General Catalogue

Quality made in AUSTRIA

D946E173

BENEDICT GMBH

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General

Test Authorities, Registration Mark, Approvals

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

Quality Control System

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

CE-Marking CE

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

Discernment at UL-Standards

Recognized Component Industrial Control Equipment	Listed Industrial Control Equipment
UL issues yellow "Guide cards" with Guide- and File-No.	UL issues white "Guide cards" with Guide- and File-No.
Devices have permission to be marked with on the label c UL us	Devices have to be marked with the "UL-Listing Mark" c UL us
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" c UL us the approval is also valid for using as "Recognized Component" c UL us.

Approvals

Country	North America		Switzerland	Europe	Russia EAC	China	CENELEC CB-Certificates
	UL		SEV				
Type	c UL us	c UL us		CE	EAC	CCC	
Micro Contactor Relays, Micro Contactors, 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 In standard version approved x In test - Not provided for test till now

Approvals

Country	North America		Switzerland	Europe	Russia EAC	China	CENELEC CB-Certificates
Type	UL		SEV	CE	EAC		
Accessories							
K2-T..E, -A	-	-	-	o	o	-	-
K2-TP	o	-	-	o	o	-	-
K2-L	o	-	-	o	o	-	-
K2-IN.	o	-	-	o	o	-	-
K2-UN.	o	-	-	o		-	-
K2-IM	-	-	-	o	o	-	-
K2-E	o	-	-	o	o	-	-
VG-K2	-	-	-	o	o	-	-
RC-K3	o	-	-	o	o	-	-
Reversing Contactors , Serie KW3							
KW3-10	o	-	-	o	o	-	-
KW3-14	o	-	-	o	o	-	-
KW3-18	o	-	-	o	o	-	-
KW3-22	o	-	-	o	o	-	-
KW3-24	o	-	-	o	o	-	-
KW3-32	o	-	-	o	o	-	-
KW3-40	o	-	-	o	o	-	-
D.O.L. Starters							
P1..	o	-	-	o	o	-	-
Thermal Overload Relays							
U3/32	o	-	-	o	o	-	o
U3/42	o	-	-	o	o	-	o
U3/74	o	-	-	o	o	-	o
U12/16E	o	-	-	o	o	-	o
U12/16A	-	-	-	o	o	-	o
U12/16EM	-	-	-	o	o	-	o
U12/16EQ	-	-	-	o	o	-	o
U32	o	-	-	o	o	-	o
U60	o	-	-	o	o	-	o
U85	o	-	-	o	o	-	o
U180	x	-	-	o	o	-	-
U320	x	-	-	o	o	-	-
U800	-	-	-	o	o	-	-
Modular Contactors							
R20	o	-	o	o	o	-	o
R25	o	-	o	o	o	-	o
R40	o	-	o	o	o	-	o
R63	o	-	o	o	o	-	o
R40, R63 2-pole	-	-	-	o	o	-	o
RH11	o	-	-	o	o	-	o

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

c UL us - and c FL us - Guide- and File-No.

These data are important for UL-inspecting engineers.

Devices	Guide-No. c UL us		c FL us		File-No.
	Kanada	USA	Kanada	USA	
Contactors	NLDX7	NLDX	NLDX8	NLDX2	E41502
Reversing Contactors	NLDX7	NLDX	-	-	E41502
Control Relays, Accessories	NKCR7	NKCR	NKCR8	NKCR2	E66273
Thermal Overload Relays	NKCR7	NKCR	-	-	E66273
Cam Switches	NLRV7	NLRV	-	-	
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	NKCR7	NKCR	-	-	E66273

Technical Information

Degree of protection acc. to IEC 60947-1

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

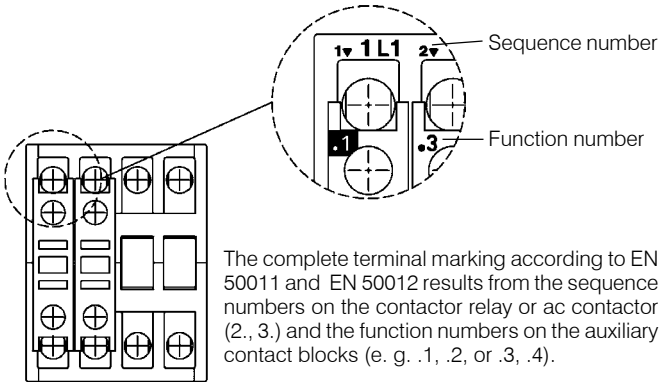
1 st digit: Pertains to solid objects
2 nd digit: Pertains to water.

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 greater than 2,5mm	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.

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 quanties.
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.

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.



The complete terminal marking according to EN 50011 and EN 50012 results from the sequence numbers on the contactor relay or ac contactor (2., 3.) and the function numbers on the auxiliary contact blocks (e. g. .1, .2, or .3, .4).

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.

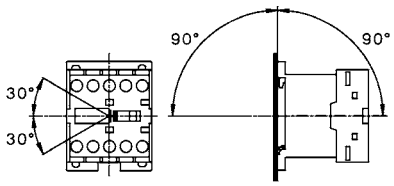
Short circuit protection

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!

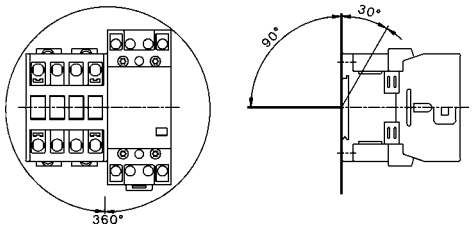
Technical Information

Mounting positions of contactors

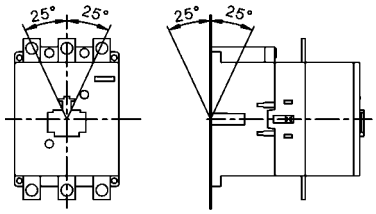
K0-.. / K1-..



K2-..A00-40, K(G)3-07 bis K3-115, R..



K3-151.. bis K3-1200..



Terminal screws

Devices Type	Kind of connection Screw with washer	Screw with clamp box		Screw w. nut	Screw driver		Tightening torque 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
Contactor 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	M4	-	-	-		Pz2	1,2 - 1,8	11 - 16
K2-45, -60A00-40	-	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	M3,5	-	-	-		Pz2	0,8 - 1,4	7 - 12
HA, HN, K2-.., HB..	M3,5	-	-	-		Pz2	0,8 - 1,4	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	-	M3	-	-		Pz2	0,6 - 1,2	5 - 11
K1R	M3,5	-	-	-		Pz2	0,8 - 1,4	7 - 12

Micro Contactor Relays AC or DC operated 10

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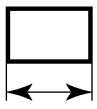
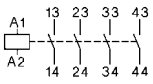


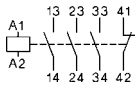
Dimensions 18

Ratings Therm.		Contacts [2]					**Type**		Coil voltage [1]		
					Distinc. Number	Additional Contact		**24**	24V 50/60Hz		
								230	220-230V 50Hz		
								= 24	24V= DC		
AC15		Rated-Current									
230V A	400V A	I_{th} A	NO	NC	acc. to EN50011	Blocks Type				Pack pcs.	Weight kg/pc.
4-pole, With Screw Terminals											
3	1,5	5	4	-	40E	-	**K0-04D40**	. . .	10		0,07
3	1,5	5	3	1	31E	-	**K0-04D31**	. . .	10		0,07
3	1,5	5	2	2	22E	-	**K0-04D22**	. . .	10		0,07

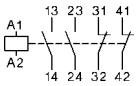
K0-04D40



K0-04D31



K0-04D22



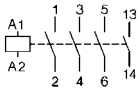
1) Other coil voltages for AC operated contactors find on page 12. For DC operated Micro Contactors contact us.
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

Micro Contactors

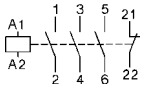
AC or DC Operated

Power Ratings AC2, AC3 AC1 380V / 400V / 415V kW		Rated Current 440V A	Aux. Contacts[2] Built-in NO	Built-in NC	Additional Type	Type	Coil voltage [1]	Pack pcs.	Weight kg/pc.
						24	24V 50/60Hz		
						230	220-230V 50Hz		
						= 24	24V= DC		
3-pole, With Screw Terminals									
2,2	-	12	1	-	-	**K0-05D10 . . .**		10	0,07
2,2	-	12	-	1	-	**K0-05D01 . . .**		10	0,07
4-pole, With Screw Terminals									
2,2	-	12	-	-	-	**K0-05D00-40 . . .**		10	0,07

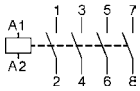
K0-05D10



K0-05D01



K0-05D00-40



Snap-On Adapter

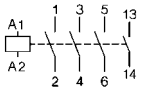
suitable for Micro Contactors	Specification	Type	Pack pcs..	Weight kg/pc.
K0	Snap on Adapter for K0	P1039	10	0,0061

Snap-on Micro Contactors to 35mm DIN-rails acc. to DIN EN 50022.

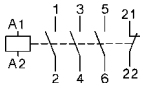
1) Other coil voltages for AC operated contactors find on page 12. For DC operated Micro Contactors contact us.
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

Power Ratings AC2, AC3 AC1 380V 400V 415V kW	660V 690V kW	Rated Current 440V A	Aux. Contacts[2] Built in NO	NC	Additional Type	Type	Coil voltage [1] 24 24V 50/60Hz 230 220-230V 50Hz = 24 24V= DC	Pack pcs.	Weight kg/pc.
3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications									
2,2	-	9	1	-	-	**K0-05L10** . . .		10	0,07
2,2	-	9	-	1	-	**K0-05L01** . . .		10	0,07
4-pole, with Solder Pins Ø1,15 for Printed Circuit Applications									
2,2	-	9	-	-	-	**K0-05L00-40** . . .		10	0,07

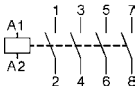
K0-05L10



K0-05L01



K0-05L00-40



Coil voltages for AC operated contactors

Suffix to contactor type e.g. K0-05D10 24	Voltage Marking at the coil for 50Hz V	for 60Hz V	Rated Control Voltage U_s range for 50Hz 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 at the coil for 50Hz V	for 60Hz V	Rated Control Voltage U_s range for 50Hz 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

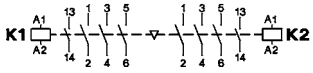
1) Other coil voltages (AC operation) see above table. For DC operated Micro Contactors contact us.
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.

Micro Reversing Contactors, Mechanical Interlocked — AC or DC Operated

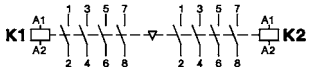
Power Ratings AC2, AC3 380V 400V 415V kW		Rated Current AC1 660V 690V 440V kW A	Aux. Contacts[2] Built-in NO	NC	Additional on left hand side Contactor K1 Type	on right hand side Contactor K2 Type	Type	Coil voltage [1] 24 24V 50/60Hz 230 220-230V 50Hz = 24 24V= DC	Pack pcs.	Weight kg/pc.
3-pole, with Screw Terminals										
2,2	-	12	-	1	-	-	**K0W05D01MC . . .**		5	0,14
2,2	-	12	1	-	-	-	**K0W05D10MC . . .**		5	0,14
4-pole, with Screw Terminals										
2,2	-	12	-	-	-	-	**K0W05D00-40MC . . .**		5	0,14
3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications										
2,2	-	xxx[3]	-	1	-	-	**K0W05L01MC . . .**		5	0,14
2,2	-	xxx[3]	1	-	-	-	**K0W05L10MC . . .**		5	0,14

K0W05D01MC

K0W05D10MC



K0W05D00-40MC



1) Other coil voltages for AC operated contactors find on page 12. For DC operated Micro Contactors contact us.
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA). Mirror contacts acc. IEC60947-4-1 Annex F.
3) Data on request.

Micro Contactors

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

Main Contacts		Type	K0-05D..(=)	K0-05L..(=)
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} cosφ = 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, cosj = 1	230V	kW	4,7	3,5
	240V	kW	4,8	3,7
	400V	kW	8,3	3,3
	415V	kW	8,6	6,4
	440V	kW	9,0	6,8
Rated operational current I_e (=I_{th}) at 60°C, enclosed		A	8	6
Rated operational power of three-phase resistive loads 50-60Hz, cosj = 1	230V	kW	3,1	2,3
	240V	kW	3,3	2,4
	400V	kW	5,5	4,1
	415V	kW	5,7	4,3
	440V	kW	6,0	4,5
Minimum cross-section of conductor at load with I_e (=I_{th})		mm^2	1,5	-
Utilization category AC2 and AC3 **Switching of three-phase motors**				
Rated operational current I_e open and enclosed	220V	A	6,2	6,2
	230V	A	6,2	6,2
	240V	A	5,6	5,6
	380-400V	**A**	**5**	**5**
	415-440V	A	5	5
Rated operational power of three-phase motors 50-60Hz	220-240V	kW	1,5	1,5
	380-440V	**kW**	**2,2**	2,2
Utilization category AC4 **Switching of squirrel cage motors, inching**				
Rated operational current I_e open and enclosed	220V	A	4,9	4,9
	230V	A	4,9	4,9
	240V	A	4,1	4,1
	380-400V	**A**	**3,5**	**3,5**
	415-440V	A	3,5	3,5
Rated operational power of three-phase motors 50-60Hz	220-240V	kW	1,1	1,1
	380-440V	**kW**	**1,5**	1,5
Utilization category AC5a **Switching of gas discharge lamps** Rated operational current I_e per pole at 220/230V				
Fluorescent lamps, uncompensated and serial compensated		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 cosφ of the lamp	max. lamps per pole ($I_{nLED} \le I_{th}$) =		$\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$	
max inrush current of contactor		A	91	91
Utilization category AC5b **Switching of incandescent lamps[5]** 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): Uimp = 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 flourescent glass bulb (daylight lamps)
5) Current inrush approx. 16 x Ie

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	A	12	9
Time constant L/R ≤1ms		60V	A	12	9
Rated operational current I_e		110V	A	-	-
		220V	A	-	-
	3 poles in series	24V	A	12	9
		60V	A	12	9
		110V	A	12	9
		220V	A	-	-
Utilization category DC3 and DC5					
Switching of shunt motors	1 pole	24V	A	12	9
and series motors		60V	A	-	-
Time constant L/R ≤15ms		110V	A	-	-
Rated operational current I_e		220V	A	-	-
	3 Pole in Serie	24V	A	12	9
		60V	A	12	9
		110V	A	12	9
		220V	A	-	-
Maximum ambient temperature					
Operation		open	°C	-40 to +60 (+90) [1]	
		enclosed	°C	-40 to +40	
with therminal 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					
Coordination-type "1" according to IEC 947-4-1					
Contact welding without hazard of persons					
max. fuse size		gL (gG)	A	32	32
Coordination-type “2” according to IEC 947-4-1					
Light contact welding accepted					
max. fuse size		gL (gG)	A	-	-
Contact welding not accepted					
max. fuse size		gL (gG)	A	-	-
For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size.					
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		without load	1/h	10000	10000
contactors without therminal oberload relay		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 /AC1according 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
Verlustleistung pro Pol	bei I_{th}	W	0,25	0,25
Utilization category AC15				
Rated operational currrent 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	60V	A	0,5	0,5
			-	-
			-	-
Maximum ambient temperature				
Operation	open	°C	-40 to +60 (+90) [2]	
	enclosed	°C	-40 to +40	
Storage		°C	-40 to +90	
Short circuit protection				
short-circuit current 1kA,				
contact welding not accepted				
max. fuse size	gL (gG)	A	10	10
For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size.				
Power consumption of coils				
AC operated	inrush	VA	9	9
	sealed	VA	4	4
		W	1,8	1,8
DC operated	inrush	W	2,5	2,5
	sealed	W	2,5	2,5
Operation rage 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 - 20	10 - 20
	release time	ms	2 - 10	2 - 10
	arc duration	ms	10 - 15	10 - 15
Cablecross-section				
all connectors	solid	mm^2	0,5 - 1,5	Solder Connector
	flexible	mm^2	0,5 - 1,5	Ø 1,15
	flexible with multicore cable end	mm^2	0,5 - 1,5	
Clamps per pole			2	-
	solid or stranded	AWG	20 - 14	-

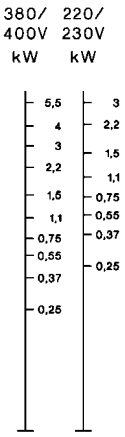
1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 4kV. Data for other conditions on request.
2) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced thermal rated current I_{th} to I_e /AC15.
3) Summary switching 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

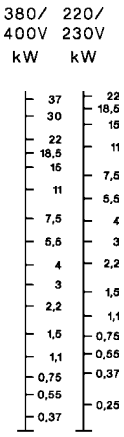
Data according to UL508

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	½	-	½	-
	200-208V	hp	1	-	1	-
	220-240V	hp	1	-	1	-
	277V	hp	1½	-	1½	-
Rated operational power of AC motors at 60Hz (1ph)	110-120V	hp	⅙	-	⅙	-
	200-208V	hp	½	-	½	-
	220-240V	hp	¾	-	¾	-
Fuse / Short-circuit current		A/kA	30/5	-	30/5	-
Rated voltage		VAC	300	300	300	300
Auxiliary Contacts (cULus)	heavy pilot duty	AC	B300	B300	B300	B300
	standard pilot duty	DC	R300	R300	R300	R300

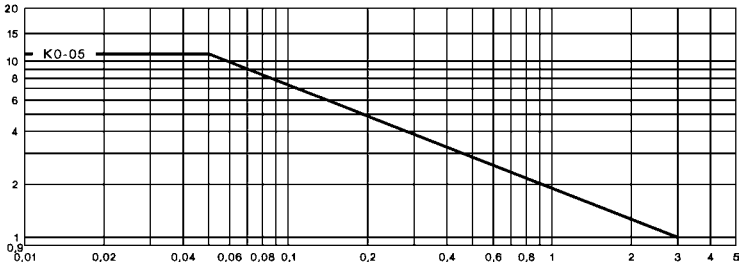
Motor Rating
P_n = AC4



Motor Rating
P_n = AC3



Breaking Current
I_a (= I_e = AC1)
A



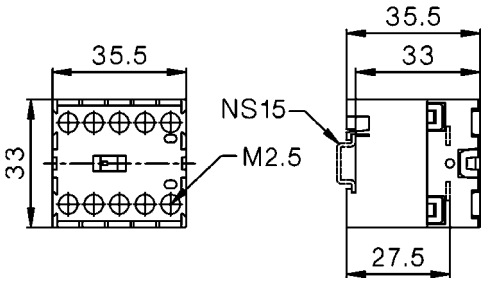
Millions of Operations

Micro Contactors

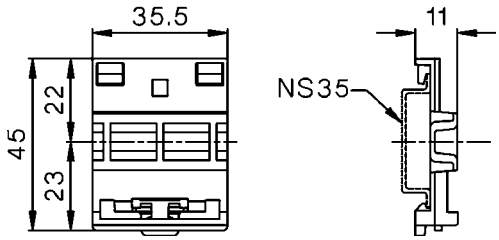
Dimensions

AC or DC operated
with screw terminals

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

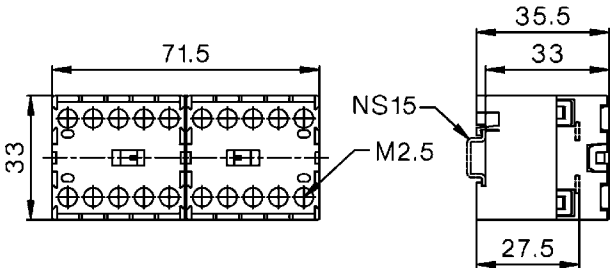


Snap-On Adapter P1039

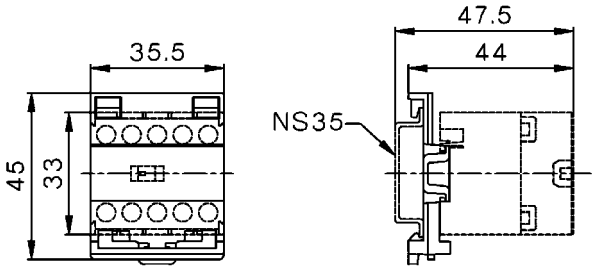


Reversing Contactors
with screw terminals

K0W05D..MC

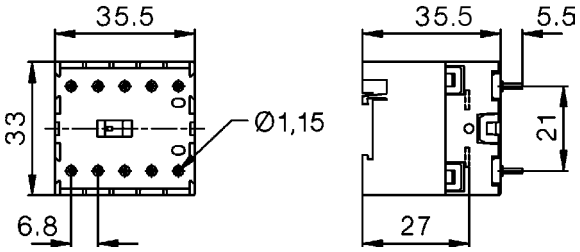


K0-..D.. with Snap-On Adapter P1039



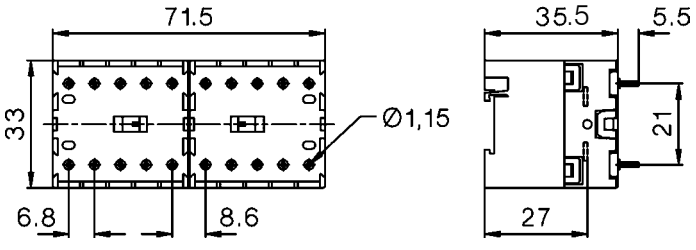
AC or DC operated
with solder connections

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



Reversing Contactors
with solder connections

K0W05L..MC



Mini Contactor Relays 4-pole 20
Auxiliary Contact Blocks

Interface Contactor Relays

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Coil voltages 24

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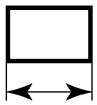
Technical Data 28



Dimensions 32

Mini Contactor Relays 4-pole — AC Operated

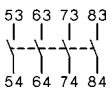
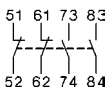
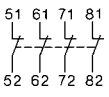
Ratings AC15 230V A	400V A	Therm. Rated Current I_{th} A	Contacts 2) NO	NC	Distinc. Number acc. to EN50011	Additional Contact Blocks Type	Type	Pack pcs.	Weight kg/pc.
4-pole, With Screw Terminals									
3	2	10	4	-	40E	1 HK..	**K1-07D40** . . .	10	0,16
3	2	10	3	1	31E	1 HK..	**K1-07D31** . . .	10	0,16
3	2	10	2	2	22E	1 HK..	**K1-07D22** . . .	10	0,16

Coil voltage 1)

24	24V 50/60Hz
230	220-230V 50Hz
24VS	24V 50/60Hz w. protection 3)
230VS	220-230V 50Hz w. protection 3)
24VM	24V 50/60Hz 24V= DC
230VM	220-240V 50/60Hz 220V= DC

Auxiliary Contact Blocks For Contactor Relays

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

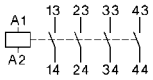
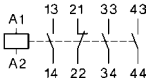
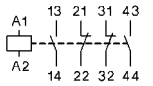
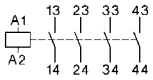
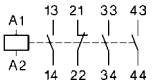
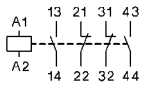
Aux. Contact Blocks	HK11	HK02	HK20	HK40	HK22	HK04
Wiring Diagrams						

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

K1-07D40	**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 24
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)

Type	Coil voltage [1]	Contacts [2] NO	NC	Distinc. Number acc. to EN50011	Additional Contact Blocks Type	Pack pcs.	Weight kg/pc.	Wiring Diagrams
	24 24V= DC **24VS** 24V= DC with protection [2]							
4-pole, With Screw Terminals, Coil 2,5W								
K1-07D40= ...		4	-	40E	1 HK..	10	0,19	
K1-07D31= ...		3	1	31E	1 HK..	10	0,19	
K1-07D22= ...		2	2	22E	1 HK..	10	0,19	
4-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor [3]								
K1-07D40= 24VR		4	-		-	10	0,20	
K1-07D31= 24VR		3	1		-	10	0,20	
K1-07D22= 24VR		2	2		-	10	0,20	

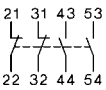
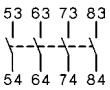
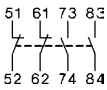
1) Other coil voltages on request
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.
3) with integrated coil suppressor (Transient Voltage Suppressor Diode)

Mini Contactors — AC Operated

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

Ratings AC15 230V A	400V A	Thermal Rated Current A	Contacts [2] NO	NC	Type	Pack pcs.	Weight kg/pc.
3	2	10	1	1	**HKM11**	10	0,04
3	2	10	-	2	**HKM02**	10	0,04
3	2	10	2	2	**HKM22**	10	0,04

Aux. Contact Blocks	HKM11	HKM02	HKM22	HK11	HK02	HK40	HK22
Wiring Diagrams							
Contactors with Auxiliary Contact Block Contacts according to EN50012							
K1-..D10	**21**	**12**	**32**	-	-	-	-
Contacts according to DIN EN50005							
K1-..D01	-	-	-	12	03	41	23
K1-..D00-40	-	-	-	11	02	40	22

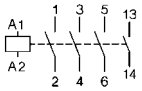
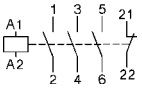
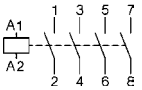
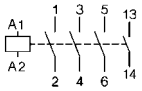
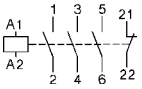
Prefer combinations according to EN50012

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 24
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]	Aux. Contacts [2] Built in NO	Aux. Contacts [2] Built in NC	Aux. Contacts [2] Additional	Additional Overload Relay see page114 Type	Pack pcs.	Weight kg/pc.	Wiring Diagrams
3-pole, With Screw Terminals, Coil 2,5W								
K1-09D10= . . .		1	-	1 HKM..	U12/16..K1	10	0,19	
K1-12D10= . . .		1	-	1 HKM..	U12/16..K1	10	0,19	
K1-09D01= . . .		-	1	1 HK..	U12/16..K1	10	0,19	
K1-12D01= . . .		-	1	1 HK..	U12/16..K1	10	0,19	
4-pole, With Screw Terminals, Coil 2,5W								
K1-09D00-40= . . .		-	-	-	U12/16..K1	10	0,19	
K1-12D00-40= . . .		-	-	-	U12/16..K1	10	0,19	
3-pole, With Screw Terminals, Coil 1,5W, 19 to 30V DC with suppressor [3]								
K1-09D10=24VR		1	-	-	U12/16..K1	10	0,20	
K1-09D01= 24VR	-	-	1	-	U12/16..K1	10	0,20	

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

Power Ratings		Rated Current	Aux. Contacts[2] Built in		Additional	Type	Coil voltage [1]		
							24 24V 50/60Hz		
							230 220-230V 50Hz		
							24VS 24V 50/60Hz w. protection [2]		
AC2, AC3		AC1					**230VS** 220-230V 50Hz w. protection [2]		
380V							**24VM** 24V 50/60Hz 24V DC		
400V	660V						**230VM** 220-240V 50/60Hz 220V DC		
415V	690V	690V						Pack	Weight
kW	kW	A	NO	NC	Type			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 at the coil for 50Hz V	for 60Hz V	Rated Control Voltage U_s range for 50Hz 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. K1-09D10 230	Voltage Marking at the coil for 50Hz V	for 60Hz V	Rated Control Voltage U_s range for 50Hz 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	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 24
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)

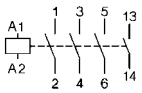
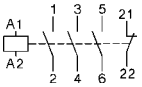
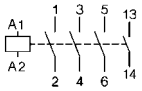
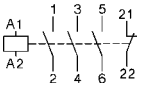
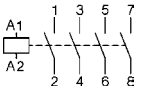
DC Solenoid Operated

Type

Coil voltage [1]
24 24V= DC
24VS 24V= DC with protection [3]

Aux. Contacts [2]: Built in NO | Additional NC

Additional Overload Relay see pages 115, 117 Type

Type	Built in NO	Additional 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	
K1-09F01= . . .	-	1	1 HK.. [4]		10	0,19	
3-pole, with Solder Pins Ø1,15 for Printed Circuit Applications						
K1-09L10= . . .	1	-	-	-	10	0,19	
K1-09L01= . . .	-	1	-	-	10	0,19	
4-pole, with Solder Pins Ø1,15 for Printed Circuit Applications						
K1-09L00-40= . . .	-	-	-	-	10	0,19	

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

Mini Reversing Contactors, Mechanical Interlocked — AC Operated

Power Ratings AC2, AC3 380V 400V 415V kW		Rated Current AC1 660V 690V A	Aux. Contacts[2] Built-in NO	NC	Additional on left hand side Contactor K1 Type	on right hand side Contactor K2 Type	Type	Pack pcs.	Weight kg/pc.
3-pole, with Screw Terminals									
4	4	20	-	1	HKM11V	HKM11X	**K1W09D01MC . . .**	1	0,32
5,5	5,5	20	-	1	HKM11V	HKM11X	**K1W12D01MC . . .**	1	0,32
4	4	20	1	-	-	HKM..	**K1W09D10MC . . .**	1	0,32
5,5	5,5	20	1	-	-	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	-	1	-	-	**K1W09L01MC . . .**	1	0,32
4	4	16	1	-	-	-	**K1W09L10MC . . .**	1	0,32

Coil voltage [1]

24	24V 50/60Hz
230	220-230V 50Hz
24VS	24V 50/60Hz w. protection [3]
230VS	220-230V 50Hz w. prot. [3]
24VM	24V 50/60Hz 24V DC
230VM	220-240V 50/60Hz 220V DC

Auxiliary Contact Blocks for Mini Reversing Contactors K1-..

Ratings AC15 230V 400V 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

1) Other coil voltages see page 24
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)

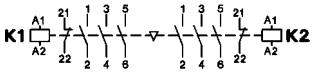
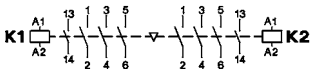
DC Solenoid Operated

Type

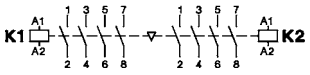
Coil voltage [1]
24 24V= DC
24VS 24V= DC with protection [2]

Additional Overload Relay see page114 Type

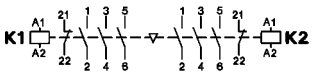
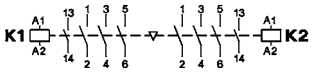
3-pole, with Screw Terminals

Type	Additional Overload Relay Type	Pack pcs.	Weight kg/pc.	Wiring Diagrams
K1W09D01MC= . . .	U12/16..K1	1	0,32	
K1W12D01MC= . . .	U12/16..K1	1	0,32	
K1W09D10MC= . . .	U12/16..K1	1	0,32	
K1W12D10MC= . . .	U12/16..K1	1	0,32	

4-pole, with Screw Terminals

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

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

K1W09L01MC= . . .	-	1	0,32	
K1W09L10MC= . . .	-	1	0,32	

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

Mini Contactors

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

Main Contacts		Type	K1-09D..	K1-09F..	K1-09L..	K1-12D..
Rated insulation voltage U_i		V AC	690 [1]	690 [1]	690 [2]	690 [1]
Making capacity I_{eff}	at U_e = 690V AC	A	165	165	165	165
Breaking capacity I_{eff}	400V AC	A	100	100	100	100
cosφ = 0,65	500V AC	A	90	90	90	90
	690V AC	A	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	230V	kW	7,9	6	6	7,9
50-60Hz, cosφ = 1	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	230V	kW	6,3	4,5	4,5	6,3
50-60Hz, cosφ = 1	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	220V	A	12	12	12	15
open and enclosed	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	220-240V	kW	3	3	3	4
50-60Hz	**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	220V	A	12	12	12	15
open and enclosed	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	220-240V	kW	3	3	3	4
50-60Hz	**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 lamps3),						
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	61	16	16
LED-Lamps						
consider the inrush current of the lamp ballast and cosφ 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	233	233	233	233
Utilization category AC5b Switching of incandescent lamps [6]						
Rated operational current I_e						
per pole at 220/230V		A	8	8	8	8

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV.
Data for other conditions on request.
2) Suitable at 690V for pollution degree 2, Uimp = 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
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 flourescent glass bulb (daylight lamps)
5) Current inrush approx. 16 x Ie

Mini Contactors

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

Main Contacts			Type	K1-09D..	K1-09F..	K1-09L..	K1-12D..
Utilization category DC1							
Switching of resistive load	1 pole	24V	A	20	16	16	20
Time constant L/R ≤1ms		60V	A	20	16	16	20
Rated operational current I_e		110V	A	5	5	5	5
		220V	A	0,6	0,6	0,6	0,6
	3 poles in series	24V	A	20	20	20	20
		60V	A	20	20	20	20
		110V	A	20	20	20	20
		220V	A	16	16	16	16
Utilization category DC3 and DC5							
Switching of shunt motors	1 pole	24V	A	20	16	16	20
and series motors		60V	A	5	5	5	5
Time constant L/R ≤15ms		110V	A	1	1	1	1
Rated operational current I_e		220V	A	0,15	0,15	0,15	0,15
	3 poles in series	24V	A	20	16	16	20
		60V	A	20	16	16	20
		110V	A	20	16	16	20
		220V	A	2	2	2	2
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							
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		1/h	600	600	600	700
	AC4, I_e		1/h	120	120	120	150
	DC3, I_e		1/h	600	600	600	700
Mechanical life	AC operated		S x 10^6	5	5	5	5
	DC operated		S x 10^6	15	15	15	15
Short time current	10s-current		A	96	96	96	120
Power loss per pole	at I_e/AC3 400V		W	0,15	0,15	0,15	0,25
Resistance to shock according to IEC 68-2-27							
Shock time 20ms sine-wave							
AC operated		NO	g	5	5	5	5
		NC	g	5	5	5	5
DC operated		NO	g	8	8	8	8
		NC	g	6	6	6	6

1) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced rated current I_e /AC1according 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..= K1-09D..= K1-12D..=**	**K1-07D..= 24VR K1-09D..= 24VR**	**K1-09F..(=)**	**K1-07L..(=) K1-09L..(=)**	**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 For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size.	gL (gG)	A	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	inrush	W	-	2,5	1,5	2,5	2,5	-
	sealed	W	-	2,5	1,5	2,5	2,5	-
Operation range of coils					19 - 30V DC			
in multiples of control voltage U_s			0,85 - 1,1	0,8 - 1,1		0,85 - 1,1	0,85 - 1,1	-
Switching time at control voltage U_s ±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 - 25	15 - 25	15 - 25	15 - 25	-
	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	mm²	0,5 - 2,5	0,5 - 2,5	0,5 - 2,5	Fast on	Solder connector	0,5 - 2,5
	flexible	mm²	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	mm²	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

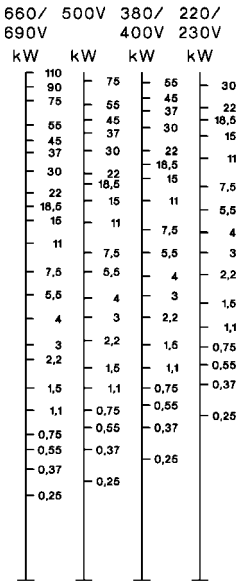
1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV.
Data for other conditions on request.
2) Suitable at 690V for pollution degree 2, Uimp = 6kV.
Pollution degree 3 U_i = 690V non-tracking of the printed circuit CTI ≥600
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

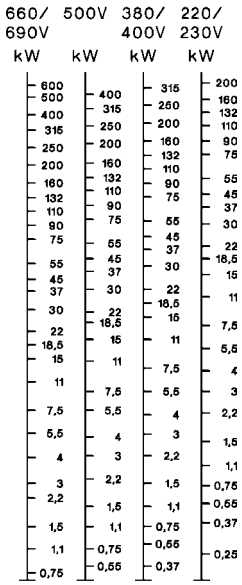
Data according to UL508

Main Contacts (cULus)		Type	K1-09D.. K1W09D01	K1-09F..	K1-09L..	K1-07D..	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

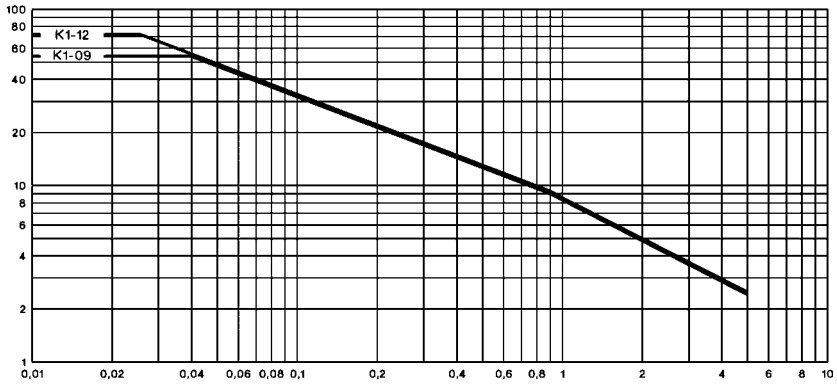
Motor Rating
P_n = AC4



Motor Rating
P_n = AC3



Breaking Current
I_a (= I_e = AC1)
A



Millions of Operations

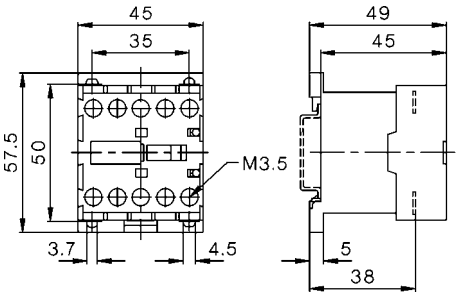
1) Pollution degree	CTI - PWB	U_i
2	≥ 100	600V
3	≥ 400	480V
3	100 - 400	240V

Mini Contactors

Dimensions

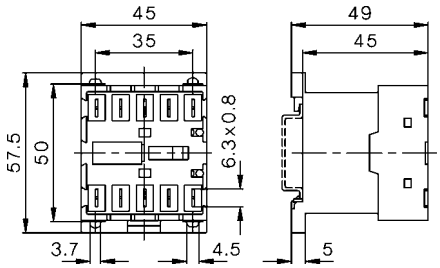
AC and DC operated
with screw terminals

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

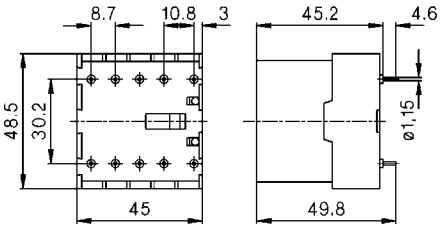


with fast on terminals

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

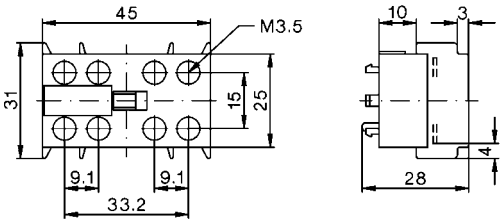


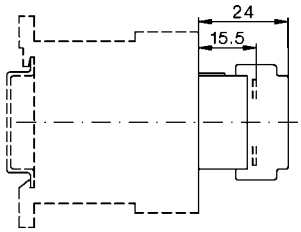
AC and DC operated
with solder connections
K1-07L..
K1-09L..



Auxiliary Contact Blocks

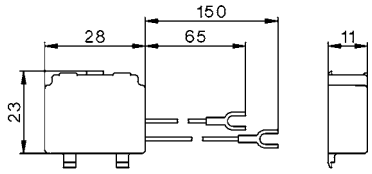
HK..

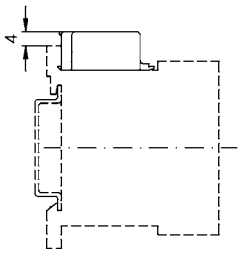




Suppressor Units

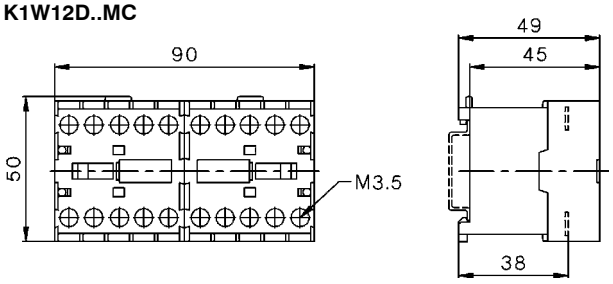
RC-K1





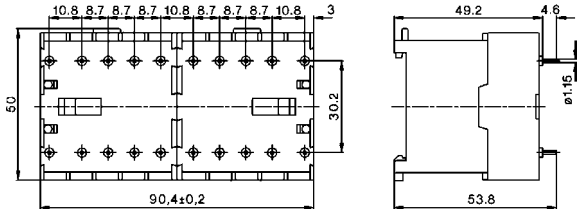
Reversing Contactors

K1W09D..MC
K1W12D..MC

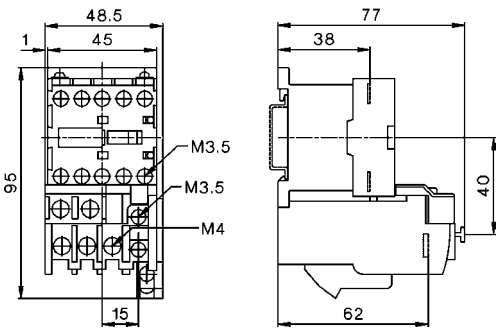


Reversing Contactors

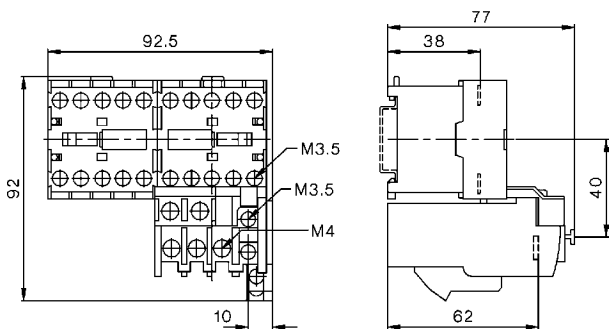
K1W09L..MC



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



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

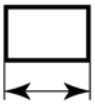


Contactor Relays 4-pole, AC Operated 34

Auxiliary Contact Blocks 1-pole 34

Contactor Relays 4-pole, DC Operated 35

Technical Data 36



Dimensions 38

Contactor Relays — AC Operated

Ratings AC15 230V A	400V A	Therm. Rated Current I_{th} A	Contacts Built-in NO	NC	Distinc. Number acc. to EN50011	Additional Contact Blocks Type	Type	Pack pcs.	Weight kg/pc.
4-pole, contacts suitable for electronic circuits according to EN947-5-4 [2]									
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		**K3-07ND22 . . .**	1	0,22
4	2	10	-	4	04E		**K3-07ND04 . . .**	1	0,22

Type — Coil voltage [1]

24 24V 50/60Hz
110 110V 50Hz 110-120V 60Hz
230 220-240V 50Hz 230-264V 60Hz
400 380-415V 50Hz 400-440V 60Hz

Auxiliary Contact Blocks [3]

Ratings AC15 230V A	Thermal 400V A	Contacts [2] Rated Current A	NO	NC	EM	LB	Type	Pack pcs.	Weight kg/pc.
1-pole, contacts suitable for electronic circuits according to EN947-5-4 [2]									
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 page 34 - 38

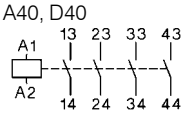
1) Other coil voltages see page 51
2) Contacts suitable for electronic circuits, according to EN947-5-4 for rated voltage 24V DC (test ratings 17V DC, 5mA) Mirror contacts acc. IEC60947-4-1 Annex F.
3) Technical Data see page 64

DC Operated

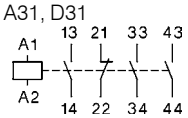
Type — Coil voltage [1]
24 24V DC
48 48V DC
110 110V DC
220 220V DC

Contacts Built-in NO	NC	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	oder	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		1	0,25
K3-07ND04= . . .		-4	04E		1	0,25

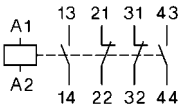
A40, D40



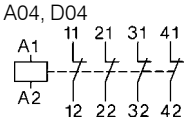
A31, D31



A22, D22



A04, D04



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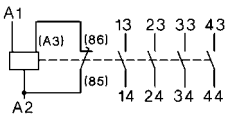

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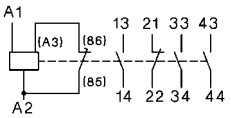

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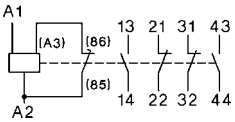
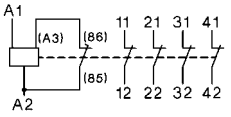


ND04=



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)

Contactor 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]		V AC	690	690	690	690
Thermal rated current I_{th} to 690V						
Ambient temperature	40°C	A	10	10	20	10
	60°C	A	6	6	16	6
Frequency of operations z		1/h	10000	10000	10000	10000
Mechanical life		S x 10^6	10	10	10	50
Utilization category AC15						
Rated operational	220-240V	A	4	4	12	4
current I_e	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	24-60V	A	3,5	3,5	8	3,5
current I_e	110V	A	0,5	0,5	1	0,5
per pole	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		-40 to +40		
Storage		°C		-40 to +90		
Short circuit protection						
short-circuit current 1kA,						
contact welding not accepted						
max. fuse size	gL (gG)	A	20	20	25	20
Cable cross-section						
Connector	solid	mm^2		0,75 - 6		
	flexible	mm^2		1 - 4		
	flexible with multicore cable end	mm^2		0,75 - 4		
Magnet coil	solid	mm^2		0,75 - 2,5		
	flexible	mm^2		0,75 - 2,5		
	flexible with multicore cable end	mm^2		0,5 - 1,5		
Clamps per pole				2		
Connector	solid	AWG		18 - 10		
	flexible	AWG		18 - 10		
Clamps per pole				2		
Magnet coil	solid	AWG		14 - 12		
	flexible	AWG		18 - 12		
Clamps per pole				2		

Data according to UL508

Rated operational current "General Use"		A	10	10	20	10
Rated operational voltage	max.	V AC	600	600	600	600
Auxiliary Contacts	heavy pilot duty		A600	A600	A600	A600

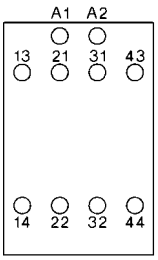
1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV. Data for other conditions on request.
2) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced thermal rated current I_{th} according to I_e /AC15
3) with built-in coil suppressor

Contactor Relays

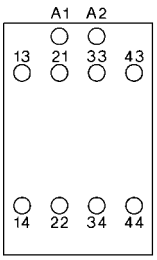
Position of Terminals

AC operated

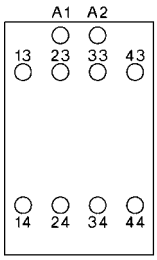
K3-07ND22



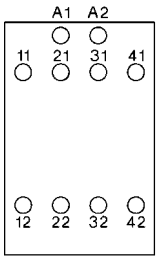
K3-07ND31



K3-07ND40

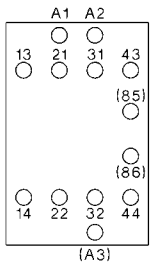


K3-07ND04



DC operated with double wound coil

K3-07ND22=



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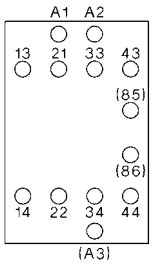

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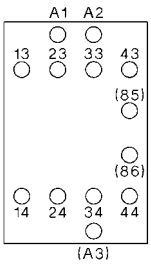

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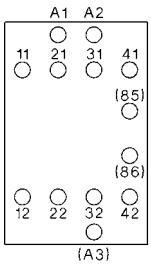
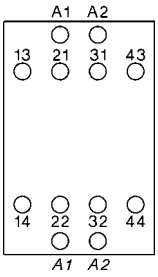
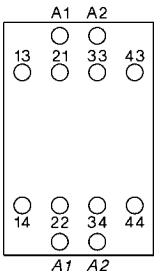


DC solenoid operated

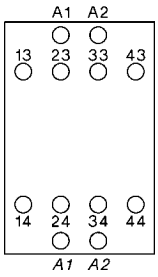
KG3-07A22
KG3-07D22



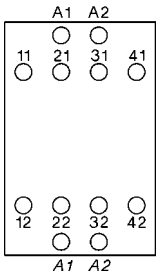
KG3-07A31
KG3-07D31



KG3-07A40
KG3-07D40



KG3-07A04
KG3-07D04

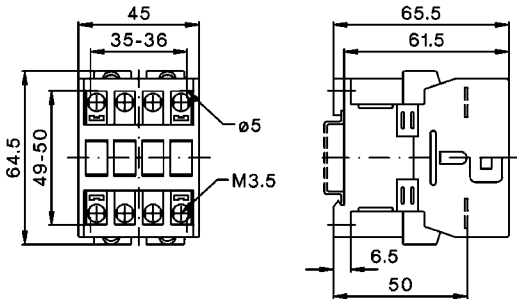


Contactor Relays

Dimensions

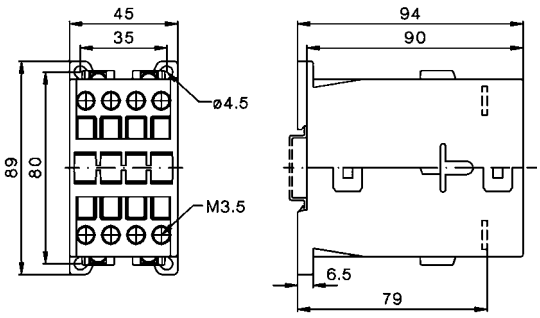
AC operated

K3-07ND..



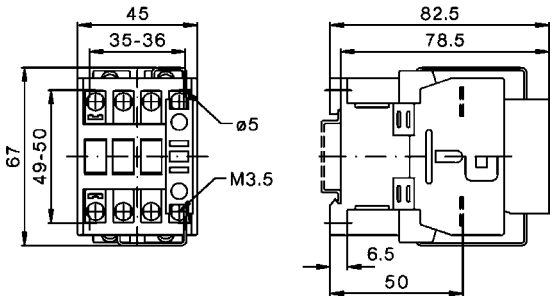
DC solenoid operated

KG3-07..



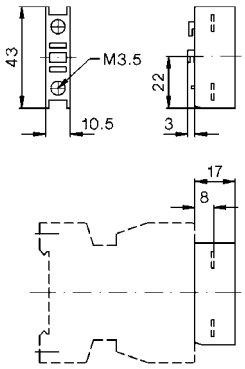
DC operated with double winding coil

K3-07ND.. =

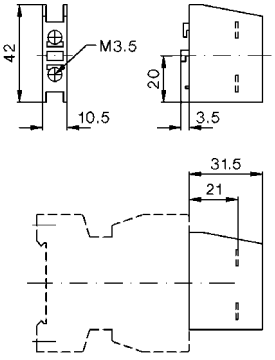


Auxiliary contact blocks

HN10, HN01



HA10, HA01



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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 AC3 400V Motor		10A	14A	18A	22A	24A	32A	40A	50A	62A	74A	90A	115A
	380-400V	**4kW**	**5,5kW**	**7,5kW**	**11kW**	**11kW**	**15kW**	**18,5kW**	**22kW**	**30kW**	**37kW**	**45kW**	**55kW**
	660-690V	5,5kW	7,5kW	10kW	10kW	15kW	18,5kW	18,5kW	30kW	37kW	45kW	55kW	55kW
AC1 690V at 40°C		25A	25A	32A	32A	50A	65A	80A	110A	120A	130A	160A	200A
Type	**K3-**	**10ND10**	**14ND10**	**18ND10**	**22ND10**	**24A00**	**32A00**	**40A00**	**50A00**	**62A00**	**74A00**	**90A00**	**115A00**
Auxiliary contacts		1NO	1NO	1NO	1NO	-	-	-	-	-	-		
Type	**K3-**	**10ND01**	**14ND01**	**18ND01**	**22ND01**								
Auxiliary contacts		1NC	1NC	1NC	1NC								
Cable cross-section													
Solid	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 Inrush	VA	33 - 45				90 - 115			140 - 165			280	
of coils hold	VA	7 - 10				9 - 13			13 - 18			5	
Operation range of coils		0,85 - 1,1				0,85 - 1,1			0,85 - 1,1			0,85 - 1,1	
Mounting		35mm DIN-rail or base										2x DIN-rail or base	
Additional aux. contact blocks Front mounting contacts **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 contacts **Type**		-	-	-	-	**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		**U12/16..K3**				**U3/42**			**U3/74**			**U85**	
		U3/32											
Number of Setting Ranges		16		16		4			5			2	
from		0,12 - 30A		0,12 - 32A		10 - 42A			20 - 74A			60 - 120A	
Busbar sets		-		-		-			-			-	

150A	**175A**	**210A**	**260A**	**315A**	**450A**	**550A**	**700A**	**860A**	**1000A**	**1200A**
75kW 90kW	**90kW** 110kW	**110kW** 160kW	**132kW** 210kW	**160kW** 250kW	**250kW** 375kW	**300kW** 475kW	**400kW** 630kW	**500kW** 700kW	**580kW** 850kW	**680kW** 1000kW
230A	250A	350A	450A	500A	700A	760A	1000A	1100A	1200A	1350A
151A00	**176A00**	**210A00**	**260A00**	**316A00**	**450A22**	**550A22**	**700A22**	**860A22**	**1000A12**	**1200A12**
-	-	-	-	-	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	1NO+2NC	1NO+2NC
2 x 16-120 2 x 16-120		busbar 30x6	busbar 30x6	busbar 30x6	busbar 30x5	busbar 40x6	busbar 50x8	busbar 50x8	busbar 50x10	busbar 50x10
- - -		- - -			10 3 2				10 3 2	
350 5	350 5	360 5	360 5	360 5	800-950 9-11	800-950 9-11	1350-1600 21-25	1350-1600 21-25	2400 70	2400 70
0,85 - 1,1		0,85 - 1,1			0,85 - 1,1				0,85-1,1	
base										

HKT11 1NO+1NC **HKT22** 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	660V 690V kW	Rated Current AC1 690V A	Aux. Contacts Built-in NO	NC	Additional see page 46 Typ	Type 24 110 230 400 ▼ Coil voltage [1] 24V 50/60Hz 110V 50/60Hz 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight kg/pc.
4	5,5	25	1	-	max. 4 HN.. or HA..	**K3-10ND10** . . .	1	0,23
4	5,5	25	-	1		**K3-10ND01** . . .	1	0,23
5,5	7,5	25	1	-		**K3-14ND10** . . .	1	0,23
5,5	7,5	25	-	1		**K3-14ND01** . . .	1	0,23
7,5	10	32	1	-		**K3-18ND10** . . .	1	0,23
7,5	10	32	-	1		**K3-18ND01** . . .	1	0,23
11	10	32	1	-		**K3-22ND10** . . .	1	0,23
11	10	32	-	1		**K3-22ND01** . . .	1	0,23
11	15	50	-	-	max. 4 HN.. or HA.. and 2HB..	**K3-24A00** . . .	1	0,48
15	18,5	65	-	-		**K3-32A00** . . .	1	0,48
18,5	18,5	80	-	-		**K3-40A00** . . .	1	0,48
22	30	110	-	-	max. 4 (3)[4] HN.. or HA.. and 2HB..	**K3-50A00** . . .	1	0,85
30	37	120	-	-		**K3-62A00** . . .	1	0,85
37	45	130	-	-		**K3-74A00** . . .	1	0,85
45	55	160	-	-	max. 7 HN.. or HA.. and 2HB..	**K3-90A00** . . . [2] / VS [3]	1	2,2
55	55	200	-	-		**K3-115A00** . . . [2] / VS [3]	1	2,2
75	110	230	-	-	1 HKT.. and 2 HKA11	**K3-151A00** . . . [2]	1	4
90	132	250	-	-		**K3-176A00** . . . [2]	1	4
110	160	350	-	-		**K3-210A00** . . . [2]	1	7,2
132	210	450	-	-		**K3-260A00** . . . [2]	1	7,2
160	250	500	-	-		**K3-316A00** . . . [2]	1	7,2
250	375	600	2	2	1 HKF22	**K3-450A22** . . . [2]	1	13
300	475	760	2	2		**K3-550A22** . . . [2]	1	13,5
400	630	1000	2	2		**K3-700A22** . . . [2]	1	26,5
500	700	1100	2	2		**K3-860A22** . . . [2]	1	27,6
580	850	1200	1	2	2 HKB11	**K3-1000A12** . . .	1	49
680	1000	1350	1	2		**K3-1200A12** . . .	1	53

1) Coil voltage range and other coil voltages see page 51
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

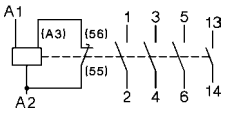
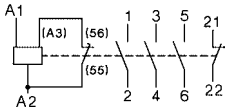
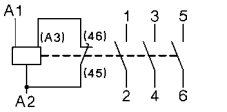
DC Operated

Type	Coil voltage [1]	Coil power	Additional Overload Relay see page 114	Pack	Weight	Wiring Diagram Coil Circuits see page 53
	24 24V DC **48** 48V DC **110** 110V DC **220** 110V DC ▼	inrush/ hold W/W	Type	pcs.	kg/pc.	Terminal Markings
KG3-10A10 . . . [5]		3/3	U3/32	1	0,53	D10
KG3-10A01 . . . [5]		3/3	U12/16E U12/16EQ	1	0,53	
KG3-14A10 . . . [5]		3/3	UAT21	1	0,53	
KG3-14A01 . . . [5]		3/3		1	0,53	
KG3-18A10 . . . [5]		3/3		1	0,53	D01
KG3-18A01 . . . [5]		3/3		1	0,53	
KG3-22A10 . . . [5]		3/3		1	0,53	
KG3-22A01 . . . [5]		3/3		1	0,53	
KG3-24A00 . . . [5]		4/4	U3/32	1	0,57	A00
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	A00=
K3-62A00= . . .		200/6		1	0,9	
K3-74A00= . . .		200/6		1	0,9	
K3-90A00 . . . [2]		280/5	U85	1	2,2	A00
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	A22
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	A12
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

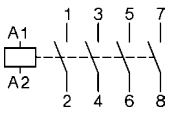
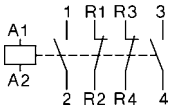
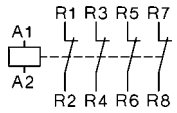
Contactors 3-pole

DC Operated with double winding coil

Ratings AC2 AC3 380V 400V 415V kW		Rated Current AC1 A	Aux. Contacts Built-in NO	NC	Additional see page 46 Type	Type	Coil voltage [1] 24 24V= DC 48 48V= DC 110 110V= DC 220 220V= DC	Pack pcs.	Weight kg/pc.	Wiring Diagram
4	5,5	25	1	-	max. 3	**K3-10ND10=** . . .		1	0,25	D10=
4	5,5	25	-	1	HN..	**K3-10ND01=** . . .		1	0,25	
					or					
5,5	7,5	25	1	-	HA..	**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	D01=
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. 4	**K3-24A00=** . . .		1	0,55	... A00=
15	18,5	65	-	-	HN.. or	**K3-32A00=** . . .		1	0,55	
18,5	18,5	80	-	-	HA..	**K3-40A00=** . . .		1	0,55	
					+ 2HB..					

Contactors 4-pole

AC or DC Operated

Ratings AC2 AC3 380V 400V 415V kW	AC1 400V kW	Rated Current AC1 A	Aux. Contacts Built-in NO	NC	Additional see page 46 Type	Type	Coil voltage [2] 24 24V 50/60Hz 110 110V 50/60Hz 230 220-240V 50Hz 400 380-415V 50Hz = 24 24V= DC [3]	Pack pcs.	Weight kg/pc.	Wiring Diagram
4	**17,5**	25	-	-	max. 4 [3]	**K3-10NA00-40** . . .[3]		1	0,23	A00-40
4	**17,5**	25	-	-	HN.. or	**K3-10NA00-22** . . .[3]		1	0,23	
4	**17,5**	25	-	-	HA..	**K3-10NA00-04** . . .[3]		1	0,23	
5,5	**17,5**	25	-	-		**K3-14NA00-40** . . .[3]		1	0,23	
5,5	**17,5**	25	-	-		**K3-14NA00-22** . . .[3]		1	0,23	
5,5	**17,5**	25	-	-		**K3-14NA00-04** . . .[3]		1	0,23	
7,5	**22**	32	-	-		**K3-18NA00-40** . . .[3]		1	0,23	A00-22
7,5	**22**	32	-	-		**K3-18NA00-22** . . .[3]		1	0,23	
7,5	**22**	32	-	-		**K3-18NA00-04** . . .[3]		1	0,23	
11	**22**	32	-	-		**K3-22NA00-40** . . .[3]		1	0,23	
11	**31**	45	-	-	max. 4	**K2-23A00-40** . . .[3]		1	0,65	
15	**34,5**	50	-	-	HN..	**K2-30A00-40** . . .[3]		1	0,65	
18,5	**34,5**	50	-	-	or HA..	**K2-37A00-40** . . .[3]		1	0,65	A00-04
22	**55**	80	-	-	max. 6	**K2-45A00-40** . . .[3]		1	1,1	
30	**69**	100	-	-	HN..	**K2-60A00-40** . . .[3]		1	1,1	
					or HA..					
15	**43**	63	-	-	1HKT..	**K3-41A00-04** . . .[4]		1	1,4	
15	**43**	63	-	-	+	**K3-41A00-22** . . .[4]		1	1,4	
					2xHKA11					
30	**85**	125	-	-		**K3-96A00-04** . . .[4]		1	2,42	
30	**85**	125	-	-		**K3-96A00-22** . . .[4]		1	2,42	
45	**94**	135	-	-		**K3-96A00-40** . . .[4]		1	2,42	
55	**139**	200	-	-		**K3-116A00-40** . . .[5]		1	4,7	
75	**159**	230	-	-		**K3-151A00-40** . . .[5]		1	4,7	
90	**173**	250	-	-		**K3-176A00-40** . . .[5]		1	4,7	
110	**242**	350	-	-		**K3-210A00-40** . . .[5]		1	8	
132	**310**	450	-	-		**K3-260A00-40** . . .[5]		1	8	
160	**346**	500	-	-		**K3-316A00-40** . . .[5]		1	8	

Latch for Contactors 4-pole see page 48

1) Other coil voltages on request
2) Coil voltage range and non-standard coil voltages see page 51
3) DC Operated with double winding coil, max. 3 additional aux. contacts
4) other technical data on request
5) with integrated coil suppressor

Capacitor Switching Contactors

for use with reactive or non-reactive capacitor banks

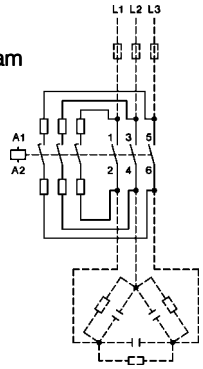
Rated Operational Power at 50/60Hz Ambient Temperature 50°C			60°C			Aux. Contacts Built-in Add.			**Type**	Coil voltage [1]		
380V	415V	660V	380V	415V	660V					**230**		
400V	440V	690V	400V	440V	690V					↓		
kVAr	kVAr	kVAr	kVAr	kVAr	kVAr	NO	NC	pcs.		220-240V 50Hz	Pack pcs.	Weight kg/pc.
0-**12,5**	0-13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

Specification: Contactors K3-..K are suitable for switching low-inductive and low loss capacitors in capacitor banks (IEC70 and 831, VDE 0560) without and with reactors.
Capacitor switching contactors are fitted with early make contacts and damping resistors, to reduce the value of make current $<70 \times I_e$.
Operating Conditions: Capacitor switching contactors are protected against contact welding for a prospective making current of $200 \times I_e$.

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

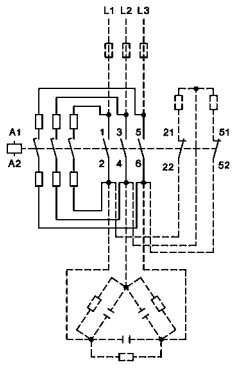
Type			**K3-18K**	**K3-24K**	**K3-32K**	**K3-50K**	**K3-62K**	**K3-74K**	**K3-90K**	**K3-115K**
Max. frequency of operations z		1/h	120	120	120	120	120	80	80	80
Contact life	non reactive capacitor banks	S x 10^3	250	150	150	150	150	120	120	120
	reactive capacitor banks	S x 10^3	400	300	300	300	300	200	200	200
Rated operational current I_e	at 50°C	A	**0-18**	**14-28**	**14-36**	**30-48**	**30-72**	**30-108**	**50-115**	**50-144**
AC6b	at 60°C	A	**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	60	100	110	120	155	190
AC1	at 60°C	A	32	40	55	90	100	110	145	170
Overload factor	at 50°C	%	78	60	67	108	53	11	35	32
acc. to EN 61921: 30% min.	at 60°C	%	78	43	53	88	39	26	34	31
Fuses gL (gG)	from / to	A	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 contacts, 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 51
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)

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

Rated Operational Current AC15 230V A	AC15 400V A	AC1 690V A	Contacts NO	NC	EM	LB	Type	Pack pcs.	Weight kg/pc.
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 Block for contactors K3-24.. to K3-115.., for low level switching [1)]

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

Auxiliary Contact Blocks for contactors K3-116.. to K3-1200

Rated Operational Current AC15 230V A	AC15 400V A	AC1 690V A	For contactors	Contacts NO	NC	Type	Pack pcs.	Weight kg/pc.
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	K3-200 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 AC15 230V A	AC15 400V A	AC1 690V A	Specification	Contacts NO	NC	Type	Pack pcs.	Weight kg/pc.
3	2	10	manual operated	1	-	**HTN10**	10	0,02
3	2	10	manual operated	-	1	**HTN01**	10	0,02

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)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 74
2) Contact travel of make contacts adjustable, see page 73

Elektronic 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

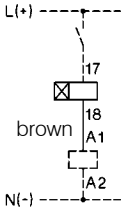
5 Functions in one device	4 Time ranges in one device s	Rated Current AC1 250V A	Type	Pack pcs.	Weight kg/pc.
ON-delay, OFF-delay, Single shot trailing edge, Single shot leding edge, Single shot leading and trailing edge	0,1 - 1, 1 - 10, 6 - 60 a. 18 - 180	5	**K3-T180 240**	1	0,085

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

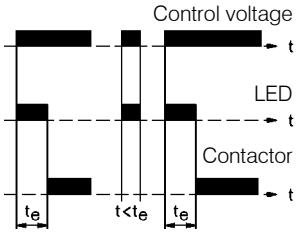
Timer will be connected with the contactor coil, can be snapped onto the contactor and occupies 2 add-on spaces. Contactor switches On-delay.

Operational Voltage V	Time Range s	Rated Current AC15 A	Type	Pack pcs.	Weight kg/pc.
24 - 60V AC/DC	1 - 30	0,75	**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
24 - 60V AC/DC	30 - 600	0,75	**K2-TE600 60**	1	0,08
100 - 250V AC/DC	30 - 600	0,75	**K2-TE600 250**	1	0,08

Wiring Diagram



Timing Chart



Operation Range	0,8 - 1,1 x U_s
Time repeat accuracy	≤1%
Recovery time (typical)	50ms
Voltage Drop after the time delay t_e	<3V
(Control voltage 24V: use contactor with 20V-coil)	
Max. inrush current (peak value)	25A <10ms
Duty Cycle	100%
Ambient temperature	-40° - +60°C
Short circuit protection	2A

Interface for contactors K3-07.. to K3-74.. and K2-07.. to K2-60..

Input Voltage U_e	Power Consumption	Rated Current I_e AC15 250V AC	400V AC	Type	Pack pcs.	Weight kg/pc.
24V DC	0,35W	0,75A	0,5A	**K2-IM**	1	0,03

Amplifier element for contactor control by programmable controller

Fuse Holders for contactors K(G)3-07.. to K3-115.. and K2-..

Specifications	Rated Voltage	Type	Pack pcs.	Weight kg/pc.
Fuse holder for fuse 5x20mm (max. 6,3A) Fuses are not included.	250V AC	**K2-F**	1	0,02

Rectifier with Fuse Holder for contactors K(G)3-07.. to K3-115.. and K2-..

Specifications	Rated Voltage	Type	Pack pcs.	Weight kg/pc.
with built-in rectifier 1A	250V AC	**K2-RF1**	1	0,03
with built-in rectifier 3A	250V AC	**K2-RF3**	1	0,03

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

with NC aux. contact

power consumption max. 30VA

Type

	Coil voltage
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

Technical data see page 74

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

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

Specifications	Voltage Range	Type	Pack pcs.	Weight kg/pc.
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 connect in series with the contactor coil. In case of coil interruption the indication goes out. Voltage drop appr. 2 volts

Voltage Indicator, clear (glow-disc. l.)	220 - 415V AC/DC	**K2-UN**	10	0,02
Voltage Indicator, red (LED)	24 - 120V AC/DC	**K2-UNR**	10	0,02

To connect parallel to the contactor coil. In case of applied voltage the indication also lights at coil interruption.

Snap-On Adapter

For Type	Specification	Type	Pack pcs.	Weight kg/pc.
K2-DK, K2-SK, K2-TE, K2-TA K2-IM, 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

Additional 4th Poles for contactors K3-315.. to K3-1200

For Ccontactors	Thermal Current I_{th} A	Type	Pack pcs.	Weight kg/pc.
K3-315, K3-450, K3-550	**325**	**NP325**	1	0,7
K3-315, K3-450, K3-550	**500**	**NP500**	1	1,3
K3-450, K3-550	**760**	**NP760**	1	1,4
K3-700, K3-860	**500**	**NP501**	1	1,3
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 mm² 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
K3-151 to K3-176		16 - 120 + 16 - 95		**LG11224**	1	0,10

Parallel Connectors

For Contactors	Cable Cross-sections to clamp mm² solid or stranded	flexible	flex. with multi-core cable end	Type	Pack pcs.	Weight kg/pc.
Parallel Connectors, 3 Poles Parallel						
Current-carrying capacity: 2,5 x AC1-value of the contactor						
K(G)3-10 to K(G)3-22	terminal hole for screw M5			**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 - 230V AC/DC	contactor	220nF / 2200 Ohm	**RC-K3N 230**	10	0,01
230 - 415V 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 - 230V AC/DC	contactor	220nF / 2200 Ohm	**RC-K3NW 230**	10	0,01
230 - 415V 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 - K3-74	To join contactors with 12mm distance, 2 pieces required	**P785-1**	10	0,002

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

Description	Specification	Type	Pack pcs.	Weight kg/100pc
Marking Plate	2-section without marking, divisible	**P487-1**	100	0,025
Marking Plate	3-section without marking, divisible	**P971-1**	100	0,038
Marking Plate	4-section without marking, divisible	**P245-1**	100	0,050
Marking Plate	marked, choice of K1...K32	**P245-K..**	100	0,013

Coil voltages for AC operated contactors

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

Suffix to contactor type	to coil type	Voltage Marking at the coil for 50Hz V	for 60Hz V	Rated Control Voltage U_s range for 50Hz min. V	max. V	for 60Hz min. V	max. V
6	41.6	6		6	6,6	6,6	7,3
6,6	41.6,6	6,6		6,6	7,3	7,3	8
7,3	41.7,3	7,3		7,3	8	8	9
8	41.8	8		8	9	9	10
9	41.9	9		9	10	10	11
10	41.10	10		10	11	11	12
11	41.11	11	12	11	12	12	13,2
12	41.12	12		12	13,2	13,2	14,5
13,2	41.13	13,2		13,2	14,5	14,5	16
14,5	41.14	14,5		14,5	16	16	18
16	41.16	16		16	18	18	20
18	41.18	18		18	20	20	22
20	41.20	20		20	22	22	24
24	**4.24**	**24**	**24**	**22**	**24**	**24**	**27**
25	41.25	25		24	27	27	30
27	41.27	27	32	27	30	30	33
32	41.32	32	36	30	33	33	36
33	41.33	36	36	33	36	36	39
36	41.36	36	42	36	39	39	42
40	41.40	42	42	39	42	42	47
42	**4.42**	**42**	**48**	**42**	**47**	**47**	**52**
48	41.48	48	48	44	48	48	52
55	41.55	55	60	52	58	58	65
60	41.60	60		58	65	65	72
65	41.65	65		65	72	72	80
75	41.75	75		72	80	80	90
85	41.85	85		80	90	90	100
90	41.90	100	100	90	100	100	110
110	**4.110**	**110**	**110-120**	**100**	**110**	**110**	**122**
115	41.115	115	125	110	122	122	135
127	41.127	127		122	135	135	150
140	41.140	140		135	150	150	165
150	41.150	150		150	165	165	180
165	41.165	165	180-208	165	180	180	208
180	41.180	180-210[1]	200-240[1]	180	210[1]	200	240[1]
190[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]
390[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)

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

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

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

110	4.110	110-115	-	110	115	110	115
230	**4.230**	**220-230**	**-**	**220**	**230**	**220**	**230**
400	**4.400**	**380-400**	**-**	**380**	**400**	**380**	**400**
440	4.440	440	-	440	440	440	440

Coil voltages for AC and DC operated contactors

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

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

Coil voltages for AC operated contactors

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

Suffix to contactor type	to coil type	Voltage Marking at the coil for 50Hz V	for 60Hz V	Rated Control Voltage U_s range for 50Hz min. V	max. V	for 60Hz min. V	max. V
110AC	**4.110AC**	110-122	132-146	110	122	132	146
230AC	**4.230AC**	**220-240**	**277**	**220**	**240**	**264**	**288**

Other coil voltages on request

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

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

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.

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
K3-07.. up to K3-22..		**K3-6/ . . .**		10	0,040
K2-07.. up to K2-16..		**K6/ . . .**		10	0,040
K3-24.. up to K3-40..		**K24/ . . .**		1	0,085
K2-23.. up to K2-37..		**K23/ . . .**		1	0,085
K3-50.. up to K3-74.., K2-45.., K2-60..		**K45/ . . .**		1	0,110
K65.., K85..		**K85/ . . .**		1	0,215
K110..		**K110/ . . .**		1	0,220

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		
		▼			
K3-150.., K3-175..		**K3-175/ . . .**		1	0,38
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	for coils	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..	K3-550/4...	**K3-550/FG . . .**		1	0,33
K3-700.., K3-860..	K3-860/4..	**K3-860/FG . . .**		1	0,54

1) Coil voltage range and non-standard coil voltages see page 51
2) In case of changing control voltage, change coil and feeder group too

Spare Coils for DC operated contactors

For Contactors	Aux. Contact Block for double winding coil	Type	Coil voltage [1]	Pack pcs.	Weight kg/pc.
		47.24	24V DC		
		47.48	48V DC		
		47.110	110V DC		
		47.220	220V DC		
		↓			
K3-07N..= up to K3-22N..=	HN01U	**K10N/ . . .**		1	0,052
K3-07..= up to K3-22..=	HN01U	**K3-6/ . . .**		1	0,042
K2-07..= up to K2-16..=	HN01U	**K6/ . . .**		1	0,042
K3-24..= up to K3-40..=	HN01X	**K24/ . . .**		1	0,090
K2-23..= up to K2-37..=	HN01X	**K23/ . . .**		1	0,090
K3-50..= up to K3-74..=, K2-45..=, K2-60..=	HN01Z	**K45/ . . .**		1	0,115
K65..=, K85..=	-	**K85/ . . .**		1	0,220
K110..=	-	**K110/ . . .**		1	0,225

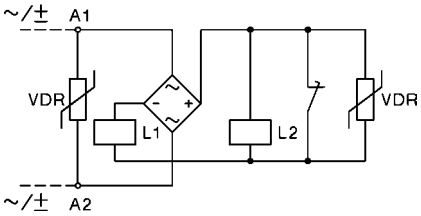
For Contactors		Type	Coil voltage [1]	pcs.	kg/pc.
		43.110	110V DC		
		43.220	220V DC		
		▼			
K3-1000..=, K3-1200..=	without feeder group [2]	**K3-1200/ . . .**		1	3,12

Wiring Diagrams for Coil Circuit

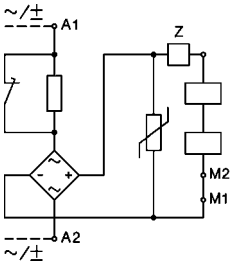
AC operated,

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

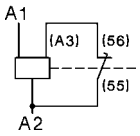
AC and DC operated
with double winding coil
K3-90A00, K3-115A00
K3-151A00, K3-176A00
K3-210A00 to K3-316A00



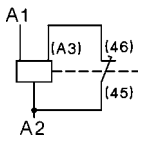
AC and DC operated
with series resistor
K3-450.. up to **K3-860..**



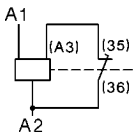
DC operated
with double winding coil
K3-07..=
up to **K3-22..=**



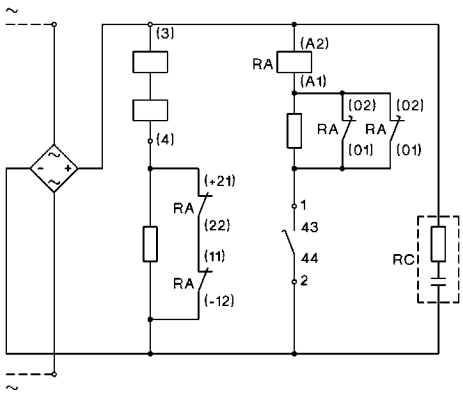
K3-24..=
to
K3-74..=



K85..=
K110..=

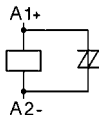


DC operated
with DC coil
K3-1000.., K3-1200..

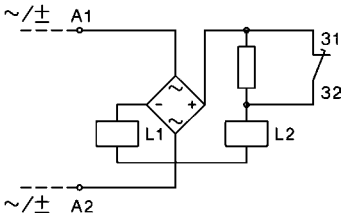


DC operated

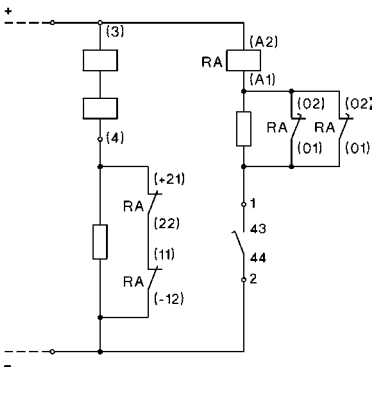
KG3..



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



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	
K3-260..	**EK3-260/10**	1	
K3-315..	**EK3-315/10**	1	0,34
K3-316..	**EK3-316/10**	1	
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		Range according to BS for 415V		F.L.C.	220-230V Motor	Value of fusing at motor start		240V Motor	Value of fusing at motor start		**380-400V** Motor	Value of fusing at motor start		415V Motor	Value of fusing at motor start		500V Motor	Value of fusing at motor start		660-690V Motor	Value of fusing at motor start	
					D.O.L.	YD	F.L.C.	D.O.L.	YD	F.L.C.	D.O.L.	YD	F.L.C.	D.O.L.	YD		F.L.C.	D.O.L.	YD	F.L.C.	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	-	-	-
0,09	0,12	-	0,7	60	0,55	2	2	0,5	2	2	**0,33**	1	1	-	-	-	0,24	1	1	-	-	-
0,12	0,16	-	0,7	61	0,76	2	2	0,68	2	2	**0,42**	2	2	-	-	-	0,33	1	1	-	-	-
0,18	0,24	-	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	-	-	-
0,37	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	-	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	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
1,5	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	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	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	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	20	14	25	20	**8,5**	16	10	-	-	-	6,5	16	10	4,9	10	6
5,5	7,5	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	35	35	24,8	35	35	**15,5**	25	20	14	25	16	11,9	20	16	9	16	10
8	11	-	0,86	85	28,8	50	35	26,4	35	35	**16,7**	25	20	-	-	-	12,7	20	16	-	-	-
11	15	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	50	40,2	63	50	**25**	35	35	-	-	-	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	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	80	63,4	80	80	**40**	63	50	-	-	-	30,6	50	35	-	-	-
22	30	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	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	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	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	200	154	200	200	**97**	125	100	-	-	-	73,7	100	80	-	-	-
55	75	-	0,88	91	181	250	200	166	200	200	**105**	160	125	-	-	-	79	125	100	60	80	63
59	80	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	125	0,88	92	292	400	315	268	315	315	**170**	250	200	165	200	200	128	160	160	98	125	125
110	150	150	0,88	92	358	500	400	327	400	400	**205**	250	250	200	250	250	156	200	200	118	160	125
129	175	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	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	630	471	630	630	**295**	400	315	-	-	-	220	315	250	170	200	200
184	250	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	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	1000	736	1000	800	**460**	630	500	-	-	-	353	500	400	268	315	315
257	350	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	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	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
hp	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

1) Determine the motor current for 200V and 208V by increasing the values for 220-240V at 200V about 15% and for 208V about 10%.

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	A	-	-	-	-	-	-	-	-	-	-
Breaking capacity I_{eff}	400V AC	A	180	180	200	200	380	400	400	600	800	800
K3-10 to K3-22 cosφ= 0,65	500V AC	A	150	150	180	180	300	370	370	500	700	700
K3-24 to K3-1200 cosφ= 0,35	690V AC	A	100	100	150	150	260	340	340	400	500	500
	1000V AC	A	-	-	-	-	-	-	-	-	-	-
Utilization category AC1												
Switching of resistive load												
Rated operational current I_e (=I_{th})	690V	**A**	**25**	**25**	**32**	**32**	**50**	**65**	**80**	**110**	**120**	**130**
at 40°C, open												
Rated operational power	220V	kW	9,5	9,5	12,2	12,2	19,0	24,7	30,4	41,9	45,7	49,5
of three-phase resistive loads	230V	kW	9,9	9,9	12,7	12,7	19,9	25,9	31,8	43,8	47,7	51,7
50-60Hz, cosφ= 1	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_{the})	690V	A	25	25	32	32	40	55	65	90	100	110
at 60°C, enclosed												
Rated operational power	220V	kW	9,5	9,5	12,2	12,2	15,2	20,9	24,7	34,3	38,1	41,9
of three-phase resistive loads	230V	kW	9,9	9,9	12,7	12,7	15,9	21,9	25,9	35,8	39,8	43,8
50-60Hz, cosφ= 1	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})		mm²	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	220V	A	12	15	18	22	24	30	40	50	63	74
open and enclosed	230V	A	11,5	14,5	18	22	24	30	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	220-230V	kW	3	4	5	6	6	8,5	11	12,5	18,5	22
of three-phase motors	240V	kW	3	4	5	7	7	9	11,5	13,5	19	23
50-60Hz	**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): Uimp = 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~	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**	**230**	**250**	**350**	**450**	**500**	**700**	**760**	**1000**	**1100**	**1200**	**1350**
kW	60	76	76	87	95	133	171	190	266	289	381	419	457	514
kW	63	79	79	91	99	139	179	199	279	302	398	438	478	537
kW	66	83	83	95	103	145	187	207	291	315	415	457	498	561
kW	105	131	131	151	164	230	296	329	460	500	658	724	789	888
kW	110	138	138	159	173	242	311	346	485	526	692	762	831	935
kW	115	143	143	165	179	251	323	359	503	546	718	790	862	970
kW	121	152	152	175	190	266	342	381	533	579	762	838	914	1028
kW	138	173	173	199	216	303	389	453	606	658	866	952	1039	1169
kW	182	228	228	262	285	400	514	571	800	868	1143	1257	1371	1543
kW	191	239	239	274	298	418	537	597	836	908	1195	1314	1434	1613
kW	221	277	216	318	346	433	546	606	692	866	-	-	-	-
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**	**10**	**14**	**18**	**18**	**24**	**32**	**40**	**50**	**62**	**62**
	415V	A	9	14	18	18	23	30	37	45	60	60
	440V	A	9	14	18	18	23	30	37	45	55	55
	500V	A	9	12	16	16	17,5	21	21	33	42	42
	660V	A	7	9	9	9	17	20	20	31	40	40
	690V	A	6,5	8,5	8,5	8,5	17	20	20	31	40	40
	1000V	A	-	-	-		-	-	-	-	-	-
Rated operational power	220-230V	kW	3	4	5	5	6	8,5	11	12,5	18,5	18,5
of three-phase motors	240V	kW	3	4	5	5	7	9	11,5	13,5	19	19
50-60Hz	**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	45
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	45
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	45
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 cosφ of the lamp			max. lamps per pole ($I_{nLED} \leq I_{th}$)				=	inrush current of contactor / 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 flourescent glass bulb (daylight lamps)
4) Current inrush approx. 16 x Ie

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
	max. lamps per pole ($I_{nLED} \leq I_{th}$)			=		$\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$							
A	1551	1692	2115	2820	2961	3666	4512	6345	7755	9870	12126	14100	16920
A	69	75	100	120	160	190	220	260	315	440	500	560	630

Contactors

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

Main Contacts		Type	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Utilization category AC6a												
Transformer primary switching												
at inrush		n	30	30	30	30	30	30	30	30	30	30
Rated operational current I_e	400V	A	4,5	5,5	7,5	7,5	10,5	13,5	13,5	20	27	33
Rated operational power	220-230V	kVA	1,8	2,2	3	3	4,2	5,4	5,4	8	10,7	13
dependent on inrush n	240V	kVA	1,9	2,3	3,1	3,1	4,3	5,6	5,6	8,3	11,2	13,5
	380-400V	kVA	3,1	3,8	5,2	5,2	7,3	9,3	9,3	13,5	18,5	22,5
For different inrush-factors x	415-440V	kVA	3,4	4,2	5,7	5,7	8	10,2	10,2	15	20,5	25
use the following formula:	500V	kVA	3,9	4,8	6,5	6,5	9	11,5	11,5	17	23	28
Px=Pn*(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		k	35	25	20	20	25	25	25	25	25	20
Rated operational current I_e	500V	A	8	12	15,5	15,5	23	32	32	45	60	70
Rated operational power	220-230V	kVAr	3	4,5	6	6	8,5	12	12	17	24	28
(sinφ→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
Px=Pk*(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 ≤1ms												
Rated operational current I_e 1 pole	24V	A	20	25	32	32	50	65	80	110	120	130
	60V	A	20	25	32	32	50	65	80	110	120	130
	110V	A	6	6	6	6	10	10	10	12	12	12
	220V	A	0,8	0,8	0,8	0,8	1,4	1,4	1,4	1,4	1,4	1,4
3 poles in series	24V	A	20	25	32	32	50	65	80	110	120	130
	60V	A	20	25	32	32	50	65	80	110	120	130
	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 ≤15ms												
Rated operational current I_e 1 pole	24V	A	20	25	32	32	50	65	80	110	120	130
	60V	A	6	6	6	6	30	30	30	60	60	60
	110V	A	1,2	1,2	1,2	1,2	1,8	1,8	1,8	1,8	1,8	1,8
	220V	A	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,25	0,25	0,25
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 56

Contactors

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

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

Contactors

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

Main Contacts		Type	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Maximum ambient temperature												
Operation	open	°C					-40 to +60 (+90) [1]					
	enclosed	°C					-40 to +40					
with thermal overload relay	open	°C					-25 to +60					
enclosed		°C					-25 to +40					
Storage		°C					-50 to +90					
Short circuit protection												
for contactors without thermal overload relay												
Coordination-type "1" according to IEC 947-4-1												
Contact welding without hazard of persons												
max. fuse size	gL (gG)	A	63	63	63	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	mm²	0,75 - 6				1,5 - 25			4 - 50		
	flexible	mm²	1 - 4				2,5 - 16			10 - 35		
	flexible with multicore cable end	mm²	0,75 - 4				1,5 - 16			6 - 35		
2 cables per clamp												
	solid or stranded	mm²	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	mm²	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	at I_e/AC3 400V	W	0,21	0,35	0,5	0,75	0,7	1,3	2	2,2	3,9	5,5
contact resistance		mOhm	2,1	1,8	1,5	1,5	1,2	1,2	1,2	1	1	1
Resistance to shock acc. to IEC 68-2-27												
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 /AC1according to I_e /AC3

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 to +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											
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	-	-	-	-	-	-	-
mm²	0,5 - 95	10 - 120	busbar 18 x 4 screw M8			busbar 25 x 6 screw M10			busbar 30 x 5 screw M12	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	
mm²	0,5 - 70	25 - 95												
mm²	0,5 - 70	10 - 95												
mm²	0,5 - 95 + 10 - 120													
mm²														
mm²	0,5 - 70 + 25 - 95													
AWG	18 - 10	-												
AWG	18 - 3/0	8 - 4/0												
AWG	-													
AWG	18 - 3/0 + 8 - 4/0													
1/h	3000		1200			1200			1200				300	
1/h	300		240			150			50				20	
1/h	120		-			-			-				-	
1/h	300		-			-			-				-	
S x 10⁶	5		10			5			5				5 [3]	
S x 10⁶	5		10			5			5				5 [3]	
S x 10⁶	-		-			-			-				-	
A	680	880	920	1200	1400	1800	2200	2600	3600	4400	5600	6900	8000	9600
A	275	330	410	500	575	800	900	1000	1400	1750	2200	2600	3000	3600
W	4,8	7,9	7,9	9	11	8	11	14,9	26,3	33,3	49	59,2	60	72
mOhm	0,6	0,5	0,5	0,4	0,35	0,18	0,16	0,15						
g	7	7	-	-	-	-	-	-	-	-	-	-	-	-
g	5	5	-	-	-	-	-	-	-	-	-	-	-	-

1) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced rated current I_e /AC1according to I_e /AC3
2) With reduced control voltage range 1,0 x U_s and with reduced rated current I_e /AC1according to I_e /AC3
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			For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse.									
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	inrush	W	75				140			200		
double winding coil	sealed	W	2				2			6		
DC solenoid operated	inrush	W	3				4			-		
(KG3)	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 ±10% [2] [3]												
AC operated	make time	ms	8-16				10-25			12-28		
	release time	ms	5-13				8-15			8-15		
	arc duration	ms	10-15				10-15			10-15		
DC operated	make time	ms	8-12				10-20			12-23		
double winding coil	release time	ms	8-13				10-15			10-18		
	arc duration	ms	10-15				10-15			10-15		
DC solenoid operated	make time	ms	65 - 85				65 - 85			-		
(KG3)	release time	ms	20 - 30 [4]				20 - 30 [4]			-		
	arc duration	ms	10-15				10-15			-		
Cable cross-section												
Auxiliary connector	solid	mm²	0,75-6				-			-		
	flexible	mm²	1-4				-			-		
	flexible with multicore cable end	mm²	0,75-4				-			-		
Magnet coil	solid	mm²	0,75-2,5				0,75-2,5			0,75-2,5		
	flexible	mm²	0,5-2,5				0,5-2,5			0,5-2,5		
	flexible with multicore cable end	mm²	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): Uimp = 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	-		-			-			-		-		-	
	0,85-1,1		0,85-1,1			0,85-1,1			0,85-1,1				0,85-1,1	
	0,8-1,1		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

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

Main Contacts		Type	K2-09	K2-12	K2-16	K2-23	K2-30	K2-37	K2-45	K2-60	K85	K110
Rated insulation voltage U_i [1]		V~	690	690	690	690	690	690	690	690	750	750
Making capacity I_{eff}	at U_e = 690V AC	A	200	200	200	400	500	500	700	900	1100	1200
Breaking capacity I_{eff}	400V~	A	180	180	200	380	400	400	600	800	950	1100
K2-09 to K2-16	cosφ = 0,65 500V AC	A	150	150	180	300	370	370	500	700	850	1100
K2-23 to K3-1200	cosφ = 0,35 690V AC	A	100	100	150	260	340	340	400	500	600	600
	1000V~	A	-	-	-	-	-	-	-	-	-	-
Utilization category AC1												
Switching of resistive load												
Rated operational current I_e (=I_{th})		**A**	**25**	**25**	**25**	**45**	**50**	**50**	**80**	**100**	**150**	**170**
at 40°C, open												
Rated operational power	220V	kW	9,5	9,5	9,5	17	19	19	30	38	57	64
of three-phase resistive loads	230V	kW	10	10	10	18	20	20	31,5	40	59	67
50-60Hz, cosφ = 1	240V	kW	10,5	10,5	10,5	18,5	20,5	20,5	33	41	62	70
	380V	kW	16,5	16,5	16,5	29,5	33	33	52	65	98	111
	400V	kW	17,5	17,5	17,5	31	34,5	34,5	55	69	103	117
	415V	kW	18	18	18	32	36	36	57	71	107	122
	440V	kW	19	19	19	34	38	38	61	76	114	129
	500V	kW	21,5	21,5	21,5	39	43	43	69	86	130	147
	660V	kW	28,5	28,5	28,5	51	57	57	91	114	171	194
	690V	kW	29,5	29,5	29,5	53,5	60	60	95	119	179	203
Rated operational current I_e (=I_{the})		A	20	25	25	35	40	40	63	80	100	125
at 60°C, enclosed												
Rated operational power	220V	kW	7,5	9,5	9,5	13	15	15	24	30	38	47
of three-phase resistive loads	230V	kW	8	10	10	13,5	16	16	25	31,5	40	49
50-60Hz, cosφ = 1	240V	kW	8	10,5	10,5	14,5	16,5	16,5	26	33	41	52
	380V	kW	13	16,5	16,5	23	26	26	41	52	65	82
	400V	kW	13,5	17,5	17,5	24	27,5	27,5	43	55	69	86
	415V	kW	14	18	18	25	28,5	28,5	45	57	71	89
	440V	kW	15	19	19	26,5	30	30	48	61	71	95
	500V	kW	17	21,5	21,5	30	34	34	54	69	86	116
	660V	kW	22,5	28,5	28,5	40	45	45	72	91	114	142
	690V	kW	23,5	29,5	29,5	42	48	48	75	95	119	149
Minimum cross-section of conductor												
at load with I_e (=I_{th})		mm^2	4	4	4	10	10	10	25	35	50	70
Utilization category AC2 and AC3												
Switching of three-phase motors												
Rated operational current I_e	220V	A	12	15	18	23	30	37	45	63	85	110
open and enclosed	230V	A	11,5	14,5	17,5	23	30	37	45	61	85	110
	240V	A	11	14	17	23	30	37	45	60	85	110
	380-400V	**A**	**10**	**12**	**16**	**23**	**30**	**37**	**45**	**60**	**85**	**110**
	415-440V	A	9	12	16	23	30	37	45	60	85	110
	500V	A	9	12	16	23	30	30	45	55	85	110
	660V	A	7	9	9	17,5	21	21	33	42	60	60
	690V	A	6,5	8,5	8,5	17	20	20	31	40	58	58
Rated operational power	220-230V	kW	3	4	5	6	8,5	11	12,5	18,5	25	33
of three-phase motors	240V	kW	3	4	5	7	9	11,5	13,5	19	27	35
50-60Hz	**380-400V**	**kW**	**4**	**5,5**	**7,5**	**11**	**15**	**18,5**	**22**	**30**	**45**	**55**
	415V	kW	4,5	6	8,5	12	16	20	24	33	49	63
	440V	kW	4,5	6	8,5	12	16	20	24	33	49	63
	500V	kW	5,5	7,5	10	15	18,5	18,5	30	37	55	55
	660-690V	kW	5,5	7,5	7,5	15	18,5	18,5	30	37	55	55

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

Contactors

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

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

1) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)
2) High-pressure lamps
3) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a flourescent glass bulb (daylight lamps)
4) Current inrush approx. 16 x Ie
5) With central compensation pay attention to the current inrush (capacitor switching contactors)

Contactors

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

Main Contacts			Type	K2-09	K2-12	K2-16	K2-23	K2-30	K2-37	K2-45	K2-60	K85	K110
Utilization category DC3 and DC5													
Switching of shunt motors and series motors													
Time constant L/R ≤15ms	1 pole	24V	A	20	25	25	45	50	50	80	100	150	170
Rated operational current I_e		60V	A	6	6	6	30	30	30	60	60	85	110
		110V	A	1,2	1,2	1,2	1,8	1,8	1,8	1,8	1,8	2	2,5
		220V	A	0,2	0,2	0,2	0,2	0,2	0,2	0,25	0,25	0,5	0,5
	2 poles in series	24V	A				45	50	50				
		60V	A				45	50	50				
		110V	A				30	30	30				
		220V	A				1,8	1,8	1,8				
	3 poles in series	24V	A	20	25	25	45	50	50	80	100	150	170
		60V	A	20	25	25	40	40	40	80	80	100	110
		110V	A	20	20	20	40	40	40	80	80	100	110
		220V	A	2,5	2,5	2,5	4	4	4	5	5	7	8
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													
Coordination-type "1" according to IEC 947-4-1 Contact welding without hazard of persons													
max. fuse size		gL (gG)	A	63	63	63	80	80	80	160	160	250	250
Coordination-type "2" according to IEC 947-4-1 Light contact welding accepted													
max. fuse size		gL (gG)	A	25	35	35	50	50	50	100	125	160	200
Contact welding not accepted													
max. fuse size		gL (gG)	A	16	16	16	25	35	35	50	63	100	125
For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size.													
Cable cross-sections for contactors without thermal overload relay													
main connector		solid or stranded	mm²		0,75 - 4			1,5-10 + 1,5-6			4 - 35 [2]		10 - 70 [2]
		flexible	mm²		0,75 - 2,5			1,5-6 + 1,5-4			6 - 25 [2]		10 - 70 [2]
		flexible with multicore cable end	mm²		0,5 - 2,5			1,5-6 + 1,5-4			4 - 25		10 - 35
Cables per clamp					2			1+1			1		1
main connector		solid	AWG		14 - 10			14 - 10 + 14 - 10			10		10
		flexible	AWG		18 - 10			14 - 8 + 14 - 10			10 - 2		6 - 0
Cables per clamp					2			1+1			1		1
Frequency of operations z													
Contactors without thermal overload relay													
	without load		1/h		10000			7000			7000		3000
	AC3, I_e		1/h		600			600			400		300
	AC4, I_e		1/h		120			120			120		120
	DC3, I_e		1/h		600			600			400		300
Mechanical life													
AC operated			S x 10^6		10			10			10		5
DC operated with economy resistor			S x 10^6		10			10			10		5
Short time current	10s-current		A	96	120	144	184	240	296	360	504	680	880
Power loss per pole	at I_e/AC3 400V		W	0,21	0,26	0,4	0,63	1,1	1,7	1,8	3,6	4,3	6,0
Resistance to shock acc. to IEC 68-2-27													
Shock time 20ms sine-wave		NO	g	10	10	10	8	8	8	8	8	7	7
		NC	g	6	6	6	5	5	5	-	-	5	5

1) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced rated current I_e /AC1according to I_e /AC3
2) Maximum cable cross-section with prepared conductor

Contactors

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

Auxiliary Contacts		Type	K2-09	K2-12	K2-16	K2-23	K2-30	K2-37	K2-45	K2-60	K85	K110
Rated insulation voltage U_i [1]		V AC		690			690			-		690
Thermal rated current I_{th} to 690V												
Ambient temperature	40°C	A		16			16			-		16
	60°C	A		12			12			-		12
Utilization category AC15												
Rated operational current I_e	220-240V	A		12			12			-		12
	380-415V	A		4			4			-		6
	440V	A		4			4			-		6
	500V	A		3			3			-		4
	660-690V	A		1			1			-		2
Utilization category DC13												
Rated operational current I_e	60V	A		8			8			-		8
	110V	A		1			1			-		1
	220V	A		0,1			0,1			-		0,1
Short circuit protection short-circuit current 1kA, contact welding not accepted												
max. fuse size	gL (gG)	A		25			-			-		25
For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse.												
Control Circuit												
Power consumption of coils												
AC operated	inrush	VA		33-45			90-115			140-165	280-350	350-420
	sealed	VA		7-10			9-13			13-18	16-23	23-29
		W		2,6-3			2,7-4			5,4-7	4-6	6-7,3
DC operated	inrush	W		75			140			200	170	320
with economic circuit	sealed	W		2			2			6	2	4
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		0,85-1,1
	DC operated			0,8-1,1			0,8-1,1			0,8-1,1		0,8-1,1
Switching time at control voltage U_s ±10% [2] [3]												
AC operated	make time	ms		8-16			10-25			12-28		13-30
	release time	ms		5-13			8-15			8-15		8-15
	arc duration	ms		10-15			10-15			10-15		10-15
DC operated	make time	ms		8-12			10-20			12-23		20-30
with AC magnet system	release time	ms		8-13			10-15			10-18		10-18
	arc duration	ms		10-15			10-15			10-15		10-15
Cable cross-section												
Auxiliary connector	solid	mm²		0,75-4			-			-		0,75-2,5
	flexible	mm²		0,75-2,5			-			-		0,75-2,5
	flexible with multicore cable end	mm²		0,5-2,5			-			-		0,5-1,5
Magnet coil	solid	mm²		0,75-2,5			0,75-2,5			0,75-2,5		0,75-2,5
	flexible	mm²		0,5-2,5			0,5-2,5			0,5-2,5		0,5-2,5
	flexible with multicore cable end	mm²		0,5-1,5			0,5-1,5			0,5-1,5		0,5-1,5
Clamps per pole				2			2			2		2

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV. Data for other conditions on request
2) Total breaking time = release time + arc duration
3) Values for delay of the release time of the make contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

Contactors for North America

Data according to UL508

Main Contacts (cULus)		Type	**K(G)3-10**	**K(G)3-14**	**K(G)3-18**	**K(G)3-22**	**K(G)3-24**	**K(G)3-32**	**K(G)3-40**	**K3-50**	**K3-62**	**K3-74**
Rated operational current "General Use"		A	25	25	30	30	50	65	80	110	120	130
Motor DOL 3-phase at 60Hz												
Rated operational current	600V	A	10	14	18	22	22	27	34	44	52	66
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 current	600V	A	10	14	18	22	22	27	34	44	52	66
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 **ANSI 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	-	-	-	-	22	27	-	44	52	66
Fuse Class RK5 / Short-circuit current		A/kA	50/5	50/5	70/5	90/5	90/5	125/5	175/5	200/5	250/5	300/5
Fuse Class T / Short-circuit current		A/kA	45/100	50/100	70/100	90/100	110/100	150/100	150/100	175/100	175/100	175/100
Rated voltage		V	600	600	600	600	600	600	600	600	600	600
Auxiliary Contacts (cULus)			A600	A600	A600	A600	-	-	-	-	-	-

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

Contactors for North America

Data according to UL508

Type	K3-90	K3-115	K3-116	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550	K3-700	K3-860	K3-1000	K3-1200
A	160	200	150	180	220	250	300	350	420	520	700	810	-	1215
A	85	99		125	150	190	240	300	300	400	550	700	-	1000
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
A	86	103		125	150	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	K3-24K	K3-32K	K3-50K	K3-62K	K3-74K	K3-90K	K3-115K
Rated operational power of 3-phase capacitor banks at 60Hz (3ph)	110-120V	kVAr	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	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	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	11,5-25	11,5-30	25-40	25-60	25-72 [1]	40-95	40-114 [2]
	550-600V	kVAr	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	90/5	125/5	200/5	250/5	300/5	300/10	300/10
Fuse Class T / Short-circuit current		A/kA	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
Auxiliary Contacts (cULus)			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

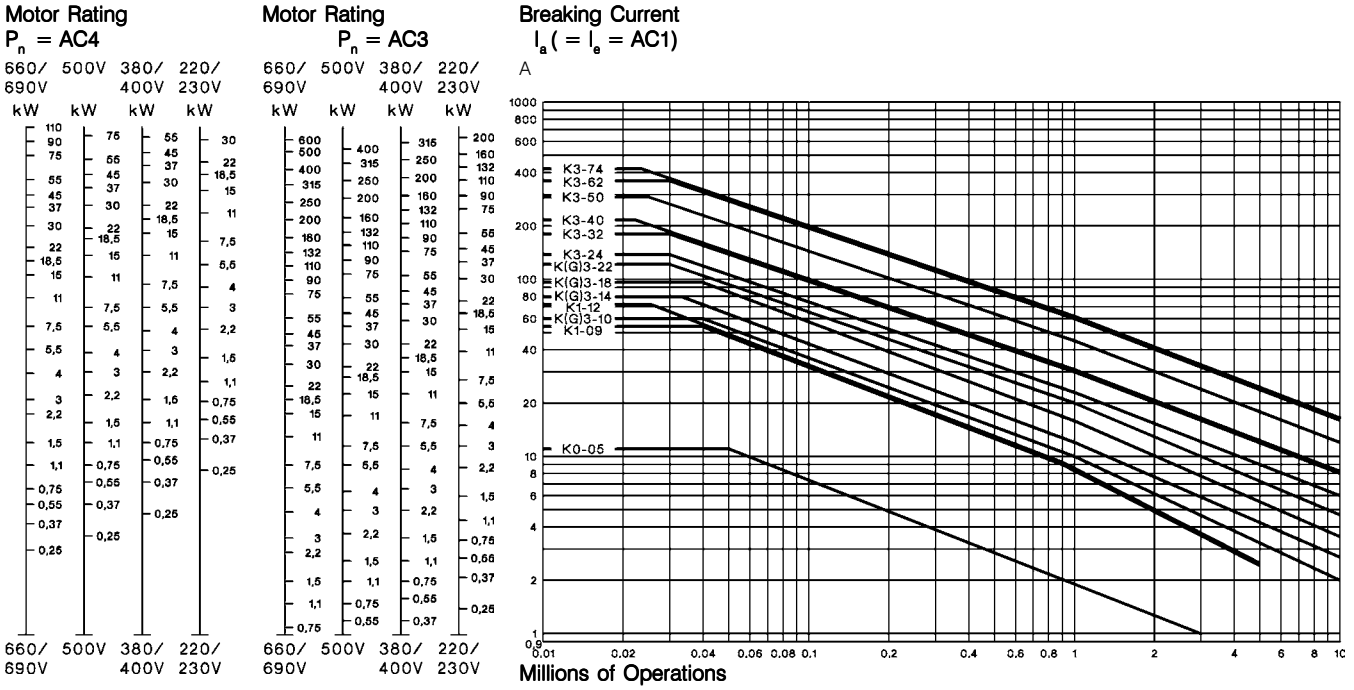
Contact Life

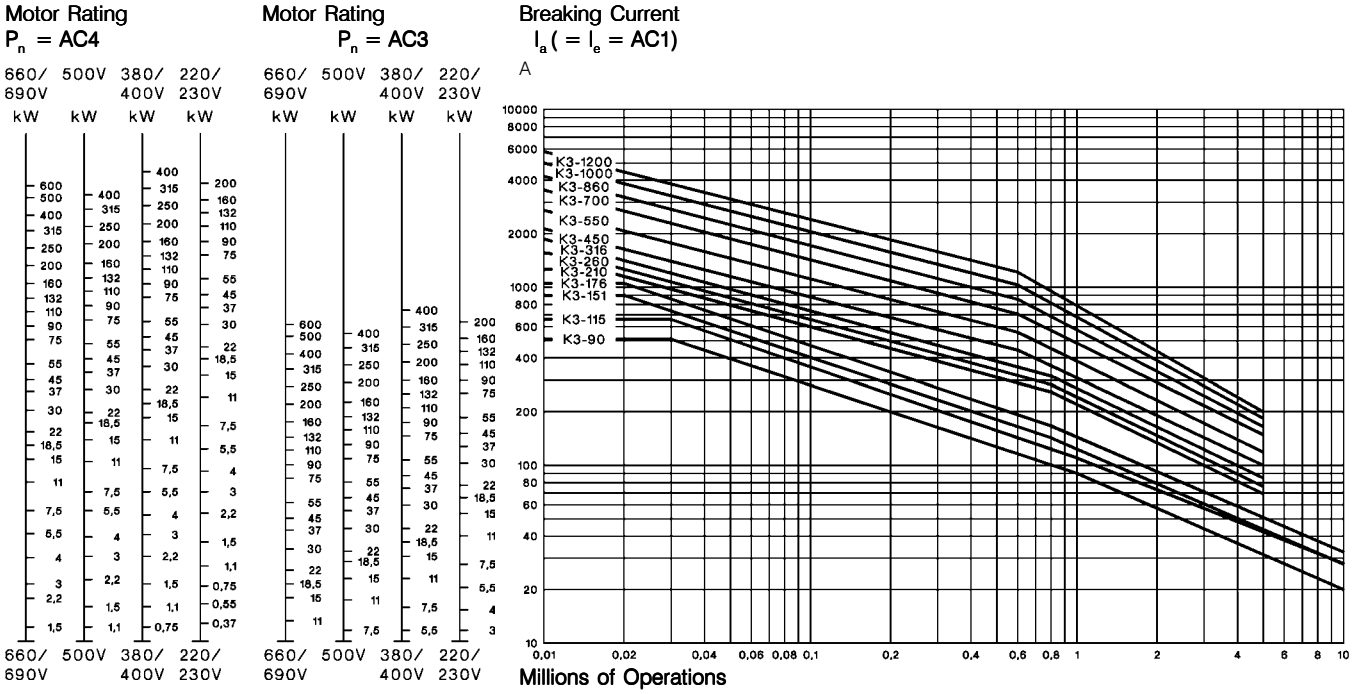
For selection of the suitable contactor-type according to supply voltage, power rating and application (utilization category AC1, AC3 or AC4) use contact life characteristic diagram.
For the most common supply voltages four scales of power ratings P_n are provided for each utilization category.
Select 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_n.
AC4 = Contact life (switching cycles) for AC4 operations (inching).
Breaking current I_a = multiples of rated motor current I_n.
%AC4 = Percents of AC4-operations related to the total cycles.





