Low Voltage Switchgear

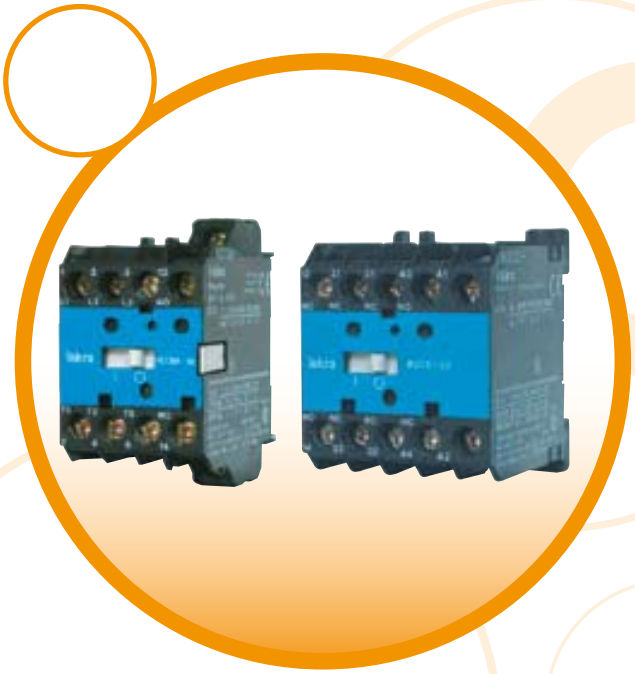
Iskra®
Iskra MIS

Index

NOTE: Data about OVERVOLTAGE PROTECTION and MOULDED CASE CIRCUIT BREAKERS can be found in separated brochures. General sales conditions can be found on our web site (www.iskra-mis.si)

MINI CONTACTORS

K03C, K07C, K07CG (DC), K07CF, K03M, K07M, K07MG (DC), K07MF, K07CX, K0CGX (DC), K07MX, K07MGX (DC)



- Contactors are used for switching electric motors and other resistive, inductive and capacitive loads
- A wide variety of snap-on auxiliary switch blocks and accessories
- Uniform marking of terminals in accordance with the EN 50005 and EN 50011 European standards
- Quick assembly to a 35 mm wide mounting rail in accordance with EN 60715 or fixing with two screws
- Open and funnel-shaped connection terminals - fast and simple connection
- High contact reliability at low voltages
- Possibility of individual marking on a special plate - easy identification of a contactor in the circuit
- Two contactor widths: 35 and 45 mm
- Optional operating position
- AC or real DC drive with low consumption
- Possibility of direct connection of the BR6 bimetal relay for protection against overload and in case of phase failure
- Version with all four main contacts (Sp4)
- Degree of protection IP20
- High electrical and mechanical endurance, and high switching capacity
- K07CF and K07MF are contactors for fast-on connection
- K07CX, K07CGX, K07MX and K07MGX are contactors with soldering pins
- Technical data for K07MF and K07MX are identical to K07M
- Technical data for K07MGX are identical to K07MG
- Technical data for K07CX are identical to K07C
- Technical data for K07CGX are identical to K07CG

TECHNICAL DATA						MOTOR CONTACTORS		
GENERAL	Type					K03M	K07M	K07MG
	Standards					IEC/EN 60947-5-1, IEC/EN 60947-4-1, UL 508		
	Approvals (K07CX, K07CGX, K07MX, K07MGX are without approvals)					UL, CSA, GOST		
	Climatic class					constant damp heat (IEC 60068-2-78) cyclic damp heat (IEC 60068-2-30)		
	Ambient temperature		open		°C	-20 … +60		
			closed			-20 … +45		
	Storage temperature				°C	-30 … +80		
	Contact reliability					17 V; ≥ 50 mA		
	Mechanical endurance				op. c.	10^7		
	Power dissipation per pole				W	1.2		
	Max. mechanical operating frequency with no load				op. c./h	3000		
	Max. electrical operating frequency AC-1/AC-3/AC-15/DC-13				op. c./h	600/600/1200/1200		
	Weight				kg	0.16	0.18	0.22
MAIN CIRCUIT	Rated insulation voltage			U_i	V	690		
	Thermal current			I_{th}	A	20		
	Rated frequency			f	Hz	50/60		
	Rated power		230 V	P_e	kW	7.5		
	AC-1		400 V			13		
			500 V			17.5		
			690 V			22		
	Rated operational current	up to 50°C	open	I_e	A	20		
	AC-1	up to 60°C	open			16		
	Rated motor power	single-phase	230 V	P_e	kW	0.75	1.1	1.1
	AC-3	three-phase	230 V			1.5	3	3
			400 V			2.2	5.5	5.5
			500 V			3	5.5	5.5
			690 V			4	5.5	5.5

MINI CONTACTORS

K03C, K07C, K07CG (DC), K07CF, K03M, K07M, K07MG (DC), K07MF, K07CX, K0CGX (DC), K07MX, K07MGX (DC)

TECHNICAL DATA						MOTOR CONTACTORS		
MAIN CIRCUIT	Type					K03M	K07M	K07MG
	Rated operational motor current	single-phase	230 V	I_e	A	8	10	10
	AC-3	three-phase	230 V	I_e	A	6.3	11.5	11.5
			400 V	I_e	A	5	11.3	11.3
			500 V	I_e	A	5.3	9	9
			690 V	I_e	A	4.9	6.5	6.5
	Rated motor power acc. to UL	single-phase	115 V	P_e	HP	1/3	½	½
			230 V	P_e	HP	¾	1½	1½
		three-phase	230 V	P_e	HP	2	3	3
			460 V	P_e	HP	3	5	5
			575 V	P_e	HP	5	7 ½	7 ½
	Electrical endurance of contacts AC-1 / AC-3				op. c.	0.2 x 10^6 / diagram 2		
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	25		
	Terminal capacity		rigid	S	mm^2	0.75 … 2.5		
			flexible	S	mm^2	0.5 … 2.5		
	Screw					M3.5		
	Screw head					PZ2		
	Tightening torque				Nm	1.2		
AUXILIARY CIRCUIT	Rated insulation voltage			U_i	V	690		
	Thermal current			I_{th}	A	20		
	Rated operational current		230 V	I_e	A	6		
	AC-15		400 V	I_e	A	4		
			500 V	I_e	A	2		
			690 V	I_e	A	1		
	Rated operational current		24 V	I_e	A	4		
	DC-13		110 V	I_e	A	0.25		
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20		
	Terminal capacity		rigid	S	mm^2	0.75 … 2.5		
			flexible	S	mm^2	0.5 … 2.5		
	Screw					M3,5		
	Screw head					PZ2		
	Tightening torque				Nm	1.2		
MAGNETIC SYSTEM	Coil consumption		switch-on	P_c	VA	39		–
				P_c	W	34		3
			operation	P_c	VA	8.1		–
				P_c	W	4		3
	Make / Break delay		make	NO	ms	10 - 15	10 - 10	25 - 30
				NC	ms	10 - 15	10 - 15	8 - 10
			break	NO	ms	6 - 15	5 - 10	7 - 10
				NC	ms	6 - 15	6 - 15	10 - 25
	Range of control voltage			U_c	%	85 … 110		
	Control voltages			U_c	V	6 - 415	6 - 690	6 - 250
	Terminal capacity		rigid	S	mm^2	0.75 … 2.5		
			flexible	S	mm^2	0.5 … 2.5		
	Screw					M3.5		
	Screw head					PZ2		
	Tightening torque				Nm	1.2		

MINI CONTACTORS

K03C, K07C, K07CG (DC), K07CF, K03M, K07M, K07MG (DC), K07MF, K07CX, K0CGX (DC), K07MX, K07MGX (DC)

TECHNICAL DATA					CONTACTOR RELAYS		
GENERAL	Type				K03C	K07C	K07CG
	Standards				IEC/EN 60947-5-1, UL 508		
	Approvals				UL, CSA, GOST		
	Climatic class				constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30		
	Ambient temperature		open	°C	-20 … +60		
			closed		-20 … +45		
	Storage temperature			°C	-30 … +80		
	Mechanical endurance			op. c.	10^7		
	Max. mechanical operating frequency with no load			op. c./h	3000		
	Max. electrical operating frequency AC-15/DC-13			op .c /h	1200/1200		
	Weight			kg	0.16	0.18	0.22
MAIN CIRCUIT	Rated insulation voltage		U_i	V	690		
	Thermal current		I_{th}	A	20		
	Rated operational current AC-15	230 V	I_e	A	6		
		400 V			4		
		500 V			2		
		690 V			1		
	Rated operational current DC-13	24 V	I_e	A	4		
		110 V			0.25		
	Electrical endurance AC-15			op. c.	diagram 1		
	Max. back-up fuse for short-circuit protection gL Coordination type 2		I_v	A	20		
MAIN CIRCUIT	Coil consumption	switch-on	P_c	VA	39		–
				W	34		3
		operation		VA	8.1		–
				W	4		3
	Range of control voltage		U_c	%	85 … 110		
	Control voltages		U_c	V	6 - 415	6 - 690	6 - 250
	Terminal capacity	rigid	S	mm²	0.75 … 2.5		
		flexible			0.5 … 2.5		
	Screw				M3.5		
	Screw head				PZ2		
	Tightening torque			Nm	1.2		

Standard control voltages and designations (AC)

V	24	42	48	110/125	220/240	380/415	440	500
50/60 Hz	B7	D7	E7	F7	M7	Q7	R7	S7

Standard control voltages and designations (DC)

V	12	24	48	60	72	110	125	220
	SD	BD	ED	ND	SD	FD	GD	MD

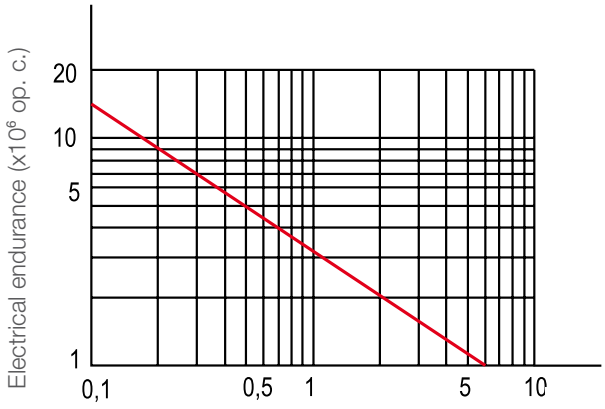
MINI CONTACTORS

K03C, K07C, K07CG (DC), K07CF, K03M, K07M, K07MG (DC), K07MF, K07CX, K0CGX (DC), K07MX, K07MGX (DC)

ELECTRICAL ENDURANCE

Diagram 1
Electrical endurance of contactor relays and auxiliary contacts of motor contactors

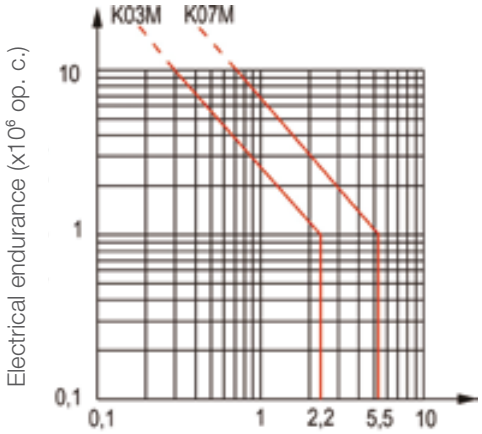
Utilization category: AC-15



Breaking current I_e (A) at 230 V
Operation frequency: 1200 op. c./h

Diagram 2
Electrical endurance of main contacts of motor contactors

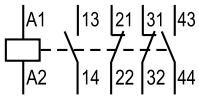
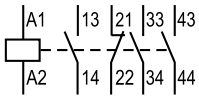
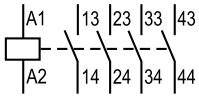
Utilization category: AC-3



