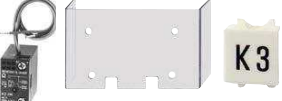


	Contactor overview	46	Contactors, Motor-Starter
	Contactors 3-pole, AC Operated	48	Circuit Breakers
	Contactors 3-pole, DC Operated	49	
	Contactors 4-pole	50	Manual Motor-Starters
	Capacitor Switching Contactors	51	Switches
	Auxiliary Contact Blocks Snap-on Momentary Contacts Additional Fourth Poles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

Contactors 3-pole

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



Ratings		10A14A18A22A				24A32A40A			50A62A74A			90A115A	
AC3 400V	Motor	4kW 5,5kW	5,5kW 7,5kW	7,5kW 10kW	11kW 10kW	11kW 15kW	15kW 18,5kW	18,5kW	22kW 30kW	30kW 37kW	37kW 45kW	45kW 55kW	55kW
	380-400V 660-690V												
	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		33 - 45				90 - 115			140 - 165			280	
Inrush VA		7 - 10				9 - 13			13 - 18			5	
of coils		0,85 - 1,1				0,85 - 1,1			0,85 - 1,1			0,85 - 1,1	
hold VA													
Operation range of coils													
Mounting		35mm DIN-rail or base										2x DIN-rail or base	
Additional aux. contact blocks													
Front mounting	Type	 HN10 1NO f. low level switching	 HN01 1NC f. low level switching	 HA10 1NO 25A I _{th}	 HA01 1NC 25A I _{th}	max. 4 HN.. or 4 HA..			max. 7 HN.. or 7 HA..				
Additional aux. contact blocks													
Side mounting	Type	-	-	-	-	 HB11 1NO+1NC f. low level switching	HB02 2NC f. low level switching		max. 2 HB..				
Overload Relay (thermal)													
Single phase protection													
Temperature compensation													
Trip and alarm contacts													
Type		  											
		U3/32					U3/74			U85			
		U12/16..K3					U3/42						
Number of Setting Ranges from		16 0,12 - 30A		16 0,12 - 32A		4 10 - 42A		5 20 - 74A			2 60 - 120A		
Busbar sets		-		-		-		-			-		

												Contactor, Motor-Starter	
150A 75kW 90kW 250A	175A 90kW 110kW 300A	210A 110kW 160kW 350A	260A 132kW 210kW 450A	315A 160kW 250kW 600A	450A 250kW 375kW 700A	550A 300kW 475kW 800A	700A 400kW 630kW 1000A	860A 500kW 700kW 1100A	1000A 580kW 850kW 1200A	1200A 680kW 1000kW 1350A	Circuit Breakers		
151A00 -	176A00 -	210A00 -	260A00 -	316A00 -	450A22 2NO+2NC	550A22 2NO+2NC	700A22 2NO+2NC	860A22 2NO+2NC	1000A12 1NO+2NC	1200A12 1NO+2NC	Manual Motor-Starters		
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		Switches		
350 5 0,85 - 1,1	350 5	360 5	360 5 0,85 - 1,1	360 5	800-950 9-11	800-950 9-11 0,85 - 1,1	1350-1600 21-25	1350-1600 21-25	2400 70 0,85-1,1	2400 70			
base													
HKT11 HKT22 1NO+1NC 2NO+2NC max. 1 pc.					HKF22 2NO+2NC max. 1 pc.			HKB11 1NO+1NC max. 2 pcs.				AC-Main Switches	
HKA11 1NO+1NC max. 2 pcs.					-			-				DC-Switch Disconnector	
U180 1 120 - 180A integrated					U320 2 144 - 320A integrated					U800 3 240 - 800A SU840/550			Push Buttons
								SU840/860				Representatives, Suppliers	

Contactors 3-pole

AC Operated

	Ratings		Rated Current	Aux. Contacts		Type	Coil voltage ¹⁾		Pack pcs.	Weight kg/pc.
	AC2, AC3			Built-in	Additional see page 52		24	110		
	380V	660V	AC1	NO NC	Typ		230	220-240V 50Hz		
	415V kW	690V kW	690V A				400	380-415V 50Hz		
	4	5,5	25	1 -	max. 4	K3-10ND10 ...			1	0,23
	4	5,5	25	- 1	HN.. or HA..	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	K3-24A00 ...			1	0,48
	15	18,5	65	- -	HN.. or	K3-32A00 ...			1	0,48
	18,5	18,5	80	- -	HA.. and 2HB..	K3-40A00 ...			1	0,48
	22	30	110	- -	max. 4 (3) ⁴⁾	K3-50A00 ...			1	0,85
	30	37	120	- -	HN.. or	K3-62A00 ...			1	0,85
	37	45	130	- -	HA.. and 2HB..	K3-74A00 ...			1	0,85
	45	55	160	- -	max. 7	K3-90A00 ... ^{2) / VS ³⁾}			1	2,2
	55	55	200	- -	HN.. or HA.. and 2HB..	K3-115A00 ... ^{2) / VS ³⁾}			1	2,2
	75	110	250	- -	1 HKT..	K3-151A00 ... ²⁾			1	4
	90	132	300	- -	and 2 HKA11	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	600	- -		K3-316A00 ... ²⁾			1	7,2
	250	375	700	2 2	1 HKF22	K3-450A22 ... ²⁾			1	13
	300	475	800	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 57

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

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

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

DC Operated

Type

Coil voltage ¹⁾
24 24V DC
48 48V DC
110 110V DC
220 110V DC

Coil power

inrush/
hold

W/W

Additional
Overload
Relay
see
page 114

Type

Pack
pcs.

Weight
kg/pc.

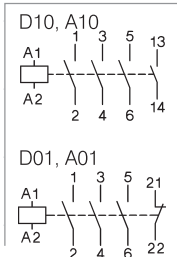
Wiring Diagram

Coil Circuits
see page 53

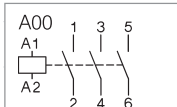
Terminal Markings



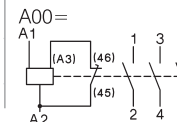
KG3-10A10 ... ⁵⁾	3/3	U3/32	1	0,53
KG3-10A01 ... ⁵⁾	3/3	U12/16E U12/16EQ	1	0,53
KG3-14A10 ... ⁵⁾	3/3	UAT21	1	0,53
KG3-14A01 ... ⁵⁾	3/3		1	0,53
KG3-18A10 ... ⁵⁾	3/3		1	0,53
KG3-18A01 ... ⁵⁾	3/3		1	0,53
KG3-22A10 ... ⁵⁾	3/3		1	0,53
KG3-22A01 ... ⁵⁾	3/3		1	0,53



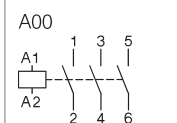
KG3-24A00 ... ⁵⁾	4/4	U3/32	1	0,57
KG3-32A00 ... ⁵⁾	4/4	U3/42	1	0,57
KG3-40A00 ... ⁵⁾	4/4	UAT..	1	0,57



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



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



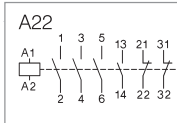
K3-151A00 ... ²⁾	350/5	U180	1	4
K3-176A00 ... ²⁾	350/5		1	4



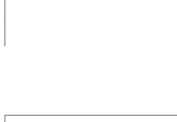
K3-210A00 ... ²⁾	360/5	U320	1	7,2
K3-260A00 ... ²⁾	360/5		1	7,2
K3-316A00 ... ²⁾	360/5		1	7,2



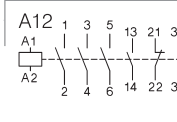
K3-450A22 ... ²⁾	800/10	U800	1	13
K3-550A22 ... ²⁾	800/10	+SU840/550	1	13,5



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



K3-1000A12= ...	2100/60		1	49
K3-1200A12= ...	2100/60		1	53



1) Other coil voltages on request

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

5) with integrated coil suppressor

Contactors 3-pole

DC Operated with double winding coil



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

Contactors 4-pole

AC or DC Operated



Ratings		Rated Current	Aux. Contacts		Type	Coil voltage ²⁾		Pack pcs.	Weight kg/pc.	Wiring Diagram
AC2	AC1		Built-in	Additional see page 52		24	110			
380V		AC1				24V 50/60Hz	110V 50/60Hz			
400V						220-240V 50Hz	380-415V 50Hz			
415V	400V	690V				= 24	24V= DC ³⁾			
kW	kW	A	NO	NC	Type					
4	17,5	25	-	-	max. 4 ³⁾			1	0,23	
4	17,5	25	-	-	HN.. or			1	0,23	
4	17,5	25	-	-	HA..			1	0,23	
5,5	17,5	25	-	-				1	0,23	
5,5	17,5	25	-	-				1	0,23	
5,5	17,5	25	-	-				1	0,23	
7,5	22	32	-	-				1	0,23	
7,5	22	32	-	-				1	0,23	
7,5	22	32	-	-				1	0,23	
11	22	32	-	-				1	0,23	
11	31	45	-	-	max. 4			1	0,65	
15	34,5	50	-	-	HN..			1	0,65	
18,5	34,5	50	-	-	or HA..			1	0,65	
22	55	80	-	-	max. 6			1	1,1	
30	69	100	-	-	HN.. or HA..			1	1,1	
15	43	63	-	-	1HKT..			1	1,4	
15	43	63	-	-	+ 2xHKA11			1	1,4	
30	85	125	-	-				1	2,42	
30	85	125	-	-				1	2,42	
45	94	135	-	-				1	2,42	
55	139	200	-	-				1	4,7	
75	173	250	-	-				1	4,7	
90	208	300	-	-				1	4,7	
110	242	350	-	-				1	8	
132	310	450	-	-				1	8	
160	415	600	-	-				1	8	

Latch for Contactors 4-pole see page 54

1) Other coil voltages on request

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

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

Capacitor Switching Contactors

for use with reactive or non-reactive capacitor banks



Rated Operational Power at 50/60Hz

Ambient Temperature

50°C

380V

400V

kVAr

415V

440V

690V

kVAr

660V

690V

kVAr

60°C

380V

415V

660V

415V

440V

690V

kVAr

660V

690V

kVAr

Aux.
Contacts
Built-in Add.

NO NC pcs.

Type

230

Coil voltage ¹⁾

220-240V 50Hz

Pack

pcs.

Weight

kg/pc.

0-12,5	0-13	0-20	0-12,5	0-13	0-20	1	-	1 ²⁾	K3-18NK10 ...	1	0,34
0-12,5	0-13	0-20	0-12,5	0-13	0-20	-	1	1 ²⁾	K3-18NK01 ...	1	0,34
0-12,5	0-13	0-20	0-12,5	0-13	0-20	1	-	1 ²⁾	K3-18NBK10 ...	1	0,40
0-12,5	0-13	0-20	0-12,5	0-13	0-20	-	1	1 ²⁾	K3-18NBK01 ...	1	0,40
10-20	10,5-22	17-33	10-20	10,5-22	17-33	-	-	3 ³⁾	K3-24K00 ...	1	0,62
10-25	10,5-27	17-41	10-25	10,5-27	17-41	-	-	3 ³⁾	K3-32K00 ...	1	0,62
20-33,3	23-36	36-55	20-33,3	23-36	36-55	-	-	3 ³⁾	K3-50K00 ...	1	1,0
20-50	23-53	36-82	20-50	23-53	36-82	-	-	3 ³⁾	K3-62K00 ...	1	1,0
20-75 ⁴⁾	23-75 ⁴⁾	36-120 ⁴⁾	20-60	23-64	36-100	-	-	3 ³⁾	K3-74K00 ...	1	1,0
33-80	36-82	57-120	33-75	36-77	57-120	-	-	6 ⁵⁾	K3-90K00 ... / VS ⁷⁾	1	2,3
33-100 ⁶⁾	36-103 ⁶⁾	57-148 ⁶⁾	33-90 ⁶⁾	36-93 ⁶⁾	57-148 ⁶⁾	-	-	6 ⁵⁾	K3-115K00 ... / VS ⁷⁾	1	2,3

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

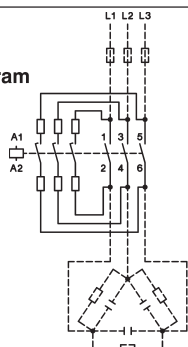
Capacitor switching contactors are fitted with early make contacts and damping resistors, to reduce the value of make current $< 70 \times I_e$.