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

Contactors

Utilization Categories

For easier choice of devices and in order to make the comparison of different products simplier 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 determind. The table offers different utilization categories, typical applications and assorted test conditions.

Type of current	Category	Typical applications	Rated operational current	Test conditions for the number of on-load operating cycles						Test conditions for making and breaking capacities					
				Make			Break			Make			Break		
				I/I_e	U/U_e	cosφ	I_c/I_e	U_r/U_e	cosφ	I/I_e	U/U_e	cosφ	I_c/I_e	U_r/U_e	cosφ
Alternating Current	**AC1**	Non-inductive or slightly inductive loads resistance furnaces	all values	1	1	0,95	1	1	0,95	1,5	1,05	0,8	1,5	1,05	0,8
	AC2	Slip-ring motors: starting, switching off	all values	2,5	1	0,65	2,5	1	0,65	4	1,05	0,65	4	1,05	0,65
	AC3	Squirrel-cage motors: starting, switching off motors during running	$I_e \leq$ 17A	6	1	0,65	1	0,17	0,65	10	1,05	0,45	8	1,05	0,45
			17A < $I_e \leq$ 100A	6	1	0,35	1	0,17	0,35	10	1,05	0,45	8	1,05	0,45
			$I_e >$ 100A	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	$I_e \leq$ 17A	6	1	0,65	6	1	0,65	12	1,05	0,45	10	1,05	0,45
			17A < $I_e \leq$ 100A	6	1	0,35	6	1	0,35	12	1,05	0,45	10	1,05	0,45
			$I_e >$ 100A	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	$I_e \leq$ 100A	-	-	-	-	-	-	4,5	1,05	0,45	3,6	1,05	0,45
			$I_e >$ 100A	-	-	-	-	-	-	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	$I_e \leq$ 100A	-	-	-	-	-	-	8	1,05	0,45	6	1,05	0,45
			$I_e >$ 100A	-	-	-	-	-	-	8	1,05	0,35	6	1,05	0,35
	AC8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases	$I_e \leq$ 100A	-	-	-	-	-	-	6	1,05	0,45	6	1,05	0,45
			$I_e >$ 100A	-	-	-	-	-	-	6	1,05	0,35	6	1,05	0,35
	AC8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases	$I_e \leq$ 100A	-	-	-	-	-	-	6	1,05	0,45	6	1,05	0,45
			$I_e >$ 100A	-	-	-	-	-	-	6	1,05	0,35	6	1,05	0,35
	AC12	Control of resistive loads and solid state loads with isolation by opto couplers	all values	-	-	-	-	-	-	1	1	0,9	1	1	0.9
	AC13	Control of solid state loads with transformer isolation	all values	-	-	-	-	-	-	10	1,1	0,65	1,1	1,1	0,65
	AC14	Control of small electromagnetic loads (≤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		L/R	Break		L/R	Make		L/R	Break		L/R
				I/I_e	U/U_e	[ms]	I_c/I_e	U_r/U_e	[ms]	I/I_e	U/U_e	[ms]	I_c/I_e	U_r/U_e	[ms]
Direct Current	**DC1**	Non-inductive or slightly inductive loads resistance furnaces	all values	1	1	1	1	1	1	1,5	1,05	1	1,5	1,05	1
	DC3	Shunt-motors: starting, plugging, inching dynamic braking of d.c. motors	all values	2,5	1	2	2,5	1	2	4	1,05	2,5	4	1,05	2,5
	DC5	Series-motors: starting, plugging, inching dynamic braking of d.c. motors	all values	2,5	1	7,5	2,5	1	7,5	4	1,05	15	4	1,05	15
	DC6	Switching of incandescent lamps	all values	-	-	-	-	-	-	1,5	1,05	1)	4	1,05	1)
	DC12	Control of resistive loads and solid state loads with isolation by opto couplers	all values	-	-	-	-	-	-	1	1	1	1	1	1
	DC13	Control of electromagnets	all values	1	1	≤300	1	1	≤300	1,1	1,1	≤300	1,1	1,1	≤300
	DC14	Control of electromagnetic loads having economy resistors in circuit	all values	-	-	-	-	-	-	10	1,1	15	10	1,1	15

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

1) Test with incandescent lamps
2) Test conditions according to standard

Accessories

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

Type			HN	HTN	HA	HB	HKT HKA	HKF HKB	K2-DK K2-SK	K2-TP	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 690V											
Ambient temperature	max. 40°C	A	10	10	25	10	10	16	26	10	10
	max. 60°C	A	6	6	20	6	-	-	-	-	6
Frequency of operations z		1/h	3000	-	3000	3000	-	-	-	1200	3000
Mechanical life		S x 10^6	10	10	10	10	-	-	-	1	10
Power loss per pole at I_e/AC1		W	0,5	0,5	1,5	0,5	-	-	-		
Utilization category AC15											
Rated operational	220-240V	A	3	3	6	3	3	3	-	4	3
current I_e	380-400V	A	2	2	3	2	2	2	-	3	2
	440V	A	1,6	1,6	2	1,6	1,5	1,5	-	2	1,6
	500V	A	1,2	1,2	2	1,2	1,5	1,5	-	2	1
	660-690V	A	0,6	0,6	1	0,6	1	1	-	2	0,5
Utilization category DC13											
Rated operational	60V	A	2	2	8	2	-	-	-	2,5	2
current I_e	110V	A	0,4	0,4	1	0,4	0,5	0,5	-	1,5	0,4
	220V	A	0,1	0,1	0,1	0,1	0,2	0,2	-	0,2	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	1-2,5	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	
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	0,75-2,5	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	

Data according to CSA, UL and CUL

Type			HN	HTN	HA	HB..	HKT, HKA HKF	K2-DK K2-SK	K2-TP	K2-L [2]
Rated operational current "General Use"		A	10	10	16	10	10	-	10	-
Rated operational voltage	max.	V AC	600	600	600	600	600	-	600	600
Auxiliary Contacts			A600	A600	A600	A600	A600	-	A600	Intermittent duty

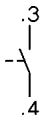
1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV. Data for other conditions on request.
2) Command duration min. 30ms, 10% duty cycle, max. 30 eec.

Contactors and Accessories

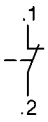
Wiring diagrams

Auxiliary contact blocks

HN10
HA10

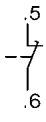


HN01
HA01



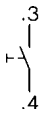
HN10U

HN01U

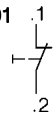


Snap-on momentary contact blocks

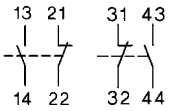
HTN10



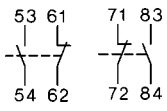
HTN01



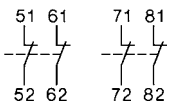
HKS11
HKA11



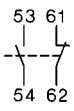
HB11



HB02

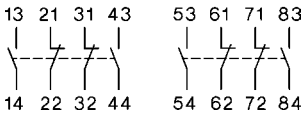


HKT11

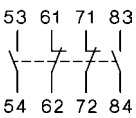


HB11, HB02:
Correct terminal marking is given by mounting.

HKF22



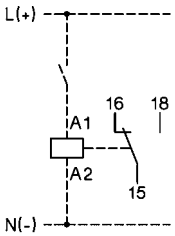
HKT22



Indicator units

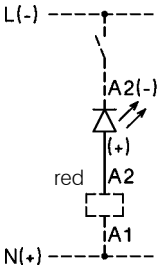
Electronic timer

K3-T180 240



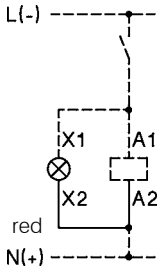
Coil current indicator

K2-ING
K2-INR



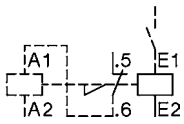
Voltage indicator

K2-UN
K2-UNR



Latch

K2-L..

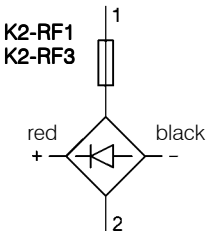


Fuse holder

K2-F

with rectifier

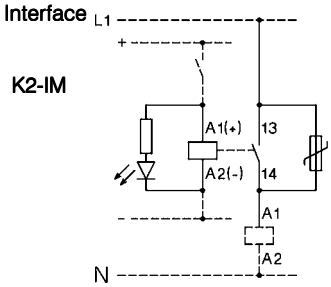
K2-RF1
K2-RF3



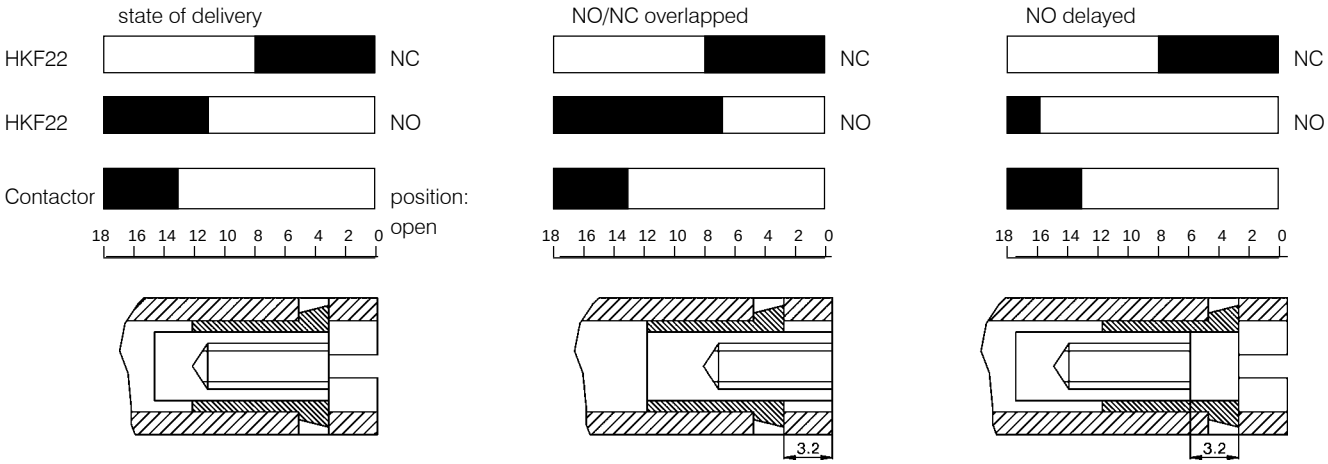
Colours mentioned in wiring diagram refer to the outgoing connection wires of the device.

Interface

K2-IM



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



Standard position of regulation screw

Regulation screw position (unscrew by 4 turns)

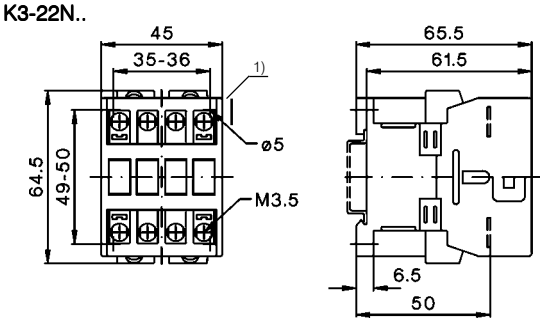
Regulation screw position (screw by 4 turns)

Contactors

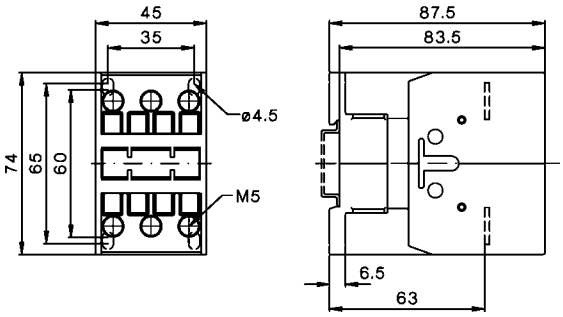
Dimensions

AC operated

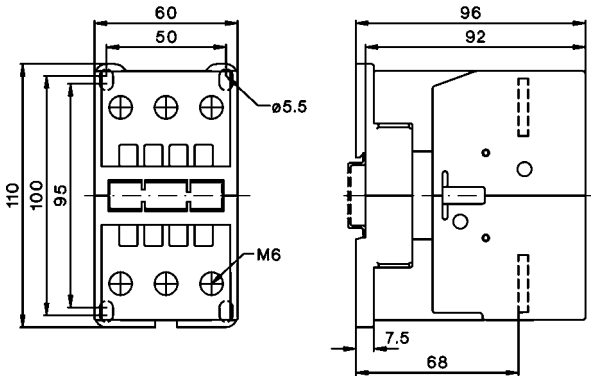
K3-10N..
K3-14N..
K3-18N..
K3-22N..



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

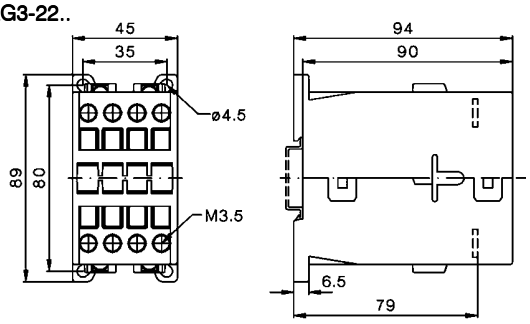


K3-50..
K3-62..
K3-74..

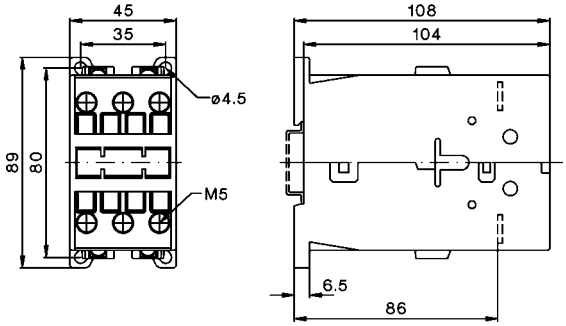


DC operated

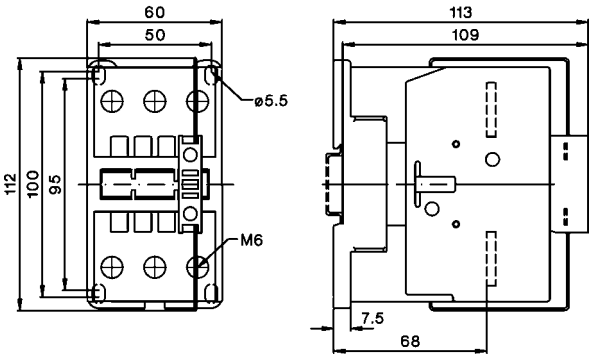
KG3-10..
KG3-14..
KG3-18..
KG3-22..



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

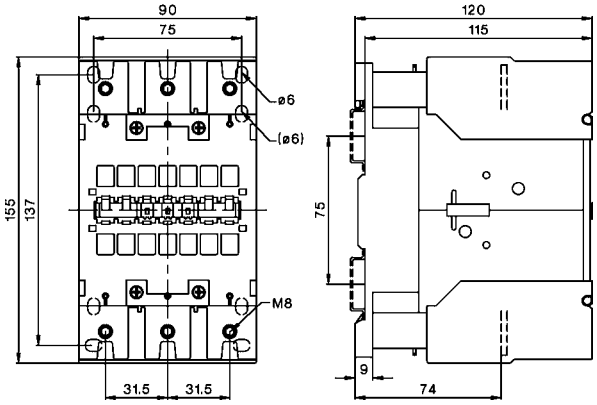


K3-50..=
K3-62..=
K3-74..=



AC and DC operated

K3-90..
K3-115..



1) Minimum side distance to conductive parts for coil voltage:

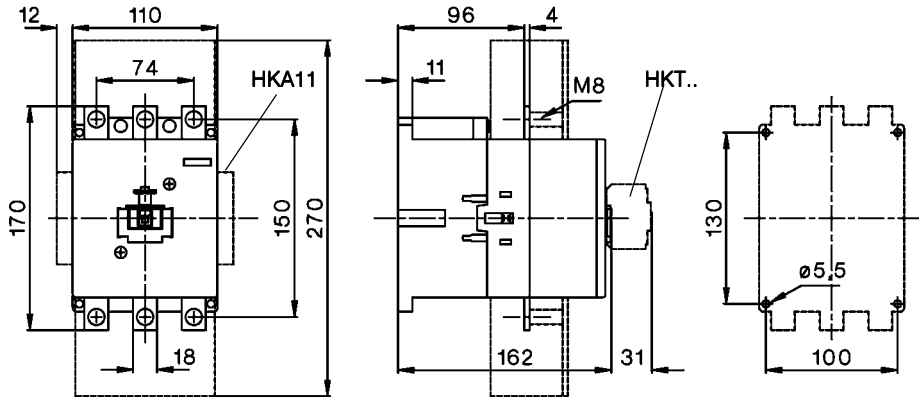
500V	U_{imp}=6kV	2mm
660-690V	U_{imp}=8kV	4,5mm

Contactors

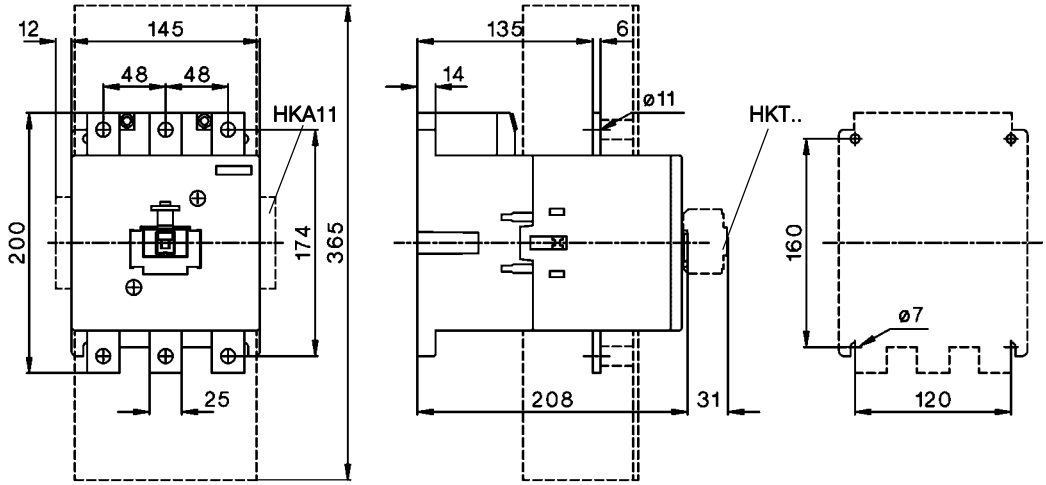
Dimensions

AC operated, DC operated

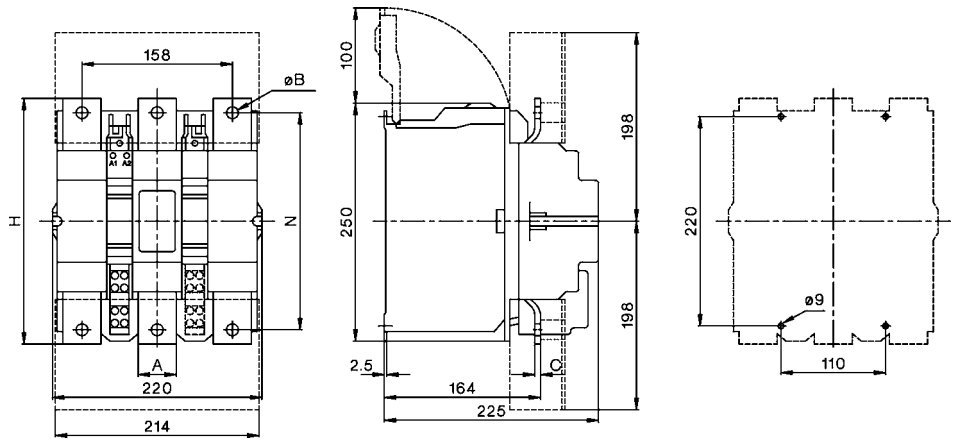
K3-151..
K3-176..



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



K3-450..
K3-550..



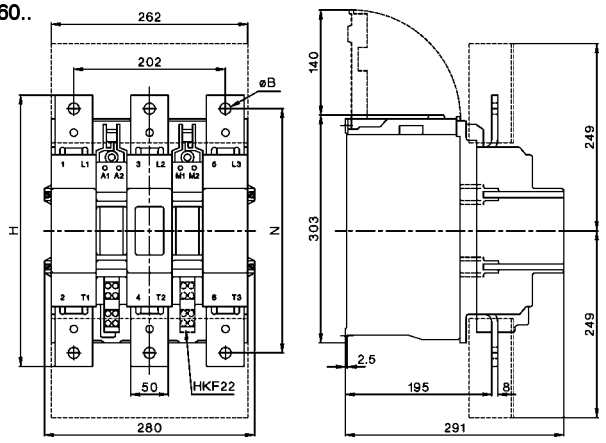
Typ	A	B	C	H	N
K3-450	40	10,5	4	233	206
K3-550	40	12,5	6	258	228

Contactors

Dimensions

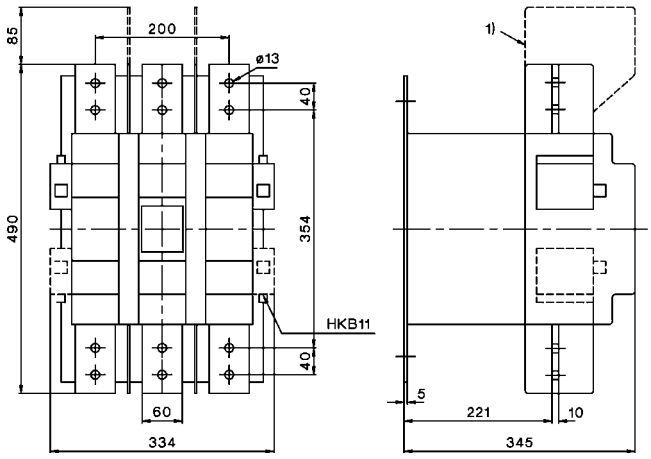
AC and DC operated

K3-700..
K3-860..

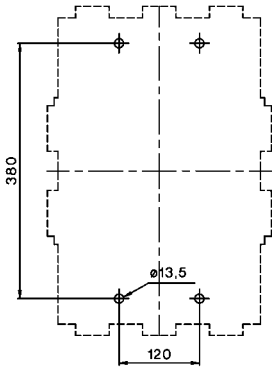


Typ	B	H	N
K3-700	13	310	277
K3-860	15	361	325

K3-1000..
K3-1200..

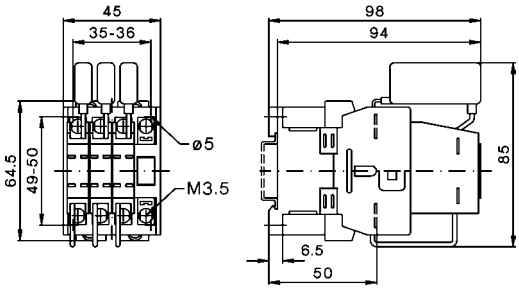


1) for K3-1200 in UL conformity application only

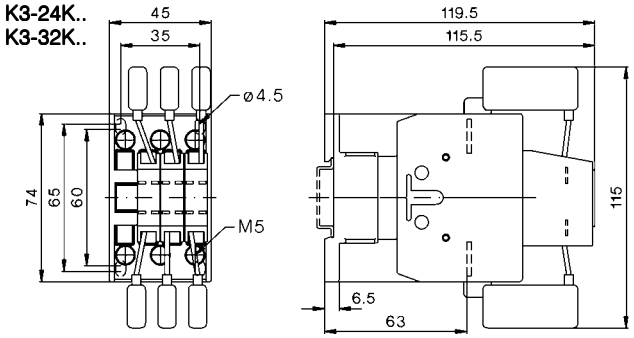


Capacitor switching contactors, AC operated

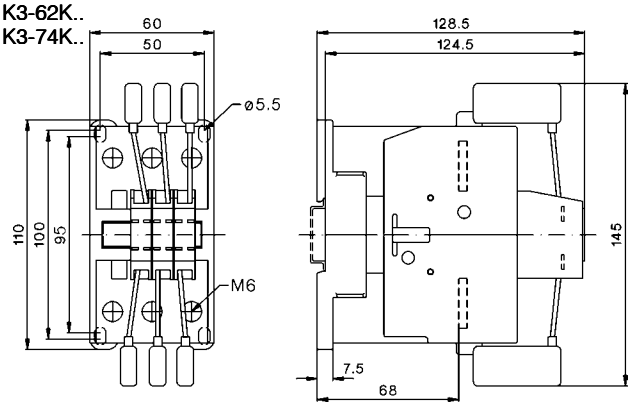
K3-18NK..



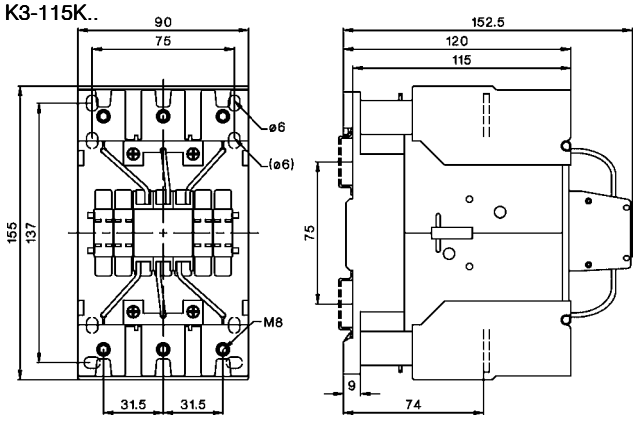
K3-24K..
K3-32K..



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



K3-90K..
K3-115K..

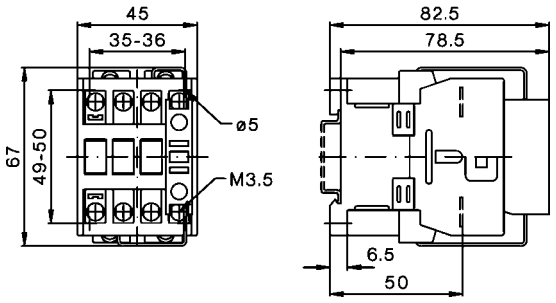


Contactors

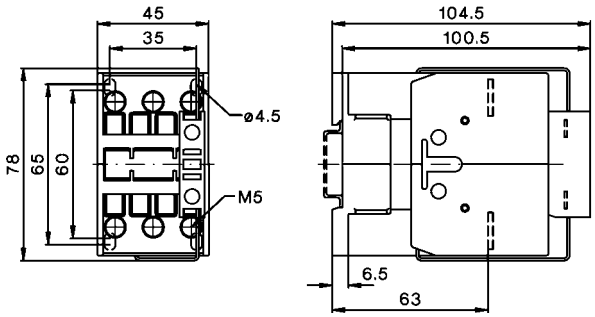
Dimensions

Contactors DC operated

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

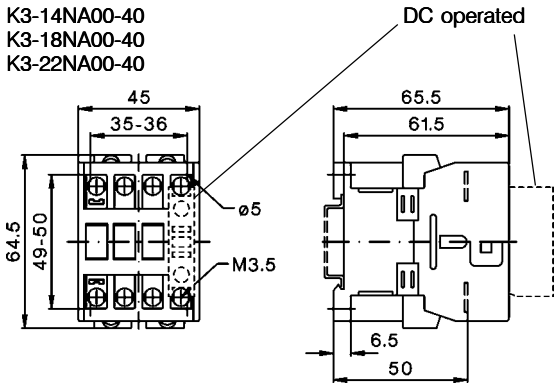


K3-24..=
K3-32..=
K3-40..=

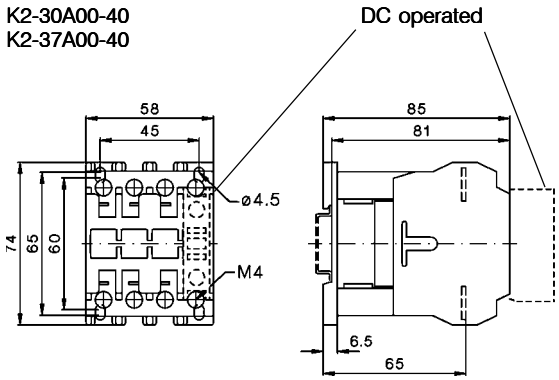


Contactors 4-pole, AC operated / DC operated

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

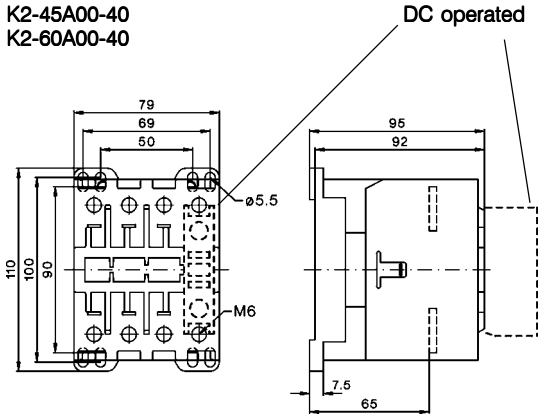


K2-23A00-40
K2-30A00-40
K2-37A00-40

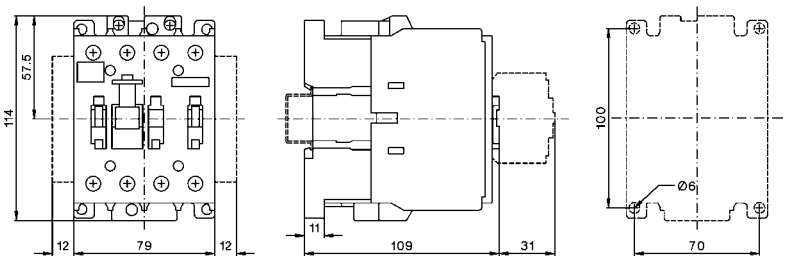


Contactors 4-pole, AC operated / DC operated

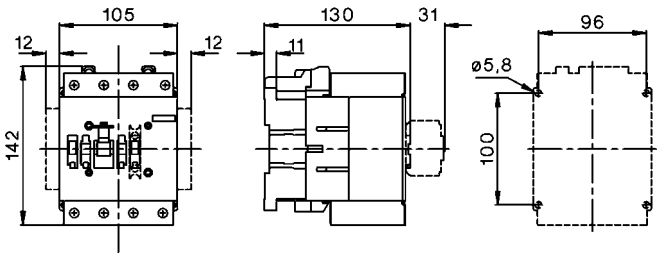
K2-45A00-40
K2-60A00-40



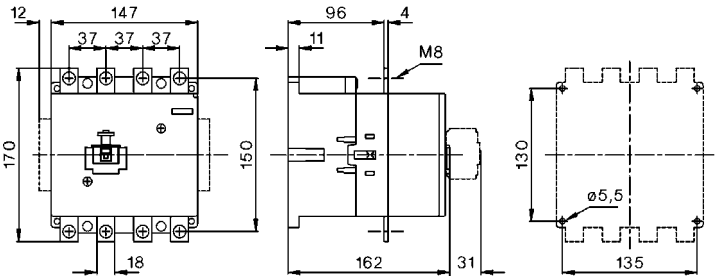
K3-41A00-40



K3-96A00-40



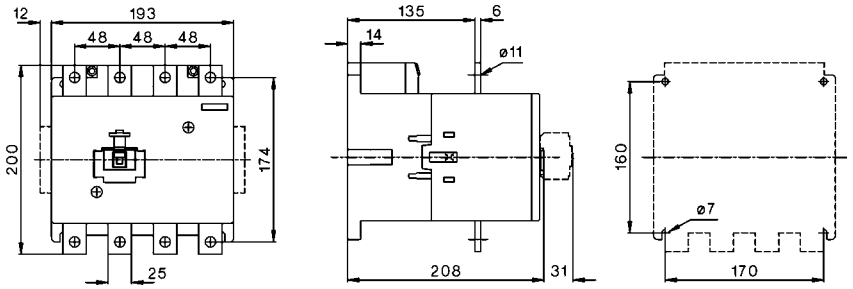
K3-116A00-40
K3-151A00-40
K3-176A00-40



Contactors

Contactors 4-pole, AC and DC operated

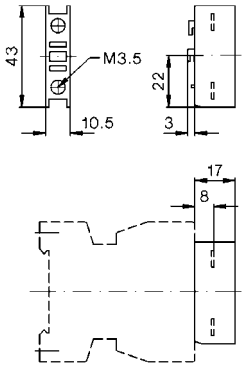
K3-210A00-40
K3-260A00-40
K3-316A00-40



Dimensions Accessories

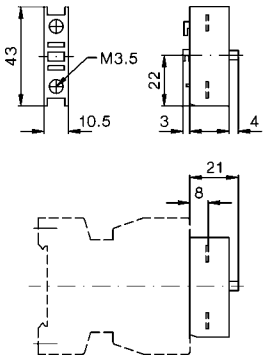
Aux. cont. blocks, terminal blocks

HN10, HN01 K2-SK, K2-DK



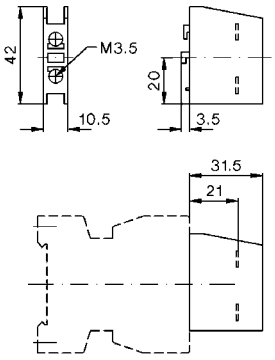
Snap-on momentary cont. blocks

HTN10, HTN01

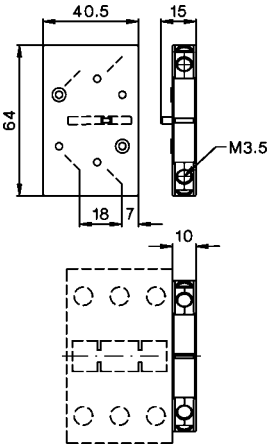


Auxiliary contact blocks

HA10, HA01

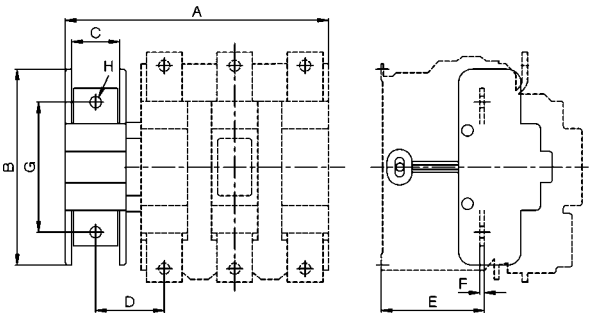


HB11, HB02



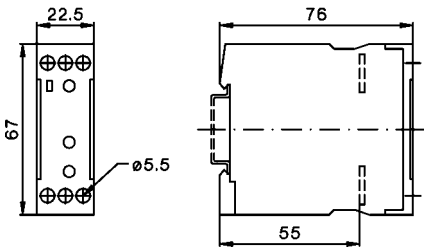
4. pole for contactors K3-200 to K3-1200

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



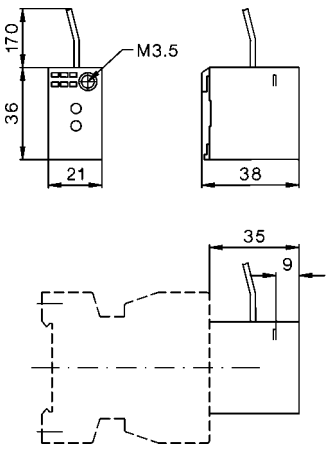
Electronic timer

K3-T180 240



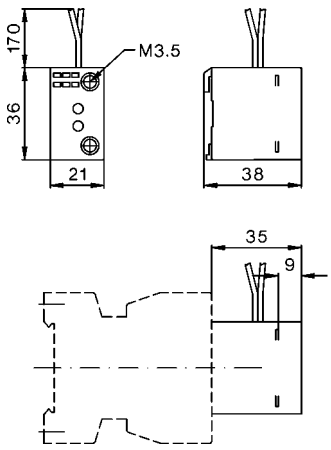
Electronic timer on-delay

K2-TE..



Electronic timer off-delay

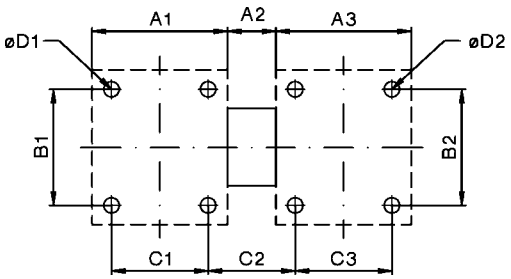
K2-TA..



Contactors

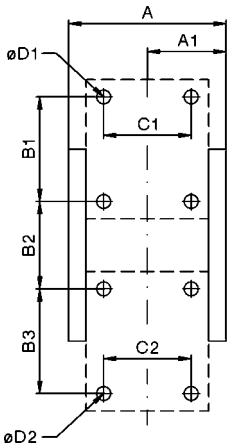
Dimensions Accessories

Mechanical interlocks

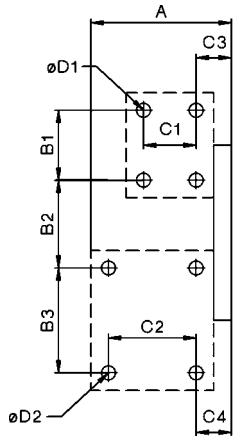


Type	Contactor 1	Contactor 2	A1	A2	A3	B1	B2	C1	C2	C3	D1	D2	
LG10889	K3-07 to K3-40	K3-07 to K3-40	45	7	45	50	50	35	17	35	4,5	4,5	
LG10889	KG3-07 to KG3-22	KG3-07 to KG3-22	45	7	45	80	50	35	17	35	4,5	4,5	
LG10889	KG3-24 to KG3-40	KG3-22 to KG3-40	45	7	45	80	50	35	17	35	4,5	4,5	
LG10890	K3-50 to K3-74	K3-24 to K3-40	60	12	55	100	65	50	22	45	5,5	4,5	
LG10890	K3-50 to K3-74	K3-50 to K3-74	60	12	60	100	100	50	22	50	5,5	5,5	
LG11478	K3-90 bis K3-115	K3-90 bis 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	

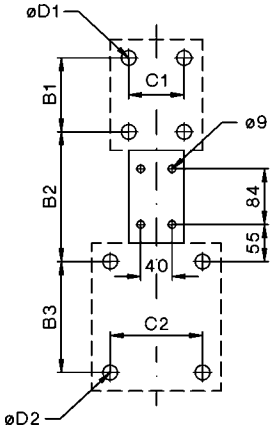
LG10400V, LG10402V



LG10399V



LG10403V, LG10401V



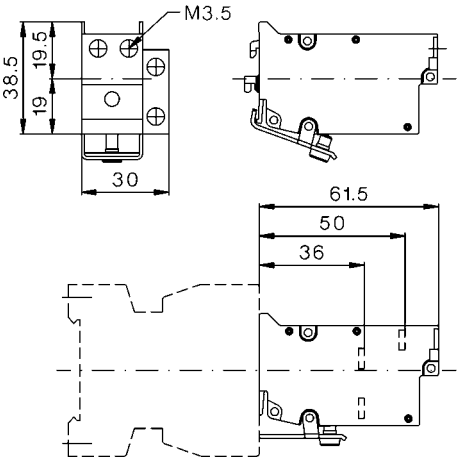
Type	Contactor 1	Contactor 2	A	A1	B1	B2	B3	C1	C2	C3	C4	D1	D2
LG10400V	K3-315 - K3-550	K3-315 - K3-550	250	134	220	94	220	110	110	-	-	9	9
LG10402V	K3-700, -860	K3-700, -860	302	162	280	200	280	175	175	-	-	11	11
LG10403V	K3-1000, -1200	K3-1000, -1200	-	-	380	280	380	120	120	-	-	13,5	13,5
LG10399V	K3-450,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

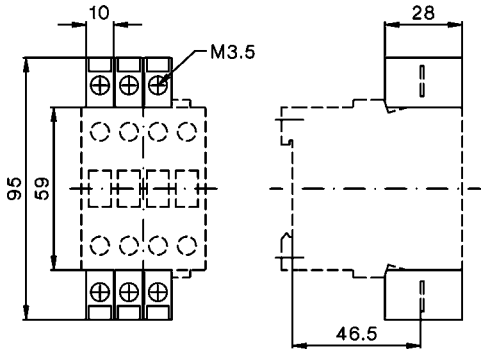
Latch

K2-L..



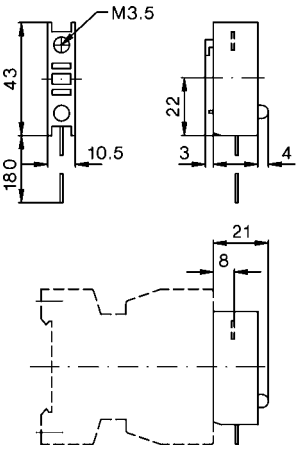
Contactors with additional terminals

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



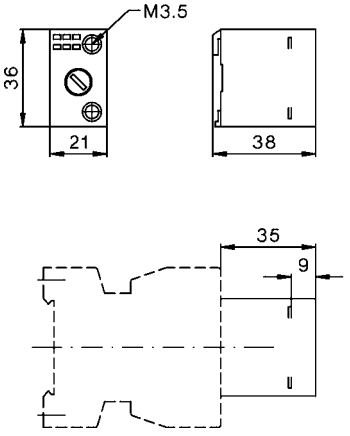
Indicator units

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



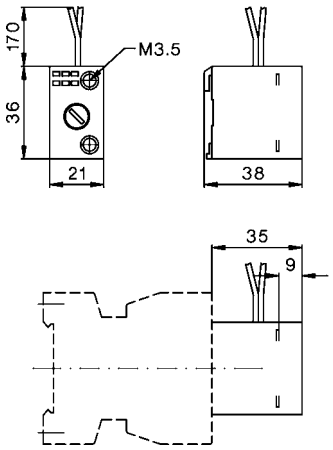
Fuse holder

K2-RF



Fuse holder with rectifier

K2-RF1
K2-RF3

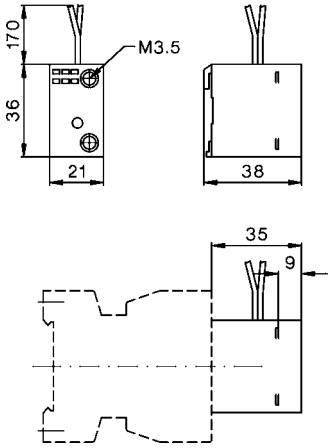


Contactors

Dimensions Accessories

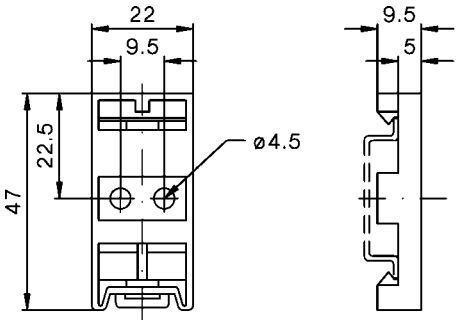
Interface

K2-IM



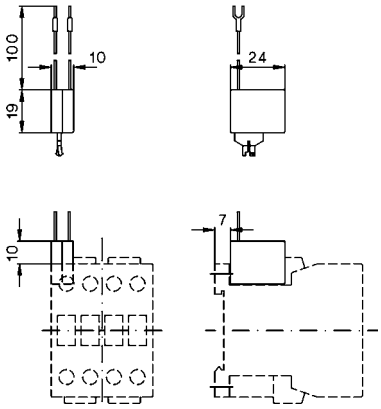
Snap-on adapter

K2-SM

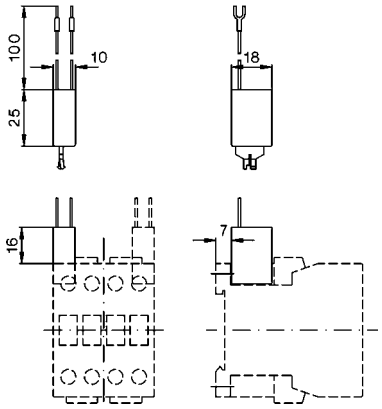


Suppressor units

RC-K3N ..

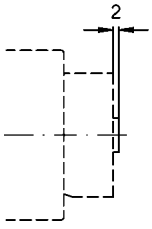


RC-K3NW ..



Marking systems

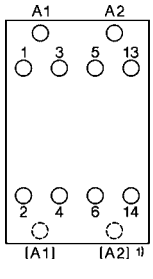
marking label
P487-1 or **P245-**.



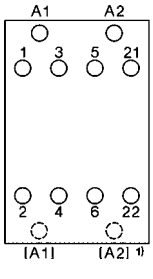
Contactors

Position of terminals

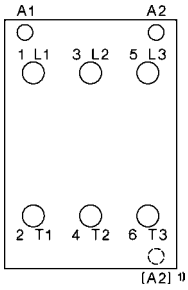
K3-10ND10
K3-14ND10
K3-18ND10
K3-22ND10
K3-18NK10



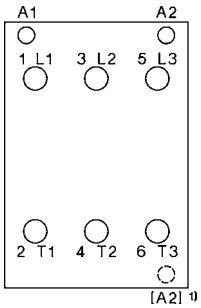
K3-10ND01
K3-14ND01
K3-18ND01
K3-22ND01
K3-18NK01



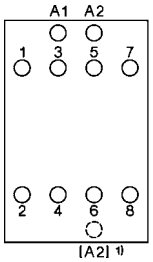
K3-24A00, K3-24K00
K3-32A00, K3-32K00
K3-40A00



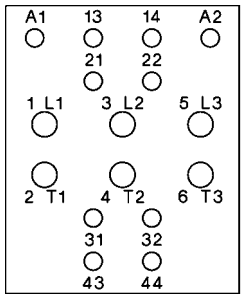
K3-50A00, K3-50K00
K3-62A00, K3-62K00
K3-74A00, K3-74K00



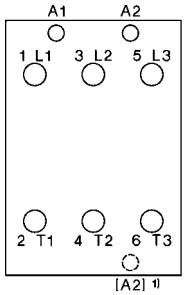
K3-10NA00-40
K3-14NA00-40
K3-18NA00-40
K3-22NA00-40
K2-23A00-40 bis
K2-60A00-40



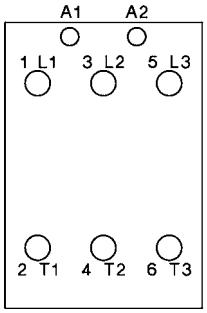
K85A22
K110A22



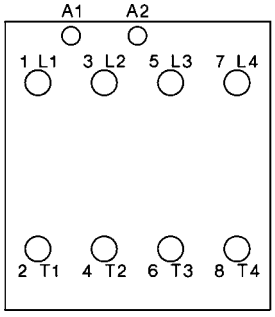
K3-90A00
K3-115A00



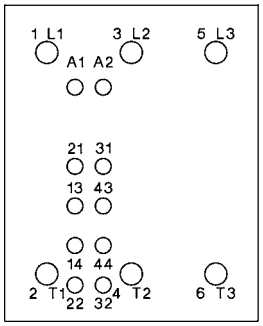
K3-151A00
K3-176A00
K3-210A00
K3-260A00
K3-316A00



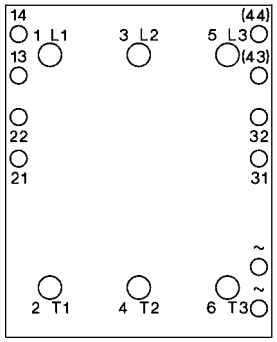
K3-116A00-40
K3-151A00-40
K3-176A00-40
K3-210A00-40
K3-260A00-40
K3-316A00-40



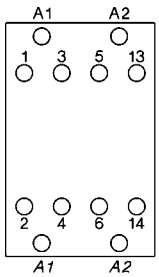
K3-450A22
K3-550A22
K3-700A22
K3-860A22



K3-1000A12
K3-1200A12



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



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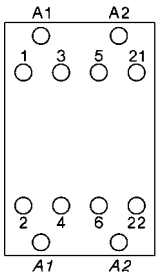
KG3-22A01



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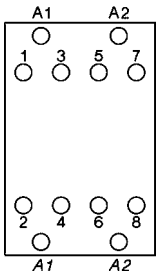
KG3-18A00-40
KG3-22A00-40



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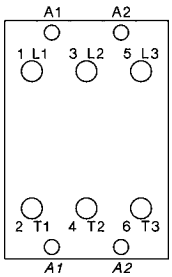
KG3-32A00
KG3-40A00



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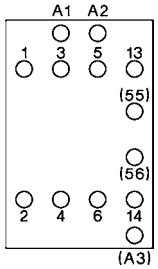

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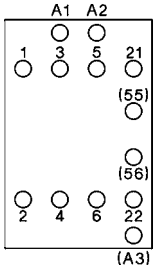

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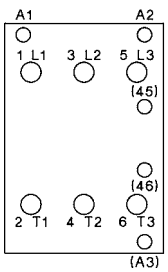

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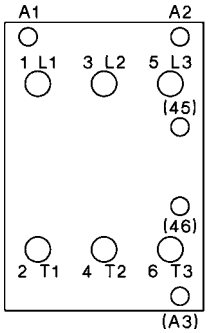
K3-74A00=



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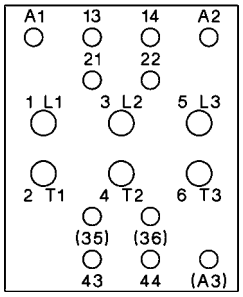
K110A21=



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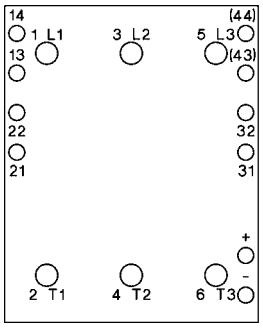


1) Type-suffux "EUR" with additional coil terminal
Ordering example: K3-10ND10 **EUR** 230

Star-Delta Starters Open Type 86

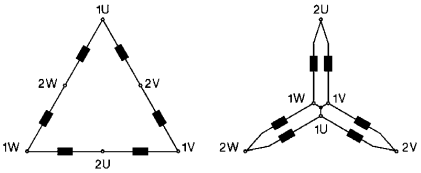
Star-Delta Starters Enclosed 88
Enclosure for Star-Delta Starters 88

Accessories 89

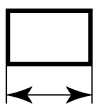
Reversing Contactors 90

Pole Changing Starters 92

Technical Data 94



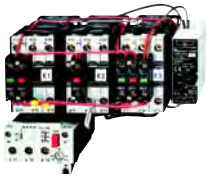
Wiring Diagrams 97



Dimensions 101

Star-Delta Starters Open Type

AC Operated

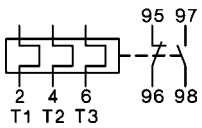


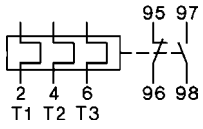
Ratings AC3 380V 400V 415V kW	500V kW	660V 690V kW	Rated Current AC3 400V A	order separately Overload Relay Type	Type 230 400 ↓	Coil voltage [1] 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight kg/pc.
7,5	7,5	11	16	U3/32 U12/16E K3	**K3NY15 . . .**		1	0,9
15	18,5	15	30		**K3NY26 . . .**		1	0,9
22	30	22	45	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

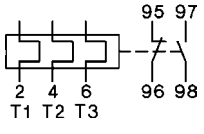
Star-delta starters are wired to accept thermal overload relay. The thermal overload relay has to be ordered separately. For full load current setting use the YD-dial of thermal overload relay.

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 eset

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 94

Components for Combinations						Auxiliary Contacts			Free Space for		
Line Contactor	Delta Contactor	Star Contactor	Electronic Timer	Mechanical Interlock between	Star-Delta Starter Connector	Built-in for use on Contactor			on Contactor		
						Line	Delta	Star	Line	Delta	Star
K1	K2	K3	K4	K2 and K3		K1	K2	K3	K1	K2	K3
Type	Type	Type	Type	Type	Type	NO/NC	NO/NC	NO/NC	HN.. or HA..		
K3-10ND01 + HN10	K3-10ND01	K3-10ND10 + HN10 + HN01	Y9A	LG10889	K3NY-VB10	-	-	-	3	4	2
K3-18ND01 + HN10	K3-18ND01	K3-14ND10 + HN10 + HN01	Y9A	LG10889	K3NY-VB10	-	-	-	3	4	2
K3-24A00 + HN10 + HN01	K3-24A00 + HN01	K3-24A00 + 2HN10 + HN01	Y9A	LG10889	K3Y-VB24	-	-	-	2	3	1
K3-32A00 + HN10 + HN01	K3-32A00 + HN01	K3-24A00 + 2HN10 + HN01	Y9A	LG10889	K3Y-VB24	-	-	-	2	3	1
K3-50A00 + HN01 + HN10	K3-50A00 + HN01	K3-32A00 + 2HN10 + HN01	Y9A	LG10890	-	-	-	-	2	3	1
K3-62A00 + HN01 + HN10	K3-62A00 + HN01	K3-50A00 + 2HN10 + HN01	Y9A	LG10890	-	-	-	-	2	3	1
K3-90A00 + HN01 + HN10	K3-90A00 + HN01	K3-90A00 + 2HN10 + HN01	Y9AL	LG11478	-	-	-	-	5	6	4
K3-115A00 + HN01 + HN10	K3-115A00 + HN01	K3-90A00 + 2HN10 + HN01	Y9AL	LG11478	-	-	-	-	5	6	4
K3-151A00 + HKT11	K3-151A00 + HKT11	K3-151A00 + HKT22	Y9AL	LG11223H	-	-	1/-	-/1	2	1	1
K3-176A00 + HKT11	K3-176A00 + HKT11	K3-151A00 + HKT22	Y9AL	LG11223H	-	-	1/-	-/1	2	1	1

Applications

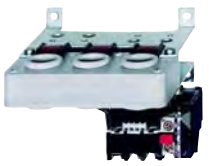
The star-delta starting method is only practicable in such cases where the motor windings are connected in delta configuration for normal operation and the torque which is needed during the starting period is not higher than approx. 30% of the rated torque. The starting current drawn from the line will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

Time setting

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

Thermal Overload Relays

Rated Motor Current A		Type	Pack pcs.	Weight kg/pc.	Wiring Diagram
For Star-Delta Starters K3Y80.., K3Y100..					
35	- 48	**U3/74 28**	1	0,40	
48	- 73	**U3/74 42**	1	0,40	
70	- 90	**U3/74 52**	1	0,40	
90	-112	**U3/74 65**	1	0,40	manual and auto reset



For Star-Delta Starters K3Y140.., K3Y200..					
104	-156	**U85 90**	1	0,90	
140	-207	**U85 120**	1	0,90	manual eset

For Star-Delta Starters K3Y240.., K3Y300..					
208	- 312	**U180 180**	1	1,5	manual and auto reset

Star-Delta Starters Enclosed Type

AC Operated

Ratings AC3 380V 400V 415V kW	500V kW	660V 690V kW	Rated Current AC3 400V A	Optional Extras	Wired to accept Overload Relay Type	Type 230 400 ↓	Coil voltage [1] 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight kg/pc.
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 94

Type-suffix for optional extras

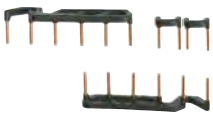
Start-Stop Push Buttons		**.T . . .**
Selector Switch		. . . . . **.W . . .**
Typical wiring diagrams see page 98		
Control Circuit Fuse	<250V (1 piece)	. . . . . **.ST . . .**
	>250V (2 pieces)	. . . . . **.ST . . .**
Run Hour Meter		. . . . . **.H . . .**

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

Enclosures for Star Delta Starter

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

Star-Delta Starter Connector



For Star-Delta Starter Types	Type	Pack pcs.	Weight kg/pc.
K3NY15, K3NY26	**K3NY-VB10**	1	0,02
K3Y40, K3Y52	**K3Y-VB24**	1	0,03

Additional Terminals

For Star-Delta Starter Types Line Conn. Line Contactor	 Motor Conn. Overload Relay	Cable cross-section mm²	Type	Pack pcs.	Weight kg/pc.
Single pole with Fingertouch Protection					
K3NY15, K3NY26	U12/16	0,75 - 10 solid 0,75 - 6 flex.	**LG9339**	6	0,009
Three-pole with Fingertouch Protection					
	U3/42	4 - 35 strand. 4 - 25 flex.	**LG7559**	1	0,052

Electronic Timers for Star-Delta Starters[1)]

Rated Control Voltage V	Time Range s	Delay Time ms	Rated Current AC15 230V A	400V A	Type	Pack pcs.	Weight kg/pc.
24 - 60V AC	1 - 20	20 - 25	6	4	**Y9A 60**	1	0,075
110 - 415V AC	1 - 20	20 - 25	6	4	**Y9A 415**	1	0,075
24 - 60V~	1 - 20	40 - 80	6	4	**Y9AL 60**	1	0,075
110 - 415V~	1 - 20	40 - 80	6	4	**Y9AL 415**	1	0,075

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

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

1) not suitable for contactors K3-450 - K3-1200

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 98.

Ordering Example: K3Y**L**52 230

Starters with two Thermal Overload Relays on request

Basic circuit diagram see page 98

Reversing Contactors with Mechanical Interlock — AC Operated

Ratings AC3 **380V** **400V** **415V** **kW**	500V kW	660V 690V kW	Rated Current AC3 400V A	Wired to accept Overload Relay page 114 Type	**Type** **110** **230** **400** ↓ Coil voltage [1] 110V 50Hz 220-240V 50Hz 380-415 50Hz	Pack pcs.	Weight > kg/pc.
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
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	**Type**	Pack pcs.	Weight kg/pc.
K3NWU10, K3NWU18	**K3NW-VB10**	1	0,02
K3WU24, K3WU32	**K3W-VB24**	1	0,025

1) Other coil voltages see page 51

Components for Combinations							
Left Hand Side Contactor	Right Hand Side Contactor	Mechanical Interlock	Reversing Starter Connector	Auxiliary Contacts Built-in for use on Contactor		Free Space for Aux. Contact Blocks on Contactor	
K1	K2			K1	K2	K1	K2
Type	Type	Type	Type	NO/NC	NO/NC	HN.. or HA..	
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
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

Reversing Contactors for North America — AC Operated

Ratings AC3 **380V** **400V** **415V** **kW**	500V kW	660V 690V kW	Rated Current AC3 400V A	Wired to accept Overload Relay page 114 Type	**Type** **230** **400** ↓	Coil voltage [1] 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight> kg/pc.
Open Type								
4	5,5	5,5	10	U3/32 U12/16E K3	**KNW3-10 . . .**		1	0,6
7,5	10	10	18		**KNW3-18 . . .**		1	0,6
11	15	15	24	U3/42	**KW3-24 . . .**		1	1,2
15	18,5	18,5	32		**KW3-32 . . .**		1	1,4
18,5	18,5	18,5	40		**KW3-40 . . .**		1	1,4

Pole Changing Starters — AC Operated

Ratings AC3 at **380V** **400V** **415V** **kW**	500V kW	660V 690V kW	Rated Current AC3 400V A	Wired to accept Overload Relay page 114 Type	**Type** **230** **400** ↓	Coil voltage [1] 220-240V 50Hz 380-415V 50Hz	Pack pcs.	Weight> kg/pc.
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

1) Other coil voltages see page 50

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 51

Components for Combinations Left Hand Side Contactor K1 Type	Right Hand Side Contactor K2 Type	Mechanical Interlock Type	Auxiliary Contacts Built-in for use on Contactor K1 NO/NC	 K2 NO/NC	Free Space for Aux. Contact Blocks on Contactor K1 HN.. or HA..	 K2
K3-10ND01	K3-10ND01	LG10889	-	-	4	4
K3-18ND01	K3-18ND01	LG10889	-	-	4	4
K3-24A00 + HN01	K3-24A00 + HN01	LG10889	-	-	3	3
K3-32A00 + HN01	K3-32A00 + HN01	LG10889	-	-	3	3
K3-40A00 + HN01	K3-40A00 + HN01	LG10890	-	-	3	3

Components for Combinations High Speed K1 Type	Low Speed K2 Type	Star Contactor K3 Type	Free Space for Aux. Contact Blocks on Contactor High Speed K1 HN.. or HA..	Low Speed K2	Star K3
K3-18ND01 + 2 x HN10	K3-18ND01 + HN10	K3-14ND10	2	3	4
K3-24A00 + HN01 + 2 x HN10	K3-24A00 + HN01 + HN10	K3-18ND10	1	2	4
K3-32A00 + HN01 + 2 x HN10	K3-32A00 + HN01 + HN10	K3-24A00 + HN10	1	2	3
K3-50A00 + HN01 + 2 x HN10	K3-50A00 + HN01 + HN10	K3-32A00 + HN10	1	2	3
K3-62A00 + HN01 + 2 x HN10	K3-62A00 + HN01 + HN10	K3-50A00 + HN10	1	2	3
K3-18ND01 + 2 x HN10	K3-18ND01 + HN10	K3-14ND10	2	3	4
K3-24A00 + HN01 + 2 x HN10	K3-24A00 + HN01 + HN10	K3-18ND10	1	2	4
K3-32A00 + HN01 + 2 x HN10	K3-32A00 + HN01 + HN10	K3-24A00 + HN10	1	2	3

Star-Delta Starters

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

Type			K3NY15	K3NY26	K3Y40	K3Y52	K3Y80	K3Y100	K3Y140	K3Y200	K3Y240	K3Y300
Main Contacts												
Rated insulation voltage U_i [1]		V AC	690	690	690	690	690	690	690	690	690	690
Frequency of operations z AC3, I_e		1/h	15									
Change-over time max. (Y-step)		s	20 (Type K3YL ... 60)									
Utilization category AC3												
Switching of three-phase motors												
Rated operational	220-230V	A	16	30	45	60	85	109	150	205	240	300
current I_e	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	220-230V	kW	4	7,5	11	15	22	30	45	55	75	90
of three-phase motors	240V	kW	5,5	11	15	18,5	22	30	45	55	75	90
50-60Hz	**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	
	lexible 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	
	lexible 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 min. V	max. V	range for 60Hz 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 min. V	max. V	range for 60Hz min. V	max. V	for DC 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): Uimp = 8kV. Data for other conditions on request.
2) Additional terminals see page 89
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	220-230V	kW	3	5	6	8,5	12,5	18,5	
of three-phase motors	240V	kW	3	5	7	9	13,5	19	23
50-60Hz	**380-400V**	**kW**	**4**	**7,5**	**11**	**15**	**22**	**30**	**37**
	415-440V	kW	4,5	8,5	12	16	24	33	40
	500V	kW	5,5	10	15	18,5	30	37	45
	660-690V	kW	5,5	10	15	18,5	30	37	45
Cable cross-sections									
Line	solid or stranded	mm²	0,75 - 6		1,5 - 25		4 - 50		
	flexible	mm²	1 - 4		2,5 - 16		6 - 35		
	flexible with multicore cable end	mm²	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	110-120V	hp	1½	2	5	5	7½
of three-phase motors	200V	hp	3	5	7½	10	10
at 60Hz (3ph)	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): Uimp = 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	220-230V	kW	5	6	8,5	12,5	18,5
of three-phase motors	240V	kW	5	7	9	13,5	19
50-60Hz	**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	

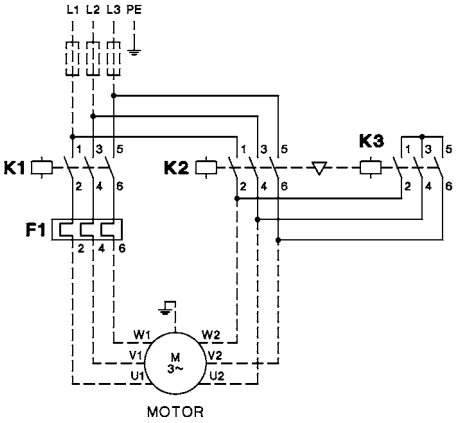
1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV. Data for other conditions on request.

Star-Delta Starters

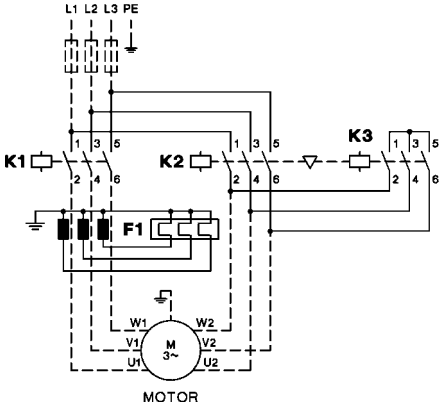
Wiring Diagrams Main Circuit

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

K3NY15 to K3Y100
with thermal overload relay U3/.. or U12/16

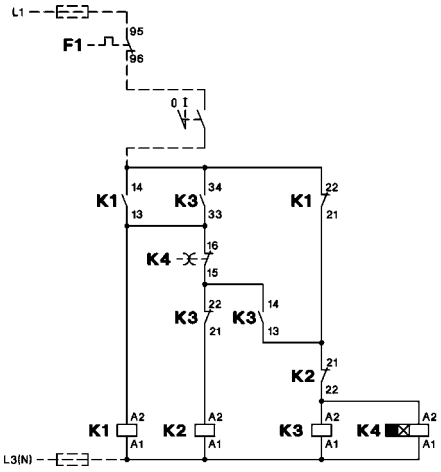


K3Y140 to K3Y300
with thermal overload relay U85 or U180

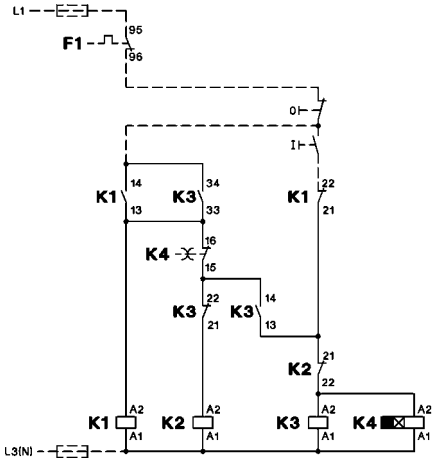


Wiring Diagrams Control Circuit

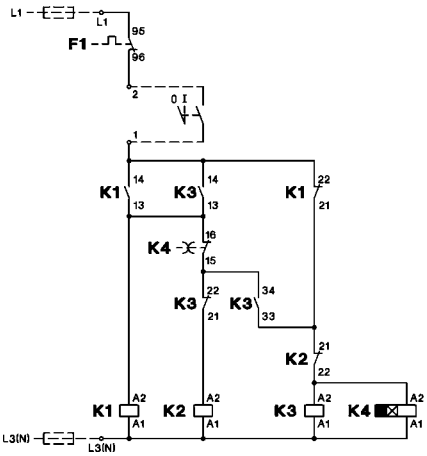
K3NY15 to K3Y52
operating with control switch



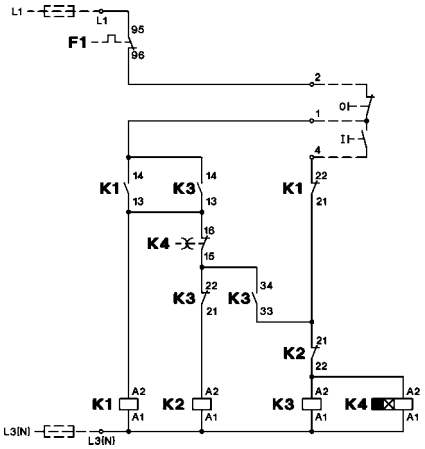
K3NY15 to K3Y52
operating with push buttons



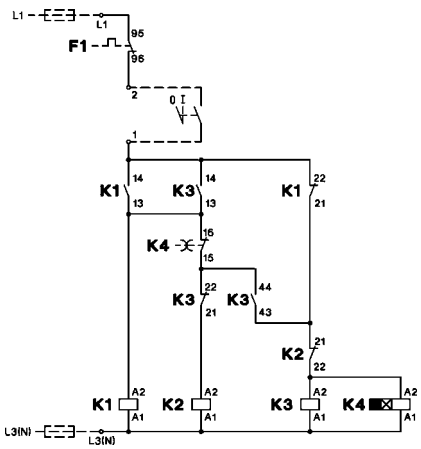
K3Y80 to K3Y200
operating with control switch



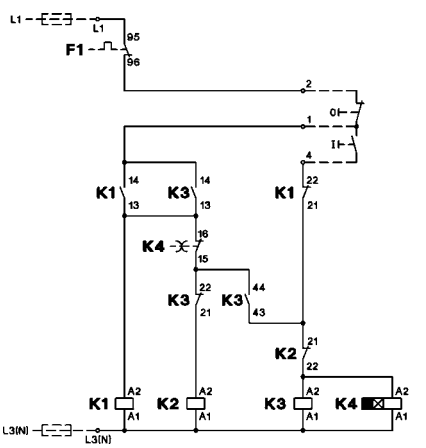
K3Y80 to K3Y200
operating with push buttons



K3Y240 to K3Y300
operating with control switch



K3Y240 to K3Y300
operating with push buttons

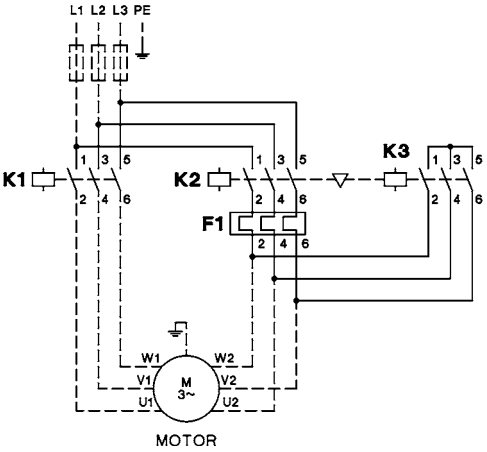


Star-Delta Starters

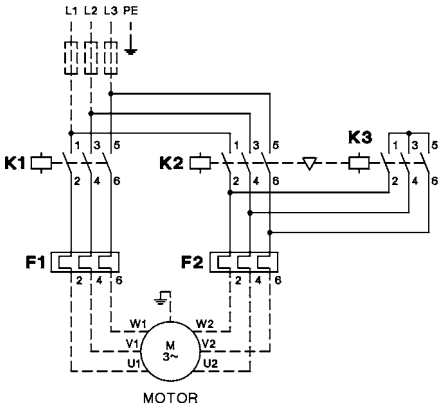
Wiring Diagrams Main Circuit

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

K3YL..
Typical circuit diagram

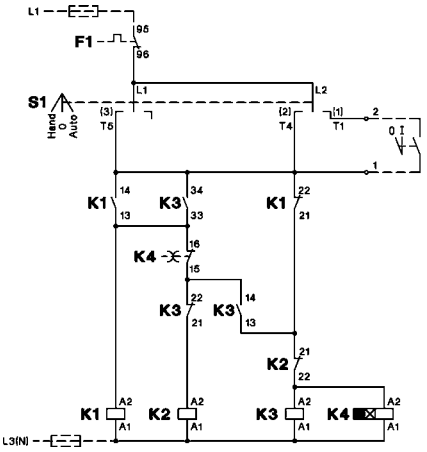


K3Y.. with 2 Thermal Overload Relays
Typical circuit diagram

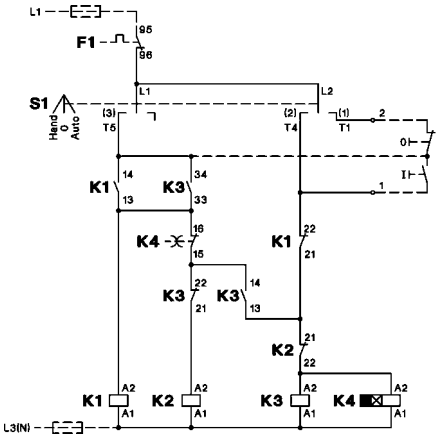


Wiring Diagrams Control Circuit

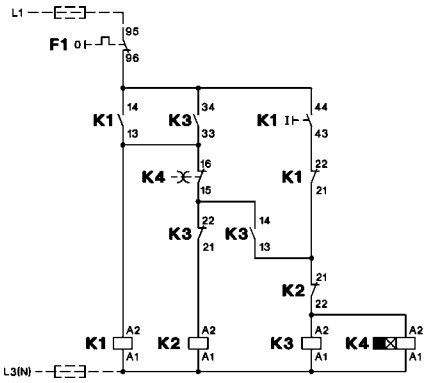
with selector switch
K3Y..W
Typical circuit diagram
operating with control switch



Typical circuit diagram
operating with push buttons



with push buttons
K3Y..T
Typical circuit diagram

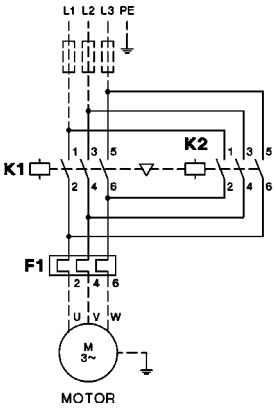


Reversing Contactors

Wiring Diagrams Main Circuit

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

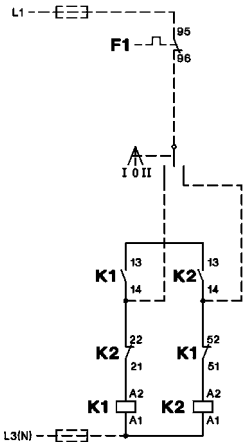
K3NWU10 to K3WU74
with thermal overload relay U3/32, U3/42 or U3/74



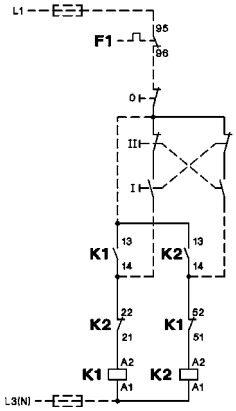
Wiring Diagrams Control Circuit

K3NWU10 to K3WU32

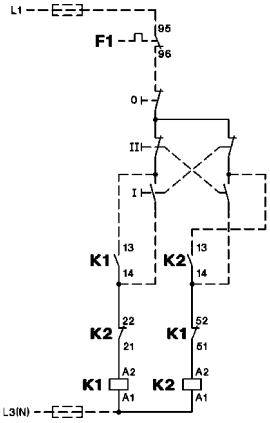
operating with control switch



operating with push buttons
Reversing over off-position

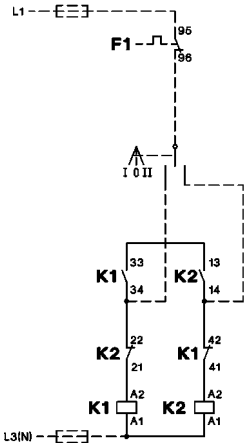


Reversing direct

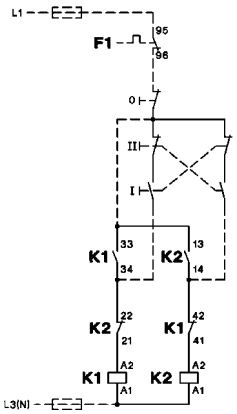


K3WU50, K3WU62, K3WU74

operating with control switch



operating with push buttons

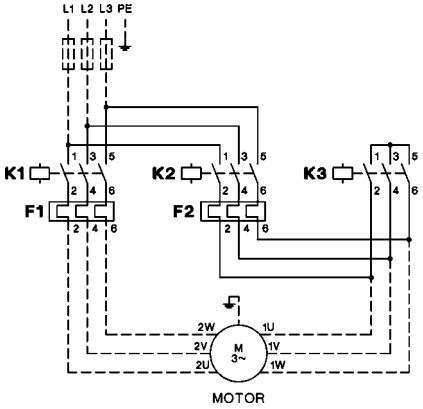


Pole Changing Starters

Wiring Diagrams

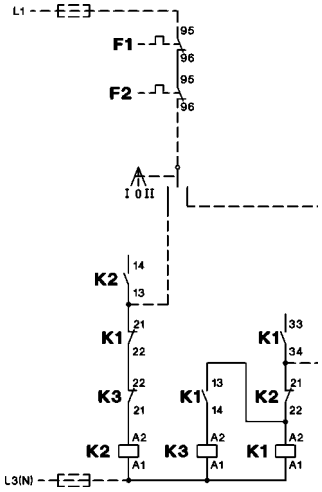
Terminal markings of contactors and relays according to DIN EN 50012
Connections shown in main and control circuits as broken lines are not included.

Main Circuit

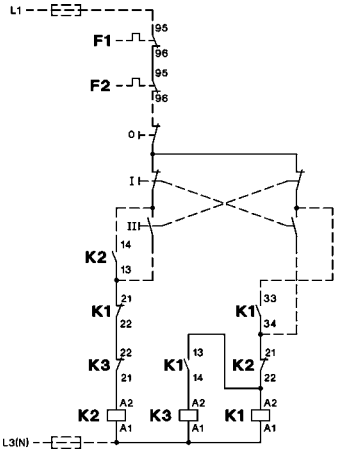


Principal Control Circuit Wiring Diagram

operating with control switch

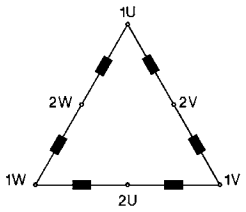


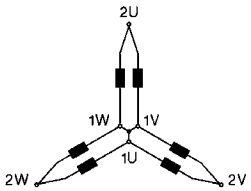
operating with push buttons

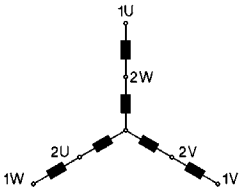


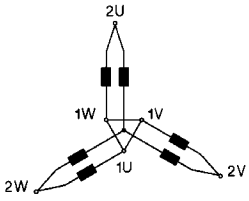
	Low speed	High speed
Operation	Delta	Double-Star
Speed relation	1	2
Power relation	1	1,5 - 1,8

Low speed	High speed
Star	Double-Star
1	2
0,3	1







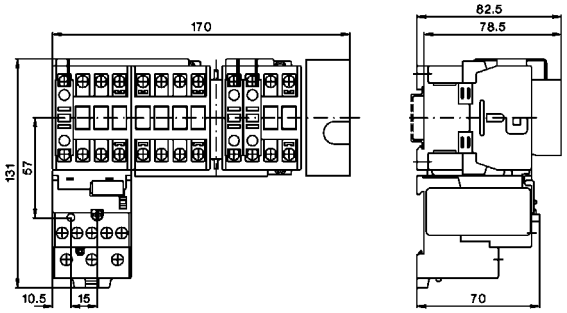


Star-Delta Starters

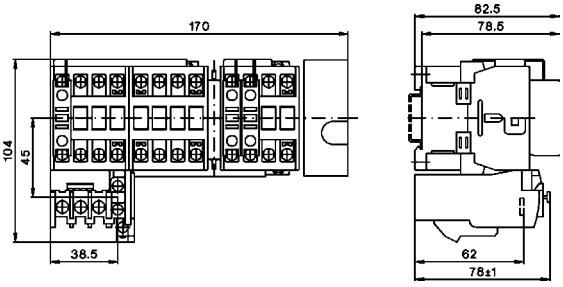
Dimensions

Star-Delta Starters, AC operated, open type

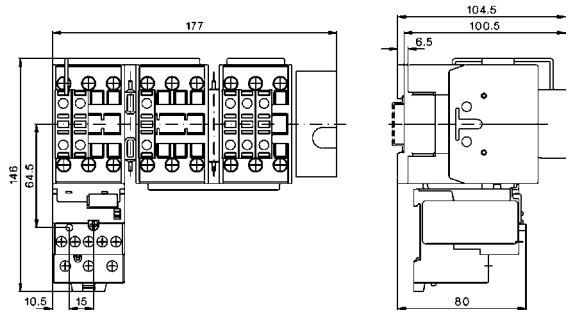
K3NY15 + U3/32
K3NY26



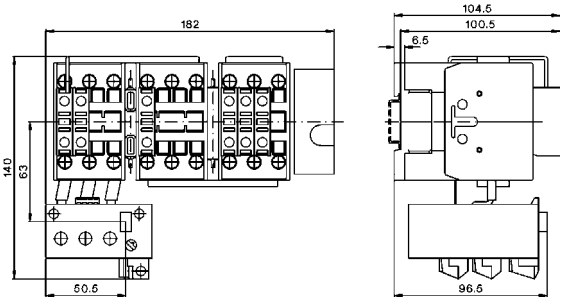
K3NY15 + U12/16E G3
K3NY26



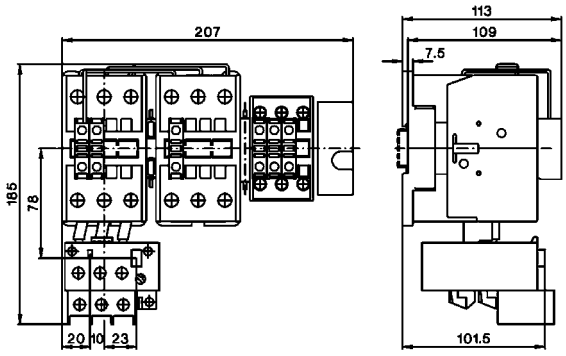
K3Y40 + U3/32
K3Y52 + U3/32



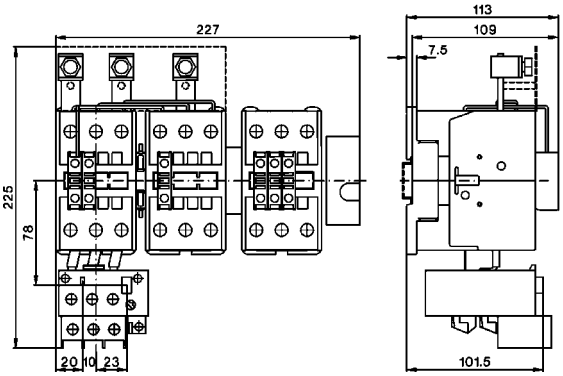
K3Y40 + U3/42
K3Y52 + U3/42



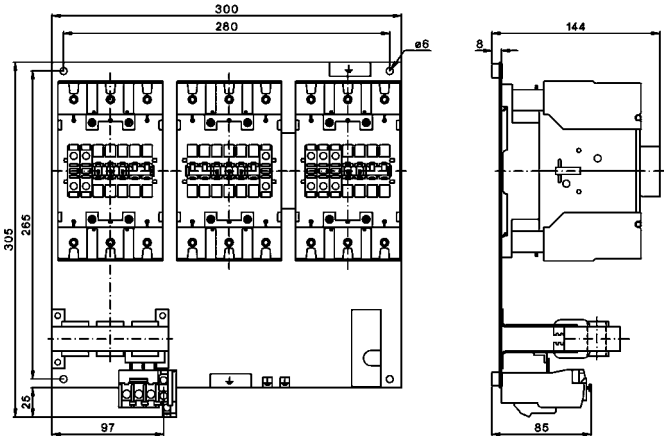
K3Y80 + U3/74



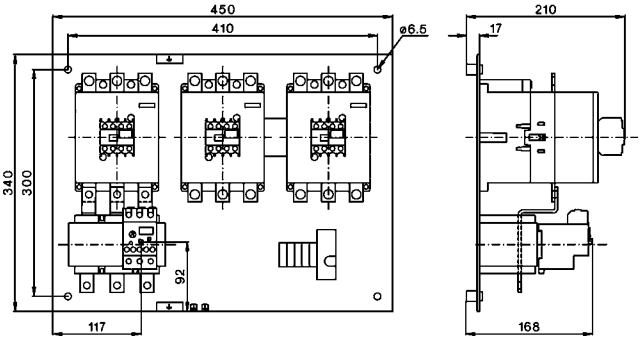
K3Y100 + U3/74



K3Y140 + U85
K3Y200



K3Y240 + U180 + SU180/176
K3Y300

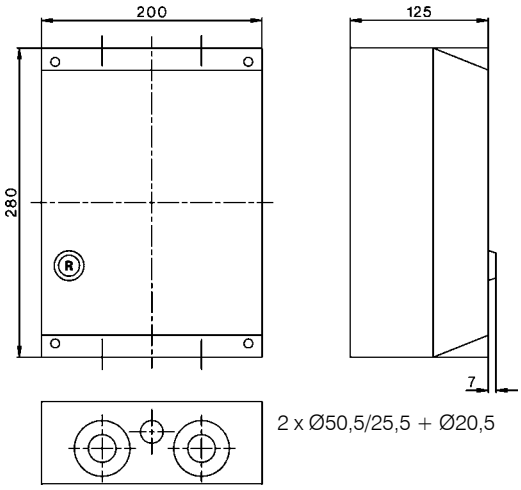


Star-Delta Starters

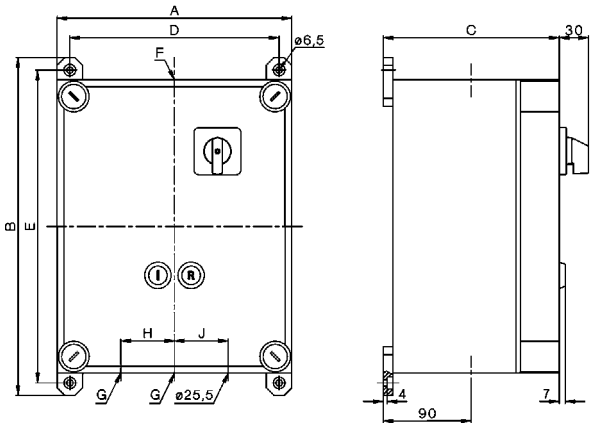
Dimensions

Star-Delta Starters, plastic enclosed, protected to IP65

K3NY26P



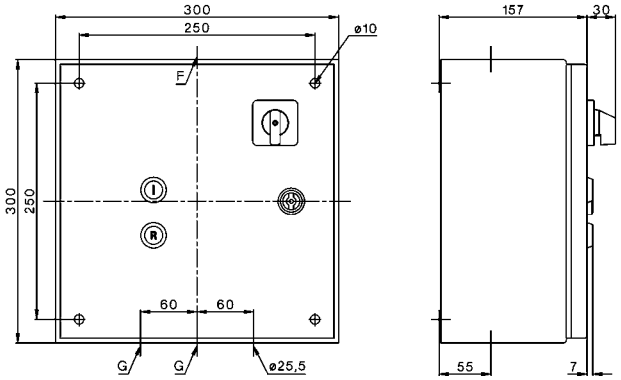
K3Y40P to K2Y100P



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

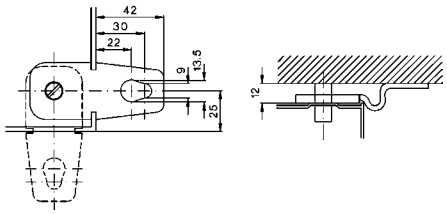
Star-Delta Starters, sheet steel enclosed, protected to IP54

K3Y26B to K3Y52B

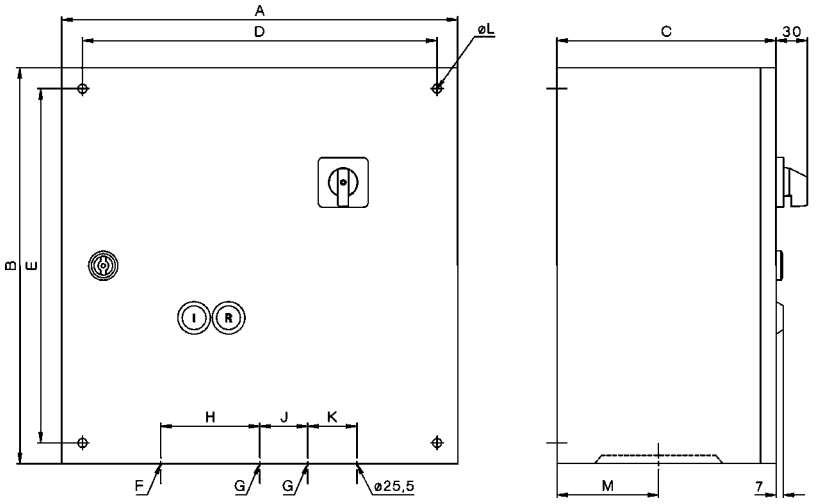


Type	Ø F	Ø G
K3NY26B	25,5	25,5
K3Y40B	32,5	32,5
K3Y52B	32,5	32,5

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

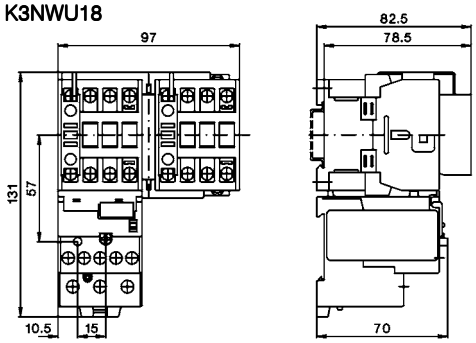
Type	Ø F	Ø G	H	J	K
K3Y80B	40,5	40,5	70	70	60
K3Y100B	50,5	40,5	80	70	60
K3Y140B	50,5	50,5	80	80	70
K3Y200B	50,5	50,5	80	80	70

Reversing Contactors

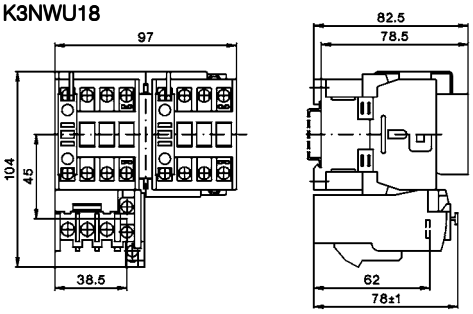
Dimensions

Reversing Starters, AC operated, open type

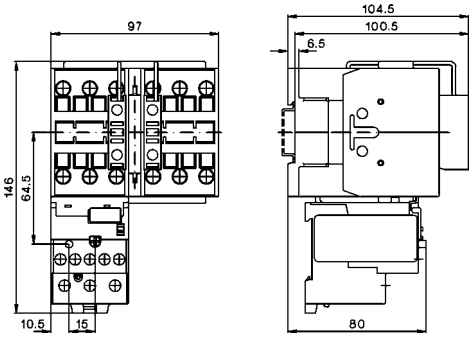
K3NWU10 + U3/32
K3NWU18



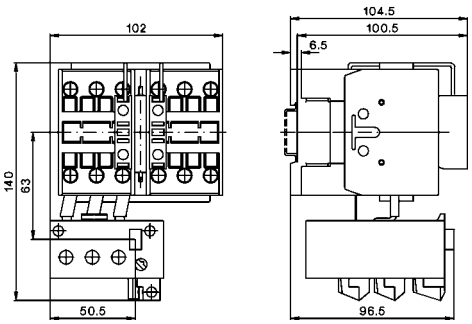
K3NWU10 + U12/16E G3
K3NWU18



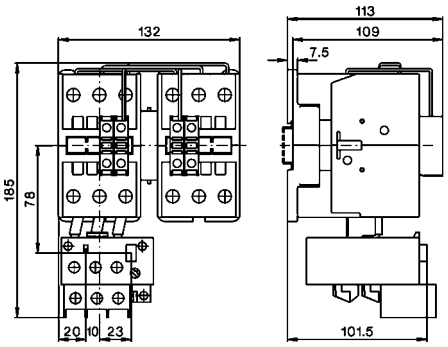
K3WU24 + U3/32
K3WU32
K3WU40



K3WU24 + U3/42
K3WU32
K3WU40

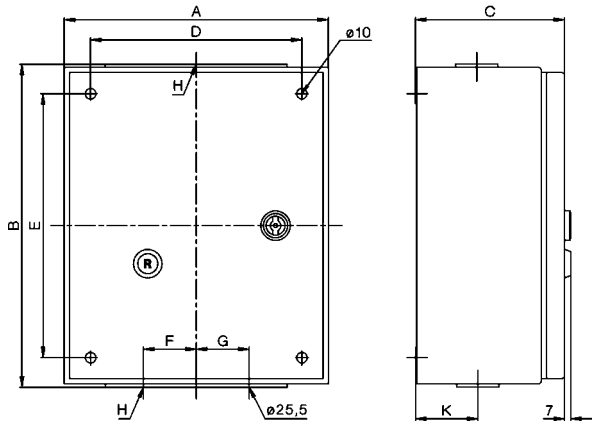


K3WU50 + U3/74
K3WU62
K3WU74

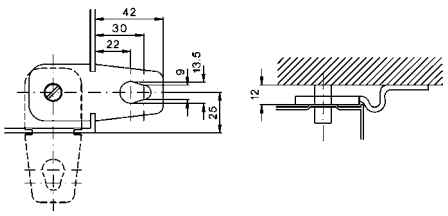


Reversing Contactors, sheet steel enclosed, protected to IP54

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

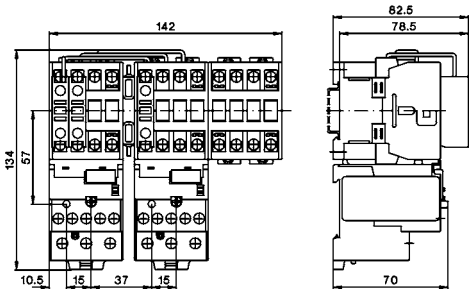


Pole Changing Starters

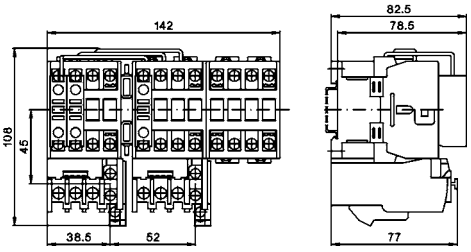
Dimensions

Pole Changing Starters, AC operated, open type

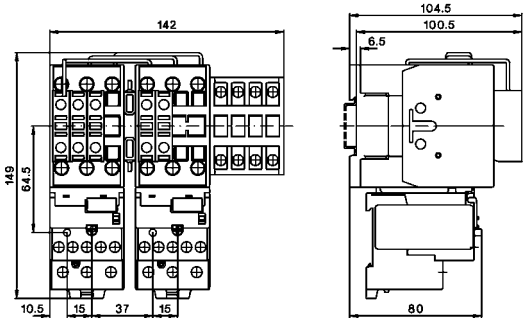
K3NPU18 + 2x U3/32



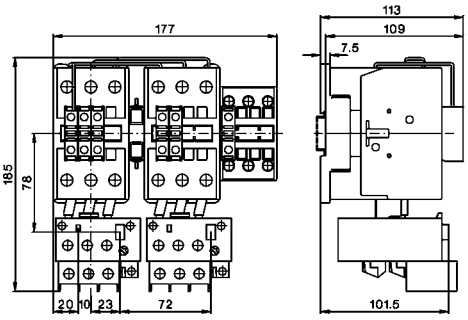
K3NPU18 + 2x U12/16



K3PU24 +2x U3/32
K3PU32



K3PU50 + 2x U3/74
K3PU62

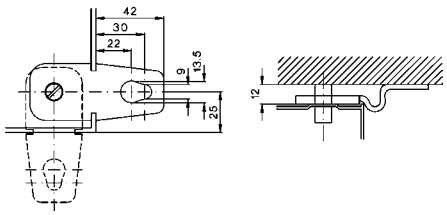


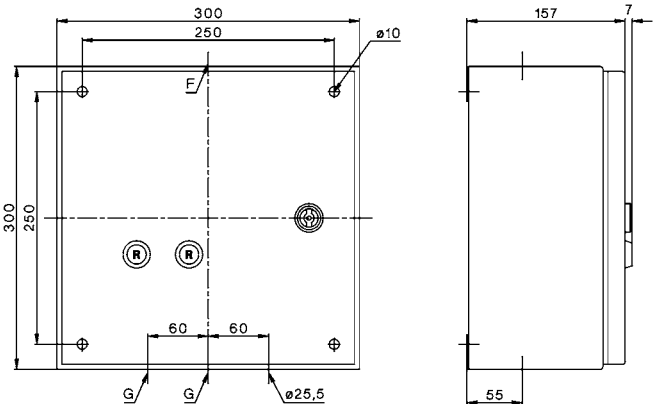
Pole Changing Starters, sheet steel enclosed, protected to IP54

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





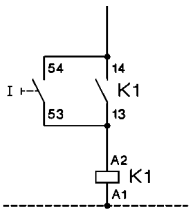
D.O.L. Starters With Start-Stop Buttons 106

D.O.L. Starters With Selector Switch 106

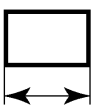
D.O.L. Starters With Selector Switch And Pneumatic Switch For Use In Moist Rooms 106

Enclosures 107

Accessories 107



Wiring Diagrams 108



Dimensions 110

D.O.L. Starters In Plastic Enclosure

Ratings AC3 at **380V** **400V** **415V** **kW**	Included Contactor Type	Free Space f. Aux. Cont. HN.. pcs.	**order extra** Overload Relay Type	Protec-tion Degree	Conduit Entries	**Type** Coil voltage [1] **230** 220-240V 50Hz 230-264V 60Hz **400** 380-415V 50Hz 400-440V 60Hz ↓	Pack pcs.	Weight 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

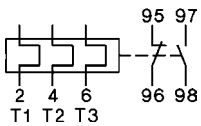
Length 5m	**P1LS-5**	1	

Pneumatic Switch

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

Thermal Overload Relays

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



manual reset

Overload Relays with Quick Tripping Characteristic see page 115

Technical data see contactors page 56 and thermal overload relays page 119
1) Non-standard coil voltages see page 51

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	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. l.)	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 112

Heating Element

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

Additional Terminals, Start Contact

Specification	Cable Cross-sections to clamp mm² solid or stranded	flexible	flexib. w. multi-core cable end	Type	Pack pcs.	Weight kg/pc.
Neutral Terminal	2 x 0,75-4	2 x 0,75-2,5	2 x 0,5-2,5	**LG9744**	10	0,009
Earth Terminal	2,5-16	1,5-10	1,5-10	**LG9750**	10	0,052

Mounting instructions see page 112

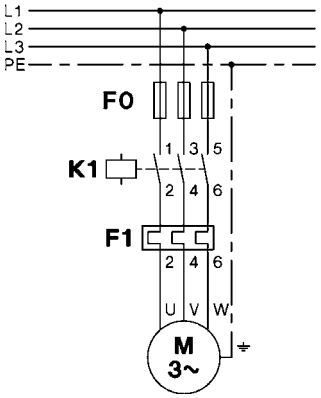
Start Contact	for contactor K3-10 to K3-22	to be snapped on top of the auxiliary contact	**LG9319-K3**	10	0,03

D.O.L. Starters

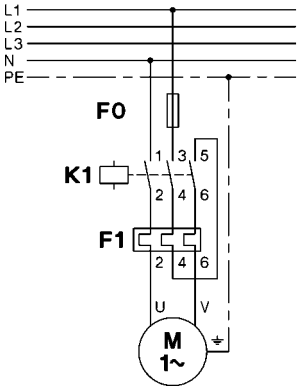
Wiring Diagrams Main Circuit

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



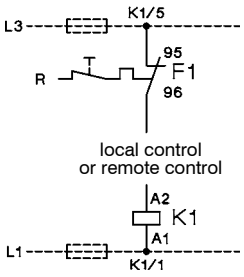
Wiring Diagrams Control Circuit

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

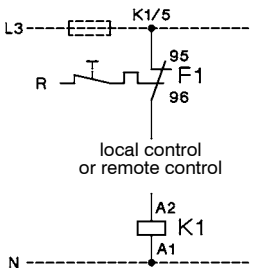
Coil connectors
Coils for **380-415V 50Hz** and **400-440V 60Hz**: The starter is supplied with control circuit connectors between terminals1 (L1) and 5 (L3).
Coils for **220-240V 50Hz** and **230-264V 60Hz**: The starter is supplied with control circuit connectors between terminals 95 and 5 (L3). Connect 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.

