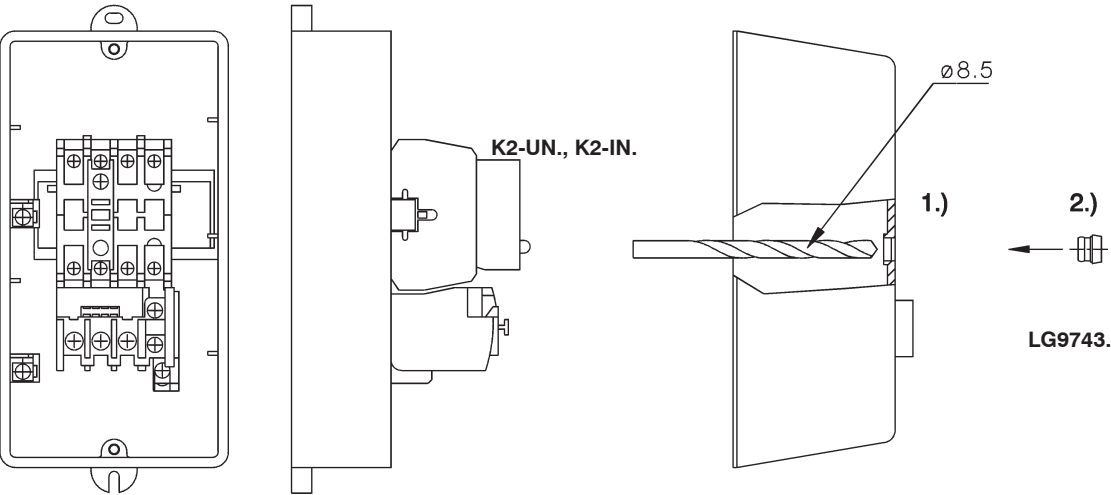
knockouts
4 x $\varnothing 23$



D.O.L. Starters

Mounting and Wiring Instructions

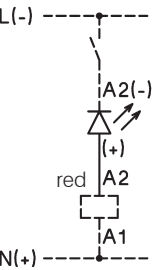
Indicators and Lens Caps for D.O.L. Starters P1



Wiring Examples

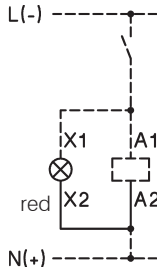
Coil Current Indicator

K2-ING
K2-INR



Voltage Indicator

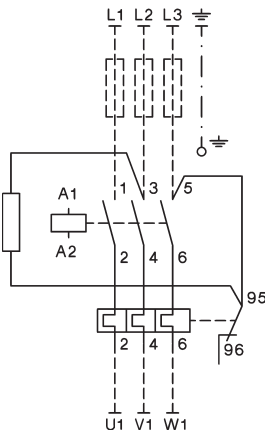
K2-UN
K2-UNR



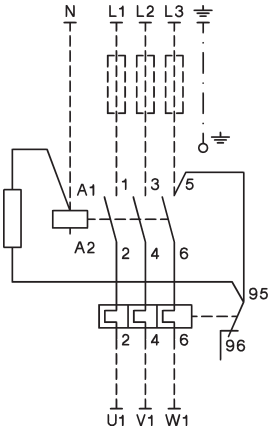
Colour mentioned in wiring diagrams refer to the outgoing connection wire of the device.

Heating Element

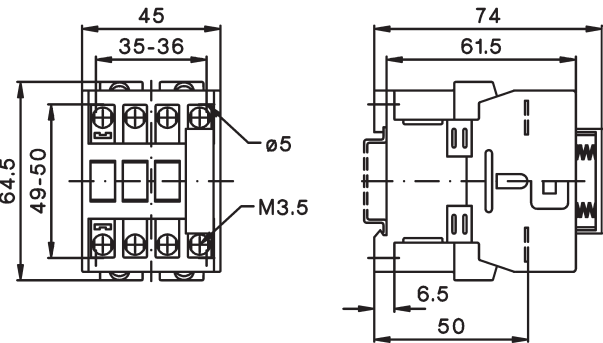
K2-HR



K2-HR 230

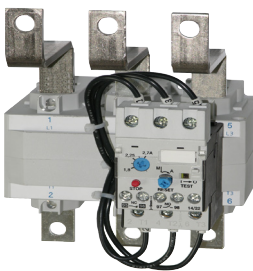


Start Contact LG9319-K3 for K3-10ND10 up to K3-22ND10





Thermal Overload Relays for Direct Mounting120



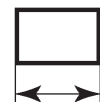
Thermal Overload Relays for Separate Mounting122



Accessories123

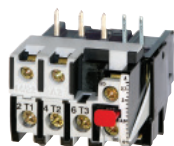


Technical Data125



Dimensions129

Thermal Overload Relays for plug-in mounting



Setting Range
D.O.L. (A) Δ (A)

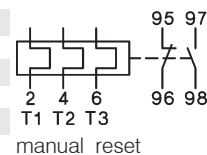
Type

Pack Weight
pcs. kg/pc.

Wiring Diagram

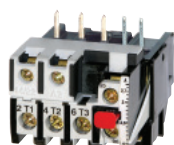
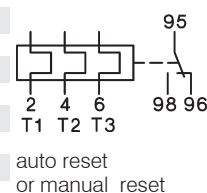
With Manual Reset, for contactors K1-..

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



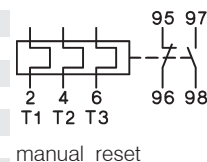
With Auto Reset, for contactors K1-..

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



Setting Range
D.O.L. (A) Δ (A)

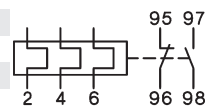
Type

Pack Weight
pcs. kg/pc.

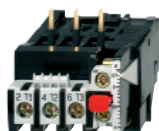
Wiring Diagram

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

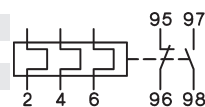


manual reset



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

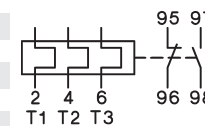


manual reset

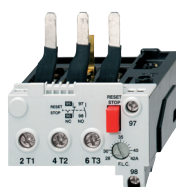


For contactors K(G)3-10.. to K(G)3-40A..

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

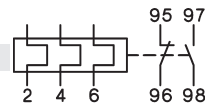


manual and auto reset



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)

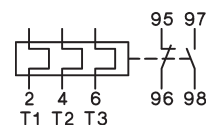
Type

Pack Weight
pcs. kg/pc.

Wiring Diagram

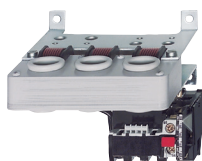
For contactors K3-50A.. to K3-74A..

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)

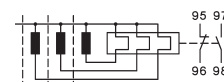
Type

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		

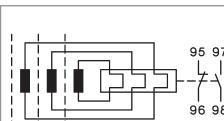


manual reset



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

120 - 180	208 - 312	U180 180	1	1,5
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manual and
auto reset

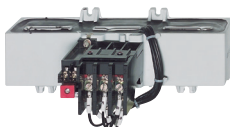


For contactors K3-210.. up to K3-316.., busbars included

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

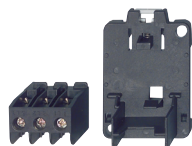
for contactors

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

overload relay

solid or stranded

flexible

Pack pcs. Weight kg/pc.

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

U12/16..K3	0,75 - 6	0,75 - 4	U12SM K3	1	0,035
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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
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for Single Mounting U3/42 or U3/74 Base for DIN-rail mounting

U3/42, U3/74	-	-	U3/42G	1	0,030
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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 ..		s	s	s	s	s	s
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

U3/42		s	s	s	s	s	s
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

U3/74		s	s	s	s	s	s
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

U85 ..		s	s	s	s	s	s
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

U840 ..		s	s	s	s	s	s
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

U12/16E(A) ..		s	s	s	s	s	s
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

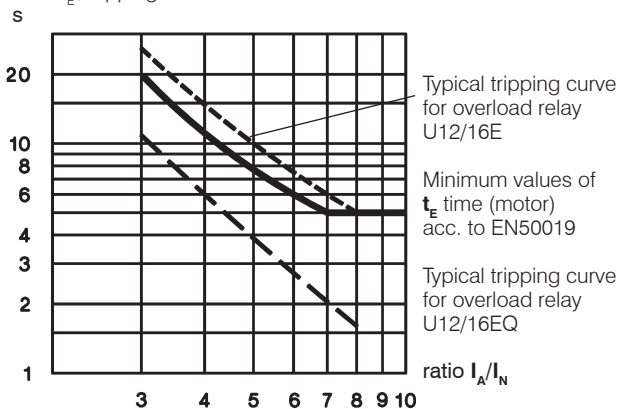
preferably for motors with short t_E time and for submersible pumps

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 ..		s	s	s	s	s	s
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

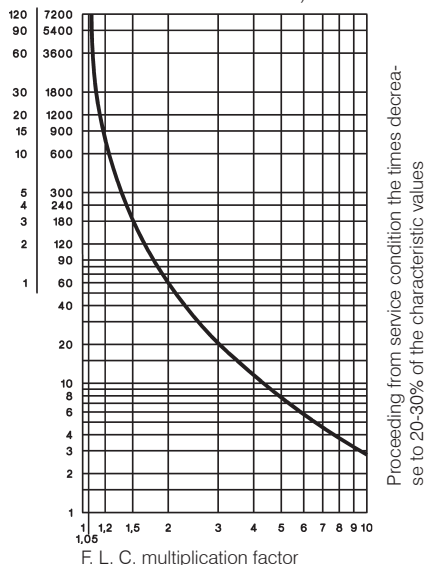
Type	Setting Range				Max. Fuse Size According to Coordination-type				Fuse UL	SCCR	
	DOL	A	Δ	A	"2" 1)		"1" 1)		A	A	kA
					quick	slow, gL(gG)	slow, gL(gG)	aM			
U3/32 (U12/16E)	0,12 -	0,18	-		0,5 ²⁾	0,5 ²⁾	25	-	15	5	
	0,18 -	0,27	-		1,0 ²⁾	1,0 ²⁾	25	-	15	5	
	0,27 -	0,4	-		2	2	25	-	15	5	
	0,4 -	0,6	-		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

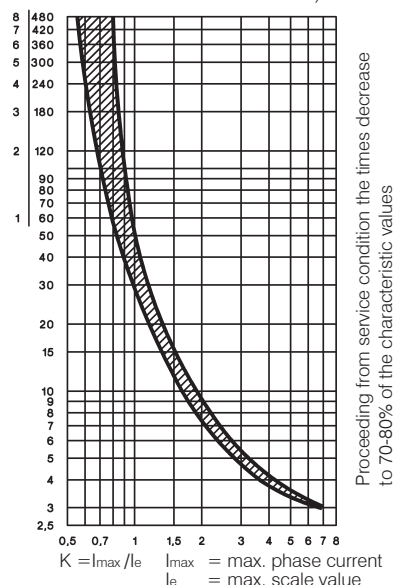
with three-phase load

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

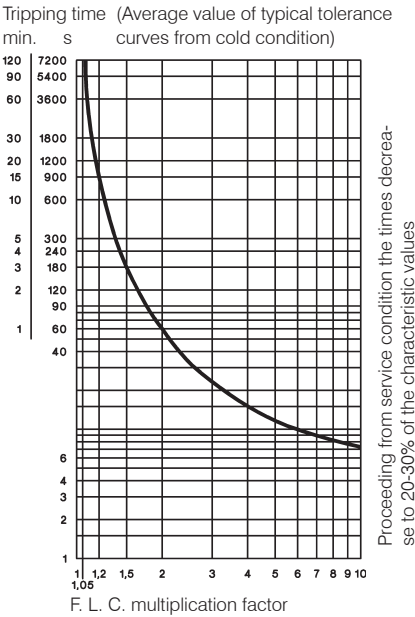
3) Suitable for use on a capability of delivering not more than

Thermal Overload Relays

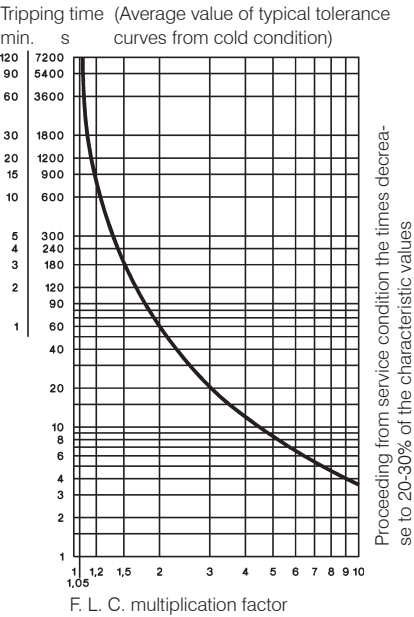
Tripping Characteristics for U85, U180, U320, and U800

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

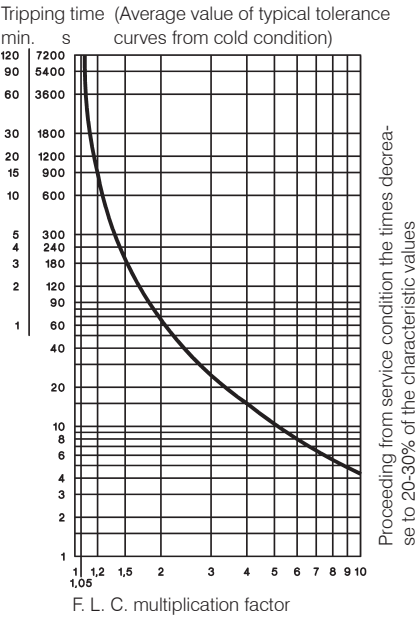
U85 with three-phase load



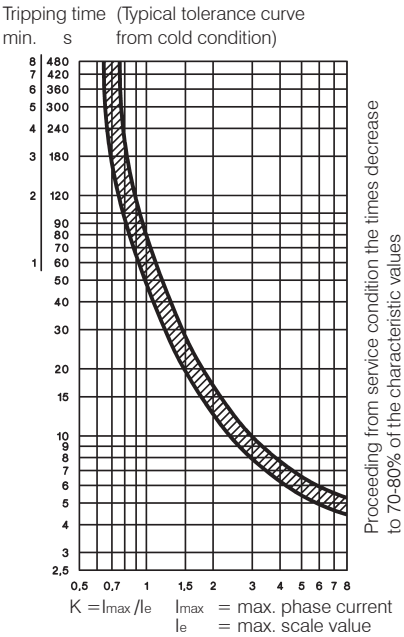
U180, U320 with three-phase load



U800 with three-phase load

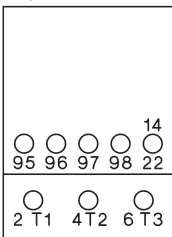


U85 with two-pole load

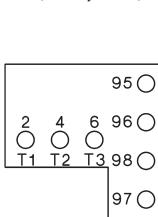


Position of Terminals

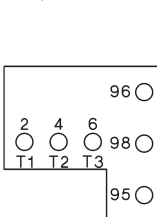
U3/32



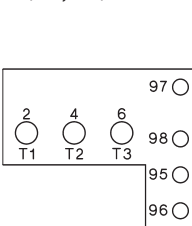
U12/16E, U12/16EM, U12/16EQ



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	"1" ¹⁾ slow, gL(gG) 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

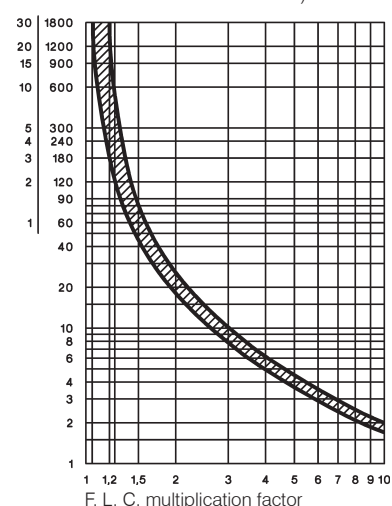
Tripping Characteristic for U12/16EQ

Detailed tripping times for each range see table page 124

with three-phase load

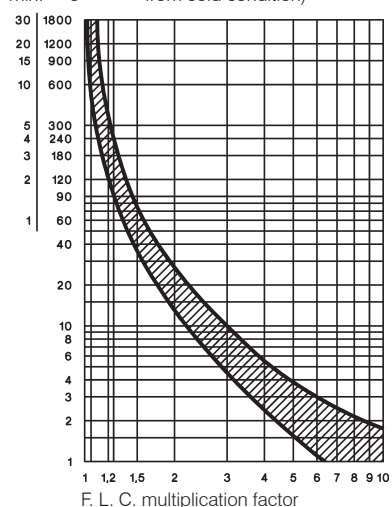
range 0,4-0,6 to 1,8-2,7A

Tripping time (Typical tolerance curve from cold condition)



range 2,7-4 to 10-14A

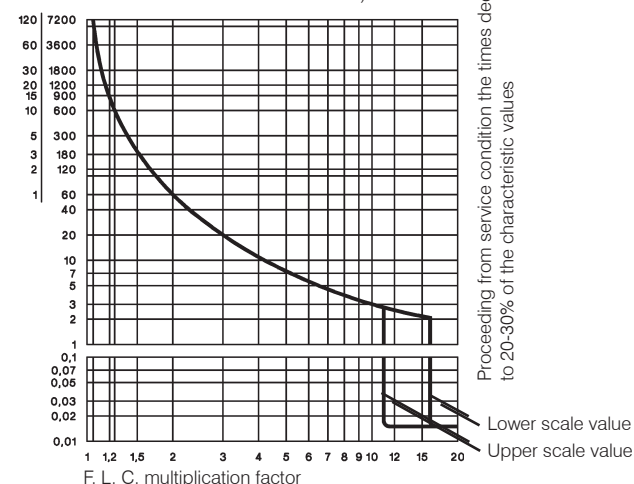
Tripping time (Typical tolerance curve from cold condition)



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_i ¹⁾								
V~	690	690	690	690	750	1000	1000	1000
Permissible ambient temperature								
operation			-25 to +60					-25 to +55
open °C			-50 to +70					-40 to +70
storage °C								
Trip class according to IEC 947-4-1	10A	10A	10A	10A	20	10A	10A	10
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⁾	-	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_i ¹⁾								
same potential V~	690	690	690	690	690	690	690	500
different potential V~	440	-	440	440	250	440	440	500
Utilization category AC15								
Rated operational current I_e 24V A	3	4	5	5	4	5	3	4 ⁵⁾
230V A	2	2,5	3	3	2,5	3	2	2,5
400V A	1	1,5	2	2	1,5	2	1	1,5
690V A	0,5	0,6	0,6	0,6	0,6	0,6	0,5	0,6
Utilization category DC13								
Rated operational current I_e 24V A	1	1,2	1,2	1,2	1,2	1,2	1	1,2
110V A	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15
220V A	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Short circuit prot. (without welding 1kA)								
highest fuse rating gL (gG) A	4	4	6	6	6	6	4	6
Type	U3/32	U12/16	U12/16E	U3/42	U3/42	U3/74	U3/74	U85
Setting range	all	to 23A	22 - 30A	to 28A	28 - 42A	to 52A	52 - 65A	all
Power loss per current path (max.)								
minimum setting value W	1,1	1,1	1,7	1,3	1,3	2,0	2,9	1,1
maximum setting value W	2,3	2,3	3,7	2,6	3,3	3,7	4,5	2,5

Data according to cULus

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

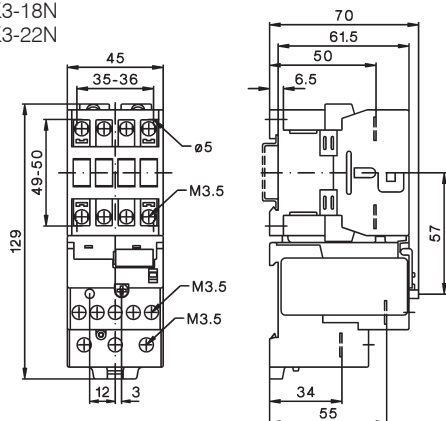
Dimensions

K3-10N + U3/32

K3-14N

K3-18N

K3-22N

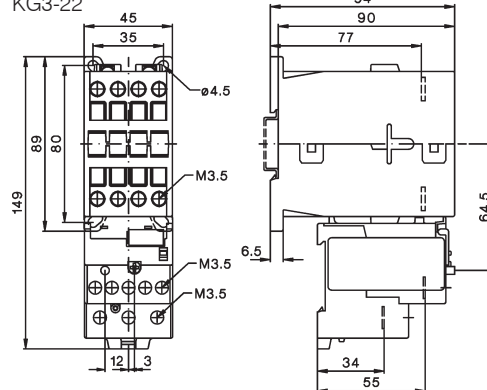


KG3-10 + U3/32

KG3-14

KG3-18

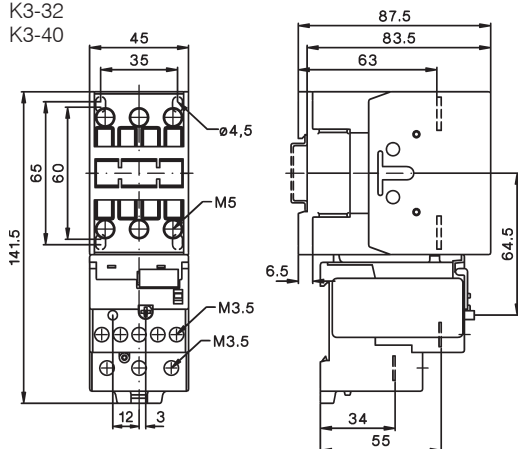
KG3-22



K3-24 + U3/32

K3-32

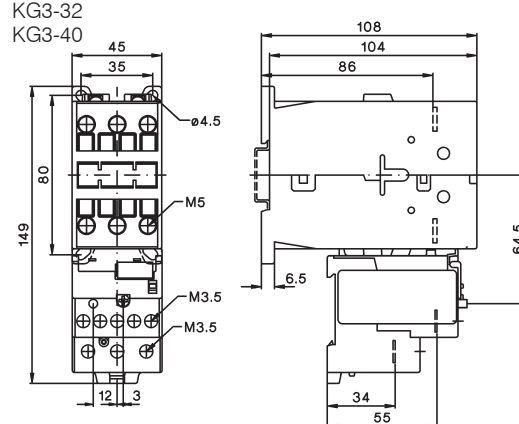
K3-40



KG3-24 + U3/32

KG3-32

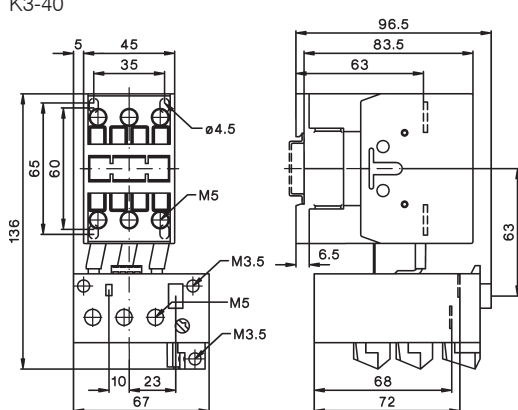
KG3-40



K3-24 + U3/42

K3-32

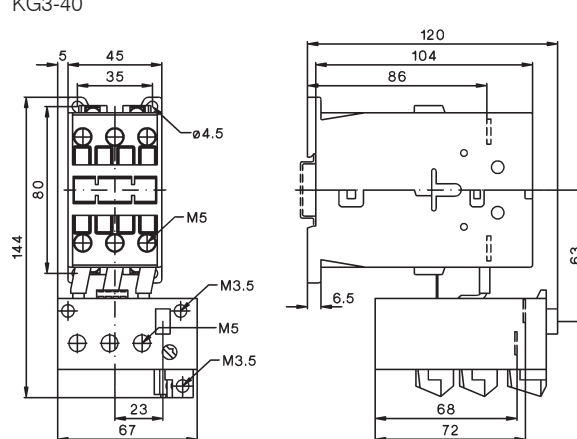
K3-40



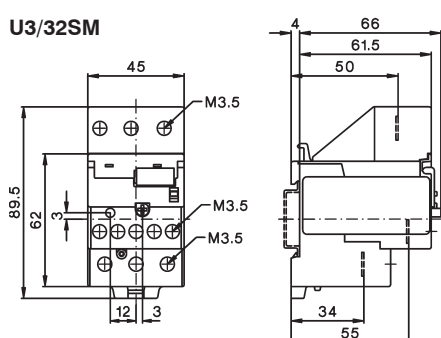
KG3-24 + U3/42

KG3-32

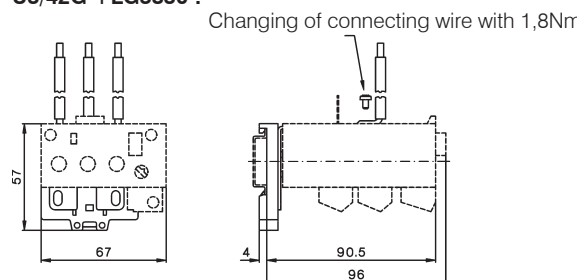
KG3-40



U3/32SM



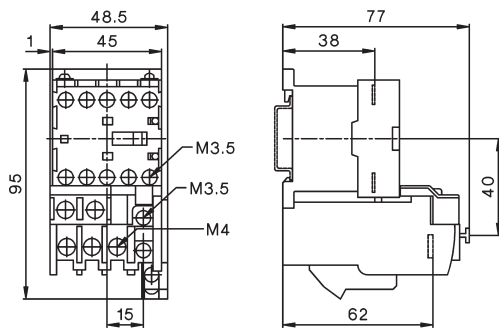
U3/42G + LG5830-



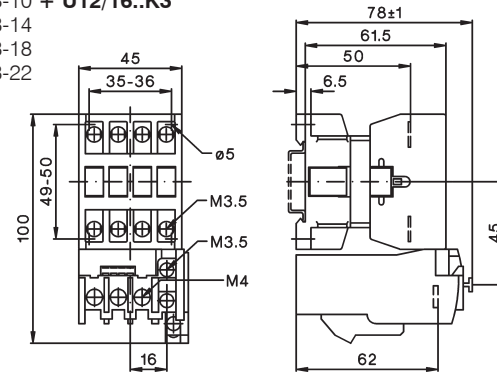
Thermal Overload Relays

Dimensions

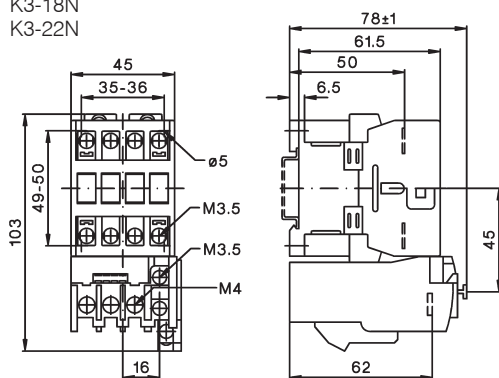
K1-09 + U12/16..K1
K1-12



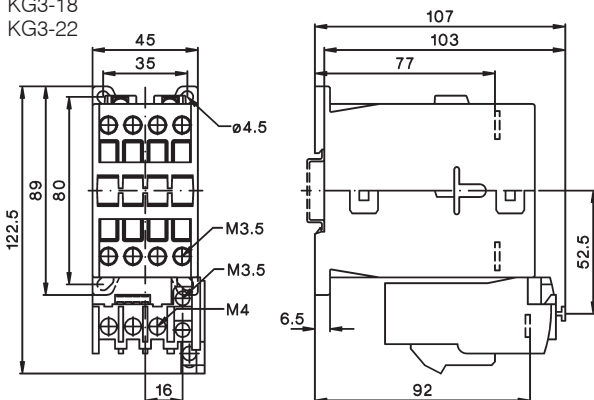
K3-10 + U12/16..K3
K3-14
K3-18
K3-22



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

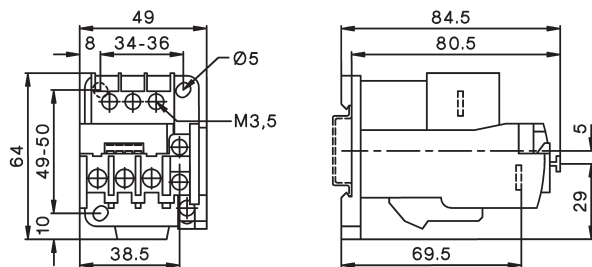


KG3-10 + U12/16..K3
KG3-14
KG3-18
KG3-22

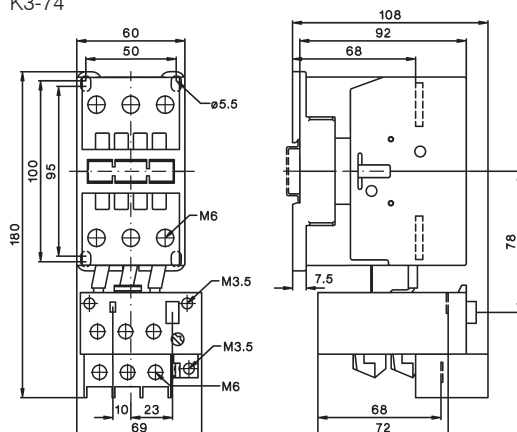


U12SM K3

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



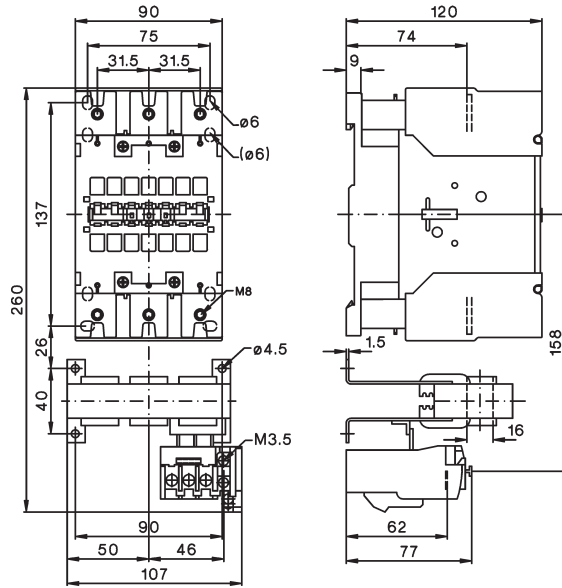
K3-50 + U3/74
K3-62
K3-74



Thermal Overload Relays

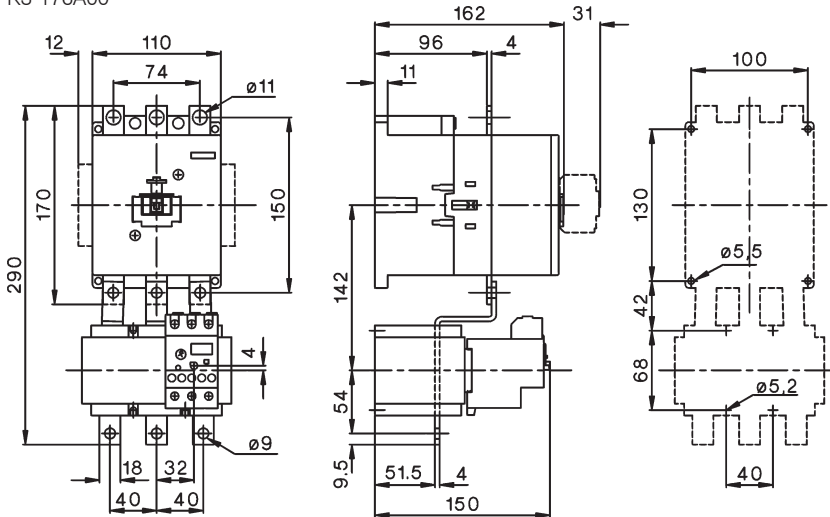
Dimensions

K3-90A + U85
K3-115A



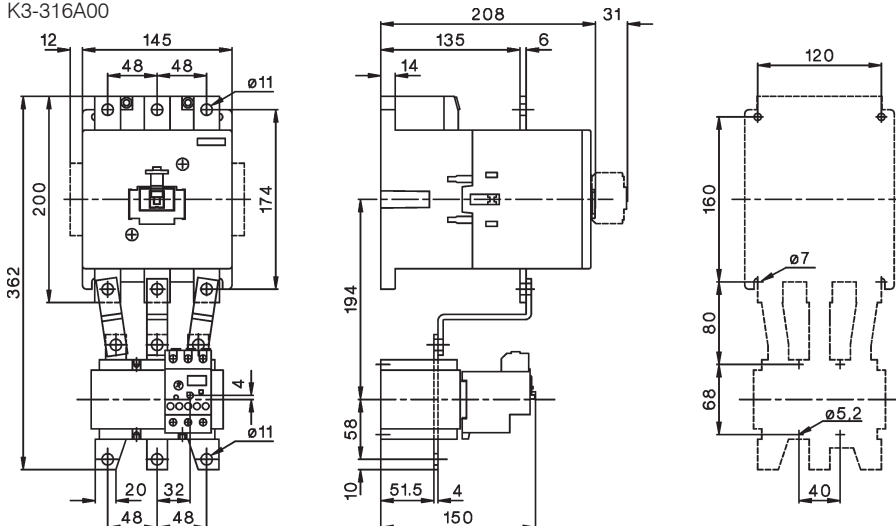
K3-151A00 + U180
K3-176A00

Mounting holes



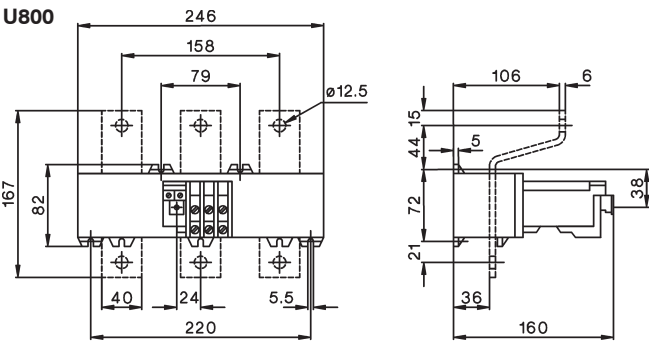
K3-210A00 + U320
K3-260A00
K3-316A00

Mounting holes

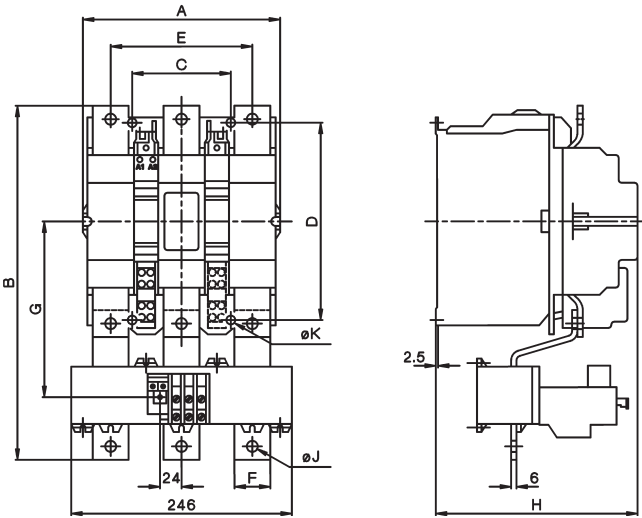


Thermal Overload Relays

Dimensions



U800 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



	Modular Contactors	134
	Auxiliary Contact Block	136
	Accessories	136
	Switching Of Lamps	137
	Technical Data	139
	Dimensions	140

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	230V	400V		24V 50/60Hz	220-240V 50Hz, 230-264V 60Hz			
400V A	kW	kW	↓					

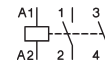
One-pole 1 module (17,5mm), AC-operated (low noise)

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

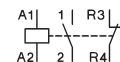


Two-pole 1 module (17,5mm), AC-operated (low noise)

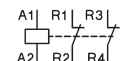
20	4,6	-	R20-20 24	12	0,12
20	4,6	-	R20-20 230	12	0,12



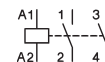
20	4,6	-	R20-11 24	12	0,12
20	4,6	-	R20-11 230	12	0,12



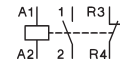
20	4,6	-	R20-02 24	12	0,12
20	4,6	-	R20-02 230	12	0,12



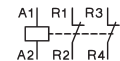
25	5,5	-	R25-20 24	12	0,14
25	5,5	-	R25-20 230	12	0,14



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

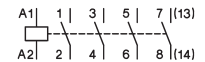


25	5,5	-	R25-02 24	12	0,14
25	5,5	-	R25-02 230	12	0,14

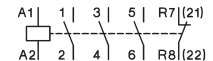


Four-pole 2 modules (35mm) ¹⁾, AC-operated (low noise)

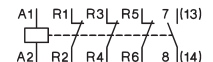
25	5,7	17	R25-40 24	6	0,21
25	5,7	17	R25-40 230	6	0,21



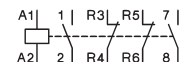
25	5,7	17	R25-31 24	6	0,21
25	5,7	17	R25-31 230	6	0,21



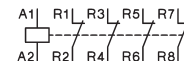
25	5,7	17	R25-13 24	6	0,21
25	5,7	17	R25-13 230	6	0,21



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 Heating Power
Current AC1 at

AC1 1-phase 3-phase
400V 230V 400V
A kW kW

Type

coil voltage

24VM
230VM

24V 50/60Hz, 24V DC
220-240V 50/60Hz, 220V DC

Pack
pcs.

Weight
kg/pc.

Wiring Diagram

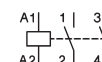
One-pole 1 module (17,5mm), AC/DC-operated (hum free)

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

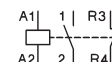


Two-pole 1 module (17,5mm), AC/DC-operated (hum free)

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



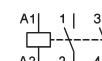
20	4,6	-	R20-11 24VM	12	0,12
20	4,6	-	R20-11 230VM	12	0,12



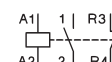
20	4,6	-	R20-02 24VM	12	0,12
20	4,6	-	R20-02 230VM	12	0,12



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

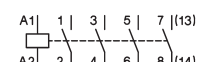


25	5,5	-	R25-02 24VM	12	0,14
25	5,5	-	R25-02 230VM	12	0,14

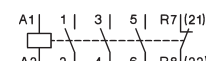


Four-pole 2 modules (35mm) ¹⁾, AC/DC-operated (hum free)

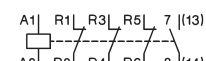
25	5,7	17	R25-40 24VM	6	0,21
25	5,7	17	R25-40 230VM	6	0,21



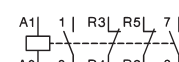
25	5,7	17	R25-31 24VM	6	0,21
25	5,7	17	R25-31 230VM	6	0,21



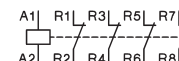
25	5,7	17	R25-13 24VM	6	0,21
25	5,7	17	R25-13 230VM	6	0,21



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)

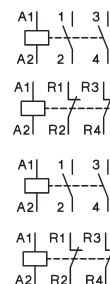
Modular Contactors, low noise

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)



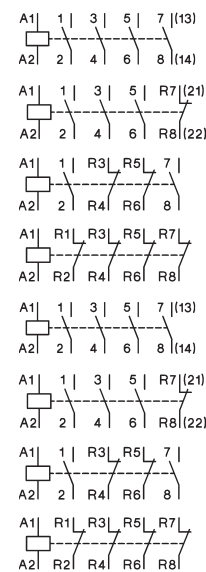
40	9	-	R40-20 24	6	0,23	
40	9	-	R40-20 230	6	0,23	
40	9	-	R40-02 24	6	0,23	
40	9	-	R40-02 230	6	0,23	
63	14,3	-	R63-20 24	6	0,23	
63	14,3	-	R63-20 230	6	0,23	
63	14,3	-	R63-02 24	6	0,23	
63	14,3	-	R63-02 230	6	0,23	



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 ½ module (8,8mm)²⁾ for contactor R25, R40, R63 (4p.) max. 1 piece for contactor R40 and R63 (2p.) max. 1 piece



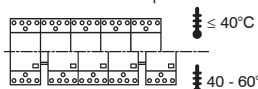
Rated current	AC15	AC1	Type	Pack pcs.	Weight kg/pc.	Wiring Diagram
AC15	230V	400V				
A	A	A	for contactor			
3	2	10	R25 ³⁾ , R40, R63	RH11	3	0,026
3	2	10	R25-...VM (4p.)	RH11-1	3	0,026



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 ½ 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
	85	0,8	5,3	11	14	35	60
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
	85	0,47	-	2 x 10	2 x 11	2 x 30	2 x 40
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
	85	0,6	8	12	16	33	44
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 _{nlamp} 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	
Sodium-vapour lamps (high pressure lamps), compensated (AC5a)	1000	10,3	-	1	1	3	4	
	150	0,83	20	5	7	20	25	
	250	1,5	33	3	4	12	15	
	330	2	40	2	3	10	13	
Sodium-vapour lamps (high pressure lamps) with serial electronic (e. g.: PCI) 50-125 x I _{nlamp} for 0,6ms (AC5a)	400	2,4	48	2	2	8	12	
	1000	6,3	106	1	1	4	6	
	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 cosφ of the lamp

max. inrush current of contactor [A]

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

195A 233A 424A 565A

max. lamps per pole at 230V 50Hz and max. 60°C ($I_{nLED} \leq I_{nV}$)

Modular Contactors

Data according to IEC60 947-4-1, IEC 60947-5-1, VDE 0660-5-1

Type		2-pole R20 (VM) ⁷⁾	R25 (VM) ⁷⁾	R40	R63	4-pole R25 (VM) ⁷⁾	R40	R63	RH11
Main Contacts ^{4) 5) 6)}									
Rated insulation voltage U_i ¹⁾									
	V~	440	440	440	440	440	440	440	440
Rated operation voltage U_e		440	440	440	440	440	440	440	440
Frequency of operations z AC1, AC3		300	300	600	600	300	600	600	600
Mechanical life		1	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		24/100	24/100	24/100	24/100	24/100	24/100	24/100	17/5
Short time current ^{10s-current}		72	72	216	240	72	216	240	-
Power loss per pole at I_e /AC1		2	3	3	7	2	3	7	0,5
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									
	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	-
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	-
	W	2 - 3	2 - 3	-	-	3 - 4	-	-	-
AC and DC-operated		W							
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				40 - 60°C
	enclosed °C				-40 to + 40				
Storage					-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_{sc}"}		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

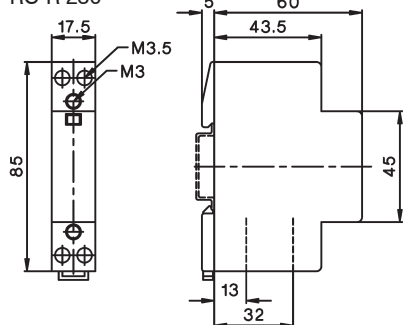
Type		R20	R25 (2p.)	R25 (4p.)	R25-..VM	R40 (2p./4p.)	R63 (2p./4p.)	RH11
Utilization category AC15								
Rated operational current I _e	220-240V A	-	-	3	3	3	3	3
	380-415V A	-	-	2	2	2	2	2
	440V A	-	-	1,6	1,6	1,6	1,6	1,6
Utilization category DC13								
Rated operational current I _e	24-60V A	-	-	2	2	2	2	2
	110V A	-	-	0,4	0,4	0,4	0,4	0,4
per pole	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

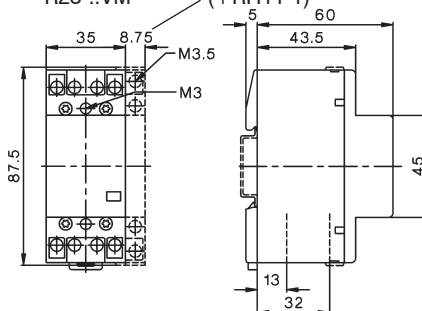
Main Contacts (cULus)	Type	R20	R25 (2p.)	R25 (4p.)	R40 (2p./4p.)	R63 (2p./4p.)	RH11
Rated operational current "General Use"	A	20	25	25	40	63	10
Rated operational power of three-phase motors at 60Hz (3ph)	110-120V hp	-	-	1	2	3	-
	200-208V hp	-	-	2	5	7½	-
	220-240V hp	-	-	3	7½	10	-
	265-277V hp	-	-	3	7½	10	-
Rated operational power of AC motors at 60Hz (1ph)	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

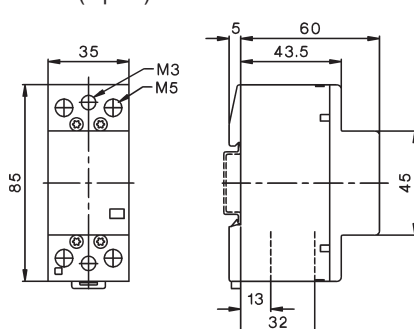
R20-.., R25-.. (2-pole)
RC-R 230



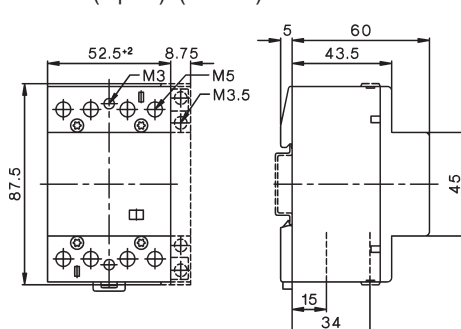
R25-.. (4-pole) (+RH11)
R25-..VM (+RH11-1)



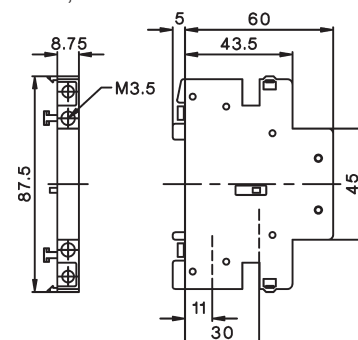
R40-.. (2-pole)
R63-.. (2-pole)



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 Weight
pcs. kg/pcs.

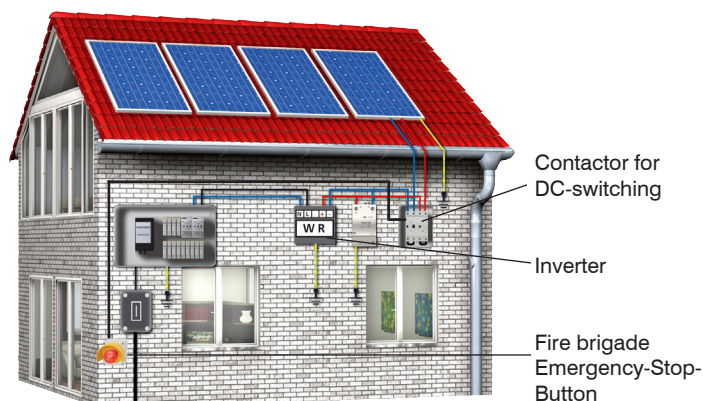
Type

Wiring diagram



20A	-	-	2 HKA11	K3DC-20A00 ...	1	0,5
50A	-	-	+1 HKT.	K3DC-48A00 ...	1	0,5
60A	30A	-	2 HKA11	K3DC-60A00...	1	1,2
80A	60A	-	+1 HKT.	K3DC-80A00 ...	1	1,2
100A	-	-		K3DC-100A00 ...	1	1,8
12A	12A	6A	2 HKA11	K3PV-12A00 ...	1	0,8
			+2 HKT.			
30A	30A	-	2 HKA11	K3PV-30A00 ...	1	0,9
60A	60A	-	+2 HKT.	K3PV-60A00 ...	1	0,9
80A	80A	-	2 HKA11	K3PV-80A00 ...	1	1,5
100A	100A	-	+1 HKT.	K3PV-100A00 ... ^{2) 3)}	1	2,3
150A	150A	-	2 HKA11	K3PV-150A00 ... ^{2) 3)}	1	5
200A	200A	-	+1 HKT.	K3PV-200A00 ... ^{2) 3)}	1	5
240A	240A	-		K3PV-240A00 ... ^{2) 3)}	1	5
300A	300A	-	2 HKA11	K3PV-300A00 ... ^{2) 3)}	1	7,5
400A	400A	-	+1 HKT.	K3PV-400A00 ... ^{2) 3)}	1	7,5
450A	450A	-		K3PV-450A00 ... ^{2) 3)}	1	7,5

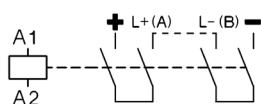
Contactors for DC-Switching for PV-installations, as remote controlled fire protection defeat device



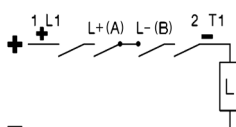
In most Photovoltaic-installations, the switch disconnectors according to IEC 60364-7-712 are integrated in the DC/AC-inverter. So the wires between solar-panels and inverter are continuously under voltage. According to ÖVE-R11-1: 2013, Photovoltaic-installations must have a fire protection defeat device.

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.

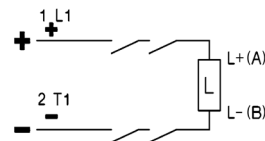
Switch diagram (4 contacts)



Connection diagram 1-pole:
connect L+ (A) and L-(B) (jumper attached)



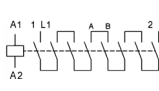
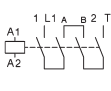
Connection diagram 2-pole:
don't use attached jumper



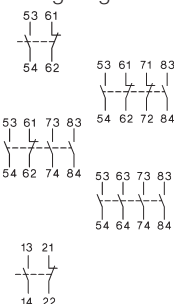
- 1) Other coil voltages from 24 to 600V AC, on request
- 2) Type for AC- and DC-operating: e.g.: 230: 220-240V 50/60Hz and 220V=
- 3) With integrated coil suppressor

Contactors for DC-Switching

DC-operated

Type	Coil voltage ¹⁾ 24 24V = DC		Aux. Contacts additional		Pack pcs.	Weight kg/pcs.	Wiring diagram
			Type				
	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		1	0,95	
	KG3PV-60A00 ... ⁵⁾		+2 HKT.		1	0,95	
	K3PV-80A00= ... ⁵⁾		2 HKA11		1	1,5	
	K3PV-100A00 ... ^{2) 5)}		+1 HKT.		1	2,3	
	K3PV-150A00 ... ^{2) 5)}		2 HKA11		1	5	
	K3PV-200A00 ... ^{2) 5)}		+1 HKT.		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	

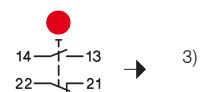
Auxiliary Contact Blocks for contactors K(G)3DC-... and K(G)3PV-..., for low level switching⁴⁾

Rated Operational Current				Type	Pack pcs.	Weight kg/pcs.	Wiring diagrams	
AC15 230V	AC15 400V	AC1 690V	for contactors					
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 BG10P44S3-11 +SK 1 0,22
key operated button Ø40mm,
according to EN418, unlock by key



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 8	600 8	600 8	1000 8	1000 8	600 8	1200 8	1000 8	1000 8	1000 8	1000 8	1000 8	1000 8	1000 8	1000 8	1000 8	1000 8	
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 mOhm	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 mOhm	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	
Mechanical life 10 ⁶	10 IP20											10 IP00 / IP20 ¹⁾			8 IP00 / IP20 ¹⁾			
Protection degree																		
Main poles																		
Cable cross AC mm ² sections DC mm ²	2 x 1,5 - 10 2 x 1,5 - 6			2,5 - 35 2,5 - 35		4 - 35 4 - 50	2x1-2,5 2x1-2,5	2 x 1,5 - 10 2 x 1,5 - 6	2,5-35 2,5-35	4 - 55 4 - 35	Busbar 18 x 4 Screw M8			Busbar 25 x 6 Screw M10				
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			35 - 42				
Mounting	DIN-rail / screws					Screws	DIN-rail / Screws				Screws	Screws			Screws			
Operation range coils U _c	0,85 - 1,1																	
Power consumption of coils																		
AC inrush VA sealed VAW	90 9 / 3			250 18 / 4			180 18 / 6			250 18 / 4		350 5 / 5			360 6 / 6			
DC inrush W sealed W	5,5	5	5	230 4			11 11			230 4		350 5			360 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



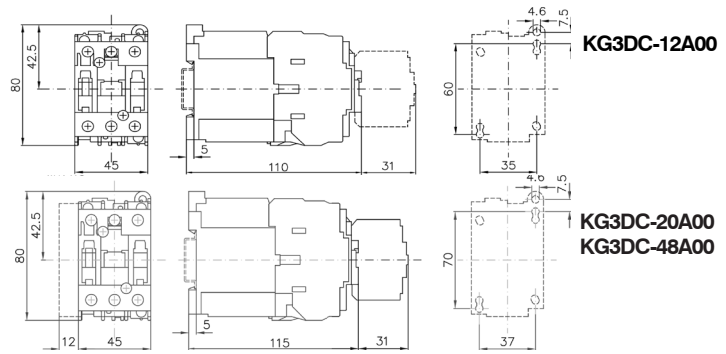
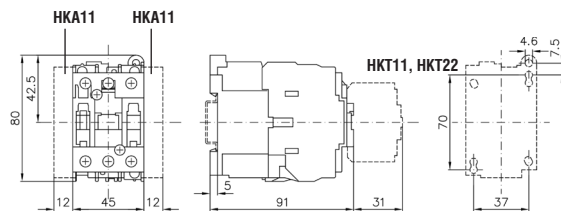
Type		K(G)3DC- 12.. 20.. 48..			K3DC- 60.. 80..		K3PV- 80..	K3PV- 150..	200..	240..	K3PV- 300..	400..	450..
General Use I _b [A]	600V DC	12	20	40	60	80	80	130	160	200	300	330	360
	1000V DC	-	-	-	30	60	80	130	160	200	300	330	360
Motor Control I _b [A]	220-240V DC	-	12	20	38	55	72	89	106	140	173	206	255
	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

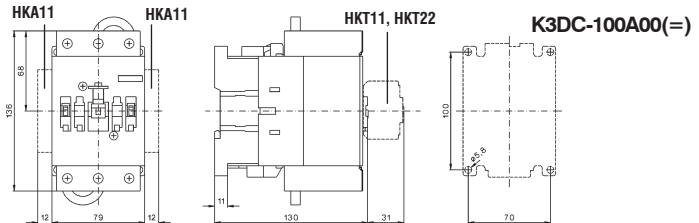
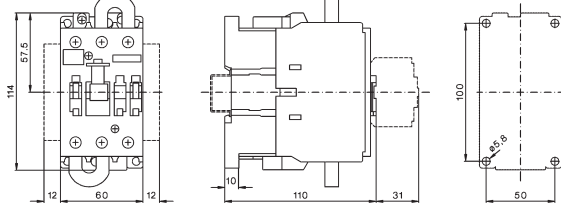
2) > 40° ... 1% / °C de-rating (eg. at 60°C 20% de-rating)

Dimensions

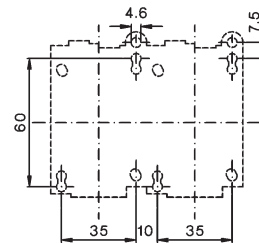
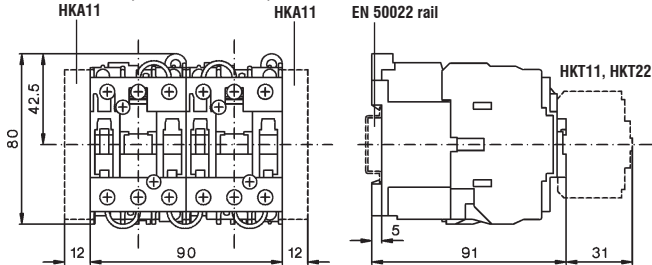
K3DC-20A00, K3DC-48A00



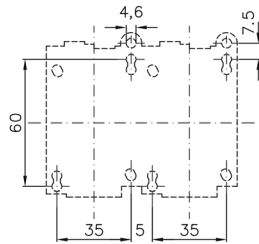
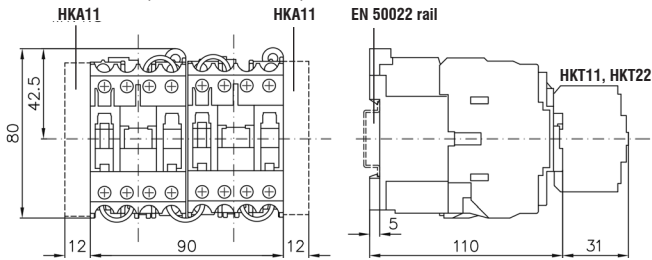
K3DC-60A00(=), K3DC-80A00(=)



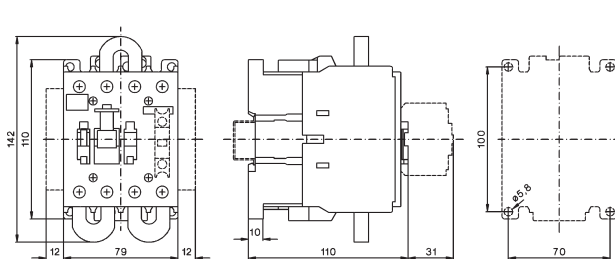
K3PV-12A00, K3PV-30A00, K3PV-60A00



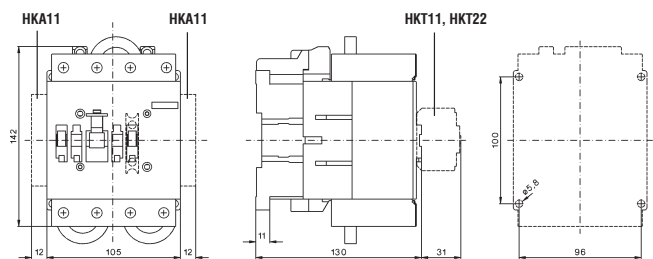
KG3PV-12A00, KG3PV-30A00, KG3PV-60A00



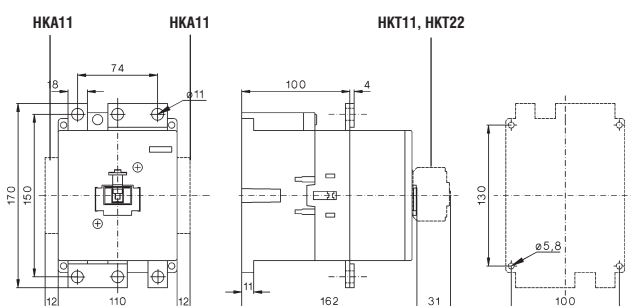
K3PV-80A00(=)



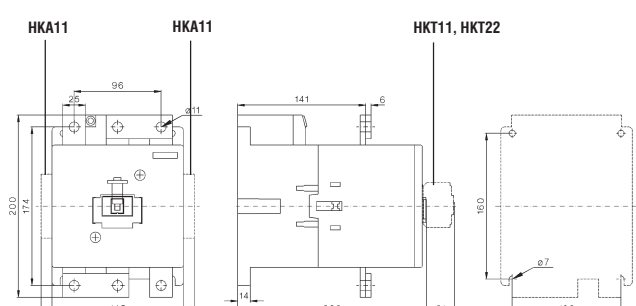
K3PV-100A00(=)

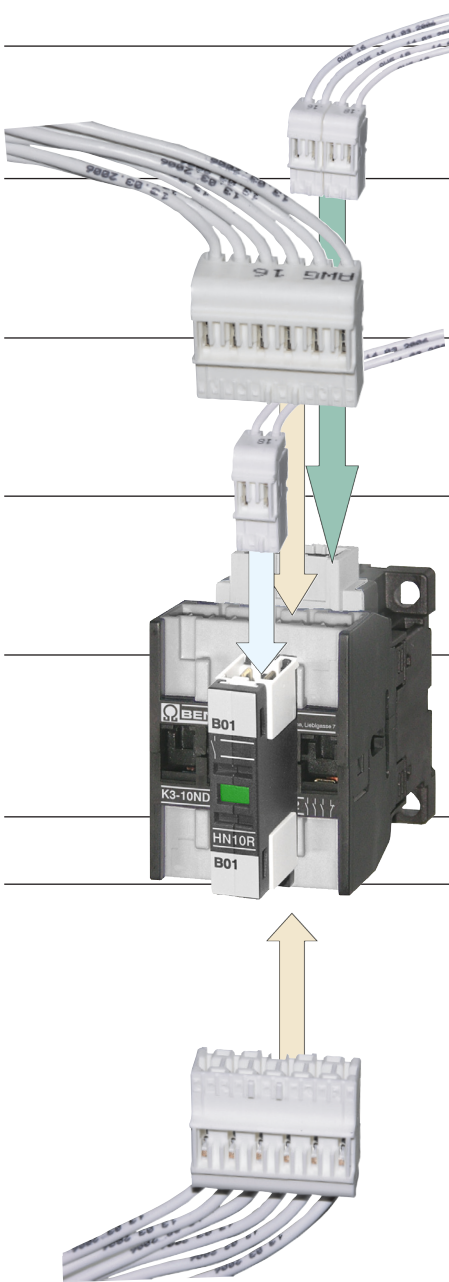


K3PV-150A00(=), K3PV-200A00(=), K3PV-240A00(=)



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



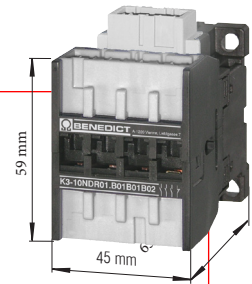
	Contactors RAST 5	147
	Contactor Relays	147
	Contactors	147
	Accessories	147
	Auxilliary Contact Blocks	147
	Combinations	148
	Contactors for Fuseless Load Feeder	148
	Contactors for Overload Relays	148
	Industry Standard RAST 5	
	Contactor-Housing	149
	Coil-Housing	150
	Auxilliary Contact Block-Housing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

RAST 5 - exclusiv for OEM-Partner

5 mm pitch connector system

Advantages RAST 5 - Technology

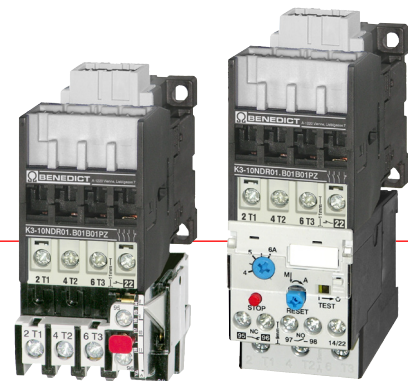
- Time saving installation
- Easy assembly without tools
- Tailor-made sockets, custom - designed codes
- Ambient temperatures up to +90°C/194°F
- Smallest sizes
- Plug technology up to 32 A / 415 V
- color coding for power ratings
- color coding for coil voltages



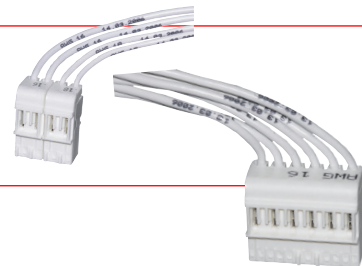
RAST 5 - Accessories



Combining switchgears with plug-in connections and screw connections



Contactors are available for plugs of many different producers



Contactors, RAST 5

AC operated

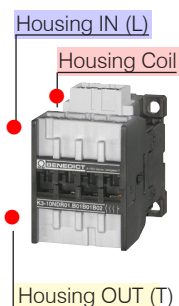
	Ratings AC2, AC3			Rated- Current	Auxilliary Contacts built in		Auxilliary Contacts snap on	Type	Coil Voltage	Code Housing Coil	Code Housing IN (L)	Code Housing OUT (T)	Pack pcs.	Weight kg/pc.
	380V	220V			NO	NC								
	400V	230V		AC1										
	415V	230V	240V	415V			HN10R..							
	kW	kW	kW	A										
● 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		I_{th}	Contacts		Type						Pack pcs.	Weight kg/pc.
		230V	A		NO	NC								
	K3-..R..	3		10	1	-	HN10R						10	0,02
	K3-..R..	3		10	-	1	HN01R						10	0,02

Order Example for Contactors:

Contactor	Coil Voltage		Code Housing Coil ... see page 152, 152, 154, 156	Code Housing IN (L)... see page 149, 151, 153, 155	Code Housing OUT (T)... see page 149, 151, 153, 155
	K3-14NDR10	230			
			B01B02B01		



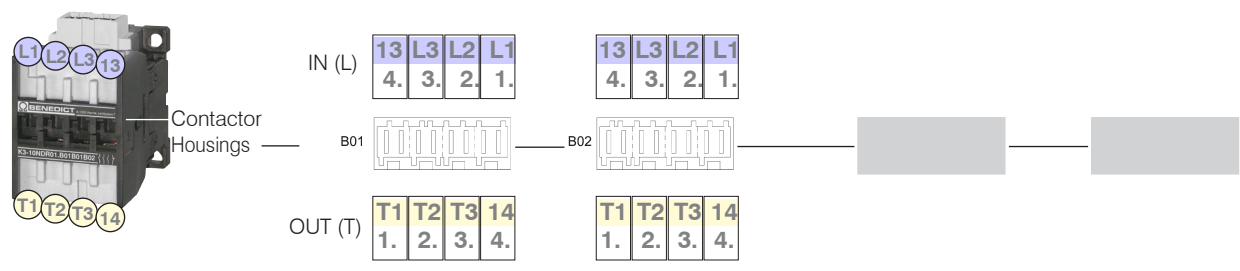
Technical data are subject to change without notice

Contactors, RAST 5 Combinations

AC operated

Motor				Type	Coil Voltage	Code Housing Coil	Code Housing IN (L)	Screw Connection OUT (T)	Pack pcs.	Weight kg/pcs.
AC2, AC3										
380V	AC3									
400V	400V		for							
415V	415V		Overload Relays							
kW	A		U12/16E.. and U3/32...							
● 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 Contactor-Housings for Standard plugs acc. **Industry Standard RAST 5**



Code Contactor-Housings — **B01** — **B02** — **B03** — **B04** further housings on request →

Standard plugs acc. Industry Standard RAST 5



Order Example for Contactors:

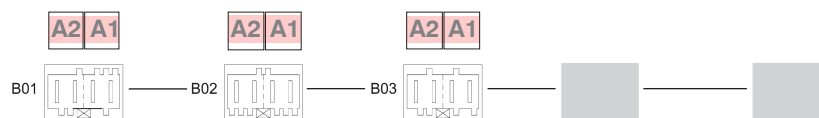
Contactor	Coil Voltage	Code Housing Coil ...see page 150, 152, 154, 156	Code Housing IN (L)... see page 149, 151, 153, 155	Code Housing OUT (T)...see page 149, 151, 153, 155
K3-14NR10	230	B01	B02	B01

8-pole				
6-pole left				
6-pole right				
4-pole left		-0A-		
4-pole right		-0B-		-0B-
2-pole left		-0I-		-0I-
		-0L-		-0L-
		-0O-		-0O-
		-0Q-		-0Q-
2-pole center left		-0A-		
		-0C-		
		-0K-		-0K-
		-0O-		
		-0Q-		
2-pole center right				-0B-
				-0F-
		-0K-		
		-0L-		-0L-
2-pole right		-0B-		
		-0F-		
		-0I-		-0I-
		-0L-		-0L-

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



Coil-Housings



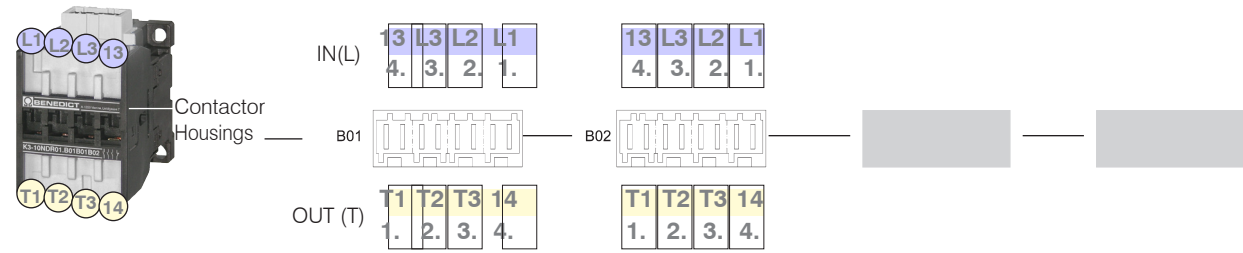
Code Coil-Housings

Standard plugs
acc.
Industry Standard RAST 5



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

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



Code Contactor-Housings	B01	B02	B03	B04 further housings on request
Standard plugs acc. System Stocko RAST 5 	8-pole 			
	6-pole left 			
	6-pole right 			
	4-pole left 			
	4-pole right 			
	2-pole see... Industry Standard RAST 5			

Order Example for Contactors:

Contactor
 Coil Voltage
 Code Housing Coil ...see page 150, 152, 154, 156
 Code Housing IN (L)... see page 149, 151, 153, 155
 Code Housing OUT (T)...see page 149, 151, 153, 155

K3-14NR10_230_B01 B02 B01

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



Coil-Housings –



B01



B02



B03



B01



B02



B03

Code Coil-Housings

Standard plugs
acc.

System Stocko RAST 5



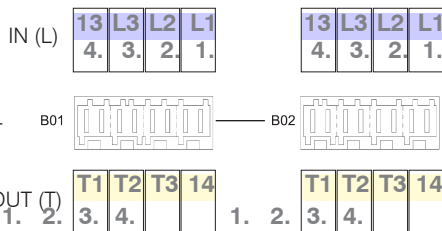
	B01	B02	B03	B01	B02	B03
4-pole	-42-	-64-			-02-	-02-
	-78-	-78-	-78-		-04-	-03-
	-79-		-79-			-18-
3-pole right			-01-	-19-		
			-05-	-21-		
			-12-			-28-
		-16-	-30-	-47-	-52-	-52-
			-32-		-53-	
	-33-		-35-		-66-	-64-
	-36-	-40-	-44-	-71-	-74-	-73-
			-48-		-75-	-75-
	-49-					
	-51-					
	-72-	-72-	-72-			
		-75-	-75-			
3-pole left						
2-pole center						

see... Industry Standard RAST 5

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



Order Example for
Contactors:

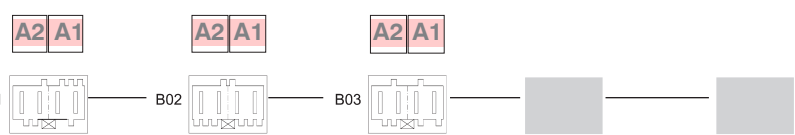
Contactor	Coil Voltage	Code Housing Coil ...see page 150, 152, 154, 156	Code Housing IN (L)... see page 149, 151, 153, 155	Code Housing OUT (T)... see page 149, 151, 153, 155
K3-14NR10	230	B01	B02	B01

8-pole					
6-pole left		928151-6			
		2-928344-6			
6-pole right					
4-pole left		928344-4			
				4-928344-4	
4-pole right					
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			928343-2

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



Coil
Housings – B01



A2 A1 A2 A1 A2 A1

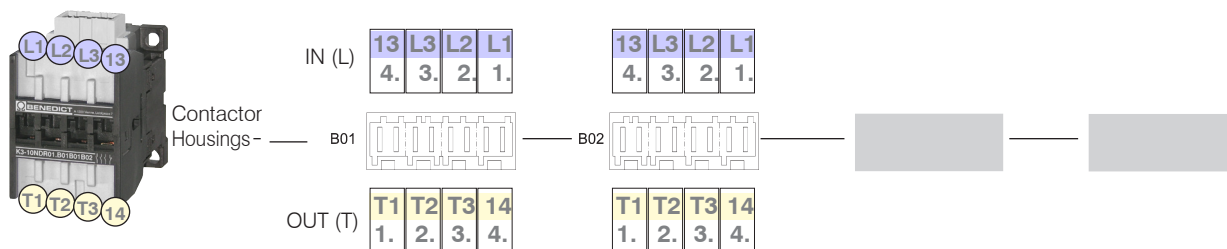
B01 B02 B03

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

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				
8-pole				
6-pole left				
6-pole right				
4-pole left				
4-pole right				
2-pole left				
2-pole center left				
2-pole center right				
2-pole right				

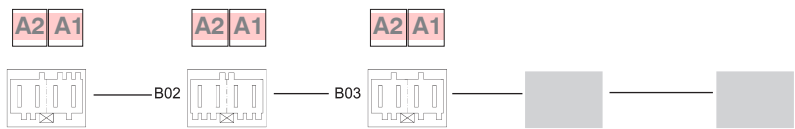
Order Example for Contactors:

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**



Coil
Housings – B01



Code Coil-Housings	B01	B02	B03	B04	B05	further housings on request
4-pole						
3-pole left						
3-pole right						
2-pole center						

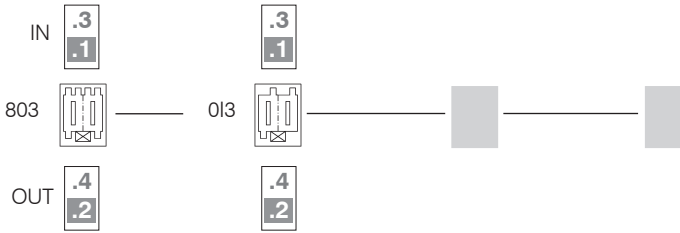
Standard plugs
acc.
System Lumberg RAST 5



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



2-pole

803

013

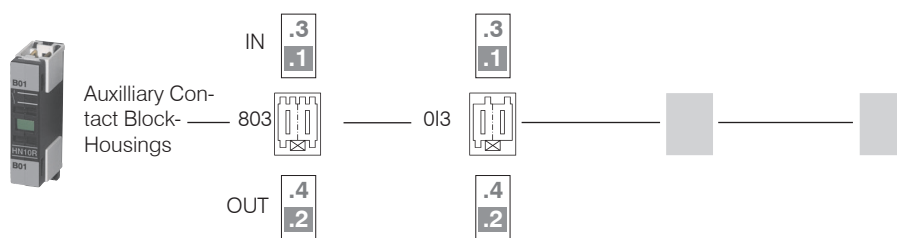
further housings on request →

- 0A-
- 0B-
- 0C-
- 0D-
- 0E-
- 0F-
- 0G-
- 0H-
- 0I-
- 0K-
- 0L-
- 0M-
- 0N-
- 0O-
- 0P-
- 0Q-
- 80-

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 Stocko RAST 5**



Code Auxilliary-Contact Block-Housings

Standard plugs
acc.
System Stocko RAST 5



803	013	further housings on request
2-pole		
-0A-		
-0B-		
-0C-		
-0D-		
-0E-		
-0F-		
-0G-		
-0H-		
-0I-	-0I-	
-0K-		
-0L-	-0L-	
-0M-		
-0N-		
-0O-		
-0P-		
-0Q-		
-80-		

Order Example for
Aux. Contact Blocks:

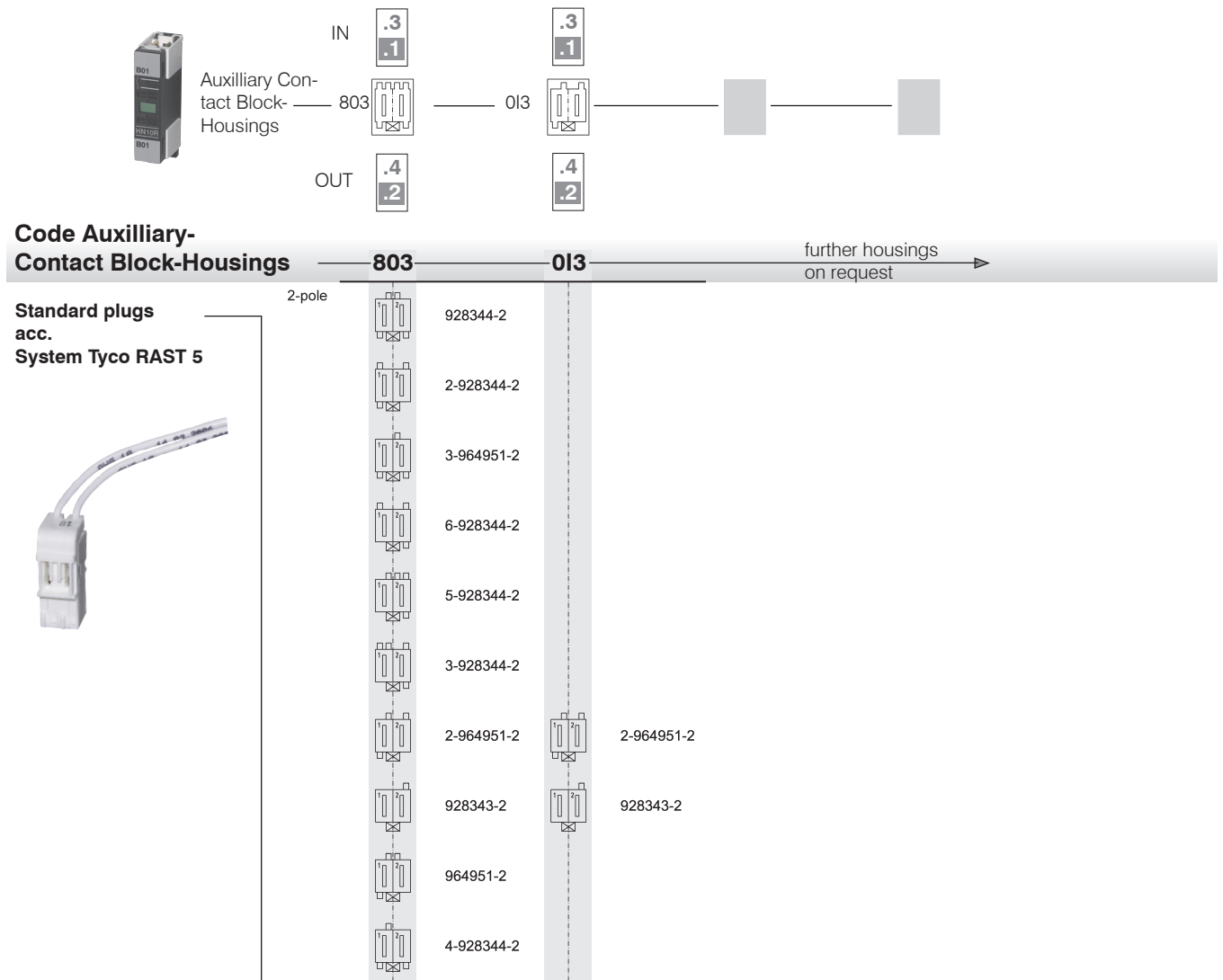
-Auxiliary Contact Block

-Code Aux. Block Housing IN (1, 3)

-Code Aux. Block Housing OUT (2, 4)

HN10R 803013

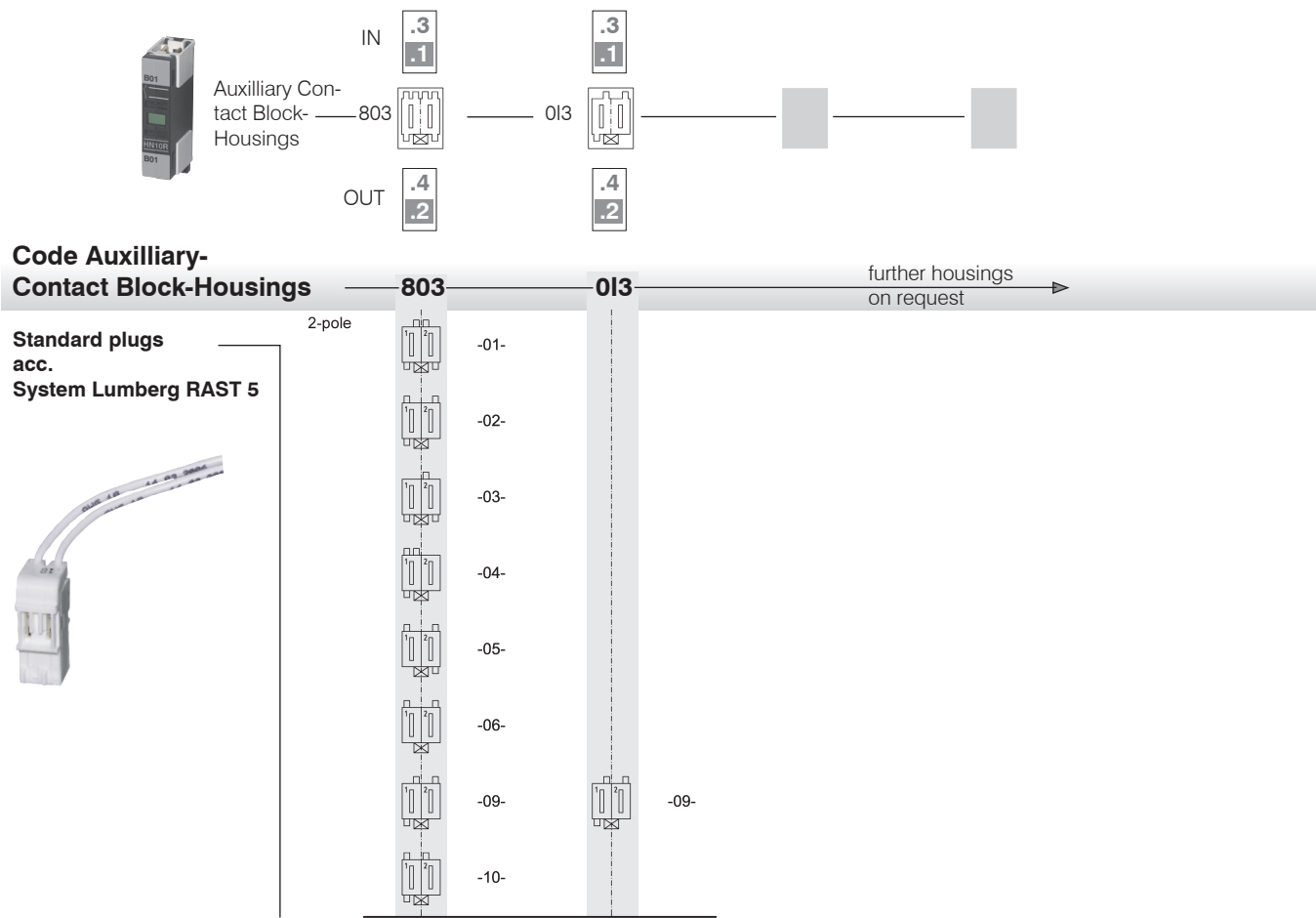
Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **System Tyco RAST 5**



Order Example for
Aux. Contact Blocks:

—Auxiliary Contact Block
—Code Aux. Block Housing IN (**.1**,**.3**)
—Code Aux. Block Housing OUT (**.2**,**.4**)
HN10R-803013

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



Order Example for
Aux. Contact Blocks:

HN10R 803013

-Auxiliary Contact Block

-Code Aux. Block Housing IN (1,3)

-Code Aux. Block Housing OUT (2,4)

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
at 40°C, open							
Rated operation power	220V	kW	-	9,5	9,5	12,2	12,2
of three-phase resistive loads	230V	kW	-	9,9	9,9	12,7	12,7
50-60Hz, $\cos\varphi = 1$	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
at 60°C, enclosed							
Rated operational power	220V	kW	-	9,5	9,5	12,2	12,2
of three-phase resistive loads	230V	kW	-	9,9	9,9	12,7	12,7
50-60Hz, $\cos\varphi = 1$	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	220V	A	-	12	15	18	22
open and enclosed	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	220-230V	kW	-	3	4	5	6
of three-phase motors	240V	kW	-	3	4	5	7
50-60Hz	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⁾ -40 up to +40 -25 up to +60 -25 up to +40 -50 up to +90					
	enclosed	°C						
with thermal overload relay	open	°C						
	enclosed	°C						
Storage		°C						
Short circuit protection without thermal O/L relay								
Rated short circuit current	„I _r “ „I _q “	kA kA	1 -	3 -	3 -	3 -	3 -	
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	
Coordination-Type “2” acc. to IEC 947-4-1, light Contact welding accepted								
max. fuse size	gL (gG)	A		25	35	35	35	
Contact welding not accepted								
max. fuse size	gL (gG)	A		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	
	AC3, I _e	1/h		600	600	600	600	
	AC4, I _e	1/h		120	120	120	120	
	DC3, I _e	1/h		600	600	600	600	
Mechanical life								
AC-operated		S x 10 ⁶	10	10	10	10	10	
DC-operated		S x 10 ⁶	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 at 60Hz					
Rated operational current 415V	A	10	14	18	22
Rated operational power 110-120V	hp	½	¾	1	1½
of AC motor at 60Hz (1ph) 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 V	5000 415	5000 415	5000 415	5000 415
Auxilliary Contacts (cULus)		A300	A300	A300	A300

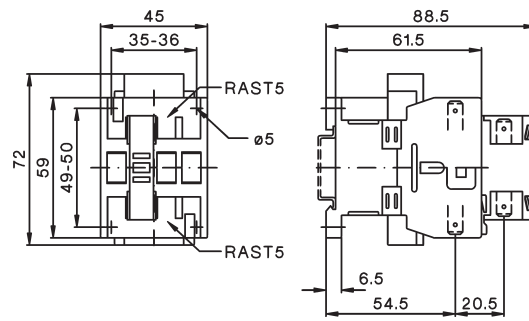
Accessories

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

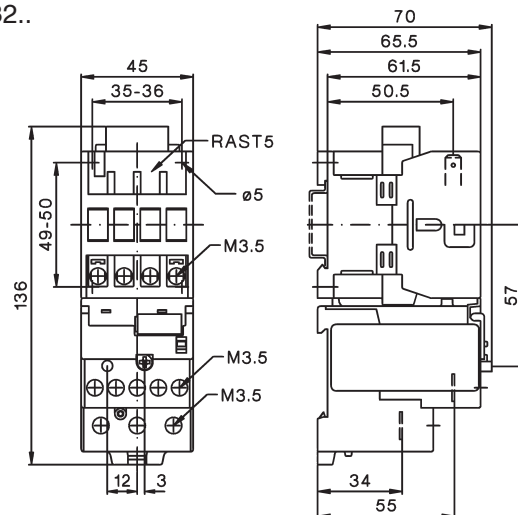
Auxilliary Contacts	Type	HN10R	HN01R
Rated insulation voltage U_i	V~	415	415
Thermal rated current I_{th} up to 415V			
Ambient temperature max. 40°C	A	10	10
max. 60°C	A	6	6
Frequency of operations z	1/h	3000	3000
Mechanical life	S x 10 ⁶	10	10
Power loss per pole at I_g /AC1	W	0,5	0,5
Utilization category AC15			
Rated operational 220-240V	A	3	3
betriebsstrom I_g 380-415V	A	2	2
Utilization category DC13			
Bemessungs- 60V	A	2	2
current I_g 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	A	10	10
„General Use“			
Rated operational voltage max.	V~	300	300
Auxiliary Contacts		A300	A300

Dimensions

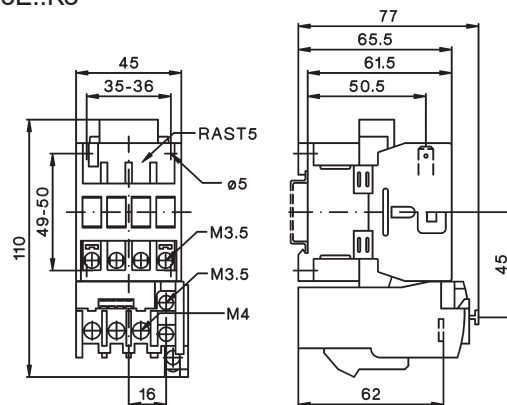
K3-..NDR.. +HN..R



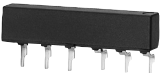
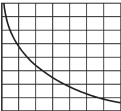
K3-..NDR.....PZ + U3/32..