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

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

Type		K3-18NK	K3-18NBK ⁶⁾	K3-24K	K3-32K	K3-50K	K3-62K	K3-74K	K3-90K	K3-115K
Max. frequency of operations z	1/h	120	120	120	120	120	120	80	80	80
Contact life non reactive cap. banks	$S \times 10^3$	250	250	150	150	150	150	120	120	120
reactive cap. banks	$S \times 10^3$	400	400	300	300	300	300	200	200	200
Rated operational current I_e	at 50°C A	0-18	0-18	14-28	14-36	30-48	30-72	30-108	50-115	50-144
AC6b	at 60°C A	0-18	0-18	14-28	14-36	30-48	30-72	30-87	50-108	50-130
Rated operational current I_{th}	at 50°C A	32	45	45	60	100	110	120	155	190
AC1	at 60°C A	32	40	40	55	90	100	110	145	170
Overload factor	at 50°C %	78	150	60	67	108	53	11	35	32
acc. to EN 61921: 30% min.	at 60°C %	78	122	43	53	88	39	26	34	31
Fuses gL (gG)	from / to A	35 / 63	35 / 63	50 / 80	63 / 100	80 / 160	125 / 160	160/200	160/200	160/250

Typical Circuit Diagram

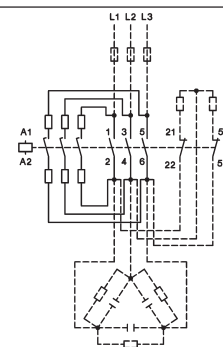


Wiring Diagram for Quick Discharge Resistors

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

Mounting instructions:

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



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

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

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

4) Consider the max. thermal current of the contactor K3-74A: I_{th} 130A

5) 2 HB.. on the left or right side and 4 HN.. or HA.. snap-on

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

7) Type 230 for AC- and DC-operating 220-240V 50/60Hz and 220V DC (with integrated coil suppressor)

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

8) Cable cross sections: 2,5 - 16mm²

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



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

Auxiliary Contact Block for contactors K3-24.. to K3-115.., for low level switching ¹⁾



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

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



Rated Operational Current			For contactors	Contacts		Type	Pack pcs.	Weight kg/pc.
AC15 230V A	AC15 400V A	AC1 690V A		NO	NC			
3	2	10	K3-116 to K3-316 top	1	1	HKT11	1	0,04
3	2	10	K3-116 to K3-316 top	2	2	HKT22	1	0,05
3	2	10	K3-116 to K3-316 outside	1	1	HKA11	1	0,05
6	3	16	K3-200 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			Specification	Contacts		Type	Pack pcs.	Weight kg/pc.
AC15 230V A	AC15 400V A	AC1 690V A		NO	NC			
3	2	10	manual operated	1	-	HTN10	10	0,02
3	2	10	manual operated	-	1	HTN01	10	0,02

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 80

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

Electronic Timer

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



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

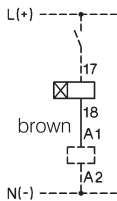
Electronic Timer On-delay for contactors K(G)3-07.. to K3-115.. and K2-..

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

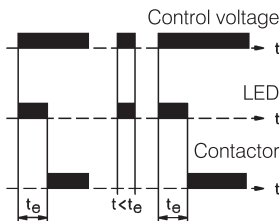


Operational Voltage V	Time Range s	Rated Current AC15 A	Type	Pack pcs.	Weight kg/pc.
24 - 60V AC/DC	1 - 30	0,75	K2-TE30 60	1	0,08
100 - 250V AC/DC	1 - 30	0,75	K2-TE30 250	1	0,08
24 - 60V AC/DC	10 - 180	0,75	K2-TE180 60	1	0,08
100 - 250V AC/DC	10 - 180	0,75	K2-TE180 250	1	0,08
24 - 60V AC/DC	30 - 600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

Time repeat accuracy
Recovery time (typical)

0,8 - 1,1 x U_s
≤1%
50ms

Voltage Drop

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

<3V
25A <10ms

Duty Cycle

Ambient temperature
Short circuit protection

100%
-40° - +60°C
2A

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	Type 24 110 230 400 ↓	Coil voltage	Pack pcs.	Weight kg/pc.
power consumption max. 30VA		22-26V 50/60Hz		
		100-120V 50/60Hz		
		210 -250V 50/60Hz		
		360-440V 50/60Hz		
For Contactors				
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. I.)	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 Type	Interlocks contactor with Type	Mounting	Type	Pack pcs.	Weight kg/pc.
K3-07 to K3-40	K3-07 to K3-40	horizontal	LG10889 ¹⁾	10	0,006
KG3-07 to KG3-22	KG3-07 to KG3-22				
KG3-24 to KG3-40	KG3-24 to KG3-40				
K2-07 to K2-37	K2-07 to K2-37				
K3-24 to K3-74	K3-50 to K3-74	horizontal	LG10890 ¹⁾	1	0,010
K2-23 to K2-60	K2-45 to K2-60				
K3-90, K3-115	K3-90, K3-115	horizontal	LG11478 ¹⁾	1	0,010
K65 to K110	K65 to K110	horizontal	LG8511	1	0,076
K3-116 to K3-316	K3-116 to K3-316	horizontal	LG11223H	1	0,06
K3-315 to K3-550	K3-315 to K3-550	horizontal	LG10400H	1	0,8
K3-315 to K3-550	K3-315 to K3-550	vertical	LG10400V	1	0,8
K3-450, K3-550	K3-700, K3-860	horizontal	LG10399H	1	1,6
K3-450, K3-550	K3-700, K3-860	vertical	LG10399V	1	0,9
K3-700, K3-860	K3-700, K3-860	horizontal	LG10402H	1	1,5
K3-700, K3-860	K3-700, K3-860	vertical	LG10402V	1	0,9
K3-700, K3-860	K3-1000, K3-1200	horizontal	LG10401H	1	1,9
K3-700, K3-860	K3-1000, K3-1200	vertical	LG10401V	1	1,6
K3-1000, K3-1200	K3-1000, K3-1200	horizontal	LG10403H	1	1,8
K3-1000, K3-1200	K3-1000, K3-1200	vertical	LG10403V	1	1,5

1) clamps for mounting incl.

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



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

Additional Terminals



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

Parallel Connectors



For Contactors	Cable Cross-sections to clamp mm²			Type	Pack pcs.	Weight kg/pc.
	solid or stranded	flexible	flex. with multi-core cable end			
Parallel Connectors, 3 Poles Parallel						
Current-carrying capacity: 2,5 x AC1-value of the contactor						
K(G)3-10 to K(G)3-22	terminal hole for screw M5			LG9241	50	0,004
K2-09 to K2-16						
K2-23 to K2-37	4 - 35	6 - 25	4 - 25	LG5587	10	0,022
Parallel Connectors, 4 Poles Parallel						
Current-carrying capacity: 3,2 x AC1-value of the contactor						
K(G)3-10 to K(G)3-22	terminal hole for screw M5			LG7360	10	0,006
K2-09 to K2-16						

Suppressor Units



Voltage Range V	Mounting		Type	Pack pcs.	Weight kg/pc.
RC-units for contactors K3-07 - K3-74					
12 - 48V AC/DC	to snap	1600nF / 22 Ohm	RC-K3N 24	10	0,01
48 - 127V AC/DC	on the	680nF / 270 Ohm	RC-K3N 110	10	0,01
110 - 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 to K3-74	To join contactors with 12mm distance, 2 pieces required	P785-1	10	0,002
Retention clamp	K3-10 to K3-74	To close contactors	P725		

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



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

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

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

Standard voltages in bold type letters

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

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

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

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

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

Coil voltages for AC and DC operated contactors
**Type-suffix for coil-types K3-115/.. to K3-860/..
for contactor-types K3-90.. to K3-860..**

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

Coil voltages for AC operated contactors
**Type-suffix for coil-types K3-115/..AC
for contactor-types K3-90..AC to K3-115..AC**

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

Other coil voltages on request

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

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

Spare Coils for AC operated contactors



For Contactors

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

Type	Coil voltage ¹⁾
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



Pack
pcs. Weight
kg/pc.

For Contactors

K3-150.., K3-175..	K3-175/ ...	1	0,38
K3-1000.., K3-1200.. without feeder group ²⁾	K3-1200/ ...	1	3,12

Type	Coil voltage ¹⁾
4.110	110V 50Hz, 110-115V 60Hz
4.230	220-230V 50Hz
4.400	380-400V 50Hz



pcs. kg/pc.

Spare Coils for AC and DC operated contactors



For Contactors

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

Type	Coil voltage ¹⁾
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



pcs. kg/pc.

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

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

Type	Coil voltage ¹⁾
110	110-120V 50/60Hz / 110V DC
230	220-240V 50/60Hz / 220V DC
400	380-415V 50/60Hz



Pack
pcs. Weight
kg/pc.

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

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

Spare Coils for DC operated contactors



Aux. Contact Block
for double winding coil

Type	Coil voltage ¹⁾
47.24	24V DC
47.48	48V DC
47.110	110V DC
47.220	220V DC

For Contactors

		Type	Pack pcs.	Weight kg/pc.
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

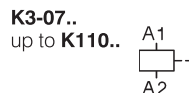
Type	Coil voltage ¹⁾
43.110	110V DC
43.220	220V DC

For Contactors

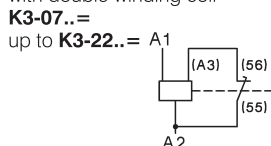
		Type	Pack pcs.	Weight kg/pc.
K3-1000..=, K3-1200..=	without feeder group ²⁾	K3-1200/ ...	1	3,12

Wiring Diagrams for Coil Circuit

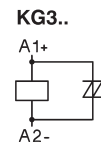
AC operated,



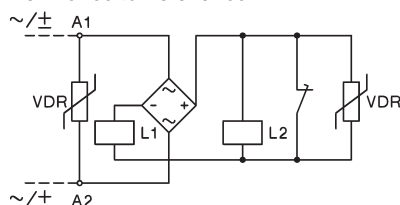
DC operated
with double winding coil



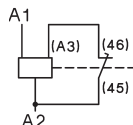
DC operated



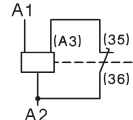
AC and DC operated
with double winding coil
K3-90A00, K3-115A00
K3-151A00, K3-176A00
K3-210A00 to K3-316A00



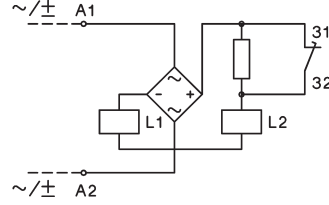
K3-24..=
to
K3-74..=



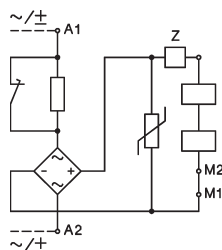
K85..=
K110..=



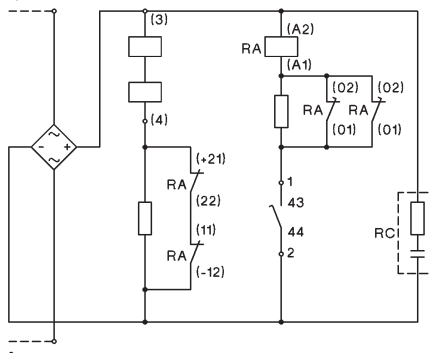
AC and DC operated
with series resistor
K3-200A21
K3-315A21



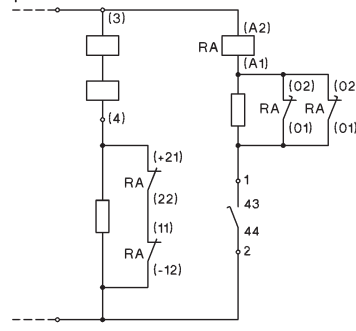
AC and DC operated
with series resistor
K3-450.. up to K3-860..