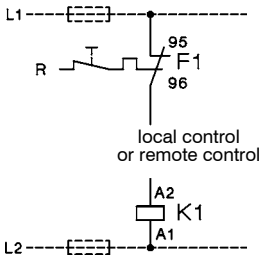
Coil phase to phase
(380-415V 50Hz)



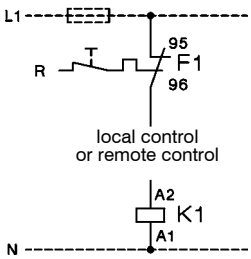
Coil phase to neutral
(220-240V 50Hz)



Coil phase to phase

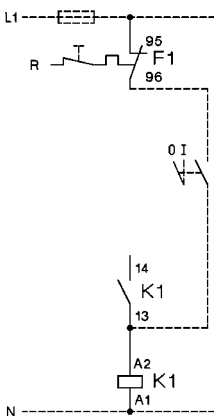


Coil phase to neutral

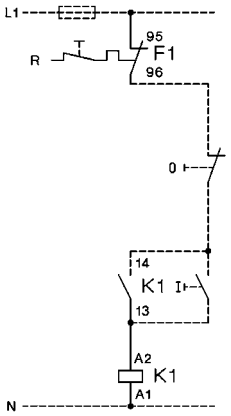


D.O.L. Starters with remote control

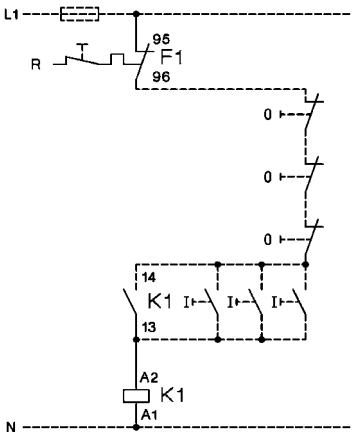
P1..
Remote 2-wire (switch) control



Remote 3-wire (push button) control



Remote start-stop control
(3 control stations)



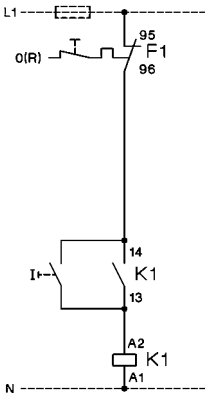
D.O.L. Starters

Wiring Diagrams Control Circuits

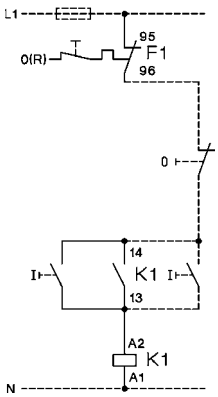
Typical circuit diagram (for separate coil supply, control circuit connected between L1 and N)
Terminal markings according to EN 50012

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

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

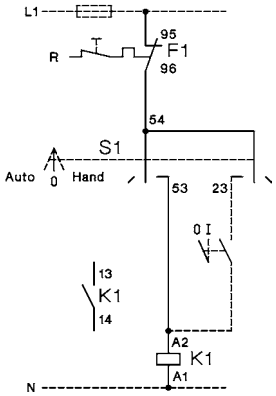


P1T10, P1T18, P1T22
with external push buttons

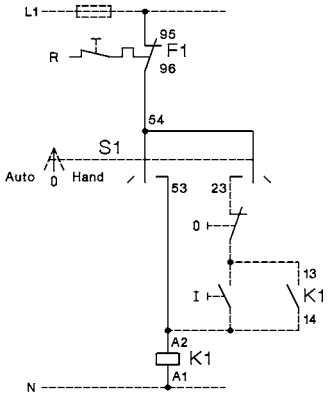


D.O.L. Starters with Selector Switch

P1W10, P1W18, P1W22
with external control switch

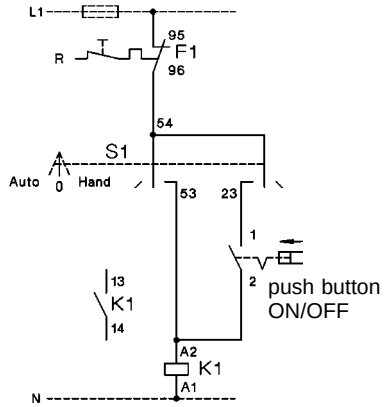


P1W10, P1W18, P1W22
with external push buttons



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

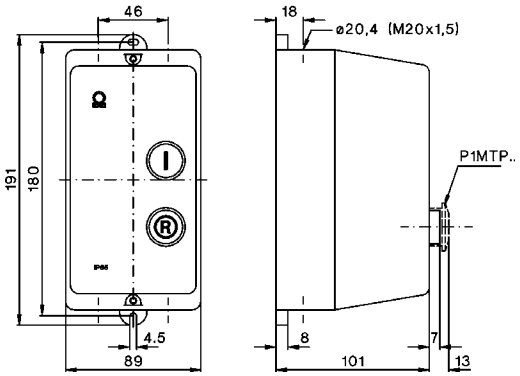


D.O.L. Starters

Dimensions

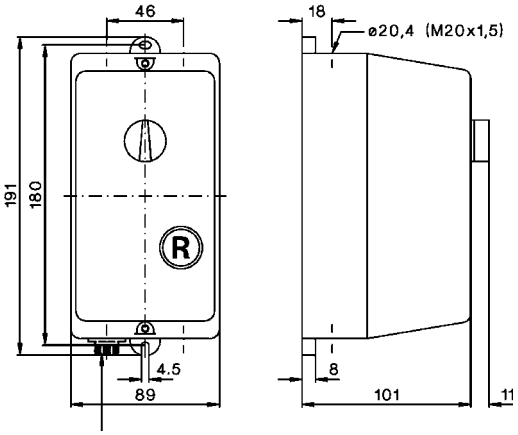
D.O.L. Starters with Start-Stop/Reset Push Buttons, Plastic Enclosed

P1T.., P1TP..



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

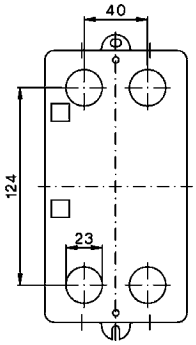
P1W.., P1W18P



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

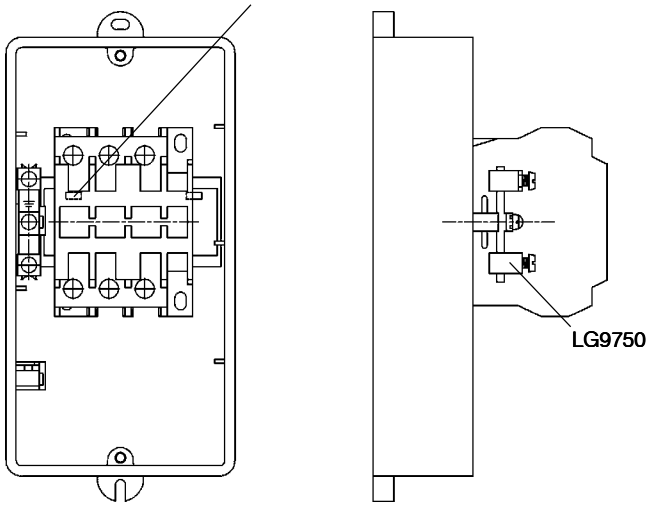
Rear Conduit Entries

knockouts
4 x Ø 23

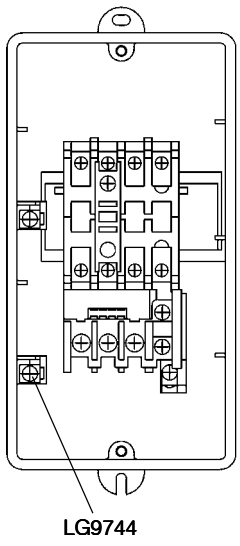


Earth Terminal LG9750 for K2-23 and K2-30 in Enclosure P1

for K2-23 and K2-30 remove spacing piece



Neutral Terminal LG9744

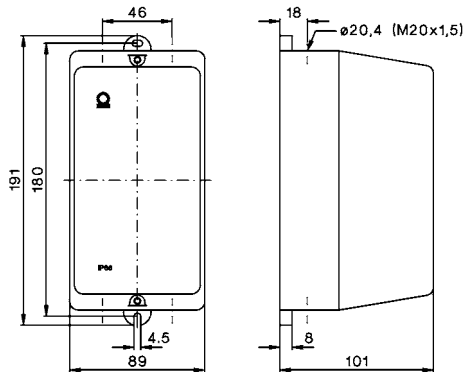


Enclosures

Dimensions

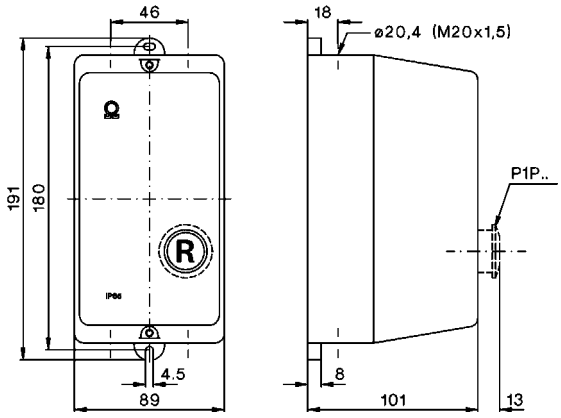
Enclosures for Contactors

P1



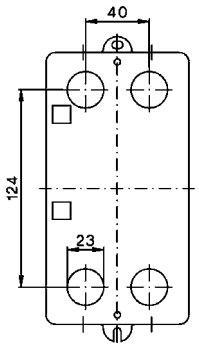
Enclosures for D.O.L. Starters

P1R, P1P



Rear Conduit Entries

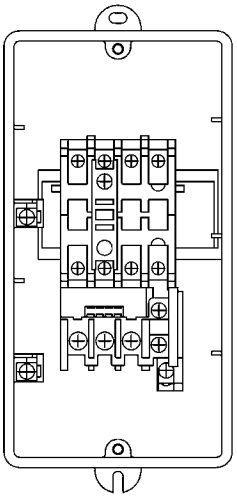
knockouts
4 x Ø 23

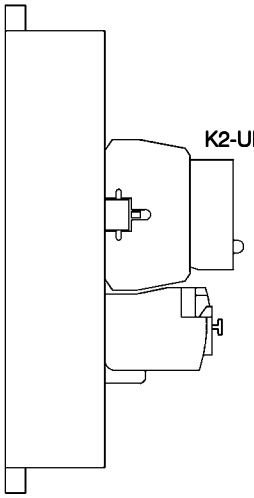


D.O.L. Starters

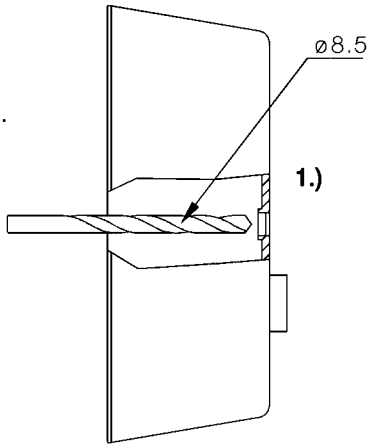
Mounting and Wiring Instructions

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





K2-UN., K2-IN.

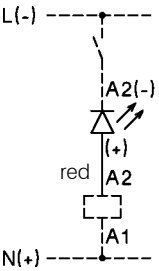


LG9743.

Wiring Examples

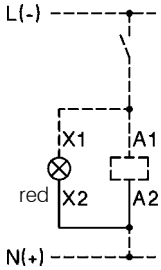
Coil Current Indicator

K2-ING
K2-INR



Voltage Indicator

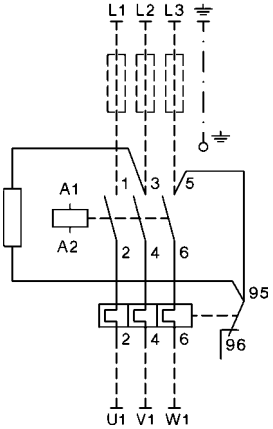
K2-UN
K2-UNR



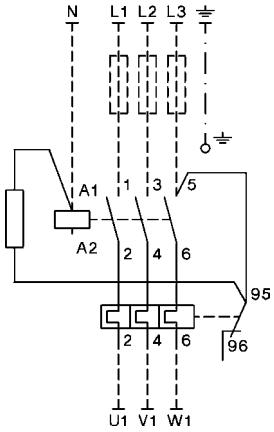
Colour mentioned in wiring diagrams refer to the outgoing connection wire of the device.

Heating Element

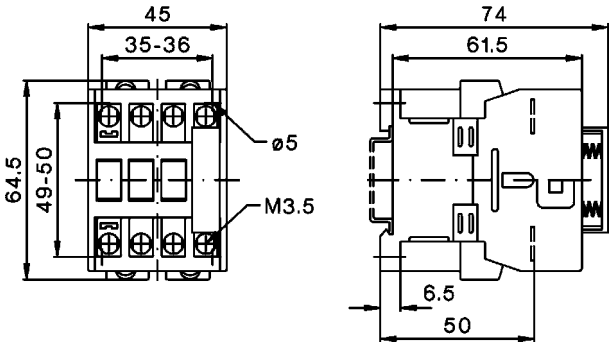
K2-HR



K2-HR 230



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

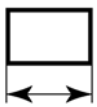


Thermal Overload Relays for Direct Mounting 114

Thermal Overload Relays for Separate Mounting 116

Accessories 117

Technical Data 118

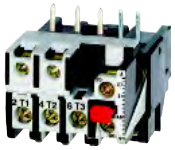


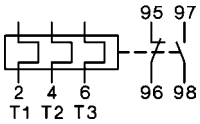
Dimensions 123

Thermal Overload Relays for plug-in mounting

Setting Range D.O.L. (A)			Y/Δ (A)			Type	Pack pcs.	Weight kg/pc.	Wiring Diagram

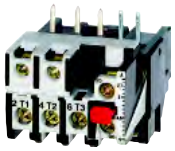
With Manual Reset, for contactors K1-..

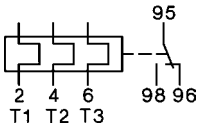


0,12	-	**0,18**		-		**U12/16E 0,18 K1**	1	0,10	
0,18	-	**0,27**		-		**U12/16E 0,27 K1**	1	0,10	
0,27	-	**0,4**		-		**U12/16E 0,4 K1**	1	0,10	
0,4	-	**0,6**		-		**U12/16E 0,6 K1**	1	0,10	
0,6	-	**0,9**		-		**U12/16E 0,9 K1**	1	0,10	
0,8	-	**1,2**		-		**U12/16E 1,2 K1**	1	0,10	
1,2	-	**1,8**		-		**U12/16E 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	

manual reset

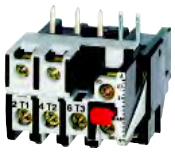
With Auto Reset, for contactors K1-..

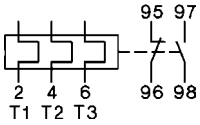


0,12	-	**0,18**		-		**U12/16A 0,18 K1**	1	0,10	
0,18	-	**0,27**		-		**U12/16A 0,27 K1**	1	0,10	
0,27	-	**0,4**		-		**U12/16A 0,4 K1**	1	0,10	
0,4	-	**0,6**		-		**U12/16A 0,6 K1**	1	0,10	
0,6	-	**0,9**		-		**U12/16A 0,9 K1**	1	0,10	
0,8	-	**1,2**		-		**U12/16A 1,2 K1**	1	0,10	
1,2	-	**1,8**		-		**U12/16A 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	

auto reset
or manual reset

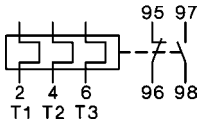
With Quick Tripping Characteristic for EEx e motors and submersible pumps, f. contactors K1-..



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	
10	-	**14**	18	-	24	**U12/16EQ 14 K1**	1	0,10	

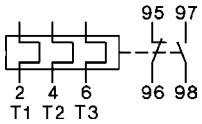
manual reset

Thermal Overload Relays for plug-in mounting

Setting Range D.O.L. (A)	Setting Range Y/Δ (A)	Type	Pack pcs.	Weight kg/pc.	Wiring Diagram
With Manual Reset, for contactors K(G)3-10.. to K(G)3-22.. ..					
0,12 - **0,18**	-	**U12/16E 0,18 K3**	1	0,10	
0,18 - **0,27**	-	**U12/16E 0,27 K3**	1	0,10	
0,27 - **0,4**	-	**U12/16E 0,4 K3**	1	0,10	
0,4 - **0,6**	-	**U12/16E 0,6 K3**	1	0,10	
0,6 - **0,9**	-	**U12/16E 0,9 K3**	1	0,10	
0,8 - **1,2**	-	**U12/16E 1,2 K3**	1	0,10	
1,2 - **1,8**	-	**U12/16E 1,8 K3**	1	0,10	
1,8 - **2,7**	-	**U12/16E 2,7 K3**	1	0,10	
2,7 - **4**	-	**U12/16E 4 K3**	1	0,10	
4 - **6**	7 - 10,5	**U12/16E 6 K3**	1	0,10	
6 - **9**	10,5 - 15,5	**U12/16E 9 K3**	1	0,10	
8 - **11**	14 - 19	**U12/16E 11 K3**	1	0,10	
10 - **14**	18 - 24	**U12/16E 14 K3**	1	0,10	
13 - **18**	23 - 31	**U12/16E 18 K3**	1	0,10	
17 - **23**	30 - 40	**U12/16E 23 K3**	1	0,10	
22 - **30**	38 - 52	**U12/16E 30 K3**	1	0,13	

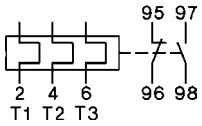
manual reset

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

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

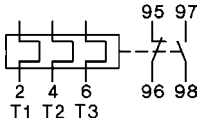
manual reset

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

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

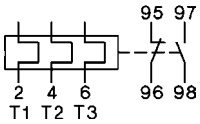
manual and auto reset

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

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

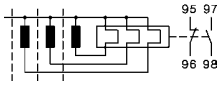
manual and auto reset

Thermal Overload Relays for plug-in mounting

Setting Range D.O.L. (A)		Setting Range Y/Δ (A)		Type	Pack pcs.	Weight 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	

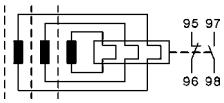
manual and auto reset

Thermal Overload Relays for separate mounting

Setting Range D.O.L. (A)		Setting Range Y/Δ (A)		Type	Pack pcs.	Weight kg/pc.	Wiring Diagram
For contactors K3-90, K3-115, K85, K110							
60	- **90**	104	- 156	**U85 90**	1	0,90	
80	-**120**	140	- 207	**U85 120**			

manual reset

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

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

manual and auto reset

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

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

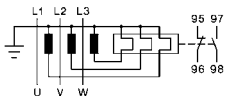
For contactors K3-315.. , K3-450.. , K3-550.. , K3-700.. , K3-860..

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

With Slow Tripping Characteristic for heavy duty starting with long run up times

For separate mounting, suitable for all contactors

0,8	- **1,2**	1,2	- 2,1	**UAT21 1,2**	1	1,0
1,2	- **1,8**	2,1	- 3,1	**UAT21 1,8**	1	1,0
1,6	- **2,4**	2,8	- 4,2	**UAT21 2,4**	1	1,0
2,4	- **3,7**	4,2	- 6,4	**UAT21 3,7**	1	1,0
3,7	- **5,7**	6,4	- 9,9	**UAT21 5,7**	1	1,0
5,3	- **8,2**	9,2	- 14,2	**UAT21 8,2**	1	1,0
8	- **12**	13,9	- 20,1	**UAT21 12**	1	1,0
12	- **18**	20,1	- 31,2	**UAT21 18**	1	1,0
16	- **24**	27,7	- 41,6	**UAT22 24**	1	1,1
24	- **37**	41,6	- 64	**UAT23 37**	1	1,3
32	- **49**	55,4	- 85	**UAT23 49**	1	1,3
48	- **72**	83	- 125	**UAT23 72**	1	1,3



manual reset

Accessories

Busbar Sets

for overload relays	for contactors	Type	Pack set	Weight kg/set
U800	K3-450.. , K3-550..	**SU840/550**	1	1,7
U800	K3-700.. , K3-860..	**SU840/860**		2,1

Set for Single Mounting on **DIN-rail** with terminals

for overload relay	Cable Cross-section (mm^2) solid or stranded	flexible	Type	Pack pcs.	Weight kg/pc.
U12/16..K3	0,75 - 6	0,75 - 4	**U12SM K3**	1	0,035

Additional Terminals with fingertouch protection

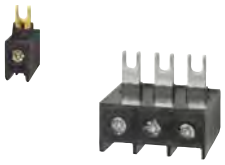
U3/32	0,75 - 6	0,75 - 4	**U3/32SM**	1	0,035

Set for Single Mounting on **DIN-rail**

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

Connecting Wire Set for U3/42, U3/74 with Single Mounting

U3/42, U3/74	150mm lang 10mm^2	**LG5830-4**	1	0,060
U3/42, U3/74	250mm lang 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 ±20% of the tripping time)					
			I_A/I_N	I_A/I_N	I_A/I_N	I_A/I_N	I_A/I_N	I_A/I_N
A		A	3	4	5	6	7,2	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

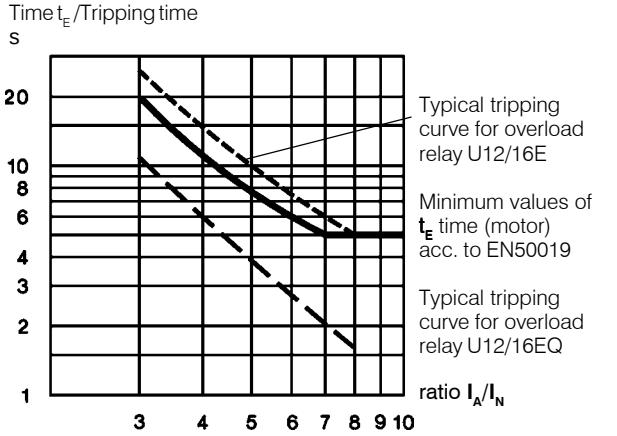
Relays With Quick Tripping Characteristic

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 ±20% of the tripping time)					
			I_A/I_N	I_A/I_N	I_A/I_N	I_A/I_N	I_A/I_N	I_A/I_N
A		A	3	4	5	6	7,2	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



Labels of tripping curves for each setting range, sized 148x105mm (self-adhesive) are available on request.
Order No. D588, specify type and setting range.

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 x I_N = 9,9s
9,9s + 20% tolerance = **11,9s** > $t_{E\,Motor}$ = **8**s
The device U12/16E 4 is **not suitable**.

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

Thermal Overload Relays

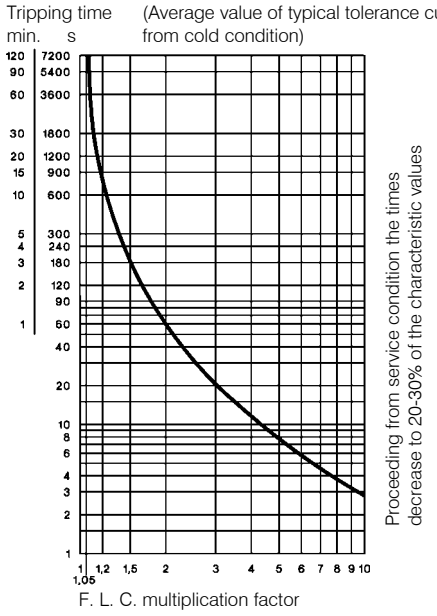
Fuses for U3/32, U3/42, U3/74, U12/16E, U85, U180, U320 and U800

Type	Setting Range DOL A	Setting Range YΔ A	Max. Fuse Size According to Coordination-type "2" [1] quick A	"2" [1] slow, gL(gG) A	"1" [1] slow, gL(gG) A	"1" [1] aM A	Fuse UL A	SCCR kA
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	all ranges		For short circuit protecting overload relays with current transformer use fuse according to the contactor of the combination.				-	-
U800	all ranges						-	-

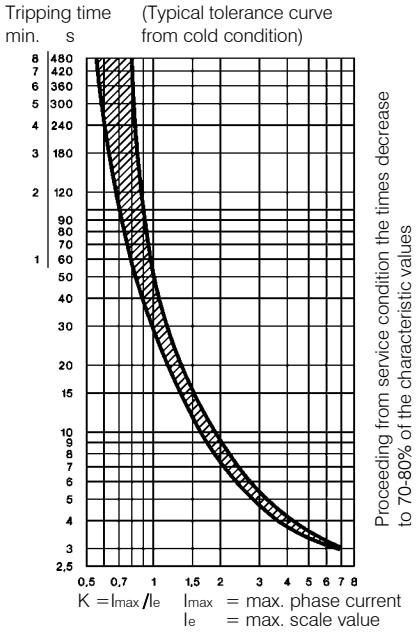
Tripping Characteristics for U3/32, U3/42, U3/74 and U12/16E

Detailed tripping times for each range see table page 118

with three-phase load



with two-pole load



Imax = max. phase current
Ie = max. scale value

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

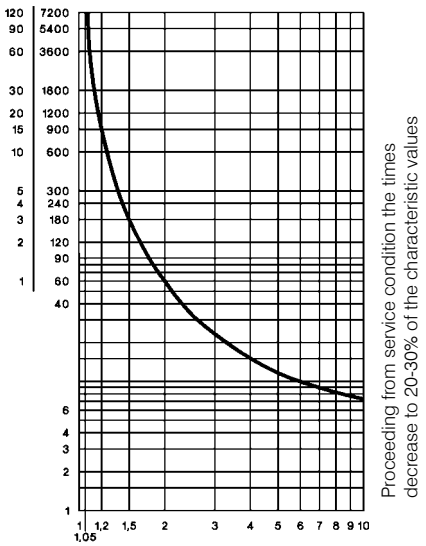
Tripping Characteristics for U85, U180, U320, and U800

Detailed tripping times for each range of U85 see table page 118

U85 with three-phase load

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

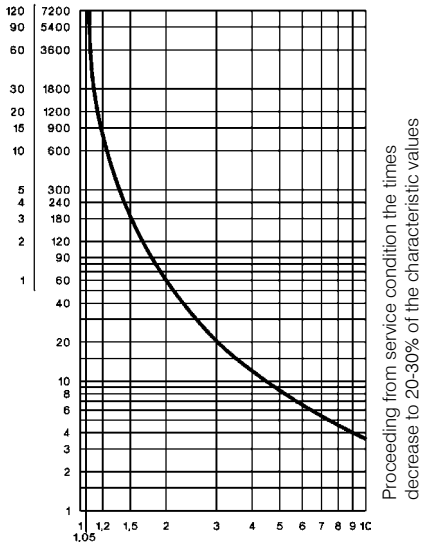
min. s



U180, U320 with three-phase load

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

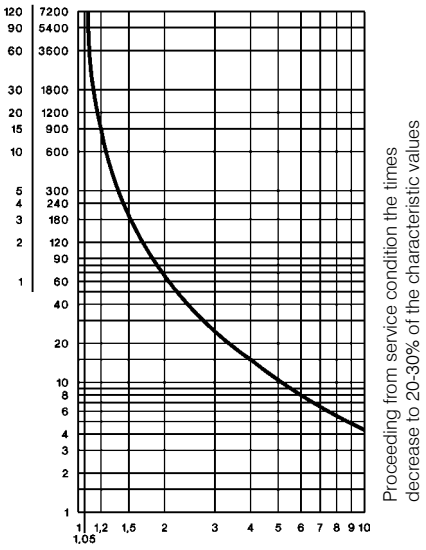
min. s



U800 with three-phase load

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

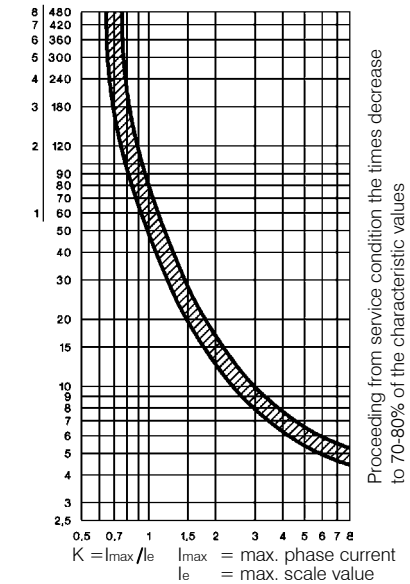
min. s



U85 with two-pole load

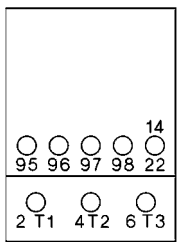
Tripping time (Typical tolerance curve from cold condition)

min. s

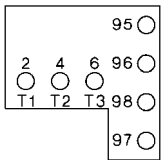


Position of Terminals

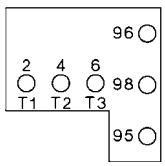
U3/32



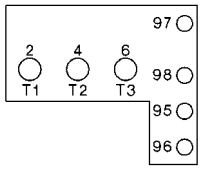
U12/16E, U12/16EM, U12/16EQ



U12/16A



U3/42, U3/74



Thermal Overload Relays in Special Version

Fuse for U12/16EQ

Setting Range A	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 A	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

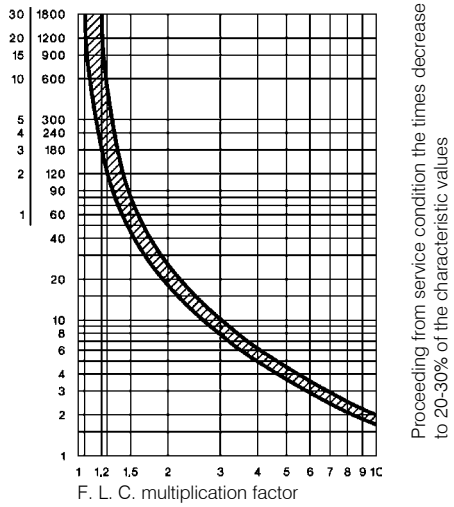
Tripping Characteristic for U12/16EQ

Detailed tripping times for each range see table page 118

with three-phase load

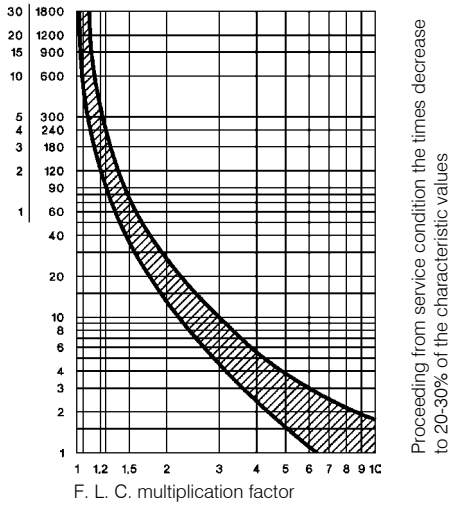
range 0,4-0,6 to 1,8-2,7A

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



range 2,7-4 to 10-14A

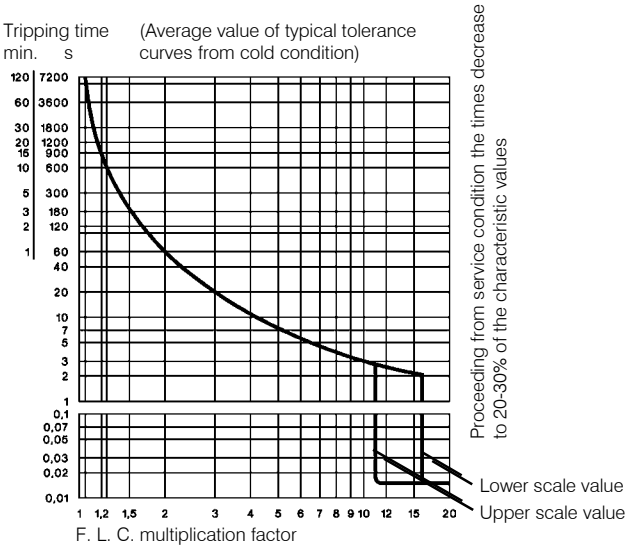
Tripping time min. s (Typical tolerance curve from cold condition)



Tripping Characteristic for U12/16EM

with three-phase load

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



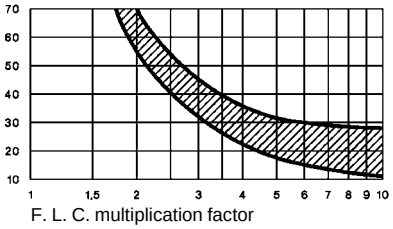
Fuse for UAT21, UAT22, UAT23

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

Tripping characteristic for UAT21, UAT22, UAT23

with three-phase load

Tripping time in s (Typical tolerance curve from cold condition)



Proceeding from service condition the times decrease to 20-30% of the characteristic values

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	UAT21	UAT22	UAT23
Rated insulation voltage U_i [1]		V~	690	690	690	690	750	1000	1000	1000	690	690	690
Permissible ambient temperature													
operation	open	°C			-25 to +60					-25 to +55		-25 to +60	
storage		°C			-50 to +70					-40 to +70		-50 to +70	
Trip class according to IEC 947-4-1			10A	10A	10A	10A	20	10A	10A	10	30	30	30
Cable cross-section													
main connector	solid or stranded	mm²	0,75-6	0,75-6+0,75-2,5 [2]	0,75-10	4-35 [2]	3)	7)	-	7)	0,5-10	0,5-16	0,5-25
	flexible	mm²	1-4	0,75-4+0,5-2,5 [2]	0,75-6	6-25 [2]					0,5-6	0,5-10	0,5-16
	flexible with multicore cable end	mm²	0,75-4	0,5-2,5+0,5-1,5	0,75-6	4-25					0,5-6	0,5-10	0,5-16
Cables per clamp	number		2	1+1	2	1					1	1	1
auxiliary connector	solid	mm²			0,75-2,5 [2]					1-2,5 [2]		0,75-2,5 [2]	
	flexible	mm²			0,5-2,5 [2]					1-2,5 [2]		0,5-2,5 [2]	
	flexible with multicore cable end	mm²			0,5-1,5					1-2,5 [2]		0,5-1,5	
Cables per clamp	number				2					2		2	

Type			U3/32	U12/16A	U12/16E U12/16EM	U12/16EQ	U3/42 U3/74	U85	U180 U320	U800	UAT21 UAT22 UAT23
Auxiliary contacts											
Rated insulation voltage U_i [1]											
same potential		V~	690	690	690	690	690	690	690	500	690
different potential		V~	440	-	440	440	250	440	440	500	440
Utilization category AC15											
Rated operational	24V	A	3	4	5	5	4	5	3	4 [5]	5
current I_e	230V	A	2	2,5	3	3	2,5	3	2	2,5	3
	400V	A	1	1,5	2	2	1,5	2	1	1,5	2
	690V	A	0,5	0,6	0,6	0,6	0,6	0,6	0,5	0,6	0,6
Utilization category DC13											
Rated operational	24V	A	1	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
current I_e	110V	A	0,15	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	0,1
Short circuit prot. (without welding 1kA)											
highest fuse rating	gL (gG)	A	4	4	6	6	6	6	4	6	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	U12/16EQ	U3/42	U3/74	U85
Rated insulation voltage	V~	600	600	600	600	600	600	600
Rated current	A	32	23	23	23	42	74	85
Auxiliary contacts								
Rated voltage								
same potential	V AC	600	600	600	600	600	600	600
different potential	V~	150	-	150	150	150	150	150
Switching capacity AC	VA	500	500	500	500	600	600	600
of aux. contacts	A	2	3	4	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

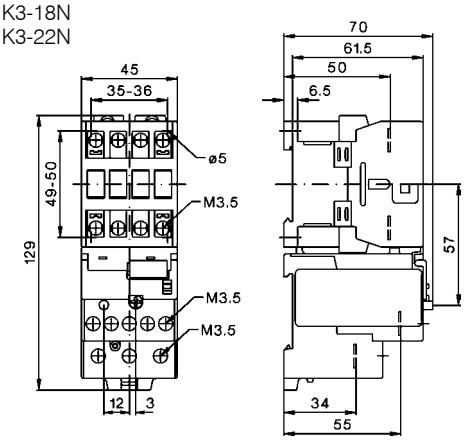
Example: Ambient temperature 70°C, full load motor current 7A
(70 - 20) x 0,125 = 6,25%
Setting value: 7A + 6,25% = 7,44A

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 117

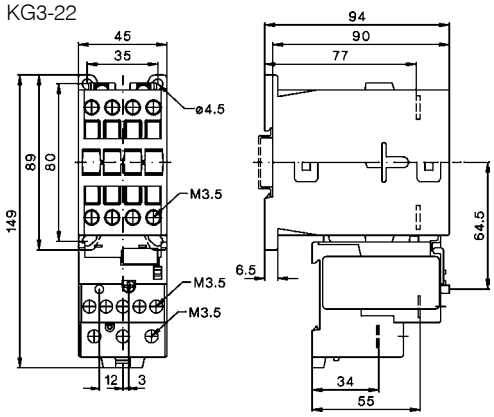
Thermal Overload Relays

Dimensions

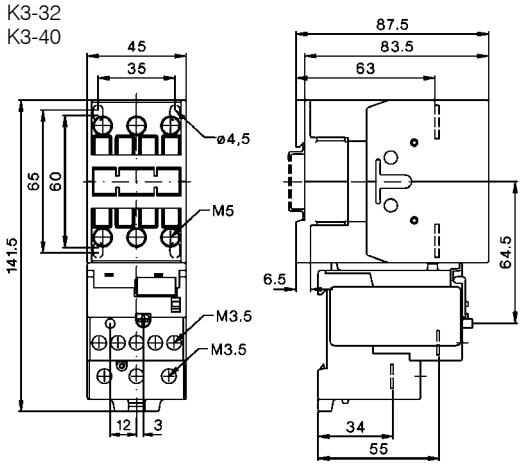
K3-10N + **U3/32**
K3-14N
K3-18N
K3-22N



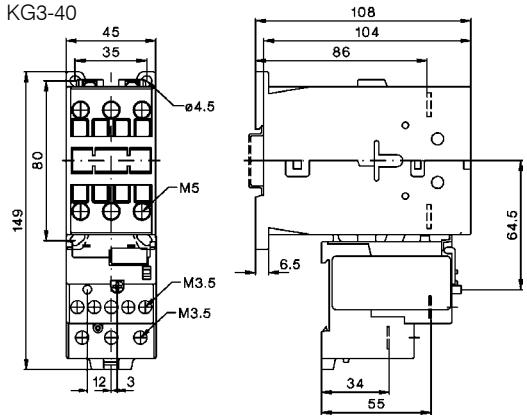
KG3-10 + **U3/32**
KG3-14
KG3-18
KG3-22



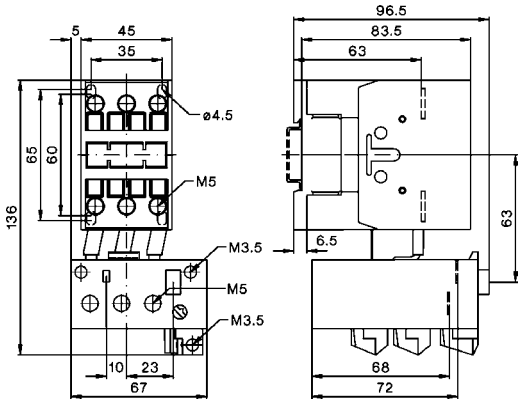
K3-24 + **U3/32**
K3-32
K3-40



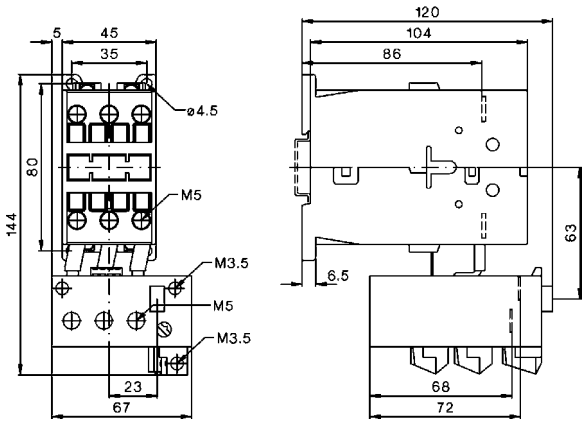
KG3-24 + **U3/32**
KG3-32
KG3-40



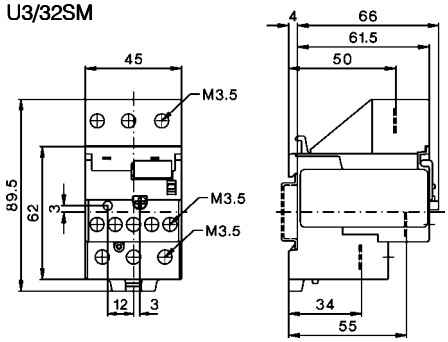
K3-24 + **U3/42**
K3-32
K3-40



KG3-24 + **U3/42**
KG3-32
KG3-40

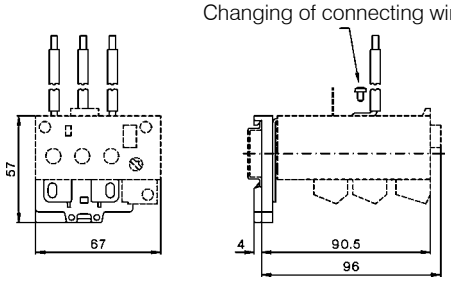


U3/32SM



U3/42G +LG5830-.

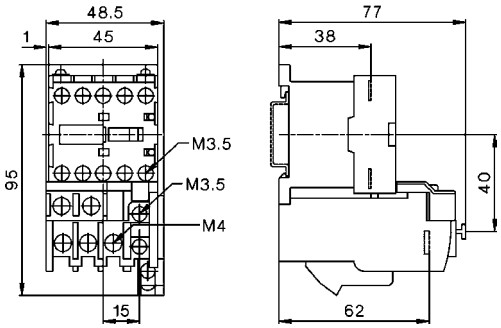
Changing of connecting wire with 1,8Nm



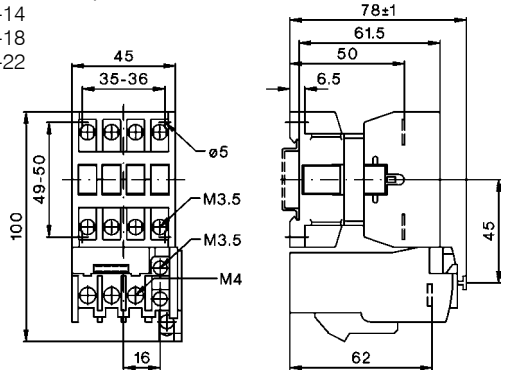
Thermal Overload Relays

Dimensions

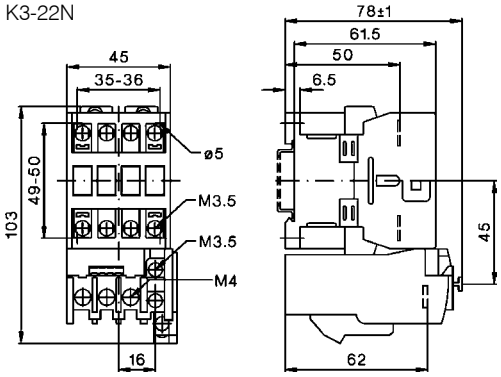
K1-09 + **U12/16.. K1**
K1-12



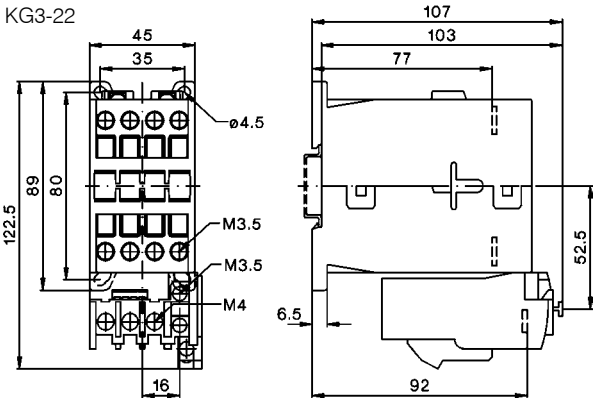
K3-10 + **U12/16..K3**
K3-14
K3-18
K3-22



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

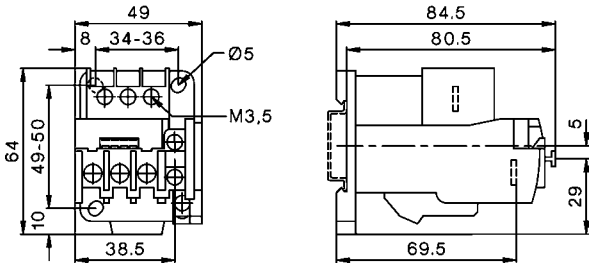


KG3-10 + **U12/16..K3**
KG3-14
KG3-18
KG3-22

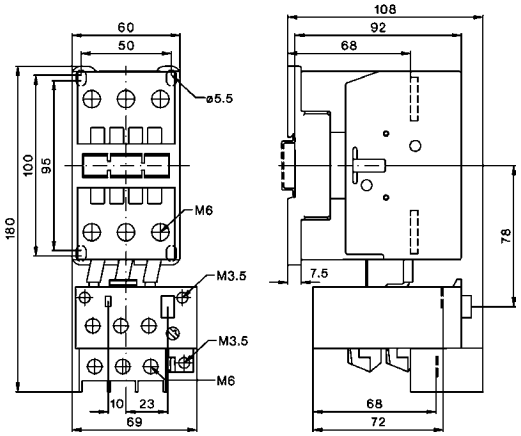


U12SM K3

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



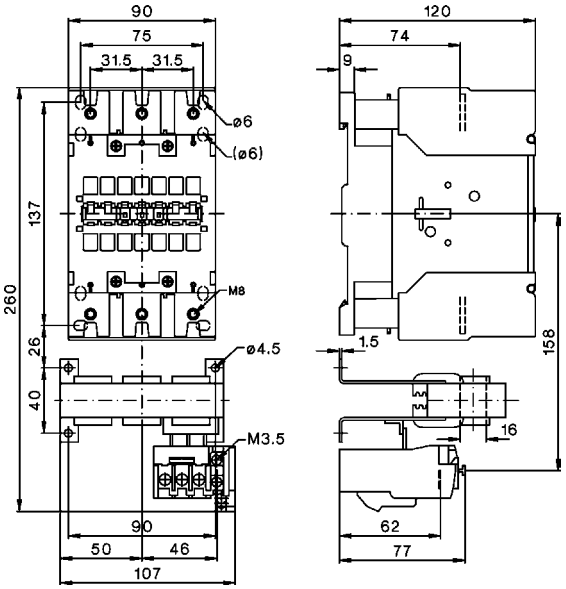
K3-50 + **U3/74**
K3-62
K3-74



Thermal Overload Relays

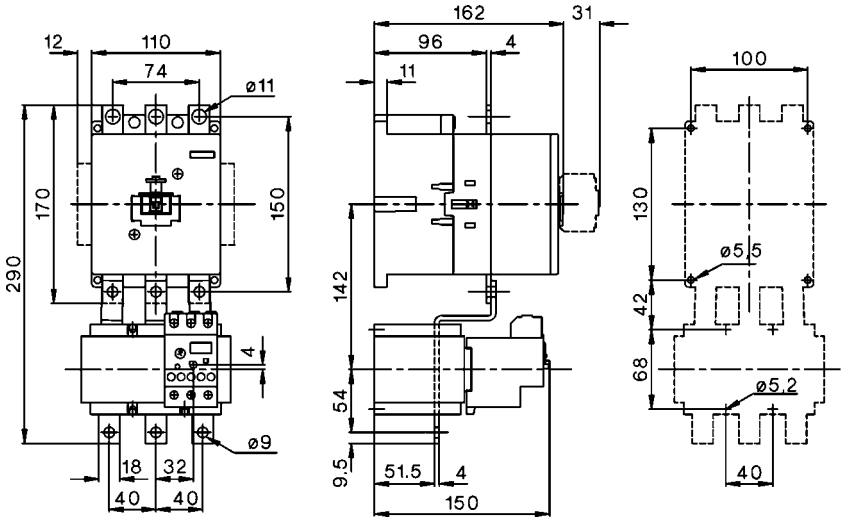
Dimensions

K3-90A + **U85**
K3-115A



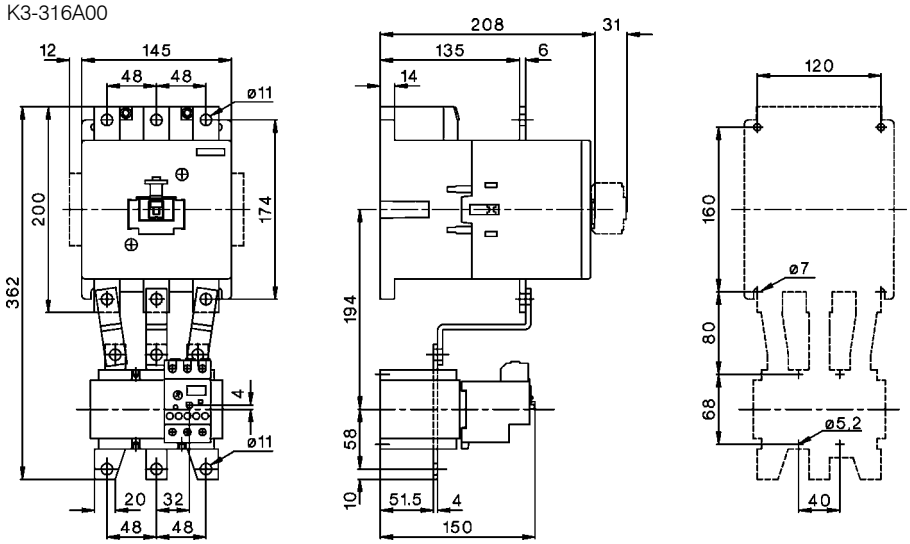
K3-151A00 + **U180**
K3-176A00

Bohrplan



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

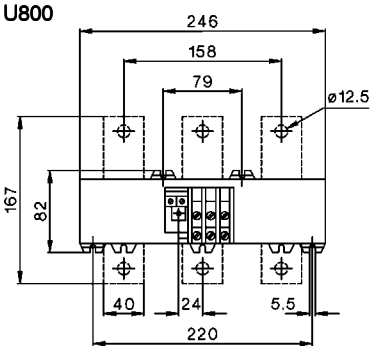
Bohrplan

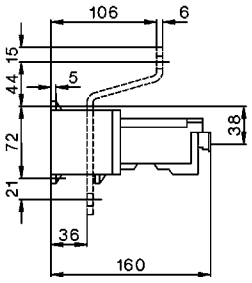


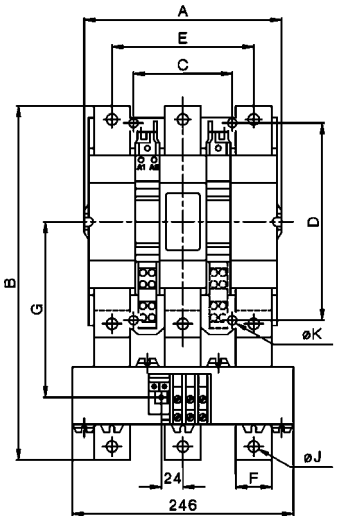
Thermal Overload Relays

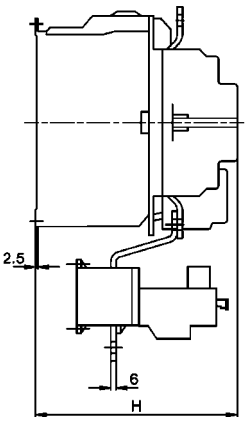
Dimensions

U800



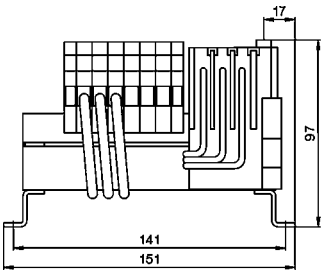


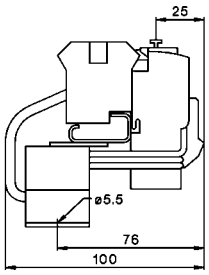




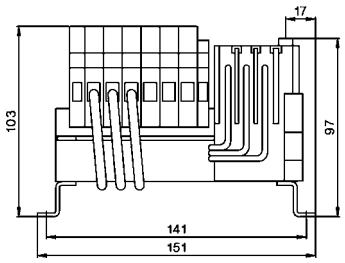
U800 with	A	B	C	D	E	F	G	H	J	K
K3-450	220	372	110	220	158	40	185	225	12,5	9
K3-550	220	395	110	220	158	40	196	225	12,5	9
K3-700	280	487	175	280	202	50	257	291	14,5	11
K3-860	280	540	175	280	202	50	280	291	14,5	11

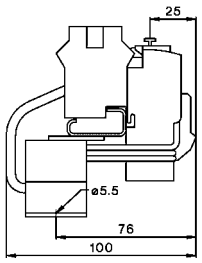
UAT21





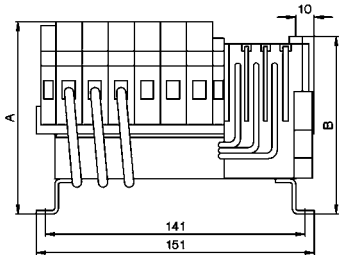
UAT22

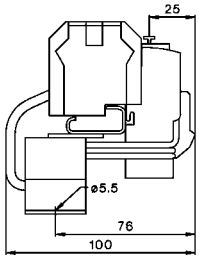




UAT23

Type	Setting Range	A	B
UAT23 37	23-37A	105,5	97,5
UAT23 49	32-49A	94	86
UAT23 72	48-72A	94	86





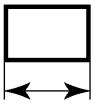
Modular Contactors 128

Auxiliary Contact Block 129
Accessories 129

Day-Night Reloading Contactors 130

Switching Of Lamps 130

Technical Data 132



Dimensions 134

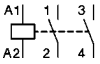
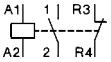
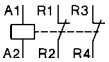
Modular Contactors

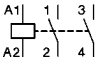
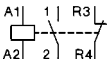
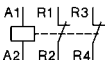
Rated Current Heating Power AC1 at			**Type**	coil voltage
			24	24V 50/60Hz
			230	220-240V 50Hz, 230-264V 60Hz
			24VM	24V 50/60Hz, 24V DC
AC1	1-phase	3-phase	**230VM**	220-240V 50/60Hz, 220V DC
400V	230V	400V		Pack / Weight
A	kW	kW	↓	pcs. / kg/pc. / Wiring Diagram

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

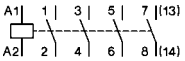
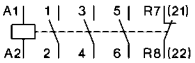
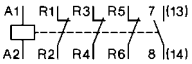
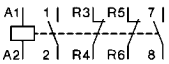
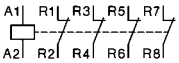
20	4,6	-	**R20-10 24**	12	0,12	
20	4,6	-	**R20-10 230**	12	0,12	

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

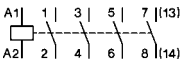
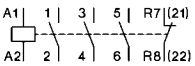
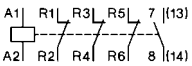
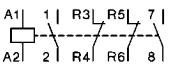
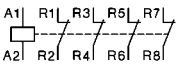
20	4,6	-	**R20-20 24**	12	0,12	
20	4,6	-	**R20-20 230**	12	0,12	
20	4,6	-	**R20-11 24**	12	0,12	
20	4,6	-	**R20-11 230**	12	0,12	
20	4,6	-	**R20-02 24**	12	0,12	
20	4,6	-	**R20-02 230**	12	0,12	

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	

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

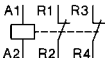
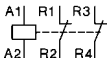
25	5,7	17	**R25-40 24VM**	6	0,22	
25	5,7	17	**R25-40 230VM**	6	0,22	
25	5,7	17	**R25-31 24VM**	6	0,22	
25	5,7	17	**R25-31 230VM**	6	0,22	
25	5,7	17	**R25-13 24VM**	6	0,22	
25	5,7	17	**R25-13 230VM**	6	0,22	
25	5,7	-	**R25-22 24VM**	6	0,22	
25	5,7	-	**R25-22 230VM**	6	0,22	
25	5,7	17	**R25-04 24VM**	6	0,22	
25	5,7	17	**R25-04 230VM**	6	0,22	

1) Sealable with Sealing Cover P721, available aux. contact block RH11(see page 129)
2) Sealable with Sealing Cover P721, available aux. contact block RH11-1(see page 129)

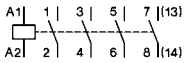
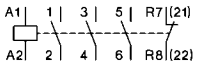
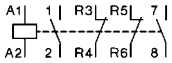
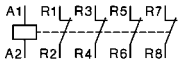
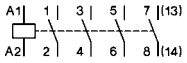
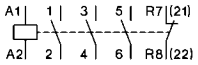
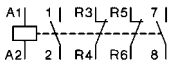
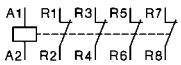
Modular Contactors

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

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	

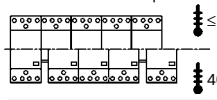
Four-pole 3 modules (52,5mm) [1], AC-operated (low noise)

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) for contactor R25 (4p.), R40, R63 (max. 1pc.)

Rated current AC15 230V AC15 400V A	AC1 690V A	for contactor	**Type**	Pack pcs.	Weight kg/pc.	Wiring Diagram
3	2	10 R25 [2], R40, R63	**RH11**	3	0,026	
3	2	10 R25-..**VM**	**RH11-1**	3	0,026	

Accessories

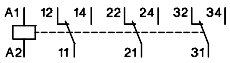
	Type	Pack pcs.	Weight kg/pc.
RC-unit 2x for R20.. to R63.. for 12V to 250V AC 220nF / 100 Ohm not for R25-..VM	**RC-R 230**	2	0,05
Spacing piece ½ module (8,8mm) for R20.. to R63.. for ambient temperature >40°C 	**P730**	10	0,012
Sealing cover for R25.. (4p.)	**P721**	10	0,002
Sealing cover for R40.., R63..	**P690**	10	0,003

1) Sealable with Sealing Cover P690, available aux. contact block RH11
2) AC-operated R25-.., 4-pole

Day-Night Reloading Contactors

	Type	Pack pcs.	Weight kg/pc.	Wiring Diagram

Compact Module, for separate tarif counters 2 modules (35mm), AC-operated (low noise)

3-pole 400V 25A	**R25-TN 230**	1	0,22	

2 Switch positions:
Day (Reloading, contact 11-14 ... closed, remains in position Night, until the next occurs)
Night (Basis operation) contact 11-12 ... closed

Contactor Module, for double tarif counters 1 module (17,5mm), AC-operated (low noise)

2-pole 400V 25A	**R25-TN20 230**	1	0,13	

4 Switch position:
Day (Reloading, contact 1-2 ... closed, remains in position Night, until the next occurs)
Night (automatic operation, contact 1-2 ... only at night closed)
On (Permanently On)
Off (permanently Off)

Switch Module 1 module (17,5mm)

2-pole 400V 25A	**RH25-20**	1	0,13	

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	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	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	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	11	0,09	2,0	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

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..
Fluorescent lamps	18	0,09	-	40	40	100	150
with electronic fluorescent	36	0,16	-	20	20	52	75
lamp ballast	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	20	0,09	-	40	52	110	174
for metal halid	50	0,22	-	20	24	50	80
low voltage lamps	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	1,30	-	3	4	9	14
Mercury-vapour lamps	50	0,61	-	16	21	38	55
(high-pressure lamps),	80	0,8	-	12	16	29	40
uncompensated	125	1,15	-	8	11	20	28
e. g. HQL, HPL	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	50	0,28	7	14	18	36	50
(high-pressure lamps),	80	0,41	8	12	16	31	44
compensated	125	0,65	10	10	13	25	35
e. g. HQL, HPL	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
Metal halide lamps	35	0,53	-	22	24	57	65
uncompensated	70	1	-	12	14	30	35
e. g. HQI, HPI, CDM	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	35	0,25	6	16	21	42	58
compensated	70	0,45	12	8	11	21	29
e. g. HQI, HPI, CDM	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	20	0,1	integrated	9	9	18	20
with electronic fluorescent	28	0,15	integrated	-	-	-	18
with electronic fluorescent	35	0,2	integrated	6	6	11	13
lamp ballast (e. g.: PCI)	70	0,36	integrated	5	5	10	12
50-125 x $I_{n\ lamp}$ for 0,6ms	150	0,7	integrated	4	4	8	10
Sodium-vapour lamps	35	1,5	-	7	9	22	30
(low pressure lamps),	55	1,5	-	7	9	22	30
uncompensated	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

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..
Sodium-vapour lamps	35	0,31	20	5	6	15	18
(low pressure lamps),	55	0,42	20	5	6	15	18
compensated	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	150	1,8	-	5	8	17	22
(high pressure lamps),	250	3	-	4	5	10	13
uncompensated	330	3,7	-	3	4	8	10
	400	4,7	-	2	3	6	8
	1000	10,3	-	1	1	3	4
Sodium-vapour lamps	150	0,83	20	5	7	20	25
(high pressure lamps),	250	1,5	33	3	4	12	15
compensated	330	2	40	2	3	10	13
	400	2,4	48	2	2	8	12
	1000	6,3	106	1	1	4	6
Sodium-vapour lamps	20	0,1	integrated	9	9	18	20
(high pressure lamps)	35	0,2	integrated	6	6	11	13
with serial electronic	70	0,36	integrated	5	5	10	12
(e. g.: PCI)	150	0,7	integrated	4	4	8	10
50-125 x I_{nlamp} for 0,6ms							
LED-Lamps consider the inrush current of the lamp ballast and the cosφ of the lamp	max. inrush current of contactor [A]			195A	233A	424A	565A
	$\frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$ =			max. lamps per pole at 230V 50Hz and max. 60°C			

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

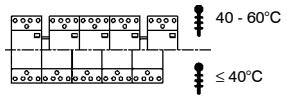
Type			2-pole R20	R25	R40	R63	4-pole R25	R40	R63	RH11
Main Contacts [5) 6) 7)]										
Rated insulation voltage U_i		V~	**440** [2)]	**440** [2)]	**440** [2)]	**440** [2)]	**440** [2)]	**440** [2)]	**440** [2)]	**440** [2)]
Rated operation voltage U_e		V~	440	440	440	440	440	440	440	440
Frequency of operations z AC1, AC3		1/h	300	300	600	600	300	600	600	600
Mechanical life		S x 10^6	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		V/mA	24/100	24/100	24/100	24/100	24/100	24/100	24/100	17/5
Short time current	10s-current	A	72	72	216	240	72	216	240	-
Power loss per pole at I_e/AC1		W	2	3	3	7	2	3	7	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	-
50-60Hz	230-240V	kW	-	-	-	-	2,5	8	8,5	-
	380-415V	kW	-	-	-	-	4	12,5	15	-
2-pole motors	230V	kW	1,1	1,3	2,6	5	-	-	-	-
Contact life		S x 10^6	0,15	0,15	0,15	0,15	0,15	0,15	0,15	-
Power consumption of coils										
AC operated	inrush	VA	7 - 9	7 - 9			20 - 25	33 - 45	33 - 45	-
	sealed	VA	2,2 - 4,2	2,2 - 4,2	5 - 7	5 - 7	4 - 6	6 - 8	6 - 8	-
		W	0,8 - 1,6	0,8 - 1,6			1,5 - 2,5	2,6	2,6	-
AC and DC-operated		W	-	-			3 - 4	-	-	-
Operation range of coils in multiples of control voltage U_s (-40° – +40°C)			0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	0,85 - 1,1	-

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV.
2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 4kV.
3) Maximum cable cross-section with prepared conductor
5) Rated frequency 50/60Hz 6) Max. occ. switching overvoltage <4kV 7) Duty cycle: 100%

Modular Contactors

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

Maximum ambient temperature			
Operation	open	°C	-40 to + 60
	enclosed	°C	-40 to + 40
Storage		°C	-50 to + 90



Type			R20	R25 (2p.)	R25 (4p.)	R25-..VM	R40	R63	RH11
Short circuit protection									
max. fuse Coordination-type "1"gL (gG)		A	35	35	35	35	63	80	-
Rated short circuit current	"r"	kA	3	3	3	3	3	3	-
	"Iq"	kA	3	3	10	10	10	10	-
Switching time at control voltage U_s ±10%									
	make time	ms	7 - 16	7 - 16	9 - 15	17 - 24	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	mm²	1,5 - 10	1,5 - 10	1,5 - 10	1,5 - 10	2,5 - 25	2,5 - 25	0,5 - 2,5 [3]
	flexible	mm²	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	mm²	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	mm²	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	mm²	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	mm²	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 [5) 6) 7)]									
Rated insulation voltage U_i [1)]		V AC	-	-	440 [2)]	440 [2)]	440 [2)]	440 [2)]	440 [2)]
Thermal rated current I_{th}	40°C	A	-	-	25	25	40	63	10
Ambient temperature	60°C	A	-	-	25	25	40	63	6
Utilization category AC15									
Rated operational	220-240V	A	-	-	3	3	3	3	3
current I_e	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	24-60V	A	-	-	2	2	2	2	2
current I_e	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

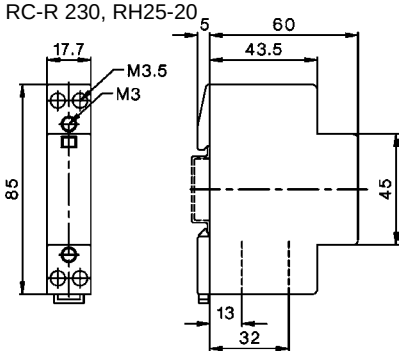
Main Contacts (cULus)			Type	R20	R25 (2p.)	R25 (4p.)	R40	R63	RH11
Rated operational current "General Use"			A	20	25	25	40	63	10
Rated operational power of three-phase motors		110-120V	hp	-	-	1	2	3	-
at 60Hz (3ph)		200-208V	hp	-	-	2	5	7½	-
		220-240V	hp	-	-	3	7½	10	-
		265-277V	hp	-	-	3	7½	10	-
Rated operational power of of AC motors		110-120V	hp	½	½	½	1	1½	-
at 60Hz (1ph)		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

2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 4kV.
3) Maximum cable cross-section with prepared conductor 4) AC7b motor 2-pole 230V 1,1kW
5) Rated frequency 50/60Hz 6) Max. occ. switching overvoltage <4kV 7) Duty cycle: 100%

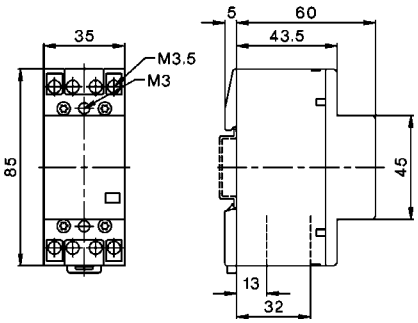
Modular Contactors

Dimensions

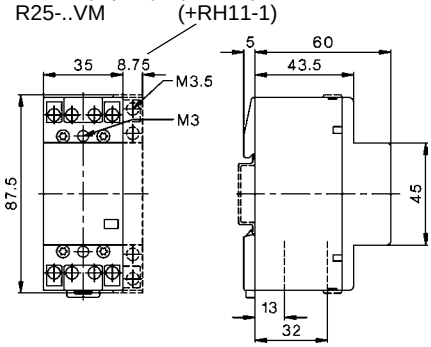
R20-.., R25-.. (2-pole)
RC-R 230, RH25-20



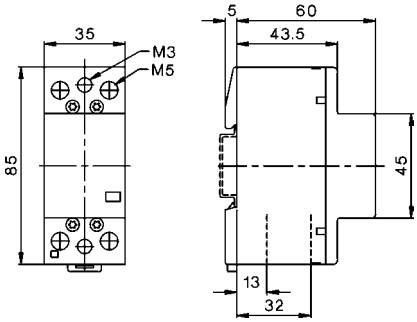
R25-TN



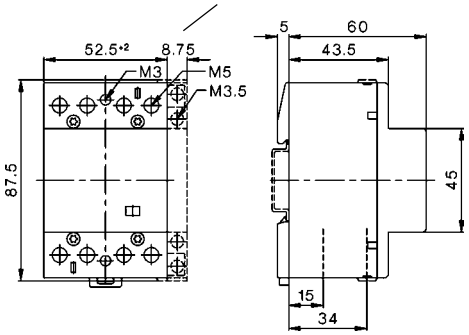
R25-.. (4-pole) (+RH11)
R25-..VM (+RH11-1)



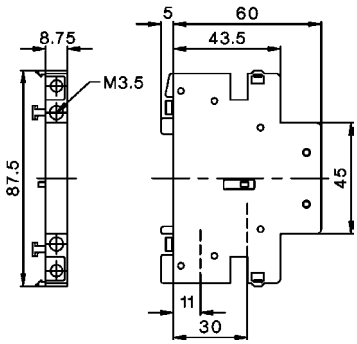
R40-.. (2-pole)
R63-.. (2-pole)



R40-.. (4-pole) (+RH11)
R63-.. (4-pole) (+RH11)

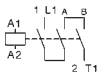
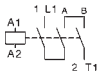
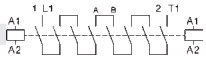
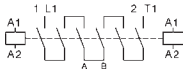
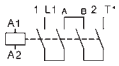
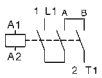
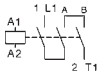


Aux. contact block
RH11, RH11-1



Contactors for DC-Switching

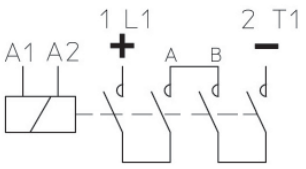
AC-operated

Rated Operational Current DC1 600V	1000V	1200V	Additional Aux. Contacts	Type	Coil voltage [1] 230 220-230V 50Hz, 240V 60Hz Pack pcs.	Weight kg/pc.	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 +2 HKT.	**K3PV-12A00 ...**	1	0,8	
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]	1	2,3	
150A	150A	-	2 HKA11	**K3PV-150A00 ...**[2]	1	5	
200A	200A	-	+1 HKT.	**K3PV-200A00 ...**[2]	1	5	
240A	240A	-		**K3PV-240A00 ...**[2]	1	5	
300A	300A	-	2 HKA11	**K3PV-300A00 ...**[2]	1	7,5	
400A	400A	-	+1 HKT.	**K3PV-400A00 ...**[2]	1	7,5	
450A	450A	-		**K3PV-450A00 ...**[2]	1	7,5	

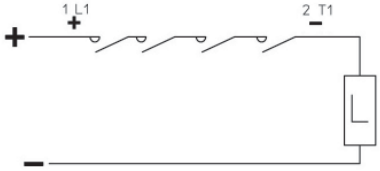
Contactors for DC-Switching for PV-installations, as remote controlled fire protection defeat device

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 continuosly 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.

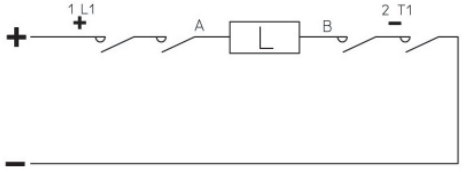
Switch diagram (4 contacts)



Connection diagram1-pole



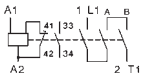
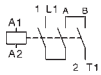
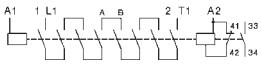
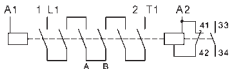
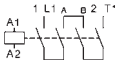
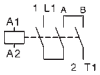
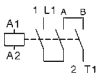
For using as two-poles contactor remove connection A-B



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=

Contactors for DC-Switching

DC-operated

Type ▼	Coil voltage [1] 24 24V DC	Aux.Contacts build in NO	NC	additional Type	Pack pcs.	Weight kg/pc.	Wiring diagram
K3DC-20A10= ...		1	-	1 HKA11	1	0,5	
K3DC-48A10= ...		1	-	+1 HKT.	1	0,5	
K3DC-60A00=...		-	-	1 HKA11	1	1,2	
K3DC-80A00= ...		-	-	+1 HKT.	1	1,2	
K3DC-100A00= ...		-	-		1	1,8	
K3PV-12A10=		1	-	1 HKA11 +2 HKT.	1	0,85	
K3PV-30A10= ...		1	-	1 HKA11	1	0,95	
K3PV-60A10= ...		1	-	+2 HKT.	1	0,95	
K3PV-80A00= ...		-	-	2 HKA11	1	1,5	
K3PV-100A00 ... [2]		-	-	+1 HKT.	1	2,3	
K3PV-150A00 ... [2]		-	-	2 HKA11	1	5	
K3PV-200A00 ... [2]		-	-	+1 HKT.	1	5	
K3PV-240A00 ... [2]		-	-		1	5	
K3PV-300A00 ... [2]		-	-	2 HKA11	1	7,5	
K3PV-400A00 ... [2]		-	-	+1 HKT.	1	7,5	
K3PV-450A00 ... [2]		-	-		1	7,5	

Auxiliary Contact Blocks for contactors K3DC-.. and K3PV-..

Rated Operational Current AC15 230V A	AC15 400V A	AC1 690V A	For contactors	Type	Pack pcs.	Weight kg/pc.	Wiring diagram
3	2	10	K3DC, K3PV-.. top	**HKT11**	1	0,04	
3	2	10	K3DC, K3PV-.. top	**HKT22**	1	0,05	
3	2	10	K3DC, K3PV-.. outside	**HKA11**	1	0,05	

Accessories

Fire Brigade-EMERGENCY STOP key operated button Ø40mm, according to EN418, unlock by key				**BG10P44S3-11 +SK**	1	0,22	

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=

Technical Data

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

Type		K3DC-20..	K3DC-48..	K3DC-60..	K3DC-80..	K3DC-100..	K3PV-12..	K3PV-30..	K3PV-60..	K3PV-80..	K3PV-100..	K3PV-150..	K3PV-200..	K3PV-240..	K3PV-300..	K3PV-400..	K3PV-450..
Rated insulation voltage	V=	600	600	1000	1000	600	1200	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
U_{imp}	kV	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
poles in series		3	3	3	3	3	8	6	6	4	4	3	3	3	3	3	3
DC1 600V dc	I_e A	20	50	60	80	100	12	30	60	80	100	150	200	240	300	400	450
DC1 1000V dc	I_e A	-	-	30	60	-	12	30	60	80	100	150	200	240	300	400	450
DC1 1200V dc	I_e A	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-
DC3/5 310V dc	I_e A	-	-	-	40	60	-	15	24	40	90	125	170	200	230	270	300
DC3/5 460V dc	I_e A	-	-	-	-	-	-	15	24	40	40	125	170	200	230	270	300
DC3/5 600V dc	I_e A	-	-	-	-	-	-	-	-	-	-	50	60	75	120	160	200
Main pole resistance	m0hm	1,8	1,8	1,4	1,2	1	2,2	1,8	1,8	1,2	1	0,5	0,5	0,35	0,15	0,15	0,15
poles in series resistance	m0hm	5,4	5,4	4,2	3,6	3	17,6	10,8	10,8	4,8	4	1,5	1,5	1,1	0,5	0,5	0,5
Mechanical life	10^6	10										10			8		
Protection degree		IP20										IP00 / IP20 [1]			IP00 / IP20 [1]		
Main poles																	
Cable cross sections	mm^2	2 x 1,5 - 10		2,5 - 35		4 - 35 +4-50	2x 1,5-2,5		2 x 1,5 - 10	2,5-35	4 - 35 +4 - 50	Busbar 18 x 4 Screw M8			Busbar 25 x 6 Screw M10		
Tightening torque	Nm	2,3 - 2,7		5 - 6		8 - 9,6	1,4 -1,6		2,3 - 2,7	5 - 6	8 - 9,6	17 - 20			35 - 42		
Mounting		DIN-rail or screw				screws	DIN-rail or screws				Screws	Screws			Screws		
Operating range of coils	U_C	0,85 - 1,1															
Power consumption of coils																	
AC inrush	VA	90		250			180			250		350			360		
sealed	VA/W	9 / 3		18 / 4			18 / 6			18 / 4		5 / 5			6 / 6		
DC inrush	W	120		230			230			230		350			360		
sealed	W	2		4			5			4		5			6		
Supressor Unit																	
Coil	AC	-		-			-			-	x	x			x		
x ... integrated	DC	x		x		-	-			x		x			x		
Switching time																	
AC make time	ms	10 - 25		12 - 30		12 - 30	10 - 25			12 - 30	15 - 50	30 - 60			40 - 60		
realease 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		
realease time	ms	40 - 70		10 - 25		10 - 25	40 - 70			10 - 25	30 - 80	30 - 80			40 - 60		
Maximum ambient temperature																	
Operation	°C	-40 to+40 (+70) [2]															
Storage	°C	-40 to+70															
Short circuit protection for contactors																	
Coordination-type „1" max. fuse size gPV																	
600VDC	A	63	80	-	-	160	-	-	-	-	-	160	200	250	-	-	-
1000VDC	A	-	-	-	-	-	12	63	100	-	160	160	200	250	315	400	500
Coordination-type „2" max. fuse size gPV																	
600VDC	A	50	63	80	100	125	-	-	-	100	-	-	-	-	-	-	-
1000VDC	A	-	-	80	100	-	-	50	80	100	125	-	-	-	-	-	-
Short-circuit current	kA	3	3	3	3	5	3	3	3	5	5	10	10	10	10	10	10

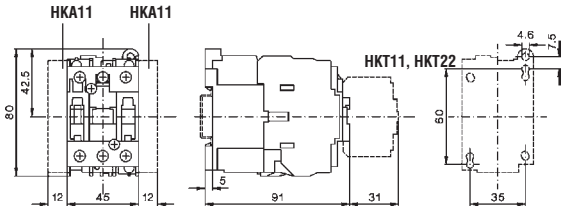
Data according to UL60947-4-1 UL LISTED

Type		K3DC-20..	K3DC-48..	K3DC-60..	K3DC-80..	K3PV-80..	K3PV-150..	K3PV-200..	K3PV-240..	K3PV-300..	K3PV-400..	K3PV-450..
General Use I_e [A]	600V DC	20	40	60	80	80	130	160	200	300	330	360
	1000V DC	-	-	30	60	80	130	160	200	300	330	360
Motor Control I_e [A]	220-240V DC	12	20	38	55	72	89	106	140	173	206	255
	500V DC	12	16	34	51	67	83	99	123	164	205	246
	550-600V DC	12	16	38	46	61	90	111	148	185	222	294

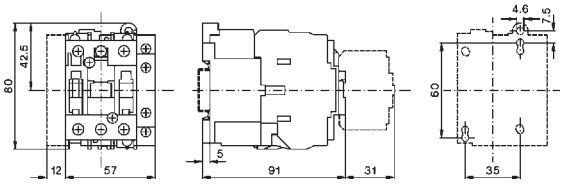
1) IP20 w. terminal lug.
2) > 40° ... 1% / C° de-rating (eg. at 60°C 20% de-rating)

Dimensions (mm)

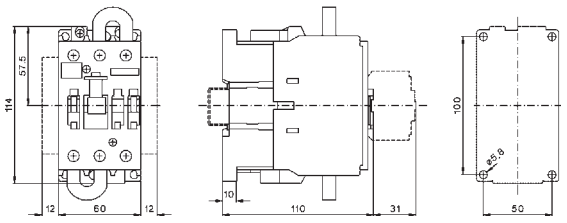
K3DC-20A00, K3DC-48A00

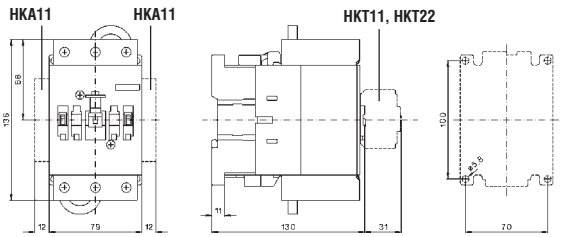


K3DC-20A10=, K3DC-48A10=

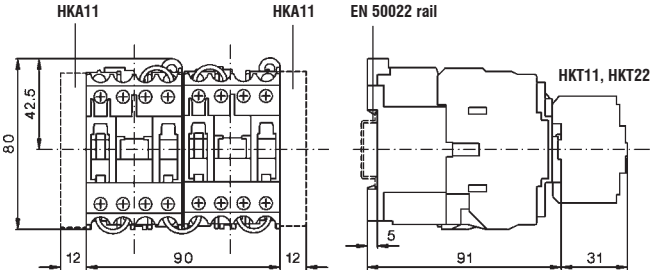


K3DC-60A00(=), K3DC-80A00(=), K3DC-100A00(=)

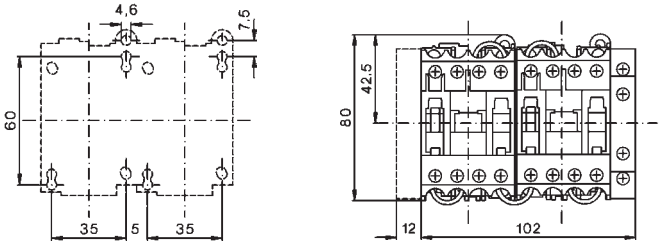




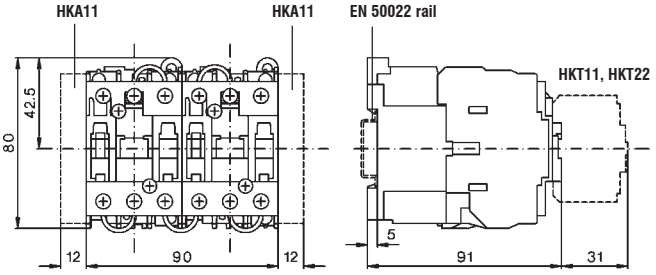
K3PV-12A00



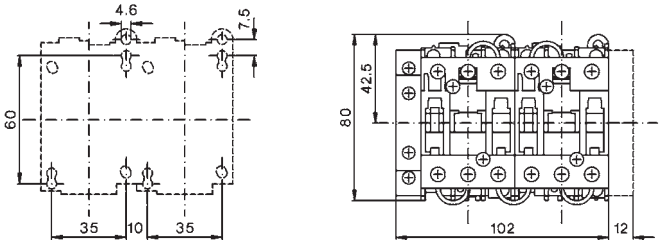
K3PV-12A10=



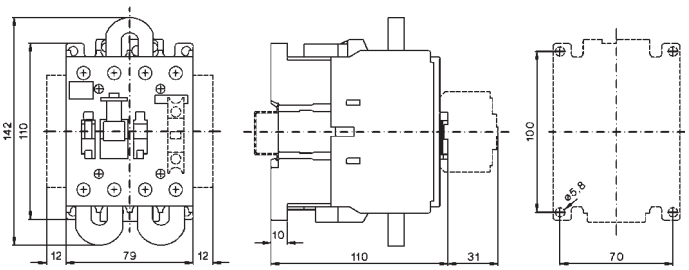
K3PV-30A00, K3PV-60A00



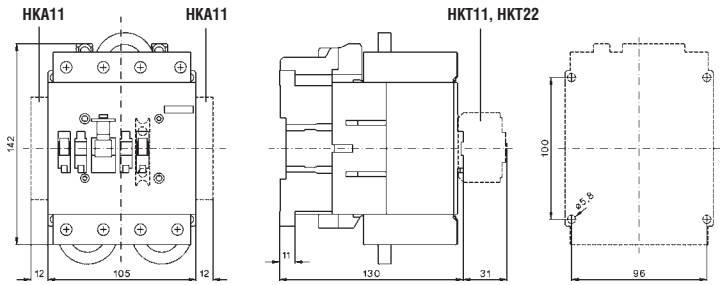
K3PV-30A10=, K3PV-60A10=



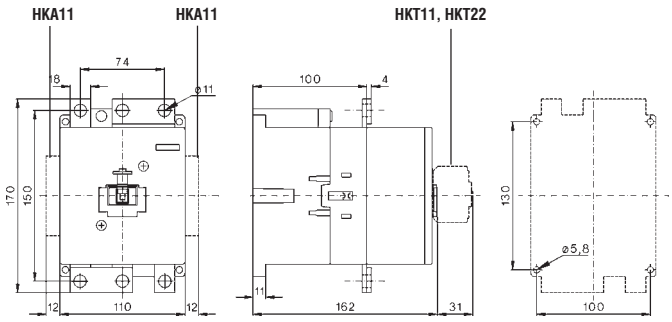
K3PV-80A00(=)



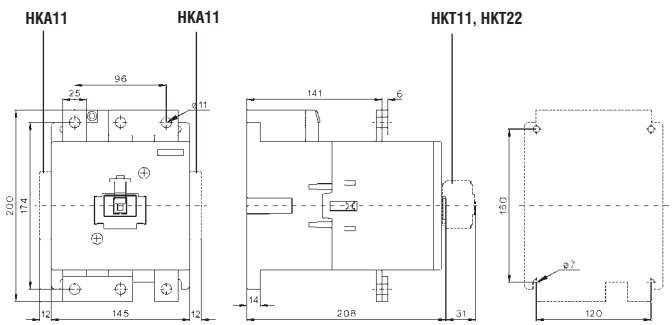
K3PV-100A00(=)



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



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



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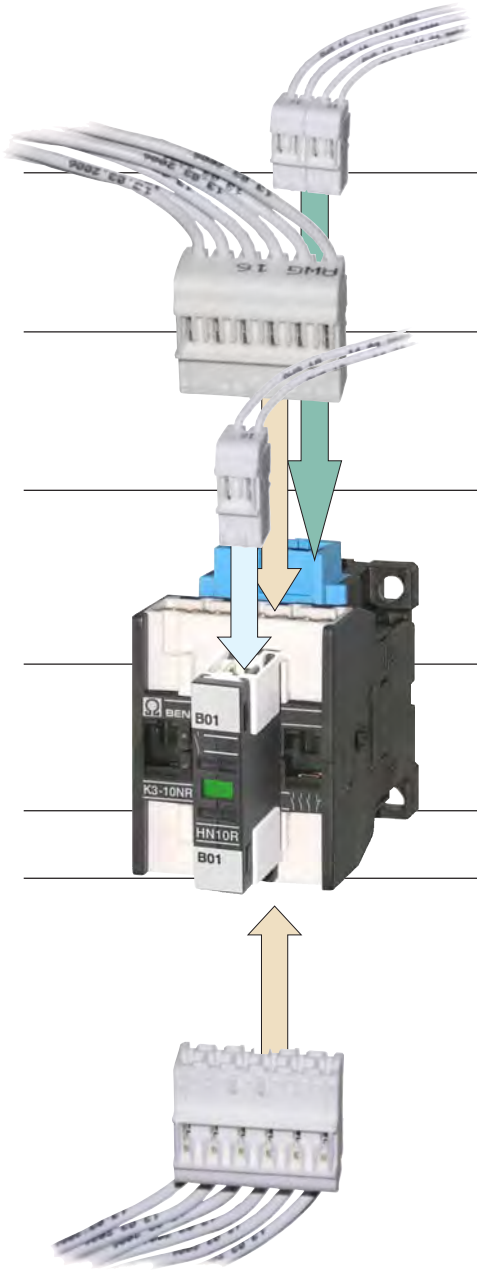
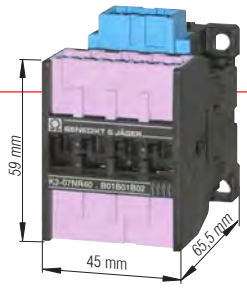


RAST 5 - exclusiv for OEM-Partner

5 mm pitch connector system

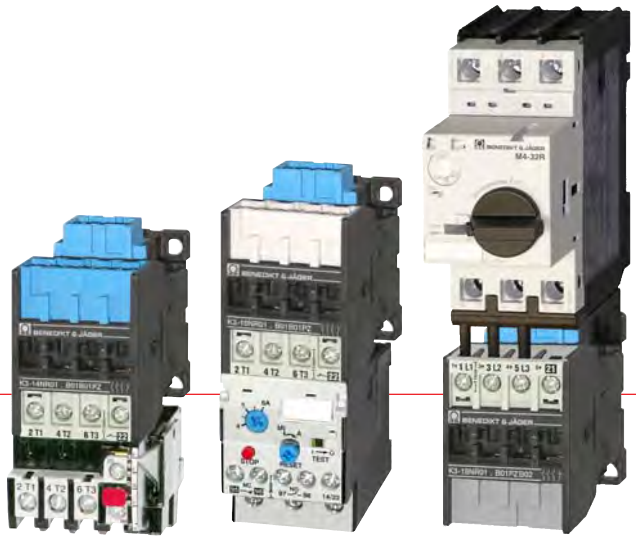


Advantages RAST 5 - Technology

- 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

●Contactor Relays

Ratings AC2, AC3 380V 400V 415V kW	220V 230V kW	240V kW	Rated-Current AC1 415V A	Auxilliary Contacts built in NO	NC	Auxilliary Contacts snap on HN10R..	Type	Coil Voltage	Code Housing Coil	Code Housing IN (L)	Code Housing OUT (T)	Pack pcs.	Weight kg/pc.
-	-	-	10	4	-	2	**K3-07NR40**	. . .	. . .	. . .	. . .	1	0,23
-	-	-	10	2	2	2	**K3-07NR22**	. . .	. . .	. . .	. . .	1	0,23

●Contactors

4	3	3	25	1	-	2	**K3-10NR10**	. . .	. . .	. . .	. . .	1	0,23
4	3	3	25	-	1	2	**K3-10NR01**	. . .	. . .	. . .	. . .	1	0,23
5,5	4	4	25	1	-	2	**K3-14NR10**	. . .	. . .	. . .	. . .	1	0,23
5,5	4	4	25	-	1	2	**K3-14NR01**	. . .	. . .	. . .	. . .	1	0,23
7,5	5	5	32	1	-	2	**K3-18NR10**	. . .	. . .	. . .	. . .	1	0,23
7,5	5	5	32	-	1	2	**K3-18NR01**	. . .	. . .	. . .	. . .	1	0,23
11	6	7	32	1	-	2	**K3-22NR10**	. . .	. . .	. . .	. . .	1	0,23
11	6	7	32	-	1	2	**K3-22NR01**	. . .	. . .	. . .	. . .	1	0,23

Standard Coils

Voltage	Color of housing
24V 50Hz	white
110V 50Hz	bright grey
180V 50Hz	yellow
230V 50Hz	blue
special voltages	pink

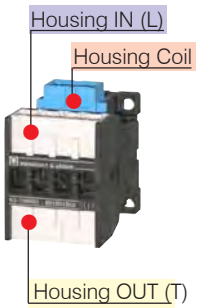
Auxilliary

●Auxilliary Contact Blocks

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

Order Example for Contactors:

Contactor K3-14NR10 ␣ Coil Voltage 230 ␣ Code Housing Coil ... see page 144, 146, 148, 150 B01 Code Housing IN (L)... see page 143, 145, 147, 149 B02 Code Housing OUT (T)... see page 143, 145, 147, 149 B01



Technical data are subject to change without notice

Contactors, RAST 5 Combinations

AC operated

●Contactors for Fuseless Load Feeders

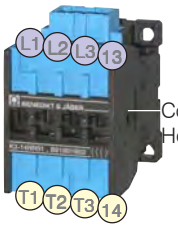
Motor AC2, AC3 380V 400V 415V kW	AC3 400V 415V A	for Circuit Breakers M4...	Type	Coil Voltage	Code Housing Coil	Screw Connection IN (L)	Code Housing OUT (T)	Pack pcs.	Weight kg/pc.
4	10	M4-32T(R)-0,16.... M4-32T(R)-10	**K3-10NR10**	. . .	.	**PZ**	**.VK3**	1	0,23
4	10	M4-32T(R)-0,16.... M4-32T(R)-10	**K3-10NR01**	. . .	.	**PZ**	**.VK3**	1	0,23
5,5	14	M4-32T(R)-13	**K3-14NR10**	. . .	.	**PZ**	**.VK3**	1	0,23
5,5	14	M4-32T(R)-13	**K3-14NR01**	. . .	.	**PZ**	**.VK3**	1	0,23
7,5	18	M4-32T(R)-17	**K3-18NR10**	. . .	.	**PZ**	**.VK3**	1	0,23
7,5	18	M4-32T(R)-17	**K3-18NR01**	. . .	.	**PZ**	**.VK3**	1	0,23
11	22	M4-32T(R)-22.... M4-32T(R)-32	**K3-22NR10**	. . .	.	**PZ**	**.VK3**	1	0,23
11	22	M4-32T(R)-22.... M4-32T(R)-32	**K3-22NR01**	. . .	.	**PZ**	**.VK3**	1	0,23

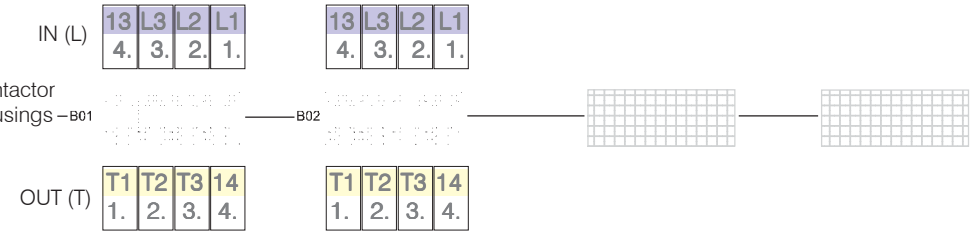
Pozidriv . . .PZ
Torx . . . . . .TX

●Contactors for Overload Relays

Motor AC2, AC3 380V 400V 415V kW	AC3 400V 415V A	for Overload Relays U12/16E.. and U3/32...	Type	Coil Voltage	Code Housing Coil	Code Housing IN (L)	Screw Connection OUT (T)	Pack pcs.	Weight kg/pc.
4	10	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-10NR10**	. . .	.	. .	**.PZ**	1	0,23
4	10	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-10NR01**	. . .	.	. .	**.PZ**	1	0,23
5,5	14	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-14NR10**	. . .	.	. .	**.PZ**	1	0,23
5,5	14	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-14NR01**	. . .	.	. .	**.PZ**	1	0,23
7,5	18	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-18NR10**	. . .	.	. .	**.PZ**	1	0,23
7,5	18	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-18NR01**	. . .	.	. .	**.PZ**	1	0,23
11	22	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-22NR10**	. . .	.	. .	**.PZ**	1	0,23
11	22	U12/16E 0,18-..23 K3 and U3/32 0,18-..32	**K3-22NR01**	. . .	.	. .	**.PZ**	1	0,23

Pozidriv . . .PZ
Torx . . . . . .TX





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

Standard plugs acc. Industry Standard RAST 5

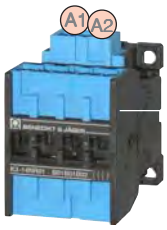
	B01	B02
8-pole		
6-pole left		
6-pole right		
4-pole left	-0A-	
4-pole right	-0B-	-0B-
2-pole left		-0A-
		-0C-
	-0I-	
	-0L-	
		-0O-
		-0Q-
2-pole center left	-0A-	
	-0C-	
		-0K-
	-0O-	
	-0Q-	
2-pole center right		-0B-
		-0F-
	-0K-	
		-0L-
2-pole right	-0B-	
	-0F-	
		-0I-
	-0L-	-0L-

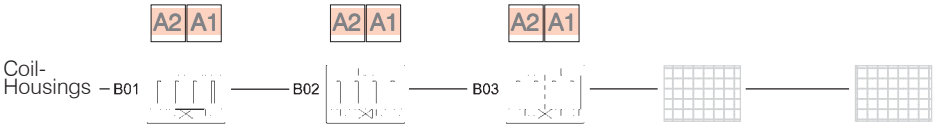
Order Example for Contactors:

K3-14NR10 ␣ 230 ␣ B01 B02 B01

- Contactor
- Coil Voltage
- Code Housing Coil ...see page 144, 146, 148, 150
- Code Housing IN (L)... see page 143, 145, 147, 149
- Code Housing OUT (T)...see page 143, 145, 147, 149

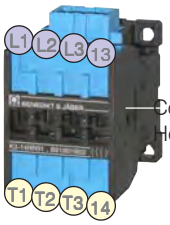
Selection of Coil-Housings for Standard plugs acc. **Industry Standard RAST 5**



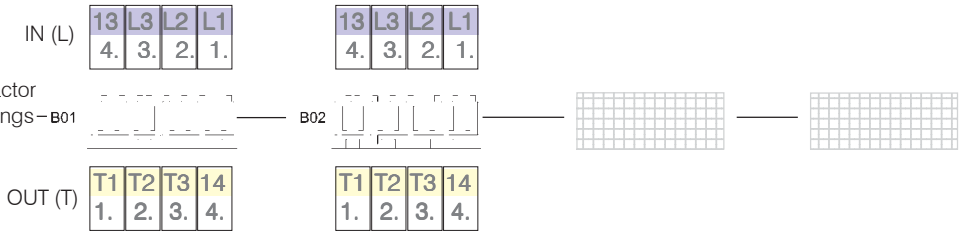


Code	Coil-Housings	B01	B02	B03	B04	B05	further housings on request
	Standard plugs acc. Industry Standard RAST 5						
	4-pole						
	3-pole left	-0B-					
			-0K-				
	3-pole right		-0A-				
		-0C-					
				-0H-			
			-0I-				
	2-pole center		-0A-				
				-0B-			
			-0C-				
				-0E-			
		-0I-					
		-0L-		-0L-			
				-0M-			
			-0O-				
				-0P-			
			-0Q-				

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



Contactor Housings – B01



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

Standard plugs acc. System Stocko RAST 5

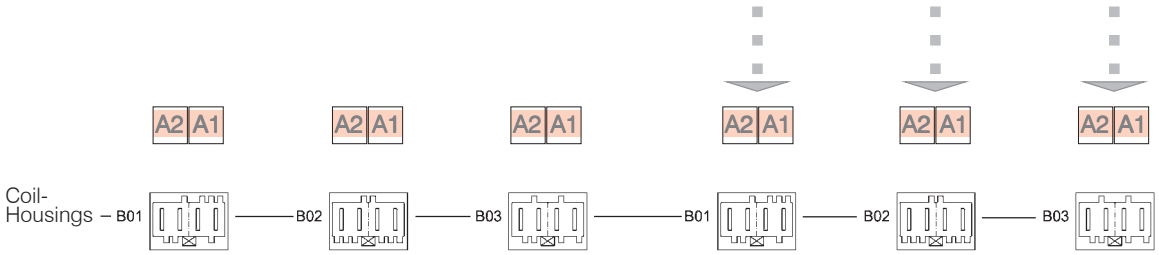
	B01	B02
8-pole		-31-
6-pole left	-34-	-34-
		-35-
	-38-	-38-
		-50-
	-65-	-65-
	-1F-	-1F-
6-pole right	-34-	-34-
	-35-	
	-38-	-38-
	-50-	
	-65-	-65-
	-1F-	
4-pole left		-14-
	-16-	
		-53-
	-60-	-60-
	-73-	
	-75-	
4-pole right		-10-
	-60-	-60-
2-pole		

see... Industry Standard RAST 5

Order Example for Contactors:

Contactor	Coil Voltage	Code Housing Coil ...see page 144, 146, 148, 150	Code Housing IN (L)... see page 143, 145, 147, 149	Code Housing OUT (T)...see page 143, 145, 147, 149
K3-14NR10	␣230␣	B01	B02	B01

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



Code Coil-Housings

B01 B02 B03 B01 B02 B03

Standard plugs acc. System Stocko RAST 5

4-pole

-42- -64- -78- -78- -78- -79- -79-

3-pole left

-01- -05- -12- -16- -30- -32- -33- -35- -36- -40- -44- -48- -49- -51- -72- -72- -72- -75- -75-

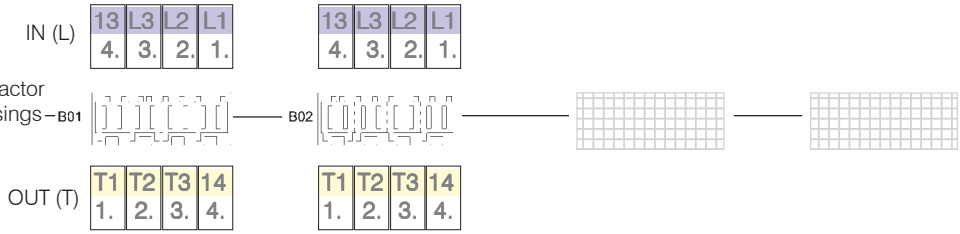
3-polig Rechts

-02- -02- -03- -04- -18- -19- -21- -28- -47- -52- -52- -53- -64- -66- -71- -73- -74- -75- -75-

2-polig Mitte

see... Industry Standard RAST 5

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



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

Standard plugs acc. System Tyco RAST 5

	B01	B02
4-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

Order Example for Contactors:

Contactor	Coil Voltage	Code Housing Coil ...see page 144, 146, 148, 150	Code Housing IN (L)... see page 143, 145, 147, 149	Code Housing OUT (T)...see page 143, 145, 147, 149
K3-14NR10	230	B01	B02	B01

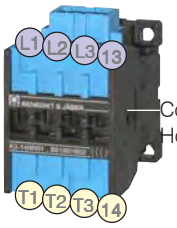
Selection of Coil-Housings for Standard plugs acc. **System Tyco RAST 5**

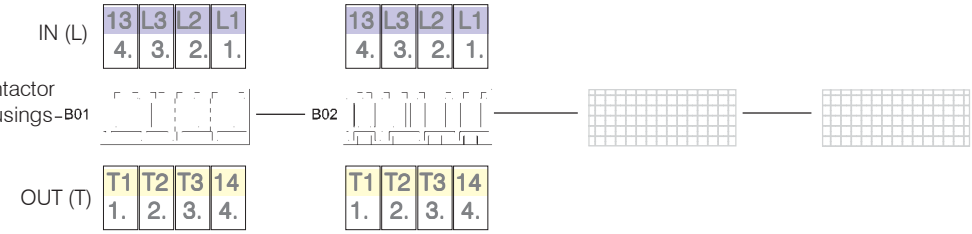
Code Coil-Housings — B01 — B02 — B03 — B04 — B05 — further housings on request

Standard plugs acc. System Tyco RAST 5

	B01	B02	B03
4-pole			
3-pole left			
3-pole right		928344-3	
2-pole center		928344-2	
			2-928344-2
		3-964951-2	
			6-928344-2
	2-964951-2		
	928343-2		928343-2
		964951-2	
		4-928344-2	

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





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

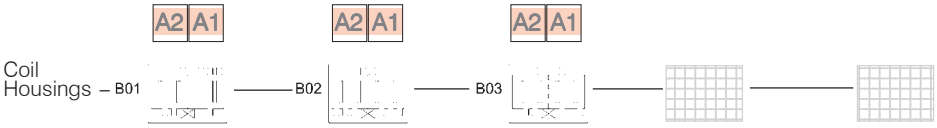
Standard plugs acc. System Lumberg RAST 5

	B01	B02
8-pole		
6-pole left		-10-
6-pole right		
4-pole left	-01-	
4-pole right	-02-	-02-
2-pole left		-01-
		-03-
	-09-	
2-pole center left	-01-	
	-03-	
		-10-
2-pole center right		-02-
		-06-
	-10-	
2-pole right	-02-	
	-06-	
		-09-

Order Example for Contactors:

Contactor	Coil Voltage	Code Housing Coil ...see page 144, 146, 148, 150	Code Housing IN (L)... see page 143, 145, 147, 149	Code Housing OUT (T)...see page 143, 145, 147, 149
K3-14NR10	230	B01	B02	B01

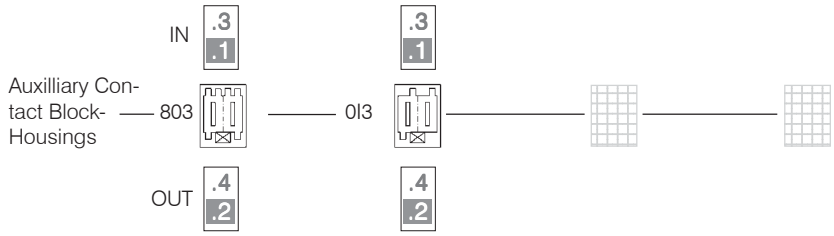
Selection of Coil-Housings for Standard plugs acc. **System Lumberg RAST 5**



Code Coil-Housings — B01 — B02 — B03 — B04 — B05 — further housings on request

Standard plugs acc. System Lumberg RAST 5

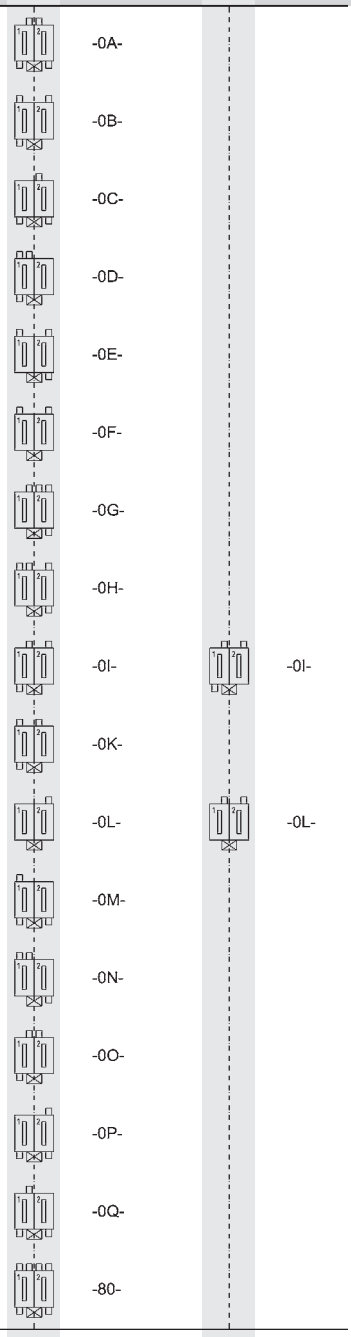
	B01	B02	B03
4-pole			
3-pole left			
3-pole right		-01-	
2-pole center		-01-	
			-02-
		-03-	
			-05-
	-09-		



Code Auxilliary-Contact Block-Housings — 803 — 0I3 — further housings on request

Standard plugs acc. Industry Standard RAST 5

2-polig

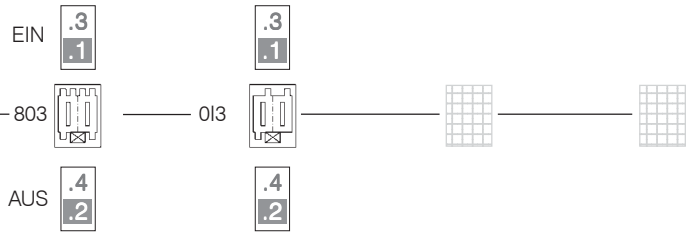


Order Example for Aux. Contact Blocks:

HN10R□8030I3
- Auxilliary Contact Block
- Code Aux. Block Housing IN (1,3)
- Code Aux. Block Housing OUT (2,4)

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

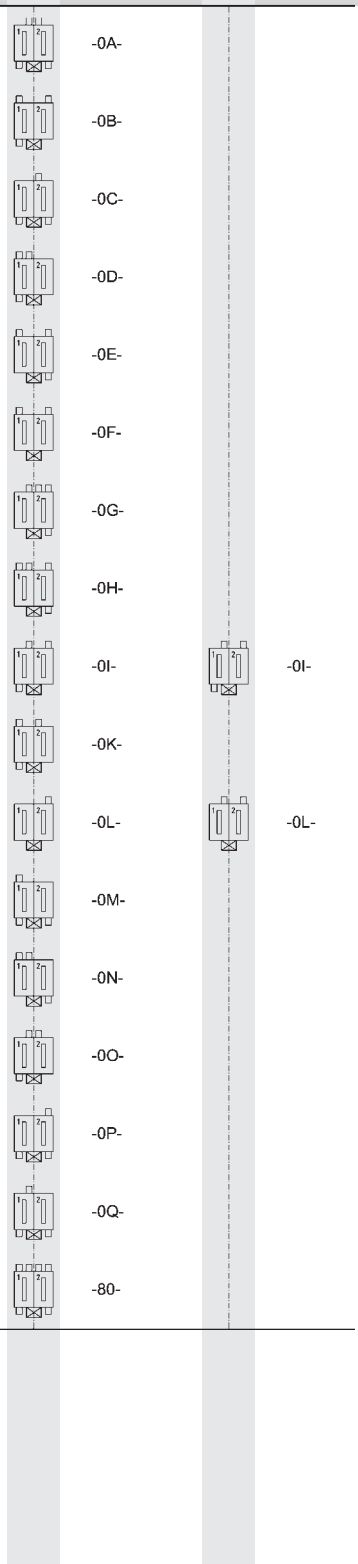
Auxilliary Contact Block-Housings



Code Auxilliary-Contact Block-Housings — 803 — 0I3 — further housings on request

Standard plugs acc. System Stocko RAST 5

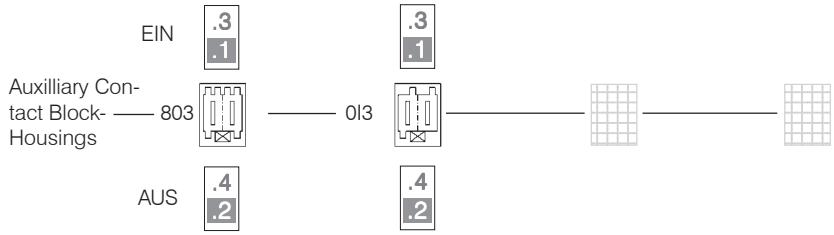
2-polig



Order Example for Aux. Contact Blocks:

HN10R□8030I3
- Auxilliary Contact Block
- Code Aux. Block Housing IN (1,3)
- Code Aux. Block Housing OUT (2,4)

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



Code Auxilliary-Contact Block-Housings — 803 — 0I3 — further housings on request

Standard plugs acc. System Tyco RAST 5

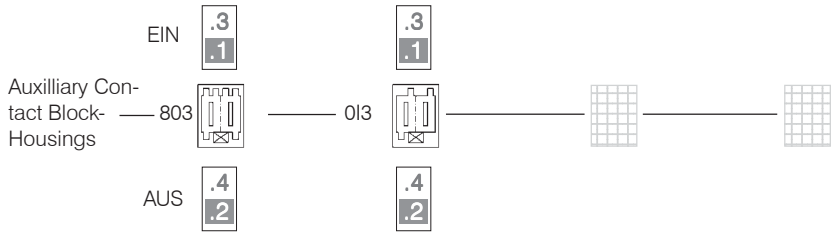
2-polig

803	0I3
928344-2	
2-928344-2	
3-964951-2	
6-928344-2	
5-928344-2	
3-928344-2	
2-964951-2	2-964951-2
928343-2	928343-2
964951-2	
4-928344-2	

Order Example for Aux. Contact Blocks:

HN10R□8030I3
- Auxilliary Contact Block
- Code Aux. Block Housing IN (1,3)
- Code Aux. Block Housing OUT (2,4)

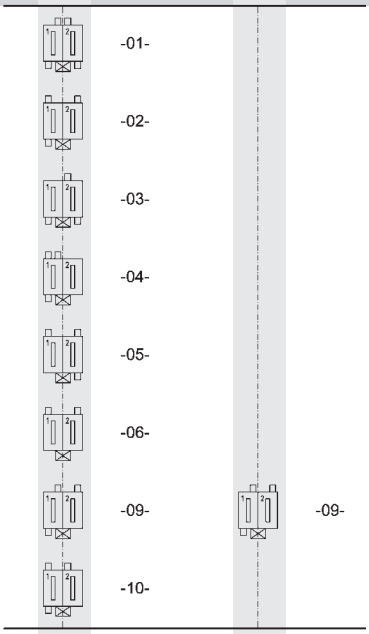
Selection of Auxiliary Contact Block-Housings for Standard plugs acc. **System Lumberg RAST 5**



Code Auxilliary-Contact Block-Housings — 803 — 0I3 — further housings on request

Standard plugs acc. System Lumberg RAST 5

2-polig



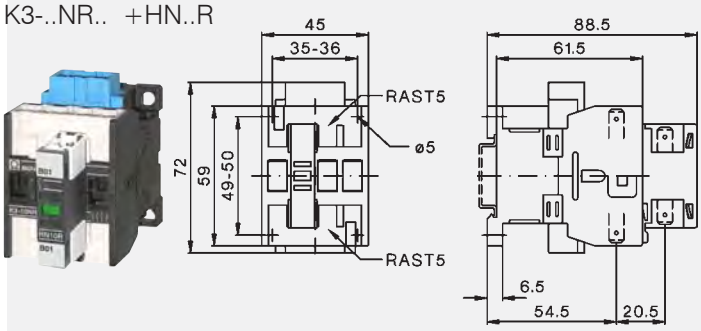
Order Example for Aux. Contact Blocks:

HN10R□8030I3

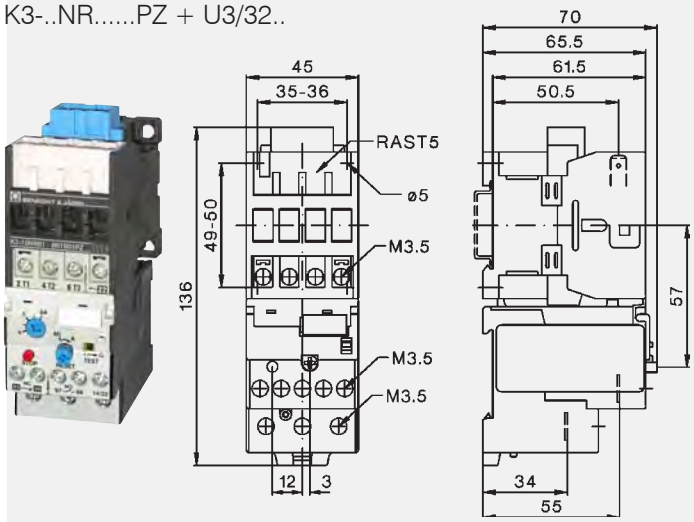
- Auxilliary Contact Block
- Code Aux. Block Housing IN (1,3)
- Code Aux. Block Housing OUT (2,4)

Dimensions

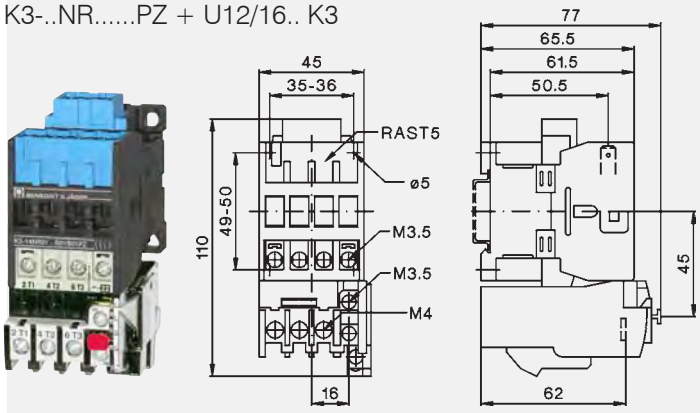
K3-..NR.. +HN..R



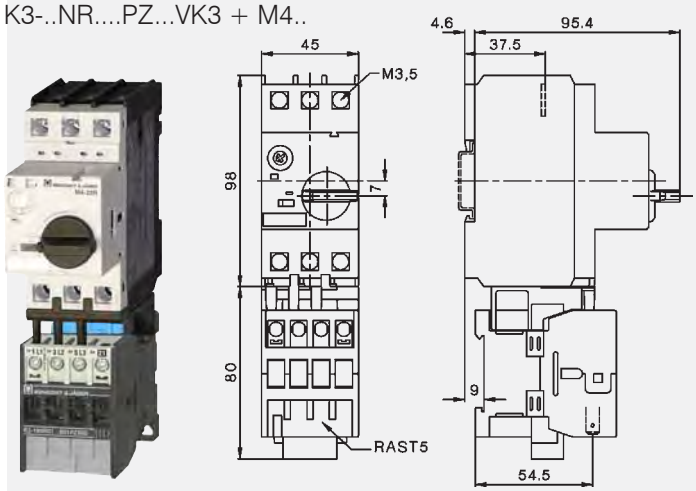
K3-..NR.....PZ + U3/32..