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



Technical data are subject to change without notice

Index		Page
	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 Link modules	169
	Technical Data	171
	Characteristics Installation Accessories	176 178
	Dimensions	182

Circuit Breakers M4 for Motor Control

	Rated Current I_n A	Suitable for motors ¹⁾ 3~400V kW	Setting range Thermal Overload Release A	Instantaneous Short Circuit Release A	Short Circuit Breaking Capacity at 3~400V kA (I_{cu})	Type	Pack pcs.	Weight approx. kg/pc.
Circuit Breaker M4-32T-..								
 switch type	0,16	-	0,10 – 0,16	2,1	100	M4-32T-0,16	1	0,32
	0,25	0,06	0,16 – 0,25	3,3	100	M4-32T-0,25	1	0,32
	0,4	0,09	0,25 – 0,4	5,2	100	M4-32T-0,4	1	0,32
	0,63	0,18	0,4 – 0,63	8,2	100	M4-32T-0,63	1	0,32
	1	0,25	0,63 – 1	13	100	M4-32T-1	1	0,32
	1,6	0,55	1 – 1,6	20,8	100	M4-32T-1,6	1	0,32
	2,5	0,75	1,6 – 2,5	32,5	100	M4-32T-2,5	1	0,32
	4	1,5	2,5 – 4	52	100	M4-32T-4	1	0,32
	6	2,2	4 – 6	78	100	M4-32T-6	1	0,32
	8	3	5 – 8	104	100	M4-32T-8	1	0,32
	10	4	6 – 10	130	50	M4-32T-10	1	0,32
	13	5,5	9 – 13	169	50	M4-32T-13	1	0,32
	17	7,5	11 – 17	221	20	M4-32T-17	1	0,32
	22	7,5	14 – 22	286	15	M4-32T-22	1	0,32
	26	11	18 – 26	338	15	M4-32T-26	1	0,32
	32	15	22 – 32	416	15	M4-32T-32	1	0,32
	40	18,5	28 – 40	520	10	M4-32T-40	1	0,32

Circuit Breaker M4-32R-..								
 rotary type	0,16	-	0,10 – 0,16	2,1	100	M4-32R-0,16	1	0,36
	0,25	0,06	0,16 – 0,25	3,3	100	M4-32R-0,25	1	0,36
	0,4	0,09	0,25 – 0,4	5,2	100	M4-32R-0,4	1	0,36
	0,63	0,18	0,4 – 0,63	8,2	100	M4-32R-0,63	1	0,36
	1	0,25	0,63 – 1	13	100	M4-32R-1	1	0,36
	1,6	0,55	1 – 1,6	20,8	100	M4-32R-1,6	1	0,36
	2,5	0,75	1,6 – 2,5	32,5	100	M4-32R-2,5	1	0,36
	4	1,5	2,5 – 4	52	100	M4-32R-4	1	0,36
	6	2,2	4 – 6	78	100	M4-32R-6	1	0,36
	8	3	5 – 8	104	100	M4-32R-8	1	0,36
	10	4	6 – 10	130	100	M4-32R-10	1	0,36
	13	5,5	9 – 13	169	100	M4-32R-13	1	0,36
	17	7,5	11 – 17	221	50	M4-32R-17	1	0,36
	22	7,5	14 – 22	286	50	M4-32R-22	1	0,36
	26	11	18 – 26	338	50	M4-32R-26	1	0,36
	32	15	22 – 32	416	50	M4-32R-32	1	0,36
	40	18,5	28 – 40	520	40	M4-32R-40	1	0,36

Circuit Breaker M4-63R-..								
 rotary type	26	12,5	18 – 26	338	50	M4-63R-26	1	1,0
	32	15	22 – 32	416	50	M4-63R-32	1	1,0
	40	18,5	28 – 40	520	50	M4-63R-40	1	1,0
	50	22	34 – 50	650	50	M4-63R-50	1	1,0
	63	30	45 – 63	819	50	M4-63R-63	1	1,0

Circuit Breaker M4-100R-..								
 rotary type	63	30	45 – 63	819	50	M4-100R-63	1	2,2
	75	37	55 – 75	975	50	M4-100R-75	1	2,2
	90	45	70 – 90	1170	50	M4-100R-90	1	2,2
	100	-	80 – 100	1300	50	M4-100R-100	1	2,2

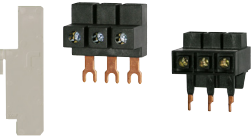
1) Approximate values of standard motors

Accessories

Contacts		Rated Operational Current			Type	Pack pcs.	Weight approx. kgpc		
NO	NC	AC15 24V A	240V A	AC1 240V A					
Transverse Auxiliary Contact Block, max. 1 pc. per circuit-breaker ¹⁾									
	1	1	3	2	5	M4 HQ11	1	0,02	
	2	-	3	2	5	M4 HQ20	1	0,02	
	-	2	3	2	5	M4 HQ02	1	0,02	
Auxiliary Contact Block for left hand side mounting, 1 or 2 pcs. per circuit-breaker ¹⁾									
	1	1	6	4	10	M4 HS11	1	0,03	
	2	-	6	4	10	M4 HS20	1	0,03	
	-	2	6	4	10	M4 HS02	1	0,03	
Alarm Switch (any tripping) for left hand side mounting, max. 1 pc. per circuit-breaker ¹⁾									
	1	1	for M4-32T, -32R	6	4	10	M4 MA11	1	0,04
	1	1	for M4-63R, -100R	6	4	10	M4 MA11 63	1	0,04
Alarm Switch (short circuit) for left hand side mounting, max. 1 pc. per circuit-breaker ¹⁾									
	1	1		6	4	10	M4 M11	1	0,04
Operates in case of short circuit accidents that is over 20 times of the rated current of the circuit breaker.									
Undervoltage Releases for right hand side mounting, max. 1 pc. per circuit-breaker ¹⁾									
	Trips the circuit-breaker when the voltage is interrupted. Prevents the motor from being restarted accidentally when the voltage is restored, suitable for EMERGENCY STOP acc. to IEC 60204								
	24V 50Hz, 28V 60Hz					M4 U24	1	0,11	
	110-127V 50Hz, 120V 60Hz					M4 U110	1	0,11	
	220-230V 50Hz, 240-260V 60Hz					M4 U230	1	0,11	
	240V 50Hz, 277V 60Hz					M4 U240	1	0,11	
	380-400V 50Hz, 440-460V 60Hz					M4 U400	1	0,11	
	415-440V 50Hz, 460-480V 60Hz					M4 U415	1	0,11	
Shunt Releases for right hand side mounting, max. 1 pc. per circuit-breaker ¹⁾									
	Trips the circuit-breaker when the release coil energized.								
	100% ON			max. 5sec. ON					
	20-24V 50Hz, 28V 60Hz		20-70V 50/60Hz DC		M4 A24	1	0,12		
	75-127V 50Hz, 120V 60Hz		75-190V 50/60Hz DC		M4 A110	1	0,12		
	190-230V 50Hz, 240-260V 60Hz		190-330V 50/60Hz DC		M4 A230	1	0,12		
	200-240V 50Hz, 277V 60Hz		200-330V 50/60Hz DC		M4 A240	1	0,12		
	300-400V 50Hz, 440-460V 60Hz		300-500V 50/60Hz DC		M4 A400	1	0,12		
330-440V 50Hz, 460-480V 60Hz		330-500V 50/60Hz DC		M4 A415	1	0,12			
Enclosure for circuit breaker M4 32R protection degree IP65									
	Plastic enclose with rotary operating mechanism black-grey lockable, with N- and PE-terminal space for 1 transverse and side aux. contact + release					M4 32R PFH4	1	0,53	
	Enclose with rotary operating mechanism yellow - red, lockable with N- and PE-terminal space for 1 transverse and side aux. contact + release					M4 32R PFHN4	1	0,53	

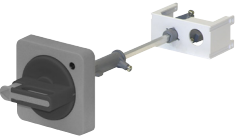
1) Number and position see page 179

Accessories and Busbars

			for circuit- breaker	Type	Pack pcs.	Weight approx. kg/pc.
Accessories						
	Scale cover sealable	for covering the current setting scale	M4-32...100	M4 K	10	0,003
	Push-in lugs	for screwing the circuit-breaker onto mounting plates. 2 units required (1 bag with 10 units)	M4-32	M4 32 L	10	0,01
	Spade terminal block	up to 600V acc.UL 489	M4-32R	M4 32R E	on request	
	Pin terminal block	up to 600V acc.UL 489	M4-32R	M4 32R EV	on request	
	Insulation barriers	up to 600V acc.UL 489 for increased distances and clearances acc. to UL Type "E", 2 pcs per device (on input side)	M4-100	M4 100 E	2	0,01

Door-coupling rotary mechanisms IP65

The door locking device prevents accidental opening of the cubicle door in the ON position of the circuit-breaker. The OFF position can be locked with up to 3 padlocks.

	Door-coupling rotary mechanism black	extension shaft 115mm	M4-32R	M4 32R EH1 115	1	0,1
		extension shaft 315mm	M4-32R	M4 32R EH1 315	1	0,2
		extension shaft 115mm	M4-63R	M4 63R EH1 115	1	0,1
		extension shaft 315mm	M4-63R	M4 63R EH1 315	1	0,2
		extension shaft 115mm	M4-100R	M4 100R EH1 115	1	0,1
		extension shaft 315mm	M4-100R	M4 100R EH1 315	1	0,2
	Emergency-Stop	extension shaft 115mm	M4-32R	M4 32R EHN1 115	1	0,1
	Door-coupling rotary mechanism; red/yellow	extension shaft 315mm	M4-32R	M4 32R EHN1 315	1	0,2
		extension shaft 115mm	M4-63R	M4 63R EHN1 115	1	0,1
		extension shaft 315mm	M4-63R	M4 63R EHN1 315	1	0,2
		extension shaft 115mm	M4-100R	M4 100R EHN1 115	1	0,1
		extension shaft 315mm	M4-100R	M4 100R EHN1 315	1	0,2

		Protection degree	Type	Pack pcs.	Weight kg/pc.
Insulated 3-phase busbar system					

For feeding several modular circuit-breakers M4-32. on standard mounting rails, insulated
Rated operational voltage max. 690 V, rated current 63 A, with **spade connection**, modular spacing 45mm (54mm on request)

	3-phase busbars	for 2 circuit-breakers	IP20	M4 32 S2	1	0,03
		for 3 circuit-breakers	IP10	M4 32 S3	1	0,05
		for 4 circuit-breakers	IP10	M4 32 S4	1	0,07
		for 5 circuit-breakers	IP10	M4 32 S5	1	0,10
	Line side terminal	Conductor cross-section	IP10	M4 32 SE	1	0,04
	3-pole, connection from above	solid or stranded 6-25mm ² with end sleeve 4-16mm ²				
	Cover for tags	Touch guard for emptyspaces		M4 32 SF	1	0,003

For feeding several modular circuit-breakers M4-32. on standard mounting rails, insulated
Rated operational voltage max. 690 V, rated current 63 A, with **pin connection**, modular spacing 45mm (54mm on request)

	3-phase busbars	for 2 circuit-breakers	IP20	M4 32 S2V	1	0,03
		for 3 circuit-breakers	IP20	M4 32 S3V	1	0,05
		for 4 circuit-breakers	IP20	M4 32 S4V	1	0,07
		for 5 circuit-breakers	IP20	M4 32 S5V	1	0,10
	Line side terminal	Conductor cross-section	IP20	M4 32 SEV	1	0,04
	3-pole, connection from above	solid or stranded 6-25mm ² with end sleeve 4-16mm ²				
	Cover for tags	Touch guard for emptyspaces		M4 32 SFV	1	0,003

For feeding several modular circuit-breakers M4-63. on standard mounting rails, insulated
Rated operational voltage max. 690 V, rated current 108 A, with **pin connection**, modular spacing 55mm

	3-phase busbars	for 2 circuit-breakers	IP20	M4 63 S2	1	0,15
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Mounting Parts for Fuseless Load Feeders

	Type	Pack pcs.	Weight approx. kg/pc.
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DIN-rail adapters with DIN-rail for contactor



for M4-32.. DIN-rails moveable for easy mounting and replacing can be connected on one 35 mm DIN-rail (high 15mm) or two 35 mm-DIN-rails (125mm distance) suitable for contactors K1-..., K(G)3-10 to K(G)3-40	M4 32 HU1	1	0,1
Adapter, for M4-63.. can be connected on two 35 mm DIN-rails (125mm distance) or one 75 mm DIN-rail, or screw mounting suitable for contactors K(G)3-24 to K(G)3-40, K3-50 to K3-74	M4 63 HU1	1	0,2
Adapter, for M4-100.. can be connected on two 35 mm DIN-rails (125mm distance) or one 75 mm DIN-rail, or screw mounting suitable for contactors K3-50 to K3-74	M4 100 HU1	1	0,2

Busbar adapters for 60-mm-system, 3 copper busbars acc. to DIN 46433



for M4-32 up to 25A, 690V 45mm width, 182mm long bar width: 12 und 15mm bar thickness: 5 and 10mm	M4 32 SA60	1	0,18
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Link modules, for mechanical and electrical connection between circuit-breaker and contactor



for M4-32.. with contactors K1-..	max. 32A	M4 32 VK1	1	0,015
for M4-32.. with contactors K3-10 to K3-22	max. 32A	M4 32 VK3	1	0,02
for M4-32.. with contactors KG3-10 to KG3-22	max. 32A	M4 32 VKG3	1	0,02

Link modules, for electrical connection between circuit-breaker and contactor

for M4-32.. with contactors K(G)3-24to K(G)3-40	max. 32A	M4 32 VD	1	0,01
for M4-63R. with contactors K3-24 to K3-74	max. 63A	M4 63 VD	1	0,02
for M4-63R. with contactors KG3-24 to KG3-40	max. 63A	M4 63 VDG	1	0,02
for M4-100R. with contactors K3-50 to K3-74	max. 100A	M4 100 VD	1	0,02

Components for Fuseless Load Feeders, DIN-Rail Mounting

Type of coordination "1" 3x415V 10kA ¹⁾



Motor 3~400V kW	Setting range A	Circuit-breaker page 166 Type	Link module Type	Contactor ²⁾ 220-230V 50Hz Type	DIN-rail adapter Type
-	0,10 – 0,16	M4-32T-0,16	M4 32 VK1	K1-09D10 230	-
0,06	0,16 – 0,25	M4-32T-0,25	M4 32 VK1	K1-09D10 230	-
0,09	0,25 – 0,4	M4-32T-0,4	M4 32 VK1	K1-09D10 230	-
0,18	0,4 – 0,63	M4-32T-0,63	M4 32 VK1	K1-09D10 230	-
0,25	0,63 – 1	M4-32T-1	M4 32 VK1	K1-09D10 230	-
0,55	1,0 – 1,6	M4-32T-1,6	M4 32 VK1	K1-09D10 230	-
0,75	1,6 – 2,5	M4-32T-2,5	M4 32 VK1	K1-09D10 230	-
1,5	2,5 – 4	M4-32T-4	M4 32 VK1	K1-09D10 230	-
2,2	4 – 6	M4-32T-6	M4 32 VK1	K1-09D10 230	-
3	5 – 8	M4-32T-8	M4 32 VK1	K1-09D10 230	-
4	6 – 10	M4-32T-10	M4 32 VK1	K1-09D10 230	-
5,5	9 – 13	M4-32T-13	M4 32 VK1	K1-12D10 230	-
7,5	11 – 17	M4-32T-17	M4 32 VK3	K3-18ND10 230EUR	-
7,5	14 – 22	M4-32T-22	M4 32 VK3	K3-22ND10 230EUR	-
11	18 – 26	M4-32T-26	M4 32 VK3	K3-22ND10 230EUR	-
15	22 – 32	M4-32T-32	M4 32 VD	K3-32A00 230	M4 32 HU1
18,5	28 – 40	M4-32T-40	M4 32 VD	K3-40A00 230	M4 32 HU1
-	0,10 – 0,16	M4-32R-0,16	M4 32 VK3	K3-10ND10 230EUR	-
0,06	0,16 – 0,25	M4-32R-0,25	M4 32 VK3	K3-10ND10 230EUR	-
0,09	0,25 – 0,4	M4-32R-0,4	M4 32 VK3	K3-10ND10 230EUR	-
0,18	0,4 – 0,63	M4-32R-0,63	M4 32 VK3	K3-10ND10 230EUR	-
0,25	0,63 – 1	M4-32R-1	M4 32 VK3	K3-10ND10 230EUR	-
0,55	1,0 – 1,6	M4-32R-1,6	M4 32 VK3	K3-10ND10 230EUR	-
0,75	1,6 – 2,5	M4-32R-2,5	M4 32 VK3	K3-10ND10 230EUR	-
1,5	2,5 – 4	M4-32R-4	M4 32 VK3	K3-10ND10 230EUR	-
2,2	4 – 6	M4-32R-6	M4 32 VK3	K3-10ND10 230EUR	-
3	5 – 8	M4-32R-8	M4 32 VK3	K3-10ND10 230EUR	-
4	6 – 10	M4-32R-10	M4 32 VK3	K3-10ND10 230EUR	-
5,5	9 – 13	M4-32R-13	M4 32 VK3	K3-14ND10 230EUR	-
7,5	11 – 17	M4-32R-17	M4 32 VK3	K3-18ND10 230EUR	-
7,5	14 – 22	M4-32R-22	M4 32 VK3	K3-22ND10 230EUR	-
11	18 – 26	M4-32R-26	M4 32 VK3	K3-22ND10 230EUR	-
15	22 – 32	M4-32R-32	M4 32 VD	K3-32A00 230	M4 32 HU1
18,5	28 – 40	M4-32R-40	M4 32 VD	K3-40A00 230	M4 32 HU1
12,5	18 – 26	M4-63R-26	M4 63 VD	K3-32A00 230	M4 63 HU1
15	22 – 32	M4-63R-32	M4 63 VD	K3-32A00 230	M4 63 HU1
18,5	28 – 40	M4-63R-40	M4 63 VD	K3-40A00 230	M4 63 HU1
22	34 – 50	M4-63R-50	M4 63 VD	K3-50A00 230	M4 63 HU1
30	45 – 63	M4-63R-63	M4 63 VD	K3-62A00 230	M4 63 HU1
30	45 – 63	M4-100R-63	M4 100 VD	K3-62A00 230	M4 100 HU1
37	55 – 75	M4-100R-75	M4 100 VD	K3-74A00 230	M4 100 HU1
45	70 – 90	M4-100R-90	-	K3-90A00 230	-
-	80 – 100	M4-100R-100	-	K3-115A00 230	-

1) Other conditions on request

2) Contactors K1.. 220-230V 50Hz, Contactors K3.. 220-240V 50Hz, further technical data see Catalog D677..

Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660

This table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} of the M4 circuit-breakers with different operational voltages as a function of the rated current I_n of the circuit-breakers.
The circuit-breakers can be fed at the top or bottom supply terminals without any reduction of the rated data.

If the short-circuit current exceeds the rated short-circuit breaking capacity of the circuit-breaker specified in the tables at the installation point, a back-up fuse is to be used.
The maximum rated current for the back-up fuse is specified in the tables. These fuses are only suitable for the short-circuit-currents as indicated on the fuses.

Circuit-breaker	Rated-current I_n	up to AC 240V ²⁾			up to AC 400V ²⁾ up to AC 415V ³⁾			up to AC 440V ²⁾ up to AC 460V ³⁾			up to AC 500V ²⁾ up to AC 525V ³⁾			up to AC 690V ²⁾		
		I_{cu}	I_{cs}	max. fuse ¹⁾ (gL/gG)	I_{cu}	I_{cs}	max. fuse ¹⁾ (gL/gG)	I_{cu}	I_{cs}	max. fuse ¹⁾ (gL/gG)	I_{cu}	I_{cs}	max. fuse ¹⁾ (gL/gG)	I_{cu}	I_{cs}	max. fuse ¹⁾ (gL/gG)
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
M4-32T	0,16 ... 0,63	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	1	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	1,6	100	100	--	100	100	--	100	100	--	100	100	--	3	3	20
	2,5	100	100	--	100	100	--	100	100	--	50	38	50	3	3	35
	4	100	100	--	100	100	--	50	38	50	15	11	40	3	3	40
	6	100	100	--	100	100	--	15	11	50	10	8	50	3	3	50
	8	100	100	--	100	100	--	15	11	63	10	8	63	3	3	63
	10	100	100	--	50	38	80	15	11	63	6	5	63	3	3	63
	13	100	100	--	50	38	80	10	8	80	6	5	80	3	3	63
	17	50	38	--	20	15	100	10	8	80	6	5	80	3	3	63
	22	40	30	125	15	11	100	8	6	100	6	5	80	3	3	63
	26	40	30	125	15	11	100	8	6	100	6	5	80	3	3	63
	32	30	22	125	15	11	100	6	4	100	5	4	80	3	3	63
	40	20	15	160	10	8	125	5	3	100	4	3	80	2	2	63
M4-32R	0,16 ... 1,0	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	1,6	100	100	--	100	100	--	100	100	--	100	100	--	100	100	--
	2,5	100	100	--	100	100	--	100	100	--	100	100	--	8	8	35
	4	100	100	--	100	100	--	100	100	--	100	100	--	8	8	40
	6	100	100	--	100	100	--	100	100	--	100	100	--	6	6	50
	8	100	100	--	100	100	--	50	38	80	50	38	63	6	6	63
	10	100	100	--	100	100	--	50	38	80	50	38	80	6	6	63
	13	100	100	--	100	100	--	50	38	80	42	32	80	6	6	63
	17	100	100	--	50	38	100	25	15	80	10	8	80	4	4	63
	22	100	100	--	50	38	125	25	15	100	10	8	80	4	4	63
	26	100	100	--	50	38	125	25	15	100	10	8	80	4	4	63
	32	100	100	--	50	38	125	25	15	100	10	8	80	4	4	63
	40	100	100	--	40	30	160	15	11	125	8	6	160	3	3	80
M4-63R	26	100	100	--	50	50	125	35	27	125	12	9	100	5	5	80
	32	100	100	--	50	50	125	35	27	125	10	8	100	5	5	80
	40	100	100	--	50	50	160	35	27	125	10	8	100	5	5	80
	50	100	100	--	50	50	160	35	27	125	10	8	100	5	5	80
	63	100	100	--	50	50	160	35	27	160	10	8	100	5	5	80
M4-100R	63	100	100	--	50	38	160	40	30	160	12	9	100	6	5	80
	75	100	100	--	50	38	160	40	30	160	8	6	125	5	4	100
	90	100	100	--	50	38	160	40	30	160	8	6	125	5	4	125
	100	100	100	--	50	38	160	40	30	160	8	6	125	5	4	125

-- No back-up fuse required

1) Back up fuse required if short-circuit current at installation point $I_{cc} > I_{cu}$

2) 10 % overvoltage

3) 5 % overvoltage

Main Circuit

Type		M4-32T	M4-32R	M4-63R	M4-100R
Number of poles		3	3	3	3
Max. rated current I_{nmax} (=max. rated operational current I_n)	A	40	40	63	100
Permissible ambient temperature					
Storage/transport	°C	-50 to +80	-50 to +80	-50 to +80	-50 to +80
Operation	°C	-20 to +60	-20 to +60	-20 to +60	-20 to +60
Storage/transport	°F	-58 to +176	-58 to +176	-58 to +176	-58 to +176
Operation	°F	-4 to +140	-4 to +140	-4 to +140	-4 to +140
Rated insulation voltage U_i	V	690 ¹⁾	690 ¹⁾	1000 ²⁾	1000 ²⁾
Rated impulse withstand voltage U_{imp}	kV	6	6	8	8
Rated operational voltage U_e	V	690	690	690	690
Rated frequency	Hz	50/60	50/60	50/60	50/60
Utilization category					
IEC 60947-2 (circuit-breaker)		A	A	A	A
IEC 60947-4-1 (motor starter)		AC3	AC3	AC3	AC3
Class	acc. to IEC 60947-4-1	10	10	10	10
Power loss P_v per circuit-breaker dependent on rated current I_n (upper setting range)	$I_n \rightarrow 0,16$ up to 1,6 A $I_n \rightarrow 2,5$ up to 26 A $I_n \rightarrow 32$ A	W W W	4,4 7,4 4	- - -	- - -
R per conducting path = $P/I^2 \times 3$	$I_n \rightarrow 26$ up to 63 A $I_n \rightarrow$ up to 63 A $I_n \rightarrow 75$ up to 100 A	W W W	- - -	9,7 - -	- 21,8 17,8
Shock resistance	acc. to IEC 60068 Part 2-27	g	25	25	25
Degree of protection	acc. to IEC 60529		IP 20	IP 20	IP 20
Shock hazard protection	acc. to DIN VDE 0106 Part 100		safe against finger touch	safe against finger touch	safe against finger touch
Temperature compensation	acc. to IEC 60947-4-1	°C	-20 to +60	-20 to +60	-20 to +60
Mechanical endurance	operating cycles	100 000	100 000	50 000	50 000
Electrical endurance		100 000	100 000	25 000	25 000
Max. operating frequency per hour (motor starts)	1/h	25	25	25	25

Approvals

				
Country Type	USA, Canada UL	Switzerland SEV	Europe CE	CB/CCA-Certificates
M4-32T	o	o	/	o
M4-32R	o	o	/	o
M4-63R	o	o	/	o
M4-100R	o	o	/	o
M4 H..	o	-	/	-
M4 M..	o	-	/	-
M4 U..	o	-	/	-
M4 A..	o	-	/	-

o In standard version approved / No testing required CE x In test
 - Not provided for test till now

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): $U_{imp} = 6kV$.

2) Suitable at 1000V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): $U_{imp} = 8kV$.

3) Data for other conditions on request.

Conductor cross-sections for main circuit

Type	Terminal type, screw type	Tightening torque		Conductor, cross-sections solid		Conductor, cross-sections stranded		Conductor, cross-sections flexible	
		Nm	lb - in	mm ²	AWG	mm ²	AWG	mm ²	AWG
M4-32T 	Pz2	0,8 - 2,5	7 - 22	1 x (1 - 10) 2 x (1 - 6)	1 x (18 - 8) 2 x (18 - 10)	1 x (1 - 6) 2 x (1 - 6)	1 x (18 - 10) 2 x (18 - 10)	1 x (1 - 6) 2 x (0,75 - 4)	1 x (18 - 10) 2 x (18 - 10)
M4-32R 	Pz2	0,8 - 2,5	7 - 22	1 x (1 - 10) 2 x (1 - 6)	1 x (18 - 8) 2 x (18 - 10)	1 x (1 - 6) 2 x (1 - 6)	1 x (18 - 10) 2 x (18 - 10)	1 x (1 - 6) 2 x (0,75 - 4)	1 x (18 - 10) 2 x (18 - 10)
M4-63R 	Pz2	3 - 4,5	26 - 39	1 x (0,75 - 35) 2 x (0,75 - 25)	1 x (18 - 2) 2 x (18 - 4)	1 x (0,75 - 35) 2 x (0,75 - 25)	1 x (18 - 2) 2 x (18 - 4)	1 x (0,75 - 25) 2 x (0,75 - 16)	1 x (18 - 4) 2 x (18 - 6)
M4-100R 	4mm hexagon socket screw	4 - 6	35 - 53	1 x (2,5 - 70) 2 x (2,5 - 50)	1 x (12 - 2/0) 2 x (12 - 1/0)	1 x (2,5 - 70) 2 x (2,5 - 50)	1 x (12 - 2/0) 2 x (12 - 1/0)	1 x (2,5 - 50) 2 x (2,5 - 35)	1 x (12 - 1/0) 2 x (10 - 2)

Auxiliary switches

Type	Rated operational voltage		Rated operational current		Rated operational current		Rated operational voltage		Rated operational current	
	U _e		I _e /AC-15		I _e /AC-12 lth		U _e		I _e /DC-13	
	AC						DC L/R 200 ms			
	V		A		A		V		A	
Front transverse auxiliary switch	M4 HQ..	24 240	3 3		5 5		24 220		1 0,1	
Lateral auxiliary switch and signalling switch	M4 HS..									
	M4 M..	24 240	6 4		10 10		24 220		2 0,25	

Type	Power consumption during pick-up		Response voltage trip		Response voltage acc. to IEC 60947-1	
	VA/W	V	V			
Undervoltage release	M4 U..	8,5/6	3/1,2	0,7 - 0,35xU _s	0,85 - 1,1xU _s	
Shunt release	M4 A..	8,5/6	3/1,2			0,7 - 1,1xU _s

Type	Fuse		Miniature circuit breaker		solid		flexible		AWG-wires, solid		flexible	
	gL/gG		C-characteristic									
	A		A		mm ²		mm ²		AWG		AWG	
Short-circuit protection for auxiliary and control circuits	16		6									
Conductor cross-sections for auxiliary and control circuits					1 x (0,5 - 2,5) 2 x (0,5 - 2,5) ¹⁾		1 x (0,5 - 4) 2 x (0,75 - 2,5)		1 x (20 - 14) 2 x (20 - 14) ¹⁾		1 x (20 - 10) 2 x (18 - 14)	

1) M4 HQ.. 1 solid conductor only

Permissible ratings of devices approved for North America

Circuit breakers M4 as „Manual Motor Starter“

If used as „Manual Motor Starter“ the circuit breaker is always operated in combination with a short circuit device. For use with approbated fuses or circuit breakers according to UL489 or CSA22.2 No. 5 only. The sizes are selected according to National Electrical Code (UL), or Canadian Electrical Code (CSA).

Typ	Rated operational current le A	Max. short-circuit current			Motor load 1-phase		Motor load 3-phase				Max. rated fuse A	Max. breaker size A
		240V kA	480V kA	600V kA	115V HP	230V HP	200V HP	230V HP	460V HP	600V HP		
M4-32T	0,16 ... 0,63	100	50	10	-	-	-	-	-	-	1	15
	1	100	50	10	-	-	-	-	-	1/2	3	15
	1,6	100	50	10	-	1/10	-	-	3/4	3/4	6	15
	2,5	100	50	10	-	1/6	1/2	1/2	1	1 1/2	10	15
	4	100	50	5	1/8	1/3	3/4	3/4	2	3	15	15
	6	100	25	5	1/4	1/2	1	1 1/2	3	5	20	20
	8	100	25	5	1/3	1	2	2	5	5	30	30
	10	50	10	5	1/2	1 1/2	2	3	5	7 1/2	40	40
	13	50	10	5	1/2	2	3	3	7 1/2	10	50	50
	17	40	10	5	1	3	3	5	10	15	60	60
	22	30	10	5	1 1/2	3	5	7 1/2	15	20	80	80
	26	30	7,5	5	2	3	7 1/2	7 1/2	15	20	100	100
	32	20	7,5	5	2	5	7 1/2	10	20	30	125	125
	40	20	7,5	5	3	7 1/2	10	10	30	30	150	150
M4-32R	0,16 ... 0,63	100	50	10	-	-	-	-	-	-	1	15
	4	100	50	10	1/8	1/3	3/4	3/4	2	3	15	15
	6	100	50	10	1/4	1/2	1	1 1/2	3	5	20	20
	8	100	50	10	1/3	1	2	2	5	5	30	30
	10	100	50	10	1/2	1 1/2	2	3	5	7 1/2	40	40
	13	100	50	10	1/2	2	3	3	7 1/2	10	50	50
	17	100	30	10	1	3	3	5	10	15	60	60
	22	100	30	10	1 1/2	3	5	7 1/2	15	20	80	80
	26	100	30	10	2	3	7 1/2	7 1/2	15	20	100	100
	32	100	30	10	2	5	7 1/2	10	20	30	125	125
	40	100	30	10	3	7 1/2	10	10	30	30	150	150
M4-63R	26	100	50	10	2	3	7 1/2	7 1/2	15	20	100	100
	32	100	50	10	2	5	7 1/2	10	20	30	125	125
	40	100	50	10	3	7 1/2	10	10	30	30	150	150
	50	100	50	10	5	10	15	15	30	40	200	200
	63	100	50	10	5	10	20	20	40	60	250	250
M4-100R	63	100	25	10	5	10	20	20	40	60	250	250
	75	100	25	10	5	15	20	25	50	60	300	300
	90	100	25	10	7 1/2	20	25	30	60	75	350	350
	100	100	25	10	10	20	30	30	75	100	400	400

Permissible ratings of devices approved for North America

Circuit breakers M4 as „Combination Motor Controller Type E“ and "Suitable for Group Installation"

Acc to UL 508 demands a line-side 1 inch air and 2 inch creepage distance for „Combination Motor Controller Type E“ is necessary. Therefore circuit-breaker M4-32R is approved to UL 508 in combination with the Terminal block M4 32R E. Circuit-breakers M4-100 are approved to UL 508 in combination with the insulation barriers M4 100 E. According to CSA these terminal blocks can be omitted when the device is used as „Combination Motor Controller Type E“.

Type	Rated operational current I _e A	Max. short-circuit current			Motor load 1-phase		Motor load 3-phase				Max. rated fuse A	Max. breaker A
		240V kA	480V kA	600V kA	115V HP	230V HP	200V HP	230V HP	460V HP	600V HP		
M4-32R	0,16 ... 0,63	100	65	25	-	-	-	-	-	-	500	500
(+ M4 32R E)	1	100	65	25	-	-	-	-	-	1/2	500	500
	1,6	100	65	25	-	1/10	-	-	3/4	3/4	500	500
	2,5	100	65	25	-	1/6	1/2	1/2	1	1 1/2	500	500
	4	100	65	25	1/8	1/3	3/4	3/4	2	3	500	500
	6	100	65	25	1/4	1/2	1	1 1/2	3	5	500	500
	8	100	65	25	1/3	1	2	2	5	5	500	500
	10	100	65	25	1/2	1 1/2	2	3	5	7 1/2	500	500
	13	100	65	25	1/2	2	3	3	7 1/2	10	500	500
	17	100	30	10	1	3	3	5	10	15	500	500
	22	100	30	10	1 1/2	3	5	7 1/2	15	20	500	500
	26	100	30	10	2	5	7 1/2	7 1/2	15	20	500	500
	32	100	30	10	2	5	7 1/2	10	20	30	500	500
	40	100	30	10	3	7 1/2	10	10	30	30	500	500
M4-63R	26	100	50	10	2	3	7 1/2	7 1/2	15	20	600	600
	32	100	50	10	2	5	7 1/2	10	20	30	600	600
	40	100	50	10	3	7 1/2	10	10	30	30	600	600
	50	100	50	10	5	10	15	15	30	40	600	600
	63	100	50	10	5	10	20	20	40	60	600	600
M4-100R	63	100	40	10	5	10	20	20	40	60	1000	1000
(+ M4 100 E)	75	100	40	10	5	15	20	25	50	60	1000	1000
	90	100	40	10	7 1/2	20	25	30	60	75	1000	1000
	100	100	40	10	10	20	30	30	75	100	1000	1000

Ratings of auxiliary switches and alarm switches

	Breaking capacity		Rated operational voltage max. V AC	Rated operational current A
	AC	DC		
Lateral auxiliary M4 HS.. and signalling switch M4 M..	A600	Q300	600	10
Transversal auxiliary switch M4 HQ..	A300	R300	240	5

Description

Releases

Circuit-breakers M4 are equipped with bimetallic-based, inverse-time delayed overload releases and with instantaneous overcurrent releases (electromagnetic short-circuit releases). The overload releases can be set in accordance with the load current. The overcurrent releases are permanently set to a value 13 times the rated current and thus enable trouble-free start-up of motors. The scale cover can be sealed to prevent unauthorized adjustments to the set current.

Operating mechanisms

Circuit-breakers M4-32T are actuated via a rocker operating mechanism and circuit-breakers M4-32R, M4-63R and M4-100R via a rotary operating mechanism. An electrical signal can be output, at all Circuit-breakers, via a signalling switch to indicate that the Circuit-breaker has tripped. All operating mechanisms can be locked in the 0 position with a padlock (shackle diameter 3.5 to 4.5 mm). The M4 Circuit-breakers fulfil the isolation characteristics specified in IEC 60947-2.

Operating conditions

Circuit-breakers M4 are suitable for use in any climate. To avoid error tripping we recommend to protect the Circuit Breakers M4 against fresh and cold air (caused by air condition etc.) They are designed for operation in enclosed rooms under normal conditions (e. g. no dust, corrosive vapours or harmful gases). Suitable enclosures must be provided for installation in dusty or damp rooms. Circuit-breakers M4 can also be fed from below. In order to prevent premature tripping due to phase failure sensitivity, the three conducting paths must always be uniformly loaded. The conducting paths must be connected in series in the case of single-phase loads.

Short-circuit protection

The short-circuit releases of M4 circuit-breakers disconnect the faulty load feeder from the system in the event of a short circuit and thus prevent any further damage from being caused. Circuit-breakers with a short-circuit breaking capacity of 50 kA or 100 kA at a voltage of 400 V AC are practically short-circuit-proof at this voltage, as higher short-circuit currents are not usually encountered at the installation point. Back-up fuses are only necessary if the short-circuit current at the installation point exceeds the rated ultimate short-circuit breaking capacity of the circuit-breakers.

Motor protection

The tripping characteristics of M4 circuit-breakers are designed mainly to protect three-phase induction motors. The circuit-breakers are therefore also referred to as Manual Motor Starters. The current of the motor to be protected is set with the aid of the scale.

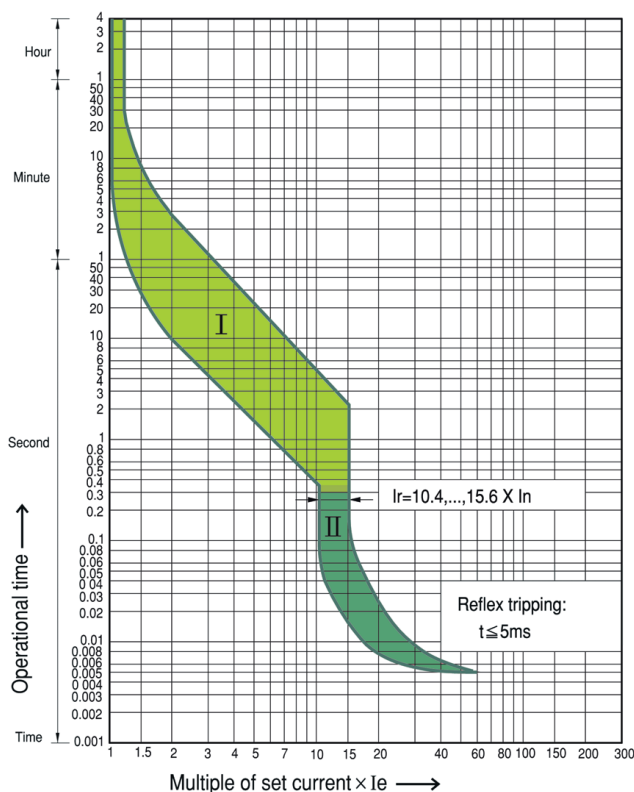
Line protection

M4 Circuit-breakers for motor protection are also suitable for line protection. The M4 Circuit-breakers fulfil the isolation conditions of IEC 60 947-3 as well as the additional test conditions for circuit-breakers with isolation characteristics specified in IEC 60947-2.

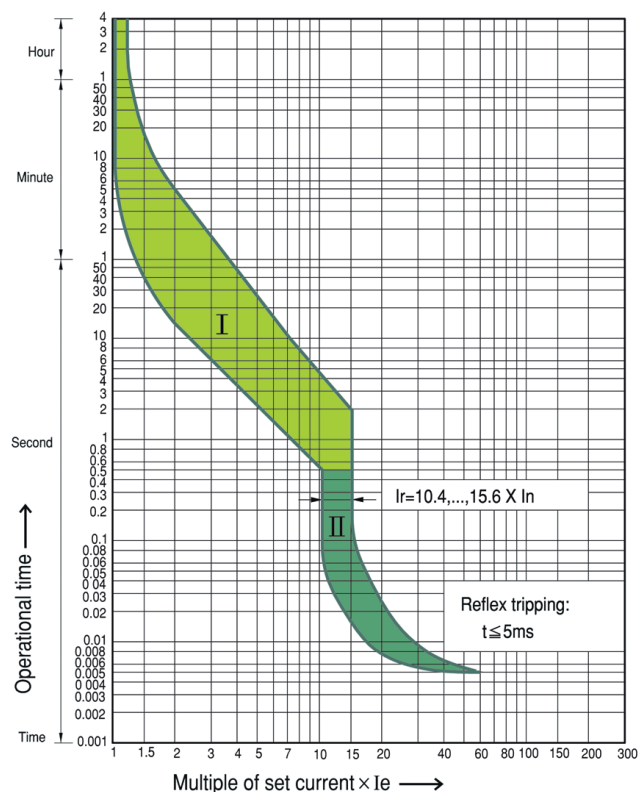
Taking IEC 60 204-1 into consideration, they can thus be implemented as main and EMERGENCY STOP switches. Door-coupling rotary operating mechanism do not fulfil the isolation characteristics.

Tripping-Characteristics

M4-32



M4-63R, M4-100R



I The curve shows the mean operating current at an ambient temperature of 20°C starting from cold.

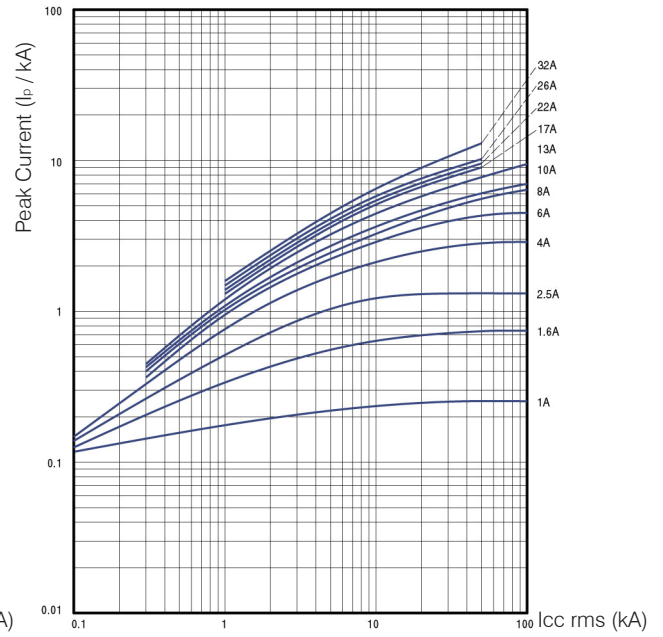
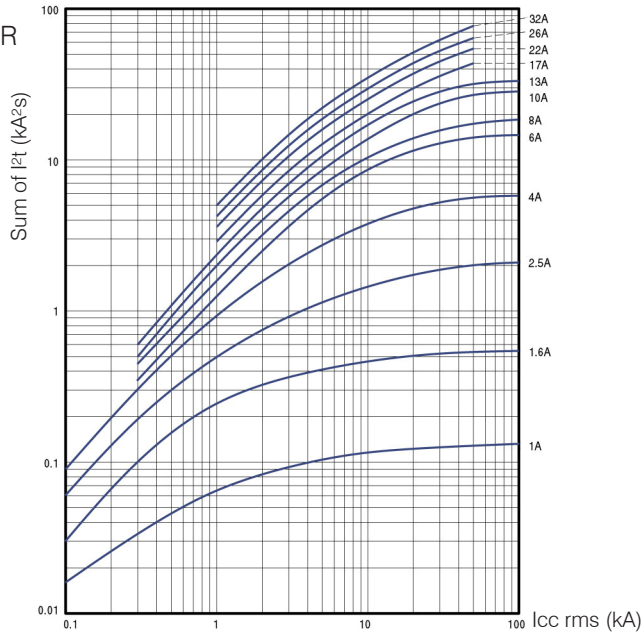
II The tripping characteristic of electromagnetic overcurrent releases (short-circuit releases)

The tripping characteristic of the inverse-time delayed overload releases apply for DC and AC with a frequency of 0 to 400 Hz. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

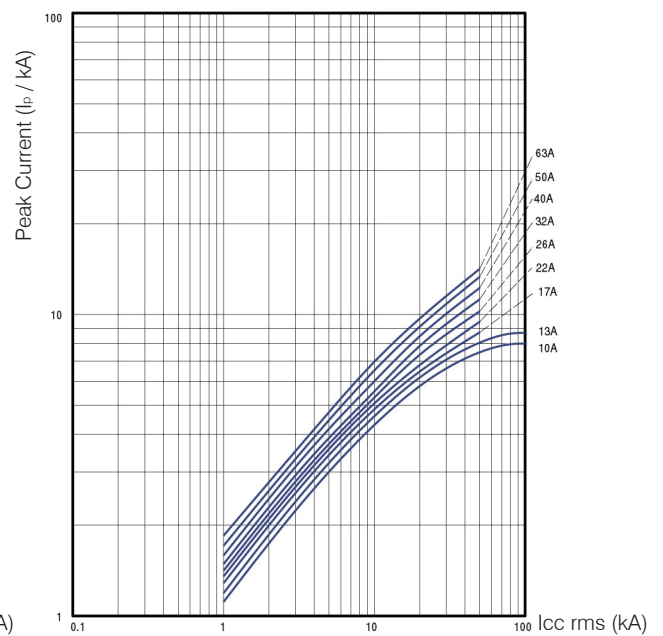
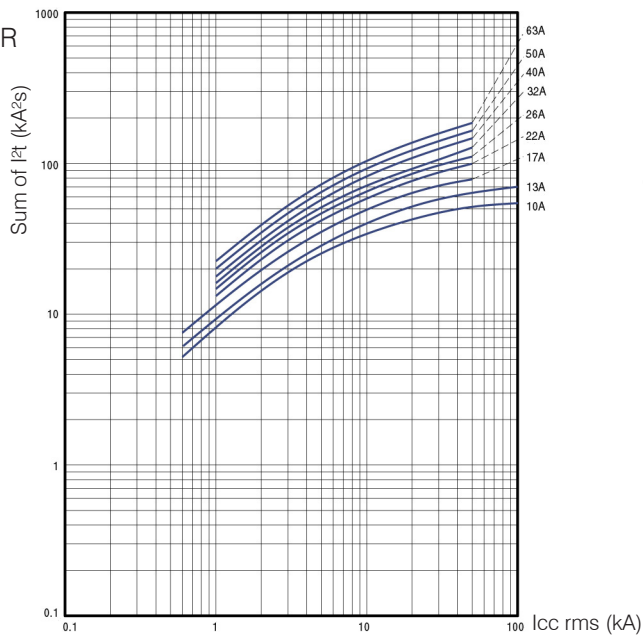
The characteristic shown here is a schematic representation of circuit-breakers for all ranges. Current limiting characteristics and I^2t characteristics are available on request.

Let-through Energy (I^2t / kA^2s) and Peak Current (I_p / kA) at $U_e=415\text{V}$

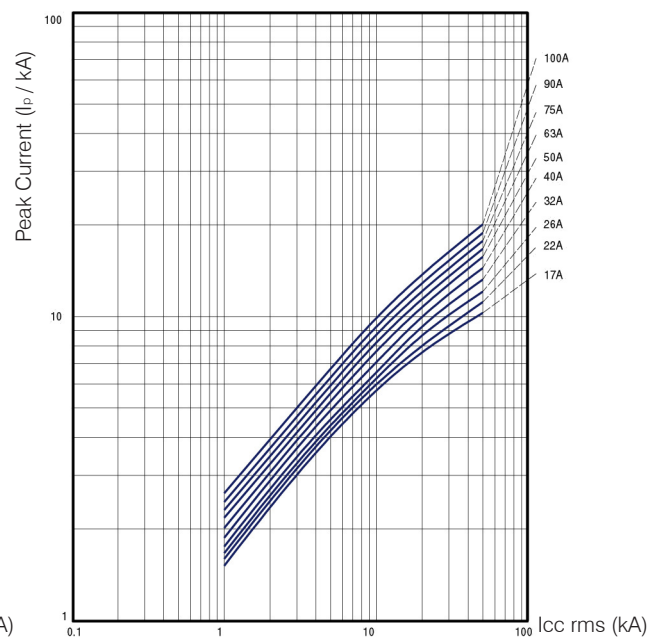
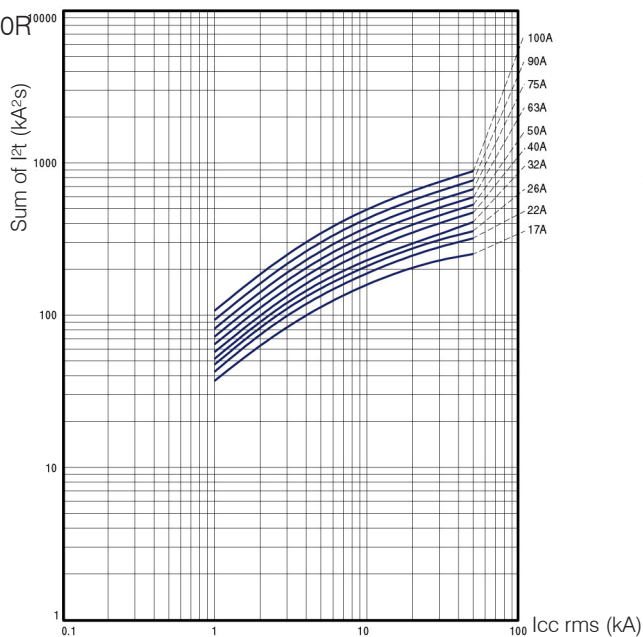
M4-32R



M4-63R



M4-100R



Circuit Breakers M4 for Motor Control



Technical Information IE3-Motor

	Rated Current In A	Instantaneous Short Circuit Release A	Setting range Thermal Overload Release A		Instantaneous Short Circuit Release Ratio A	
			Min	Max	Min	Max
Circuit Breakers M4-32T-..., M4-32R-...						
	0,16	2,1	0,1	0,16	21	13
	0,25	3,3	0,16	0,25	20	13
	0,4	5,2	0,25	0,4	21	13
	0,63	8,2	0,4	0,63	21	13
	1	13	0,63	1	21	13
	1,6	20,8	1	1,6	21	13
	2,5	32,5	1,6	2,5	20	13
	4	52	2,5	4	21	13
	6	78	4	6	20	13
	8	104	5	8	21	13
	10	130	6	10	22	13
	13	169	9	13	19	13
	17	221	11	17	20	13
	22	286	14	22	20	13
	26	338	18	26	19	13
	32	416	22	32	19	13
	40	520	28	40	19	13

Circuit Breakers M4-63R-...						
	10	130	6	10	22	13
	13	169	9	13	19	13
	17	221	11	17	20	13
	22	286	14	22	20	13
	26	338	18	26	19	13
	32	416	22	32	19	13
	40	520	28	40	19	13
	50	650	34	50	19	13
	63	819	45	63	18	13
	65	845	47	65	18	13

Circuit Breakers M4-100R-...						
	17	221	11	17	20	13
	22	286	14	22	20	13
	26	338	18	26	19	13
	32	416	22	32	19	13
	40	520	28	40	19	13
	50	650	34	50	19	13
	63	819	45	63	18	13
	75	975	55	75	18	13
	90	1170	70	90	17	13
	100	1300	80	100	16	13

- What is the IE3?

Motor is rated from IE1 through IE4 depends on its energy efficiency which means IE3 is more efficient compared to IE1 and IE2-rated motors.

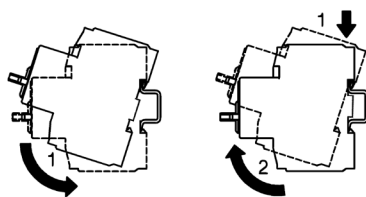
IEC 60034-30 standard specifies IE classes for motors in accordance with the above requirements. Therefore, consumers must comply with the standard when using Circuit Breaker products.

- IE1 Standard Efficiency
- IE2 High Efficiency
- **IE3 Premium Efficiency**
- IE4 Super Premium Efficiency Was bedeutet IE3?

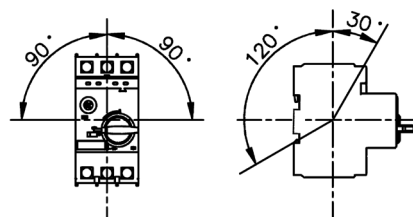
Pay attention that the ratio between inrush current and rated current of the motor is smaller than the instantaneous short circuit release ratio of the Circuit Breaker for Motor Control.

Mounting

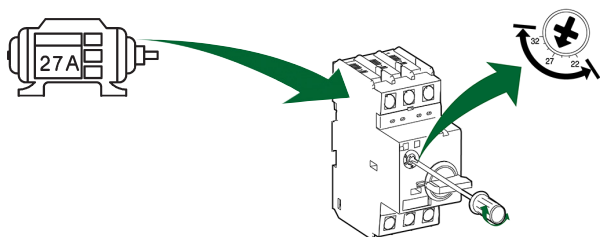
DIN-rail mounting



Operating positions



Current setting (dont rotate the dial out of the shown range)

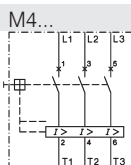


Connection of 1-phase motor



Wiring diagrams

Circuit breaker

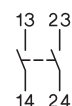


Traverse Aux. Contact Block

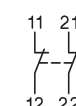
M4 HQ11



M4 HQ20

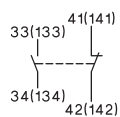


M4HQ02

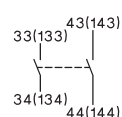


Aux. Contact Block (side mounted)

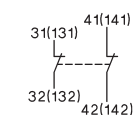
M4 HS11



M4 HS20

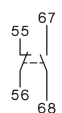


M4 HS02

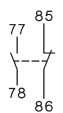


Alarm Switch

M4 M11

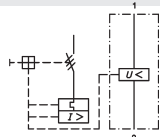


M4 MA11

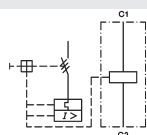


Undervoltage Release

M4 U...



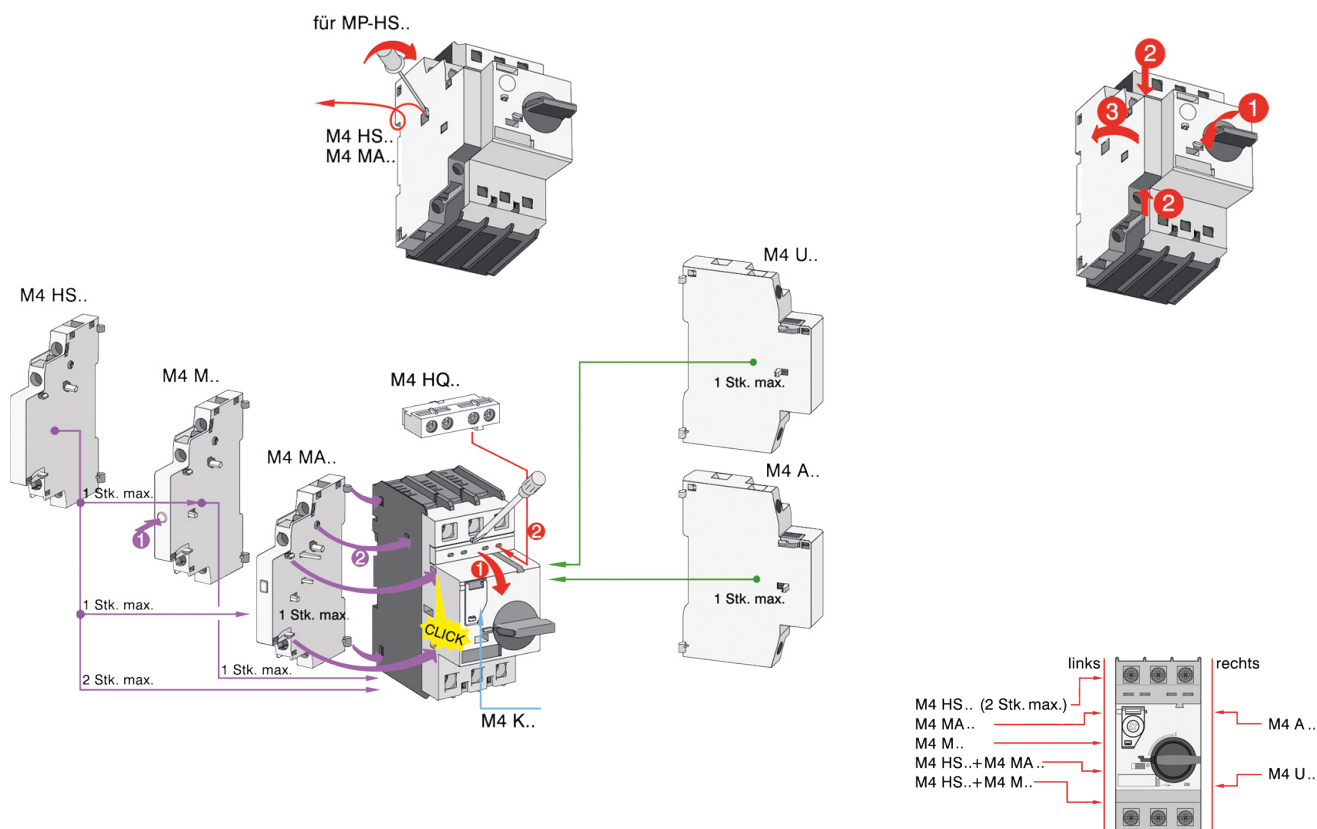
Shunt Release



Installation of accessories

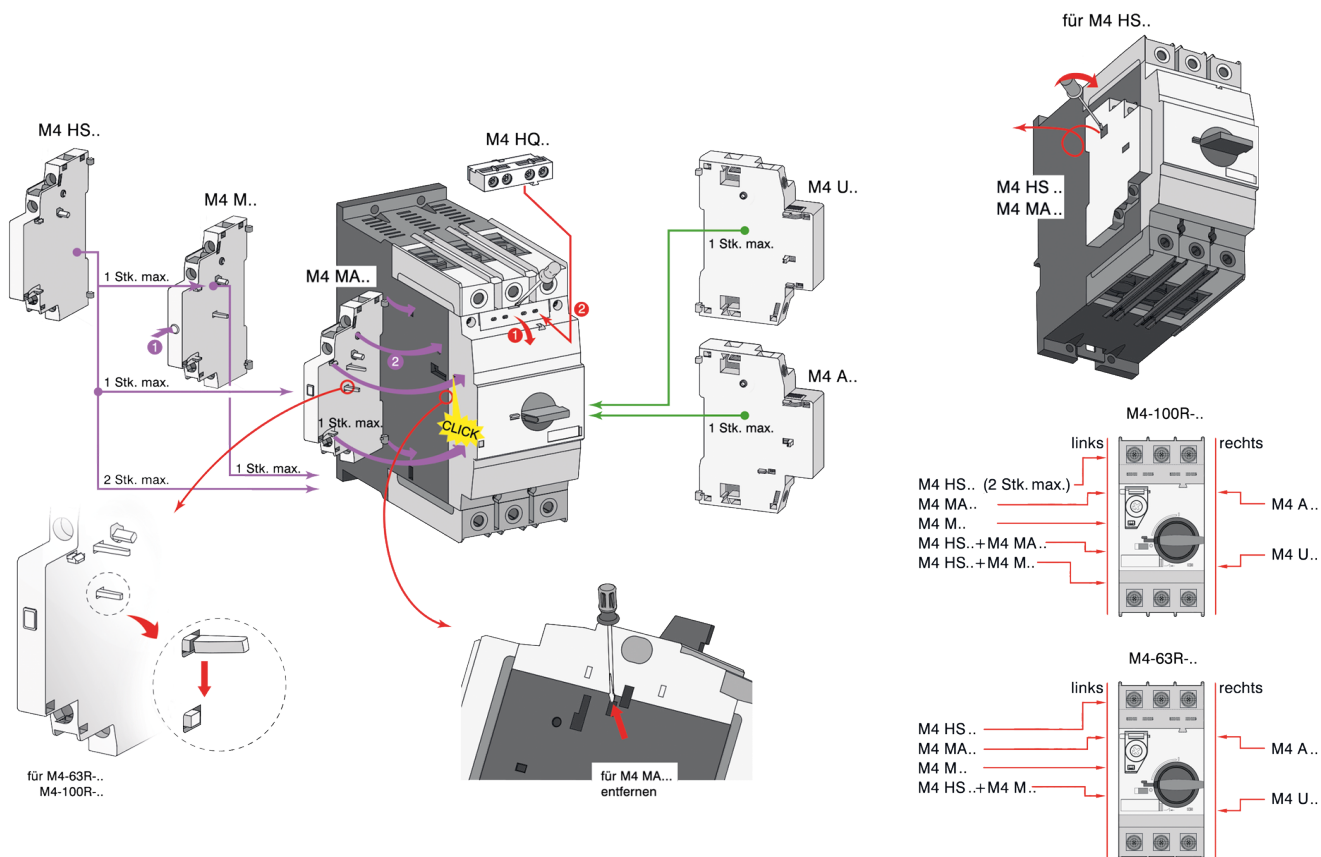
M4-32T

M4-32R



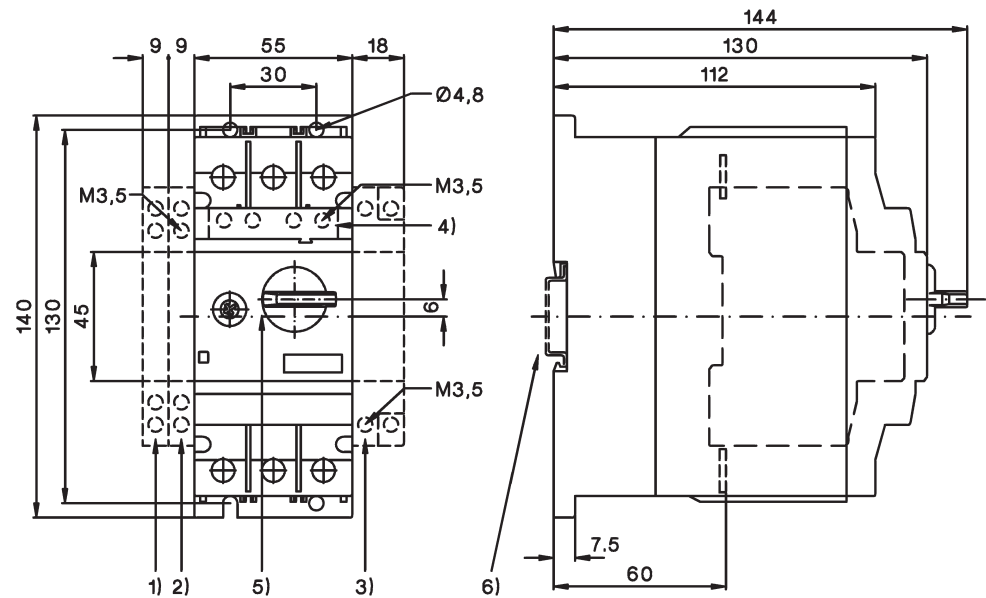
M4-63R

M4-100R



Dimensions

Circuit-breaker M4-63R

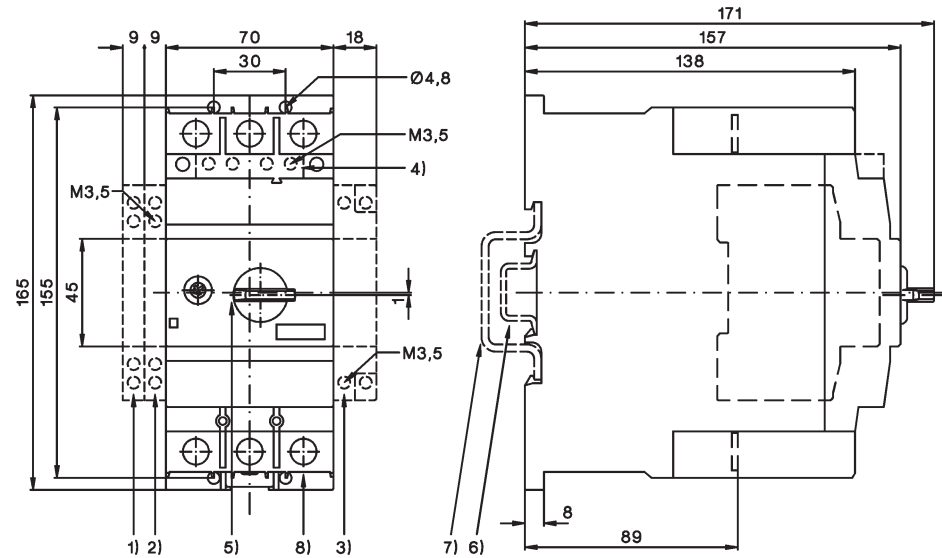


Height of arcing spaces (clearance from earthed parts)

at Ue (V)	240	415	460	525	690
mm	50	50	50	50	50
inch	2	2	2	2	2

- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) 35mm DIN-rail acc. to EN 50022

Circuit-breaker M4-100R



Height of arcing spaces (clearance from earthed parts)

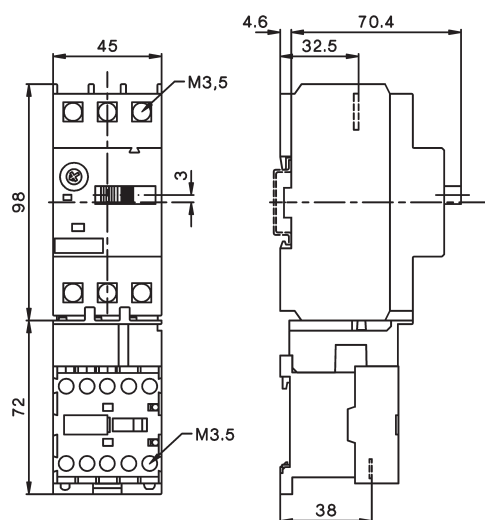
at Ue (V)	240	415	460	525	690
mm	50	70	70	110	150
inch	2	2¾	2¾	4,33	6

- 1) Side aux. contact
- 2) Magnetic trip alarm
- 3) Shunt or undervoltage release
- 4) Transverse aux. contact
- 5) Handle lock in OFF-position (Ø 5mm)
- 6) 35mm DIN-rail acc. to EN 50022
- 7) 70mm DIN-rail acc. to EN 50023
- 8) 4mm hexagon socket screw

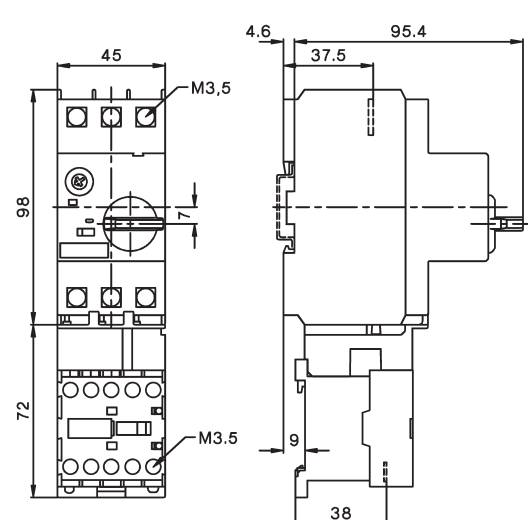
Dimensions

Link Module M4 32 VK1

M4-32T + K1-..



M4-32R + K1-..



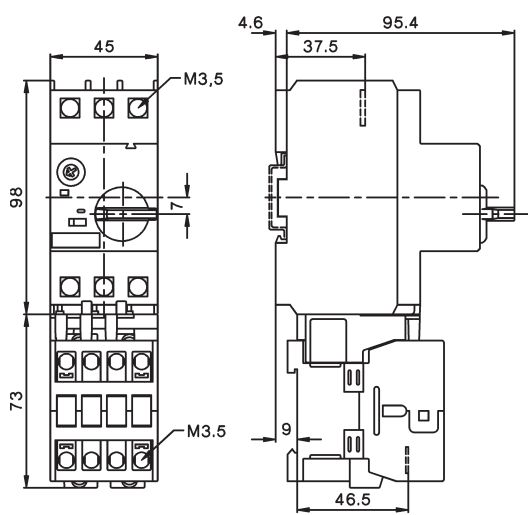
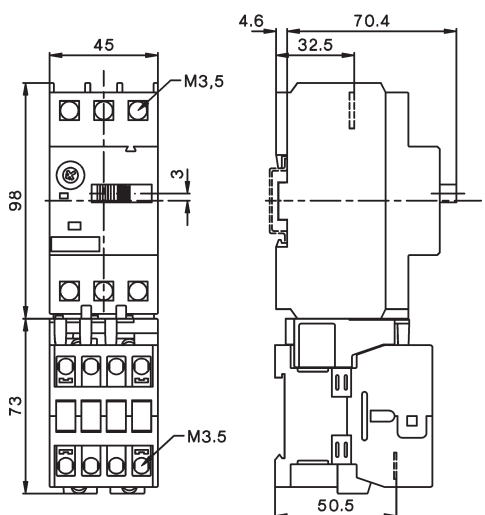
Link Module M4 32 VK3

M4-32T + K3-10ND..
M4-32T + K3-18ND..

M4-32T + K3-14ND..
M4-32T + K3-22ND..

M4-32R + K3-10ND..
M4-32R + K3-18ND..

M4-32R + K3-14ND..
M4-32R + K3-22ND..



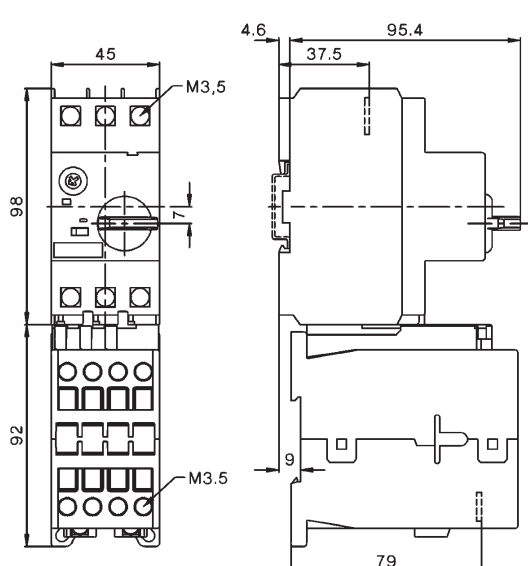
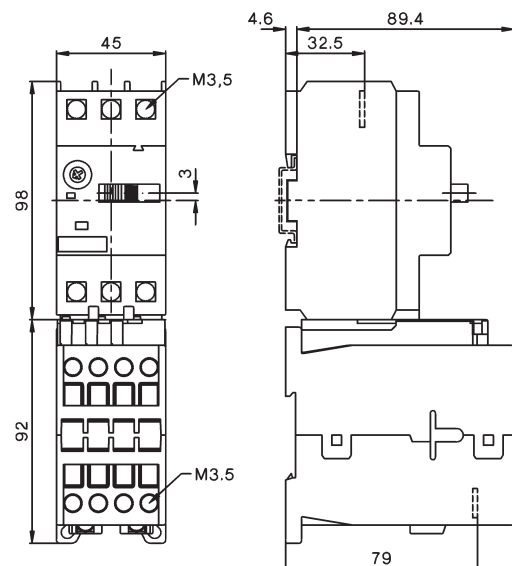
Link Module M4 32 VKG3

M4-32T + KG3-10..
M4-32T + KG3-18..

M4-32T + KG3-14..
M4-32T + KG3-22..

M4-32R + KG3-10..
M4-32R + KG3-18..

M4-32R + KG3-14..
M4-32R + KG3-22..