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



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



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

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

¹⁾ Other coil voltages on request

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

Spare Contacts

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

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 kW	Range acc. to BS for 415V			220-230V Motor fuse size motor start			240V Motor fuse size motor start			380-400V Motor fuse size motor start			415V Motor fuse size motor start			500V Motor fuse size motor start			660-690V Motor fuse size motor start		
	PS~hp	hp	cosφ %	I _n A	D.O.L. A	YD A	I _n A	D.O.L. A	YD A	I _n A	D.O.L. A	YD A	I _n A	D.O.L. A	YD A	I _n A	D.O.L. A	YD A	I _n A	D.O.L. A	YD 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	35	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 hp	Motor F.L.C. at 110-120V			Motor F.L.C. at 220-240V ¹⁾			Motor F.L.C. at 440-480V			Motor F.L.C. at 550-600V		
	1-phase A	2-phase A	3-phase A	1-phase A	2-phase A	3-phase A	1-phase A	2-phase A	3-phase A	1-phase A	2-phase A	3-phase 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

Contactors

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

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

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

Contactors

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

Type	K3-90	K3-115	K3-116	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550	K3-700	K3-860	K3-1000	K3-1200
V AC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	690	690	690	690
A	1100	1200	1200	1500	2000	2100	2600	3200	4500	5500	7000	8600	10000	12000
A	540	600	600	720	840	1020	1200	1500	2400	3000	-	-	-	-
A	950	1100	1000	1200	1500	1600	2100	2600	4500	5500	7000	8000	8000	10000
A	850	1000	1000	1200	1500	1600	2100	2600	4500	5500	7000	8000	8000	10000
A	600	600	800	1000	800	1200	1900	2300	3200	4400	5600	6900	7000	8000
A	450	450	400	500	600	700	850	1000	-	-	-	-	-	-
A	160	200	200	250	300	350	450	600	700	800	1000	1100	1200	1350
kW	60	76	76	95	114	133	171	228	266	304	381	419	457	514
kW	63	79	79	99	119	139	179	238	279	318	398	438	478	537
kW	66	83	83	103	124	145	187	249	291	332	415	457	498	561
kW	105	131	131	165	197	230	296	394	460	526	658	724	789	888
kW	110	138	138	173	208	242	311	415	485	554	692	762	831	935
kW	115	143	143	179	215	251	323	430	503	574	718	790	862	970
kW	121	152	152	190	228	266	342	456	533	609	762	838	914	1028
kW	138	173	173	216	260	303	389	518	606	692	866	952	1039	1169
kW	182	228	228	285	343	400	514	684	800	914	1143	1257	1371	1543
kW	191	239	239	298	358	418	537	715	836	955	1195	1314	1434	1613
kW	221	277	216	345	415	433	546	727	692	911	-	-	-	-
A	145	170	170	180	200	280	360	400	550	600	800	875	960	1080
kW	55	64	64	68	76	106	137	152	209	228	304	333	365	411
kW	57	67	67	71	79	111	143	159	219	239	318	348	382	430
kW	59	70	70	74	83	116	150	166	228	249	332	363	399	448
kW	95	111	111	118	131	184	237	263	362	395	526	575	631	710
kW	100	117	117	124	138	193	249	277	381	415	554	606	665	748
kW	104	122	122	129	143	201	259	287	395	431	575	628	690	776
kW	110	129	129	137	152	213	274	304	419	457	609	666	731	823
kW	125	147	147	155	173	242	312	346	476	519	692	757	831	935
kW	165	194	194	205	228	320	412	457	628	685	914	1000	1097	1234
kW	173	202	202	215	239	334	430	478	657	717	956	1045	1147	1290
kW	166	187	216	277	346	388	499	554	692	866	-	-	-	-
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 of three-phase motors 50-60Hz	220-230V kW	3	4	5	5	6	8,5	11	12,5	18,5	18,5
	240V kW	3	4	5	5	7	9	11,5	13,5	19	19
	380-400V kW	4	5,5	7,5	7,5	11	15	18,5	22	30	30
	415V kW	4,5	6	8,5	8,5	12	16	20	24	33	33
	440V kW	4,5	6	8,5	8,5	12	16	20	24	33	33
	500V kW	5,5	7,5	10	10	15	18,5	18,5	30	37	37
	660-690V kW	5,5	7,5	10	10	15	18,5	18,5	30	37	37
	1000V kW	-	-	-	-	-	-	-	-	-	-
Utilization category AC5a											
Switching of gas discharge lamps											
Rated operational current I_e per pole at 220/230V											
Fluorescent lamps, uncompensated and serial compensated	A	20	20	25	25	40	52	64	88	96	104
parallel compensated	A	7	9	9	9	18	22	22	30	40	40
dual-connection	A	22,5	22,5	28	28	45	58	72	98	108	117
Metal halide lamps ¹⁾ , uncompensated	A	12	15	19	19	30	39	48	66	72	78
parallel compensated	A	7	9	9	9	18	22	22	30	40	40
Mercury-vapour lamps ²⁾ , uncompensated	A	22,5	25	28	28	45	58	72	99	108	117
parallel compensated	A	7	9	9	9	18	22	22	30	40	40
Mixed light lamps ³⁾	A	20	20	25	25	40	52	64	88	96	104
LED-Lamps											
consider the inrush current of the lamp ballast and $\cos\phi$ of the lamp.											
max. lamps per pole ($I_{nLED} \leq I_{in}$)		$= \frac{\text{inrush current of contactor}}{\text{inrush current of lamp/EVG}}$									
max inrush current of contactor	A	282	282	282	282	564	705	705	987	1269	1268
Utilization category AC5b											
Switching of incandescent lamps⁴⁾											
Rated operational current I_e per pole at 220/230V	A	12,5	12,5	12,5	12,5	25	31	31	43	56	56

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

2) High-pressure lamps

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

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

Contactors

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

Type	K3-90	K3-115	K3-151	K3-176	K3-210	K3-260	K3-316	K3-450	K3-550	K3-700	K3-860	K3-1000	K3-1200
A	85	98	55	63	85	100	120	150	180	230	280	340	400
A	85	98	55	63	85	100	120	150	180	230	280	340	400
A	85	98	55	63	85	100	120	150	180	230	280	340	400
A	85	85	55	63	85	100	120	150	180	230	280	340	400
A	85	85	55	63	85	100	120	150	180	230	280	340	400
A	85	85	55	63	85	100	120	150	180	230	280	340	400
A	85	85	-	-	-	-	-	-	-	-	-	-	-
A	60	60	-	-	-	-	-	-	-	-	-	-	-
A	57,5	57,5	-	-	-	-	-	-	-	-	-	-	-
A	-	-	-	-	-	-	-	-	-	-	-	-	-
kW	25	30	15	18,5	25	30	37	45	51	68	80	110	132
kW	27	32	15,5	19	26	31	38	47	53	71	83	115	137
kW	45	45	25	30	45	55	63	75	90	120	150	185	220
kW	49	49	25	33	45	55	65	80	100	132	160	200	230
kW	49	49	30	34	48	55	67	85	100	132	160	200	230
kW	55	55	25	30	55	65	75	100	110	150	185	220	257
kW	55	55	25	30	55	65	75	100	110	150	185	220	257
kW	-	-	-	-	-	-	-	-	-	-	-	-	-
A	100	120	120	140	180	220	280	360	450	570	700	850	1000
A	55	70	85	100	130	160	200	300	360	460	550	660	800
A	112	144	120	140	180	220	280	360	450	570	700	850	1000
A	85	90	95	110	140	180	230	300	380	490	610	750	890
A	55	70	75	85	110	140	170	260	300	400	480	580	700
A	112	144	120	140	180	220	280	360	450	570	700	850	1000
A	55	70	75	85	110	140	170	260	300	400	480	580	700
A	100	120	100	120	160	200	250	320	400	500	600	700	800
	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
$P_x = P_n \cdot (n/x)$	660-690V kVA	5,4	6,5	9	9	12,5	16	16	24	32	39
Utilization category AC6b											
Switching of three-phase capacitors											
Maximum inrush current (peak value)											
as multiple k of the	k										
capacitor rated current		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 current	220-230V kVAr	3	4,5	6	6	8,5	12	12	17	24	28
($\sin\phi \rightarrow 1$)	240V kVAr	3,5	5	6,5	6,5	9,5	13	13	18,5	25	29
	380-400V kVAr	5	7,5	10	10	15	20	20	29	39	46
For different multiples x	415-440V kVAr	5,5	8	11	11	16	22	22	32	43	50
use the following formula:	500V kVAr	7	10	13	13	20	26	26	39	50	58
$P_x = P_k \cdot (k/x)$	660-690V kVAr	7	10	13	13	20	26	26	40	50	58
Switching of reactive capacitor banks											
Rated operational current I_e	690V A	8	13	18	20	28	36	42	48	72	108 ¹⁾
Rated operational power	220-230V kVAr	2,9	5	7	7,5	11	14	16	20	28	33
	240V kVAr	3,1	5,4	7	8	11	14	17	20	28	36
	380-400V kVAr	5	9	12,5	13	20	25	27,5	33,3	50	75 ¹⁾
	415-440V kVAr	5,5	9,5	13	14	22	27	30	36	53	75 ¹⁾
	500V kVAr	6	11	15	17	25	30	36	40	60	75
	660-690V kVAr	8	15	20	22	33	41	48	55	82	100
	1000V kVAr	-	-	-	-	-	-	-	-	-	-
Utilization category DC1											
Switching of resistive load											
Time constant L/R $\leq 1\text{ms}$											
Rated operational current I_e	1 pole 24V 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 $\leq 15\text{ms}$											
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_{tr}). see page 62

Contactors

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

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

Contactors, Motor-Starter

Circuit Breakers

Manual Motor-Starters

Switches

AC-Main Switches

DC-Switch Disconnector

Push Buttons

Representatives, Suppliers

Contactors

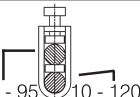
Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

Main Contacts			Type	K(G)3-10K(G)3-14K(G)3-18K(G)3-22K(G)3-24K(G)3-32K(G)3-40K3-50									K3-62	K3-74
Maximum ambient temperature														
Operation	open	°C	-40 to +60 (+90) ¹⁾											
	enclosed	°C												
with thermal overload relay	open	°C	-25 to +60											
	enclosed	°C												
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				0,75 - 6 1 - 4 0,75 - 4			1,5 - 25 2,5 - 16 1,5 - 16			4 - 50 10 - 35 6 - 35				
1 cable per clamp														
main connector														
	solid or stranded	mm ²												
	flexible	mm ²												
	flexible with multicore cable end	mm ²												
2 cables per clamp														
	solid or stranded	mm ²	6+(1-6) / 4+(0,75-4) 2,5+(0,75-2,5) / 1,5+(0,75-1,5) 6+(1,5-4) / 4+(1-4)			16+(2,5-16) / 10+(4-16) 6+(4-16) / 4+(2,5-16) 16+(2,5-6) / 10+(4-10) 6+(4-16) / 4+(2,5-16)			50+4 / 35+6 / 25+(6-16) 16+(6-16) / 10+(6-16) 50+(4-10) / 35+(4-16) 25+(4-25) / 16+(4-16)					
	flexible	mm ²	2,5+(0,75-2,5) / 1,5+(0,75-1,5)											
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+(14-10) / 12+(18-12) 14+(18-14) / 16+(18-16)			10+(16-10) / 12+(18-12) 14+(18-14) / 16+(18-16) 4+(18-12) / 6+(18-8) 8+(18-8) / 10+(18-12)			10+(12-10) / 12+12					
	flexible	AWG							1+(12-10) / 2+(8-12) 3+(12-8) / 4+(10-6)					
Frequency of operations z														
Contactors without thermal overload relay														
	without load	1/h	10000			7000			7000					
	AC3, I _e	1/h	600			600			400					
	AC4, I _e	1/h	120			120			120					
	DC3, I _e	1/h	600			600			400					
Mechanical life														
AC operated	S x 10 ⁶		10			10			10					
DC operated	S x 10 ⁶		10			10			10					
DC-solenoid operated (KG3)	S x 10 ⁶		50			50			-					
Short time current														
	10s-current	A	96	120	144	176	184	240	296	450	504	592		
	120s-current	A	42	52	58	66	80	97	110	195	203	222		
Power loss per pole														
contact resistance	at I _e /AC3 400V	W	0,21	0,35	0,5	0,75	0,7	1,3	2	2,2	3,9	5,5		
		mOhm	2,1	1,8	1,5	1,5	1,2	1,2	1,2	1	1	1		
Resistance to shock acc. to IEC 60068-2-27														
Shock time 20ms sine-wave	NO	g	10	10	10	10	8	8	8	8	8	8		
	NC	g	6	6	6	6	-	-	-	-	-	-		