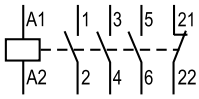
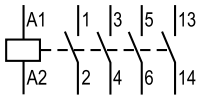
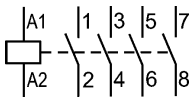
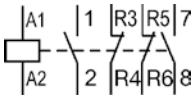
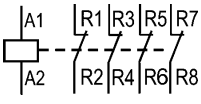
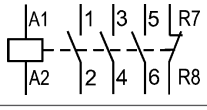
Rated motor power (kW) at 400 V, 50 Hz
Operation frequency: 600 op. c./h

CONTACT ARRANGEMENTS

CONTACTOR RELAYS

Type	Arrangement of contacts and terminal designation
K03C -22 K07C -22 K07CG -22 K07CF -22 K07CX -22 K07CGX -22	
K03C -31 K07C -31 K07CG -31 K07CF -31 K07CX -31 K07CGX -31	
K03C -40 K07C -40 K07CG -40 K07CF -40 K07CX -40 K07CGX -40	

MOTOR CONTACTORS

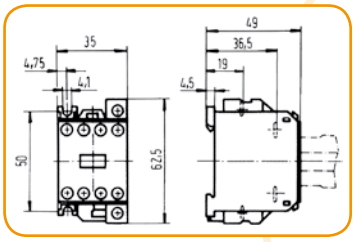
Type	Arrangement of contacts and terminal designation
K03M -01 K07M -01 K07MG -01 K07MF -01 K07MX -01 K07MGX -01	
K03M -10 K07M -10 K07MG -10 K07MF -10 K07MX -10 K07MGX -10	
K03M -10 Sp4 K07M -10 Sp4 K07MG -10 Sp4	
K07M -22 Sp4 K07MG -22 Sp4	
K07M -04 Sp4 K07MG -04 Sp4	
K07M -01 Sp4 K07MG -01 Sp4	

MINI CONTACTORS

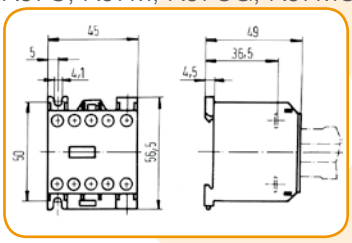
K03C, K07C, K07CG (DC), K07CF, K03M, K07M, K07MG (DC), K07MF, K07CX, K0CGX(DC), K07MX, K07MGX(DC)

DIMENSIONS

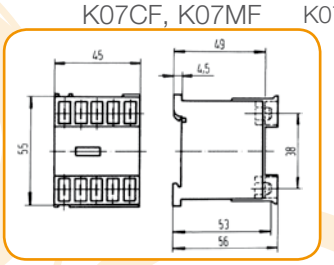
K03C, K03M



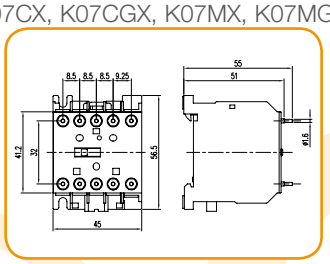
K07C, K07M, K07CG, K07MG



K07CF, K07MF

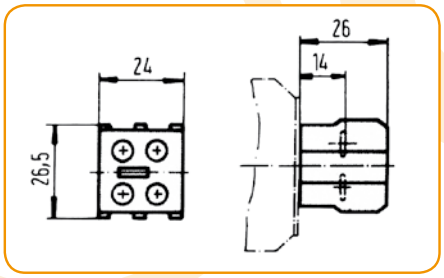


K07CX, K07CGX, K07MX, K07MGX



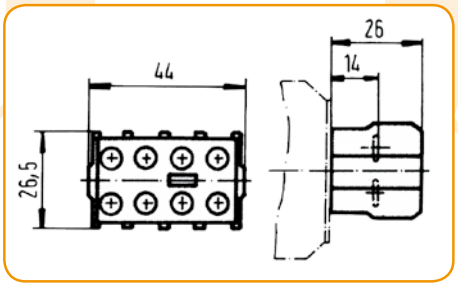
ACCESSORIES

ND2 - Two-pole snap-on auxiliary switch blocks



ND2C-02	51 61 52 62	ND2C-11	53 61 54 62	ND2C-20	53 63 54 64	ND2M-02	21 31 22 32
ND2M-11	21 33 22 34						

ND4 - Four-pole snap-on auxiliary switch blocks



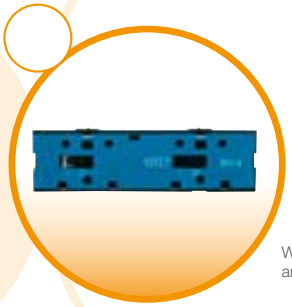
ND4C-04	51 61 71 81 52 62 72 82	ND4C-13	53 61 71 81 54 62 72 82	ND4C-22	53 61 71 83 54 62 72 84	ND4C-31	53 61 73 83 54 62 74 84
ND4C-40	53 63 73 83 54 64 74 84	ND4M-22	21 31 43 53 22 32 44 54	ND4M-31	21 33 43 53 22 34 44 54	ND4M-13	21 31 41 53 22 32 42 54

MINI CONTACTORS

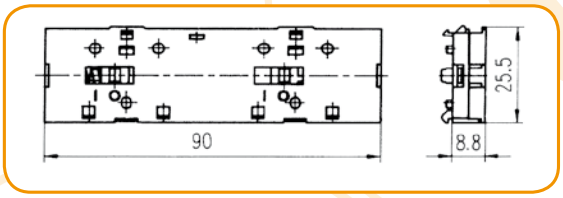
K03C, K07C, K07CG (DC), K07CF, K03M, K07M, K07MG (DC), K07MF, K07CX, K0CGX (DC), K07MX, K07MGX (DC)

ACCESSORIES

Type	Version	Rated operational current I_e (A) at AC-15			
		230 V	400 V	500 V	690 V
ND2	-20, -02, -11	6	4	2	1
ND4	-40, -04, -13, -31, -22	6	4	2	1

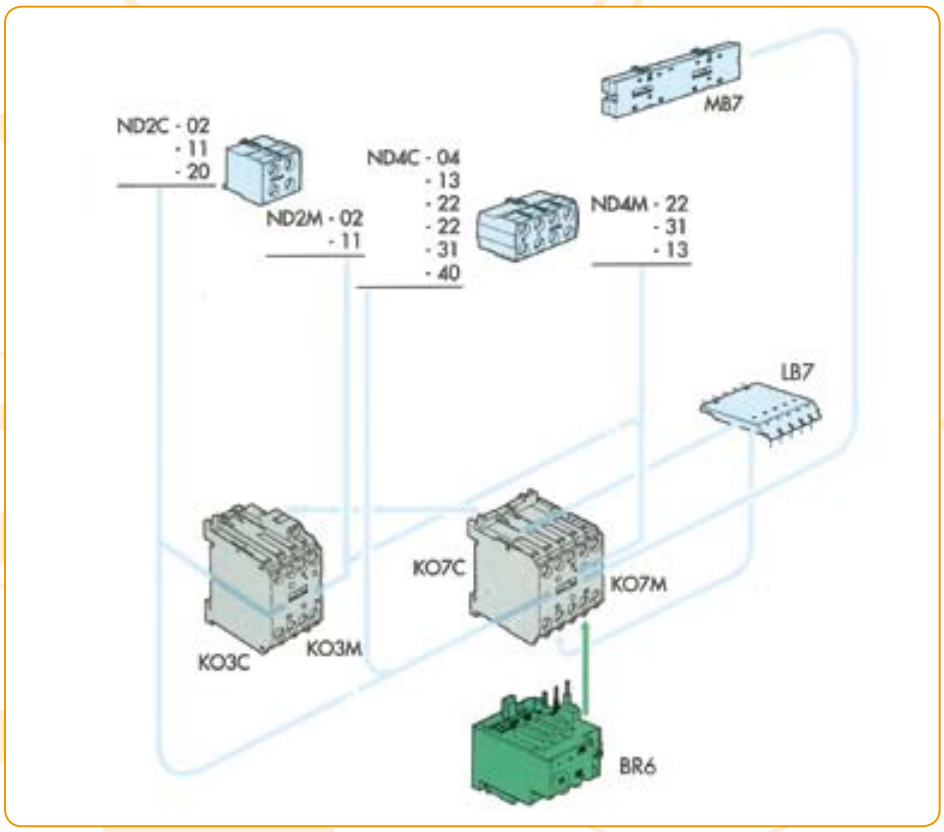


MB7 - Mechanical interlock



When a mechanical interlock is used, the minimum time of 50 ms is required from switching off the first contactor to switching on the second contactor and vice versa.

MOUNTING POSITIONS OF ACCESSORIES



ORDERING DATA

The type designation and control voltage are stated when ordering the contactors.
When ordering snap-on auxiliary switch blocks, only the type is stated.
Example: ND2M-22

K07M - 01 - M7

- M7: Control voltage (see page 4), frequency
- 01: Version of contacts
- K07M: Type

THERMAL OVERLOAD RELAY

BR6

- A three-pole relay for use with K07C, K07CG, K07M, K07MG mini contactors
- Used for overload protection of motors with operational currents up to 14 A and operational voltages up to 690 V AC
- Electrically isolated auxiliary contacts
- A RESET button provided with elements enabling selection between a manual and automatic mechanism and contacts reset to initial position
- A double trip lever enables sensitivity to phase failure in accordance with IEC/EN 60947-4-1
- Degree of protection IP20
- A scale for setting the motor operational current

Setting ranges and maximum permitted back-up fuses

Setting range (A)	Max. back-up fuse gL/gG For coordination "1": (A)	Max. back-up fuse gL/gG For coordination "2": (A)
0.11 - 0.16	20	0.5
0.16 - 0.25	20	1
0.25 - 0.4	20	2
0.4 - 0.6	20	2
0.6 - 0.9	20	4
0.9 - 1.3	20	4
1.3 - 1.9	20	6
1.9 - 2.8	20	6
2.8 - 4	20	10
4 - 6	20	10
6 - 9	20	16
8 - 11	25	20
11 - 14	35	25