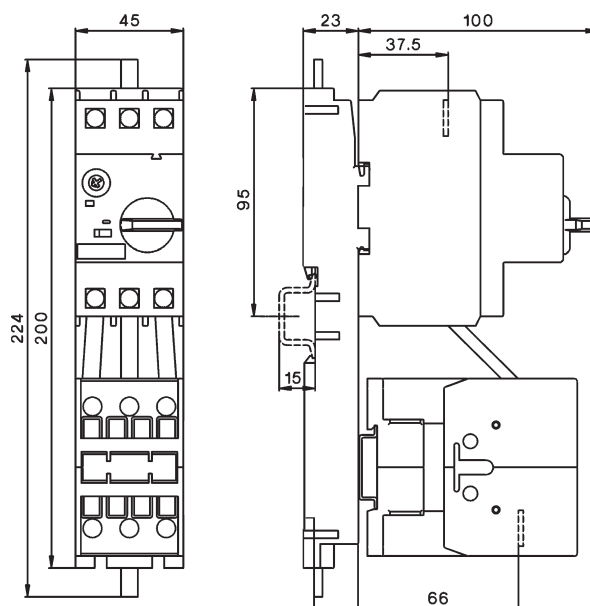
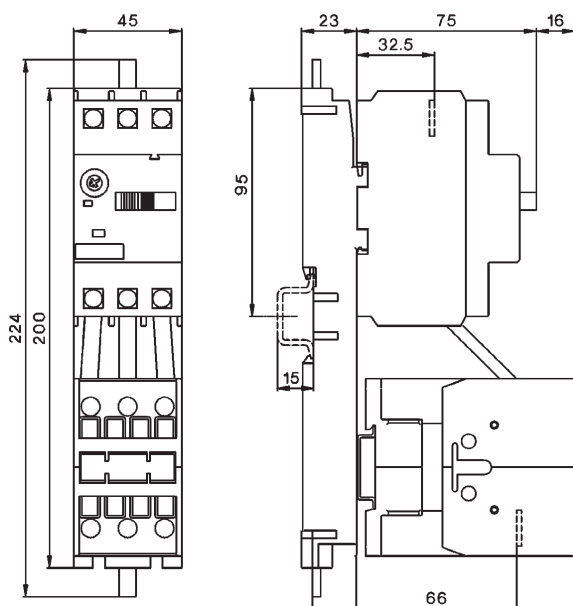


Dimensions

DIN-rail adapter M4 32 HU1

M4-32T + K3-24 + M4 32VD
M4-32T + K3-32 + M4 32VD

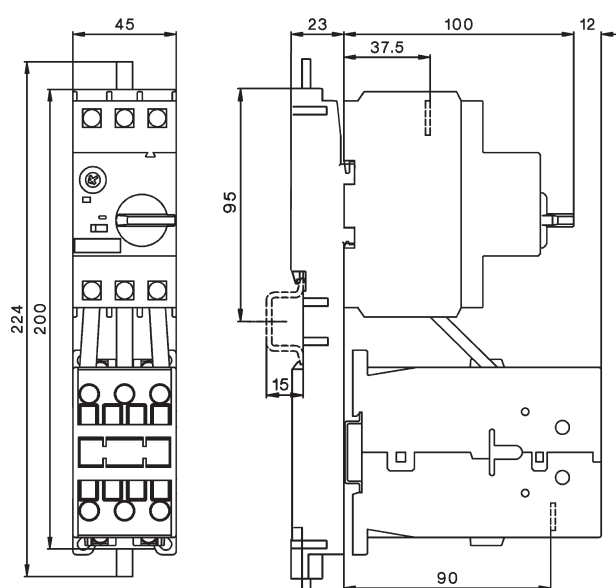
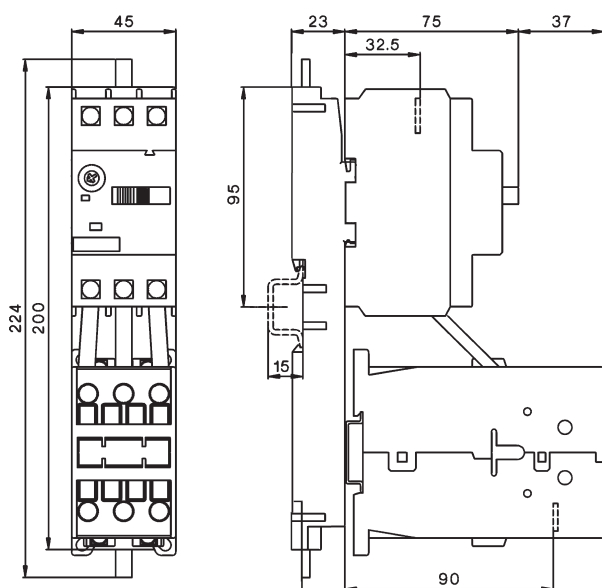
M4-32R + K3-24 + M4 32VD
M4-32R + K3-32 + M4 32VD



DIN-rail adapter M4 32 HU1

M4-32T + KG3-24 + M4 32 VD
M4-32T + KG3-32 + M4 32 VD

M4-32R + KG3-24 + M4 32 VD
M4-32R + KG3-32 + M4 32 VD

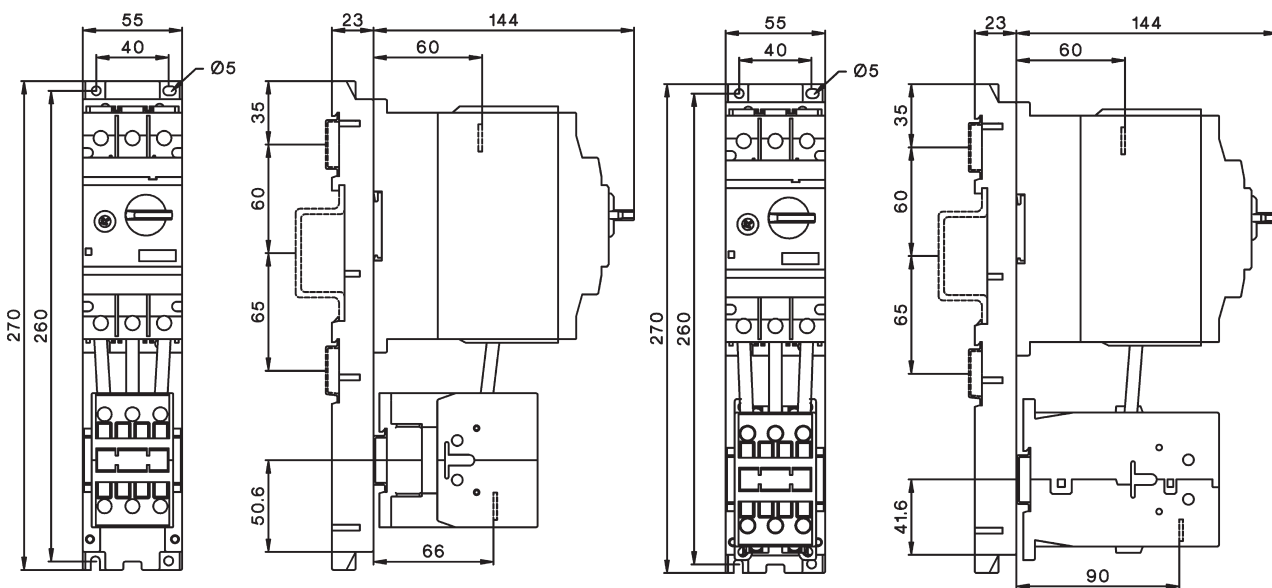


Dimensions

DIN-rail adapter M4 63 HU1

M4-63T + K3-32 + M4 63 VD
M4-63T + K3-40 + M4 63 VD

M4-63T + KG3-32 + M4 63 VDG
M4-63T + KG3-40 + M4 63 VDG

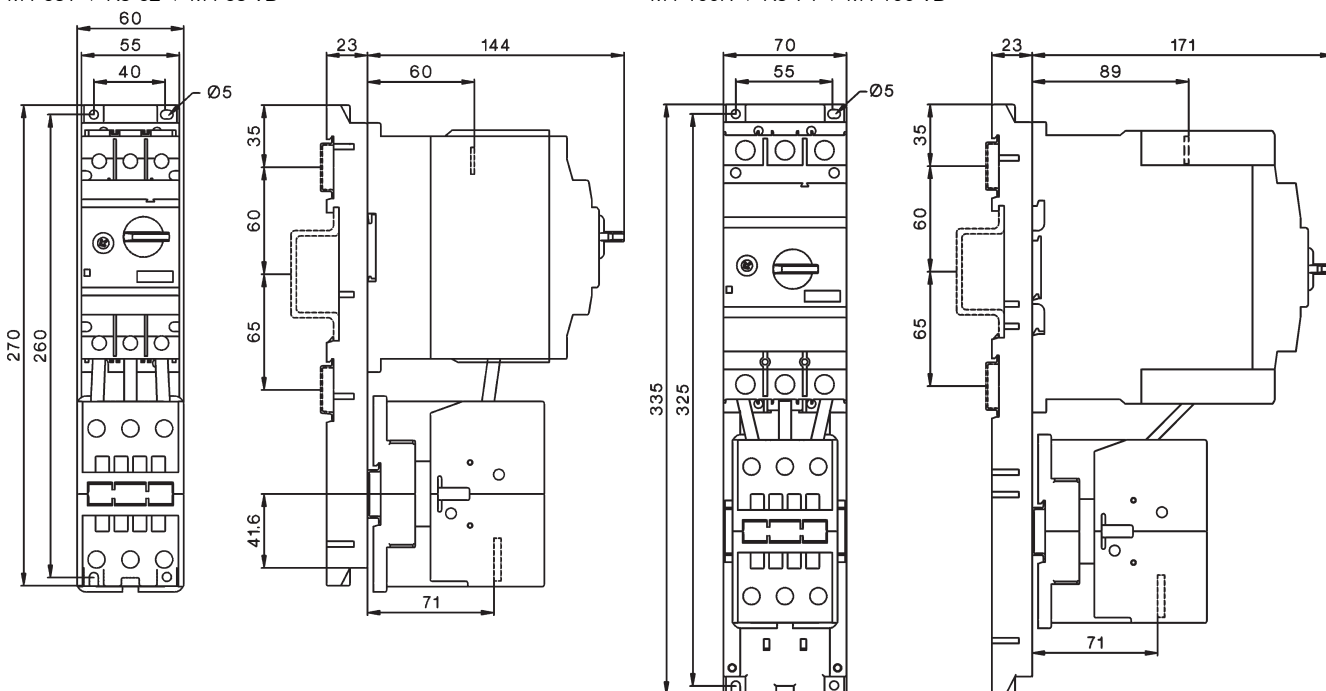


DIN-rail adapter M4 63 HU1

M4-63T + K3-50 + M4 63 VD
M4-63T + K3-62 + M4 63 VD

DIN-rail adapter M4 100 HU1

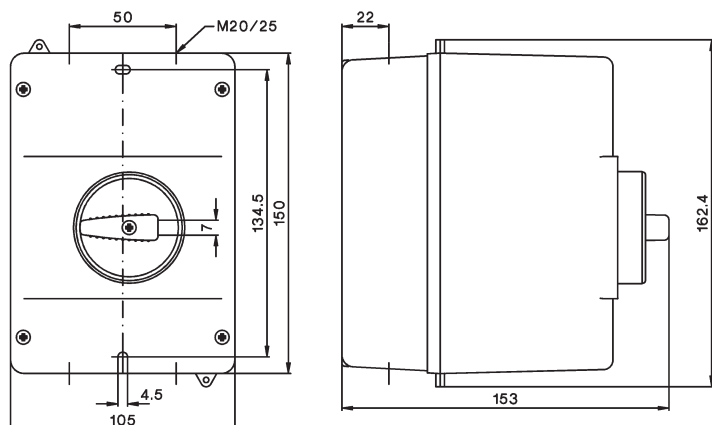
M4-100R + K3-62 + M4 100 VD
M4-100R + K3-74 + M4 100 VD



Dimensions

Enclosures

M4 32R PFH4
M4 32R PFHN4



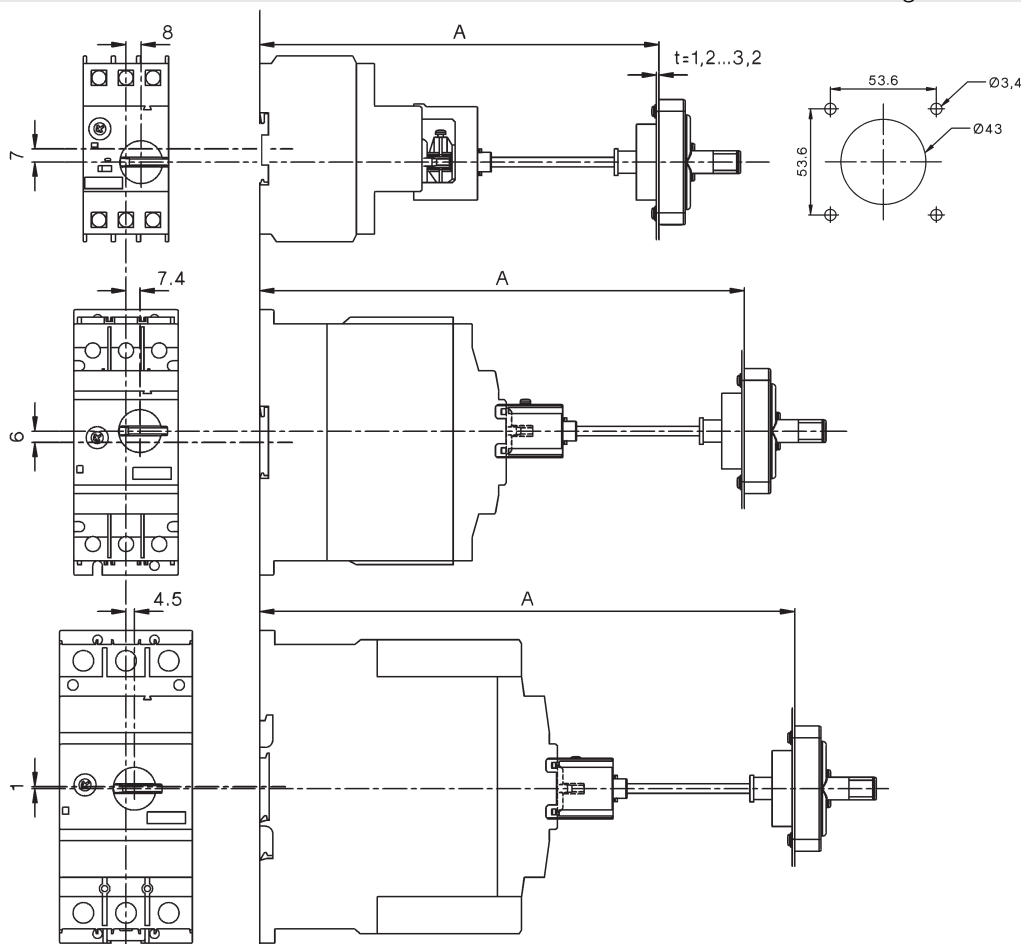
Door-coupling rotary mechanisms

Mounting holes

Type	A
M4 32R EH1 115	149 - 210
M4 32R EHN1 115	149 - 210
M4 32R EH1 315	149 - 410
M4 32R EHN1 315	149 - 410

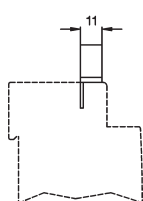
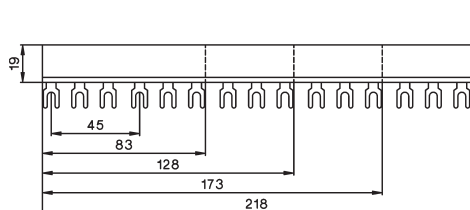
Type	A
M4 63R EH1 115	194 - 255
M4 63R EHN1 115	194 - 255
M4 63R EH1 315	194 - 455
M4 63R EHN1 315	194 - 455

Type	A
M4 100R EH1 115	220 - 282
M4 100R EHN1 115	220 - 282
M4 100R EH1 315	220 - 482
M4 100R EHN1 315	220 - 482

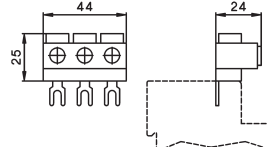


Insulated 3-phase busbar system

M4 32 S..



M4 32 SE





Manual Motors Starters

188



Auxiliary Contact Blocks

188



Shunt Release

189



Under-voltage Release

189



Accessories

189



Busbar Connectors

189



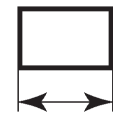
Enclosures

189



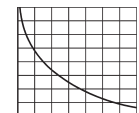
Technical Data

190



Dimensions

191



Tripping Characteristic

191

Manual Motor Starters



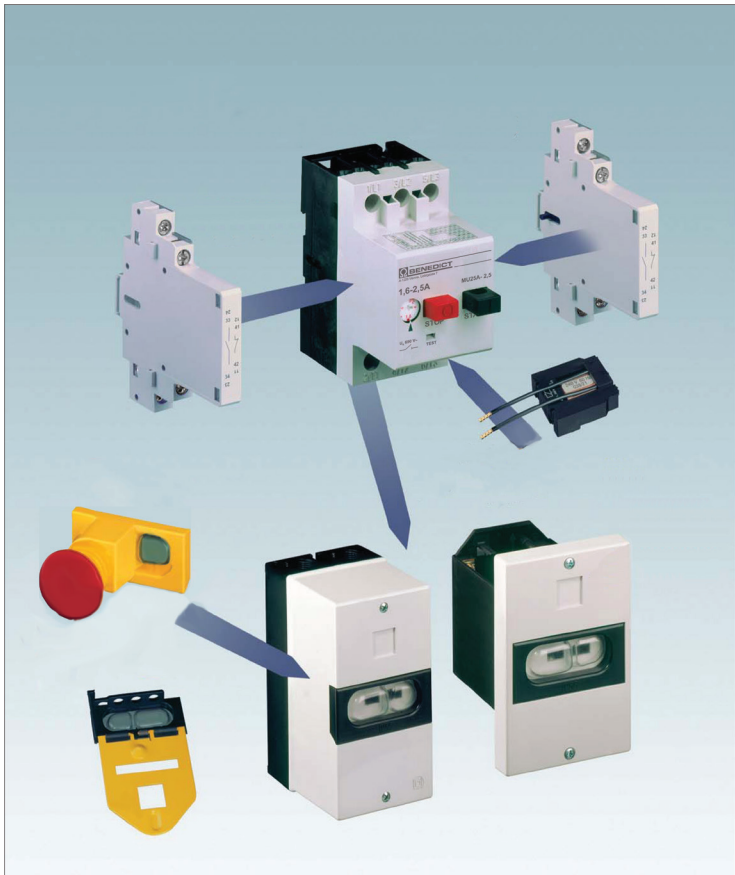
Thermal Overload Release Setting Range A	Ratings AC3 at		Magnetic short circuit trip A	Type	Pack pcs.	Weight kg/pc.
	400V kW	690V kW				
0,16 - 0,25	0,06 0,09	0,12 0,18	3,75 6	MU25-0,25 MU25-0,4	1 1	0,25 0,25
0,4 - 0,63	0,12 0,25	0,25 0,55	7,45 15	MU25-0,63 MU25-1	1 1	0,25 0,25
1 - 1,6	0,55 0,75	1,1 1,5	24 37,50	MU25-1,6 MU25-2,5	1	0,25
2,5 - 4	1,5 2,5	3 4	60 94,50	MU25-4 MU25-6,3	1 1	0,25 0,25
6,3 - 10	4 7,5	7,5 11	150 240	MU25-10 MU25-16	1 1	0,25 0,25
16 - 20	9 15	12 22	300 480	MU25-20 MU25-25 MU25-32	1 1	0,25 0,25

Auxiliary Contact Blocks, for side mounting, max. 2 pieces



Contacts				Rated Operational Current			Type	Pack pcs.	Weight kg/pc.
NO	NC	EM ¹⁾		AC15 230V A	400V A	AC1 500V A			
1	1	-	-	3,5	2	6	MU25-PS11	10	0,03

System MU25



Approvals

Country	USA, Canada UL	Europe
Type		

Shunt Release for mounting under the cover



Rated Control Voltage and Frequency V	Power Consumption		Type	Pack pcs.	Weight kg/pc.
	VA	W			
110V 50Hz, 110-120V 60Hz	2,7	1,8	MU25-A110	10	0,06
220-230V 50Hz, 240V 60Hz	2,7	1,8	MU25-A230	10	0,06

Under-voltage Release for mounting under the cover



Rated Control Voltage and Frequency V	Power Consumption		Type	Pack pcs.	Weight kg/pc.
	VA	W			
110V 50Hz, 110-120V 60Hz	2,7	1,8	MU25-U110	10	0,06
220-230V 50Hz, 240V 60Hz	2,7	1,8	MU25-U230	10	0,06
380-415V 50Hz, 440V 60Hz	2,7	1,8	MU25-U400	10	0,06

Accessories



Description	Specification	Type	Pack pcs.	Weight kg/pc.
Busbar Connector Fully Isolated, Ui 690V, Iu 63A				
Busbar	for 2 units, 99mm long	MU25A-D99	10	0,036
Busbar	for 3 units, 154mm long	MU25A-D154	10	0,060
Busbar	for 4 units, 208mm long	MU25A-D208	10	0,084
Busbar	for 5 units, 262mm long	MU25A-D262	10	0,107
Supply Block	3-pole for use with busbar connector	MU25A-DB	10	0,034
Spacing piece ½TE	for ambient temperature >40°C	P730	10	0,013
Enclosures				
Moulded Enclosure	Protection to IP55	MU25-O55	1	0,24
Moulded Front Plate	Protection to IP55	MU25-C55	1	0,16
Locking Bracket	Suitable for 3 padlocks in "OFF"-position, stirrup diameter of the padlock max. 8 mm	MU25-Z	1	0,1
Emergency Stop Button	latch, release by turning	MU25-NAV	1	0,04

Manual Motor Starters

Data according to IEC 947, IEC 204, EN 60947, EN 60204, VDE 0660, VDE 0113

Type			MU25			
Main Contacts						
Rated insulation voltage U_i	V~ ¹⁾		690			
Rated operational current I_e (=Ith) open, at 50°C	A		25 ²⁾			
Mechanical life	S x 10 ⁶		0,1			
Contact life at I_e /AC3	S x 10 ⁶		0,1			
Tripping class according to IEC 60947-4-1			10A			
Rated ultimate short-circuit breaking capacity I_{cu}			220-240V~	380-415V~	500V~	660-690V~
Values for open unit, when incoming supply on upper terminals						
Setting range						
	bis 1A	kA	50	50	50	50
	1 - 1,6A	kA	50	50	50	50
	1,6 - 2,5A	kA	50	50	3	2,5
	2,5 - 4A	kA	50	50	3	2,5
	4 - 6,3A	kA	50	50	3	2,5
	6,3 - 10A	kA	50	6	3	2,5
	10 - 16A	kA	10	6	2,5	2
	16 - 20A	kA	10	6	2,5	2
	20 - 25A	kA	10	6	2,5	2
	25 - 32A	kA	10	6	2,5	2
Short circuit protection			220-240V~	380-415V~	500V~	660-690V~
Setting range						
	bis 1A	A	-	-	-	-
	1 - 1,6A	A	-	-	-	-
Fuse gL(gG) only necessary if the short circuit current could be greater than the rated ultimate short-circuit breaking capacity						
	1,6 - 2,5A	A	-	-	25	20
	2,5 - 4A	A	-	-	35	25
	4 - 6,3A	A	-	-	50	35
	6,3 - 10A	A	-	80	50	35
	10 - 16A	A	80	80	63	35
	16 - 20A	A	80	80	63	50
	20 - 25A	A	80	80	63	50
	25 - 32A	A	80	80	63	50
Maximum ambient temperature						
Operation						
	open	°C	-25 bis +60			
	enclose	°C	-25 bis +40			
Temperature compensation			-5 bis +40			
Storage			-25 bis +70			
Power loss at rated current, warm condition						
	W		6 - 8			
Auxiliary Contacts						
Rated insulation voltage U_i	V~		500			
Thermal rated current Ith	Ambient temperature max. 50°C	A	6			
Utilization category AC15						
Rated operational current I_e			220-240V	A	3,5	
			380-415V	A	2	
			500V	A	1,5	
Short circuit protection max. fuse size			gL (gG)	A	6	
Cable cross-section						
Main connector			solid or stranded	mm²	1 - 6	
			flexible	mm²	1 - 4	
			flexible with multicore cable end	mm²	0,75 - 4	
Number of clampable conductors per terminal / Screw torque					2 / M3 - Pz2 1,8Nm	
Auxiliary connector			solid or stranded	mm²	0,75 - 2,5	
			flexible	mm²	0,75 - 1,5	
			flexible with multicore cable end	mm²	0,75 - 1,5	
Number of clampable conductors per terminal / Screw torque					2 / M3,5 - Pz1 1Nm	
Resistance to shock according to IEC 68-2-27			g		20	
vibration resistance to IEC68-2-6			g		5 (by f= 5...150Hz)	

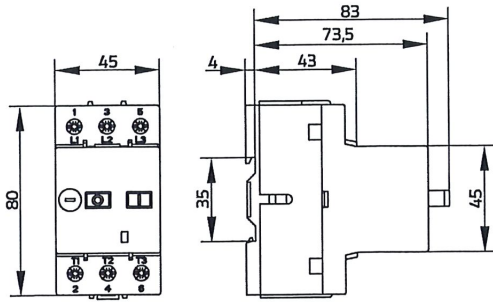
1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp} = 6kV$.

2) Maximum number without gap: 3

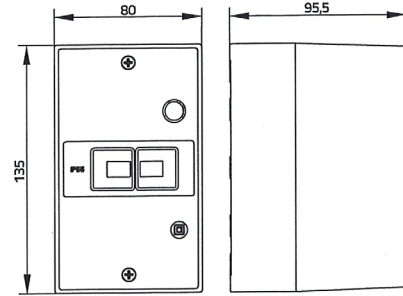
Manual Motor Starters

Maße

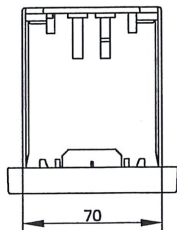
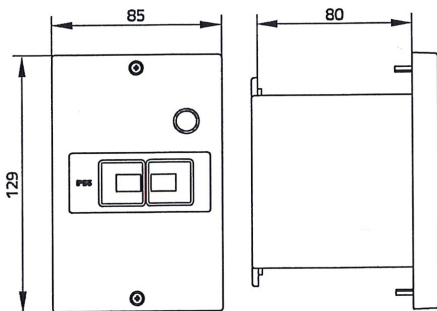
Manual Motor Starter MU25



Moulded Enclosure MU25-O55

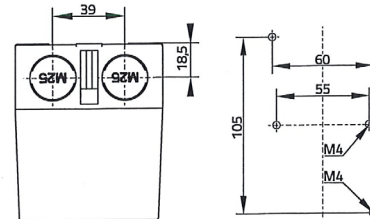


Moulded Front Plate MU25-C55



Mounting
with clamps

with screws



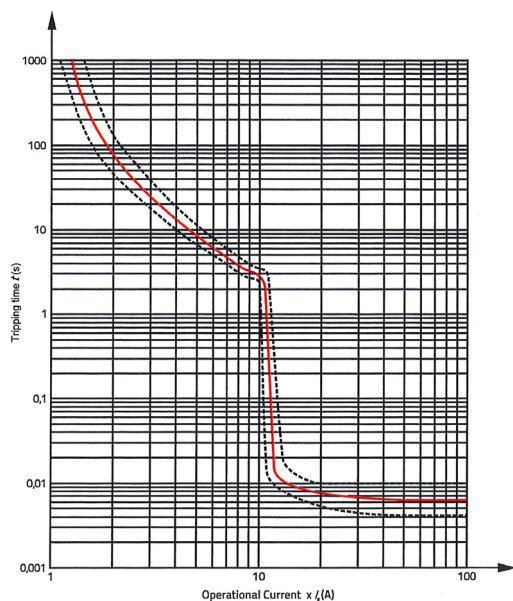
Temperature Compensation

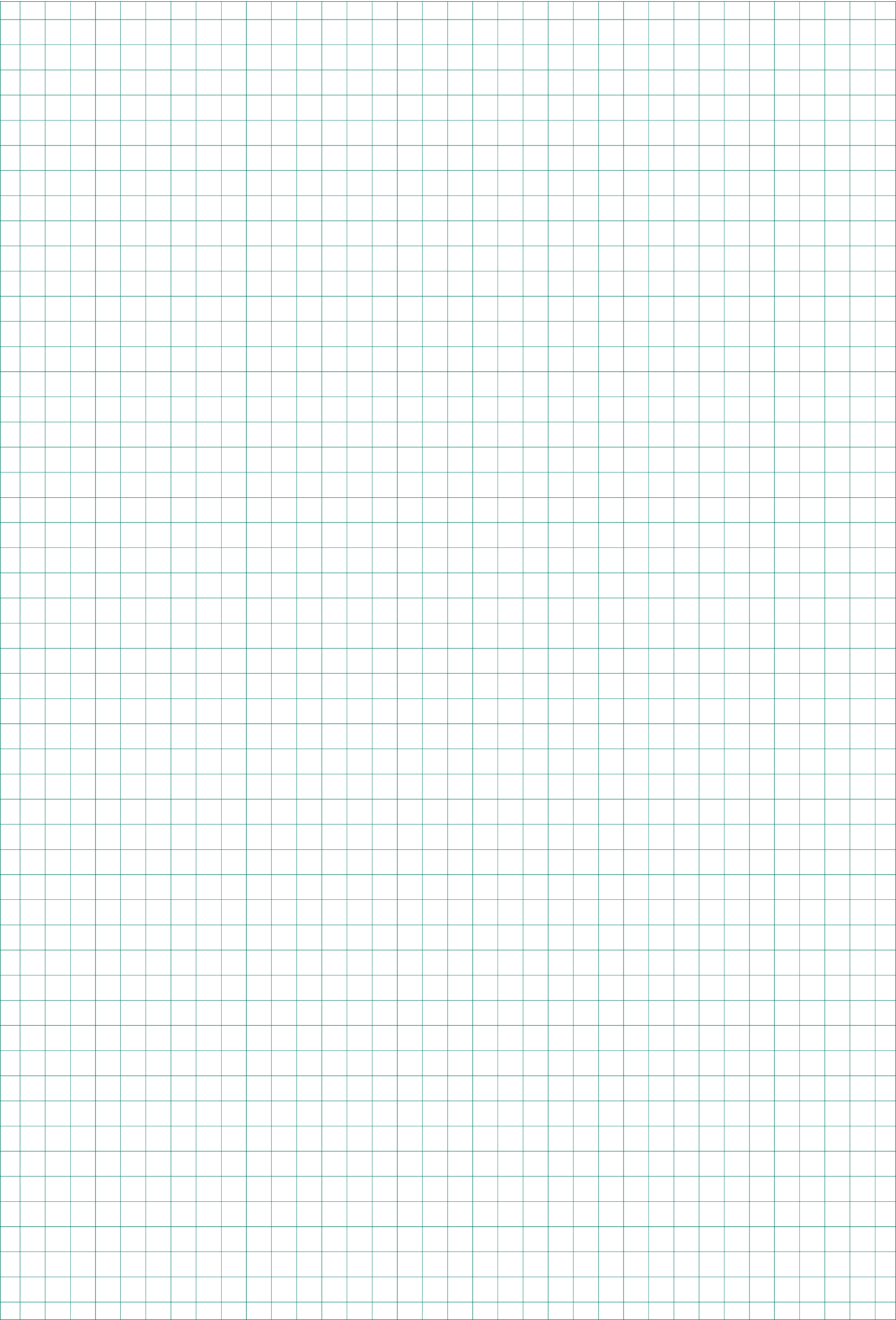
In case of higher ambient temperature use the following formula: $(\text{Ambient temperature} - 20) \times 0,3 = \text{correction factor in \% of the full load motor current}$

Example:

Ambient temperature 60°C, full load motor current 5A
 $(60 - 20) \times 0,3 = 12\%$

Tripping Characteristic





	General	194
	Approvals	195
	Informations	196
	Cam Switches	198
	Basic designs	200
	Cam Switches	203
	On-Off switches, Changeover switches	203
	Star-Delta switches	207
	Multi speed switches	211
	Control switches	215
	Voltmeter selector switches	218
	Ammeter switches	219
	Gang switches	221
	Multi step switches	224
	Mini-Cam Switches	236
	Technical data	236
	On-Off switches, Changeover switches	237
	Star-Delta switches	237
	Control switches	237
	Voltmeter selector switches, Ammeter switches	238
	Gang switches, Multi step switches	238
	Load switches	240
	On-Off switches	240
	Changeover switches	241
	Handles and plates	242
	Operating knobs and handles	242
	Escutcheon plates	243
	Standard Markings	244
	Angles of rotation	247
 	Optional Extras	249
	Drive units	249
	Door couplings	250
	Key operated switches	251
	Padlock devices	252
	Switch interlocks	253
	Couplings	254
	Accessories	256
	Special switches	257
	Technical data	259
	Cam switches	259
	Load switches	260
	Dimensions	262
	Cam switches	262
	Load switches	266
	Accessories	267

General

Test Authorities, Registration Mark, Approvals

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

Quality Control System

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

CE-Marking



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

Below you find the EEC Directives concerning our products.

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC

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

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

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

Marking of auxiliary contacts

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

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

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

Discernment at UL-Standards

Recognized Component Industrial Control Equipment

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

Devices have permission to be marked with the label



Listed Industrial Control Equipment

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

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



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

Devices approved for "field wiring",
a) devices for employment in control panels, when they are mounted and wired by skilled worker.
b) devices for retail in USA

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

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

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

Approvals

Country	USA, Canada UL	Europe	Russia EAC	CB/CCA- Certificates	China
Type					
Cam Switches (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)					
M10	o	/	o	o	-
M10H	o	/	o	o	o
M20	o	/	o	o	o
N20	o	/	o	o	o
N33F	o	/	o	o	o
N40	-	/	o	o	-
N61	o	/	o	o	-
N80	o	/	o	o	-
N100	o	/	o	o	-
N200	o	/	o	o	-
L400	o	/	-	-	-

o In standard version approved
- Not provided for test till now

/ No testing required CE

x In test

Contactors, Motor-Starters

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnectors

Push Buttons

Representatives, Suppliers

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

Resistance to climatic conditions acc. to IEC60068

Open-type devices are climate-resistant in the constant climate according to IEC60068-2-3 (this is a climate with an ambient temperature of 40°C and an atmospheric humidity of 90 to 95%).

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

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

Short circuit protection

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

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

Mounting positions

No limitations, all kind of positions allowed.

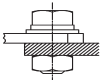
2 nd digit	Short description	Definition
1	Protected against dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	Protected against dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle 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.

Suitable ambient temperatures:

Operation	open °C	-40 up to +60
	enclosed °C	-40 up to +40
Storage	°C	-50 up to +90

Technical Information

Terminal screws

Devices Type	Kind of connection Screw with washer	2 Screw s		Screw driver	Tightening torque	
					Nm	lb. inch
Cam Switches						
M4H..	M2,5	-	-	 Pz1	0,6	5
M10	M3	-	-	 Pz2	0,6 - 1,2	5 - 11
M10H, M10HD	M3,5	-	-	 Pz2	0,8 - 1,4	7 - 12
M20, N20, N33F	M4	-	-	 Pz2	1,2 - 1,8	11 - 16
N40	M5	-	-	 Pz2	2,5 - 3	22 - 26
N61, N80	-	2 x M5	-	 Pz2	2,5 - 3	22 - 26
N100	-	2 x M6	-	 Pz3	3,5 - 4,5	31 - 40
N200	-	-	M10		10	88
L400	-	-	M12		16	140
L600	-	-	M16		24	210
L800	-	-	M16		24	210
L1200	-	-	M16		24	210

Ratings								Designs			
Typ	Rated current			Motor			Plate	Panel moun. M10H, M20 IP65 IP40	Single hole mount. Ø22,5mm		Flush mount. IP40
	Therm. I _{th} open A	AC21 A	atU _e V	AC3 3~400V kW	AC23 3~400V						
					A	kW					
Protection degree from front in mounted position											
M4H	10	10	440	2,2	6	3	30□	M4H E	M4H Z	M4H ZO	-
M10H	20	20	690	5,5	16	7,5	48□	M10H E	M10H Z	M10H ZO	-
M10HD ¹⁾	10	10	690	-	-	-	48□	M10HD E	M10HD Z	M10HD ZO	-
M10	20	20	440	5,5	16	7,5	48□	-	-	-	M10 UP
M20	32	32	690	11	30	15	48□	M20 E	M20 Z	M20 ZO	-
N20	32	32	690	11	30	15	64□	N20 E	-	-	-
N33F	50	50	690	15	45	22	64□	N33F E	N33F Z	-	-
N40	63	63	690	15	45	22	88□	N40 E	-	-	-
N61	90	85	690	25	60	30	88□	N61 E	-	-	-
N80	115	115	690	30	85	45	88□	N80 E	-	-	-
N100	150	150	690	40	110	55	132□	N100 E	-	-	-
N200	250	250	690	70	140	70	132□	N200 E	-	-	-
L400	400	400	690	70	140	70	132□	L400 E	-	-	-
L600	600	400	690	70	140	70	132□	L600 E	-	-	-
L800	800	400	690	70	140	70	132□	L800 E	-	-	-
L1200	1200	400	690	70	140	70	132□	L1200 E	-	-	-

Cam Switches 10 - 250A

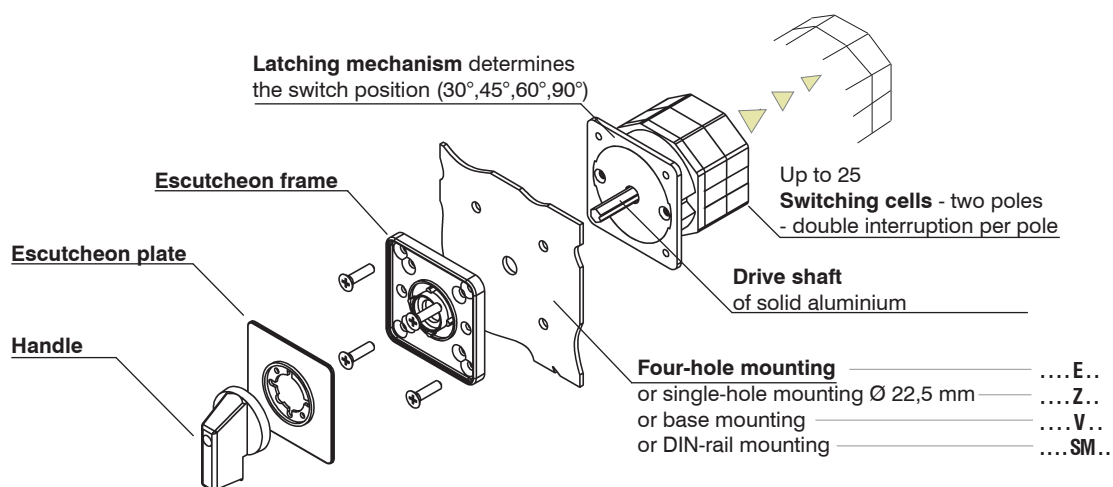
Cam switches can be used for virtually all purposes, e.g. as motor, main, control or instrument switches. Over and above the switching programs mentioned in the list, an effectively limitless number of special programs can be implemented.

Load switch L.. 400 - 1200A

Load switches are primarily employed where resistive or slightly inductive current loads are to be switched on and off, or switching takes place without loading.

Load switches are assembled by parallel switching of two or more of cam switch contacts.

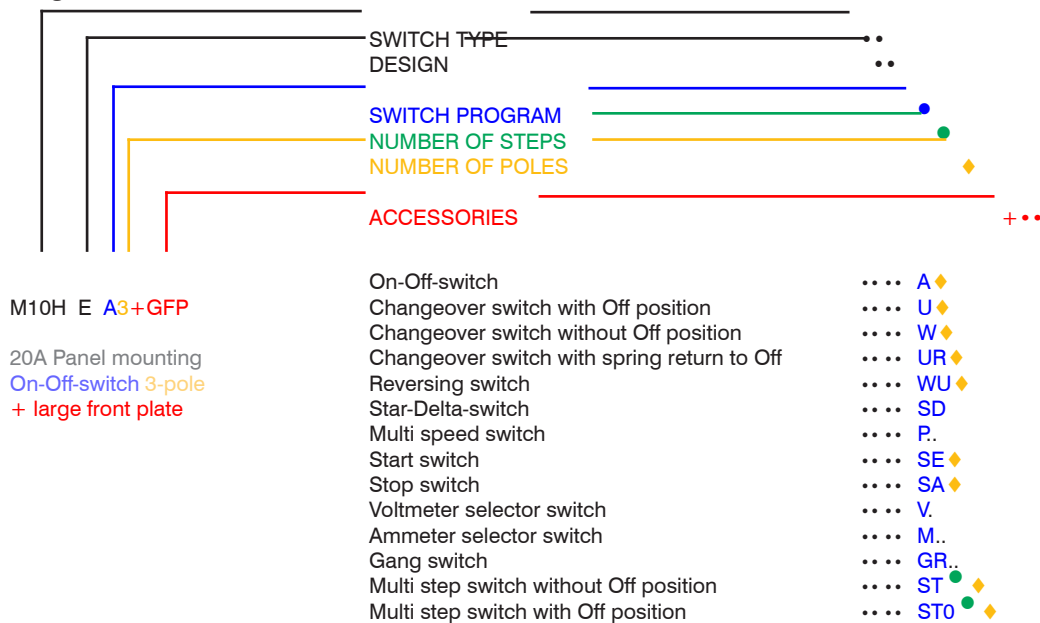
With customer built main terminal protection, load switch L.. can also be used as main switch.



1) Control Switches with double contacts for highest contact reliability.

Designs Base mounting M10H, M20 IP65 IP40	DIN-rail mounting IP40	Modular IP40	Plastic enclosed ..P.. IP40 ..PF.. IP65	horizontal, IP65	Motor switch enclosed IP65	Terminal box mounting IP65
						
-	-	-	-	-	-	-
M10H V 	M10H SM 	M10H SMA 	-	-	M10 PM 	-
M10HD V 	M10HD SM 	M10HD SMA 	-	-	-	-
-	-	-	M10 P(F) 	-	-	M10 KE 
M20 V 	M20 SM 	M20 SMA 	-	-	-	-
N20 V 	N20 SM 	-	N20 P(F) 	-	N20 PM 	N20 KE 
N33F V 	N33F SM 	-	N33F P(F) 	-	-	-
N40 V 	-	-	N40 P(F) 	N40 PLF 	-	-
N61 V 	-	-	-	N61 PLF 	-	-
N80 V 	-	-	-	N80 PLF 	-	-
N100 V 	-	-	-	-	-	-
N200 V 	-	-	-	-	-	-
L400 V 	-	-	-	-	-	-
L600 V 	-	-	-	-	-	-
L800 V 	-	-	-	-	-	-
L1200 V 	-	-	-	-	-	-

Ordering



Panel mounting designs

Switches of the panel mounting designs listed below have protection from front IP40. Where a shaft seal (appendix +WD) is used, the protection is increased to IP54. Use of a moisture proofing cap (appendix +FR) results in an increase in rear protection to IP54. In the standard version, the switches are delivered with a square escutcheon plate and black instrument knob. Forward mounting is possible for some of the design

E switches. The position of the terminals of the standard switches is left and right, at switch M10H the terminals are above and below. Where a knob insert is turned by 90° (can easily be performed after delivery), the position of the terminals can be changed.

Dimensions see page 262.



Design

Description	Type appendix	Possible switch sizes					
		M10H M10HD	M20	N20 N33F	N40 N61 N80	N100 N200	L...
Panel mounting For installation in control panels, machines and equipment. For panel thickness of over 5mm, an extended switch shaft is required (appendix +VW). Protection from front: M10H, M20 IP65 all others IP40	E	X	X	X	X	X	X
Central fixing 22,5mm Switch for mounting with standard 22,5mm mounting holes and 1-4mm panel thickness. Protection from front: IP65 Wrench J7049 necessary	Z	X	X	X ²⁾	-	-	-
Central fixing 22,5mm Switch without escutcheon plate , for installation with standard 22,5mm mounting holes and 1-4mm panel thickness. Protection from front: IP65 Wrench J7049 necessary	ZO	X	X	-	-	-	-
Flush mounting version Switch with white instrument knob, cream escutcheon plate with black markings, for installation in 65mm flush mounting boxes and use of Unitas plate. Supplied with flush mounting box: appendix +UP. Maximum number of cells with: M10 FM box 45mm deep 2 FM box 65mm deep 4	UP	X ¹⁾	-	-	-	-	-

1) Switches are delivered with switch type M10

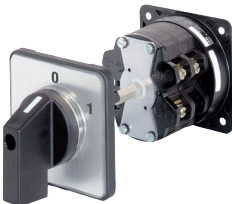
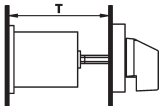
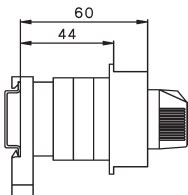
2) For switch types N33F only, max. 3 cells

Base mounting designs

Switches of the designs listed below have protection from front IP40. When a shaft seal (appendix +WD) is used, the front protection type is increased to IP54. In the standard version, the switches are delivered with a square escutcheon plate and black instrument knob (design SMA with grey cover and grey toggle knob). Door couplings are advisable for switchgear cabinets with hinged doors.

The position of the terminals of the standard switches is left and right, at switch M10H the terminals are above and below. Where a knob insert is turned by 90° (can easily be performed after delivery), the position of the terminals can be changed.

Dimensions see page 263.

Design		Possible switch sizes					
Description	Type appendix	M10H	M20	N20 N33F	N40 N61 N80	N100 N200	L...
 Base mounting For screw mounting to the back wall or floor of distributor boxes, or of appliances with removable lids. Additionally it is possible to state the installation depth - that is the distance between mounting level of the switch and the inside edge of the door (dimension T).  Door couplings see page 250.	V ... +T/...	X	X	X	X	X	X
 Snap-on mounting on DIN-rail with installation cover for standard opening and toggle knob. The lay-out of the terminals of the standard switches is above and below. Dimensions for Switch types M10H SMA .. with 1-3 cells M20 SMA .. with 1 or 2 cells  Further dimensions see page 263.	SMA	X	X	-	-	-	-

Plastic enclosed switches

The switches, which have durable plastic enclosures, are intended for wall mounting or attachment to machines. In the standard version, they are supplied with a light-grey enclosure, square escutcheon plate, black markings on a silver background, and a black instrument knob. Other colours and colour combinations are available for most enclosure types. It is not possible to mount an additional rectangular plate. The enclosure base is equipped with 4 entry glands with heavy-gauge conduit threads (see drawings). In all types of plastic enclosures, two terminals that are connected and insulated from switch column can be provided for a PE conductor (appendix + PE). **Dimensions** see page 264.



Design

Description	Type appendix	Possible switch sizes						
		M10H	N20	N33F	N40	N61	N80	N100
Plastic enclosure light grey Protection class IP40 Maximum number of cells	P	X	X	X	X	-	-	-
Plastic enclosure light grey Moisture protection Protection class IP65 Maximum number of cells	PF	X	X	X	X	-	-	-
Plastic enclosure horizontal light grey Moisture protection Protection class IP65 Maximum number of cells	PLF	-	-	-	X	X	X	-
Terminal box mounting Protection class IP65 These switches are front mounted on a terminal box. The switch cells protrude through a hole into the terminal compartment. Maximum number of cells	KE	X	X	-	-	-	-	-
Plastic motor switch enclosure Moisture protection Protection class IP65 Maximum number of cells	PM	-	X	-	-	-	-	-

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
On-Off-switches A							
1-pole		60°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. A1 . A1	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. A1 . A1	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. A1 . A1 . A1	+003
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. A1 . A1	
2-pole		60°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. A2 . A2	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. A2 . A2	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. A2 . A2 . A2	+003
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. A2 . A2	
3-pole		60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. A3 . A3	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. A3 . A3	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. A3 . A3 . A3	+003
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. A3 . A3	
4-pole 4. pole early make		60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. A4 . A4	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. A4 . A4	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. A4 . A4 . A4	+003
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. A4 . A4	
6-pole		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. A6 . A6	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. A6 . A6	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. A6 . A6 . A6	+003
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. A6 . A6	

Ordering example: AC21 250A panel mounting, On-Off-switch 6-pole, Escutcheon plate OFF - ON **N200 E A6+003**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

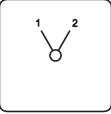
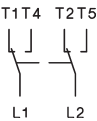
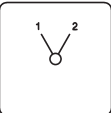
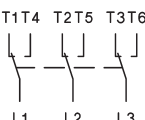
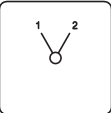
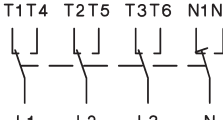
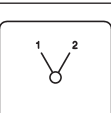
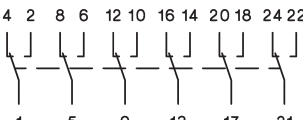
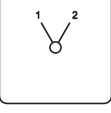
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate	
Changeover switches U								
1-pole		60°	1	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132□ 150A 250A	M10H . M20 . N20 . N33F . N40 . N61 . N80 . N100 . N200 .	x x x x x ¹⁾ x x x x - x - x - x x x x - x x - x - x x - x - x x - x - - x - x - - x - x - -	. U1 . U1 . U1 . U1 . U1 . U1 . U1 . U1 . U1	 +007
2-pole		60°	2	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132□ 150A 250A	M10H . M20 . N20 . N33F . N40 . N61 . N80 . N100 . N200 .	x x x x x ¹⁾ x x x x - x - x - x x x x - x x - x - x x - x - x x - x - - x - x - - x - x - -	. U2 . U2 . U2 . U2 . U2 . U2 . U2 . U2 . U2	 +007
3-pole		60°	3	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132□ 150A 250A	M10H . M20 . N20 . N33F . N40 . N61 . N80 . N100 . N200 .	x x x x x ¹⁾ x x x x - x - x - x x x x - x x - x - x x - x - x x - x - - x - x - - x - x - -	. U3 . U3 . U3 . U3 . U3 . U3 . U3 . U3 . U3	 +007
4-pole 4. pole early make		60°	4	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132□ 150A 250A	M10H . M20 . N20 . N33F . N40 . N61 . N80 . N100 . N200 .	x x x x x ¹⁾ x x x x - x - x - x x - x - x x - x - x x - x - x x - x - - x - x - - x - x - -	. U4 . U4 . U4 . U4 . U4 . U4 . U4 . U4 . U4	 +007
6-pole		60°	6	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132□ 150A 250A	M10H . M20 . N20 . N33F . N40 . N61 . N80 . N100 . N200 .	x x x x - x ¹⁾ x x x x - x - x - x x - x - x x - x - x x - x - x x - x - - x - x - - x - x - -	. U6 . U6 . U6 . U6 . U6 . U6 . U6 . U6 . U6	 +007

Ordering example: AC21 250A panel mounting, changeover switch 6-pole, Escutcheon plate 1 - OFF - 2

N200 E U6+007

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Changeover switches without off W							
1-pole		60°	1	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ M20 . x x x x - N20 . x - x - x N33F . x x x - x N40 . x - x - x N61 . x - x - x N80 . x - x - - N100 . x - x - - N200 . x - x - -	. W1 . W1 . W1 . W1 . W1 . W1 . W1 . W1 . W1	
2-pole		60°	2	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ M20 . x x x x - N20 . x - x - x N33F . x x x - x N40 . x - x - x N61 . x - x - x N80 . x - x - - N100 . x - x - - N200 . x - x - -	. W2 . W2 . W2 . W2 . W2 . W2 . W2 . W2 . W2	
3-pole		60°	3	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ M20 . x x x x - N20 . x - x - x N33F . x x x - x N40 . x - x - x N61 . x - x - x N80 . x - x - - N100 . x - x - - N200 . x - x - -	. W3 . W3 . W3 . W3 . W3 . W3 . W3 . W3 . W3	
4-pole 4. pole early make		60°	4	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ M20 . x x x x - N20 . x - x - x N33F . x - x - x N40 . x - x - x N61 . x - x - x N80 . x - x - - N100 . x - x - - N200 . x - x - -	. W4 . W4 . W4 . W4 . W4 . W4 . W4 . W4 . W4	
6-pole		60°	6	48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x - x ¹⁾ M20 . x x x - - N20 . x - x - x N33F . x - x - x N40 . x - x - x N61 . x - x - x N80 . x - x - - N100 . x - x - - N200 . x - x - -	. W6 . W6 . W6 . W6 . W6 . W6 . W6 . W6 . W6	

Ordering example: AC21 250A panel mounting, changeover switch without off 6-pole, **N200 E W6**

1) Plastic enclosed switches are delivered with switch type M10.

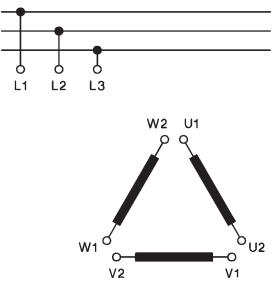
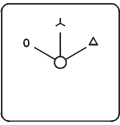
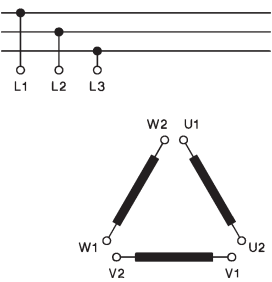
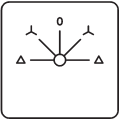
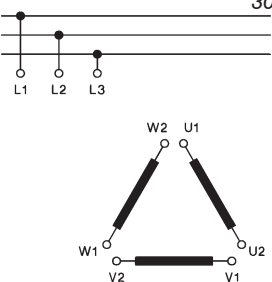
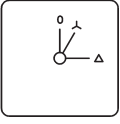
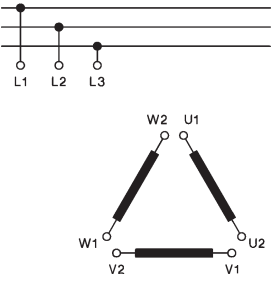
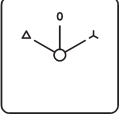
Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Reversing switches WU							
2-pole		60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WU2 . WU2	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. WU2 . WU2	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. WU2 . WU2 . WU2	+007
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. WU2 . WU2	
2-pole without off cross switch		60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WK2 . WK2	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. WK2 . WK2	
				88 □ 63A 90A 115A	N40 . x x x - x N61 . x - x - x N80 . x - x - -	. WK2 . WK2 . WK2	
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. WK2 . WK2	
2-pole with spring return from both sides to off		30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WU2R2 . WU2R2	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. WU2R2 . WU2R2	
				88 □ 63A	N40 . x - x - x	. WU2R2	
2-pole position 1 latched position 2 with spring return to off		60°+30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WU2R1 . WU2R1	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. WU2R1 . WU2R1	
				88 □ 63A	N40 . x - x - x	. WU2R1	
3-pole		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WU3 . WU3	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. WU3 . WU3	
				88 □ 63A 90A 115A	N40 . x - x - x N60 . x - x - x N80 . x - x - -	. WU3 . WU3 . WU3	+007
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. WU3 . WU3	
3-pole with spring return from both sides to off		30°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WU3R2 . WU3R2	
				64 □ 32A 50A	N20 . x - x - x N33F . x x x - x	. WU3R2 . WU3R2	
				88 □ 63A	N40 . x - x x	. WU3R2	
3-pole position 1 latched position 2 with spring return to off		60°+30°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. WU3R1 . WU3R1	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. WU3R1 . WU3R1	
				88 □ 63A	N40 . x - x - x	. WU3R1	

Ordering example: AC21 63A base mounting, reversing switch 3-pole, position 2 with spring to off **N40 V WU3R1**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Star-Delta switches SD							
1 rotary direction		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. SD . SD	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. SD . SD	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. SD . SD . SD	
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. SD . SD	
both rotary directions		45°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. SDR . SDR	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. SDR . SDR	
				88 □ 63A 90A 115A	N40 . x - x - x N61 . x - x - x N80 . x - x - -	. SDR . SDR . SDR	
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. SDR . SDR	
1 rotary direction spring return from Y to off		30° + 60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. SRD . SRD	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. SRD . SRD	
				88 □ 63A 90A 115A	N40 . x - x - x N60 . x - x - x N80 . x - x - -	. SRD . SRD . SRD	
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. SRD . SRD	
Star-Delta selector switch		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ M20 . x x x x -	. SDU . SDU	
				64 □ 32A 50A	N20 . x - x - x N33F . x - x - x	. SDU . SDU	
				88 □ 63A 90A 115A	N40 . x - x - x N60 . x - x - x N80 . x - x - -	. SDU . SDU . SDU	
				132 □ 150A 250A	N100 . x - x - - N200 . x - x - -	. SDU . SDU	

Ordering example: AC21 32A plastic enclosed, star-delta selector switch

N20 P SDU

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Star-Delta switches SD							
with double outfeed phases for use with manual motor starter		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SDMO . SDMO	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. SDMO . SDMO	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SDMO . SDMO . SDMO	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SDMO . SDMO	
with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break- down		90°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SDJ1 . SDJ1	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. SDJ1 . SDJ1	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SDJ1 . SDJ1 . SDJ1	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SDJ1 . SDJ1	
with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break- down, spring return to		90°+30°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SDJ2 . SDJ2	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. SDJ2 . SDJ2	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SDJ2 . SDJ2 . SDJ2	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SDJ2 . SDJ2	
as type SDJ1 but for both rotary directions		60°	7	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. SDRJ1 . SDRJ1	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - - -	. SDRJ1 . SDRJ1	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. SDRJ1 . SDRJ1 . SDRJ1	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SDRJ1 . SDRJ1	
with brake position (counter current braking) brake position is a momentary operation		45°+30°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SDB . SDB	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. SDB . SDB	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SDB . SDB . SDB	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SDB . SDB	

Ordering example: AC21 250A panel mounting star-delta switch with brake position

N200 E SDB

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Split phase switches HP							
for starting up single-phase motors with split-phase, spring return from START to Off		30° + 60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. HP1 . HP1	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. HP1 . HP1	
				88 □ 63A	N40 . x - x - x -	. HP1	
for starting up single-phase motors with split-phase, spring return from START to 1		90° + 30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. HP2 . HP2	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. HP2 . HP2	
				88 □ 63A	N40 . x - x - x -	. HP2	
for starting up single-phase motors with split-phase, both rotary directions		60° + 30°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. HPR1 . HPR1	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. HPR1 . HPR1	
				88 □ 63A	N40 . x - x - x -	. HPR1	
as type HPR1 with starting and phase-shifting capacitor		60° + 30°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. HPR2 . HPR2	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. HPR2 . HPR2	
				88 □ 63A	N40 . x - x - x -	. HPR2	

Ordering example: AC21 63A panel mounting, split phase switch, both rotary directions **N40 E HPR1**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi speed switches P							
1 Dahlander winding 1 rotary direction		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. P61 . P61	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. P61 . P61	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P61 . P61 . P61	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P61 . P61	
1 Dahlander winding 1 rotary direction		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. P62 . P62	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. P62 . P62	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P62 . P62 . P62	+007
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P62 . P62	
1 Dahlander winding both rotary directions		45°	7	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. P61R . P61R	
				64 □ 32A 50A	N20 . x - x - x - N33F . x - x - - -	. P61R . P61R	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. P61R . P61R . P61R	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P61R . P61R	
1 Dahlander winding 1 rotary direction, with auxiliary contacts for contactor control		60°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. P61J . P61J	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. P61J . P61J	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P61J . P61J . P61J	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P61J . P61J	

Ordering example: AC21 32A cast enclosed, multi speed switch, 1 Dahlander winding, 1 rotary direction

N20 G P61

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi speed switches P							
open Dahlander winding 1 rotary direction low speed with star-delta-start		45°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. P91 . P91	
			64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. P91 . P91		
			88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P91 . P91 . P91		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P91 . P91		
open Dahlander winding both rotary directions low speed with star-delta-start		30°	8	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. P91R . P91R	
			64 □ 32A 50A	N20 . x - x - x - N33F . x - x - - -	. P91R . P91R		
			88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. P91R . P91R . P91R		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P91R . P91R		
open Dahlander winding 1 rotary direction, low speed with star-delta-start, with additional start position (starting resistor)		30°	7	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. P91W . P91W	
			64 □ 32A 50A	N20 . x - x - x - N33F . x - x - - -	. P91W . P91W		
			88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. P91W . P91W . P91W		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. P91W . P91W		

Ordering example: AC21 250A panel mounting, multi speed switch, 1 rotary direction, low speed with star-delta-start

N200 E P91

1) Plastic enclosed switches are delivered with switch type M10.

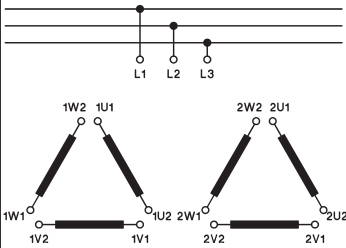
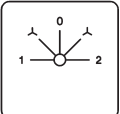
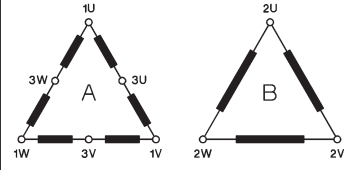
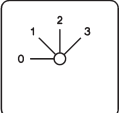
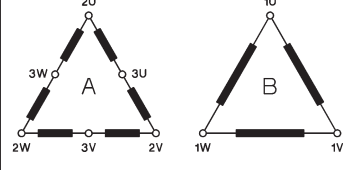
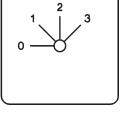
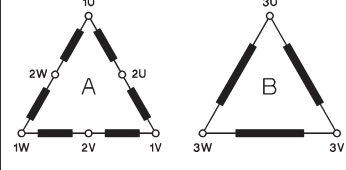
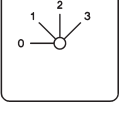
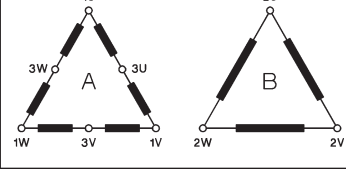
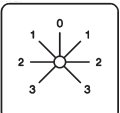
Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi speed switches P							
2 separate windings 1 rotary direction		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . P63 M20 . x x x x - - . P63		
				64 □ 32A 50A	N20 . x - x - x x . P63 N33F . x - x - x - . P63		
				88 □ 63A 90A 115A	N40 . x - x - x - . P63 N61 . x - x - x - . P63 N80 . x - x - - - . P63		
				132 □ 150A 250A	N100 . x - x - - - . P63 N200 . x - x - - - . P63		
2 separate windings 1 rotary direction		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . P64 M20 . x x x x - - . P64		
				64 □ 32A 50A	N20 . x - x - x x . P64 N33F . x - x - x - . P64		
				88 □ 63A 90A 115A	N40 . x - x - x - . P64 N61 . x - x - x - . P64 N80 . x - x - - - . P64		+007
				132 □ 150A 250A	N100 . x - x - - - . P64 N200 . x - x - - - . P64		
2 separate windings both rotary directions		60°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . P66 M20 . x x x x - - . P66		
				64 □ 32A 50A	N20 . x - x - x x . P66 N33F . x - x - x - . P66		
				88 □ 63A 90A 115A	N40 . x - x - x - . P66 N61 . x - x - x - . P66 N80 . x - x - - - . P66		
				132 □ 150A 250A	N100 . x - x - - - . P66 N200 . x - x - - - . P66		
2 separate windings 1 opened 1 rotary direction		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . P71 M20 . x x x x - - . P71		
				64 □ 32A 50A	N20 . x - x - x x . P71 N33F . x - x - x - . P71		
				88 □ 63A 90A 115A	N40 . x - x - x - . P71 N61 . x - x - x - . P71 N80 . x - x - - - . P71		
				132 □ 150A 250A	N100 . x - x - - - . P71 N200 . x - x - - - . P71		
2 separate windings 1 rotary direction star-delta-start		45°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - . P96 M20 . x x x - - - . P96		
				64 □ 32A 50A	N20 . x - x - x x . P96 N33F . x - x - x - . P96		
				88 □ 63A 90A 115A	N40 . x - x - x - . P96 N61 . x - x - x - . P96 N80 . x - x - - - . P96		
				132 □ 150A 250A	N100 . x - x - - - . P96 N200 . x - x - - - . P96		

Ordering example: AC21 250A panel mounting, multi speed switch, 2 separate windings, low speed with star-delta-start **N200 E P96**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi speed switches P							
2 separate windings 1 rotary direction both speeds with star-delta-start		45°	8	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. P122 . P122	
			64 □	32A 50A	N20 . x - x - x - N33F . x - x - - -	. P122 . P122	
			88 □	63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. P122 . P122 . P122	
			132 □	150A 250A	N100 . x - x - - - N200 . x - x - - -	. P122 . P122	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-AΔ-BΔ or Δ-AΔ		45°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. P93 . P93	
			64 □	32A 50A	N20 . x - x - x x N33F . x - x - x -	. P93 . P93	
			88 □	63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P93 . P93 . P93	
			132 □	150A 250A	N100 . x - x - - - N200 . x - x - - -	. P93 . P93	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-BΔ or Δ-AΔ-AΔ		45°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. P94 . P94	
			64 □	32A 50A	N20 . x - x - x - N33F . x - x - x -	. P94 . P94	
			88 □	63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P94 . P94 . P94	
			132 □	150A 250A	N100 . x - x - - - N200 . x - x - - -	. P94 . P94	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-AΔ-AΔ-BΔ or Δ		45°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. P95 . P95	
			64 □	32A 50A	N20 . x - x - x x N33F . x - x - x -	. P95 . P95	
			88 □	63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. P95 . P95 . P95	
			132 □	150A 250A	N100 . x - x - - - N200 . x - x - - -	. P95 . P95	
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions		45°	9	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. P93R . P93R	
			64 □	32A 50A	N20 . x - x - - - N33F . x - x - - -	. P93R . P93R	
			88 □	63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. P93R . P93R . P93R	
			132 □	150A 250A	N100 . x - x - - - N200 . x - x - - -	. P93R . P93R	

Ordering example: AC21 250A panel mounting, multi speed switch, 1 Dahlander winding A,
1 normal winding B, 3 speeds, both rotary directions **N200 E P93R**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi speed switches P							
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions		45°	9 48 □ 20A 32A	M10H . M20 .	x x x - - - x x x - - -	. P94R . P94R	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. P94R . P94R	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. P94R . P94R . P94R	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. P94R . P94R	
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions		45°	8 48 □ 20A 32A	M10H . M20 .	x x x - - - x x x - - -	. P95R . P95R	
			64 □ 32A 50A	N20 . N33F .	x - x - x - x - x - - -	. P95R . P95R	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - x - x - x - - - x - x - - -	. P95R . P95R . P95R	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. P95R . P95R	
2 Dahlander windings 4 speeds 1 rotary direction 0-AΔ-BΔ-AΔ-BΔ		30°	8 48 □ 20A 32A	M10H . M20 .	x x x - - - x x x - - -	. P124 . P124	
			64 □ 32A 50A	N20 . N33F .	x - x - x - x - x - - -	. P124 . P124	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - x - x - x - - - x - x - - -	. P124 . P124 . P124	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. P124 . P124	
2 Dahlander windings 4 speeds both rotary directions		30°	12 48 □ 20A 32A	M10H . M20 .	x x x - - - x x x - - -	. P124R . P124R	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. P124R . P124R	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. P124R . P124R . P124R	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. P124R . P124R	

Ordering example: AC21 250A Base mounting, multi speed switch, 2 Dahlander windings, 4 speeds, 1 rotary direction

N200 V P124

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Changeover switches with spring return to off UR							
1-pole		30°	1 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. UR1 . UR1	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. UR1 . UR1	
			88 □ 63A	N40 .	x - x - x -	. UR1	
			+264				
2-pole		30°	2 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. UR2 . UR2	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. UR2 . UR2	
			88 □ 63A	N40 .	x - x - x -	. UR2	
			+264				
3-pole		30°	3 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. UR3 . UR3	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. UR3 . UR3	
			88 □ 63A	N40 .	x - x - x -	. UR3	
			+264				
Changeover switches with 1 latched and 1 momentary position UK							
1-pole position 1 latched position 2 with spring return		60°+30°	1 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. UK1 . UK1	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. UK1 . UK1	
			88 □ 63A	N40 .	x - x - x -	. UK1	
2-pole position 1 latched position 2 with spring return		60°+30°	2 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. UK2 . UK2	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. UK2 . UK2	
			88 □ 63A	N40 .	x - x - x -	. UK2	
3-pole position 1 latched position 2 with spring return		60°+30°	3 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. UK3 . UK3	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. UK3 . UK3	
			88 □ 63A	N40 .	x - x - x -	. UK3	

Ordering example: AC21 63A panel mounting, changeover switch, position 1 latched, position 2 with spring return, 3-pole: **N40 E UK3**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Double throw switches with spring return to off WR							
1-pole		30°	1 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. W1R . W1R	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. W1R . W1R	
			88 □ 63A	N40 .	x - x - x -	. W1R	
2-pole		30°	2 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. W2R . W2R	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. W2R . W2R	
			88 □ 63A	N40 .	x - x - x -	. W2R	
3-pole		30°	3 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. W3R . W3R	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. W3R . W3R	
			88 □ 63A	N40 .	x - x - x -	. W3R	

Start-Stop switches S

Start-switch, 1-pole		30°	1 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. SE . SE	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. SE . SE	
Start-switch, 2-pole		30°	1 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. S2E . S2E	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. S2E . S2E	
Start-switch, 3-pole		30°	2 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. S3E . S3E	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. S3E . S3E	

Bestellbeispiel: AC21 50A base mounting, Start-switch, 3-pole

N33F V S3E

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

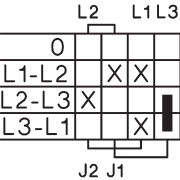
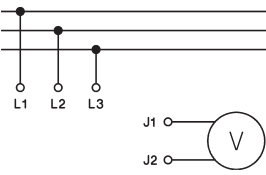
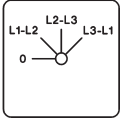
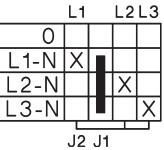
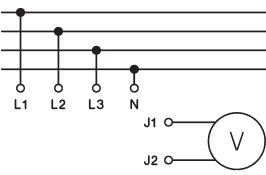
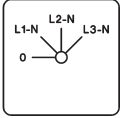
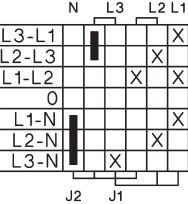
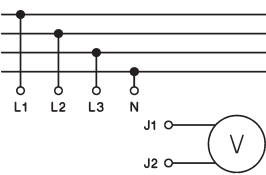
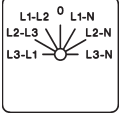
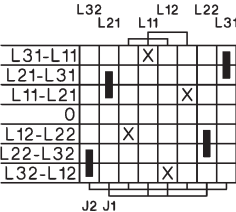
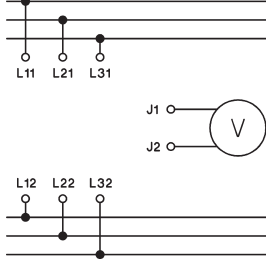
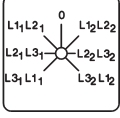
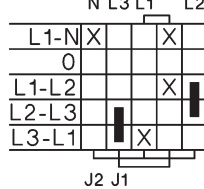
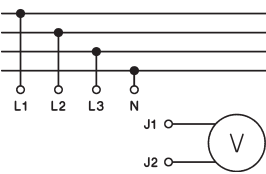
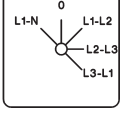
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Start-Stop switches S							
Stop-switch, 1-pole		30°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SA . SA	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. SA . SA	
				88 □ 63A	N40 . x - x - x -	. SA	
Stop-switch, 2-pole		30°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. S2A . S2A	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. S2A . S2A	
				88 □ 63A	N40 . x - x - x -	. S2A	
Stop-switch, 3-pole		30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. S3A . S3A	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. S3A . S3A	
				88 □ 63A	N40 . x - x - x -	. S3A	
Start-Stop-switch, 1-pole		30°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SEA . SEA	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. SEA . SEA	
Start-Stop-switch, 1-pole position START with spring return to 1		90° + 30°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. S392 . S392	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. S392 . S392	
Start-Stop-switch, 1-pole for reversing contactors		60° + 30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. S2EA . S2EA	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. S2EA . S2EA	
Start-Stop-switch, 1-pole for reversing contactors with limit switches		30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. S22 . S22	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. S22 . S22	

Ordering example: AC21 50A panel mounting, Start-Stop-switch, 1-pole for reversing contactors

N33F E S2EA

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Voltmeter selector switches V							
3 line voltages 		45°	2 48 □ 20A 32A 64 □ 32A 50A	M10H . x x x x x ¹⁾ - . V3 M20 . x x x x - - . V3 N20 . x - x - x x . V3 N33F . x x x - x - . V3			
3 phase voltages 		45°	2 48 □ 20A 32A 64 □ 32A 50A	M10H . x x x x x ¹⁾ - . V0 M20 . x x x x - - . V0 N20 . x - x - x x . V0 N33F . x x x - x - . V0			
3 line voltages and 3 phase voltages 		30°	3 48 □ 20A 32A 64 □ 32A 50A	M10H . x x x x x ¹⁾ - . V1 M20 . x x x x - - . V1 N20 . x - x - x x . V1 N33F . x x x - x - . V1			
2 3-phase systems 2 x 3 line voltages 		45°	4 48 □ 20A 32A 64 □ 32A 50A	M10H . x x x x x ¹⁾ - . V32 M20 . x x x x - - . V32 N20 . x - x - x x . V32 N33F . x - x - x - . V32			
3 line voltages and 1 phase voltage 		45°	3 48 □ 20A 32A 64 □ 32A 50A	M10H . x x x x x ¹⁾ - . V13 M20 . x x x x - - . V13 N20 . x - x - x x . V13 N33F . x x x - x - . V13			

Ordering example: AC21 50A panel mounting, Voltmeter selector switch, 3 line voltages and 1 phase voltage

N33F E V13

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

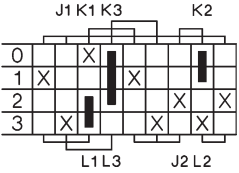
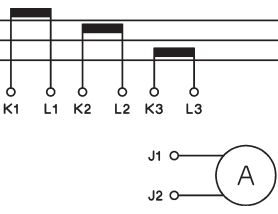
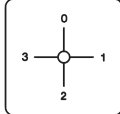
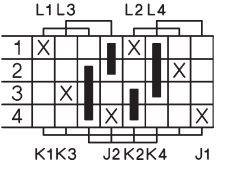
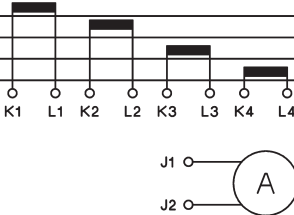
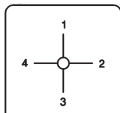
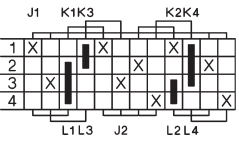
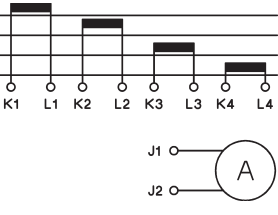
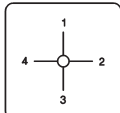
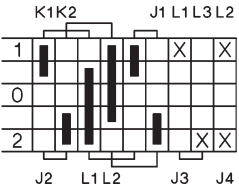
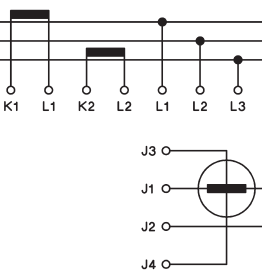
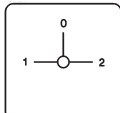
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Ammeter selector switches M							
1-pole, for current transformer 		90°	1	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . M11 M20 . x x x x - - . M11		
				64 □ 32A 50A	N20 . x - x - x x . M11 N33F . x x x - x - . M11		
				88 □ 63A	N40 . x - x - x - . M11		
2-pole, for 1 current transformer or direct current measurement 		90°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . M12 M20 . x x x x - - . M12		
				64 □ 32A 50A	N20 . x - x - x x . M12 N33F . x x x - x - . M12		
				88 □ 63A 90A 115A	N40 . x - x - x - . M12 N60 . x - x - x - . M12 N80 . x - x - - - . M12		
				132 □ 150A 250A	N100 . x - x - - - . M12 N200 . x - x - - - . M12		
1-pole, for 2 current transformers 		90°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . M21 M20 . x x x x - - . M21		
				64 □ 32A 50A	N20 . x - x - x x . M21 N33F . x x x - x - . M21		
				88 □ 63A	N40 . x - x - x - . M21		
2-pole, for 2 current transformers or direct current measurement in 2 phases 		90°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . M22 M20 . x x x x - - . M22		
				64 □ 32A 50A	N20 . x - x - x x . M22 N33F . x x x - x - . M22		
				88 □ 63A 90A 115A	N40 . x - x - x - . M22 N60 . x - x - x - . M22 N80 . x - x - - - . M22		
				132 □ 150A 250A	N100 . x - x - - - . M22 N200 . x - x - - - . M22		
1-pole, for 3 current transformers 		90°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . M31 M20 . x x x x - - . M31		
			4	64 □ 32A 50A	N20 . x - x - x x . M31 N33F . x - x - x - . M31		
				88 □ 63A	N40 . x - x - x - . M31		

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 3 current transformers 1-pole

N40 V M31

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Ammeter selector switches M							
2-pole, for 3 current transformers or direct current measurement in 3 phases 		90°	6 48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ - . M32 M20 . x x x - - - . M32 N20 . x - x - x x . M32 N33F . x - x - x - . M32 N40 . x - x - x - . M32 N61 . x - x - x - . M32 N80 . x - x - - - . M32 N100 . x - x - - - . M32 N200 . x - x - - - . M32	x x x x x ¹⁾ - x x x - - - x - x - x x x - x - x - x - x - x - x - x - x - x - x - - - x - x - - -	. M32 . M32 . M32 . M32 . M32 . M32 . M32 . M32	
1-pole, for 4 current transformers 		90°	4 48 □ 20A 32A 64 □ 32A 50A 88 □ 63A	M10H . x x x x x ¹⁾ - . M41 M20 . x x x x - - . M41 N20 . x - x - x x . M41 N33F . x - x - x - . M41 N40 . x - x - x - . M41	x x x x x ¹⁾ - x x x x - - x - x - x x x - x - x - x - x - x -	. M41 . M41 . M41 . M41 . M41	
2-pole, for 4 current transformers or direct current measurement in 4 phases 		90°	6 48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ - . M42 M20 . x x x - - - . M42 N20 . x - x - x x . M42 N33F . x - x - x - . M42 N40 . x - x - x - . M42 N61 . x - x - x - . M42 N80 . x - x - - - . M42 N100 . x - x - - - . M42 N200 . x - x - - - . M42	x x x x x ¹⁾ - x x x - - - x - x - x x x - x - x - x - x - x - x - x - x - x - x - - - x - x - - -	. M42 . M42 . M42 . M42 . M42 . M42 . M42 . M42	
f. output measurement in 3-phase systems by 2-wattmeter method 		90°	5 48 □ 20A 32A 64 □ 32A 50A 88 □ 63A 90A 115A 132 □ 150A 250A	M10H . x x x x x ¹⁾ - . M2W M20 . x x x x - - . M2W N20 . x - x - x x . M2W N33F . x - x - x - . M2W N40 . x - x - x - . M2W N61 . x - x - x - . M2W N80 . x - x - - - . M2W N100 . x - x - - - . M2W N200 . x - x - - - . M2W	x x x x x ¹⁾ - x x x x - - x - x - x x x - x - x - x - x - x - x - x - x - x - x - - - x - x - - -	. M2W . M2W . M2W . M2W . M2W . M2W . M2W . M2W	

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 4 current transformers 1-pole

N40 V M41

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Gang switches GR							
2 circuits A and B 1-pole 0 - A - A+B		45°	1 48 □ 20A	M10H .	x x x x x ¹⁾ -	. GR11	
				M20 .	x x x x - -	. GR11	
			64 □ 32A	N20 .	x - x - x x	. GR11	
				N33F .	x x x - x -	. GR11	
			88 □ 63A	N40 .	x - x - x -	. GR11	
2 circuits A and B 1-pole 0 - A - B - A+B		45°	1 48 □ 20A	M10H .	x x x x x ¹⁾ -	. GR12	
				M20 .	x x x x - -	. GR12	
			64 □ 32A	N20 .	x - x - x x	. GR12	
				N33F .	x x x - x -	. GR12	
			88 □ 63A	N40 .	x - x - x -	. GR12	
2 circuits A and B 2-pole 0 - A - A+B		45°	2 48 □ 20A	M10H .	x x x x x ¹⁾ -	. GR21	
				M20 .	x x x x - -	. GR21	
			64 □ 32A	N20 .	x - x - x x	. GR21	
				N33F .	x x x - x -	. GR21	
			88 □ 63A	N40 .	x - x - x -	. GR21	
2 circuits A and B 2-pole 0 - A - B - A+B		45°	2 48 □ 20A	M10H .	x x x x x ¹⁾ -	. GR22	
				M20 .	x x x x - -	. GR22	
			64 □ 32A	N20 .	x - x - x x	. GR22	
				N33F .	x x x - x -	. GR22	
			88 □ 63A	N40 .	x - x - x -	. GR22	
2 circuits A and B 3-pole 0 - A - A+B		45°	3 48 □ 20A	M10H .	x x x x x ¹⁾ -	. GR31	
				M20 .	x x x x - -	. GR31	
			64 □ 32A	N20 .	x - x - x x	. GR31	
				N33F .	x - x - x -	. GR31	
			88 □ 63A	N40 .	x - x - x x	. GR31	

Ordering example: AC21 250A panel mounting, gang switch, 2 circuits A and B, 3-pole **N200 E GR31**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Gang switches GR							
2 circuits A and B 3-pole 0 - A - B - A+B 		45°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . GR32 M20 . x x x x - - . GR32		
				64 □ 32A 50A	N20 . x - x - x x . GR32 N33F . x - x - x - . GR32		
				88 □ 63A 90A 115A	N40 . x - x - x - . GR32 N61 . x - x - x - . GR32 N80 . x - x - - - . GR32		
				132 □ 150A 250A	N100 . x - x - - - . GR32 N200 . x - x - - - . GR32		
3 circuits A, B and C 1-pole 0 - A - A+B - A+B+C 		45°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . GR14 M20 . x x x x - - . GR14		
				64 □ 32A 50A	N20 . x - x - x x . GR14 N33F . x - x - x - . GR14		
				88 □ 63A 90A 115A	N40 . x - x - x - . GR14 N61 . x - x - x - . GR14 N80 . x - x - - - . GR14		
				132 □ 150A 250A	N100 . x - x - - - . GR14 N200 . x - x - - - . GR14		
3 circuits A, B and C 2-pole 0 - A - A+B - A+B+C 		45°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . GR23 M20 . x x x x - - . GR23		
				64 □ 32A 50A	N20 . x - x - x x . GR23 N33F . x - x - x - . GR23		
				88 □ 63A 90A 115A	N40 . x - x - x - . GR23 N61 . x - x - x - . GR23 N80 . x - x - - - . GR23		
				132 □ 150A 250A	N100 . x - x - - - . GR23 N200 . x - x - - - . GR23		
3 circuits A, B and C 3-pole 0 - A - A+B - A+B+C 		45°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . GR33 M20 . x x x x - - . GR33		
				64 □ 32A 50A	N20 . x - x - x x . GR33 N33F . x - x - x - . GR33		
				88 □ 63A 90A 115A	N40 . x - x - x - . GR33 N61 . x - x - x - . GR33 N80 . x - x - - - . GR33		
				132 □ 150A 250A	N100 . x - x - - - . GR33 N200 . x - x - - - . GR33		

Ordering example: AC21 250A panel mounting, gang switch, 3 circuits A, B and C, 3-pole

N200 E GR33

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Series-Parallel switches SP							
2 circuits A and B 2-pole 0 - A + B - A,B (parallel)		45°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SP1 . SP1	
				64 □ 32A 50A	N20 . x - x - x x N33F . x x x - x -	. SP1 . SP1	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SP1 . SP1 . SP1	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SP1 . SP1	
2 circuits A and B 2-pole 0 - A,B (parall.) - A - A+B		90°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SP4 . SP4	
				64 □ 32A 50A	N20 . x - x - x x N33F . x x x - x -	. SP4 . SP4	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SP4 . SP4 . SP4	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SP4 . SP4	
2 circuits A and B for 3-phase systems 0 - A+B - A - B - A,B		30°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. SP3 . SP3	
				64 □ 32A 50A	N20 . x - x - x x N33F . x x x - x -	. SP3 . SP3	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. SP3 . SP3 . SP3	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. SP3 . SP3	

Ordering example: AC21 250A panel mounting, series-parallel switch, 2 circuits for 3-phase systems

N200 E SP3

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

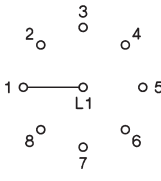
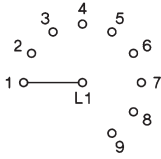
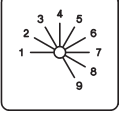
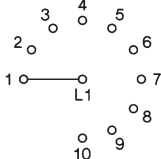
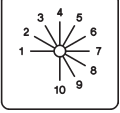
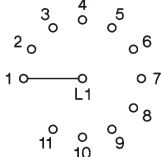
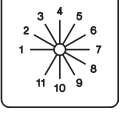
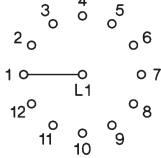
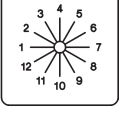
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 1-pole without Off ST.1							
3 steps		60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST31 M20 . x x x x - - . ST31		
			64 □ 32A 50A	N20 . x - x - x x . ST31 N33F . x x x - x - . ST31			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST31 N61 . x - x - x - . ST31 N80 . x - x - - - . ST31			
			132 □ 150A 250A	N100 . x - x - - - . ST31 N200 . x - x - - - . ST31			
4 steps		60°	2	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST41 M20 . x x x x - - . ST41		
			64 □ 32A 50A	N20 . x - x - x x . ST41 N33F . x x x - x - . ST41			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST41 N61 . x - x - x - . ST41 N80 . x - x - - - . ST41			
			132 □ 150A 250A	N100 . x - x - - - . ST41 N200 . x - x - - - . ST41			
5 steps		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST51 M20 . x x x x - - . ST51		
			64 □ 32A 50A	N20 . x - x - x x . ST51 N33F . x x x - x - . ST51			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST51 N61 . x - x - x - . ST51 N80 . x - x - - - . ST51			
			132 □ 150A 250A	N100 . x - x - - - . ST51 N200 . x - x - - - . ST51			
6 steps		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST61 M20 . x x x x - - . ST61		
			64 □ 32A 50A	N20 . x - x - x x . ST61 N33F . x x x - x - . ST61			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST61 N61 . x - x - x - . ST61 N80 . x - x - - - . ST61			
			132 □ 150A 250A	N100 . x - x - - - . ST61 N200 . x - x - - - . ST61			
7 steps		45°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST71 M20 . x x x x - - . ST71		
			64 □ 32A 50A	N20 . x - x - x x . ST71 N33F . x - x - x - . ST71			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST71 N61 . x - x - x - . ST71 N80 . x - x - - - . ST71			
			132 □ 150A 250A	N100 . x - x - - - . ST71 N200 . x - x - - - . ST71			

Ordering example: AC21 250A panel mounting, multi step switch 1-pole without off, 7 steps

N200 E ST71

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

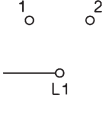
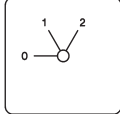
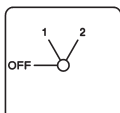
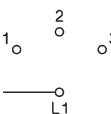
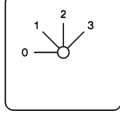
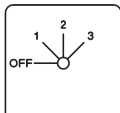
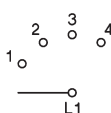
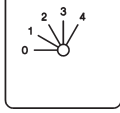
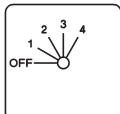
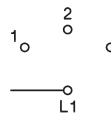
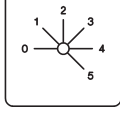
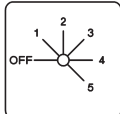
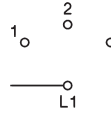
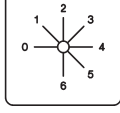
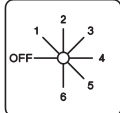
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 1-pole without Off ST.1							
8 steps		45°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. ST81 . ST81	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST81 . ST81	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST81 . ST81 . ST81	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST81 . ST81	
9 steps		30°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. ST91 . ST91	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST91 . ST91	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST91 . ST91 . ST91	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST91 . ST91	
10 steps		30°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. ST101 . ST101	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST101 . ST101	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST101 . ST101 . ST101	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST101 . ST101	
11 steps		30°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. ST111 . ST111	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST111 . ST111	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST111 . ST111 . ST111	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST111 . ST111	
12 steps		30°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. ST121 . ST121	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST121 . ST121	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST121 . ST121 . ST121	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST121 . ST121	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole without off, 12 steps

N200 E ST121

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

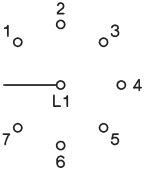
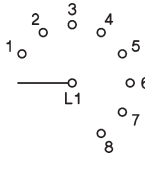
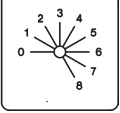
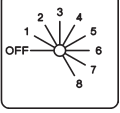
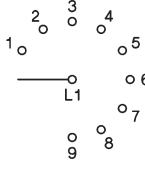
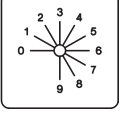
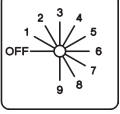
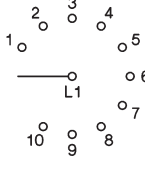
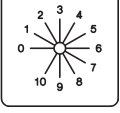
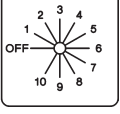
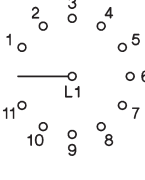
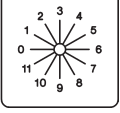
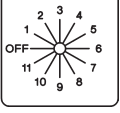
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 1-pole with Off ST0.1							
2 steps		60°	1 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST021 M20 . x x x x - - . ST021			
			64 □ 32A 50A	N20 . x - x - x x . ST021 N33F . x x x - x - . ST021			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST021 N61 . x - x - x - . ST021 N80 . x - x - - - . ST021			+ 422 
			132 □ 150A 250A	N100 . x - x - - - . ST021 N200 . x - x - - - . ST021			
3 steps		45°	2 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST031 M20 . x x x x - - . ST031			
			64 □ 32A 50A	N20 . x - x - x x . ST031 N33F . x x x - x - . ST031			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST031 N61 . x - x - x - . ST031 N80 . x - x - - - . ST031			+ 127 
			132 □ 150A 250A	N100 . x - x - - - . ST031 N200 . x - x - - - . ST031			
4 steps		30°	2 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST041 M20 . x x x x - - . ST041			
			64 □ 32A 50A	N20 . x - x - x x . ST041 N33F . x x x - x - . ST041			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST041 N61 . x - x - x - . ST041 N80 . x - x - - - . ST041			+ 112 
			132 □ 150A 250A	N100 . x - x - - - . ST041 N200 . x - x - - - . ST041			
5 steps		45°	3 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST051 M20 . x x x x - - . ST051			
			64 □ 32A 50A	N20 . x - x - x x . ST051 N33F . x x x - x - . ST051			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST051 N61 . x - x - x - . ST051 N80 . x - x - - - . ST051			+ 423 
			132 □ 150A 250A	N100 . x - x - - - . ST051 N200 . x - x - - - . ST051			
6 steps		45°	4 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST061 M20 . x x x x - - . ST061			
			64 □ 32A 50A	N20 . x - x - x x . ST061 N33F . x - x - x - . ST061			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST061 N61 . x - x - x - . ST061 N80 . x - x - - - . ST061			+ 128 
			132 □ 150A 250A	N100 . x - x - - - . ST061 N200 . x - x - - - . ST061			

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 6 steps

N200 E ST061

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

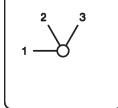
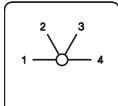
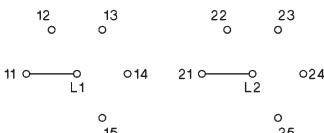
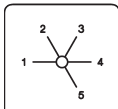
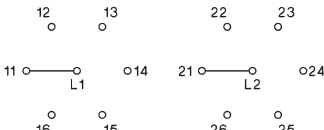
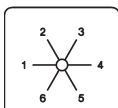
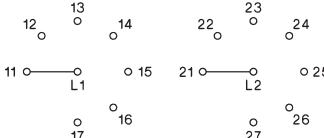
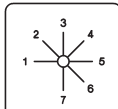
Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 1-pole with Off ST0.1							
7 steps		45°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST071 M20 . x x x x - - . ST071		 + 129 
			64 □	32A 50A	N20 . x - x - x x . ST071 N33F . x - x - x - . ST071		
			88 □	63A 90A 115A	N40 . x - x - x - . ST071 N61 . x - x - x - . ST071 N80 . x - x - - - . ST071		
			132 □	150A 250A	N100 . x - x - - - . ST071 N200 . x - x - - - . ST071		
8 steps		30°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST081 M20 . x x x x - - . ST081		 + 114 
			64 □	32A 50A	N20 . x - x - x x . ST081 N33F . x - x - x - . ST081		
			88 □	63A 90A 115A	N40 . x - x - x - . ST081 N61 . x - x - x - . ST081 N80 . x - x - - - . ST081		
			132 □	150A 250A	N100 . x - x - - - . ST081 N200 . x - x - - - . ST081		
9 steps		30°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST091 M20 . x x x x - - . ST091		 + 115 
			64 □	32A 50A	N20 . x - x - x x . ST091 N33F . x - x - x - . ST091		
			88 □	63A 90A 115A	N40 . x - x - x - . ST091 N61 . x - x - x - . ST091 N80 . x - x - - - . ST091		
			132 □	150A 250A	N100 . x - x - - - . ST091 N200 . x - x - - - . ST091		
10 steps		30°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - . ST0101 M20 . x x x - - - . ST0101		 + 116 
			64 □	32A 50A	N20 . x - x - x x . ST0101 N33F . x - x - x - . ST0101		
			88 □	63A 90A 115A	N40 . x - x - x - . ST0101 N61 . x - x - x - . ST0101 N80 . x - x - - - . ST0101		
			132 □	150A 250A	N100 . x - x - - - . ST0101 N200 . x - x - - - . ST0101		
11 steps		30°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - . ST0111 M20 . x x x - - - . ST0111		 + 117 
			64 □	32A 50A	N20 . x - x - x x . ST0111 N33F . x - x - x - . ST0111		
			88 □	63A 90A 115A	N40 . x - x - x - . ST0111 N61 . x - x - x - . ST0111 N80 . x - x - - - . ST0111		
			132 □	150A 250A	N100 . x - x - - - . ST0111 N200 . x - x - - - . ST0111		

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 11 steps

N200 E ST0111

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 2-pole without Off ST.2							
3 steps		60°	3	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST32 M20 . x x x x x - - . ST32		
			64 □ 32A 50A	N20 . x - x - x x . ST32 N33F . x x x - x - . ST32			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST32 N61 . x - x - x - . ST32 N80 . x - x - - - . ST32			
			132 □ 150A 250A	N100 . x - x - - - . ST32 N200 . x - x - - - . ST32			
4 steps		60°	4	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST42 M20 . x x x x x - - . ST42		
			64 □ 32A 50A	N20 . x - x - x x . ST42 N33F . x - x - x - . ST42			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST42 N61 . x - x - x - . ST42 N80 . x - x - - - . ST42			
			132 □ 150A 250A	N100 . x - x - - - . ST42 N200 . x - x - - - . ST42			
5 steps		60°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST52 M20 . x x x x x - - . ST52		
			64 □ 32A 50A	N20 . x - x - x x . ST52 N33F . x - x - x - . ST52			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST52 N61 . x - x - x - . ST52 N80 . x - x - - - . ST52			
			132 □ 150A 250A	N100 . x - x - - - . ST52 N200 . x - x - - - . ST52			
6 steps		60°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - . ST62 M20 . x x x - - - . ST62		
			64 □ 32A 50A	N20 . x - x - x x . ST62 N33F . x - x - x - . ST62			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST62 N61 . x - x - x - . ST62 N80 . x - x - - - . ST62			
			132 □ 150A 250A	N100 . x - x - - - . ST62 N200 . x - x - - - . ST62			
7 steps		45°	7	48 □ 20A 32A	M10H . x x x - - - . ST72 M20 . x x x - - - . ST72		
			64 □ 32A 50A	N20 . x - x - x - . ST72 N33F . x - x - - - . ST72			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST72 N61 . x - x - - - . ST72 N80 . x - x - - - . ST72			
			132 □ 150A 250A	N100 . x - x - - - . ST72 N200 . x - x - - - . ST72			

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 7 steps

N200 E ST72

1) Plastic enclosed switches are delivered with switch type M10.