1) With reduced control voltage range 0,9 up to 1,0 x U_e and with reduced rated current I_e/AC1 according 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 bis +60 (+90) ¹⁾ -40 to +40 -25 to +60 -25 to +40 -50 to +90		-25 to +55 (+70) ²⁾ -25 to +40 -25 to +55 -25 to +40 -55 to +80											
°C														
°C														
°C														
°C														
A	250	250	200	250	315	400	450	500	630	630	800	1000	1000	1250
A	160	200	160	200	250	315	400	400	500	560	-	-	-	-
A	100	125	125	160	200	250	315	-	-	-	-	-	-	-
mm ² mm ² mm ²	 0,5 - 95 10 - 120 0,5 - 70 25 - 95 0,5 - 70 10 - 95		 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			
mm ² mm ² mm ²	0,5 - 95 + 10 - 120 0,5 - 70 + 25 - 95													
AWG AWG	18 - 10 18 - 3/0	- 8 - 4/0												
AWG	-													
AWG	18 - 3/0 + 8 - 4/0													
1/h 1/h 1/h 1/h	3000 300 120 300		1200 240 - -		1200 150 - -		1200 150 - -		1200 50 25 -			300 20 - -		
S x 10 ⁶ S x 10 ⁶ S x 10 ⁶	5 5 -		10 10 -		5 5 -		5 5 -		5 5 -			5 ³⁾ 5 ³⁾ -		
A A	680 275	880 330	920 410	1200 500	1400 575	1800 800	2200 900	2600 1000	3600 1400	4400 1750	5600 2200	6900 2600	8000 3000	9600 3600
W mOhm	4,8 0,6	7,9 0,5	7,9 0,5	9 0,4	11 0,35	8 0,18	11 0,16	14,9 0,15	26,3	33,3	49	59,2	60	72
g g	7 5	7 5	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

- 1) With reduced control voltage range 0,9 up to 1,0 x U_s and with reduced rated current I_e/AC1 according to I_e/AC3
 2) With reduced control voltage range 1,0 x U_s and with reduced rated current I_e/AC1 according 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				For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse.									
short-circuit current 1kA, contact welding not accepted max. fuse size		gL (gG)	A	20	(25) ⁵⁾			-		-			
Control Circuit													
Power consumption of coils													
AC operated		inrush	VA	33-45				90-115		140-165			
		sealed	VA	7-10				9-13		13-18			
			W	2,6-3				2,7-4		5,4-7			
DC operated		inrush	W	75				140		200			
double winding coil		sealed	W	2				2		6			
DC solenoid operated (KG3)		inrush	W	3				4		-			
		sealed	W	3				4		-			
Operation range of coils													
in multiples of control voltage U _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 (KG3)		make time	ms	65 - 85				65 - 85		-			
		release time	ms	20 - 30 ⁴⁾				20 - 30 ⁴⁾		-			
		arc duration	ms	10-15				10-15		-			
Cable cross-section													
Auxiliary connector		solid	mm ²	0,75-6				-		-			
		flexible	mm ²	1-4				-		-			
		flexible with multicore cable end	mm ²	0,75-4				-		-			
Magnet coil		solid	mm ²	0,75-2,5				0,75-2,5		0,75-2,5			
		flexible	mm ²	0,5-2,5				0,5-2,5		0,5-2,5			
		flexible with multicore cable end	mm ²	0,5-1,5				0,5-1,5		0,5-1,5			
Clamps per pole				2				2		2			
Auxiliary connector		solid	AWG	18 - 10				-		-			
		flexible	AWG	18 - 10				-		-			
Magnet coil		solid	AWG	14 - 12				14 - 12		14 - 12			
		flexible	AWG	18 - 12				18 - 12		18 - 12			
Clamps per pole				2				2		2			

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

2) Total breaking time = release time + arc duration

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

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

Contactors

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

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

1) 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 $U_e = 690V\sim$	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 $\cos\phi = 0,65$ 500V AC	A	150	150	180	300	370	370	500	700	850	1100
K2-23 to K3-1200 $\cos\phi = 0,35$ 690V AC	A	100	100	150	260	340	340	400	500	600	600
1000V~	A	-	-	-	-	-	-	-	-	-	-
Utilization category AC1											
Switching of resistive load											
Rated operational current $I_e (=I_{th})$ at 40°C, open	A	25	25	25	45	50	50	80	100	150	170
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, $\cos\phi = 1$ 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 $I_e (=I_{th})$ at 60°C, enclosed	A	20	25	25	35	40	40	63	80	100	125
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, $\cos\phi = 1$ 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 open and enclosed 220V	A	12	15	18	23	30	37	45	63	85	110
230V	A	11,5	14,5	17,5	23	30	37	45	61	85	110
240V	A	11	14	17	23	30	37	45	60	85	110
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 of three-phase motors 50-60Hz 220-230V	kW	3	4	5	6	8,5	11	12,5	18,5	25	33
240V	kW	3	4	5	7	9	11,5	13,5	19	27	35
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): $U_{imp} = 8kV$.
Data for other conditions on request.

Contactors

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

Main Contacts	Type	K2-09	K2-12	K2-16	K2-23	K2-30	K2-37	K2-45	K2-60	K85	K110
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 of three-phase motors	220-230V kW	3	4	5	6	8,5	11	12,5	18,5	25	30
50-60Hz	240V kW	3	4	5	7	9	11,5	13,5	19	27	32
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 lamps⁴⁾											
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 use the following formula: $P_x = P_n \cdot (n/x)$	415-440V kVA	3,4	4,2	5,7	8	10,2	10,2	15	20,5	29	38
	500V kVA	3,9	4,8	6,5	9	11,5	11,5	17	23	33	43
	660-690V kVA	5,4	6,5	9	12,5	16	16	24	32	45	60
Utilization category DC1											
Switching of resistive load											
Time constant $L/R \leq 1\text{ms}$	1 pole 24V A	20	25	25	45	50	50	80	100	150	170
Rated operational current I_e	60V A	20	25	25	45	50	50	80	100	150	170
	110V A	6	6	6	10	10	10	12	12	20	25
	220V A	0,8	0,8	0,8	1,4	1,4	1,4	1,4	1,4	2	2,5
	2 poles in series 24V A				45	50	50				
	60V A				45	50	50				
	110V A				45	50	50				
	220V A				10	10	10				
	3 poles in series 24V A	20	25	25	45	50	50	80	100	150	170
	60V A	20	25	25	45	50	50	80	100	150	170
	110V A	20	25	25	45	50	50	80	100	150	170
	220V A	16	20	20	30	35	35	63	80	100	160

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

2) High-pressure lamps

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

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

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

Contactors

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

Main Contacts	Type	K2-09	K2-12	K2-16	K2-23	K2-30	K2-37	K2-45	K2-60	K85	K110
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 mm ² 0,75 - 4 1,5-10 + 1,5-6 4 - 35 ²⁾ 10 - 70 ²⁾ flexible mm ² 0,75 - 2,5 1,5-6 + 1,5-4 6 - 25 ²⁾ 10 - 70 ²⁾ flexible with multicore cable end mm ² 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/AC1 according 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 with economic circuit	inrush	W			75			140			200	170	320
	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	0,85-1,1
DC operated					0,8-1,1			0,8-1,1			0,8-1,1	0,8-1,1	0,8-1,1
Switching time at control voltage $U_s \pm 10\%$ ^{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 with AC magnet system	make time	ms			8-12			10-20			12-23	20-30	
	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	mm ²			0,75-4			-			-	0,75-2,5	
	flexible	mm ²			0,75-2,5			-			-	0,75-2,5	
	flexible with multicore cable end	mm ²			0,5-2,5			-			-	0,5-1,5	
Magnet coil	solid	mm ²			0,75-2,5			0,75-2,5			0,75-2,5	0,75-2,5	
	flexible	mm ²			0,5-2,5			0,5-2,5			0,5-2,5	0,5-2,5	
	flexible with multicore cable end	mm ²			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): $U_{imp} = 8kV$. Data for other conditions on request

2) Total breaking time = release time + arc duration

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

Contactors for North America

Data according to UL508

Main Contacts (cULus)		Type	K(G)3-10	K(G)3-14	K(G)3-18	K(G)3-22	K(G)3-24	K(G)3-32	K(G)3-40	K3-50	K3-62	K3-74
Rated operational current "General Use"		A	25	25	30	30	50	65	80	110	120	130
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/kA	300/10	300/10	225/10	300/10	350/10	400/18	500/18	500/18	1200/18	1200/18	2000/30	2000/30	-	2000/42
A/kA	300/100 ³⁾	300/100 ³⁾	-	-	-	-	-	-	-	-	-	-	-	-
V	600	600	600	600	600	600	600	600	600	600	600	600	-	600
	-	-	-	-	-	-	-	-	A600	A600	A600	A600	-	A600

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

1) Consider the max. thermal current of the contactor K3-74A: I_{th} 130A

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

3) Class T and Class RK1

Contactors

Contact Life

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

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

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

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

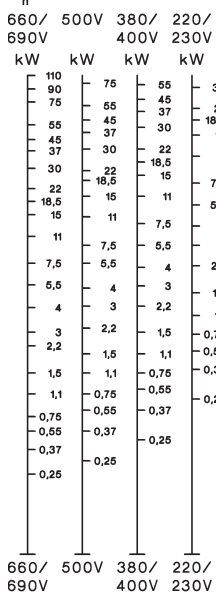
For contactors frequently used under AC3/AC4-mixed service conditions calculate contact life with the formula:

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

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

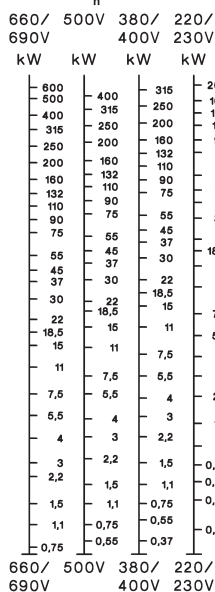
Motor Rating

$P_n = AC4$



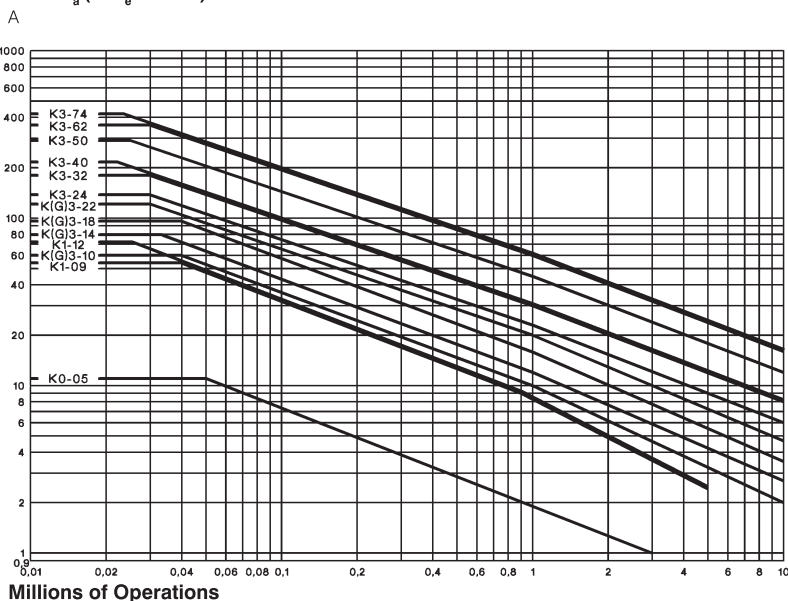
Motor Rating

$P_n = AC3$



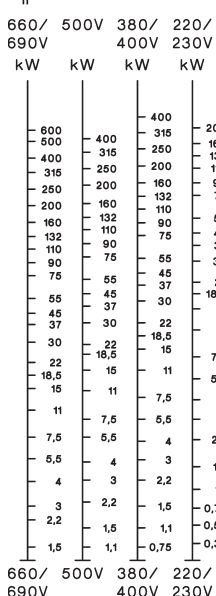
Breaking Current

$I_a (= I_e = AC1)$



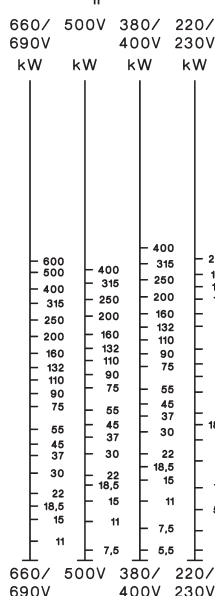
Motor Rating

$P_n = AC4$



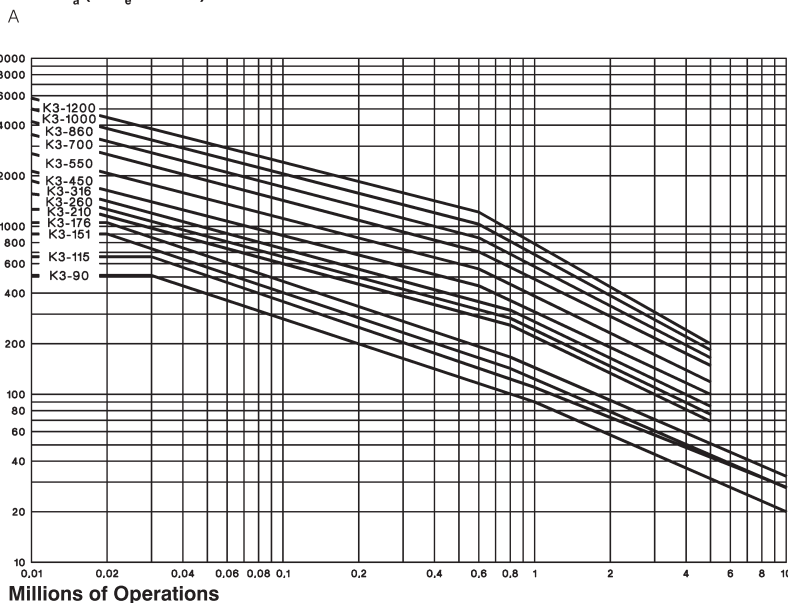
Motor Rating

$P_n = AC3$



Breaking Current

$I_a (= I_e = AC1)$



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

Contactors

Utilization Categories

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

102, for control circuit devices and switching elements according to IEC 947-5-1 and VDE 0660 Part 200 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 I_e	U/U_e	$\cos\phi$	Break I_e	U/U_e	$\cos\phi$	Make I_e	U/U_e	$\cos\phi$	Break I_e	U/U_e	$\cos\phi$
Alternating Current	AC1	Non-inductive or slightly inductive loads resistance furnaces	all values	1	1	0,95	1	1	0,95	1,5	1,05	0,8	1,5	1,05	0,8
	AC2	Slip-ring motors: starting, switching off	all values	2,5	1	0,65	2,5	1	0,65	4	1,05	0,65	4	1,05	0,65
	AC3	Squirrel-cage motors: starting, switching off motors during running	$17A < \begin{matrix} I_e \leq 17A \\ I_e > 100A \end{matrix}$	6 6 6	1 1 1	0,65 0,35 0,35	1 1 1	0,17 0,17 0,17	0,65 0,35 0,35	10 10 10	1,05 1,05 1,05	0,45 0,45 0,35	8 8 8	1,05 1,05 1,05	0,45 0,45 0,35
	AC4	Squirrel-cage motors: starting, plugging, inching	$17A < \begin{matrix} I_e \leq 17A \\ I_e > 100A \end{matrix}$	6 6 6	1 1 1	0,65 0,35 0,35	6 6 6	1 1 1	0,65 0,35 0,35	12 12 12	1,05 1,05 1,05	0,45 0,45 0,35	10 10 10	1,05 1,05 1,05	0,45 0,45 0,35
	AC5a	Switching of electric discharge lamp controls	all values	-	-	-	-	-	-	3	1,05	0,45	3	1,05	0,45
	AC5b	Switching of incandescent lamps	all values	-	-	-	-	-	-	1,5	1,05	¹⁾	4	1,05	¹⁾
	AC6a	Switching of transformers	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	- -	- -	- -	- -	- -	- -	4,5 4,5	1,05 1,05	0,45 0,35	3,6 3,6	1,05 1,05	0,45 0,35
	AC6b	Switching of capacitors	-	-	-	-	-	-	-	²⁾			²⁾		
	AC7a	Slightly inductive loads in household appliances and similar applications	all values	-	-	-	-	-	-	1,5	1,05	0,8	1,5	1,05	0,8
	AC7b	Motor loads for household applications	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	- -	- -	- -	- -	- -	- -	8 8	1,05 1,05	0,45 0,35	6 6	1,05 1,05	0,45 0,35
	AC8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	- -	- -	- -	- -	- -	- -	6 6	1,05 1,05	0,45 0,35	6 6	1,05 1,05	0,45 0,35
	AC8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases	$\begin{matrix} I_e \leq 100A \\ I_e > 100A \end{matrix}$	- -	- -	- -	- -	- -	- -	6 6	1,05 1,05	0,45 0,35	6 6	1,05 1,05	0,45 0,35
	AC12	Control of resistive loads and solid state loads with isolation by opto couplers	all values	-	-	-	-	-	-	1	1	0,9	1	1	0,9
	AC13	Control of solid state loads with transformer isolation	all values	-	-	-	-	-	-	10	1,1	0,65	1,1	1,1	0,65
	AC14	Control of small electromagnetic loads ($\leq 72VA$)	-	-	-	-	-	-	-	6	1,1	0,7	6	1,1	0,7
	AC15	Control of electromagnetic load ($> 72VA$)	-	10	1	0,7	1	1	0,4	10	1,1	0,3	10	1,1	0,3
Direct Current				Make I_e	U/U_e	L/R [ms]	Break I_e	U/U_e	L/R [ms]	Make I_e	U/U_e	L/R [ms]	Break I_e	U/U_e	L/R [ms]
				1	1	1	1	1	1	1,5	1,05	1	1,5	1,05	1
				2,5	1	2	2,5	1	2	4	1,05	2,5	4	1,05	2,5
				2,5	1	7,5	2,5	1	7,5	4	1,05	15	4	1,05	15
				-	-	-	-	-	-	1,5	1,05	¹⁾	4	1,05	¹⁾
				-	-	-	-	-	-	1	1	1	1	1	1
				1	1	≤ 300	1	1	≤ 300	1,1	1,1	≤ 300	1,1	1,1	≤ 300
				-	-	-	-	-	-	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 bis 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	$S \times 10^6$	10	10	10	10	-	-	-	1	10
Power loss per pole at $I_g/AC1$	W	0,5	0,5	1,5	0,5	-	-	-	-	
Utilization category AC15										
Rated operational current I_g 220-240V	A	3	3	6	3	3	3	-	4	3
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 current I_g 60V	A	2	2	8	2	-	-	-	2,5	2
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	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	0,75-2,5	1-2,5	0,75-2,5
flexible	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	0,75-2,5	0,75-2,5	0,75-2,5
flexible with multicore cable end	mm²	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,75-2,5	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	2

Data according to CSA, UL and CUL

Type		HN	HTN	HA	HB..	HKA, HKT HKF	K2-DK K2-SK	K2-TP	K2-L ²⁾
Rated operational current	A	10	10	16	10	10	-	10	-
"General Use"									
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): $U_{imp} = 8kV$. Data for other conditions on request.

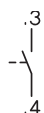
2) Command duration min. 30ms, 10% duty cycle, max. 30 eec.

Leistungsschütze und Zubehör

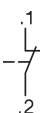
Schaltbilder

Hilfskontaktblöcke

HN10
HA10



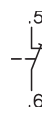
HN01
HA01



HN10U

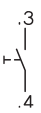


HN01U



Aufsteckbare Tastkontakte

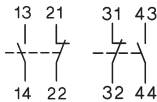
HTN10



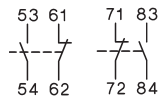
HTN01



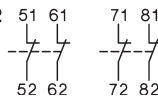
HKA11



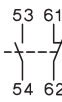
HB11



HB02

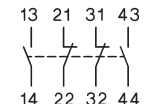


HKT11

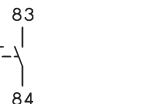


HKA11, HB11, HB02:
Die richtige Klemmenbezeichnung ergibt sich durch die Montage

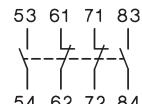
HKF22



HB11



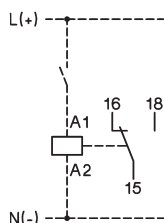
HKT22



Anzeigeelemente

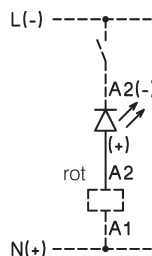
Elektronisches Zeitrelais

K3-T180 240



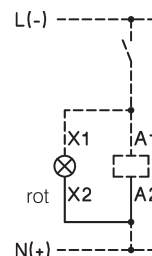
Spulenstromindikator

K2-ING
K2-INR



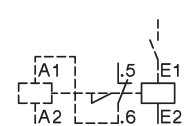
Spannungsindikator

K2-UN
K2-UNR



Mechanische Verklammerung

K2-L..



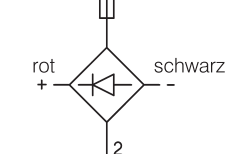
Sicherungshalter

K2-F



mit Gleichrichter

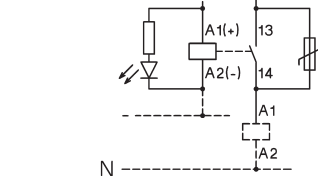
K2-RF1
K2-RF3



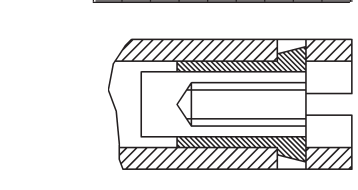
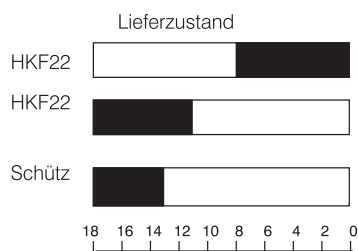
Die im Schaltbild angegebenen Farben beziehen sich auf die vom Gerät abgehenden Anschlußleitungen.