K3-..NR.....PZ + U12/16.. K3



K3-..NR....PZ...VK3 + M4..



Color-Coding acc. to Ratings

Contactor	Type	Ratings AC3/415V	Color Contactor Housing
Contactor Relay			
	K3-07NR...	-	pink
Contactor			
	K3-10NR...	4 kW	bright grey
	K3-14NR...	5,5 kW	blue
	K3-18NR...	7,5 kW	dark grey
	K3-22NR...	11 kW	yellow

Color-Coding acc. to Coil Voltage

Voltage	Color Coil Housing
24V	white
110V	bright grey
180V	yellow
230V	blue
Special Voltage	pink

Technical data are subject to change without notice

Data acc. to IEC 60947-4-1, VDE 0660

Main Contacts		Type	K3-07NR	K3-10NR	K3-14NR	K3-18NR	K3-22NR
Rated insulation voltage U_i [1]		V~	415	415	415	415	415
Making capacity I_{eff}	at U_e = 415V~	A	-	200	200	200	200
Breaking capcity I_{eff} cosφ= 0,65	at U_e = 415V~	A	-	180	180	200	200
Utilization category AC1							
Switching of resistive load							
Rated operational current I_e (=I_{th}) at 40°C, open	415V	**A**	**10**	**25**	**25**	**32**	**32**
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, cosφ = 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}) at 60°C, enclosed	415V	A	6	25	25	32	32
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, cosφ = 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})		mm²	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 categoryDC13							
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): Uimp = 4kV. Data for other conditions on request.

Data acc. to IEC 60947-4-1, VDE 0660

Main Contacts		Type	K3-07NR	K3-10NR	K3-14NR	K3-18NR	K3-22NR
Maximum ambient temperature							
Operation	open	°C			-40 up to +60 (+90) [1]		
	enclosed	°C			-40 up to +40		
with thermal overload relay	open	°C			-25 up to +60		
	enclosed	°C			-25 up to +40		
Storage		°C			-50 up to +90		
Short circuit protection							
for contactors without themal overload relay 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 acc. to I_e/AC3
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	K3-10NR	K3-14NR	K3-18NR	K3-22NR
Rated operational current "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	5000	5000	5000	5000
		V	415	415	415	415
Auxilliary Contacts (cULus)			A300	A300	A300	A300

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

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

Data acc. to UL508

Rated operational current "General Use"		A	10	10
Rated operational voltage	max.	V~	300	300
Auxiliary Contacts			A300	A300

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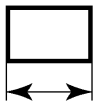
	**Dimensions**	176

Circuit Breakers M4 for Motor Control

Circuit Breaker M4-32T-..

switch type

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.
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

Circuit Breaker M4-32R-..

rotary type

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.
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

Circuit Breaker M4-63R-..

rotary type

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.
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

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.
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 NO	Contacts NC	Rated Operational Current AC15 24V A	AC15 240V A	AC1 240V A	Type	Pack pcs.	Weight approx. kg/pc.
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 172

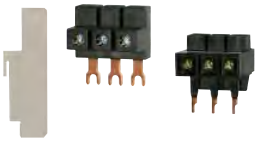
Accessories and Busbars

Accessories

		for circuit-breaker	Type	Pack pcs.	Weight approx. kg/pc.
Scale cover sealable	for covering the current setting scale	M4-32...100	M4 K	10	0,003

Push-in lugs		M4-32	M4 32 L	10	0,01

for screwing the circuit-breaker onto mounting plates. 2 units required (1 bag with 10 units)



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	M4-100	M4 100 E	2	0,01

for increased distances and clearances acc. to UL Type "E", 2 pcs per device (on input side)

Door-coupling rotary mechanisms IP65

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

Door-coupling rotary mechanism black	extension shaft 115mm	M4-32R	M4 32R EH1 115	1	0,1
	extension shaft 315mm	M4-32R	M4 32R EH1 315	1	0,2
	extension shaft 115mm	M4-63R	M4 63R EH1 115	1	0,1
	extension shaft 315mm	M4-63R	M4 63R EH1 315	1	0,2
	extension shaft 115mm	M4-100R	M4 100R EH1 115	1	0,1
	extension shaft 315mm	M4-100R	M4 100R EH1 315	1	0,2

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

Insulated 3-phase busbar system

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

		Protection degree	Type	Pack pcs.	Weight kg/pc.
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 3-pole, connection from above	Conductor cross-section solid or stranded 6-25mm² with end sleeve 4-16mm²	IP10	M4 32 SE	1	0,04

Cover for tags	Touch guard for emptyspaces		M4 32 SF	1	0,003

For feeding several modular circuit-breakers M4-32. on standard mounting rails, insulated
Rated operational voltage max. 690 V, 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 3-pole, connection from above	Conductor cross-section solid or stranded 6-25mm² with end sleeve 4-16mm²	IP20	M4 32 SEV	1	0,04

Cover for tags	Touch guard for emptyspaces		M4 32 SFV	1	0,003

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

3-phase busbars	for 2 circuit-breakers	IP20	M4 63 S2	1	0,15

Mounting Parts for Fuseless Load Feeders

			Type	Pack pcs.	Weight approx. kg/pc.
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 32A, 690V 45mm width, 182mm long bar width: 12 und 15mm bar thickness: 5 and 10mm		M4 32 SA60	1	0,18
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 2 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– 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	K3-18ND10EUR 230	-
7,5	14 – 22	M4-32T-22	M4 32 VK3	K3-22ND10EUR 230	-
11	18 – 26	M4-32T-26	M4 32 VK3	K3-22ND10EUR 230	-
15	22 – 32	M4-32T-32	M4 32 VD	K3-32A00 230	M4 32 HU1
-	0,10 – 0,16	M4-32R-0,16	M4 32 VK3	K3-10ND10EUR 230	-
0,06	0,16 – 0,25	M4-32R-0,25	M4 32 VK3	K3-10ND10EUR 230	-
0,09	0,25 – 0,4	M4-32R-0,4	M4 32 VK3	K3-10ND10EUR 230	-
0,18	0,4 0– 0,63	M4-32R-0,63	M4 32 VK3	K3-10ND10EUR 230	-
0,25	0,63 –1	M4-32R-1	M4 32 VK3	K3-10ND10EUR 230	-
0,55	1,0 – 1,6	M4-32R-1,6	M4 32 VK3	K3-10ND10EUR 230	-
0,75	1,6 – 2,5	M4-32R-2,5	M4 32 VK3	K3-10ND10EUR 230	-
1,5	2,5 – 4	M4-32R-4	M4 32 VK3	K3-10ND10EUR 230	-
2,2	4 – 6	M4-32R-6	M4 32 VK3	K3-10ND10EUR 230	-
3	5 – 8	M4-32R-8	M4 32 VK3	K3-10ND10EUR 230	-
4	6 – 10	M4-32R-10	M4 32 VK3	K3-10ND10EUR 230	-
5,5	9 – 13	M4-32R-13	M4 32 VK3	K3-14ND10EUR 230	-
7,5	11 – 17	M4-32R-17	M4 32 VK3	K3-18ND10EUR 230	-
7,5	14 – 22	M4-32R-22	M4 32 VK3	K3-22ND10EUR 230	-
11	18 – 26	M4-32R-26	M4 32 VK3	K3-22ND10EUR 230	-
15	22 – 32	M4-32R-32	M4 32 VD	K3-32A00 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 Icu and the rated service short-circuit breaking capacity Ics of the M4 circuit-breakers with different operational voltages as a function of the rated current In 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 In	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]		
		Icu	Ics	max. fuse [1] (gL/gG)	Icu	Ics	max. fuse [1] (gL/gG)	Icu	Ics	max. fuse [1] (gL/gG)	Icu	Ics	max. fuse [1] (gL/gG)	Icu	Ics	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	40	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
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	20	15	80	10	8	80	4	4	63
	22	100	100	--	50	38	125	20	15	100	10	8	80	4	4	63
	26	100	100	--	50	38	125	20	15	100	10	8	80	4	4	63
	32	100	100	--	50	38	125	20	15	100	10	8	80	4	4	63
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-cicuit current at installation point > Icu
2) 10 % overvoltage
3) 5 % overvoltage

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

Main Circuit

Type	Number of poles	Max. rated current Inmax (= max.rated operational current Ie)	Storage / Transport Permissible ambient temperature	Operation Permissible ambient temperature	Rated insulation voltage Ui	Rated impulse withstand voltage Uimp	Rated operational Voltage Ue	Rated frequency	Utilisation category IEC 60947-2 (circuit-breaker)	Utilisation category IEC 60947-4-1 (motor starter)	Class acc. to IEC 609747-4-1
		A	°C	°C	V	kV	V	Hz			
M4-32T	3	32	-50°C to +80°C -58°F to +176°F	-20°C to +60°C -4°F to +140°F	690 [1]	6	690	50/60	A	AC3	10
M4-32R	3	32	-50°C to +80°C -58°F to +176°F	-50°C to +80°C -4°F to +140°F	690 [1]	6	690	50/60	A	AC3	10
M4-63R	3	63	-50°C to +80°C -58°F to +176°F	-50°C to +80°C -4°F to +140°F	1000 [2]	8	690	50/60	A	AC3	10
M4-100R	3	100	--50°C to +80°C -58°F to +176°F	-50°C to +80°C -4°F to +140°F	1000 [2]	8	690	50/60	A	AC3	10

Type	Power loss P_v per circuit-breaker dependent on rated current In (upper setting range)			R per conducting path = $P/I^2 \times 3$			Shock resistance	Degree of protection	Shock hazard protection	Temperature compensation	Mechanical endurance	Electrical endurance	Max. operation frequency per hour (motor starts)
	In -> to 4 A	In -> 6 to 26 A	In -> 32A	In -> 26 to 63 A	In -> to 63 A	In-> 75 to 100 A	acc. to IEC 60068 Part 2-27	acc. to IEC 60529	acc. to DIN VDE 0106 Part 100	acc. to IEC 60947-4-1			
	W	W	W	W	W	W	g			°C	operating cycles		1/h
M4-32T	9,8	8	3,9	-	-	-	25	IP 20	safe against finger touch	-20 bis +60	100 000	100 000	25
M4-32R	9,8	8	3,9	-	-	-	25	IP 20	safe against finger touch	-20 bis +60	100 000	100 000	25
M4-63R	-	-	-	12,6	-	-	25	IP 20	safe against finger touch	-20 bis +60	50 000	25 000	25
M4-100R	-	-	-	-	11,9	15	25	IP 20	safe against finger touch	-20 bis +60	50 000	25 000	25

Approvals

Type	c UL us LISTED USA, Canada UL	SEV Switzerland	CE Europe CCC	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): Uimp = 6kV.
2) Suitable at 1000V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): Uimp = 8kV.
Data for other conditions on request.

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

Conductor cross-sections for main circuit

Type	Terminal Type, Screw Type	Tightening torque Nm	Tightening torque lb - in	Conductor cross-sections solid mm²	Conductor cross-sections solid AWG	Conductor cross-sections stranded mm²	Conductor cross-sections stranded AWG	Conductor cross-sections flexible mm²	Conductor cross-sections flexible 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 Ue AC V		Rated operational current Ie/AC-15 A		Rated operational current e/AC-12 Ith A		Rated operational voltage Ue DC L/R 200 ms V		Rated operational current Ie/DC-13 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 VA/W	Power consumption uninterrupted duty VA/W	Response voltage trip V	Response voltage pick-up V	Response voltage acc. to IEC 60947-1 V
Undervoltage release	M4 U..	8,5/6	3/1,2	0,7 - 0,35xUs	0,85 - 1,1xUs	
Shunt release	M4 A..	8,5/6	3/1,2			0,7 - 1,1xUs

	Fuse gL/gG A	Miniature circuit breaker C-characteristic A	solid mm²	flexible mm²	AWG-wires, solid AWG	flexible AWG
Short-circuit protection for auxiliary and control circuits	16	6				
Conductor cross-section 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).

	Rated operational current Ie	Max. short-circuit current			Motor load 1-phase		Motor load 3-phase				Max. rated fuse	Max. breaker size
		240V	480V	600V	115V	230V	200V	230V	460V	600V		
Type	A	kA	kA	kA	HP	HP	HP	HP	HP	HP	A	A
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
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
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 UL508 demands a line-side 1 inch air and 2 inch creepage distance for „Combination Motor Controller Type E“ is necessary. Therefor 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“.

	Rated operational current Ie	Max. short-circuit current			Motor load 1-phase		Motor load 3-phase				Max. rated fuse	Max. breaker
		240V	480V	600V	115V	230V	200V	230V	460V	600V		
Typ	A	kA	kA	kA	HP	HP	HP	HP	HP	HP	A	A
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
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	Rated operational current
	AC	DC	max. V AC	A
Lateral auxiliary switch **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

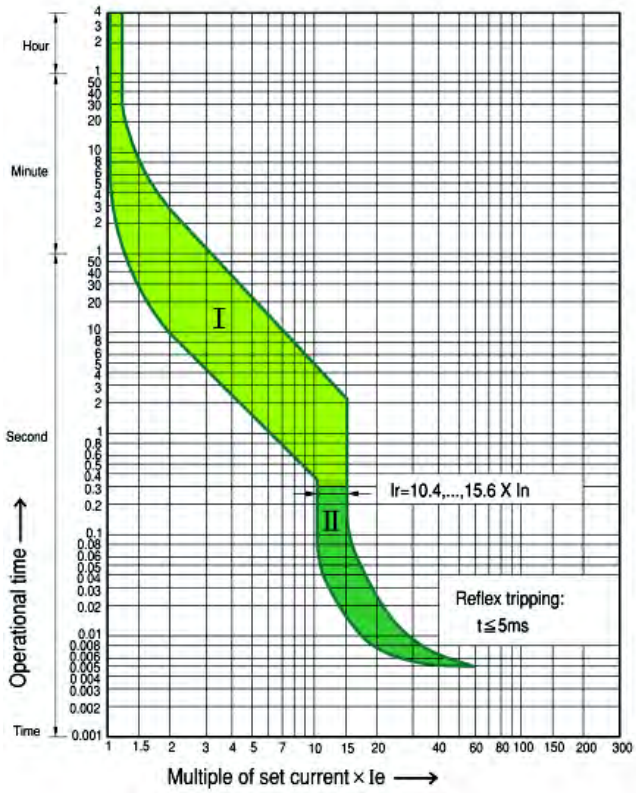
The tripping characteristics of M4 circuit-breakers are designed mainly to protect three-phase induction motors. The circuit-breakers are therefore also referred to as Manual Motor Starters. The current of the motor to be protected is set with the aid of the scale.

Line protection

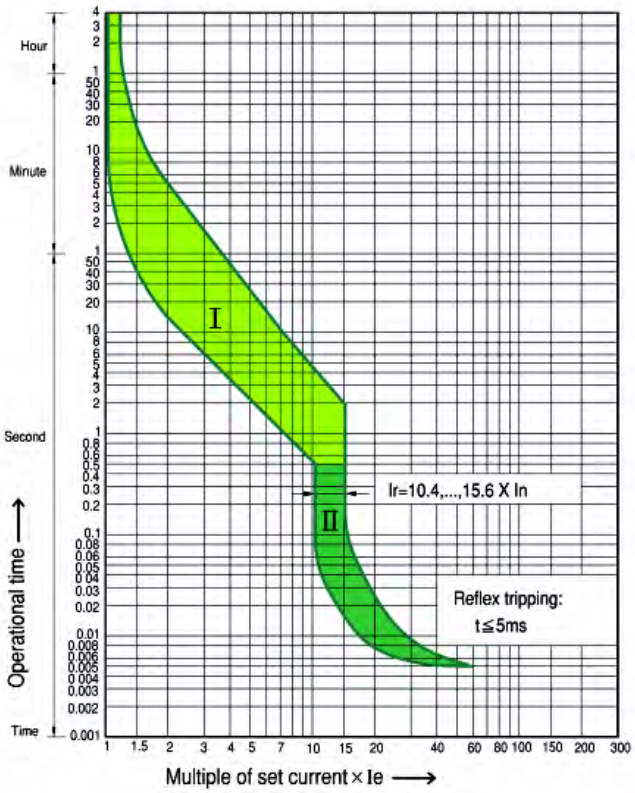
M4 Circuit-breakers for motor protection are also suitable for line protection. The M4 Circuit-breakers fulfil the isolation conditions of IEC 60 947-3 as well as the additional test conditions for circuit-breakers with isolation characteristics specified in IEC 60947-2.
Taking IEC 60 204-1 into consideration, 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



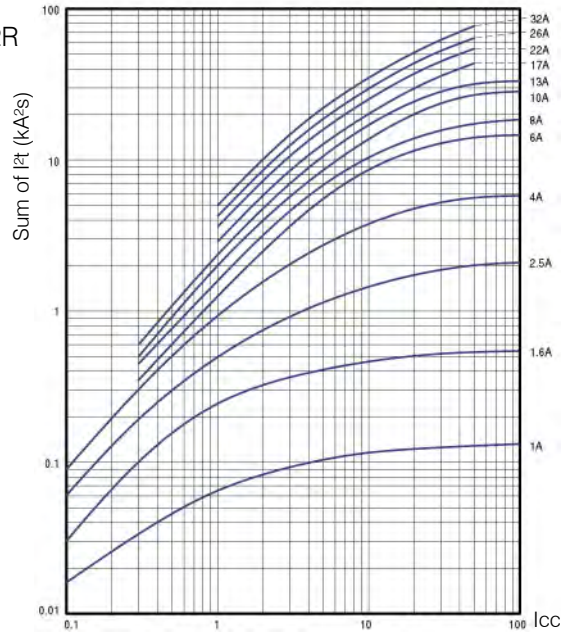
I The curve shows the mean operating current at an ambient temperature of 20°C starting from cold.
II The tripping characteristic of electromagnetic overcurrent releases (short-circuit releases)

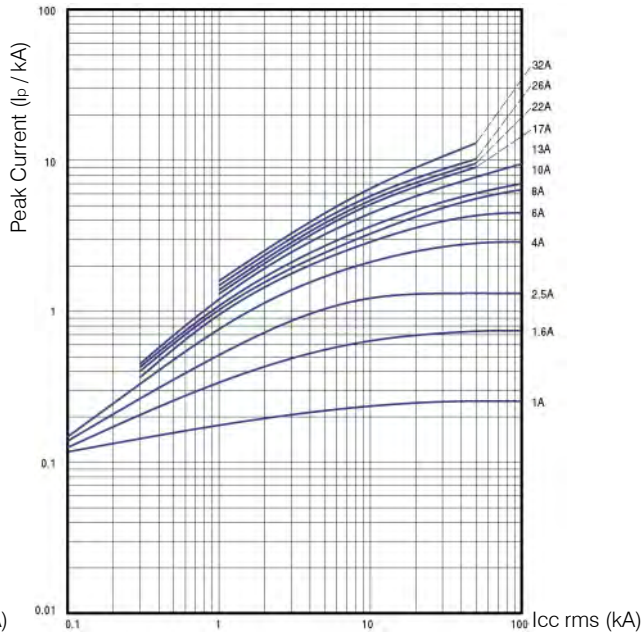
The tripping characteristic of the inverse-time delayed overload releases apply for DC and AC with a frequency of 0 to 400 Hz.
At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

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.

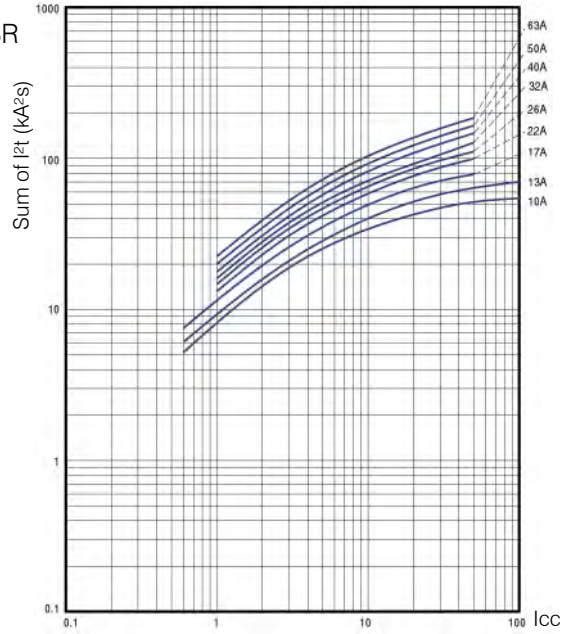
Let-through Energy (I^2t / kA^2s) and Peak Current (I_p / kA) at U_e=415V)

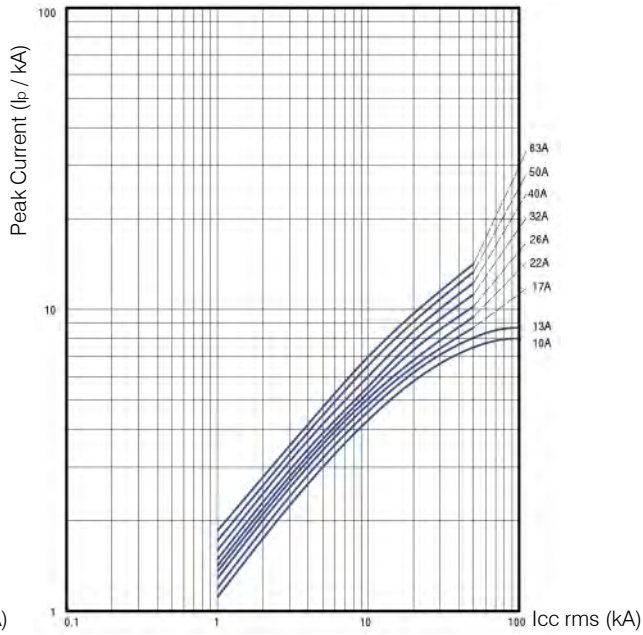
M4-32R



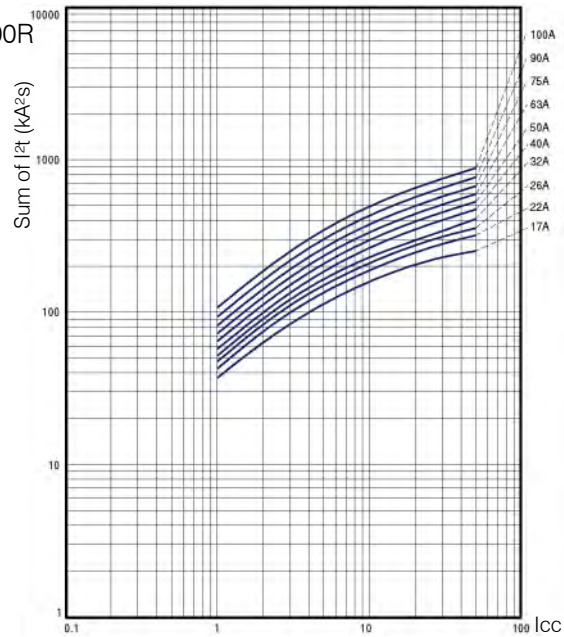


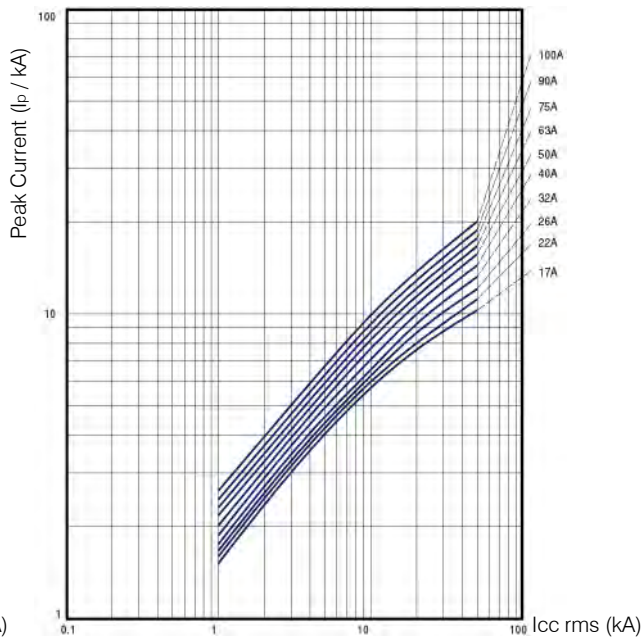
M4-63R





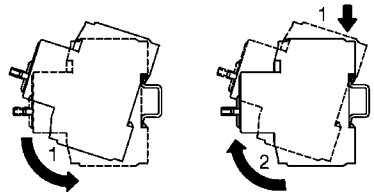
M4-100R



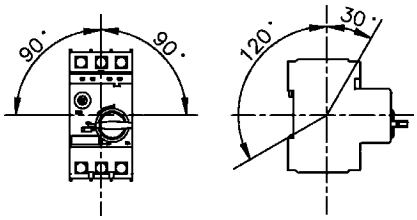


Mounting

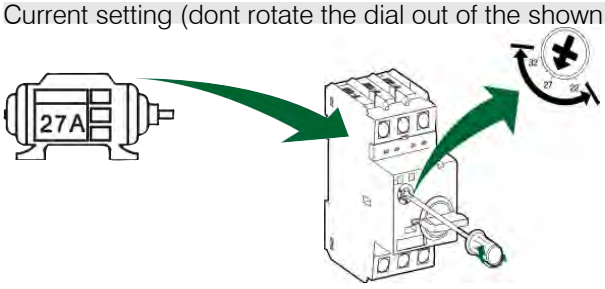
DIN-rail mounting



Operating positions



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

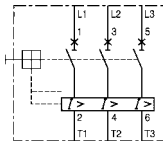


Connectioin of 1-phase motor

Wiring diagrams

Circuit breaker

M4...

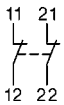


Traverse Aux. Contact Block

M4 HQ11

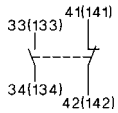
M4 HQ20

M4HQ02

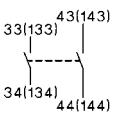


Aux. Contact Block (side mounted)

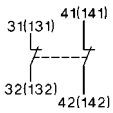
M4 HS11



M4 HS20

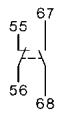


M4 HS02



Alarm Switch

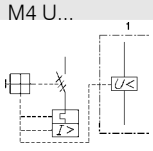
M4 M11



M4 MA11

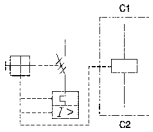
Undervolatage Release

M4 U...

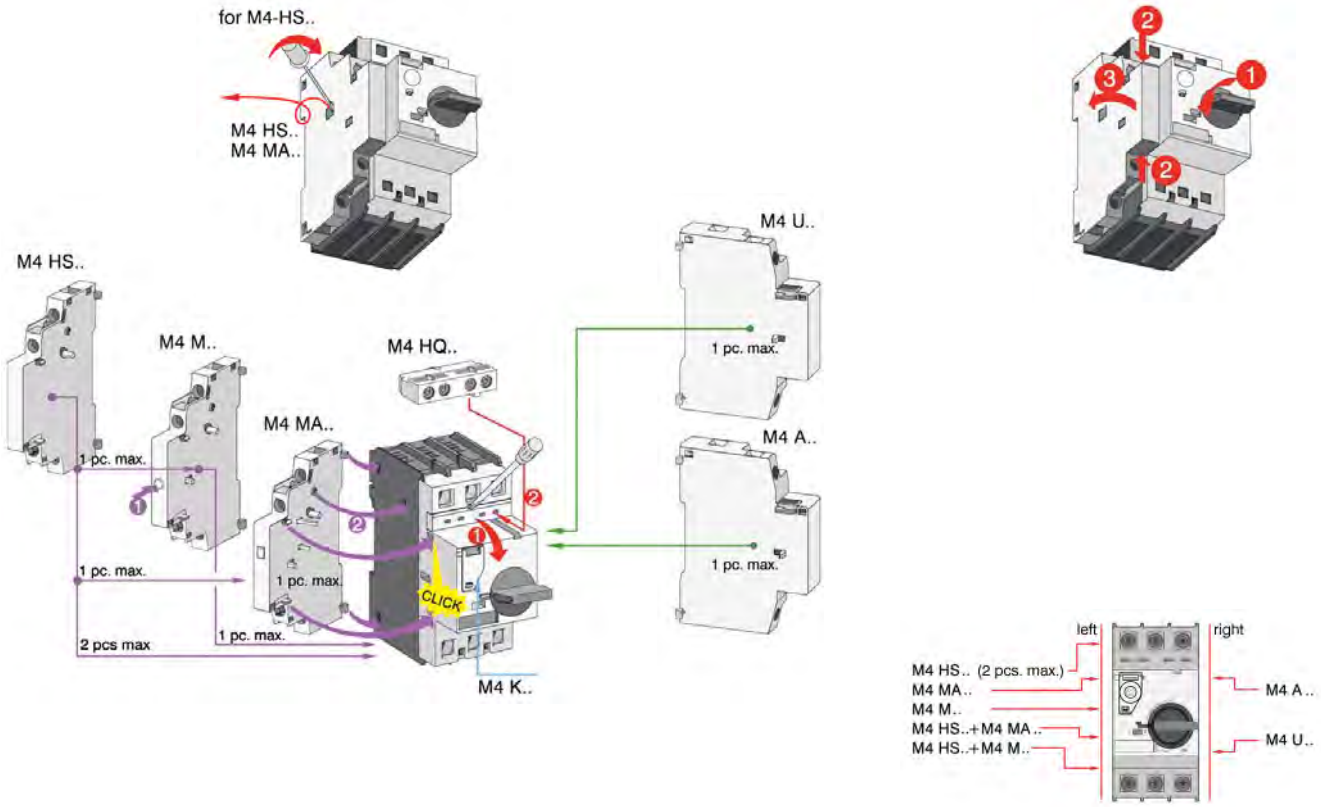


Shunt Release

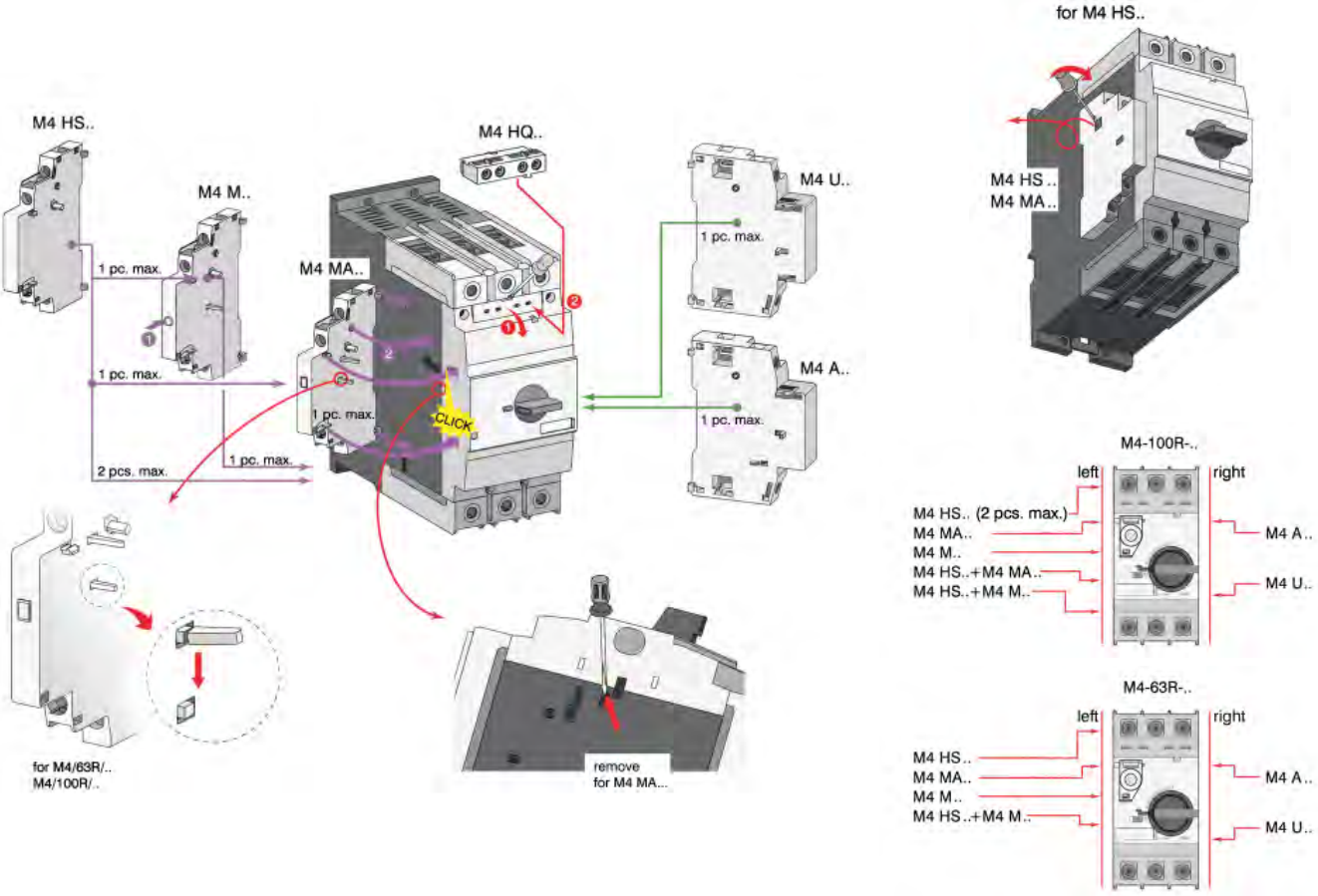
M4 A...



M4-32T
M4-32R

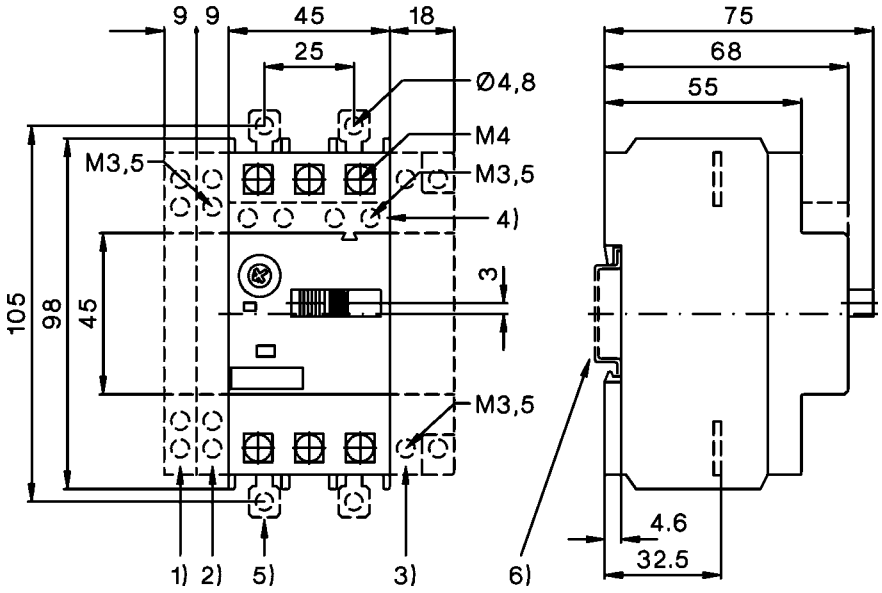


M4-63R
M4-100R



Dimensions

Circuit-breaker M4-32T

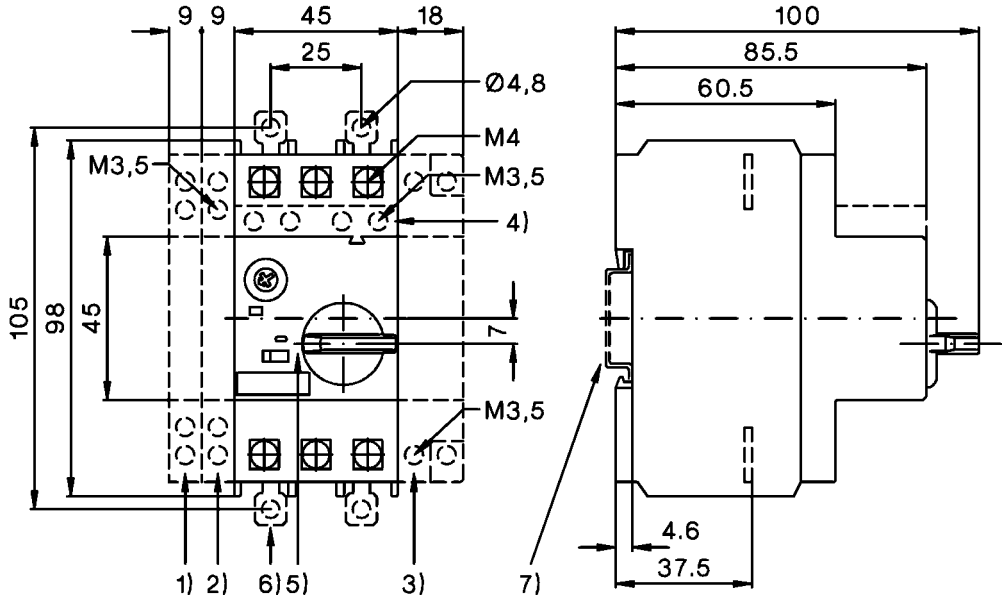


1) Side aux. contact
2) Magnetic trip alarm
3) Shunt or undervoltage release of arcing
4) Transverse aux. contact
5) Push-in Lugs for screw mounting
6) 35mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts)

at Ue (V)	240	415	460	525	690
mm	20	20	20	20	20
inch	0,8	0,8	0,8	0,8	0,8

Circuit-breaker M4-32R



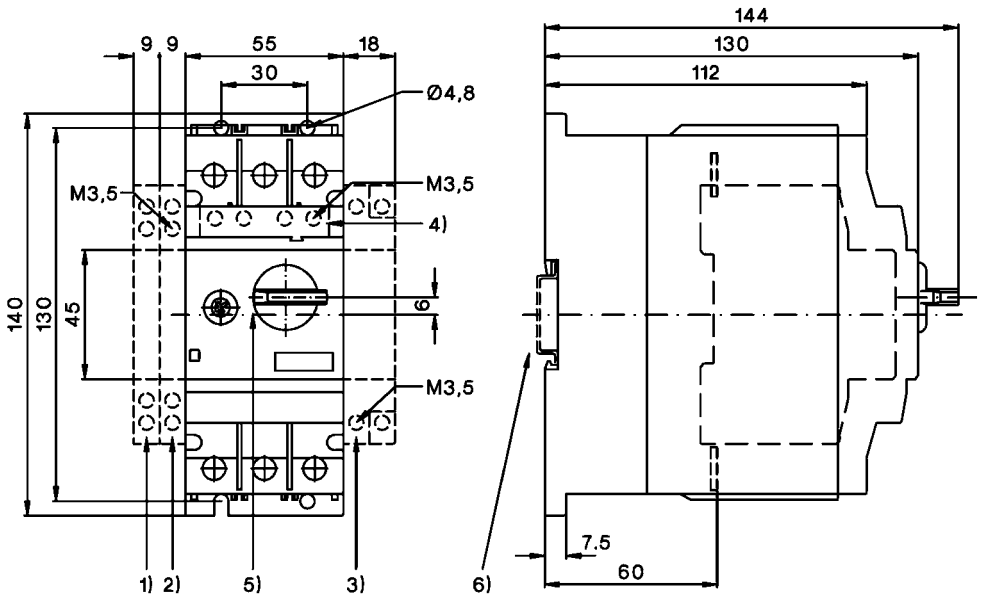
1) Side aux. contact
2) Magnetic trip alarm
3) Shunt or undervoltage release of arcing
4) Transverse aux. contact
5) Handle lock in OFF-position (Ø 5mm)
6) Push-in Lugs for screw mounting
7) 35mm DIN-rail acc. to EN 50022

Height of arcing spaces (clearance from earthed parts)

at Ue (V)	240	415	460	525	690
mm	30	30	30	30	50
inch	1,18	1,18	1,18	1,18	2

Dimensions

Circuit-breaker M4-63R

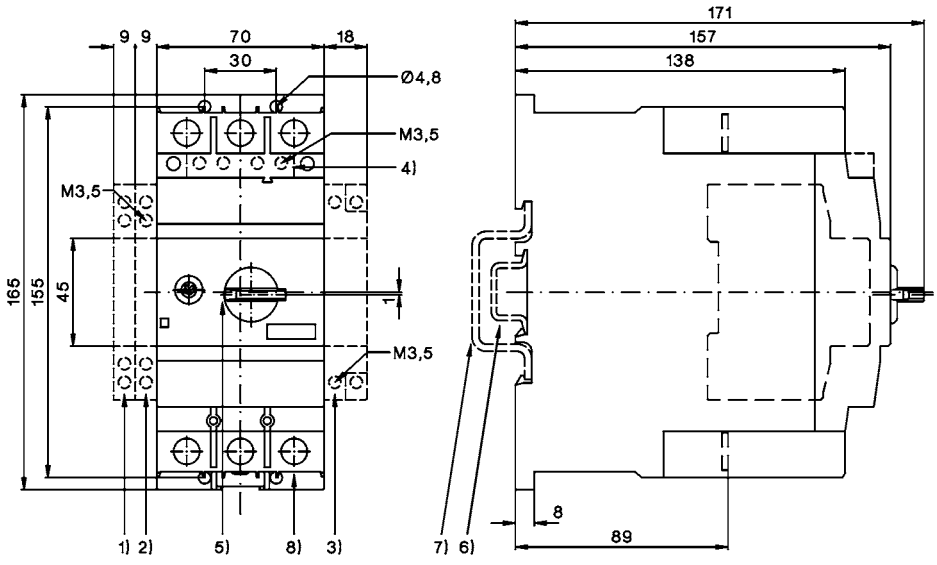


1) Side aux. contact
2) Magnetic trip alarm
3) Shunt or undervoltage release
4) Transverse aux. contact
5) Handle lock in OFF-position (Ø 5mm)
6) 35mm DIN-rail acc. to EN 50022

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

Circuit-breaker M4-100R



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

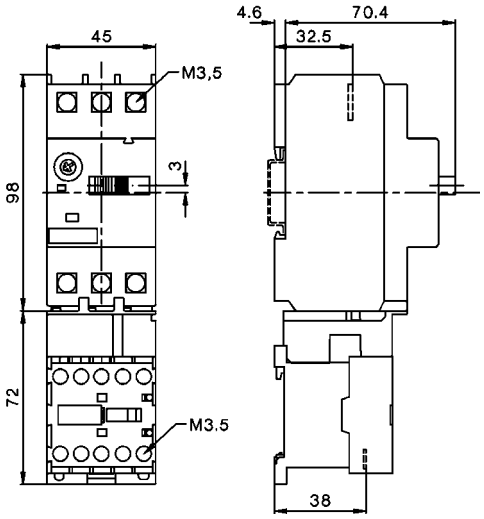
Height of arcing spaces (clearance from earthed parts)

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

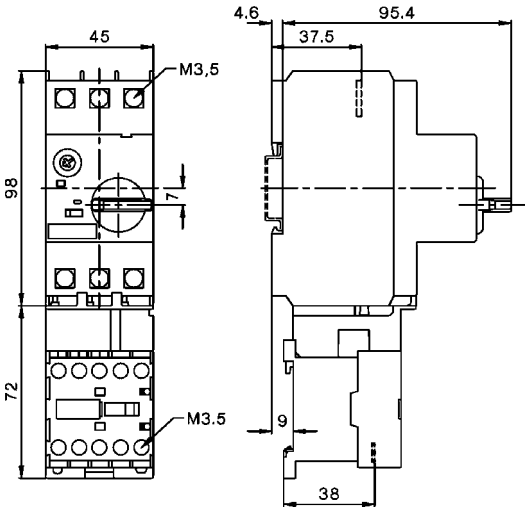
Dimensions

Link Module M4 32 VK1

M4-32T + K1-. .

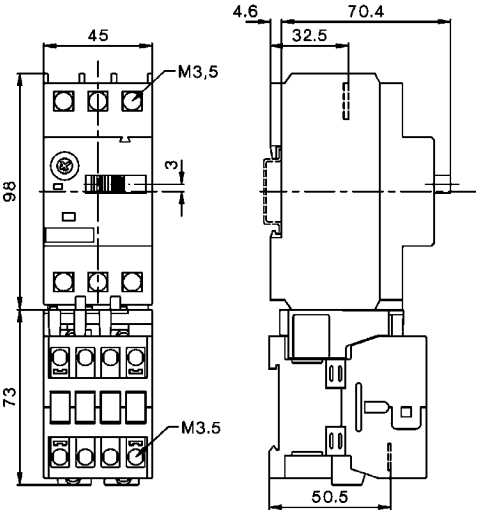


M4-32R + K1-. .

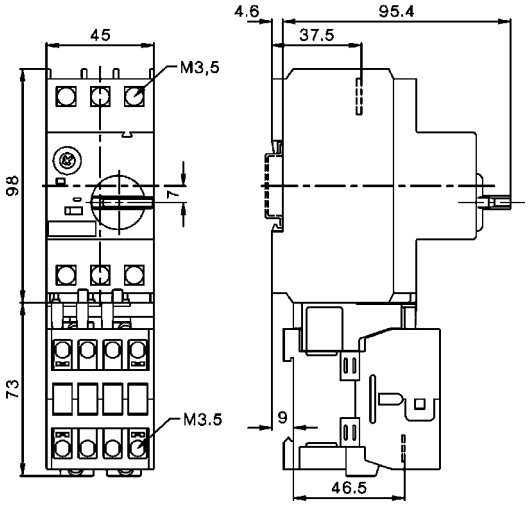


Link Module M4 32 VK3

M4-32T + K3-10ND. .
M4-32T + K3-18ND. .
M4-32T + K3-14ND. .
M4-32T + K3-22ND. .

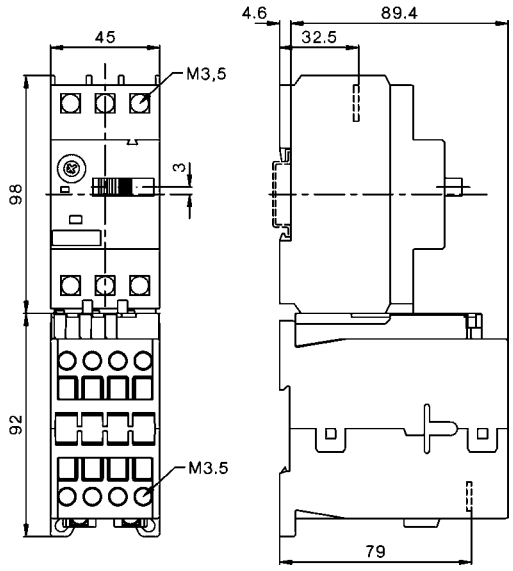


M4-32R + K3-10ND. .
M4-32R + K3-18ND. .
M4-32R + K3-14ND. .
M4-32R + K3-22ND. .



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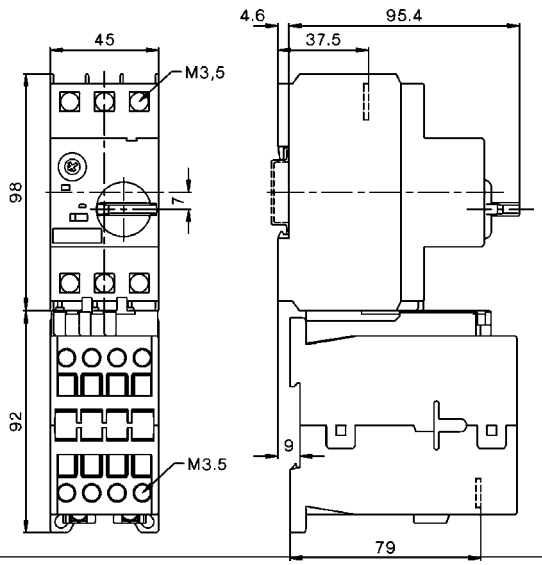
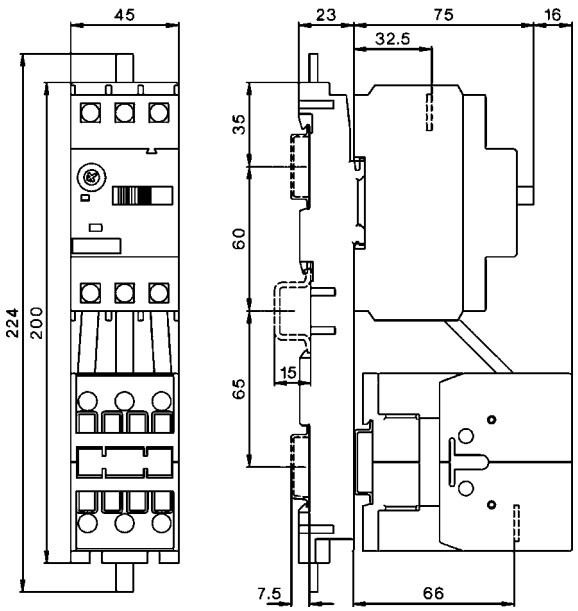
M4-32R + KG3-22. .



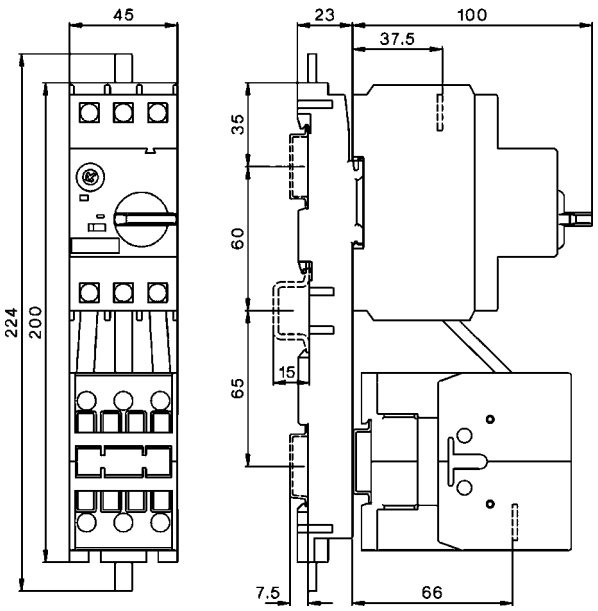
Dimensions

DIN-rail adapter M4 32 HU1

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

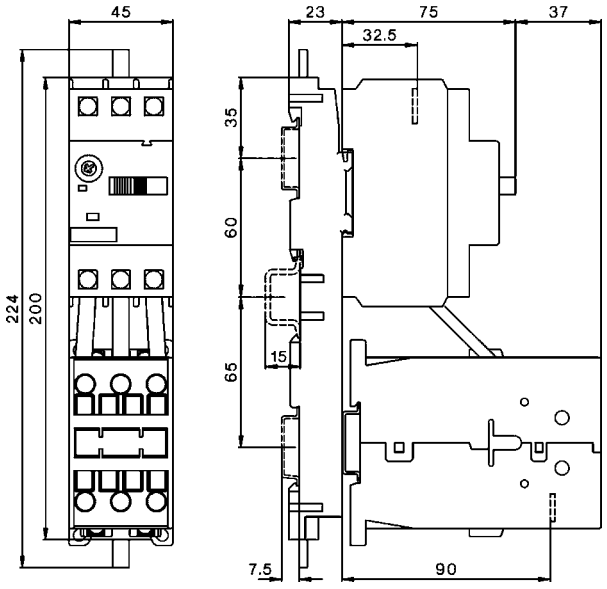


M4-32R + K3-24 + M4 32VD
M4-32R + K3-32 + M4 32VD

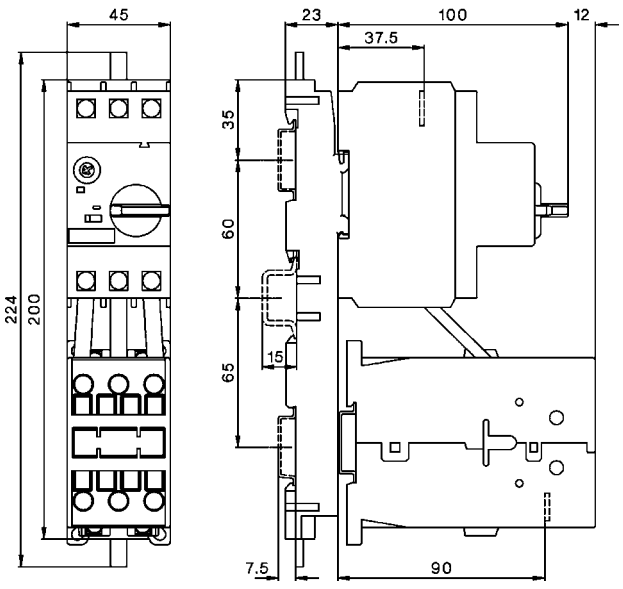


DIN-rail adapter M4 32 HU1

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



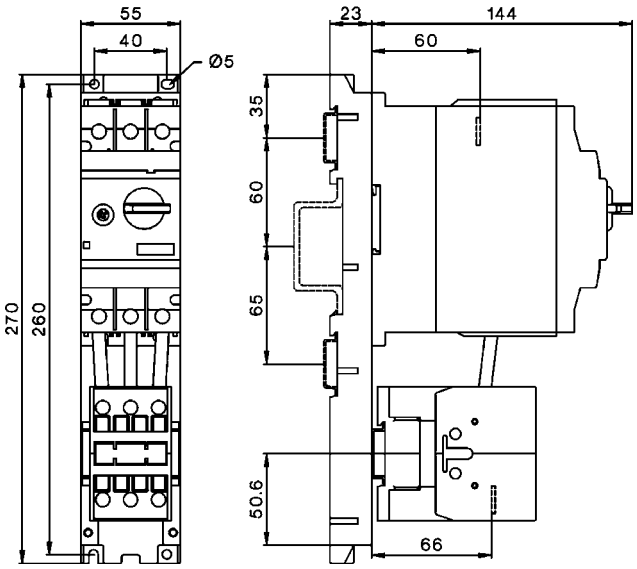
M4-32R + KG3-24 + M4 32 VD
M4-32R + KG3-32 + M4 32 VD



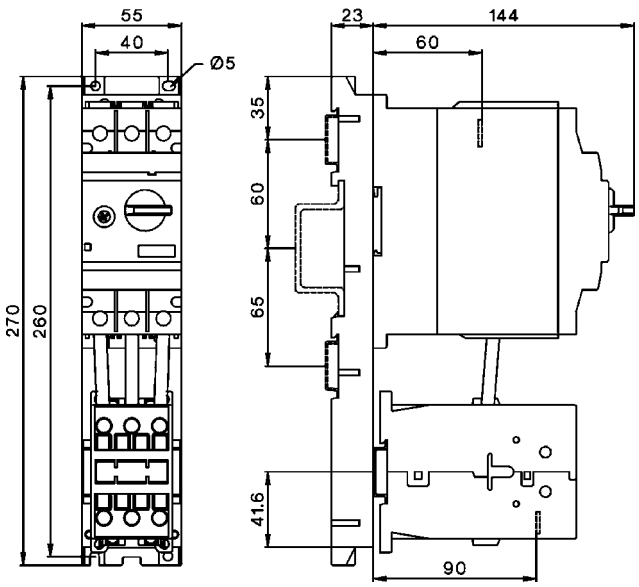
Dimensions

DIN-rail adapter M4 63 HU1

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

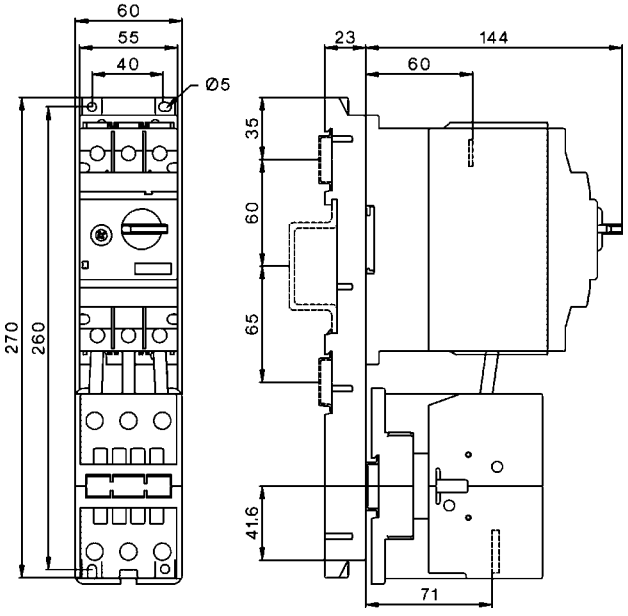


M4-63T + KG3-32 + M4 63 VDG
M4-63T + KG3-40 + M4 63 VDG



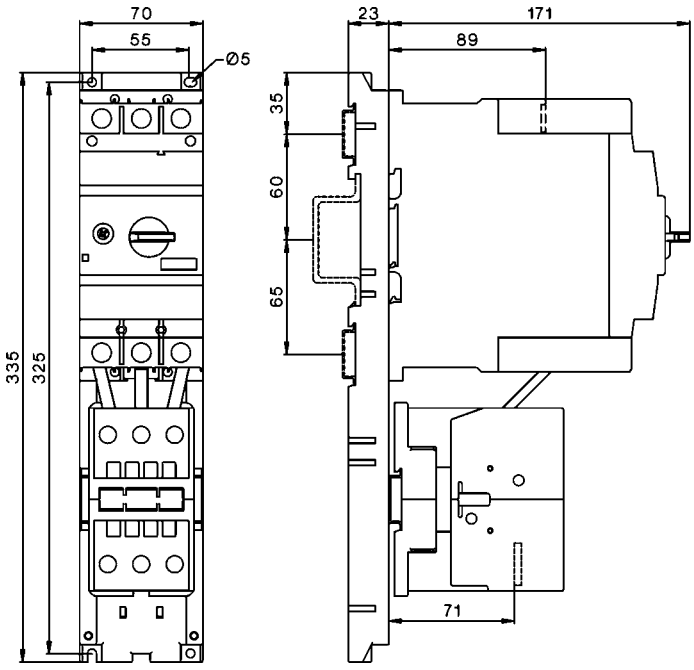
DIN-rail adapter M4 63 HU1

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



DIN-rail adapter M4 100 HU1

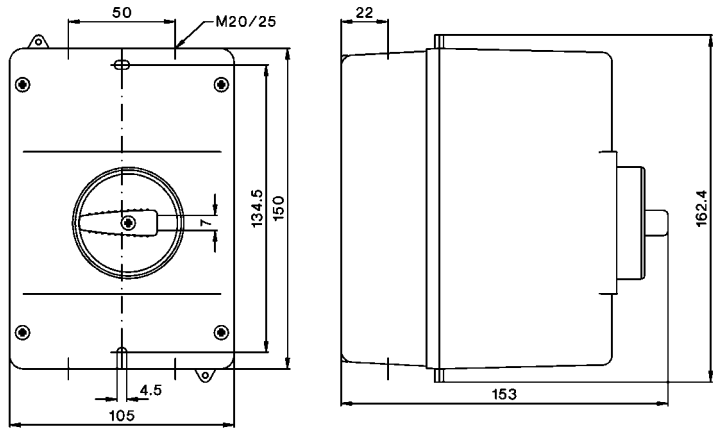
M4-100R + K3-62 + M4 100 VD
M4-100R + K3-74 + M4 100 VD



Dimensions

Enclosures

M4 32R PFH4
M4 32R PFHN4



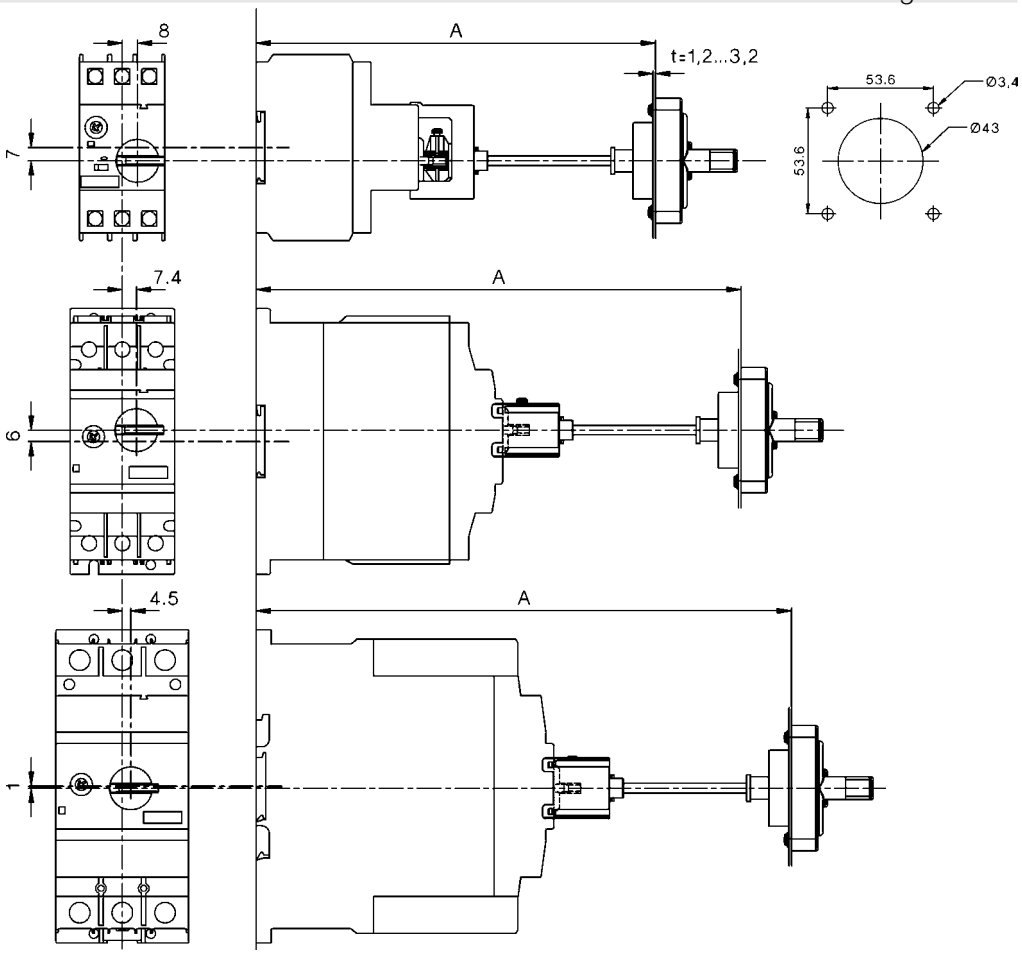
Door-coupling rotary mechanisms

Mounting holes

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

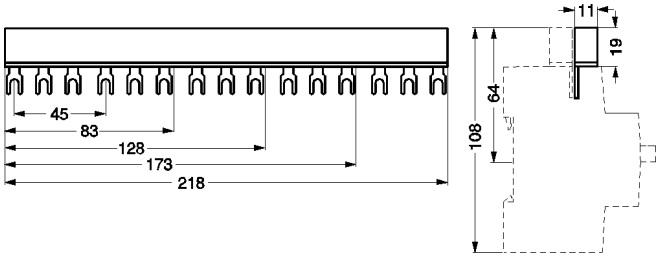
Type	A
M4 63R EH1 115	194 - 255
M4 63R EHN1 115	194 - 255
M4 63R EH1 315	194 - 455
M4 63R EHN1 315	194 - 455

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

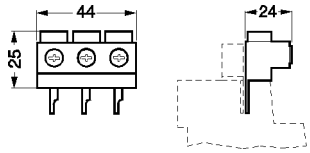


Insulated 3-phase busbar system

M4 32 S..



M4 32 SE



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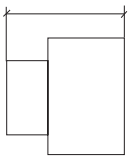
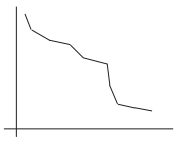
	Dimensions	185
	Tripping Charactaristic	185

Manual Motor Starters

Thermal Overload Release Setting Range A	Ratings AC3 at 400V kW	690V kW	Magnetic short circuit trip A	Type	Pack pcs.	Weight kg/pc.
0,1 - **0,16**	**0,02**	0,06	1,92	**MU25A-0,16**	1	0,25
0,16 - **0,25**	**0,06**	0,12	3,0	**MU25A-0,25**	1	0,25
0,25 - **0,4**	**0,09**	0,18	4,8	**MU25A-0,4**	1	0,25
0,4 - **0,63**	**0,12**	0,25	7,6	**MU25A-0,63**	1	0,25
0,63 - **1**	**0,25**	0,55	12,0	**MU25A-1**	1	0,25
1 - **1,6**	**0,55**	1,1	19,2	**MU25A-1,6**	1	0,25
1,6 - **2,5**	**0,75**	1,5	30	**MU25A-2,5**	1	0,25
2,5 - **4**	**1,5**	3	48	**MU25A-4**	1	0,25
4 - **6,3**	**2,5**	4	75,6	**MU25A-6,3**	1	0,25
6,3 - **10**	**4**	7,5	120	**MU25A-10**	1	0,25
10 - **16**	**7,5**	11	192	**MU25A-16**	1	0,25
16 - **20**	**9**	12	240	**MU25A-20**	1	0,25
20 - **25**	**12,5**	22	300	**MU25A-25**	1	0,25
25 - **32**	**15**		384	**MU25A-32**	1	0,25

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

Contacts NO	NC	EM[1]	Rated Operational Current AC15 230V A	AC1 400V A	AC1 500V A	Type	Pack pcs.	Weight kg/pc.
1	-	-	**3,5**	2	6	**MU25A-PS10**	10	0,03
-	1	-	**3,5**	2	6	**MU25A-PS01**	10	0,03
2	-	-	**3,5**	2	6	**MU25A-PS20**	10	0,03
1	1	-	**3,5**	2	6	**MU25A-PS11**	10	0,03
-	2	-	**3,5**	2	6	**MU25A-PS02**	10	0,03
-	1	1	**3,5**	2	6	**MU25A-PV11**	10	0,03
-	-	2	**3,5**	2	6	**MU25A-PV20**	10	0,03

Transverse Auxiliary Contact Block, max. 1 piece

Contacts NO	NC	EM[1]	Rated Operational Current AC15 230V A	AC1 230V A	Type	Pack pcs.	Weight kg/pc.
1	1	-	**1**	5	**MU25A-PA11**	10	0,02

Auxiliary Contact Blocks for mounting under the cover, max. 1 piece

Contacts NO	NC	EM[1]	Rated Operational Current AC15 230V A	AC1 400V A	AC1 500V A	Type	Pack pcs.	Weight kg/pc.
1	1	-	**3,5**	2	6	**MU25A-PE11**	10	0,02

Trip Alarm Auxiliary Switch for mounting under the cover, max. 1 piece

Contacts NO	NC	EM[1]	Rated Operational Current AC15 230V A	AC1 400V A	AC1 500V A	Type	Pack pcs.	Weight kg/pc.
1	-	-	**3,5**	2	6	**MU25A-PM10**	10	0,02
-	1	-	**3,5**	2	6	**MU25A-PM01**	10	0,02

1) early make

Shunt Release for mounting under the cover

Rated Control Voltage and Frequency V	Power Consumption VA	W	Type	Pack pcs.	Weight kg/pc.
24V 50/60Hz	2,7	1,8	**MU25A-A24**	10	0,06
110V 50Hz, 110-120V 60Hz	2,7	1,8	**MU25A-A110**	10	0,06
220-230V 50Hz, 240V 60Hz	2,7	1,8	**MU25A-A230**	10	0,06
380-415V 50Hz, 440V 60Hz	2,7	1,8	**MU25A-A400**	10	0,06

Under-voltage Release for mounting under the cover

Rated Control Voltage and Frequency V	Power Consumption VA	W	Type	Pack pcs.	Weight kg/pc.
24V 50/60Hz	2,7	1,8	**MU25A-U24**	10	0,06
110V 50Hz, 110-120V 60Hz	2,7	1,8	**MU25A-U110**	10	0,06
220-230V 50Hz, 240V 60Hz	2,7	1,8	**MU25A-U230**	10	0,06
380-415V 50Hz, 440V 60Hz	2,7	1,8	**MU25A-U400**	10	0,06

Accessories

Description	Specification	Type	Pack pcs.	Weight kg/pc.
Busbar Connector Fully Isolated, U_i 690V, I_u 63A				
Busbar	For 2 units 3-pole, 99mm long	**MU25A-D99**	10	0,036
Busbar	For 3 units 3-pole, 154mm long	**MU25A-D154**	10	0,060
Busbar	For 4 units 3-pole, 208mm long	**MU25A-D208**	10	0,084
Busbar	For 5 units 3-pole, 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	**MU25A-O55**	1	0,24
Moulded Front Plate	Protection to IP55	**MU25A-C55**	1	0,16
Locking Bracket	Suitable for 3 padlocks in "OFF"-position, stirrup diameter of the padlock max. 8 mm	**MU25A-Z**	1	0,10

Stop Button	Mushroom head	**MU25A-NAT**	1	0,04
Emergency Stop Button	latch, release by turning	**MU25A-NAV**	1	0,04
Emergency Stop Button	latch, release by key	**MU25A-NAS**	1	0,04

Neutral Conductor Block	for mounting in enclosure and front plate Wiring cross section 0,75 - 2,5mm²	**MU25A-NL**	10	0,01
Moulded Enclosure for 5-pole CEE-plug	Protection to IP54 with phase changing	**MU25A-GC1**	1	0,40

Manual Motor Starters

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

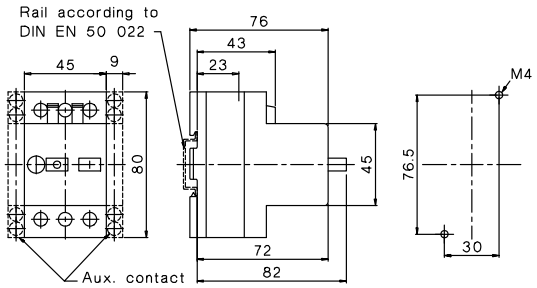
Type			MU25A			
Main Contacts						
Rated insulation voltage U_i		V~ [1]	690			
Rated operational current I_e (=I_{th}) open, at 50°C		A	25			
Mechanical life		S x 10^6	0,1			
Contact life at I_e /AC3		S x 10^6	0,1			
Tripping class according to IEC 60947-4-1			10A			
Rated ultimate short-circuit breaking capacity I_{cu}			220-240V AC	380-415V AC	500V AC	660-690V AC
Values for open unit, when incoming supply on upper terminals						
Setting range	to 1A	kA	100	100	100	100
	1 - 1,6A	kA	100	100	100	100
	1,6 - 2,5A	kA	100	100	3	2,5
	2,5 - 4A	kA	100	100	3	2,5
	4 - 6,3A	kA	100	100	3	2,5
	6,3 - 10A	kA	100	6/50 [2]	3	2,5
	10 - 16A	kA	10/100 [2]	6/50 [2]	2,5	2
	16 - 20A	kA	10/100 [2]	6/50 [2]	2,5	2
	20 - 25A	kA	10/100 [2]	6/50 [2]	2,5	2
	25 - 32A	kA	10/100 [2]	6/50 [2]	2,5	2
Short circuit protection			220-240V AC	380-415V AC	500V AC	660-690V AC
Setting range	to 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 to +55		
	enclosed	°C		-25 to +40		
Temperature compensation		°C		-20 to +55		
Power loss						
at rated current, warm condition		W	6 - 8			
Auxiliary Contacts						
Rated insulation voltage U_i		V~	500			
Thermal rated current I_{th}	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			
Short circuit protection						
max. fuse size	gL (gG)	A	6			
Cable cross-section						
Main connector	solid or stranded	mm²	0,75 - 4			
	flexible	mm²	0,75 - 2,5			
	flexible with multicore cable end	mm²	0,75 - 2,5			
Cables per clamp			2			
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			
Cables per clamp			2			
Resistance to shock according to IEC 68-2-27	Operation	g / ms	4 / 11			
	Solidity	g / ms	30 / 18			

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 6kV.
2) with current limiter MBS25-ID50 up to 415V AC

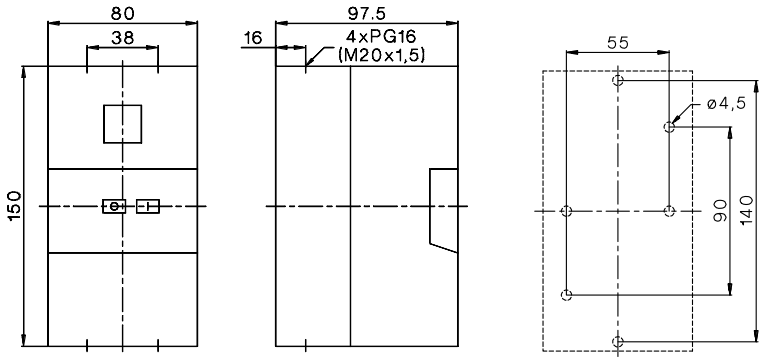
Manual Motor Starters

Dimensions

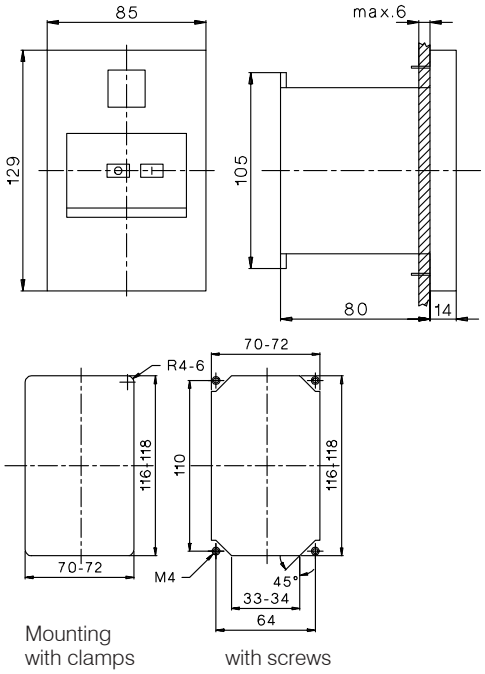
Manual Motor Starter
MU25A



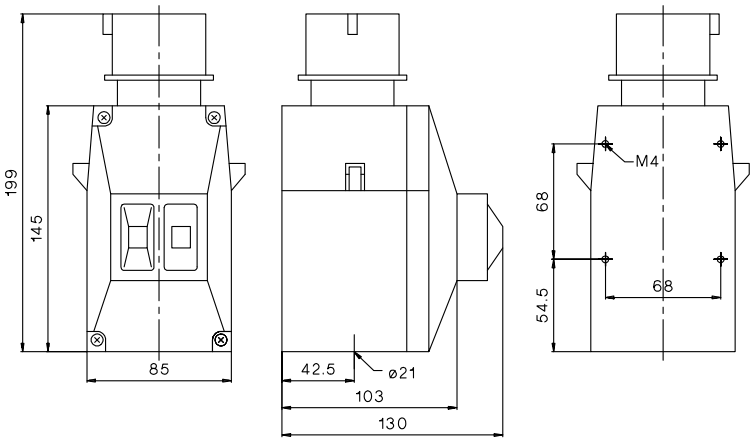
Moulded Enclosure
MU25A-O55



Moulded Front Plate
MU25A-C55



Moulded Enclosure for 5-pole CEE-plug
MU25A-GC1



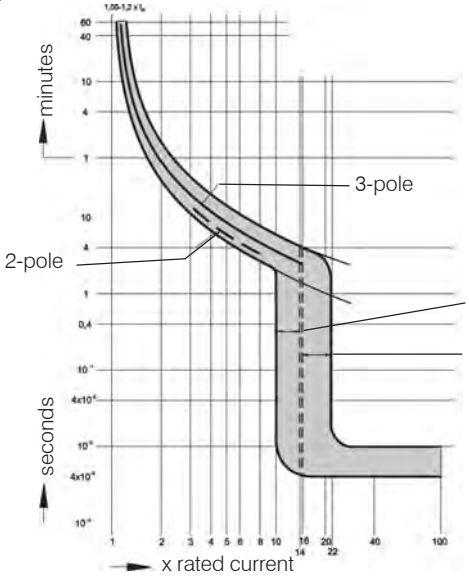
Temperature Compensation

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

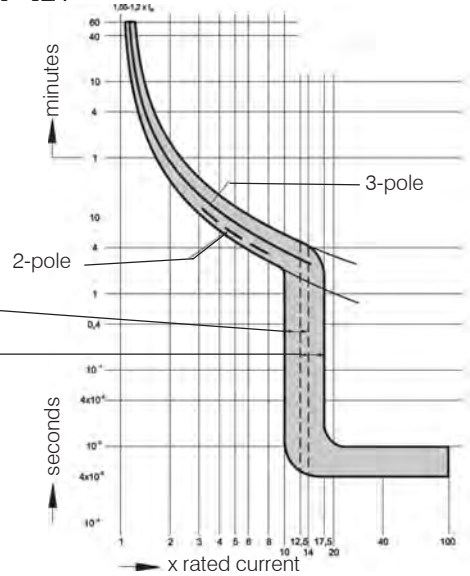
Example: Ambient temperature 60°C, full load motor current 5A
(60 - 20) x 0,3 = 12%
Setting value: 5A + 12% = 5,6A

Tripping Characteristic

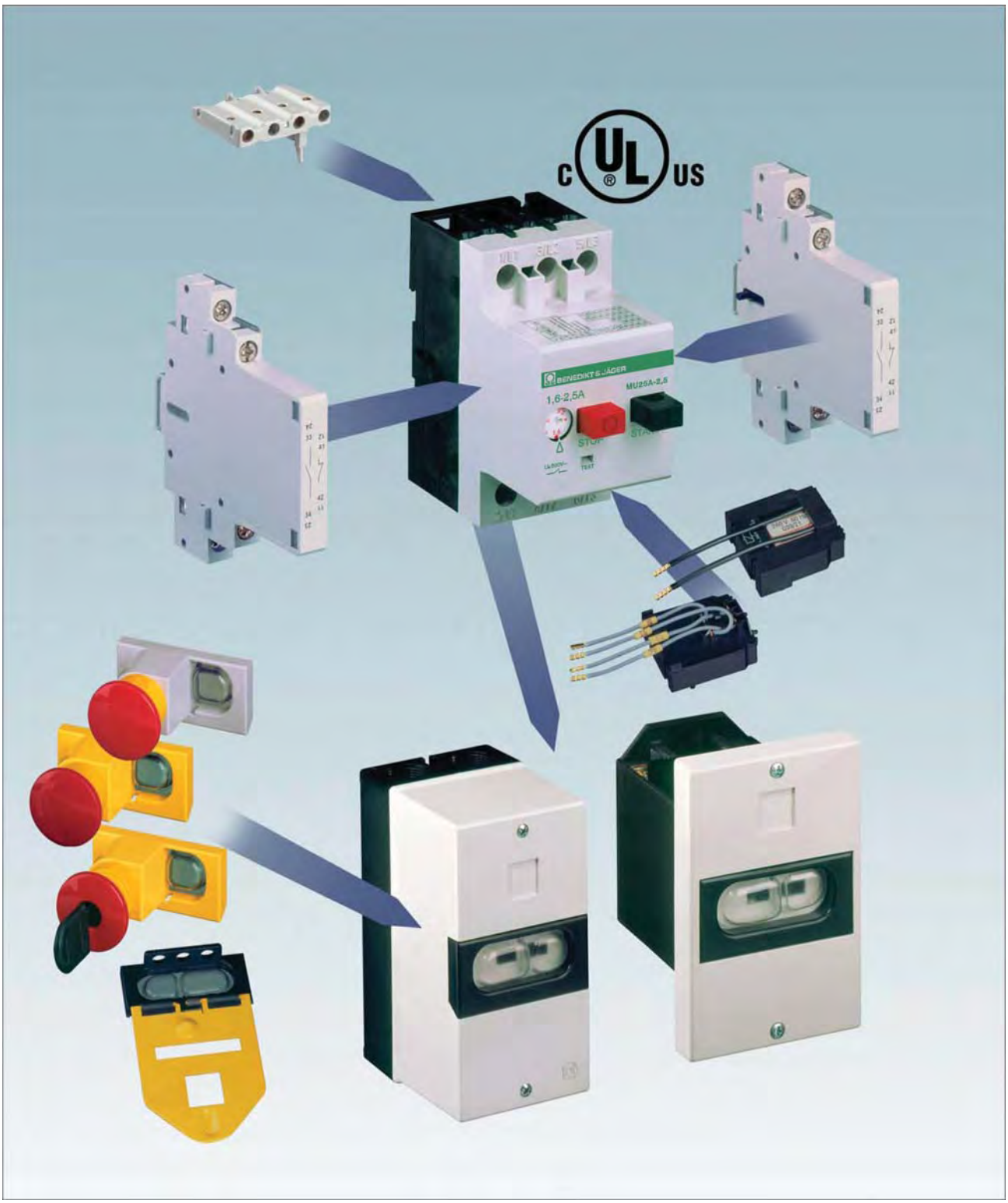
0,16 - 16A



16 - 32A



System MU25A



Approvals

Country	USA, Canada UL	Switzerland SEV	Europe	CB/CCA-Certificates
Type	c UL us LISTED		CE	
MU25A	o	o	/	-

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

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General

Test Authorities, Registration Mark, Approvals

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

Quality Control System

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

CE-Marking CE

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	c UL us Listed c UL us Component	EAC
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 Voltage V	Current Make A	Current Break A	Cont. Current A	Contact Rating Code Designation
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	Listed Industrial Control Equipment
UL issues yellow "Guide cards" with Guide- and File-No.	UL issues white "Guide cards" with Guide- and File-No.
Devices have permission to be marked with on the label c UL us	Devices have to be marked with the "UL-Listing Mark" c UL us
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" c UL us the approval is also valid for using as "Recognized Component" c UL us.

Approvals

Country	USA, Canada UL	Europe	Russia EAC	CB/CCA- Certificates
Type	c UL us	CE	EAC	
Cam Switches (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)				
M10	o	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	o
N61	-	o	o	o
N80	o	o	o	o
N100	o	o	o	o
N200	o	o	o	o
L400	o	o	-	-

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

/ No testing required CE

x In test

Technical Information

Degree of protection acc. to IEC 60947-1

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

1 st digit: Pertains to solid objects
2 nd 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 greater than 2,5mm	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.

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 quanties.
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 IEC60068-2-3 (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

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!

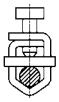
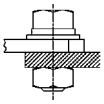
Mounting positions

Zulässige Umgebungstemperatur

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	Screw with clamp box	2 Screw s	Screw with w. nut	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	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
L100	-	-	2 x M5	-	Pz2	2,5 - 3	22 - 26
L160	-	-	-	M8		4 - 6,5	35 - 57
L400	-	-	-	M12		16	140
L600	-	-	-	M16		24	210
L800	-	-	-	M16		24	210
L1200	-	-	-	M16		24	210

Telux - Cam Switches

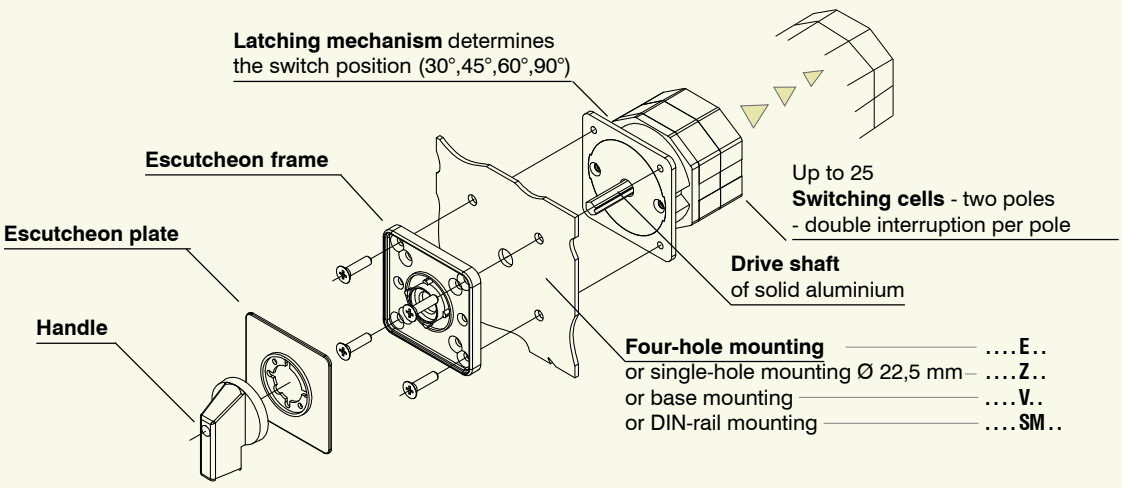
Typ	Ratings: Rated current Therm. I_{th} open A	AC21 A	atU_e V	Motor AC3 3~400V kW	AC23 3~400V A	kW	Plate mm	Designs: Panel moun. M10H, M20 IP65 IP40	Single hole mount. Ø22,5mm with Plate IP65	without Plate IP65	Flush mount. IP40
M4H	10	**10**	440	2,2	6	3	30❐	M4H E ●♦	M4H Z ●♦	M4H ZO ●♦	-
M10H	20	**20**	690	5,5	16	7,5	48❐	M10H E ●♦	M10H Z ●♦	M10H ZO ●♦	-
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	85	**85**	690	25	60	30	88❐	N61 E ●♦ -		-	-
N80	115	**115**	690	30	85	45	88❐	N80 E ●♦	-	-	-
L100	**125**	**125**	690	15	45	22	88❐	L100 E ●♦	-	-	-
L160	**180**	**180**	690	25	60	30	88❐	L160 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.

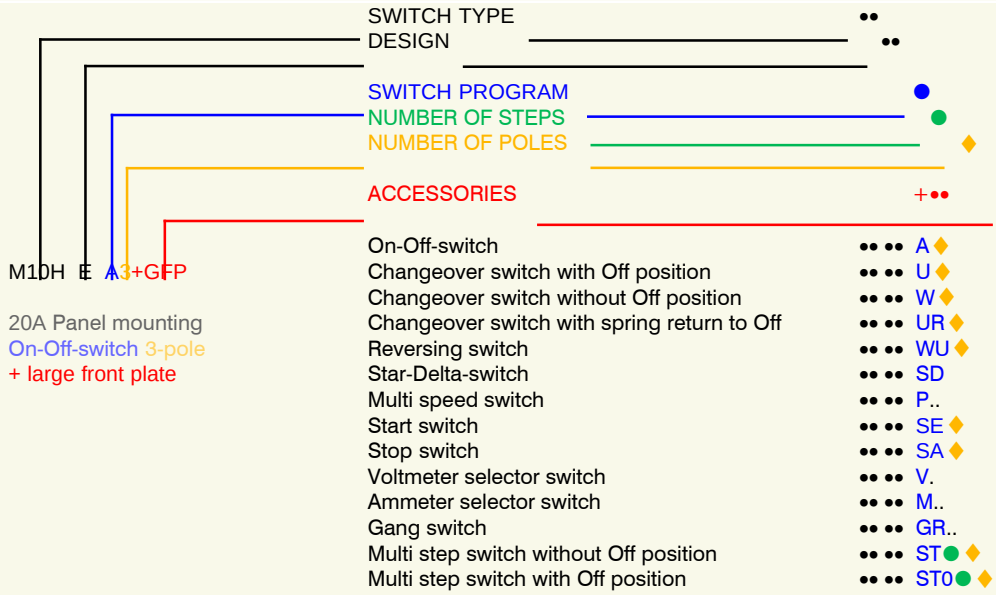
Load switch L.. 125 - 1200A

Load switches are primarily employed where resistive or slightly inductive current loads are to be switched on and off, or switching takes place without loading.
Load switches are assembled by parallel switching of two or more of cam switch contacts.
With customer built main terminal protection, load switch L.. can also be used as main switch.



Designs Base mounting IP40	DIN-rail mounting IP40	Modular IP40	Plastic enclosed ..P.. IP40 ..PF.. IP65	horizontal, IP65	Motor switch enclosed IP65	Terminal box mounting IP65	Cast enclosed ..G.. IP40 ..GF.. IP65
-	-	-	-	-	-	-	-
M10H V ●♦	M10H SM ●♦	M10H SMA ●♦	-	-	M10H PM ●♦	-	-
-	-	-	M10 P(F) ●♦	-	-	M10 KE ●♦	-
M20 V ●♦	M20 SM ●♦	M20 SMA ●♦	-	-	-	-	-
N20 V ●♦	N20 SM ●♦	-	N20 P(F) ●♦	-	N20 PM ●♦	N20 KE ●♦	N20 G(F) ●♦
N33F V ●♦	N33F SM ●♦	-	N33F P(F) ●♦	-	N33F PM ●♦	N33F KE ●♦	-
N40 V ●♦	-	-	N40 P(F) ●♦	N40 PLF ●♦	-	-	-
N61 V ●♦	-	-	N61 P(F) ●♦	N61 PLF ●♦ -		-	-
N80 V ●♦	-	-	N80 P(F) ●♦	N80 PLF ●♦	-	-	-
L100 V ●♦	-	-	-	-	-	-	-
L160 V ●♦	-	-	-	-	-	-	-
N100 V ●♦	-	-	N100 PF ●♦	-	-	-	-
N200 V ●♦	-	-	N200 PF ●♦	-	-	-	-
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 twist 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 256.

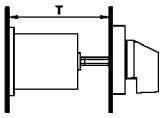
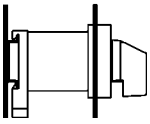
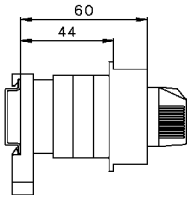
Design		Possible switch sizes					
Description	**Type appendix**	M10H	M20	N20 N33F	N40 N61 N80	N100 N200	L...
Panel mounting For installation in control panels, machines and equipment. For panel thickness of over 5mm, an extended switch shaft is required (appendix +VW). Protection from front: M10H, M20 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 poles and 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 twist 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 257.

Design Description	Type appendix	Possible switch sizes 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. Additional it is necessary to state the installation depth - that is the distance between mounting level of the switch and the inside edge of the door (dimension T).  Door couplings see page 244	**V ... +T/...**	**X**	**X**	**X**	**X**	**X**	**X**
 Snap-on mounting on DIN-rail Switch with square escutcheon plate, for snap-on mounting on standard DIN EN 50022 rail. Additional it is necessary to state the installation depth - that is the distance between mounting level of the switch and the inside edge of the door (dimension T).  Door couplings see page 244	**SM ... +T/...**	**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 .. with1-3 cells M20 SMA .. with1 or 2 cells  further dimensions see page 257	**SMA**	**X**	**X**	-	-	-	-

Plastic enclosed switches

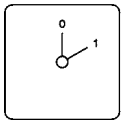
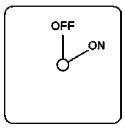
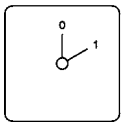
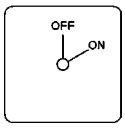
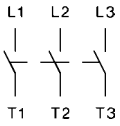
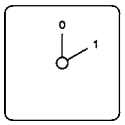
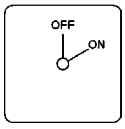
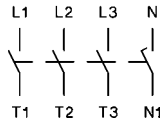
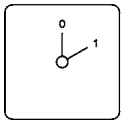
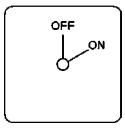
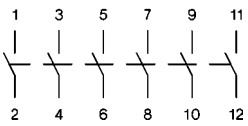
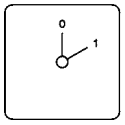
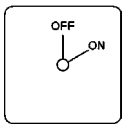
The switches, which have durable plastic enclosures, are intended for wall mounting or attachment to machines. In the standard version, they are supplied with a light-grey enclosure, square escutcheon plate, black markings on a silver background, and a black twist knob. Other colours and colour combinations 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). In addition, 1 or 2 pilot lamps (appendix +SL..) with neon lights can be installed.
Dimensions see page 258.

Cast aluminium enclosed switches

The switches with cast aluminium enclosures are intended for wall mounting or attachment to machines, under heavy-duty operating conditions. The switches are delivered with a square escutcheon plate, black markings on a silver background, and a black instrument knob. It is not possible to mount an additional rectangular plate. The enclosure base makes provision for 2 (4) entry glands with heavy-gauge conduit threads. If a switch with an aluminium enclosure is to be mounted directly on the terminal box of a motor, a 35mm or 50mm hole can be made in the floor of the switch enclosure. Design PLF is the replacement for designs G and GF at types N40 to N80.
Dimensions see page 259.