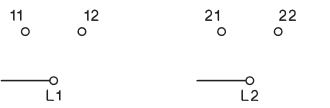
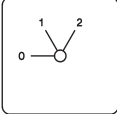
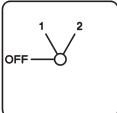
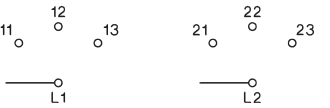
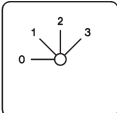
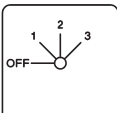
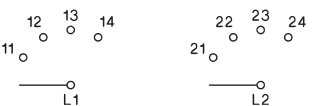
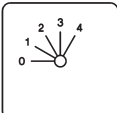
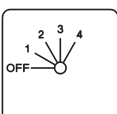
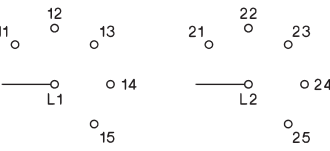
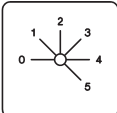
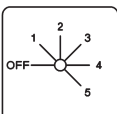
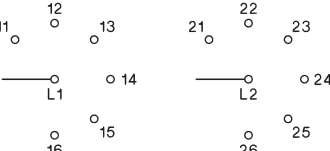
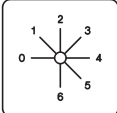
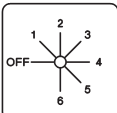
Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 2-pole without Off ST.2							
8 steps		45°	8	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST82 . ST82	
			64 □ 32A 50A	N20 . x - x - x - N33F . x - x - - -	. ST82 . ST82		
			88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. ST82 . ST82 . ST82		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST82 . ST82		
9 steps		30°	9	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST92 . ST92	
			64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST92 . ST92		
			88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST92 . ST92 . ST92		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST92 . ST92		
10 steps		30°	10	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST102 . ST102	
			64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST102 . ST102		
			88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST102 . ST102 . ST102		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST102 . ST102		
11 steps		30°	11	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST112 . ST112	
			64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST112 . ST112		
			88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST112 . ST112 . ST112		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST112 . ST112		
12 steps		30°	12	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST122 . ST122	
			64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST122 . ST122		
			88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST122 . ST122 . ST122		
			132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST122 . ST122		

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 12 steps

N200 E ST122

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 2-pole with Off ST0.2							
2 steps		60°	2 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST022 M20 . x x x x - - . ST022			
			64 □ 32A 50A	N20 . x - x - x x . ST022 N33F . x x x - x - . ST022			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST022 N61 . x - x - x - . ST022 N80 . x - x - - - . ST022			+ 422 
			132 □ 150A 250A	N100 . x - x - - - . ST022 N200 . x - x - - - . ST022			
3 steps		45°	3 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST032 M20 . x x x x - - . ST032			
			64 □ 32A 50A	N20 . x - x - x x . ST032 N33F . x x x - x - . ST032			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST032 N61 . x - x - x - . ST032 N80 . x - x - - - . ST032			+ 127 
			132 □ 150A 250A	N100 . x - x - - - . ST032 N200 . x - x - - - . ST032			
4 steps		30°	4 48 □ 20A 32A	M10H . x x x x x ¹⁾ - . ST042 M20 . x x x x - - . ST042			
			64 □ 32A 50A	N20 . x - x - x x . ST042 N33F . x - x - x - . ST042			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST042 N61 . x - x - x - . ST042 N80 . x - x - - - . ST042			+ 112 
			132 □ 150A 250A	N100 . x - x - - - . ST042 N200 . x - x - - - . ST042			
5 steps		45°	6 48 □ 20A 32A	M10H . x x x - x ¹⁾ - . ST052 M20 . x x x - - - . ST052			
			64 □ 32A 50A	N20 . x - x - x x . ST052 N33F . x - x - x - . ST052			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST052 N61 . x - x - x - . ST052 N80 . x - x - - - . ST052			+ 423 
			132 □ 150A 250A	N100 . x - x - - - . ST052 N200 . x - x - - - . ST052			
6 steps		45°	7 48 □ 20A 32A	M10H . x x x - x ¹⁾ - . ST062 M20 . x x x - - - . ST062			
			64 □ 32A 50A	N20 . x - x - x - . ST062 N33F . x - x - - - . ST062			
			88 □ 63A 90A 115A	N40 . x - x - x - . ST062 N61 . x - x - - - . ST062 N80 . x - x - - - . ST062			+ 128 
			132 □ 150A 250A	N100 . x - x - - - . ST062 N200 . x - x - - - . ST062			

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 6 steps

N200 E ST062

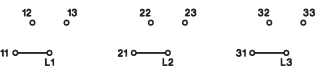
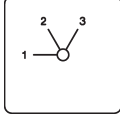
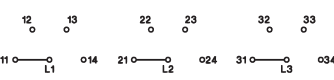
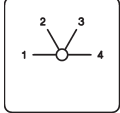
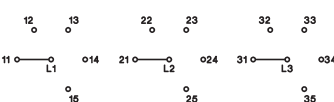
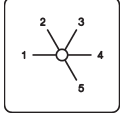
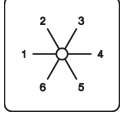
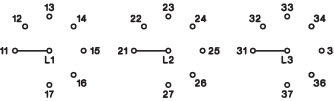
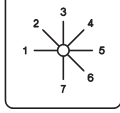
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 2-pole with Off ST0.2							
7 steps		45°	8	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST072 . ST072	
				64 □ 32A 50A	N20 . x - x - x - N33F . x - x - - -	. ST072 . ST072	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. ST072 . ST072 . ST072	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST072 . ST072	
8 steps		30°	9	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST082 . ST082	
				64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST082 . ST082	
				88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST082 . ST082 . ST082	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST082 . ST082	
9 steps		30°	10	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST092 . ST092	
				64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST092 . ST092	
				88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST092 . ST092 . ST092	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST092 . ST092	
10 steps		30°	11	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST0102 . ST0102	
				64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST0102 . ST0102	
				88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST0102 . ST0102 . ST0102	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST0102 . ST0102	
11 steps		30°	12	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST0112 . ST0112	
				64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST0112 . ST0112	
				88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST0112 . ST0112 . ST0112	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST0112 . ST0112	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 11 steps **N200 E ST0112**

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 3-pole without Off ST.3							
3 steps		60°	5	48 □ 20A 32A	M10H . x x x x x ¹⁾ - M20 . x x x x - -	. ST33 . ST33	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST33 . ST33	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST33 . ST33 . ST33	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST33 . ST33	
4 steps		60°	6	48 □ 20A 32A	M10H . x x x - x ¹⁾ - M20 . x x x - - -	. ST43 . ST43	
				64 □ 32A 50A	N20 . x - x - x x N33F . x - x - x -	. ST43 . ST43	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - x - N80 . x - x - - -	. ST43 . ST43 . ST43	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST43 . ST43	
5 steps		60°	8	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST53 . ST53	
				64 □ 32A 50A	N20 . x - x - x - N33F . x - x - - -	. ST53 . ST53	
				88 □ 63A 90A 115A	N40 . x - x - x - N61 . x - x - - - N80 . x - x - - -	. ST53 . ST53 . ST53	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST53 . ST53	
6 steps		60°	9	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST63 . ST63	
				64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST63 . ST63	
				88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST63 . ST63 . ST63	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST63 . ST63	
7 steps		45°	11	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	. ST73 . ST73	
				64 □ 32A 50A	N20 . x - x - - - N33F . x - x - - -	. ST73 . ST73	
				88 □ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	. ST73 . ST73 . ST73	
				132 □ 150A 250A	N100 . x - x - - - N200 . x - x - - -	. ST73 . ST73	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 7 steps

N200 E ST73

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 3-pole without Off ST.3							
8 steps		45°	12	48 □ 20A 32A	M10H . x x x - - - M20 . x x x - - -	.ST83 .ST83	
			64	□ 32A 50A	N20 . x - x - - - N33F . x - x - - -	.ST83 .ST83	
			88	□ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	.ST83 .ST83 .ST83	
			132	□ 150A 250A	N100 . x - x - - - N200 . x - x - - -	.ST83 .ST83	
9 steps		30°	14	48 □ 20A 32A	M10H . x - x - - - M20 . x - x - - -	.ST93 .ST93	
			64	□ 32A 50A	N20 . x - x - - - N33F . x - x - - -	.ST93 .ST93	
			88	□ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	.ST93 .ST93 .ST93	
			132	□ 150A 250A	N100 . x - x - - - N200 . x - x - - -	.ST93 .ST93	
10 steps		30°	15	48 □ 20A 32A	M10H . x - x - - - M20 . x - x - - -	.ST103 .ST103	
			64	□ 32A 50A	N20 . x - x - - - N33F . x - x - - -	.ST103 .ST103	
			88	□ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	.ST103 .ST103 .ST103	
			132	□ 150A 250A	N100 . x - x - - - N200 . x - x - - -	.ST103 .ST103	
11 steps		30°	17	48 □ 20A 32A	M10H . x - x - - - M20 . x - x - - -	.ST113 .ST113	
			64	□ 32A 50A	N20 . x - x - - - N33F . x - x - - -	.ST113 .ST113	
			88	□ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	.ST113 .ST113 .ST113	
			132	□ 150A 250A	N100 . x - x - - - N200 . x - x - - -	.ST113 .ST113	
12 steps		30°	18	48 □ 20A 32A	M10H . x - x - - - M20 . x - x - - -	.ST123 .ST123	
			64	□ 32A 50A	N20 . x - x - - - N33F . x - x - - -	.ST123 .ST123	
			88	□ 63A 90A 115A	N40 . x - x - - - N61 . x - x - - - N80 . x - x - - -	.ST123 .ST123 .ST123	
			132	□ 150A 250A	N100 . x - x - - - N200 . x - x - - -	.ST123 .ST123	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 12 steps

N200 E ST123

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 3-pole with Off ST0.3							
2 steps		60°	3 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. ST023 . ST023	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x x x - x -	. ST023 . ST023	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - x - x - x - x - x - x - - -	. ST023 . ST023 . ST023	+422
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST023 . ST023	
3 steps		45°	5 48 □ 20A 32A	M10H . M20 .	x x x x x ¹⁾ - x x x x - -	. ST033 . ST033	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. ST033 . ST033	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - x - x - x - x - x - x - - -	. ST033 . ST033 . ST033	+127
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST033 . ST033	
4 steps		30°	6 48 □ 20A 32A	M10H . M20 .	x x x x - x ¹⁾ - x x x x - -	. ST043 . ST043	
			64 □ 32A 50A	N20 . N33F .	x - x - x x x - x - x -	. ST043 . ST043	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - x - x - x - x - x - x - - -	. ST043 . ST043 . ST043	+112
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST043 . ST043	
5 steps		45°	9 48 □ 20A 32A	M10H . M20 .	x x x x - - - x x x x - - -	. ST053 . ST053	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST053 . ST053	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST053 . ST053 . ST053	+423
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST053 . ST053	
6 steps		45°	11 48 □ 20A 32A	M10H . M20 .	x x x x - - - x x x x - - -	. ST063 . ST063	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST063 . ST063	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST063 . ST063 . ST063	+128
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST063 . ST063	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole with off, 6 steps **N200 E ST063**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design E. Z. V. SMA. P. ↓ ↓ ↓ ↓ ↓	Switch pro-	Escutcheon plate
Multi step switches 3-pole with Off ST0.3							
7 steps		45°	12 48 □ 20A 32A	M10H . M20 .	x x x - - - x x x - - -	. ST073 . ST073	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST073 . ST073	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST073 . ST073 . ST073	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST073 . ST073	
8 steps		30°	14 48 □ 20A 32A	M10H . M20 .	x - x - - - x - x - - -	. ST083 . ST083	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST083 . ST083	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST083 . ST083 . ST083	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST083 . ST083	
9 steps		30°	15 48 □ 20A 32A	M10H . M20 .	x - x - - - x - x - - -	. ST093 . ST093	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST093 . ST093	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST093 . ST093 . ST093	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST093 . ST093	
10 steps		30°	17 48 □ 20A 32A	M10H . M20 .	x - x - - - x - x - - -	. ST0103 . ST0103	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST0103 . ST0103	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST0103 . ST0103 . ST0103	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST0103 . ST0103	
11 steps		30°	18 48 □ 20A 32A	M10H . M20 .	x - x - - - x - x - - -	. ST0113 . ST0113	
			64 □ 32A 50A	N20 . N33F .	x - x - - - x - x - - -	. ST0113 . ST0113	
			88 □ 63A 90A 115A	N40 . N61 . N80 .	x - x - - - x - x - - - x - x - - -	. ST0113 . ST0113 . ST0113	
			132 □ 150A 250A	N100 . N200 .	x - x - - - x - x - - -	. ST0113 . ST0113	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole with off, 11 steps

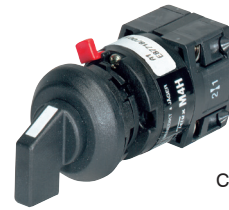
N200 E ST0113

Mini-Cam Switches M4H

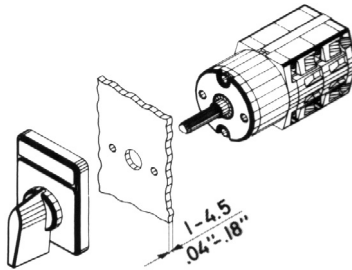
Panel mounting E, IP40

Central fixing Z

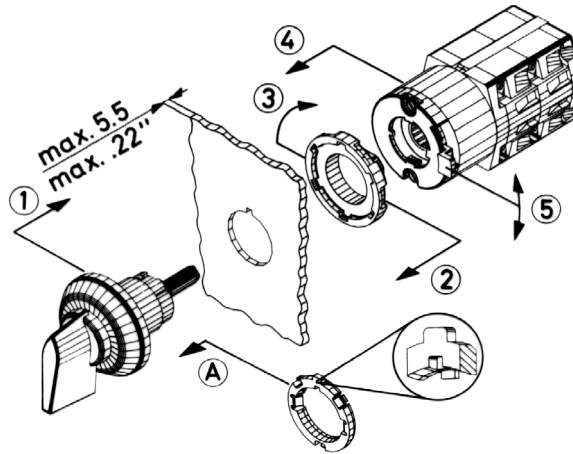
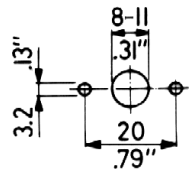
Central fixing without escutcheon plate ZO



Central fixing 16mm

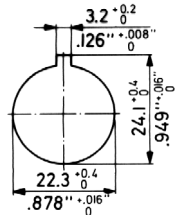
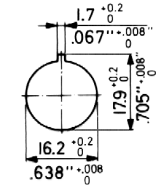


Mounting holes



lock

unlock Central fixing 22mm

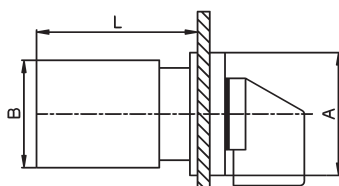


Single hole mountings are generally delivered for a 16mm (.64") mounting. Using the forwarded adapter ring, it is possible to alter the single hole mountings from 22mm (.88"). For that purpose the adapter ring has to be attached onto the threaded part of the body in such a manner, that 1. the flat side of the adapter ring shows towards the front seal and 2. the inner nose fits into the notch of the body. The adapter ring has to be pushed towards the front seal.

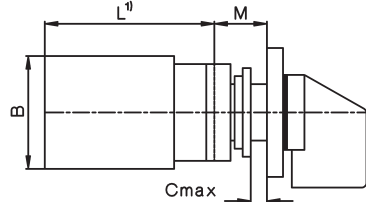
Optional extras	ordering code	for design	M4H Z ... +SRE	M4H Z ... +SA.	M4H ZO ... +SA.	M4H Z ... +SRE+SA.
Additional escutcheon plate	+SRE	E, Z, ZO				
Additional escutcheon plate	+SRE2	E, Z, ZO				
Key operated switch with lock KABA	+SA1	Z, ZO				
with lock Ronis	+SA2	Z, ZO				

Wrench J7400
for switches M4H with central fixing is necessary

Panel mounting E

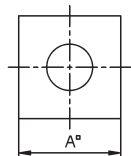
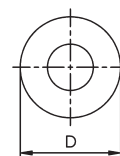


Central fixing Z, ZO



ZO

Z



Type		A	B	D	M	Dimension L for ... cells							
						1	2	3	4	5	6	7	8
M4H	mm	30	28	29,5	12,5	38,5	50,5	62,5	74,5	86,5	98,5	110,5	122,5

Technical data

Type	according to specifications	AC21A	AC15	Motor rating AC3							
		General use	110V 380V 240V 440V Pilot Duty	Volt	3 phase 3-pole	1 phase 2-pole					
					110 220 380	110 220 380					
					120 240 440	120 240 277 440					
M4H	IEC, VDE, BS, SEV UL, CSA	10A/500V 10A/300V	2,5A 1,5A A300	kW HP	0,65 1,5 2,2 0,75 1 -	0,3 0,55 - 0,33 0,75 0,75				0,75 -	

Type	according to specifications	Motor rating AC23							
		Volt	3-pole	2-pole					
			110 220 380	110 220 380					
			120 240 440	120 240 440					
M4H	IEC, VDE, BS, SEV UL, CSA	kW HP	0,75 1,8 3 - - -	0,37 0,75 1,1 - - -					

additional data for wiring according to UL and CSA

Type	type of wire	temp. rating of wire	torque value for field wiring terminals
M4H	copper wire only	60/75°C	0,4Nm / 3,5lb - inch

Mini-Cam Switches M4H

Switch programs

Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓ .Z. ↓ .ZO. ↓	Switch pro- gram
On-Off-switch A 1-pole 2-pole 3-pole 4-pole 6-pole				1 1 2 2 3	M4H . M4H . M4H . M4H . M4H .	x x x x x x x x x x x x x x x	. A1 . A2 . A3 . A4 . A6
Changeover switch U 1-pole 2-pole 3-pole 4-pole				1 2 3 4	M4H . M4H . M4H . M4H .	x x x x x x x x x x x x	. U1 . U2 . U3 . U4
Changeover switch without off W 1-pole 2-pole 3-pole 4-pole 6-pole				1 2 3 4 6	M4H . M4H . M4H . M4H . M4H .	x x x x x x x x x x x x x x x	. W1 . W2 . W3 . W4 . W6
Reversing switch WU 2-pole 3-pole 3-pole with spring return to 0				2 3 3	M4H . M4H . M4H .	x x x x x x x x x	. WU2 . WU3 . WU3R2
Star-delta switch SD 1 rotary direction both rotary directions				4 5	M4H . M4H .	x x x x x x	. SD . SDR
Changeover with spring return UR 1-pole 2-pole 3-pole				1 2 3	M4H . M4H . M4H .	x x x x x x x x x	. UR1 . UR2 . UR3
Start switch 1-pole				1	M4H .	x x x	. SE
Stop switch 1-pole				1	M4H .	x x x	. SA

Ordering example: Stop switch, 1-pole, Central fixing: **M4H Z SA**

Mini-Cam Switches M4H

Switch programs

Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓ .Z. ↓ .ZO. ↓	Switch pro- gram	
Start-Stop switch			1	M4H .	x	x	x	. SEA
Start-Stop switch position START with spring return to 1			1	M4H .	x	x	x	. S392
Start-Stop switch for reversing contactors			2	M4H .	x	x	x	. S2EA
Voltmeter selector switch V 3 line voltages			2	M4H .	x	x	x	. V3
3 phase voltages			2	M4H .	x	x	x	. V0
3 line voltages 3 phase voltages			3	M4H .	x	x	x	. V1
Ammeter selector switch A 1-pole, 3 current transformer			4	M4H .	x	x	x	. M31
Gang switch GR 2 circuits A and B 1-pole 0 - A - A+B			1	M4H .	x	x	x	. GR11
2 circuits A and B 1-pole 0 - A - B - A+B			1	M4H .	x	x	x	. GR12
3 circuits A, B and C 1-pole			2	M4H .	x	x	x	. GR14
Multi step switch without 0 ST 3 steps, 1-pole			2	M4H .	x	x	x	. ST31
3 steps, 2-pole			3	M4H .	x	x	x	. ST32
3 steps, 3-pole			5	M4H .	x	x	x	. ST33

Ordering example: Multi step switch without 0, 3 steps, 3-pole, panel mounting: **M4H E ST33**

Mini-Cam Switches M4H

Switch programs

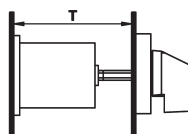
Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓	.Z. ↓	.ZO. ↓	Switch pro- gram
Multi step switch without 0 ST									
4 steps, 1-pole				2	M4H .	x	x	x	. ST41
4 steps, 2-pole				4	M4H .	x	x	x	. ST42
4 steps, 3-pole				6	M4H .	x	x	x	. ST43
5 steps, 1-pole				3	M4H .	x	x	x	. ST51
5 steps, 2-pole				5	M4H .	x	x	x	. ST52
6 steps, 1-pole				3	M4H .	x	x	x	. ST61
6 steps, 2-pole				6	M4H .	x	x	x	. ST62
Multi step switch with 0 ST0.									
2 steps, 1-pole				1	M4H .	x	x	x	. ST021
2 steps, 2-pole				2	M4H .	x	x	x	. ST022
2 steps, 3-pole				3	M4H .	x	x	x	. ST023
3 steps, 1-pole				2	M4H .	x	x	x	. ST031
3 steps, 2-pole				3	M4H .	x	x	x	. ST032
3 steps, 3-pole				5	M4H .	x	x	x	. ST033
4 steps, 1-pole				2	M4H .	x	x	x	. ST041
4 steps, 2-pole				4	M4H .	x	x	x	. ST042
4 steps, 3-pole				6	M4H .	x	x	x	. ST043
5 steps, 1-pole				3	M4H .	x	x	x	. ST051
5 steps, 2-pole				5	M4H .	x	x	x	. ST052
6 steps, 1-pole				4	M4H .	x	x	x	. ST061
7 steps, 1-pole				4	M4H .	x	x	x	. ST071
8 steps, 1-pole				5	M4H .	x	x	x	. ST081
9 steps, 1-pole				5	M4H .	x	x	x	. ST091
10 steps, 1-pole				6	M4H .	x	x	x	. ST0101

Ordering example: Multi step switch with 0, 10 steps, 1-pole, Central fixing without escutcheon plate: **M4H ZO ST0101**

Load Switches for resistive or slightly inductive loads or switching without load

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design .E. ↓ .V. ↓	Switch pro- gram	Escutcheon plate
On-Off-switches A							
1-pole		60°	2 88 □ 125A	L100 .	x x	. A1	
			1 132 □ 400A	L400 .	x x	. A1	
			3 600A	L600 .	x x	. A1	
			2 800A	L800 .	x x	. A1	
			3 1200A	L1200 .	x x	. A1	
2-pole		60°	2 88 □ 125A	L100 .	x x	. A2	
			2 132 □ 400A	L400 .	x x	. A2	
			3 600A	L600 .	x x	. A2	
			4 800A	L800 .	x x	. A2	
			6 1200A	L1200 .	x x	. A2	
3-pole		60°	4 88 □ 125A	L100 .	x x	. A3	
			3 132 □ 400A	L400 .	x x	. A3	
			6 600A	L600 .	x x	. A3	
			6 800A	L800 .	x x	. A3	
			9 1200A	L1200 .	x x	. A3	
4-pole 4. pole early make		60°	4 88 □ 125A	L100 .	x x	. A4	
			4 132 □ 400A	L400 .	x x	. A4	
			6 600A	L600 .	x x	. A4	
			8 800A	L800 .	x x	. A4	
			12 1200A	L1200 .	x x	. A4	
6-pole		60°	6 88 □ 125A	L100 .	x x	. A6	
			6 132 □ 400A	L400 .	x x	. A6	
			9 600A	L600 .	x x	. A6	
			12 800A	L800 .	x x	. A6	
			18 1200A	L1200 .	x x	. A6	

For switches with the design **V.**, it is necessary to state the installation depth - that is, the distance between mounting level of the switch and the inside edge of the door (dimension T).



Further informations	page
Technical Data	259
Dimensions	262

Load Switches for resistive or slightly inductive loads or switching without load

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design .E. .V. ↓ ↓	Switch pro- gram	Escutcheon plate
Changeover switches U							
1-pole		60°	2 88 □ 125A	L100 .	x x	. U1	
			2 180A	L160 .	x x	. U1	
			2 132□ 400A	L400 .	x x	. U1	
			3 600A	L600 .	x x	. U1	
			4 800A	L800 .	x x	. U1	
6 1200A	L1200 .	x x	. U1				
2-pole		60°	4 88 □ 125A	L100 .	x x	. U2	
			4 180A	L160 .	x x	. U2	
			4 132□ 400A	L400 .	x x	. U2	
			6 600A	L600 .	x x	. U2	
			8 800A	L800 .	x x	. U2	
12 1200A	L1200 .	x x	. U2				
3-pole		60°	6 88 □ 125A	L100 .	x x	. U3	
			6 180A	L160 .	x x	. U3	
			6 132□ 400A	L400 .	x x	. U3	
			9 600A	L600 .	x x	. U3	
			12 800A	L800 .	x x	. U3	
18 1200A	L1200 .	x x	. U3				
4-pole 4. pole early make		60°	8 88 □ 125A	L100 .	x x	. U4	
			8 180A	L160 .	x x	. U4	
			8 132□ 400A	L400 .	x x	. U4	
			12 600A	L600 .	x x	. U4	
			16 800A	L800 .	x x	. U4	
24 1200A	L1200 .	x x	. U4				
Changeover switches without off W							
1-pole		60°	2 88 □ 125A	L100 .	x x	. W1	
			2 180A	L160 .	x x	. W1	
			2 132□ 400A	L400 .	x x	. W1	
			3 600A	L600 .	x x	. W1	
			4 800A	L800 .	x x	. W1	
6 1200A	L1200 .	x x	. W1				
2-pole		60°	4 88 □ 125A	L100 .	x x	. W2	
			4 180A	L160 .	x x	. W2	
			4 132□ 400A	L400 .	x x	. W2	
			6 600A	L600 .	x x	. W2	
			8 800A	L800 .	x x	. W2	
12 1200A	L1200 .	x x	. W2				
3-pole		60°	6 88 □ 125A	L100 .	x x	. W3	
			6 180A	L160 .	x x	. W3	
			6 132□ 400A	L400 .	x x	. W3	
			9 600A	L600 .	x x	. W3	
			12 800A	L800 .	x x	. W3	
18 1200A	L1200 .	x x	. W3				
4-pole 4. pole early make		60°	8 88 □ 125A	L100 .	x x	. W4	
			8 180A	L160 .	x x	. W4	
			8 132□ 400A	L400 .	x x	. W4	
			12 600A	L600 .	x x	. W4	
			16 800A	L800 .	x x	. W4	
24 1200A	L1200 .	x x	. W4				

Ordering example: AC1 1200A panel mounting, changeover switch without off 4-pole

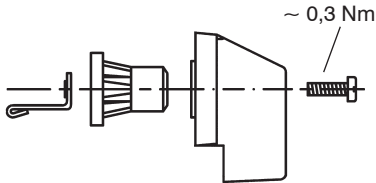
L1200 E W4

Operating Knobs and Handles

Types of handles

In the standard version, the switches are supplied with a black twist knob or instrument knob (M10H - N33F), except for design SMA, which has a grey toggle knob. Switches of size L, which consist of 2 or 3 switch columns, come with a black hand wheel. If required, the switch can be supplied with other knobs, which can later easily be exchanged. All operating knobs have an insert, which sets the position of the knob in relation to the switch shaft. This insert can be mounted in 8 different positions (at intervals of 45°), causing the angle of each individual switch setting to be rotated by 45°.

In the standard version, the switch terminals are positioned left and right (except M10H). When the knob insert is turned by 90°, the lay-out of the terminals changes to top and bottom.



All operating knobs can be moved on the hexagonal shaft, to permit adaptation to different sheet thicknesses, etc.

Type	M10 M10H M10HD M20	N20 N33F	N40 N61 N80 L100	N100 N200 L400 L600 L800 L1200
Knob movement mm	5	5	7	9
Hexagonal shaft dimension mm	5	7	9	12

Ordering example: Cam switch N61 V U3 with Instrument knob red
Order type: **N61 V U3 +G3**
Dimensions see page 267

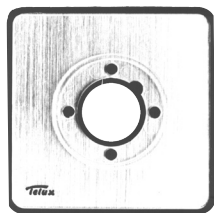


Knobs and handles Description	Colour	Ordering Code	M10 M10H M10HD M20	N20 N33F	N40 N61 N80 L100	N100 N200 L400 L600 L800 L1200
Instrument knob Standard for M10 to N200	grey	+G1	X	X		
	black	+G2	X	X		
	red	+G3	X	X	X	
	white	+G5	X	X		X
Toggle knob	grey	+K1	X	X		
	black	+K2	X	X		
	red	+K3	X	X		
	white	+K5	X	X		
	blue	+K6	X			

Escutcheon Plates

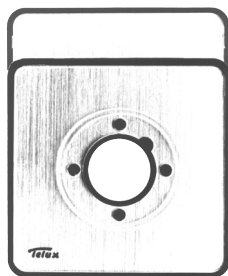
TELUX-Cam Switches in designs E, V, P, PF, SM, UP, Z and KE are supplied with a square escutcheon plate consisting of a black frame and plexi insert plate. The markings are printed in black on the back of the insert plate. To protect the markings so that they remain easy to read, the back of the insert plate is lined with silver foil. In addition, rectangular plates can be provided for all switch sizes, which can be fitted on all switches after mounting.

Square plate



Preferred position of the slot on bottom of the cover plate

Rectangular plate (with square plate)
Slot on the cover plate upper side



Slot for additional plate

TELUX-Cam Switches in design SMA, for distribution boards with 45mm inside edge of installation cover, is supplied with a grey cover and black markings.



Special engraved markings on escutcheon plates are limited by the available space. In the case of relatively large production runs or frequent use of the text, we recommend ordering of a printing block. This will be invoiced at cost price, and the engraving will not be charged for. This investment generally pays with batches from 50 pieces upwards.

The "escutcheon plate" column of the selection and ordering tables for switch programs indicates the standard plate and, in some cases, an additional plate that is often used for the programs in question. If such a plate, listed in the selection table, is desired, the appropriate code number should be stated when ordering a switch and switch program.

Should only **plates** or **parts** of the latter be ordered, the order type is assembled as shown by the following example.

Code letter of switch sizes

M10, M10H, M10HD, M20	A
N20, N33F	E
N40, N61, N80, L100	H
N100, N200, L400, L600, L800, L1200	L

Ordering example: Escutcheon plate silver, complete, for cam switch M10, marked with MAN OFF AUTO, angle of rotation 60°

Order type:

A85081		
Switch size	Plate	Marking
Code letter for M10, M10H and M20	Art.No. for standard plate with markings, complete	Code number with label MAN - 0 - AUTO angle of rot. 60°

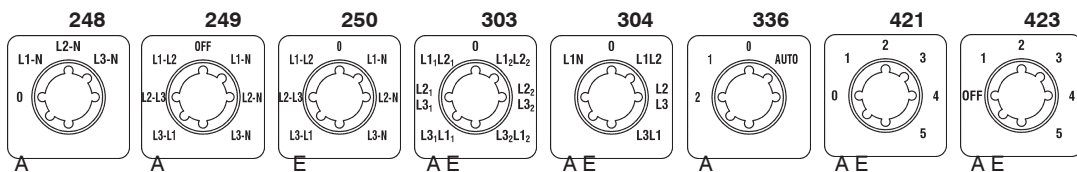
However, if a **switch** with non-standard lettering is required, only three-digit code number for the marking need be added to the order type (see next page).

Dimensions see page 267

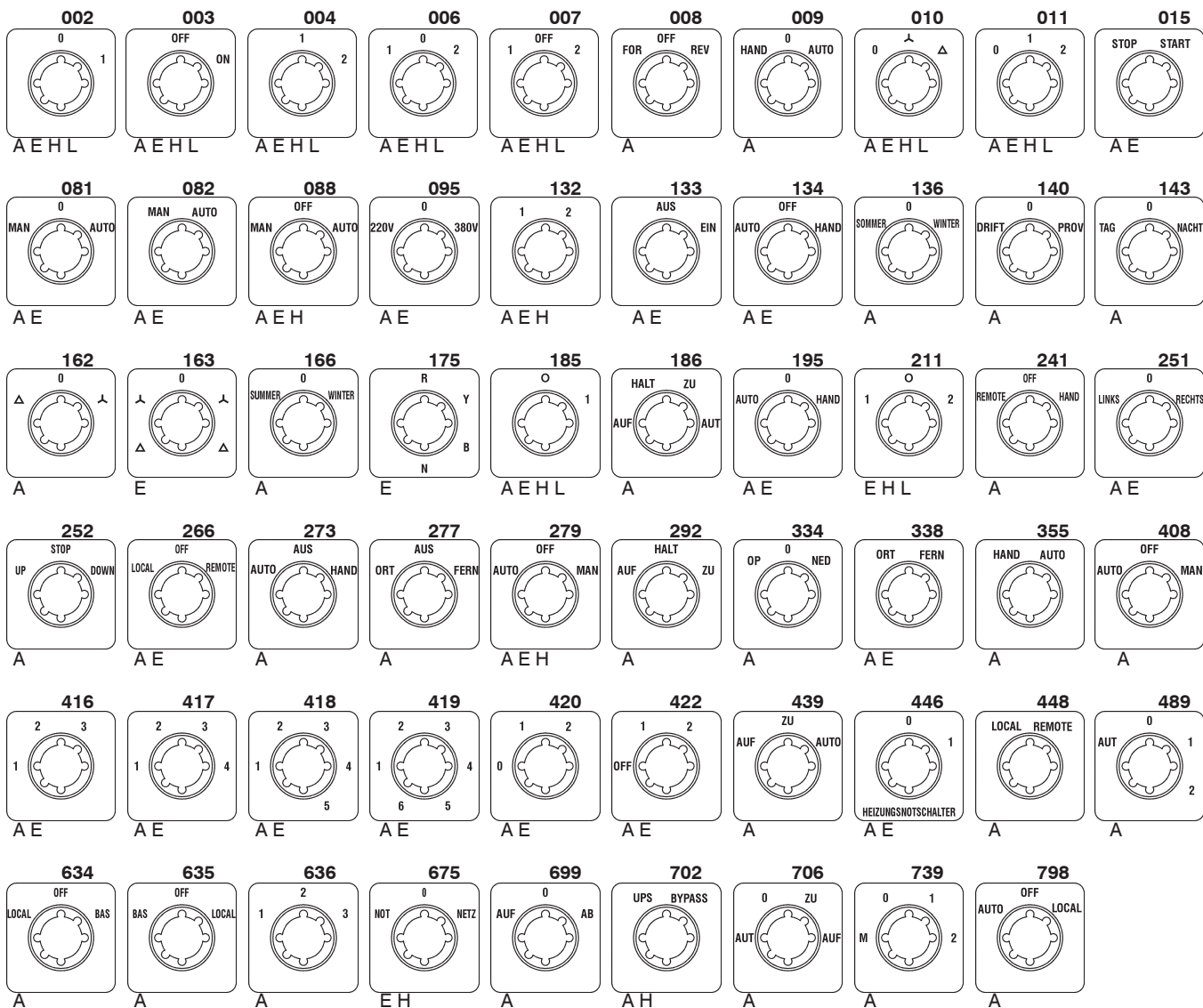
Description	Order type Switch size Code letter	Plate Art.No.	Marking Code number
Escutcheon plate for designs E, V, P, Z, SM, KE and UP Escutcheon frame black, plexi insert plate silver, markings black			
Plexi insert plate silver	A E H L	.85...	... (see pp. 244-248)
Plexi insert plate yellow	A E H L	.80...	... (see pp. 244-248)
Escutcheon frame black	A E H L	.8203	-
Rectangular escutcheon plate for designs E, V, Z and SM Escutcheon frame black, plexi insert plate silver, markings black			
Plexi insert plate silver	A E H L	.885..	... (see pp. 244-248)
Plexi insert plate yellow	A E H L	.895..	... (see pp. 244-248)
Escutcheon frame black	A E H L	.8503	-
Installation cover for design SMA grey cover, markings black	A - - -	.69...	... (see page 246)

Escutcheon Plates

Switching angle 45°

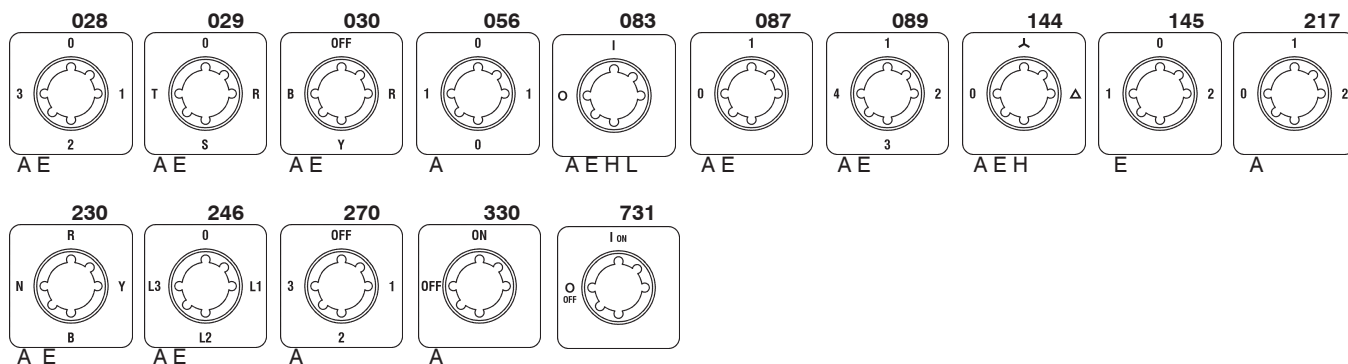


Switching angle 60°

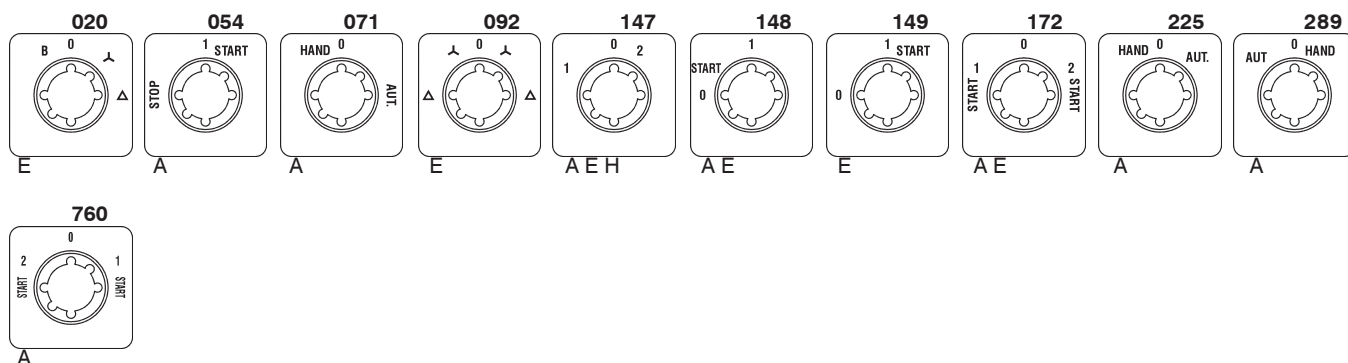


Escutcheon Plates

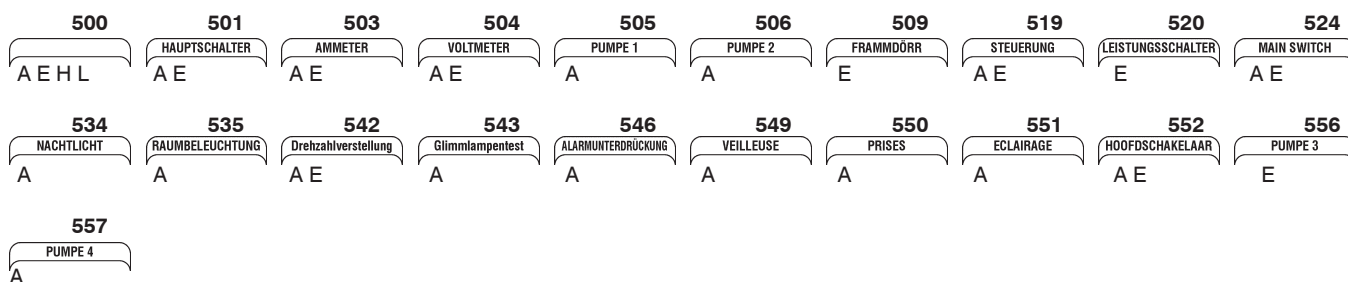
Switching angle 90°



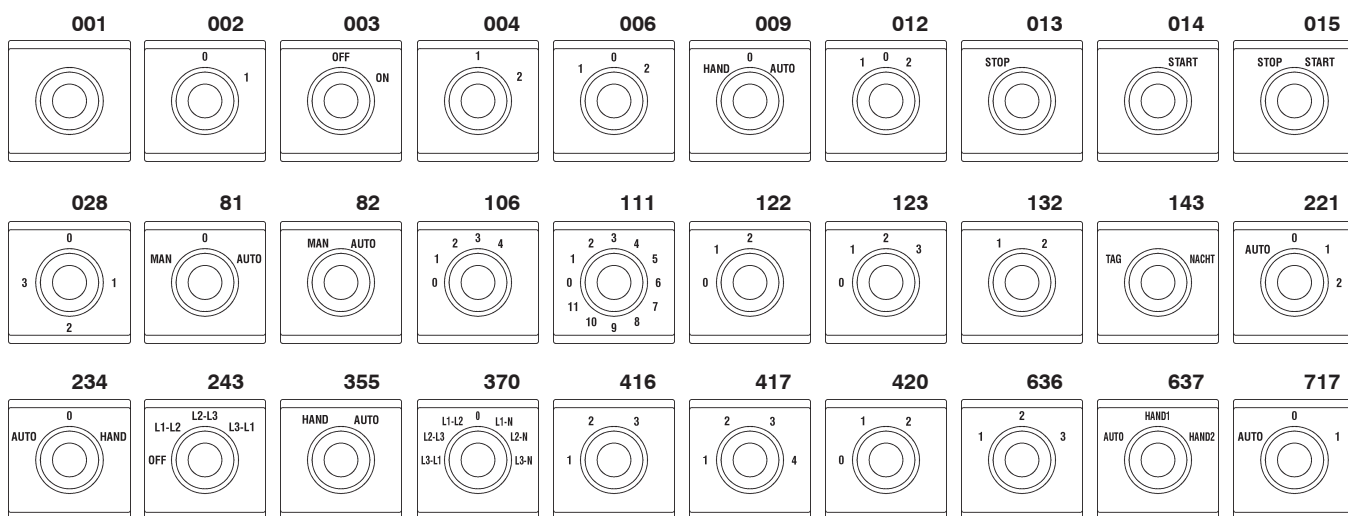
Miscellaneous



Rectangular additional escutcheon plates



Covers for design SMA



Switching angles

Arrangement of switch settings

All feasible arrangements of switch settings are shown, and defined by position numbers, in the following tables. Not only the switching angles, but also switches with latched or momentary settings, or combinations of the two, are distinguished from one another.

Knowledge of the following variations is particularly important when planning special switches. It is necessary to state the position number when ordering special switches, as the cheapest version will otherwise be selected.

All the switches types listed can be supplied with switching angles other than those indicated, provided that they are permitted by the switch program (additional charge).

Switching angle 30°

PN01	PN02	PN03	PN04	PN05	PN06	PN07	PN08	PN09	PN10
PN11	PN12	PN13	PN14	PN15	PN16	PN17	PN18	PN19	PN20
PN21	PN22	PN23	PN24	PN25	PN26	PN27	PN28		

Switching angle 45°

PN30	PN31	PN32	PN33	PN34	PN35	PN36	PN37	PN38	PN39
PN40	PN41	PN42	PN43	PN44	PN45	PN46	PN47	PN48	PN49

Switching angle 60°

PN50	PN51	PN52	PN53	PN54	PN55	PN56	PN57	PN58	PN59
PN76	PN77	PN78	PN79	PN150	PN151				

Switching angle 45/90°

PN70	PN71	PN72	PN73

+) Not available for switch types M10, M10H and M20

Switching angles

Switching angle 90°

PN60	PN61	PN62	PN63	PN64	PN65	PN66	PN67	PN68	PN69

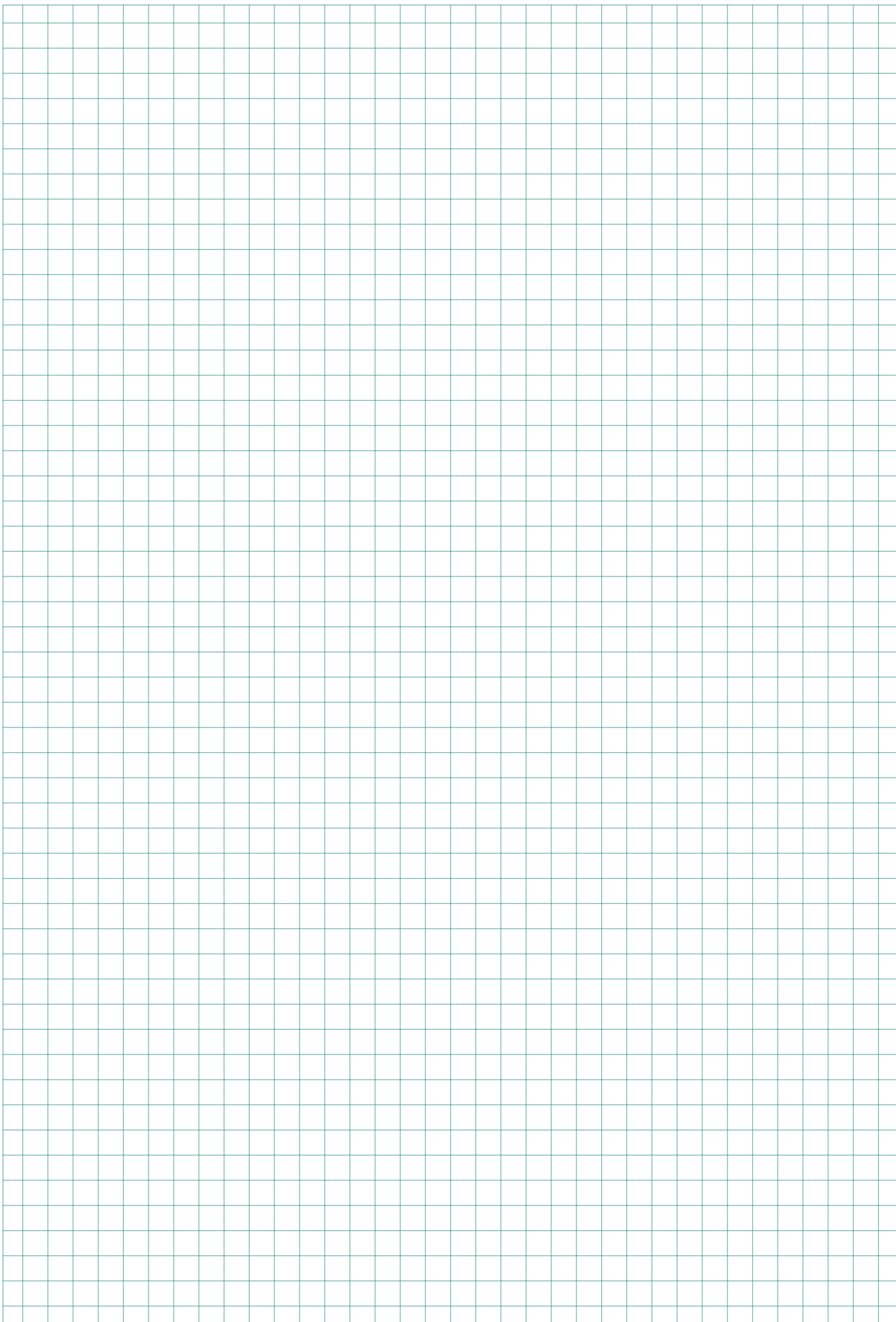
Momentary settings and special combinations

PN80	PN82	PN83	PN84	PN85	PN86	PN87	PN88	PN89	PN90
PN91	PN92	PN93	PN94	PN95	PN96	PN97	PN98	PN99	PN100
PN101	PN102	PN103	PN104	PN105	PN106	PN107	PN108	PN109	PN124
PN125	PN126	PN127	PN128	PN129	PN130	PN131			

Spring return over several settings

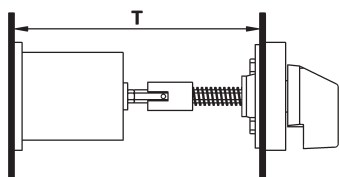
PN110	PN111	PN112	PN113	PN114	PN115	PN116	PN117	PN118	PN119
PN120	PN121	PN122	PN123						

+) Not available for switch types M10, M10H and M20



Door couplings

For switches with door couplings it is necessary to state the installation depth - that is, the distance between mounting level of the switch and the inside edge of the door (dimension T).



Door couplings are available for switches to be installed in switchgear cabinets or distribution boards with hinged doors. These permit the doors to be opened without removal of the operating knobs.

Ordering example: Cam switch N100 V A3 with lockable door coupling, moisture protected IP65, dimension T=580mm
Order type: **N100 V A3 + TK2FR/580**

Dimensions see page 269



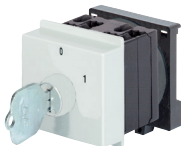
	Ordering Code	Suitable for designs	Suitable for switch type
Door coupling Protection class from front: IP65 5-hole mounting	+TKE/...	V, SM	M10H, M10HD, M20, N20, N33F
Door coupling locked Protection class from front: IP65 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	+TK2E/...	V, SM	M10H, M10HD, M20, N20, N33F
Door coupling locked Protection class from front: IP65 Central fixing Ø22mm Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	+TK2Z/...	V, SM	M10H, M10HD, M20, N20, N33F
Door coupling Protection class from front: IP40 5-hole mounting	+TK/...	V	N40, N61, N80, N100, N200 L100, L400, L600 L800
Door coupling Protection class from front: IP54 5-hole mounting	+TKFR/...	V	N40, N60, N80, N100, N200 L100, L400, L600 L800
Door coupling locked Protection class from front: IP40 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	+TK2/...	V	N40, N61, N80, N100, N200 L100, L400, L600 L800
Door coupling locked Protection class from front: IP54 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	+TK2FR/...	V	N40, N61, N80, N100, N200 L100, L400, L600 L800

Lockable switches

Key-operated and lockable switches are supplied with two keys. Additional keys or other types of lock on request.

Ordering example: Cam switch N20 E A3 key operated
Order type: **N20 E A3 +SA**

Dimensions see page 270 and 271



Key operated switch

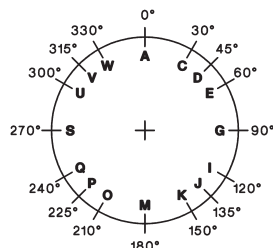
Lock Willenhal FT101, key removable in all lockable settings.

Other types of lock on request.

Maximum number of cells

M10 - N33F: 6 N40, N61, N80: 2

Key operated switch, key removable only in some settings. Add letter of setting where key is removable to ordering code according to the scetch below.



Ordering Code

+SA

+SA/.

Suitable for designs

E, V, SM
E, V
P
SMA
UP

Suitable for switch type

M10H, M10HD, M20
N20, N33F, N40, N61, N80
M10, N20, N33F
M10H, M10HD, M20
M10

Key operated switch IP65

Lock Ronis R455, key removable in all lockable settings.

Key operated switch, key removable only in some settings. Add letter of setting where key is removable to ordering code according to the scetch above.

+SA

+SA/.

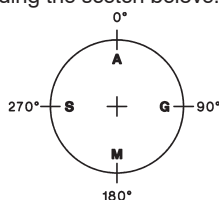
Z, ZO

M10H, M10HD, M20

Key operated switch

Lock KABA8, key removable in all lockable settings.

Key operated switch, key removable only in some settings. Add letter of setting where key is removable to ordering code according the scetch below.



+SAK

+SAK/.

E

M10H, M10HD, M20

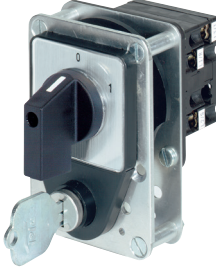
Padlock devices

A range of padlock devices designed to prevent from being turned on by unauthorized personnel, or during maintenance and repair work, can be supplied.

Dimensions see page 272

Ordering example: Cam switch N33F E A3 with interlocking device SV3 suitable for 3 padlocks

Order type: **N33F E A3 +SV3**

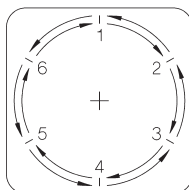
	Padlock device Description	escut. plate [mm]	Ordering Code	Suitable for designs	Suitable for switch type
	Padlock device Standard version black , otherwise red , for 1 or 2 padlocks. Shackles up to Ø6mm	48x48	+SV1 +SV1R	E, V, SM P, PF	M10H, M20 M10
	Standard version black , otherwise red .	64x64	+SV164 +SV164R	E, V P, PF	M10H, N20, N33F N20, N33F
	Padlock device Standard version black , otherwise yellow insert plate and red twist knob for 1-3 padlocks. Shackles up to Ø8,5mm Prior to insertion of the first padlock, a red locking ledge must be depressed. This indicates that the switch is locked.	88x88	+SV3 +SV3R	E, V E, V E, V PF	N40, N61, N80 N100, N200, L400, L600, L800, L1200 N40, N61, N80
		132x132	+SV3 +SV3R	E, V E, V E, V PF	N40, N61, N80 N100, N200, L400, L600, L800, L1200 N40, N61, N80
	Padlock device Standard base grey , locking ring black , or with yellow base and red locking ring. Locking ring for 1-3 padlocks. Shackles up to Ø6mm	64x64	+SV4 +SV4R	E, V SM P, PF	M10H, N20, N33F M10H, N20, N33F N20, N33F
	Standard base grey , locking ring black , or with yellow base and red locking ring.	88x88	+SV488 +SV488R	E, V E, V P, PF	N20, N33F N40, N61, N80 N40, N61, N80
	Key lock device With a cylinder lock in the lock attach- ment, one or more switch settings are lockable (state when ordering). The operating knob can only be turned when unlocked. The key can be withdrawn wheter locked or unlocked. Special versions, in which the key cannot be withdrawn when in some (unlockable) settings can be supplied.		+SZ	E, V SM	all M10H, M20, N20, N33F
	Key lock device Special version for on-off switches, in which it is possible to switch off without a key.		+SZ2	E, V SM	all M10H, M20, N20, N33F

Switch interlocks

A wide range of locks and interlocking devices, designed to prevent accidental or hazardous switching, can be supplied.

Ordering example: Cam switch N20 E A3 with push button switch lock
Order type: **N20 E A3 +DV**

Dimensions see page 273



Description	Ordering Code	Suitable for designs	Suitable for switch type
Push button interlock The switch can only be actuated when the pushbutton is simultaneously depressed (two-handed operation).	+DV	E, V	all
Interlock with electrical contact The switch can only be actuated when the pushbutton, which also operates a make and break contact, is actuated (for external interlocking devices or safety measures).	+ET	E, V	all
Magnetic interlock The switch can only be actuated when an electromagnet is simultaneously excited. When ordering, voltage and percentage duty cycle of the magnet coil should be stated.	+MV	E	N20, N33F, N40, N61, N80 N100, N200
Circular switch Switches that have the maximum number of settings for a given switching angle can be made without a stop position, permitting direct switching from the last to the first setting.	+RU	all	all

Couplings and stop mechanism

A range of couplings and stop mechanisms for trouble-free operation of switches with a very large number of contacts can be supplied.

Dimension see page 274

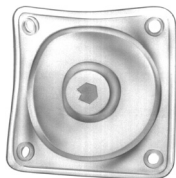


Description	Ordering Code	Suitable for designs	Suitable for switch type
Coupling of different switch sizes For attachment of control switches (auxiliary contacts) to larger switches. M10H, M20 in sizes E and H. N20 to N80 in size L.	+ZWK	E	N40, N61, N80, L100 N100, N200, L400, L600, L800, L1200
Second stop mechanism With switches in which a large number of contacts is simultaneously operated, use of a second stop mechanism is sometimes necessary, in order to ensure precise switching to the next setting.	+RW2	all	all

Special versions

A number of special versions can be supplied for adaptation of switches to various conditions of use.

Ordering example: Cam switch M10H E U3 with large front plate
Order type: **M10H E U3 +GFP**



Description	Ordering Code	Suitable for designs	Suitable for switch type
Switch shaft sealing For increased front protection class on IP54.	+WD	E, V SM	N20 to L1200 N20, N33F
Front plate/switch shaft sealing For increased front protection class on IP65. In this version, a wider hole is required for the shaft. Dimensions see page 272	+FPWD	E, V, SM	N20, N33F
Extended switch shaft For adaptation of switch designs V and SM to the enclosure depth. State additional shaft length when ordering.	+VW/...	E, V SM	all M10H, M10HD, M20, N20, N33F
Large front plate Switch with front plate and operating knob of the next size (for replacement of older, larger switches or aesthetic reasons).	+GFP	E, V, SM	M10H, M10HD, N20, N33F
Neon safety switch For all-pole switching off of neon advertisement circuits by the Fire Brigade. Dimensions see page 274	+FEU	E	N20, N33F

Accessories

A number of special versions can be supplied for adaptation of switches to various conditions of use.

Dimensions see page 273

Ordering example: Cam switch N20 E A3 with terminal cover plate

Order type: **N20 E A3 + KLAD**

Description	Ordering Code	Suitable for designs	Suitable for switch type
Terminal cover plate Prevents accidental touching of live terminals (requirement for main switches according to VDE 0113) only for 2 cells for all cells	+KLAD +KLAD	E, V E, V	N20, N40, N61, N80 N100, N200 N33F
Moisture proofing caps Protection class from rear: IP54. For protection of the switch from dust and moisture (e.g. when installed in machine pedestals). For switch mounting from the front and rear. Conical cable entry glands. Maximum number of cells: M10H 7 N20 5 N40 4 N61 2	+FR	E	M10H, M10HD, N20, N40, N61
Angled terminals For easy connection of inaccessible switches. Unless otherwise stated, all terminals specified with markings are equipped in this manner. A distinction is drawn between left and right angled terminals. Seen from the switch end, the left terminals are located above left and below right; conversely, right terminals are above right and below left.	+WK	E, V	M20, N20, N40, N61, N80, N100
Fast-on connectors For 6,3 x 0,8mm plugs.	+AMPZ	E, V	M20, N20
Earth terminals 2 terminals, connected with one another, insulated from switch column: for earth conductors.	+PE	E, V, P, PF PF G, GF	all M10, N20, N33F, N40, N61 N80 N20
Additional rectangular escutcheon plate 1 line Dimensions see page 267	SRE	E, Z, V, SM	all
Big additional rectangular escutcheon plate for 2 lines Dimensions see page 267	SRE2	E, V	M10H, M10HD, M20, N20, N33F
Spare key for key operated switches with Lock Willenhal FT101	J7101	E, V, P SMA	M10H, M10HD, M20, N20, N33F, N40 M10H, M10HD, M20
Spare key for key operated switches with Lock Ronis R455	B4-R455	Z, ZO	M10H, M10HD, M20
Wrench for switches with central fixing	J7049	Z, ZO	M10H, M10HD, M20



Contactors, Motor-Starters

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnect

Push Buttons

Representatives, Suppliers

Order sheet A4 see page 275

Utilization Categories

For easier choice of devices and in order to make the comparison of different products simpler are utilization categories for cam switches according to IEC 947-3, VDE 0660 Part 107 and

auxiliary contacts according to IEC 947-5-1 and VDE 0660 Part 200 determined. The Table below offers diverse utilization categories and assorted test conditions.

Kind of current	Category		Typical applications	Rated operational current	Test conditions for the number of on-load operating cycles (normal service)									Test conditions for making and breaking capacities (operation in fault case)								
	fre-quent operation	infre-quent operation			Make			Break			Make			Break								
					I/I _e	U/U _e	cosφ	I _c /I _e	U _r /U _e	cosφ	I/I _e	U/U _e	cosφ	I _c /I _e	U _r /U _e	cosφ						
Alternating Current	AC20A	AC20B	No-load conditions	all values	-	-	-	-	-	-	-	-	-	-	-	-						
	AC21A	AC21B	Switching of resistive loads including moderate overloads	all values	1	1	0,95	1	1	0,95	1,5	1,05	0,95	1,5	1,05	0,95						
	AC22A	AC22B	Switching of mixed resistive and inductive loads including moderate overloads	all values	1	1	0,8	1	1	0,8	3	1,05	0,65	3	1,05	0,65						
	AC23A	AC23B	Switching of motor loads or other highly inductive loads	0<I _e ≤100A all values 100A<I _e	1	1	0,65	1	1	0,65	10	1,05	0,45 10	1,05	0,35	8	1,05	0,45 8	1,05	0,35		
	AC2		Slip-ring motors: Starting, plugging	all values	2,5	1	0,65	2,5	1	0,65	4	1,05	0,65	4	1,05	0,65						
	AC3		Squirrel-cage motors: Starting, switching off motors during running	0<I _e ≤100A all values 100A<I _e	I _e ≤17A 6 I _e >17A	0,65 1 0,35	I _e ≤17A 1 I _e >17A	0,65 0,17 0,35	10	1,05	0,45 0,35	8	1,05	0,45 0,35								
	AC4		Squirrel-cage motors: Starting, plugging, inching	0<I _e ≤100A all values 100A<I _e	I _e ≤17A 6 I _e >17A	0,65 1 0,35	I _e ≤17A 6 I _e >17A	0,65 0,35	12	1,05	0,45 0,35	10	1,05	0,45 0,35								
	AC15		Control of electromagnetic loads (> 72VA)	-	10	1	0,7	1	1	0,4	10	1,1	0,3	10	1,1	0,3						
					I/I _e	U/U _e	L/R ¹⁾	I _c /I _e	U _r /U _e	L/R ¹⁾	I/I _e	U/U _e	L/R ¹⁾	I _c /I _e	U _r /U _e	L/R ¹⁾						
Direct current	DC20A	DC20B	No-load conditions	all values	-	-	-	-	-	-	-	-	-	-	-	-						
	DC21A	DC21B	Switching of resistive loads including moderate overloads	all values	1	1	1	1	1	1	1,5	1,05	1	1,5	1,05	1						
	DC22A	DC22B	Switching of mixed resistive a. induct. loads incl. moderate overloads (shunt motors)	all values	1	1	2	1	1	2	4	1,05	2,5	4	1,05	2,5						
	DC23A	DC23B	Switching of highly inductive loads (e.g. series motors)	all values	1	1	7,5	1	1	7,5	4	1,05	15	4	1,05	15						
	DC3		Shunt-motors: Starting, plugging, inching	all values	2,5	1	2	2,5	1	2	4	1,05	2,5	4	1,05	2,5						
	DC5		Series-motors: Starting, plugging, inching	all values	2,5	1	7,5	2,5	1	7,5	4	1,05	15	4	1,05	15						

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

1) Time in milliseconds (ms)

Note:
By plugging, is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.
By inching (jogging), is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type		M10 P	M10H	M10HD	M20	N20	N33F	N40	N61	N80	N100	N200
Rated therm. current I_{th} open	A	20	20	10	32	32	50	63	90	115	150	250
Rated therm. current I_{the} encl.	A	20	20	10	32	32	50	63	90	115	150	250
Rated operational voltage U_e	V	440	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾	690 ¹⁾
Disconnection property ²⁾ acc. to VDE, IEC up to	V	440	440	- ⁴⁾	440	440	440	690	440	440	690	690
Breaking capacity I_{eff}												
3 x 220-440V	A	160	160	35	220	220	260	380	520	740	900	1100
3 x 500V	A	-	100	-	160	160	200	290	380	560	680	850
3 x 660-690V	A	-	80	-	120	120	150	200	290	520	450	-
Utilization categ. AC21A, AC21B Switching of resistive loads including moderate overloads Rated operational current I_e												
	A	20	20	10	32	32	50	63	90	115	150	250
Utilization categ. AC23A, AC23B Switching of motor loads or other highly inductive loads Rated current I_e 400V												
	A	16	16	3,5	30	30	45	45	60	85	105	135
Power rating 220-240V	kW	4	4	0,75	7,5	7,5	11	15	22	30	40	40
3-phase 3-pole 380-440V	kW	7,5	7,5	1,5	15	15	22	22	30	45	55	70
500V	kW	-	7,5	1,5	15	15	22	22	30	45	55	70
660-690V	kW	-	7,5	1,5	15	15	22	18,5	30	45	45	-
Star-Delta-Switches for squirrel cage motors Power rating												
3-phase 3-pole 220-240V	kW	3,7	3,7	-	7,5	7,5	8	11	15	18,5	37	40
380-415V	kW	7,5	7,5	-	15	15	18,5	18,5	25	30	40	70
Utilization category AC3 Switching of three-phase motors Rated current I_e 400V												
	A	12	12	2	22	22	30	30	50	60	80	135
Power rating 220-240V	kW	3	3	0,37	5,5	5,5	7,5	7,5	15	18,5	25	40
3-phase 3-pole 380-440V	kW	5,5	5,5	0,75	11	11	15	15	25	30	40	70
500V	kW	-	5,5	0,75	11	11	15	15	25	30	40	70
660-690V	kW	-	5,5	0,75	11	11	15	15	25	30	40	70
Utilization category AC4 squirrel cage motors, inching Power rating 220-240V												
	kW	0,55	0,55	-	2,2	2,2	3,7	4	5,5	6	11	18,5
3-phase 3-pole 380-440V	kW	1,5	1,5	-	4	4	5,5	7,5	11	15	18,5	35
500V	kW	-	1,5	-	4	4	5,5	7,5	11	15	22	35
660-690V	kW	-	1,5	-	4	4	5,5	7,5	11	15	22	-
Utilization category AC15 Control of electromagnetic loads, contactors, Rated current I_e												
up to 240V	A	6	6	2,5	12	12	16	-	-	-	-	-
380 - 440V	A	4	4	1,5	6	6	7	-	-	-	-	-
2-pole in series 500V	A	-	5	-	8	8	10	-	-	-	-	-
Utilization categ. DC21A, DC21B Switching of resistive loads Time constant $L/R \leq 1ms$ Rated current I_e												
1-pole 30V	A	20	20	10	32	32	40	63	80	100	150	250
60V	A	4	4	-	6	6	20	30	30	30	-	-
110V	A	0,6	0,6	-	3	3	4	6	6	6	-	-
220V	A	0,5	0,5	-	0,8	0,8	0,8	1,3	1,3	1,3	2,5	2,5
440V	A	-	-	-	0,4	0,4	0,4	0,6	0,6	0,6	0,7	0,7
Utilization category DC3 - DC5 Switching of shunt motors and series motors Time constant $L/R \leq 15ms$ Rated current I_e												
1-pole 30V	A	8	8	-	13	13	16	25	32	40	60	100
60V	A	1	1	-	2,4	2,4	4	12	12	12	-	-
110V	A	0,3	0,3	-	0,5	0,5	1,6	2,4	2,4	2,4	-	-
Protection class of terminals ¹⁾		IP00	IP20	IP20	IP00	IP00	IP20	IP00	IP00	IP00	IP00	IP00

1) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp} = 6kV$. Data for other conditions on request

2) valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3.

3) Protection degree of the terminals with connected insulated conductor. Additional protection with terminal cover (KLAD).

4) Fulfil the requirements acc. to load switches.

Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type		M10 P	M10H	M10HD	M20	N20	N33F	N40	N61	N80	N100	N200
Cable cross-sections												
solid	mm ²	1-2,5	1-2,5 ¹⁾	1-2,5 ¹⁾	1,5-6	1,5-6	2,5-10	2,5-16 ¹⁾	6-25 ¹⁾	6-35	10-50 ¹⁾	50-150
flexible	mm ²	0,75-2,5	0,75-2,5 ¹⁾	0,75-2,5 ¹⁾	1-4	1-4	1,5- 6	2,5-10 ¹⁾	6-25 ¹⁾	6-35	10-35 ¹⁾	35-120
flexible w. multicore cable end	mm ²	0,75-2,5	0,75-1,5	0,75-1,5	1-4	1-4	1,5- 6	2,5-6	6-16	6-35	10-25	-
Conductors to clamp per pole		2	2	2	2	2	2	2	1	1	1	1
Size of terminal screw		M3	M3,5	M3,5	M4	M4	M4	M5	2xM5	2xM5	2xM6	M10
Tightening torque	Nm lb.inch	0,6-1,2 5-11	0,8-1,4 7-12	0,8-1,4 7-12	1,2-1,8 11-16	1,2-1,8 11-16	1,2-1,8 11-16	2,5-3 22-26	2,5-3 22-26	2,5-3 22-26	3,5-4,5 31-40	23 202
Short circuit protection												
Max. fuse size	gL (gG) A	20	20	20	35	35	50	63	100	125	160	250
Rated short-time withstand current (1sec. current)	A	250	250	-	400	400	500	800	1000	1400	1800	3000
Rated conditional short-circuit current	kA _{eff}	10	10	1	10	10	10	10	10	10	10	10
Short-time capacity												
Load duration	3s A	100	100	-	200	200	350	400	600	720	1000	2000
	10s A	60	60	-	130	130	230	250	400	480	600	1200
Note: Ratings applies to contacts already closed	30s A	35	35	-	85	85	110	160	250	300	500	600
	60s A	25	25	-	65	65	80	110	200	250	370	480
Power loss at AC21A												
per pole	A W	20 0,6	20 0,5	10 0,5	32 0,9	32 1,1	50 1,9	63 2	85 2,8	115 4,4	150 5,7	250 21
Switching of capacitive loads												
maximum making capacity up to 500V	A	140	140	-	300	300	350	400	600	700	900	1800

Data according to UL and cUL

Type		M10 P	M10H	M10HD	M20	N20	N33F	N61	N80	N100	N200	L400
Rated voltage	V~	300	600	600	600	600	600	600	600	600	600	600
Rated operational current "General Use" with jumper	A A	20 15	20 -	5 -	35 25	35 25	60 40	90 80	115/125 ³⁾ 80/125 ³⁾	130 -	250 -	350 -
DOL-Rating 3-phase	110-120V hp	1½	1½	-	5	5	7½	8½	10	15	15	15
	200-208V hp	2	2	-	5	5	10	12½	15	25	25	25
	220-240V hp	3	3	-	5	5	15	17	20	30	30	30
	440-480V hp	-	5	-	10	10	25	35	40	40	60	60
	550-600V hp	-	7½	-	15	15	30	40	50	50	75	75
DOL-Rating 1-phase	110-120V hp	½	½	-	1½	1½	3	4	5	7½	7½	7½
	200-208V hp	1	1	-	3	3	5	6½	7½	15	15	15
	220-240V hp	1½	1½	-	5	5	7½	8	10	15	20	20
Fuse size (RK5) Man. Motor Controller 5kA / 600V and Motor Disconnect	A	40 ²⁾	40	-	80	80	150	150	200	300	350	350
Heavy pilot duty	AC	A300	A600	B600	A600	A600	A600	A600	A600	A600	A600	A600
Cable cross sections												
solid	AWG	12 - 20	12 - 20	12 - 20	10 - 18	10 - 18	10 - 12	10 - 12	10 - 12	10 - 14	-	-
flexible	AWG	14 - 20	14 - 20	14 - 20	8 - 18	8 - 18	6 - 12	2 - 12	2/1 ³⁾ - 12	1 - 14	250kcmil	500kcmil
Tightening torque	Nm lb.inch	1-1.2 9-11	1-1.4 9-13	1-1.4 9-13	1.7-1.8 15-16	1.7-1.8 15-16	1.2-1.8 11-16	2.8 25	2.8 25	4.5 40	23 202	40 352

1) Maximum cable cross-section with prepared conductor

2) 5kA / 300V

3) Increased rated operational current 125A "General Use" and "with jumper" with AWG 1. Add suffix + WK.

Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type		L100	L400	L600	L800	L1200
Rated insulation voltage U_i	V	690 ²⁾	690 ²⁾	690 ²⁾	690 ²⁾	690 ²⁾
Rated thermal current I_{th} openA	125	180	600	800	1200	
Rated thermal current I_{the} encl. A	125	180	600	800	1200	
with conductor	mm ²	50	busbar 40x5	busbar 40x10	busbar 2x40x10	busbar 2x50x10
Utilization category AC21A, AC21B						
Switching of resistive loads, including moderate overloads						
Rated operational current I_e	A	125	400	400	400	400
Shot-time current-carrying capacity						
Load duration	1s	-	4800	6500	8500	10000
	3s	800	3600	5000	6500	8000
	10s	500	2000	3200	4000	5800
Note: Ratings applies to contacts already closed	30s	320	1200	1700	2200	3200
	60s	180	960	1300	1700	2300
Cable cross-sections						
solid or stranded	mm ²	25-50 ¹⁾	busbar	busbar	busbar	busbar
flexible	mm ²	25-50 ¹⁾	40x5	40x10	2x40x10	2x50x10
flexible with multicore cable end	mm ²	25-35	-	-	-	-
Number of conductors to clamp per pole		1	1	2	1	1
Size of terminal screw		2xM5	M12	M16	M16	M16
Tightening torque	Nm	3	40	98	98	98
	lb.inch	26	352	862	862	862
Short circuit protection						
Max. fuse size	slow, gL (gG) A	125	400	630	800	1250

1) Maximum cable cross-section with prepared conductor

2) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp} = 6kV$.
Data for other conditions on request

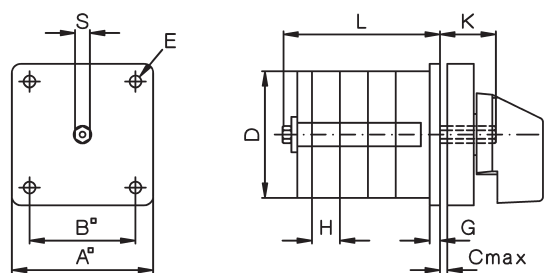
Mechanical Life

Schwitch type		M10, M10H	M20, N20, N33F	N40, N60, N80	N100, N200
Operations	x10 ³	300	250	200	150

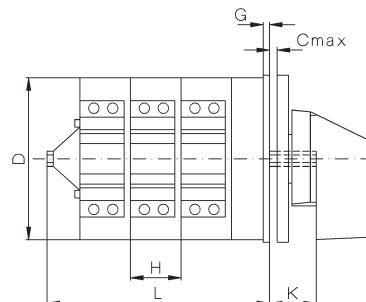
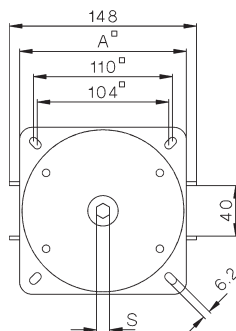
Note: The minimum mechanical and electrical life is defined according to IEC/EN60946-3 (approx. 10.000 operations).

Dimensions (mm)

Panel mounting E M10 - N100



N200

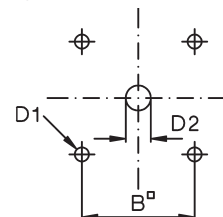


Type	A	B	C	D	D1	D2	D3	E	G	H	K	S
M10H	48	36	5	44 ¹⁾	5	8	-	4	3,5	9,5	19	SW5
M20	48	36	5	56	5	8	-	4	3,5	12,5	19	SW5
N20	64	48	5	56	5	12	57	4,2	3	12,5	20	SW7
N33F	64	48	5	58 ²⁾	5	12	-	4,2	3	15,5	20	SW7
N40	86	68	7	80	6	12	82	5,2	3,5	18	24,5	SW9
N61	86	68	7	80	6	12	82	5,2	3,5	29,5	24,5	SW9
N80	86	68	7	80	6	12	82	5,2	3,5	29,5	24,5	SW9
N100	132	110	9	128	7	16	129	6,2	5	30	37	SW12
N200	132	110	9	128	7	16	-	6,2	5	40	37	SW12

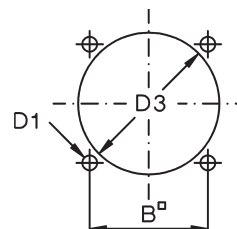
1) 44,5 x 42

2) 58 x 58

Mounting holes: built in from rear
Mounting screw: J3631N M=1,2-1,4 Nm

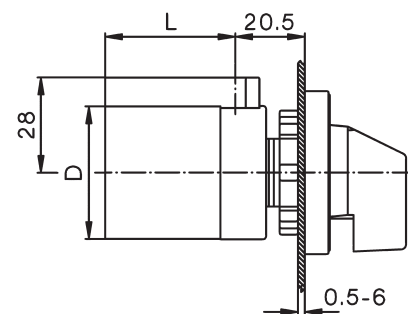


Mounting holes: built in from front

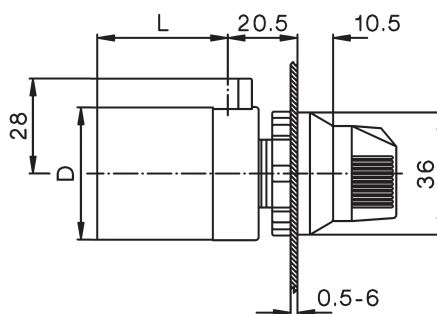


Type	Dimension L with .. cells														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M10H	36,5	46	55,5	65	74,5	84	93,5	103	112,5	122	131,5	141	-	-	-
M20	38,5	51	63,5	76	88,5	101	113,5	126	138,5	151	163,5	176	-	-	-
N20	40,5	53	65,5	78	90,5	103	115,5	128	140,5	153	165,5	178	190,5	203	215,5
N33F	44	59,5	75	90,5	106	121,5	137	152,5	168	183,5	199	214,5	230	245,5	261
N40	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5	268,5	286,5	304,5
N61	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N80	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N100	88	118	148	178	208	238	268	298	328	358	388	418	-	-	-
N200	96	136	176	216	256	296	336	376	416	456	496	536	-	-	-

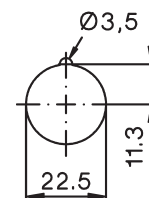
Central fixing Z M10H, M20, N33F



Central fixing without escutcheon plate ZO M10H, M20



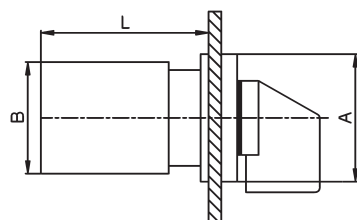
Mounting hole:



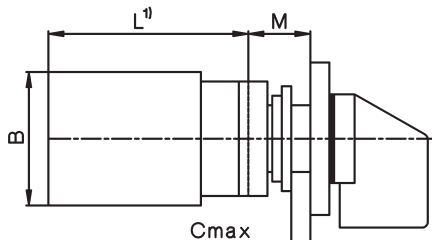
Further dimensions see tables above

Mini-Cam Switches M4H

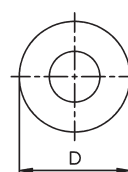
Panel mounting E



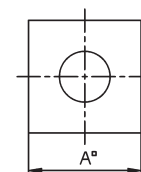
Central fixing Z, ZO



ZO



Z

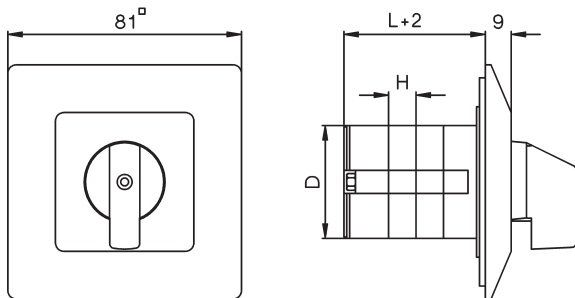


Typ	Dimension L with .. cells														
	A	B	D	M	1	2	3	4	5	6	7	8			
M4H	mm	30	28	29,5	12,5	38,5	50,5	62,5	74,5	86,5	98,5	110,5	122,5		

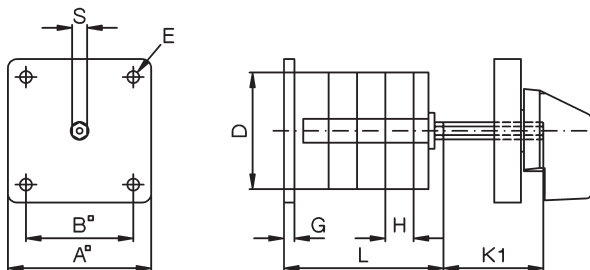
Mounting holes see page 236

Dimensions (mm)

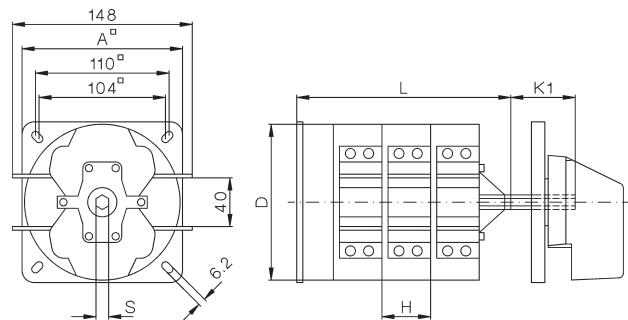
Flush mounting UP M10



Base mounting V M10H - N100



N200

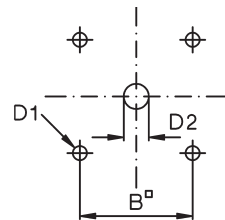


Type	A	B	D	D1	D2	E	G	H	I	K	K1	
M10	48	36	39	5	8	4	3,5	9,5	6	19	41	SW5
M10H	48	36	44 ¹⁾	5	8	4,2	3	9,5	6	19	41	SW5
M20	48	36	56	5	8	4,2	3	12,5	6	19	47	SW5
N20	64	48	56	5	12	4,2	3	12,5	0	20	29	SW7
N33F	64	48	58 ²⁾	5	12	4,2	3	15,5	0	20	31,5	SW7
N40	86	68	80	6	12	5,2	3,5	18	-	-	38,5	SW9
N61	86	68	80	6	12	5,2	3,5	29,5	-	-	49,5	SW9
N80	86	68	80	6	12	5,2	3,5	29,5	-	-	49,5	SW9
N100	132	110	128	7	16	6,2	5	30	-	-	79,5	SW12
N200	132	110	128	7	16	6,2	5	40	-	-	104	SW12

Mounting holes: for escutcheon plate

1) 42 x 44,5

2) 58 x 58

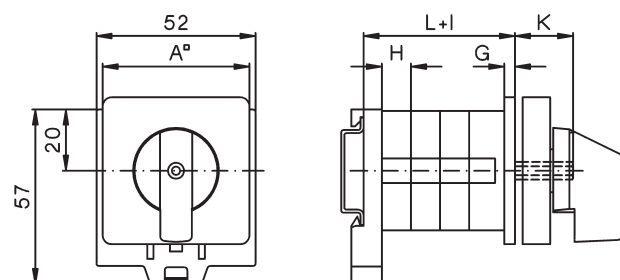


Type	Dimensions L with .. cells														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M10	34,5	44	53,5	63	72,5	82	91,5	101	110,5	120	129,5	139	-	-	-
M10H	36,5	46	55,5	65	74,5	84	93,5	103	112,5	122	131,5	141	-	-	-
M20	38,5	51	63,5	76	88,5	101	113,5	126	138,5	151	163,5	176	-	-	-
N20	40,5	53	65,5	78	90,5	103	115,5	128	140,5	153	165,5	178	190,5	203	215,5
N33F	44	59,5	75	90,5	106	121,5	137	152,5	168	183,5	199	214,5	230	245,5	261
N40	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5	268,5	286,5	304,5
N61	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N80	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N100	88	118	148	178	208	238	268	298	328	358	388	418	-	-	-
N200	96	136	176	216	256	296	336	376	416	456	496	536	-	-	-

Snap-on mounting SM

M10H - N33F for 35mm DIN-rail mounting according to DIN EN 50022

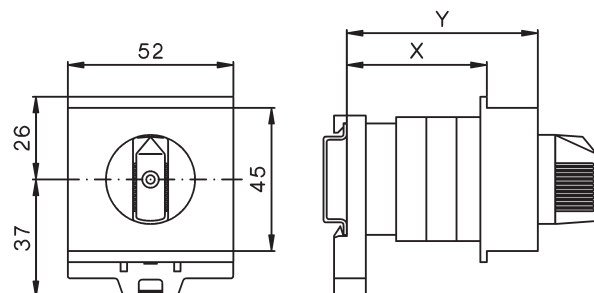
Dimensions see tables above



Switch with installation cover SMA

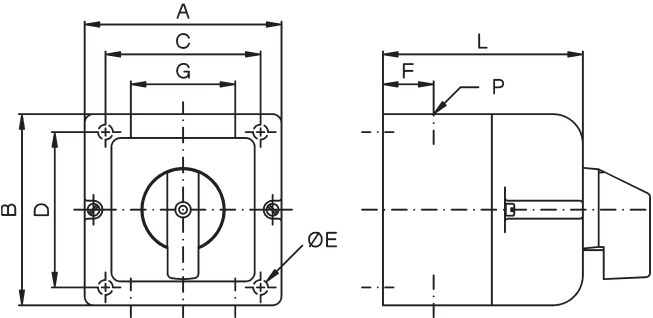
M10H, M20 for 35mm DIN-rail mounting according to DIN EN 50022

Type	Dimension X with .. cells						Dimension Y with .. cells					
	1, 2	3	4	5	6		1, 2	3	4	5	6	
M10H	44	44	72,5	72,5	72,5		60	60	88,5	88,5	88,5	
M20	44	61	76	76	76		60	75	90	90	90	



Dimensions (mm)

Plastic enclosed switches P, PF
M10 - N61

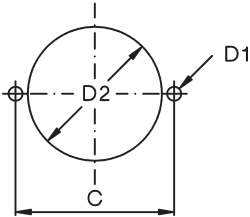
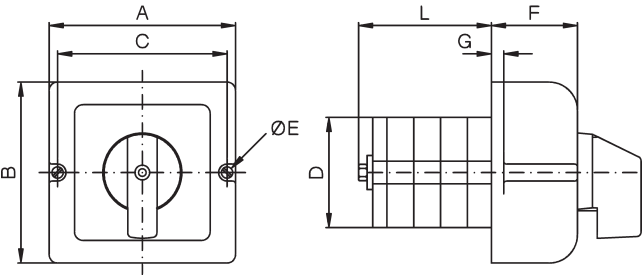


Type	A	B	C	D	E	F	G	P	Dimension L with .. cells					
									1	2	3	4	5	6
M10	66	64	50	36	5	15,5	26	M20	43	52	62	71	81	90
N20	82	78	57	53	4,5	17	29	M20	66	66	80	94	108	122
N33F	112	108	85	50	5	20	50	M25	92	92	92	110	128	146
N40	112	108	85	50	5	20	50	M25	92	92	110	128	146	164

1) Knock outs for M40/M32 + 4x M20 at top and bottom M32/M25 + 4x M20 at the right and left hand side.

Motor terminal box mounting KE
M10 - N20

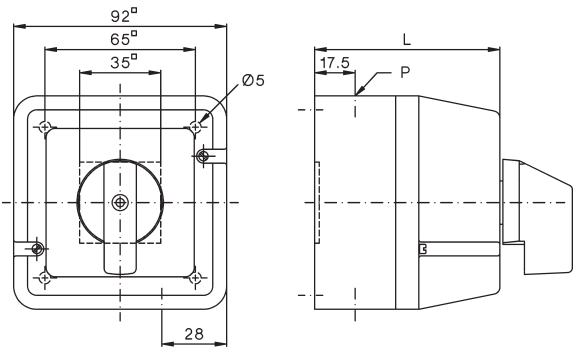
Mounting holes



Type	A	B	C	D	D1	D2	E	F	G	Dimension L with .. cells				
										2	3	4	5	6
M10	66	64	58	39	4	48	3,2	24	6	22	31,5	41	50,5	60
N20	82	78	71	48	5	57	4,2	34	5	24,5	37	49,5	62	74,5

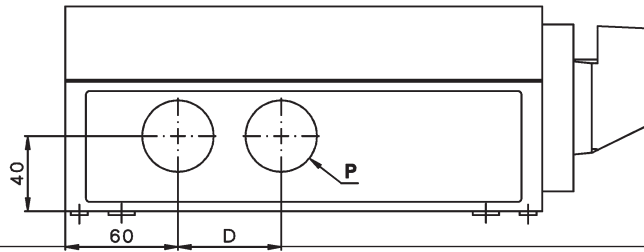
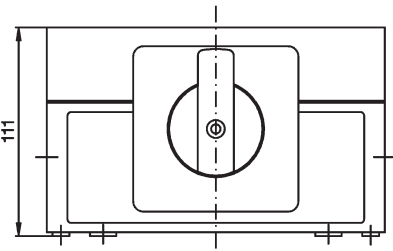
Plastic enclosed motor starter PM
N20

Typ	P	Dimension L with .. cells					
		1	2	3	4	5	6
N20	M25	80	80	80	92,5	105	117,5

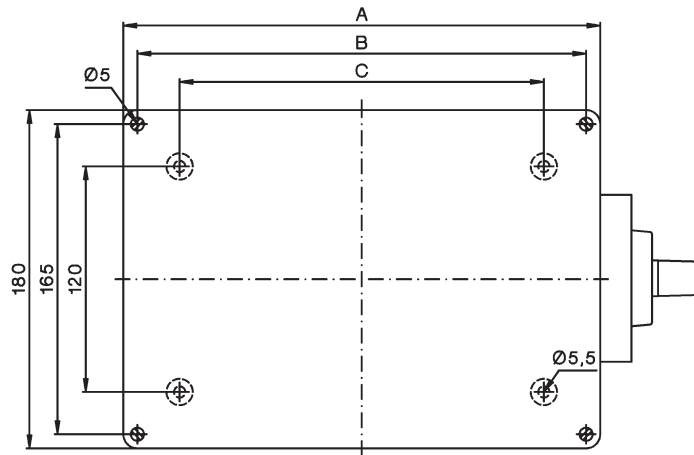


Dimensions (mm)

Plastic enclosure horizontal PLF (Replacement for cast aluminium enclosure G, GF)
N40, N61, N80



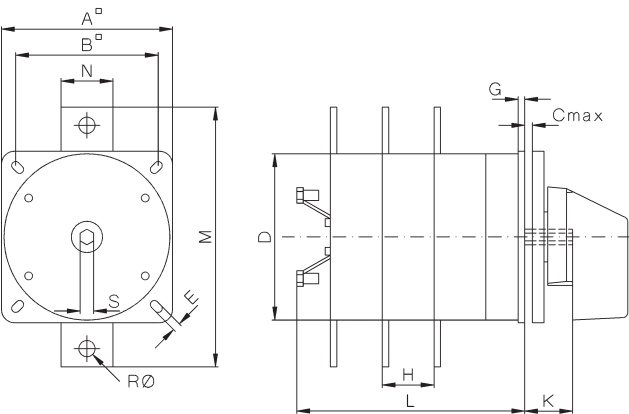
Type	N40 1 - 6 cells N61 1 - 3 cells N80 1 - 3 cells	N40 7 - 10 cells N61 4 - 6 cells N80 4 - 6 cells
A	182	254
B	167	239
C	120	190
D	-	65
P	2 x Ø40,5 (M40)	4 x Ø40,5 (M40)



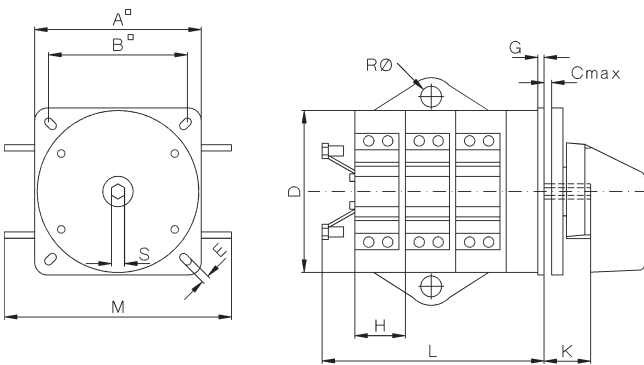
Dimensions (mm)

Load Switches

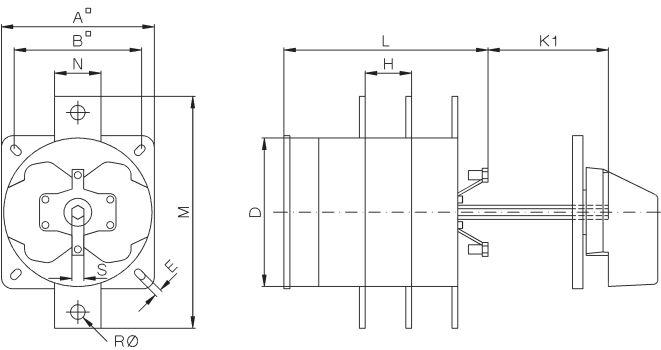
Panel mounting E
L100 - 400, L800, L1200



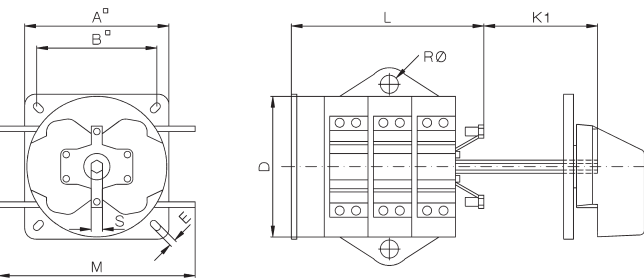
L600



Base mounting V
L100 - 400, L800, L1200

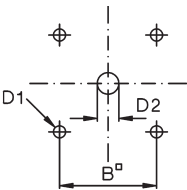


L600



Type	A	B	C	D	D1	D2	E	G	H	K	K1	M	N	R	S
L100	86	68	7	80	6	12	5,2	3,5	18	24,5	38,5	103	27	-	SW9
L400	132	110	9	128	7	16	6,2	5	40	37	104	200	40	12,5	SW12
L600	132	110	9	128	7	16	6,2	5	40	37	104	180	-	16,5	SW12
L800	132	110	9	128	7	16	6,2	5	40	37	104	240	40	16,5	SW12
L1200	132	110	9	128	7	16	6,2	5	40	37	104	240	40	16,5	SW12

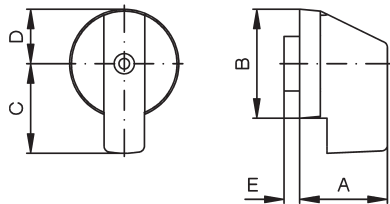
Mounting holes:



Type	Dimension L with .. cells											
	1	2	3	4	5	6	7	8	9	10	11	12
L100	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5
L400	96	136	176	216	256	296	336	376	416	456	496	536
L600	96	136	176	216	256	296	336	376	416	456	496	536
L800	96	136	176	216	256	296	336	376	416	456	496	536
L1200	96	136	176	216	256	296	336	376	416	456	496	536

Operating Knobs and Handles

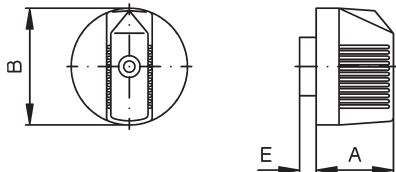
Instrument knob G.



Type	A	B	C	D	E
M10, M10H, M10HD, M20		23	28	24	14
N20, N33F	27	36	32	18	3
N40, N61, N80, L100	36	47	42	24	3,5
N100, N200	48,10	75	63	37,5	-

4

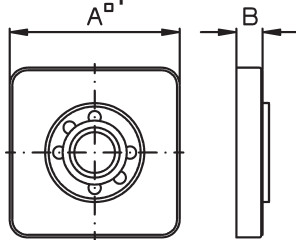
Toggle knob K.



Type	A	B	E
M10, M10H, M10HD, M20	18,5	28	4
N20, N33F	24	36	3

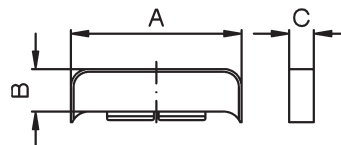
Escutcheon plates

Escutcheon plate

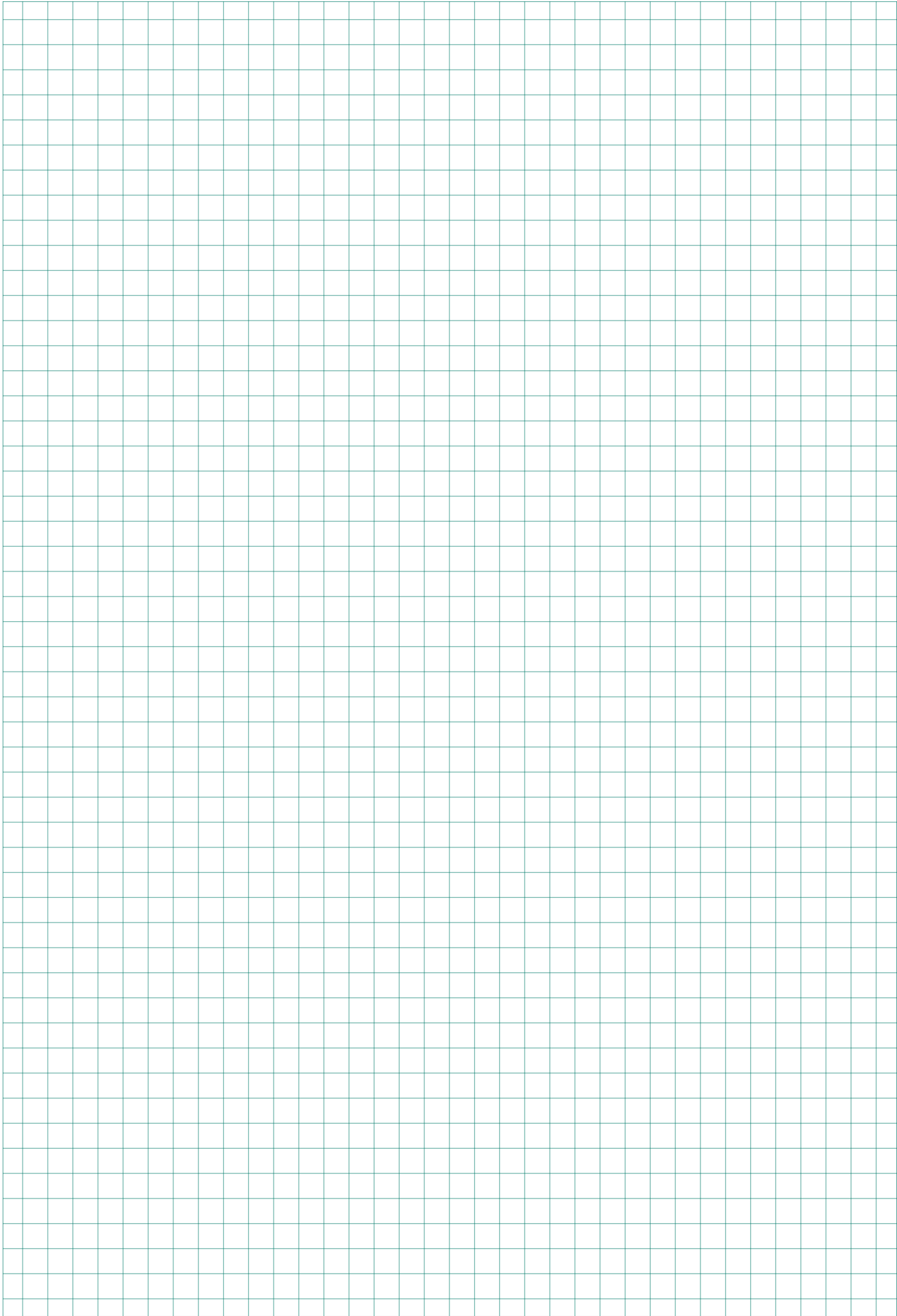


Type	A	B
M10, M10H, M10HD, M20	48	7,5
N20, N33F	64	7,5
N40, N61, N80, L100, L160	88	8
N100, N200, L400, L600, L800, L1200	132	9

Rectangular additional plate SRE



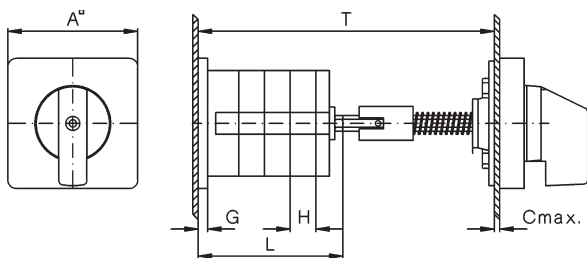
Type	A	B	C
M10, M10H, M10HD, M20	48	12	7,5
N20, N33F	64	14	7,5
N40, N61, N80, L100, L160	88	22	8
N100, N200, L400, L600, L800, L1200	132	31	9



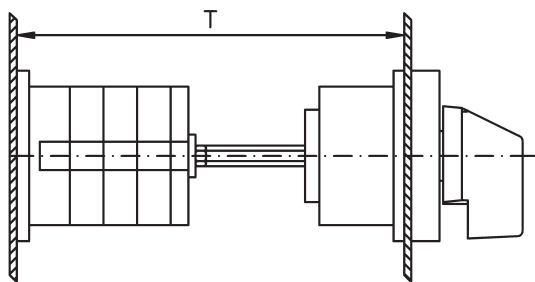
Door couplings

Dimension T is a minimum value. In case of order the dimension T is necessary.

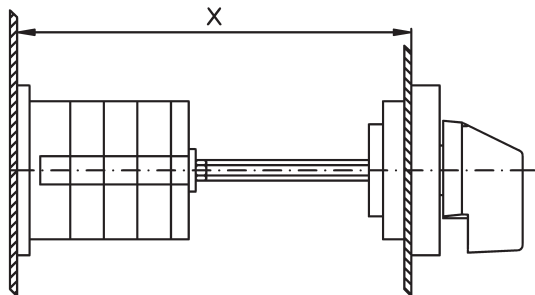
Door coupling TK, TKFR N40 - L800



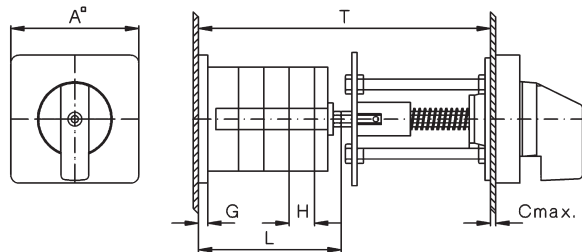
Door coupling TKE, TK2E M10H, M10HD, M20, N20, N33F



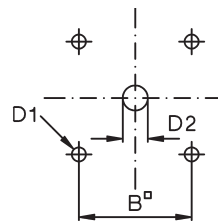
Door coupling, lockable TK2Z M10H, M10HD, M20, N20, N33F



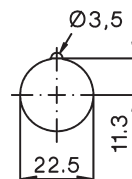
Door coupling, lockable TK2, TK2FR N40 - L800



Mounting holes:
TK, TKFR, TK2, TK2FR
TKE, TK2E



Mounting holes:
TKZ



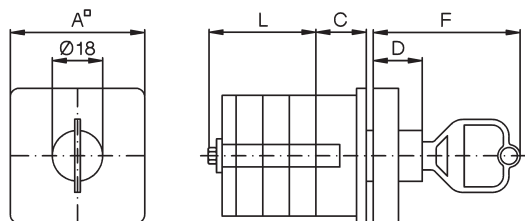
Further dimensions see pages 262 and 263.

Dimension T is a minimum value dependent on switch Type and number of cells. For ordering dimension T is necessary

Type	A	B	C	D1	D2	Minimum dimension T with .. cells							
						1	2	3	4	5	6	7	8
M10H	48	36	5	5	8	108	117,5	127	136,5	146	155,5	165	174,5
M20	48	36	5	5	8	100	112,5	125	137,5	150	162,5	175	187,5
N20	64	48	5	5	10	100	112,5	125	137,5	150	162,5	175	187,5
N33F	64	48	5	5	10	103	118,5	134	149,5	165	180,5	196	211,5
N40	88	48	7	6	12	134	152	170	188	206	224	242	260
N61	88	48	7	6	12	145,5	175	245,5	234	263,5	293	322,5	352
N80	88	48	7	6	12	145,5	175	245,5	234	263,5	293	322,5	352
N100	132	110	9	7	15	202	232	262	292	322	352	382	412
N200	132	110	9	7	15	212	252	292	332	372	412	452	492
L100	88	48	7	6	12	-	152	-	188	-	224	-	260
L400	132	110	9	7	15	212	252	292	332	372	412	452	492
L600	132	110	9	7	15	-	-	292	-	-	412	-	-
L800	132	110	9	7	15	-	252	-	332	-	412	452	492
L1200	132	110	9	7	15	-	-	292	-	-	412	-	-

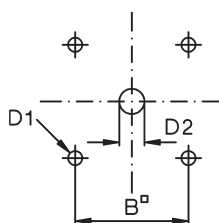
Key operated switches SA

Panel mounting E M10 - N61



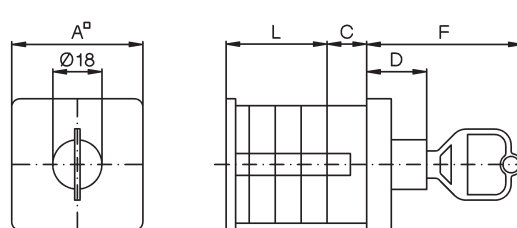
Type	A	B	C	D	D1	D2	F
M10H, M10HD, M20	48	36	18	17,5	5	18,5	52,5
N20, N33F	64	48	10	17,5	5	18,5	52,5
N40, N61	88	68	23,5	15	6	18,5	50

Mounting holes



Dimension L see page 262

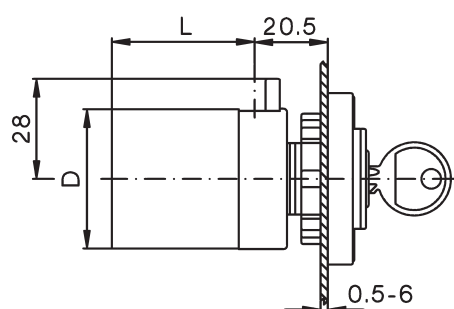
Base mounting V M10 - N61



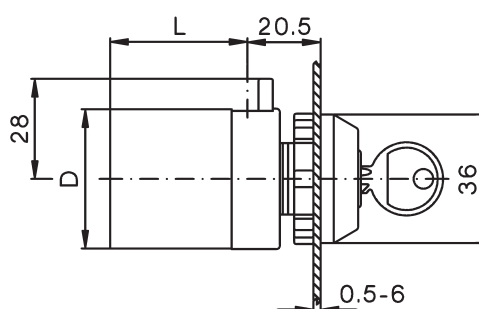
Type	A	C	D	F
M10H, M10HD, M20	48	18	22	57
N20, N33F	64	8	22	57
N40, N61	88	15	15	50

Dimension L
see page 263

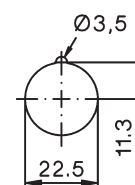
Central fixing Z M10H Z ... + SA M20 Z ... + SA



Central fixing without escutcheon plate ZO M10H ZO ... + SA M20 ZO ... + SA

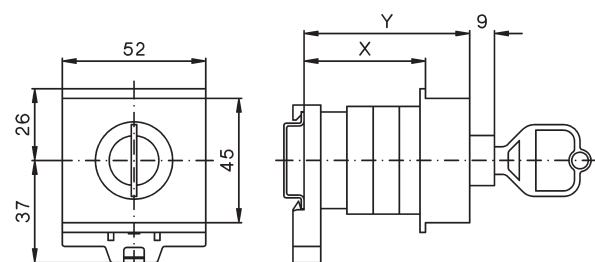


Mounting holes:



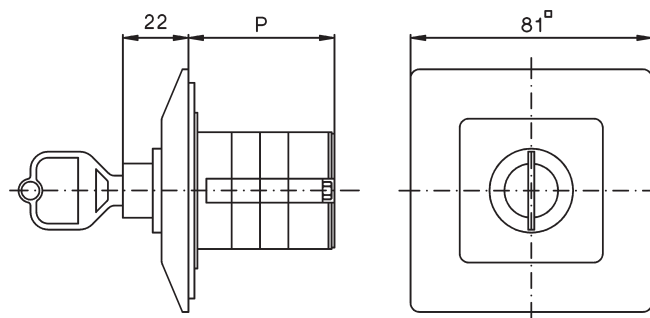
Further dimensions see page 262

DIN rail mounting SMA M10H, M10HD, M20



Type	Dimension X with .. cells				Dimension Y with .. cells			
	1	2	3	4	1	2	3	4
M10H	44	75	75	91	60	90	90	107
M20	59	75	75	91	75	90	90	107

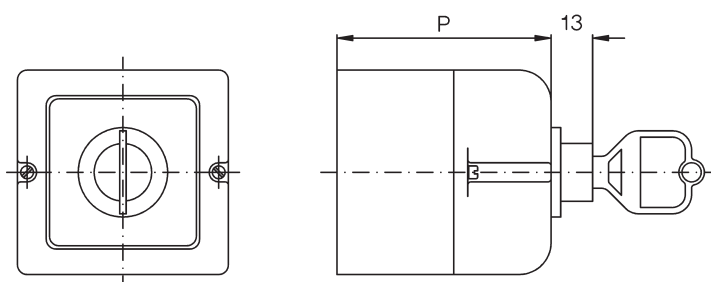
Flush mounting UP M10



Plastic enclosed switches P, PF M10, N20, N33F, N40, N61

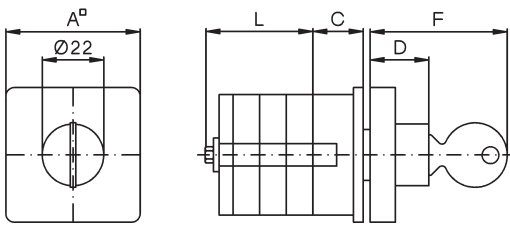
Type	Dimension P with .. cells			
	1	2	3	4
M10	62	71	81	90
N20	66	80	94	108
N33F	92	110	110	128
N40	92	110	-	-
N61	110	-	-	-

Further dimensions see page 264



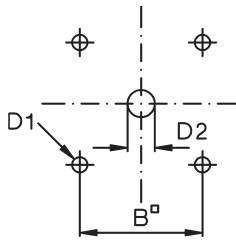
Key operated switches

Key operated switch SAK
Panel mounting E M10H, M10HD, M20

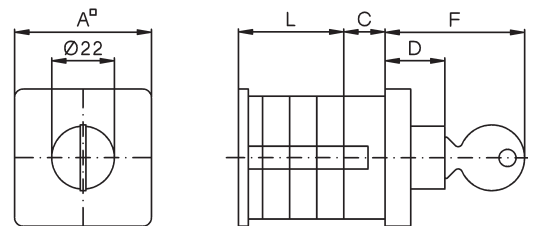


Type	A	B	C	D	D1	D2	F
M10H, M10HD, M20	48	36	25	21	5	22,5	49

Mounting holes



Key operated switch SAK
Base mounting V M10H, M10HD, M20



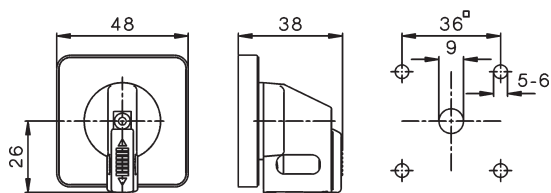
Type	A	C	D	F
M10H, M10HD, M20	48	25	21	49

Padlock devices

Padlock device SV1 (max. 2 padlocks with stirrup Ø6mm)

M10H, M10HD, M20

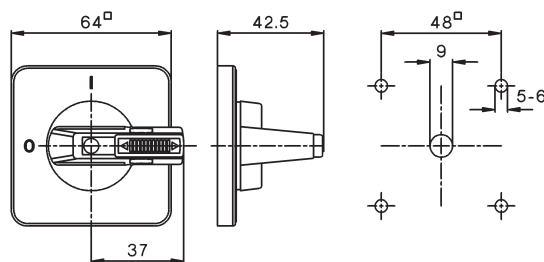
**Mounting holes
design E, V**



Padlock device SV164

M10H - N33F

**Mounting holes
design E, V**



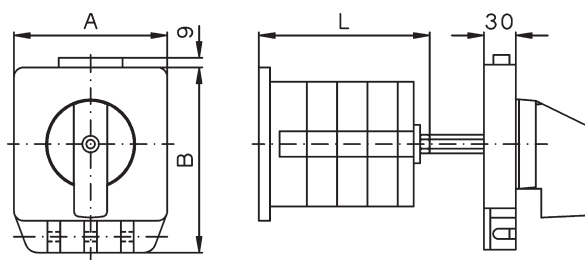
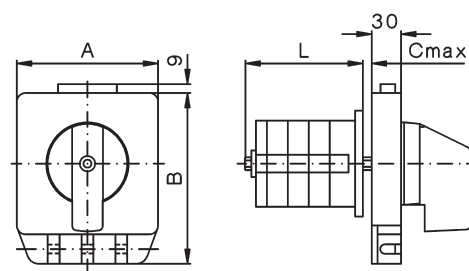
Padlock device SV3 (max. 3 padlocks with stirrup Ø8,5mm)

Panel mounting E

N20 - N200, L100 - L1200

Base mounting V

N20 - N200, L100 - L1200



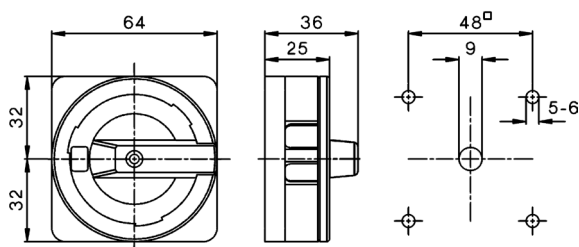
Further dimensions see page 263

Type		A	B	C
N20, N33F		102	128	5
N40, N61, N80, L100	102	128	7	
N100, N200, L400, L600, L800, L1200		132	159	9

Padlock device SV4 (max. 3 padlocks with stirrup Ø6mm)

M10H - N33F

**Mounting holes
design E, V**



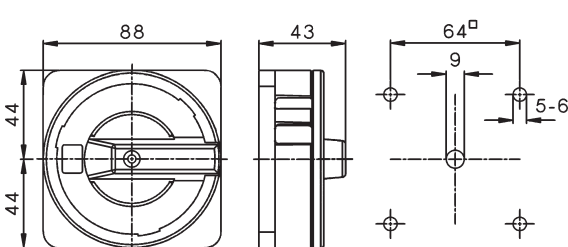
Padlock device SV4 (max. 3 padlocks with stirrup Ø6mm)

N40 - N80, L100

Padlock device SV488

N20, N33F

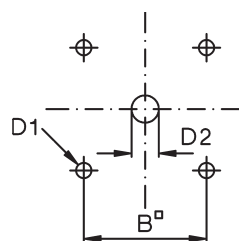
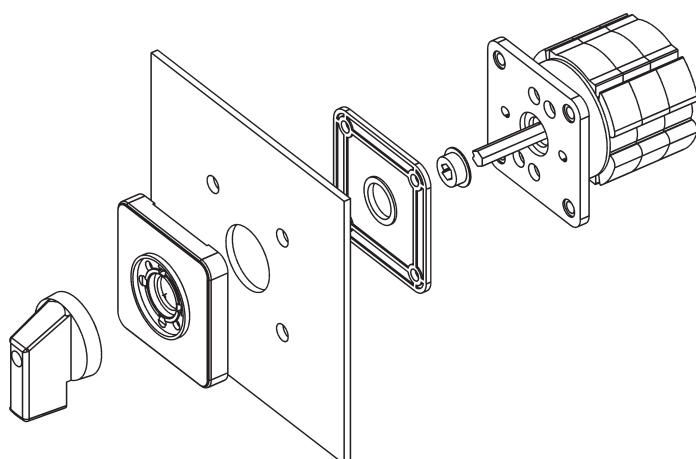
**Mounting holes
design E, V**



Front plate/switch shaft sealing FPWD

N20, N33F

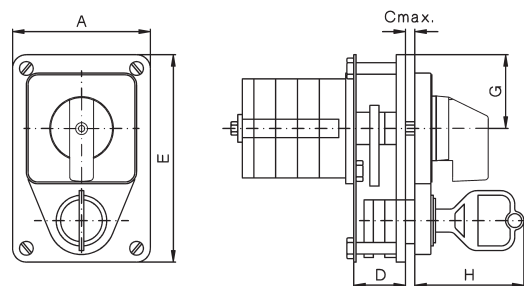
Mounting holes



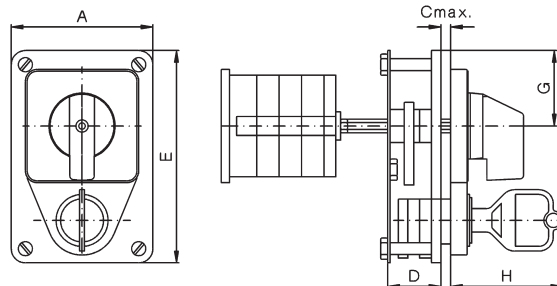
Typ	B	D1	D2
N20, N33F	48	5	17

Interlocks, Moisture caps

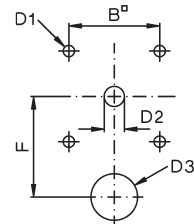
Lock switch SZ, SZ2 Panel mounting E



Base mounting V

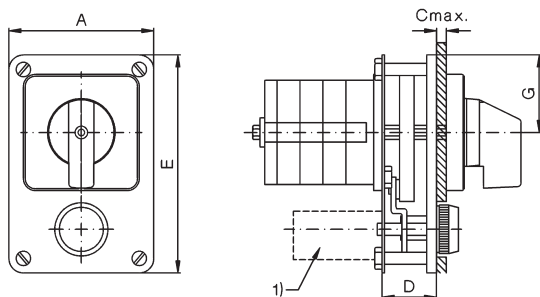


Mounting holes

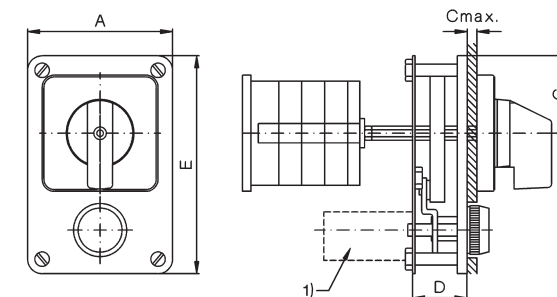


Type	A	B	C	D	D1	D2	D3	E	F	G	H
M10H, M10HD, M20	60	36	3	22,5	5	8	18,5	90	40	32	47,5
N20, N33F	60	36	3	22,5	5	12	18,5	90	45	32	47,5
N40, N61, N80, L100, L160	90	68	4	24	6	12	18,5	142	61	61,5	48
N100, N200, L400, L600, L800, L1200	140	110	4	27	7	15	18,5	180	83	90,5	49

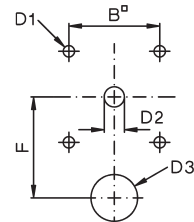
Push-button switch lock DV Switch interlock with electrical contact ET Panel mounting E



Base mounting V



Mounting holes

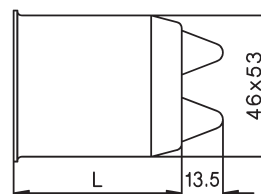
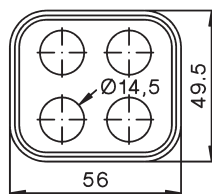


Type	A	B	C	D	D1	D2	D3	E	F	G
M10H, M10HD, M20	60	36	3	22,5	5	8	26	90	45	32
N20, N33F	60	36	3	22,5	5	10	26	90	45	32
N40, N601 N80, L100	90	68	4	25	6	12	29	142	61	61,5
N100, N200, L400, L600, L800, L1200	140	110	4	41	7	15	29	180	83	90,5

1) only at +ET

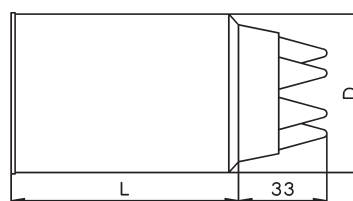
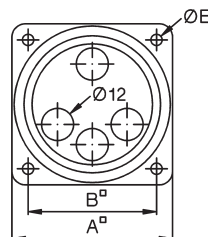
Moisture proofing caps for panel switches FR M10H, M10HD

Type	Dimension L with .. cells						
	1	2	3	4	5	6	7
M10H	55	55	75	75	88	106	106



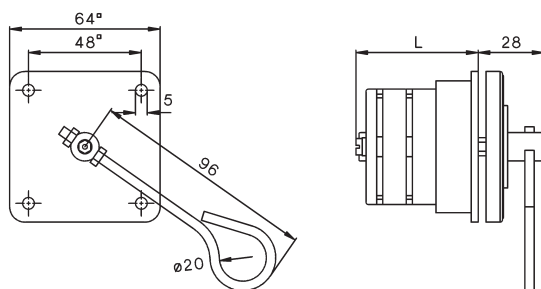
Moisture proofing caps for panel switches FR N20, N40, N61

Type	A	B	D	E	Dimension L with .. cells				
					1	2	3	4	5
N20	60	48	59	5,5	68	68	68	91	91
N40	87	68	83	5,5	82	82	117	117	-

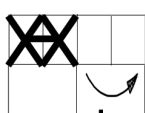
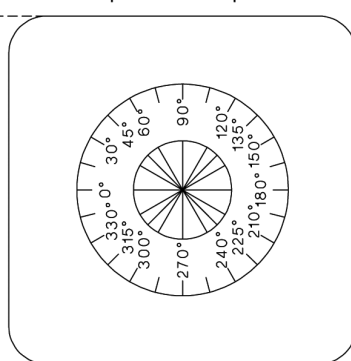


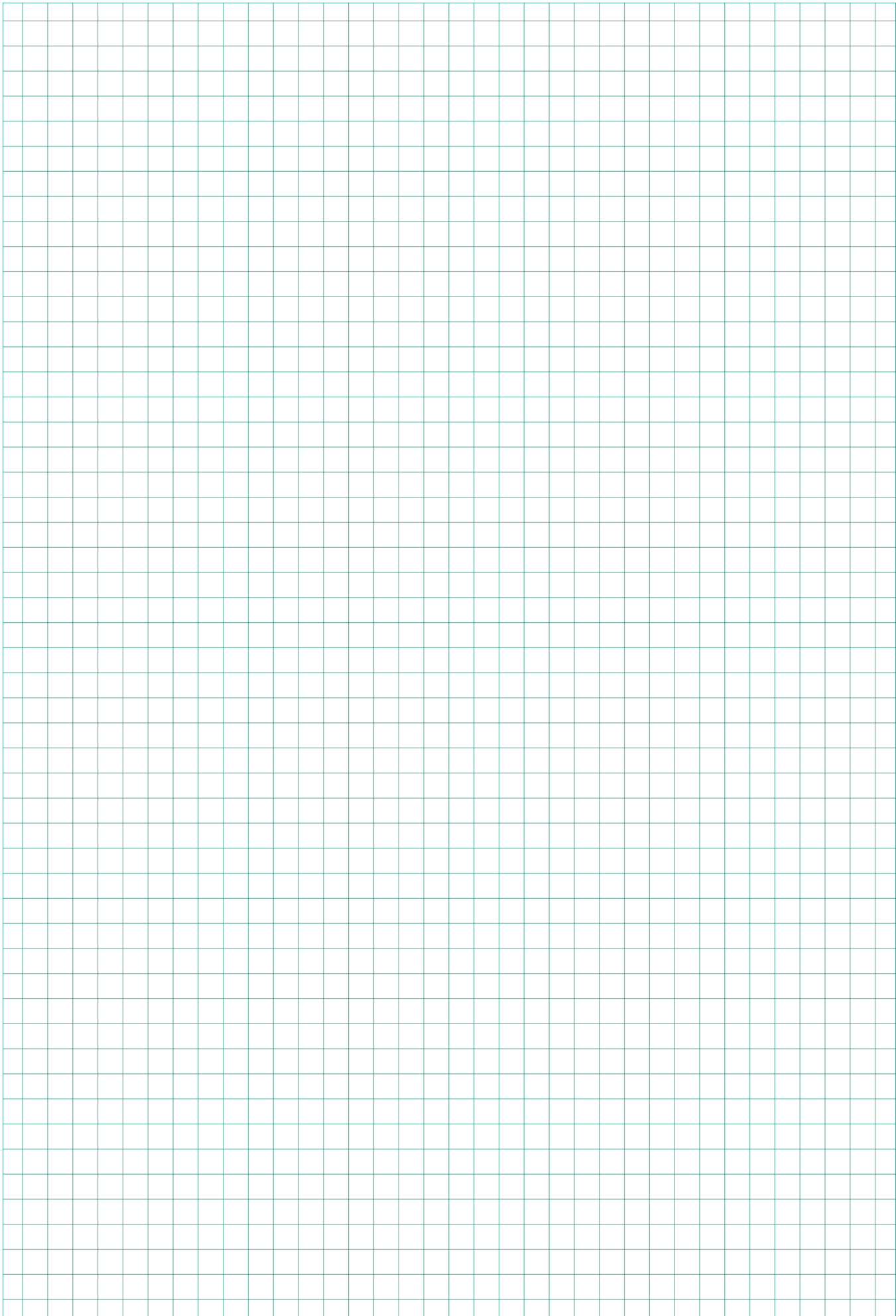
Fire Brigade Switch

Neon safety switch N20 E .. +FEU, N33F E .. +FEU



Further dimensions see pages 262

Order sheet D399E		Cam switches with special switching program		Customer:	
Switch Type M4H M10 M10H M10HD M20 N20 N33F N40 N61 N80 N100 N200		Handles Instrument knob Twist knob Toggle knob Ball type handle Hand wheel		Handle colour black (standard) red grey (standard SMA) white cream-coloured yellow blue	
Explanations: Contact closed over several positions Spring return from pos.					
Design Panel mounting E Central fixing Z ZO Base mounting V Snap-on mount.SM SMA Plastic enclosure P IP54					
Optional extras		Marking for switch positions			
Circular switch		Degree			
Key removeable					



Index

Page



Main Switches for Panel Mounting
Changover Switches for Panel Mounting
Main Switches for Single Hole Mounting

280
281
281



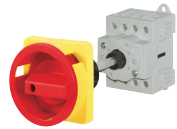
Main Switches for Base Mounting with Door Clutch

282



Main Switches-Emergency-Stop for Panel Mounting
Changover Switches-Emergency-Stop for Panel Mounting
Main Switches-Emergency-Stop for Single Hole Mounting

286
287
287



Main Switches-Emergency-Stop for Base Mounting

288



Main Switches-Emergency-Stop for Distribution Boards
Changover Switches-Emergency-Stop for Distribution Boards

290
290



Maintenance and Safety Switches, in Plastic Enclosure
Changover Safety Switches, in Plastic Enclosure

291
291



Switch Disconnectors for Panel Mounting

292



Switch Disconnectors for Single Hole Mounting

293



Switch Disconnectors for Base Mounting

293



Switch Disconnectors for Distribution Boards

295



Switch Disconnectors in Plastic Enclosure

296



Add-on modules

297



Technical Data

299



Dimensions

300

Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnectors

Push Buttons

Representatives, Suppliers

Ratings									Panel mounting 4 hole mount. IP66			Single hole mount. Ø22,5mm IP66				
Protection degree from front in mounted position																
Rated current		Motor		AC3		AC23		AC21		Plate						
Type	Therm. I _{th} open A	AC21 A	at U _e V	3~400V kW	3~400V A	kW	3~40 0V kW	mm	EH4	EHN4	EHN1	Z	ZHN1	ZH1		
LTS20	20	20	690	5,5	16	7,5	13,8	48□	LTS20 E ¹⁾ ..			LTS20 Z ¹⁾ ..				
LTS25	25	25	690	7,5	20	10	17,3	48□	LTS25 E ¹⁾ ..			LTS25 Z ¹⁾ ..				
LTS32	32	32	690	11	25	12,5	22,1	48□	LTS32 E ¹⁾ ..			LTS32 Z ¹⁾ ..				
LTS40	40	40	690	15	32	16	27,6	48□	LTS40 E ¹⁾ ..			LTS40 Z ¹⁾ ..				
LTS63	63	63	690	18,5	45	22	43,6	48□	LTS63 E ¹⁾ ..			-				
LTS80	80	80	690	18,5	45	22	55,3	48□	LTS80 E ¹⁾ ..			-				
LTS85	85	85	690	22	60	30	58,8	64□	LTS85 E ¹⁾ ..			-				
LTS100	100	100	690	30	72	37	69,2	64□	LTS100 E ¹⁾ ..			-				
LTS125	125	125	690	37	85	45	86,5	64□	LTS125 E ¹⁾ ..			-				
LT160	160	160	690	45	110	55	110	88□	LT160 E ¹⁾ ..			-				

Switch disconnecter LT.. 20 - 160A

Switch disconnectors are to be used as an ON-OFF-switch where a high breaking capacity with high contact pressure and in fact better short circuit behavior is necessary. These applications are:

Main switches according to IEC/EN 60204 respectively VDE0113 with interlocking device, terminal protection and restrictive contacts.

Switch disconnectors according to IEC/EN 60947-3 and VDE 0660 part 107 with break distance for 690V.

Motor switches 3-pole or 4-pole; according to IEC/EN 60947-3 respectively VDE 0660 part 107, motor switches series LT are dimensioned for switching high rated current AC3 and AC23A.

Switch program

On-Off Switch 3-pole		A3
On-Off Switch 4-pole		A4
On-Off Switch 6-pole		A6
On-Off Switch 8-pole		A8
Changeover Switches 3-pole		U3
Changeover Switches 4-pole		U4
On-Off Switch 3-pole		T300 (for LT160)
On-Off Switch 4-pole		T400 (for LT160)

Mounting positions:

No limitations, all kind of positions allowed.

Main switches and Main switches with Emergency-Stop function

According to standards IEC/EN60204 or VDE0113, all electrical equipment of industrial machines must be equipped with a main switch. This must permit disconnection of all the electrical equipment during cleaning, maintenance and repair work, and other extended periods when it is stationary. In case of two or more main switches, an interlock system must be used. It is recommended to use a multiple-pole main switch (cam switch).

Main switches have to correspond to:

- Switch disconnecter according to IEC/EN 60947-3 and VDE 0660 part 107 for utilization category AC23-B or DC-23B.
- Disconnectors are selected according to thermal rated current. They must possess a contact that ensures load switching via the contactors (see switching program A3-10). This contact must have a sufficient AC15 switching capacity.
- The interruption capacity of the switch must equal or exceed the locked rotor current of the largest motor plus the total current of all other electrical equipment in the circuit.

Requirements:

Interruption of the electrical equipment, with only on and off positions clearly marked with O and I.

It must be lockable in the off setting.

The line terminals of the main switch must be protected according to utilization category IP2X.

Colour of handle black or grey.

Main switches with Emergency-Off function are additional supplied with red handles and contrasting yellow escutcheon plates.

1) Main Switches (H1/H4 Main Switches-Emergency-Stop (HN1/HN4))
Switch Disconnectors (without H(N)1/4)

Base mounting with door coupling Handle Single hole mount. Ø22,5mm IP66  VZVH4 VZVHN4 VZVHN1	Base mounting with door coupling Panel mounting 4 hole mount. IP66  VH4 VHN4 VH1	Modular switch IP40  SMA SMAHN1 SMAH1	Plastic enclosed IP66  PF(L²)H4 PF(L²)HN4 PF(L²)
---	---	---	--

LTS20 VZV ¹⁾ ..	LTS20 V ¹⁾ ..	LTS20 SMA ¹⁾ ..	LTS20 PF(L ²) ¹⁾ ..
LTS25 VZV ¹⁾ ..	LTS25 V ¹⁾ ..	LTS25 SMA ¹⁾ ..	LTS25 PF(L ²) ¹⁾ ..
LTS32 VZV ¹⁾ ..	LTS32 V ¹⁾ ..	LTS32 SMA ¹⁾ ..	LTS32 PF(L ²) ¹⁾ ..
LTS40 VZV ¹⁾ ..	LTS40 V ¹⁾ ..	LTS40 SMA ¹⁾ ..	LTS40 PF(L ²) ¹⁾ ..
LTS63 VZV ¹⁾ ..	LTS63 V ¹⁾ ..	LTS63 SMA ¹⁾ ..	LTS63 PFL ¹⁾ ..
LTS80 VZV ¹⁾ ..	LTS80 V ¹⁾ ..	LTS80 SMA ¹⁾ ..	LTS80 PFL ¹⁾ ..
LTS85 VZV ¹⁾ ..	LTS85 V ¹⁾ ..	LTS85 SMA ¹⁾ ..	LTS85 PFL ¹⁾ ..
LTS100 VZV ¹⁾ ..	LTS100 V ¹⁾ ..	LTS100 SMA ¹⁾ ..	LTS100 PFL ¹⁾ ..
LTS125 VZV ¹⁾ ..	LTS125 V ¹⁾ ..	LTS125 SMA ¹⁾ ..	LTS125 PFL ¹⁾ ..
-	LT160 V ¹⁾ ..	-	LT160 PF ¹⁾ .. ³⁾

Approvals

Area	USA, Canada / UL	Europe	Russia / EAC	CB/CCA-Certificates
Type				

Switch disconnecter (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)

LTS20	o	/	o	o
LTS25	o	/	o	o
LTS32	o	/	o	o
LTS40	o	/	o	o
LTS63	o	/	o	o
LTS80	o	/	o	o
LTS85	o	/	-	-
LTS100	o	/	-	-
LTS125	o	/	-	-
LT160	o	/	-	o

o in standard version approved
/ No testing required CE
x in test
- Not provided for test till now

Terminal screws

Devices	Kind of connection		Tightening torque		Protection class
Type	screw with clamp box	Screwdriver	Nm	lb. inch	of terminals ⁴⁾
Switch Disconnectors					
LTS20, LTS25	M3,5	Pz2	1,7 - 2,3	15 - 20	IP20
LTS32, LTS40	M5	Pz2	2,8 - 4	25 - 35	IP20
LTS63, LTS80	M6	Pz2	1,7 - 4,5	15 - 40	IP20
LTS85, LTS100, LTS125					
LT160	M10		14	124	IP20

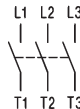
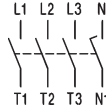
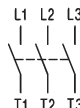
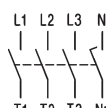
1) Main Switches (H1/H4 Main Switches-Emergency-Stop (HN1/HN4)) and Switch Disconnectors (without H(N)1/4)

2) PFL... larger enclosure

3) IP. Type..

4) Protection degree of the terminals with connected insulated conductor. Additional protection with terminal cover (KLAD).

Main Switches for Panel Mounting, lockable IP66, Type 3R

		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigh kg/pcs.
3-pole, padlock device SV1								
			20A	7,5kW	48 □ ¹⁾	LTS20 EH1 A3	1	0,15
			25A	10kW	48 □ ¹⁾	LTS25 EH1 A3	1	0,15
			32A	12,5kW	48 □ ¹⁾	LTS32 EH1 A3	1	0,15
			40A	16kW	48 □ ¹⁾	LTS40 EH1 A3	1	0,15
			63A	22kW	48 □ ¹⁾	LTS63 EH1 A3	1	0,17
			80A	22kW	48 □ ¹⁾	LTS80 EH1 A3	1	0,17
4-pole, padlock device SV1								
			20A	7,5kW	48 □ ¹⁾	LTS20 EH1 A4	1	0,19
			25A	10kW	48 □ ¹⁾	LTS25 EH1 A4	1	0,19
			32A	12,5kW	48 □ ¹⁾	LTS32 EH1 A4	1	0,19
			40A	16kW	48 □ ¹⁾	LTS40 EH1 A4	1	0,19
			63A	22kW	48 □ ¹⁾	LTS63 EH1 A4	1	0,21
			80A	22kW	48 □ ¹⁾	LTS80 EH1 A4	1	0,21
3-pole, padlock device SV4(34)								
			20A	7,5kW	64 □ ²⁾	LTS20 EH4 A3	1	0,17
			25A	10kW	64 □ ²⁾	LTS25 EH4 A3	1	0,17
			32A	12,5kW	64 □ ²⁾	LTS32 EH4 A3	1	0,17
			40A	16kW	64 □ ²⁾	LTS40 EH4 A3	1	0,17
			63A	22kW	64 □ ²⁾	LTS63 EH4 A3	1	0,19
			80A	22kW	64 □ ²⁾	LTS80 EH4 A3	1	0,19
			80A	30kW	64 □ ²⁾	LTS85 EH4 A3	1	0,39
			100A	37kW	64 □ ²⁾	LTS100 EH4 A3	1	0,39
			125A	45kW	64 □ ²⁾	LTS125 EH4 A3	1	0,39
			160A	55kW	88 □	LT160 EH34 T300	1	1,16
4-pole, padlock device SV4(34)								
			20A	7,5kW	64 □ ²⁾	LTS20 EH4 A4	1	0,20
			25A	10kW	64 □ ²⁾	LTS25 EH4 A4	1	0,20
			32A	12,5kW	64 □ ²⁾	LTS32 EH4 A4	1	0,20
			40A	16kW	64 □ ²⁾	LTS40 EH4 A4	1	0,20
			63A	22kW	64 □ ²⁾	LTS63 EH4 A4	1	0,23
			80A	22kW	64 □ ²⁾	LTS80 EH4 A4	1	0,23
			85A	30kW	64 □ ²⁾	LTS85 EH4 A4	1	0,44
			100A	37kW	64 □ ²⁾	LTS100 EH4 A4	1	0,44
			125A	45kW	64 □ ²⁾	LTS125 EH4 A4	1	0,44
			160A	55kW	88 □	LT160 EH34 T400	1	1,55

Add-on modules see page 297

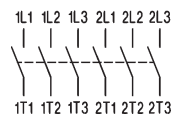
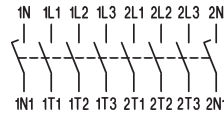
Extended Switch Shaft for switches for panel mounting type suffix **+VW"x"**

x = panel thickness

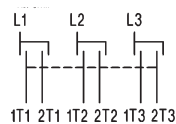
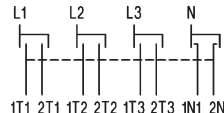
1) Types with padlock device 64 □ type suffix **64**, ordering example: LTS32 EH1**64** A3, on request

2) Types with padlock device 88 □ type suffix **88**, ordering example: LTS32 EH4**88** A3, on request

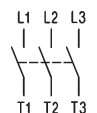
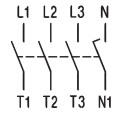
Main Switches for Panel Mounting, lockable IP66, Type 3R

		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
6-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EH4 A6	1	0,30
			25A	10kW	64 □	LTS25 EH4 A6	1	0,30
			32A	12,5kW	64 □	LTS32 EH4 A6	1	0,30
			40A	16kW	64 □	LTS40 EH4 A6	1	0,30
			63A	22kW	64 □	LTS63 EH4 A6	1	0,34
			80A	22kW	64 □	LTS80 EH4 A6	1	0,34
8-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EH4 A8	1	0,38
			25A	10kW	64 □	LTS25 EH4 A8	1	0,38
			32A	12,5kW	64 □	LTS32 EH4 A8	1	0,38
			40A	16kW	64 □	LTS40 EH4 A8	1	0,38
			63A	22kW	64 □	LTS63 EH4 A8	1	0,42
			80A	22kW	64 □	LTS80 EH4 A8	1	0,42

Changeover Switches with padlockdevice for Panel Mounting, lockable IP66

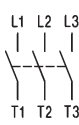
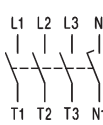
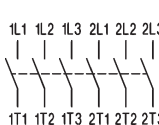
3-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EH4 U3	1	0,30
			25A	10kW	64 □	LTS25 EH4 U3	1	0,30
			32A	12,5kW	64 □	LTS32 EH4 U3	1	0,30
			40A	16kW	64 □	LTS40 EH4 U3	1	0,30
			63A	22kW	64 □	LTS63 EH4 U3	1	0,34
4-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EH4 U4	1	0,38
			25A	10kW	64 □	LTS25 EH4 U4	1	0,38
			32A	12,5kW	64 □	LTS32 EH4 U4	1	0,38
			40A	16kW	64 □	LTS40 EH4 U4	1	0,38
			63A	22kW	64 □	LTS63 EH4 U4	1	0,42

Main Switches for Single Hole Mounting IP66, Type 4X

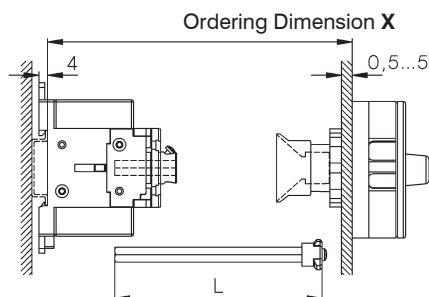
		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV1 								
			20A	7,5kW	48 □	LTS20 ZH1 A3	1	0,16
			25A	10kW	48 □	LTS25 ZH1 A3	1	0,16
			32A	12,5kW	48 □	LTS32 ZH1 A3	1	0,16
			40A	16kW	48 □	LTS40 ZH1 A3	1	0,16
4-pole, padlock device SV1 								
			20A	7,5kW	48 □	LTS20 ZH1 A4	1	0,20
			25A	10kW	48 □	LTS25 ZH1 A4	1	0,20
			32A	12,5kW	48 □	LTS32 ZH1 A4	1	0,20
			40A	16kW	48 □	LTS40 ZH1 A4	1	0,20

Add-on modules see page 297

Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting Depth X is adjustable (delivered with X_{max} see below), IP66, Type 4X

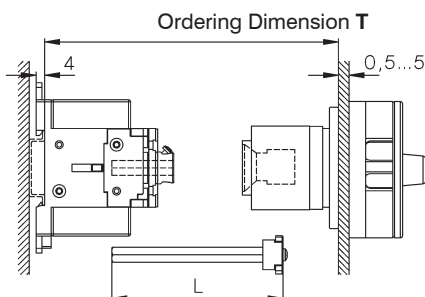
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV4 							
							
		20A	7,5kW	64 □	LTS20 VZVH4 A3	1	0,19
		25A	10kW	64 □	LTS25 VZVH4 A3	1	0,19
		32A	12,5kW	64 □	LTS32 VZVH4 A3	1	0,19
		40A	16kW	64 □	LTS40 VZVH4 A3	1	0,19
		63A	22kW	64 □	LTS63 VZVH4 A3	1	0,22
		80A	22kW	64 □	LTS80 VZVH4 A3	1	0,22
		85A	30kW	64 □	LTS85 VZVH4 A3	1	0,40
		100A	37kW	64 □	LTS100 VZVH4 A3	1	0,40
		125A	45kW	64 □	LTS125 VZVH4 A3	1	0,40
4-pole, padlock device SV4 							
							
		20A	7,5kW	64 □	LTS20 VZVH4 A4	1	0,20
		25A	10kW	64 □	LTS25 VZVH4 A4	1	0,20
		32A	12,5kW	64 □	LTS32 VZVH4 A4	1	0,20
		40A	16kW	64 □	LTS40 VZVH4 A4	1	0,20
		63A	22kW	64 □	LTS63 VZVH4 A4	1	0,26
		80A	22kW	64 □	LTS80 VZVH4 A4	1	0,26
		85A	30kW	64 □	LTS85 VZVH4 A4	1	0,45
		100A	37kW	64 □	LTS100 VZVH4 A4	1	0,45
		125A	45kW	64 □	LTS125 VZVH4 A4	1	0,45
6-pole, padlock device SV4 							
							
		20A	7,5kW	64 □	LTS20 VZVH4 A6	1	0,32
		25A	10kW	64 □	LTS25 VZVH4 A6	1	0,32
		32A	12,5kW	64 □	LTS32 VZVH4 A6	1	0,32
		40A	16kW	64 □	LTS40 VZVH4 A6	1	0,32
		63A	22kW	64 □	LTS63 VZVH4 A6	1	0,37
		80A	22kW	64 □	LTS80 VZVH4 A6	1	0,37
8-pole, padlock device SV4 							
							
		20A	7,5kW	64 □	LTS20 VZVH4 A8	1	0,34
		25A	10kW	64 □	LTS25 VZVH4 A8	1	0,34
		32A	12,5kW	64 □	LTS32 VZVH4 A8	1	0,34
		40A	16kW	64 □	LTS40 VZVH4 A8	1	0,34
		63A	22kW	64 □	LTS63 VZVH4 A8	1	0,45
		80A	22kW	64 □	LTS80 VZVH4 A8	1	0,45

Depth
Single Hole Mounting Ø22mm
LTS.. VZV..