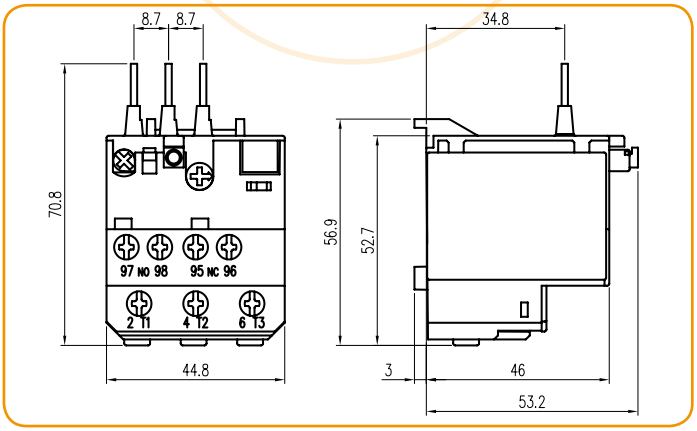
BR6 THERMAL OVERLOAD RELAY

BR6

TECHNICAL DATA

GENERAL	Type				BR6
	Standards				IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508
	Ambient temperature	open		°C	-25 ….+50
		closed		°C	-25 … +40
	Storage temperature			°C	-25 … +70
	Terminal capacity	solid or stranded		mm²	1 x 0.75 … 2 x 2.5
		flexible			1 x 0.75 … 2 x 2.5
		flexible with end sleeve			1 x 0.5 … 2 x 1.5
	Screw				M 3.5
	Screw head				PZ 2
	Tightening torque			Nm	1.0
	Weight			kg	0.08
MAIN CIRCUIT	Rated insulation voltage		U_i	V	690
	Rated impulse withstand voltage		U_{imp}	kV	6
	Rated operational voltage		U_e	V	690
	Rated frequency			Hz	0 … 400
	Adjustable current			A	0.11 - 14 (13 ranges)
	Overvoltage category / pollution category				III / 3
	Trip class acc. to IEC/EN 60947-4-1				10
	Power loss				approx. 2W / pole
AUXILIARY CIRCUIT	Rated insulation voltage		U_i	V	690
	Rated impulse withstand voltage		U_{imp}	kV	6
	Rated operational voltage		U_e	V	500 V AC. 220 V DC
	Overvoltage category / pollution degree				III / 3
	Thermal current		I_{th}	A	6
	Rated operational currents AC-15	make contact 220/240 V	I_e	A	0.5
		make contact 380/415 V			0.5
		make contact 500 V			0.3
		break contact 220/240 V			1.5
		break contact 380/415 V			0.7
		break contact 500 V			0.5
	Rated operation currents DC-13	both contacts 24 V	I_e	A	0.9
		both contacts 60 V			0.75
		both contacts 110 V			0.4
		both contacts 220 V			0.2

DIMENSIONS



KNL CONTACTORS

KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

- Contactors are used for switching electric motors and other resistive inductive and capacitive loads
- A wide variety of snap-on auxiliary switch blocks and accessories
- Uniform marking of connection terminals in accordance with EN 50005 and EN 50011
- Quick assembly to a 35 mm wide mounting rail in accordance with EN 60715 or fixing with screws
- KNL6 - KNL18 are 4-pole and KNL22 - KNL30 are 3-pole contactors
- Open and funnel-shaped connection terminals - fast and simple connection
- Plus/minus screws, protected against falling out - standard or posidrive screwdrivers can be used
- High contact reliability at low voltages
- Possibility of individual marking on a special plate - easy identification of a contactor in the circuit
- Auxiliary contact with a pushbutton function
- Uniform contactor width - 45 mm
- Assembly to vertical or horizontal surface with ±20° deviation
- Third coil terminal
- Possibility of direct connection of a bimetal relay for protection against overload and in case of phase failure
- Version with all four main contacts (Sp4) (KNL9 - KNL18)
- Degree of protection IP20
- High electrical and mechanical endurance, and high switching capacity
- Existing version KNL18 St4 for utilization category AC-6b (300 uF)

TEHNICAL DATA						MOTOR CONTACTORS					
GENERAL	Type					KNL9	KNL12	KNL16	KNL18	KNL22	KNL30
	Standards					IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508					
	Approvals					UL, CSA (except for KNL18), GOST					
	Climatic category					constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30					
	Ambient temperature		open		°C	-25 … +55					
			closed			-25 … +45					
	Storage temperature				°C	-30 … +80					
	Contact reliability					17 V ; ≥ 50 mA					
	Mechanical endurance				op. c.	10^7					
	Max. mechanical operating frequency with no load				c/h	3000					
	Max. electrical operating frequency AC-3/AC-4/AC-15/DC-13/ DC-1 to DC5/AC-6B				op. c/h	600/300/1200/1200/300/600					
	Weight				kg	0.3				0.32	
MAIN CIRCUIT	Rated insulation voltage			U_i	V	690					
	Thermal current at ≤ 40°C			I_{th}	A	25	25	25	32	35	35
	Rated frequency			f	Hz	50/60					
	Rated motor power	single-phase	230 V	P_e	kW	1.5	1.5	2.2	2.2	2.2	3.7
	AC-3	three-phase	230 V			2.2	3	4	4	5.5	7.5
			400 V			4	5.5	7.5	9	11	15
			500 V			5.5	5.5	7.5	9	11	15
			690 V			5.5	7.5	7.5	9	11	15
	Rated operational current	single-phase	230 V	I_e	A	12	12	17	17	17	28
	AC-3	three-phase	230 V			8.7	11.5	14.8	14.8	19.6	26.4
			400 V			9	12	16	18	22	30
			500 V			9	9	12.1	14	17.4	23.4
			690 V			6.5	8.8	8.8	10	12.6	17
	Rated motor power	three-phase	230 V	P_e	kW	0.75	1.1	1.5	1.5	2.2	4
	AC-4		400 V			1.5	2.2	3	3	4	6.5
			500 V			1.5	2.2	3	3	4	6.5
			690 V			1.5	2.2	3	3	4	6.5

Contactor versions: KNL6 (-40, -22, -31) KNL9-KNL18 (-10, -01, Sp4 -01, Sp4 -10) KNL9-KNL16 (Sp4 -22, Sp4 -04) KNL22- KNL30 (-00)

KNL CONTACTORS

KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

TECHNICAL DATA						MOTOR CONTACTORS					
MAIN CIRCUIT	Type					KNL9	KNL12	KNL16	KNL18	KNL22	KNL30
	Rated motor power according to UL	single-phase	115 V	P_e	HP	1	1	1½	1½	2	2
			230 V			2	2	3	3	3	5
		three-phase	230 V			3	3	5	5	7½	10
			460 V			5	5	7½	7½	15	20
			575 V			7½	7½	10	10	15	20
	Electrical endurance of contacts AC-3 / AC-4				op.c.	diagram 2 / diagram 3					
	Rated operational current at 24/110/220 V	DC-1	1 [1]	I_e	A	15 / 6 / 4				28 / 7 / 4	
			2 [1]			18 / 12 / 8				30 / 23 / 13	
			3 [1]			20 / 15 / 10				32 / 25 / 20	
	[1] Number of poles in series	DC-3 – DC-5	1 [1]			12 / 2 / 0.75				18 / 2 / 1	
			2 [1]			15 / 8 / 1.5				23 / 13 / 2	
			3 [1]			18 / 12 / 6				28 / 18 / 9	
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	25	25	35	35	50	50
	Terminal capacity		rigid	S	mm^2	0.75 … 6				2.5 … 10	
			flexible			0.5 … 6				1.5 … 10	
	Screw					M3.5				M4	
	Screw head					PZ2				PZ2	
	Tightening torque				Nm	1.4				1.8	
AUXILIARY CIRCUIT	Rated insulation voltage			U_i	V	690				–	
	Thermal current			I_{th}	A	20				–	
	Rated operational current AC-15		230 V	I_e	A	6				–	
			400 V			4				–	
			500 V			2				–	
			690 V			1				–	
	Rated operational current DC-13		24 V	I_e	A	10				–	
			60 V			4				–	
			110 V			0.9				–	
			220 V			0.4				–	
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20				–	
	Terminal capacity		rigid	S	mm^2	0.75 … 6				–	
			flexible			0.5 … 6				–	
	Screw					M3.5				–	
	Screw head					PZ2				–	
	Tightening torque				Nm	1.4				–	
MAGNETIC SYSTEM	Coil consumption		switch-on	P_c	VA	66					
					W	48					
			operation		VA	8					
					W	2.5					
	Make / Break delay		make		NO	10 - 20				10 - 20	
					NC	15 - 25				–	
			break	ms	NO	10 - 15				5 - 15	
					NC	8 - 15				–	
	Range of control voltage			U_c	%	85 … 110					
	Control voltages			U_c	V	12 … 600					
	Terminal capacity		rigid	S	mm^2	0.75 … 4					
			flexible			0.5 … 2.5					
	Screw					M3.5					
	Screw head					PZ2					
	Tightening torque				Nm	1.4					

KNL CONTACTORS

KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

TECHNICAL DATA					CONTACTOR RELAYS
GENERAL	Type				KNL6
	Standards				IEC / EN 60947-5-1, UL 508
	Approvals				UL, CSA, GOST
	Climatic class				constant damp heat (IEC 60068-2-78) cyclic damp heat (IEC 60068-2-30)
	Ambient temperature	open		°C	-25 … +55
		closed			-25 … +40
	Storage temperature			°C	-30 … +80
	Mechanical endurance			op. c.	10^7
	Max. mechanical operating frequency with no load			op. c./h	3000
	Max. electrical operating frequency AC-15/DC-13			op. c./h	1200/1200
	Weight			kg	0.3
MAIN CIRCUIT	Rated insulation voltage		U_i	V	690
	Thermal current		I_{th}	A	20
	Rated operational current AC-15	230 V	I_e	A	6
		400 V			4
		500 V			2
		690 V			1
	Rated operational current DC-13	24 V	I_e	A	10
		60 V			4
		110 V			0.9
		220 V			0.4
	Electrical endurance of contacts AC-15			op. c.	diagram 1
	Max. back-up fuse for short-circuit protection gL Coordination type 2		I_v	A	20
MAGNETIC SYSTEM	Coil consumption	switch-on	P_c	VA	66
				W	48
		operation		VA	8
				W	2.5
	Make / Break delay	make	NO	ms	10 - 15
			NC		15 - 20
		break	NO		10 - 15
			NC		8 - 15
	Rated control voltage limits for closing		U_c	%	85 … 110
	Control voltages		U_c	V	12 … 600
	Terminal capacity	rigid	S	mm^2	0.75 … 4
		flexible			0.5 … 2.5
	Screw				M3.5
	Screw head				PZ2
	Tightening torque			Nm	1.4

Standard control voltages and designations (AC)								
V	24	42	48	110/125	220/240	380/415	440	480/520
50/60 Hz	B7	D7	E7	F7	M7	Q7	R7	S7