Design		Possible switch sizes							
Description	**Type appendix**	M10H	N20	N33F	N40	N61	N80	N100	N200
Plastic enclosure light grey Protection class IP40 Maximum number of cells	**P**	**X** 6	**X** 6	**X** 6	**X** 6	**X** 2	- 	- 	-
Plastic enclosure light grey Moisture protection Protection class IP65 Maximum number of cells	**PF**	**X** 6	**X** 6	**X** 6	**X** 6	**X** 5	**X** 5	**X** 4	**X** 3
Plastic enclosure horizontal light grey Moisture protection Protection class IP65 Maximum number of cells	**PLF**	- -	- -	- -	**X** 10	**X** 6	**X** 6	- 	-
Cast enclosure Protection class IP40 Maximum number of cells	**G**	- -	**X** 6	**-**	-	**-**	**-**	**-**	**-**
Cast enclosure Moisture protection Protection class IP65 Maximum number of cells	**GF**	**-** -	**X** 6	**-**	-	**-**	**-**	**-**	**-**
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** 12	**X** 12	**X** 12	-	-	-	-	-
Plastic motor switch enclosure Moisture protection Protection class IP65 Maximum number of cells	**PM**	**-** 	**X** 6	**-**	-	-	-	-	_

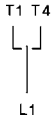
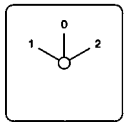
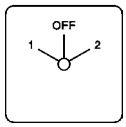
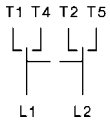
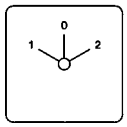
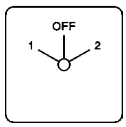
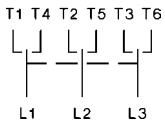
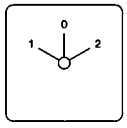
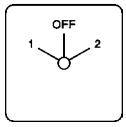
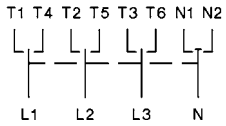
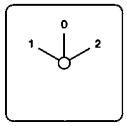
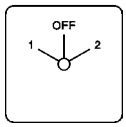
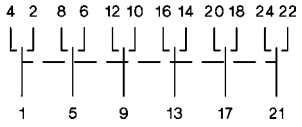
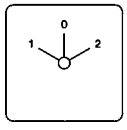
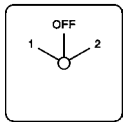
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
On-Off-switches A							
1-pole		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. A1**	
			32A	**M20 .**	**x x x x - -**	**. A1**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A1**	
			50A	**N33F .**	**x x x - x -**	**. A1**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A1**	**+003**
			80A	**N61 .**	**x - x - x -**	**. A1**	
			115A	**N80 .**	**x - x - - -**	**. A1**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A1**	
			250A	**N200 .**	**x - x - - -**	**. A1**	
2-pole		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. A2**	
			32A	**M20 .**	**x x x x - -**	**. A2**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A2**	
			50A	**N33F .**	**x x x - x -**	**. A2**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A2**	**+003**
			80A	**N61 .**	**x - x - x -**	**. A2**	
			115A	**N80 .**	**x - x - - -**	**. A2**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A2**	
			250A	**N200 .**	**x - x - - -**	**. A2**	
3-pole		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. A3**	
			32A	**M20 .**	**x x x x - -**	**. A3**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A3**	
			50A	**N33F .**	**x x x - x -**	**. A3**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A3**	**+003**
			80A	**N61 .**	**x - x - x -**	**. A3**	
			115A	**N80 .**	**x - x - - -**	**. A3**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A3**	
			250A	**N200 .**	**x - x - - -**	**. A3**	
4-pole 4. pole early make		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. A4**	
			32A	**M20 .**	**x x x x - -**	**. A4**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A4**	
			50A	**N33F .**	**x - x - x -**	**. A4**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A4**	**+003**
			80A	**N61 .**	**x - x - x -**	**. A4**	
			115A	**N80 .**	**x - x - - -**	**. A4**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A4**	
			250A	**N200 .**	**x - x - - -**	**. A4**	
6-pole		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. A6**	
			32A	**M20 .**	**x x x x - -**	**. A6**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A6**	
			50A	**N33F .**	**x - x - x -**	**. A6**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A6**	**+003**
			80A	**N61 .**	**x - x - x -**	**. A6**	
			115A	**N80 .**	**x - x - - -**	**. A6**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A6**	
			250A	**N200 .**	**x - x - - -**	**. A6**	

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

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

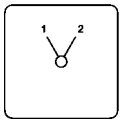
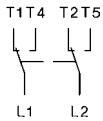
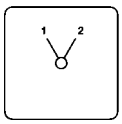
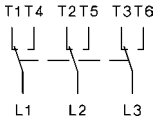
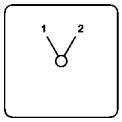
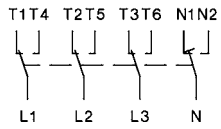
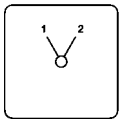
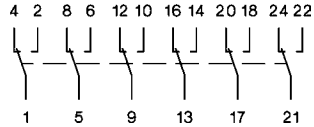
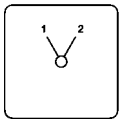
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Changeover switches U						
1-pole	*60°* 	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x** [1)] **x x x x - -**	**. U1** **. U1**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. U1** **. U1**	
		88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U1** **. U1** **. U1**	**+007** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U1** **. U1**	
2-pole	*60°* 	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1)] **-** **x x x x - -**	**. U2** **. U2**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. U2** **. U2**	
		88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x -**	**. U2** **. U2** **. U2**	**+007** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U2** **. U2**	
3-pole	*60°* 	3 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1)] **-** **x x x x - -**	**. U3** **. U3**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. U3** **. U3**	
		88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U3** **. U3** **. U3**	**+007** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U3** **. U3**	
4-pole 4. pole early make	*60°* 	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1)] **-** **x x x x - -**	**. U4** **. U4**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. U4** **. U4**	
		88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U4** **. U4** **. U4**	**+007** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U4** **. U4**	
6-pole	*60°* 	6 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - x**[1)] **-** **x x x - - -**	**. U6** **. U6**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. U6** **. U6**	
		88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U6** **. U6** **. U6**	**+007** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U6** **. U6**	

Ordering example: AC21 250A panel mounting, changeover switch 6-pole, Escutcheon plate 1 - OFF - 2 **N200 E U6+007**

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

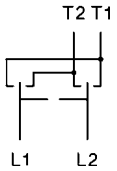
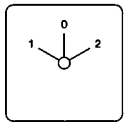
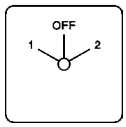
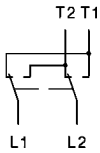
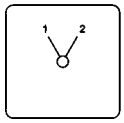
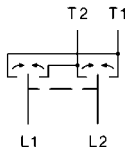
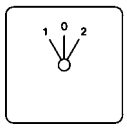
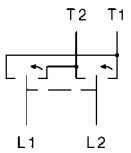
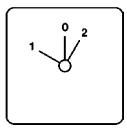
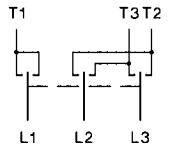
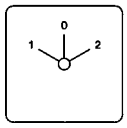
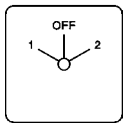
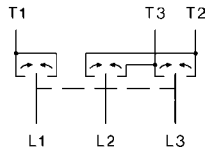
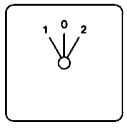
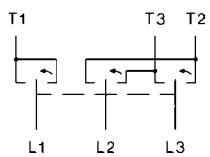
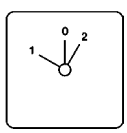
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Changeover switches without off W							
1-pole		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. W1**	
			32A	**M20 .**	**x x x x - -**	**. W1**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W1**	
			50A	**N33F .**	**x x x - x -**	**. W1**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W1**	
			80A	**N61 .**	**x - x - x -**	**. W1**	
			115A	**N80 .**	**x - x - - -**	**. W1**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W1**	
			250A	**N200 .**	**x - x - - -**	**. W1**	
2-pole		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. W2**	
			32A	**M20 .**	**x x x x - -**	**. W2**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W2**	
			50A	**N33F .**	**x x x - x -**	**. W2**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W2**	
			80A	**N61 .**	**x - x - x -**	**. W2**	
			115A	**N80 .**	**x - x - - -**	**. W2**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W2**	
			250A	**N200 .**	**x - x - - -**	**. W2**	
3-pole		*60°*	3 48❐ 20A	**M10H .**	**x x x x x¹) - -**	**. W3**	
			32A	**M20 .**	**x x x x - -**	**. W3**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W3**	
			50A	**N33F .**	**x x x - x -**	**. W3**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W3**	
			80A	**N61 .**	**x - x - x -**	**. W3**	
			115A	**N80 .**	**x - x - - -**	**. W3**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W3**	
			250A	**N200 .**	**x - x - - -**	**. W3**	
4-pole 4. pole early make		*60°*	4 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. W4**	
			32A	**M20 .**	**x x x x - -**	**. W4**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W4**	
			50A	**N33F .**	**x - x - x -**	**. W4**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W4**	
			80A	**N61 .**	**x - x - x -**	**. W4**	
			115A	**N80 .**	**x - x - - -**	**. W4**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W4**	
			250A	**N200 .**	**x - x - - -**	**. W4**	
6-pole		*60°*	6 48 ❐ 20A	**M10H .**	**x x x - x¹) - -**	**. W6**	
			32A	**M20 .**	**x x x - - -**	**. W6**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W6**	
			50A	**N33F .**	**x - x - x -**	**. W6**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W6**	
			80A	**N61 .**	**x - x - x -**	**. W6**	
			115A	**N80 .**	**x - x - - -**	**. W6**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W6**	
			250A	**N200 .**	**x - x - - -**	**. W6**	

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

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

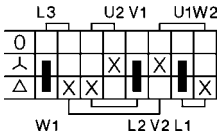
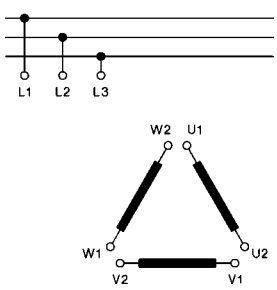
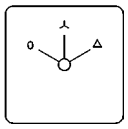
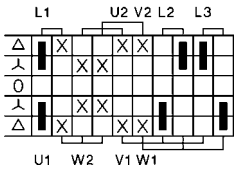
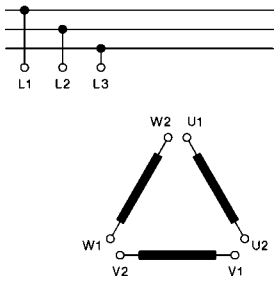
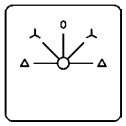
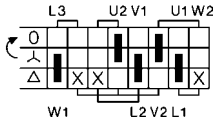
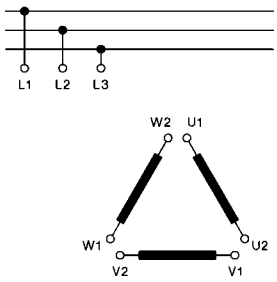
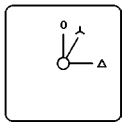
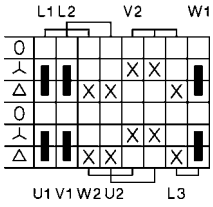
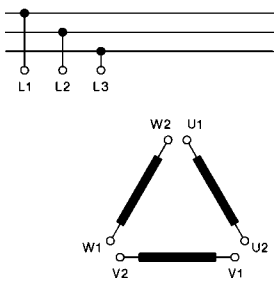
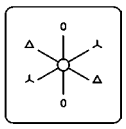
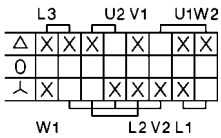
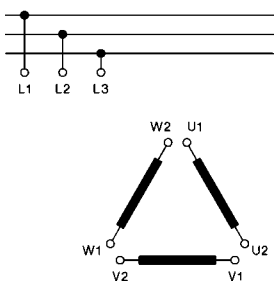
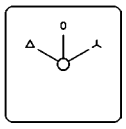
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Reversing switches WU							
2-pole		*60°*	2 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WU2** **. WU2**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x x x - x - .**	**. WU2** **. WU2**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**. WU2** **. WU2** **. WU2**	**+007** 
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**. WU2** **. WU2**	
2-pole without off cross switch		*60°*	2 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WK2** **. WK2**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x x x - x - .**	**. WK2** **. WK2**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x x - x - .** **x - x - x - .** **x - x - - - .**	**. WK2** **. WK2** **. WK2**	
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**. WK2** **. WK2**	
2-pole with spring return from both sides to off		*30°*	2 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WU2R2** **. WU2R2**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **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 .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WU2R1** **. WU2R1**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x x x - x - .**	**. WU2R1** **. WU2R1**	
			88 ❒ 63A	**N40 .**	**x - x - x - .**	**. WU2R1**	
3-pole		*60°*	3 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WU3** **. WU3**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x x x - x - .**	**. WU3** **. WU3**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**. WU3** **. WU3** **. WU3**	**+007** 
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**. WU3** **. WU3**	
3-pole with spring return from both sides to off		*30°*	3 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WU3R2** **. WU3R2**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **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 .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**. WU3R1** **. WU3R1**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **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.

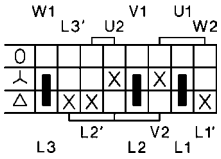
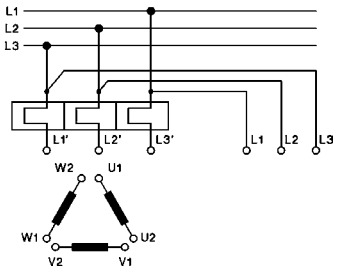
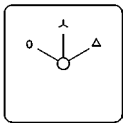
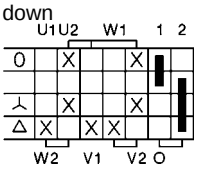
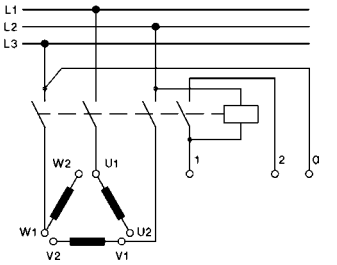
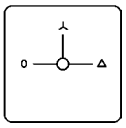
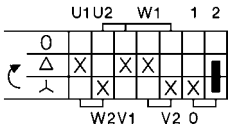
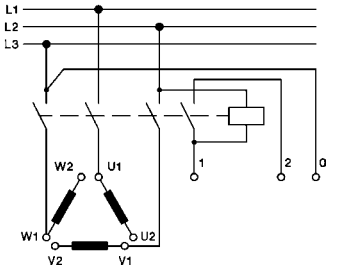
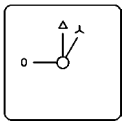
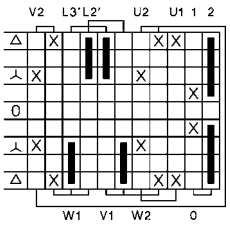
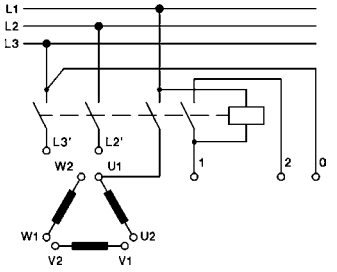
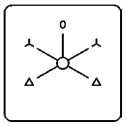
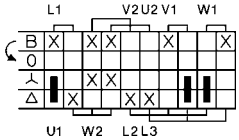
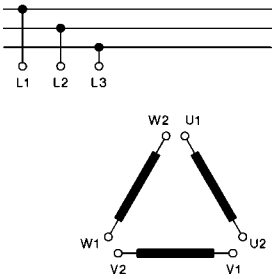
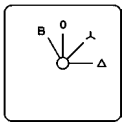
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Star-Delta switches SD							
1 rotary direction 		*60°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - -** **x x x x - -**	**. SD** **. SD**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SD** **. SD**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SD** **. SD** **. SD**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SD** **. SD**	
both rotary directions 		*45°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ -** **x x x x - -**	**. SDR** **. SDR**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDR** **. SDR**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDR** **. SDR** **. SDR**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDR** **. SDR**	
1 rotary direction spring return from ⅄ to off 		°	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ -** **x x x x - -**	**. SRD** **. SRD**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SRD** **. SRD**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SRD** **. SRD** **. SRD**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SRD** **. SRD**	
1 rotary direction with clockwise operation and backswitch interlock 		*60°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ -** **x x x x - -**	**. SDRU** **. SDRU**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDRU** **. SDRU**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDRU** **. SDRU** **. SDRU**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDRU** **. SDRU**	
Star-Delta selector switch 		*60°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ -** **x x x x - -**	**. SDU** **. SDU**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDU** **. SDU**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDU** **. SDU** **. SDU**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDU** **. SDU**	

Ordering example: AC21 32A cast enclosed, star-delta selector switch **N20 G SDU**

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

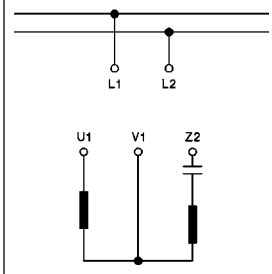
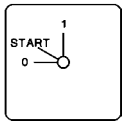
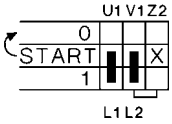
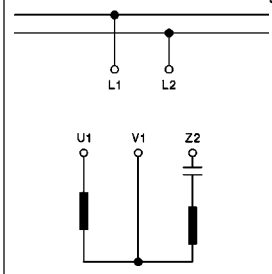
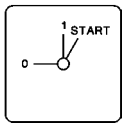
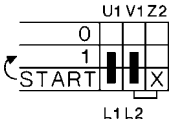
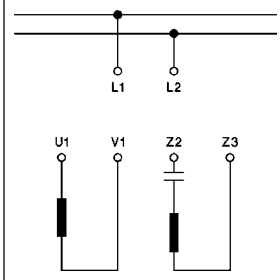
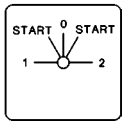
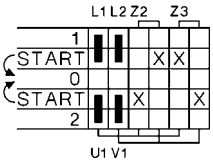
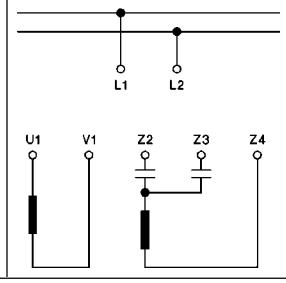
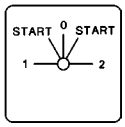
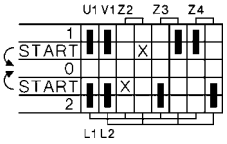
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Star-Delta switches SD						
with double outfeed phases for use with manual motor starter 	*60°* 	4 48 ❒ 20A	**M10H .**	x x x x x[1] -	. SDMO	
		32A	**M20 .**	x x x x - -	. SDMO	
		64 ❒ 32A	**N20 .**	x - x - x x	. SDMO	
		50A	**N33F .**	x - x - x -	. SDMO	
		88 ❒ 63A	**N40 .**	x - x x -	. SDMO	
		80A	**N61 .**	x - x - x -	. SDMO	
		115A	**N80 .**	x - x - - -	. SDMO	
		132❒ 150A	**N100 .**	x - x - - -	. SDMO	
		250A	**N200 .**	x - x - - -	. SDMO	
with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break-down 	*90°* 	4 48 ❒ 20A	**M10H .**	x x x x x[1] -	. SDJ1	
		32A	**M20 .**	x x x x - -	. SDJ1	
		64 ❒ 32A	**N20 .**	x - x - x x	. SDJ1	
		50A	**N33F .**	x - x - x -	. SDJ1	
		88 ❒ 63A	**N40 .**	x - x - x -	. SDJ1	
		80A	**N61 .**	x - x - x -	. SDJ1	
		115A	**N80 .**	x - x - - -	. SDJ1	
		132❒ 150A	**N100 .**	x - x - - -	. SDJ1	
		250A	**N200 .**	x - x - - -	. SDJ1	
with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break-down, spring return to 	*90°+30°* 	4 48 ❒ 20A	**M10H .**	x x x x x[1] -	. SDJ2	
		32A	**M20 .**	x x x x - -	. SDJ2	
		64 ❒ 32A	**N20 .**	x - x - x x	. SDJ2	
		50A	**N33F .**	x - x - x -	. SDJ2	
		88 ❒ 63A	**N40 .**	x - x - x -	. SDJ2	
		80A	**N61 .**	x - x - x -	. SDJ2	
		115A	**N80 .**	x - x - - -	. SDJ2	
		132❒ 150A	**N100 .**	x - x - - -	. SDJ2	
		250A	**N200 .**	x - x - - -	. SDJ2	
as type SDJ1 but for both rotary directions 	*60°* 	7 48 ❒ 20A	**M10H .**	x x x - - -	. SDRJ1	
		32A	**M20 .**	x x x - - -	. SDRJ1	
		64 ❒ 32A	**N20 .**	x - x - x x	. SDRJ1	
		50A	**N33F .**	x - x - - -	. SDRJ1	
		88 ❒ 63A	**N40 .**	x - x - x -	. SDRJ1	
		80A	**N61 .**	x - x - - -	. SDRJ1	
		115A	**N80 .**	x - x - - -	. SDRJ1	
		132❒ 150A	**N100 .**	x - x - - -	. SDRJ1	
		250A	**N200 .**	x - x - - -	. SDRJ1	
with brake position (counter current braking) brake position is a momentary operation 	*45°+30°* 	5 48 ❒ 20A	**M10H .**	x x x x x[1] -	. SDB	
		32A	**M20 .**	x x x x - -	. SDB	
		64 ❒ 32A	**N20 .**	x - x - x x	. SDB	
		50A	**N33F .**	x - x - x -	. SDB	
		88 ❒ 63A	**N40 .**	x - x - x -	. SDB	
		80A	**N61 .**	x - x - x -	. SDB	
		115A	**N80 .**	x - x - - -	. SDB	
		132 ❒ 150A	**N100 .**	x - x - - -	. SDB	
		250A	**N200 .**	x - x - - -	. SDB	

Ordering example: AC21 250A panel mounting star-delta switch with brake position **N200 E SDB**

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

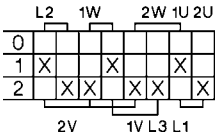
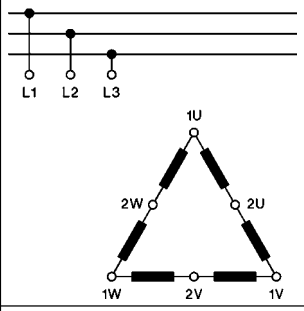
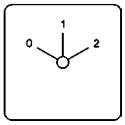
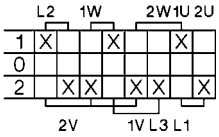
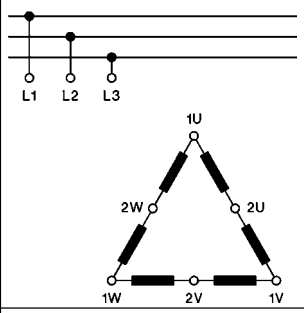
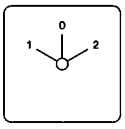
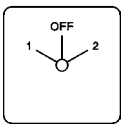
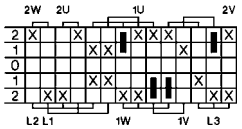
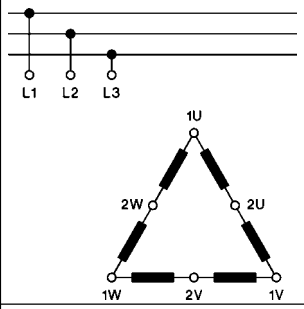
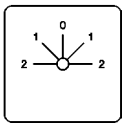
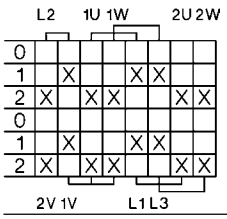
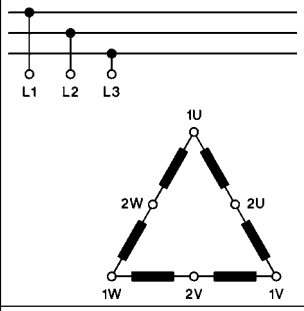
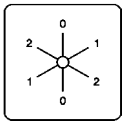
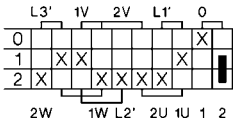
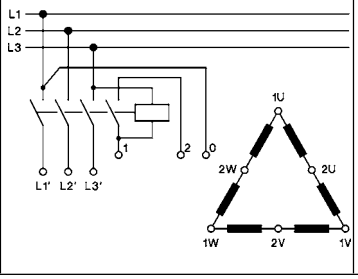
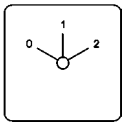
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	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	**M10H .**	x x x x x[1] -	**. HP1**	
					32A	**M20 .**	x x x x - -	**. HP1**	
				64 ❐	32A	**N20 .**	x - x - x x	**. HP1**	
					50A	**N33F .**	x - x - x -	**. 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	**M10H .**	x x x x x[1] -	**. HP2**	
					32A	**M20 .**	x x x x - -	**. HP2**	
				64 ❐	32A	**N20 .**	x - x - x x	**. HP2**	
					50A	**N33F .**	x - x - x -	**. 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	**M10H .**	x x x x x[1] -	**. HPR1**	
					32A	**M20 .**	x x x x - -	**. HPR1**	
				64 ❐	32A	**N20 .**	x - x - x x	**. HPR1**	
					50A	**N33F .**	x - x - x -	**. HPR1**	
				88 ❐	63A	**N40 .**	x - x - x -	**. HPR1**	
as type HPR1 with starting and phase-shifting capacitor		*60°+30°*	4	48 ❐	20A	**M10H .**	x x x x x[1] -	**. HPR2**	
					32A	**M20 .**	x x x x - -	**. HPR2**	
				64 ❐	32A	**N20 .**	x - x - x x	**. HPR2**	
					50A	**N33F .**	x - x - x -	**. 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.

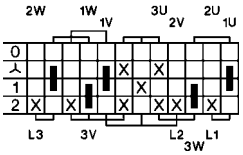
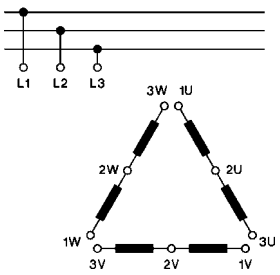
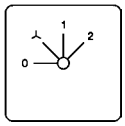
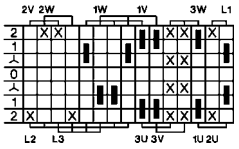
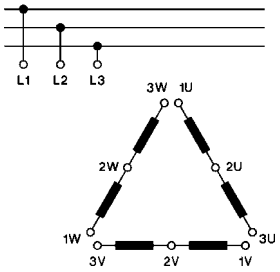
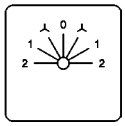
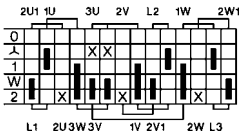
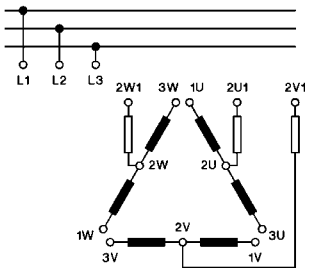
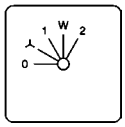
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P						
1 Dahlander winding 1 rotary direction 	*60°* 	4 48 ❐ 20A 32A	**M10H . x x x x x¹⁾ - . P61** **M20 . x x x x - - . P61**			
		64 ❐ 32A 50A	**N20 . x - x - x x . P61** **N33F . x - x - x - . P61**			
		88 ❐ 63A 80A 115A	**N40 . x - x - x - . P61** **N61 . x - x - x - . P61** **N80 . x - x - - - . P61**			
		132❐ 150A 250A	**N100 . x - x - - - . P61** **N200 . x - x - - - . P61**			
1 Dahlander winding 1 rotary direction 	*60°* 	4 48 ❐ 20A 32A	**M10H . x x x x x¹⁾ - . P62** **M20 . x x x x - - . P62**			
		64 ❐ 32A 50A	**N20 . x - x - x x . P62** **N33F . x - x - x - . P62**			
		88 ❐ 63A 80A 115A	**N40 . x - x - x - . P62** **N61 . x - x - x - . P62** **N80 . x - x - - - . P62**			**+007** 
		132❐ 150A 250A	**N100 . x - x - - - . P62** **N200 . x - x - - - . P62**			
1 Dahlander winding both rotary directions 		7 48 ❐ 20A 32A	**M10H . x x x - - - . P61R** **M20 . x x x - - - . P61R**			
		64 ❐ 32A 50A	**N20 . x - x - x - . P61R** **N33F . x - x - - - . P61R**			
		88 ❐ 63A 80A 115A	**N40 . x - x - x - . P61R** **N61 . x - x - - - . P61R** **N80 . x - x - - - . P61R**			
		132❐ 150A 250A	**N100 . x - x - - - . P61R** **N200 . x - x - - - . P61R**			
1 Dahlander winding 1 rotary direction, clockwise operation 	*60°* 	5 48 ❐ 20A 32A	**M10H . x x x x x¹⁾ - . P61RU** **M20 . x x x x - - . P61RU**			
		64 ❐ 32A 50A	**N20 . x - x - x x . P61RU** **N33F . x - x - x - . P61RU**			
		88 ❐ 63A 80A 115A	**N40 . x - x - x - . P61RU** **N61 . x - x - x - . P61RU** **N80 . x - x - - - . P61RU**			
		132❐ 150A 250A	**N100 . x - x - - - . P61RU** **N200 . x - x - - - . P61RU**			
1 Dahlander winding 1 rotary direction, with auxiliary contacts for contactor control 	*60°* 	5 48 ❐ 20A 32A	**M10H . x x x x x¹⁾ - . P61J** **M20 . x x x x - - . P61J**			
		64 ❐ 32A 50A	**N20 . x - x - x x . P61J** **N33F . x - x - x - . P61J**			
		88 ❐ 63A 80A 115A	**N40 . x - x - x - . P61J** **N61 . x - x - x - . P61J** **N80 . x - x - - - . P61J**			
		132❐ 150A 250A	**N100 . x - x - - - . P61J** **N200 . x - x - - - . 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.

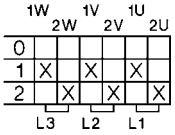
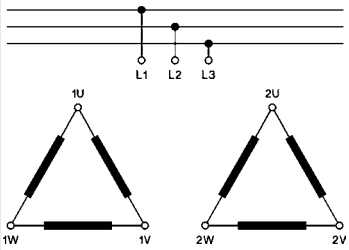
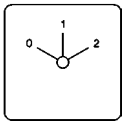
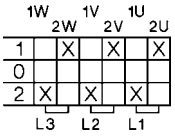
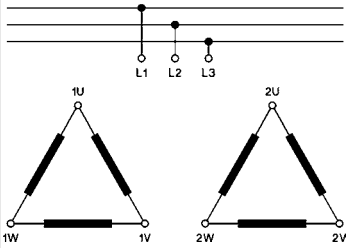
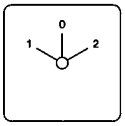
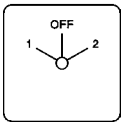
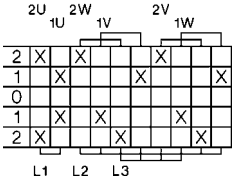
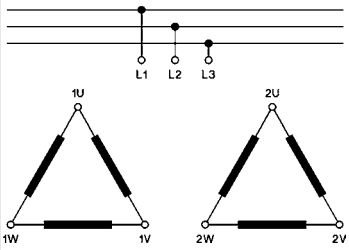
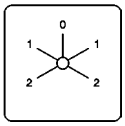
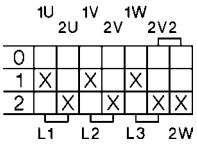
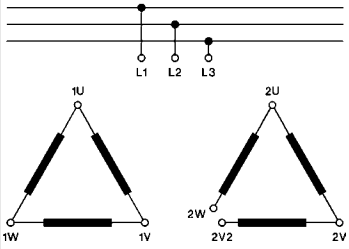
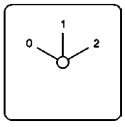
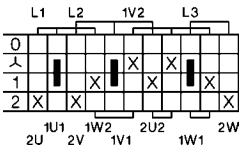
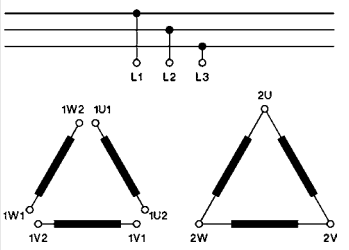
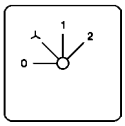
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21		Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P								
open Dahlander winding 1 rotary direction low speed with star-delta-start 		*45°*	6	48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - x[1] - x x x - - -	**. P91** **. P91**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. P91** **. P91**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. P91** **. P91** **. P91**	
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. P91** **. P91**	
open Dahlander winding both rotary directions low speed with star-delta-start 		*30°*	8	48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. P91R** **. P91R**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x - x - x - - -	**. P91R** **. P91R**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - - - x - x - - -	**. P91R** **. P91R** **. P91R**	
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - 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 .** **M20 .**	x x x - - - x x x - - -	**. P91W** **. P91W**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x - x - x - - -	**. P91W** **. P91W**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - - - x - x - - -	**. P91W** **. P91W** **. P91W**	
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - 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.

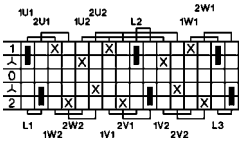
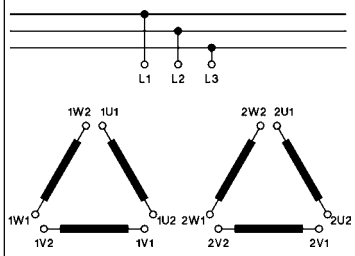
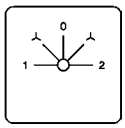
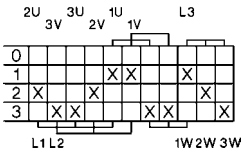
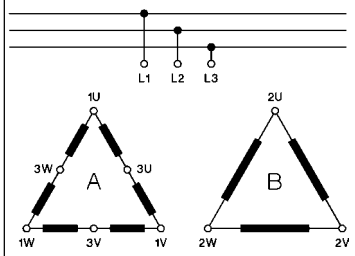
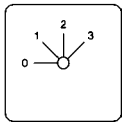
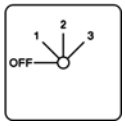
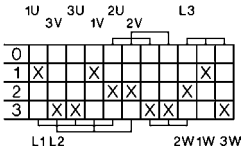
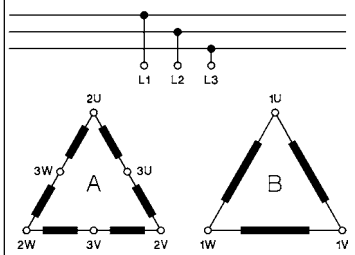
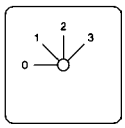
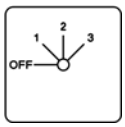
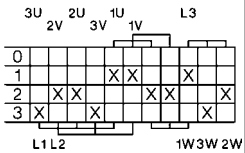
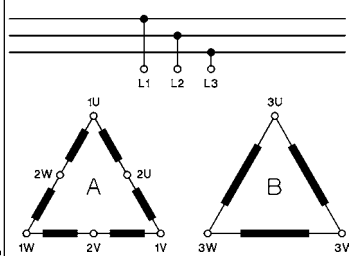
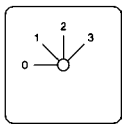
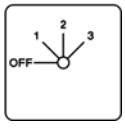
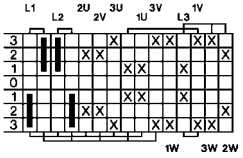
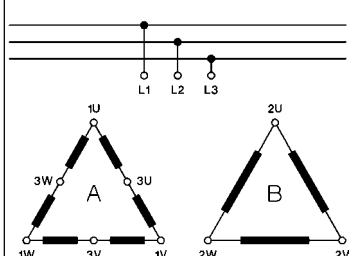
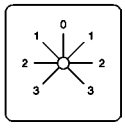
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P						
2 separate windings 1 rotary direction 	*60°* 	3 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 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 - - - - - - - -**	**. P63** **. P63** **. P63** **. P63** **. P63** **. P63** **. P63** **. P63** **. P63**	
2 separate windings 1 rotary direction 	*60°* 	3 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 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 - - - - - - - -**	**. P64** **. P64** **. P64** **. P64** **. P64** **. P64** **. P64** **. P64** **. P64**	 **+007** 
2 separate windings both rotary directions 	*60°* 	5 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 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 - - - - - - - -**	**. P66** **. P66** **. P66** **. P66** **. P66** **. P66** **. P66** **. P66** **. P66**	
2 separate windings 1 opened 1 rotary direction 	*60°* 	4 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 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 - - - - - - - -**	**. P71** **. P71** **. P71** **. P71** **. P71** **. P71** **. P71** **. P71** **. P71**	
2 separate windings 1 rotary direction low speed with star-delta-start 	*45°* 	6 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N61 .** **N80 .** **N100 .** **N200 .**	**x x x - x[1] - x x x - - x x - x - x - x - - - - - - - -**	**. P96** **. P96** **. P96** **. P96** **. P96** **. P96** **. P96** **. P96** **. 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 see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P								
2 separate windings 1 rotary direction both speeds with star-delta-start		*45°* 	8	48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. P122** **. P122**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x - x - x - - -	**. P122** **. P122**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - - - x - x - - -	**. P122** **. P122** **. P122**	
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. P122** **. P122**	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-A△-B△or⅄-A⅄		*45°* 	6	48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - x[1] - x x x - - -	**. P93** **. P93**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. P93** **. P93**	
				88 ❐ 63A 80A 115A	**N40 .** **N61.** **N80 .**	x - x - x - x - x - x - x - x - - -	**. P93** **. P93** **. P93**	+127 
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. P93** **. P93**	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-B△or⅄-A△-A⅄		*45°* 	6	48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - x[1] - x x x - - -	**. P94** **. P94**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x - x - x - x -	**. P94** **. P94**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. P94** **. P94** **. P94**	+127 
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. P94** **. P94**	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-A△-A⅄-B△or⅄		*45°* 	6	48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - x[1] - x x x - - -	**. P95** **. P95**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. P95** **. P95**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. P95** **. P95** **. P95**	+127 
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. P95** **. P95**	
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 - - -	**. P93R** **. P93R**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. P93R** **. P93R**	
				88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. P93R** **. P93R** **. P93R**	
				132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - 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**

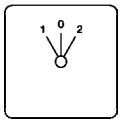
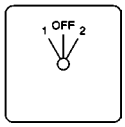
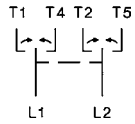
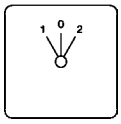
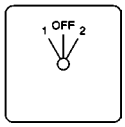
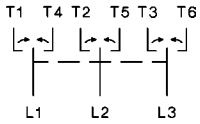
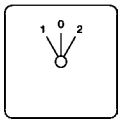
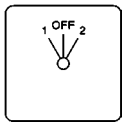
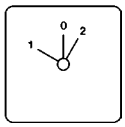
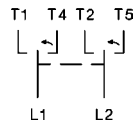
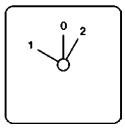
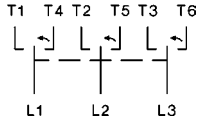
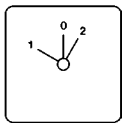
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P						
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions	*45°*	9 48 ❒ 20A	**M10H .**	x x x - - -	**. P94R**	
		32A	**M20 .**	x x x - - -	**. P94R**	
		64 ❒ 32A	**N20 .**	x - x - - -	**. P94R**	
		50A	**N33F .**	x - x - - -	**. P94R**	
		88 ❒ 63A	**N40 .**	x - x - - -	**. P94R**	
		80A	**N61 .**	x - x - - -	**. P94R**	
		115A	**N80 .**	x - x - - -	**. P94R**	
		132❒ 150A	**N100 .**	x - x - - -	**. P94R**	
		250A	**N200 .**	x - x - - -	**. P94R**	
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions	*45°*	8 48 ❒ 20A	**M10H .**	x x x - - -	**. P95R**	
		32A	**M20 .**	x x x - - -	**. P95R**	
		64 ❒ 32A	**N20 .**	x - x - x -	**. P95R**	
		50A	**N33F .**	x - x - - -	**. P95R**	
		88 ❒ 63A	**N40 .**	x - x - x -	**. P95R**	
		80A	**N61 .**	x - x - - -	**. P95R**	
		115A	**N80 .**	x - x - - -	**. P95R**	
		132❒ 150A	**N100 .**	x - x - - -	**. P95R**	
		250A	**N200 .**	x - x - - -	**. P95R**	
2 Dahlander windings 4 speeds 1 rotary direction 0 - A △ - B △ - A 丛 - B 丛	*30°*	8 48 ❒ 20A	**M10H .**	x x x - - -	**. P124**	
		32A	**M20 .**	x x x - - -	**. P124**	
		64 ❒ 32A	**N20 .**	x - x - x -	**. P124**	
		50A	**N33F .**	x - x - - -	**. P124**	
		88 ❒ 63A	**N40 .**	x - x - x -	**. P124**	+112
		80A	**N61 .**	x - x - - -	**. P124**	
		115A	**N80 .**	x - x - - -	**. P124**	
		132❒ 150A	**N100 .**	x - x - - -	**. P124**	
		250A	**N200 .**	x - x - - -	**. P124**	
2 Dahlander windings 4 speeds both rotary directions	*30°*	12 48 ❒ 20A	**M10H .**	x x x - - -	**. P124R**	
		32A	**M20 .**	x x x - - -	**. P124R**	
		64 ❒ 32A	**N20 .**	x - x - - -	**. P124R**	
		50A	**N33F .**	x - x - - -	**. P124R**	
		88 ❒ 63A	**N40 .**	x - x - - -	**. P124R**	
		80A	**N61 .**	x - x - - -	**. P124R**	
		115A	**N80 .**	x - x - - -	**. P124R**	
		132❒ 150A	**N100 .**	x - x - - -	**. P124R**	
		250A	**N200 .**	x - x - - -	**. P124R**	

Ordering example: AC21 250A Base mounting, multi speed switch, 2 Dahlander windings, 4 speeds, 1 rotary direction **N200 V P124**

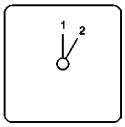
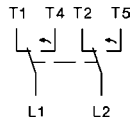
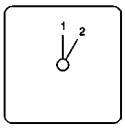
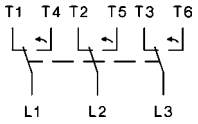
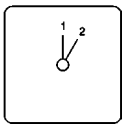
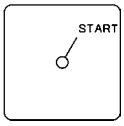
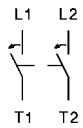
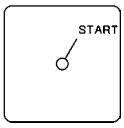
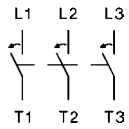
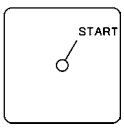
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Changeover switches with spring return to off UR									
1-pole		*30°*	1	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UR1**	
					32A	**M20 .**	**x x x x - -**	**. UR1**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UR1**	
					50A	**N33F .**	**x - x - x -**	**. UR1**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UR1**	**+264** 
2-pole		*30°*	2	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UR2**	
					32A	**M20 .**	**x x x x - -**	**. UR2**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UR2**	
					50A	**N33F .**	**x - x - x -**	**. UR2**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UR2**	**+264** 
3-pole		*30°*	3	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UR3**	
					32A	**M20 .**	**x x x x - -**	**. UR3**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UR3**	
					50A	**N33F .**	**x - x - x -**	**. 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	**M10H .**	**x x x x x[1] - -**	**. UK1**	
					32A	**M20 .**	**x x x x - -**	**. UK1**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UK1**	
					50A	**N33F .**	**x - x - x -**	**. UK1**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UK1**	
2-pole position 1 latched position 2 with spring return		*60°+30°*	2	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UK2**	
					32A	**M20 .**	**x x x x - -**	**. UK2**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UK2**	
					50A	**N33F .**	**x - x - x -**	**. UK2**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UK2**	
3-pole position 1 latched position 2 with spring return		*60°+30°*	3	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UK3**	
					32A	**M20 .**	**x x x x - -**	**. UK3**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UK3**	
					50A	**N33F .**	**x - x - x -**	**. UK3**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UK3**	

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

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

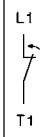
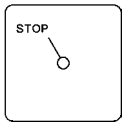
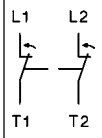
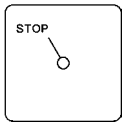
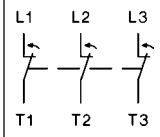
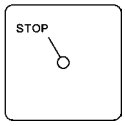
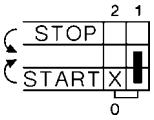
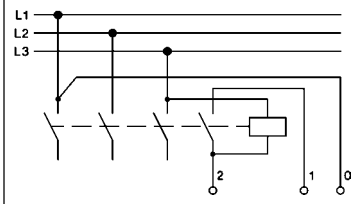
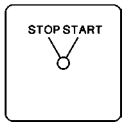
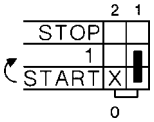
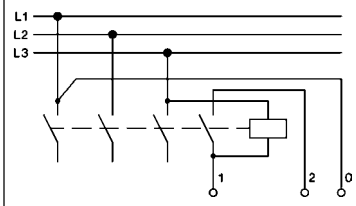
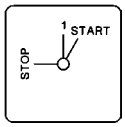
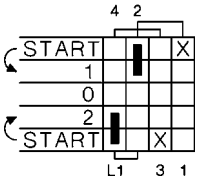
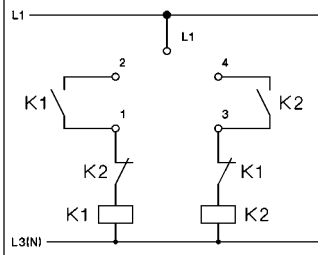
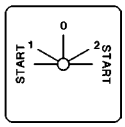
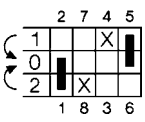
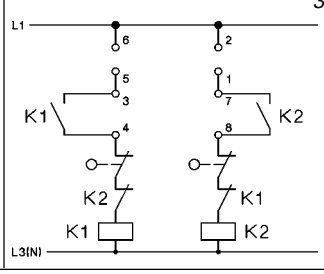
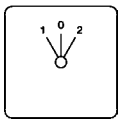
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Double throw switches with spring return to off WR						
1-pole	*30°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. W1R**	
		32A	**M20 .**	**x x x x - -**	**. W1R**	
		64 ❐ 32A	**N20 .**	**x - x - x x**	**. W1R**	
		50A	**N33F .**	**x - x - x -**	**. W1R**	
		88 ❐ 63A	**N40 .**	**x - x - x -**	**. W1R**	
2-pole	*30°* 	2 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. W2R**	
		32A	**M20 .**	**x x x x - -**	**. W2R**	
		64 ❐ 32A	**N20 .**	**x - x - x x**	**. W2R**	
		50A	**N33F .**	**x - x - x -**	**. W2R**	
		88 ❐ 63A	**N40 .**	**x - x - x -**	**. W2R**	
3-pole	*30°* 	3 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. W3R**	
		32A	**M20 .**	**x x x x - -**	**. W3R**	
		64 ❐ 32A	**N20 .**	**x - x - x x**	**. W3R**	
		50A	**N33F .**	**x - x - x -**	**. W3R**	
		88 ❐ 63A	**N40 .**	**x - x - x -**	**. W3R**	
Start-Stop switches S						
Start-switch,1-pole	*30°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. SE**	
		32A	**M20 .**	**x x x x - -**	**. SE**	
		64 ❐ 32A	**N20 .**	**x - x - x x**	**. SE**	
		50A	**N33F .**	**x - x - x -**	**. SE**	
Start-switch, 2-pole	*30°* 	1 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. S2E**	
		32A	**M20 .**	**x x x x - -**	**. S2E**	
		64 ❐ 32A	**N20 .**	**x - x - x x**	**. S2E**	
		50A	**N33F .**	**x - x - x -**	**. S2E**	
Start-switch, 3-pole	*30°* 	2 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. S3E**	
		32A	**M20 .**	**x x x x - -**	**. S3E**	
		64 ❐ 32A	**N20 .**	**x - x - x x**	**. S3E**	
		50A	**N33F .**	**x - x - x -**	**. S3E**	

Bestellbeispiel: AC21 50A base mounting, Start-switch, 3-pole **N33F V S3E**

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

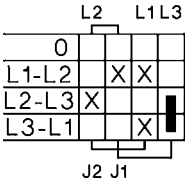
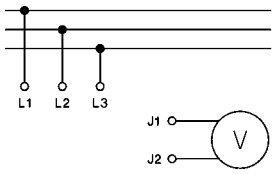
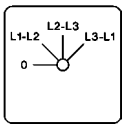
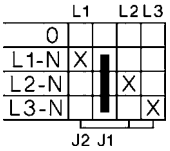
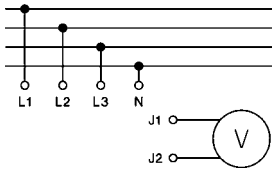
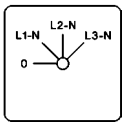
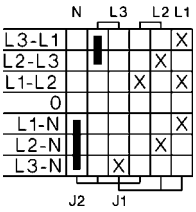
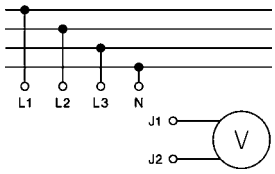
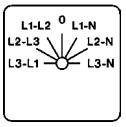
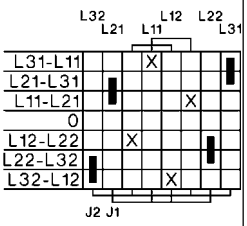
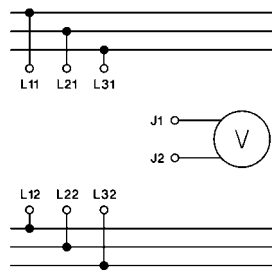
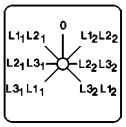
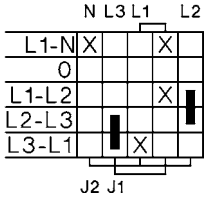
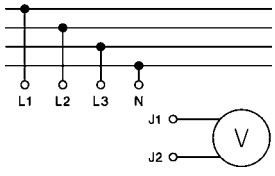
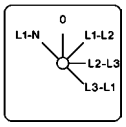
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Start-Stop switches S							
Stop-switch,1-pole		*30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. SA** **. SA**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SA** **. SA**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. SA**	
Stop-switch, 2-pole		*30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. S2A** **. S2A**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S2A** **. S2A**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. S2A**	
Stop-switch, 3-pole		*30°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. S3A** **. S3A**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S3A** **. S3A**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. S3A**	
Start-Stop-switch, 1-pole 		*30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. SEA** **. SEA**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SEA** **. SEA**	
Start-Stop-switch, 1-pole position START with spring return to 1 		*90°+30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. S392** **. S392**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S392** **. S392**	
Start-Stop-switch, 1-pole for reversing contactors 		*60°+30°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. S2EA** **. S2EA**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S2EA** **. S2EA**	
Start-Stop-switch, 1-pole for reversing contactors with limit switches 		*30°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹) - -** **x x x x - -**	**. S22** **. S22**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **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.

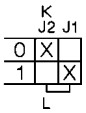
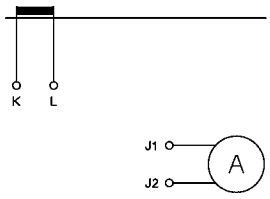
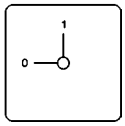
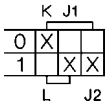
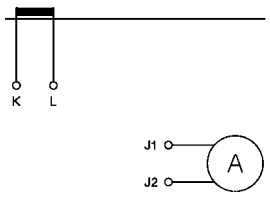
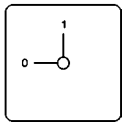
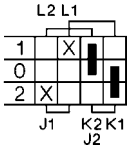
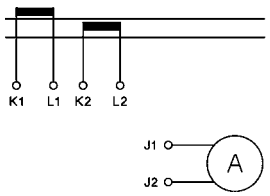
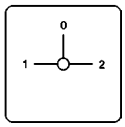
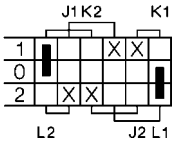
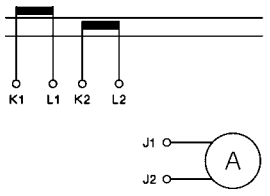
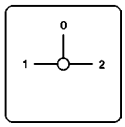
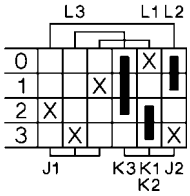
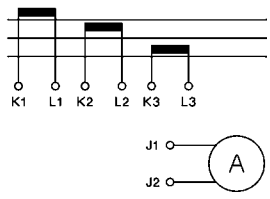
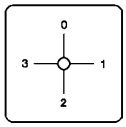
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**			**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Voltmeter selector switches V									
3 line voltages 		*45°*	2	48 ❒	20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - x x x** **x x x x - - x x x**	**. V3** **. V3**	
				64 ❒	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. V3** **. V3**	
3 phase voltages 		*45°*	2	48 ❒	20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - x x x** **x x x x - - x x x**	**. V0** **. V0**	
				64 ❒	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. V0** **. V0**	
3 line voltages and 3 phase voltages 		*30°*	3	48 ❒	20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - x x x** **x x x x - - x x x**	**. V1** **. V1**	
				64 ❒	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. V1** **. V1**	
2 3-phase systems 2 x 3 line voltages 		*45°*	4	48 ❒	20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - x x x** **x x x x - - x x x**	**. V32** **. V32**	
				64 ❒	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. V32** **. V32**	
3 line voltages and 1 phase voltage 		*45°*	3	48 ❒	20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - x x x** **x x x x - - x x x**	**. V13** **. V13**	
				64 ❒	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. V13** **. 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.

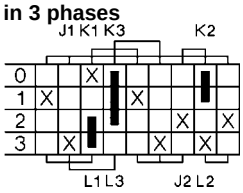
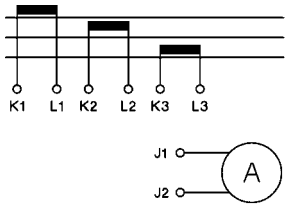
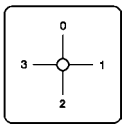
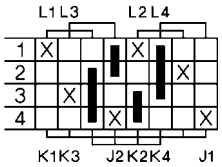
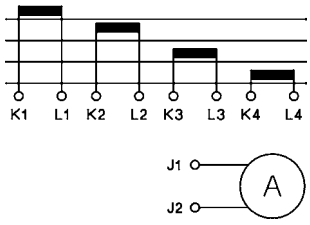
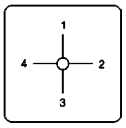
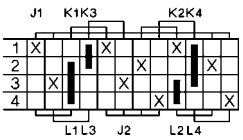
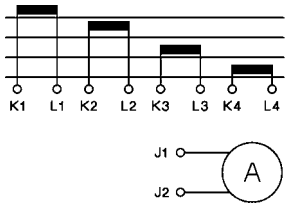
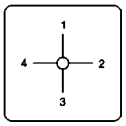
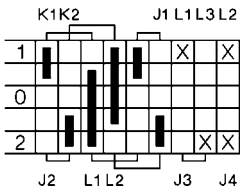
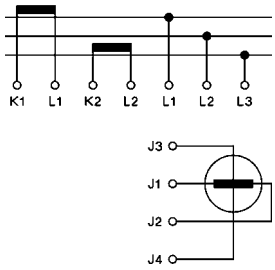
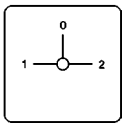
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Ammeter selector switches M							
1-pole, for current transformer 		*90°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - x x x x - -**	**. M11** **. M11**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. M11** **. M11**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. M11**	
2-pole, for 1 current transformer or direct current measurement 		*90°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - x x x x - -**	**. M12** **. M12**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. M12** **. M12**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. M12** **. M12** **. M12**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. M12** **. M12**	
1-pole, for 2 current transformers 		*90°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - x x x x - -**	**. M21** **. M21**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. M21** **. 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 .** **M20 .**	**x x x x x¹⁾ - x x x x - -**	**. M22** **. M22**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. M22** **. M22**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. M22** **. M22** **. M22**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. M22** **. M22**	
1-pole, for 3 current transformers 		*90°*	3 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - x x x x - -**	**. M31** **. M31**	
			64 ❐ 32A 4 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. M31** **. 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.

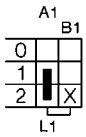
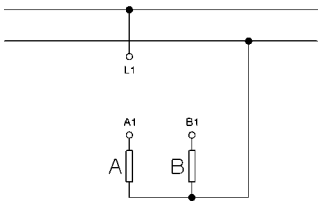
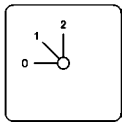
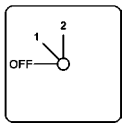
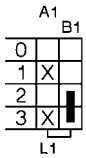
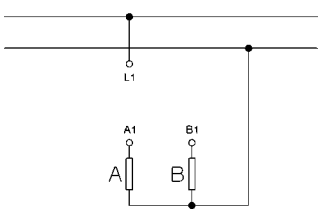
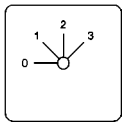
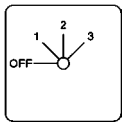
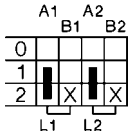
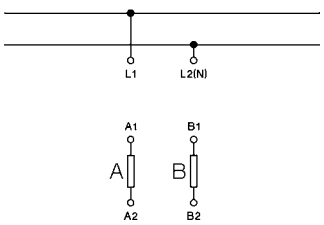
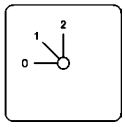
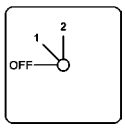
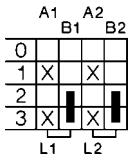
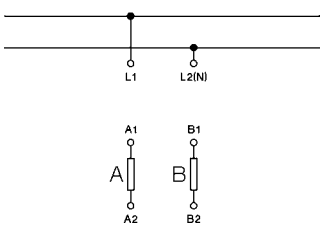
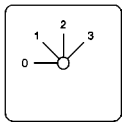
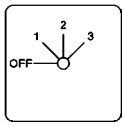
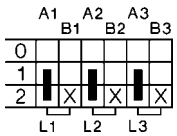
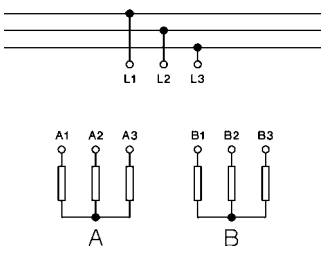
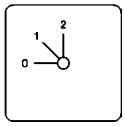
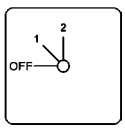
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	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 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N61 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . M32** **x x x - - - . M32** **x - x - x x . M32** **x - x - x - . M32** **x - x - x - . M32** **x - x - x - . M32** **x - x - - - . M32** **x - x - - - . M32** **x - x - - - . M32**		
1-pole, for 4 current transformers 		*90°*	4 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .**	**x x x x x[1] - . M41** **x x x x - - . M41** **x - x - x x . M41** **x - x - x - . M41** **x - x - x - . M41**		
2-pole, for 4 current transformers or direct current measurement in 4 phases 		*90°*	6 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N61 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . M42** **x x x - - - . M42** **x - x - x x . M42** **x - x - x - . M42** **x - x - x - . M42** **x - x - x - . M42** **x - x - - - . M42** **x - x - - - . M42** **x - x - - - . M42**		
f. output measurement in 3-phase ystems by 2-wattmeter method 		*90°*	5 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N61 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . M2W** **x x x x - - . M2W** **x - x - x x . M2W** **x - x - x - . M2W** **x - x - x - . M2W** **x - x - x - . M2W** **x - x - - - . M2W** **x - x - - - . M2W** **x - x - - - . M2W**		

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 4 current transformers 1-pole **N40 V M41**

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

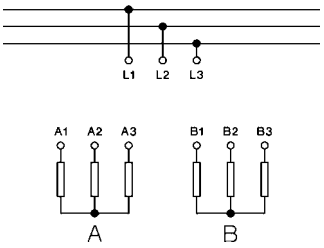
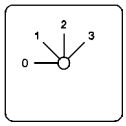
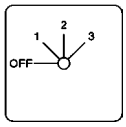
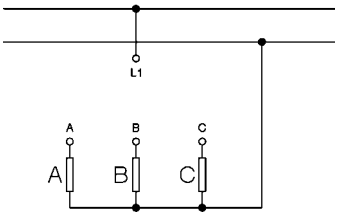
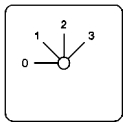
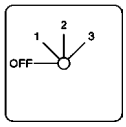
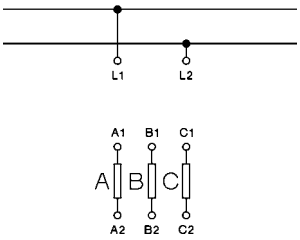
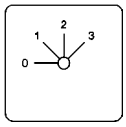
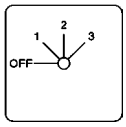
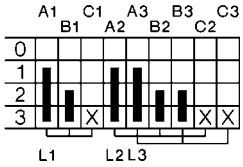
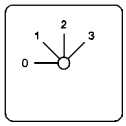
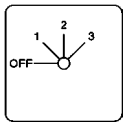
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Gang switches GR							
2 circuits A and B 1-pole 0 - A - A+B 		*45°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. GR11** **. GR11**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x x x - x -	**. GR11** **. GR11**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. GR11** **. GR11** **. GR11**	**+126** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. GR11** **. GR11**	
2 circuits A and B 1-pole 0 - A - B - A+B 		*45°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. GR12** **. GR12**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x x x - x -	**. GR12** **. GR12**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. GR12** **. GR12** **. GR12**	**+127** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. GR12** **. GR12**	
2 circuits A and B 2-pole 0 - A - A+B 		*45°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. GR21** **. GR21**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x x x - x -	**. GR21** **. GR21**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. GR21** **. GR21** **. GR21**	**+126** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. GR21** **. GR21**	
2 circuits A and B 2-pole 0 - A - B - A+B 		*45°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. GR22** **. GR22**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x x x - x -	**. GR22** **. GR22**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. GR22** **. GR22** **. GR22**	**+127** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. GR22** **. GR22**	
2 circuits A and B 3-pole 0 - A - A+B 		*45°*	3 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. GR31** **. GR31**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. GR31** **. GR31**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x x x - x - x - x - x - - -	**. GR31** **. GR31** **. GR31**	**+126** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. GR31** **. 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.

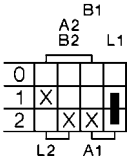
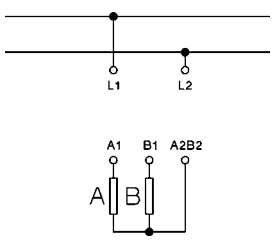
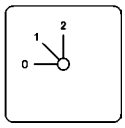
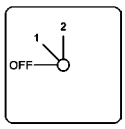
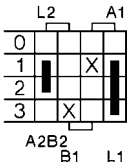
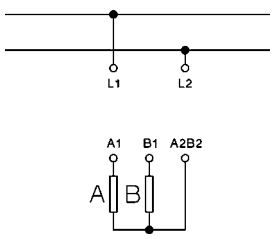
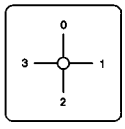
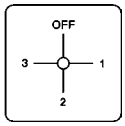
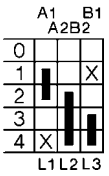
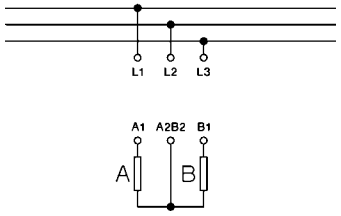
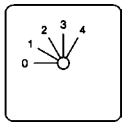
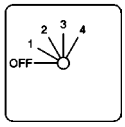
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Gang switches GR							
2 circuits A and B **3-pole** **0 - A - B - A+B**		*45°*	3 48 ❒ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - . x x x x - - .	**GR32** **GR32**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	x - x - x x . x - x - x - .	**GR32** **GR32**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - . x - x - x - . x - x - - - .	**GR32** **GR32** **GR32**	**+127** 
			132❒ 150A 250A	**N100 .** **N200 .**	x - x - - - . x - x - - - .	**GR32** **GR32**	
3 circuits A, B and C **1-pole** **0 - A - A+B - A+B+C**		*45°*	2 48 ❒ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - . x x x x - - .	**GR14** **GR14**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	x - x - x x . x - x - x - .	**GR14** **GR14**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - . x - x - x - . x - x - - - .	**GR14** **GR14** **GR14**	**+127** 
			132❒ 150A 250A	**N100 .** **N200 .**	x - x - - - . x - x - - - .	**GR14** **GR14**	
3 circuits A, B and C **2-pole** **0 - A - A+B - A+B+C**		*45°*	3 48 ❒ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - . x x x x - - .	**GR23** **GR23**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	x - x - x x . x - x - x - .	**GR23** **GR23**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - . x - x - x - . x - x - - - .	**GR23** **GR23** **GR23**	**+127** 
			132❒ 150A 250A	**N100 .** **N200 .**	x - x - - - . x - x - - - .	**GR23** **GR23**	
3 circuits A, B and C **3-pole** **0 - A - A+B - A+B+C**		*45°*	5 48 ❒ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - . x x x x - - .	**GR33** **GR33**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	x - x - x x . x - x - x - .	**GR33** **GR33**	
			88 ❒ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - . x - x - x - . x - x - - - .	**GR33** **GR33** **GR33**	**+127** 
			132❒ 150A 250A	**N100 .** **N200 .**	x - x - - - . x - x - - - .	**GR33** **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.

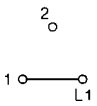
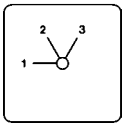
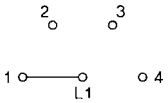
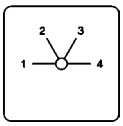
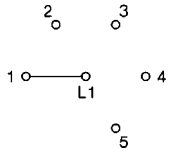
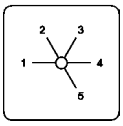
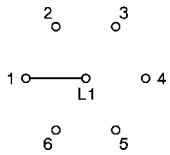
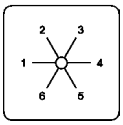
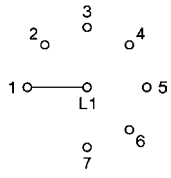
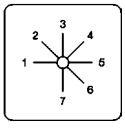
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Series-Parallel switches SP							
2 circuits A and B 2-pole 0 - A + B - A,B (parallel) 		*45°*	2 48 ❐ 20A 32A 64 ❐ 32A 50A 88 ❐ 63A 80A 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 - x - - -**	**. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1**	 **+126** 
2 circuits A and B 2-pole 0 - A,B (parall.) - A - A+B 		*90°*	3 48 ❐ 20A 32A 64 ❐ 32A 50A 88 ❐ 63A 80A 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 - x - - -**	**. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4**	 **+270** 
2 circuits A and B for 3-phase systems 0 - A+B - A - B - A,B 		*30°*	2 48 ❐ 20A 32A 64 ❐ 32A 50A 88 ❐ 63A 80A 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 - x - - -**	**. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3**	 **+112** 

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.

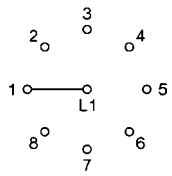
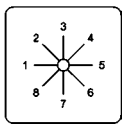
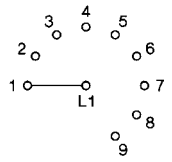
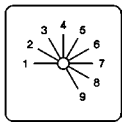
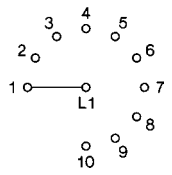
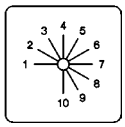
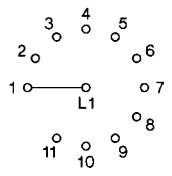
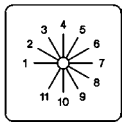
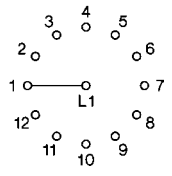
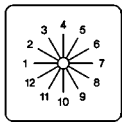
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 1-pole without Off ST.1							
3 steps		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST31**	
			32A	**M20 .**	**x x x x - -**	**. ST31**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST31**	
			50A	**N33F .**	**x x x - x -**	**. ST31**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST31**	
			80A	**N61 .**	**x - x - x -**	**. ST31**	
			115A	**N80 .**	**x - x - - -**	**. ST31**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST31**	
			250A	**N200 .**	**x - x - - -**	**. ST31**	
4 steps		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST41**	
			32A	**M20 .**	**x x x x - -**	**. ST41**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST41**	
			50A	**N33F .**	**x x x - x -**	**. ST41**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST41**	
			80A	**N61 .**	**x - x - x -**	**. ST41**	
			115A	**N80 .**	**x - x - - -**	**. ST41**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST41**	
			250A	**N200 .**	**x - x - - -**	**. ST41**	
5 steps		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST51**	
			32A	**M20 .**	**x x x x - -**	**. ST51**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST51**	
			50A	**N33F .**	**x x x - x -**	**. ST51**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST51**	
			80A	**N61 .**	**x - x - x -**	**. ST51**	
			115A	**N80 .**	**x - x - - -**	**. ST51**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST51**	
			250A	**N200 .**	**x - x - - -**	**. ST51**	
6 steps		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST61**	
			32A	**M20 .**	**x x x x - -**	**. ST61**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST61**	
			50A	**N33F .**	**x x x - x -**	**. ST61**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST61**	
			80A	**N61 .**	**x - x - x -**	**. ST61**	
			115A	**N80 .**	**x - x - - -**	**. ST61**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST61**	
			250A	**N200 .**	**x - x - - -**	**. ST61**	
7 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST71**	
			32A	**M20 .**	**x x x x - -**	**. ST71**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST71**	
			50A	**N33F .**	**x - x - x -**	**. ST71**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST71**	
			80A	**N61 .**	**x - x - x -**	**. ST71**	
			115A	**N80 .**	**x - x - - -**	**. ST71**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST71**	
			250A	**N200 .**	**x - x - - -**	**. ST71**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole without off, 7 steps **N200 E ST71**

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

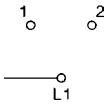
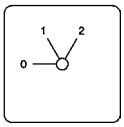
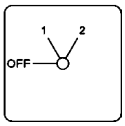
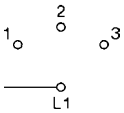
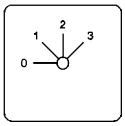
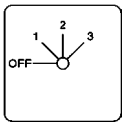
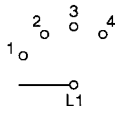
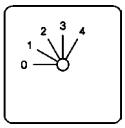
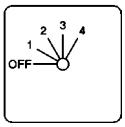
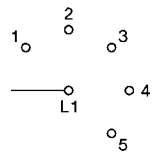
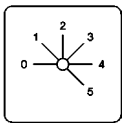
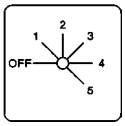
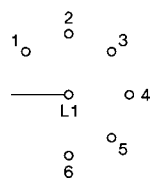
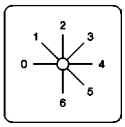
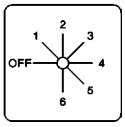
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 1-pole without Off ST.1							
8 steps		*45°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. ST81** **. ST81**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. ST81** **. ST81**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. ST81** **. ST81** **. ST81**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST81** **. ST81**	
9 steps		*30°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. ST91** **. ST91**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. ST91** **. ST91**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. ST91** **. ST91** **. ST91**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST91** **. ST91**	
10 steps		*30°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x x x[1] - x x x x - -	**. ST101** **. ST101**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. ST101** **. ST101**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. ST101** **. ST101** **. ST101**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST101** **. ST101**	
11 steps		*30°*	6 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - x[1] - x x x - - -	**. ST111** **. ST111**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. ST111** **. ST111**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. ST111** **. ST111** **. ST111**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST111** **. ST111**	
12 steps		*30°*	6 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - x[1] - x x x - - -	**. ST121** **. ST121**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x x x - x - x -	**. ST121** **. ST121**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - x - x - x - - -	**. ST121** **. ST121** **. ST121**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - 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.

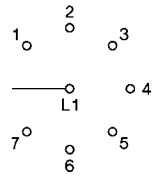
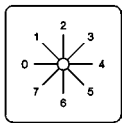
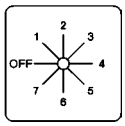
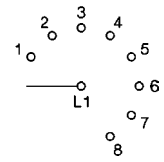
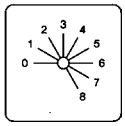
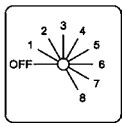
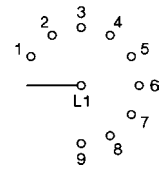
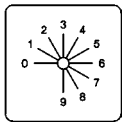
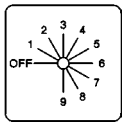
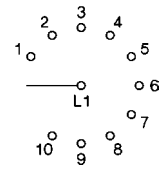
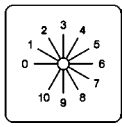
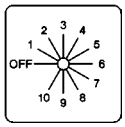
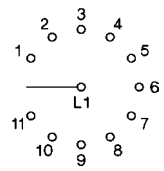
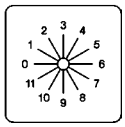
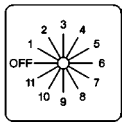
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Multi step switches 1-pole with Off ST0.1							
2 steps		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST021**	
			32A	**M20 .**	**x x x x - -**	**. ST021**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST021**	
			50A	**N33F .**	**x x x - x -**	**. ST021**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST021**	**+422**
			80A	**N61 .**	**x - x - x -**	**. ST021**	
			115A	**N80 .**	**x - x - - -**	**. ST021**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST021**	
			250A	**N200 .**	**x - x - - -**	**. ST021**	
3 steps		*45°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST031**	
			32A	**M20 .**	**x x x x - -**	**. ST031**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST031**	
			50A	**N33F .**	**x x x - x -**	**. ST031**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST031**	**+127**
			80A	**N61 .**	**x - x - x -**	**. ST031**	
			115A	**N80 .**	**x - x - - -**	**. ST031**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST031**	
			250A	**N200 .**	**x - x - - -**	**. ST031**	
4 steps		*30°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST041**	
			32A	**M20 .**	**x x x x - -**	**. ST041**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST041**	
			50A	**N33F .**	**x x x - x -**	**. ST041**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST041**	**+112**
			80A	**N61 .**	**x - x - x -**	**. ST041**	
			115A	**N80 .**	**x - x - - -**	**. ST041**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST041**	
			250A	**N200 .**	**x - x - - -**	**. ST041**	
5 steps		*45°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST051**	
			32A	**M20 .**	**x x x x - -**	**. ST051**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST051**	
			50A	**N33F .**	**x x x - x -**	**. ST051**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST051**	**+423**
			80A	**N61 .**	**x - x - x -**	**. ST051**	
			115A	**N80 .**	**x - x - - -**	**. ST051**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST051**	
			250A	**N200 .**	**x - x - - -**	**. ST051**	
6 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST061**	
			32A	**M20 .**	**x x x x - -**	**. ST061**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST061**	
			50A	**N33F .**	**x - x - x -**	**. ST061**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST061**	**+128**
			80A	**N61 .**	**x - x - x -**	**. ST061**	
			115A	**N80 .**	**x - x - - -**	**. ST061**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST061**	
			250A	**N200 .**	**x - x - - -**	**. ST061**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 6 steps **N200 E ST061**

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

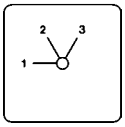
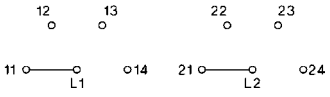
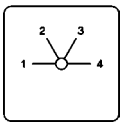
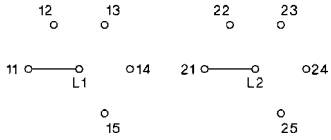
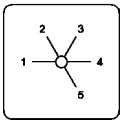
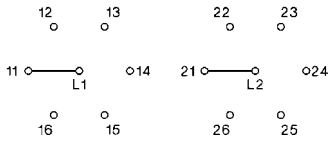
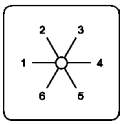
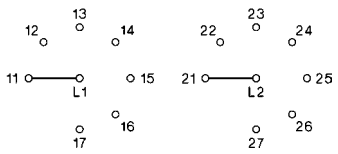
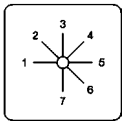
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 1-pole with Off ST0.1							
7 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x¹) - -**	**. ST071**	
			32A	**M20 .**	**x x x x - -**	**. ST071**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST071**	**+129**
			50A	**N33F .**	**x - x - x -**	**. ST071**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST071**	
			80A	**N61 .**	**x - x - x -**	**. ST071**	
			115A	**N80 .**	**x - x - - -**	**. ST071**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST071**	
			250A	**N200 .**	**x - x - - -**	**. ST071**	
8 steps		*30°*	5 48 ❐ 20A	**M10H .**	**x x x x x¹) -**	**. ST081**	
			32A	**M20 .**	**x x x x - -**	**. ST081**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST081**	**+114**
			50A	**N33F .**	**x - x - x -**	**. ST081**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST081**	
			80A	**N61 .**	**x - x - x -**	**. ST081**	
			115A	**N80 .**	**x - x - - -**	**. ST081**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST081**	
			250A	**N200 .**	**x - x - - -**	**. ST081**	
9 steps		*30°*	5 48 ❐ 20A	**M10H .**	**x x x x x¹) -**	**. ST091**	
			32A	**M20 .**	**x x x x - -**	**. ST091**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST091**	**+115**
			50A	**N33F .**	**x - x - x -**	**. ST091**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST091**	
			80A	**N61 .**	**x - x - x -**	**. ST091**	
			115A	**N80 .**	**x - x - - -**	**. ST091**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST091**	
			250A	**N200 .**	**x - x - - -**	**. ST091**	
10 steps		*30°*	6 48 ❐ 20A	**M10H .**	**x x x - x¹) -**	**. ST0101**	
			32A	**M20 .**	**x x x - - -**	**. ST0101**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST0101**	**+116**
			50A	**N33F .**	**x - x - x -**	**. ST0101**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST0101**	
			80A	**N61 .**	**x - x - x -**	**. ST0101**	
			115A	**N80 .**	**x - x - - -**	**. ST0101**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST0101**	
			250A	**N200 .**	**x - x - - -**	**. ST0101**	
11 steps		*30°*	6 48 ❐ 20A	**M10H .**	**x x x - x¹) -**	**. ST0111**	
			32A	**M20 .**	**x x x - - -**	**. ST0111**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST0111**	**+117**
			50A	**N33F .**	**x - x - x -**	**. ST0111**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST0111**	
			80A	**N61 .**	**x - x - x -**	**. ST0111**	
			115A	**N80 .**	**x - x - - -**	**. ST0111**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST0111**	
			250A	**N200 .**	**x - x - - -**	**. ST0111**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 11 steps **N200 E ST0111**

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

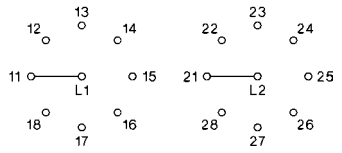
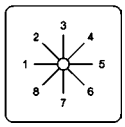
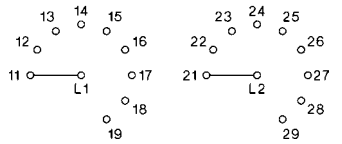
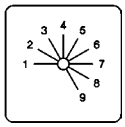
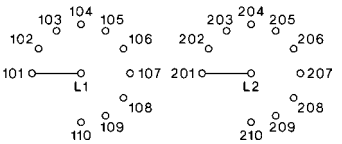
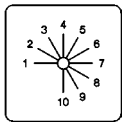
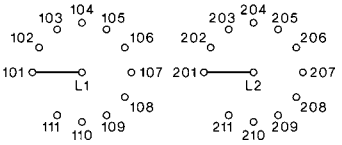
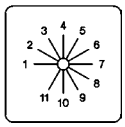
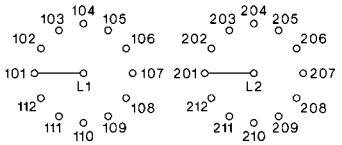
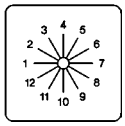
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E.	Z.	V.	SMA.	P.	G.	Switch pro-gram	Escutcheon plate
Multi step switches 2-pole without Off ST.2														
3 steps		*60°*	3	48 ❒	20A	**M10H .**	x	x	x	x	x[1]	-	**. ST32**	
					32A	**M20 .**	x	x	x	x	-	-	**. ST32**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	x	**. ST32**	
					50A	**N33F .**	x	x	x	-	x	-	**. ST32**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST32**	
					80A	**N61 .**	x	-	x	-	x	-	**. ST32**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST32**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST32**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST32**	
4 steps		*60°*	4	48 ❒	20A	**M10H .**	x	x	x	x	x[1]	-	**. ST42**	
					32A	**M20 .**	x	x	x	x	-	-	**. ST42**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	x	**. ST42**	
					50A	**N33F .**	x	-	x	-	x	-	**. ST42**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST42**	
					80A	**N61 .**	x	-	x	-	x	-	**. ST42**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST42**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST42**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST42**	
5 steps		*60°*	5	48 ❒	20A	**M10H .**	x	x	x	x	x[1]	-	**. ST52**	
					32A	**M20 .**	x	x	x	x	-	-	**. ST52**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	x	**. ST52**	
					50A	**N33F .**	x	-	x	-	x	-	**. ST52**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST52**	
					80A	**N61 .**	x	-	x	-	x	-	**. ST52**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST52**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST52**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST52**	
6 steps		*60°*	6	48 ❒	20A	**M10H .**	x	x	x	-	x[1]	-	**. ST62**	
					32A	**M20 .**	x	x	x	-	-	-	**. ST62**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	x	**. ST62**	
					50A	**N33F .**	x	-	x	-	x	-	**. ST62**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST62**	
					80A	**N61 .**	x	-	x	-	x	-	**. ST62**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST62**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST62**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST62**	
7 steps		*45°*	7	48 ❒	20A	**M10H .**	x	x	x	-	-	-	**. ST72**	
					32A	**M20 .**	x	x	x	-	-	-	**. ST72**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	-	**. ST72**	
					50A	**N33F .**	x	-	x	-	-	-	**. ST72**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST72**	
					80A	**N61 .**	x	-	x	-	-	-	**. ST72**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST72**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST72**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST72**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 7 steps **N200 E ST72**

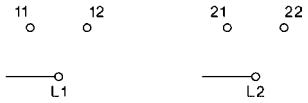
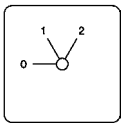
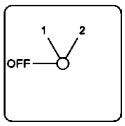
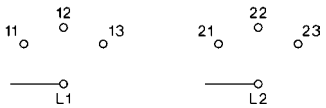
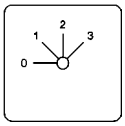
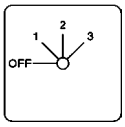
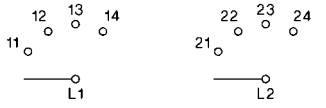
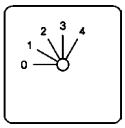
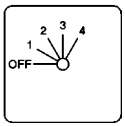
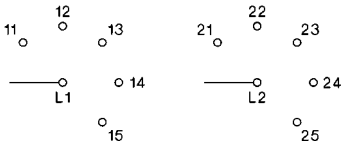
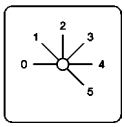
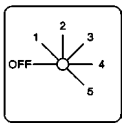
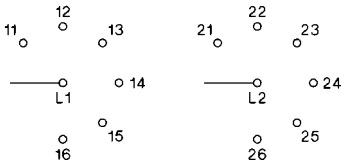
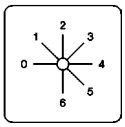
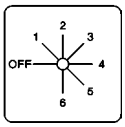
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 2-pole without Off ST.2							
8 steps		*45°*	8 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST82** **. ST82**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x - x - x - - -	**. ST82** **. ST82**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - x - x - x - - - x - x - - -	**. ST82** **. ST82** **. ST82**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST82** **. ST82**	
9 steps		*30°*	9 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST92** **. ST92**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST92** **. ST92**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST92** **. ST92** **. ST92**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST92** **. ST92**	
10 steps		*30°*	10 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST102** **. ST102**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST102** **. ST102**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST102** **. ST102** **. ST102**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST102** **. ST102**	
11 steps		*30°*	11 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST112** **. ST112**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST112** **. ST112**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST112** **. ST112** **. ST112**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST112** **. ST112**	
12 steps		*30°*	12 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST122** **. ST122**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST122** **. ST122**	
			88 ❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST122** **. ST122** **. ST122**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST122** **. ST122**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 12 steps **N200 E ST122**

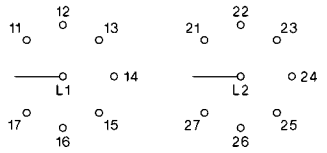
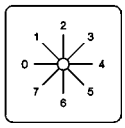
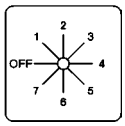
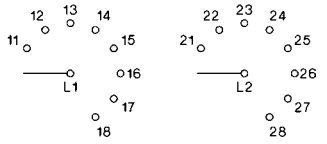
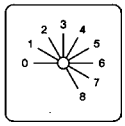
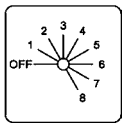
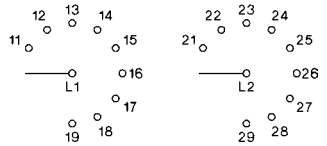
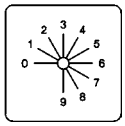
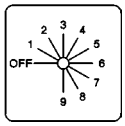
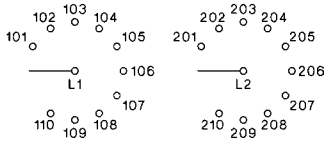
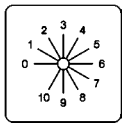
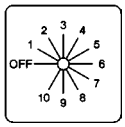
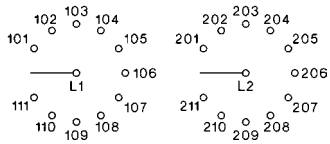
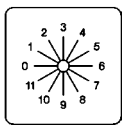
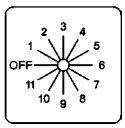
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**			**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Multi step switches 2-pole with Off ST0.2									
2 steps		*60°*	2	48 ❐	20A	**M10H .**	**x x x x x**[1] **- .**	**ST022**	
					32A	**M20 .**	**x x x x - -**	**ST022**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**ST022**	
					50A	**N33F .**	**x x x - x -**	**ST022**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**ST022**	**+422**
					80A	**N61 .**	**x - x - x -**	**ST022**	
					115A	**N80 .**	**x - x - - -**	**ST022**	
				132❐	150A	**N100 .**	**x - x - - -**	**ST022**	
					250A	**N200 .**	**x - x - - -**	**ST022**	
3 steps		*45°*	3	48 ❐	20A	**M10H .**	**x x x x x**[1] **- .**	**ST032**	
					32A	**M20 .**	**x x x x - -**	**ST032**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**ST032**	
					50A	**N33F .**	**x x x - x -**	**ST032**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**ST032**	**+127**
					80A	**N61 .**	**x - x - x -**	**ST032**	
					115A	**N80 .**	**x - x - - -**	**ST032**	
				132❐	150A	**N100 .**	**x - x - - -**	**ST032**	
					250A	**N200 .**	**x - x - - -**	**ST032**	
4 steps		*30°*	4	48 ❐	20A	**M10H .**	**x x x x x**[1] **- .**	**ST042**	
					32A	**M20 .**	**x x x x - -**	**ST042**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**ST042**	
					50A	**N33F .**	**x - x - x -**	**ST042**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**ST042**	**+112**
					80A	**N61 .**	**x - x - x -**	**ST042**	
					115A	**N80 .**	**x - x - - -**	**ST042**	
				132❐	150A	**N100 .**	**x - x - - -**	**ST042**	
					250A	**N200 .**	**x - x - - -**	**ST042**	
5 steps		*45°*	6	48 ❐	20A	**M10H .**	**x x x - x**[1] **- .**	**ST052**	
					32A	**M20 .**	**x x x - - -**	**ST052**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**ST052**	
					50A	**N33F .**	**x - x - x -**	**ST052**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**ST052**	**+423**
					80A	**N61 .**	**x - x - x -**	**ST052**	
					115A	**N80 .**	**x - x - - -**	**ST052**	
				132❐	150A	**N100 .**	**x - x - - -**	**ST052**	
					250A	**N200 .**	**x - x - - -**	**ST052**	
6 steps		*45°*	7	48 ❐	20A	**M10H .**	**x x x - x**[1] **- .**	**ST062**	
					32A	**M20 .**	**x x x - - -**	**ST062**	
				64 ❐	32A	**N20 .**	**x - x - x -**	**ST062**	
					50A	**N33F .**	**x - x - - -**	**ST062**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**ST062**	**+128**
					80A	**N61 .**	**x - x - - -**	**ST062**	
					115A	**N80 .**	**x - x - - -**	**ST062**	
				132❐	150A	**N100 .**	**x - x - - -**	**ST062**	
					250A	**N200 .**	**x - x - - -**	**ST062**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 6 steps **N200 E ST062**

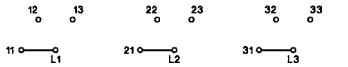
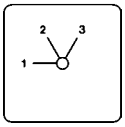
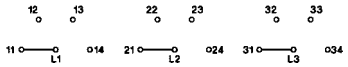
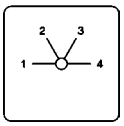
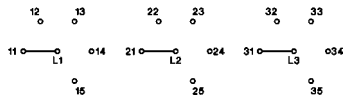
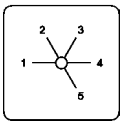
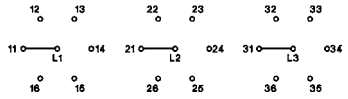
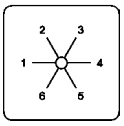
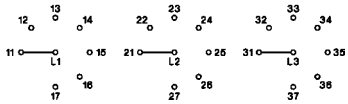
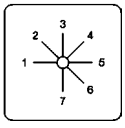
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 2-pole with Off ST0.2							
7 steps		*45°*	8 48 ❐ 20A	**M10H .**	x x x - - -	**. ST072**	
			32A	**M20 .**	x x x - - -	**. ST072**	
			64 ❐ 32A	**N20 .**	x - x - x -	**. ST072**	
			50A	**N33F .**	x - x - - -	**. ST072**	
			88 ❐ 63A	**N40 .**	x - x - x -	**. ST072**	**+129**
			80A	**N61 .**	x - x - - -	**. ST072**	
			115A	**N80 .**	x - x - - -	**. ST072**	
			132❐ 150A	**N100 .**	x - x - - -	**. ST072**	
			250A	**N200 .**	x - x - - -	**. ST072**	
8 steps		*30°*	9 48 ❐ 20A	**M10H .**	x x x - - -	**. ST082**	
			32A	**M20 .**	x x x - - -	**. ST082**	
			64 ❐ 32A	**N20 .**	x - x - - -	**. ST082**	
			50A	**N33F .**	x - x - - -	**. ST082**	
			88 ❐ 63A	**N40 .**	x - x - - -	**. ST082**	**+114**
			80A	**N61 .**	x - x - - -	**. ST082**	
			115A	**N80 .**	x - x - - -	**. ST082**	
			132❐ 150A	**N100 .**	x - x - - -	**. ST082**	
			250A	**N200 .**	x - x - - -	**. ST082**	
9 steps		*30°*	10 48 ❐ 20A	**M10H .**	x x x - - -	**. ST092**	
			32A	**M20 .**	x x x - - -	**. ST092**	
			64 ❐ 32A	**N20 .**	x - x - - -	**. ST092**	
			50A	**N33F .**	x - x - - -	**. ST092**	
			88 ❐ 63A	**N40 .**	x - x - - -	**. ST092**	**+115**
			80A	**N61 .**	x - x - - -	**. ST092**	
			115A	**N80 .**	x - x - - -	**. ST092**	
			132❐ 150A	**N100 .**	x - x - - -	**. ST092**	
			250A	**N200 .**	x - x - - -	**. ST092**	
10 steps		*30°*	11 48 ❐ 20A	**M10H .**	x x x - - -	**. ST0102**	
			32A	**M20 .**	x x x - - -	**. ST0102**	
			64 ❐ 32A	**N20 .**	x - x - - -	**. ST0102**	
			50A	**N33F .**	x - x - - -	**. ST0102**	
			88 ❐ 63A	**N40 .**	x - x - - -	**. ST0102**	**+116**
			80A	**N61 .**	x - x - - -	**. ST0102**	
			115A	**N80 .**	x - x - - -	**. ST0102**	
			132❐ 150A	**N100 .**	x - x - - -	**. ST0102**	
			250A	**N200 .**	x - x - - -	**. ST0102**	
11 steps		*30°*	12 48 ❐ 20A	**M10H .**	x x x - - -	**. ST0112**	
			32A	**M20 .**	x x x - - -	**. ST0112**	
			64 ❐ 32A	**N20 .**	x - x - - -	**. ST0112**	
			50A	**N33F .**	x - x - - -	**. ST0112**	
			88 ❐ 63A	**N40 .**	x - x - - -	**. ST0112**	**+117**
			80A	**N61 .**	x - x - - -	**. ST0112**	
			115A	**N80 .**	x - x - - -	**. ST0112**	
			132❐ 150A	**N100 .**	x - x - - -	**. ST0112**	
			250A	**N200 .**	x - x - - -	**. ST0112**	

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

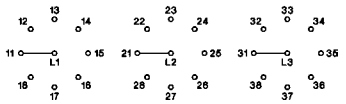
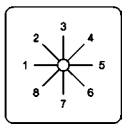
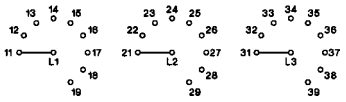
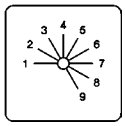
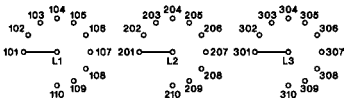
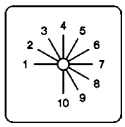
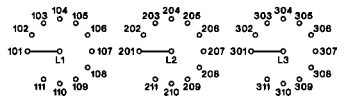
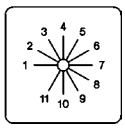
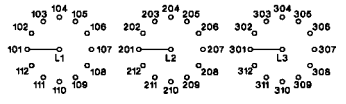
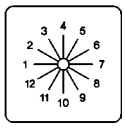
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓	Size ↓	AC21	Type	Design see page 6-8 E.	Z.	V.	SMA.	P.	G.	Switch program	Escutcheon plate
Multi step switches 3-pole without Off ST.3														
3 steps		*60°*	5	48 ❒	20A	**M10H .**	x	x	x	x	x[1]	-	**. ST33**	
					32A	**M20 .**	x	x	x	x	-	-	**. ST33**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	x	**. ST33**	
					50A	**N33F .**	x	-	x	-	x	-	**. ST33**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST33**	
					80A	**N61 .**	x	-	x	-	x	-	**. ST33**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST33**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST33**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST33**	
4 steps		*60°*	6	48 ❒	20A	**M10H .**	x	x	x	-	x[1]	-	**. ST43**	
					32A	**M20 .**	x	x	x	-	-	-	**. ST43**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	x	**. ST43**	
					50A	**N33F .**	x	-	x	-	x	-	**. ST43**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST43**	
					80A	**N61 .**	x	-	x	-	x	-	**. ST43**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST43**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST43**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST43**	
5 steps		*60°*	8	48 ❒	20A	**M10H .**	x	x	x	-	-	-	**. ST53**	
					32A	**M20 .**	x	x	x	-	-	-	**. ST53**	
				64 ❒	32A	**N20 .**	x	-	x	-	x	-	**. ST53**	
					50A	**N33F .**	x	-	x	-	-	-	**. ST53**	
				88 ❒	63A	**N40 .**	x	-	x	-	x	-	**. ST53**	
					80A	**N61 .**	x	-	x	-	-	-	**. ST53**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST53**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST53**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST53**	
6 steps		*60°*	9	48 ❒	20A	**M10H .**	x	x	x	-	-	-	**. ST63**	
					32A	**M20 .**	x	x	x	-	-	-	**. ST63**	
				64 ❒	32A	**N20 .**	x	-	x	-	-	-	**. ST63**	
					50A	**N33F .**	x	-	x	-	-	-	**. ST63**	
				88 ❒	63A	**N40 .**	x	-	x	-	-	-	**. ST63**	
					80A	**N61 .**	x	-	x	-	-	-	**. ST63**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST63**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST63**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST63**	
7 steps		*45°*	11	48 ❒	20A	**M10H .**	x	x	x	-	-	-	**. ST73**	
					32A	**M20 .**	x	x	x	-	-	-	**. ST73**	
				64 ❒	32A	**N20 .**	x	-	x	-	-	-	**. ST73**	
					50A	**N33F .**	x	-	x	-	-	-	**. ST73**	
				88 ❒	63A	**N40 .**	x	-	x	-	-	-	**. ST73**	
					80A	**N61 .**	x	-	x	-	-	-	**. ST73**	
					115A	**N80 .**	x	-	x	-	-	-	**. ST73**	
				132❒	150A	**N100 .**	x	-	x	-	-	-	**. ST73**	
					250A	**N200 .**	x	-	x	-	-	-	**. ST73**	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 7 steps **N200 E ST73**

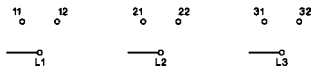
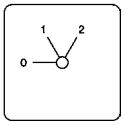
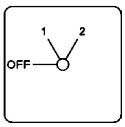
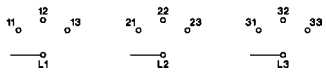
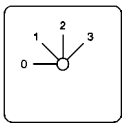
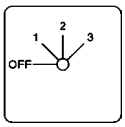
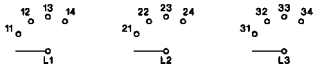
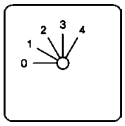
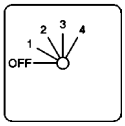
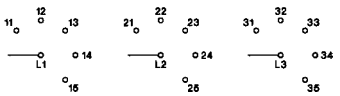
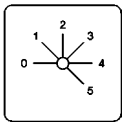
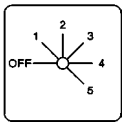
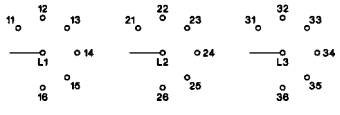
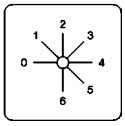
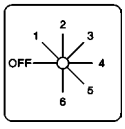
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 3-pole without Off ST.3							
8 steps		*45°*	12 48❐ 20A 32A	**M10H .** **M20 .**	**x x x - - -**	**. ST83**	
			64❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -**	**. ST83**	
			88❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -**	**. ST83**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. ST83**	
9 steps		*30°*	14 48❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -**	**. ST93**	
			64❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -**	**. ST93**	
			88❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -**	**. ST93**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. ST93**	
10 steps		*30°*	15 48❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -**	**. ST103**	
			64❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -**	**. ST103**	
			88❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -**	**. ST103**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. ST103**	
11 steps		*30°*	17 48❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -**	**. ST113**	
			64❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -**	**. ST113**	
			88❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -**	**. ST113**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. ST113**	
12 steps		*30°*	18 48❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -**	**. ST123**	
			64❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -**	**. ST123**	
			88❐ 63A 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -**	**. ST123**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -**	**. ST123**	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 12 steps **N200 E ST123**

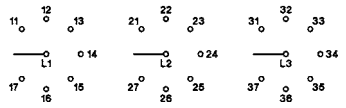
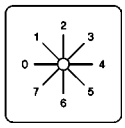
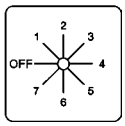
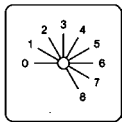
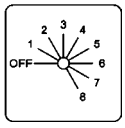
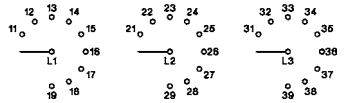
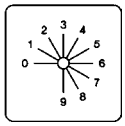
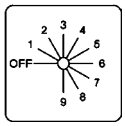
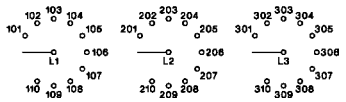
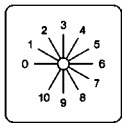
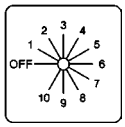
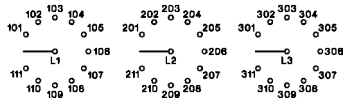
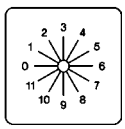
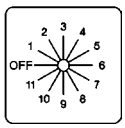
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 3-pole with Off ST0.3						
2 steps	*60°* 	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **- . ST023**		
		32A	**M20 .**	**x x x x - - . ST023**		
		64 ❐ 32A	**N20 .**	**x - x - x x . ST023**		
		50A	**N33F .**	**x x x - x - . ST023**		
		88 ❐ 63A	**N40 .**	**x - x - x - . ST023**	**+422**	
		80A	**N61 .**	**x - x - x - . ST023**		
		115A	**N80 .**	**x - x - - - . ST023**		
		132❐ 150A	**N100 .**	**x - x - - - . ST023**		
		250A	**N200 .**	**x - x - - - . ST023**		
3 steps	*45°* 	5 48 ❐ 20A	**M10H .**	**x x x x x**[1] **- . ST033**		
		32A	**M20 .**	**x x x x - - . ST033**		
		64 ❐ 32A	**N20 .**	**x - x - x x . ST033**		
		50A	**N33F .**	**x - x - x - . ST033**		
		88 ❐ 63A	**N40 .**	**x - x - x - . ST033**	**+127**	
		80A	**N61 .**	**x - x - x - . ST033**		
		115A	**N80 .**	**x - x - - - . ST033**		
		132❐ 150A	**N100 .**	**x - x - - - . ST033**		
		250A	**N200 .**	**x - x - - - . ST033**		
4 steps	*30°* 	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **- . ST043**		
		32A	**M20 .**	**x x x - - - . ST043**		
		64 ❐ 32A	**N20 .**	**x - x - x x . ST043**		
		50A	**N33F .**	**x - x - x - . ST043**		
		88 ❐ 63A	**N40 .**	**x - x - x - . ST043**	**+112**	
		80A	**N61 .**	**x - x - x - . ST043**		
		115A	**N80 .**	**x - x - - - . ST043**		
		132❐ 150A	**N100 .**	**x - x - - - . ST043**		
		250A	**N200 .**	**x - x - - - . ST043**		
5 steps	*45°* 	9 48 ❐ 20A	**M10H .**	**x x x - - - . ST053**		
		32A	**M20 .**	**x x x - - - . ST053**		
		64 ❐ 32A	**N20 .**	**x - x - - - . ST053**		
		50A	**N33F .**	**x - x - - - . ST053**		
		88 ❐ 63A	**N40 .**	**x - x - - - . ST053**	**+423**	
		80A	**N61 .**	**x - x - - - . ST053**		
		115A	**N80 .**	**x - x - - - . ST053**		
		132❐ 150A	**N100 .**	**x - x - - - . ST053**		
		250A	**N200 .**	**x - x - - - . ST053**		
6 steps	*45°* 	11 48 ❐ 20A	**M10H .**	**x x x - - - . ST063**		
		32A	**M20 .**	**x x x - - - . ST063**		
		64 ❐ 32A	**N20 .**	**x - x - - - . ST063**		
		50A	**N33F .**	**x - x - - - . ST063**		
		88 ❐ 63A	**N40 .**	**x - x - - - . ST063**	**+128**	
		80A	**N61 .**	**x - x - - - . ST063**		
		115A	**N80 .**	**x - x - - - . ST063**		
		132❐ 150A	**N100 .**	**x - x - - - . ST063**		
		250A	**N200 .**	**x - x - - - . ST063**		

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

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

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	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 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST073** **. ST073** **. ST073**	**+129** 
			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 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST083** **. ST083** **. ST083**	**+114** 
			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 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST093** **. ST093** **. ST093**	**+115** 
			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 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST0103** **. ST0103** **. ST0103**	**+116** 
			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 80A 115A	**N40 .** **N61 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST0113** **. ST0113** **. ST0113**	**+117** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. ST0113** **. ST0113**	

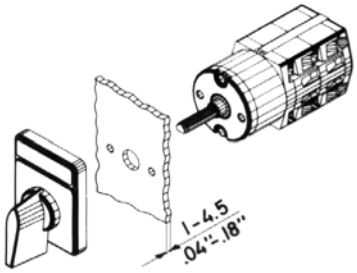
Ordering example: AC21 250A panel mounting, multi step switch 3-pole with off, 11 steps **N200 E ST0113**

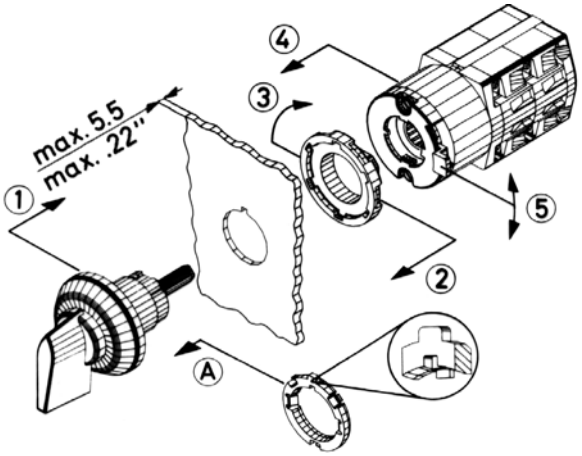
Mini-Cam Switches M4H

Panel mounting E, IP40

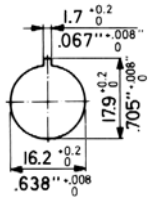
Central fixing Z

Central fixing without escutcheon plate ZO

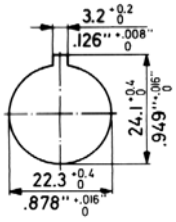




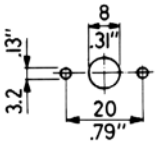
Central fixing 16mm



ock Central fixing 22mm



Mounting holes

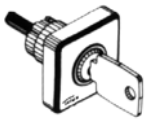


Single hole mountings are generally delivered for a 16mm (.64") mounting.
Using the forwarded adapter ring, it is possible to alter the single hole mountings from 22mm (.88"). For that purpose the adapter ring has to be attatched onto the threded part of the body in such a manner, that
1. the flat side 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
Additional escutcheon plate	**+SRE**	E, Z, ZO
Additional escutcheon plate	**+SRE2**	E, Z, ZO
Key operated switch with lock KABA with lock Ronis	 **+SA1** **+SA2**	 Z, ZO Z, ZO

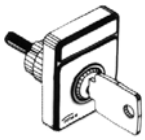
M4H Z ... +SRE

M4H Z ... +SA.