Type	X min	X max	L
LTS20-80 VZV.. 3, 4-pole	91	190	X - 40±3
LTS20-80 VZV.. 6, 8-pole	111	190	X - 60±3
LTS85-125 VZV.. 3, 4-pole	95	190	X - 44±3

4-Hole Mounting
LTS.. V(H).. (3, 4-pole)



Type	T min	T max	L	Type	T min	T max
LTS20-80 VH..	111	190	T - 60±3	LT160 VH..	120	450
LTS85-125 VH..	115	190	T - 64±3			

greater X- and T-Dimensions (max. 380mm for LTS..) on request

Main Switches, Base Mounting with Door Clutch, Padlock Device for 4-Hole Mounting

Depth T is adjustable (delivered with T_{max} see page 282), IP66, cUL_{us} Type 4X

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV4(34) 							
		20A	7,5kW	64 □ 1)	LTS20 VH4 A3	1	0,20
		25A	10kW	64 □ 1)	LTS25 VH4 A3	1	0,20
		32A	12,5kW	64 □ 1)	LTS32 VH4 A3	1	0,20
		40A	16kW	64 □ 1)	LTS40 VH4 A3	1	0,20
		63A	22kW	64 □ 1)	LTS63 VH4 A3	1	0,24
		80A	22kW	64 □ 1)	LTS80 VH4 A3	1	0,24
		85A	30kW	64 □ 1)	LTS85 VH4 A3	1	0,40
		100A	37kW	64 □ 1)	LTS100 VH4 A3	1	0,40
		125A	45kW	64 □ 1)	LTS125 VH4 A3	1	0,40
		160A	55kW	88 □	LT160 VH34 T300	1	1,38
4-pole, padlock device SV4(34) 							
		20A	7,5kW	64 □ 1)	LTS20 VH4 A4	1	0,21
		25A	10kW	64 □ 1)	LTS25 VH4 A4	1	0,21
		32A	12,5kW	64 □ 1)	LTS32 VH4 A4	1	0,21
		40A	16kW	64 □ 1)	LTS40 VH4 A4	1	0,21
		63A	22kW	64 □ 1)	LTS63 VH4 A4	1	0,28
		80A	22kW	64 □ 1)	LTS80 VH4 A4	1	0,28
		85A	30kW	64 □ 1)	LTS85 VH4 A4	1	0,45
		100A	37kW	64 □ 1)	LTS100 VH4 A4	1	0,45
		125A	45kW	64 □ 1)	LTS125 VH4 A4	1	0,45
		160A	55kW	88 □	LT160 VH34 T400	1	1,77

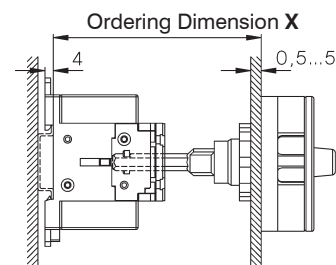
Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting

Depth X is not adjustable, declare depth X when ordering, IP66, cUL_{us} Type 4X

4-pole, padlock device SV4 							
		20A	7,5kW	64 □	LTS20 VZH4 A4 X..	1	0,18
		25A	10kW	64 □	LTS25 VZH4 A4 X..	1	0,18
		32A	12,5kW	64 □	LTS32 VZH4 A4 X..	1	0,18
		40A	16kW	64 □	LTS40 VZH4 A4 X..	1	0,18
		63A	22kW	64 □	LTS63 VZH4 A4 X..	1	0,25
		80A	22kW	64 □	LTS80 VZH4 A4 X..	1	0,25

Declare depth X when ordering

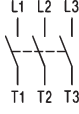
Type	Preference values for X
LT.. VZH..	80, 85, 104, 129 (tolerance -3, +1,5)

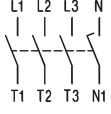


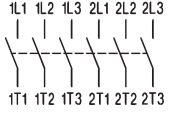
Add-on modules see page 297

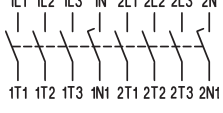
1) Types with padlock device 88 'type suffix **88**, ordering example: LTS32 VHN**488** A3, on request

Main Switches for Distribution Boards, lockable IP40, Open Type

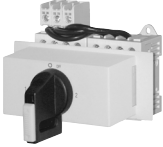
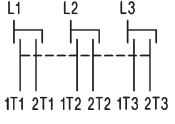
		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV1 								
			20A	7,5kW	52x45	LTS20 SMAH1 A3 ²⁾	1	0,15
			25A	10kW	52x45	LTS25 SMAH1 A3 ²⁾	1	0,15
			32A	12,5kW	52x45	LTS32 SMAH1 A3 ²⁾	1	0,15
			40A	16kW	52x45	LTS40 SMAH1 A3 ²⁾	1	0,15
			63A	22kW	52x45	LTS63 SMAH1 A3 ²⁾	1	0,18
			80A	22kW	52x45	LTS80 SMAH1 A3 ²⁾	1	0,18
			85A	30kW	78x45	LTS85 SMAH1 A3	1	0,37
			100A	37kW	78x45	LTS100 SMAH1 A3	1	0,37
			125A	45kW	78x45	LTS125 SMAH1 A3	1	0,37

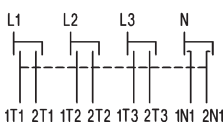
4-pole, padlock device SV1 								
			20A	7,5kW	52x45	LTS20 SMAH1 A4 ²⁾	1	0,16
			25A	10kW	52x45	LTS25 SMAH1 A4 ²⁾	1	0,16
			32A	12,5kW	52x45	LTS32 SMAH1 A4 ²⁾	1	0,16
			40A	16kW	52x45	LTS40 SMAH1 A4 ²⁾	1	0,16
			63A	22kW	52x45	LTS63 SMAH1 A4 ²⁾	1	0,21
			80A	22kW	52x45	LTS80 SMAH1 A4 ²⁾	1	0,21
			85A	30kW	78x45	LTS85 SMAH1 A4	1	0,42
			100A	37kW	78x45	LTS100 SMAH1 A4	1	0,42
			125A	45kW	78x45	LTS125 SMAH1 A4	1	0,42

6-pole, padlock device SV1 (64) 								
			20A	7,5kW	52x45	LTS20 SMAH1 A6	1	0,29
			25A	10kW	52x45	LTS25 SMAH1 A6	1	0,29
			32A	12,5kW	52x45	LTS32 SMAH1 A6	1	0,29
			40A	16kW	52x45	LTS40 SMAH1 A6	1	0,29
			63A	22kW	97x45	LTS63 SMAH1 A6 ¹⁾	1	0,34
			80A	22kW	97x45	LTS80 SMAH1 A6 ¹⁾	1	0,34

8-pole, padlock device SV164 								
			20A	7,5kW	97x45	LTS20 SMAH1 A8	1	0,31
			25A	10kW	97x45	LTS25 SMAH1 A8	1	0,31
			32A	12,5kW	97x45	LTS32 SMAH1 A8	1	0,31
			40A	16kW	97x45	LTS40 SMAH1 A8	1	0,31
			63A	22kW	126x45	LTS63 SMAH1 A8	1	0,42
			80A	22kW	126x45	LTS80 SMAH1 A8	1	0,42

Changeover Switch with Padlock Device for Distribution Boards, lockable

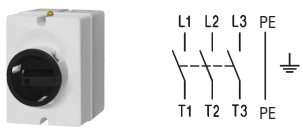
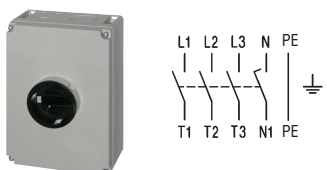
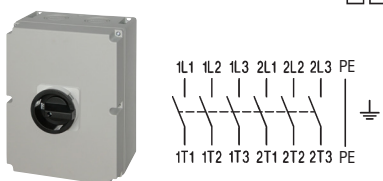
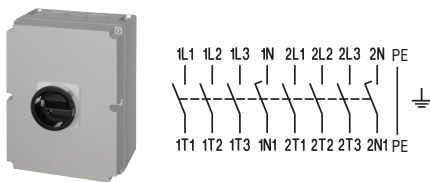
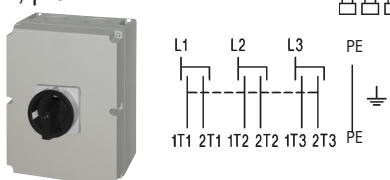
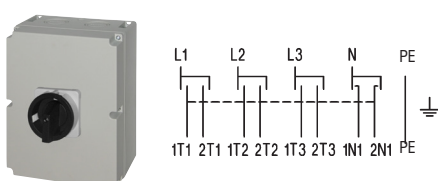
3-pole, padlock device SV164 								
			20A	7,5kW	97x45	LTS20 SMAH1 U3	1	0,29
			25A	10kW	97x45	LTS25 SMAH1 U3	1	0,29
			32A	12,5kW	97x45	LTS32 SMAH1 U3	1	0,29
			40A	16kW	97x45	LTS40 SMAH1 U3	1	0,29
			63A	22kW	97x45	LTS63 SMAH1 U3	1	0,34

4-pole, padlock device SV164 								
			20A	7,5kW	97x45	LTS20 SMAH1 U4	1	0,31
			25A	10kW	97x45	LTS25 SMAH1 U4	1	0,31
			32A	12,5kW	97x45	LTS32 SMAH1 U4	1	0,31
			40A	16kW	97x45	LTS40 SMAH1 U4	1	0,31
			63A	22kW	126x45	LTS63 SMAH1 U4	1	0,42

1) With padlock device SV164

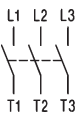
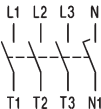
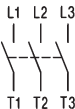
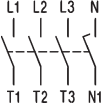
2) Emergency-Stop-Main Switches for Distribution Boards, lockable with low height handle, IP40
Type with Type-suffix „+SV1N“ e.g.: **LTS40 SMAHN1 A3 +SV1N**

Maintenance and Safety Switches, in Plastic Enclosure, lockable IP66, Type 4X

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV4(34) 							
		20A	7,5kW	64 □	LTS20 PF(L ¹)H4 A3	1	0,32
		25A	10kW	64 □	LTS25 PF(L ¹)H4 A3	1	0,32
		32A	12,5kW	64 □	LTS32 PF(L ¹)H4 A3	1	0,32
		40A	16kW	64 □	LTS40 PF(L ¹)H4 A3	1	0,32
		63A	22kW	64 □	LTS63 PFLH4 A3	1	0,60
		80A	22kW	64 □	LTS80 PFLH4 A3	1	0,60
		85A	30kW	64 □	LTS85 PFLH4 A3	1	0,78
		100A	37kW	64 □	LTS100 PFLH4 A3	1	0,78
Larger enclosure Type: ..PFL.. on request		125A	45kW	64 □	LTS125 PFLH4 A3	1	0,78
		160A	55kW	88 □	LT160 PFH34 T300	1	2,09
4-pole, padlock device SV4(34) 							
		20A	7,5kW	64 □	LTS20 PF(L ¹)H4 A4	1	0,33
		25A	10kW	64 □	LTS25 PF(L ¹)H4 A4	1	0,33
		32A	12,5kW	64 □	LTS32 PF(L ¹)H4 A4	1	0,33
		40A	16kW	64 □	LTS40 PF(L ¹)H4 A4	1	0,33
		63A	22kW	64 □	LTS63 PFLH4 A4	1	0,64
		80A	22kW	64 □	LTS80 PFLH4 A4	1	0,64
		85A	30kW	64 □	LTS85 PFLH4 A4	1	0,83
Larger enclosure Type appendix +PF3 on request		100A	37kW	64 □	LTS100 PFLH4 A4	1	0,83
+PF3/M50 on request		125A	45kW	64 □	LTS125 PFLH4 A4	1	0,83
		160A	55kW	88 □	LT160 PFH34 T400	1	2,47
6-pole, padlock device SV4 							
		20A	7,5kW	64 □	LTS20 PFLH4 A6	1	1,39
		25A	10kW	64 □	LTS25 PFLH4 A6	1	1,39
		32A	12,5kW	64 □	LTS32 PFLH4 A6	1	1,39
		40A	16kW	64 □	LTS40 PFLH4 A6	1	1,39
		63A	22kW	64 □	LTS63 PFLH4 A6	1	1,42
		80A	22kW	64 □	LTS80 PFLH4 A6	1	1,42
knockoutlets M50/40 +PF3/M50 on request							
8-pole, padlock device SV4 							
		20A	7,5kW	64 □	LTS20 PFLH4 A8	1	1,44
		25A	10kW	64 □	LTS25 PFLH4 A8	1	1,44
		32A	12,5kW	64 □	LTS32 PFLH4 A8	1	1,44
		40A	16kW	64 □	LTS40 PFLH4 A8	1	1,44
		63A	22kW	64 □	LTS63 PFLH4 A8	1	1,50
		80A	22kW	64 □	LTS80 PFLH4 A8	1	1,50
knockoutlets M50/40 +PF3/M50 on request							
Changeover Switch with Padlock Device, lockable							
3-pole, padlock device SV4 							
		20A	7,5kW	64 □	LTS20 PFLH4 U3	1	1,39
		25A	10kW	64 □	LTS25 PFLH4 U3	1	1,39
		32A	12,5kW	64 □	LTS32 PFLH4 U3	1	1,39
		40A	16kW	64 □	LTS40 PFLH4 U3	1	1,39
		63A	22kW	64 □	LTS63 PFLH4 U3	1	1,42
4-pole, padlock device SV4 							
		20A	7,5kW	64 □	LTS20 PFLH4 U4	1	1,44
		25A	10kW	64 □	LTS25 PFLH4 U4	1	1,44
		32A	12,5kW	64 □	LTS32 PFLH4 U4	1	1,44
		40A	16kW	64 □	LTS40 PFLH4 U4	1	1,44
		63A	22kW	64 □	LTS63 PFLH4 U4	1	1,50

1) PFL.... larger enclosure

Emergency-Stop-Main Switches for Panel Mounting, lockable IP66, Type 3R

		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV1 								
			20A	7,5kW	48 □ ¹⁾	LTS20 EHN1 A3	1	0,15
			25A	10kW	48 □ ¹⁾	LTS25 EHN1 A3	1	0,15
			32A	12,5kW	48 □ ¹⁾	LTS32 EHN1 A3	1	0,15
			40A	16kW	48 □ ¹⁾	LTS40 EHN1 A3	1	0,15
			63A	22kW	48 □ ¹⁾	LTS63 EHN1 A3	1	0,17
			80A	22kW	48 □ ¹⁾	LTS80 EHN1 A3	1	0,17
4-pole, padlock device SV1 								
			20A	7,5kW	48 □ ¹⁾	LTS20 EHN1 A4	1	0,19
			25A	10kW	48 □ ¹⁾	LTS25 EHN1 A4	1	0,19
			32A	12,5kW	48 □ ¹⁾	LTS32 EHN1 A4	1	0,19
			40A	16kW	48 □ ¹⁾	LTS40 EHN1 A4	1	0,19
			63A	22kW	48 □ ¹⁾	LTS63 EHN1 A4	1	0,21
			80A	22kW	48 □ ¹⁾	LTS80 EHN1 A4	1	0,21
3-pole, padlock device SV4(34) 								
			20A	7,5kW	64 □ ²⁾	LTS20 EHN4 A3	1	0,17
			25A	10kW	64 □ ²⁾	LTS25 EHN4 A3	1	0,17
			32A	12,5kW	64 □ ²⁾	LTS32 EHN4 A3	1	0,17
			40A	16kW	64 □ ²⁾	LTS40 EHN4 A3	1	0,17
			63A	22kW	64 □ ²⁾	LTS63 EHN4 A3	1	0,19
			80A	22kW	64 □ ²⁾	LTS80 EHN4 A3	1	0,19
			85A	30kW	64 □ ²⁾	LTS85 EHN4 A3	1	0,39
			100A	37kW	64 □ ²⁾	LTS100 EHN4 A3	1	0,39
			125A	45kW	64 □ ²⁾	LTS125 EHN4 A3	1	0,39
			160A	55kW	88 □	LT160 EHN34 T300	1	1,16
4-pole, padlock device SV4(34) 								
			20A	7,5kW	64 □ ²⁾	LTS20 EHN4 A4	1	0,20
			25A	10kW	64 □ ²⁾	LTS25 EHN4 A4	1	0,20
			32A	12,5kW	64 □ ²⁾	LTS32 EHN4 A4	1	0,20
			40A	16kW	64 □ ²⁾	LTS40 EHN4 A4	1	0,20
			63A	22kW	64 □ ²⁾	LTS63 EHN4 A4	1	0,23
			80A	22kW	64 □ ²⁾	LTS80 EHN4 A4	1	0,23
			85A	30kW	64 □ ²⁾	LTS85 EHN4 A4	1	0,44
			100A	37kW	64 □ ²⁾	LTS100 EHN4 A4	1	0,44
			125A	45kW	64 □ ²⁾	LTS125 EHN4 A4	1	0,44
			160A	55kW	88 □	LT160 EHN34 T400	1	1,55

Add-on modules see page 297

Extended Switch Shaft for switches for panel mounting

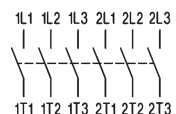
type suffix +VW"x"

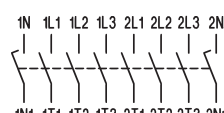
x = panel thickness

1) Types with padlock device 64 type suffix **64**, ordering example: LTS32 EHN1**64** A3, on request

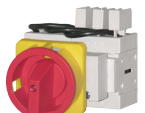
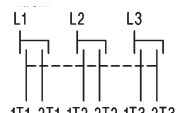
2) Types with padlock device 88 type suffix **88**, ordering example: LTS32 EHN4**88** A3, on request

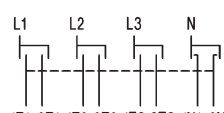
Emergency-Stop-Main Switches for Panel Mounting, lockable IP66, Type 3R

		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
6-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EHN4 A6	1	0,30
			25A	10kW	64 □	LTS25 EHN4 A6	1	0,30
			32A	12,5kW	64 □	LTS32 EHN4 A6	1	0,30
			40A	16kW	64 □	LTS40 EHN4 A6	1	0,30
			63A	22kW	64 □	LTS63 EHN4 A6	1	0,34
			80A	22kW	64 □	LTS80 EHN4 A6	1	0,34

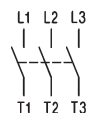
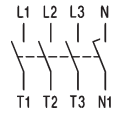
8-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EHN4 A8	1	0,38
			25A	10kW	64 □	LTS25 EHN4 A8	1	0,38
			32A	12,5kW	64 □	LTS32 EHN4 A8	1	0,38
			40A	16kW	64 □	LTS40 EHN4 A8	1	0,38
			63A	22kW	64 □	LTS63 EHN4 A8	1	0,42
			80A	22kW	64 □	LTS80 EHN4 A8	1	0,42

Changeover Switch with Padlock Device for Panel Mounting, lockable IP66

3-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EHN4 U3	1	0,30
			25A	10kW	64 □	LTS25 EHN4 U3	1	0,30
			32A	12,5kW	64 □	LTS32 EHN4 U3	1	0,30
			40A	16kW	64 □	LTS40 EHN4 U3	1	0,30
			63A	22kW	64 □	LTS63 EHN4 U3	1	0,34

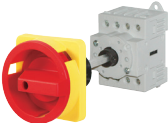
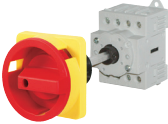
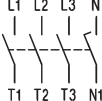
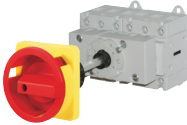
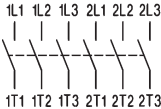
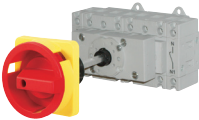
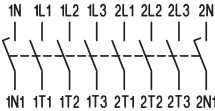
4-pole, padlock device SV4 								
			20A	7,5kW	64 □	LTS20 EHN4 U4	1	0,38
			25A	10kW	64 □	LTS25 EHN4 U4	1	0,38
			32A	12,5kW	64 □	LTS32 EHN4 U4	1	0,38
			40A	16kW	64 □	LTS40 EHN4 U4	1	0,38
			63A	22kW	64 □	LTS63 EHN4 U4	1	0,42

Main Switches Emergency-Stop for Single Hole Mounting, lockable IP66 Type 4X

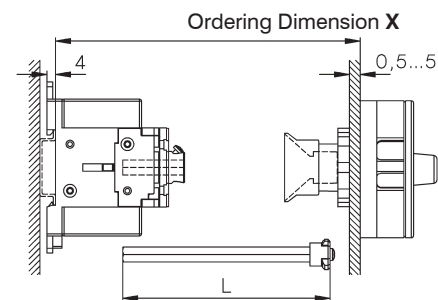
		max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV1 								
			20A	7,5kW	48 □	LTS20 ZHN1 A3	1	0,16
			25A	10kW	48 □	LTS25 ZHN1 A3	1	0,16
			32A	12,5kW	48 □	LTS32 ZHN1 A3	1	0,16
			40A	16kW	48 □	LTS40 ZHN1 A3	1	0,16
4-pole, padlock device SV1 								
			20A	7,5kW	48 □	LTS20 ZHN1 A4	1	0,20
			25A	10kW	48 □	LTS25 ZHN1 A4	1	0,20
			32A	12,5kW	48 □	LTS32 ZHN1 A4	1	0,20
			40A	16kW	48 □	LTS40 ZHN1 A4	1	0,20

Add-on modules see page 295

Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting
Depth X is adjustable (delivered with $X_{\max}$ see below), IP66, cUL_{us} Type 4X

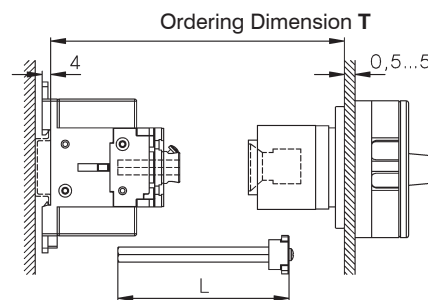
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigh kg/pcs.
3-pole, padlock device SV4							
		20A	7,5kW	64 □	LTS20 VZVHN4 A3	1	0,19
		25A	10kW	64 □	LTS25 VZVHN4 A3	1	0,19
		32A	12,5kW	64 □	LTS32 VZVHN4 A3	1	0,19
		40A	16kW	64 □	LTS40 VZVHN4 A3	1	0,19
		63A	22kW	64 □	LTS63 VZVHN4 A3	1	0,22
		80A	22kW	64 □	LTS80 VZVHN4 A3	1	0,22
		85A	30kW	64 □	LTS85 VZVHN4 A3	1	0,40
		100A	37kW	64 □	LTS100 VZVHN4 A3	1	0,40
		125A	45kW	64 □	LTS125 VZVHN4 A3	1	0,40
4-pole, padlock device SV4							
		20A	7,5kW	64 □	LTS20 VZVHN4 A4	1	0,20
		25A	10kW	64 □	LTS25 VZVHN4 A4	1	0,20
		32A	12,5kW	64 □	LTS32 VZVHN4 A4	1	0,20
		40A	16kW	64 □	LTS40 VZVHN4 A4	1	0,20
		63A	22kW	64 □	LTS63 VZVHN4 A4	1	0,26
		80A	22kW	64 □	LTS80 VZVHN4 A4	1	0,26
		85A	30kW	64 □	LTS85 VZVHN4 A4	1	0,45
		100A	37kW	64 □	LTS100 VZVHN4 A4	1	0,45
		125A	45kW	64 □	LTS125 VZVHN4 A4	1	0,45
6-pole, padlock device SV4							
		20A	7,5kW	64 □	LTS20 VZVHN4 A6	1	0,32
		25A	10kW	64 □	LTS25 VZVHN4 A6	1	0,32
		32A	12,5kW	64 □	LTS32 VZVHN4 A6	1	0,32
		40A	16kW	64 □	LTS40 VZVHN4 A6	1	0,32
		63A	22kW	64 □	LTS63 VZVHN4 A6	1	0,37
		80A	22kW	64 □	LTS80 VZVHN4 A6	1	0,37
8-pole, padlock device SV4							
		20A	7,5kW	64 □	LTS20 VZVHN4 A8	1	0,34
		25A	10kW	64 □	LTS25 VZVHN4 A8	1	0,34
		32A	12,5kW	64 □	LTS32 VZVHN4 A8	1	0,34
		40A	16kW	64 □	LTS40 VZVHN4 A8	1	0,34
		63A	22kW	64 □	LTS63 VZVHN4 A8	1	0,45
		80A	22kW	64 □	LTS80 VZVHN4 A8	1	0,45

Depth
Single Hole Mounting Ø22mm
LTS.. VZV..



Type		X min	X max	L
LTS20-80 VZV..	3, 4-polig	91 -	190	X - 40±3
LTS20-80 VZV..	6, 8-polig	111 -	190	X - 60±3
LTS85-125 VZV..	3, 4-polig	95-	190	X - 44±3

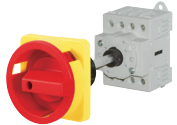
4-Hole Mounting
LTS.. V(HN).. (3, 4-pole)



Type		T min	T max	L	Type		T min	T max
LTS20-80 VH..		111 -	190	T - 60±3	LTS160 VH..		120 -	450
LTS85-125 VH..		115 -	190	T - 64±3				

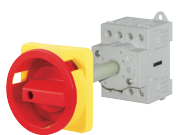
Greater X- and T-Dimensions (max. 380mm for LTS..) on request

Emergency-Stop-Main Switches, Base Mounting with Door Clutch, Padlock Device for 4-Hole Mounting, Depth T is adjustable (delivered with T_{max} see page 282), IP66, us Type 4X

	max. padlocks	AC21 690V	AC23 3x400V	Schild	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV4(34) 							
		20A	7,5kW	64 □ ¹⁾	LTS20 VHN4 A3	1	0,20
		25A	10kW	64 □ ¹⁾	LTS25 VHN4 A3	1	0,20
		32A	12,5kW	64 □ ¹⁾	LTS32 VHN4 A3	1	0,20
		40A	16kW	64 □ ¹⁾	LTS40 VHN4 A3	1	0,20
		63A	22kW	64 □ ¹⁾	LTS63 VHN4 A3	1	0,24
		80A	22kW	64 □ ¹⁾	LTS80 VHN4 A3	1	0,24
		85A	30kW	64 □ ¹⁾	LTS85 VHN4 A3	1	0,40
		100A	37kW	64 □ ¹⁾	LTS100 VHN4 A3	1	0,40
		125A	45kW	64 □ ¹⁾	LTS125 VHN4 A3	1	0,40
		160A	55kW	88 □	LT160 VHN34 T300	1	1,38

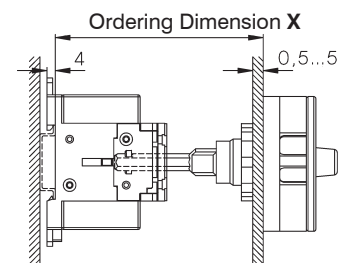
4-pole, padlock device SV4(34) 							
		20A	7,5kW	64 □ ¹⁾	LTS20 VHN4 A4	1	0,21
		25A	10kW	64 □ ¹⁾	LTS25 VHN4 A4	1	0,21
		32A	12,5kW	64 □ ¹⁾	LTS32 VHN4 A4	1	0,21
		40A	16kW	64 □ ¹⁾	LTS40 VHN4 A4	1	0,21
		63A	22kW	64 □ ¹⁾	LTS63 VHN4 A4	1	0,28
		80A	22kW	64 □ ¹⁾	LTS80 VHN4 A4	1	0,28
		85A	30kW	64 □ ¹⁾	LTS85 VHN4 A4	1	0,45
		100A	37kW	64 □ ¹⁾	LTS100 VHN4 A4	1	0,45
		125A	45kW	64 □ ¹⁾	LTS125 VHN4 A4	1	0,45
		160A	55kW	88 □	LT160 VHN34 T400	1	1,77

Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting Depth X is not adjustable, declare depth X when ordering, IP66, us Type 4x

4-pole, padlock device SV4 							
		20A	7,5kW	64 □	LTS20 VZHN4 A4 X..	1	0,18
		25A	10kW	64 □	LTS25 VZHN4 A4 X..	1	0,18
		32A	12,5kW	64 □	LTS32 VZHN4 A4 X..	1	0,18
		40A	16kW	64 □	LTS40 VZHN4 A4 X..	1	0,18
		63A	22kW	64 □	LTS63 VZHN4 A4 X..	1	0,25
		80A	22kW	64 □	LTS80 VZHN4 A4 X..	1	0,25

Declare depth X when ordering

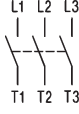
Type	Preference values for X
LTS.. VZH..	80, 85, 104, 129 (tolerance -3, +1,5)

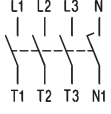


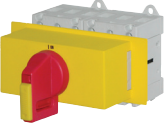
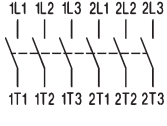
Add-on modules see page 297

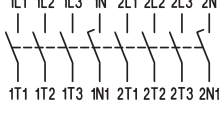
1) Types with padlock device 88 'type suffix **88**, ordering example: LTS32 VHN4**88** A3, on request

Emergency-Stop-Main Switches for Distribution Boards, lockable IP40, Open Type

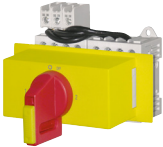
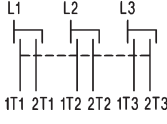
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
3-pole, padlock device SV1 							
		20A	7,5kW	52x45	LTS20 SMAHN1 A3 ²⁾	1	0,15
		25A	10kW	52x45	LTS25 SMAHN1 A3 ²⁾	1	0,15
		32A	12,5kW	52x45	LTS32 SMAHN1 A3 ²⁾	1	0,15
		40A	16kW	52x45	LTS40 SMAHN1 A3 ²⁾	1	0,15
		63A	22kW	52x45	LTS63 SMAHN1 A3 ²⁾	1	0,18
		80A	22kW	52x45	LTS80 SMAHN1 A3 ²⁾	1	0,18
		85A	30kW	78x45	LTS85 SMAHN1 A3	1	0,37
		100A	37kW	78x45	LTS100 SMAHN1 A3	1	0,37
		125A	45kW	78x45	LTS125 SMAHN1 A3	1	0,37

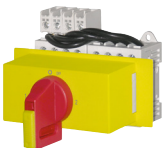
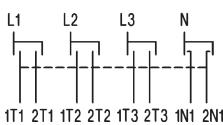
4-pole, padlock device SV1 							
		20A	7,5kW	52x45	LTS20 SMAHN1 A4 ²⁾	1	0,16
		25A	10kW	52x45	LTS25 SMAHN1 A4 ²⁾	1	0,16
		32A	12,5kW	52x45	LTS32 SMAHN1 A4 ²⁾	1	0,16
		40A	16kW	52x45	LTS40 SMAHN1 A4 ²⁾	1	0,16
		63A	22kW	52x45	LTS63 SMAHN1 A4 ²⁾	1	0,21
		80A	22kW	52x45	LTS80 SMAHN1 A4 ²⁾	1	0,21
		85A	30kW	78x45	LTS85 SMAHN1 A4	1	0,42
		100A	37kW	78x45	LTS100 SMAHN1 A4	1	0,42
		125A	45kW	78x45	LTS125 SMAHN1 A4	1	0,42

6-pole, padlock device SV1 (64) 							
		20A	7,5kW	52x45	LTS20 SMAHN1 A6	1	0,29
		25A	10kW	52x45	LTS25 SMAHN1 A6	1	0,29
		32A	12,5kW	52x45	LTS32 SMAHN1 A6	1	0,29
		40A	16kW	52x45	LTS40 SMAHN1 A6	1	0,29
		63A	22kW	97x45	LTS63 SMAHN1 A6 ¹⁾	1	0,34
		80A	22kW	97x45	LTS80 SMAHN1 A6 ¹⁾	1	0,34

8-pole, padlock device SV164 							
		20A	7,5kW	97x45	LTS20 SMAHN1 A8	1	0,31
		25A	10kW	97x45	LTS25 SMAHN1 A8	1	0,31
		32A	12,5kW	97x45	LTS32 SMAHN1 A8	1	0,31
		40A	16kW	97x45	LTS40 SMAHN1 A8	1	0,31
		63A	22kW	126x45	LTS63 SMAHN1 A8	1	0,42
		80A	22kW	126x45	LTS80 SMAHN1 A8	1	0,42

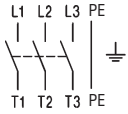
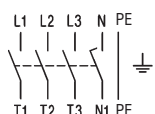
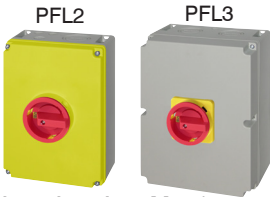
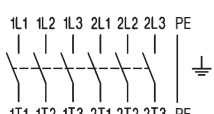
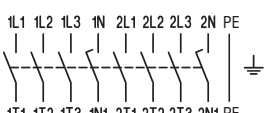
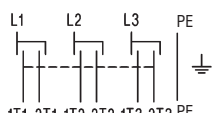
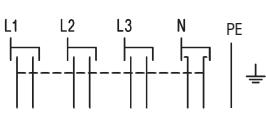
Changeover Switch with Padlock Device for Distribution Boards, lockable

3-pole, padlock device SV164 							
		20A	7,5kW	97x45	LTS20 SMAHN1 U3	1	0,29
		25A	10kW	97x45	LTS25 SMAHN1 U3	1	0,29
		32A	12,5kW	97x45	LTS32 SMAHN1 U3	1	0,29
		40A	16kW	97x45	LTS40 SMAHN1 U3	1	0,29
		63A	22kW	97x45	LTS63 SMAHN1 U3	1	0,34

4-pole, padlock device SV164 							
		20A	7,5kW	97x45	LTS20 SMAHN1 U4	1	0,31
		25A	10kW	97x45	LTS25 SMAHN1 U4	1	0,31
		32A	12,5kW	97x45	LTS32 SMAHN1 U4	1	0,31
		40A	16kW	97x45	LTS40 SMAHN1 U4	1	0,31
		63A	22kW	126x45	LTS63 SMAHN1 U4	1	0,42

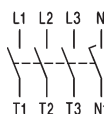
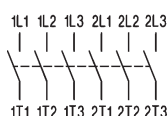
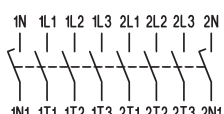
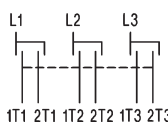
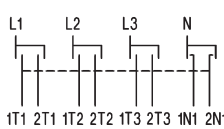
1) With padlock device SV164

2) Emergency-Stop-Main Switches for Distribution Boards, lockable with low height handle, IP40
Type with Type-suffix „+SV1RN“ e.g.: **LTS40 SMAHN1 A3 +SV1RN**

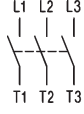
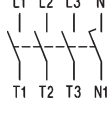
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	size	Pack pcs.	Weight kg/Stk.
3-pole, padlock device SV4(34) 								
		20A	7,5kW	64 □	LTS20 PF(L ¹)HN4 A3	PF1, PFL	1	0,32
		25A	10kW	64 □	LTS25 PF(L ¹)HN4 A3	PF1, PFL	1	0,32
		32A	12,5kW	64 □	LTS32 PF(L ¹)HN4 A3	PF1, PFL	1	0,32
		40A	16kW	64 □	LTS40 PF(L ¹)HN4 A3	PF1, PFL	1	0,32
		63A	22kW	64 □	LTS63 PFLHN4 A3	PFL2	1	0,60
		80A	22kW	64 □	LTS80 PFLHN4 A3	PFL2	1	0,60
		85A	30kW	64 □	LTS85 PFLHN4 A3	PFL2	1	0,78
		100A	37kW	64 □	LTS100 PFLHN4 A3	PFL2	1	0,78
Larger enclosure Type: ..PFL..	on request	125A	45kW	64 □	LTS125 PFLHN4 A3	PFL2	1	0,78
		160A	55kW	88 □	LT160 PFHN34 T300	PF4	1	2,09
4-pole, padlock device SV4(34) 								
		20A	7,5kW	64 □	LTS20 PF(L ¹)HN4 A4	PF1, PFL	1	0,33
		25A	10kW	64 □	LTS25 PF(L ¹)HN4 A4	PF1, PFL	1	0,33
		32A	12,5kW	64 □	LTS32 PF(L ¹)HN4 A4	PF1, PFL	1	0,33
		40A	16kW	64 □	LTS40 PF(L ¹)HN4 A4	PF1, PFL	1	0,33
		63A	22kW	64 □	LTS63 PFLHN4 A4	PFL2	1	0,64
		80A	22kW	64 □	LTS80 PFLHN4 A4	PFL2	1	0,64
		85A	30kW	64 □	LTS85 PFLHN4 A4	PFL2	1	0,83
		100A	37kW	64 □	LTS100 PFLHN4 A4	PFL2	1	0,83
Larger enclosure Type appendix +PF3	on request	125A	45kW	64 □	LTS125 PFLHN4 A4	PFL2	1	0,83
+PF3/M50	on request	160A	55kW	88 □	LT160 PFHN34 T400	PF5	1	2,47
6-pole, padlock device SV4 								
		20A	7,5kW	64 □	LTS20 PFLHN4 A6	PFL2	1	1,39
		25A	10kW	64 □	LTS25 PFLHN4 A6	PFL2	1	1,39
		32A	12,5kW	64 □	LTS32 PFLHN4 A6	PFL2	1	1,39
		40A	16kW	64 □	LTS40 PFLHN4 A6	PFL2	1	1,39
		63A	22kW	64 □	LTS63 PFLHN4 A6	PFL3	1	1,42
		80A	22kW	64 □	LTS80 PFLHN4 A6	PFL3	1	1,42
knockoutlets M50/40 +PF3/M50	on request							
8-pole, padlock device SV4 								
		20A	7,5kW	64 □	LTS20 PFLHN4 A8	PFL3	1	1,44
		25A	10kW	64 □	LTS25 PFLHN4 A8	PFL3	1	1,44
		32A	12,5kW	64 □	LTS32 PFLHN4 A8	PFL3	1	1,44
		40A	16kW	64 □	LTS40 PFLHN4 A8	PFL3	1	1,44
		63A	22kW	64 □	LTS63 PFLHN4 A8	PFL3	1	1,50
		80A	22kW	64 □	LTS80 PFLHN4 A8	PFL3	1	1,50
knockoutlets M50/40 +PF3/M50	on request							
Changeover Switch with Padlock Device, lockable								
3-pole, padlock device SV4 								
		20A	7,5kW	64 □	LTS20 PFLHN4 U3	PFL3	1	1,39
		25A	10kW	64 □	LTS25 PFLHN4 U3	PFL3	1	1,39
		32A	12,5kW	64 □	LTS32 PFLHN4 U3	PFL3	1	1,39
		40A	16kW	64 □	LTS40 PFLHN4 U3	PFL3	1	1,39
		63A	22kW	64 □	LTS63 PFLHN4 U3	PFL3	1	1,42
4-pole, padlock device SV4 								
		20A	7,5kW	64 □	LTS20 PFLHN4 U4	PFL3	1	1,44
		25A	10kW	64 □	LTS25 PFLHN4 U4	PFL3	1	1,44
		32A	12,5kW	64 □	LTS32 PFLHN4 U4	PFL3	1	1,44
		40A	16kW	64 □	LTS40 PFLHN4 U4	PFL3	1	1,44
		63A	22kW	64 □	LTS63 PFLHN4 U4	PFL3	1	1,50

1) PFL..... larger enclosure

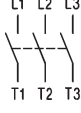
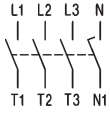
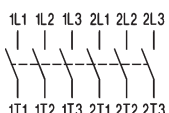
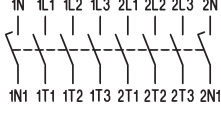
Switch Disconnectors for Panel Mounting, IP66, Type 3R

		AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
On-Off Switches 3-pole							
		20A	7,5kW	48 □	LTS20 E A3	1	0,15
		25A	10kW	48 □	LTS25 E A3	1	0,15
		32A	12,5kW	48 □	LTS32 E A3	1	0,15
		40A	16kW	48 □	LTS40 E A3	1	0,15
		63A	22kW	48 □	LTS63 E A3	1	0,17
		80A	22kW	48 □	LTS80 E A3	1	0,17
		85A	30kW	64 □	LTS85 E A3	1	0,39
		100A	37kW	64 □	LTS100 E A3	1	0,39
		125A	45kW	64 □	LTS125 E A3	1	0,39
		160A	55kW	88 □	LT160 E T300	1	1,10
On-Off Switches 4-pole							
		20A	7,5kW	48 □	LTS20 E A4	1	0,18
		25A	10kW	48 □	LTS25 E A4	1	0,18
		32A	12,5kW	48 □	LTS32 E A4	1	0,18
		40A	16kW	48 □	LTS40 E A4	1	0,18
		63A	22kW	48 □	LTS63 E A4	1	0,21
		80A	22kW	48 □	LTS80 E A4	1	0,21
		85A	30kW	64 □	LTS85 E A4	1	0,44
		100A	37kW	64 □	LTS100 E A4	1	0,44
		125A	45kW	64 □	LTS125 E A4	1	0,44
		160A	55kW	88 □	LT160 E T400	1	1,50
On-Off Switches 6-pole							
		20A	7,5kW	64 □	LTS20 E A6	1	0,30
		25A	10kW	64 □	LTS25 E A6	1	0,30
		32A	12,5kW	64 □	LTS32 E A6	1	0,30
		40A	16kW	64 □	LTS40 E A6	1	0,30
		63A	22kW	64 □	LTS63 E A6	1	0,36
		80A	22kW	64 □	LTS80 E A6	1	0,36
On-Off Switches 8-pole							
		20A	7,5kW	64 □	LTS20 E A8	1	0,32
		25A	10kW	64 □	LTS25 E A8	1	0,32
		32A	12,5kW	64 □	LTS32 E A8	1	0,32
		40A	16kW	64 □	LTS40 E A8	1	0,32
		63A	22kW	64 □	LTS63 E A8	1	0,43
		80A	22kW	64 □	LTS80 E A8	1	0,43
Changeover Switches 3-pole							
		20A	7,5kW	64 □	LTS20 E U3	1	0,31
		25A	10kW	64 □	LTS25 E U3	1	0,31
		32A	12,5kW	64 □	LTS32 E U3	1	0,31
		40A	16kW	64 □	LTS40 E U3	1	0,31
		63A	22kW	64 □	LTS63 E U3	1	0,37
Changeover Switches 4-pole							
		20A	7,5kW	64 □	LTS20 E U4	1	0,33
		25A	10kW	64 □	LTS25 E U4	1	0,33
		32A	12,5kW	64 □	LTS32 E U4	1	0,33
		40A	16kW	64 □	LTS40 E U4	1	0,33
		63A	22kW	64 □	LTS63 E U4	1	0,44

Switch Disconnectors for Single Hole Mounting, lockable IP66, Type 4X

	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
On-Off Switches 3-pole						
 	20A	7,5kW	48 □	LTS20 Z A3	1	0,16
	25A	10kW	48 □	LTS25 Z A3	1	0,16
	32A	12,5kW	48 □	LTS32 Z A3	1	0,16
	40A	16kW	48 □	LTS40 Z A3	1	0,16
On-Off Switches 4-pole						
 	20A	7,5kW	48 □	LTS20 Z A4	1	0,20
	25A	10kW	48 □	LTS25 Z A4	1	0,20
	32A	12,5kW	48 □	LTS32 Z A4	1	0,20
	40A	16kW	48 □	LTS40 Z A4	1	0,20

Switch Disconnectors, Base Mounting with Door Clutch for Single-Hole Mounting Depth X is adjustable (delivered with X_{max} see page 294), IP66, Type 4X

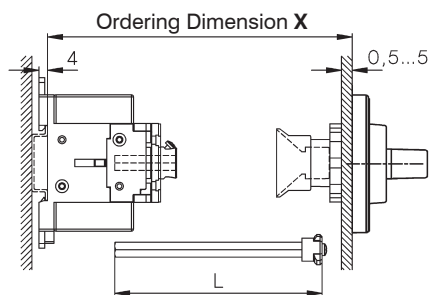
	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
On-Off Switches 3-pole						
 	20A	7,5kW	64 □	LTS20 VZV A3	1	0,19
	25A	10kW	64 □	LTS25 VZV A3	1	0,19
	32A	12,5kW	64 □	LTS32 VZV A3	1	0,19
	40A	16kW	64 □	LTS40 VZV A3	1	0,19
	63A	22kW	64 □	LTS63 VZV A3	1	0,22
	80A	22kW	64 □	LTS80 VZV A3	1	0,22
	85A	30kW	64 □	LTS85 VZV A3	1	0,40
	100A	37kW	64 □	LTS100 VZV A3	1	0,40
	125A	45kW	64 □	LTS125 VZV A3	1	0,40
On-Off Switches 4-pole						
 	20A	7,5kW	64 □	LTS20 VZV A4	1	0,20
	25A	10kW	64 □	LTS25 VZV A4	1	0,20
	32A	12,5kW	64 □	LTS32 VZV A4	1	0,20
	40A	16kW	64 □	LTS40 VZV A4	1	0,20
	63A	22kW	64 □	LTS63 VZV A4	1	0,26
	80A	22kW	64 □	LTS80 VZV A4	1	0,26
	85A	30kW	64 □	LTS85 VZV A4	1	0,45
	100A	37kW	64 □	LTS100 VZV A4	1	0,45
	125A	45kW	64 □	LTS125 VZV A4	1	0,45
On-Off Switches 6-pole						
 	20A	7,5kW	64 □	LTS20 VZV A6	1	0,32
	25A	10kW	64 □	LTS25 VZV A6	1	0,32
	32A	12,5kW	64 □	LTS32 VZV A6	1	0,32
	40A	16kW	64 □	LTS40 VZV A6	1	0,32
	63A	22kW	64 □	LTS63 VZV A6	1	0,37
	80A	22kW	64 □	LTS80 VZV A6	1	0,37
On-Off Switches 8-pole						
 	20A	7,5kW	64 □	LTS20 VZV A8	1	0,34
	25A	10kW	64 □	LTS25 VZV A8	1	0,34
	32A	12,5kW	64 □	LTS32 VZV A8	1	0,34
	40A	16kW	64 □	LTS40 VZV A8	1	0,34
	63A	22kW	64 □	LTS63 VZV A8	1	0,45
	80A	22kW	64 □	LTS80 VZV A8	1	0,45

Switch Disconnecter, Base Mounting with Door Clutch for Single-Hole Mounting

Depth X is adjustable (delivered with $X_{\max}$ see below), IP66, cUL_{US} Type 4X

Depth

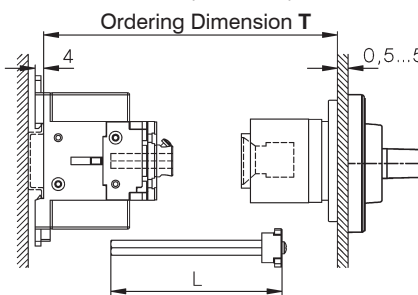
Single Hole Mounting Ø22mm
LTS.. VZV..



Type		X min	X max	L
LTS20-80 VZV..	3, 4-polig	91 -	190	X - 40±3
LTS20-80 VZV..	6, 8-polig	111 -	190	X - 60±3
LTS85-125 VZV..	3, 4-polig	95 -	190	X - 44±3

4-Hole Mounting

LTS.. V(HN).. (3, 4-pole)



Type		T min	T max	L	Type		T min	T max
LTS20-80 V..		111 -	190	T - 60±3	LT160 V..		120 -	450
LTS85-125 V..		115 -	190	T - 64±3				

greater X- and T-Dimensions (max. 380mm for LTS..) on request

Switch Disconnecter, Base Mounting with Door Clutch for Hole Mounting

Depth X is adjustable (delivered with $T_{\max}$ see above), IP66, cUL_{US} Type 4X

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigh kg/pcs.
On-Off Switches 3-pole							
		20A	7,5kW	64 □ 1)	LTS20 V A3	1	0,20
		25A	10kW	64 □ 1)	LTS25 V A3	1	0,20
		32A	12,5kW	64 □ 1)	LTS32 V A3	1	0,20
		40A	16kW	64 □ 1)	LTS40 V A3	1	0,20
		63A	22kW	64 □ 1)	LTS63 V A3	1	0,24
		80A	22kW	64 □ 1)	LTS80 V A3	1	0,24
		85A	30kW	64 □ 1)	LTS85 V A3	1	0,40
		100A	37kW	64 □ 1)	LTS100 V A3	1	0,40
		125A	45kW	64 □ 1)	LTS125 V A3	1	0,40
		160A	55kW	88 □	LT160 V T300	1	1,38
On-Off Switches 4-pole							
		20A	7,5kW	64 □ 1)	LTS20 V A4	1	0,21
		25A	10kW	64 □ 1)	LTS25 V A4	1	0,21
		32A	12,5kW	64 □ 1)	LTS32 V A4	1	0,21
		40A	16kW	64 □ 1)	LTS40 V A4	1	0,21
		63A	22kW	64 □ 1)	LTS63 V A4	1	0,28
		80A	22kW	64 □ 1)	LTS80 V A4	1	0,28
		85A	30kW	64 □ 1)	LTS85 V A4	1	0,45
		100A	37kW	64 □ 1)	LTS100 V A4	1	0,45
		125A	45kW	64 □ 1)	LTS125 V A4	1	0,45
		160A	55kW	88 □	LT160 V T400	1	1,77

Add-on modules see page 297

1) Types with padlock device 88 † type suffix **88**, ordering example: LTS32 VHN**88** A3, on request

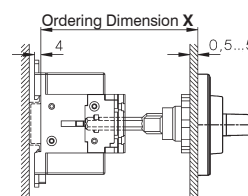
Switch Disconnecter, Base Mounting with Door Clutch for Single-Hole Mounting

Depth X is not adjustable, declare depth X when ordering, IP66, cUL_{us} Type 4X

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
On-Off Switches 4-pole							
		20A	7,5kW	64 □	LTS20 VZ A4 X..	1	0,18
		25A	10kW	64 □	LTS25 VZ A4 X..	1	0,18
		32A	12,5kW	64 □	LTS32 VZ A4 X..	1	0,18
		40A	16kW	64 □	LTS40 VZ A4 X..	1	0,18
		63A	22kW	64 □	LTS63 VZ A4 X..	1	0,25
		80A	22kW	64 □	LTS80 VZ A4 X..	1	0,25

Declare depth X when ordering

Type	Preference values for X
LTS.. VZ..	80, 85, 104, 129 (tolerance -3, +1,5)

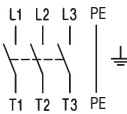
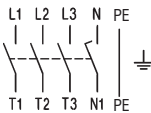
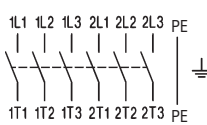
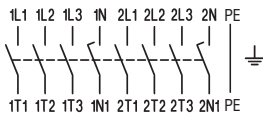
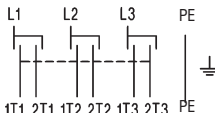
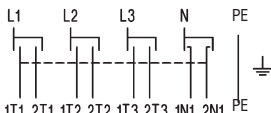


Add-on modules see page 297

Switch Disconnectors for Distribution Boards, IP40, cUL_{us} Open Type

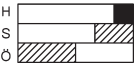
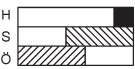
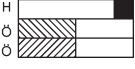
On-Off Switches 3-pole							
		20A	7,5kW	52x45	LTS20 SMA A3	1	0,15
		25A	10kW	52x45	LTS25 SMA A3	1	0,15
		32A	12,5kW	52x45	LTS32 SMA A3	1	0,15
		40A	16kW	52x45	LTS40 SMA A3	1	0,15
		63A	22kW	52x45	LTS63 SMA A3	1	0,17
		80A	22kW	52x45	LTS80 SMA A3	1	0,17
		85A	30kW	78x45	LTS85 SMA A3	1	0,37
		100A	37kW	78x45	LTS100 SMA A3	1	0,37
		125A	45kW	78x45	LTS125 SMA A3	1	0,37
On-Off Switches 4-pole							
		20A	7,5kW	52x45	LTS20 SMA A4	1	0,16
		25A	10kW	52x45	LTS25 SMA A4	1	0,16
		32A	12,5kW	52x45	LTS32 SMA A4	1	0,16
		40A	16kW	52x45	LTS40 SMA A4	1	0,16
		63A	22kW	52x45	LTS63 SMA A4	1	0,21
		80A	22kW	52x45	LTS80 SMA A4	1	0,21
		85A	30kW	78x45	LTS85 SMA A4	1	0,42
		100A	37kW	78x45	LTS100 SMA A4	1	0,42
		125A	45kW	78x45	LTS125 SMA A4	1	0,42
On-Off Switches 6-pole							
		20A	7,5kW	52x45	LTS20 SMA A6	1	0,29
		25A	10kW	52x45	LTS25 SMA A6	1	0,29
		32A	12,5kW	52x45	LTS32 SMA A6	1	0,29
		40A	16kW	52x45	LTS40 SMA A6	1	0,29
		63A	22kW	97x45	LTS63 SMA A6	1	0,34
		80A	22kW	97x45	LTS80 SMA A6	1	0,34
On-Off Switches 8-pole							
		20A	7,5kW	97x45	LTS20 SMA A8	1	0,31
		25A	10kW	97x45	LTS25 SMA A8	1	0,31
		32A	12,5kW	97x45	LTS32 SMA A8	1	0,31
		40A	16kW	97x45	LTS40 SMA A8	1	0,31
		63A	22kW	126x45	LTS63 SMA A8	1	0,42
		80A	22kW	126x45	LTS80 SMA A8	1	0,42
Changeover Switches 3-pole							
		20A	7,5kW	97x45	LTS20 SMA U3	1	0,30
		25A	10kW	97x45	LTS25 SMA U3	1	0,30
		32A	12,5kW	97x45	LTS32 SMA U3	1	0,30
		40A	16kW	97x45	LTS40 SMA U3	1	0,30
		63A	22kW	97x45	LTS63 SMA U3	1	0,35
Changeover Switches 4-pole							
		20A	7,5kW	97x45	LTS20 SMA U4	1	0,32
		25A	10kW	97x45	LTS25 SMA U4	1	0,32
		32A	12,5kW	97x45	LTS32 SMA U4	1	0,32
		40A	16kW	97x45	LTS40 SMA U4	1	0,32
		63A	22kW	126x45	LTS63 SMA U4	1	0,43

Switch Disconnectors in Plastic Enclosure IP66, Type 4X

	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weight kg/pcs.
On-Off Switches 3-pole						
 	20A	7,5kW	64 □	LTS20 PF(L ¹) A3	1	0,30
	25A	10kW	64 □	LTS25 PF(L ¹) A3	1	0,30
	32A	12,5kW	64 □	LTS32 PF(L ¹) A3	1	0,30
	40A	16kW	64 □	LTS40 PF(L ¹) A3	1	0,30
	63A	22kW	64 □	LTS63 PFL A3	1	0,58
	80A	22kW	64 □	LTS80 PFL A3	1	0,58
On-Off Switches 4-pole						
 	20A	7,5kW	64 □	LTS20 PF(L ¹) A4	1	0,31
	25A	10kW	64 □	LTS25 PF(L ¹) A4	1	0,31
	32A	12,5kW	64 □	LTS32 PF(L ¹) A4	1	0,31
	40A	16kW	64 □	LTS40 PF(L ¹) A4	1	0,31
	63A	22kW	64 □	LTS63 PFL A4	1	0,62
	80A	22kW	64 □	LTS80 PFL A4	1	0,62
On-Off Switches 6-pole						
 	20A	7,5kW	64 □	LTS20 PFL A6	1	1,39
	25A	10kW	64 □	LTS25 PFL A6	1	1,39
	32A	12,5kW	64 □	LTS32 PFL A6	1	1,39
	40A	16kW	64 □	LTS40 PFL A6	1	1,39
	63A	22kW	64 □	LTS63 PFL A6	1	1,42
	80A	22kW	64 □	LTS80 PFL A6	1	1,42
knockoutlets M50/40 +PF3/M50 on request						
On-Off Switches 8-pole						
 	20A	7,5kW	64 □	LTS20 PFL A8	1	1,44
	25A	10kW	64 □	LTS25 PFL A8	1	1,44
	32A	12,5kW	64 □	LTS32 PFL A8	1	1,44
	40A	16kW	64 □	LTS40 PFL A8	1	1,44
	63A	22kW	64 □	LTS63 PFL A8	1	1,50
	80A	22kW	64 □	LTS80 PFL A8	1	1,50
knockoutlets M50/40 +PF3/M50 on request						
Changeover Switches 3-pole						
 	20A	7,5kW	64 □	LTS20 PFL U3	1	1,39
	25A	10kW	64 □	LTS25 PFL U3	1	1,39
	32A	12,5kW	64 □	LTS32 PFL U3	1	1,39
	40A	16kW	64 □	LTS40 PFL U3	1	1,39
	63A	22kW	64 □	LTS63 PFL U3	1	1,42
Changeover Switches 4-pole						
 	20A	7,5kW	64 □	LTS20 PFL U4	1	1,44
	25A	10kW	64 □	LTS25 PFL U4	1	1,44
	32A	12,5kW	64 □	LTS32 PFL U4	1	1,44
	40A	16kW	64 □	LTS40 PFL U4	1	1,44
	63A	22kW	64 □	LTS63 PFL U4	1	1,50

1) PFL.... larger enclosure

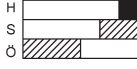
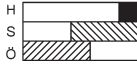
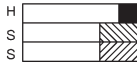
Add-on Modules for Main Switches, Panel Mounting and Single Hole Mounting

	for switch	Type	Pack pcs.	Weight kg/pcs.
	4th Add-on Neutral Switching Pole			
	 LTS20 ... to LTS40 ... LTS63 ... , LTS80 ...	N40E N80E	1 1	0,035 0,042
	Aux. Contact Block 1NO + 1NC			
	 LTS20 ... to LTS125 ...	LH11	1	0,02
	Aux. Contact Block 1NO + 1NC Overlapping			
	 LTS20 ... to LTS125 ...	LH11X	1	0,02
	Aux. Contact Block 2NC			
	 LTS20 ... to LTS125 ...	LH20V/02E	1	0,02
	PE-Terminal			
	 LTS20 ... to LTS80 ... LT125 E.. to LT160 E..	PE80E LTXX-E/E	1 1	0,04 0,2
	N-Terminal			
	 LTS20 ... to LTS80 ... LT125 E.. to LT160 E..	PEN80E LTXX-N/E	1 1	0,04 0,2
	Terminal Cover 3-pole			
	LTS20 ... to LTS80 ...	KLAD70	1	0,005
	LTS85.. to LTS125. LT125.. to LT160..	KLAD125 XX-KLAD3	1 1	0,01 0,02
	Terminal Cover for 4th pole			
	Mains Load circuit	KLAD70N KLAD70NI	1 1	0,002 0,002
	Terminal Cover 4-pole			
	LTS85.. to LTS125. LT125.. to LT160..	KLAD125 XX-KLAD4	1 1	0,01 0,02

Accessories for Main Switches, Panel Mounting, Single Hole and Base Mounting

	for switch	Type	Pack pcs.	Weight kg/pcs.
	Additional Escutcheon Plate Yellow, Marked with: HAUPTSCHALTER			
	for plate 48 ^r	LTS.. .HN1..	A91501	1 0,003
	for plate 64 ^r	LTS.. .HN4..	E91501	1 0,005
	Additional Escutcheon Plate Yellow, Marked with: MAIN SWITCH			
	for plate 48 ^r	LTS.. .HN1..	A91524	1 0,003
	for plate 64 ^r	LTS.. .HN4..	E91524	1 0,005
	Tab Terminal 6,3 x 0,8mm			
	LTS20 ... bis LTS40 ...	LG11073	10 0,001	

Add-on Modules for Main Switches, Base and Rail Mounting

		for switch	Type	Pack pcs.	Weight kg/pcs.
	4th Add-on Neutral Switching Pole				
		LTS20 ... , LTS40 ... LTS63 ... , LTS80 ...	N40V N80V	1 1	0,035 0,042
		LTS20 ... to LTS125 ...	LH11	1	0,02
		LTS20 ... to LTS125 ...	LH11X	1	0,02
		LTS20 ... to LTS80 ...	LH20V/02E	1	0,02
	PE-Terminal				
		LTS20 ... to LTS80 ... LT125 .. to LT160 ..	PE80V LTXX-E/V	1 1	0,04 0,2
	N-Terminal				
		LTS20 ... to LTS80 ... LT125 .. to LT160 ..	PEN80V LTXX-N/V	1 1	0,04 0,2
	Terminal Cover 3-pole				
		LTS20 ... to LTS40 ...	KLAD40	1	0,005
		LTS63 ... to LTS80 ...	KLAD70	1	0,005
		LTS85.. to LTS125.	KLAD125	1	0,01
		LT125.. to LT160..	XX-KLAD3	1	0,02
	Terminal Cover for 4th pole				
	Mains	LTS63.., LTS80..	KLAD70N	1	0,002
	Load circuit	LTS63.., LTS80..	KLAD70NI	1	0,002
	Terminal Cover 4-pole				
		LTS20 ... to LTS40 ...	KLAD40	1	0,005
		LTS85.. to LTS125.	KLAD125	1	0,01
		LT125.. to LT160..	XX-KLAD4	1	0,02
	Additional Cover SMA for				
	4. Pole	N40V, N80V	grey	LG8628-2	1 0,047
	Aux. Contacts	LH..	yellow	LG8628-7	1 0,047
	PE and N-Terminal	PE80V, PEN80V			

Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type			LTS20	LTS25	LTS32	LTS40	LTS63	LTS80	LTS85	LTS100	LTS125	LT160	
Main contacts													
Rated thermal current I _{th} open	A		20	25	32	40	63	80	85	100	125	160	
Rated thermal current I _{the} enclosed	A		20	25	32	40	63	80	85	100	110	160	
Rated insulation voltage U _i ¹⁾	V		690	690	690	690	690	690	1000 ³⁾	1000 ³⁾	1000 ³⁾	1000 ³⁾	
Rated operational current I _e AC21A	A		20	25	32	40	63	80	85	100	125	160	
Rated operational voltage U _e max. AC21A	V		690	690	690	690	690	690	1000	1000	1000	690	
Making capacity I _{eff} 3x380-440V	A		160	190	220	300	370	440	600	725	850	1050	
Breaking capacity	3x220-240V	A	160	180	200	250	330	380	480	580	680	900	
	3x380-440V	A	160	180	200	250	330	380	480	580	680	850	
	3x660-690V	A	80	110	140	170	190	220	250	330	420	340	
Disconnection property performed up to	V		690	690	690	690	690	690	1000	1000	1000	1000	
Motor Switch AC3 3x400V	A		12	16	23	30	37	37	45	60	72	85	
Motor Switch AC3 3x220-240V	kW		3	4	5,5	7,5	11	11	15	18,5	22	30	
Direct switching of single motors	3x380-440V	kW	5,5	7,5	11	15	18,5	18,5	22	30	37	45	
	3x660-690V	kW	5,5	7,5	11	15	18,5	18,5	18,5	22	30	37	
Main Switch AC23 3x400V	A		16	20	25	32	45	45	60	72	85	110	
Motor Switch, AC23A, 3x220-240V	kW		4	5,5	7,5	9	15	15	18,5	22	30	30	
Main Switch, AC23B 3x380-440V	kW		7,5	10	12,5	16	22	22	30	37	45	55	
Safety Switch 3x660-690V	kW		5,5	7,5	11	15	18,5	18,5	22	30	37	37	
Rated conditional short-circuit current 400V	kA _{eff}		10	10	10	10	10	10	10	10	5	30	
Max. fuse size gL (gG) 400V	A		25	35	40	40	63	80	100	100	125	160	
Rated conditional short-circuit current 690V	kA _{eff}		10	5	3	1	5	1,5	10	10	5	30	
Max. fuse size gL (gG) 690V	A		20	25	32	40	63	80	85	100	125	-	
Mechanical life x10 ³			200	200	200	200	100	100	100	100	100	100	
Electrical life x10 ³			5	5	5	5	4	4	3	3	3	2	
Rated short-time withstand current (1sec. current)	A		250	300	400	500	600	850	1000	1200	1500	3000	
Power loss per pole AC21 = I _{th}	P/pole [W]	E, Z	0,322	0,503	0,824	1,288	2,739	4,416	3,851	5,330	8,328	-	
		V, SMA, PF	0,364	0,569	0,933	1,458	2,739	4,416	3,851	5,330	8,328	-	
	R/pole [mOhm]	E, Z	0,805	0,805	0,805	0,805	0,690	0,690	0,533	0,533	0,533	-	
		V, SMA, PF	0,911	0,911	0,911	0,911	0,690	0,690	0,533	0,533	0,533	-	
Maximum ambient temperature			Operation open enclosed Storage									-40°C to +60°C (90°C) ⁵⁾ -40°C to +40°C -50°C to +90°C ⁶⁾	+60°C +40°C +90°C ⁶⁾
Cable cross sections			mm ²	0,5 - 10			1 - 25 ⁴⁾		4 - 50		max.95		
solid or stranded			AWG	20 - 8 (10)			16 - 3 (10)		10 - 00 (10)		max.3/0		
flexible			mm ²	0,5 - 6			4 - 16 ⁴⁾		10 - 35		max.70		
flexible (+ multicore cable end)			AWG	20 - 10			16 - 6		8 - 2		max.2/0		
Size of terminal screw			mm ²	0,5 - 6			0,75 - 16 ⁴⁾		6 - 35		max.50		
Tightening torque			Nm	20 - 10			16 - 6		8 - 2		max.1/0		
				M3,5			M5		M6		M10		
				1 - 1,7			2,8 - 4		1,7 - 4,5		14		
Auxiliary contacts													
Rated insulation voltage U _i ¹⁾	V		690				690		690		690		
Rated thermal current I _{th} , I _{the}	A		10				10		10		16		
Switching capacity AC15 380-450V	A		2,5/1,5				2,5/1,5		2,5/1,5		6/4		
DC13 60-110V	A		2/0,4				2/0,4		2/0,4		-		
Rated conditional short-circuit current	kA _{eff}		3				3		3		3		
Max. short circuit protection gL (gG)	A		10				10		10		16		
Cable cross sections			mm ²	0,75 - 2,5			0,75 - 2,5		0,75 - 2,5		max.4		
solid or stranded			AWG	14 - 12			14 - 12		14 - 12		max.12		
flexible (+ multicore cable end)			mm ²	0,75 - 2,5 (1,5)			0,75 - 2,5 (1,5)		0,75 - 2,5 (1,5)		max.2,5		
			AWG	18 - 14			18 - 14		18 - 14		max.14		
Data according to UL and cUL													
Type			LTS20	LTS25	LTS32	LTS40	LTS63	LTS80	LTS85	LTS100	LTS125	LT160	
Rated voltage	V		600	600	600	600	600	600	600	600	600	600	
Ampere-Rating "General use"	A		20	25	32	40	63	80	85	100	125	200	
DOL-Rating 3-phase	110-120V	HP	1	1,5	2	2	3	5	7,5	10	15	20	
	220-240V	HP	3	5	5	5	10	10	20	25	30	40	
	440-480V	HP	7,5	10	10	10	20	20	40	50	60	60	
	550-600V	HP	10	10	15	15	25	25	50	60	60	60	
DOL-Rating 1-phase	110-120V	HP	1	1	1	1	2	2	3	5	7,5	-	
	200-208V	HP	1	2	2	2	3	3	7,5	10	10	-	
	220-240V	HP	2	2	3	3	5	5	10	15	15	-	
Fuse size (RK5) Manual Motor Controller	A		40	50	50	70	90	110	125	125	125	400 ²⁾	
5kA / 600V Motor Disconnect	A		40	50	50	50	70	70	125	125	125	400 ²⁾	
Tightening torque	Nm		1,7	1,7	1,7	1,7	2,8-4	2,8-4	1,7-4,5	1,7-4,5	1,7-4,5	14	

1) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp} = 6kV$.

2) Fuse RK1 / 10kA / 600V

3) $U_{imp} = 8kV$

4) LTS63..U. stranded 16mm², flexible 10mm²

5) Derating acc. to cable cross sections

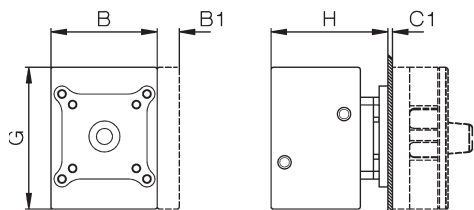
6) for switches with transparent plates 48 □ max. +65°C

Dimensions (mm)

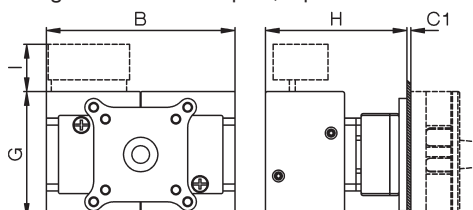
Main Switches, Switch Disconnectors LT(S)..

Panel mounting LT(S).. E(HN)..

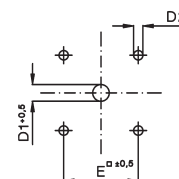
ON-OFF Switches 3-pole, 4-pole



ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole

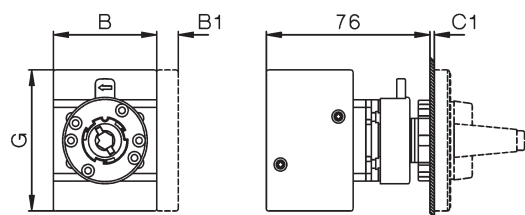


Mounting holes
Mounting screw: J3631N M=1,2-1,4 Nm



Single hole mounting LTS.. Z(HN)..

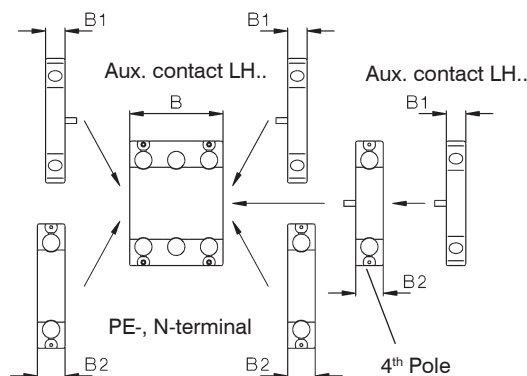
ON-OFF Switches 3-pole, 4-pole



Mounting holes

Mounting of add-on modules LTS20 - LTS80

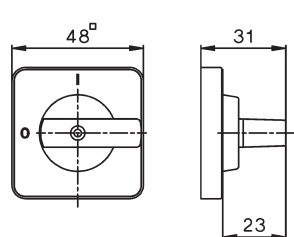
Panel mounting, Single hole mounting



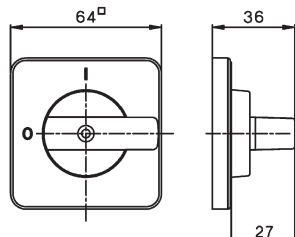
			Changeover ON-OFF					3-pole	4-pole	3-pole 6-pole	4-pole 8-pole	aux. contact	4. Pole PE						3,4-pole 6,8-pole			3,4-pole 6,8-pole
Type	Esc. plate	padlock device	A	B	B	B	B	B1	B2	C1	D1	D2	E	F	G	H	H	I				
LTS20-80..	48 □, SV1		48	48	62,5	-	-	10	14,5	1-5	9	5	36	-	64	49	74	24				
LTS20-80..	64 □, SV4, SV164		64	48	62,5	97	126	10	14,5	1-5	9	5	48	-	64	49	74	24				
LTS85-125..	64 □, SV4		64	78	78	-	-	10	-	1-5	9	5	48	-	85	55	-	-				
LTS85-125..	88 □, SV488		88	78	78	-	-	10	-	1-5	9	6	68	-	85	55	-	-				
LT160	88 □, SV34		88	112	150	224	-	-	-	1-4	13-17	6	68	49.3	108	96	98	-				

Escutcheon plate

48 □

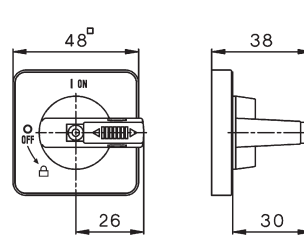


64 □

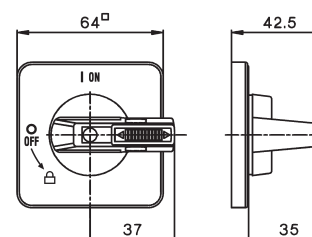


Padlock devices

SV1

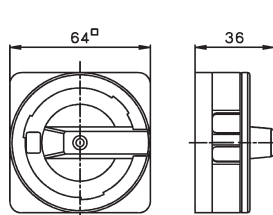


SV164

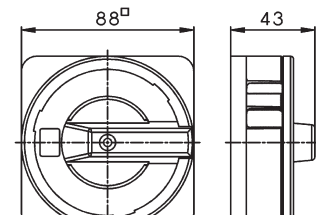


Padlock devices

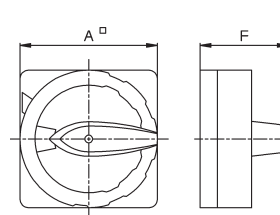
SV4



SV488

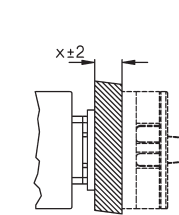


SV34



Extended Switch Shaft

+ VW"x"



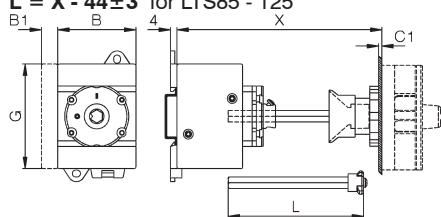
Dimensions (mm)

Main Switches, Switch Disconnectors LT(S)..

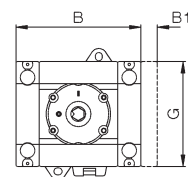
Base mounting LTS.. VZV(HN)..

ON-OFF Switches 3-pole, 4-pole

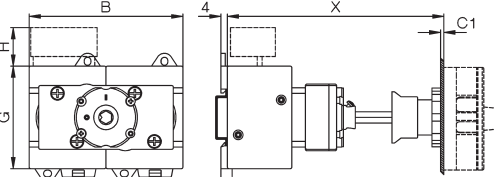
$L = X - 40 \pm 3$ for LTS20 - 80
 $L = X - 44 \pm 3$ for LTS85 - 125



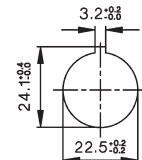
6-pole
 for LTS20 - 40 only
 $L = X - 40 \pm 3$



ON-OFF Switches 6-pole, 8-pole
 Changeover Switches 3-pole, 4-pole
 $L = X - 60 \pm 3$



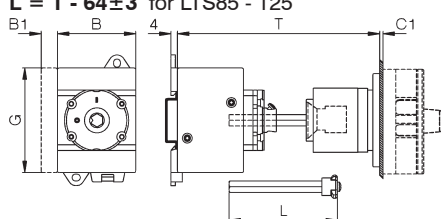
Mounting holes



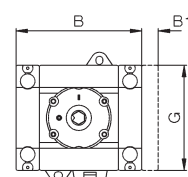
Base mounting LT(S).. V(HN)..

ON-OFF Switches 3-pole, 4-pole

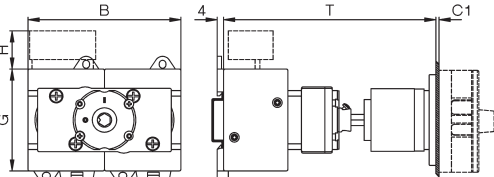
$L = T - 60 \pm 3$ for LTS20 - 80
 $L = T - 64 \pm 3$ for LTS85 - 125



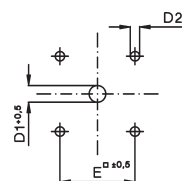
6-pole
 for LTS20 - 40 only
 $L = T - 60 \pm 3$



ON-OFF Switches 6-pole, 8-pole
 Changeover Switches 3-pole, 4-pole
 $L = T - 80 \pm 3$ for LTS20 - 80 only



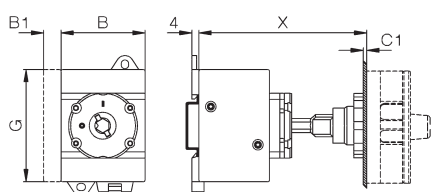
Mounting holes



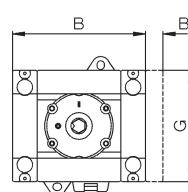
Base mounting LTS.. VZ(HN)..

ON-OFF Switches 3-pole, 4-pole

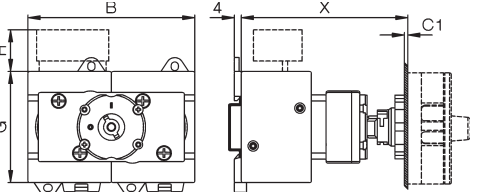
Preference values for X: 80, 85, 104, 129



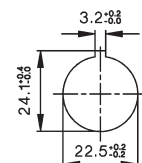
6-pole
 for LTS20 - 40 only



ON-OFF Switches 6-pole, 8-pole
 Changeover Switches 3-pole, 4-pole



Mounting holes

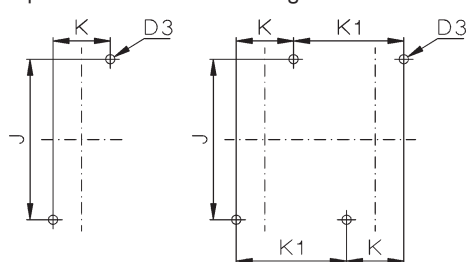


Changeover ON-OFF		3,4-pole																
Escutch. plate or padlock device		3-pole	4-pole	6-pole	8-pole	aux. contact	4Pole PE											
Type		A	B	B	B	B	B1	B2	H	C1	D1	D2	D3	E	G	K	K1	J
LTS20 -40	64 □, SV4, SV164	64	48	48	77	97	10	14,5	24	1-5	9	5	M4	48	64	25	48	70
LTS63, 80	64 □, SV4, SV164	64	48	62,5	97	126	10	14,5	24	1-5	9	5	M4	48	64	25	48	70
LTS85-125..	64 □, SV4	64	78	78	-	-	10	-	-	1-5	9	5	M4	48	85	38	-	90
LT125/160	88 □, SV34	88	112	150	224	-	-	-	-	1-4	13/27 ²⁾	6	M6	68	108	36	-	120

Base mounting

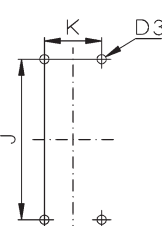
ON-OFF Switches LTS20 - LTS80

3-pole, 4-pole
 6-pole LTS20 -40



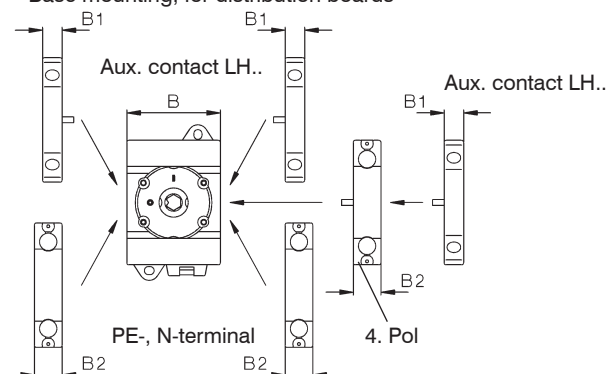
LTS85-125, LT160

3-pole, 4-pole



Mounting of Accessories LTS20 - LTS80

Base mounting, for distribution boards



- 1) Ø 22-25 for LT80(100) VH(N)34 .. only
- 2) Ø 26-30 for LT125(160) VH(N)34 .. only

Dimensions (mm)

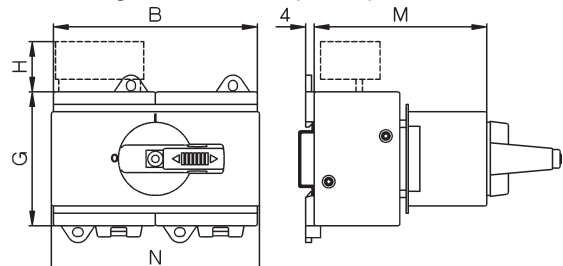
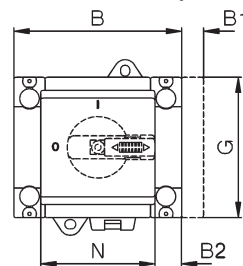
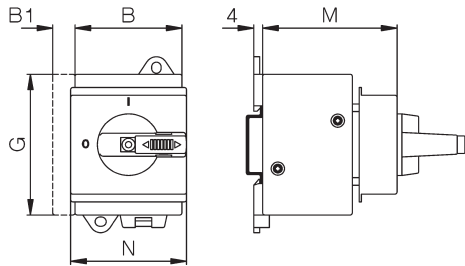
Main Switches, Switch Disconnectors LT(S)..

Installation cover LT(S).. SMA(HN)..

ON-OFF Switches 3-pole, 4-pole

ON-OFF Switches 6-pole
for LTS20 - 40 only

ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole



		Changeover ON-OFF								U3/U4								
		A3	A4	A6	A8	U3 -	U4 -	aux. contact	4.pole PE	A3 A4	A6	A8	A3 A4	A6	A8	U3 -	U4 -	
Type	padlock device	B	B	B	B	B	B	B1	B2	G	M	M	M	N	N	N	N	H
LTS20 - 40	SV1, SV164	48	48	77	96	96	96	10	14,5	64	60	60	74	52	52	97 ²⁾	97 ²⁾	24
LTS63, 80	SV1, SV164	48	62,5	96	125	96	125	10	14,5	64	60	79	79	52	97 ²⁾	126 ¹⁾	126 ¹⁾	-
LTS85-125..	SV164	78	78	-	-	-	-	10	-	85	60	-	-	78	-	-	-	-

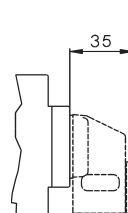
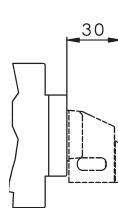
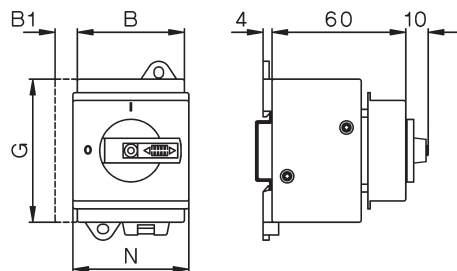
Installation cover with low height handle LTS SMAHN1.. +SV1N

Main switch 3-pole, 4-pole

LTS20 - LTS80

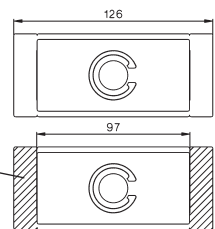
Padlock device SV1

Padlock device SV164



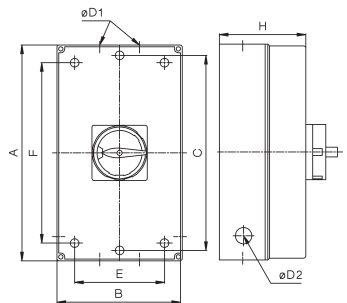
1) Original cover

2) Remove cover parts



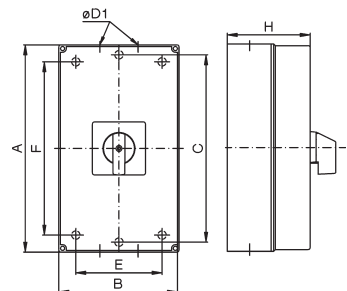
Maintenance and Safety Switches LT(S)..PF..

Type	pole	size	A	B	C	D1	D2	E	F	H
LTS20 PFH.. A. - LTS40 PFH.. A. ³⁾	3, 4	PF1	130	98	120	2x25,5/20,5	-	75	100	76
LTS20 PFLH.. A., LTS40 PFLH A. ³⁾	3, 4	PFL	180	98	170	2x25,5/20,5 / 16,5/12,5-	-	75	150	76
LTS20 PFLH.. A. - LTS40 PFLH.. A. ⁴⁾	6	PFL2	200	140	188,5	40,5/32,5+16,5+12,5 -	-	100	160	86
LTS63 PFLH.. A. - LTS80 PFLH.. A. ⁴⁾	3, 4	PFL2	200	140	188,5	40,5/32,5+16,5+12,5 -	-	100	160	86
LTS85 PFLH.. A. - LTS125 PFLH.. A. ⁵⁾	3, 4	PFL2	200	140	188,5	40,5/32,5+16,5+12,5 -	-	100	160	86
suffix + PF3	3, 4	PFL3	240	176	228,5	2x40,5/32,5	-	120	200	120
suffix + PF3/M50	3, 4	PFL3	240	176	228,5	50,5/40,5	-	120	200	120
LTS20 PFLH.. A. - LTS40 PFLH.. A. ⁵⁾	8	PFL3	240	176	228,5	2x40,5/32,5	-	120	200	120
LTS63 PFLH.. A. - LTS80 PFLH.. A. ⁵⁾	6, 8	PFL3	240	176	228,5	2x40,5/32,5	-	120	200	120
suffix + M50	6, 8	PFL3	240	176	228,5	50,5/40,5	-	120	200	120
LT160 PF..	3	PF4	300	200	-	2x50,5	25,5	172	272	172
LT160 PF..	4	PF5	300	280	-	2x50,5	-	254	254	180



Switch Disconnectors in Plastic Enclosure LTS..PF..

Type	pole	size	A	B	C	D1	E	F	H
LTS20 PF A., LTS40 PF A. ³⁾	3, 4	PF1	130	98	121	2x25,5/20,5	75	100	76
LTS20 PFL A., LTS40 PFL A. ³⁾	3, 4	PFL	180	98	170	2x25,5/20,5 / 16,5/12,5	75	150	76
LTS63 PFL A., LTS80 PFL A. ⁴⁾	3, 4	PFL2	200	140	188,5	40,5/32,5+16,5+12,5	100	160	86
suffix + PF3	3, 4	PFL3	240	176	228,5	2x40,5/32,5	120	200	120
suffix + PF3/M50	3, 4	PFL3	240	176	228,5	50,5/40,5	120	200	120



Max. quantity of poles + aux. contacts in enclosure:

3) LTS40 PF. A5 + LH11

4) LTS40 PFL.. A6, LTS80 PFL.. A5 + LH11, LTS125 PFL.. A4 + LH11

5) LTS40 PFL.. A10, LTS40 PFL.. U4 + LH11, LTS80 PFL.. A8, LTS80 PFL.. A6 + LH11, LTS40 PFL.. U3 + LH11, LTS125 PFL.. A4+LH11



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 Datas
Approvals

315

319



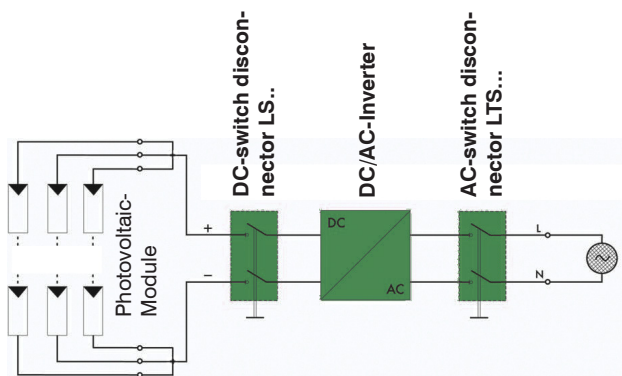
Dimensions

321

Ratings				DC-Switch Disconnectors			
Rated current				Design			
Type	I_{th} open A	DC21B(DC-PV1) 4 poles in series A	at U_e V	Panel mounting 4-hole mounting IP66 ¹⁾	Single hole mounting Ø22,5mm IP66 ¹⁾	Base mounting w. door coupling IP66 ¹⁾ 	Modular switch IP40 ¹⁾
LS16	16	16	1500	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS25	25	25	1500	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS32	32	32	1500	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS38	38	38	1500	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS40	40	40	1500	.. E ..	-	.. VZV ..	.. SMA ..
LS55	55	55	1500	.. E ..	-	.. VZV ..	.. SMA ..
LS65	65	65	1500	.. E ..	-	.. VZV ..	.. SMA ..

Switch Disconnectors for Photovoltaic

Switch disconnectors „LS..“ are switch gears for interrupting the DC/AC-Inverter from the solar-panels. Photovoltaic-installations have to be equipped with DC-isolators according to IEC 60364-7-712.



Switch disconnectors „LS..“ ensures a reliable switching up to 85A with 1500V in the category DC21B (DC-PV1).

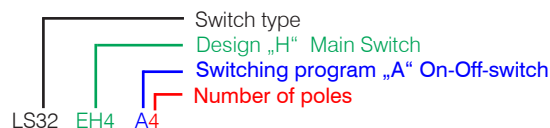
The construction of the contacts and the material selection guarantee that no oxidation (small switching frequency) develops, and is thus prevented inadmissible heating-up.

The switch disconnector has 2, 4, 6 or 8 contacts, by serial or parallel wiring of the contacts the contact rating will be increased. The switching speed at the manually operated handle does not have an effect on the switching attitude of the contacts.

Mounting positions:

No limitations, all kind of positions allowed.

Ordering



Switching programs

Type	2-pole	2+2-pole 2 poles in series +2 poles parallel	4-pole	4-pole with jumpers Input on top Output bottom	4-pole with jumpers Input and Output bottom	4-pole with jumpers Input and Output on top
LS16 ... LS55	.. A2	.. A2+2	.. A4(2 x A2)	.. A4B	.. A4O	.. A4U
Contacts Wiring diagram						
Switching example						

1) Protection in front and built in.

DC-Main Switches

Panel mounting
Four-hole mounting
IP66¹⁾ Type 3R



Single hole mounting
Ø22,5mm IP66¹⁾ Type 4X



Base mounting
with door coupling
IP66¹⁾ Type 4X



Modular
switch IP40¹⁾ Open Type

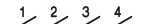
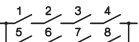


Plastic enclosed
PFL..IP66/67 Type 4X



.. EH4. ..	.. Z(O)H1 ..	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..
.. EH4. ..	.. Z(O)H1 ..	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..
.. EH4. ..	.. Z(O)H1 ..	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..
.. EH4. ..	.. Z(O)H1 ..	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..
.. EH4. ..	-	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..
.. EH4. ..	-	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..
.. EH4. ..	-	.. VZVH4 ..	.. SMAH1 ..	.. PFLH4 ..

Technical Data for DC, according to IEC 60947-3, VDE0660, more data find on page 315.

Type			DC-PSV1 (=DC21B)							
			500V	600V	700V	800V	900V	1000V	1200V	1500V
2 Poles in series 	LS16..	A	16	16	16	16	16	10	7	3
	LS25..	A	25	25	25	20	17	11,5	8,5	5
	LS32..	A	32	32	32	23	20	13	10	6
	LS38..	A	45	45	-	30	-	20	-	-
	LS40..	A	48	48	37	35	31	29	11	7,5
	LS55..	A	55	55	55	55	43	36	17	10
	LS65..	A	75	75	75	65	55	40	17	10
2 Poles in series+2 parallel 	LS16..	A	29	29	22	17	16	10	7	3
	LS25..	A	45	36	27	19	17	11,5	8,5	5
	LS32..	A	58	55	32	23	20	13	10	6
	LS38..	A	-	-	-	30	-	20	-	-
	LS40..	A	72	68	49	42	31	29	11	7,5
	LS55..	A	85	85	77	63	43	36	17	10
	LS65..	A	85	85	80	65	55	40	17	10
4 Poles in series 	LS16..	A	16	16	16	16	16	16	16	16
	LS25..	A	25	25	25	25	25	25	25	25
	LS32..	A	32	32	32	32	32	32	32	32
	LS38..	A	45	45	45	45	45	38	32	32
	LS40..	A	48	48	40	40	40	40	40	40
	LS55..	A	55	55	55	55	55	55	55	55
	LS65..	A	75	75	75	75	75	75	65	65
4 Poles in series+2 parallel 	LS16..	A	29	29	29	29	29	29	29	20
	LS25..	A	45	45	45	45	45	45	45	26
	LS32..	A	58	58	58	58	58	58	50	32
	LS38..	A	-	-	-	-	-	-	-	-
	LS40..	A	72	72	72	72	72	72	56	42
	LS55..	A	85	85	85	85	85	85	65	55
	LS65..	A	85	85	85	85	85	85	65	55

Type	6-pole	3+2-pole 3 poles in series +2 poles parallel	8-pole	4+2-pole 4 poles in series +2 poles parallel
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LS16 ... LS55	...A6	.. A3+2	...A8	.. A4+2
Contacts Wiring diagram				
Switching example				

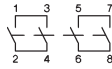
Insulated jumpers LSV-.. for series and parallel switching of contacts see page 325.