KNL CONTACTORS

KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

ELECTRICAL ENDURANCE

DIAGRAM 1

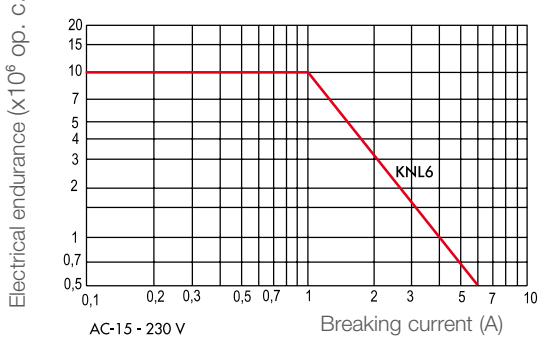


DIAGRAM 2

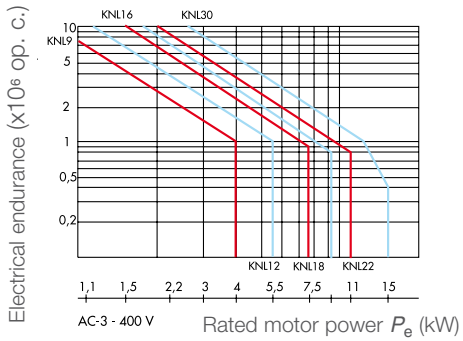
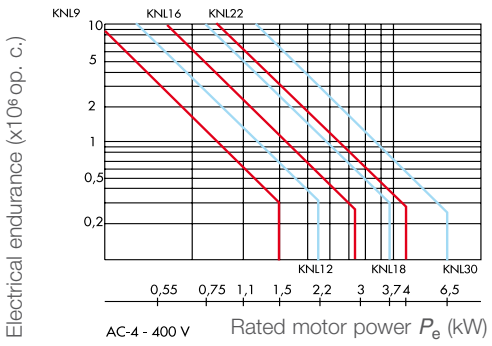
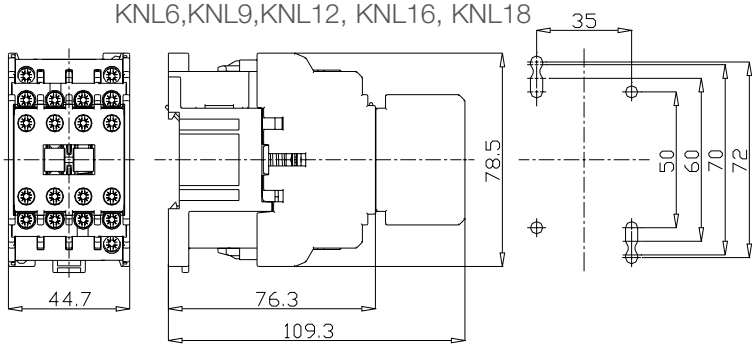


DIAGRAM 3

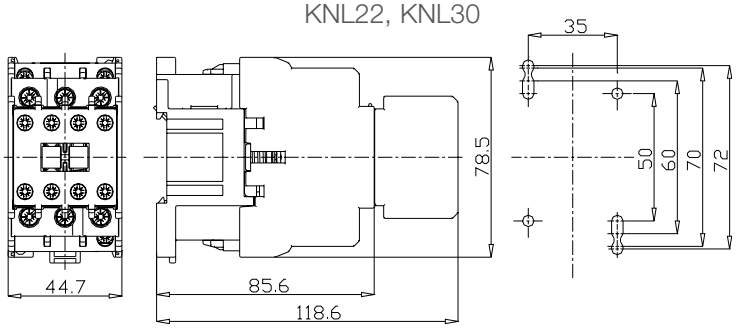


DIMENSIONS

KNL6,KNL9,KNL12, KNL16, KNL18



KNL22, KNL30

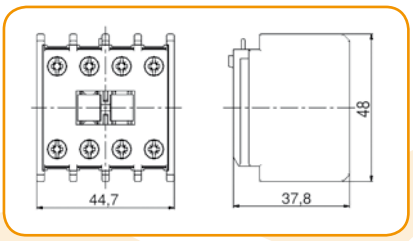


KNL CONTACTORS

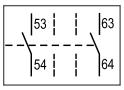
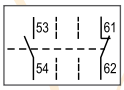
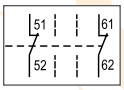
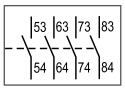
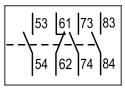
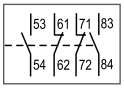
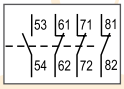
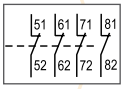
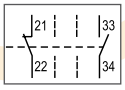
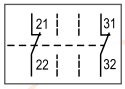
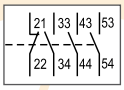
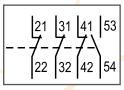
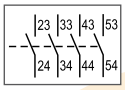
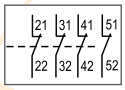
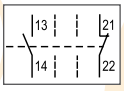
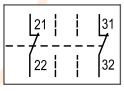
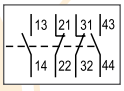
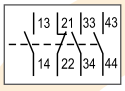
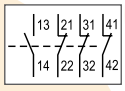
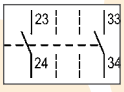
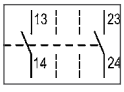
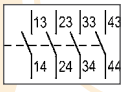
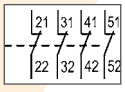
KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

ACCESSORIES

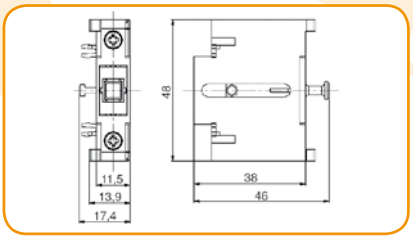
NDL1, NDL1, NDL3 - Two- and four-pole snap-on auxiliary switch blocks (mounting on a basic contactor)



Type	Version	Rated operational current I_e (A) at AC-15			
		230 V	400 V	500 V	690 V
NDL1 (for KNL6)	-11, -02, -20, -22, -31, -13, -40, -04	6	4	2	1
NDL2 (for KNL9, KNL12, KNL16, KNL18)	-11, -02, -20, -22, -31, -13, -40, -04				
NDL3 (for KNL22, KNL30)	-11, -02, -20, -22, -31, -13, -40, -04				

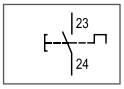
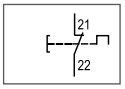
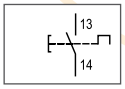
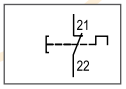
NDL1-20		NDL1-11		NDL1-02		NDL1-40		NDL1-31	
NDL1-22		NDL1-13		NDL1-04		NDL2-11		NDL2-02	
NDL2-22		NDL2-31		NDL2-13		NDL2-40		NDL2-04	
NDL3-11		NDL3-02		NDL3-22		NDL3-31		NDL3-13	
NDL2-20		NDL3-20		NDL3-40		NDL3-04			

NPL1, NPL2 - Single-pole snap-on auxiliary switch block for side mounting + push-button



Type	Version	Rated operational current I_e (A) at AC-15			
		230 V	400 V	500 V	690 V
NPL1 (only for KNL9, KNL12, KNL16, KNL18)	-10, -01	6	4	2	1
NPL2 (only for KNL22, KNL30)	-10, -01				

CONTACT ARRANGEMENTS

NPL1-10		NPL1-01		NPL2-10		NPL2-01	

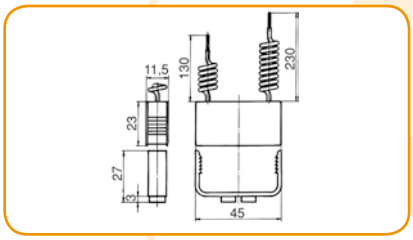
At all KNL6-KNL30 contactor versions, both snap-on auxiliary switch blocks with KNL+NDL+NPL auxiliary contacts can be used simultaneously.

KNL CONTACTORS

KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

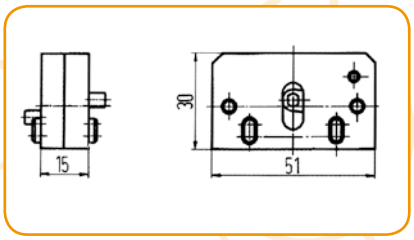
ACCESSORIES

RC suppressor

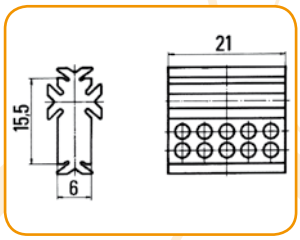


Type	RC1	RC2	RC3	RC4
Control voltage range U_c (V)	24 … 48	48 … 250	250 … 380	380 … 500

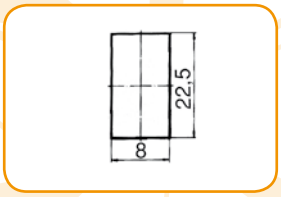
MBL mechanical interlock



DZ distance spacer



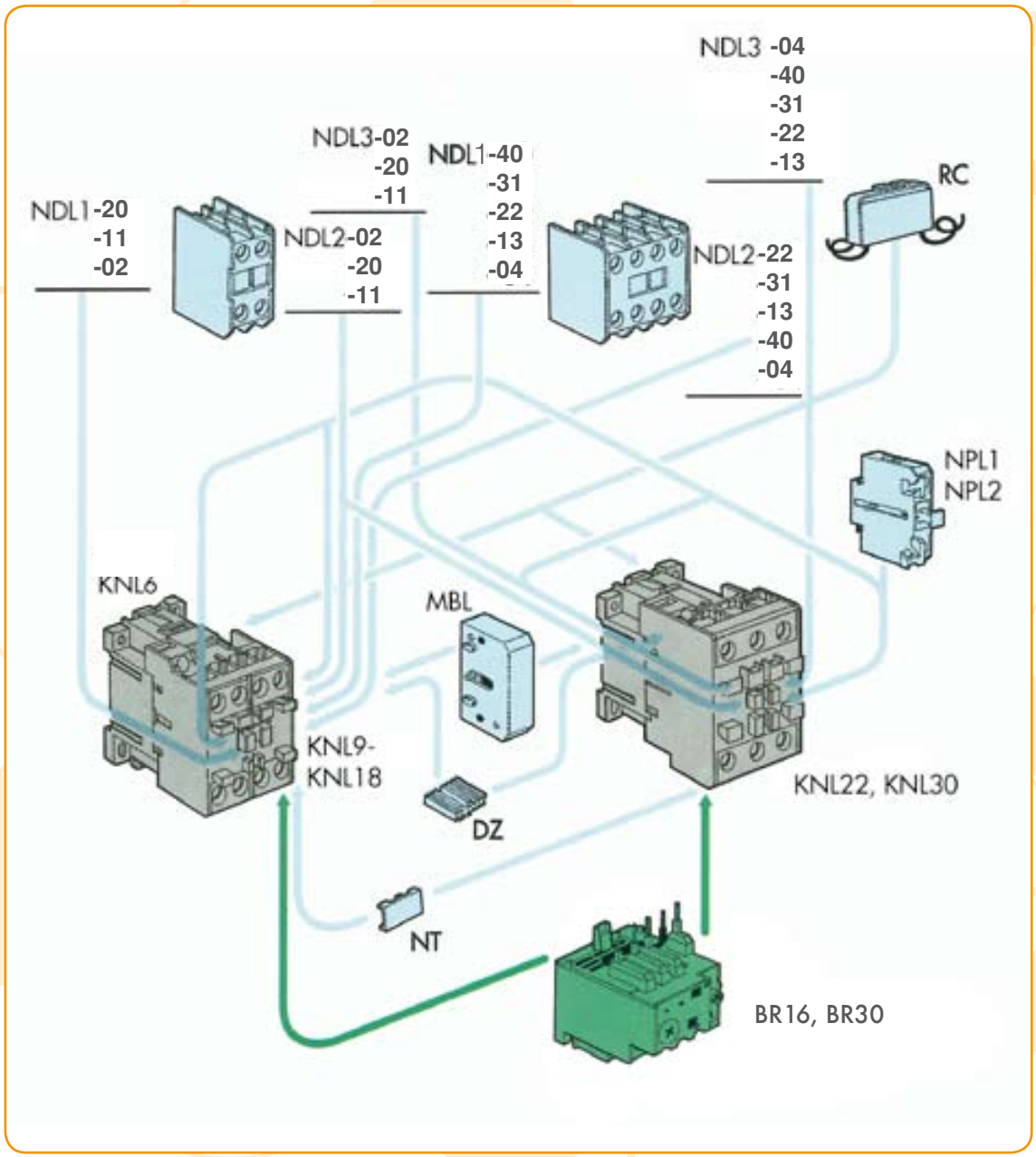
NT identification plate



KNL CONTACTORS

KNL6, KNL9, KNL12, KNL16, KNL18, KNL22, KNL30

MOUNTING POSITIONS OF ACCESSORIES



ORDERING DATA
The type designation and control voltage are stated when ordering the contactors.