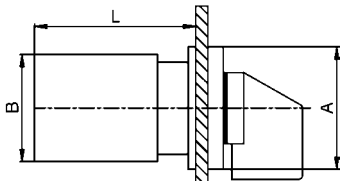
M4H ZO ... +SA.

M4H Z ... +SRE+SA.

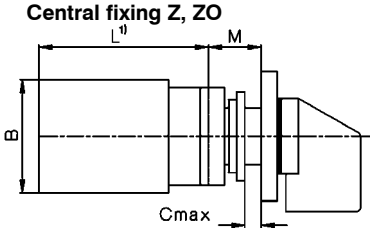


Wrench J7400
for switches M4H with central fixing is necessary

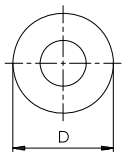
Panel mounting E



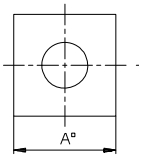
Central fixing Z, ZO



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

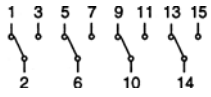
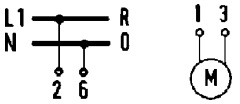
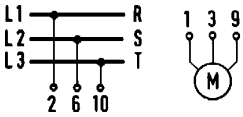
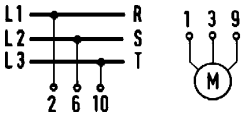
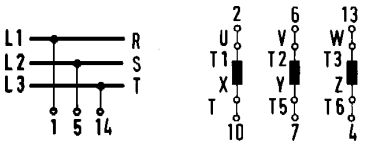
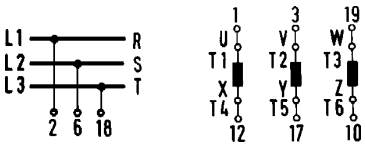
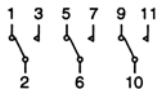
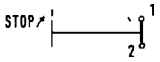
Type	according to specifications	Motor rating AC23					
			3-pole			2-pole	
		Volt	110 220 380			110 220 380	
			120 240 440			120 240 440	
M4H	IEC, VDE, BS, SEV	kW	0,75	1,8	3	0,37	0,75	1,1
	UL, CSA	HP	-	-	-	-	-	-

additional data for wiring according to UL and CSA

Type	type of wire	temp. rating of wire	torque value for field wiring terminals
M4H	copper wire only	60/75°C	0,6Nm / 5lb - inch

Mini-Cam Switches M4H

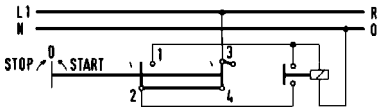
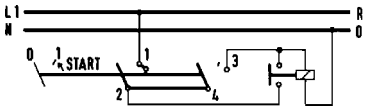
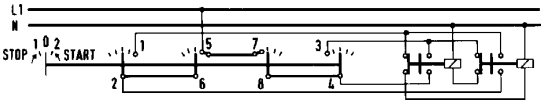
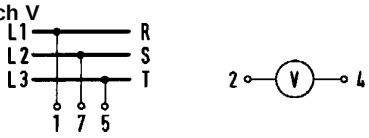
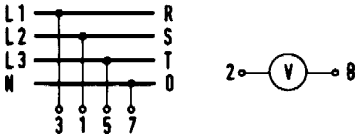
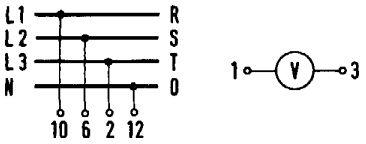
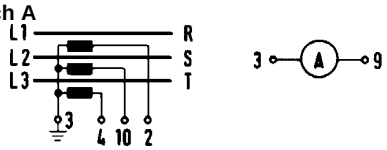
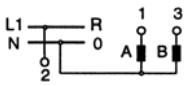
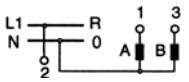
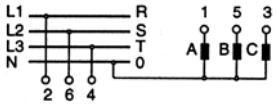
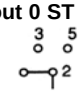
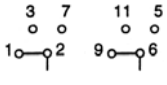
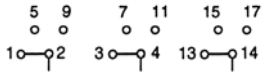
Switch programs

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				1	**M4H .**	**x**	**x**	**x**	**. A1**
2-pole				1	**M4H .**	**x**	**x**	**x**	**. A2**
3-pole				2	**M4H .**	**x**	**x**	**x**	**. A3**
4-pole				2	**M4H .**	**x**	**x**	**x**	**. A4**
6-pole				3	**M4H .**	**x**	**x**	**x**	**. A6**
Changeover switch U									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. U1**
2-pole				2	**M4H .**	**x**	**x**	**x**	**. U2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. U3**
4-pole				4	**M4H .**	**x**	**x**	**x**	**. U4**
Changeover switch without off W									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. W1**
2-pole				2	**M4H .**	**x**	**x**	**x**	**. W2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. W3**
4-pole				4	**M4H .**	**x**	**x**	**x**	**. W4**
6-pole				6	**M4H .**	**x**	**x**	**x**	**. W6**
Reversing switch WU									
2-pole				2	**M4H .**	**x**	**x**	**x**	**. WU2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. WU3**
3-pole with spring return to 0				3	**M4H .**	**x**	**x**	**x**	**. WU3R2**
Star-delta switch SD									
1 rotary direction				4	**M4H .**	**x**	**x**	**x**	**. SD**
both rotary directions				5	**M4H .**	**x**	**x**	**x**	**. SDR**
Changeover with spring return UR									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. UR1**
2-pole				2	**M4H .**	**x**	**x**	**x**	**. UR2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. 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

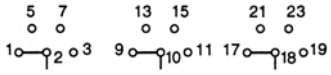
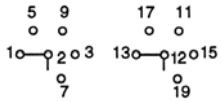
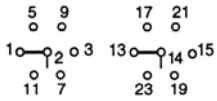
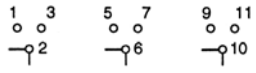
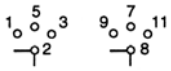
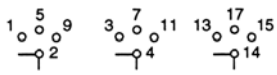
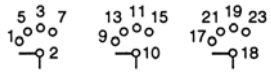
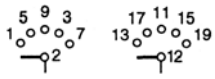
Switch programs

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**

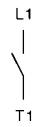
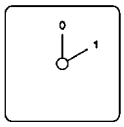
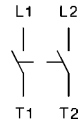
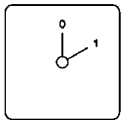
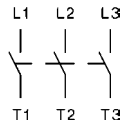
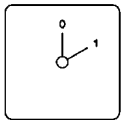
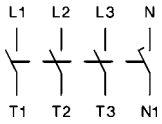
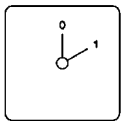
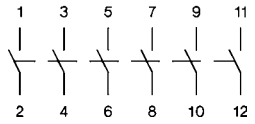
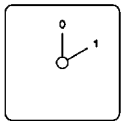
Mini-Cam Switches M4H

Switch programs

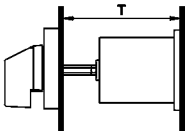
Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓	.Z. ↓	.ZO. ↓	Switch pro-gram
Multi step switch without 0 ST									
4 steps, 1-pole				2	**M4H .**	**x**	**x**	**x**	**. ST41**
4 steps, 2-pole				4	**M4H .**	**x**	**x**	**x**	**. 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

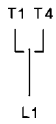
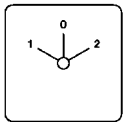
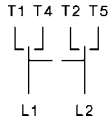
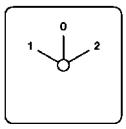
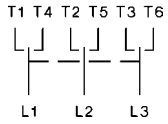
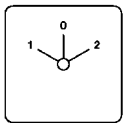
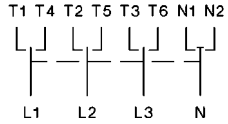
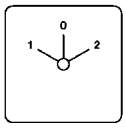
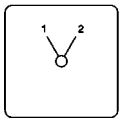
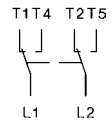
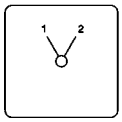
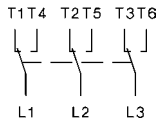
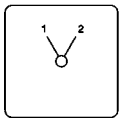
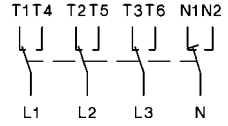
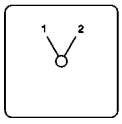
Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** **.E.** ↓	**.V.** ↓	**Switch pro-gram**	Escutcheon plate
On-Off-switches A								
1-pole		*60°*	2 88 ❒ 125A	**L100 .**	**x**	**x**	**. A1**	
			1 180A	**L160 .**	**x**	**x**	**. A1**	
			1 132❒ 400A	**L400 .**	**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 180A	**L160 .**	**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 180A	**L160 .**	**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 180A	**L160 .**	**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 180A	**L160 .**	**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	255
Dimensions	260

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

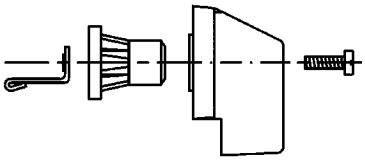
Types of handles

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°.

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

Type		M10 M10H M20	N20 N33F	N40 N61 N80 L100 L160	N100 N200 L400 L600 L800 L1200
Knob movement	mm	5	5	7	9
Hexagonal shaft dimension	mm	5	7	9	12

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.



Ordering example: Cam switch N61 V U3 with Instrument knob red
Order type: **N61 V U3 +G3**
Dimensions see page 261

Knobs and handles Description	Colour	**Ordering Code**	M10 M10H M20	N20 N33F	N40 N61 N80 L100 L160	N100 N200 L400 L600 L800 L1200
 Instrument knob Standard for M10 to N200	grey black red white	**+G1** **+G2** **+G3** **+G5**	**X** **X** **X** **X**	**X** **X** **X** **X**	**X**	**X**
 Toggle knob	grey black red white blue	**+K1** **+K2** **+K3** **+K5** **+K6**	**X** **X** **X** **X** **X**	**X** **X** **X** **X**		
 Hand wheel	black	**+HR**				**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 are 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 fitted on all switches after mounting.

Square plate

Rectangular plate
(with square plate)

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

Special engraved markings on escutcheon plates are limited by the available space. In the case of relatively large production runs or frequent use of the text, we recommend ordering of a printing block. This will be invoiced at cost price, and the engraving will not be charged for. This investment generally pays with batches from 50 pieces upwards.
The "escutcheon plate" column of the selection and ordering tables for switch programs indicates the standard plate and, in some cases, an additional plate that is often used for the programs in question. If such a plate, listed in the selection table, is desired, the appropriate code number should be stated when ordering a switch and switch program.

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

Code letter of switch sizes

M10, M10H, M20	**A**
N20, N33F	**E**
N40, N61, N80, L100, L160	**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:

A85009

Switch size	**Plate**	**Marking**
Code letter for M10, M10H and M20	Art.No. for standard plate with markings, complete	Code number with label MAN OFF 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 261

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. 238-240)
Plexi insert plate yellow	A E H L	.80...	... (see pp. 238-240)
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. 238-240)
Plexi insert plate yellow	A E H L	.895..	... (see pp. 238-240)
Escutcheon frame black	A E H L	.8503	-
Installation cover for design SMA			
grey cover, markings black	A - - -	.68...	... (see page 240)

Escutcheon Plates

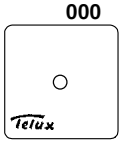
Selected standard markings
The markings that are most commonly required are shown below, together with code letters for the switch size and the code number.
Ordering example: Switch type M10H E A3 with escutcheon plate "OFF ON" and additional rectangular escutcheon plate "PUMP"
Order type: **M10H E A3 +003 +516**

Code letter of switch sizes

M10, M10H, M20	**A**
N20, N33F	**E**
N40, N61, N80, L100, L160	**H**
N100, N200, L400, L600, L800, L1200	**L**

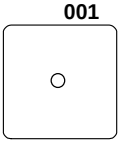
Blank escutcheon plates

000



A E H L

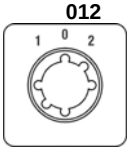
001



A E H L

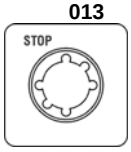
Switching angle 30°

012



A E H

013



A E

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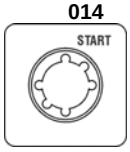

A

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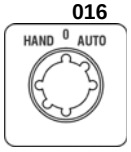

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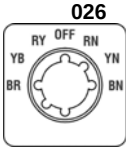

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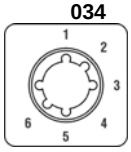

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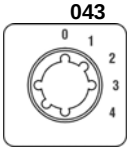

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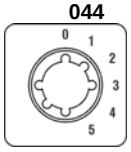

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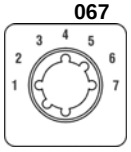

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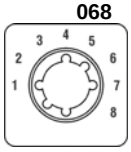

A

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A

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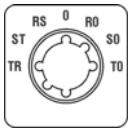

A

097

A

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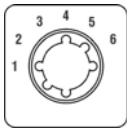

A E H

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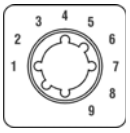

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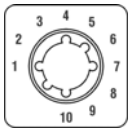

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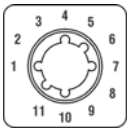

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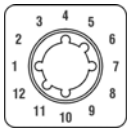

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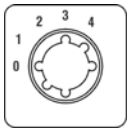

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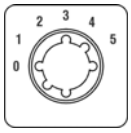

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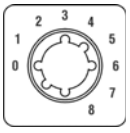

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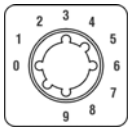

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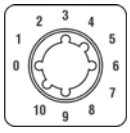

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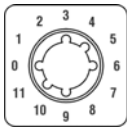

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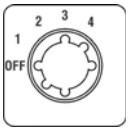

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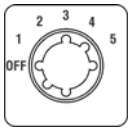

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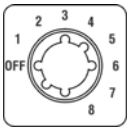

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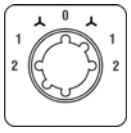

E

157

A

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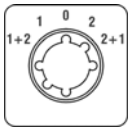

E

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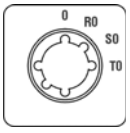

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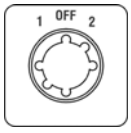

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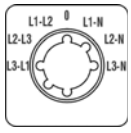

A E

371

A

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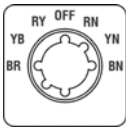

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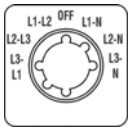

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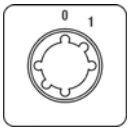

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A E

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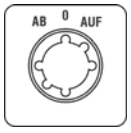
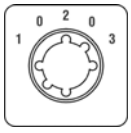


E

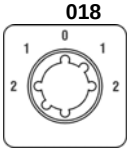
749



A

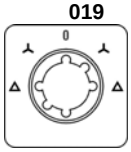
Switching angle 45°

018



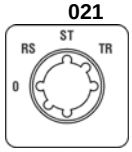
A E

019



A E H L

021



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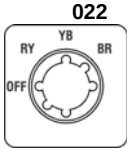
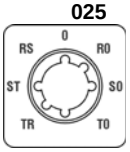
022



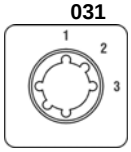
E

025



E

031



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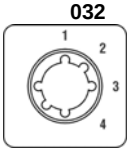
032



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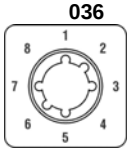
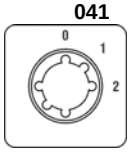
036



E

041



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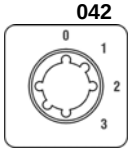
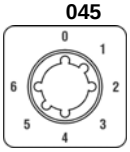
042



A E

045



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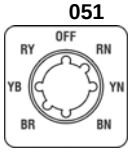
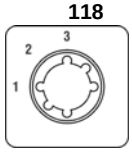


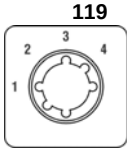
A E

118



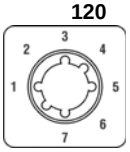
A E

119



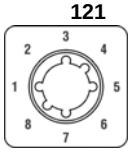
A E

120



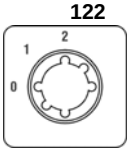
E

121



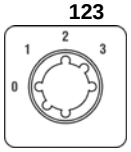
A E

122



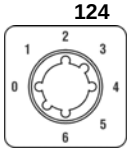
A E

123



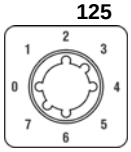
A E H L

124



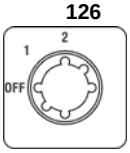
A E

125



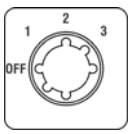
A E

126



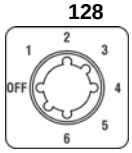
A E

127



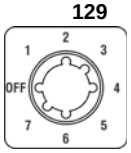
A E

128



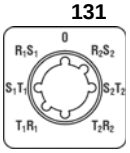
A E

129



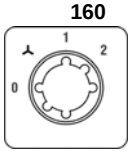
A

131



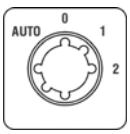
E

160



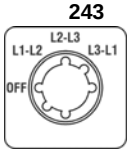
E H

221



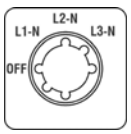
A

243



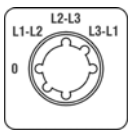
A E

244



A E

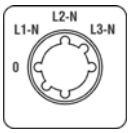
247



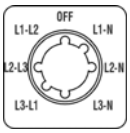
A E

Escutcheon Plates

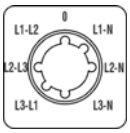
Switching angle 45°

248


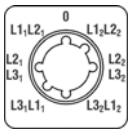
A

249


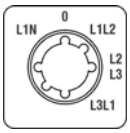
A

250


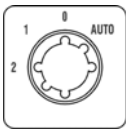
E

303


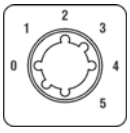
A E

304


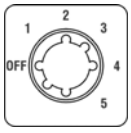
A E

336


A

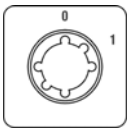
421


A E

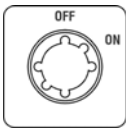
423


A E

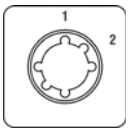
Switching angle 60°

002


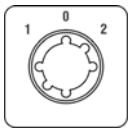
A E H L

003


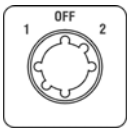
A E H L

004


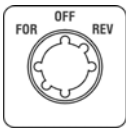
A E H L

006


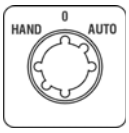
A E H L

007


A E H L

008


A

009


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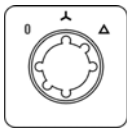
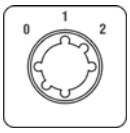
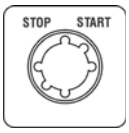


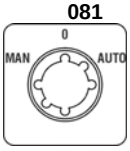
A E H L

011


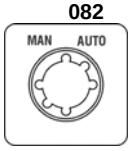
A E H L

015


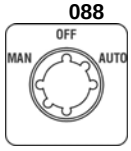
A E

081


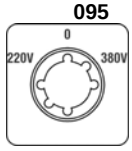
A E

082


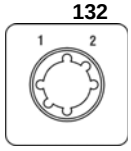
A E

088


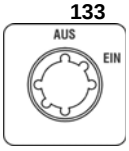
A E H

095


A E

132


A E H

133


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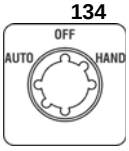

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136

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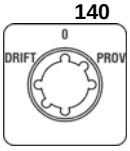

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143

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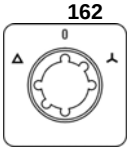

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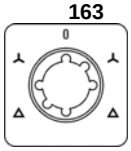

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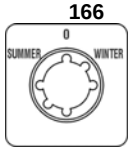

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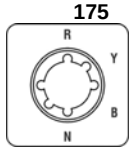

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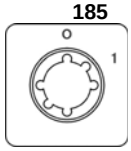

A E H L

186

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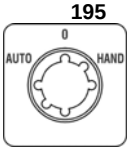

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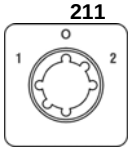

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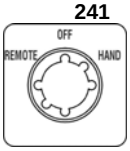

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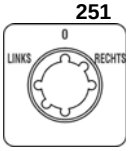

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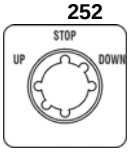

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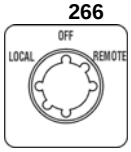

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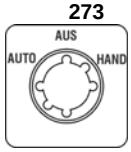

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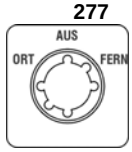

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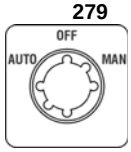

A E H

292

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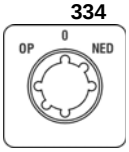

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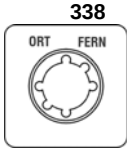

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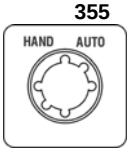

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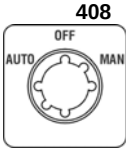

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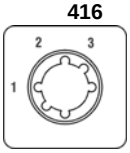

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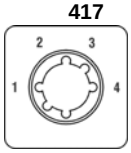

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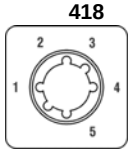

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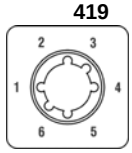

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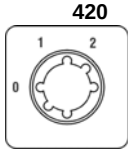

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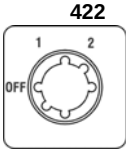

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439

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446

A E

448

A

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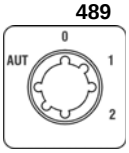

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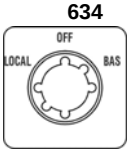

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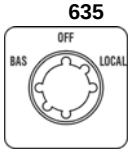

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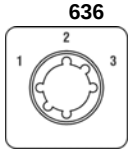

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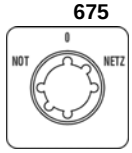

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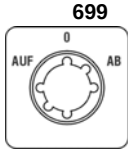

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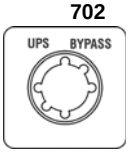

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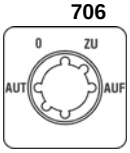

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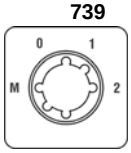

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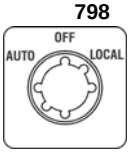

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Escutcheon Plates

Switching angle 90°

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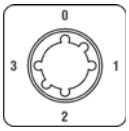

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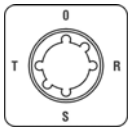

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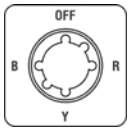

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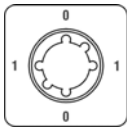

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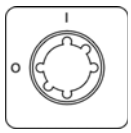

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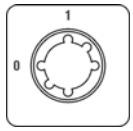

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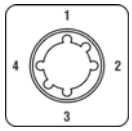

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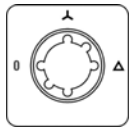

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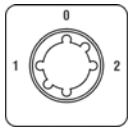

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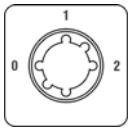

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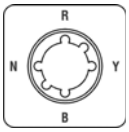

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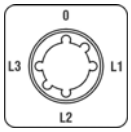

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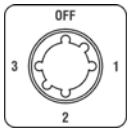

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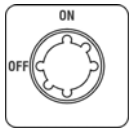

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Miscellaneous

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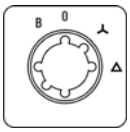

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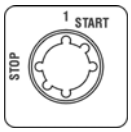

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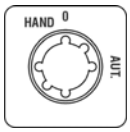

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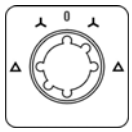
092


E

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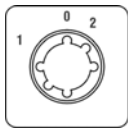

A E H

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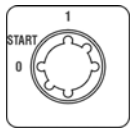

A E

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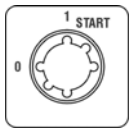

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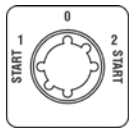

A E

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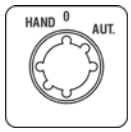

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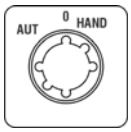

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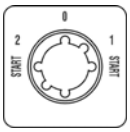


A

Rectangular additional escutcheon plates

500
A E H L

501
HAUPTSCHALTER
A E

503
AMMETER
A E

504
VOLTMETER
A E

505
PUMPE 1
A

506
PUMPE 2
A

509
FRAMMDÖRR
E

519
STEUERUNG
A E

520
LEISTUNGSSCHALTER
E

524
MAIN SWITCH
A E

534
NACHTLICHT
A

535
RAUMBELEUCHTUNG
A

542
Drehzahlverstellung
A E

543
Glimmlampentest
A

546
ALARMUNTERDRÜCKUNG
A

549
VEILLEUSE
A

550
PRISES
A

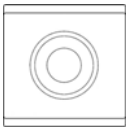
551
ECLAIRAGE
A

552
HOOFDSCHAKELAAR
A E

556
PUMPE 3
E

557
PUMPE 4
A

Covers for design SMA

001


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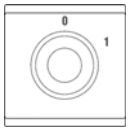

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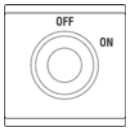

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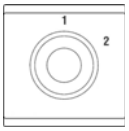

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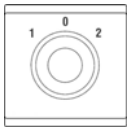

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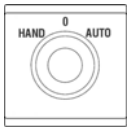

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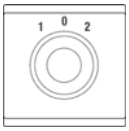

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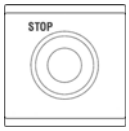

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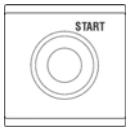

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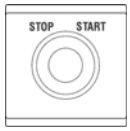

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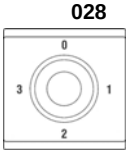

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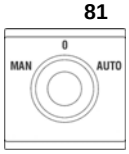

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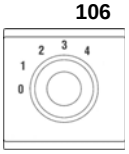

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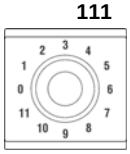

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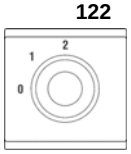

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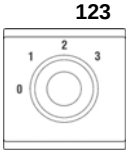

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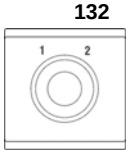

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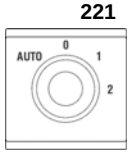

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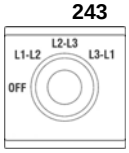

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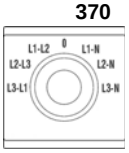

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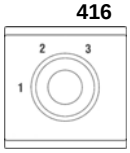

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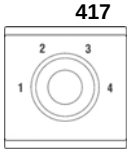

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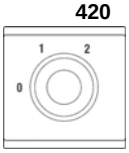

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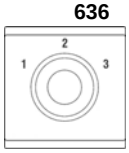

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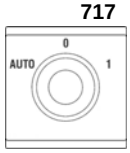


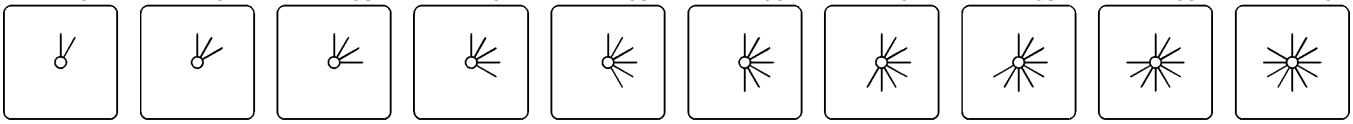
Switching angles

Arrangement of switch settings

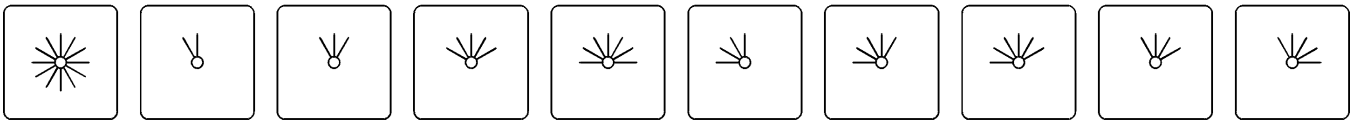
All feasible arrangements of switch settings are shown, and defined by position numbers, in the following tables. Not only the switching angles, but also switches with latched or momentary settings, or combinations of the two, are distinguished from one another.
Knowledge of the following variations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

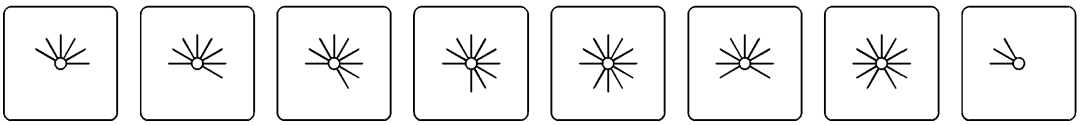
PN01 PN02 PN03 PN04 PN05 PN06 PN07 PN08 PN09 PN10



PN11 PN12 PN13 PN14 PN15 PN16 PN17 PN18 PN19 PN20

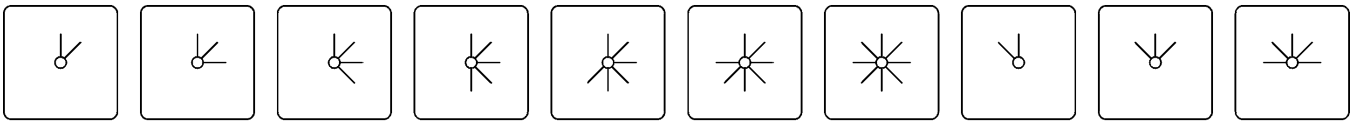


PN21 PN22 PN23 PN24 PN25 PN26 PN27 PN28

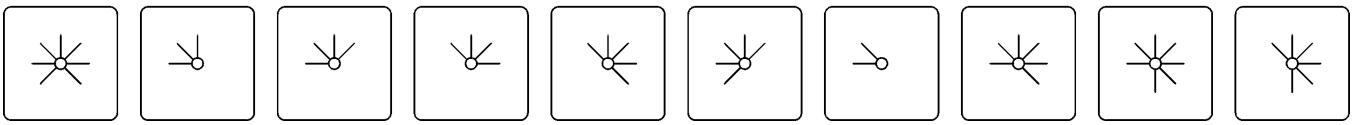


Switching angle 45°

PN30 PN31 PN32 PN33 PN34 PN35 PN36 PN37 PN38 PN39

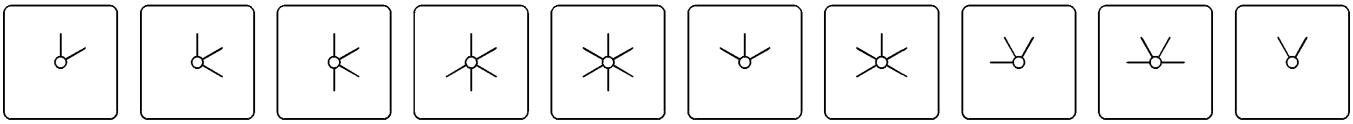


PN40 PN41 PN42 PN43 PN44 PN45 PN46 PN47 PN48 PN49

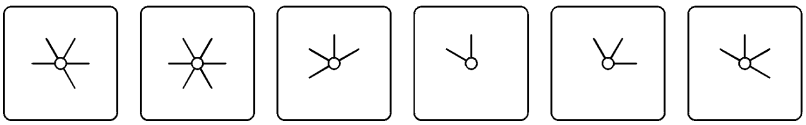


Switching angle 60°

PN50 PN51 PN52 PN53 PN54 PN55 PN56 PN57 PN58 PN59

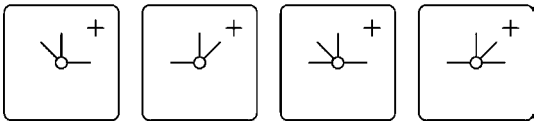


PN76 PN77 PN78 PN79 PN150 PN151



Switching angle 45/90°

PN70 PN71 PN72 PN73

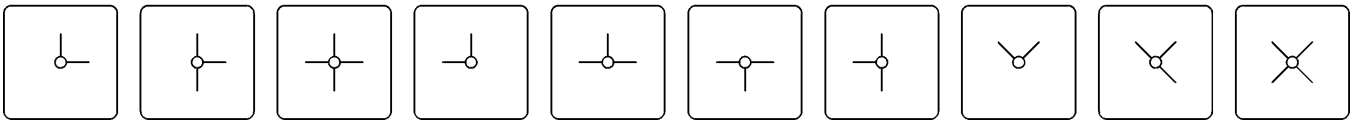


+) Not available for switch types M10, M10H and M20

Switching angles

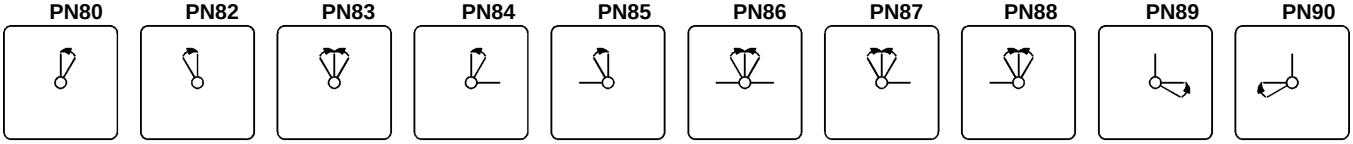
Switching angle 90°

PN60 PN61 PN62 PN63 PN64 PN65 PN66 PN67 PN68 PN69

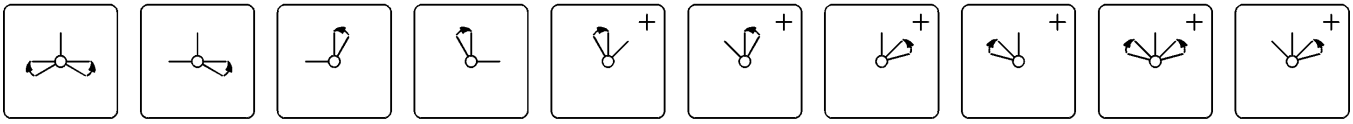


Momentary settings and special combinations

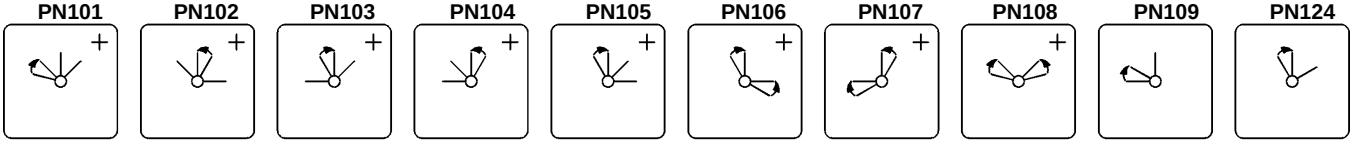
PN80 PN82 PN83 PN84 PN85 PN86 PN87 PN88 PN89 PN90



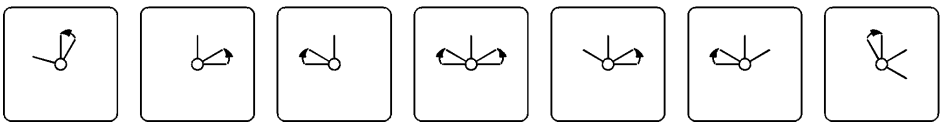
PN91 PN92 PN93 PN94 PN95 PN96 PN97 PN98 PN99 PN100



PN101 PN102 PN103 PN104 PN105 PN106 PN107 PN108 PN109 PN124

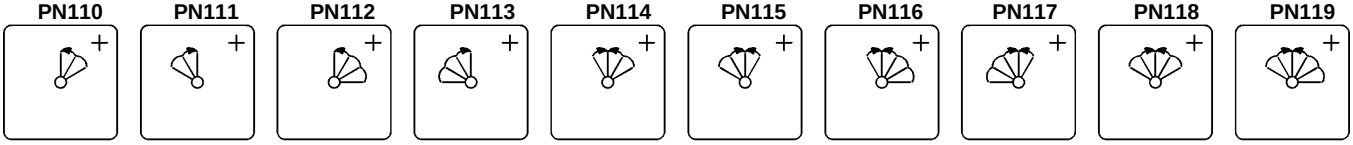


PN125 PN126 PN127 PN128 PN129 PN130 PN131

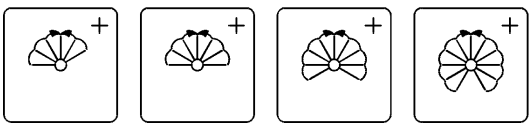


Spring return over several settings

PN110 PN111 PN112 PN113 PN114 PN115 PN116 PN117 PN118 PN119



PN120 PN121 PN122 PN123



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

Handles and drive units

Special actuating mechanisms and ancillary attachments can be provided for many switch sizes and designs. Here, the switch type is followed by order code for the ancillary attachment.

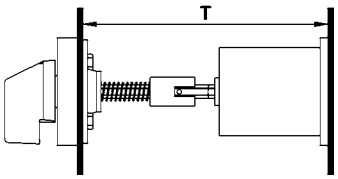
Ordering example: Cam switch N20 GF W3R with removable knob
Order type: **N20 E W3R +STGR**

Dimensions see page 262

	Ordering Code	Suitable for designs	Suitable for switch type
Removable knob drive The operating knob is designed to be removable, and can be withdrawn in any setting. The switch shaft is covered when the knob is withdrawn.	**+STGR**	E P	M10H, M20, N20, N33F M10, N20, N33F
Removable knob drive 2 The operating knob is designed to be removable. It can be withdrawn in one setting, to be stated when ordering.	**+STGR2**	E P	M10H, M20, N20, N33F M10, N20, N33F

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 openened 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 263

	Ordering Code	Suitable for designs	Suitable for switch type
Door coupling Protection class from front: IP65 5-hole mounting	**+TKE/...**	V, SM	M10H, 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, 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, M20, N20, N33F

Door coupling Protection class from front: IP40 5-hole mounting	**+TK/...**	V	N40, N61, N80, N100, N200 L100, L160, L400, L600 L800
Door coupling Protection class from front: IP54 5-hole mounting	**+TKFR/...**	V	N40, N61, N80, N100, N200 L100, L160, L400, L600 L800

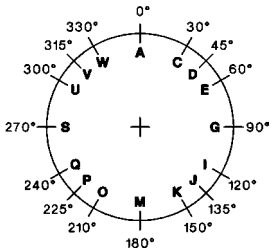
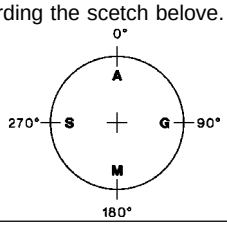
Door coupling locked Protection class from front: IP40 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	**+TK2/...**	V	N40, N61, N80, N100, N200 L100, L160, L400, L600 L800
Door coupling locked Protection class from front: IP54 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	**+TK2FR/...**	V	N40, N61, N80, N100, N200 L100, L160, 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 264 and 265

	Ordering Code	Suitable for designs	Suitable for switch type
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: 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. 	**+SA** **+SA/.**	E, V, SM E, V P SMA UP	M10H, M20, N20, N33F N40, N61 M10, N20, N33F, N40, N61 M10H, 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, 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, M20
Key operated switch with barrel for special security functions Lock EVVA EHZ50/5 Nickel matt Special version which prevents not only switching but also access to the cable ends and removal of the switch when locked. Maximum number of cells Design E, P: 4 Design UP : 3	**+SASI**	E P UP	M10H, M20 M10, M20 M10, M20
Key operated switch for special security functions without lock for use of lock EVVA EHZ50/5 or with same dimensions Maximum number of cells Design E, P: 4 Design UP : 3	**+SASO**	E P UP	M10H, M20 M10, M20 M10, 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 266

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

	Padlock device Description	**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 Standard version **black** 64 x 64mm, otherwise **red** 64 x 64mm	**+SV1** **+SV1R** **+SV164** **+SV164R**	E, V, SM P, PF E, V P, PF	M10H, M20 M10 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.	**+SV3** **+SV3R**	E, V E, V E, V PF	N40, N61, N80, L100, L160 N100, N200, L400, L600, L800, L1200 N40, N61, N80, N100, N200
	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 Standard base **grey**, locking ring **black** 88 x 88mm, or with **yellow** base and **red** locking ring 88 x 88mm	**+SV4** **+SV4R** **+SV488** **+SV488R**	E, V SM P, PF E, V E, V P, PF	M10H, N20, N33F M10H, N20, N33F N20, N33F N20, N33F N40, N61, N80 N40, N61, N80
	Key lock device With a cylinder lock in the lock attachment, 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 (unlokkable) settings can be supplied.	**+SZ**	E, V SM	alle 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	alle M10H, M20, N20, N33F

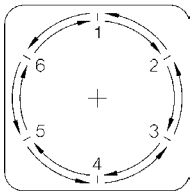
Switch interlocks

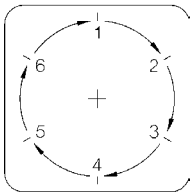
A wide range of locks and interlocking devices, designed to prevent accidental or hazardous switching, can be supplied.

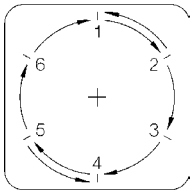
Ordering example: Cam switch N20 E A3 with push button switch lock
Order type: **N20 E A3 +DV**

Dimensions see page 267

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 coll 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
Backswitch 1 Special version of the circular switch, in which the switch can only be turned in one direction.	**+RS1**	all	all
Backswitch 2 Special version of the circular switch, in which, in given positions, the switch can only be operated in one direction.	**+RS2**	all	all



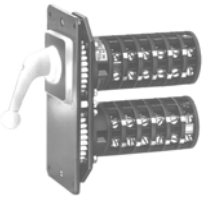




Couplings and stop mechanism

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 268

Ordering example: Cam switch N200 V ST0113 spread over three columns interconnected by gears
Order type: **N200 V ST0113 +ZK3**

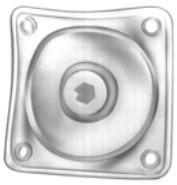


Description	Ordering Code	Suitable for designs	Suitable for switch type
Coupling of two columns For simultaneous drive of two switch columns (with very large number of switch cells or limited installation depth).	**+ZK2**	E, V	all
Coupling of three columns For simultaneous drive of three switch columns.	**+ZK3**	E, V	all
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, L160 N100, N200, L400, L600, L800, L1200
Delayed action switch Using a delayed action coupling, two switch shafts - a main shaft and delayed shaft - can be coupled, such that the delayed shaft is rotated together with the main shaft once a given angle of rotation is reached (e.g. for off-load return of switches used with pole-changing motors).	**+SK**	E, V G, GF	N20, N33F, N40, N61, N80 N20
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
Metal stop mechanism for extreme mecanical stress on the stop mechanism, e.g. where many contacts are switched at the same time. Not for PN110 to PN123	**+MRW**	E, V E, V E, V G, GF	N40, N61, N80, L100, L160 N100, N200, L400, L600, L800, L1200 N20

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 268	**+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, 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, N20, N33F
Switch with pilot lamp lamp red, 230V lamp red, 400V lamp green, 230V lamp green, 400V	 **+SLR/230** **+SLR/400** **+SLG/230** **+SLG/400**	E P UP	all M10, N20, N33F, N40, N61 M10, N20
Gold plated contacts For electronic circuits with low voltages and currents.	**+GK**	all	M10H, M20, N20, N33F
Tropical proof type	**+TR**	all	all
Neon safety switch For all-pole switching off of neon advertisement circuits by the Fire Brigade. Dimensions see page 268	**+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 267

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, 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, N100, N200 N20
Additional rectangular escutcheon plate 1 line Dimensions see page 261	**SRE**	E, Z, V, SM	all
Big additional rectangular escutcheon plate for 2 lines Dimensions see page 261	**SRE2**	E, V	M10H, M20, N20, N33F
Spare key for key operated switches with Lock Willenhal FT101	**J7101**	E, V, P SMA	M10H, M20, N20, N33F,N40 M10H, M20
Spare key for key operated switches with Lock Ronis R455	**B4-R455**	Z, ZO	M10H, M20
Wrench for switches with central fixing	**J7049**	Z, ZO	M10H, M20

Switching Programs according to Customer Requirements

As a result of their modular construction, TELUX cam switches are particularly suitable for manufacturing of special variants. According to its function, each pair of contacts in the switch is adapted to the desired program by appropriate design of the cam plate. In the case of switches with an overall switching angle of more than 180°, provision must made for a cam plate in each switching cell, controlling two opposite, independent contact pairs with matching programs (does not apply to M10, M10H, M20 and N20).

Depending on the desired contact program for the special switch, it may often be impossible to make full use of all switching cells, that is, to include the maximum possible number of contacts. In determining the number of cells or switch length, one-contact cells will sometimes be resorted to.

Switch sizes M10, M10H, M20 and N20 are exceptions to this rule. Here, two cam plates can be built into each cell, so that both contacts are independently controlled (full use of the cells with special programs).

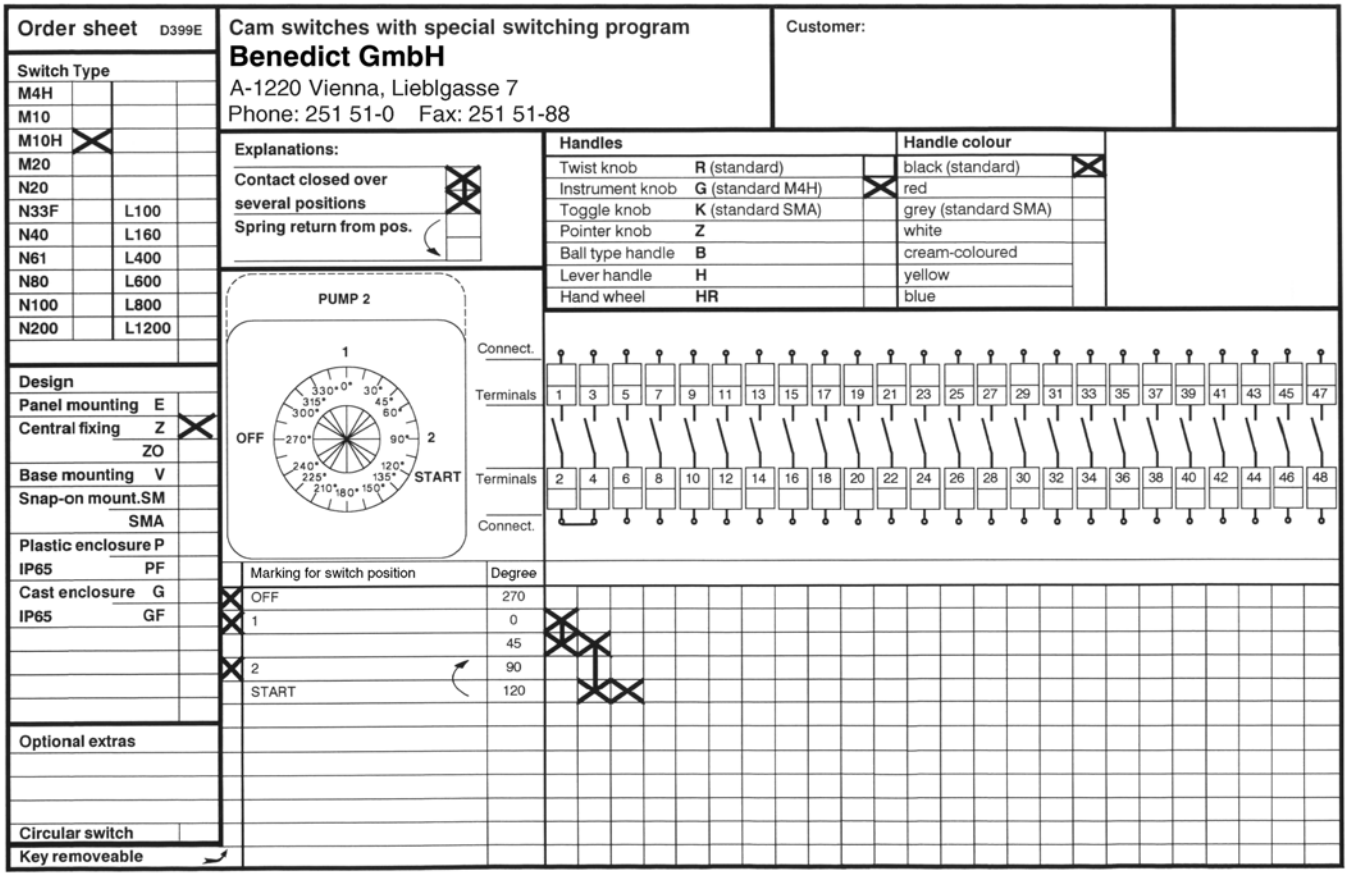
In all special switches with overall switching angles of less than 180°, the number of cells required is calculated by having the total number of contacts in the switching program.

When planning for switches with special programs, choice of the optimum switching angle thus plays an important part. The listing of all the options for lay-out of switch settings, on pages 241 and 242, should be an aid to planning (position numbers PN).

If special markings are to be engraved on the escutcheon plates, it is vital to take account of the available space. It is advisable to use abbreviations.

We provide forms (see page 269) on request, free of charge, to give a clear overview when special programs are being defined. Switch size, design, type of operating knob and desired switching angle, as well as the function of the contacts, are entered on these forms. Provision has also been made in them for entry of details as to escutcheon plate engravings or other special requirements.

Ordering Example



Order sheet A4 see page 269

Utilization Categories

For easier choice of devices and in order to make the comparison of different products simplier are utilization categories for cam switches according to IEC 947-3, VDE 0660 Part 107 and auiliary contacts according to IEC 947-5-1 and VDE 0660 Part 200 determind. The Table below offers divers utilization catagories and assorted test conditions.

Kind of current	Category fre-quent oper-ation	Category infre-quent oper-ation	Typical applications	Rated operational current	Test conditions for the number of on-load operating cycles (normal service) Make I/Ie	Make U/Ue	Make cosφ	Break Ic/Ie	Break Ur/Ue	Break cosφ	Test conditions for making and breaking capacities (operation in fault case) Make I/Ie	Make U/Ue	Make cosφ	Break Ic/Ie	Break Ur/Ue	Break cosφ
Alter-nating 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<Ie≤100A all values 100A<Ie	1	1	0,65	1	1	0,65	10 10	1,05 1,05	0,45 0,35	8 8	1,05 1,05	0,45 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 runing	0<Ie≤100A all values 100A<Ie	Ie≤17A 6 Ie>17A	1	0,65 0,35	Ie≤17A 1	0,17	0,65 0,35	10	1,05	0,45 0,35	8	1,05	0,45 0,35
	AC4		Squirrel-cage motors: Starting, plugging, inching	0<Ie≤100A all values 100A<Ie	Ie≤17A 6 Ie>17A	1	0,65 0,35	Ie≤17A 6	1 0,35	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/Ie	U/Ue	L/R[1)]	Ic/Ie	Ur/Ue	L/R[1)]	I/Ie	U/Ue	L/R[1)]	Ic/Ie	Ur/Ue	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 repeatly 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	M20	N20	N33F	N40	N61	N80	N100	N200
Rated therm. current I_{th}	open	A	20	20	32	32	50	63	85	115	150	250
Rated therm. current I_{the}	encl.	A	20	20	32	32	50	63	85	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]
Disconnection property [2] acc. to VDE, IEC up to		V	440	440	440	440	440	690	440	440	690	690
Breaking capacity I_{eff}												
3 x 220-440V		A	160	160	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	32	32	50	63	85	115	150	250
Utilization categ. AC23A, AC23B Switching of motor loads or other highly inductive loads Rated current I_e	400V	A	16	16	30	30	45	45	60	85	105	135
Power rating	220-240V	kW	4	4	7,5	7,5	11	15	22	30	40	40
3-phase 3-pole	380-440V	kW	7,5	7,5	15	15	22	22	30	45	55	70
	500V	kW	-	7,5	15	15	22	22	30	45	55	70
	660-690V	kW	-	7,5	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	22	22	30	30	50	60	80	135
Power rating	220-240V	kW	3	3	5,5	5,5	7,5	7,5	15	18,5	37	40
3-phase 3-pole	380-440V	kW	5,5	5,5	11	11	15	15	25	30	40	70
	500V	kW	-	5,5	11	11	15	15	25	30	40	70
	660-690V	kW	-	5,5	11	11	15	15	25	30	40	-
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	12	12	16	-	-	-	-	-
	380 -440V	A	4	4	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≤1ms Rated current I_e												
1-pole	30V	A	20	20	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≤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 ot terminals [1]			IP00	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): Uimp = 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).

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	M20	N20	N33F	N40	N61	N80	N100	N200
Cable cross-sections											
solid	mm^2	1-2,5	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]	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	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	1	1	1	1
Size of terminal screw		M3	M3,5	M4	M4	M4	M5	2xM5	2xM5	2xM6	M10
Tightening torque	Nm	0,6-1,2	0,8-1,4	1,2-1,8	1,2-1,8	1,2-1,8	2,5-3	2,5-3	2,5-3	3,5-4,5	10
	lb.inch	5-11	7-12	11-16	11-16	11-16	22-26	22-26	22-26	31-40	88
Short circuit protection											
Max. fuse size	gL (gG) A	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	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	30s A	35	35	85	85	110	160	250	300	500	600
contacts already closed	60s A	25	25	65	65	80	110	200	250	370	480
Power loss at AC21A	A	20	20	32	32	50	63	85	115	150	250
per pole	W	0,6	0,5	0,9	1,1	1,9	2	2,8	4,4	5,7	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	M20	N20	N33F	N80	N100	N200	L400
Rated voltage		V~	300	600	600	600	600	600	600	600	600
Rated operational current	"General Use"	A	20	20	35	35	60	115	130	250	350
	with jumper	A	15	-	25	25	40	80	-	-	-
DOL-Rating 3-phase	110-120V	hp	1½	1½	5	5	7½	10	15	15	15
	200-208V	hp	2	2	5	5	10	15	25	25	25
	220-240V	hp	3	3	5	5	15	20	30	30	30
	440-480V	hp	-	5	10	10	25	40	40	60	60
	550-600V	hp	-	7½	15	15	30	50	50	75	75
DOL-Rating 1-phase	110-120V	hp	½	½	1½	1½	3	5	7½	7½	7½
	200-208V	hp	1	1	3	3	5	7½	15	15	15
	220-240V	hp	1½	1½	5	5	7½	10	15	20	20
Fuse size (RK5) 5kA / 600V	Manual Motor Controller and Motor Disconnect	A	40 [2]	40	80	80	150	200	300	350	350
Heavy pilot duty		AC	A300	A600	A600	A600	A600	-	-	-	-
Cable cross sections											
solid		AWG	12 - 20	12 - 20	10 - 18	10 - 18	10 - 12	10 - 12	10 - 14	-	-
flexible		AWG	14 - 20	14 - 20	8 - 18	8 - 18	6 - 12	2 - 12	1 - 14	250kcmil	500kcmil
Tightening torque		Nm	1.7	1-1.7	1.7-2.8	1.7-2.8	2.3-2.8	2.8	4.5	-	-
		lb.inch	15	9-15	15-25	15-25	20-25	25	40	-	-

1) Maximum cable cross-section with prepared conductor
2) 5kA / 300V

Technical Data

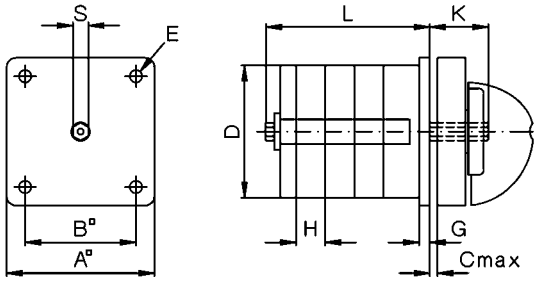
Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type			L100	L160	L400	L600	L800	L1200
Rated insulation voltage U_i		V	690 [2]	690 [2]	690 [2]	690 [2]	690 [2]	690 [2]
Rated thermal current I_{th}	open	A	125	180	400	600	800	1200
Rated thermal current I_{the}	encl.A	125	180	400	600	800	1200	
with conductor		mm^2	50	70	40x5	40x10	busbar 2x40x10	busbar 2x50x10
Utilization category AC21A, AC21B								
Switching of resistive loads, including moderate overloads								
Rated operational current I_e		A	125	180	400	400	400	400
Shot-time current-carrying capacity								
Load duration		1s	-	-	4800	6500	8500	10000
		3s	800	1200	3600	5000	6500	8000
		10s	500	800	2000	3200	4000	5800
Note: Ratings applies to		30s	320	480	1200	1700	2200	3200
contacts already closed		60s	180	380	960	1300	1700	2300
Cable cross-sections								
solid or stranded		mm^2	25-50 [1]	cable lug	busbar	busbar	busbar	busbar
flexible		mm^2	25-50 [1]	70	40x5	40x10	2x40x10	2x50x10
flexible with multicore cable end		mm^2	25-35	-	-	-	-	-
Size of terminal screw			2xM5	M8	M12	M16	M16	M16
Number of conductors to clamp per pole			1	1	1	2	1	1
Short circuit protection								
Max. fuse size	slow, gL (gG)	A	125	200	400	630	800	1250

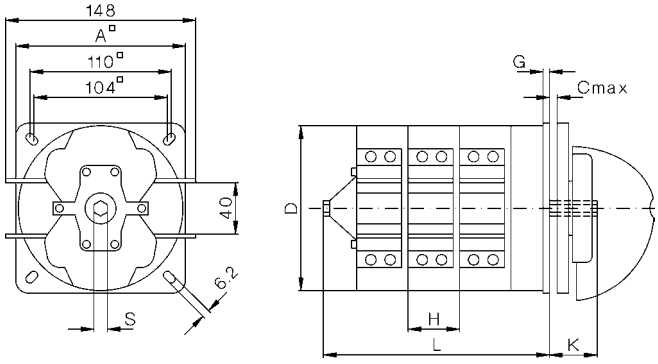
1) Maximum cable cross-section with prepared conductor
2) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} = 6kV. Data for other conditions on request

Dimensions (mm)

Panel mounting E
M10 - N100



N200

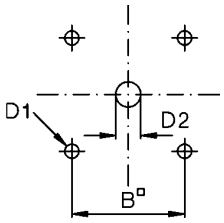


Type	A	B	C	D	D1	D2	D3	E	G	H	K	S
M10H	48	36	5	44 [1)]	5	8	-	4	3,5	9,5	19	SW5
M20	48	36	5	56	5	8	57	4	3,5	12,5	19	SW5
N20	64	48	5	56	5	12	57	4,2	3	12,5	20	SW7
N33F	64	48	5	58 [2)]	5	12	-	4,2	3	15,5	20	SW7
N40	86	68	7	80	6	12	82	5,2	3,5	18	24,5	SW9
N61	86	68	7	80	6	12	82	5,2	3,5	29,5	24,5	SW9
N80	86	68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

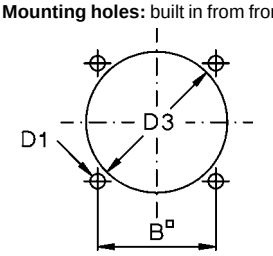
2) 58 x 58

Mounting holes: built in from ear

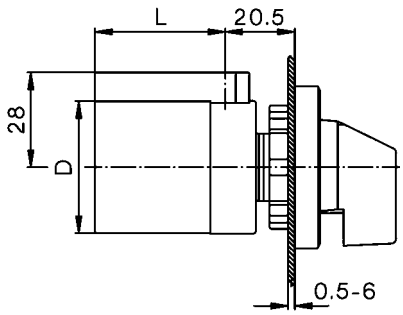


Type	Dimension L with .. cells 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M10H	36,5	46	55,5	65	74,5	84	93,5	103	112,5	122	131,5	141	-	-	-
M20	38,5	51	63,5	76	88,5	101	113,5	126	138,5	151	163,5	176	-	-	-
N20	40,5	53	65,5	78	90,5	103	115,5	128	140,5	153	165,5	178	190,5	203	215,5
N33F	44	59,5	75	90,5	106	121,5	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	-	-	-

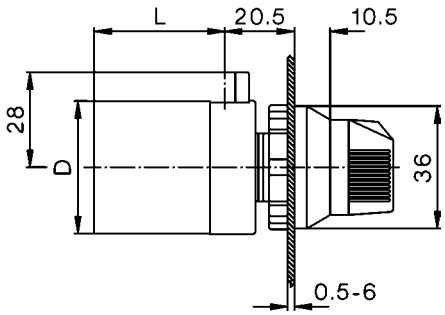
Mounting holes: built in from front



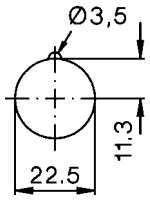
Central fixing Z
M10H, M20, N33F



Central fixing without escutcheon plate ZO
M10H, M20



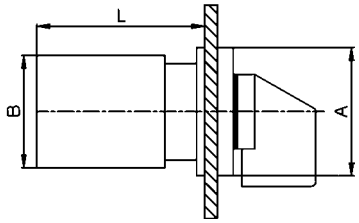
Mounting hole:



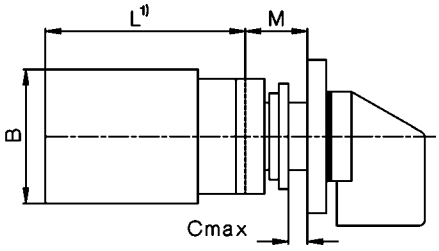
Further dimensions see tables above

Mini-Cam Switches M4H

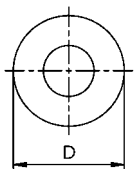
Panel mounting E



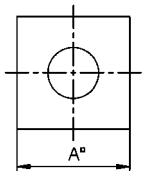
Central fixing Z, ZO



ZO



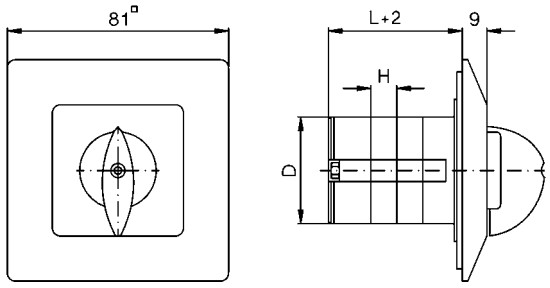
Z



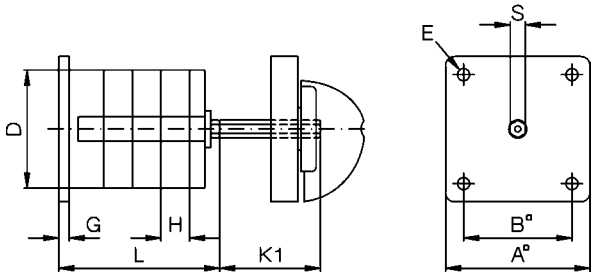
Type		A	B	D	M	Dimension L with .. cells 1	2	3	4	5	6	7	8
M4H	mm	30	28	29,5	12,5	38,5	50,5	62,5	74,5	86,5	98,5	110,5	122,5

Mounting holes see page 230

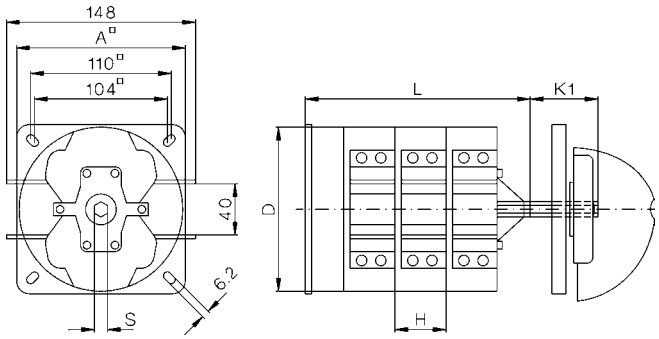
Flush mounting UP
M10



Base mounting V
M10H - N100



N200

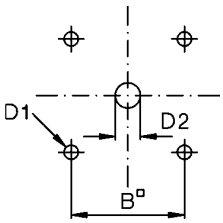


Type	A	B	D	D1	D2	E	G	H	I	K	K1	S
M10	48	36	39	5	8	4	3,5	9,5	6	19	41	SW5
M10H	48	36	44 [1)]	5	8	4,2	3	9,5	6	19	41	SW5
M20	48	36	56	5	8	4,2	3	12,5	6	19	47	SW5
N20	64	48	56	5	12	4,2	3	12,5	0	20	29	SW7
N33F	64	48	58 [2)]	5	12	4,2	3	15,5	0	20	31,5	SW7
N40	86	68	80	6	12	5,2	3,5	18	-	-	38,5	SW9
N61	86	68	80	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

1) 42 x 44,5

2) 58 x 58

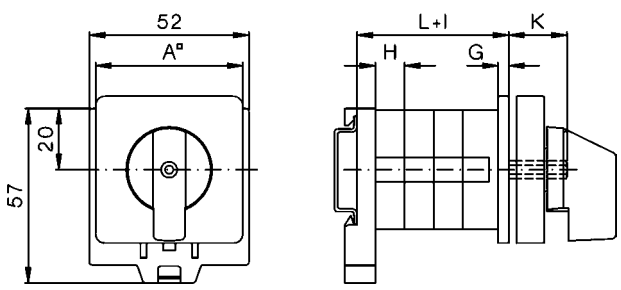
Mounting holes: for escutcheon plate



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	-	-	-

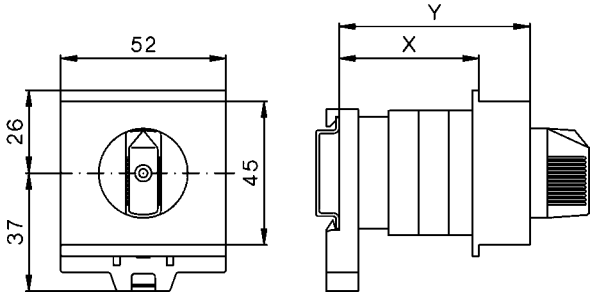
Snap-on mounting SM
M10H - N33F for 35mm DIN-rail mounting according to DIN EN 50022

Dimensions see tables above

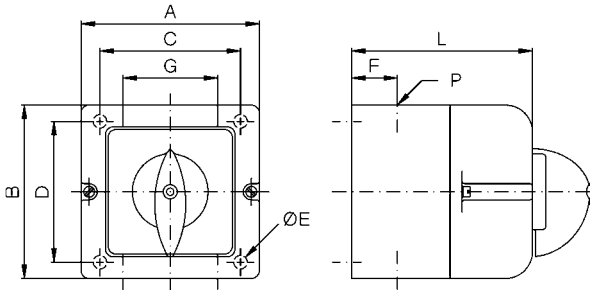


Swich with installation cover SMA
M10H, M20 for 35mm DIN-rail mounting according to DIN EN 50022

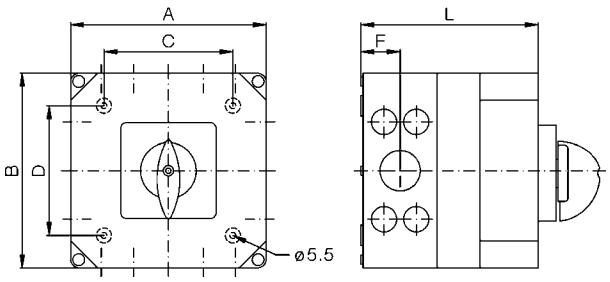
Type	Dimension X with .. cells 1, 2	3	4	5	Dimension Y with .. cells 1, 2	3	4	5
M10H	44	44	61	76	60	60	75	90
M20	44	61	76	76	60	75	90	90



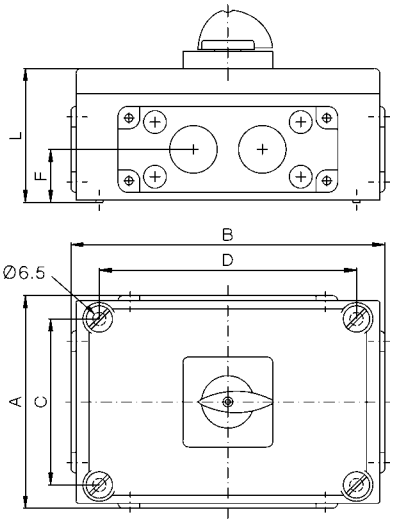
Plastic enclosed switches P, PF
M10 - N61



N61, N80



N100, N200



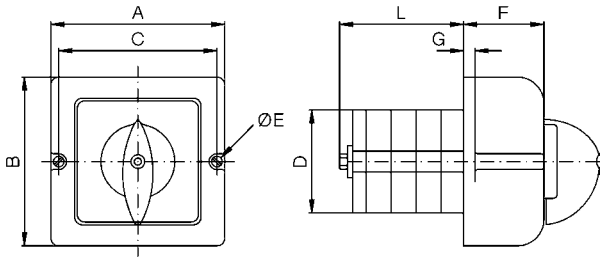
1) knock outs for M40/M32 + 4x M20 at top and bottom
M32/M25 + 4x M20 at the right and left hand side,

2) 2 flange plates with hole 50,5 at top and bottom

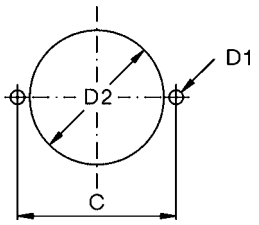
3) 2 flange plates with hole 50,5 at top and bottom, can also be mounted at the right and left hand side

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
N61	112	108	85	50	5	20	50	M25	92	110	-	-	-	-
N61	182	180	120	120	5,5	36,5	-	1)	-	-	165	215	215	-
N80	182	180	120	120	5,5	36,5	-	1)	110	110	165	215	215	-
N100	210	310	165	255	6,5	52,5	-	2)	130	130	180	-	-	-
N200	310	310	255	255	6,5	52,5	-	3)	130	180	230	-	-	-

Motor terminal box mounting KE
M10 - N33F



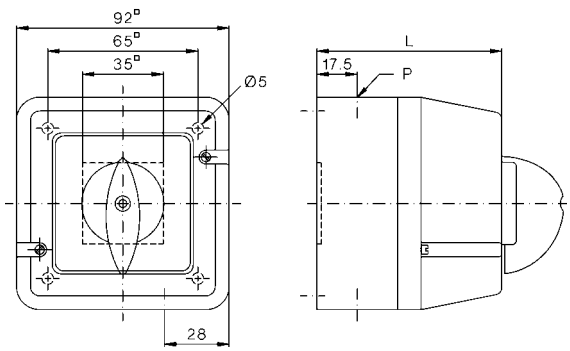
Mounting holes



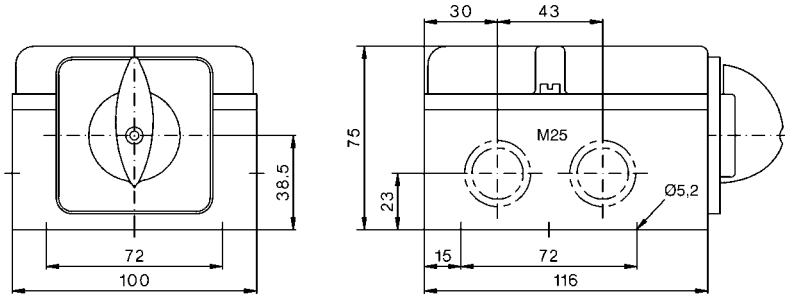
Type	A	B	C	D	D1	D2	E	F	G	Dimension L with .. cells 2	3	4	5	6
M10	66	64	58	39	4	48	3,2	24	6	22	31,5	41	50,5	60
N20	82	78	71	48	5	57	4,2	34	5	24,5	37	49,5	62	74,5
N33F	112	108	100	56	5	70	4,2	49	11	32,5	48	63,5	79	94,5

Plastic enclosed motor starter PM
N20

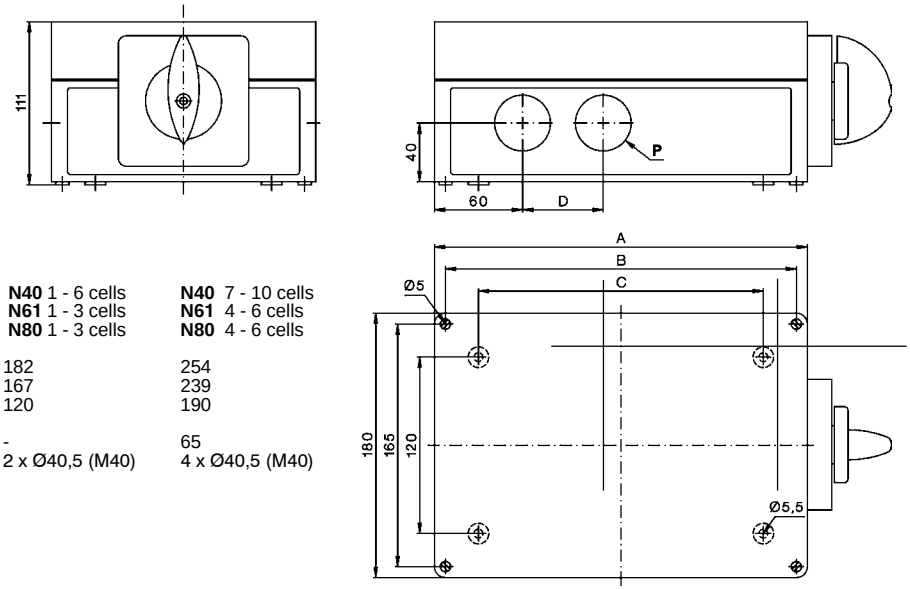
Typ	P	Dimension L with .. cells 1	2	3	4	5	6
N20	M25	80	80	80	92,5	105	117,5



Cast aluminium enclosed switches G, GF
N20



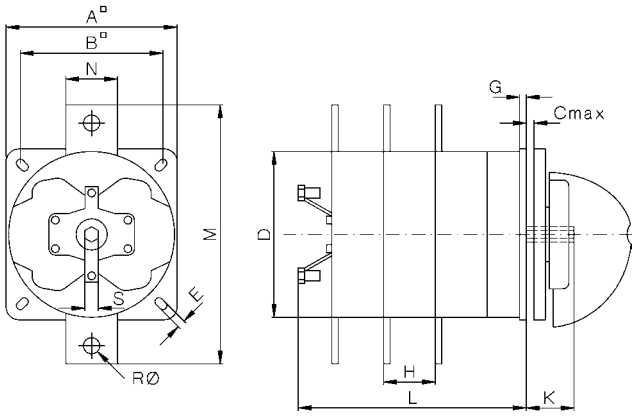
Plastic enclosure horizontal PLF (Replacement for cast aluminium enclosure G, GF)
N40, N61, N80



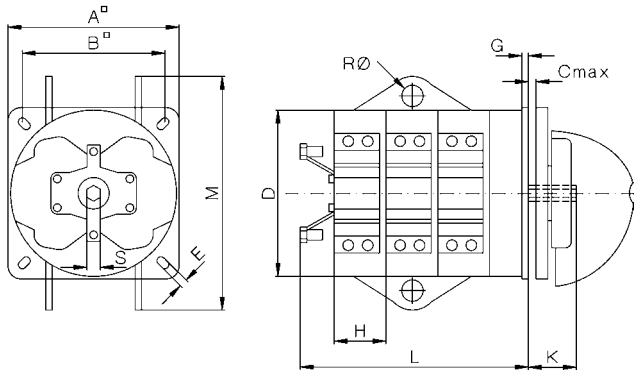
Type	**N40** 1 - 6 cells **N61** 1 - 3 cells **N80** 1 - 3 cells	**N40** 7 - 10 cells **N61** 4 - 6 cells **N80** 4 - 6 cells
A	182	254
B	167	239
C	120	190
D	-	65
P	2 x Ø40,5 (M40)	4 x Ø40,5 (M40)

Load Switches

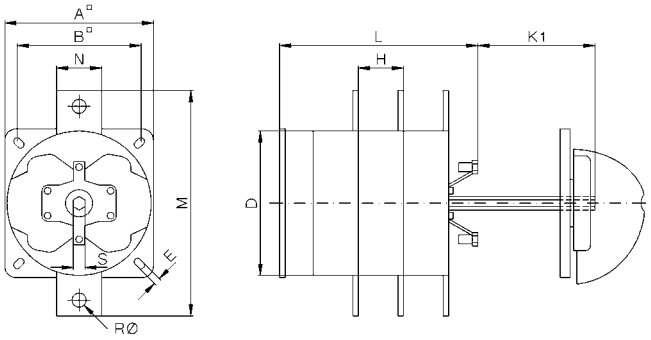
Panel mounting E
L100 - 400, L800, L1200



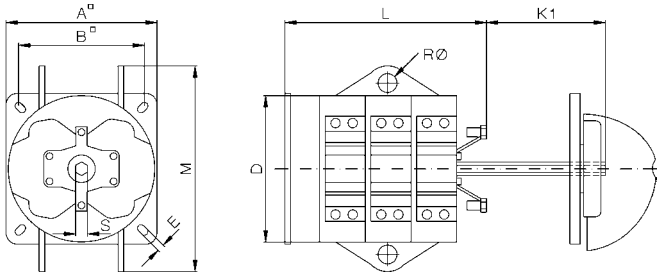
L600



Base mounting V
L100 - 400, L800, L1200

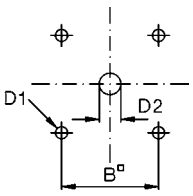


L600



Type	A	B	C	D	D1	D2	E	G	H	K	K1	M	N	R	S
L100	86	68	7	80	6	12	5,2	3,5	18	24,5	38,5	103	27	-	SW9
L160	86	68	7	80	6	12	5,2	3,5	29,5	24,5	38,5	115	-	8,5	SW9
L400	132	110	9	128	7	16	6,2	5	40	37	104	200	40	12,5	SW12
L600	132	110	9	128	7	16	6,2	5	40	37	104	180	-	16,5	SW12
L800	132	110	9	128	7	16	6,2	5	40	37	104	240	40	16,5	SW12
L1200	132	110	9	128	7	16	6,2	5	40	37	104	240	40	16,5	SW12

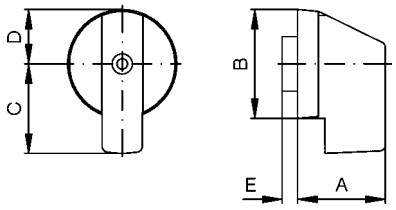
Mounting holes :



	Dimension L with .. cells											
Type	1	2	3	4	5	6	7	8	9	10	11	12
L100	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5
L160	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5
L400	96	136	176	216	256	296	336	376	416	456	496	536
L600	96	136	176	216	256	296	336	376	416	456	496	536
L800	96	136	176	216	256	296	336	376	416	456	496	536
L1200	96	136	176	216	256	296	336	376	416	456	496	536

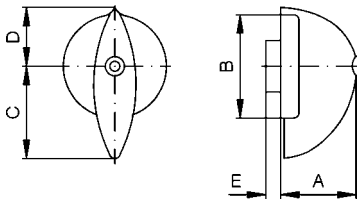
Operating Knobs and Handles

Instrument knob G.



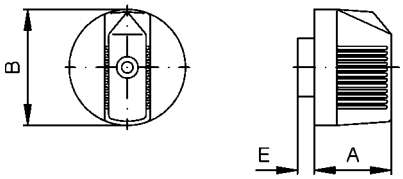
Type	A	B	C	D	E
M10, M10H, M20	23	28	24	14	4
N20, N33F	27	36	32	18	3
N40, N61, N80, L100, L160	36	47	42	24	3,5
N100, N200	48,10	75	63	37,5	-

Twist knob R.



Type	A	B	C	D	E
M10, M10H, M20	20,5	28	25	15	4
N20, N33F	24	36	29,5	19	3
N40, N61, N80, L100, L160	31	49	41	28	3,5
N100, N200, L400, L600, L800, L1200	50	75	62	41	2,5

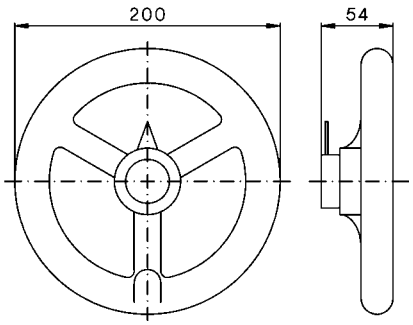
Toggle knob K.



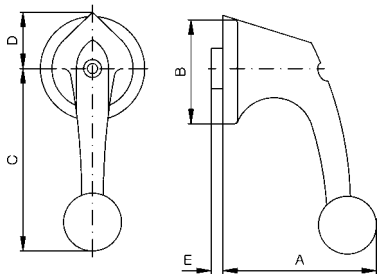
Type	A	B	E
M10, M10H, M20	18,5	28	4
N20, N33F	24	36	3

Hand wheel HR

N100, N200,
L400, L600, L800, L1200



Ball type handle B.



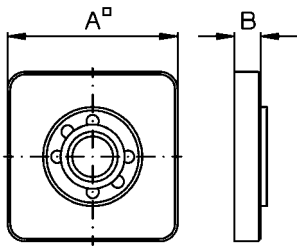
Type	A	B	C	D	E
N20, N33F	53	36,5	64	21	3
N40, N61, N80, L100, L160	62	49	82	31	3,5
N100, N200, L400, L600, L800, L1200	63	75	110	45	2,5

Code number for colour

grey	**.1**	white	**.5**
black	**.2**	blue	**.6**
red	**.3**	yellow	**.7**
cream-coloured	**.4**	euro-white	**.8**

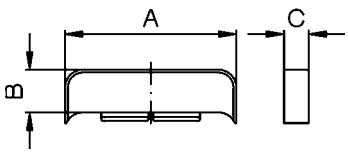
Escutcheon plates

Escutcheon plate



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

Rectangular additional plate SRE



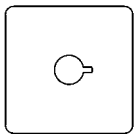
Type	A	B	C
M10, M10H, M20	48	12	7,5
N20, N33F	64	14	7,5
N40, N61, N80, L100, L160	88	22	8
N100, N200, L400, L600, L800, L1200	132	31	9

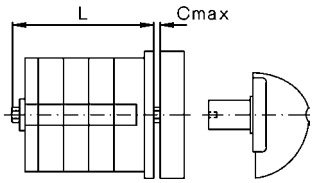
Special drives

Removable knob drive STGR, STGR2
M10H - N33F

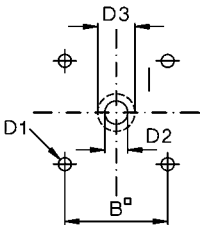
Type	B	C	D1	D2	D3
M10H, M20	36	5	5	12	18
N20, N33F	48	5	5	12	18

Replace dimension D2 with dimension D3 for STGR2
Dimension L see page 256





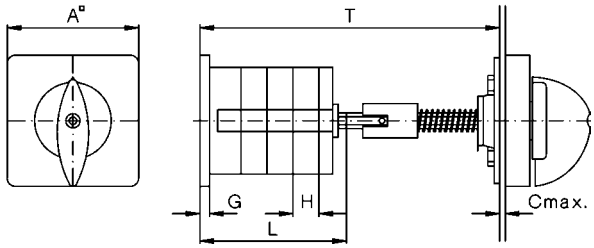
Mounting holes



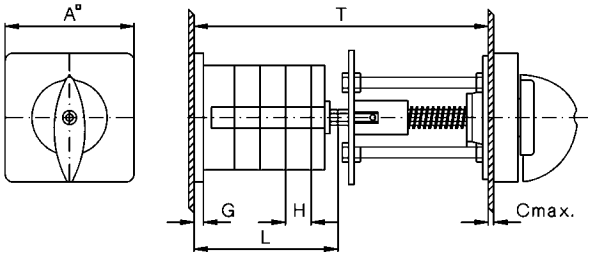
Door couplings

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

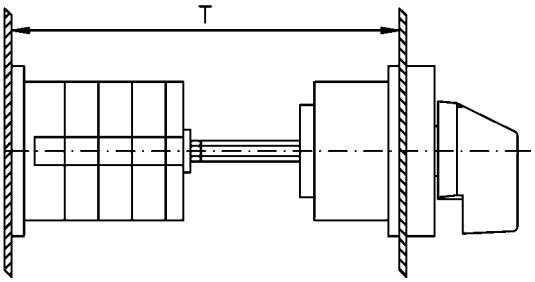
Door coupling TK, TKFR
N40 - L1200



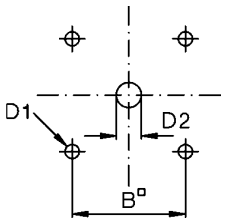
Door coupling, lockable TK2, TK2FR
N40 - L1200



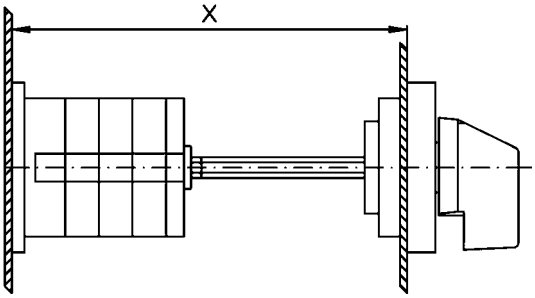
Door coupling TKE, TK2E
M10H, M20, N20, N33F



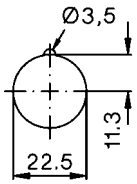
Mounting holes:
TK, TKFR, TK2, TK2FR
TKE, TK2E



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



Mounting holes:
TKZ

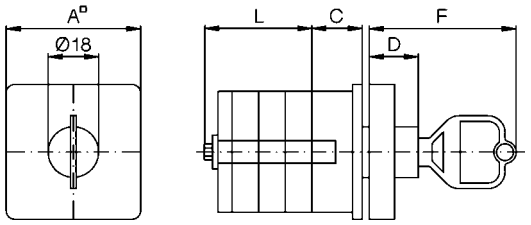


Further dimensions see pages 256 and 257.
Dimension T is a minimum value dependent on switch Type and number of cells. For ordering dimension T is necessary

						Minimum dimension T with .. cells							
Type	A	B	C	D1	D2	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
L160	88	48	7	6	12	145,5	175	245,5	234	263,5	293	322,5	352
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	-	-

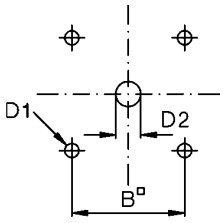
Key operated switches SA

Panel mounting E
M10 - N61



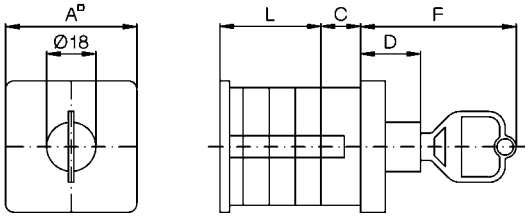
Type	A	B	C	D	D1	D2	F
M10H, M20	48	36	18	17,5	5	18,5	52,5
N20, N33F	64	48	10	17,5	5	18,5	52,5
N40,N61	88	68	23,5	15	6	18,5	50

Mounting holes



Dimension L see page 256

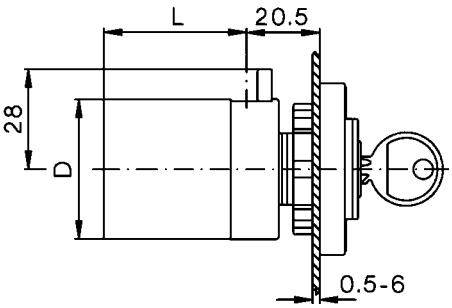
Base mounting V
M10 - N61



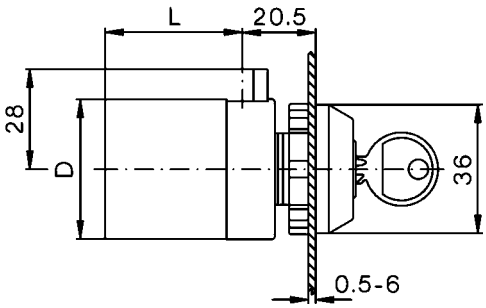
Type	A	C	D	F
M10H, M20	48	18	22	57
N20, N33F	64	8	22	57
N40,N61	88	15	15	50

Dimension L see page 257

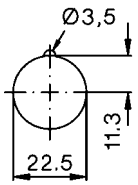
Central fixing Z
M10H Z ... + SA
M20 Z ... + SA



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

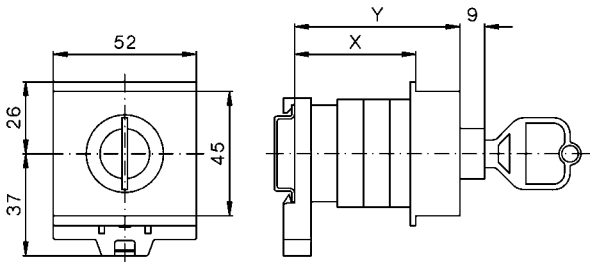


Mounting holes:



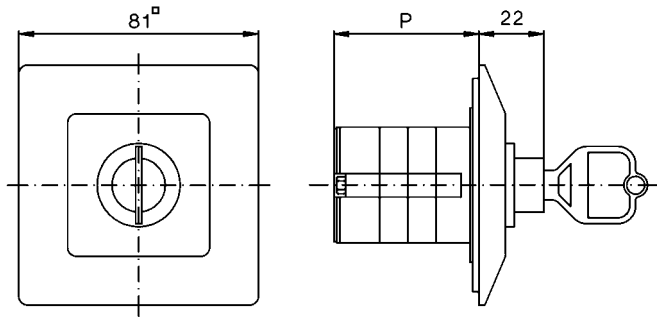
Further dimensions see page 256

DIN rail mounting SMA
M10H, M20



Type	Dimension X with .. cells 1	2	3	4	Dimension Y with .. cells 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

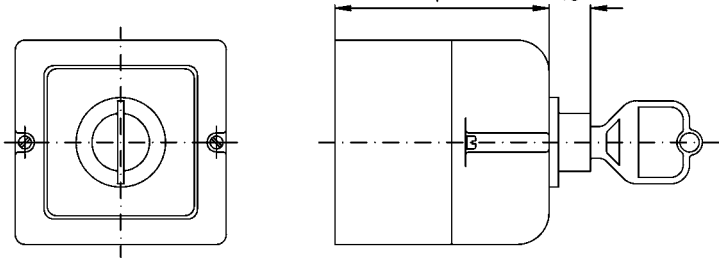


Type	Dimension P with .. cells 1	2
M10	47,5	57

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

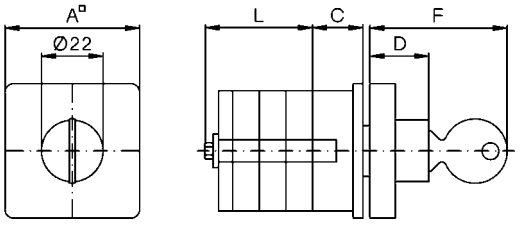
Type	Dimension P with .. cells 1	2	3	4
M10	62	71	81	90
N20	66	80	94	108
N33F	92	110	110	128
N40	92	110	-	-
N61	110	-	-	-

Further dimensions see page 258



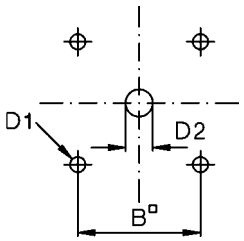
Key operated switches

Key operated switch SAK
Panel mounting E M10H, M20

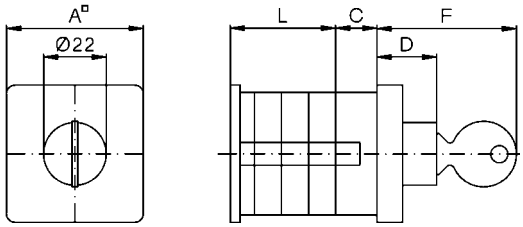


Type	A	B	C	D	D1	D2	F
M10H, M20	48	36	25	21	5	22,5	49

Mounting holes

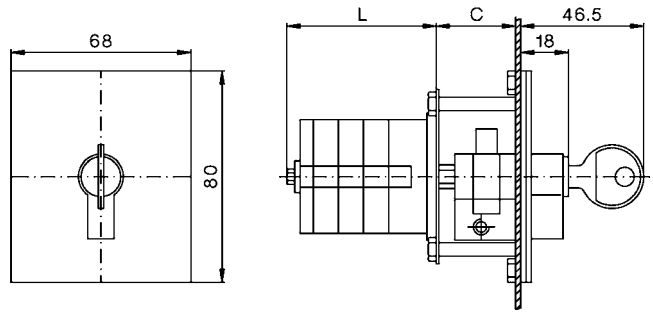


Key operated switch SAK
Base mounting V M10H, M20



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

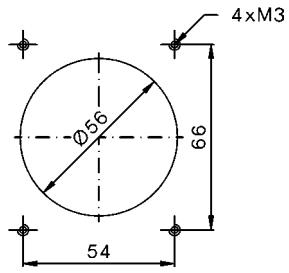
Key operated switch SASI
Panel mounting E M10, M20



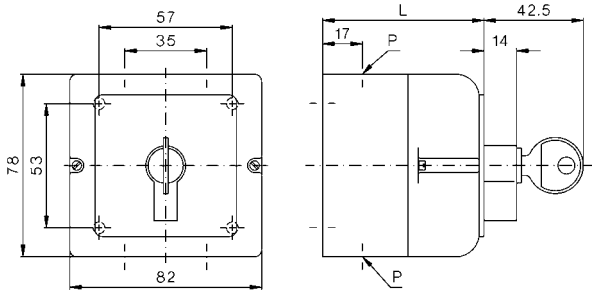
Type	M10	M20
C	20	20

Dimension L see page 256

Mounting holes M10, M20

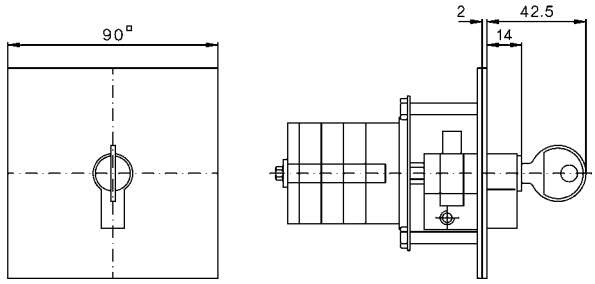


Key operated switch SASI
Plastic enclosured P M10, M20



Typ	Dimension P with .. cells 1	2	3	4	P
M10	67	79,5	92	104,5	2xM20
M20	79,5	92	104,5	117	2xM20

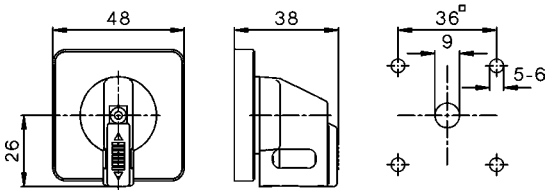
Key operated switch SASI
Flush mounting UP M10, M20



Padlock devices

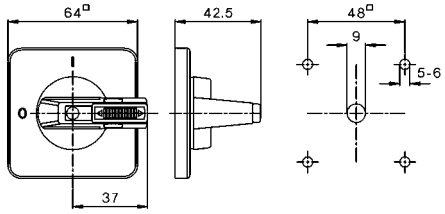
Padlock device SV1 (max. 2 padlocks with stirrup Ø6mm)
M10H, M20

Mounting holes design E, V

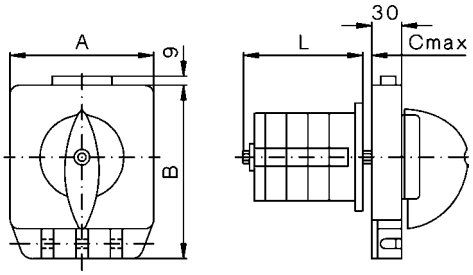


Padlock device SV164
M10H - N33F

Mounting holes design E, V



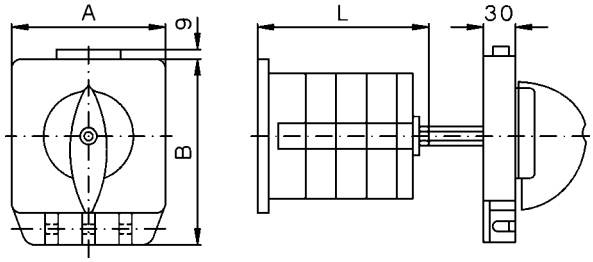
Padlock device SV3 (max. 3 padlocks with stirrup Ø8,5mm)
Panel mounting E
N20 - N200, L100 - L1200



Further dimensions see page 77

Type	A	B	C
N20, N33F	102	128	5
N40, N61, N80, L100, L160	102	128	7
N100, N200, L400, L600, L800, L1200	132	159	9

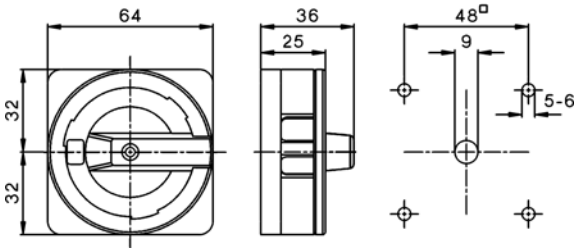
Base mounting V
N20 - N200, L100 - L1200



Further dimensions see page 257

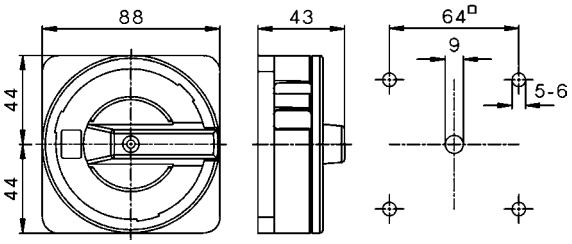
Padlock device SV4 (max. 3 padlocks with stirrup Ø6mm)
M10H - N33F

Mounting holes design E, V

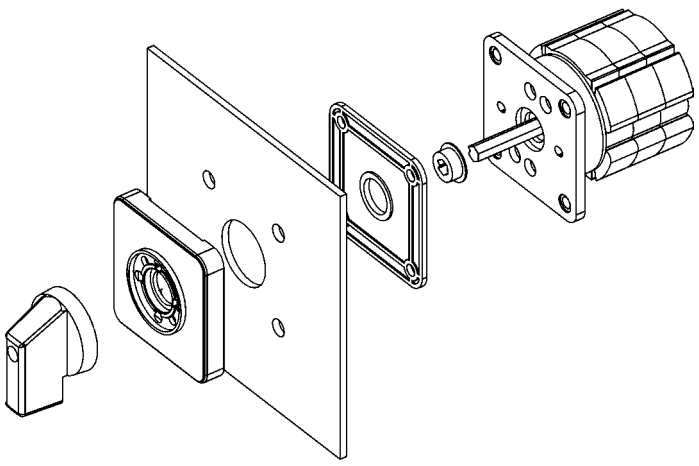


Padlock device SV4 (max. 3 padlocks with stirrup Ø6mm)
N40 - N80, L100 - L160
Padlock device SV488
N20, N33F

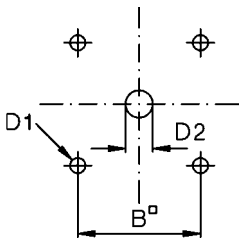
Mounting holes design E, V



Front plate/switch shaft sealing FPWD
N20, N33F



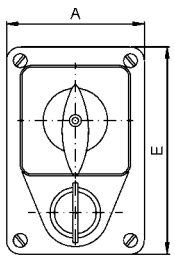
Mounting holes

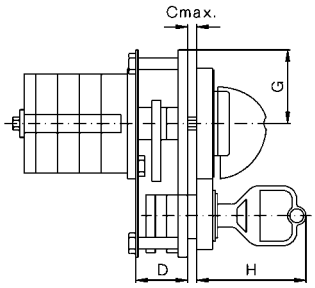


Typ	B	D1	D2
N20, N33F	48	5	17

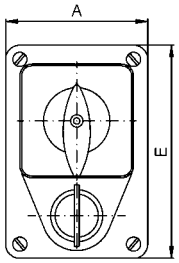
Interlocks

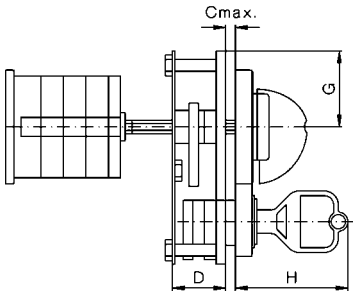
Lock switch SZ, SZ2
Panel mounting E



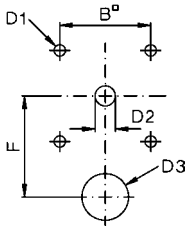


Base mounting V



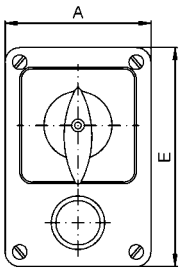


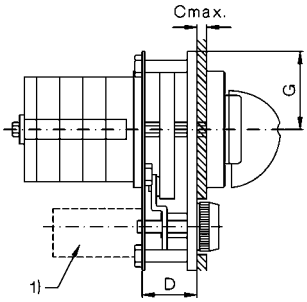
Mounting holes



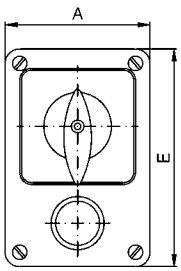
Type	A	B	C	D	D1	D2	D3	E	F	G	H
M10H, M20	60	36	3	22,5	5	8	18,5	90	40	32	47,5
N20, N33F	60	36	3	22,5	5	12	18,5	90	45	32	47,5
N40, N61, N80, L100, L160	90	68	4	24	6	12	18,5	142	61	61,5	48
N100, N200, L400, L600, L800, L1200	140	110	4	27	7	15	18,5	180	83	90,5	49

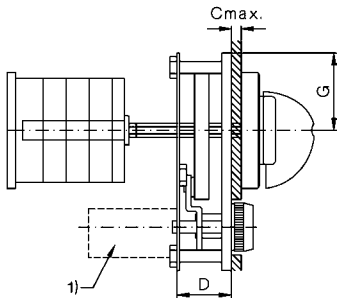
Push-button switch lock DV
Switch interlock with electrical contact ET
Panel mounting E



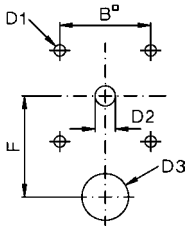


Base mounting V





Mounting holes

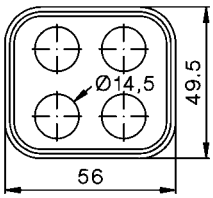


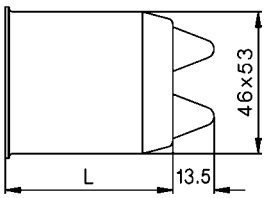
Type	A	B	C	D	D1	D2	D3	E	F	G
M10H, M20	60	36	3	22,5	5	8	26	90	40	32
N20, N33F	60	36	3	22,5	5	10	26	90	45	32
N40, N61, N80, L100, L160	90	68	4	25	6	12	29	142	61	61,5
N100, N200, L400, L600, L800, L1200	140	110	4	41	7	15	29	180	83	90,5

1) only at +ET

Moisture proofing caps for panel switches FR
M10H

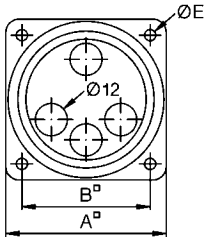
Type	Dimension L with .. cells 1	2	3	4	5	6	7
M10H	55	55	75	75	88	106	106

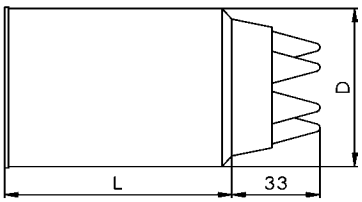




Moisture proofing caps for panel switches FR
N20, N40, N61

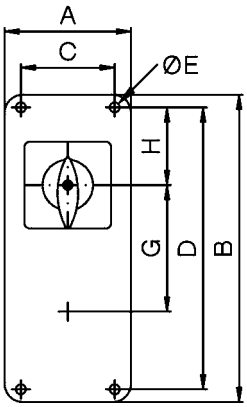
Type	A	B	D	E	Dimension L with .. cells 1	2	3	4	5
N20	60	48	59	5,5	68	68	68	91	91
N40	87	68	83	5,5	82	82	117	117	-

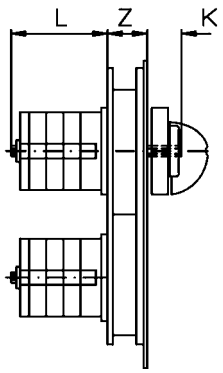




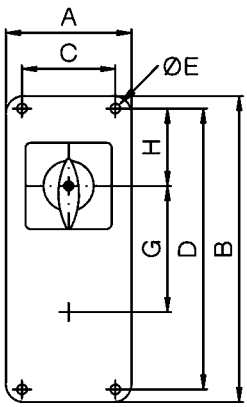
Interlocks

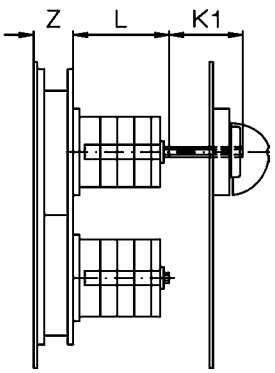
Geared switch with two columns ZK2
Panel mounting E





Base mounting V

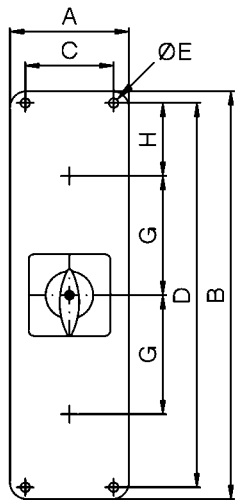


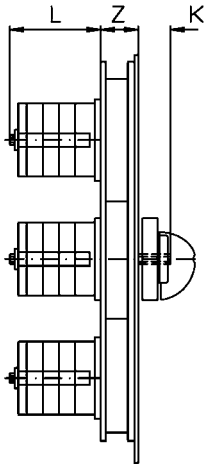


Type	A	B	C	D	E	G	H	Z
M10H, M20	70	170	52	156	5,5	70	43	22
N20, N33F	70	170	52	156	5,5	70	43	22
N40, N61, N80, L100, L160	170	190	150	168	6,5	100	43	23
N100, N200, L400, L600, L800, L1200	180	340	150	310	6,5	140	80	25

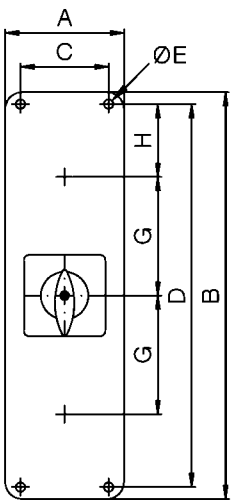
Further dimensions see pages 256 and 257

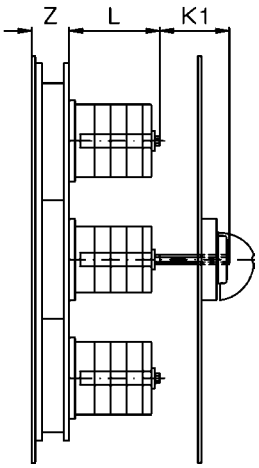
Geared switch with tree columns ZK3
Panel mounting E





Base mounting V

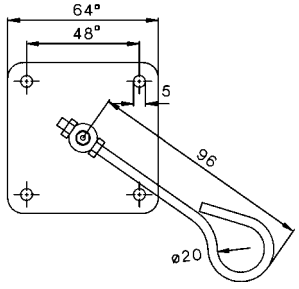


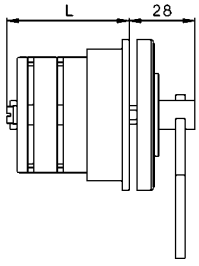


Type	A	B	C	D	E	G	H	Z
M10H, M20	70	240	52	226	5,5	70	43	22
N20, N33F	70	240	52	226	5,5	70	43	22
N40, N61, N80, L100, L160	170	290	150	269	6,5	100	43	23
N100, N200, L400, L600, L800, L1200	180	490	150	460	6,5	140	80	25

Further dimensions see pages 256 and 257

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





Further dimensions see pages 256

Order sheet D399E

Cam switches with special switching program

Benedict GmbH
A-1220, Vienna, Lieblgasse 7
Tel.: 251 51-0 Fax: 251 51-88

Customer:

Switch Type

M4H			
M10			
M10H			
M20			
N20			
N33F		L100	
N40		L160	
N61		L400	
N80		L600	
N100		L800	
N200		L1200	

Design

Panel mounting	E	
Central fixing	Z	
	ZO	
Base mounting	V	
Snap-on mount.SM		
	SMA	
Plastic enclosure	P	
IP65	PF	
Cast enclosure	G	
IP65	GF	

Optional extras

Circular switch

Key removeable

Explanations:

Contact closed over several positions

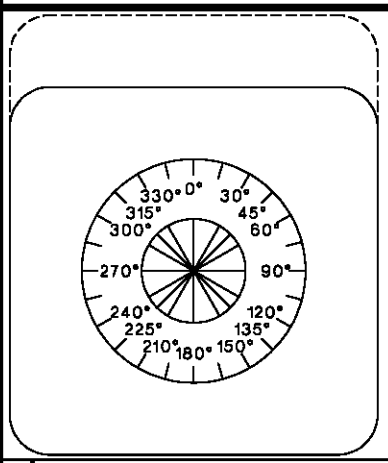
Spring return from pos.