Interface

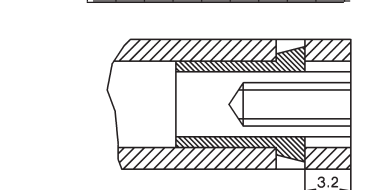
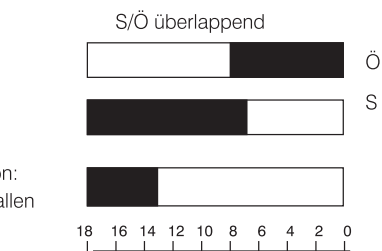
K2-IM



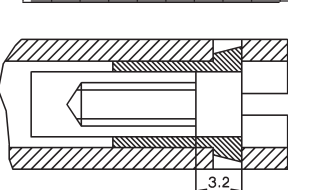
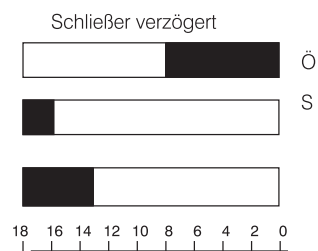
Schaltwegverstellung bei Hilfskontaktblöcken HKF22 für Schütze K3-450 bis K3-860



Standardstellung der Einstellschraube



Schraube 4 Umdrehungen herausdrehen



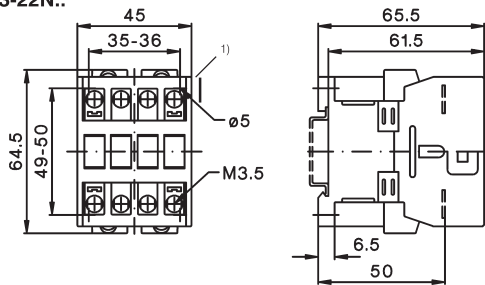
Schraube 4 Umdrehungen hineindrehen

Leistungsschütze

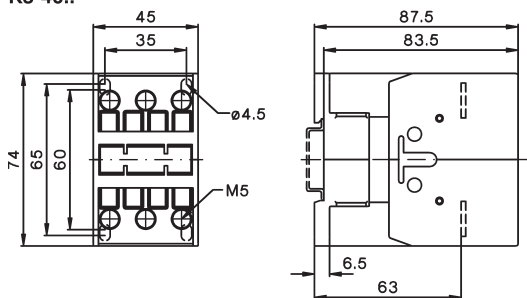
Maße

wechselstrombetätigt

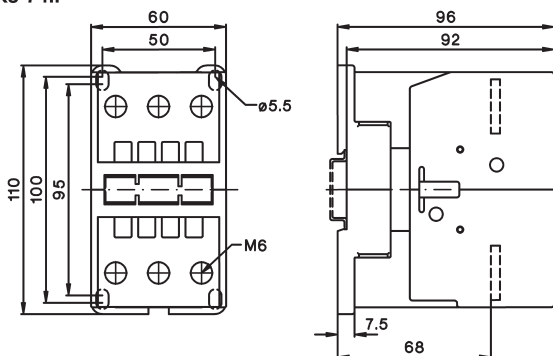
K3-10N..
K3-14N..
K3-18N..
K3-22N..



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

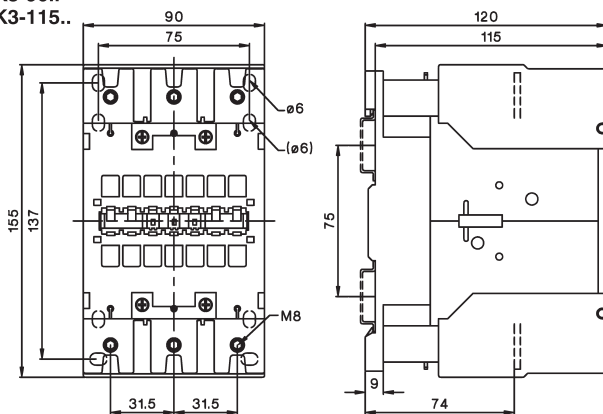


K3-50..
K3-62..
K3-74..



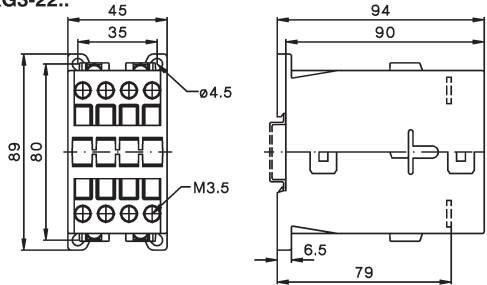
wechsel- und gleichstrombetätigt

K3-90..
K3-115..

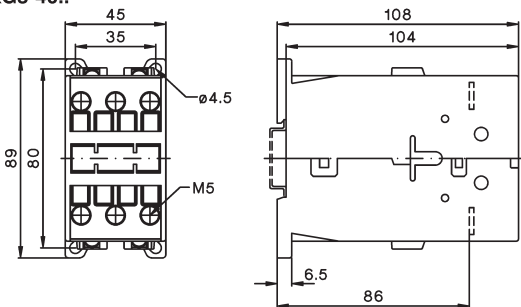


gleichstrombetätigt

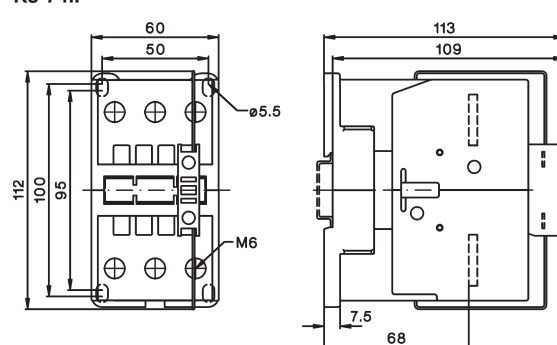
KG3-10..
KG3-14..
KG3-18..
KG3-22..



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



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



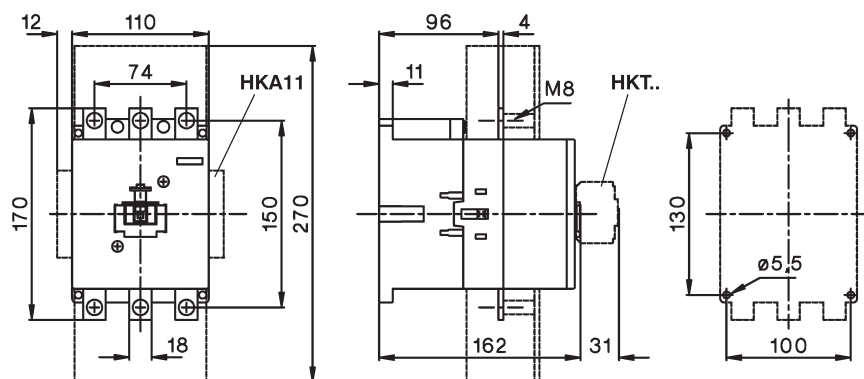
1) Mindestseitenabstände zu leitfähigen
Teilen bei Spulenspannungen:

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

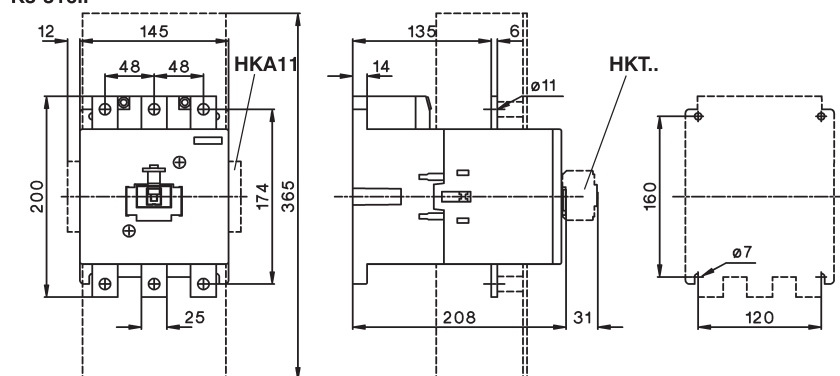
Leistungsschütze

Maße, wechsel- und gleichstrombetätigt

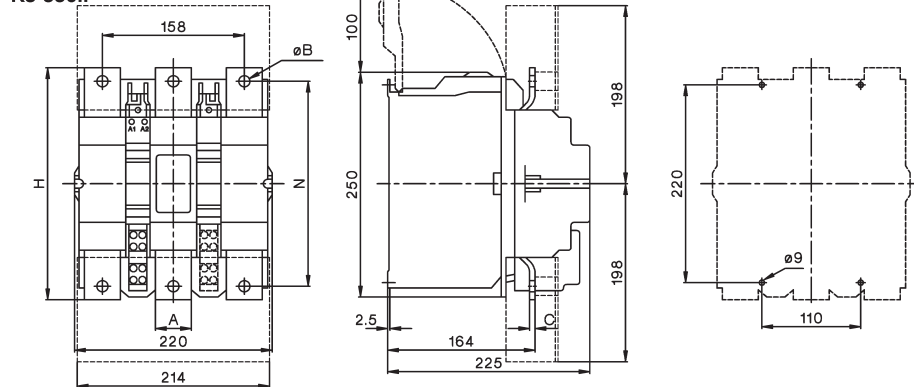
K3-151..
K3-176..



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

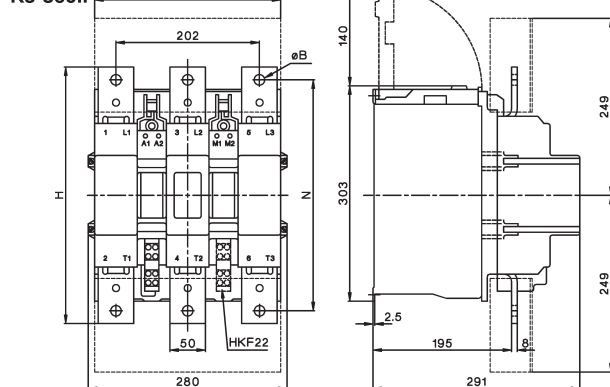


K3-450..
K3-550..



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

K3-700..
K3-860..



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

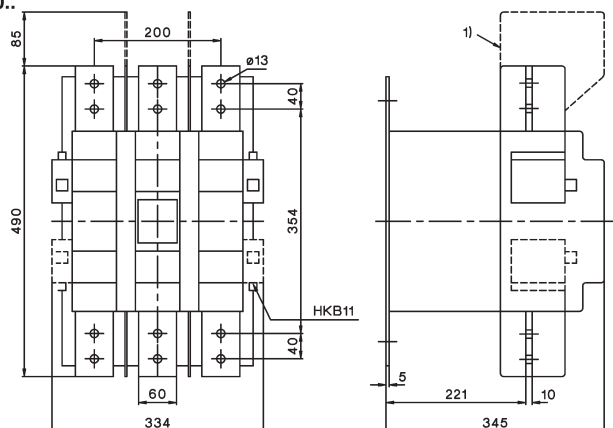
Leistungsschütze

Maße

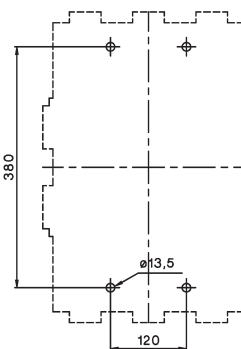
wechsel- und gleichstrombetätigt

K3-1000..

K3-1200..

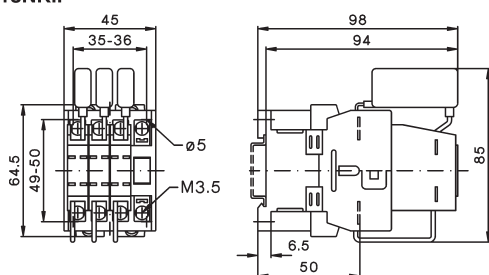


1) nur für K3-1200 in UL-Ausführung

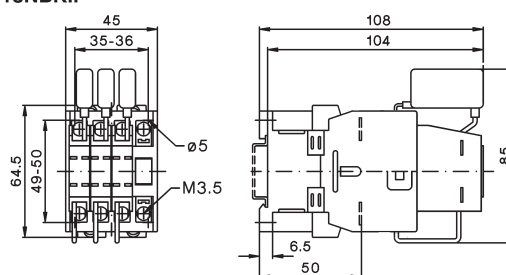


Kondensatorschütze, wechselstrombetätigt

K3-18NK..

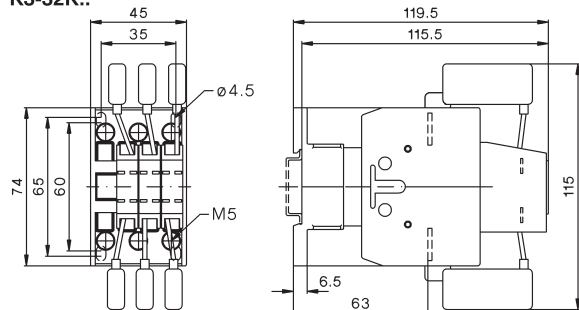


K3-18NBK..



K3-24K..

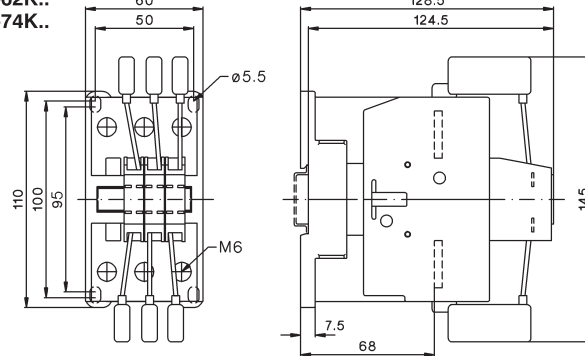
K3-32K..