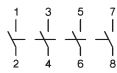
ON-OFF Switches for Panel Mounting, Escutcheon plate 64°, IP66, cULus Type 3R



DC21B / DC-PV1 600V DC 1000V DC		Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A	10A	2	1	LS16 E A2	1	0,20
25A	11,5A	2	1	LS25 E A2	1	0,20
32A	13A	2	1	LS32 E A2	1	0,20
45A	20A	2	1	LS38 E A2	1	0,20
48A	29A	2	1	LS40 E A2	1	0,41
55A	36A	2	1	LS55 E A2	1	0,41
65A	40A	2	1	LS65 E A2	1	0,41



29A	10A	2	1	LS16 E A2+2	1	0,25
36A	11,5A	2	1	LS25 E A2+2	1	0,25
55A	13A	2	1	LS32 E A2+2	1	0,25
-	20A	2	1	LS38 E A2+2	1	0,25
68A	29A	2	1	LS40 E A2+2	1	0,54
85A	36A	2	1	LS55 E A2+2	1	0,54
85A	40A	2	1	LS65 E A2+2	1	0,54

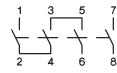


16A	10A	2	2	LS16 E A4	1	0,23
25A	11,5A	2	2	LS25 E A4	1	0,23
32A	13A	2	2	LS32 E A4	1	0,23
45A	20A	2	2	LS38 E A4	1	0,23
48A	29A	2	2	LS40 E A4	1	0,49
55A	36A	2	2	LS55 E A4	1	0,49
65A	40A	2	2	LS65 E A4	1	0,49

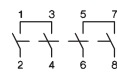
Type suffix



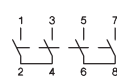
B ..A4B



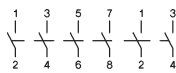
O ..A4O



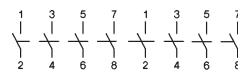
U ..A4U



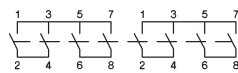
16A	16A	4	1	LS16 E A4.	1	0,24
25A	25A	4	1	LS25 E A4.	1	0,24
32A	32A	4	1	LS32 E A4.	1	0,24
45A	-	4	1	LS38 E A4.	1	0,24
48A	40A	4	1	LS40 E A4.	1	0,52
55A	55A	4	1	LS55 E A4.	1	0,52
-	-	4	1	LS65 E A4.	1	0,52



16A	10A	2	3	LS16 E A6	1	0,36
25A	11,5A	2	3	LS25 E A6	1	0,36
32A	13A	2	3	LS32 E A6	1	0,36
45A	20A	2	3	LS38 E A6	1	0,36
48A	29A	2	3	LS40 E A6	1	0,99
55A	36A	2	3	LS55 E A6	1	0,99
-	-	2	3	LS65 E A6	1	0,99



16A	10A	2	4	LS16 E A8	1	0,41
25A	11,5A	2	4	LS25 E A8	1	0,41
32A	13A	2	4	LS32 E A8	1	0,41
45A	20A	2	4	LS38 E A8	1	0,41
48A	29A	2	4	LS40 E A8	1	1,09
55A	36A	2	4	LS55 E A8	1	1,09
-	-	2	4	LS65 E A8	1	1,09



29A	29A	4	1	LS16 E A4+2	1	0,46
45A	45A	4	1	LS25 E A4+2	1	0,46
58A	58A	4	1	LS32 E A4+2	1	0,46
-	-	4	1	LS38 E A4+2	1	0,46
72A	72A	4	1	LS40 E A4+2	1	1,20
85A	85A	4	1	LS55 E A4+2	1	1,20
85A	85A	4	1	LS65 E A4+2	1	1,20

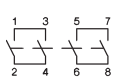
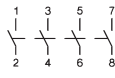
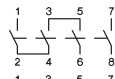
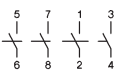
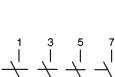
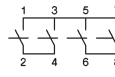
Extended Switch Shaft for all switches for Panel Mounting

Type suffix

+VW"x"

x = panel thickness

ON-OFF Switches for Single Hole Mounting Ø22mm, Escutcheon plate 48², IP66, cUL^{us} Type 4X

		DC21B / DC-PV1 600V DC 1000V DC	Anzahl Pole in Serie	Anzahl Strings	Typ	VPE Stk.	Gewicht kg/Stk.
		16A 10A	2	1	LS16 Z A2	1	0,21
		25A 11,5A	2	1	LS25 Z A2	1	0,21
		32A 13A	2	1	LS32 Z A2	1	0,21
		45A 20A	2	1	LS38 Z A2	1	0,21
		29A 10A	2	1	LS16 Z A2+2	1	0,26
		36A 11,5A	2	1	LS25 Z A2+2	1	0,26
		55A 13A	2	1	LS32 Z A2+2	1	0,26
		- 20A	2	1	LS38 Z A2+2	1	0,26
		16A 10A	2	2	LS16 Z A4	1	0,23
		25A 11,5A	2	2	LS25 Z A4	1	0,23
		32A 13A	2	2	LS32 Z A4	1	0,23
		45A 20A	2	2	LS38 Z A4	1	0,23
Typenzusatz ↓							
		B ..A4B					
		O ..A4O					
		U ..A4U					
		16A 16A	4	1	LS16 Z A4.	1	0,25
		25A 25A	4	1	LS25 Z A4.	1	0,25
		32A 32A	4	1	LS32 Z A4.	1	0,25
		45A -	4	1	LS38 Z A4.	1	0,25
		16A 10A	2	3	LS16 Z A6	1	0,38
		25A 11,5A	2	3	LS25 Z A6	1	0,38
		32A 13A	2	3	LS32 Z A6	1	0,38
		45A 20A	2	3	LS38 Z A6	1	0,38
		16A 10A	2	4	LS16 Z A8	1	0,43
		25A 11,5A	2	4	LS25 Z A8	1	0,43
		32A 13A	2	4	LS32 Z A8	1	0,43
		45A 20A	2	4	LS38 Z A8	1	0,43
		29A 29A	4	1	LS16 Z A4+2	1	0,48
		45A 45A	4	1	LS25 Z A4+2	1	0,48
		58A 58A	4	1	LS32 Z A4+2	1	0,48
		- -	4	1	LS38 Z A4+2	1	0,48

ON-OFF Switches for Single Hole Mounting Ø22mm, without Escutcheon plate, IP66, cUL^{us} Type 4X



Replace the Type „Z“ with „ZO“

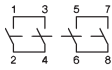
LS.. ZO A.

ON-OFF Switches f. Base Mounting w. Door Clutch f. Single Hole, Plate 64[□], IP66, cUL^{us} Type 4X

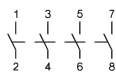


DC21B / DC-PV1 600V DC 1000V DC	Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A 10A	2	1	LS16 VZV A2	1	0,22
25A 11,5A	2	1	LS25 VZV A2	1	0,22
32A 13A	2	1	LS32 VZV A2	1	0,22
45A 20A	2	1	LS38 VZV A2	1	0,22
48A 29A	2	1	LS40 VZV A2	1	0,51
55A 36A	2	1	LS55 VZV A2	1	0,51
65A 40A	2	1	LS65 VZV A2	1	0,51

Depth is adjustable



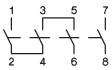
29A 10A	2	1	LS16 VZV A2+2	1	0,27
36A 11,5A	2	1	LS25 VZV A2+2	1	0,27
55A 13A	2	1	LS32 VZV A2+2	1	0,27
- 20A	2	1	LS38 VZV A2+2	1	0,27
68A 29A	2	1	LS40 VZV A2+2	1	0,55
85A 36A	2	1	LS55 VZV A2+2	1	0,55
85A 40A	2	1	LS65 VZV A2+2	1	0,55



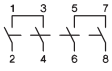
16A 10A	2	2	LS16 VZV A4	1	0,25
25A 11,5A	2	2	LS25 VZV A4	1	0,25
32A 13A	2	2	LS32 VZV A4	1	0,25
45A 20A	2	2	LS38 VZV A4	1	0,25
48A 29A	2	2	LS40 VZV A4	1	0,56
55A 36A	2	2	LS55 VZV A4	1	0,56
65A 40A	2	2	LS65 VZV A4	1	0,56

Type suffix

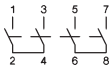
↓
B ..A4B



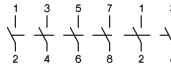
O ..A4O



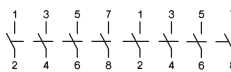
U ..A4U



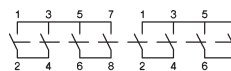
16A 16A	4	1	LS16 VZV A4.	1	0,26
25A 25A	4	1	LS25 VZV A4.	1	0,26
32A 32A	4	1	LS32 VZV A4.	1	0,26
45A -	4	1	LS38 VZV A4.	1	0,26
48A 40A	4	1	LS40 VZV A4.	1	0,58
55A 55A	4	1	LS55 VZV A4.	1	0,58
- -	4	1	LS65 VZV A4.	1	0,58



16A 10A	2	3	LS16 VZV A6	1	0,38
25A 11,5A	2	3	LS25 VZV A6	1	0,38
32A 13A	2	3	LS32 VZV A6	1	0,38
45A 20A	2	3	LS38 VZV A6	1	0,38
48A 29A	2	3	LS40 VZV A6	1	1,00
55A 36A	2	3	LS55 VZV A6	1	1,00
- -	2	3	LS65 VZV A6	1	1,00



16A 10A	2	4	LS16 VZV A8	1	0,43
25A 11,5A	2	4	LS25 VZV A8	1	0,43
32A 13A	2	4	LS32 VZV A8	1	0,43
45A 20A	2	4	LS38 VZV A8	1	0,43
48A 29A	2	4	LS40 VZV A8	1	1,10
55A 36A	2	4	LS55 VZV A8	1	1,10
- -	2	4	LS65 VZV A8	1	1,10

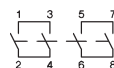


29A 29A	4	1	LS16 VZV A4+2	1	0,48
45A 45A	4	1	LS25 VZV A4+2	1	0,48
58A 58A	4	1	LS32 VZV A4+2	1	0,48
- -	4	1	LS38 VZV A4+2	1	0,48
72A 72A	4	1	LS40 VZV A4+2	1	1,21
85A 85A	4	1	LS55 VZV A4+2	1	1,21
85A 85A	4	1	LS65 VZV A4+2	1	1,21

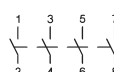
ON-OFF Switches for Distribution Boards, IP40, cULus Open Type



DC21B / DC-PV1 600V DC 1000V DC		Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A	10A	2	1	LS16 SMA A2	1	0,19
25A	11,5A	2	1	LS25 SMA A2	1	0,19
32A	13A	2	1	LS32 SMA A2	1	0,19
45A	20A	2	1	LS38 SMA A2	1	0,19
48A	29A	2	1	LS40 SMA A2	1	0,41
55A	36A	2	1	LS55 SMA A2	1	0,41
65A	40A	2	1	LS65 SMA A2	1	0,41



29A	10A	2	1	LS16 SMA A2+2	1	0,24
36A	11,5A	2	1	LS25 SMA A2+2	1	0,24
55A	13A	2	1	LS32 SMA A2+2	1	0,24
-	20A	2	1	LS38 SMA A2+2	1	0,24
68A	29A	2	1	LS40 SMA A2+2	1	0,52
85A	36A	2	1	LS55 SMA A2+2	1	0,52
85A	40A	2	1	LS65 SMA A2+2	1	0,52

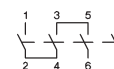


16A	10A	2	2	LS16 SMA A4	1	0,22
25A	11,5A	2	2	LS25 SMA A4	1	0,22
32A	13A	2	2	LS32 SMA A4	1	0,22
45A	20A	2	2	LS38 SMA A4	1	0,22
48A	29A	2	2	LS40 SMA A4	1	0,45
55A	36A	2	2	LS55 SMA A4	1	0,45
65A	40A	2	2	LS65 SMA A4	1	0,45

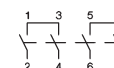
Type suffix



B ..A4B



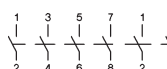
O ..A4O



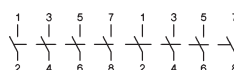
U ..A4U



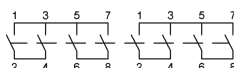
16A	16A	4	1	LS16 SMA A4.	1	0,23
25A	25A	4	1	LS25 SMA A4.	1	0,23
32A	32A	4	1	LS32 SMA A4.	1	0,23
45A	-	4	1	LS32 SMA A4.	1	0,23
48A	40A	4	1	LS40 SMA A4.	1	0,49
55A	55A	4	1	LS55 SMA A4.	1	0,49
-	-	4	1	LS65 SMA A4.	1	0,49



16A	10A	2	3	LS16 SMA A6	1	0,35
25A	11,5A	2	3	LS25 SMA A6	1	0,35
32A	13A	2	3	LS32 SMA A6	1	0,35
45A	20A	2	3	LS38 SMA A6	1	0,35
48A	29A	2	3	LS40 SMA A6	1	0,89
55A	36A	2	3	LS55 SMA A6	1	0,89
-	-	2	3	LS65 SMA A6	1	0,89



16A	10A	2	4	LS16 SMA A8	1	0,40
25A	11,5A	2	4	LS25 SMA A8	1	0,40
32A	13A	2	4	LS32 SMA A8	1	0,40
45A	20A	2	4	LS38 SMA A8	1	0,40
48A	29A	2	4	LS40 SMA A8	1	0,99
55A	36A	2	4	LS55 SMA A8	1	0,99
-	-	2	4	LS65 SMA A8	1	0,99



29A	29A	4	1	LS16 SMA A4+2	1	0,43
45A	45A	4	1	LS25 SMA A4+2	1	0,43
58A	58A	4	1	LS32 SMA A4+2	1	0,43
-	-	4	1	LS38 SMA A4+2	1	0,43
72A	72A	4	1	LS40 SMA A4+2	1	1,01
85A	85A	4	1	LS55 SMA A4+2	1	1,01
85A	85A	4	1	LS65 SMA A4+2	1	1,01

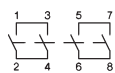
Main Switches for Panel Mounting, Escutcheon plate 64[□], IP66, Type 3R



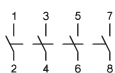
padlock device SV4



DC21B / DC-PV1 600V DC 1000V DC		Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A	10A	2	1	LS16 EH4 A2	1	0,21
25A	11,5A	2	1	LS25 EH4 A2	1	0,21
32A	13A	2	1	LS32 EH4 A2	1	0,21
45A	20A	2	1	LS38 EH4 A2	1	0,21
48A	29A	2	1	LS40 EH4 A2	1	0,43
55A	36A	2	1	LS55 EH4 A2	1	0,43
65A	40A	2	1	LS65 EH4 A2	1	0,43



29A	10A	2	1	LS16 EH4 A2+2	1	0,26
36A	11,5A	2	1	LS25 EH4 A2+2	1	0,26
55A	13A	2	1	LS32 EH4 A2+2	1	0,26
-	20A	2	1	LS38 EH4 A2+2	1	0,26
68A	29A	2	1	LS40 EH4 A2+2	1	0,57
85A	36A	2	1	LS55 EH4 A2+2	1	0,57
85A	40A	2	1	LS65 EH4 A2+2	1	0,57

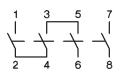


16A	10A	2	2	LS16 EH4 A4	1	0,24
25A	11,5A	2	2	LS25 EH4 A4	1	0,24
32A	13A	2	2	LS32 EH4 A4	1	0,24
45A	20A	2	2	LS38 EH4 A4	1	0,24
48A	29A	2	2	LS40 EH4 A4	1	0,50
55A	36A	2	2	LS55 EH4 A4	1	0,50
65A	40A	2	2	LS65 EH4 A4	1	0,50

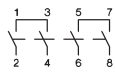
Type suffix



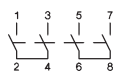
B ..A4B



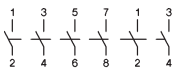
O ..A4O



U ..A4U



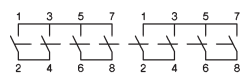
16A	16A	4	1	LS16 EH4 A4.	1	0,25
25A	25A	4	1	LS25 EH4 A4.	1	0,25
32A	32A	4	1	LS32 EH4 A4.	1	0,25
45A	-	4	1	LS38 EH4 A4.	1	0,25
48A	40A	4	1	LS40 EH4 A4.	1	0,53
55A	55A	4	1	LS55 EH4 A4.	1	0,53
-	-	4	1	LS65 EH4 A4.	1	0,53



16A	10A	2	3	LS16 EH4 A6	1	0,37
25A	11,5A	2	3	LS25 EH4 A6	1	0,37
32A	13A	2	3	LS32 EH4 A6	1	0,37
45A	20A	2	3	LS38 EH4 A6	1	0,37
48A	29A	2	3	LS40 EH4 A6	1	0,53
55A	36A	2	3	LS55 EH4 A6	1	0,53
-	-	2	3	LS65 EH4 A6	1	0,53



16A	10A	2	4	LS16 EH4 A8	1	0,42
25A	11,5A	2	4	LS25 EH4 A8	1	0,42
32A	13A	2	4	LS32 EH4 A8	1	0,42
45A	20A	2	4	LS38 EH4 A8	1	0,42
48A	29A	2	4	LS40 EH4 A8	1	1,10
55A	36A	2	4	LS55 EH4 A8	1	1,10
-	-	2	4	LS65 EH4 A8	1	1,10



29A	29A	4	1	LS16 EH4 A4+2	1	0,47
45A	45A	4	1	LS25 EH4 A4+2	1	0,47
58A	58A	4	1	LS32 EH4 A4+2	1	0,47
-	-	4	1	LS38 EH4 A4+2	1	0,47
72A	72A	4	1	LS40 EH4 A4+2	1	1,21
85A	85A	4	1	LS55 EH4 A4+2	1	1,21
85A	85A	4	1	LS65 EH4 A4+2	1	1,21

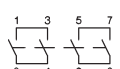
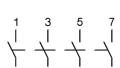
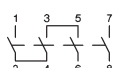
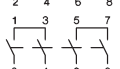
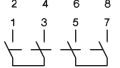
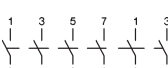
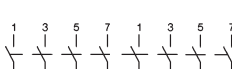
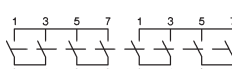
Extended Switch Shaft for all switches for panel mounting

Type suffix

+ VW"x"

x = panel thickness

Main Switches for Single Hole Mounting Ø22mm, Escutcheon plate 48°, IP66, Type 4X

		DC21B / DC-PV1 600V DC 1000V DC	Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
		16A 10A	2	1	LS16 ZH1 A2	1	0,21
		25A 11,5A	2	1	LS25 ZH1 A2	1	0,21
		32A 13A	2	1	LS32 ZH1 A2	1	0,21
		45A 20A	2	1	LS38 ZH1 A2	1	0,21
Sperrvorrichtung SV1		29A 10A	2	1	LS16 ZH1 A2+2	1	0,27
		36A 11,5A	2	1	LS25 ZH1 A2+2	1	0,27
		55A 13A	2	1	LS32 ZH1 A2+2	1	0,27
		- 20A	2	1	LS38 ZH1 A2+2	1	0,27
		16A 10A	2	2	LS16 ZH1 A4	1	0,24
		25A 11,5A	2	2	LS25 ZH1 A4	1	0,24
		32A 13A	2	2	LS32 ZH1 A4	1	0,24
		45A 20A	2	2	LS38 ZH1 A4	1	0,24
Typenzusatz ↓							
B ..A4B		16A 16A	4	1	LS16 ZH1 A4.	1	0,25
		25A 25A	4	1	LS25 ZH1 A4.	1	0,25
		32A 32A	4	1	LS32 ZH1 A4.	1	0,25
		45A -	4	1	LS38 ZH1 A4.	1	0,25
O ..A4O							
U ..A4U							
		16A 10A	2	3	LS16 ZH1 A6	1	0,39
		25A 11,5A	2	3	LS25 ZH1 A6	1	0,39
		32A 13A	2	3	LS32 ZH1 A6	1	0,39
		45A 20A	2	3	LS38 ZH1 A6	1	0,39
		16A 10A	2	4	LS16 ZH1 A8	1	0,44
		25A 11,5A	2	4	LS25 ZH1 A8	1	0,44
		32A 13A	2	4	LS32 ZH1 A8	1	0,44
		45A 20A	2	4	LS38 ZH1 A8	1	0,44
		29A 29A	4	1	LS16 ZH1 A4+2	1	0,49
		45A 45A	4	1	LS25 ZH1 A4+2	1	0,49
		58A 58A	4	1	LS32 ZH1 A4+2	1	0,49
		- -	4	1	LS38 ZH1 A4+2	1	0,49

Main Switches, Single Hole Mounting Ø22mm, without Escutcheon plate, IP66, Type 4X

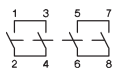
Replace the Type „ZH1“ with „ZOH1“ **LS.. ZOH1 A.**

Main Switches f. Base Mounting, Door Clutch f. Single Hole, Plate 64[□], IP66, Type 4X

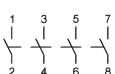


DC21B / DC-PV1 600V DC 1000V DC		Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A	10A	2	1	LS16 VZVH4 A2	1	0,23
25A	11,5A	2	1	LS25 VZVH4 A2	1	0,23
32A	13A	2	1	LS32 VZVH4 A2	1	0,23
45A	20A	2	1	LS38 VZVH4 A2	1	0,23
48A	29A	2	1	LS40 VZVH4 A2	1	0,51
55A	36A	2	1	LS55 VZVH4 A2	1	0,51
65A	40A	2	1	LS65 VZVH4 A2	1	0,51

Depth is adjustable
see page 322
padlock device SV4



29A	10A	2	1	LS16 VZVH4 A2+2	1	0,28
36A	11,5A	2	1	LS25 VZVH4 A2+2	1	0,28
55A	13A	2	1	LS32 VZVH4 A2+2	1	0,28
-	20A	2	1	LS38 VZVH4 A2+2	1	0,28
68A	29A	2	1	LS40 VZVH4 A2+2	1	0,65
85A	36A	2	1	LS55 VZVH4 A2+2	1	0,65
85A	40A	2	1	LS65 VZVH4 A2+2	1	0,65

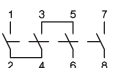


16A	10A	2	2	LS16 VZVH4 A4	1	0,26
25A	11,5A	2	2	LS25 VZVH4 A4	1	0,26
32A	13A	2	2	LS32 VZVH4 A4	1	0,26
45A	20A	2	2	LS38 VZVH4 A4	1	0,26
48A	29A	2	2	LS40 VZVH4 A4	1	0,58
55A	36A	2	2	LS55 VZVH4 A4	1	0,58
65A	40A	2	2	LS65 VZVH4 A4	1	0,58

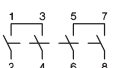
Type suffix



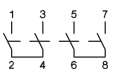
B ..A4B



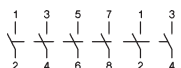
O ..A4O



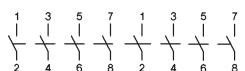
U ..A4U



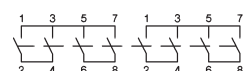
16A	16A	4	1	LS16 VZVH4 A4.	1	0,27
25A	25A	4	1	LS25 VZVH4 A4.	1	0,27
32A	32A	4	1	LS32 VZVH4 A4.	1	0,27
45A	-	4	1	LS38 VZVH4 A4.	1	0,27
48A	40A	4	1	LS40 VZVH4 A4.	1	0,62
55A	55A	4	1	LS55 VZVH4 A4.	1	0,62
-	-	4	1	LS65 VZVH4 A4.	1	0,62



16A	10A	2	3	LS16 VZVH4 A6	1	0,39
25A	11,5A	2	3	LS25 VZVH4 A6	1	0,39
32A	13A	2	3	LS32 VZVH4 A6	1	0,39
45A	20A	2	3	LS38 VZVH4 A6	1	0,39
48A	29A	2	3	LS40 VZVH4 A6	1	1,00
55A	36A	2	3	LS55 VZVH4 A6	1	1,00
-	-	2	3	LS65 VZVH4 A6	1	1,00



16A	10A	2	4	LS16 VZVH4 A8	1	0,44
25A	11,5A	2	4	LS25 VZVH4 A8	1	0,44
32A	13A	2	4	LS32 VZVH4 A8	1	0,44
45A	20A	2	4	LS38 VZVH4 A8	1	0,44
48A	29A	2	4	LS40 VZVH4 A8	1	1,11
55A	36A	2	4	LS55 VZVH4 A8	1	1,11
-	-	2	4	LS65 VZVH4 A8	1	1,11



29A	29A	4	1	LS16 VZVH4 A4+2	1	0,49
45A	45A	4	1	LS25 VZVH4 A4+2	1	0,49
58A	58A	4	1	LS32 VZVH4 A4+2	1	0,49
-	-	4	1	LS38 VZVH4 A4+2	1	0,49
72A	72A	4	1	LS40 VZVH4 A4+2	1	1,22
85A	85A	4	1	LS55 VZVH4 A4+2	1	1,22
85A	85A	4	1	LS65 VZVH4 A4+2	1	1,22

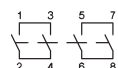
Main Switches for Distribution Boards, lockable, IP40, Open Type



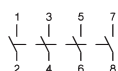
Padlock device SV1



DC21B / DC-PV1 600V DC 1000V DC		Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A	10A	2	1	LS16 SMAH1 A2	1	0,19
25A	11,5A	2	1	LS25 SMAH1 A2	1	0,19
32A	13A	2	1	LS32 SMAH1 A2	1	0,19
45A	20A	2	1	LS38 SMAH1 A2	1	0,19
48A	29A	2	1	LS40 SMAH1 A2	1	0,40
55A	36A	2	1	LS55 SMAH1 A2	1	0,40
65A	40A	2	1	LS65 SMAH1 A2	1	0,40



29A	10A	2	1	LS16 SMAH1 A2+2 ¹⁾	1	0,25
36A	11,5A	2	1	LS25 SMAH1 A2+2 ¹⁾	1	0,25
55A	13A	2	1	LS32 SMAH1 A2+2 ¹⁾	1	0,25
-	20A	2	1	LS38 SMAH1 A2+2 ¹⁾	1	0,25
68A	29A	2	1	LS40 SMAH1 A2+2	1	0,54
85A	36A	2	1	LS55 SMAH1 A2+2	1	0,54
85A	40A	2	1	LS65 SMAH1 A2+2	1	0,54

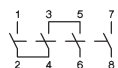


16A	10A	2	2	LS16 SMAH1 A4 ¹⁾	1	0,22
25A	11,5A	2	2	LS25 SMAH1 A4 ¹⁾	1	0,22
32A	13A	2	2	LS32 SMAH1 A4 ¹⁾	1	0,22
45A	20A	2	2	LS38 SMAH1 A4 ¹⁾	1	0,22
48A	29A	2	2	LS40 SMAH1 A4	1	0,47
55A	36A	2	2	LS55 SMAH1 A4	1	0,47
65A	40A	2	2	LS65 SMAH1 A4	1	0,47

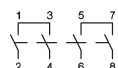
Type suffix



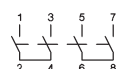
B ..A4B



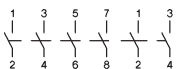
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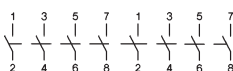
U ..A4U



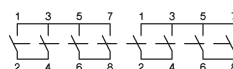
16A	16A	4	1	LS16 SMAH1 A4. ¹⁾	1	0,23
25A	25A	4	1	LS25 SMAH1 A4. ¹⁾	1	0,23
32A	32A	4	1	LS32 SMAH1 A4. ¹⁾	1	0,23
45A	-	4	1	LS38 SMAH1 A4. ¹⁾	1	0,23
48A	40A	4	1	LS40 SMAH1 A4.	1	0,50
55A	55A	4	1	LS55 SMAH1 A4.	1	0,50
-	-	4	1	LS65 SMAH1 A4.	1	0,50



16A	10A	2	3	LS16 SMAH1 A6	1	0,36
25A	11,5A	2	3	LS25 SMAH1 A6	1	0,36
32A	13A	2	3	LS32 SMAH1 A6	1	0,36
45A	20A	2	3	LS38 SMAH1 A6	1	0,36
48A	29A	2	3	LS40 SMAH1 A6	1	0,90
55A	36A	2	3	LS55 SMAH1 A6	1	0,90
-	-	2	3	LS65 SMAH1 A6	1	0,90



16A	10A	2	4	LS16 SMAH1 A8	1	0,41
25A	11,5A	2	4	LS25 SMAH1 A8	1	0,41
32A	13A	2	4	LS32 SMAH1 A8	1	0,41
45A	20A	2	4	LS38 SMAH1 A8	1	0,41
48A	29A	2	4	LS40 SMAH1 A8	1	0,41
55A	36A	2	4	LS55 SMAH1 A8	1	0,41
-	-	2	4	LS65 SMAH1 A8	1	0,41



29A	29A	4	1	LS16 SMAH1 A4+2	1	0,46
45A	45A	4	1	LS25 SMAH1 A4+2	1	0,46
58A	58A	4	1	LS32 SMAH1 A4+2	1	0,46
-	-	4	1	LS38 SMAH1 A4+2	1	0,46
72A	72A	4	1	LS40 SMAH1 A4+2	1	1,12
85A	85A	4	1	LS55 SMAH1 A4+2	1	1,12
85A	85A	4	1	LS65 SMAH1 A4+2	1	1,12

¹⁾ Main Switches for Distribution Boards with low height handle, IP40, Open Type

With type suffix „+SV1N“, e.g.: **LS.. SMAH1 A2+2 +SV1N**

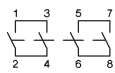
Main Switches in Plastic Enclosure, Escutcheon plate 64⁰, IP66/67, Type 4X



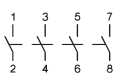
Padlock device SV4



DC21B / DC-PV1 600V DC 1000V DC		Poles in series	Number of strings	Type	Pack pcs.	Weight kg/pcs.
16A	10A	2	1	LS16 PFLH4 A2	1	0,43
25A	11,5A	2	1	LS25 PFLH4 A2	1	0,43
32A	13A	2	1	LS32 PFLH4 A2	1	0,43
45A	20A	2	1	LS38 PFLH4 A2	1	0,43
48A	29A	2	1	LS40 PFLH4 A2 ¹⁾	1	1,59
55A	36A	2	1	LS55 PFLH4 A2 ¹⁾	1	1,59
65A	40A	2	1	LS65 PFLH4 A2 ¹⁾	1	1,59



29A	10A	2	1	LS16 PFLH4 A2+2	1	0,49
36A	11,5A	2	1	LS25 PFLH4 A2+2	1	0,49
55A	13A	2	1	LS32 PFLH4 A2+2	1	0,49
-	20A	2	1	LS38 PFLH4 A2+2	1	0,49
68A	29A	2	1	LS40 PFLH4 A2+2 ¹⁾	1	1,74
85A	36A	2	1	LS55 PFLH4 A2+2 ¹⁾	1	1,74
85A	40A	2	1	LS65 PFLH4 A2+2 ¹⁾	1	1,74

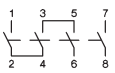


16A	10A	2	2	LS16 PFLH4 A4	1	0,46
25A	11,5A	2	2	LS25 PFLH4 A4	1	0,46
32A	13A	2	2	LS32 PFLH4 A4	1	0,46
45A	20A	2	2	LS38 PFLH4 A4	1	0,46
48A	29A	2	2	LS40 PFLH4 A4 ¹⁾	1	1,67
55A	36A	2	2	LS55 PFLH4 A4 ¹⁾	1	1,67
65A	40A	2	2	LS65 PFLH4 A4 ¹⁾	1	1,67

Type suffix

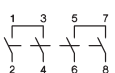


B ..A4B



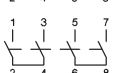
16A	16A	4	1	LS16 PFLH4 A4.	1	0,47
25A	25A	4	1	LS25 PFLH4 A4.	1	0,47

O ..A4O

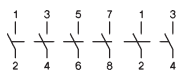


32A	32A	4	1	LS32 PFLH4 A4.	1	0,47
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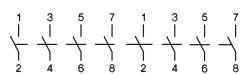
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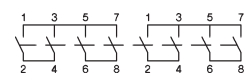
45A	-	4	1	LS38 PFLH4 A4.	1	0,47
48A	40A	4	1	LS40 PFLH4 A4. ¹⁾	1	1,70
55A	55A	4	1	LS55 PFLH4 A4. ¹⁾	1	1,70
-	-	4	1	LS65 PFLH4 A4. ¹⁾	1	1,70



16A	10A	2	3	LS16 PFLH4 A6	1	1,53
25A	11,5A	2	3	LS25 PFLH4 A6	1	1,53
32A	13A	2	3	LS32 PFLH4 A6	1	1,53
45A	20A	2	3	LS38 PFLH4 A6	1	1,53
48A	29A	2	3	LS40 PFLH4 A6	1	1,87
55A	36A	2	3	LS55 PFLH4 A6	1	1,87
-	-	2	3	LS65 PFLH4 A6	1	1,87



16A	10A	2	4	LS16 PFLH4 A8	1	1,58
25A	11,5A	2	4	LS25 PFLH4 A8	1	1,58
32A	13A	2	4	LS32 PFLH4 A8	1	1,58
45A	20A	2	4	LS38 PFLH4 A8	1	1,58
48A	29A	2	4	LS40 PFLH4 A8	1	1,94
55A	36A	2	4	LS55 PFLH4 A8	1	1,94
-	-	2	4	LS65 PFLH4 A8	1	1,94



29A	29A	4	1	LS16 PFLH4 A4+2	1	1,63
45A	45A	4	1	LS25 PFLH4 A4+2	1	1,63
58A	58A	4	1	LS32 PFLH4 A4+2	1	1,63
-	-	4	1	LS38 PFLH4 A4+2	1	1,63
72A	72A	4	1	LS40 PFLH4 A4+2	1	2,07
85A	85A	4	1	LS55 PFLH4 A4+2	1	2,07
85A	85A	4	1	LS65 PFLH4 A4+2	1	2,07

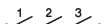
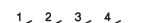
¹⁾ **Small Plastic Enclosure:** Type plus Type-suffix „+PF2“

z.B.: **LS.. PFLH4 A2+2 +PF2** (Dimensions see page 325)

Technical Data

Kind of current	Category	Typical applications	Test conditions for the number of on-load operating cycles (normal service)						Test conditions for making and breaking capacities (operation in fault case)					
			Make I _e	U _e /U _e	L/R	Break I _c /I _e	U _r /U _e	L/R	Make I _e	U _e /U _e	L/R	Break I _c /I _e	U _r /U _e	L/R
Direct current	DC21A frequent operation	DC21B infrequent operation	Switching of resistive loads including moderate overloads						1,5	1,05	1ms	1,5	1,05	1ms
	DC22A frequent operation	DC22B infrequent operation	Switching of mixed resistive a.induct. loads incl. moderate overloads (shunt motors)						4	1,05	2,5ms	4	1,05	2,5ms
	DC-PV1		Switching of single PV string(s) without reverse- and overcurrents.						1,5	1,05	1ms	1,5	1,05	1ms
	DC-PV2		Switching of several PV strings with reverse- and overcurrents.						4	1,05	1ms	4	1,05	1ms

Data according to IEC 60947-3, VDE 0660, GB/T14048.3 (CCC China)

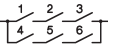
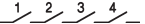
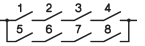
Main contacts			Typ	LS16	LS25	LS32	LS38	LS40	LS55
Rated thermal current I _{th}			A	16	25	32	45	48	55
Rated insulation voltage U _i ¹⁾			V	1000	1000	1000	1000	1500	1500
Rated insulation voltage U _i ²⁾			V	1500	1500	1500	1500	1500	1500
Distance of contacts (per pole)			mm	8	8	8	8	8	8
Rated operational current I_e									
DC21A and DC21B	1 pole A1	300V	A	16	23	27	27	40	55
		400V	A	12/14	14/22	16/25	16/25	30/33	40/44
		500V	A	9/10	11/17	13/20	13/20	19/24	25/32
		600V	A	6/7	8/12	10/15	10/15	15/19	20/25
only DC21B		700V	A	4,5/5	6	7,5	7,5	10/12	15/18
		800V	A	3	4	5	5	8/10	10/13
		900V	A	2,5/3	3	4	4	6/8	8/10
		1000V	A	1,5/2	2	2,5/3	2,5/3	4/5	6/8
	2 poles in series A2	500V	A	16	25	32	- /45	48	55
		600V	A	16	25	32	- /45	48	55
		700V	A	16	23/25	27/32	- /36	35/37	55
		800V	A	16/16	20	- /23	- /30	35	45/55
		900V	A	13/16	16/17	- /20	- /25	25/31	35/43
		1000V	A	9/10	11/11,5	13	- /20	25/29	- /36
		1200V	A	6/7	8/8,5	10	10	10/11	15/17
		1500V	A	3	4/5	5/6	- /6	6/7,5	7,5/10
	2 poles in series + 2 poles parallel A2+2	500V	A	29	45	58	- /65	72	85
		600V	A	29	45	50/55	-	64/68	80/85
		700V	A	16/22	23/27	27/32	-	35/49	55/77
		800V	A	16/17	20	- /23	- /30	35/42	45/63
	900V	A	13/16	16/17	- /20	-	25/31	35/43	
	1000V	A	9/10	11/11,5	13	- /20	23/29	25/36	
	1200V	A	6/7	8/8,5	10	-	10/11	15/17	
	1500V	A	3	4/5	5/6	- /6	6/7,5	7,5/10	
3 poles in series + 2 poles parallel A3+2	500V	A	29	45	58	-	72	85	
	600V	A	29	45	50/58	-	72	85	
	700V	A	29	38/43	45/55	-	72	85	
	800V	A	29	38/40	- /51	-	68	85	
	900V	A	29	- /38	- /47	-	62	78	
	1000V	A	29	- /38	- /45	-	58	70	
	1200V	A	12	14/25	16/28	-	-	-	
	1500V	A	9	11/14	13/20	-	-	-	
4 poles in series A4	500V	A	16	25	32	- /45	48	55	
	600V	A	16	25	32	- /45	48	55	
	700V	A	16	25	32	-	40	55	
	800V	A	16	25	32	-	40	55	
	900V	A	16	25	32	-	40	55	
	1000V	A	16	25	32	- /38	40	55	
	1200V	A	16	25	32	-	40	55	
	1500V	A	16	20/25	23/32	- /32	30/40	40/55	
4 poles in series + 2 poles parallel A4+2	500V	A	29	45	58	- /65	72	85	
	600V	A	29	45	58	-	72	85	
	700V	A	29	45	- /58	-	72	85	
	800V	A	29	45	- /58	-	72	85	
	900V	A	29	45	- /58	-	72	85	
	1000V	A	29	- /45	- /58	- /65	- /72	- /85	
	1200V	A	29	- /45	50	- /50	- /56	- /65	
	1500V	A	16	20/26	23/32	- /32	- /42	- /55	
Rated operational current I_e									
AC21B	A2, A4	U _e max. 440V	A	16	25	32	45	48	55
	A2+2	U _e max. 440V	A	29	45	58		72	85

1) Suitable at overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} = 8kV.

2) Suitable at overvoltage category I to III, pollution degree 2 (min. IP55): U_{imp} = 8kV.

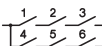
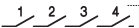
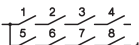
Technical Data

Data according to IEC 60947-3, VDE 0660

Main contacts	Type		LS16	LS25	LS32	LS38	LS40	LS55	LS65
Rated operational current I_e									
DC-PV1 1 Pole A1 	300V	A	16	23	27	27	40	55	65
	400V	A	14	22	25	25	33	44	50
	500V	A	10	17	20	20	24	32	40
	600V	A	7	12	15	15	19	25	30
	700V	A	5	6	7,5	7,5	12	18	21
	800V	A	3	4	5	5	10	13	15
	900V	A	3	3	4	4	8	10	10
	1000V	A	2	2	3	3	5	8	8
	1100V	A	8	10	11,5	-	19	25	-
	1200V	A	7	8,5	10	10	11	17	17
2 Poles in series A2 	500V	A	16	25	32	45	48	55	75
	600V	A	16	25	32	45	48	55	75
	700V	A	16	25	32	36	37	55	75
	800V	A	16	20	23	30	35	55	65
	900V	A	16	17	20	25	31	43	55
	1000V	A	10	11,5	13	20	29	36	40
	1100V	A	8	10	11,5	-	19	25	-
	1200V	A	7	8,5	10	10	11	17	17
	1300V	A	6	7	8	-	10	14	-
	1400V	A	5	6	7	-	9	12	-
2 Poles in series + 2 Pole parallel A2+2 	500V	A	29	45	58	65	72	85	85
	600V	A	29	45	55	58	68	85	85
	700V	A	22	27	32	36	49	77	80
	800V	A	17	20	23	30	42	63	65
	900V	A	16	17	20	25	31	43	55
	1000V	A	10	11,5	13	20	29	36	40
	1100V	A	8	10	11,5	-	19	25	-
	1200V	A	7	8,5	10	10	11	17	17
	1300V	A	6	7	8	-	10	14	-
	1400V	A	5	6	7	-	9	12	-
3 Poles in series + 2 Poles parallel A3+2 	500V	A	29	45	58	-	72	85	-
	600V	A	29	45	58	-	72	85	-
	700V	A	29	43	55	-	72	85	-
	800V	A	29	40	51	-	68	85	-
	900V	A	29	38	47	-	62	78	-
	1000V	A	29	38	45	-	58	70	-
	1100V	A	19	27	37	-	-	-	-
	1200V	A	17	25	28	-	-	-	-
	1300V	A	15	21	25	-	-	-	-
	1400V	A	12	18	22	-	-	-	-
4 Poles in series A4 	500V	A	16	25	32	45	48	55	75
	600V	A	16	25	32	45	48	55	75
	700V	A	16	25	32	45	48	55	75
	800V	A	16	25	32	45	48	55	75
	900V	A	16	25	32	45	48	55	75
	1000V	A	16	25	32	38	40	55	75
	1100V	A	16	25	32	32	40	55	65
	1200V	A	16	25	32	32	40	55	65
	1300V	A	16	25	32	32	40	55	65
	1400V	A	16	25	32	32	40	55	65
4 Poles in series + 2 Poles parallel A4+2 	500V	A	29	45	58	65	72	85	85
	600V	A	29	45	58	65	72	85	85
	700V	A	29	45	58	65	72	85	85
	800V	A	29	45	58	65	72	85	85
	900V	A	29	45	58	65	72	85	85
	1000V	A	29	45	58	65	72	85	85
	1100V	A	29	45	54	-	60	68	-
	1200V	A	29	45	50	50	56	65	65
	1300V	A	26	39	44	-	50	61	-
	1400V	A	23	33	38	-	46	-	-
	1500V	A	20	26	32	32	42	55	55

Technical Data

Data according to IEC 60947-3, VDE 0660

Main contacts	Type		LS16	LS25	LS32	LS38	LS40	LS55	LS65
Rated operational current I_e									
DC-PV2 1 Pole A1 	300V	A	16	23	27	27	40	55	-
	400V	A	14	18	20	20	30	40	-
	500V	A	10	12	14	14	19	25	-
	600V	A	5	6	8	8	10	13	-
	700V	A	1,5	2	3	3	7	10	-
	800V	A	1,5	2	3	3	6	8	-
	900V	A	1	1,5	2	2	5	6	-
	1000V	A	1	1,5	2	2	3	4	-
	500V	A	16	25	32	38	40	55	65
	600V	A	14	21	27	31	40	55	65
	700V	A	13	19	22	25	35	55	65
	800V	A	12	15	17	19	33	49	52
	900V	A	8	10	12	14	25	35	38
	1000V	A	4	5	6	7	16	20	20
	1100V	A	3	4	5	-	11	15	-
	1200V	A	2	3	4	4	8	12	12
	1300V	A	1,5	2	3	-	7	10	-
	1400V	A	1	2	3	-	7	9	-
	1500V	A	1	1,5	2	2	6	8	8
2 Poles in series A2 	500V	A	25	39	50	58	72	85	85
	600V	A	20	32	35	38	60	75	75
	700V	A	13	19	22	25	38	60	65
	800V	A	12	15	17	19	33	49	52
	900V	A	8	10	12	14	25	35	38
	1000V	A	4	5	6	7	16	20	20
	1100V	A	3	4	5	-	11	15	-
	1200V	A	2	3	4	4	8	12	12
	1300V	A	1,5	2	3	-	7	10	-
	1400V	A	1	2	3	-	7	9	-
	1500V	A	1	1,5	2	2	6	8	8
2 Poles in series + 2 Poles parallel A2+2 	500V	A	27	45	58	65	72	85	-
	600V	A	22	34	44	48	78	-	-
	700V	A	20	28	34	35	62	69	-
	800V	A	18	24	29	31	53	61	-
	900V	A	16	20	24	24	55	-	-
	1000V	A	14	18	20	20	35	50	-
	1100V	A	-	-	-	-	-	-	-
	1200V	A	11	13	15	15	-	-	-
	1300V	A	-	-	-	-	-	-	-
	1400V	A	-	-	-	-	-	-	-
	1500V	A	4	6	8	8	-	-	-
3 Poles in series + 2 Poles parallel A3+2 	500V	A	16	25	32	45	48	55	65
	600V	A	16	25	32	45	48	55	65
	700V	A	16	25	32	45	48	55	65
	800V	A	16	25	32	38	40	55	65
	900V	A	16	25	32	38	40	55	65
	1000V	A	16	25	32	38	40	55	65
	1100V	A	15	25	32	-	-	55	-
	1200V	A	13,5	21	27	40	55	55	55
	1300V	A	12	19	24	-	50	-	-
	1400V	A	10,5	16	21	-	45	-	-
	1500V	A	9	14	18	18	30	40	40
4 Poles in series A4 	500V	A	29	45	58	65	72	85	-
	600V	A	29	45	58	65	72	85	-
	700V	A	25	40	53	65	72	80	-
	800V	A	21	35	45	60	67	75	-
	900V	A	18	30	37	55	59	70	-
	1000V	A	16	25	32	50	52	64	-
	1100V	A	-	-	-	-	44	59	-
	1200V	A	13,5	21	27	27	40	55	-
	1300V	A	-	-	-	-	36	50	-
	1400V	A	-	-	-	-	33	45	-
	1500V	A	9	14	18	18	30	40	-
4 Poles in series + 2 Poles parallel A4+2 	500V	A	29	45	58	65	72	85	-
	600V	A	29	45	58	65	72	85	-
	700V	A	25	40	53	65	72	80	-
	800V	A	21	35	45	60	67	75	-
	900V	A	18	30	37	55	59	70	-
	1000V	A	16	25	32	50	52	64	-
	1100V	A	-	-	-	-	44	59	-
	1200V	A	13,5	21	27	27	40	55	-
	1300V	A	-	-	-	-	36	50	-
	1400V	A	-	-	-	-	33	45	-
	1500V	A	9	14	18	18	30	40	-

Contactors, Motor-Starters

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

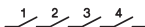
DC-Switch Disconnectors

Push Buttons

Representatives, Suppliers

Technical Data

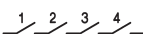
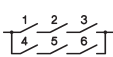
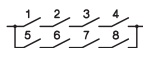
Data according to IEC 60947-3, VDE 0660

Main contacts			Type	LS16	LS25	LS32	LS38	LS40	LS55/LS65
Rated operational current I_e DC22B 1 pole A1  2 poles in series A2  4 poles in series A4 	500V	A	1	1,25	1,5	x	x	2,5	
	600V	A	0,5	0,75	1	x	x	2,0	
	800V	A	0,3	0,4	0,5	x	x	1,5	
	1000V	A	0,15	0,2	0,25	x	x	1,0	
	1200V	A	-	-	-	x	x	x	
	1500V	A	-	-	-	x	x	x	
	500V	A	7	8	9	x	x	x	
	600V	A	5,5	6	6,5	x	x	x	
	800V	A	2	2,5	3	x	x	x	
	1000V	A	1	1,5	2	x	x	x	
	1200V	A	-	-	-	x	x	x	
	1500V	A	-	-	-	x	x	x	
	500V	A	16	25	32	x	x	x	
	600V	A	16	25	27,5	x	x	x	
	800V	A	11,5	12	12,5	x	x	x	
	1000V	A	8	9	10	x	x	x	
	1200V	A	-	-	-	x	x	x	
	1500V	A	-	-	-	x	x	x	
	Rated conditional short-circuit current		kA _{eff}	5	5	5	5	10	10
	Max. fuse size		gL (gG)	40	63	80	80	125	160
Mechanical life		x10 ³	10	10	10	10	10	10	
Rated short-time withstand current (1s)	I _{cw} A2, A4, A6, A8	A	800	900	1000	1000	A2, A4: 1200	A2, A4: 1400	
	A2+2, A3+2, A4+2	A	1300	1500	1700	1700	A2+2: 2000	A2+2: 2400	
Short circuit making capacity	I _{cm} A2, A4, A6, A8	A	800	900	1000	1000	A2, A4: 1200	A2, A4: 1400	
	A2+2, A3+2, A4+2	A	1300	1500	1700	1700	A2+2: 2000	A2+2: 2400	
Maximum cable cross sections (incl. jumper)			LSV-B1	LSV-B1	LSV-B1	LSV-B1	LSV-B2	LSV-B2	
solid or stranded	mm ²	4 - 16	4 - 16	4 - 16	4-16	2,5 - 25	2,5 - 25		
flexible	mm ²	4 - 10	4 - 10	4 - 10	4-10	2,5 - 16	2,5 - 16		
flexible (+ multicore cable end)	mm ²	4 - 10	4 - 10	4 - 10	4-10	1,5 - 16	1,5 - 16		
Size of terminal screw		M4 Pz2	M4 Pz2	M4 Pz2	M4 Pz2	M5 Pz2	M5 Pz2		
Tightening torque	Nm	1,8 - 2	1,8 - 2	1,8 - 2	1,8 - 2	2,5 - 2,8	2,5 - 2,8		
2 cables per terminal without jumper LSV-B1 / LSV-B2									
solid or stranded	mm ²	16+(1,5-2,5) / 10+(1,5-6) / 6+(1,5-10) / 4+(1,5-10)					16+(1,5-2,5) / 10+(1,5-10) / 6+(1,5-10) / 4+(1,5-10)		
flexible	mm ²	16+(1,5-2,5) / 10+(1,5-4) / 6+(1,5-6)					16+(1,5-6) / 10+(1,5-10) / 6+(1,5-16) / 4+(1,5-16)		
& flexible + multicore cable end									
stranded	AWG	8+(16-12) / 10+(16-10) / 12+(16-8) 14+(16-8)					3+(18-10) / 4+(18-10) / 6+(18-8) 8+(18-8)		
solid	AWG	10+(16-12) / 12+(16-10) 14+(16-10)					10+(16-10) / 12+(16-10) / 14+(16-10) 12+(16-10)/14+(16-10)		
Maximum ambient temperature									
Operation	open	°C	-40 to +65						
	enclosed	°C	-40 to +45						
Storage		°C	-50 to +90						
Power loss per switch at I _e max.			A	A	A		A	A	
A2	(A)/W	(16)/ 1	(25)/ 2,3	(32)/ 3,7		(40)/ 4	(55)/ 7,5		
A4	(A)/W	(16)/ 2	(25)/ 4,6	(32)/ 7,4		(40)/ 8	(55)/ 15		
A6	(A)/W	(16)/ 3	(25)/ 6,9	(32)/ 11,1		(40)/ 12	(55)/ 22,5		
A8	(A)/W	(16)/ 4	(25)/ 9,2	(32)/ 14,8		(40)/ 16	(55)/ 30		
A2+2	(A)/W	(29)/1,5	(45)/ 3,7	(58)/ 6		(72)/ 6,5	(85)/ 9		
A3+2	(A)/W	(29)/2,3	(45)/ 5,6	(58)/ 9		(72)/ 9,8	(85)/ 14		
A4+2	(A)/W	(29)/3	(45)/ 7,4	(58)/ 12		(72)/ 13	(85)/ 18		
Contact resistance per pole		mΩ	1,75	1,75	1,75		1,25	1,25	

x pending

Technical Data

Daten according to UL508  File E359344 Category np.: NMSJ and UL508  File E332938, Category no.: NRNT2, NRNT8

LISTED				LS16	LS25	LS32	LS38	LS40	LS55	LS65	
Ampere-Rating	"General use"	DC									
	1 Pole	350V	A	4	5	6	6	7,1	10,0	10,0	
		500V	A	4	5	6	6	5,7	7,0	7,0	
		600V	A	4	5	6	6	5,0	5,8	5,8	
		700V	A	-	-	-	-	3,9	5,0	5,0	
		800V	A	-	-	-	-	3,2	4,4	4,4	
		900V	A	-	-	-	-	2,5	3,5	3,5	
		1000V	A	-	-	-	-	1,5	2,0	2,0	
	2 Poles in series A2	350V	A	16	25	32	45	48	55	65	
		500V	A	16	25	32	45	48	55	65	
		600V	A	16	25	32	36	40	55	65	
		700V	A	-	-	-	-	32	46	50	
		800V	A	-	-	-	-	26	37	40	
		900V	A	-	-	-	-	20	28	32	
		1000V	A	-	-	-	-	16	20	25	
	2 Poles in series + 2 Poles parallel A2+2	350V	A	29	45	58	58	72	85	85	
		500V	A	29	41	43	45	53	66	73	
		600V	A	21	30	33	36	42	55	65	
		700V	A	-	-	-	-	35	47	50	
		800V	A	-	-	-	-	30	40	40	
		900V	A	-	-	-	-	26	32	32	
		1000V	A	-	-	-	-	22	25	25	
	4 Poles in series A4	350V	A	16	25	32	45	48	55	65	
		500V	A	16	25	32	45	48	55	65	
		600V	A	16	25	32	36	40	55	65	
		700V	A	-	-	-	-	40	55	65	
		800V	A	-	-	-	-	40	55	65	
		900V	A	-	-	-	-	40	55	65	
		1000V	A	-	-	-	-	40	55	65	
	3 Poles in series + 2 Poles parallel A3+2	350V	A	29	45	58	58	72	85	85	
		500V	A	29	41	50	50	56	80	85	
		600V	A	21	38	45	45	52	65	72	
		700V	A	-	-	-	-	46	58	66	
		800V	A	-	-	-	-	40	51	60	
		900V	A	-	-	-	-	36	45	54	
		1000V	A	-	-	-	-	33	42	48	
	4 Poles in series + 2 Poles parallel A4+2	350V	A	29	45	58	58	80	85	85	
		500V	A	29	45	58	58	71	85	85	
		600V	A	29	45	50	50	65	85	85	
		700V	A	-	-	-	-	58	76	85	
		800V	A	-	-	-	-	51	71	76	
		900V	A	-	-	-	-	45	67	73	
		1000V	A	-	-	-	-	42	64	70	
AC-Rating	"General use"										
2 Poles in series		1 phase	600V	A	16	25	32	-	40	55	-
2 Poles in series		1 phase	277V	A	-	-	50	-	72	85	-
+ 2 Poles parallel											
3 Poles		3 phase	480V	A	-	-	32	-	40	55	-
Fuse size (RK5) Industrial Control Switch											
5kA / 600V				A	40	60	80	80	-	-	-
5kA/1000V				A	-	-	-	-	160	160	160
Max. cable cross sections incl. jumpers LSV-B1 / LSV-B2											
solid				AWG	12 - 10	12 - 10	12 - 10	12 - 10	16 - 10	16 - 10	
flexible or stranded				AWG	12 - 6	12 - 6	12 - 6	12 - 6	14 - 3	14 - 3	
flexible (+ multicore cable end)				AWG	12 - 6	12 - 6	12 - 6	12 - 6	16 - 4	16 - 4	
Size of terminal screw					M4 Pz2	M4 Pz2	M4 Pz2	M4 Pz2	M5 Pz2	M5 Pz2	
Tightening torque				Nm	1,8 - 2	1,8 - 2	1,8 - 2	1,8 - 2	2,5 - 2,8	2,5 - 2,8	
Protection class of terminals ¹⁾					IP20	IP20	IP20	IP20	IP20	IP20	

1) Protection class of the terminals with connected, insulated conductors.

Approvals

Country	USA, UL508 	US, Canada UL508 	Europe 	China CCC 	CB- Certificates	EAC 
Type						
LS16	o	o	/	o	o	o
LS25	o	o	/	o	o	o
LS32	o	o	/	o	o	o
LS38	o	o	/	o	o	o
LS40, LS55	o	o	/	o	o	o
LS65	o	o	/	-	o	o

o In standard version approved

/ No testing required CE

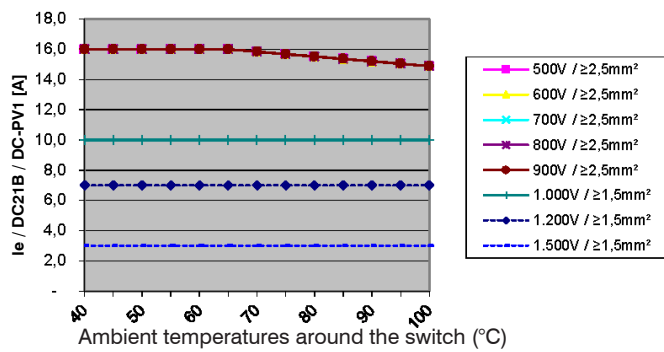
x In test

- Not provided for test

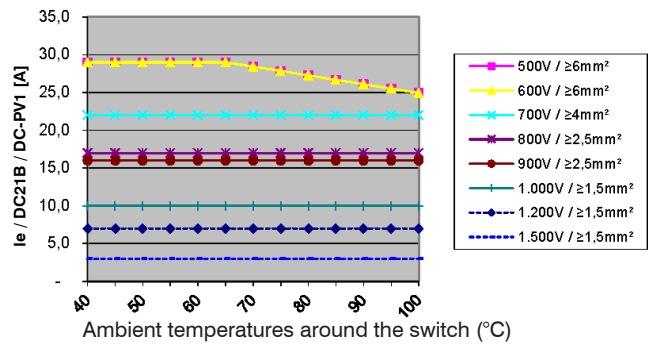
Technical Data

Example for maximum currents according to ambient temperatures and cable cross sections:

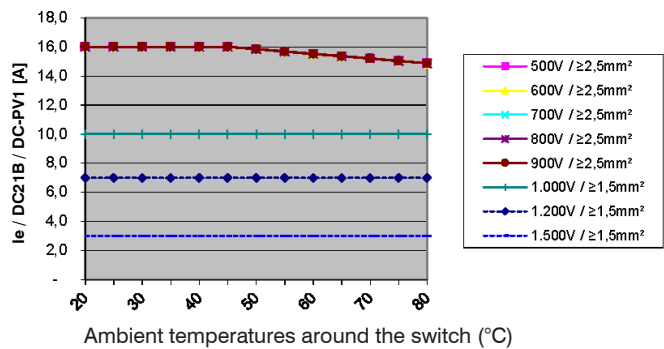
Switch **open** LS16..., 2 contacts in series (A2)



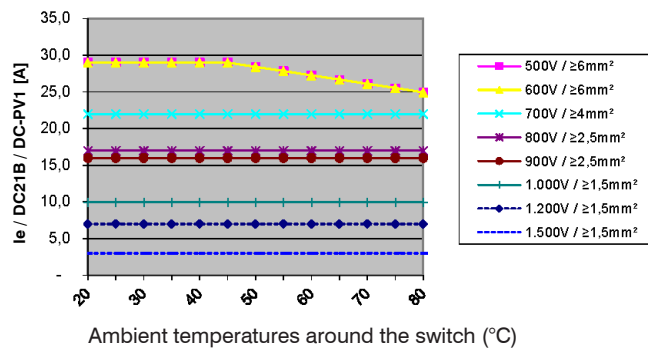
Switch **open** LS16 ..., 2 contacts in series + 2 parallel (A2+2)



Switch **enclosed** LS16 PFL..., 2 contacts in series (A2)



Switch **enclosed** LS16 PFL..., 2 contacts in series + 2 parallel (A2+2)



All data about maximum currents according to ambient temperatures and cable cross sections for switches LS16.. to LS65.. (open or enclosed) please find under ➡ www.benedict.at (Button "Customers").

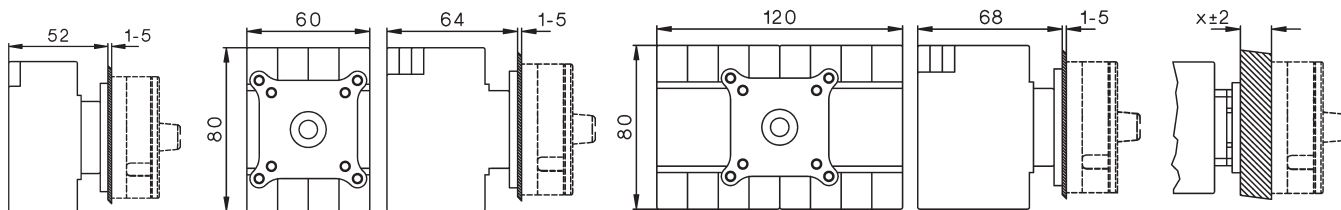
Dimensions

LS16 E.., LS25 E.., LS32 E.., LS38E..
..A2

..A2+2, ..A4.

LS16 E.., LS25 E.., LS32 E.., LS38 E
..A6, ..A8, ..A3+2, ..A4+2

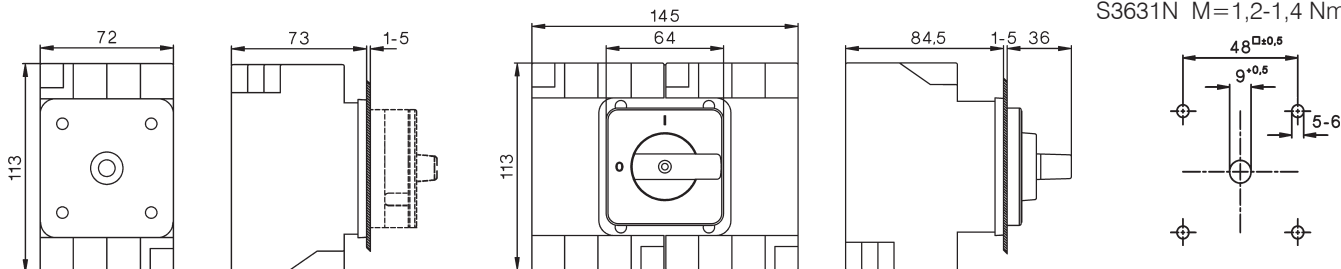
LS... +VW"x"
Extended Switch Shaft



LS40 E.., LS55 E.., LS65E..
..A2, ..A2+2, ..A4.

LS40 E.., LS55 E.., LS65E..
..A6, ..A8, ..A3+2, ..A4+2

Mounting hole
Mounting screw:
S3631N M=1,2-1,4 Nm

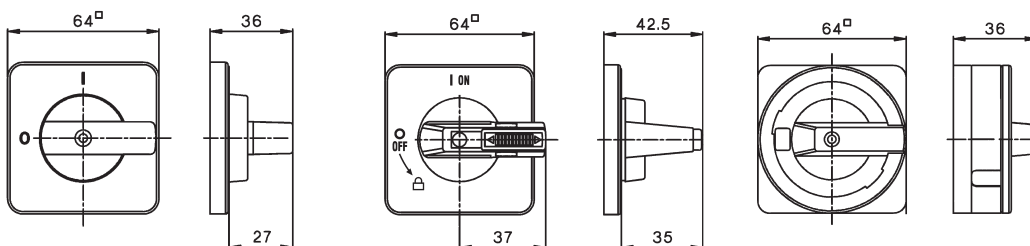


Escutcheon plate 64[□]

Handle

Padlock device SV1.

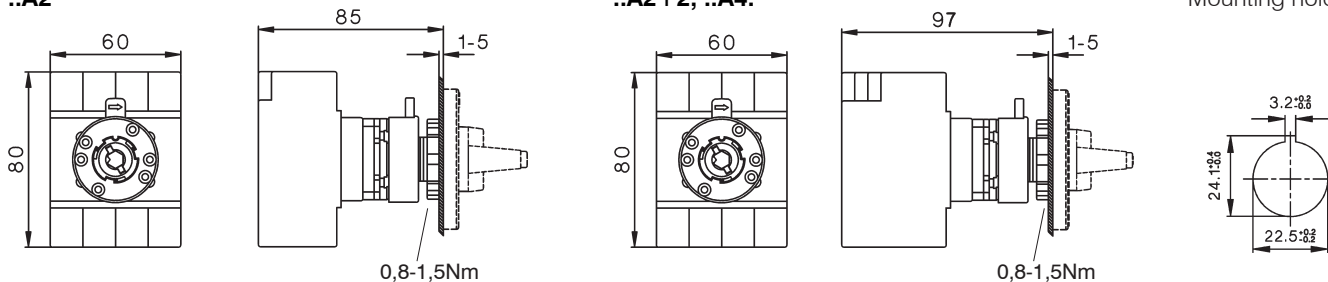
Padlock device SV4.



LS16 Z.., LS25 Z.., LS32 Z.., LS38 Z..
..A2

..A2+2, ..A4.

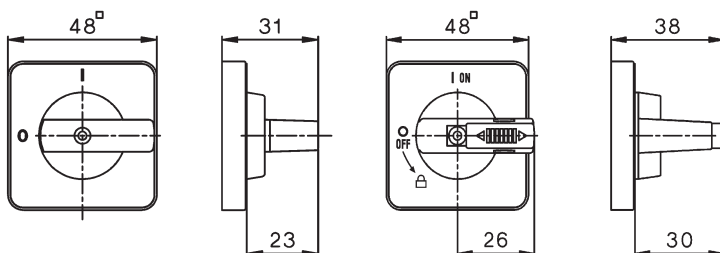
Mounting hole



Escutcheon plate 48[□]

Handle

Padlock device SV1.



LS.. ZO..

Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

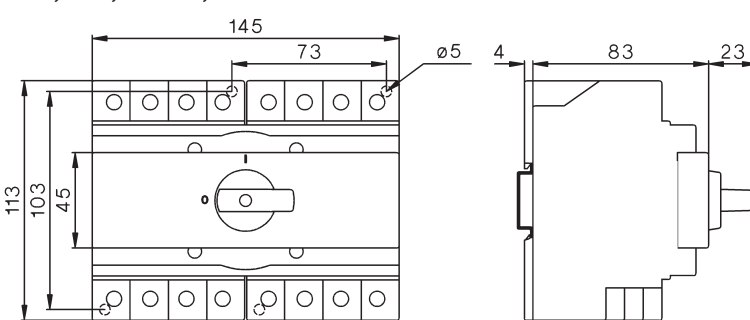
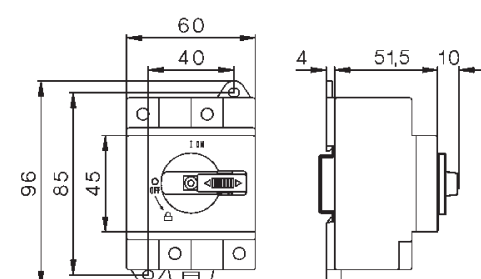
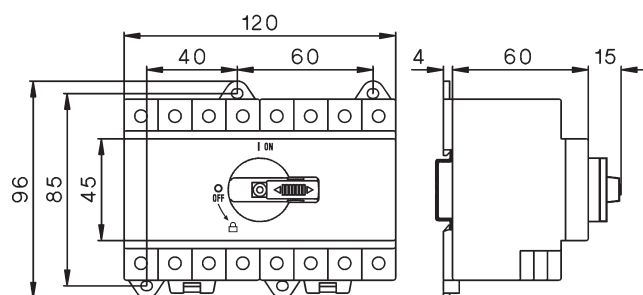
Switches

AC-Main Switches

DC-Switch Disconnect

Push Buttons

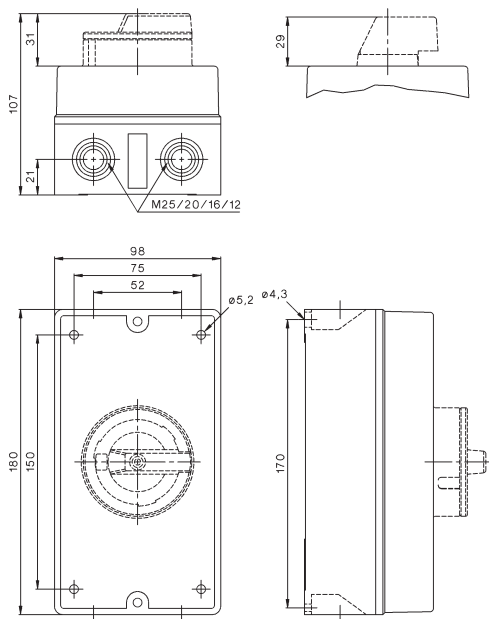
Representatives, Suppliers

[illegible][illegible][illegible]

Dimensions

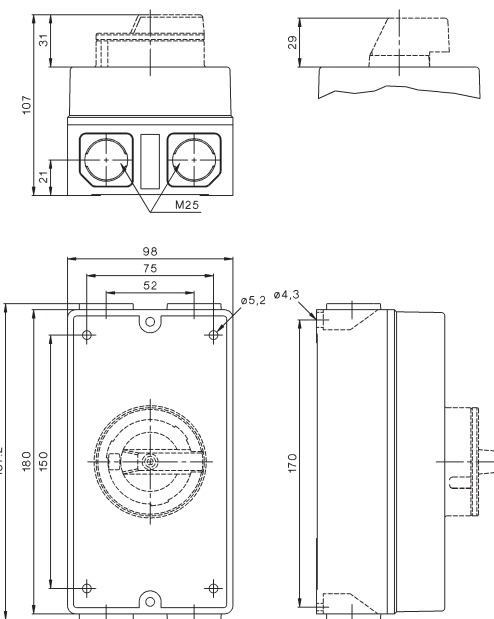
**LS16 PFL..., LS25 PFL..., LS32 PFL..., LS38 PFL..
..A2, ..A2+2, ..A4.**

**Main-Switch (lockable)
LS..PFLH4 A..**



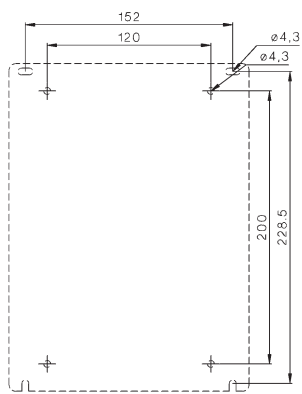
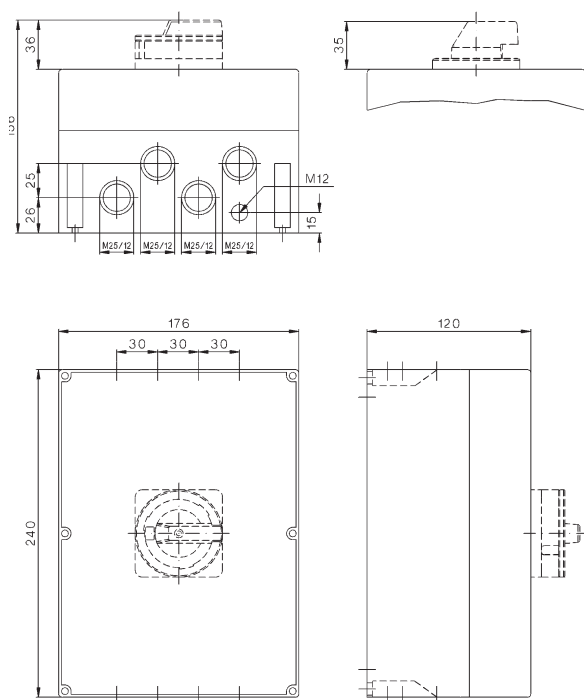
**LS16 PFL..., LS25 PFL..., LS32 PFL..., LS38 PFL..
..A2, ..A2+2, ..A4.
+ M25**

**Main-Switch (lockable)
LS..PFLH4 A..**



**LS16 PFL..., LS25 PFL..., LS32 PFL..., LS38 PFL...,
..A2, ..A4, ..A6, ..A8, ..A2+2, ..A3+2, ..A4+2
LS40 PFL..., LS55 PFL..., LS65 PFL..
..A6, ..A8, ..A3+2, ..A4+2**

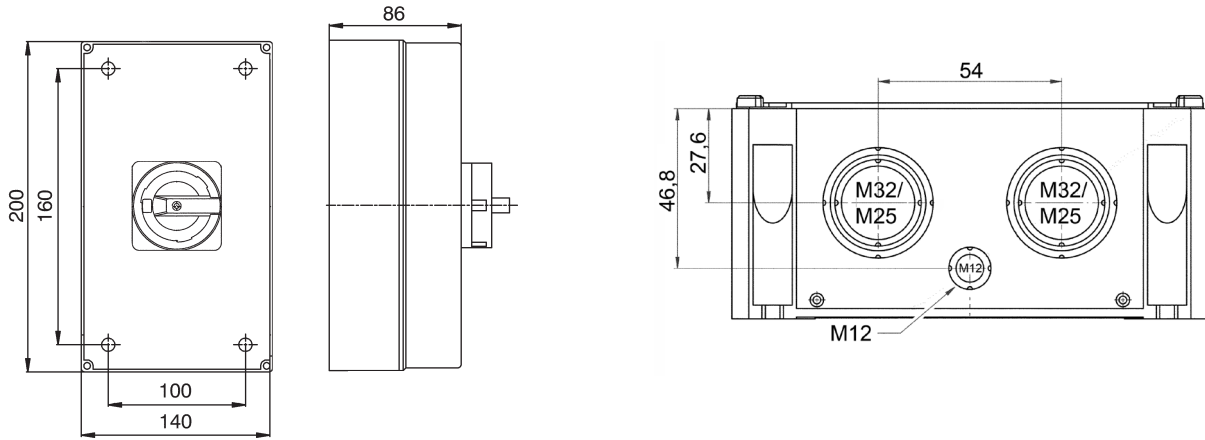
**Main-Switch (lockable)
LS..PFLH4 A..**



Dimensions

LS40 PFL..., LS55 PFL..., LS65 PFL..
..A2, ..A4, ..A2+2

Main switch (lockable)
LS..PFLH4 A.. +PF2 (small enclosure)



Insulated jumpers LSV-.. for series- and parallel switching of contacts:

for switches	Type	Pack	Weight
LS16, LS25, LS32, LS38	LSV-B1-1	100	7,0 g/pcs.
LS16, LS25, LS32, LS38	LSV-B1-2	100	12,0 g/pcs.
LS40, LS55, LS65	LSV-B2-1	100	9,0 g/pcs.
LS40, LS55, LS65	LSV-B2-2	100	17,0 g/pcs.

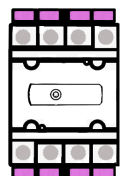
Typ	LS16	LS25	LS32	LS38	LS40	LS55	LS65
A4O A4U A4B	2 x  LSV-B1-1 N			2 x  LSV-B1-2 N	2 x  LSV-B2-2 N		
A2+2	4 x  LSV-B1-1 N				4 x  LSV-B2-1 N		
A4+2	8 x  LSV-B1-1 N				8 x  LSV-B2-1 N		
	2 x  LSV-B1-2 N				2 x  LSV-B2-2 N		

Applications:

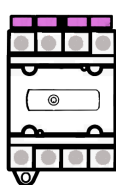
LS16-38 VZV.. A2+2



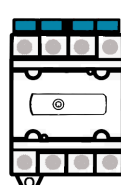
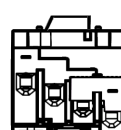
2x LSV-B1-1



LS16-32 VZV.. A4O



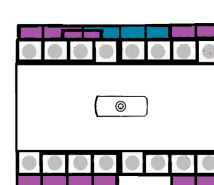
LS38 VZV.. A4O



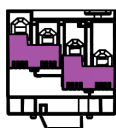
LS16-38 VZV.. A4+2



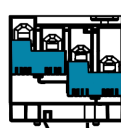
4x LSV-B1-1



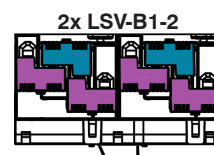
2x LSV-B1-1



2x LSV-B1-1



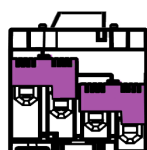
2x LSV-B1-2



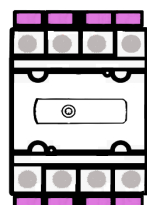
2x LSV-B1-2

4x LSV-B1-1

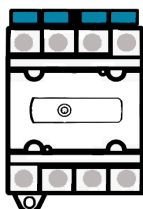
LS40-65 VZV.. A2+2



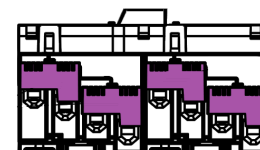
2x LSV-B2-1



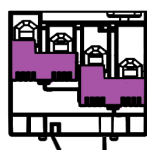
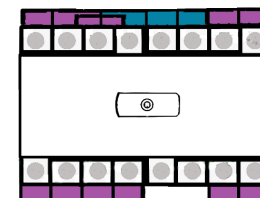
LS40-65 VZV.. A4O



LS40-65 VZV.. A4+2



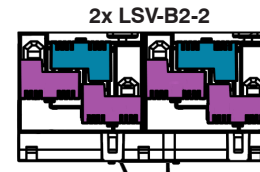
4x LSV-B2-1



2x LSV-B2-1



2x LSV-B2-2



2x LSV-B2-2

4x LSV-B2-1

Further applications for switches LS16.. to LS65.. please find under ➡ www.benedict.at (Button "Certificates/Declarations").

**Program B3**

Push Buttons	329
EMERGENCY STOP Buttons	330
Key Operated Rotary Switches	331
Rotary Knobs and Swing Knobs	331
Illuminated Rotary Knobs and Swing Knobs	332
Illuminated Push Buttons	332
Double Push Buttons	332
Lens Caps	333
Monoblock-Multi-LEDs	333
Push Button-Sets	334
Illuminated Push Button-Sets	334
Pilot Lights-Sets	335
Connectors	336
Insert Actuator	336
Contact Blocks and Lamp Holders	336
Lamps, LED Lamps	337
Accessories	337
Label Holder, Legend Plates, Actuator Caps	338

**Program B5**

Push Buttons	341
Rotary Knobs and Swing Knobs	342
Key Operated Rotary Switches	343
Illuminated Push Buttons	343
Lens Caps	343
Connectors	344
Contact Blocks and Lamp Holders	344
Lamps, Accessories	345


Units for Surface Mounting
 Assembled Units IP65
**Enclosures BG.**
 Contact Blocks and Lamp Holders
 for Enclosures BG..

Push Buttons for Enclosures
 Extensions for Push Buttons
**Technical Data**

Approvals	350
Dimensions	351

Actuators and Lens Caps 22mm IP67 (IP65), Type 12

Push Buttons



→ page 329



IP65

→ page 331,
332

EMERGENCY STOP Buttons



→ page 330

Illuminated Operators



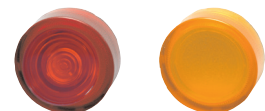
→ page 331, 332

Double Push Buttons with Indicator Lamp, IP65



→ page 332

Lens Caps



→ page 333

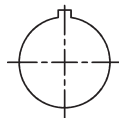
Mono Block Multi Chip LED IP65, IEC 60947, EN 60947



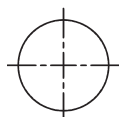
→ page 333

Mounting hole
Ø 22,5mm

with key way



without key way



→ page 330



→ page 336

Connectors



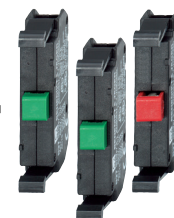
Thickness
0,5 - 4 mm
→ page 336

or



Thickness
1 - 6 mm
→ page 336

Contacts Lamp Holders



Actuator insert
→ page 336



→ page 336



LED
24-230V



Filament
6-130V



Glow-discharge
230V
→ page 337

Wrech for Actuators
Lens Caps and
Mono Block Multi Chip LED
J7049



Actuators 22mm IP67, Type 12

Ring

Colour Symbol

Alu

Black

Chrome

Pack
pcs.

Weight
kg/pc.