Handles

Instrument knob	**G** (standard)	
Twist knob	**R** (standard N40 ->)	
Toggle knob	**K** (standard SMA)	
Ball type handle	**B**	
Hand wheel	**HR**	

Handle colour

black (standard)	
red	
grey (standard SMA)	
white	
cream-coloured	
yellow	
blue	



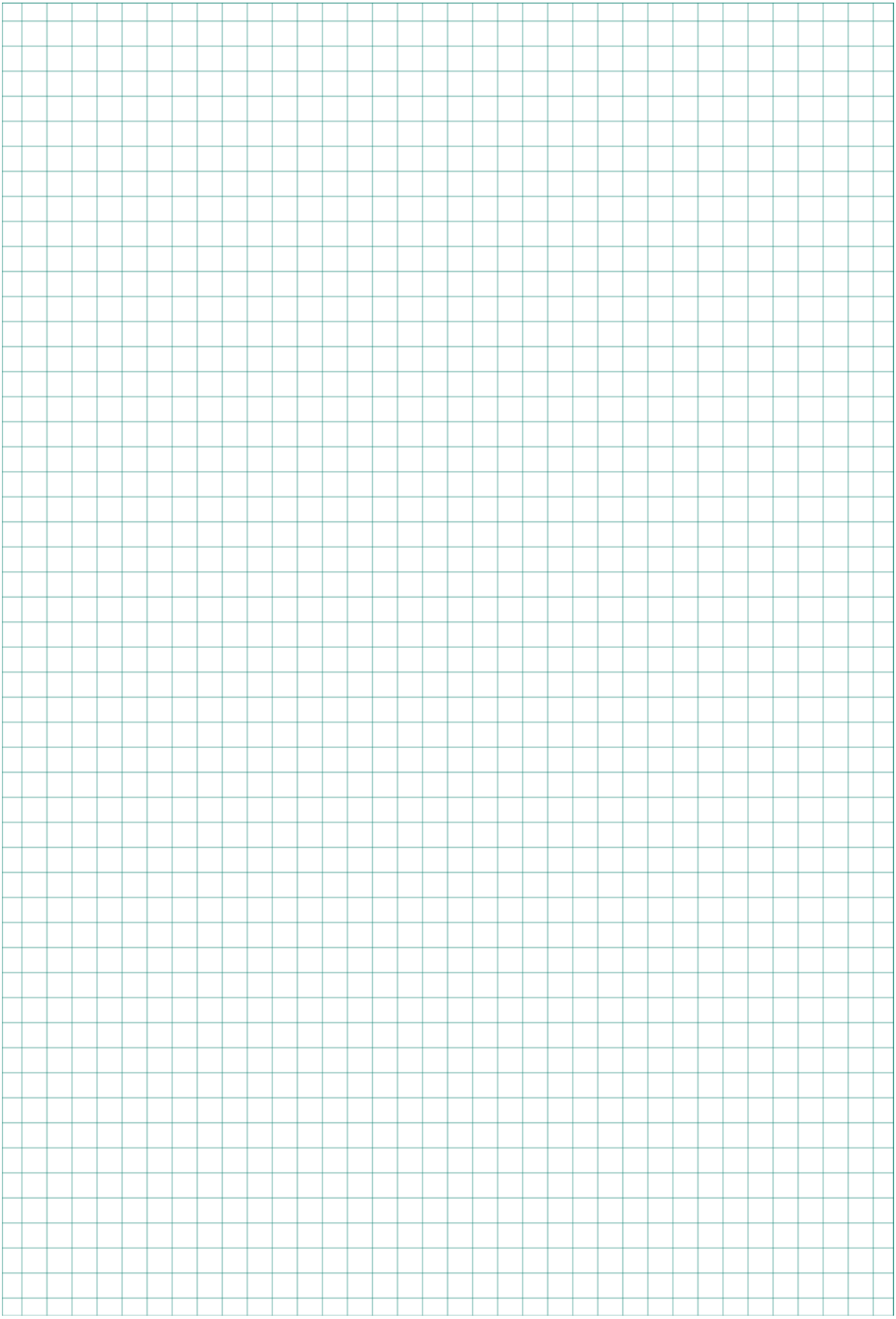
Connect.

Terminals 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47

Terminals 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Connect.

Marking for switch positions	Degree



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Main Switches for Base Mounting with Door Clutch 276

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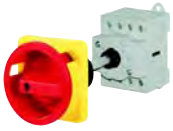
Main Switches-Emergency-Stop for Single Hole Mounting 281



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Ratings								Panel mounting 4 hole mount.			Single hole mount. Ø22,5mm		
							Protection degree from front in mounted position	IP66			IP66		
	Rated current Therm.			Motor AC3	AC23		Plate Switch						
Type	I_{th} open A	AC21 A	bei U_e V	3~400V kW	3~400V A	kW	mm	EH4	EHN4	EHN1	Z	ZHN1	ZH1
LTS20	20	**20**	690	5,5	16	7,5	48❐	LTS20 E[1] ..			LTS20 Z[1] ..		
LTS25	25	**25**	690	7,5	20	10	48❐	LTS25 E[1] ..			LTS25 Z[1] ..		
LTS32	32	**32**	690	11	25	12,5	48❐	LTS32 E[1]) ..			LTS32 Z[1] ..		
LTS40	40	**40**	690	15	32	16	48❐	LTS40 E[1] ..			LTS40 Z[1] ..		
LTS63	63	**63**	690	18,5	45	22	48❐	LTS63 E[1] ..			-		
LTS80	80	**80**	690	18,5	45	22	48❐	LTS80 E[1] ..			-		
LTS85	85	**85**	690	22	60	30	64❐	LTS85 E[1] ..			-		
LTS100	100	**100**	690	30	72	37	64❐	LTS100 E[1] ..			-		
LTS125	125	**125**	690	37	85	45	64❐	LTS125 E[1] ..			-		
LT160	160	**160**	690	45	110	55	88❐	LT160 E[1] ..			-		

Switch disconnector 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 restrective 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)

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:
a) Switch disconnector according to IEC/EN 60947-3 and VDE 0660 part 107 for utilization category AC23-B or DC-23B.
b) 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.
c) 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	Base mounting with door coupling Panel mounting 4 hole mount. IP66	Modular switch IP40	Plastic enclosed IP66
VZVH4 VZVHN4 VZVHN1	VH4 VHN4 VH1	SMA SMAHN1 SMAH1	PF(L[2])H4 PF(L[2])HN4 PF(L[2])
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	c UL us	CE	EAC	
Lasttrennschalter (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)				
LTS20	o	o	o	o
LTS25	o	o	o	o
LTS32	o	o	o	o
LTS40	o	o	o	o
LTS63	o	o	o	o
LTS80	o	o	o	o
LTS85	o	o	-	-
LTS100	o	o	-	-
LTS125	o	o	-	-
LT160	o	o	-	o

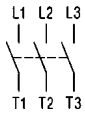
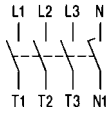
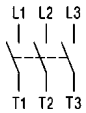
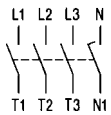
o in standard version approved
/ No testing required CE
x in test
- Not provided for test til now

Terminal screws

Devices Type	Kind of connection screw with clamp box	Screwdriver	Tightening torque Nm	lb. inch	Protection class of terminals[4]
Switch Disconnectors					
LTS20, LTS25					IP20
LTS32, LTS40	M3,5	Pz2	0,8 - 1,4	7 - 12	IP20
LTS63, LTS80	M5	Pz2	2,5 - 4	22 - 35	IP20
LTS85, LTS100, LTS125	M6	Pz3	3,5 - 4,5	31 - 40	IP20
LT160	M10		14	124	IP20

1) Main Switches (H1/H4 Main Switches-Emergency-Stop (HN1/HN4))
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, cULus Type 1

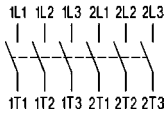
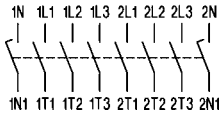
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
3-pole, padlock device SV1	🔒🔒						
		20A	**7,5kW**	48 ❐ [1])	LTS20 EH1 A3	1	0,15
		25A	**10kW**	48 ❐ [1])	LTS25 EH1 A3	1	0,15
		32A	**12,5kW**	48 ❐ [1])	LTS32 EH1 A3	1	0,15
		40A	**16kW**	48 ❐ [1])	LTS40 EH1 A3	1	0,15
		63A	**22kW**	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
		80A	**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 page291

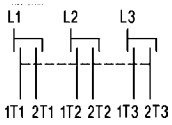
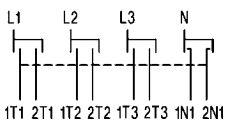
Extended Switch Shaft for switches for panel mounting type suffix **+VW"x"** x = panel thickness

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

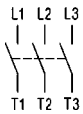
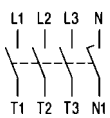
Main Switches for Panel Mounting, lockable IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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

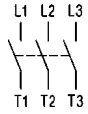
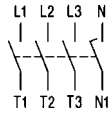
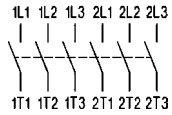
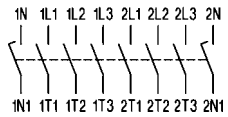
3-pole, padlock device SV4	🔒🔒🔒						
		20A	**7,5kW**	64	LTS20 EH4 U3	1	0,30
		25A	**10kW**	64	LTS25 EH4 U3	1	0,30
		32A	**12,5kW**	64	LTS32 EH4 U3	1	0,30
		40A	**16kW**	64	LTS40 EH4 U3	1	0,30
		63A	**22kW**	64	LTS63 EH4 U3	1	0,34
4-pole, padlock device SV4	🔒🔒🔒						
		20A	**7,5kW**	64	LTS20 EH4 U4	1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

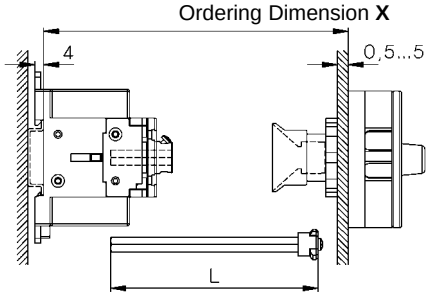
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
3-pole, padlock device SV1	🔒🔒						
		20A	**7,5kW**	48	LTS20 ZH1 A3	1	0,16
		25A	**10kW**	48	LTS25 ZH1 A3	1	0,16
		32A	**12,5kW**	48	LTS32 ZH1 A3	1	0,16
		40A	**16kW**	48	LTS40 ZH1 A3	1	0,16
4-pole, padlock device SV1	🔒🔒						
		20A	**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 page291

Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting
Depth X is adjustable (delivered with X_{max} see below), IP66, cULusType 1

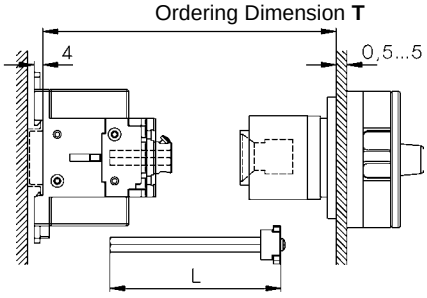
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
3-pole, padlock device SV4							
		20A	**7,5kW**	64 ❐	LTS20 VZVH4 A3	1	0,19
		25A	**10kW**	64 ❐	LTS25 VZVH4 A3	1	0,19
		32A	**12,5kW**	64 ❐	LTS32 VZVH4 A3	1	0,19
		40A	**16kW**	64 ❐	LTS40 VZVH4 A3	1	0,19
		63A	**22kW**	64 ❐	LTS63 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-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(H).. (3, 4-polig)

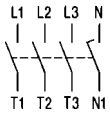


Type	T min	T max	L
LTS20-80 VH..	111 -	190	**T - 60±3**
LTS85-125 VH..	115 -	190	**T - 64±3**

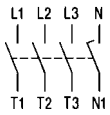
Type	T min	T max
LT160 VH..	120 -	450

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

Main Switches, Base Mounting with Door Clutch, Padlock Device for Four-Hole Mounting
Depth T is adjustable (delivered with T_{max} see page 267), IP66, cULus Type 1

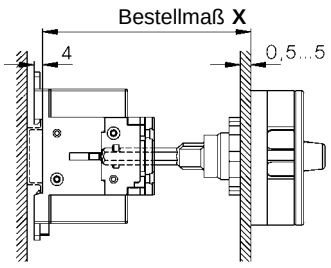
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
3-pole, padlock device SV4(34)	🔒🔒🔒						
		20A	**7,5kW**	64 ❐ [1]	LTS20 VH4 A3	1	0,20
		25A	**10kW**	64 ❐ [1]	LTS25 VH4 A3	1	0,20
		32A	**12,5kW**	64 ❐ [1]	LTS32 VH4 A3	1	0,20
		40A	**16kW**	64 ❐ [1]	LTS40 VH4 A3	1	0,20
		63A	**22kW**	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, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
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

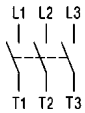
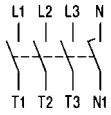
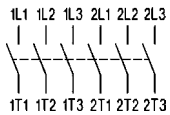
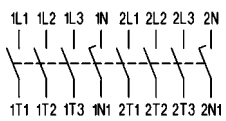
Type	Preference values for X
LT.. VZH..	80, 85, 104, 129 (tolerance -3, +1,5)



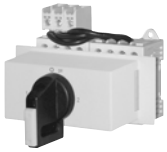
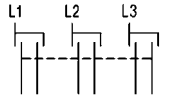
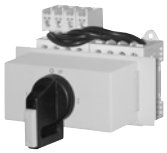
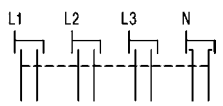
Add-on modules see page 291

1) Types with padlock device 88 ❐ type suffix **88,** ordering example: LTS32 VHN4**88** A3, on request

Main Switches for Distribution Boards, lockable IP40, $_{c}$UL$_{us}$ Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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 SV1164							
		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

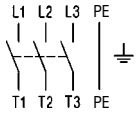
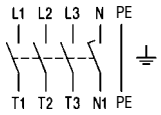
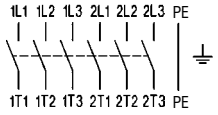
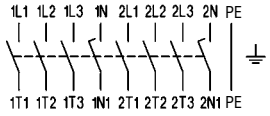
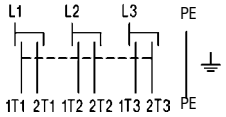
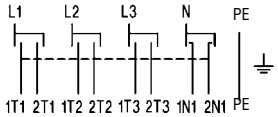
Changeover Switch with Padlock Device for Distribution Boards, lockable

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

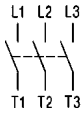
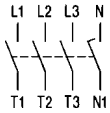
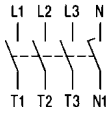
2) Emergency-Stop-Main Switches for Distribution Boards, lockable with low height handle, IP40
Type with Type-suffix „**+SV1N**“ e.g.: **LTS40 SMAHN1 A3 +SV1N**

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

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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		125A	**45kW**	64 ❐	LTS125 PFLH4 A3	1	0,78
Type: ..**PFL**..	on request	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		100A	**37kW**	64 ❐	LTS100 PFLH4 A4	1	0,83
Type appendix **+PF3**	on request	125A	**45kW**	64 ❐	LTS125 PFLH4 A4	1	0,83
+PF3/M50	on request	160A	**55kW**	88 ❐	LT160 PFH34 T400	1	2,47
6-polig, Sperrvorrichtung 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-polig, Sperrvorrichtung 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
knockoutletsM50/40							
+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
		80A	**22kW**	64 ❐	LTS80 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
		80A	**22kW**	64 ❐	LTS80 PFLH4 U4	1	1,50

1) PFL.... larger enclosure

Emergency-Stop-Main Switches for Panel Mounting, lockable IP66, Type 1

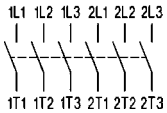
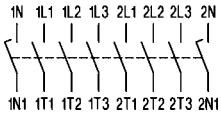
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
3-pole, padlock device SV1	🔒🔒						
		20A	**7,5kW**	48 ❐ [1]	LTS20 EHN1 A3	1	0,15
		25A	**10kW**	48 ❐ [1]	LTS25 EHN1 A3	1	0,15
		32A	**12,5kW**	48 ❐ [1]	LTS32 EHN1 A3	1	0,15
		40A	**16kW**	48 ❐ [1]	LTS40 EHN1 A3	1	0,15
		63A	**22kW**	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

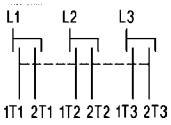
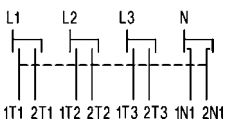
Extended Switch Shaft for switches for panel mounting type suffix **+VW"x"** x = panel thickness

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

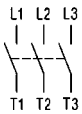
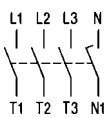
Emergency-Stop-Main Switches for Panel Mounting, lockable IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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**

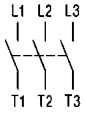
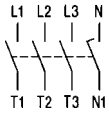
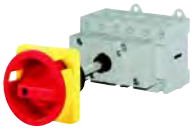
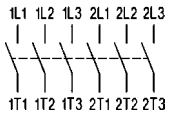
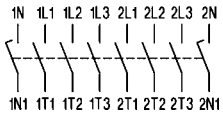
3-pole, padlock device SV4	🔒🔒🔒						
		20A	**7,5kW**	64	LTS20 EHN4 U3	1	0,30
		25A	**10kW**	64	LTS25 EHN4 U3	1	0,30
		32A	**12,5kW**	64	LTS32 EHN4 U3	1	0,30
		40A	**16kW**	64	LTS40 EHN4 U3	1	0,30
		63A	**22kW**	64	LTS63 EHN4 U3	1	0,34
4-pole, padlock device SV4	🔒🔒🔒						
		20A	**7,5kW**	64	LTS20 EHN4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

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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

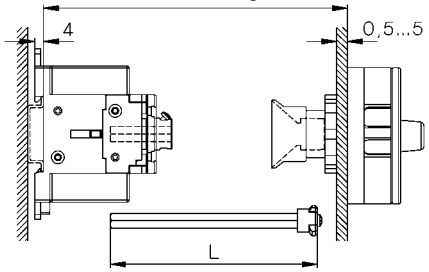
Add-on modules see page 291

Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting
Depth X is adjustable (delivered with X_{max} see below), IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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..

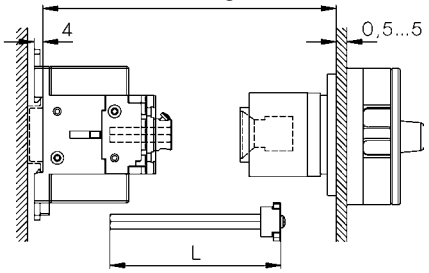
Ordering Dimension **X**



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(HN).. (3, 4-pole)

Ordering Dimension **T**



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

Type	T min	T max
LT160 VH..	120 -	450

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

Emergency-Stop-Main Switches, Base Mounting with Door Clutch, Padlock Device for Four-Hole Mounting, Depth T is adjustable (delivered with T_{max} see page 282), IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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

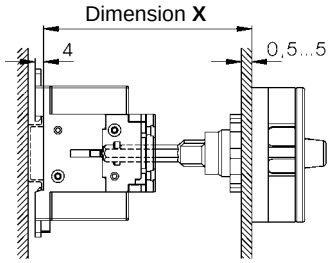
Emergency-Stop-Main Switches, Base Mounting with Door Clutch for Single-Hole Mounting Depth X is not adjustable, declare depth X when ordering, IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
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**

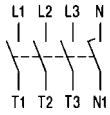
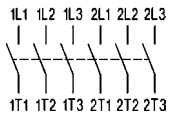
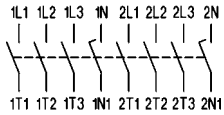
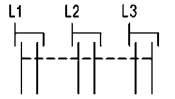
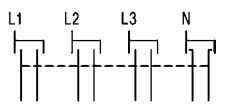
LTS.. VZH.. 80, 85, 104, 129 (tolerance -3, +1,5)



Add-on modules see page 291

1) Types with padlock device 88 ❐ type suffix **88,** ordering example: LTS32 VHN4**88** A3, on request

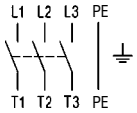
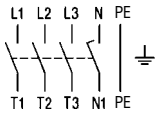
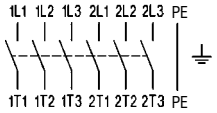
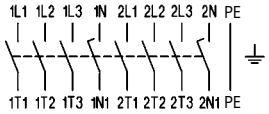
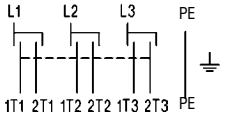
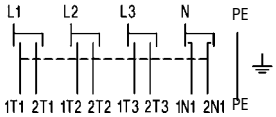
Emergency-Stop-Main Switches for Distribution Boards, lockable IP40, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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

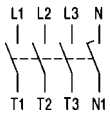
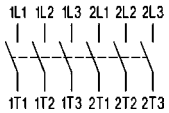
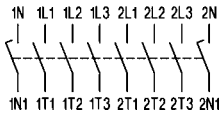
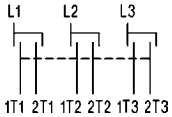
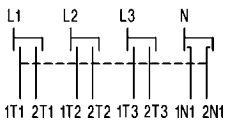
2) Emergency-Stop-Main Switches for Distribution Boards, lockable with low height handle, IP40
Type with Type-suffix „**+SV1N**“ e.g.: **LTS40 SMAHN1 A3 +SV1N**

Maintenance and Safety Emergency-Stop-Main Switches, in Plastic Enclosure, lockable IP66, cULusType 4X

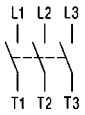
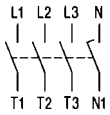
	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
3-pole, padlock device SV4(34)							
		20A	**7,5kW**	64	LTS20 PF(L[1])HN4 A3	1	0,32
		25A	**10kW**	64	LTS25 PF(L[1])HN4 A3	1	0,32
		32A	**12,5kW**	64	LTS32 PF(L[1])HN4 A3	1	0,32
		40A	**16kW**	64	LTS40 PF(L[1])HN4 A3	1	0,32
		63A	**22kW**	64	LTS63 PFLHN4 A3	1	0,60
		80A	**22kW**	64	LTS80 PFLHN4 A3	1	0,60
		85A	**30kW**	64	LTS85 PFLHN4 A3	1	0,78
		100A	**37kW**	64	LTS100 PFLHN4 A3	1	0,78
Larger enclosure		125A	**45kW**	64	LTS125 PFLHN4 A3	1	0,78
Type: ..**PFL**..	on request	160A	**55kW**	88	LT160 PFHN34 T300	1	2,09
4-pole, padlock device SV4(34)							
		20A	**7,5kW**	64	LTS20 PF(L[1])HN4 A4	1	0,33
		25A	**10kW**	64	LTS25 PF(L[1])HN4 A4	1	0,33
		32A	**12,5kW**	64	LTS32 PF(L[1])HN4 A4	1	0,33
		40A	**16kW**	64	LTS40 PF(L[1])HN4 A4	1	0,33
		63A	**22kW**	64	LTS63 PFLHN4 A4	1	0,64
		80A	**22kW**	64	LTS80 PFLHN4 A4	1	0,64
		85A	**30kW**	64	LTS85 PFLHN4 A4	1	0,83
Larger enclosure		100A	**37kW**	64	LTS100 PFLHN4 A4	1	0,83
Type appendix **+PF3**	on request	125A	**45kW**	64	LTS125 PFLHN4 A4	1	0,83
+PF3/M50	on request	160A	**55kW**	88	LT160 PFHN34 T400	1	2,47
6-pole, padlock device SV4							
		20A	**7,5kW**	64	LTS20 PFLHN4 A6	1	1,39
		25A	**10kW**	64	LTS25 PFLHN4 A6	1	1,39
		32A	**12,5kW**	64	LTS32 PFLHN4 A6	1	1,39
		40A	**16kW**	64	LTS40 PFLHN4 A6	1	1,39
		63A	**22kW**	64	LTS63 PFLHN4 A6	1	1,42
		80A	**22kW**	64	LTS80 PFLHN4 A6	1	1,42
knockoutlets M50/40							
+PF3/M50	on request						
8-pole, padlock device SV4							
		20A	**7,5kW**	64	LTS20 PFLHN4 A8	1	1,44
		25A	**10kW**	64	LTS25 PFLHN4 A8	1	1,44
		32A	**12,5kW**	64	LTS32 PFLHN4 A8	1	1,44
		40A	**16kW**	64	LTS40 PFLHN4 A8	1	1,44
		63A	**22kW**	64	LTS63 PFLHN4 A8	1	1,50
		80A	**22kW**	64	LTS80 PFLHN4 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 PFLHN4 U3	1	1,39
		25A	**10kW**	64	LTS25 PFLHN4 U3	1	1,39
		32A	**12,5kW**	64	LTS32 PFLHN4 U3	1	1,39
		40A	**16kW**	64	LTS40 PFLHN4 U3	1	1,39
		63A	**22kW**	64	LTS63 PFLHN4 U3	1	1,42
		80A	**22kW**	64	LTS80 PFLHN4 U3	1	1,42
4-pole, padlock device SV4							
		20A	**7,5kW**	64	LTS20 PFLHN4 U4	1	1,44
		25A	**10kW**	64	LTS25 PFLHN4 U4	1	1,44
		32A	**12,5kW**	64	LTS32 PFLHN4 U4	1	1,44
		40A	**16kW**	64	LTS40 PFLHN4 U4	1	1,44
		63A	**22kW**	64	LTS63 PFLHN4 U4	1	1,50
		80A	**22kW**	64	LTS80 PFLHN4 U4	1	1,50

1) PFL.... larger enclosure

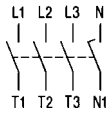
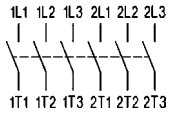
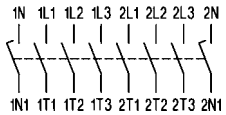
Switch Disconnectors for Panel Mounting, IP66, cULusType 1

	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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, cULus Type 1

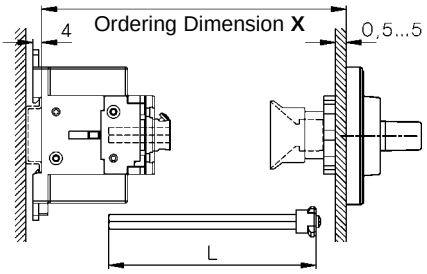
	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth kg/pcs
On-Off Switches 3-pole						
	20A	**7,5kW**	48 ❐	LTS20 Z A3	1	0,16
	25A	**10kW**	48 ❐	LTS25 Z A3	1	0,16
	32A	**12,5kW**	48 ❐	LTS32 Z A3	1	0,16
	40A	**16kW**	48 ❐	LTS40 Z A3	1	0,16
On-Off Switches 4-pole						
	20A	**7,5kW**	48 ❐	LTS20 Z A4	1	0,20
	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 288), IP66, cULus Type 1

	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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

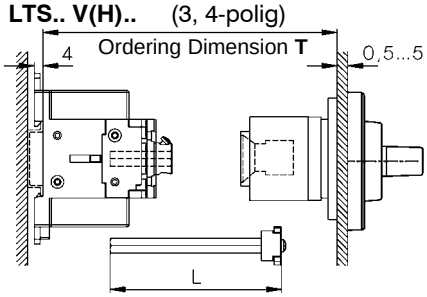
Switch Disconnector, Base Mounting with Door Clutch for Single-Hole Mounting
Depth X is adjustable (delivered with X_{max} see below), IP66, cULus Type 1

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(H).. (3, 4-polig)



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

Type	T min	T max
LT160 VH..	120 -	450

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

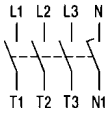
Switch Disconnector, Base Mounting with Door Clutch for Hole Mounting
Depth X is adjustable (delivered with T_{max} see above), IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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 291

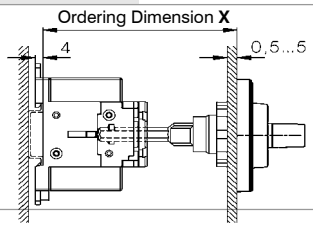
1) Types with padlock device 88 ❐ type suffix **88,** ordering example: LTS32 VHN4**88** A3, on request

Switch Disconnector, Base Mounting with Door Clutch for Single-Hole Mounting
Depth X is not adjustable, declare depth X when ordering, IP66, cULus Type 1

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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

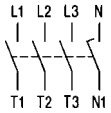
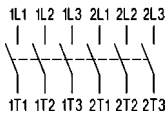
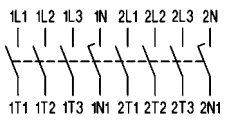
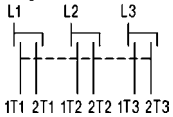
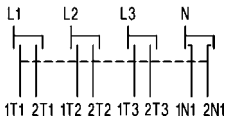
Declare depth X when ordering

Type	**Preference values for X**
LTS.. VZ..	80, 85, 104, 129 (tolerance -3, +1,5)

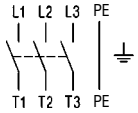
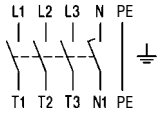
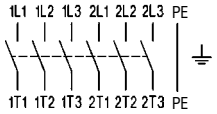
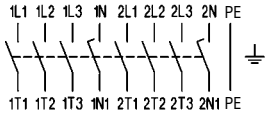
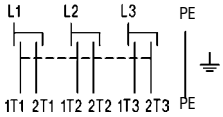
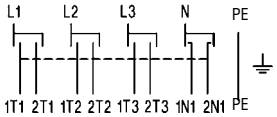


Add-on modules see page 291

Switch Disconnectors for Distribution Boards, IP40, cULus Type 1

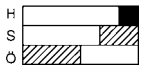
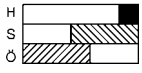
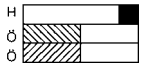
On-Off Switches 3-pole							
		20A	**7,5kW**	52x45	LTS20 SMA A3	1	0,15
		25A	**10kW**	52x45	LTS25 SMA A3	1	0,15
		32A	**12,5kW**	52x45	LTS32 SMA A3	1	0,15
		40A	**16kW**	52x45	LTS40 SMA A3	1	0,15
		63A	**22kW**	52x45	LTS63 SMA A3	1	0,17
		80A	**22kW**	52x45	LTS80 SMA A3	1	0,17
		85A	**30kW**	78x45	LTS85 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, cULus Type 4X

	max. padlocks	AC21 690V	AC23 3x400V	Plate	Type	Pack pcs.	Weigth 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
		80A	**22kW**	64 ❐	LTS80 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
		80A	**22kW**	64 ❐	LTS80 PFL U4	1	1,50

1) PFL.... larger enclosure

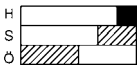
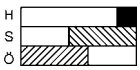
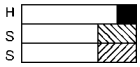
Add-on Modules for Main Switches, Panel Mounting and Single Hole Mounting

	for switch	Type	Pack pcs.	Weigth kg/pcs
4th Add-on Neutral Switching Pole	LTS20 ... to LTS40 ...	N40E	1	0,035
	LTS63 ... , LTS80 ...	N80E	1	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 ...	PE80E	1	0,04
	LT125 E.. to LT160 E..	LTXX-E/E	1	0,2
N-Terminal	LTS20 ... to LTS80 ...	PEN80E	1	0,04
	LT125 E.. to LT160 E..	LTXX-N/E	1	0,2
Terminal Cover 3-pole	LTS20 ... 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	LTS20 ... to LTS80..	KLAD70N	1	0,002
Load circuit	LTS20 ... to LTS80..	KLAD70NI	1	0,002
Terminal Cover 4-pole	LTS85.. to LTS125.	KLAD125	1	0,01
	LT125.. to LT160..	XX-KLAD4	1	0,02

Accessories for Main Switches, Panel Mounting, Single Hole and Base Mounting

	for switch	Type	Pack pcs.	Weigth kg/pcs
Additional Escutcheon Plate Yellow, Marked with: HAUPTSCHALTER				
for plate 48r	LTS.. .HN1..	A91501	1	0,003
for plate 64r	LTS.. .HN4..	E91501	1	0,005
Additional Escutcheon Plate Yellow, Marked with: MAIN SWITCH				
for plate 48r	LTS.. .HN1..	A91524	1	0,003
for plate 64r	LTS.. .HN4..	E91524	1	0,005
Tab Terminal 6,3 x 0,8mm	LTS20 ... to LTS40 ...	LG11073	10	0,001

Add-on Modules for Main Switches, Base and Rail Mounting

	for switch	Type		Pack pcs.	Weigth kg/pcs
	4th Add-on Neutral Switching Pole				
	LTS20 ... , LTS40 ... N40V		1	0,035	
	LTS63 ... , LTS80 ... N80V		1	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 2NO				
	LTS20 ... to LTS125 ...	LH20V/02E		1	0,02
	PE-Terminal				
	LTS20 ... to LTS80 ...	PE80V		1	0,04
	LT125 .. to LT160 ..	LTXX-E/V		1	0,2
	N-Terminal				
	LTS20 ... to LTS80 ...	PEN80V		1	0,04
	LT125 .. to LT160 ..	LTXX-N/V		1	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	LG8628		1	0,047
	4.Pole N40V, N80V				
	Aux. Contacts LH..				
	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 [5]	1000 [5]	1000 [5]	1000 [3]
Rated operational current I_e AC21A			A	20	25	32	40	63	80	85	100	125	160
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 [3]
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			kA_{eff}	10	10	10	10	10	10	10	10	5	30
Max. fuse size		gL (gG)	A	25	35	40	40	63	80	100	100	125	160
Mechanical life			$x10^3$	200	200	200	200	100	100	100	100	100	100
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		-40°C to +60°C									
		enclosed		-40°C to +40°C									
Storage				-50°C to +90°C									

			LTS20	LTS25	LTS32	LTS40	LTS63	LTS80	LTS85	LTS100	LTS125	LT160
Cable cross sections		mm²	0,5 - 10				1 - 25[6]		4 - 50			max.95
solid or stranded		AWG	20 - 8 (10)				16 - 4 (10)		10 - 0 (10)			max.3/0
flexible		mm²	0,5 - 6				4 - 16[6]		10 - 35			max.70
		AWG	20 - 10				16 - 6		8 - 2			max.2/0
flexible (+ multicore cable end)		mm²	0,5 - 6				0,75 - 16[6]		6 - 35			max.50
		AWG	20 - 10				16 - 6		8 - 2			max.1/0
Size of terminal screw			M3,5				M5		M6			M10
Tightening torque		Nm	0,8 - 1,4				2,5 - 4		3,5 - 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 220-240V	A	2,5				2,5		2,5			6
	AC15 380-440V	A	1,5				1,5		1,5			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		mm²	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)		mm²	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 und cUL

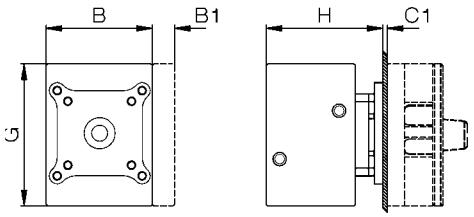
Type				LTS20	LTS25	LTS32	LTS40	LTS63	LTS80	LTS85	LTS100	LTS125	LT160
Rated voltage			V	600	600	600	600	600	600	600	600	600	600
Ampere-Rating "General use"			A	20	25	32	40	63	80	85	100	125	200
DOL-Rating 3-phase		110-120V	HP	1	1,5	2	2	3	5	7.5	10	15	20
		220-240V	HP	3	5	5	5	10	10	20	25	30	40
		440-480V	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 [4]
5kA / 600V	Motor Disconnect		A	40	50	50	50	70	70	125	125	125	400 [4]
Tightening torque			Nm	1,7-2,3	1,7-2,3	1,7-2,3	1,7-2,3	2,8-4	2,8-4	1,7-4,5	1,7-4,5	1,7-4,5	14
			lb.inch	11-20	11-20	11-20	11-20	24-35	24-35	15-40	15-40	15-40	124

1) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 6kV.
2) the values after the slash are valid for switches 6-pole or more
3) Suitable for no load applications(AC20A) above 690V
4) Fuse RK1 / 10kA / 600V
5) Uimp = 8kV
6) LTS63..U. stranded 16mm², flexible 10mm²

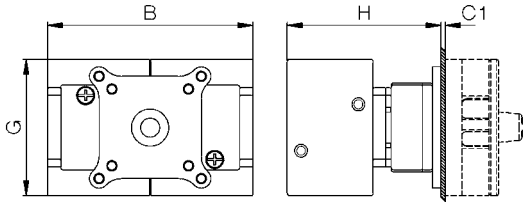
Dimensions (mm)

Main Switches, Switch Disconnectors LT(S)..

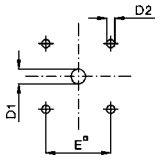
Panel mounting LT(S).. E(HN)..
ON-OFF Switches 3-pole, 4-pole



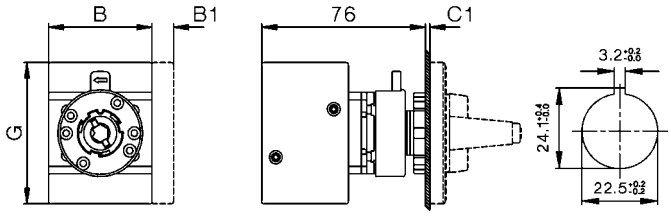
ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole



Mounting holes

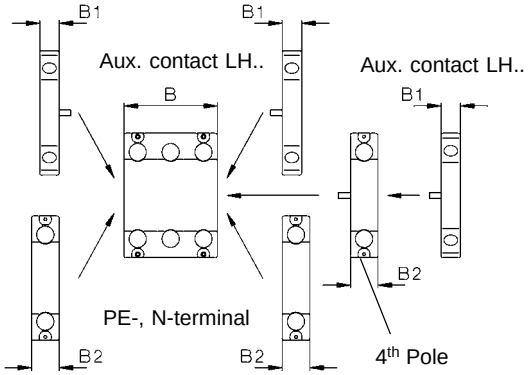


Single hole mounting LTS.. Z(HN)..
ON-OFF Switches 3-pole, 4-pole



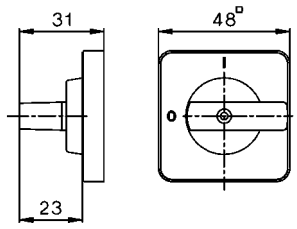
Mounting holes

Mounting of add-on modules LTS20 - LTS80
Panel mounting, Single hole mounting

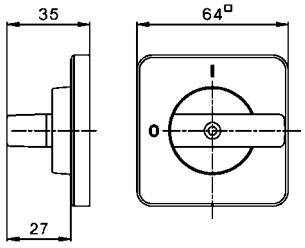


Type	Escutch. plate or padlock device	Changeover ON-OFF 3-pole 4-pole A	B	B	3-pole 6-pole B	4-pole 8-pole B	aux. contact B1	4· Pole PE B2	C1	D1	D2	E	F	G	3-pole 4-pole H	3,4-pole 6-pole 8-pole H
LTS..	48 ❐, SV1	48	48	62,5	-	-	10	14,5	1-5	9	5	36	-	64	54	-
LTS..	64 ❐, SV4, SV164	64	48	62,5	97	126	10	14,5	1-5	9	5	48	-	64	54	74
LTS85-125..	64 ❐, SV4	64	78	78	-	-	10	-	1-5	9	5	48	-	85	60	-
LTS85-125..	88 ❐, SV488	88	78	78	-	-	10	-	1-5	9	6	68	-	85	60	-
LT125/160	88 ❐, SV34	88	112	150	224	-	-	-	1-4	13-17	6	68	49,3	108	96	98

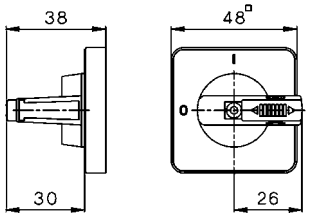
Escutcheon plate
48 ❐



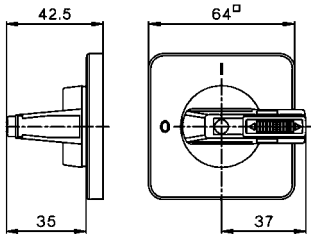
64 ❐



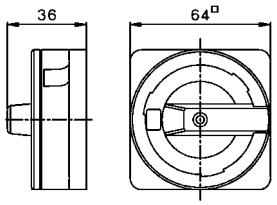
Padlock devices
SV1



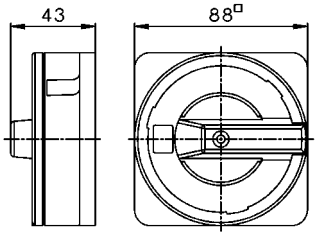
SV164



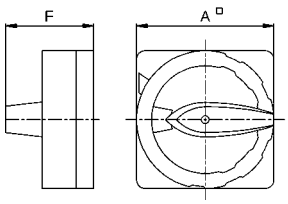
Padlock devices
SV4



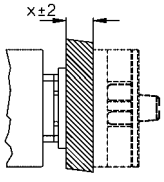
SV488



SV34



Extended Switch Shaft
+VW"x"

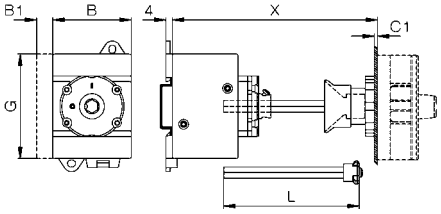


Dimensions (mm)

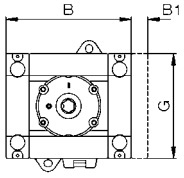
Main Switches, Switch Disconnectors LT(S)..

Base mounting LTS.. VZV(HN)..
ON-OFF Switches 3-pole, 4-pole

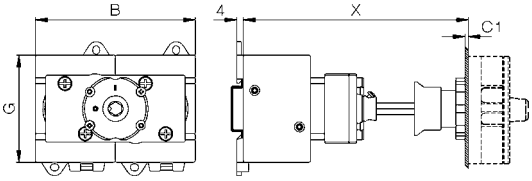
L = X - 40±3 for LTS20 - 80
L = X - 44±3 for LTS85 - 125



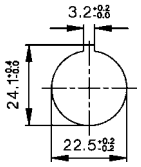
6-pole
for LTS20 - 40 only
L = X - 40±3



ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole
L = X - 60±3

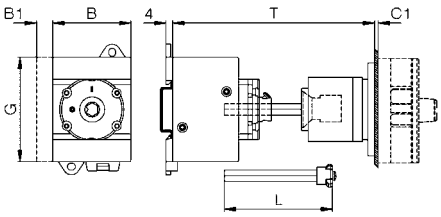


Mounting holes

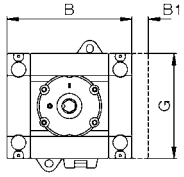


Base mounting LT(S).. V(HN)..
ON-OFF Switches 3-pole, 4-pole

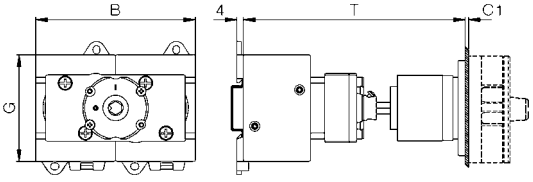
L = T - 60±3 for LTS20 - 80
L = T - 64±3 for LTS85 - 125



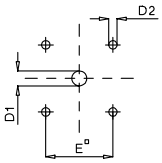
6-pole
for LTS20 - 40 only
L = T - 60±3



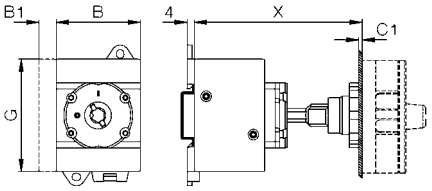
ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole
L = T - 80±3 for LTS20 - 80 only



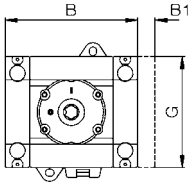
Mounting holes



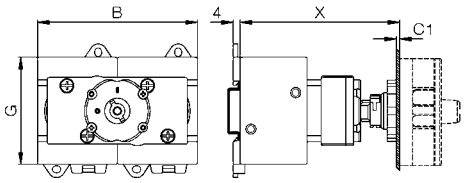
Base mounting LTS.. VZ(HN)..
ON-OFF Switches 3-pole, 4-pole
Preference values for X: 80, 85, 104, 129



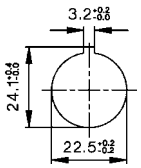
6-pole
for LTS20 - 40 only



ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole

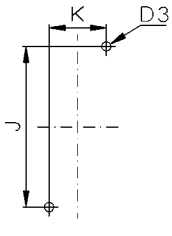


Mounting holes

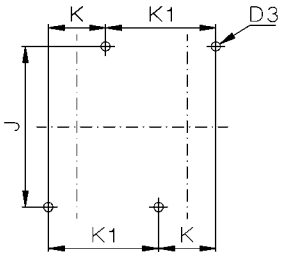


Type	Changeover ON-OFF Escutch. plate or padlock device	A	3-pole B	4-pole B	6-pole B	3,4-pole 8-pole B	aux. contact B1	4.Pole PE B2	C1	D1	D2	D3	E	G	K	K1	J
LTS20 -40	64 ❐, SV4, SV164	64	48	48	77	97	10	14,5	1-5	9	5	M4	48	64	25	48	70
LTS63, 80	64 ❐, SV4, SV164	64	48	62,5	97	126	10	14,5	1-5	9	5	M4	48	64	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

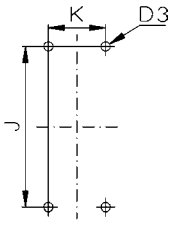
Base mounting
ON-OFF Switches **LTS20 - LTS80**
3-pole, 4-pole
6-pole LTS20 -40



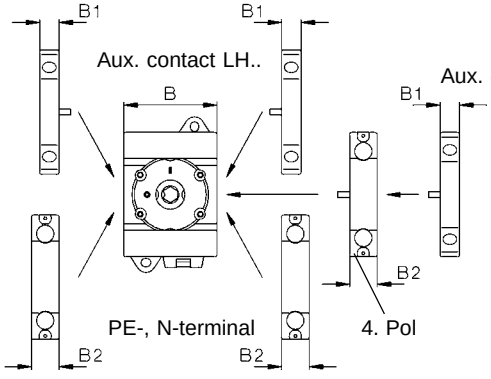
6-pole, 8-pole
Changeover Switches



LTS85-125, LT160
3-pole, 4-pole



Mounting of Accessories LTS20 - LTS80
Base mounting, for distribution boards



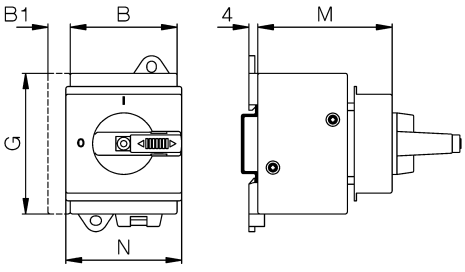
1) Ø 22-25 for LT80(100) VH(N)34 .. only
2) Ø 26-30 for LT125(160) VH(N)34 .. only

Dimensions (mm)

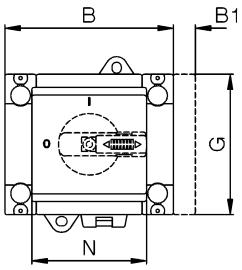
Main Switches, Switch Disconnectors LT(S)..

Installation cover LT(S).. SMA(HN)..

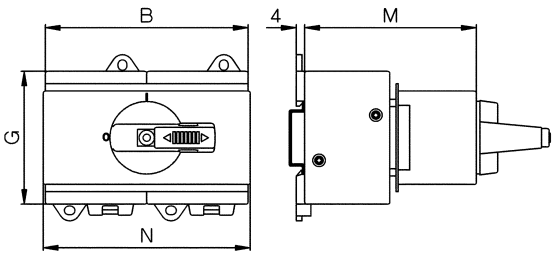
ON-OFF Switches 3-pole, 4-pole



ON-OFF Switches 6-pole for LTS20 - 40 only



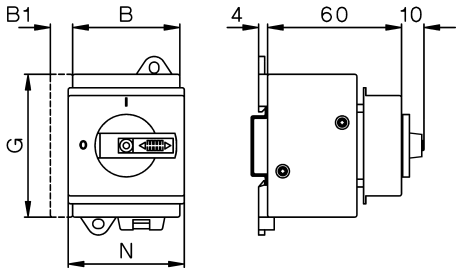
ON-OFF Switches 6-pole, 8-pole
Changeover Switches 3-pole, 4-pole

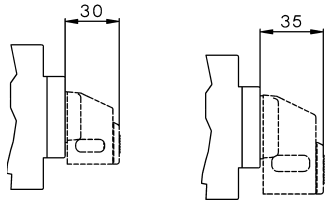


		Changeover ON-OFF	3,4-pole						3,4-pole					
		3-pole	4-pole	6-pole	8-pole	aux. contact	4.pole PE		3-pole 4-pole	6-pole	8-pole	3-pole 4-pole	6-pole	8-pole
Type	padlock device	B	B	B	B	B1	B2	G	M	M	M	N	N	N
LTS20 - 40	SV1, SV164	48	48	77	96	10	14,5	64	60	60	74	52	52	97[2]
LTS63, 80	SV1, SV164	48	62,5	96	125	10	14,5	64	60	74	74	52	97[2]	126[1]
LTS85-125..	SV164	78	78	-	-	10	-	85	60	-	-	78	-	-

Installation cover with low height handle LTS SMAHN1.. +SV1N

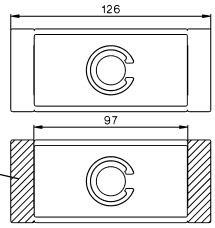
Main switch 3-pole, 4-pole LTS20 - LTS80 Padlock device SV1 Padlock device SV164





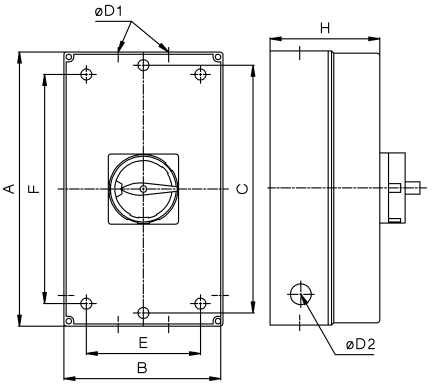
1) Original cover

2) Remove cover parts



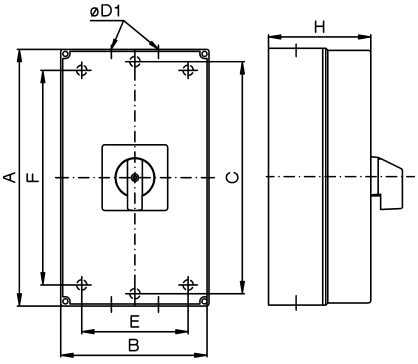
Maintenance and Safety Switches LT(S)..PF..

Type	pole	size	A	B	C	D1	D2	E	F	H
LTS20 PFH.. A. - LTS40 PFH.. A. [3]	3, 4	**PF1**	130	98	121	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,		75	150	76
LTS20 PFLH.. A. - LTS40 PFLH.. A.[4]	6	**PFL2**	200	140	-	40,5/32,5+16,5+12,5	-	100	160	86
LTS63 PFLH.. A. - LTS80 PFLH.. A.[4]	3, 4	**PFL2**	200	140	-	40,5/32,5+16,5+12,5	-	100	160	86
LTS85 PFLH.. A. - LTS125 PFLH..A.[4]	3, 4	**PFL2**	200	140	-	40,5/32,5+16,5+12,5	-	100	160	86
LTS20 PFLH.. A. - LTS40 PFLH.. A.[5]	8	**PFL3**	240	176	-	2x40,5/32,5	-	120	200	120
LTS63 PFLH.. A. - LTS80 PFLH.. A.[5]	6, 8	**PFL3**	240	176	-	2x40,5/32,5	-	120	200	120
LTS85 PFLH.. A. - LTS125 PFLH..A.[5]	3, 4	**PFL3**	240	176	-	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,	75	150	76
LTS63 PFL A., LTS80 PFL A.[4]	3, 4	**PFL2**	240	176	-	40,5/32,5+16,5+12	95	165	86
+ PF3	3, 4	**PFL3**	240	176	-	2x40,5/32,5	130	228	120
+ PF3/M50 [6]	3, 4	**PFL3**	240	176	-	50,5/40,5	130	228	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, LTS80 PFL.. U4, LTS40 PFL.. U3 + LH11; LTS125 PFL.. A4+LH11

Index

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	ON-OFF Switches for Panel Mounting	300
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	ON-OFF Switches for Base Mounting with Door Clutch	302
	ON-OFF Switches for Distribution Boards	303
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	Main Switches for Single Hole Mounting	305
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	Main Switches for Distribution Boards	307
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	Technical Datas Approvals Dimensions	309 313 319

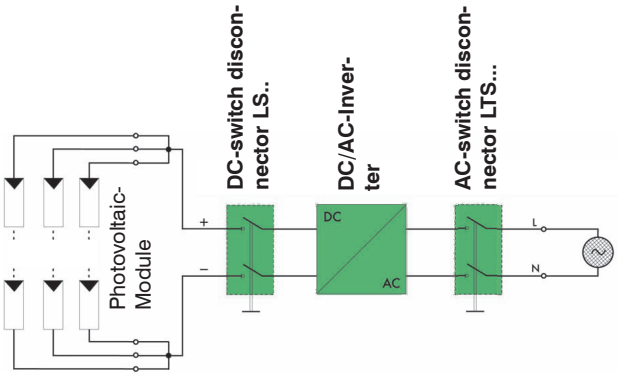
Ratings

DC-Switch Disconnectors

Type	I_{th} open A	DC21B(DC-PV1) 4 poles in series A	at U_e V	Design: Panel mounting Four-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**	1000	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS25	25	**25**	1000	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS32	32	**32**	1000	.. E ..	.. Z(O) ..	.. VZV ..	.. SMA ..
LS40	40	**25**	1000	.. E ..	-	.. VZV ..	.. SMA ..
LS55	55	**32**	1000	.. E ..	-	.. VZV ..	.. SMA ..

Switch Disconnectors for Photovoltaic

Switch disconnectors „LS..“ are switch gears for interupting the DC/AC-Inverter from the solar-panels. Photovoltaic-installations have to be equipped with DC-isolators according to IEC 60364-7-712.



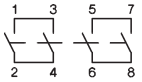
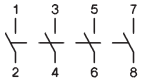
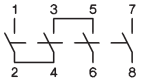
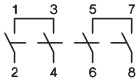
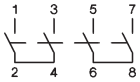
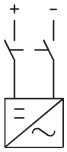
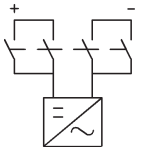
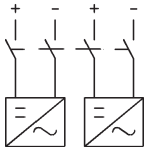
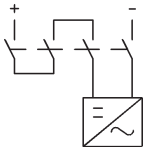
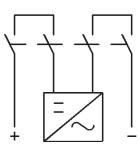
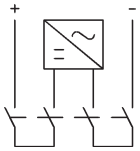
Switch disconnectors „LS..“ ensures a reliable switching up to 85A with 1500V in the category DC21B (DC-PV1).

The construction of the contacts and the material selection guarantee that no oxidation (small switching frequency) develops, and is thus prevented inadmissible heating-up.

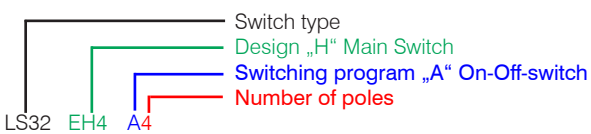
The switch disconnector has 2, 4, 6 or 8 contacts, by serial or parallel wiring of the contacts the contact rating will be increased.

The switching speed at the manually operated handle does not have an effect on the switching attitude of the contacts.

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	.. A2	.. A2+2	..A4(2 x A2)	.. A4B	.. A4O	.. A4U
LS25	.. A2	.. A2+2	..A4(2 x A2)	.. A4B	.. A4O	.. A4U
LS32	.. A2	.. A2+2	..A4(2 x A2)	.. A4B	.. A4O	.. A4U
LS40	.. A2	.. A2+2	..A4(2 x A2)	.. A4B	.. A4O	.. A4U
LS55	.. A2	.. A2+2	..A4(2 x A2)	.. A4B	.. A4O	.. A4U
Contacts Wiring diagram						
Switching example						

Ordering

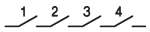
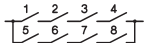


1) Protection in front and built in

DC-Main Switch

Panel mounting Four-hole mounting IP66[1]	Single hole mounting Ø22,5mm IP66[1]	Base mounting with door coupling IP66[1]	Modular switch IP40[1]	Plastic enclosed IP66/67[1]
.. 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 ..

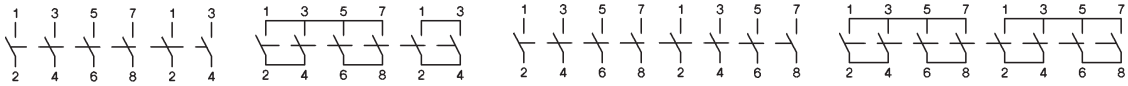
Technical data for DC, according to IEC 60947-3, VDE0660, more data see page 307

Type		DC21A/B (DC-PV1) 500V	600V	700V	800V	900V	1000V	1200V	1500V	DC22B 500V	600V	800V	1000V
2 poles in series	**LS16 ..**	16A	16A	16A	16A	16A	10A	7A	3A	7A	5,5A	2A	1A
	LS25..	25A	25A	25A	19A	17A	11,5A	8,5A	5A	8A	6A	2,5A	1,5A
	LS32 ..	32A	32A	32A	21A	18A	13A	10A	6A	9A	6,5A	3A	2A
	LS40 ..	40A	40A	37A	35A	31A	29A	11A	7,5A	-	-	-	-
	LS55..	55A	55A	55A	55A	43A	36A	17A	10A	-	-	-	-
2 poles in series+2 parallel	**LS16 ..**	29A	29A	22A	17A	16A	10A	7A	3A	-	-	-	-
	LS25..	45A	36A	27A	19A	17A	12A	9A	5A	-	-	-	-
	LS32 ..	58A	55A	32A	21A	18A	13A	10A	6A	-	-	-	-
	LS40 ..	72A	72A	49A	42A	31A	29A	11A	7,5A	-	-	-	-
	LS55..	85A	85A	77A	63A	43A	36A	17A	10A	-	-	-	-
4 poles in series 	**LS16 ..**	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	11,5A	8A
	LS25..	25A	25A	25A	25A	25A	25A	25A	25A	25A	25A	12A	9A
	LS32 ..	32A	32A	32A	32A	32A	32A	32A	32A	32A	27,5A	12,5A	10A
	LS40 ..	40A	40A	40A	40A	40A	40A	40A	40A	-	-	-	-
	LS55..	55A	55A	55A	55A	55A	55A	55A	55A	-	-	-	-
4 poles in series+2 parallel 	**LS16 ..**	29A	29A	29A	29A	29A	29A	29A	20A	-	-	-	-
	LS25..	45A	45A	45A	45A	45A	45A	45A	26A	-	-	-	-
	LS32 ..	58A	58A	58A	58A	58A	58A	50A	32A	-	-	-	-
	LS40 ..	72A	72A	72A	72A	72A	72A	56A	42A	-	-	-	-
	LS55 ..	85A	85A	85A	85A	85A	85A	65A	55A	-	-	-	-

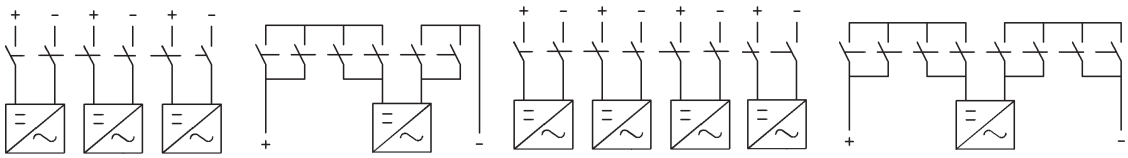
Switching programs

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
LS16	...A6	.. A3+2	...A8	.. A4+2
LS25	...A6	.. A3+2	...A8	.. A4+2
LS32	...A6	.. A3+2	...A8	.. A4+2
LS40	...A6	.. A3+2	...A8	.. A4+2
LS55	...A6	.. A3+2	...A8	.. A4+2

Contacts Wiring diagram



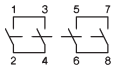
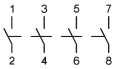
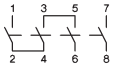
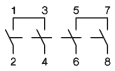
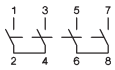
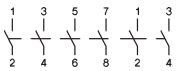
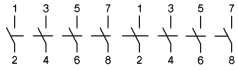
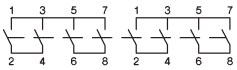
Switching example



Insulated Jumper LSV-.. for series and parallel switching of contacts

	Type	Pack	Weigth
LS16, LS25, LS32	**LSV-B1**	100	6,6 g/pc.
LS40, LS55	**LSV-B2**	100	9,64 g/pc.

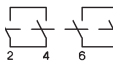
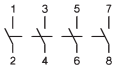
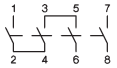
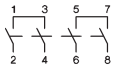
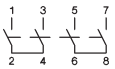
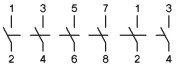
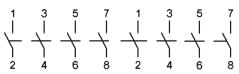
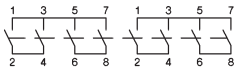
ON-OFF Switches for Panel Mounting, Escutcheon plate 64□, IP66 UL LISTED c UL us Type 3R

		DC21B / DC-PV1 600V DC	1000V DC	Poles in series	Number of Strings	**Type**	Pack pcs	Weigth 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
		40A	29A	2	1	**LS40 E A2**	1	0,41
		55A	36A	2	1	**LS55 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
		68A	29A	2	1	**LS40 E A2+2**	1	0,54
		85A	36A	2	1	**LS55 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
		40A	29A	2	2	**LS40 E A4**	1	0,49
		55A	36A	2	2	**LS55 E A4**	1	0,49
		16A	16A	4	1	**LS16 E A4B**	1	0,24
		25A	25A	4	1	**LS25 E A4B**	1	0,24
		32A	32A	4	1	**LS32 E A4B**	1	0,24
		40A	40A	4	1	**LS40 E A4B**	1	0,52
		55A	55A	4	1	**LS55 E A4B**	1	0,52
		16A	16A	4	1	**LS16 E A4O**	1	0,24
		25A	25A	4	1	**LS25 E A4O**	1	0,24
		32A	32A	4	1	**LS32 E A4O**	1	0,24
		40A	40A	4	1	**LS40 E A4O**	1	0,52
		55A	55A	4	1	**LS55 E A4O**	1	0,52
		16A	16A	4	1	**LS16 E A4U**	1	0,24
		25A	25A	4	1	**LS25 E A4U**	1	0,24
		32A	32A	4	1	**LS32 E A4U**	1	0,24
		40A	40A	4	1	**LS40 E A4U**	1	0,52
		55A	55A	4	1	**LS55 E A4U**	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
		40A	29A	2	3	**LS40 E A6**	1	-
		55A	36A	2	3	**LS55 E A6**	1	-
		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
		40A	29A	2	4	**LS40 E A8**	1	-
		55A	36A	2	4	**LS55 E A8**	1	-
		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
		72A	72A	4	1	**LS40 E A4+2**	1	-
		85A	85A	4	1	**LS55 E A4+2**	1	-

Extended Switch Shaft for all switches for panel mounting

type suffix **+VW"x"** x = panel thickness

ON-OFF Switches for Single Hole Mounting Ø22mm, Escutcheon plate 48°, IP66 UL LISTED c UL us Type 4X

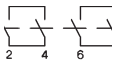
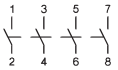
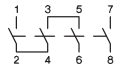
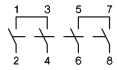
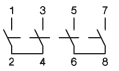
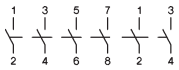
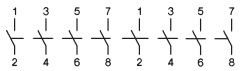
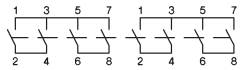
	DC21B / DC-PV1 600V DC	1000V DC	Poles in series	Number of Strings	**Type**	Pack pcs	Weigth kg/pcs.
	16A	10A	2	1	**LS16 Z A2**	1	0,21
	25A	11,5A	2	1	**LS25 Z A2**	1	0,21
	32A	13A	2	1	**LS32 Z A2**	1	0,21
	29A	10A	2	1	**LS16 Z A2+2**	1	0,26
	36A	11,5A	2	1	**LS25 Z A2+2**	1	0,26
	55A	13A	2	1	**LS32 Z A2+2**	1	0,26
	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
	16A	16A	4	1	**LS16 Z A4B**	1	0,25
	25A	25A	4	1	**LS25 Z A4B**	1	0,25
	32A	32A	4	1	**LS32 Z A4B**	1	0,25
	16A	16A	4	1	**LS16 Z A4O**	1	0,25
	25A	25A	4	1	**LS25 Z A4O**	1	0,25
	32A	32A	4	1	**LS32 Z A4O**	1	0,25
	16A	16A	4	1	**LS16 Z A4U**	1	0,25
	25A	25A	4	1	**LS25 Z A4U**	1	0,25
	32A	32A	4	1	**LS32 Z A4U**	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
	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
	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

ON-OFF Switches for Single Hole Mounting Ø22mm, without Escutcheon plate, IP66, UL LISTED c UL us Typ 4X

Replace at the Type „**Z**“ with „**ZO**“	**LS.. ZO A.**	

ON-OFF Switches f. Base Mounting w. Door Clutch f. Single Hole, Plate 64□, IP66, UL LISTED c UL us Type 4X

Depth is adjustable
see page 317

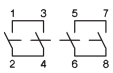
	DC21B / DC-PV1 600V DC	1000V DC	Poles in series	Number of Strings	**Type**	Pack pcs	Weigth kg/pcs.
	16A	10A	2	1	**LS16 VZV A2**	1	0,22
	25A	11,5A	2	1	**LS25 VZV A2**	1	0,22
	32A	13A	2	1	**LS32 VZV A2**	1	0,22
	40A	29A	2	1	**LS40 VZV A2**	1	0,51
	55A	36A	2	1	**LS55 VZV A2**	1	0,51
	29A	10A	2	1	**LS16 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
	68A	29A	2	1	**LS40 VZV A2+2**	1	0,55
	85A	36A	2	1	**LS55 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
	40A	29A	2	2	**LS40 VZV A4**	1	0,56
	55A	36A	2	2	**LS55 VZV A4**	1	0,56
	16A	16A	4	1	**LS16 VZV A4B**	1	0,26
	25A	25A	4	1	**LS25 VZV A4B**	1	0,26
	32A	32A	4	1	**LS32 VZV A4B**	1	0,26
	40A	40A	4	1	**LS40 VZV A4B**	1	0,58
	55A	55A	4	1	**LS55 VZV A4B**	1	0,58
	16A	16A	4	1	**LS16 VZV A4O**	1	0,26
	25A	25A	4	1	**LS25 VZV A4O**	1	0,26
	32A	32A	4	1	**LS32 VZV A4O**	1	0,26
	40A	40A	4	1	**LS40 VZV A4O**	1	0,58
	55A	55A	4	1	**LS55 VZV A4O**	1	0,58
	16A	16A	4	1	**LS16 VZV A4U**	1	0,26
	25A	25A	4	1	**LS25 VZV A4U**	1	0,26
	32A	32A	4	1	**LS32 VZV A4U**	1	0,26
	40A	40A	4	1	**LS40 VZV A4U**	1	0,58
	55A	55A	4	1	**LS55 VZV A4U**	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
	40A	29A	2	3	**LS40 VZV A6**	1	-
	55A	36A	2	3	**LS55 VZV A6**	1	-
	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
	40A	29A	2	4	**LS40 VZV A8**	1	-
	55A	36A	2	4	**LS55 VZV A8**	1	-
	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
	72A	72A	4	1	**LS40 VZV A4+2**	1	-
	85A	85A	4	1	**LS55 VZV A4+2**	1	-

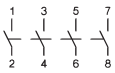
ON-OFF Switches for Distribution Boards, IP40, Type1

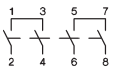
DC21B / DC-PV1 600V DC	DC-PV1 1000V DC	Poles in series	Number of Strings	Type	Pack pcs	Weigth kg/pcs.
16A	10A	2	1	**LS16 SMA A2**	1	0,19
25A	11,5A	2	1	**LS25 SMA A2**	1	0,19
32A	13A	2	1	**LS32 SMA A2**	1	0,19
40A	29A	2	1	**LS40 SMA A2**	1	0,41
55A	36A	2	1	**LS55 SMA A2**	1	0,41
29A	10A	2	1	**LS16 SMA 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
68A	29A	2	1	**LS40 SMA A2+2**	1	0,52
85A	36A	2	1	**LS55 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
40A	29A	2	2	**LS40 SMA A4**	1	0,45
55A	36A	2	2	**LS55 SMA A4**	1	0,45
16A	16A	4	1	**LS16 SMA A4B**	1	0,23
25A	25A	4	1	**LS25 SMA A4B**	1	0,23
32A	32A	4	1	**LS32 SMA A4B**	1	0,23
40A	40A	4	1	**LS40 SMA A4B**	1	0,49
55A	55A	4	1	**LS55 SMA A4B**	1	0,49
16A	16A	4	1	**LS16 SMA A4O**	1	0,23
25A	25A	4	1	**LS25 SMA A4O**	1	0,23
32A	32A	4	1	**LS32 SMA A4O**	1	0,23
40A	40A	4	1	**LS40 SMA A4B**	1	0,49
55A	55A	4	1	**LS55 SMA A4B**	1	0,49
16A	16A	4	1	**LS16 SMA A4U**	1	0,23
25A	25A	4	1	**LS25 SMA A4U**	1	0,23
32A	32A	4	1	**LS32 SMA A4U**	1	0,23
40A	40A	4	1	**LS40 SMA A4B**	1	0,49
55A	55A	4	1	**LS55 SMA A4B**	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
40A	29A	2	3	**LS40 SMA A6**	1	-
55A	36A	2	3	**LS55 SMA A6**	1	-
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
40A	29A	2	4	**LS40 SMA A8**	1	-
55A	36A	2	4	**LS55 SMA A8**	1	-
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
72A	72A	4	1	**LS40 SMA A4+2**	1	-
85A	85A	4	1	**LS55 SMA A4+2**	1	-

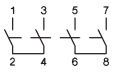
Main Switches for Panel Mounting, Escutcheon plate 64□, IP66, UL LISTED c UL us Type 4X

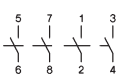
padlock device SV4

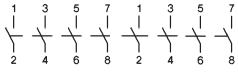


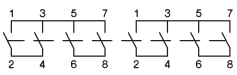










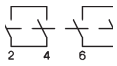
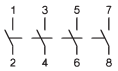
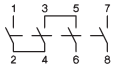
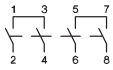
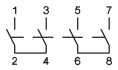
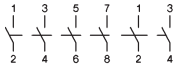
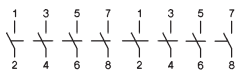
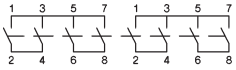


DC21B / DC-PV1 600V DC	1000V DC	Poles in series	Number of Strings	**Type**	Pack pcs	Weigth kg/pcs.
16A	10A	2	1	**LS16 EH4 A2**	1	0,21
25A	11,5A	2	1	**LS25 EH4 A2**	1	0,21
32A	13A	2	1	**LS32 EH4 A2**	1	0,21
40A	29A	2	1	**LS40 EH4 A2**	1	0,43
55A	36A	2	1	**LS55 EH4 A2**	1	0,43
29A	10A	2	1	**LS16 EH4 A2+2**	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
68A	29A	2	1	**LS40 EH4 A2+2**	1	0,57
85A	36A	2	1	**LS55 EH4 A2+2**	1	0,57
16A	16A	2	2	**LS16 EH4 A4**	1	0,24
25A	25A	2	2	**LS25 EH4 A4**	1	0,24
32A	32A	2	2	**LS32 EH4 A4**	1	0,24
40A	40A	2	2	**LS40 EH4 A4**	1	0,50
55A	55A	2	2	**LS55 EH4 A4**	1	0,50
16A	10A	4	1	**LS16 EH4 A4B**	1	0,25
25A	11,5A	4	1	**LS25 EH4 A4B**	1	0,25
32A	13A	4	1	**LS32 EH4 A4B**	1	0,25
40A	29A	4	1	**LS40 EH4 A4B**	1	0,53
55A	36A	4	1	**LS55 EH4 A4B**	1	0,53
16A	16A	4	1	**LS16 EH4 A4O**	1	0,25
25A	25A	4	1	**LS25 EH4 A4O**	1	0,25
32A	32A	4	1	**LS32 EH4 A4O**	1	0,25
40A	40A	4	1	**LS40 EH4 A4O**	1	0,53
55A	55A	4	1	**LS55 EH4 A4O**	1	0,53
16A	16A	4	1	**LS16 EH4 A4U**	1	0,25
25A	25A	4	1	**LS25 EH4 A4U**	1	0,25
32A	32A	4	1	**LS32 EH4 A4U**	1	0,25
40A	40A	4	1	**LS40 EH4 A4U**	1	0,53
55A	55A	4	1	**LS55 EH4 A4U**	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
40A	29A	2	3	**LS40 EH4 A6**	1	0,53
55A	36A	2	3	**LS55 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
40A	29A	2	4	**LS40 EH4 A8**	1	-
55A	36A	2	4	**LS55 EH4 A8**	1	-
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
72A	72A	4	1	**LS40 EH4 A4+2**	1	-
85A	85A	4	1	**LS55 EH4 A4+2**	1	-

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	DC-PV1 1000V DC	Poles in series	Number of Strings	Type	Pack pcs	Weigth 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
padlock device 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
						
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
						
16A	16A	4	1	**LS16 ZH1 A4B**	1	0,25
25A	25A	4	1	**LS25 ZH1 A4B**	1	0,25
32A	32A	4	1	**LS32 ZH1 A4B**	1	0,25
						
16A	16A	4	1	**LS16 ZH1 A4O**	1	0,25
25A	25A	4	1	**LS25 ZH1 A4O**	1	0,25
32A	32A	4	1	**LS32 ZH1 A4O**	1	0,25
						
16A	16A	4	1	**LS16 ZH1 A4U**	1	0,25
25A	25A	4	1	**LS25 ZH1 A4U**	1	0,25
32A	32A	4	1	**LS32 ZH1 A4U**	1	0,25
						
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
						
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
						
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

Main Switches f. Base Mounting, Door Clutch f. Single Hole, Escutcheon plate 64□, IP66, UL LISTED c UL us Type4X

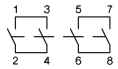
Depth is adjustable
see page 317
padlock device SV4

DC21B / DC-PV1 600V DC	DC21B / DC-PV1 1000V DC	Poles in series	Number of Strings	Type	Pack pcs	Weigth 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
40A	29A	2	1	**LS40 VZVH4 A2**	1	0,51
55A	36A	2	1	**LS55 VZVH4 A2**	1	0,51
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
68A	29A	2	1	**LS40 VZVH4 A2+2**	1	0,65
85A	36A	2	1	**LS55 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
40A	29A	2	2	**LS40 VZVH4 A4**	1	0,58
55A	36A	2	2	**LS55 VZVH4 A4**	1	0,58
16A	16A	4	1	**LS16 VZVH4 A4B**	1	0,27
25A	25A	4	1	**LS25 VZVH4 A4B**	1	0,27
32A	32A	4	1	**LS32 VZVH4 A4B**	1	0,27
40A	40A	4	1	**LS40 VZVH4 A4B**	1	0,62
55A	55A	4	1	**LS55 VZVH4 A4B**	1	0,62
16A	16A	4	1	**LS16 VZVH4 A4O**	1	0,27
25A	25A	4	1	**LS25 VZVH4 A4O**	1	0,27
32A	32A	4	1	**LS32 VZVH4 A4O**	1	0,27
40A	40A	4	1	**LS40 VZVH4 A4O**	1	0,62
55A	55A	4	1	**LS55 VZVH4 A4O**	1	0,62
16A	16A	4	1	**LS16 VZVH4 A4U**	1	0,27
25A	25A	4	1	**LS25 VZVH4 A4U**	1	0,27
32A	32A	4	1	**LS32 VZVH4 A4U**	1	0,27
40A	40A	4	1	**LS40 VZVH4 A4U**	1	0,62
55A	55A	4	1	**LS55 VZVH4 A4U**	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
40A	29A	2	3	**LS40 VZVH4 A6**	1	-
55A	36A	2	3	**LS55 VZVH4 A6**	1	-
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
40A	29A	2	4	**LS40 VZVH4 A8**	1	-
55A	36A	2	4	**LS55 VZVH4 A8**	1	-
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
72A	72A	4	1	**LS40 VZVH4 A4+2**	1	-
85A	85A	4	1	**LS55 VZVH4 A4+2**	1	-

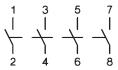
Main Switches for Distribution Boards, IP40, UL LISTED c UL us Type 1

DC21B / DC-PV1 600V DC	DC-PV1 1000V DC	Poles in series	Number of Strings	**Type**	Pack pcs	Weigth 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
40A	29A	2	1	**LS40 SMAH1 A2**	1	0,40
55A	36A	2	1	**LS55 SMAH1 A2**	1	0,40

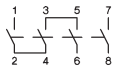
padlock device SV1



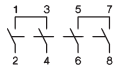
29A	10A	2	1	**LS16 SMAH1 A2+2** [1]	1	0,25
36A	11,5A	2	1	**LS25 SMAH1 A2+2** [1]	1	0,25
55A	13A	2	1	**LS32 SMAH1 A2+2** [1]	1	0,25
68A	29A	2	1	**LS40 SMAH1 A2+2**	1	0,54
85A	36A	2	1	**LS55 SMAH1 A2+2**	1	0,54



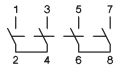
16A	10A	2	2	**LS16 SMAH1 A4** [1]	1	0,22
25A	11,5A	2	2	**LS25 SMAH1 A4** [1]	1	0,22
32A	13A	2	2	**LS32 SMAH1 A4** [1]	1	0,22
40A	29A	2	2	**LS40 SMAH1 A4**	1	0,47
55A	36A	2	2	**LS55 SMAH1 A4**	1	0,47



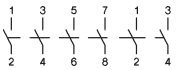
16A	16A	4	1	**LS16 SMAH1 A4B** [1]	1	0,23
25A	25A	4	1	**LS25 SMAH1 A4B** [1]	1	0,23
32A	32A	4	1	**LS32 SMAH1 A4B** [1]	1	0,23
40A	40A	4	1	**LS40 SMAH1 A4B**	1	0,50
55A	55A	4	1	**LS55 SMAH1 A4B**	1	0,50



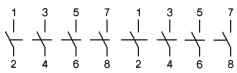
16A	16A	4	1	**LS16 SMAH1 A4O** [1]	1	0,23
25A	25A	4	1	**LS25 SMAH1 A4O** [1]	1	0,23
32A	32A	4	1	**LS32 SMAH1 A4O** [1]	1	0,23
40A	40A	4	1	**LS40 SMAH1 A4B**	1	0,50
55A	55A	4	1	**LS55 SMAH1 A4B**	1	0,50



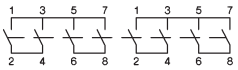
16A	16A	4	1	**LS16 SMAH1 A4U** [1]	1	0,23
25A	25A	4	1	**LS25 SMAH1 A4U** [1]	1	0,23
32A	32A	4	1	**LS32 SMAH1 A4U** [1]	1	0,23
40A	40A	4	1	**LS40 SMAH1 A4B**	1	0,50
55A	55A	4	1	**LS55 SMAH1 A4B**	1	0,50



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
40A	29A	2	3	**LS40 SMAH1 A6**	1	-
55A	36A	2	3	**LS55 SMAH1 A6**	1	-



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
40A	29A	2	4	**LS32 SMAH1 A8**	1	-
55A	36A	2	4	**LS32 SMAH1 A8**	1	-



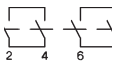
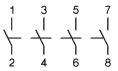
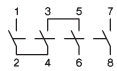
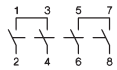
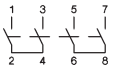
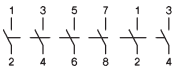
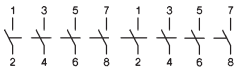
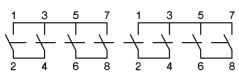
29A	29A	4	1	**LS16 SMAH1 A4+2**	1	0,46
45A	45A	4	1	**LS25 SMAH1 A4+2**	1	0,46
58A	58A	4	1	**LS32 SMAH1 A4+2**	1	0,46
72A	72A	4	1	**LS40 SMAH1 A4+2**	1	-
85A	85A	4	1	**LS55 SMAH1 A4+2**	1	-

[1] Main Switches for Distribution Boards with low height handle, IP40, UL LISTED c UL us Typ 1

Type with Type-suffix „**+SV1N**“	e.g.	**LS.. SMAH1 A2+2 +SV1N**

Main Switches in Plastic Enclosure, Escutcheon plate 64□, IP66, UL LISTED, c UL us Type 4X [1]

padlock device SV4

DC21B / DC-PV1 600V DC	DC21B / DC-PV1 1000V DC	Poles in series	Number of Strings	Type	Pack pcs	Weigth kg/pcs.
16A	10A	2	1	**LS16 PFLH4 A2** [1]	1	0,43
25A	11,5A	2	1	**LS25 PFLH4 A2** [1]	1	0,43
32A	13A	2	1	**LS32 PFLH4 A2** [1]	1	0,43
40A	29A	2	1	**LS40 PFLH4 A2**	1	1,59
55A	36A	2	1	**LS55 PFLH4 A2**	1	1,59
						
29A	10A	2	1	**LS16 PFLH4 A2+2** [1]	1	0,49
36A	11,5A	2	1	**LS25 PFLH4 A2+2** [1]	1	0,49
55A	13A	2	1	**LS32 PFLH4 A2+2** [1]	1	0,49
68A	29A	2	1	**LS40 PFLH4 A2+2**	1	1,74
85A	36A	2	1	**LS55 PFLH4 A2+2**	1	1,74
						
16A	10A	2	2	**LS16 PFLH4 A4** [1]	1	0,46
25A	11,5A	2	2	**LS25 PFLH4 A4** [1]	1	0,46
32A	13A	2	2	**LS32 PFLH4 A4** [1]	1	0,46
40A	29A	2	2	**LS40 PFLH4 A4**	1	1,67
55A	36A	2	2	**LS55 PFLH4 A4**	1	1,67
						
16A	16A	4	1	**LS16 PFLH4 A4B** [1]	1	0,47
25A	25A	4	1	**LS25 PFLH4 A4B** [1]	1	0,47
32A	32A	4	1	**LS32 PFLH4 A4B** [1]	1	0,47
40A	40A	4	1	**LS40 PFLH4 A4B**	1	1,70
55A	55A	4	1	**LS55 PFLH4 A4B**	1	1,70
						
16A	16A	4	1	**LS16 PFLH4 A4O** [1]	1	0,47
25A	25A	4	1	**LS25 PFLH4 A4O** [1]	1	0,47
32A	32A	4	1	**LS32 PFLH4 A4O** [1]	1	0,47
40A	40A	4	1	**LS40 PFLH4 A4O**	1	1,70
55A	55A	4	1	**LS55 PFLH4 A4O**	1	1,70
						
16A	16A	4	1	**LS16 PFLH4 A4U** [1]	1	0,47
25A	25A	4	1	**LS25 PFLH4 A4U** [1]	1	0,47
32A	32A	4	1	**LS32 PFLH4 A4U** [1]	1	0,47
40A	40A	4	1	**LS40 PFLH4 A4U**	1	1,70
55A	55A	4	1	**LS55 PFLH4 A4U**	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
40A	29A	2	3	**LS40 PFLH4 A6**	1	1,87
55A	36A	2	3	**LS55 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
40A	29A	2	4	**LS40 PFLH4 A8**	1	1,94
55A	36A	2	4	**LS55 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
72A	72A	4	1	**LS40 PFLH4 A4+2**	1	2,07
85A	85A	4	1	**LS55 PFLH4 A4+2**	1	2,07

1) enclosure with thread, type suffix: +M25

Technical Data

Kind of current	Category		Typical applications	Test conditions for the number of on-load operating cycles (normal service) Make I/Ie	U/Ue	L/R	Break Ic/Ie	Ur/Ue	L/R	Test conditions for making and breaking capacities (operation in fault case) Make I/Ie	U/Ue	L/R	Break Ic/Ie	Ur/Ue	L/R
Direct current	**DC21A** frequent operation	**DC21B** infrequent operation	Switching of resistive loads including moderate overloads	1	1	1ms	1	1	1ms	1,5	1,05	1ms	1,5	1,05	1ms
	DC22A frequent operation	**DC22B** infrequent operation	Switching of mixed resistive a.induct. loads incl. moderate overloads (shunt motors)	1	1	2ms	1	1	2ms	4	1,05	2,5ms	4	1,05	2,5ms
	DC-PV1		Switching of single PV string(s) without reverse- and overcurrents.	1	1	1ms	1	1	1ms	1,5	1,05	1ms	1,5	1,05	1ms
	DC-PV2		Switching of several PV strings with reverse- and overcurrents.	1	1	1ms	1	1	1ms	4	1,05	1ms	4	1,05	1ms

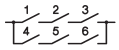
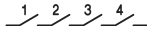
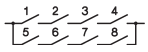
Data according to IEC 60947-3, VDE 0660, GB14048.3 (CCC China)

Main contacts			**Type**	**LS16**	**LS25**	**LS32**	**LS40**	**LS55**
Rated thermal current I_{the}			A	16	25	32	40	55
Rated insulation voltage U_i 1)			V	1000	1000	1000	1500	1500
Rated insulation voltage U_i 2)			V	1500	1500	1500	1500	1500
Distance of contacts (per pole)			mm	8	8	8		
Rated operational current I_e		300V	A	16	23	27	40	55
	1 pole	400V	A	12	14	16	30	40
DC21A and DC21B	A1	500V	A	9	11	13	19	25
		600V	A	6	8	10	15	20
		700V	A	4,5	6	7,5	10	15
		800V	A	3	4	5	8	10
		900V	A	2,5	3	4	6	8
DC21B		1000V	A	1,5	2	2,5	4	6
	2 pole in series	500V	A	16	25	32	40	55
	A2	600V	A	16	25	32	40	55
		700V	A	16	23	27	35	55
		800V	A	16	20	21	30	45
		850V	A	18	22	25	-	-
		900V	A	13	16	18	25	35
		1000V	A	9	11	13	20	36
		1200V	A	6	8	10	10	15
		1500V	A	3	4	5	6	7,5
	2 poles in series	500V	A	29	45	58	72	85
	+ 2 poles parallel	600V	A	29	45	50	64	80
	A2+2	700V	A	16	23	27	35	55
		800V	A	16	20	21	30	45
		900V	A	13	16	18	25	35
		1000V	A	9	11	13	20	25
		1200V	A	6	8	10	10	15
		1500V	A	3	4	5	6	7,5
	3 poles in series	500V	A	29	45	58	72	85
	+ 2 poles parallel	600V	A	29	45	50	72	85
	A3+2	700V	A	29	38	45	72	85
		800V	A	29	38	45	68	85
		900V	A	29	38	45	62	78
		1000V	A	29	38	45	58	70
		1200V	A	12	14	16	-	-
		1500V	A	9	11	13	-	-
	4 poles in series	500V	A	16	25	32	40	55
	A4	600V	A	16	25	32	40	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	40	55
		1200V	A	16	25	32	40	55
		1500V	A	16	20	23	30	40
	4 poles in series	500V	A	29	45	58	72	85
	+ 2 poles parallel	600V	A	29	45	58	72	85
	A4+2	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	72	85
		1200V	A	29	45	50	56	65
		1500V	A	16	20	23	42	55
Rated operational current I_e								
AC21B	A2, A4	U_e max. 440V	A	16	25	32	40	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.

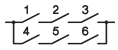
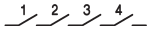
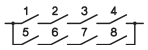
Technical Data

Data according to IEC 60947-3, VDE 0660

Main contacts			Type	LS16	LS25	LS32	LS40	LS55
Rated operational current I_e		300V	A	16	23	27	40	55
DC-PV1	1 pole	400V	A	14	22	25	33	44
	A1	500V	A	10	17	20	24	32
		600V	A	7	12	15	19	25
		700V	A	5	6	7	12	18
		800V	A	3	4	5	10	13
		900V	A	3	3	4	8	10
		1000V	A	2	2	3	5	8
	2 poles in series	500V	A	16	25	32	40	55
	A2	600V	A	16	25	32	40	55
		700V	A	16	25	32	37	55
		800V	A	16	19	21	35	55
		900V	A	16	17	18	31	43
		1000V	A	10	11,5	13	29	36
		1100V	A	8	10	11,5	19	25
		1200V	A	7	8,5	10	11	17
		1300V	A	6	7	8	10	14
		1400V	A	5	6	7	9	12
		1500V	A	3	5	6	7,5	10
	2 poles in series	500V	A	29	45	58	72	85
	+ 2 poles parallel	600V	A	29	36	55	68	85
	A2+2	700V	A	22	27	32	49	77
		800V	A	17	19	21	42	63
		900V	A	16	17	18	31	43
		1000V	A	10	11,5	13	29	36
		1100V	A	8	10	11,5	19	25
		1200V	A	7	8,5	10	11	17
		1300V	A	6	7	8	10	14
		1400V	A	5	6	7	9	12
		1500V	A	3	5	6	7,5	10
	3 poles in series	500V	A	29	45	58	72	85
	+ 2 poles parallel	600V	A	29	45	58	72	85
	A3+2	700V	A	29	43	55	72	85
		800V	A	29	40	51	68	85
		900V	A	29	38	47	62	78
		1000V	A	29	38	45	58	70
		1100V	A	19	27	37	-	-
		1200V	A	17	25	28	-	-
		1300V	A	15	21	25	-	-
		1400V	A	12	18	22	-	-
		1500V	A	10	14	20	-	-
	4 poles in series	500V	A	16	25	32	40	55
	A4	600V	A	16	25	32	40	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	40	55
		1100V	A	16	25	32	40	55
		1200V	A	16	25	32	40	55
		1300V	A	16	25	32	40	55
		1400V	A	16	25	32	40	55
		1500V	A	16	25	32	40	55
	4 poles in series	500V	A	29	45	58	72	85
	+ 2 poles parallel	600V	A	29	45	58	72	85
	A4+2	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	72	85
		1100V	A	29	45	54	60	68
		1200V	A	29	45	50	56	65
		1300V	A	26	39	44	50	61
		1400V	A	23	33	38	46	58
		1500V	A	20	26	32	42	55

Technical Data

Data according to IEC 60947-3, VDE 0660

Main contacts		Type	LS16	LS25	LS32	LS40	LS55
Rated operational current I_e	300V	A	16	23	27	40	55
DC-PV2 1 pole	400V	A	15	18	20	30	40
A1	500V	A	10	12	14	19	25
	600V	A	5	6	8	10	13
	700V	A	1,5	2	3	7	10
	800V	A	1,5	2	3	6	8
	900V	A	1	1,5	2,0	5	6
	1000V	A	1	1,5	2,0	3	4
2 poles in series	500V	A	16	25	32	40	55
A2	600V	A	14	21	27	40	55
	700V	A	13	19	22	35	55
	800V	A	12	15	17	33	49
	900V	A	8	10	12	25	35
	1000V	A	4	5	6	16	20
	1100V	A	3	4	5	11	15
	1200V	A	2	3	4	8	12
	1300V	A	1,5	2	3	7	10
	1400V	A	1	2	3	7	9
	1500V	A	1	1,5	2	6	8
2 poles in series	500V	A	25	39	50	72	85
+ 2 poles parallel	600V	A	20	32	35	60	75
A2+2	700V	A	13	19	22	38	60
	800V	A	12	15	17	33	49
	900V	A	8	10	12	25	35
	1000V	A	4	5	6	16	25
	1100V	A	3	4	5	10	15
	1200V	A	2	3	4	8	12
	1300V	A	1,5	2	3	7	10
	1400V	A	1	2	3	7	9
	1500V	A	1	1,5	2	6	8
3 poles in series	500V	A	-	-	-	72	85
+ 2 poles parallel	600V	A	-	-	-	72	78
A3+2	700V	A	-	-	-	62	69
	800V	A	-	-	-	53	61
	900V	A	-	-	-	44	55
	1000V	A	-	-	-	35	50
	1100V	A	-	-	-	-	-
	1200V	A	-	-	-	-	-
	1300V	A	-	-	-	-	-
	1400V	A	-	-	-	-	-
	1500V	A	-	-	-	-	-
4 poles in series	500V	A	16	25	32	40	55
A4	600V	A	16	25	32	40	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	40	55
	1100V	A	16	25	32	40	55
	1200V	A	13,5	21	27	40	55
	1300V	A	12	19	24	36	50
	1400V	A	10,5	16	21	33	45
	1500V	A	9	14	18	30	40
4 poles in series	500V	A	-	-	-	72	85
+ 2 poles parallel	600V	A	-	-	-	72	85
A4+2	700V	A	-	-	-	72	80
	800V	A	-	-	-	67	75
	900V	A	-	-	-	59	70
	1000V	A	-	-	-	52	64
	1100V	A	-	-	-	44	59
	1200V	A	-	-	-	40	55
	1300V	A	-	-	-	36	50
	1400V	A	-	-	-	33	45
	1500V	A	-	-	-	30	40

Technical Data

Data according to IEC 60947-3, VDE 0660

Main contacts			**Type**	**LS16**	**LS25**	**LS32**	**LS40**	**LS55**
Rated operational current I_e		500V	A	1	1,25	1,5	x	2,5
DC22B	1 pole	600V	A	0,5	0,75	1	x	2,0
	A1	800V	A	0,3	0,4	0,5	x	1,5
	1	1000V	A	0,15	0,2	0,25	x	1,0
		1200V	A	-	-	-	x	x
		1500V	A	-	-	-	x	x
	2 poles in series	500V	A	7	8	9	x	x
	A2	600V	A	5,5	6	6,5	x	x
	1 2	800V	A	2	2,5	3	x	x
		1000V	A	1	1,5	2	x	x
		1200V	A	-	-	-	x	x
		1500V	A	-	-	-	x	x
	4 poles in series	500V	A	16	25	32	x	x
	A4	600V	A	16	25	27,5	x	x
	1 2 3 4	800V	A	11,5	12	12,5	x	x
		1000V	A	8	9	10	x	x
		1200V	A	-	-	-	x	x
		1500V	A	-	-	-	x	x
Rated conditional short-circuit current			kA_{eff}	5	5	5	10	10
Max. fuse size		gL (gG)	A	40	63	80	125	160
Mechanical life			$x10^3$	10	10	10	10	10
Rated short-time	Icw	A2, A4, A6, A8	A	800	900	1000	A2, A4: 1200	A2, A4: 1400
withstand current (1s)		A2+2, A3+2, A4+2	A	1300	1500	1700	A2+2: 2000	A2+2: 2400
Short circuit	Icm	A2, A4, A6, A8	A	800	900	1000	A2, A4: 1200	A2, A4: 1400
making capacity		A2+2, A3+2, A4+2	A	1300	1500	1700	A2+2: 2000	A2+2: 2400
Maximum cable cross sections (incl. jumper LSV-B1)								
solid or stranded			mm^2	4 - 16	4 - 16	4 - 16	2,5 - 25	2,5 - 25
flexible			mm^2	4 - 10	4 - 10	4 - 10	4 - 16	4 - 16
flexible (+ multicore cable end)			mm^2	4 - 10	4 - 10	4 - 10	2,5 - 16	2,5 - 16
Size of terminal screw				M4 Pz2	M4 Pz2	M4 Pz2	M5 Pz2	M5 Pz2
Tightening torque			Nm	1,7 - 1,8	1,7 - 1,8	1,7 - 1,8	2,5 - 2,8	2,5 - 2,8
2 cables per clamp 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 & flexible + multicore cable end			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)	
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 in test

Technical Data

Data according to UL508I File E359344, Category no.: NMSJ, and UL508 File E332938, Category no.: NRNT2, NRNT8

Type				LS16	LS25	LS32	LS40	LS55
Ampere-Rating	"General use"	DC						
1	1 Pol	350V	A	4	5	6	7,1	10,0
		500V	A	4	5	6	5,7	7,0
		600V	A	4	5	6	5,0	5,8
		700V	A	-	-	-	3,9	5,0
		800V	A	-	-	-	3,2	4,4
		900V	A	-	-	-	2,5	3,5
		1000V	A	-	-	-	1,5	2,0
1 2	2 poles in series A2	350V	A	16	20	32	40	55
		500V	A	16	20	32	40	55
		600V	A	16	20	32	40	55
		700V	A	-	-	-	32	46
		800V	A	-	-	-	26	37
		900V	A	-	-	-	20	28
		1000V	A	-	-	-	16	20
1 2 3 4	2 poles in series + 2 poles parallel A2+2	350V	A	29	45	58	72	85
		400V	A				67	79
		500V	A	29	38	40	53	66
		600V	A	21	23	32	42	55
		700V	A	-	-	-	35	47
		800V	A	-	-	-	30	40
		900V	A	-	-	-	26	32
		1000V	A	-	-	-	22	25
1 2 3 4	4 poles in series A4	350V	A	16	25	32	40	55
		500V	A	16	25	32	40	55
		600V	A	16	25	32	40	55
		700V	A	-	-	-	40	55
		800V	A	-	-	-	40	55
		900V	A	-	-	-	40	55
		1000V	A	-	-	-	40	55
1 2 3 4 5 6	3 poles in series + 2 poles parallel A3+2	350V	A	29	45	58	68	71
		500V	A	29	38	50	56	64
		600V	A	21	38	45	52	60
		700V	A	-	-	-	46	57
		800V	A	-	-	-	40	55
		900V	A	-	-	-	36	53
		1000V	A	-	-	-	33	51
1 2 3 4 5 6 7 8	4 poles in series + 2 poles parallel A4+2	350V	A	29	45	58	80	85
		500V	A	29	45	58	71	85
		600V	A	29	45	50	65	82
		700V	A	-	-	-	58	76
		800V	A	-	-	-	51	71
		900V	A	-	-	-	45	67
		1000V	A	-	-	-	42	64
AC-Rating	"General use"							
2 poles in series	1 2	600V	A	16	25	32	40	55
2 poles in series		277V	A	-	-	50	72	85
+ 2 poles parallel								
3 poles parallel	1 2 3 4	3x480V	A	-	-	32	-	-
Fuse size (RK5)	Industrial Control Switch							
5kA / 600V			A	40	60	80	-	-
5KA/1000V			A	-	-	-	160	160
Maximum cable cross sections (incl. jumper LSV-B1)								
solid or stranded			AWG	12 - 10	12 - 10	12 - 10	16 - 10	16 - 10
flexible			AWG	12 - 6	12 - 6	12 - 6	14 - 4	14 - 4
flexible (+ multicore cable end)			AWG	12 - 6	12 - 6	12 - 6		
Size of terminal screw				M4 Pz2	M4 Pz2	M4 Pz2	M5 Pz2	M5 Pz2
Tightening torque			lb.inch	9 - 16	9 - 16	9 - 16	22 - 25	22 - 25
Protection class of terminals [1]				IP20	IP20	IP20	IP20	IP20

1) Protection degree of the terminals with connected insulated conductor.