KNL16-10 - M7

- M7: Control voltage (see page 12), frequency
- KNL16-10: Type

Thermal overload relays

BR16, BR30

- A three-pole overload relays for use with KNL6 to KNL30 and KNL6G to KNL30G contactors
- Used for overload protection of motors with operational currents up to 16 A (BR16) or 30 A (BR30) and operational voltages up to 690 V AC.
- Adjustable current setting
- Ambient temperature compensated
- Electrically isolated auxiliary contacts (1×NO and 1×NC)
- A RESET button provides both manual and automatic reset options
- A double trip lever provides sensitivity to phase loss in accordance with IEC/EN 60947-4-1.
- Degree of protection IP20

Setting ranges and maximum permitted back-up fuses

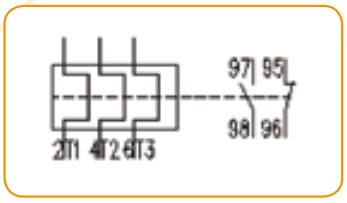
Type	Setting range (A)	Max. back-up fuse gL/gG (A)
BR16	0.1 - 0.16	1
	0.16 - 0.25	1
	0.25 - 0.4	1
	0.35 - 0.5	1
	0.45 - 0.63	1
	0.55 - 0.8	3
	0.75 - 1	3
	0.9 - 1.3	3
	1.1 - 1.6	3
	1.4 - 2	6
	1.8 - 2.5	6
	2.3 - 3.2	6
	2.9 - 4	10
	3.5 - 4.8	10
	4.5 - 6.3	15
	5.5 - 7.5	15
	7.2 - 10	25
	9 - 12.5	30
	11.3 - 16	40
	15 - 20	50
BR30	17.5 - 21.5	50
	21 - 25	60
	24.5 - 30	70

Thermal overload relays

BR16, BR30

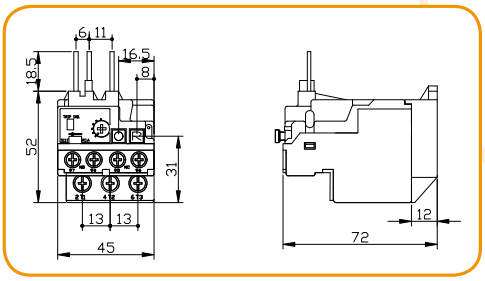
TECHNICAL DATA					CONTACTOR RELAYS	
GENERAL	Type				BR16	BR30
	Standards				IEC / EN 60947-4-1 , IEC / EN 60947-5-1, UL 508	
	Approvals				UL	
	For use with				KNL6-18, KNL6G-18G	KNL22, KNL30
	Ambient temperature	open closed		°C	-5 … +55 -5 … +55	
	Terminal capacity			mm2	1…10 (main) 0.75…2.5 (auxiliary)	
	Screw	main terminals auxiliary terminals			M 4 M3.5	
	Screw head				PZ2	
	Tightening torque	main terminals auxiliary terminals		Nm	1.2 0.8	
	Dimensions (W×H×D)			mm	45×70.5×60	45×69×60
	Weight			kg	0.115	
MAIN CIRCUIT	Rated insulation voltage		U_i	V	690	
	Rated impulse withstand voltage		Uimp	kV	6	
	Rated operational voltage		Ue	V	690	
	Adjustable current		Ir	A	0.1…20	17.5…30
	Rated frequency		f	Hz	50 / 60	
	Overvoltage category and pollution degree acc. to IEC/EN 60947-1				III / 3	
	Trip class acc. to IEC/EN 60947-4-1				10	
	Power loss		P	W	5…6.5 (depending on setting range)	
AUXILIARY CIRCUITS	Rated insulation voltage		*Ui*	V	690	
	Rated impulse withstand voltage		U_{imp}	kV	6	
	Rated operational voltage		U_e	V	up to 500 (AC) up to 230 (DC)	
	Overvoltage category and pollution degree acc. to IEC/EN 60947-1				III / 3	
	Thermal current (both contacts)		I_{th}	A	6	
	Rated operational currents (both contacts) AC-15	230 V 400 V 500 V	I_e	A	3 2 1	
	Rated operational currents (both contacts) DC-13	60 V 110 V 230 V	I_e	A	0.45 0.25 0.10	

CONNECTION DIAGRAM

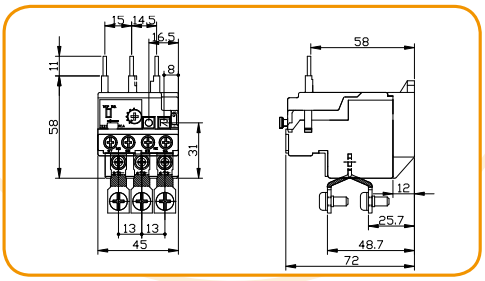


DIMENSIONS

BR16



BR30



KNL CONTACTORS

KNL6G, KNL9G, KNL12G, KNL16G, KNL18G, KNL22G, KNL30G

- KNLG contactors are used for DC control voltages
- KNL6G contactor relays are mainly used for switching control and signal circuits, and KNL9G-KNL30G motor contactors are used for switching motors and other resistive, inductive and capacitive consumers
- Assembly to a 35 mm wide mounting rail in accordance with EN 60715 or fixing with screws
- Assembly to vertical or horizontal surface with ±20° deviation
- Degree of protection IP20

TECHNICAL DATA

GENERAL	Type					KNL6G	KNL9G	KNL12G	KNL16G	KNL18G	KNL22G	KNL30G
	Standards					IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508						
	Approvals					GOST						
	Climatic category					constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30						
	Ambient temperature		open		°C	-25 … +60						
			closed			-25 … +40						
	Storage temperature				°C	-30 … +80						
	Contact reliability					17 V; ≥ 50 mA						
	Mechanical endurance				op. c.	5×10^6						
	Max. mechanical operating frequency with no load				op. c/h	3000						
	Max. electrical operating frequency AC-3/AC-4/AC-15/DC-13/DC-1 to DC-5				op. c/h	600/300/1200/1200/300						
	Weight			NPLG/ NDLG	kg	0.335 / 0.385				0.36 / 0.41		
MAIN CIRCUIT	Rated insulation voltage			U_i	V	690						
	Thermal current			I_{th}	A	20	25	25	25	32	35	35
	Rated frequency			f	Hz	50/60						
	Rated motor power	single-phase	230 V	P_e	kW	–	1.5	1.5	2.2	2.2	2.2	3.7
	AC-3	three-phase	230 V			–	2.2	3	4	4	5.5	7.5
			400 V			–	4	5.5	7.5	9	11	15
			500 V			–	5.5	5.5	7.5	9	11	15
			690 V			–	5.5	7.5	7.5	9	11	15
	Rated operational current	single-phase	230 V	I_e	A	–	12	12	17	17	17	28
	AC-3	three-phase	230 V			–	8.7	11.5	14.8	14.8	19.6	26.4
			400 V			–	9	12	16	18	22	30
			500 V			–	9	9	12.1	14	17.4	23.4
			690 V			–	6.5	8.8	8.8	10	12.6	17
	Rated motor power	three-phase	230 V	P_e	kW	–	0.75	1.1	1.5	1.5	2.2	4
	AC-4		400 V			–	1.5	2.2	3	3	4	6.5
			500 V			–	1.5	2.2	3	3	4	6.5
			690 V			–	1.5	2.2	3	3	4	6.5
	Rated motor power acc. to UL	single-phase	115 V	P_e	HP	–	1	1	1½	1½	2	2
			230 V			–	2	2	3	3	3	5
		three-phase	230 V			–	3	3	5	5	7½	10
			460 V			–	5	5	7½	7½	15	20
			575 V			–	7½	7½	10	10	15	20

KNLG CONTACTORS

KNL6G, KNL9G, KNL12G, KNL16G, KNLG18G, KNL22G, KNL30G

TECHNICAL DATA — MOTOR CONTACTORS

MAIN CIRCUIT	Type					KNL6G	KNL9G	KNL12G	KNL16G	KNL18G	KNL22G	KNL30G
	Electrical endurance of contacts AC-3 / AC-4				op. c.	diagram1 (AC-15)	diagram 2 / diagram 3					
	Rated operational current at: 24/110/220 V	DC-1	1 [1]	I_e	A	–	15 / 6 / 4				28 / 7 / 4	
			2 [1]			–	18 / 12 / 8				30 / 23 / 13	
			3 [1]			–	20 / 15 / 10				32 / 25 / 20	
	[1] Number of poles in series	DC-3 – DC-5	1 [1]			–	12 / 2 / 0.75				18 / 2 / 1	
			2 [1]			–	15 / 8 / 1.5				23 / 13 / 2	
			3 [1]			–	18 / 12 / 6				28 / 18 / 9	
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20	25	25	25	35	50	50
	Terminal capacity		rigid	S	mm^2	0.75 … 6					2.5 … 10	
			flexible			0.5 … 6					1.5 … 10	
	Screw					M3.5					M4	
	Screw head					PZ 2					PZ 2	
	Tightening torque				Nm	1.4					1.8	
AUXILIARY CIRCUIT	Rated insulation voltage			U_i	V	690					–	
	Thermal current			I_{th}	A	20					–	
	Rated operational current	AC-15	230 V	I_e	A	6					–	
			400 V			4					–	
			500 V			2					–	
			690 V			1					–	
	Rated operational current	DC-13	24 V	I_e	A	10					–	
			60 V			4					–	
			110 V			0.9					–	
			220 V			0.4					–	
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20					–	
	Terminal capacity		rigid	S	mm^2	0.75 … 6					–	
			flexible			0.5 … 6					–	
	Screw					M3.5					–	
	Screw head					PZ 2					–	
	Tightening torque				Nm	1.4					–	
MAGNETIC SYSTEM	Coil consumption		switch-on	P_c	W	110						
			operation			3						
	Make / Break delay		make	NO	ms	15 - 20					15 - 20	
				NC		10 - 20					–	
			break	NO		5 - 10					5 - 10	
				NC		10 - 15					–	
	Range of control voltage			U_c	%	85 … 110						
	Control voltage			U_c	V	12 … 240						
	Terminal capacity		rigid	S	mm^2	0.75 … 4						
			flexible			0.5 … 2.5						
	Screw					M3.5						
	Screw head					PZ 2						
	Tightening torque				Nm	1.4						

Standard control voltages and designations (DC)