Push Buttons, Actuator Caps markable see page 337



red		B3D RT	BS3D RT	BC3D RT	10	0,014
red	0	B3D RT-0	BS3D RT-0	BC3D RT-0	10	0,014
green		B3D GN	BS3D GN	BC3D GN	10	0,014
grün	I	B3D GN-I	BS3D GN-I	BC3D GN-I	10	0,014
grün	II	B3D GN-II	BS3D GN-II	BC3D GN-II	10	0,014
grün	→	B3D GN-PF	BS3D GN-PF	BC3D GN-PF	10	0,014
yellow		B3D GE	BS3D GE	BC3D GE	10	0,014
blue		B3D BL	BS3D BL	BC3D BL	10	0,014
white		B3D WS	BS3D WS	BC3D WS	10	0,014
black		B3D SW	BS3D SW	BC3D SW	10	0,014
black	→	B3D SW-PF	BS3D SW-PF	BC3D SW-PF	10	0,014

Push Buttons, Maintained, Actuator Caps markable see page 339



red		B3DR RT	BS3DR RT	BC3DR RT	10	0,014
green		B3DR GN	BS3DR GN	BC3DR GN	10	0,014
yellow		B3DR GE	BS3DR GE	BC3DR GE	10	0,014
blue		B3DR BL	BS3DR BL	BC3DR BL	10	0,014
white		B3DR WS	BS3DR WS	BC3DR WS	10	0,014
black		B3DR SW	BS3DR SW	BC3DR SW	10	0,014

Mushroom Head Ø28mm



red		B3P1 RT	BS3P1 RT	BC3P1 RT	10	0,017
red	0	B3P1 RT-0	BS3P1 RT-0	BC3P1 RT-0	10	0,017
green		B3P1 GN	BS3P1 GN	BC3P1 GN	10	0,017
yellow		B3P1 GE	BS3P1 GE	BC3P1 GE	10	0,017
blue		B3P1 BL	BS3P1 BL	BC3P1 BL	10	0,017
black		B3P1 SW	BS3P1 SW	BC3P1 SW	10	0,017

Mushroom Head Ø40mm



red	0	B3P14 RT-0	BS3P14 RT-0	BC3P14 RT-0	10	0,020
-----	---	------------	-------------	-------------	----	-------

Mushroom Head Ø40mm



red		BS3P44T RT	BS3P44T RT	BS3P44T RT	10	0,028
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Foot and Palm switch Ø70mm



red		BS3P14P RT	BS3P14P RT	BS3P14P RT	1	0,062
grey		BS3P14P GR	BS3P14P GR	BS3P14P GR	1	0,062

Actuators 22mm IP67, Type 12

Ring	Colour	Symbol/ high				Pack pcs.	Weight kg/pc
			Alu	Black	Chrome		

EMERGENCY STOP Push Buttons, according to EN ISO 13850, push to trip, pull to release Ø40mm



red	30mm	BS3P44 RT	BS3P44 RT	BS3P44 RT	10	0,028
red	38mm	BS3P45 RT	BS3P45 RT	BS3P45 RT	10	0,028

EMERGENCY STOP Push Buttons, according to EN ISO 13850, release by key, Ø40mm



red	38mm	BS3P44S3	BS3P44S3	BS3P44S3	1	0,050
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Spare Key	lock Ronis R455		B4-R455	1	0,007
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EMERGENCY STOP Push Buttons, release by turning, Ø28mm



red		B3P3 RT	BS3P3 RT	BC3P3 RT	10	0,017
red	0	B3P3 RT-0	BS3P3 RT-0	BC3P3 RT-0	10	0,017
red	0	B3P3 RT-0-RGE ²⁾	BS3P3 RT-0-RGE ²⁾	BC3P3 RT-0-RGE ²⁾	10	0,017

EMERGENCY STOP Push Buttons, release by turning, Ø40mm



red	0	B3P34 RT-0	BS3P34 RT-0	BC3P34 RT-0	10	0,020
-----	---	------------	-------------	-------------	----	-------

red	Pfeile	B3P34 RT-PF	BS3P34 RT-PF	BC3P34 RT-PF	10	0,020
-----	--------	-------------	--------------	--------------	----	-------

red illuminated		B3P34L RT	BS3P34L RT	BC3P34L RT	10	0,020
--------------------	--	-----------	------------	------------	----	-------

EMERGENCY STOP Push Buttons, release by turning, Ø70mm



red		BS3P34P RT	BS3P34P RT	BS3P34P RT	1	0,062
-----	--	------------	------------	------------	---	-------

Yellow Disk Ø70mm, Thickness 1mm ¹⁾



neutral	B3-7603	1	0,004
with marking NOT-HALT-symbol	B3-7603-S	1	0,004
with marking NOT-AUS	B3-7603-1	1	0,004
with marking EMERGENCY STOP	B3-7603-2	1	0,004
2-side markings: NOT-AUS / EMERGENCY STOP	B3-7603-12	1	0,004
2-side markings: ARRET D'URGENCE / NØDSTOP	B3-7603-34	1	0,004
2-side markings: ARRET D'URGENCE / NOODSTOP	B3-7603-35	1	0,004

Protection cover against unintentional manipulation, Thickness 1mm



for Push Buttons Ø28mm and Ø40mm	yellow	B3-SK GE	1	0,04
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Sealing cap

for Push Buttons BS3P45RT and BS3P44S3	transparent	B3-PH GE	1	0,03
--	-------------	----------	---	------

1) Not for enclosure BG.. 2) Front ring yellow

Actuators 22mm Type 12

Ring

Knob

Alu

Black

Chrome

Pack
pcs.

Weight
kg/pc.

Rotary Knobs and Swing Knobs, black IP65



Rotary



Swing

maintained 60°



Rotary
Swing

B3KN2
B3KRN2

BS3KN2
BS3KRN2

BC3KN2
BC3KRN2

10
10

0,020
0,020

maintained 60°



Rotary

B3KN29

BS3KN29

BC3KN29

10

0,020

spring return 60°



Rotary
Swing

B3KN8
B3KRN8

BS3KN8
BS3KRN8

BC3KN8
BC3KRN8

10
10

0,020
0,020

spring return 60°



Rotary
Swing

B3KN1
B3KRN1

BS3KN1
BS3KRN1

BC3KN1
BC3KRN1

10
10

0,020
0,020

maintained 60°



Rotary
Swing

B3KN3
B3KRN3

BS3KN3
BS3KRN3

BC3KN3
BC3KRN3

10
10

0,020
0,020

maintained/spring return 60°



Rotary

B3KN6

BS3KN6

BC3KN6

10

0,020

spring return/maintained 60°



Rotary

B3KN7

BS3KN7

BC3KN7

10

0,020

maintained 120°



Rotary

B3KN9

BS3KN9

BC3KN9

10

0,020

maintained 90°
according to EN81



Rotary

B3KN10

BS3KN10

BC3KN10

10

0,020

maintained 90°



Rotary

B3KN11

BS3KN11

BC3KN11

10

0,020

Illuminated Rotary Knobs and Swing Knobs, clear IP67, lamp max. 1,2W, lamps see page 339



Rotary



Swing

Toggle IP65



maintained 90°



Rotary

B3KL2

BS3KL2

BC3KL2

10

0,016

spring return 60°



Rotary
Swing

B3KL1
B3KRL1

BS3KL1
BS3KRL1

BC3KL1
BC3KRL1

10
10

0,016
0,016

maintained 60°



Rotary
Swing

B3KL3
B3KRL3

BS3KL3
BS3KRL3

BC3KL3
BC3KRL3

10
10

0,016
0,016

maintained/spring return 60°



Rotary

B3KL6

BS3KL6

BC3KL6

10

0,016

O - I

B3E

BS3E

BC3E

10

0,017

Actuators 22mm IP65, Type 12

Ring

Key
removeable in



Alu



Black



Chrome

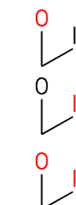
Pack
pcs.

Weight
kg/pc.

Key Operated Rotary Switches with lock Ronis 455



B3SAR 0



maintained 60°

B3SAR 0

BS3SAR 0

BC3SAR 0

1

0,044

B3SAR 1

BS3SAR 1

BC3SAR 1

1

0,044

B3SAR 01

BS3SAR 01

BC3SAR 01

1

0,044



B3SARR 0



spring return 60°

B3SAT 0

BS3SAT 0

BC3SAT 0

1

0,044

maintained 60°

B3SARR 0

BS3SARR 0

BC3SARR 0

1

0,044

B3SARR 102

BS3SARR 102

BC3SARR 102

1

0,044

spring return/maintained 60°



B3SATR 02

BS3SATR 02

BC3SATR 02

1

0,044

spring return 60°



B3SATT 0

BS3SATT 0

BC3SATT 0

1

0,044

Spare Key lock Ronis R455

B4-R455

1

0,007

Colour Symbol

Pack
pcs.

Weight
kg/pc.

Illuminated Push Buttons IP67, lamp max. 1,9W, lamps see page 339



red
green
yellow

B3DL RT
B3DL GN
B3DL GE

BS3DL RT
BS3DL GN
BS3DL GE

BC3DL RT
BC3DL GN
BC3DL GE

10
10
10

0,014
0,014
0,014

blue
white

B3DL BL
B3DL WS

BS3DL BL
BS3DL WS

BC3DL BL
BC3DL WS

10
10

0,014
0,014

Illuminated Push Buttons, Maintained IP67, lamp max. 1,9W, lamps see page 339



red
green
yellow

B3DLR RT
B3DLR GN
B3DLR GE

BS3DLR RT
BS3DLR GN
BS3DLR GE

BC3DLR RT
BC3DLR GN
BC3DLR GE

10
10
10

0,014
0,014
0,014

blue
white

B3DLR BL
B3DLR WS

BS3DLR BL
BS3DLR WS

BC3DLR BL
BC3DLR WS

10
10

0,014
0,014

Double Push Buttons, with indicator lamp white, lamp max. 1,9W, lamps see page 339



green
red

B3DT G/R ¹⁾

BS3DT G/R

BC3DT G/R

10

0,016

white
black

B3DT W/S ¹⁾

BS3DT W/S

BC3DT W/S

10

0,016

green
red

I
0

B3DT GI/RO ¹⁾

BS3DT GI/RO

BC3DT GI/RO

10

0,016

white
black

I
0

B3DT WI/SO ¹⁾

BS3DT WI/SO

BC3DT WI/SO

10

0,016

with non-standard marking on request

1) Plastic ring in alu design.

suitable for Alu, Black and Chrome

Colour Type Pack pcs. Weight kg/pc.

Lens Caps IP67 with fresnel lens, lamp max. 1,9W, lamps see page 339, laser marking on request



red	B3R RT	10	0,009
green	B3R GN	10	0,009
yellow	B3R GE	10	0,009
blue	B3R BL	10	0,009
clear	B3R KL	10	0,009
white	B3R WS	10	0,009

Lens Caps Low IP67 with fresnel lens, lamp max. 1,9W, lamps see page 339, laser marking on request



red	B3RN RT	10	0,008
green	B3RN GN	10	0,008
yellow	B3RN GE	10	0,008
blue	B3RN BL	10	0,008
clear	B3RN KL	10	0,008
white	B3RN WS	10	0,008

Lens Caps IP67, lamp max. 1,9W, lamps see page 337, laser marking on request



red	B3RF RT	10	0,009
green	B3RF GN	10	0,009
yellow	B3RF GE	10	0,009
blue	B3RF BL	10	0,009
white	B3RF WS	10	0,009

Colour Voltage Power VA W Type Pack pcs. Weight kg/pc

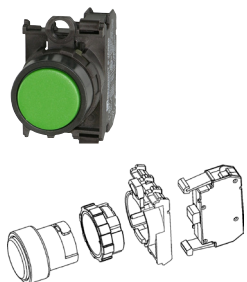
Monoblock LEDs IP65, IEC 60947, EN 60947 (6 years middle lifetime) ¹⁾



red	20-30V AC/DC	0,4	0,4	B3-MB24 RTB	10	0,022
green	20-30V AC/DC	0,4	0,4	B3-MB24 GNB	10	0,022
yellow	20-30V AC/DC	0,4	0,4	B3-MB24 GEB	10	0,022
blue	20-30V AC/DC	0,4	0,4	B3-MB24 BLB	10	0,022
white	20-30V AC/DC	0,4	0,4	B3-MB24 WSB	10	0,022
red	110-130V AC 110V DC	1,2	1,2	B3-MB110 RTB	10	0,022
green	110-130V AC 110V DC	1,2	1,2	B3-MB110 GNB	10	0,022
yellow	110-130V AC 110V DC	1,2	1,2	B3-MB110 GEB	10	0,022
blue	110-130V AC 110V DC	1,2	1,2	B3-MB110 BLB	10	0,022
white	110-130V AC 110V DC	1,2	1,2	B3-MB110 WSB	10	0,022
red	170-250V AC	4,0	1,0	B3-MB230 RTB	10	0,022
green	170-250V AC	4,0	1,0	B3-MB230 GNB	10	0,022
yellow	170-250V AC	4,0	1,0	B3-MB230 GEB	10	0,022
blue	170-250V AC	4,0	1,0	B3-MB230 BLB	10	0,022
white	170-250V AC	4,0	1,0	B3-MB230 WSB	10	0,022
red	400V AC		0,5	B3-MB400 RTB	10	0,022
green	400V AC		0,5	B3-MB400 GNB	10	0,022
yellow	400V AC		0,5	B3-MB400 GEB	10	0,022
blue	400V AC		0,5	B3-MB400 BLB	10	0,022
white	400V AC		0,5	B3-MB400 WSB	10	0,022

1) Ambient temperatures on request.

Push Button 22mm-Sets, with Contact Block and Connector

	Actuator Colour	Symbol	with	Type	Pack pcs.	Weight kg/pc.
	black		+connector +1NO	BS3D SW/10	1	0,037
	green		+connector +1NO	BS3D GN/10	1	
	yellow		+connector +1NO	BS3D GE/10	1	0,037
	blue		+connector +1NO	BS3D BL/10	1	0,037
	red		+connector +1NC	BS3D RT/01	1	
	green		+connector +1NO	BS3D GN-I/10	1	0,037
	red		+connector +1NC	BS3D RT-0/01	1	0,037

Double Push Buttons, IP65

	green/ red		+connector +1NO +1NC	BS3DT G/R/11	1	0,049
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EMERGENCY STOP Push Buttons, IP67 Ø40mm

	pull to release acc. EN ISO 13850	+connector +1NO +1NC	BS3P44 RT/11	1	0,061
	key release acc. EN ISO 13850	+connector +1NO +1NC	BS3P44S3 RT/11	1	0,083
	twist release	+connector +1NO +1NC	BS3P34 RT-0/11	1	0,053

Rotary Knobs, IP65

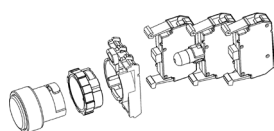
		+connector +1NO	BS3KN2/10	1	0,043
		+connector +1NO +1NC	BS3KN2/11	1	0,053
		+connector +2NO	BS3KN3/20	1	0,053
		+connector +2NO	BS3KN1/20	1	0,053

Key Operated Rotary Switch with lock Ronis 455, IP65

		key removeable in 0-position	+connector +1NO	BS3SAR 0/10	1	0,057
		key removeable in all positions	+connector +1NO	BS3SAR 01/10	1	0,057
		key removeable in 0-position	+connector +1NO	BS3SAT 0/10	1	0,057
		key removeable in all positions	+connector +2NO	BS3SARR 102/20	1	0,067
		key removeable in 0-position	+connector +2NO	BS3SARR 0/20	1	0,067

Illuminated Push Button 22mm-Sets, with Contact Block, Connector and LED

Illuminated Push Buttons, IP67



Actuator Colour	with	LED	Type	Pack pcs.	Weight kg/pc.
white	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL WS/11/L24	1	0,054
green	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL GN/11/L24	1	0,054
red	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL RT/11/L24	1	0,054
yellow	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL GE/11/L24	1	0,054
blue	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL BL/11/L24	1	0,054
white	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL WS/11/L110	1	0,054
green	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL GN/11/L110	1	0,054
red	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL RT/11/L110	1	0,054
yellow	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL GE/11/L110	1	0,054
blue	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL BL/11/L110	1	0,054
white	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL WS/11/L230	1	0,054
green	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL GN/11/L230	1	0,054
red	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL RT/11/L230	1	0,054
yellow	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL GE/11/L230	1	0,054
blue	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL BL/11/L230	1	0,054

Double Push Buttons with Pilot Light, IP65



green/ red	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DT G/R/11/L24	1	0,066
green/ red	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DT G/R/11/L110	1	0,066
green/ red	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DT G/R/11/L230	1	0,066

Pilot Lights, IP67 with socket BA9S (without lamp)



white	+connector +socket BA9S	-	B3R WS/0	1	0,037
green	+connector +socket BA9S	-	B3R GN/0	1	0,037
red	+connector +socket BA9S	-	B3R RT/0	1	0,037
yellow	+connector +socket BA9S	-	B3R GE/0	1	0,037

Pilot Lights with LEDs, IP67



white	+connector +socket BA9S	20-30V AC/DC	B3R WS/L24	1	0,042
green	+connector +socket BA9S	20-30V AC/DC	B3R GN/L24	1	0,042
red	+connector +socket BA9S	20-30V AC/DC	B3R RT/L24	1	0,042
yellow	+connector +socket BA9S	20-30V AC/DC	B3R GE/L24	1	0,042
white	+connector +socket BA9S	90-120V AC/DC	B3R WS/L110	1	0,042
green	+connector +socket BA9S	90-120V AC/DC	B3R GN/L110	1	0,042
red	+connector +socket BA9S	90-120V AC/DC	B3R RT/L110	1	0,042
yellow	+connector +socket BA9S	90-120V AC/DC	B3R GE/L110	1	0,042
white	+connector +socket BA9S	200-250V AC/DC	B3R WS/L230	1	0,042
green	+connector +socket BA9S	200-250V AC/DC	B3R GN/L230	1	0,042
red	+connector +socket BA9S	200-250V AC/DC	B3R RT/L230	1	0,042
yellow	+connector +socket BA9S	200-250V AC/DC	B3R GE/L230	1	0,042

Connectors

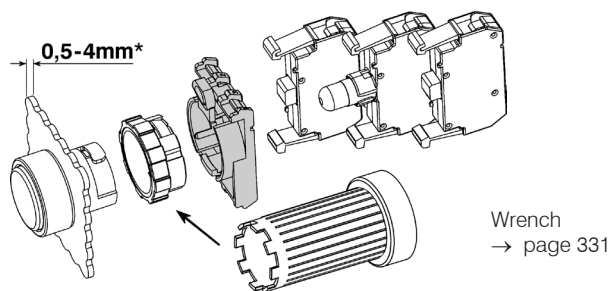
Specification	Description	Type	Pack pcs.	Weight kg/pc.
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Connector B3S

B3S

10

0,013

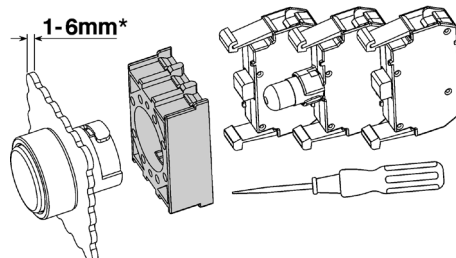


Connector B3M

B3M

10

0,013



*) inclusive Thickness from Label Holder and Yellow Disk

Contact Blocks and Lamp Holders for Panel Mounting

for voltage	Description	Type	Pack pcs.	Weight kg/pc.
-------------	-------------	------	-----------	---------------

Contact blocks, screw terminals



max. 690V AC	1 NC ¹⁾			B3T01 ²⁾	10	0,010
max. 690V AC	1 NO ¹⁾			B3T10 ²⁾	10	0,010

Contact blocks, RAST 5 terminals (note coding)



max. 690V~	1 NC			B3RT01	10	0,010
max. 690V~	1 NO			B3RT10	10	0,010



Actuator insert	to actuate the center contact block			P642	10	0,001
-----------------	-------------------------------------	--	--	------	----	-------

Lamp holders, socket BA9s



max. 440V AC/DC	direct connection, for lamps max. 1,9W (active power consumption)			B3F	10	0,012
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Lamp holders for lamp test circuits, socket BA9s



max. 440V AC	direct connection, for filament and glow-discharge lamps max. 1,7W (active power consumption)			B3FT	10	0,020
max. 250V	direct connection of LED			B3FTD	10	0,020

1) NC contact has a positive opening according to IEC/EN 60947-5-1.

2) Contact blocks with gold contacts (B3T..G) on request, suitable for 17V = / 1 mA and for difficult ambient conditions.

Lamps

Socket BA9s
Lamp voltage

Type

Pack
pcs.

Weight
kg/pc.

LED lamps ^{2) 3)} (6 years middle lifetime, for equivalent lens caps only)



24V 10mA AC/DC +-10%	for red lens caps	B3-L24 RTB	50	0,005
24V 10mA AC/DC +-10%	for green lens caps	B3-L24 GNB	50	0,005
24V 10mA AC/DC +-10%	for yellow lens caps	B3-L24 GEB	50	0,005
24V 10mA AC/DC +-10%	for blue lens caps	B3-L24 BLB	50	0,005
24V 10mA AC/DC +-10%	for white lens caps	B3-L24 WSB	50	0,005
110V 3,2mA AC/DC +-10%	for red lens caps	B3-L110 RTB	50	0,005
110V 3,2mA AC/DC +-10%	for green lens caps	B3-L110 GNB	50	0,005
110V 3,2mA AC/DC +-10%	for yellow lens caps	B3-L110 GEB	50	0,005
110V 3,2mA AC/DC +-10%	for blue lens caps	B3-L110 BLB	50	0,005
110V 3,2mA AC/DC +-10%	for white lens caps	B3-L110 WSB	50	0,005
220V 1,7mA AC/DC +-10%	for red lens caps	B3-L230 RTB	50	0,005
220V 1,7mA AC/DC +-10%	for green lens caps	B3-L230 GNB	50	0,005
220V 1,7mA AC/DC +-10%	for yellow lens caps	B3-L230 GEB	50	0,005
220V 1,7mA AC/DC +-10%	for blue lens caps	B3-L230 BLB	50	0,005
220V 1,7mA AC/DC +-10%	for white lens caps	B3-L230 WSB	50	0,005

Filament lamps ³⁾



Power consumption					
24V	1,2W	for all lens caps	B4-G24	100	0,005
42V	1W	for all lens caps	B4-G42	100	0,005
48V	1,2W	for all lens caps	B4-G48	100	0,005
60V	1,2W	for all lens caps	B4-G60	100	0,005

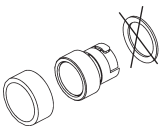
Glow-discharge lamps ³⁾



220-250V AC	0,3W	for clear, red, yellow lens caps	B4-GL230K	100	0,005
220-250V AC	0,3W	for green, blue lens caps	B4-GL230G	100	0,005

Accessories



		Type	Pack pcs.	Weight kg/pc.	
Wrench	for mounting of actuators and lens caps B(S)3..	J7049	1	0,018	
Marking plate	for marking of contact blocks B3T. and lamp holders B3F	P672-1	10	0,001	
Lamp Installer	used to install or replace lamps BA9s	B4-7408	1	0,010	
Spare Key	for B(S)3SA.. and BS3P44S3, Ronis R455 for B(S)3SB.., Ronis R786	B4-R455 B4-R786	1 1	0,007 0,007	
Hole Plug	black, for fixing holes grey Ø22,5mm	B3-DU SW B3-DU GR	10 10	0,007 0,007	
Sealing Cover	for single and double push buttons, protection against coarse contamination	P279-1	1	0,003	
	for all single push buttons silicone, ambient temp. -25°...+60 °C	P279-5	1	0,003	
	for double push buttons silicone, ambient temp. -25°...+60 °C	P279-DT	1	0,003	
	Protection cover	against unintentional manipulation			
	Thickness 1mm yellow	B3-SK GE	1	0,04	
	Thickness 1mm grey	B3-SK GR	1	0,04	
Protection ring with thread	against unintentional manipulation				
	has to be mounted instead of the existing ring	black	P921-1	1	0,012
		chrome	P921-2	1	0,012
		alu	P921-3	1	0,012

1) Voltage marking 130V / 2W max. rated voltage 120V / 1,8W.

2) Suitable for B3FT lamp test holders.

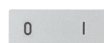
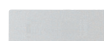
3) Ambient temperatures on request.

Label Holders and Legend Plates for Push Buttons B3, 22mm

Marking 1 or 2 lines



	Type	Pack pcs.	Weight kg/pc.
Label holder for legend plate BK4, black, Thickness 0,8mm	P751	100	0,001
Label holder for legend plate BK4, yellow, Thickness 0,8mm	P751-3	10	0,001



marking	Type	marking	Type	Pack pcs.	Weight kg/pc.
Legend plate alu, for label holder P751					
blank	BK4-9736			100	0,0002
I	BK4-I	II	BK4-II	10	0,0002
III	BK4-III	IV	BK4-IV	10	0,0002
V	BK4-V			10	0,0002
→	BK4--->	←	BK4-<--	10	0,0002
0 I	BK4-0-I	H 0 A	BK4-H 0 A	10	0,0002
0 I	BK4-0 __ I	1 0 2	BK4-1 0 2	10	0,0002
START	BK4-START	STOP	BK4-STOP	10	0,0002
EIN	BK4-EIN	AUS	BK4-AUS	10	0,0002
BETRIEB	BK4-BETRIEB	STÖRUNG	BK4-STÖRUNG	10	0,0002
VOR	BK4-VOR	ZURÜCK	BK4-ZURÜCK	10	0,0002
HEBEN	BK4-HEBEN	SENKEN	BK4-SENKEN	10	0,0002
LINKS	BK4-LINKS	RECHTS	BK4-RECHTS	10	0,0002
MEHR	BK4-MEHR	WENIGER	BK4-WENIGER	10	0,0002
SCHNELL	BK4-SCHNELL	LANGSAM	BK4-LANGSAM	10	0,0002
HELLER	BK4-HELLER	DUNKLER	BK4-DUNKLER	10	0,0002
AUF	BK4-AUF	ZU	BK4-ZU	10	0,0002
AB	BK4-AB	HALT	BK4-HALT	10	0,0002
EILGANG	BK4-EILGANG	TIPPEN	BK4-TIPPEN	10	0,0002

Legend plate with non-standard marking (e. g.: BK4-MOTOR-START)

Text 1 line, max. 11 letters, letter height 3mm	BK4-...	1	0,0002
Text 2 lines, max. 2 x 11 letters, letter height 3mm	BK4-...-...	1	0,0002

Legend plate yellow, for label holder P751-3

Legend plate yellow without marking	BK4-10827	10	0,0002
Legend plate yellow with marking NOT-AUS	BK4-10827-1	10	0,0002
Legend plate yellow with marking EMERGENCY STOP	BK4-10827-2	10	0,0002
Legend plate yellow with marking ARRET D`URGENCE	BK4-10827-3	10	0,0002



Marking 3 or 4 lines



Label holder for legend plate BK8, black, Thickness 0,8mm	P761	10	0,0013
Label holder for legend plate BK8, yellow, Thickness 0,8mm	P761-3	10	0,0013
Label holder for BK8, for double push buttons only	P761-DT	10	0,0013

Legend plate BK8 for label holder P761 (with marking e. g.: BK8-WATER-PUMP-START)

Legend plate without marking	BK8-9736	10	0,0004
Text 3 lines, max. 3 x 11 letters, letter height 3mm	BK8-...-...-...	10	0,0004
Text 4 lines, max. 4 x 11 letters, letter height 3mm	BK8-...-...-...-...	10	0,0004



Actuator Caps with Laser Markings

Codes for colours

Colour	for buttons		for illuminated buttons	
	B3D(R)	B5D(R)	B3DL(R)	B5DL(R)
	BS3D(R)	BS5D(R)	BS3DL(R)	BS5DL(R)
	BC3D(R)	BC5D(R)	BC3DL(R)	BC5DL(R)
red	DK RT-..		DKL RT-..	
green	DK GN-..		DKL GN-..	
yellow	DK GE-..		DKL GE-..	
blue	DK BL-..		DKL BL-..	
white	DK WS-..		DKL WS-..	
black	DK SW-..		-	

Actuator Caps with text, the Suffix must be completed with the colour code



Marking	Suffix for Marking	Marking	Suffix for Marking	Pack pcs.	Weight kg/pc.
		NOT AUS	...-NOT-AUS	10	0,001
START	...-START	STOP	...-STOP	10	0,001
EIN	...-EIN	AUS	...-AUS	10	0,001
BETRIEB	...-BETRIEB	STÖRUNG	...-STÖRUNG	10	0,001
ANLAUF	...-ANLAUF	HALT	...-HALT	10	0,001
VOR	...-VOR	ZURÜCK	...-ZURÜCK	10	0,001
HEBEN	...-HEBEN	SENKEN	...-SENKEN	10	0,001
LINKS	...-LINKS	RECHTS	...-RECHTS	10	0,001
MEHR	...-MEHR	WENIGER	...-WENIGER	10	0,001
SCHNELL	...-SCHNELL	LANGSAM	...-LANGSAM	10	0,001
HELLER	...-HELLER	DUNKLER	...-DUNKLER	10	0,001
AUF	...-AUF	ZU	...-ZU	10	0,001
AB	...-AB	LAUF	...-LAUF	10	0,001
EILGANG	...-EILGANG	TIPPEN	...-TIPPEN	10	0,001

Actuator Caps with symbols according to ISO 7000, the Suffix must be completed with the colour code

Symbol	Suffix for Marking	ISO 7000 reference no.	Symbol	Suffix for Marking	ISO 7000 reference no.	Pack pcs.	Weight kg/pc.
	...-100	-		...-101	-	10	0,001
	...-102	-		...-103	-	10	0,001
	...-200	0011		...-201	0244	10	0,001
	...-202	-		...-203	-	10	0,001
	...-204	0355		...-205	-	10	0,001
	...-300	-		...-301	-	10	0,001
	...-302	-		...-303	-	10	0,001
	...-304	-		...-305	0259	10	0,001
	...-306	-		...-307	-	10	0,001
	...-400	-		...-401	0018	10	0,001
	...-402	0019		...-403	0020	10	0,001
	...-404	0021		...-405	0022	10	0,001
	...-406	0023		...-407	0910	10	0,001
	...-408	-		...-409	0096	10	0,001
	...-410	0017		...-411	0033	10	0,001
	...-412	0032		...-413	-	10	0,001

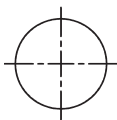
Actuators and Lens Caps 30mm IP67 (IP65)

Push Buttons



→ page 341

Mounting hole
Ø 30,5mm



Connectors

Contacts Lamp Holder



IP65

→ page 342,
343

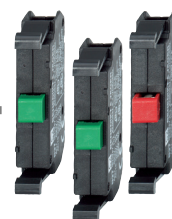
EMERGENCY STOP Buttons



→ page 341



→ page 341



Actuator insert
→ page 344

Illuminated Operators



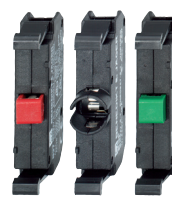
→ page 342



→ page 345



Thickness
0,5 - 3 mm
→ page 344



→ page 344

Lens Caps



→ page 343

Wrench
J7049



LED
24-230V



Filament
6-130V



Glow-discharge
230V

→ page 345

Actuators 30mm IP67

Ring

Colour

Symbol

Alu

Black

Chrome

Pack
pcs.

Weight
kg/pc.

Push Buttons, Actuator Caps markable



red		B5D RT	BS5D RT	BC5D RT	10	0,029
red	0	B5D RT-0	BS5D RT-0	BC5D RT-0	10	0,029
green		B5D GN	BS5D GN	BC5D GN	10	0,029
green	I	B5D GN-I	BS5D GN-I	BC5D GN-I	10	0,029
green	II	B5D GN-II	BS5D GN-II	BC 5D GN-II	10	0,029
green	→	B5D GN-PF	BS5D GN-PF	BC5D GN-PF	10	0,029



yellow		B5D GE	BS5D GE	BC5D GE	10	0,029
blue		B5D BL	BS5D BL	BC5D BL	10	0,029
white		B5D WS	BS5D WS	BC 5D WS	10	0,029
black		B5D SW	BS5D SW	BC5D SW	10	0,029
black	→	B5D SW-PF	BS5D SW-PF	BC5D SW-PF	10	0,029

Push Buttons, Maintained, Actuator Caps markable



red		B5DR RT	BS5DR RT	BC5DR RT	10	0,029
green		B5DR GN	BS5DR GN	BC5DR GN	10	0,029
yellow		B5DR GE	BS5DR GE	BC5DR GE	10	0,029
blue		B5DR BL	BS5DR BL	BC5DR BL	10	0,029
white		B5DR WS	BS5DR WS	BC5DR WS	10	0,029
black		B5DR SW	BS5DR SW	BC5DR SW	10	0,029

Mushroom Heads, Ø28mm



red		B5P1 RT	BS5P1 RT	BC5P1 RT	10	0,032
red	0	B5P1 RT-0	BS5P1 RT-0	BC5P1 RT-0	10	0,032
green		B5P1 GN	BS5P1 GN	BC5P1 GN	10	0,032
yellow		B5P1 GE	BS5P1 GE	BC5P1 GE	10	0,032
blue		B5P1 BL	BS5P1 BL	BC5P1 BL	10	0,032
black		B5P1 SW	BS5P1 SW	BC5P1 SW	10	0,032

Mushroom Heads, Ø40mm



red	0	B5P14 RT-0	BS5P14 RT-0	BC5P14 RT-0	10	0,035
-----	---	------------	-------------	-------------	----	-------

EMERGENCY STOP Push Buttons, Ø 28mm, release by turning, with yellow ring



red		B5P3 RT-RGE			10	0,032
red	0	B5P3 RT-0-RGE			10	0,032

EMERGENCY STOP Push Buttons, Ø 40mm, release by turning



red	0	B5P34 RT-0	BS5P34 RT-0	BC5P34 RT-0	10	0,035
-----	---	------------	-------------	-------------	----	-------

Yellow Disk for EMERGENCY-STOP Push Buttons, Ø70mm, Thickness 1mm



neutral		B5-7603			1	0,004
with marking NOT-HALT-symbol		B5-7603-S			1	0,004



with marking NOT-AUS		B5-7603-1			1	0,004
with marking EMERGENCY STOP		B5-7603-2			1	0,004

Actuators 30mm

Ring

Knob

Alu

Black

Chrome

Pack
pcs.

Weight
kg/pc.

Rotary Knobs and Swing Knobs, black IP65



Rotary



Swing

maintained 60°



Rotary
Swing

B5KN2
B5KRN2

BS5KN2
BS5KRN2

BC5KN2
BC5KRN2

10
10

0,035
0,035

spring return 60°



Rotary
Swing

B5KN8
B5KRN8

BS5KN8
BS5KRN8

BC5KN8
BC5KRN8

10
10

0,035
0,035

spring return 60°



Rotary
Swing

B5KN1
B5KRN1

BS5KN1
BS5KRN1

BC5KN1
BC5KRN1

10
10

0,035
0,035

spring return 60°



Rotary
Swing

B5KN3
B5KRN3

BS5KN3
BS5KRN3

BC5KN3
BC5KRN3

10
10

0,035
0,035

maintained/spring return 60°



Rotary

B5KN6

BS5KN6

BC5KN6

10

0,035

spring return/maintained 60°



Rotary

B5KN7

BS5KN7

BC5KN7

10

0,035

maintained 120°



Rotary

B5KN9

BS5KN9

BC5KN9

10

0,035

maintained 90°
according to EN81



Rotary

B5KN10

BS5KN10

BC5KN10

10

0,035

Illuminated Rotary Knobs and Swing Knobs IP67, clear, lamp max. 1,2W, lamps see page 347



Rotary



Swing

maintained 90°



Rotary

B5KL2

BS5KL2

BC5KL2

10

0,031

spring return 60°



Rotary
Swing

B5KL1
B5KRL1

BS5KL1
BS5KRL1

BC5KL1
BC5KRL1

10
10

0,031
0,031

maintained 60°



Rotary
Swing

B5KL3
B5KRL3

BS5KL3
BS5KRL3

BC5KL3
BC5KRL3

10
10

0,031
0,031

maintained/spring return 60°



Rotary

B5KL6

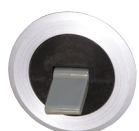
BS5KL6

BC5KL6

10

0,031

Toggle IP65



O - I

B5E

BS5E

BC5E

10

0,032

Actuators and Lens Caps 30mm IP65

Ring

key
removeable in

Alu

Black

Chrome

Pack
pcs.

Weight
kg/pc.

Key Operated Rotary Switch with lock Ronis 455

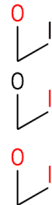


B3SAR 0



B3SARR 0

maintained 60°



B5SAR 0

BS5SAR 0

BC5SAR 0

1

0,059

B5SAR 1

BS5SAR 1

BC5SAR 1

1

0,059

B5SAR 01

BS5SAR 01

BC5SAR 01

1

0,059

spring return 60°



B5SAT 0

BS5SAT 0

BC5SAT 0

1

0,059

maintained 60°



B5SARR 0

BS5SARR 0

BC5SARR 0

1

0,059

B5SARR 102

BS5SARR 102

BC5SARR 102

1

0,059

spring return/maintained 60°



B5SATR 02

BS5SATR 02

BC5SATR 02

1

0,059

spring return 60°



B5SATT 0

BS5SATT 0

BC5SATT 0

1

0,059

Spare Keylock Ronis R455

B4-R455

1

0,007

Colour

Pack
pcs.

Weight
kg/pc.

Illuminated Push Buttons IP67, lamp max. 1,9W, lamps see page 347



red

B5DL RT

BS5DL RT

BC5DL RT

10

0,029

green

B5DL GN

BS5DL GN

BC5DL GN

10

0,029

yellow

B5DL GE

BS5DL GE

BC5DL GE

10

0,029

blue

B5DL BL

BS5DL BL

BC5DL BL

10

0,029

white

B5DL WS

BS5DL WS

BC5DL WS

10

0,029

Illuminated Push Buttons IP67, Maintained, lamp max. 1,9W, lamps see page 347



red

B5DLR RT

BS5DLR RT

BC5DLR RT

10

0,029

green

B5DLR GN

BS5DLR GN

BC5DLR GN

10

0,029

yellow

B5DLR GE

BS5DLR GE

BC5DLR GE

10

0,029

blue

B5DLR BL

BS5DLR BL

BC5DLR BL

10

0,029

white

B5DLR WS

BS5DLR WS

BC5DLR WS

10

0,029

Lens Caps with fresnel lens IP67, lamp max. 1,9W, lamps see page 347



red

B5R RT

BS5R RT

BC5R RT

10

0,029

green

B5R GN

BS5R GN

BC5R GN

10

0,029

yellow

B5R GE

BS5R GE

BC5R GE

10

0,029

blue

B5R BL

BS5R BL

BC5R BL

10

0,029

clear

B5R KL

BS5R KL

BC5R KL

10

0,029

white

B5R WS

BS5R WS

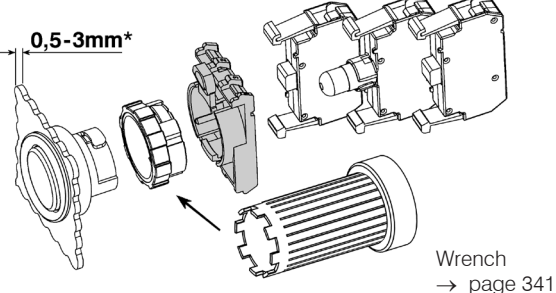
BC5R WS

10

0,029

Connectors

Specification	Description	Type	Pack pcs.	Weight kg/pc.
Connector B3S		B3S	10	0,013



0,5-3mm*

Wrench
→ page 341

*) inclusive Thickness from Label Holder and Yellow Disk

Contact Blocks and Lamp Holders for Panel Mounting

for voltage	Description	Type	Pack pcs.	Weight kg/pc.
Contact blocks				
max. 690V AC	1 NC 	 B3T01 ²⁾	10	0,010
max. 690V AC	1 NO	 B3T10 ²⁾	10	0,010
max. 690V~	1 NC ¹⁾ 	 B3RT01 ²⁾	10	0,010
max. 690V~	1 NO	 B3RT10 ²⁾	10	0,010
Actuator insert	to actuate the center contact block	P642	10	0,001



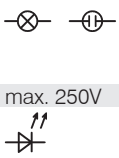
Lamp holders, socket BA9s

max. 440V AC/DC	direct connection, for lamps max. 1,9W (active power consumption)	 B3F	10	0,012
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Lamp holders for lamp test circuits, socket BA9s

max. 440V AC	direct connection, for filament and glow-discharge lamps max. 1,7W (active power consumption)	 B3FT	10	0,020
max. 250V	direct connection of LED	 B3FTD	10	0,020



1)  NC contact has a positive opening according to IEC/EN 60947-5-1
2) Contact blocks with gold contacts (B3T..G) on request, suitable for 17V= /1mA and for difficult ambient conditions.

Lamps

	Socket BA9s Lamp voltage	Power consumption	Type	Pack pcs.	Weight kg/pc.
--	-----------------------------	----------------------	------	--------------	------------------

LED lamps ^{2) 3)} (6 years middle lifetime, for equivalent lens caps only)



20-30V AC/DC	17mA / 0,4W	for red lens caps	B3-L24 RTB	50	0,005
20-30V AC/DC	17mA / 0,4W	for green lens caps	B3-L24 GNB	50	0,005
20-30V AC/DC	17mA / 0,4W	for yellow lens caps	B3-L24 GEB	50	0,005
20-30V AC/DC	17mA / 0,4W	for blue lens caps	B3-L24 BLB	50	0,005
20-30V AC/DC	17mA / 0,4W	for white lens caps	B3-L24 WSB	50	0,005
90-120V AC/DC	7mA / 0,8W	for red lens caps	B3-L110 RTB	50	0,005
90-120V AC/DC	7mA / 0,8W	for green lens caps	B3-L110 GNB	50	0,005
90-120V AC/DC	7mA / 0,8W	for yellow lens caps	B3-L110 GEB	50	0,005
90-120V AC/DC	7mA / 0,8W	for blue lens caps	B3-L110 BLB	50	0,005
90-120V AC/DC	7mA / 0,8W	for white lens caps	B3-L110 WSB	50	0,005
200-250V AC/DC	4mA / 0,9W	for red lens caps	B3-L230 RTB	50	0,005
200-250V AC/DC	4mA / 0,9W	for green lens caps	B3-L230 GNB	50	0,005
200-250V AC/DC	4mA / 0,9W	for yellow lens caps	B3-L230 GEB	50	0,005
200-250V AC/DC	4mA / 0,9W	for blue lens caps	B3-L230 BLB	50	0,005
200-250V AC/DC	4mA / 0,9W	for white lens caps	B3-L230 WSB	50	0,005

Filament lamps ³⁾



24V	1,2W	for all lens caps	B4-G24	100	0,005
42V	1W	for all lens caps	B4-G42	100	0,005
48V	1,2W	for all lens caps	B4-G48	100	0,005
60V	1,2W	for all lens caps	B4-G60	100	0,005

Glow-discharge lamps ³⁾



220-250V AC	0,3W	for clear, red, yellow lens caps	B4-GL230K	100	0,005
220-250V AC	0,3W	for green, blue lens caps	B4-GL230G	100	0,005

1) Voltage marking 130V / 2W max. rated voltage 120V / 1,8W.

2) Suitable for B3FT lamp test holders.

3) Ambient temperatures on request.

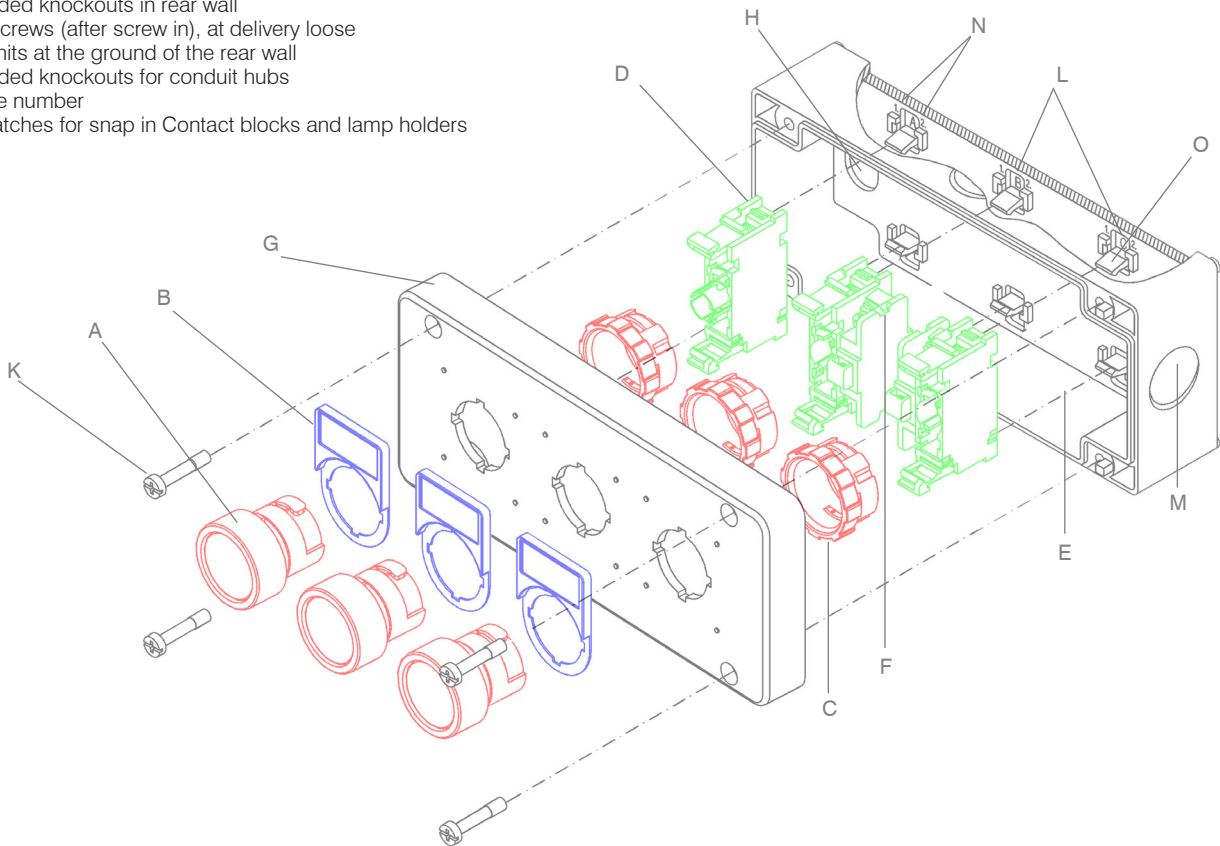
Accessories



	Type	Pack pcs.	Weight kg/pc.	
Wrench	for mounting of actuators and lens caps B(S)3..	J7049	1	0,018
Marking plate	for marking of contact blocks B3T. and lamp holders B3F	P672-1	10	0,001
Lamp Installer	used to install or replace lamps BA9s	B4-7408	1	0,010
Spare Key	for B(S)3SA.. and BS3P44S3, Ronis R455 for B(S)3SB.. , Ronis R786	B4-R455 B4-R786	1 1	0,007 0,007
Protectiv cover sealable	against unintentional manupulation of buttons B5, (<i>not for mushroom heads, rotary and swing knobs</i>)	B5-SAP	1	0,008
Label holder for legend plate BK5, black, 1 or 2 lines	P942-1	10	0,0013	
Legend plate BK5 with for label holder P942-1 (with marking e. g.: BK5-MOTOR-START)	BK5-11374	10	0,0003	
Legend plate alu without marking for label holder P42-1	BK5-11374	10	0,0003	
	Text 1 or 2 lines, max. 2 x 13 letters, letter height 3mm			
Label holder for legend plate BK10, black, 3 or 4 lines	P1043	10	0,0015	
Legend plate BK10 with for label holder P1043 (with marking e. g.: BK10-WATER-PUMP-START)	BK10-11724	10	0,0005	
Legend plate alu without marking for label holder P1043	BK10-11724	10	0,0005	
	Text 3 or 4 lines, max. 4 x 13 letters, letter height 3mm			
Adapter to convert Actuators 22mm to 30mm				
	alu	B5	10	0,017
	black	BS5	10	0,017
	chrome	BC5	10	0,017

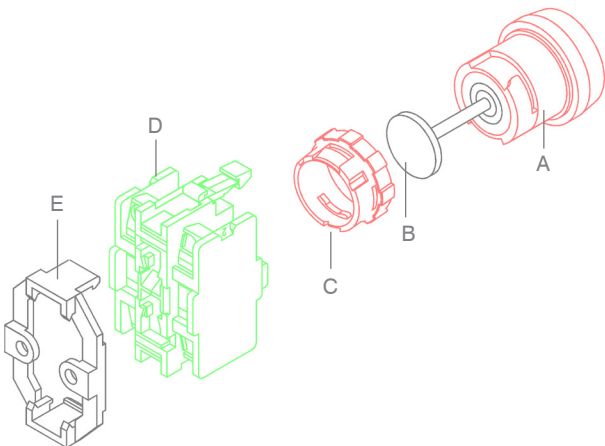
Assembled Stations BG.. IP67 Type 12

- A Actuators or Lens caps, see page 325 – 328
- B Legend plates with label holder
- C Ring and nut (included with actuator or lens cap)
- D Contact blocks and lamp holders, see page 344
- E Rear shroud
- F Function number
- G Cover
- H Pre-moulded knockouts in rear wall
- K Captive screws (after screw in), at delivery loose
- L Sign of units at the ground of the rear wall
- M Pre-moulded knockouts for conduit hubs
- N Sequence number
- O Spring-catches for snap in Contact blocks and lamp holders



Buttons for base mounting

- A Actuator Ø 22mm see page 325 – 328, Ø 30mm see page 337 – 339
- B Extension B4V...
- C Ring and nut (included with actuator or lens cap)
- D Contact block B4.. see page 344
- E Base B4U for base and DIN-rail mounting of contact blocks



Mounting Plate for base and DIN-rail mounting of contact blocks



Mounting Plate	for base and DIN-rail mounting of contact blocks and lamp holders B4.U...	B4U	10	0,010
Ring and Nut	for mounting former actuators and lens caps B4...	B3UP	10	0,004

Assembled Stations IP67 (IP65) Type 12

For conduit entries are in top and both small sides only one knockouts for conduit hubs Ø20,5mm, for M20 or PG13,5 provided.

Type		Diagram		Pack pcs.	Weight kg/pc.		
Plastic enclosed buttons and Pilot Lights							
	ON push button green	 14 — 13	BG10 GN	1	0,135		
	OFF push button red	 22 — 21	BG10 RT	1	0,135		
	Pilot light green	X2 — ⊗ — X1	BG01 GN	1	0,135		
	Pilot light red		BG01 RT	1	0,135		
	Key operated 0 - I ¹⁾ lock Ronis R455 60° maintained	 14 — 13	BG10SAR 0	1	0,165		
	Key operated I - 0 - II ¹⁾ lock Ronis R455 60° maintained	 14 — 13 24 — 23	BG10SARR 0	1	0,172		
	2 push buttons 0 - I	 22 — 21	 14 — 13	BG20	1	0,200	
	2 push buttons ← →	 14 — 13 22 — 21	 14 — 13 22 — 21	BG20PF	1	0,200	
	3 push buttons ← 0 →	 14 — 13 22 — 21	 22 — 21	 14 — 13 22 — 21	BG30PF	1	0,283
	3 push buttons I - 0 - II	 14 — 13 22 — 21	 22 — 21	 14 — 13 22 — 21	BG30	1	0,283
	2 push buttons 0 - I with pilot light green	 X2 — ⊗ — X1	 22 — 21	 14 — 13	BG21 GN	1	0,270
	Foot and palm button mushroom Ø70mm	 14 — 13 22 — 21		BG10P14P GR	1	0,187	
Plastic enclosed EMERGENCY STOP buttons							
	EMERGENCY STOP button head Ø40mm unlock by turning	 14 — 13 22 — 21		BG10P34-11	1	0,145	
	EMERGENCY STOP mushroom button Ø40mm according to EN ISO 13850 unlock by pull	 14 — 13 22 — 21		BG10P44-11	1	0,145	
	EMERGENCY STOP key operated button Ø40mm according to EN ISO 13850 unlock by key	 14 — 13 22 — 21		BG10P44S3-11	1	0,178	
	EMERGENCY STOP mushroom button Ø70mm unlock by turning	 14 — 13 22 — 21		BG10P34P-11	1	0,187	

1) IP65

Enclosures BG.. IP67, Type 12

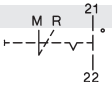
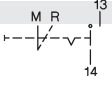
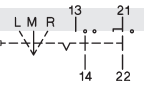
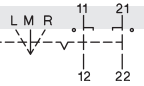
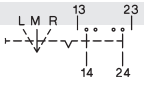


Number of units	Description	Type	Pack pcs.	Weight kg/pc.
1	3 knockouts Ø20,5mm (M20 or PG13,5)	BG1	1	0,108
1 yellow	3 knockouts Ø20,5mm (M20 or PG13,5)	BG1 GE	1	0,108
2	3 knockouts Ø20,5mm (M20 or PG13,5)	BG2	1	0,145
3	3 knockouts Ø20,5mm (M20 or PG13,5)	BG3	1	0,188

Buttons and Lens Caps B3.. see page 331 -334

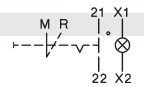
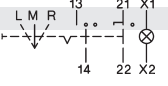
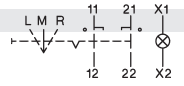
Contact blocks for enclosures BG..



Contacts	Lamp voltage	Wiring diagram	actuators with 2 or 3 switch positions	Type	Pack pcs.	Weight kg/pc.
1NC ¹⁾ 				B4TU01	10	0,015
1NO 				B4TU10	10	0,015
1NO+1NC ¹⁾ 				B4TU11	10	0,022
2NC ¹⁾ 				B4TU02	10	0,022
2NO 				B4TU20	10	0,022

Contact blocks with lamp holder, socket BA9s for LED or lamps, for enclosures BG.., lamps see page 347



1NC ¹⁾ 	max. 440V AC/DC			B4TU01F	10	0,020
1NO 	max. 440V AC/DC			B4TU10F	10	0,020
1NO+1NC ¹⁾ 	max. 440V AC/DC			B4TU11F	10	0,027
2NC ¹⁾ 	max. 440V AC/DC			B4TU02F	10	0,027
2NO 	max. 440V AC/DC			B4TU20F	10	0,027

Lamp holder, socket BA9s for LED or lamps, lamps see page 345

max. 440V AC/DC	direct connection, for lamps max. 1,9W (take care for active power consumption)		B4FU	10	0,013
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1)  NC contact has a positive opening according to IEC/EN 60947-5-1

Accessories for Plastic enclosed buttons



		Type	Pack pcs.	Weight kg/pc.
Wrench	for mounting of actuators	J7049	1	0,018
	and lens caps B(S)3..			
Couple Part	to couple enclosures BKLK or assembled stations BG..	B4-8852	1	0,018

Push Buttons for Enclosures 22mm IP65

Push buttons grey RAL7035



Specification	Colour	Symbol	Length mm	Type	Pack pcs.	Weight kg/pc.
Reset push button	blue	R	8-22	B2GRB-22	10	0,005
	blue	R	22-60	B2GRB-60	10	0,016
Reset push button with stop function	red	0/R	8-22	B2GR-22	10	0,005
	red	0/R	22-60	B2GR-60	10	0,016
Start push button	green	I	8-22	B2GI-22	10	0,005
	green	I	22-60	B2GI-60	10	0,016
Stop push button	red	0	8-22	B2G0-22	10	0,005
	red	0	22-60	B2G0-60	10	0,016
Mushroom head lockable Ø28mm	red	0	8-22	B2GP-22	10	0,005
	red	0	22-60	B2GP-60	10	0,016

Push buttons with metal ring and self adjusting extension pin



Reset push button	blue	R	19,5-38,5	B3GRB-31,5	10	0,023
	blue	R	38,5-60	B3GRB-60	10	0,026
Reset push button with stop function	red	0/R	19,5-38,5	B3GR-31,5	10	0,023
	red	0/R	38,5-60	B3GR-60	10	0,026
Start push button	green	I	19,5-38,5	B3GI-31,5	10	0,023
	green	I	38,5-60	B3GI-60	10	0,026
Stop push button	red	0	19,5-38,5	B3G0-31,5	10	0,023
	red	0	38,5-60	B3G0-60	10	0,026

Specification	Diameter Ø mm	Length mm	Type	Pack pcs.	Weight kg/pc.
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Extensions for push buttons



self adjusting pin, for B(S, C)3D.. and B(S, C)3P..	15	19,5 - 38,5	B4V31,5	10	0,001
	18,5	38,5 - 60	B4V60	10	0,004

Technical Data

Terminal markings for control units according to DIN EN 50013

Distinc. number	Contact elements	Distinc. number	Contact elements	Distinc. number	Contact elements	Distinc. number	Contact elements	Distinc. number	Contact elements	Colour code
10								01		 NO Green NC Red
20		11						02		
30		21		12				03		
40		31		22		13		04		

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

Type		B3T	B4T
Rated insulation voltage U_i	V AC	690 ¹⁾	500
Utilization category AC12 Control of resistive loads and solid stateloads with isolation by opto couplers			
Rated current I_e	220-240V A	10	10
	380-415V A	10	10
	500V A	10	10
	690V A	10	-
Utilization category AC15 Control of electromagnetic load (> 72VA)			
Rated current I_e	220-240V A	6	6
	380-415V A	5	5
	500V A	3	3
	690V A	2	-
Utilization category DC12 L/R = 1ms Control of resistive loads and solid stateloads with isolation by opto couplers			
Rated current I_e	24V A	10	10
	60V A	6	6
	110V A	2,5	2,5
	220V A	0,8	0,8
Utilization category DC14 L/R = 15ms Control of electromagnetic loads having economy resistors in circuit			
Rated current I_e	24V A	8	8
	60V A	1	1
	110V A	2	2
	220V A	0,5	0,5
Utilization category DC13 L/R = 300ms Control of electromagnets			
Rated current I_e	24V A	2	2
	60V A	5	5
	110V A	0,5	0,5
	220V A	0,2	0,2
Making capacity	A	60	60
Breaking capacity $\cos \phi = 0,7-1$	40-60Hz A	50	50
Mechanical life	10 ⁵ operations	3	3
Contact life (AC15)			
100VA	10 ⁵ operations	2,5	2,5
300VA	10 ⁵ operations	2	2
800VA	10 ⁵ operations	1,5	1,5
1200VA	10 ⁵ operations	1	1
Maximum frequency of operations	ops. per hour	60	60
Short circuit protection	slow, gL (gG) A	25	25
Type		B3F	B4F
Rated insulation voltage U_i	V AC	440 ²⁾	440 ²⁾
Lamp base		BA9s	

Type		B3., B4., B5.
Protection degree (according to IEC 947-1) in assembled state, from the front from rear		IP67/IP65 IP20/IP00
Ambient temperature	°C	-40 to +60 ³⁾
Cable cross-section		
	solid, mm ²	0,5 - 2,5
	flexible, mm ²	0,5 - 2,5
	flexible with multicore cable end, mm ²	0,5 - 1,5
Cables per clamp	number	2
Mounting hole (according to IEC 947-1)	Ø mm	22,5
	Ø mm	30,5
Mounting position		optional
Terminal screws		Pozidriv No. 2 screws M3,5

Data according to cULus

Type	B3.	B4.
Contact Block for NO and NC	600 V AC max.	600 V AC max.
General use	10A	10A
Heavy pilot duty	A600	A600
Lamp Holder with socket BA9s	240V 2,6W max.	240V 2,6W max.
Wire (Contact and lamp holder)	14 - 18AWG	14 - 18AWG
Torque	9 lb/in.	9 lb/in.

Approvals

Country	USA, Canada UL	Europe CE	Register of Shipping Great Britain LRS	CENELEC CB- Certificates
Type				
B3T..	o	o	-	o
B3F..	o	o	-	o
B4TU..	o	o	o	o
B4TU..	o	o	o	o
B4FU..	o	o	o	o
B3-MB..	-	o	-	-

o In standard version approved

- Not provided for test till now

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): $U_{mp} = 6kV$.

Data for other conditions on request.

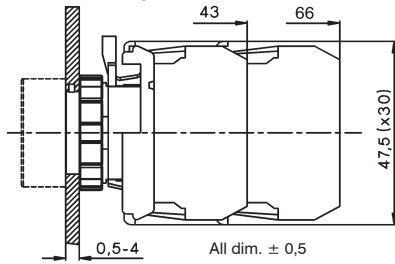
2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{mp} = 4kV$

3) Ambient temperatures for lamps find on pages 337, 341, 349.

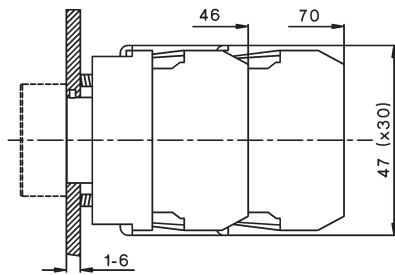
Dimensions

Actuators and Lens Caps 22mm

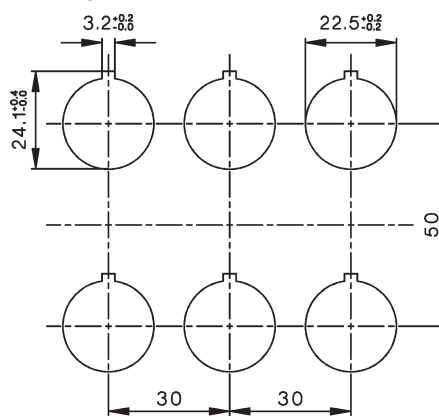
Panel mounting B3S



Panel mounting B3M

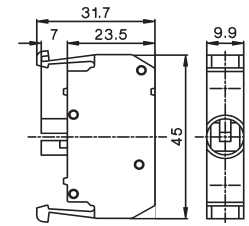


Mounting holes



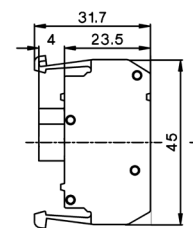
Dimensions of minimum space requirements according to IEC. Take to consideration the field of traverse of swing knobs (27mm) and the diameter of mushroom heads.

Contact blocks and Lamp Holder B3...



All dim. ± 0,2

Contact block B3T...

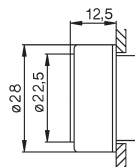


All dim. ± 0,2

Actuators and Lens caps

Flush Head
Illuminated Flush Head

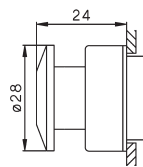
B3D(R), B3DL(R)
BS3D(R), BS3DL(R)
BC3D(R), BC3DL(R)



All dim. ± 0,5

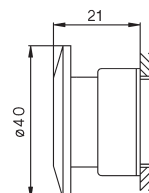
Mushroom Head Ø28mm
Emergency Stop Ø28mm

B3P1 bis B3P3
BS3P1 bis BS3P3
BC3P1 bis BC3P3



Mushroom Head Ø40mm
Emergency Stop Ø40mm

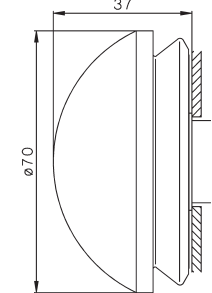
B3P14, B3P34
BS3P14, BS3P34
BC3P14, BC3P34



All dim. ± 0,5

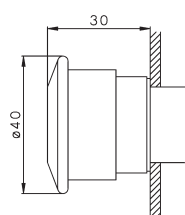
Mushroom Head Ø70mm
Emergency Stop Ø70mm

BS3P14P
BS3P34P



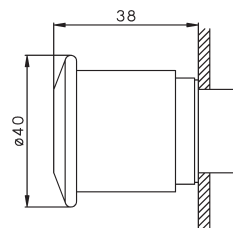
Push-and pull button Ø40mm

BS3P44

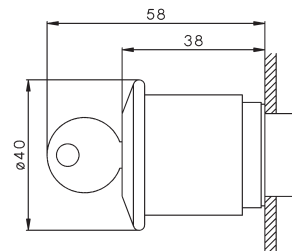


Push-and pull button Ø40mm

BS3P45

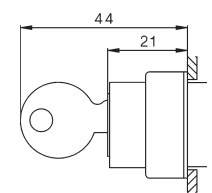


Push-and pull button Ø40mm
with key
BS3P44S3



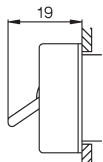
Lockable Push button

B3SAR., B3SAT.
BS3SAR., BS3SAT.
BC3SAR., BC3SAT.



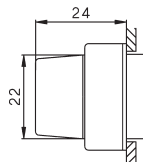
Toggle

B3E
BS3E
BC3E



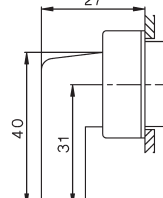
Rotary Knob

B3KN, B3KL
BS3KN, BS3KL
BC3KN, BC3KL



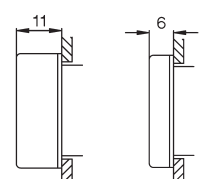
Swing Knob

B3KRL, B3KRN
BS3KRL, BS3KRN
BC3KRL, BC3KRN



Lens Cap

B3R(F) B3RN



Dimensions

Actuators and Lens Caps 22mm

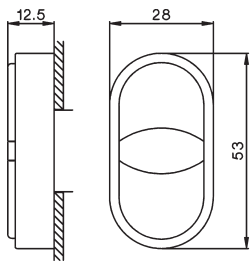
Double push button

Monoblock Multi-LED

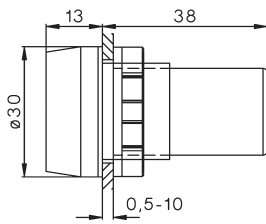
Protection cover

Protection ring w. thread

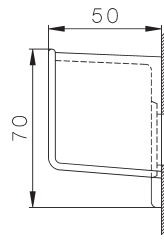
B3DT



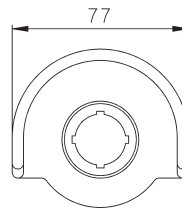
B3-MB...



B3-SK ..

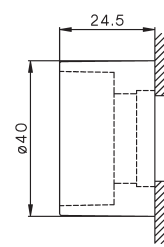


All dim. $\pm 0,5$



All dim. $\pm 0,5$

P921-.



Label holder

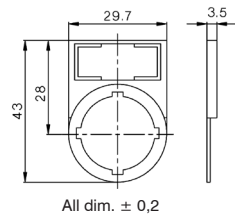
Legend plate

Label holder

Label holder

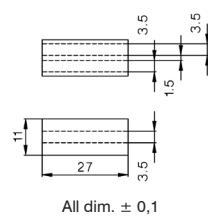
Legend plate

P751



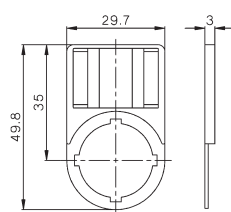
All dim. $\pm 0,2$

BK4-...

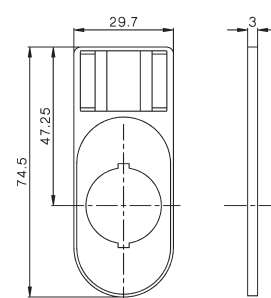


All dim. $\pm 0,1$

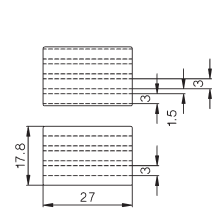
P761



P761-DT



BK8-...

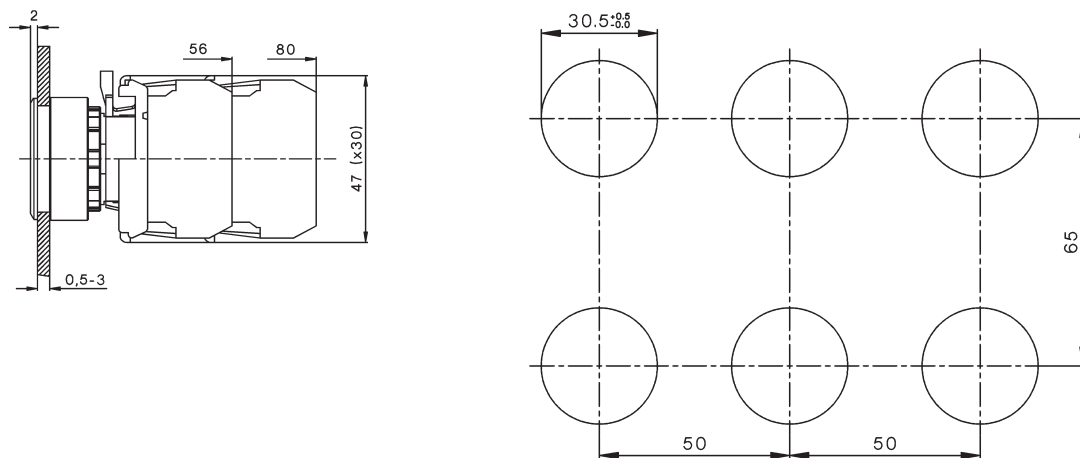


Dimensions

Actuators and Lens Caps 30mm

Panel mounting B3S

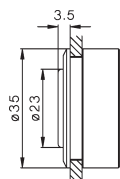
Mounting holes



Actuators and Lens caps

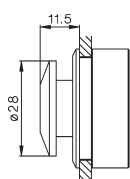
Flush Head
Illuminated Flush Head

B5D(R), B5DL(R)
BS5D(R), BS5DL(R)



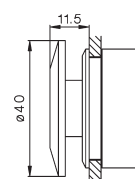
Mushroom Head Ø28mm
Emergency Stop Ø28mm

B5P1 to B5P3
BS5P1 to BS5P3



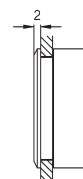
Mushroom Head Ø40mm
Emergency Stop Ø40mm

B5P14, B5P34
BS5P14, BS5P34



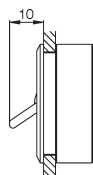
Lens Cap

B5RF



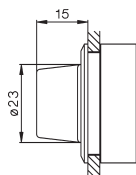
Toggle

B5E
BS5E



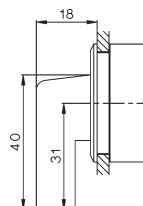
Rotary Knob

B5KN, B5KL
BS5KN, BS5KL



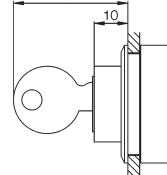
Swing Knob

B5KRL, B5KRN
BS5KRL, BS5KRN



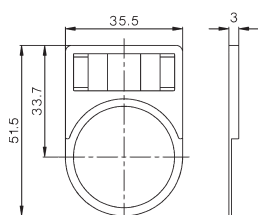
Lockable Push button

B5SAR., B5SAT.
BS5SAR., BS5SAT.



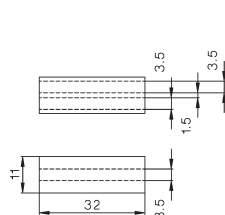
Label holder

P942-1



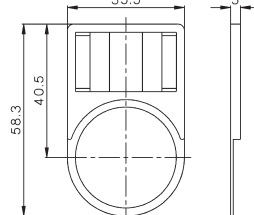
Legend plate

BK5-...



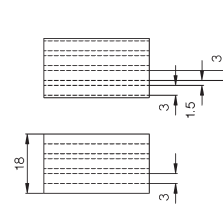
Label holder

P1043



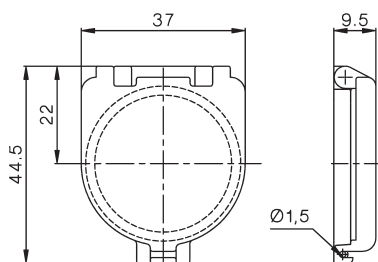
Legend plate

BK10-..

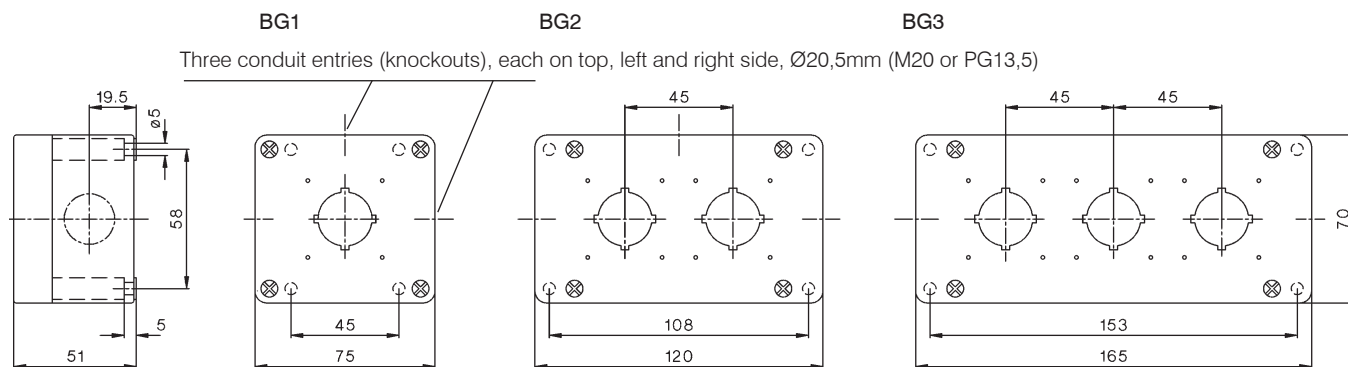


Dimensions

Protective Cover
B5-SAP

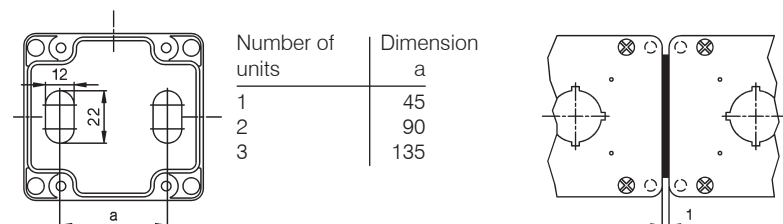


Enclosures for Custom Built Stations



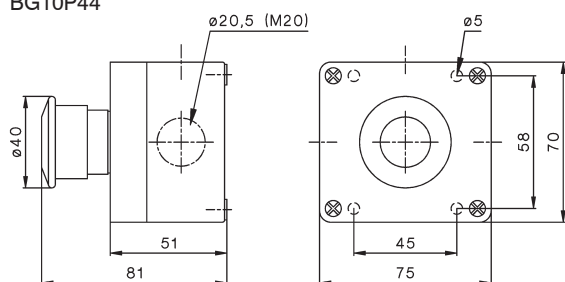
Conduit entries in the bottom
(knockouts)

Coupled Enclosures
B4-8852



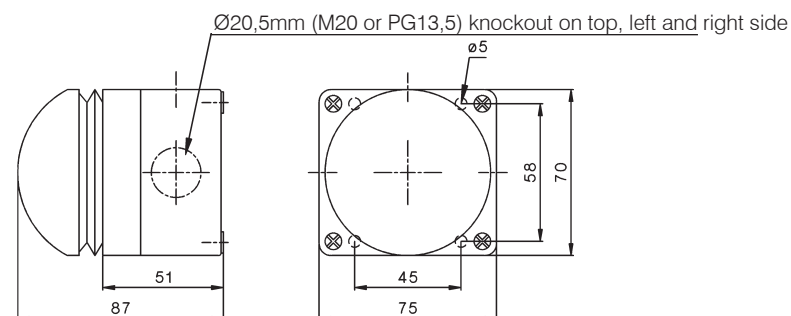
EMERGENCY STOP Push Button Ø40 mm

BG10P44



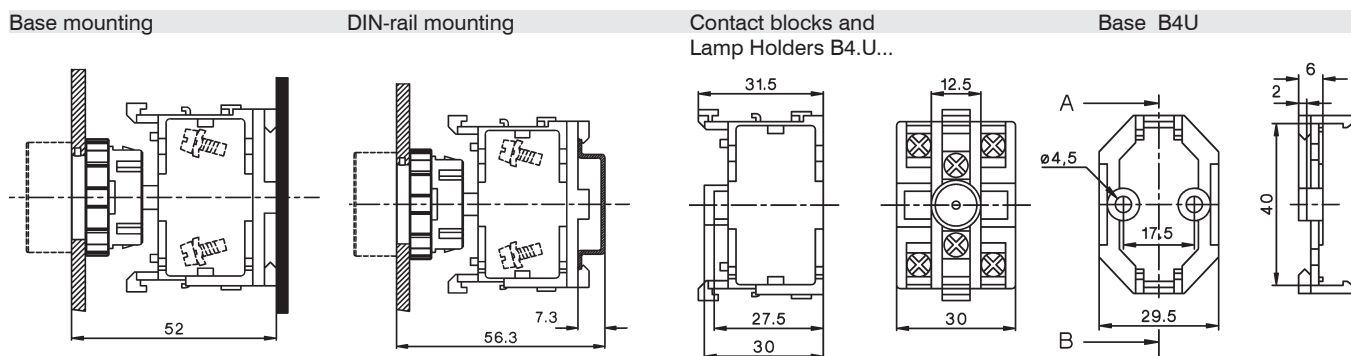
EMERGENCY STOP Push Button Ø70 mm, Foot switch

BG10P34P, BG10P14P



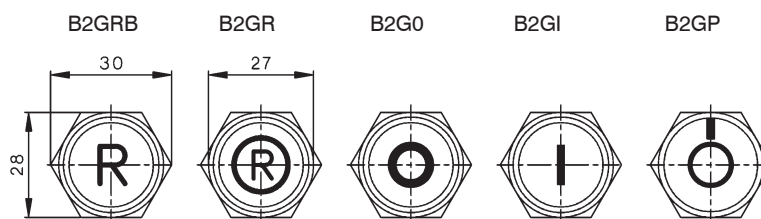
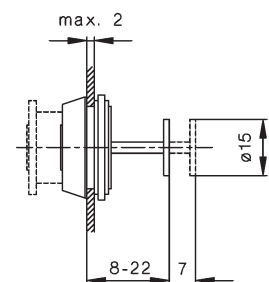
Dimensions

Actuators 22mm

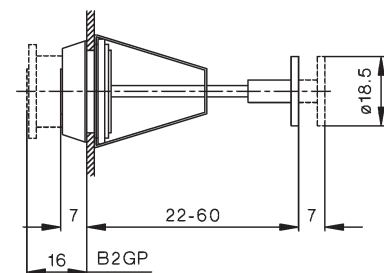


Push buttons for enclosures

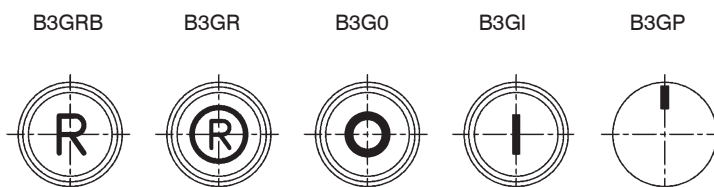
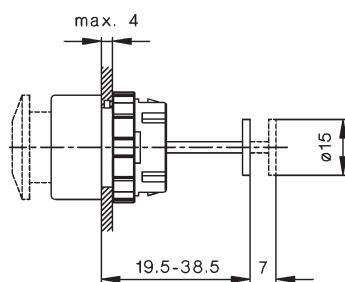
B2G...-22



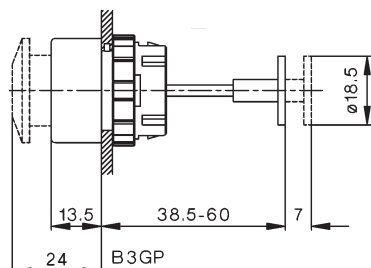
B2G...-60

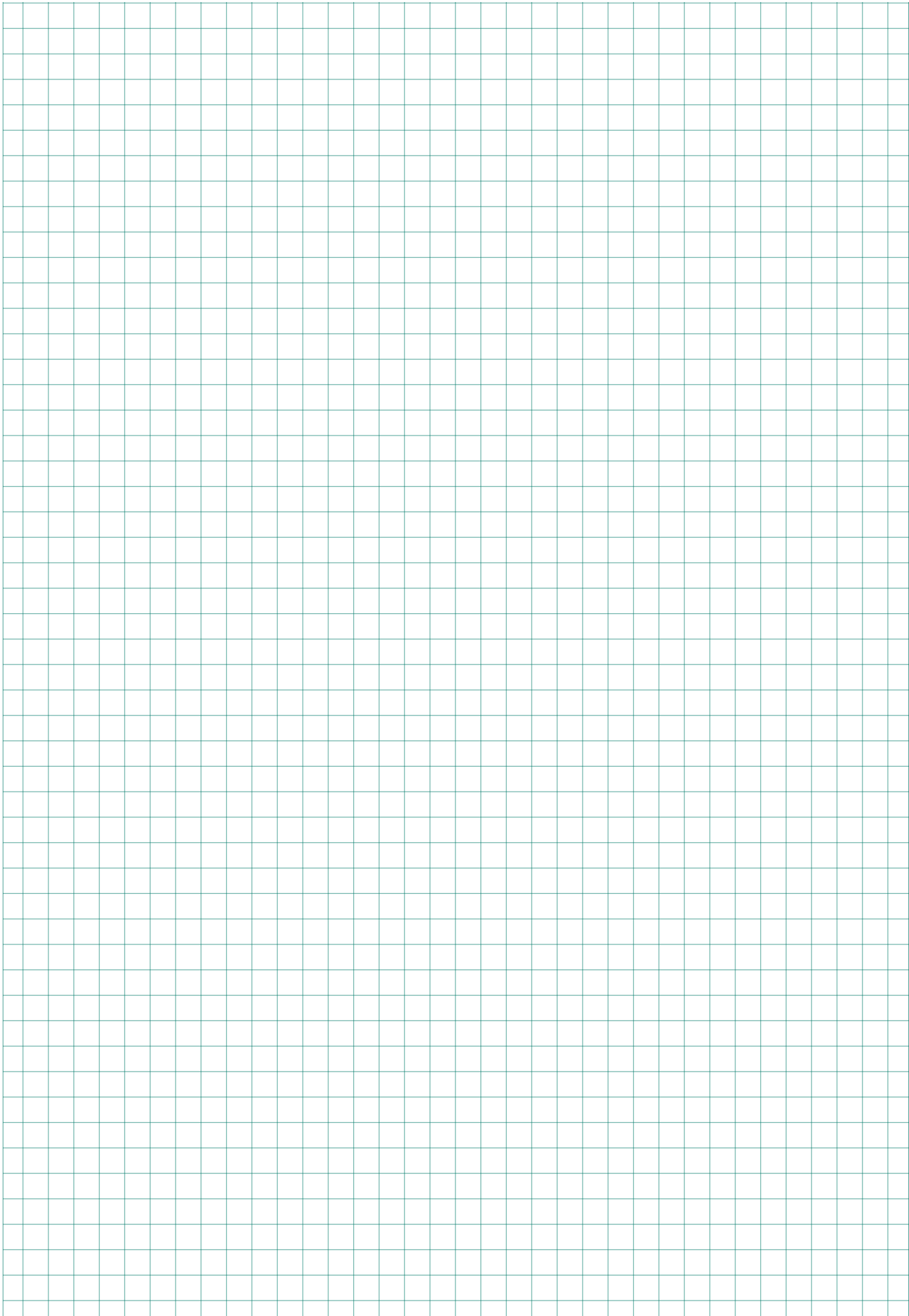


B3G...-31,5



B3G...-60





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Chile

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Egypt

Economic Co. Electrical Commerce & Import 44, Naguib El-Rihani St. ET - Kairo	Tel: +20 / 02 / 592 91 80 Fax: +20 / 02 / 590 78 82 economic@economic-ec.com
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Hong Kong

Creation Building Services Materials Limited Unit A & B, 15th Floor, Worldwide Centre 123 Tung Chau Street, Tai Kok Tsui, Kowloon Hong Kong - China SAR	Tel: +852 / 2398 2106 Fax: +852 / 2191 5808 sales@creation-trading.com www.creation-trading.com
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Jordan

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Kenia

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