Approvals

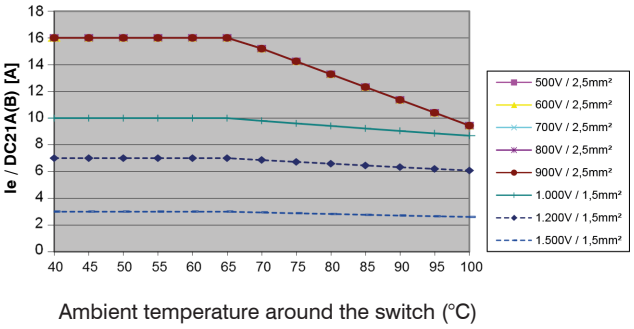
Country / Type	USA, UL508I	US, Canada UL508	Europe	TÜVRheinland	China CCC	CB-Zertifikate	EAC
LS16	o	o	/	o	o	o	o
LS25	o	o	/	o	o	o	o
LS32	o	o	/	o	o	o	o
LS40	o	o	/	-	-	o	o
LS55	o	o	/	-	-	o	o

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

Technical Datas

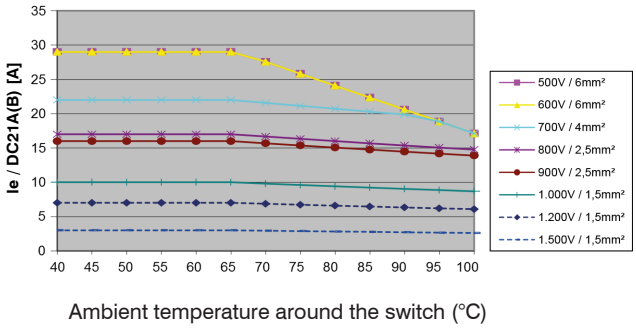
Maximum current according to ambient temperature and cable cross section

Switch open LS16.., 2 contacts in series (A2)



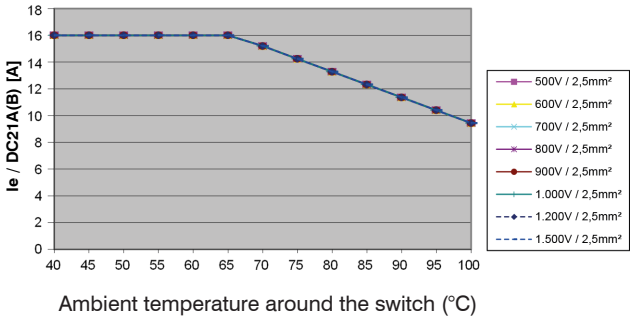
Ambient temperature around the switch (°C)

Switch open LS16 .., 2 contacts in series + 2 parallel (A2+2)



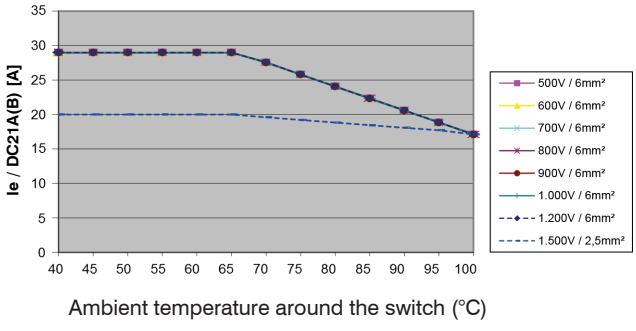
Ambient temperature around the switch (°C)

Switch open LS16.., 4 contacts in series (A4x)



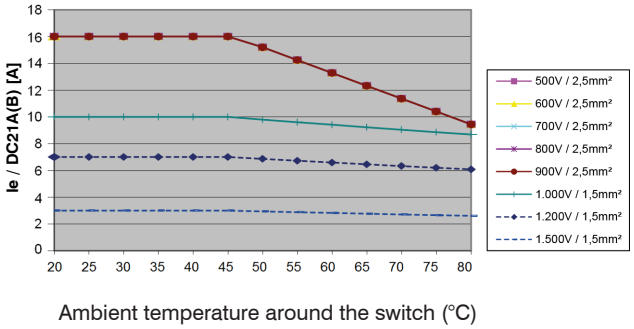
Ambient temperature around the switch (°C)

Switch open LS16 .., 4 contacts in series + 2 parallel (A4+2)



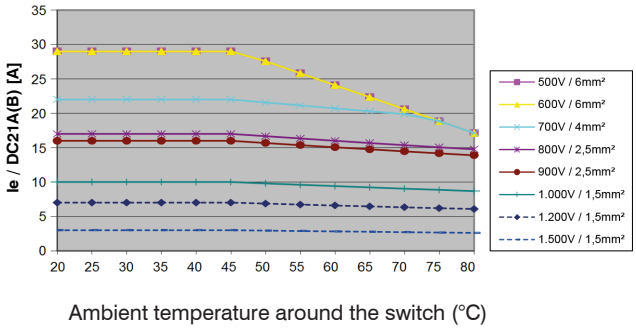
Ambient temperature around the switch (°C)

Switch enclosed LS16 PFL.., 2 contacts in series (A2)



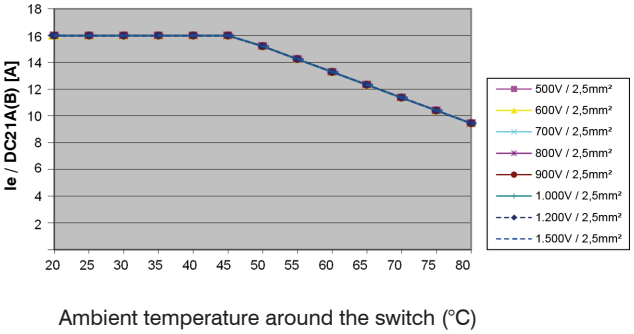
Ambient temperature around the switch (°C)

Switch enclosed LS16 PFL.., 2 contacts in series + 2 parallel (A2+2)



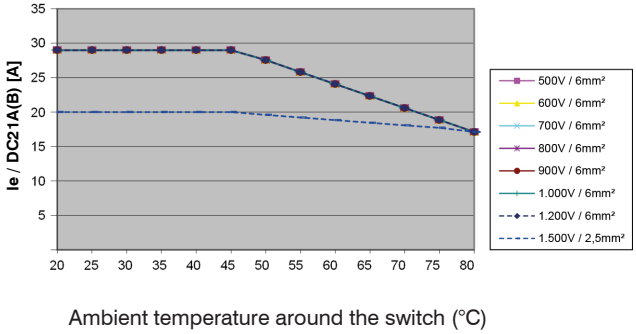
Ambient temperature around the switch (°C)

Switch enclosed LS16 PFL.., 4 contacts in series (A4x)



Ambient temperature around the switch (°C)

Switch enclosed LS16 PFL.., 4 contacts in series + 2 parallel (A4+2)

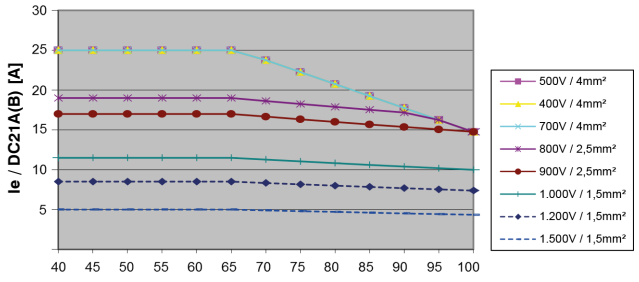


Ambient temperature around the switch (°C)

Technical Datas

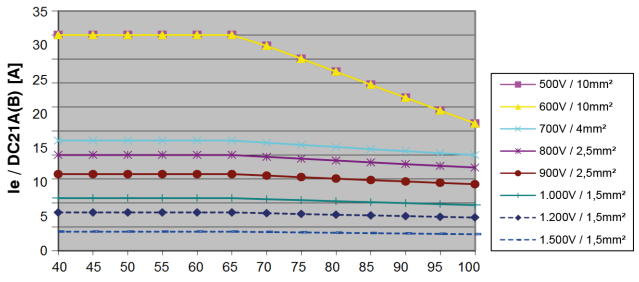
Maximum current according to ambient temperature and cable cross section

Switch open LS25.., 2 contacts in series (A2)



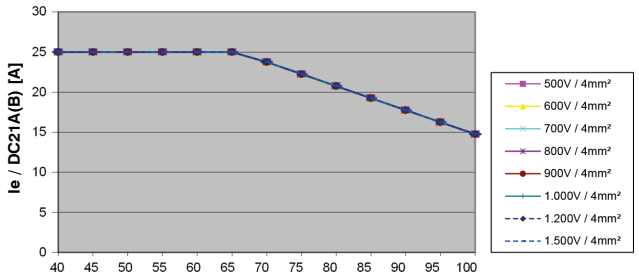
Ambient temperature around the switch (°C)

Switch open LS25 .., 2 contacts in series + 2 parallel (A2+2)



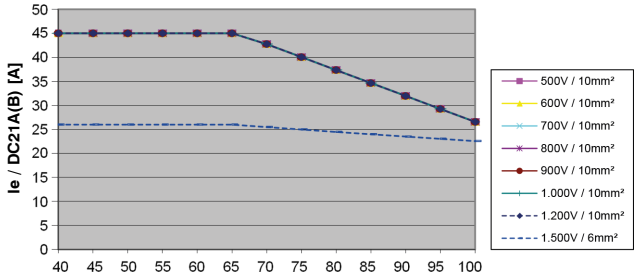
Ambient temperature around the switch (°C)

Switch open LS25.., 4 contacts in series (A4x)



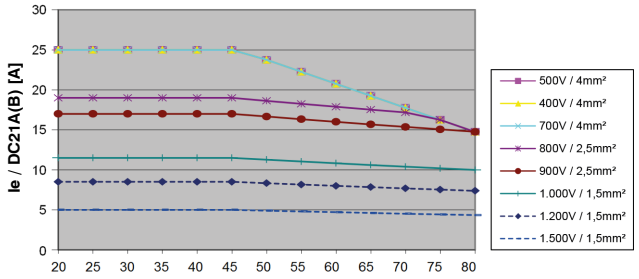
Ambient temperature around the switch (°C)

Switch open LS25 .., 4 contacts in series + 2 parallel (A4+2)



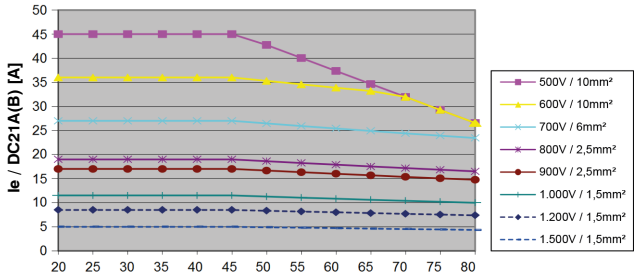
Ambient temperature around the switch (°C)

Switch enclosed LS25 PFL.., 2 contacts in series (A2)



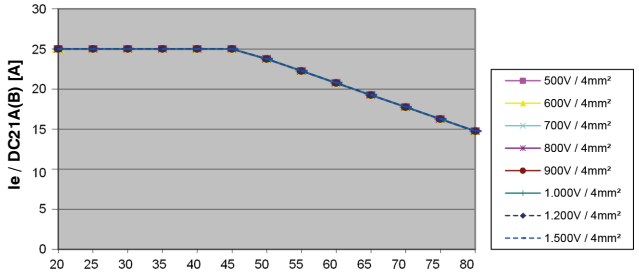
Ambient temperature around the switch (°C)

Switch enclosed LS25 PFL.., 2 contacts in series + 2 parallel (A2+2)



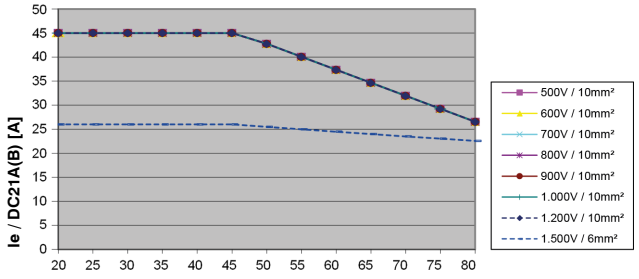
Ambient temperature around the switch (°C)

Switch enclosed LS25 PFL.., 4 contacts in series (A4x)



Ambient temperature around the switch (°C)

Switch enclosed LS25 PFL.., 4 contacts in series + 2 parallel (A4+2)

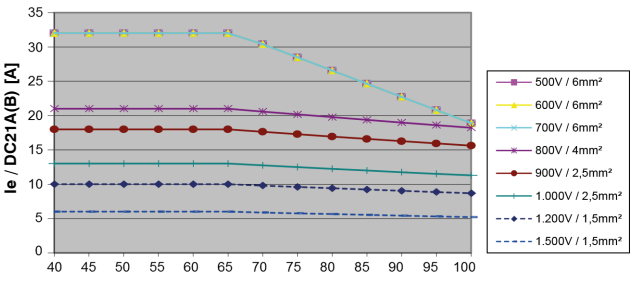


Ambient temperature around the switch (°C)

Technical Datas

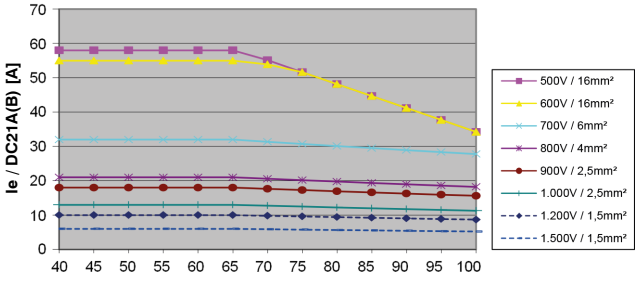
Maximum current according to ambient temperature and cable cross section

Switch open LS32.., 2 contacts in series (A2)



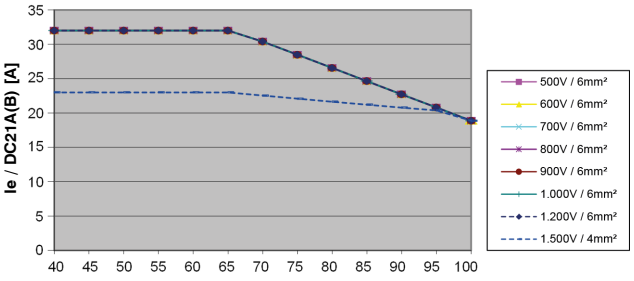
Ambient temperature around the switch (°C)

Switch open LS32 .., 2 contacts in series + 2 parallel (A2+2)



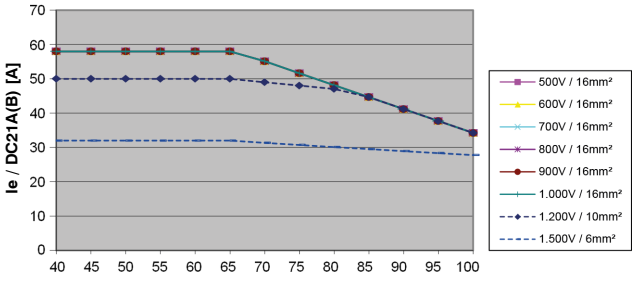
Ambient temperature around the switch (°C)

Switch open LS32.., 4 contacts in series (A4x)



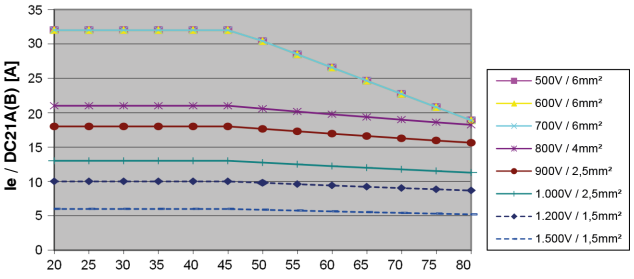
Ambient temperature around the switch (°C)

Switch open LS32 .., 4 contacts in series + 2 parallel (A4+2)



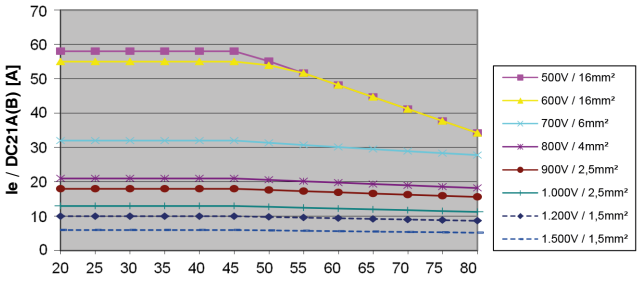
Ambient temperature around the switch (°C)

Switch enclosed LS32 PFL.., 2 contacts in series (A2)



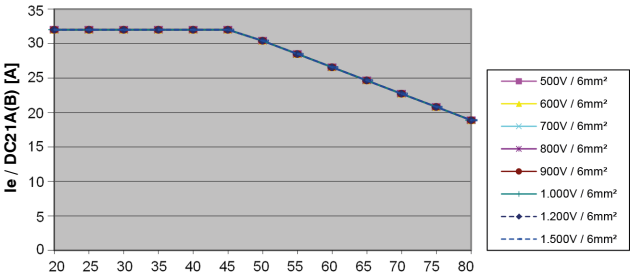
Ambient temperature around the enclosed switch (°C)

Switch enclosed LS32 PFL.., 2 contacts in series + 2 parallel (A2+2)



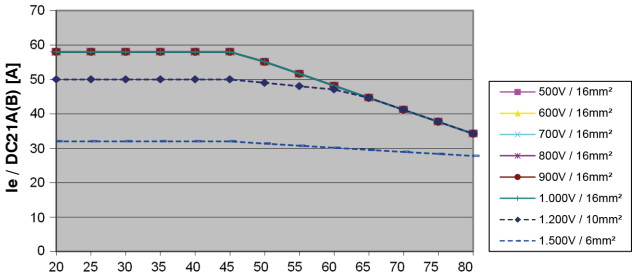
Ambient temperature around the enclosed switch (°C)

Switch enclosed LS32 PFL.., 4 contacts in series (A4x)



Ambient temperature around the enclosed switch (°C)

Switch enclosed LS32 PFL.., 4 contacts in series + 2 parallel (A4+2)

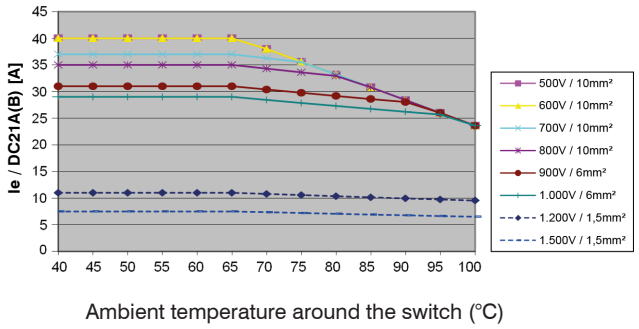


Ambient temperature around the enclosed switch (°C)

Technical Datas

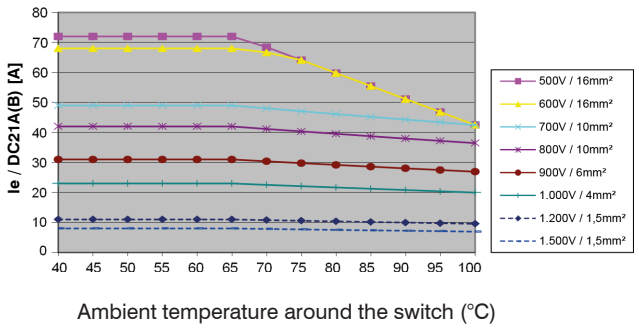
Maximum current according to ambient temperature and cable cross section

Switch open LS40.., 2 contacts in series (A2)



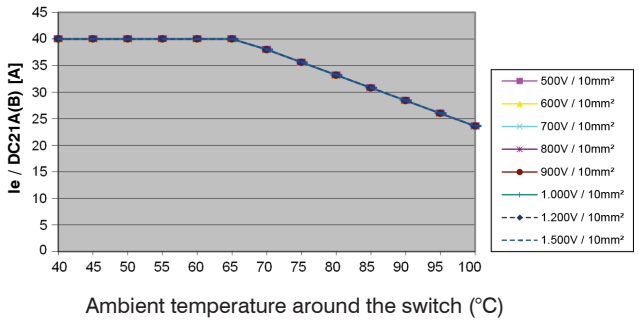
Ambient temperature around the switch (°C)

Switch open LS40 .., 2 contacts in series + 2 parallel (A2+2)



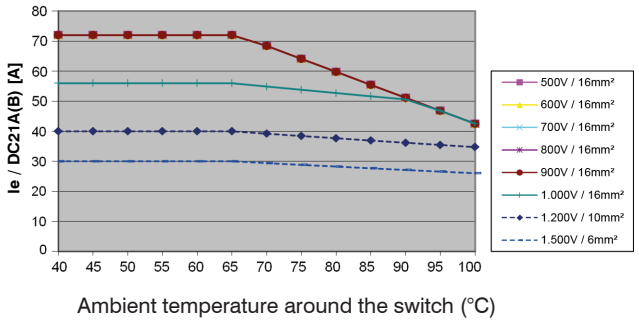
Ambient temperature around the switch (°C)

Switch open LS40.., 4 contacts in series (A4x)



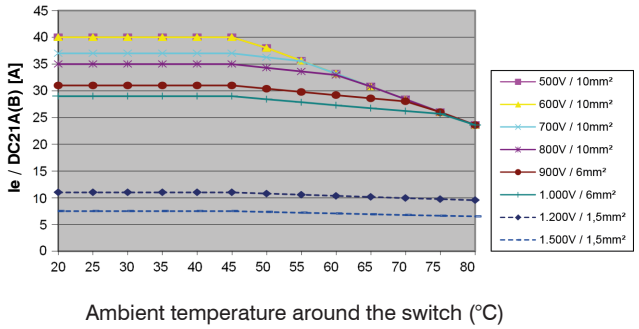
Ambient temperature around the switch (°C)

Switch open LS40.., 4 contacts in series + 2 parallel (A4+2)



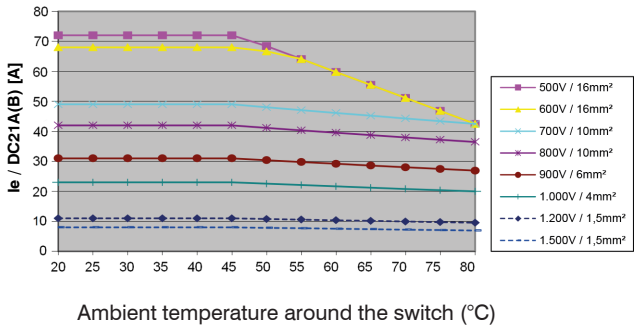
Ambient temperature around the switch (°C)

Switch enclosed LS40.., 2 contacts in series (A2)



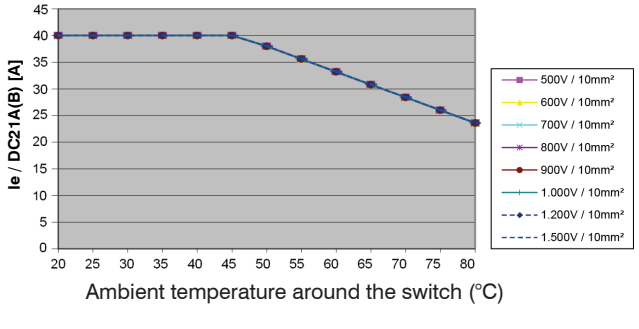
Ambient temperature around the switch (°C)

Switch enclosed LS40.., 2 contacts in series + 2 parallel (A2+2)



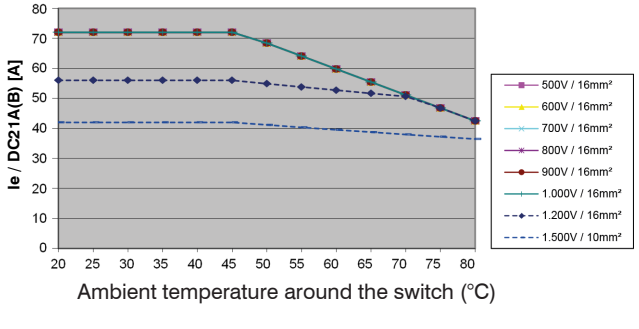
Ambient temperature around the switch (°C)

Switch enclosed LS40PFL.., 4 contacts in series (A4x)



Ambient temperature around the switch (°C)

Switch enclosed LS40PFL.., 4 contacts in series + 2parallel (A4+2)

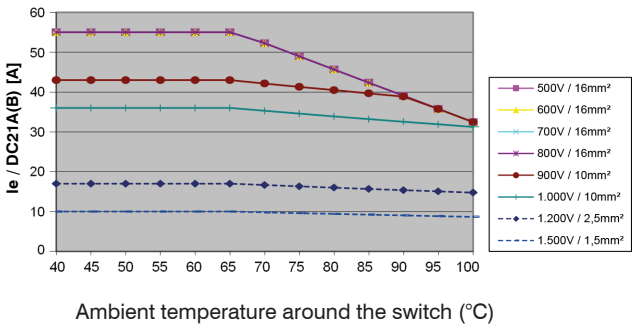


Ambient temperature around the switch (°C)

Technical Datas

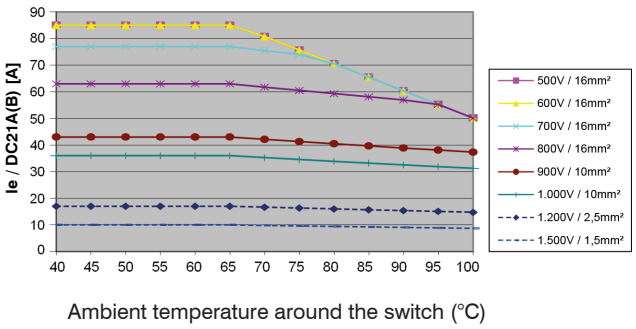
Maximum current according to ambient temperature and cable cross section

Switch open LS55.., 2 contacts in series (A2)



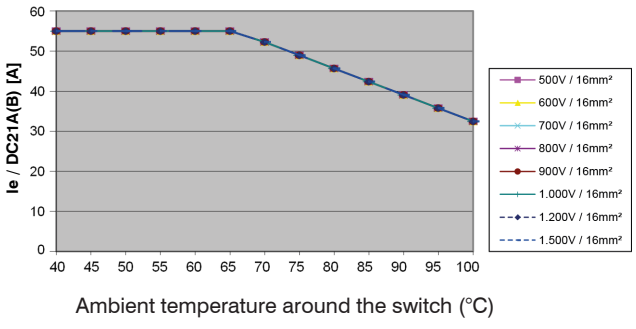
Ambient temperature around the switch (°C)

Switch open LS55.., 2 contacts in series + 2 parallel (A2+2)



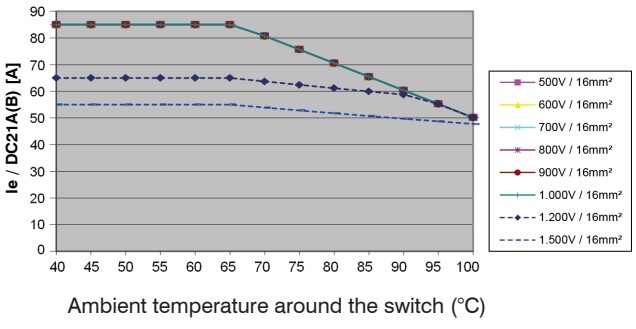
Ambient temperature around the switch (°C)

Switch open LS55.., 4 contacts in series (A4x)



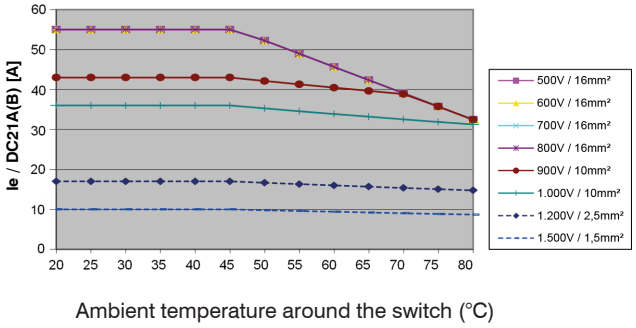
Ambient temperature around the switch (°C)

Switch open LS55.., 4 contacts in series + 2 parallel (A4+2)



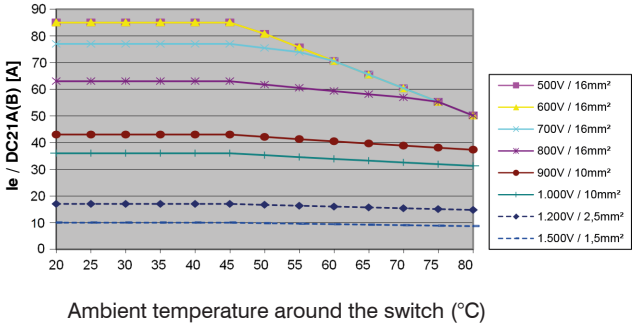
Ambient temperature around the switch (°C)

Switch enclosed LS55.., 2 contacts in series (A2)



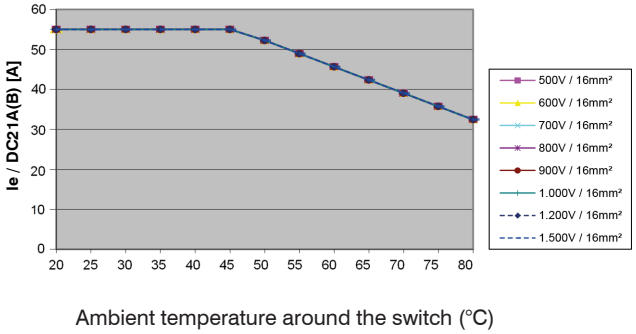
Ambient temperature around the switch (°C)

Switch enclosed LS55.., 2 contacts in series + 2 parallel (A2+2)



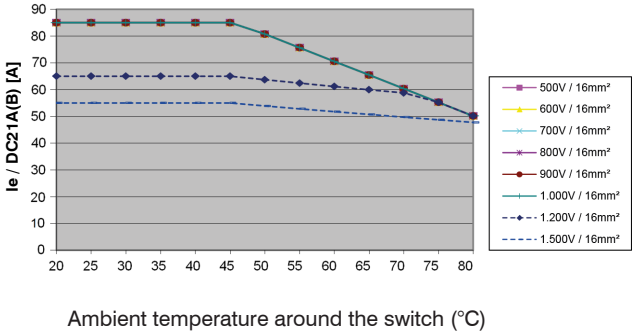
Ambient temperature around the switch (°C)

Switch enclosed LS55PFL.., 4 contacts in series (A4x)



Ambient temperature around the switch (°C)

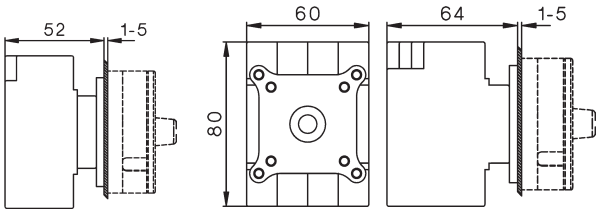
Switch enclosed LS55PFL.., 4 contacts in series + 2parallel (A4+2)



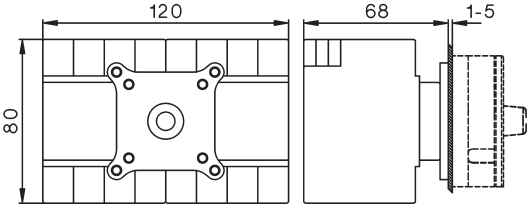
Ambient temperature around the switch (°C)

Dimensions

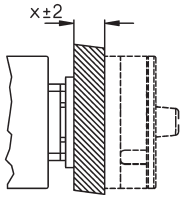
LS16 E.., LS25 E.., LS32 E..,
..A2 **..A2+2, ..A4.**



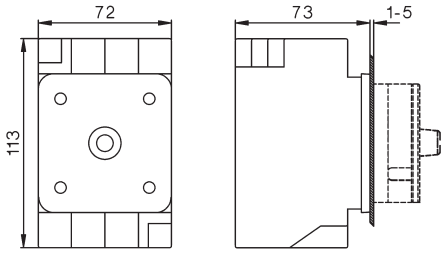
LS16 E.., LS25 E.., LS32 E..,
..A6, ..A8, ..A3+2, ..A4+2



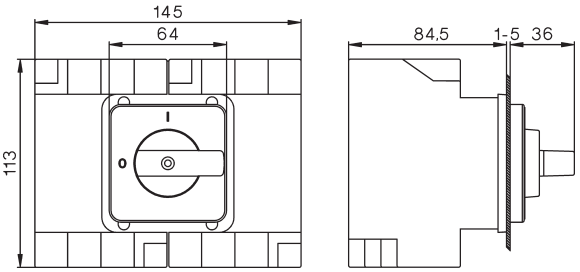
LS... +VW"x"
Extended Switch Shaft



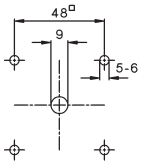
LS40 E.., LS55 E..
..A2, ..A2+2, ..A4.



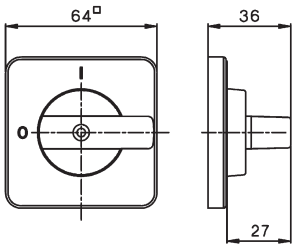
LS40 E.., LS55 E..
..A6, ..A8, ..A3+2, ..A4+2



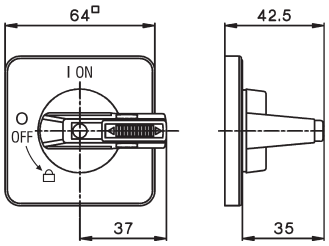
Mounting hole



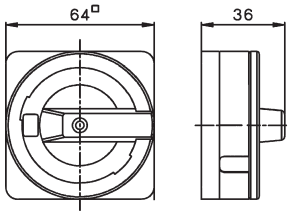
Escutcheon plate 64
Handle



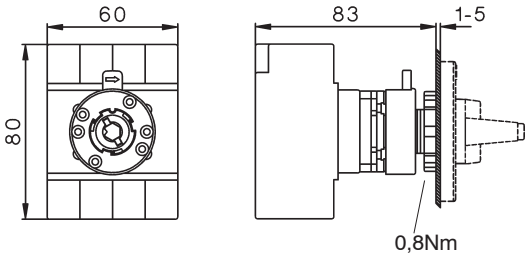
Padlock device SV1.



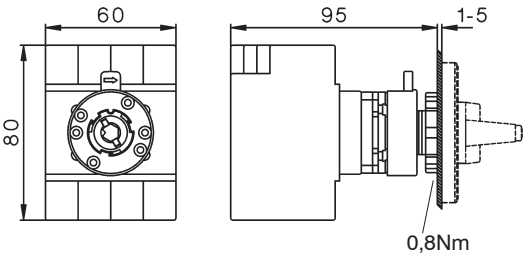
Padlock device SV4.



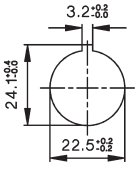
LS16 Z.., LS25 Z.., LS32 Z..,
..A2



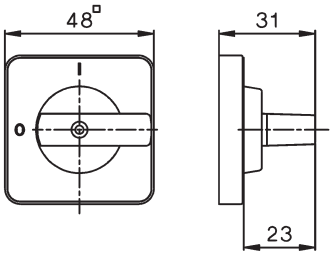
..A2+2, ..A4.



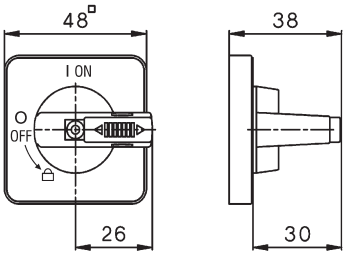
Mounting hole



Escutcheon plate 48
Handle

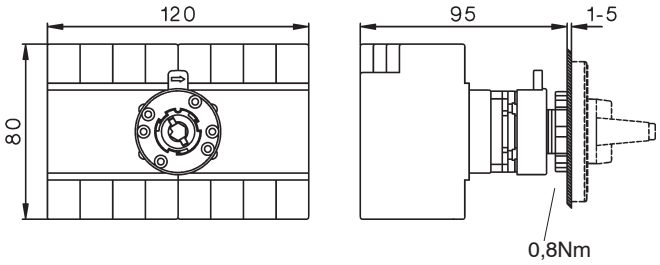


Padlock device SV1.

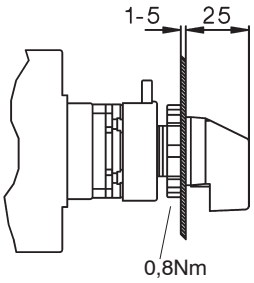


Dimensions

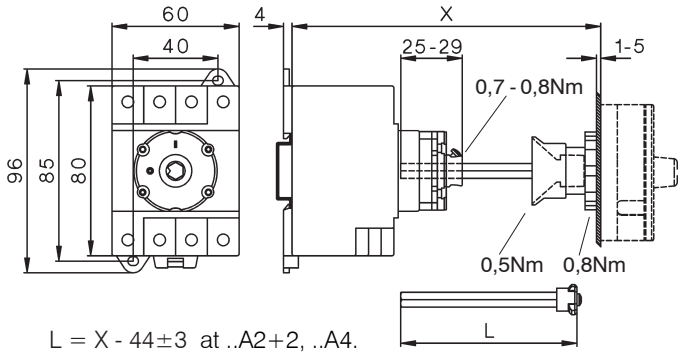
LS16 Z.., LS25 Z.., LS32 Z..,
..A6, ..A8, ..A3+2, ..A4+2



LS.. ZO..



LS16 VZV.., LS25 VZV.., LS32 VZV..,
..A2, ..A2+2, ..A4



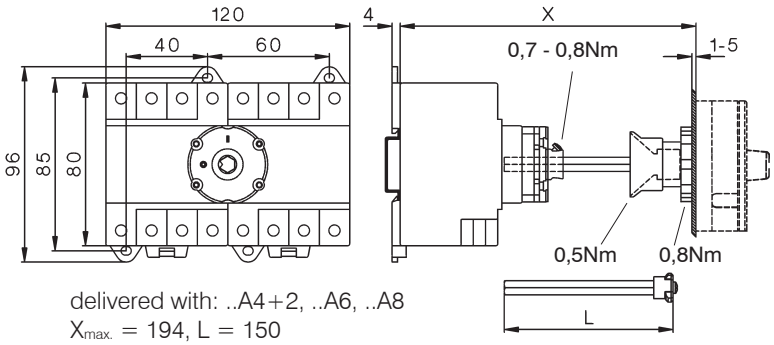
L = X - 44±3 at ..A2+2, ..A4.
L = X - 32±3 at ..A2

delivered with: ..A2+2, ..A4.
$X_{max.}$ = 194, L = 150
($X_{min.}$ = 89)

delivered with: ..A2
$X_{max.}$ = 182, L = 150
($X_{min.}$ = 77)

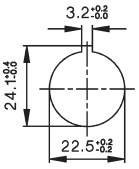
Bigger X-Dimensions on request

LS16 VZV.., LS25 VZV.., LS32 VZV..,
..A6, ..A8, ..A3+2, ..A4+2



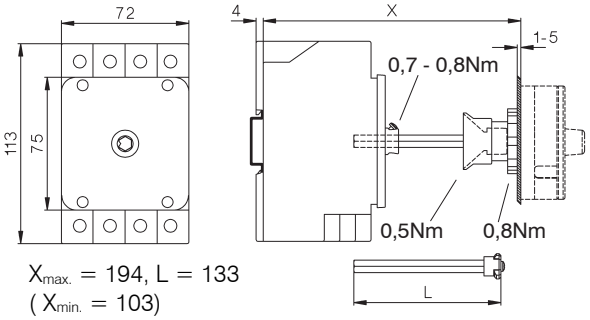
delivered with: ..A4+2, ..A6, ..A8
$X_{max.}$ = 194, L = 150
($X_{min.}$ = 95)

Mounting hole



L = X - 49±3

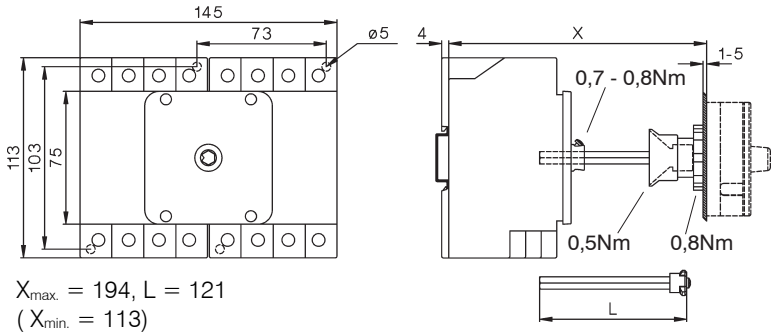
LS40 VZV.., LS55 VZV..
..A2, ..A2+2, ..A4.



$X_{max.}$ = 194, L = 133
($X_{min.}$ = 103)

L = X - 61± 3

LS40 VZV.., LS55 VZV..
..A6, ..A8, ..A3+2, ..A4+2

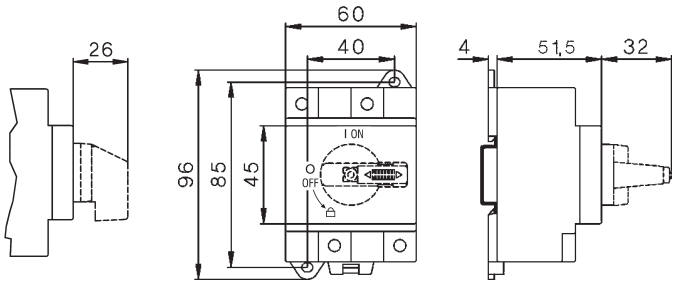


$X_{max.}$ = 194, L = 121
($X_{min.}$ = 113)

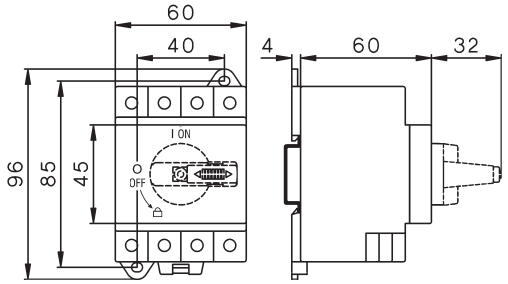
L = X - 73± 3

Dimensions

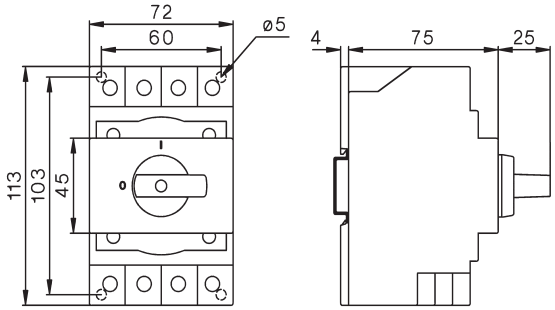
LS16 SMA.., LS25 SMA.., LS32 SMA..,
..A2



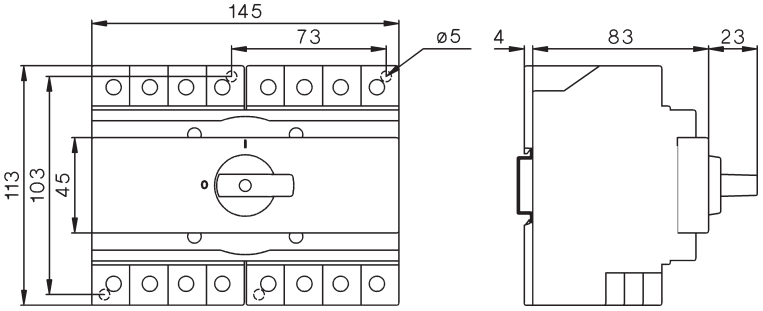
..A2+2, ..A4.



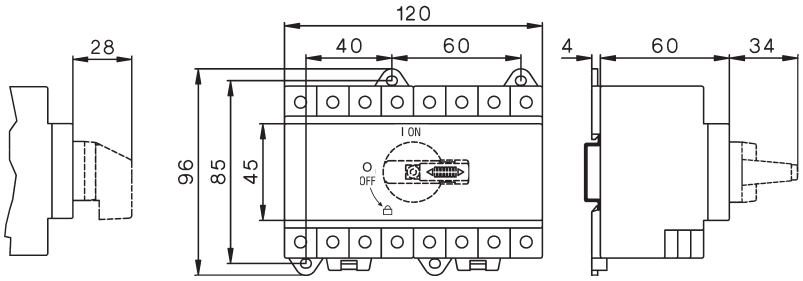
LS40 SMA.., LS55 SMA..
..A2, ..A2+2, ..A4.



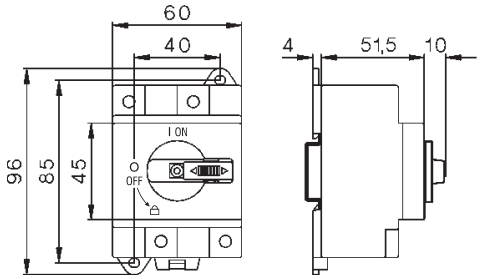
LS40 SMA.., LS55 SMA..
..A6, ..A8, ..A3+2, ..A4+2



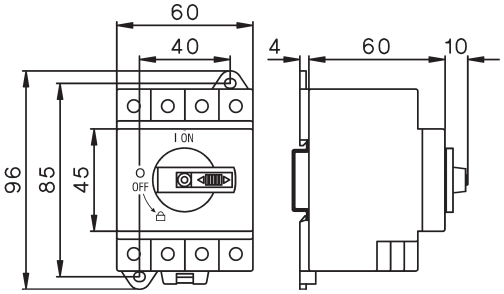
LS16 SMA.., LS25 SMA.., LS32 SMA..,
..A6, ..A8, ..A3+2, ..A4+2



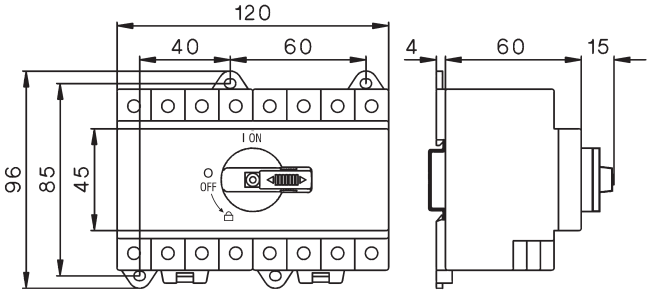
LS.. SMAH1.. with low height handle
A2+SV1N



LS16 SMAH1.., LS25 SMAH1, LS32 SMAH1 with low height handle
A2+2 +SV1N, A4.+SV1N



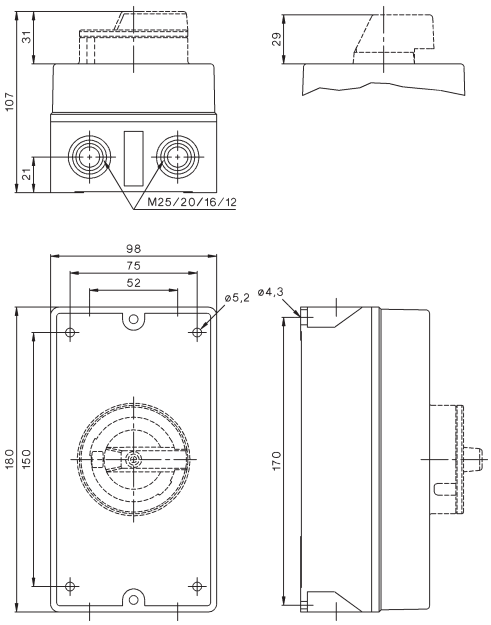
A4+2 +SV1N, A6+SV1N,A8+SV1N



Dimensions:

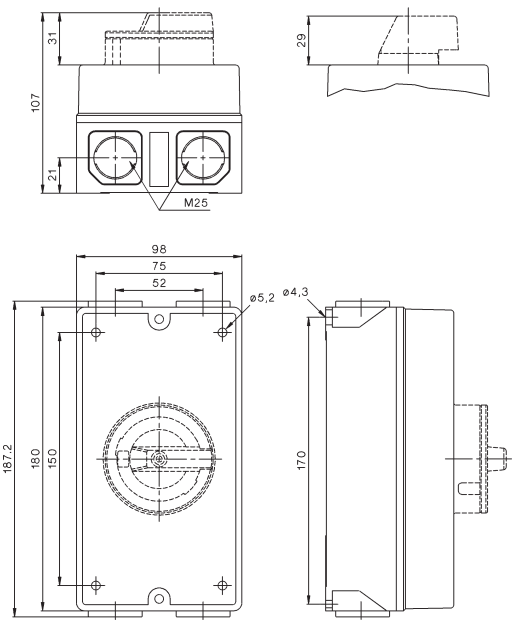
LS16 PFL.., LS25 PFL.., LS32 PFL..
..A2, ..A2+2, ..A4.

Main-Switch (lockable)
LS..PFLH4 A..

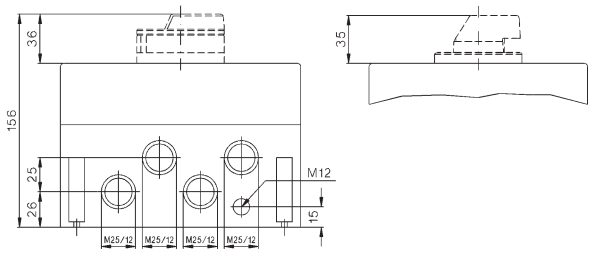


LS16 PFL.., LS25 PFL.., LS32 PFL..
..A2, ..A2+2, ..A4.
+ M25

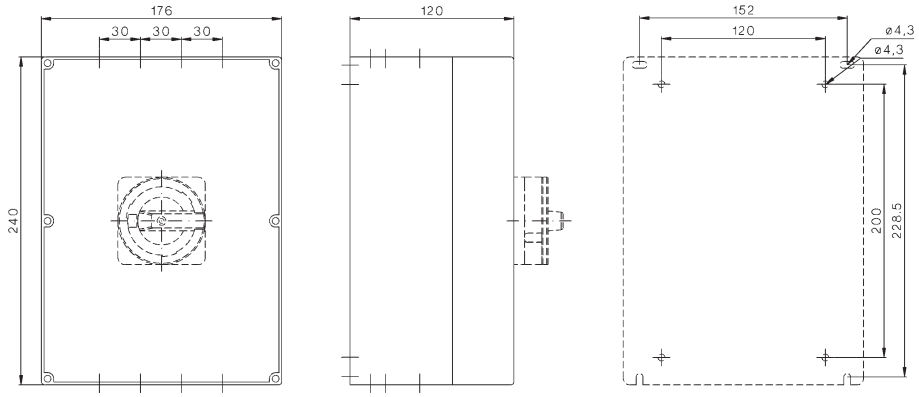
Main-Switch (lockable)
LS..PFLH4 A..



LS16 PFL.., LS25 PFL.., LS32 PFL..
..A6, ..A8, ..A3+2, ..A4+2
Main-Switch (lockable)
LS..PFLH4 A..



LS40 PFL.., LS55 PFL..
..A2, ..A4, ..A6, ..A8, ..A2+2, ..A3+2, ..A4+2



Ø 22,5mm

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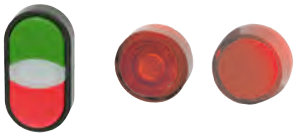
Illuminated Rotary Knobs and Swing Knobs 327
Illuminated Push Buttons 328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Contact Blocks and Lamp Holders 332

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Accessories 333
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Ø 30,5mm

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Acuators and Lens Caps 22mm IP67 (IP65), cULus Type12

Push Buttons

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IP65

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EMERGENCY STOP Buttons

→ page 332

Illuminated Operators

→ page 327, 328

Double Push Buttons with Indicator Lamp, IP65

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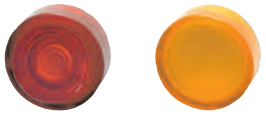
Lens Caps



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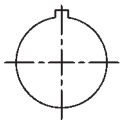
Mounting hole Ø 22,5mm

with key way



without key way

→ page 332

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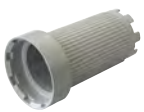
Wrech for Actuators Lens Caps and Mono Block Multi Chip LED J7049



Connectors

Thikness **0,5 - 4 mm**

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or

Thikness **1 - 6 mm**

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Contacts Lamp Holders

Actuator insert

→ page 332

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LED 24-230V

Filament 6-130V

Glow-discharge 230V

→ page 333

Mono Block Multi Chip LED IP65, IEC 60947, EN 60947

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Actuators 22mm IP67, cULus Type12

Ring

Colour	Symbol	Alu	Black	Chrome	Pack pcs.	Weight kg/pc.
Push Buttons, Actuator Caps markable see page 331						
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 333						
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
yelow		B3P1 GE	BS3P1 GE	BC3P1 GE	10	0,017
blue		B3P1 BL	BS3P1 BL	BC3P1 BL	10	0,017
black		B3P1 SW	BS3P1 SW	BC3P1 SW	10	0,017
Mushroom Head Ø40mm						
red	0	B3P14 RT-0	BS3P14 RT-0	BC3P14 RT-0	10	0,020
Mushroom Head Ø40mm						
red		BS3P44T RT	BS3P44T RT	BS3P44T RT	10	0,028
Foot and Palm switch Ø70mm						
red		BS3P14P RT	BS3P14P RT	BS3P14P RT	1	0,062
grey		BS3P14P GR	BS3P14P GR	BS3P14P GR	1	0,062

Actuators 22mm IP67, cULusType12

Ring	Colour	Symbol/ high	Alu	Black	Chrome	Pack pcs.	Weight kg/pc

EMERGENCY STOP Push Buttons, according to EN418, 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 EN418, release by key, Ø40mm

red	38mm	BS3P44S3	BS3P44S3	BS3P44S3	1	0,050
Spare Key	lock Ronis R455			B4-R455	1	0,007

EMERGENCY STOP Push Buttons, release by turning, Ø28mm

red		B3P3 RT	BS3P3 RT	BC3P3 RT	10	0,017
red	0	B3P3 RT-0	BS3P3 RT-0	BC3P3 RT-0	10	0,017

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-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 manupulation, Thickness 1mm

for Push Buttons Ø28mm and Ø40mm	yellow	B3-SK GE	1	0,04

1) Not for enclosure BG..

Actuators 22mm cULusType12

Ring	Knob	Alu	Black	Chrome	Pack pcs.	Weight kg/pc.

Rotary Knobs and Swing Knobs, black IP65

Rotary

Swing

maintained 60°						
	Rotary	B3KN2	BS3KN2	BC3KN2	10	0,020
	Swing	B3KRN2	BS3KRN2	BC3KRN2	10	0,020
spring return 60°						
	Rotary	B3KN8	BS3KN8	BC3KN8	10	0,020
	Swing	B3KRN8	BS3KRN8	BC3KRN8	10	0,020
spring return 60°						
	Rotary	B3KN1	BS3KN1	BC3KN1	10	0,020
	Swing	B3KRN1	BS3KRN1	BC3KRN1	10	0,020
maintained 60°						
	Rotary	B3KN3	BS3KN3	BC3KN3	10	0,020
	Swing	B3KRN3	BS3KRN3	BC3KRN3	10	0,020
maintained/spring return 60°						
	Rotary	B3KN6	BS3KN6	BC3KN6	10	0,020
spring return/maintained 60°						
	Rotary	B3KN7	BS3KN7	BC3KN7	10	0,020
maintained 120°						
	Rotary	B3KN9	BS3KN9	BC3KN9	10	0,020
maintained 90° according to EN81						
	Rotary	B3KN10	BS3KN10	BC3KN10	10	0,020
maintained 90°						
	Rotary	B3KN11	BS3KN11	BC3KN11	10	0,020

Illuminated Rotary Knobs and Swing Knobs, clear IP67, lamp max. 1,2W, lamps see page 333

Rotary

Swing

maintained 90°						
	Rotary	B3KL2	BS3KL2	BC3KL2	10	0,016
spring return 60°						
	Rotary	B3KL1	BS3KL1	BC3KL1	10	0,016
	Swing	B3KRL1	BS3KRL1	BC3KRL1	10	0,016
maintained 60°						
	Rotary	B3KL3	BS3KL3	BC3KL3	10	0,016
	Swing	B3KRL3	BS3KRL3	BC3KRL3	10	0,016
maintained/spring return 60°						
	Rotary	B3KL6	BS3KL6	BC3KL6	10	0,016

Toggle IP65

O - I	B3E	BS3E	BC3E	10	0,017

Actuators 22mm IP65, Type12

Ring

Key removeable in	Alu	Black	Chrome	Pack pcs.	Weight kg/pc.

Key Operated Rotary Switches with lock Ronis 455

B3SAR 0

maintained 60°					
	B3SAR 0	BS3SAR 0	BC3SAR 0	1	0,044
	B3SAR 1	BS3SAR 1	BC3SAR 1	1	0,044
	B3SAR 01	BS3SAR 01	BC3SAR 01	1	0,044
spring return 60°					
	B3SAT 0	BS3SAT 0	BC3SAT 0	1	0,044
maintained 60°					
	B3SARR 0	BS3SARR 0	BC3SARR 0	1	0,044
	B3SARR 102	BS3SARR 102	BC3SARR 102	1	0,044
spring return/maintained 60°					
	B3SATR 02	BS3SATR 02	BC3SATR 02	1	0,044
spring return 60°					
	B3SATT 0	BS3SATT 0	BC3SATT 0	1	0,044
Spare Key lock Ronis R455			B4-R455	1	0,007

B3SARR 0

Colour	Symbol				pcs.	kg/pc.

Illuminated Push Buttons IP67, lamp max. 1,9W, lamps see page 333

red	B3DL RT	BS3DL RT	BC3DL RT	10	0,014
green	B3DL GN	BS3DL GN	BC3DL GN	10	0,014
yellow	B3DL GE	BS3DL GE	BC3DL GE	10	0,014
blue	B3DL BL	BS3DL BL	BC3DL BL	10	0,014
white	B3DL WS	BS3DL WS	BC3DL WS	10	0,014

Illuminated Push Buttons, Maintained IP67, lamp max. 1,9W, lamps see page 333

red	B3DLR RT	BS3DLR RT	BC3DLR RT	10	0,014
green	B3DLR GN	BS3DLR GN	BC3DLR GN	10	0,014
yellow	B3DLR GE	BS3DLR GE	BC3DLR GE	10	0,014
blue	B3DLR BL	BS3DLR BL	BC3DLR BL	10	0,014
white	B3DLR WS	BS3DLR WS	BC3DLR WS	10	0,014

Double Push Buttons, with indicator lamp white, lamp max. 1,9W, lamps see page 333

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

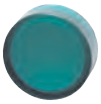
Lens Caps IP67 with fresnel lens, lamp max. 1,9W, lamps see page 333, laser marking on request

Colour	Type	Pack pcs.	Weight kg/pc.
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 333, laser marking on request

Colour	Type	Pack pcs.	Weight kg/pc.
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 333, laser marking on request



Colour	Type	Pack pcs.	Weight kg/pc.
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

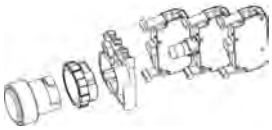
Monoblock LEDs IP65, IEC 60947, EN 60947 (6 years middle lifetime)

Colour	Voltage	Power VA	W	Type	Pack pcs.	Weight kg/pc
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

Push Button 22mm-Sets, with Contact Block and Connector

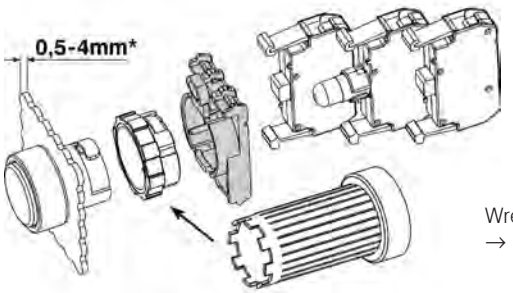
	Aktuator Farbe	Symbol	with	Type	Pack pcs.	Weight kg/pc.
Push Buttons, IP67						
	black		+connector +1NO	**BS3D SW/10**	1	0,037
	green		+connector +1NO	**BS3D GN/10**	1	
	yellow		+connector +1NO	**BS3D GE/10**	1	0,037
	blue		+connector +1NO	**BS3D BL/10**	1	0,037
	red		+connector +1NC	**BS3D RT/01**	1	
	green		+connector +1NO	**BS3D GN-I/10**	1	0,037
	red		+connector +1NC	**BS3D RT-0/01**	1	0,037
Double Push Buttons, IP65						
	green/ red		+connector +1NO +1NC	**BS3DT G/R/11**	1	0,049
EMERGENCY STOP Push Buttons, IP67 Ø40mm						
	pull to release acc. EN418		+connector +1NO +1NC	BS3P44 RT/11	1	0,061
	key release acc. EN418		+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

Aktuator colour	with	LED	Type	Pack pcs.	Weight kg/pc.
Illuminated Push Buttons, IP67					
white	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL WS/11/L24	1	0,054
green	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL GN/11/L24	1	0,054
red	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL RT/11/L24	1	0,054
yellow	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL GE/11/L24	1	0,054
blue	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DL BL/11/L24	1	0,054
					
white	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL WS/11/L110	1	0,054
green	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL GN/11/L110	1	0,054
red	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL RT/11/L110	1	0,054
yellow	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL GE/11/L110	1	0,054
blue	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DL BL/11/L110	1	0,054
white	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL WS/11/L230	1	0,054
green	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL GN/11/L230	1	0,054
red	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL RT/11/L230	1	0,054
yellow	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL GE/11/L230	1	0,054
blue	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DL BL/11/L230	1	0,054
Double Push Buttons with Pilot Light, IP65					
green/ red	+connector +1NO +1NC +LED	20-30V AC/DC	BS3DT G/R/11/L24	1	0,066
green/ red	+connector +1NO +1NC +LED	90-120V AC/DC	BS3DT G/R/11/L110	1	0,066
green/ red	+connector +1NO +1NC +LED	200-250V AC/DC	BS3DT G/R/11/L230	1	0,066
Pilot Lights, IP67 with socket BA9S (without lamp)					
white	+connector +socket BA9S	-	B3R WS/0	1	0,037
green	+connector +socket BA9S	-	B3R GN/0	1	0,037
red	+connector +socket BA9S	-	B3R RT/0	1	0,037
yellow	+connector +socket BA9S	-	B3R GE/0	1	0,037
Pilot Lights with LEDs, IP67					
white	+connector +socket BA9S	20-30V AC/DC	B3R WS/L24	1	0,042
green	+connector +socket BA9S	20-30V AC/DC	B3R GN/L24	1	0,042
red	+connector +socket BA9S	20-30V AC/DC	B3R RT/L24	1	0,042
yellow	+connector +socket BA9S	20-30V AC/DC	B3R GE/L24	1	0,042
white	+connector +socket BA9S	90-120V AC/DC	B3R WS/L110	1	0,042
green	+connector +socket BA9S	90-120V AC/DC	B3R GN/L110	1	0,042
red	+connector +socket BA9S	90-120V AC/DC	B3R RT/L110	1	0,042
yellow	+connector +socket BA9S	90-120V AC/DC	B3R GE/L110	1	0,042
white	+connector +socket BA9S	200-250V AC/DC	B3R WS/L230	1	0,042
green	+connector +socket BA9S	200-250V AC/DC	B3R GN/L230	1	0,042
red	+connector +socket BA9S	200-250V AC/DC	B3R RT/L230	1	0,042
yellow	+connector +socket BA9S	200-250V AC/DC	B3R GE/L230	1	0,042

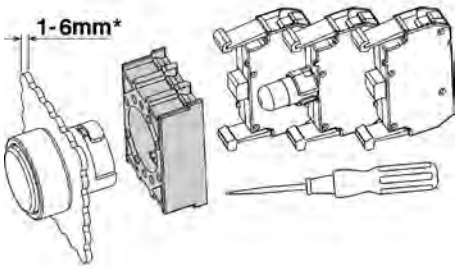
Connectors

Specification	Description	Type	Pack pcs.	Weight kg/pc.
Connector B3S		B3S	10	0,013



Wrench
→ page 331

Connector B3M		B3M	10	0,013



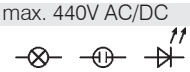
*) inclusive Thikness from Label Holder and Yellow Disk

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



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

LED lamps [2] (6 years middle lifetime, for equivalent lens caps only)

Socket BA9s Lamp voltage	Power consumption		Type	Pack pcs.	Weight kg/pc.
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

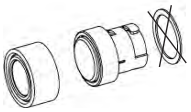
Filament lamps

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
110/120V 1)	1,5/1,8W	for all lens caps	B4-G130	100	0,005

Glow-discharge lamps

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		B4-R455	1	0,007
	for B(S)3SB.., Ronis R786		B4-R786	1	0,007
Hole Plug	black, for fixing holes		**B3-DU SW**	10	0,007
	grey	Ø22,5mm	**B3-DU GR**	10	0,007
Sealing Cover protection against coarse contamination	for single and double push buttons, except B3D..R..(maintained) petrol-resistant, ambient temp. 0°…+50°C		**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 manupulation				
	Thickness 1mm	yellow	B3-SK GE	1	0,04
	Thickness 1mm	grey	B3-SK GR	1	0,04
Protection ring with thread	against unintentional manupulation 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 lamp holders

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 Marking

Code for colours

Colour	for buttons B3D(R) BS3D(R) BC3D(R)	B5D(R) BS5D(R) BC5D(R)	for illuminated buttons B3DL(R) BS3DL(R) BC3DL(R)	B5DL(R) BS5DL(R) BC5DL(R)
rot	DK RT-..		DKL RT-..	
grün	DK GN-..		DKL GN-..	
gelb	DK GE-..		DKL GE-..	
blau	DK BL-..		DKL BL-..	
weiß	DK WS-..		DKL WS-..	
schwarz	DK SW-..		-	

Actuator Caps with text, the Type must be completed with the code for colours

marking	Type -suffix for marking	marking	Type -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 DIN 30600, the Type must be completed with the code for colours

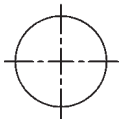
	...-100		...-101	10	0,001
	...-102		...-103	10	0,001
	...-200		...-201	10	0,001
	...-202		...-203	10	0,001
	...-204		...-205	10	0,001
	...-300		...-301	10	0,001
	...-302		...-303	10	0,001
	...-304		...-305	10	0,001
	...-306		...-307	10	0,001
	...-400		...-401	10	0,001
	...-402		...-403	10	0,001
	...-404		...-405	10	0,001
	...-406		...-407	10	0,001
	...-408		...-409	10	0,001
	...-410		...-411	10	0,001
	...-412		...-413	10	0,001

Acuators and Lens Caps 30mm IP67 (IP65)

Push Buttons

→ page 331

Mounting hole
Ø 30,5mm



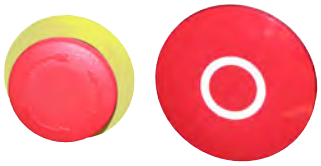
Connectors

Contacts
Lamp Holder

IP65

→ page 338
339

EMERGENCY STOP Buttons



→ page 337

→ page 337

Actuator insert
→ page 340

Illuminated Operators

→ page 339

→ page 341

Thikness
0,5 - 3 mm
→ page 340

→ page 340

Lens Caps

→ page 339

LED
24-230V

Filament
6-130V

Glow-discharge

230V

→ page 341

Wrench
J7049

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			10	0,032
red	0	B5P3 RT-0			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-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	B5KN2	BS5KN2	BC5KN2	10	0,035
	Swing	B5KRN2	BS5KRN2	BC5KRN2	10	0,035
spring return 60°						
	Rotary	B5KN8	BS5KN8	BC5KN8	10	0,035
	Swing	B5KRN8	BS5KRN8	BC5KRN8	10	0,035
spring return 60°						
	Rotary	B5KN1	BS5KN1	BC5KN1	10	0,035
	Swing	B5KRN1	BS5KRN1	BC5KRN1	10	0,035
spring return 60°						
	Rotary	B5KN3	BS5KN3	BC5KN3	10	0,035
	Swing	B5KRN3	BS5KRN3	BC5KRN3	10	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 341

Knebel

Rüssel

maintained 90°						
	Rotary	B5KL2	BS5KL2	BC5KL2	10	0,031
spring return 60°						
	Rotary	B5KL1	BS5KL1	BC5KL1	10	0,031
	Swing	B5KRL1	BS5KRL1	BC5KRL1	10	0,031
maintained 60°						
	Rotary	B5KL3	BS5KL3	BC5KL3	10	0,031
	Swing	B5KRL3	BS5KRL3	BC5KRL3	10	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				pcs.	kg/pc.

Illuminated Push Buttons IP67, lamp max. 1,9W, lamps see page 341

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 341

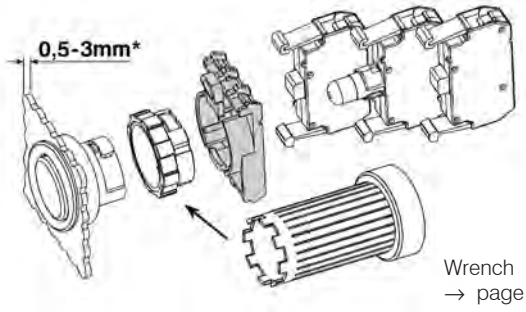
red	B5DLR RT	BS5DLR RT	BC5DLR RT	10	0,029
green	B5DLR GN	BS5DLR GN	BC5DLR GN	10	0,029
yellow	B5DLR GE	BS5DLR GE	BC5DLR GE	10	0,029
blue	B5DLR BL	BS5DLR BL	BC5DLR BL	10	0,029
white	B5DLR WS	BS5DLR WS	BC5DLR WS	10	0,029

Lens Caps with fresnel lens IP67, lamp max. 1,9W, lamps see page 341

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



Wrench
→ page 341

*) inclusive Thikness from Label Holder and Yellow Disk

Contact Blocks and Lamp Holders for Panel Mounting

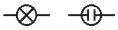
Contact blocks

for voltage	Description		Type	Pack pcs.	Weight kg/pc.
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

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] (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

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
110/120V [1]	1,5/1,8W	for all lens caps	**B4-G130**	100	0,005

Glow-discharge lamps

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

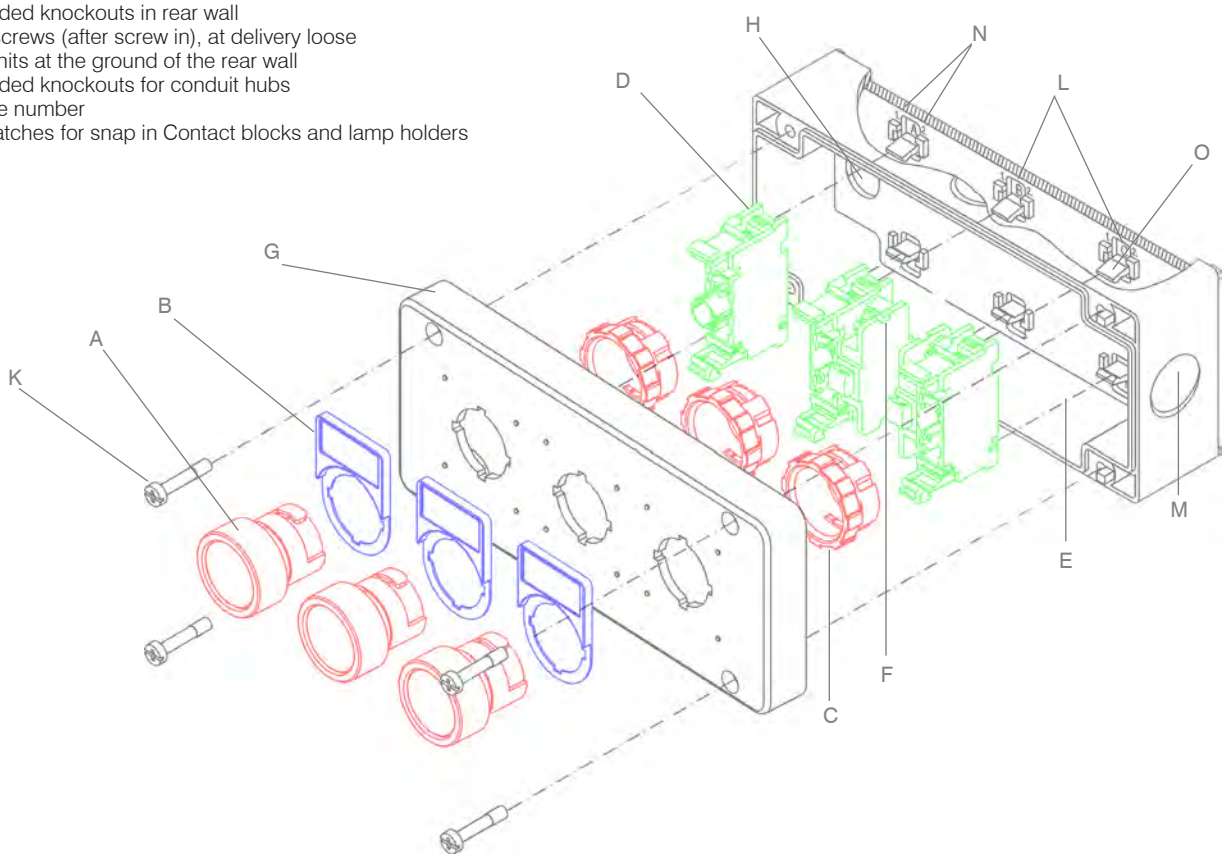
2) suitable for B3FT lamp test lamp holders

Accessories

		Type	Pack Stk.	Weight kg/Stk.
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	**B4-R455**	1	0,007
	for B(S)3SB.. , Ronis R786	**B4-R786**	1	0,007
Protectiv cover sealable	against unintentional manupulation of buttons B5, *(not for mushroom heads, rotary and swing knobs)*	**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)				
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)				
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

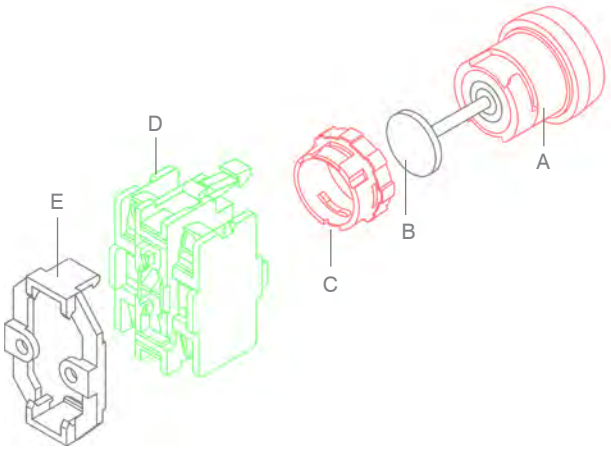
Assembled Stations BG.. IP67 cULus Type12

A Actuators or Lens caps, see page 325 – 328
B Legend plates with label holder
C Ring and nut (included with actuator or lens cap)
D Contact blocks and lamp holders, see page 344
E Rear shroud
F Function number
G Cover
H Pre-moulded knockouts in rear wall
K Captive screws (after screw in), at delivery loose
L Sign of units at the ground of the rear wall
M Pre-moulded knockouts for conduit hubs
N Sequence number
O Spring-catches for snap in Contact blocks and lamp holders



Buttons for base mounting

A Actuator Ø 22mm see page 325 – 328, Ø 30mm see page 337 – 339
B Extension B4V...
C Ring and nut (included with actuator or lens cap)
D Contact block B4.. see page 344
E Base B4U for base and DIN-rail mounting of contact blocks

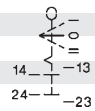
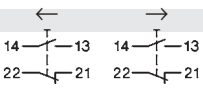
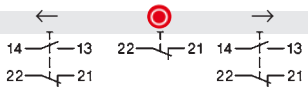
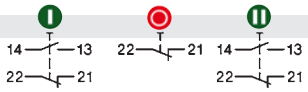
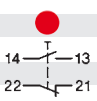


Mounting Plate for base and DIN-rail mounting of contact blocks

		Type	Pack pcs.	Weight kg/pc.
Mounting Plate	for base and DIN-rail mounting of contact blocks and lamp holders 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) Typ12

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		BG10 GN	1	0,135
	OFF push button red		BG10 RT	1	0,135
	Pilot light green Pilot light red		BG01 GN BG01 RT	1 1	0,135 0,135
	Key operated 0 - I [1] lock Ronis R455 60° maintained		BG10SAR 0	1	0,165
	Key operated I - 0 - II [1] lock Ronis R455 60° maintained		BG10SARR 0	1	0,172
	2 push buttons 0 - I		BG20	1	0,200
	2 push buttons ← →		BG20PF	1	0,200
	3 push buttons ← 0 →		BG30PF	1	0,283
	3 push buttons I - 0 - II		BG30	1	0,283
	2 push buttons 0 - I with pilot light green		BG21 GN	1	0,270
	Foot and palm button mushroom Ø70mm		BG10P14P GR	1	0,187
Plastic enclosed EMERGENCY STOP buttons				
	EMERGENCY STOP button head Ø40mm unlock by turning		BG10P34-11	1	0,145
	EMERGENCY STOP mushroom button Ø40mm according to EN418 unlock by pull		BG10P44-11	1	0,145
	EMERGENCY STOP key operated button Ø40mm according to EN418 unlock by key		BG10P44S3-11	1	0,178
	EMERGENCY STOP mushroom button Ø70mm unlock by turning		BG10P34P-11	1	0,187

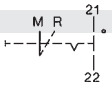
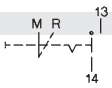
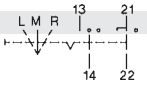
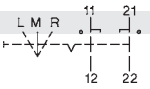
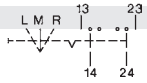
1) IP65

Enclosures BG.. IP67, cULus Type12

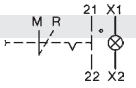
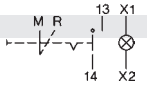
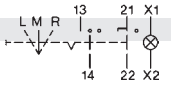
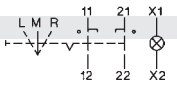
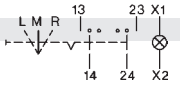
	Number of units	Description	Type	Pack pcs.	Weight kg/pc.
	1	3 knockouts Ø20,5mm (M20 or PG13,5)	BG1	1	0,108
	2	3 knockouts Ø20,5mm (M20 or PG13,5)	BG2	1	0,145
	3	3 knockouts Ø20,5mm (M20 or PG13,5)	BG3	1	0,188

Buttons and Lens Caps B3.. see page 325 -326

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 341

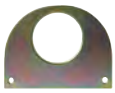
Contacts	Lamp voltage	Wiring diagram	actuators with 2 or 3 switch positions	Type	Pack pcs.	Weight kg/pc.
1NC [1] ⊖	max. 440V AC/DC			B4TU01F	10	0,020
1NO	max. 440V AC/DC			B4TU10F	10	0,020
1NO+1NC [1] ⊖	max. 440V AC/DC			B4TU11F	10	0,027
2NC [1] ⊖	max. 440V AC/DC			B4TU02F	10	0,027
2NO	max. 440V AC/DC			B4TU20F	10	0,027

Lamp holder, socket BA9s for LED or lamps, lamps see page 341

max. 440V AC/DC	direct connection, for lamps max. 1,9W (take care for active power consumption)		B4FU	10	0,013

1) ⊖ NC contact has a positive opening according to IEC/EN 60947-5-1

Accessories for Plastic enclosed buttons



		Type	Pack pcs.	Weight kg/pc.
Wrench and lens caps B(S)3..	for mounting of actuators	**J7049**	1	0,018
Couple Part stations BG..	to couple enclosures BKLG or assembled	**B4-8852**	1	0,018
Suspension Eye	for hanging stations	**B4-9929**	1	0,188
Handle and Cable Inlet	to change enclosures BG.. or assembled stations BG.. into a hanging station	**B4-9149**	1	0,064

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

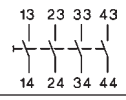
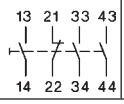
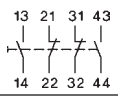
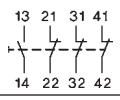
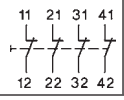
Specification	Colour	Symbol	Length mm	Type	Pack pcs.	Weight kg/pc.
Reset push button	blue	R	19,5-38,5	**B3GRB-31,5**	10	0,023
	blue	R	38,5-60	**B3GRB-60**	10	0,026
Reset push button with stop function	red	0/R	19,5-38,5	**B3GR-31,5**	10	0,023
	red	0/R	38,5-60	**B3GR-60**	10	0,026
Start push button	green	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

Extensions for push buttons

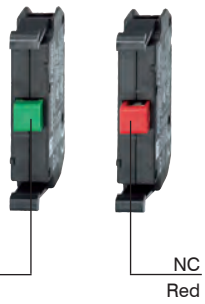
Specification	Diameter Ø mm	Length mm	Type	Pack pcs.	Weight kg/pc.
self adjusting pin, for B(S, C)3D.. and B(S, C)3P..	15	19,5 - 38,5	**B4V31,5**	10	0,001
	18,5	38,5 - 60	**B4V60**	10	0,004

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
10								01	
20		11						02	
30		21		12				03	
40		31		22		13		04	

Colour code



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 cosj = 0,7-1	40-60Hz	A	50	50
Mechanical life	millions of operations		10	10
Contact life (AC15)				
100VA	millions of operations		10	10
300VA	millions of operations		3	3
800VA	millions of operations		1	1
1200VA	millions of operations		0,5	0,5
Maximum frequency of operations	ops. per hour		600	600
Short circuit protection	slow, gL (gG)	A	25	25

Type		B3F	B4F
Rated insulation voltage U_i	V AC	440 [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 +50
Cable cross-section		
	solid, mm²	0,5 - 2,5
	flexible, mm²	0,5 - 2,5
	flexible with multicore cable end, mm²	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 Type	USA, Canada UL c UL us	Europe CE	Register of Shipping Great Britain LRS	CENELEC CB-Certificates
B3T..	o	o	-	o
B3F..	o	o	-	o
B4TU..	o	o	o	o
B4T..UF	o	o	o	o
B4FU..	o	o	o	o
B3-MB..	-	o	-	-

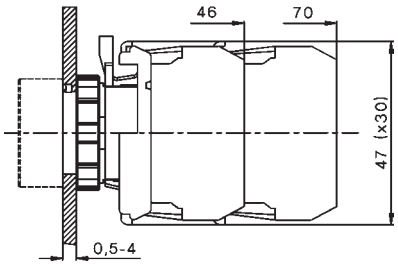
o In standard version approved - Not provided for test till now

1) suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U_{imp} = 6kV. Data for other conditions on request
2) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} = 4kV

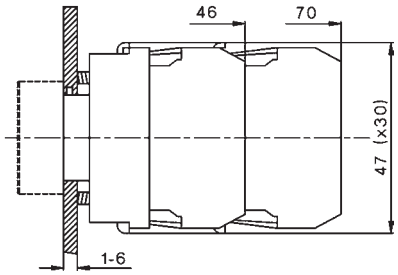
Dimensions

Actuators and Lens Caps 22mm

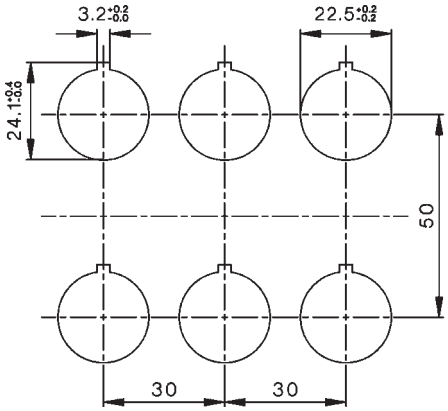
Panel mounting B3S



Panel mounting B3M

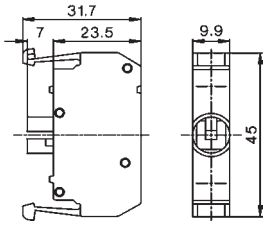


Mounting holes



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.

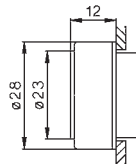
Contact blocks and Lampenhalter B3...



Actuators and Lens caps

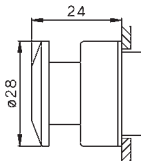
Flush Head
Illuminated Flush Head

B3D(R), B3DL(R)
BS3D(R), BS3DL(R)
BC3D(R), BC3DL(R)



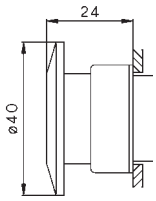
Mushroom Head Ø28mm
Emergency Stop Ø28mm

B3P1 bis B3P3
BS3P1 bis BS3P3
BC3P1 bis BC3P3



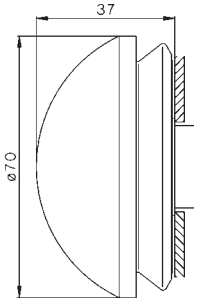
Mushroom Head Ø40mm
Emergency Stop Ø40mm

B3P14, B3P34
BS3P14, BS3P34
BC3P14, BC3P34



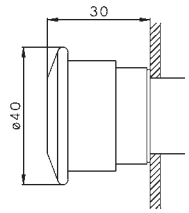
Mushroom Head Ø70mm
Emergency Stop Ø70mm

BS3P14P
BS3P34P



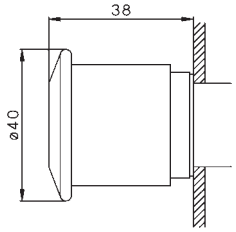
Push-and pull button Ø40mm

BS3P44



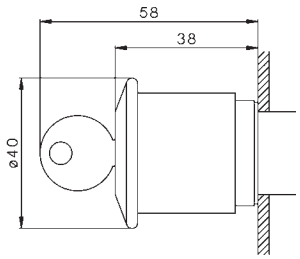
Push-and pull button Ø40mm

BS3P45



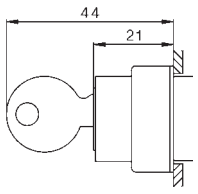
Push-and pull button Ø40mm with key

BS3P44S3



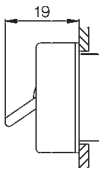
Lockable Push button

B3SAR., B3SAT.
BS3SAR., BS3SAT.
BC3SAR., BC3SAT.



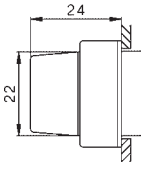
Toggle

B3E
BS3E
BC3E



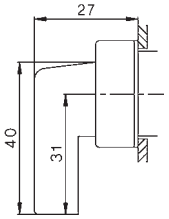
Rotary Knob

B3KN, B3KL
BS3KN, BS3KL
BC3KN, BC3KL



Swing Knob

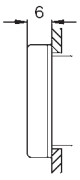
B3KRL, B3KRN
BS3KRL, BS3KRN
BC3KRL, BC3KRN



Lens Cap

B3R(F)

B3RN

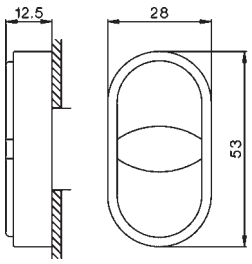


Dimensions

Actuators and Lens Caps 22mm

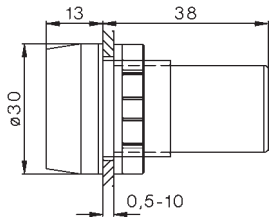
Double push button

B3DT



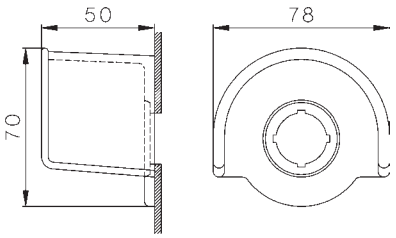
Monoblock Multi-LED

B3-MB...



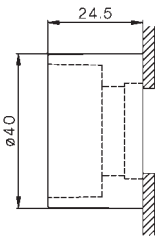
Protection cover

B3-SK ..



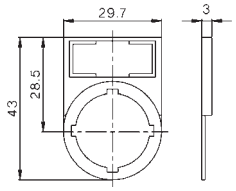
Protection ring w. thread

P921-.



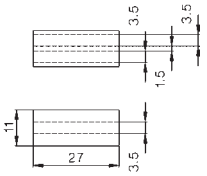
Label holder

P751



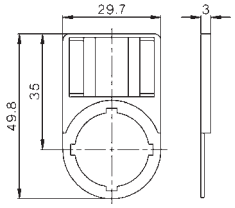
Legend plate

BK4-...



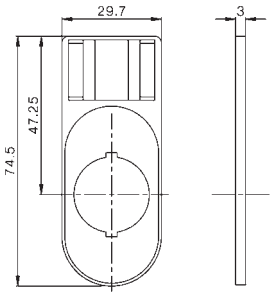
Label holder

P761



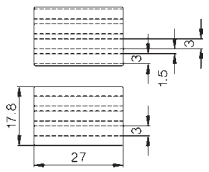
Label holder

P761-DT



Legend plate

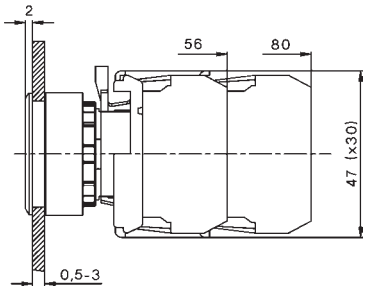
BK8-...



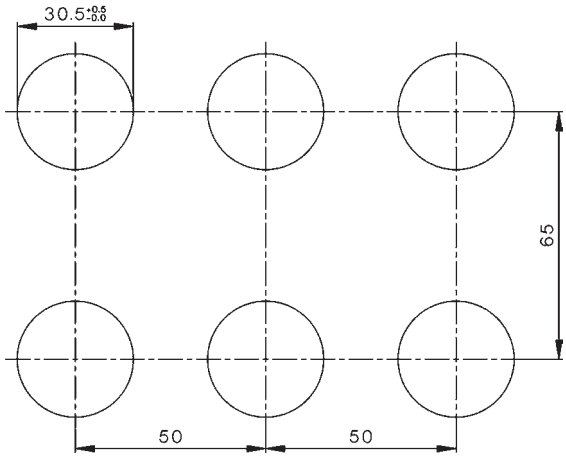
Dimensions

Actuators and Lens Caps 30mm

Panel mounting B3S



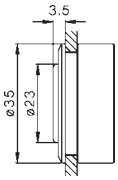
Mounting holes



Actuators and Lens caps

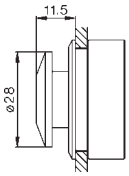
Flush Head
Illuminated Flush Head

B5D(R), B5DL(R)
BS5D(R), BS5DL(R)



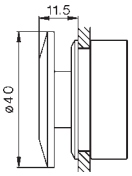
Mushroom Head Ø28mm
Emergency Stop Ø28mm

B5P1 to B5P3
BS5P1 to BS5P3



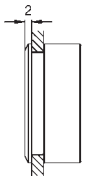
Mushroom Head Ø40mm
Emergency Stop Ø40mm

B5P14, B5P34
BS5P14, BS5P34



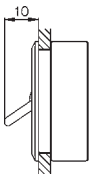
Lens Cap

B5RF



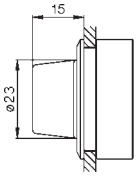
Toggle

B5E
BS5E



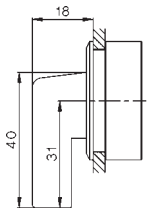
Rotary Knob

B5KN, B5KL
BS5KN, BS5KL



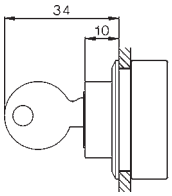
Swing Knob

B5KRL, B5KRN
BS5KRL, BS5KRN



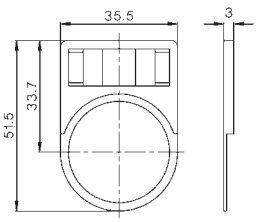
Lockable Push button

B5SAR., B5SAT.
BS5SAR., BS5SAT.



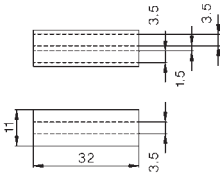
Label holder

P942-1



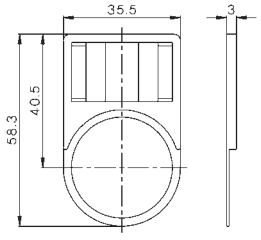
Legend plate

BK5-...



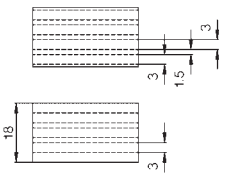
Label holder

P1043



Legend plate

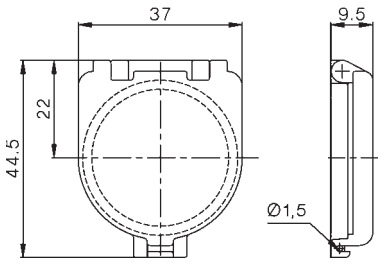
BK10-..



Dimensions

Protective Cover

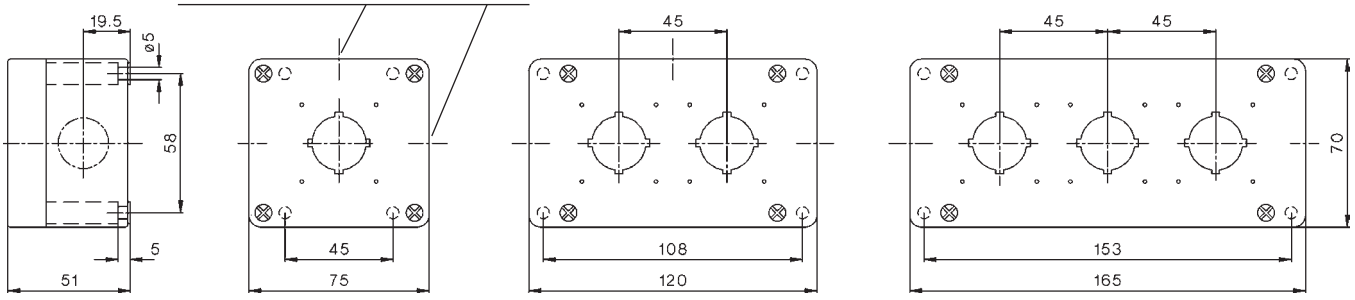
B5-SAP



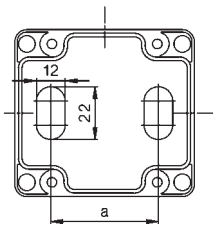
Enclosures for Custom Built Stations

BG1 BG2 BG3

Three conduit entries (knockouts), each on top, left and right side, Ø20,5mm (M20 or PG13,5)



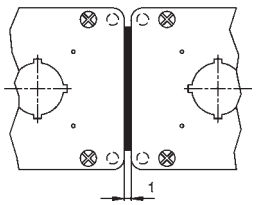
Conduit entries in the bottom
(knockouts)



Number of units	Dimension a
1	45
2	90
3	135

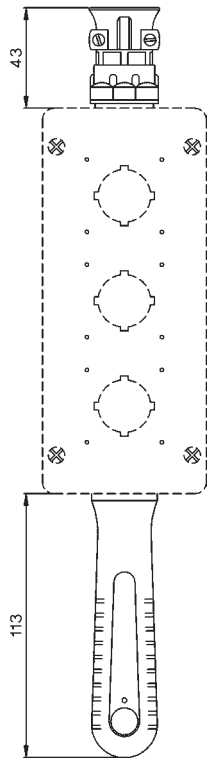
Coupled Enclosures

B4-8852



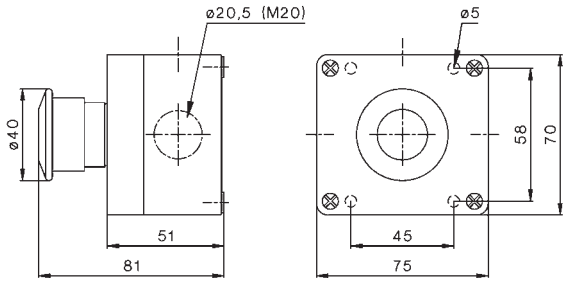
Hanging Station

B4-9149



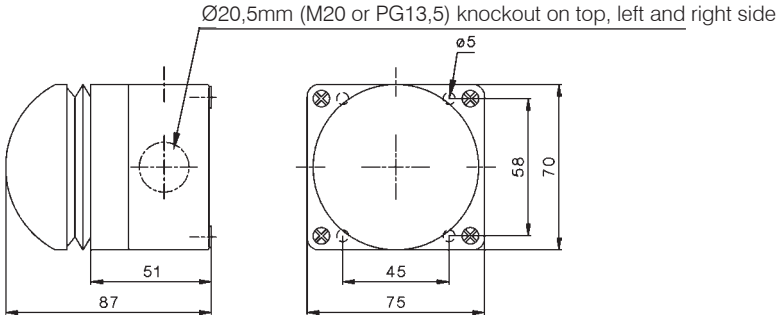
EMERGENCY STOP Push Button Ø40 mm

BG10P44



EMERGENCY STOP Push Button Ø70 mm, Foot switch

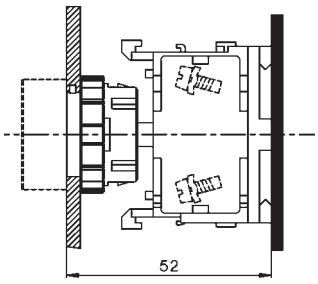
BG10P34P, BG10P14P



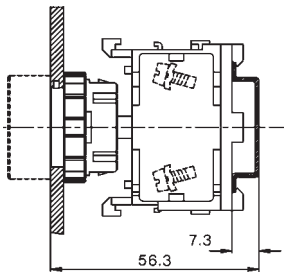
Dimensions

Actuators 22mm

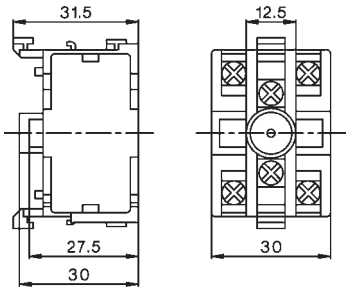
Base mounting



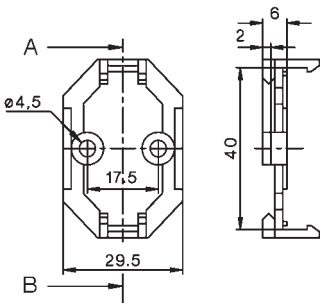
DIN-rail mounting



Contact blocks and Lamp Holders B4.U...

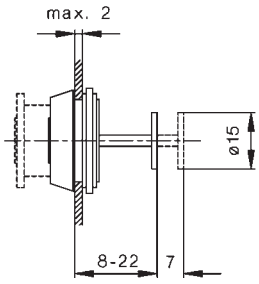


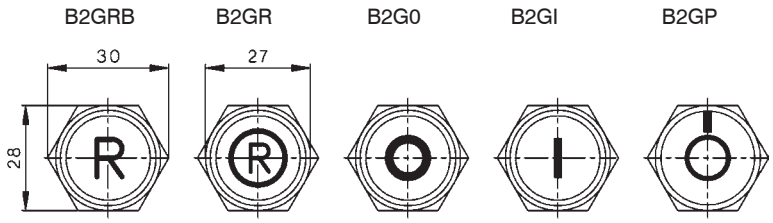
Base B4U



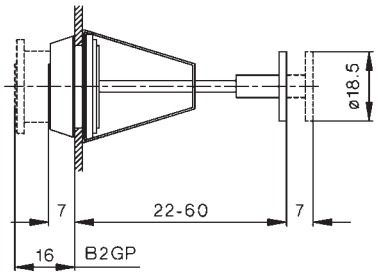
Push buttons for enclosures

B2G..-22

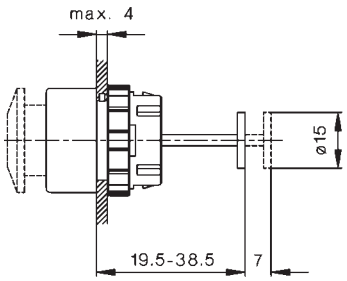


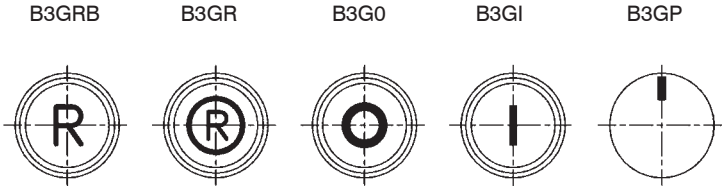


B2G..-60

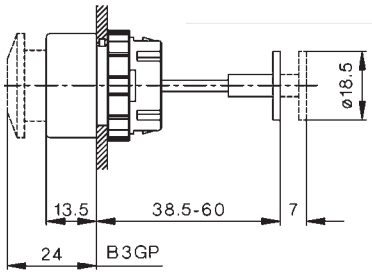


B3G..-31,5





B3G..-60



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