Volts	12	24	48	60	72	110	125	220	240
	JD	BD	ED	ND	SD	FD	GD	MD	MUD

KNLG CONTACTORS

KNL6G, KNL9G, KNL12G, KNL16G, KNL18G, KNL22G, KNL30G

ELECTRICAL ENDURANCE

DIAGRAM 1

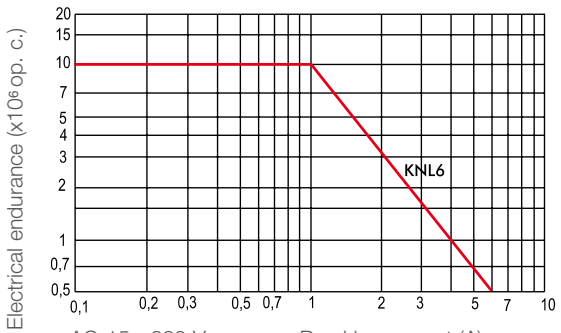


DIAGRAM 2

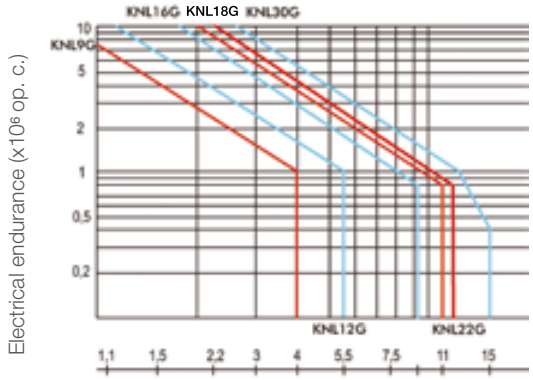
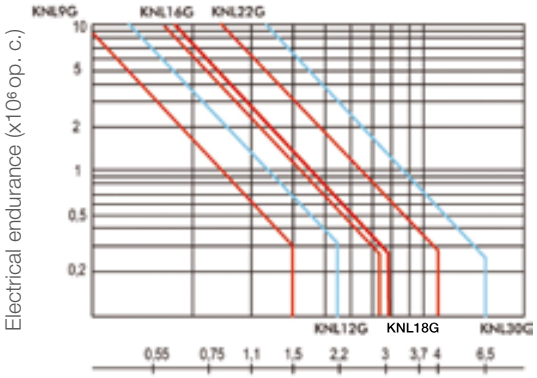
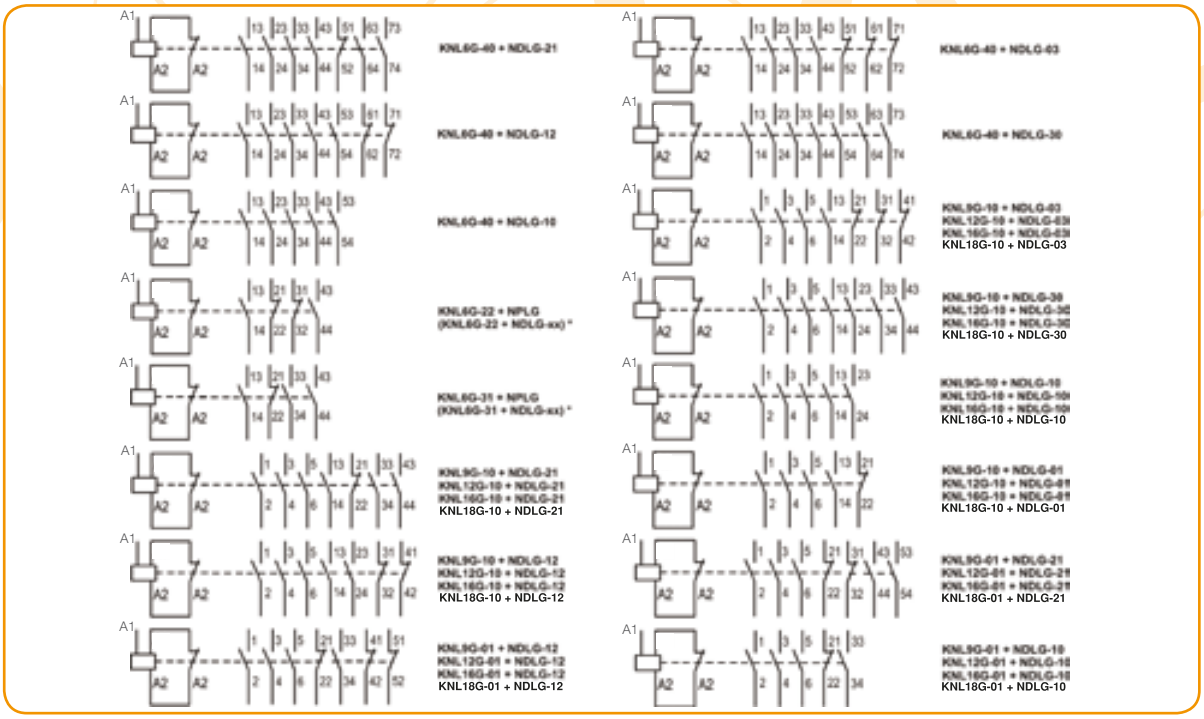


DIAGRAM 3



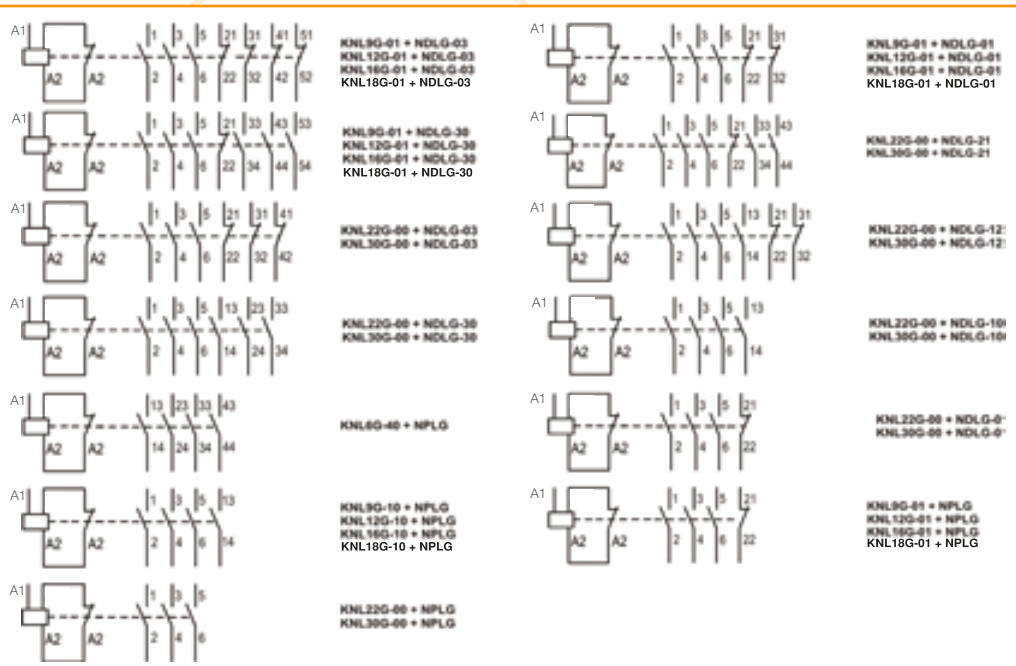
CONTACT ARRANGEMENTS



KNLG CONTACTORS

KNL6G, KNL9G, KNL12G, KNL16G, KNLG18G, KNL22G, KNL30G

CONTACT ARRANGEMENTS

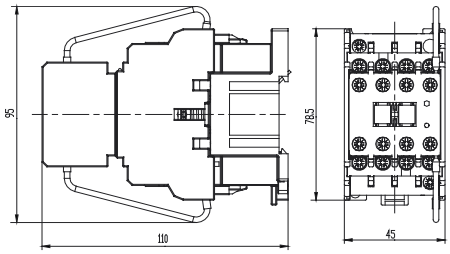


*Contactors in combination with NDLG can have the following versions of auxiliary contacts: 21, -12, -03, -30, -10, -01 -21, -12, -03, -30, -10, -01

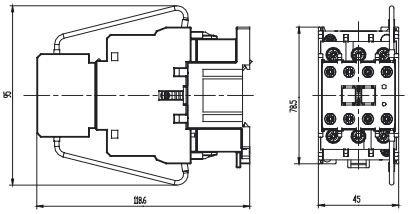
Simultaneous application of NDLG+NPL and NDL+NPLG snap-on auxiliary switch blocks is available.

DIMENSIONS

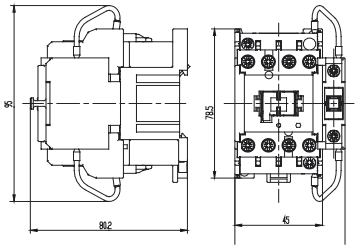
(KNL6G - KNL18G) + NDLG



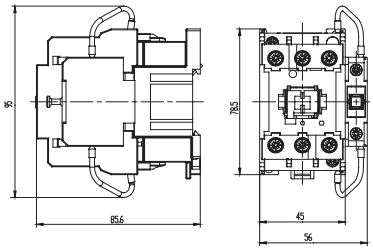
KNL22G + NDLG, KNL30G + NDLG



(KNL6G - KNL18G) + NPLG



KNL22G + NPLG, KNL30G + NPLG



ORDERING DATA

The type designation and control voltage are stated when ordering the contactors.

KNLG + NDLG

KNL16G -10 /21 - BD

- Control voltage (see page 20)
- NDLG snap-on auxiliary switch block
- Type

KNLG + NPLG

KNL16G - 10 - BD

- Control voltage (see page 20)
- Type

KNL CONTACTORS

KNL43, KNL63

- KNL43/63 contactors are mainly used for switching electric motors
- Possibility of direct connection of the BR63 bimetal relay for protection against overload and in case of phase failure
- Quick assembly to a 35 mm wide mounting rail in accordance with EN 60715
- Possibility of mounting the NDL4 snap-on auxiliary switch block with four auxiliary contacts
- Uniform marking of connection terminals in accordance with EN 50005 and EN 50011
- Use of the MBL43 mechanical interlock
- Degree of protection IP20

TECHNICAL DATA						MOTOR CONTACTORS	
GENERAL	Type					KNL43	KNL63
	Standards					IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60947-1, UL 508	
	Approvals					UL, CSA, GOST	
	Ambient temperature		open		°C	-20 … +60	
			closed			-20 … +45	
	Storage temperature				°C	-30 … +80	
	Power dissipation per pole				W	5	6
	Mechanical endurance				op. c.	3×10^6	
	Max. mechanical operating frequency with no load				c./h	3000	
	Max. electrical operating frequency AC-3/AC-4/AC-15/DC-13				c./h	600/300/1200/1200	
	Weight				kg	0,93	
MAIN CIRCUIT	Rated insulation voltage			U_i	V	690	
	Thermal current			I_{th}	A	75	85
	Rated frequency			f	Hz	50/60	
	Rated motor power	three-phase	230 V	P_e	kW	12,5	15
			400 V			22	30
	AC-3		690 V			30	40
	Rated operational current	three-phase	230 V	I_e	A	45	63
			400 V			45	63
	AC-3		690 V			33	45
	Rated operational current	three-phase	400 V	P_e	kW	15	22
	AC-4		690 V			18,5	25
	Electrical endurance AC-3 / AC-4				op. c.	diagram 1 / diagram 2	
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	80	125
	Terminal capacity		rigid	S	mm²	35	
			flexible			25	
	Screw					M6	
	Screw head					PZ2	
	Tightening torque				Nm	4	
AUXILIARY CIRCUIT	Rated insulation voltage			U_i	V	690	
	Thermal current			I_{th}	A	16	
	Rated operational current		230 V	I_e	A	6	
			400 V			4	
	AC-15		500 V			2	
			690 V			1	