K3-50K..

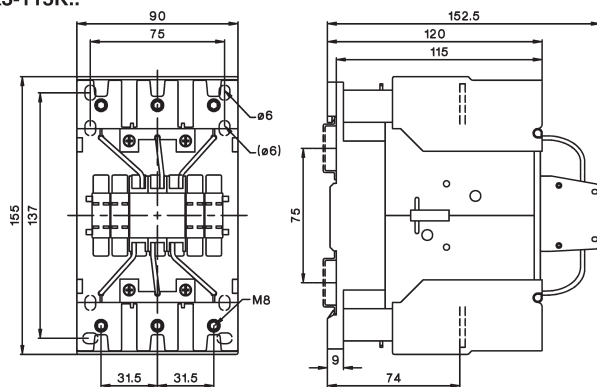
K3-62K..

K3-74K..



K3-90K..

K3-115K..

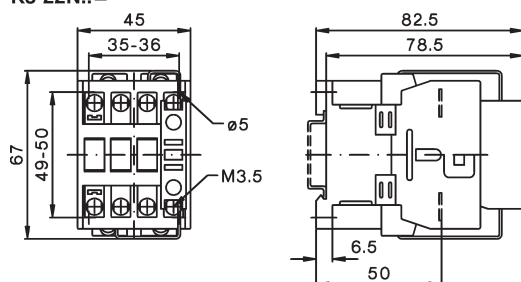


Leistungsschütze

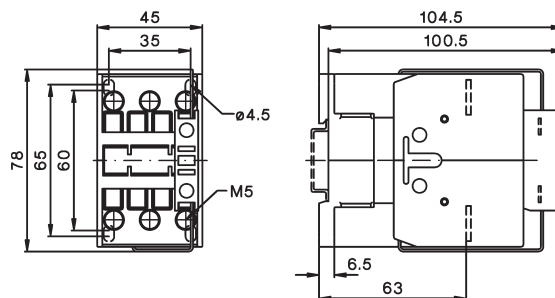
Maße

Schütze 3-polig, gleichstrombetätigt

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

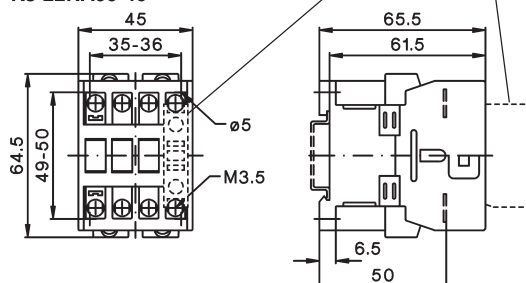


K3-24..
K3-32..
K3-40..

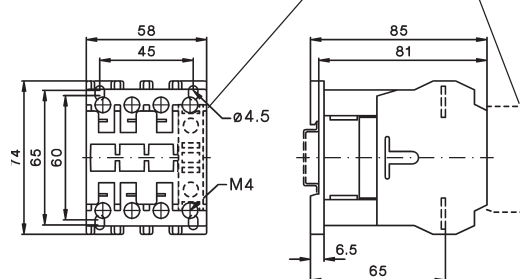


Schütze 4-polig, wechselstrombetätigt / gleichstrombetätigt

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

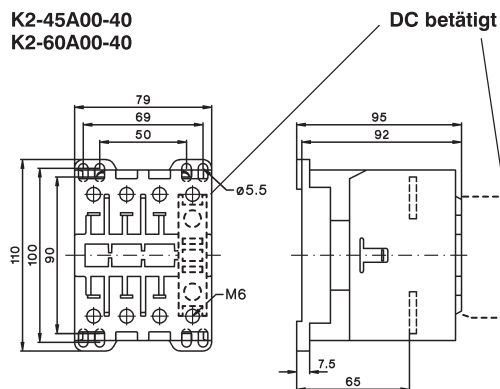


K2-23A00-40
K2-30A00-40
K2-37A00-40

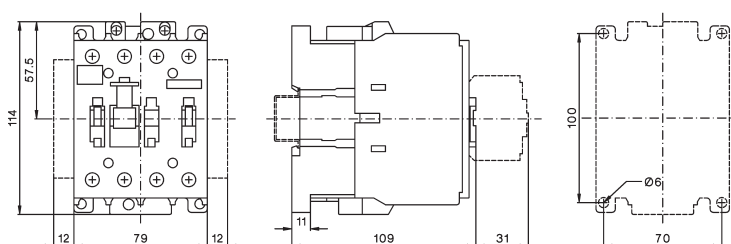


Schütze 4-polig, wechselstrombetätigt / gleichstrombetätigt

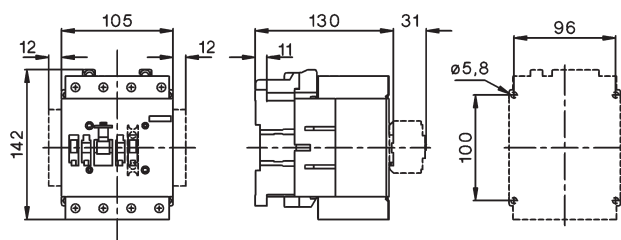
K2-45A00-40
K2-60A00-40



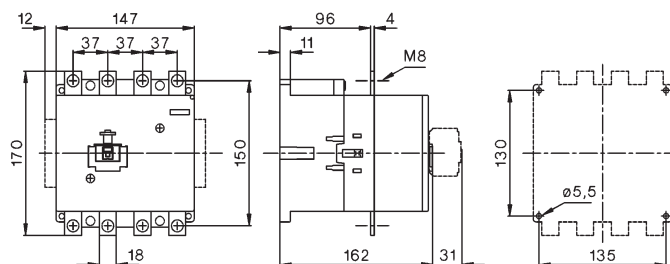
K3-41A00-40



K3-96A00-40



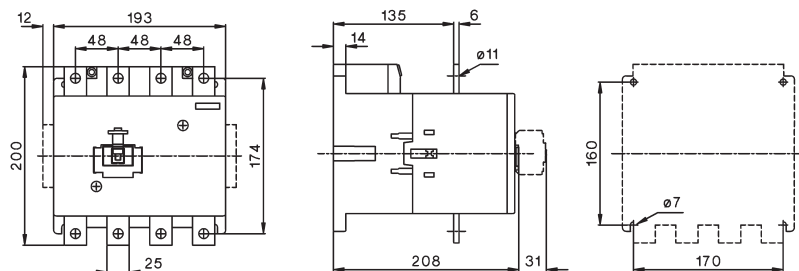
K3-116A00-40
K3-151A00-40
K3-176A00-40



Leistungsschütze

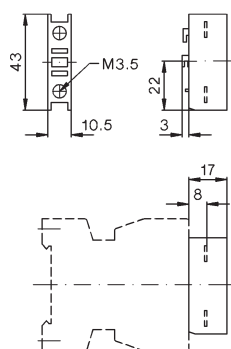
Schütze 4-polig, wechsel- und gleichstrombetätigt

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

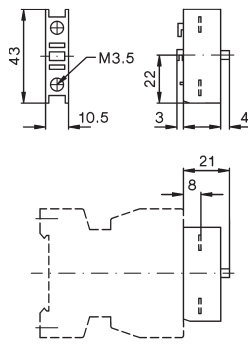


Maße Zubehör

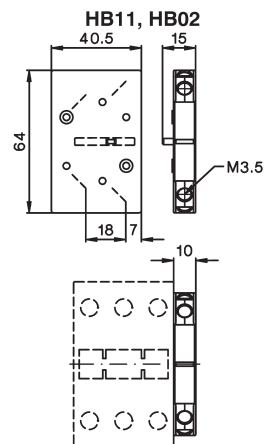
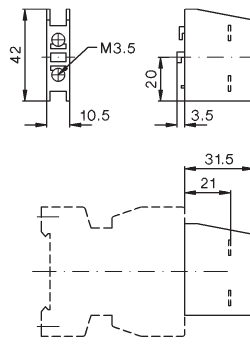
Hilfskontakte Stützklemmen
HN10, HN01 K2-SK, K2-DK



Tastkontakte
HTN10, HTN01

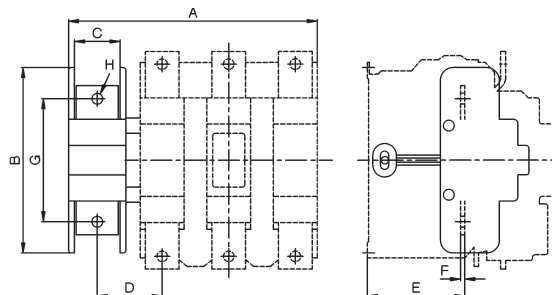


Hilfskontakte
HA10, HA01



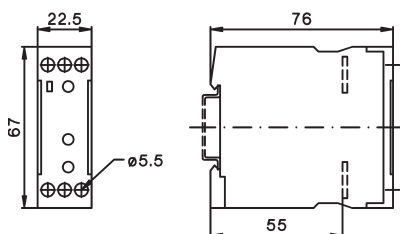
4. Pol für Schütze K3-200 bis K3-1200

Typ	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



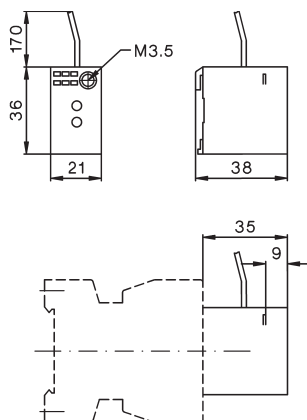
Elektronisches Zeitrelais

K3-T180 240



Elektronische Einschaltverzögerung

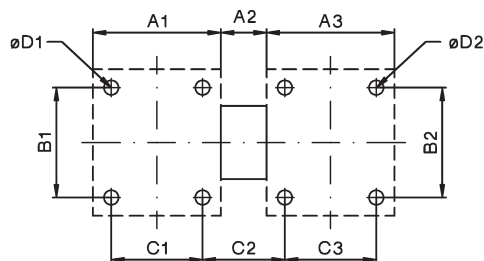
K2-TE..



Leistungsschütze

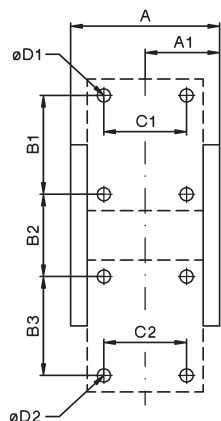
Maße Zubehör

Mechanische Verriegelungen

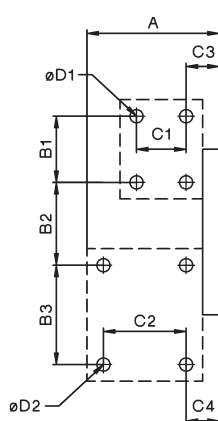


Typ	Schütz 1	Schütz 2	A1	A2	A3	B1	B2	C1	C2	C3	D1	D2	
LG10889	K3-07 bis K3-40	K3-07 bis K3-40	45	7	45	50	50	35	17	35	4,5	4,5	
LG10889	KG3-07 bis KG3-22	KG3-07 bis KG3-22	45	7	45	80	50	35	17	35	4,5	4,5	
LG10889	KG3-24 bis KG3-40	KG3-22 bis KG3-40	45	7	45	80	50	35	17	35	4,5	4,5	
LG10890	K3-50 bis K3-74	K3-24 bis K3-40	60	12	55	100	65	50	22	45	5,5	4,5	
LG10890	K3-50 bis K3-74	K3-50 bis 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-polige Schütze
LG11223H	K3-116, -151, -176	K3-116, -151, -176	147	30	147	130	130	135	42	135	6	6	4-polige Schütze
LG11223H	K3-210, -260, -316	K3-210, -260, -316	145	30	145	160	160	120	55	120	6	6	3-polige Schütze
LG11223H	K3-210, -260, -316	K3-210, -260, -316	193	30	193	160	160	170	55	170	6	6	4-polige Schütze
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	