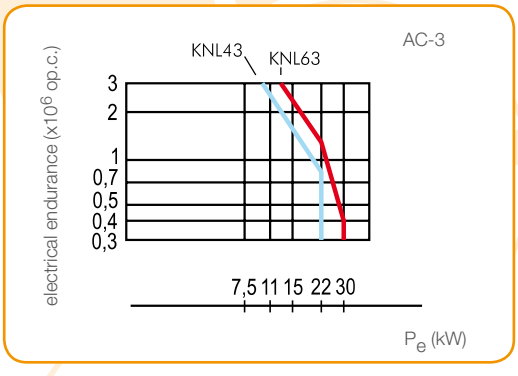
KNL CONTACTORS

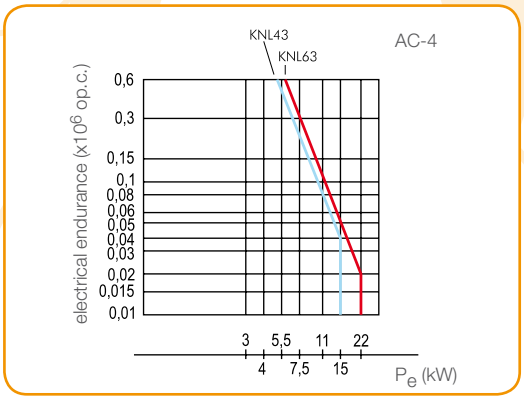
KNL43, KNL63

TECHNICAL DATA					MOTOR CONTACTORS	
	Type				KNL43	KNL63
AUXILIARY CIRCUIT	Rated operational current DC-13	24 V 110 V 220 V	I_e	A	4 0.25 0.1	
	Max. back-up fuse for short-circuit protection gL Coordination type 2		I_v	A	10	
	Terminal capacity	rigid flexible	S	mm²	1 … 2.5 1 … 2.5	
	Screw				M3.5	
	Screw head				PZ 2	
	Tightening torque			Nm	0.8	
MAGNETIC SYSTEM	Coil consumption	switch-on operation	P_c	VA W VA W	130 80 10 3	
	Make / brake delays	make brake		ms	10 - 20 8 - 15	
	Range of control voltage		U_c	%	85 … 110	
	Control voltage		U_c	V	12 … 500	
	Terminal capacity	rigid flexible	S	mm²	1 … 2.5 1 … 2.5	
	Screw				M3.5	
	Screw head				PZ 2	
	Tightening torque			Nm	0.8	

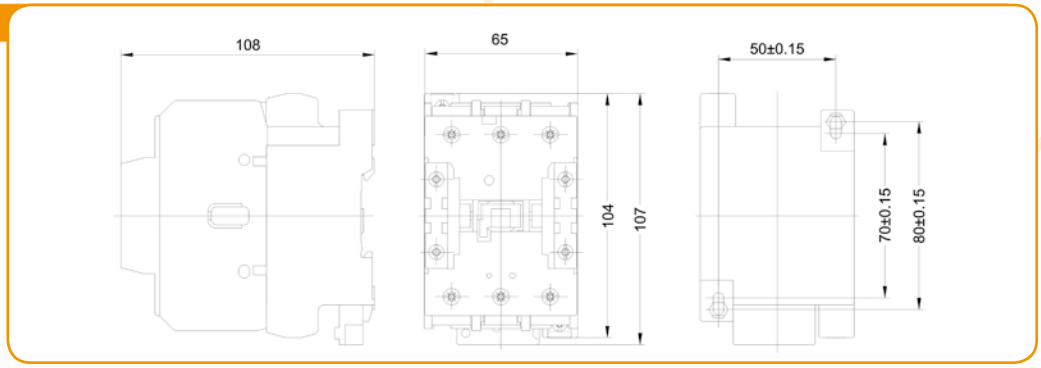
STANDARD CONTROL VOLTAGES AND DESIGNATIONS (AC)

V	24	42	48	220/240	380/415
50/60 Hz	B7	D7	E7	M7	Q7





DIMENSIONS

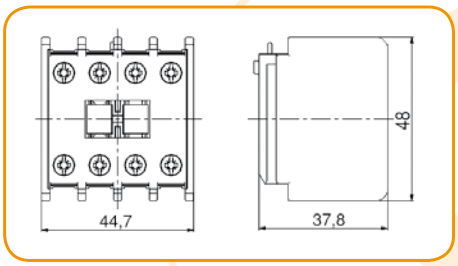


KNL CONTACTORS

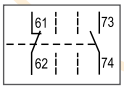
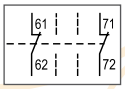
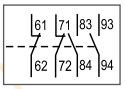
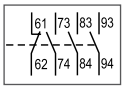
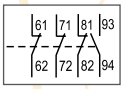
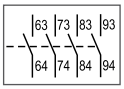
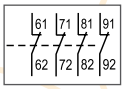
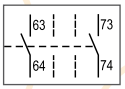
KNL43, KNL63

ACCESSORIES

NDL4
Two- and four-pole snap-on auxiliary switch blocks
(mounting on a basic contactor)



Type	Version	Rated operational current Ie (A) at AC-15			
		230 V	400 V	500 V	690 V
NDL4	-11, -02, -20, -22, -31, -13, -40, -04	6	4	2	1

NDL4-11		NDL4-02		NDL4-22		NDL4-31		NDL4-13	
NDL4-40		NDL4-04		NDL4-20					

MBL43 Mechanical interlock

ORDERING DATA

The type designation and control voltage are stated when ordering the contactors.

KNL43/63 - 11 - M7 - 50/60

- 50/60 — Frequency
- M7 — Control voltage (see page 24)
- 11 — Version of contacts
- KNL43/63 — Type

BR63 thermal overload relay

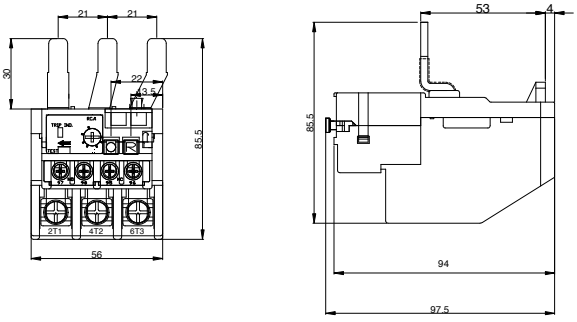
- A three-pole thermal overload relay for use with KNL43/63 contactors
- Used for overload protection of motors with operational currents up to 97 A and operational voltages up to 690 V AC
- Adjustable current setting
- Ambient temperature compensated
- Electrically isolated auxiliary contacts (1×NO, 1×NC)
- A RESET button provides both manual and automatic reset options
- A double trip lever provides sensitivity to phase loss in accordance with IEC/EN 60947-4-1.
- Degree of protection IP20

Setting ranges and maximum permitted back-up fuses

Type	Setting range (A)	Max. back-up fuse gL/gG (A)
BR63	17 - 25	100
	24.5 - 36	100
	35 - 47	125
	45 - 60	150
	58 - 75	200
	72 - 90	250
	77 - 97	250

DIMENSIONS

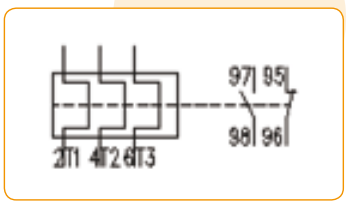
BR63



BR63 thermal overload relay

TECHNICAL DATA				CONTACTOR RELAYS
GENERAL	Type			BR63
	Standards			IEC / EN 60947-4-1 , IEC / EN 60947-5-1, UL 508
	Approvals			UL
	For use with			KNL43/63
	Ambient temperature open closed		°C	-5 … +55 -5 … +55
	Terminal capacity		mm2	6…35 (main), 0.75…2.5 (auxiliary)
	Screw main terminals auxiliary terminals			M 5 M 3.5
	Screw head main terminals auxiliary terminals			PZ2
	Tightening torque main terminals auxiliary terminals		Nm	2.5 0.8
	Dimensions (W×H×D)		mm	56x85.5x97.5
	Weight		kg	0.350
MAIN CIRCUIT	Rated insulation voltage	U_i	V	690
	Rated impulse withstand voltage	Uimp	kV	6
	Rated operational voltage	Ue	V	690
	Adjustable current	Ir	A	17…97
	Rated frequency	f	Hz	50 / 60
	Overvoltage category and pollution degree acc. to IEC/EN 60947-1			III / 3
	Trip class acc. to IEC/EN 60947-4-1			10
	Power loss at I_n	P	W	11…15.5 (depending on setting range)
AUXILIARY CIRCUITS	Rated insulation voltage	*Ui*	V	690
	Rated impulse withstand voltage	U_{imp}	kV	6
	Rated operational voltage	U_e	V	up to 600 (AC) up to 250 (DC)
	Overvoltage category and pollution degree acc. to IEC/EN 60947-1			III / 3
	Thermal current (both contacts)	I_{th}	A	10
	Rated operational currents (both contacts) AC-15 120 V 240 V 380 V 480 V 500 V 600 V	I_e	A	 6 3 1.9 1.5 1.4 1.2
	Rated operational currents (both contacts) DC-13 125 V 250 V	I_e	A	 0.55 0.27

CONNECTION DIAGRAM



Lamps for KNL

Switching of Lamps

Type	P [W]	C [µF]	I [A]	KNL9 / KNL9G	KNL12 / K
Incandescent lamps and tungsten halogen lamps	15	-	0.07	90	120
	25	-	0.11	55	73
	40	-	0.18	35	47
	60	-	0.2 6	23	31
	75	-	0.33	19	25
	100	-	0.44	14	19
	150	-	0.65	9	12
	200	-	0.87	7	9
	300	-	1.30	5	6
	500	-	2.17	2	3
	1000	-	4.35	1	1
Energy saving lamps	3	-	0.030	33	43
	5	-	0.040	30	40
	7	-	0.055	28	37
	8	-	0.065	25	33
	9	-	0.075	23	30
	10	-	0.080	23	30
	11	-	0.090	23	30
	12	-	0.100	20	27
	14	-	0.110	20	27
	15	-	0.120	18	23
	16	-	0.130	18	23
	18	-	0.145	15	20
	20	-	0.160	14	18
	21	-	0.170	13	17
	23	-	0.185	13	17
	24	-	0.195	13	17
	30	-	0.160	13	17
Compact fluorescent lamps - series correction	10	1.4	0.19	33	43
	13	1.4	0.18	33	43
	18	1.7	0.23	28	37
	26	2.5	0.33	19	25
	18	2.7	0.38	16	21
	24	2.7	0.35	16	21
	36	3.4	0.44	14	18
Compact fluorescent lamps - parallel correction	5	2.2	0.18	23	30
	7	2.1	0.18	24	31
	9	2,0	0.17	25	33
	10	2.2	0.19	23	30
	11	1.7	0.16	28	37
	13	1.8	0.18	28	37
	18	2.3	0.23	22	29
	26	3.3	0.33	15	20
	18	4.2	0.38	11	15
	24	3.6	0.35	13	18
	36	4.4	0.44	11	15
Compact fluorescent lamps with electronic control gear (ECG)	5	-	0.05	35	47
	7	-	0.05	35	47
	9	-	0.07	25	33
	10	-	0.07	25	33
	11	-	0.07	25	33