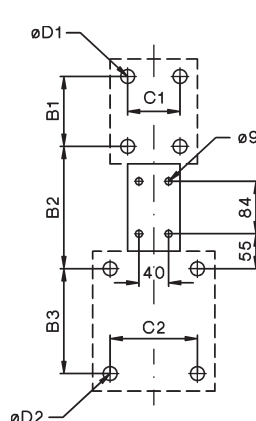
LG10400V, LG10402V



LG10399V



LG10403V, LG10401V



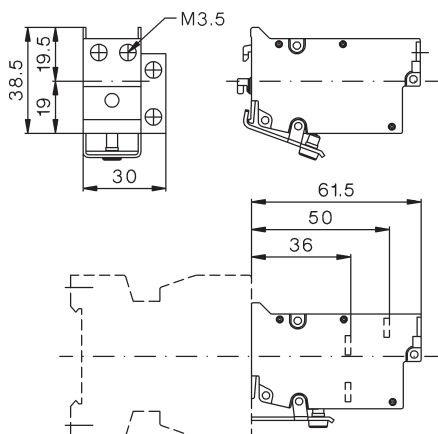
Typ	Schütz 1	Schütz 2	A	A1	B1	B2	B3	C1	C2	C3	C4	D1	D2
LG10400V	K3-315 - K3-550	K3-315 - K3-550	250	134	220	94	220	110	110	-	-	9	9
LG10402V	K3-700, -860	K3-700, -860	302	162	280	200	280	175	175	-	-	11	11
LG10403V	K3-1000, -1200	K3-1000, -1200	-	-	380	280	380	120	120	-	-	13,5	13,5
LG10399V	K3-450, -550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

Leistungsschütze

Maße Zubehör

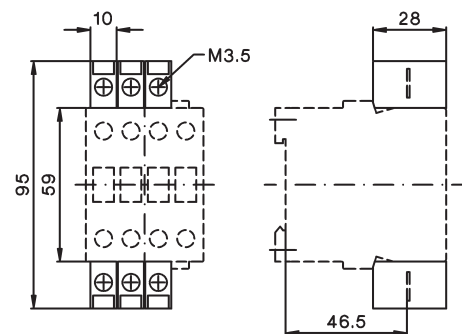
Mech. Verklückung

K2-L..



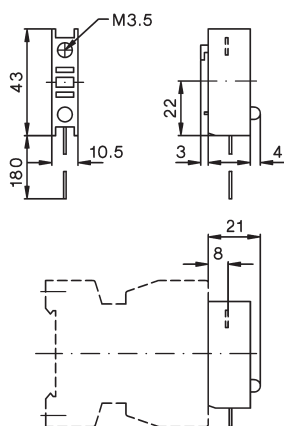
Schütze mit Zusatzklemmen

LG9339N (2 x 3 Stück)
für K3-10N. bis K3-22N.



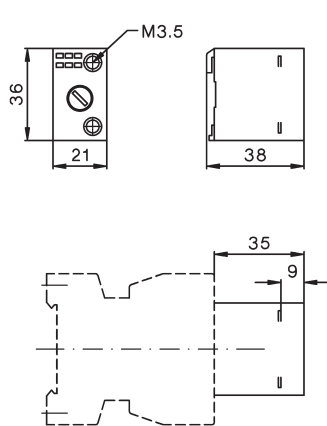
Anzeigeelemente

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



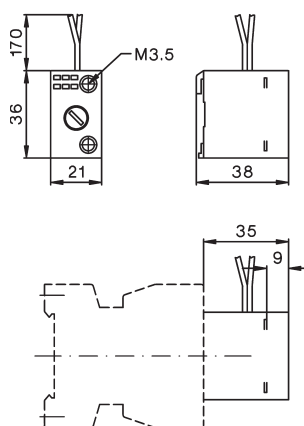
Sicherungshalter

K2-RF



Sicherungshalter mit Gleichrichter

K2-RF1
K2-RF3

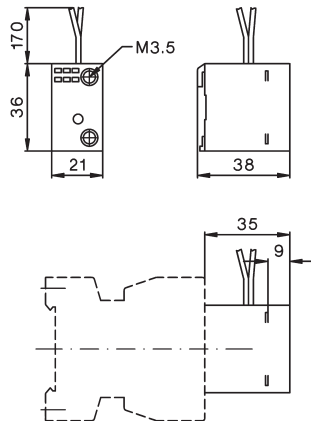


Leistungsschütze

Maße Zubehör

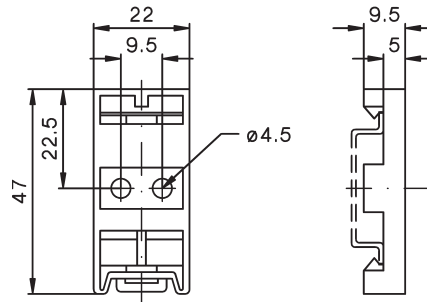
Interface

K2-IM



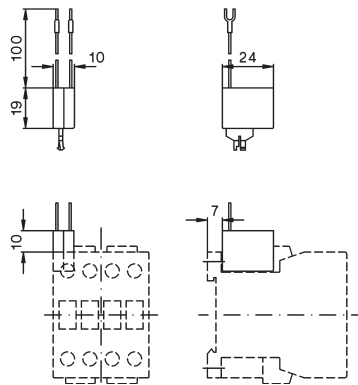
Schienenadapter

K2-SM

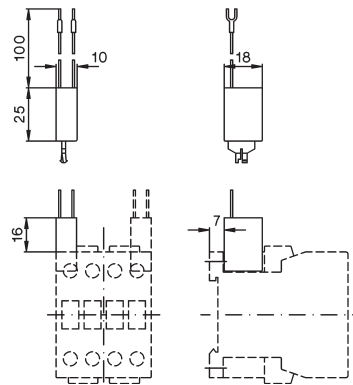


Entstörbauteile

RC-K3N ..

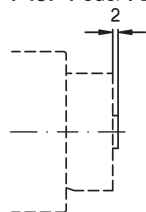


RC-K3NW ..



Bezeichnungsmaterial

Bezeichnungsschild
P487-1 oder P245-.



Schütze, Motorstarter

Leistungsschalter

Motorschuttschalter

Schalter

AC-Hauptschalter

DC-Lasttrennschalter

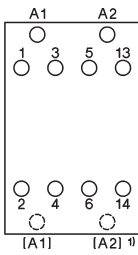
Befehls- und Meldegeräte

Vertretungen, Bezugsquellen

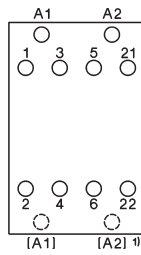
Leistungsschütze

Lage der Anschlußklemmen

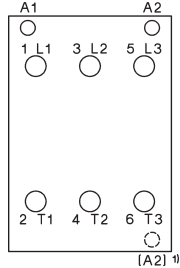
K3-10ND10
K3-14ND10
K3-18ND10
K3-22ND10
K3-18NK10



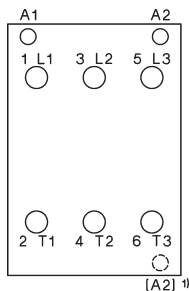
K3-10ND01
K3-14ND01
K3-18ND01
K3-22ND01
K3-18NK01



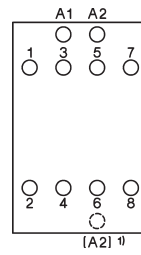
K3-24A00, K3-24K00
K3-32A00, K3-32K00
K3-40A00



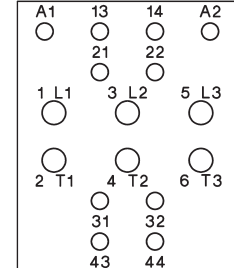
K3-50A00, K3-50K00
K3-62A00, K3-62K00
K3-74A00, K3-74K00



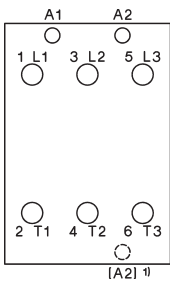
K3-10NA00-40
K3-14NA00-40
K3-18NA00-40
K3-22NA00-40
K2-23A00-40 bis
K2-60A00-40



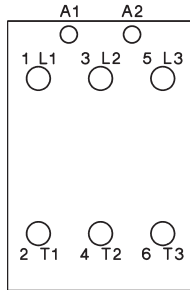
K85A22
K110A22



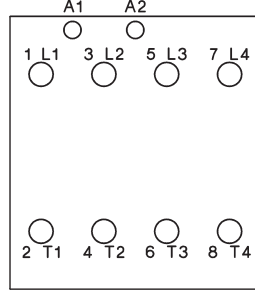
K3-90A00
K3-115A00



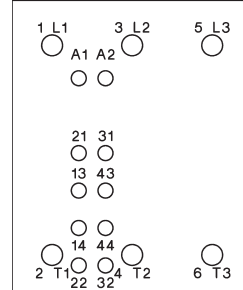
K3-151A00
K3-176A00
K3-210A00
K3-260A00
K3-316A00



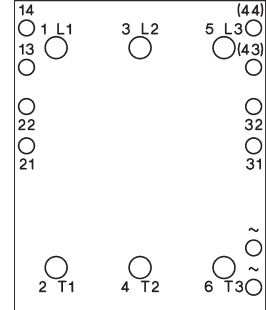
K3-116A00-40
K3-151A00-40
K3-176A00-40
K3-210A00-40
K3-260A00-40
K3-316A00-40



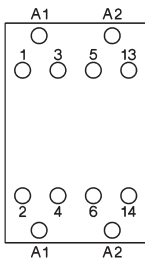
K3-450A22
K3-550A22
K3-700A22
K3-860A22



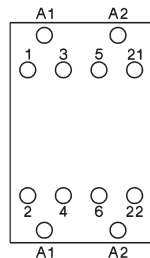
K3-1000A12
K3-1200A12



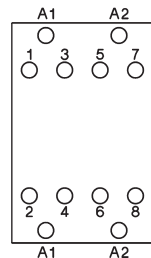
KG3-10A10
KG3-14A10
KG3-18A10
KG3-22A10



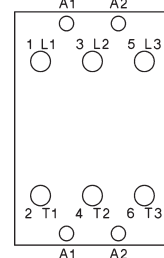
KG3-10A01
KG3-14A01
KG3-18A01
KG3-22A01



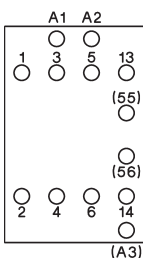
KG3-10A00-40
KG3-14A00-40
KG3-18A00-40
KG3-22A00-40



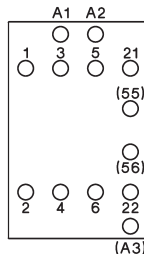
KG3-24A00
KG3-32A00
KG3-40A00



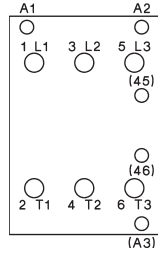
K3-10ND10=
K3-14ND10=
K3-18ND10=
K3-22ND10=



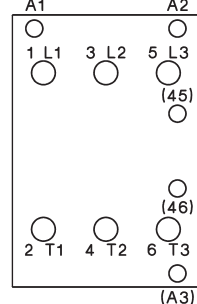
K3-10ND01=
K3-14ND01=
K3-18ND01=
K3-22ND01=



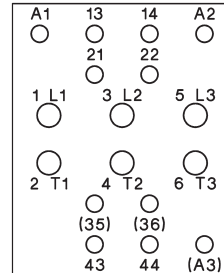
K3-24A00=
K3-32A00=
K3-40A00=



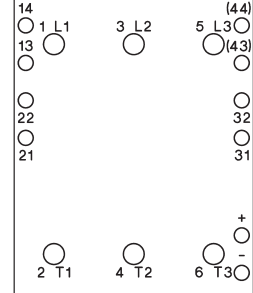
K3-50A00=
K3-62A00=
K3-74A00=



K85A21=
K110A21=



K3-1000A12=
K3-1200A12=



1) Typenzusatz "EUR" mit zusätzlichem Spulenanschluß
Bestellbeispiel - K3-10ND10EUR 230