Lamps for KNL

Max. number of lamps per pole at 230 V 50 Hz						
KNL12G	KNL16 / KNL16G	KNL18 / KNL18G	KNL22 / KNL22G	KNL30 / KNL30G	KNL43	KNL63
	160	180	360	470	560	800
	100	110	220	280	340	480
	62	70	130	170	210	300
	41	46	92	118	140	200
	33	37	73	94	110	160
	25	28	55	71	85	120
	16	18	36	47	56	80
	12	14	27	35	42	60
	8	9	18	23	28	40
	4	5	10	13	17	24
	2	2	5	6	8	12
	58	65	150	200	650	1100
	53	60	135	180	500	900
	49	55	120	160	380	700
	44	50	110	150	320	600
	40	45	100	140	280	530
	40	45	100	140	260	500
	40	45	100	140	240	440
	35	40	95	120	210	400
	35	40	90	120	200	360
	30	35	85	115	180	330
	30	35	80	105	165	300
	26	30	70	95	150	270
	24	27	65	85	135	245
	22	25	60	80	125	230
	22	25	60	70	115	210
	22	25	55	70	110	200
	22	25	55	70	110	200
	58	65	105	165	200	280
	58	65	105	165	200	280
	49	55	85	135	165	230
	34	38	60	95	115	160
	28	32	50	80	100	140
	28	32	50	80	100	140
	24	27	45	70	85	120
	40	45	100	150	270	380
	42	47	104	157	285	400
	44	50	110	165	300	420
	40	45	100	150	270	380
	49	55	125	194	350	490
	49	55	120	183	330	460
	38	43	95	143	260	360
	27	30	66	100	180	250
	20	23	52	78	140	200
	24	27	61	91	160	230
	19	22	50	75	130	190
	62	70	180	250	400	700
	62	70	180	250	400	700
	45	50	128	180	300	500
	45	50	128	180	300	500
	45	50	128	180	300	500

Lamps for KNL

Switching of Lamps

Type	P [W]	C [µF]	I [A]		
				KNL9 / KNL9G	KNL12 / K
Compact fluorescent lamps with electronic control gear (ECG)	13	-	0.07	25	33
	18	-	0.22	10	13
	24	-	0.22	10	13
	26	-	0.22	10	13
	32	-	0.22	10	13
	36	-	0.22	10	13
	40	-	0.22	10	13
	42	-	0.22	10	13
	55	-	0.28	8	11
	57	-	0.28	8	11
	70	-	0.35	7	10
	80	-	0.41	6	8
	120	-	0.58	5	6
	2 x 9	-	0.11	2 x 12	2 x 16
	2 x 10	-	0.11	2 x 12	2 x 16
	2 x 11	-	0.11	2 x 12	2 x 16
	2 x 13	-	0.11	2 x 12	2 x 16
	2 x 18	-	0.30	2 x 5	2 x 6
	2 x 24	-	0.31	2 x 5	2 x 6
	2 x 26	-	0.31	2 x 5	2 x 6
	2 x 32	-	0.31	2 x 5	2 x 6
	2 x 36	-	0.31	2 x 5	2 x 6
	2 x 40	-	0.40	2 x 4	2 x 5
	2 x 42	-	0.40	2 x 4	2 x 5
	2 x 55	-	0.55	2 x 3	2 x 4
	2 x 57	-	0.55	2 x 3	2 x 4
Fluorescent lamps - uncorrected or series correction	11	1.3	0.16	43	65
	18	2.7	0.37	22	26
	24	2.5	0.35	20	24
	36	3.4	0.43	17	21
	58	5.3	0.67	11	14
	65	5.3	0.67	11	14
	85	5.3	0.80	9	12
Fluorescent lamps - lead-lag circuit	2 x 11	-	0.07	2 x 50	2 x 64
	2 x 18	-	0.11	2 x 30	2 x 36
	2 x 24	-	0.14	2 x 28	2 x 35
	2 x 36	-	0.22	2 x 17	2 x 20
	2 x 58	-	0.35	2 x 10	2 x 12
	2 x 65	-	0.35	2 x 9	2 x 11
	2 x 85	-	0.47	2 x 6	2 x 9
Fluorescent lamps - parallel correction	11	3.5	0.16	25	33
	18	4.5	0.37	20	27
	24	4.5	0.35	20	27
	36	4.5	0.43	20	27
	58	7.0	0.67	13	17
	65	7.0	0.67	13	17
	85	8.0	0.80	11	15
Fluorescent lamps with electronic control gear (ECG)	18	-	0.09	55	60
	36	-	0.16	31	34
	58	-	0.25	20	22
	2 x 18	-	0.17	2 x 31	2 x 34
	2 x 36	-	0.32	2 x 15	2 x 17
	2 x 58	-	0.49	2 x 10	2 x 11

Lamps for KNL

Max. number of lamps per pole at 230 V 50 Hz						
KNL12G	KNL16 / KNL16G	KNL18 / KNL18G	KNL22 / KNL22G	KNL30 / KNL30G	KNL43	KNL63
	45	50	128	180	300	500
	17	20	40	57	95	180
	17	20	40	57	95	180
	17	20	40	57	95	180
	17	20	40	57	95	180
	17	20	40	57	95	180
	17	20	40	57	95	180
	17	20	40	57	95	180
	14	16	32	45	75	140
	14	16	32	45	75	140
	13	15	25	36	55	110
	11	13	22	30	50	95
	8	10	15	22	35	65
	2 x 22	2 x 25	2 x 90	2 x 125	2 x 150	2 x 250
	2 x 22	2 x 25	2 x 90	2 x 125	2 x 150	2 x 250
	2 x 22	2 x 25	2 x 90	2 x 125	2 x 150	2 x 250
	2 x 22	2 x 25	2 x 90	2 x 125	2 x 150	2 x 250
	2 x 7	2 x 8	2 x 20	2 x 28	2 x 47	2 x 90
	2 x 7	2 x 8	2 x 20	2 x 28	2 x 47	2 x 90
	2 x 7	2 x 8	2 x 20	2 x 28	2 x 47	2 x 90
	2 x 7	2 x 8	2 x 20	2 x 28	2 x 47	2 x 90
	2 x 7	2 x 8	2 x 20	2 x 28	2 x 47	2 x 90
	2 x 6	2 x 7	2 x 18	2 x 26	2 x 45	2 x 85
	2 x 6	2 x 7	2 x 18	2 x 26	2 x 45	2 x 85
	2 x 5	2 x 6	2 x 16	2 x 22	2 x 37	2 x 70
	2 x 5	2 x 6	2 x 16	2 x 22	2 x 37	2 x 70
	75	85	150	200	240	340
	34	42	74	90	110	145
	32	40	70	85	100	140
	28	34	59	79	85	125
	17	21	37	50	60	80
	17	21	37	50	60	80
	15	17	31	42	50	65
	2 x 80	2 x 100	2 x 170	2 x 240	2 x 280	2 x 400
	2 x 46	2 x 58	2 x 102	2 x 135	2 x 180	2 x 250
	2 x 45	2 x 57	2 x 100	2 x 120	2 x 140	2 x 200
	2 x 25	2 x 32	2 x 56	2 x 75	2 x 100	2 x 125
	2 x 16	2 x 21	2 x 37	2 x 45	2 x 60	2 x 80
	2 x 15	2 x 20	2 x 35	2 x 43	2 x 60	2 x 80
	2 x 12	2 x 15	2 x 26	2 x 35	2 x 50	2 x 60
	45	50	79	120	170	240
	35	40	62	90	130	180
	35	40	62	90	130	180
	35	40	62	90	130	180
	22	25	40	60	85	120
	22	25	40	60	85	120
	20	22	34	52	75	100
	70	80	160	220	270	450
	40	44	88	122	150	250
	26	29	59	82	100	160
	2 x 40	2 x 44	2 x 88	2 x 122	2 x 135	2 x 225
	2 x 20	2 x 22	2 x 45	2 x 62	2 x 75	2 x 125
	2 x 13	2 x 15	2 x 30	2 x 42	2 x 50	2 x 80

Lamps for KNL

Switching of Lamps

Type		P [W]	C [µF]	I [A]	KNL9 / KNL9G	KNL12 / K
Fluorescent lamps T5 with electronic control gear (ECG)	FC	22	-	0.11	30	40
		40	-	0.21	15	20
		55	-	0.28	10	13
	HE	14	-	0.08	40	53
		21	-	0.11	30	40
		28	-	0.14	25	33
		35	-	0.18	18	23
	HO	24	-	0.12	28	38
		39	-	0.20	18	23
		49	-	0.24	14	19
		54	-	0.27	13	17
		80	-	0.39	9	11
	2 x FC	2 x 22	-	0.23	2 x 15	2 x 20
		2 x 40	-	0.42	2 x 7	2 x 10
		2 x 55	-	0.55	2 x 5	2 x 6
	2 x HE	2 x 14	-	0.15	2 x 20	2 x 26
		2 x 21	-	0.22	2 x 15	2 x 20
		2 x 28	-	0.28	2 x 12	2 x 16
		2 x 35	-	0.36	2 x 9	2 x 11
	2 x HO	2 x 24	-	0.24	2 x 14	2 x 19
		2 x 39	-	0.39	2 x 9	2 x 11
		2 x 49	-	0.48	2 x 7	2 x 9
		2 x 54	-	0.54	2 x 6	2 x 8
		2 x 80	-	0.74	2 x 4	2 x 5
High-pressure mercury-vapour lamps - uncorrected		50	-	0.61	8	11
		80	-	0.80	6	8
		125	-	1.15	4	5
		250	-	2.15	2	2
		400	-	3.25	1	1
		700	-	5.40	-	1
		1000	-	7.50	-	-
High-pressure mercury-vapour lamps - parallel correction		50	7	0.28	12	17
		80	8	0.41	11	15
		125	10	0.65	7	9
		250	18	1.22	4	5
		400	25	1.95	2	2
		700	45	3.45	1	1
		1000	60	4.80	-	1
Metal halide lamps - uncorrected		35	-	0.53	14	18
		70	-	1.00	8	11
		150	-	1.80	4	5
		250	-	3.00	2	2
		400	-	3.50	1	1
		1000	-	9.50	-	1
		2000	-	16.50	-	-
Metal halide lamps - parallel correction		35	6	0.25	16	21
		70	12	0.45	8	10
		150	20	0.75	5	6
		250	33	1.50	2	3
		400	35	2.50	1	2
		1000	95	5.80	-	1
		2000	148	11.50	-	-
Metal halide lamps with electronic control gear (PCI)		20	-	0.10	8	12
		35	-	0.20	5	7
		70	-	0.36	4	6

Lamps for KNL

Max. number of lamps per pole at 230 V 50 Hz						
KNL12G	KNL16 / KNL16G	KNL18 / KNL18G	KNL22 / KNL22G	KNL30 / KNL30G	KNL43	KNL63
	53	60	90	100	145	230
	25	30	45	55	75	120
	18	20	35	40	60	90
	70	80	120	150	200	310
	53	60	90	100	145	230
	44	50	70	80	110	180
	30	35	50	60	85	140
	50	55	70	100	130	200
	30	35	40	60	80	125
	24	28	35	50	65	100
	22	25	30	45	60	90
	15	17	20	30	40	65
	2 x 26	2 x 30	2 x 45	2 x 50	2 x 72	2 x 115
	2 x 12	2 x 15	2 x 22	2 x 27	2 x 37	2 x 60
	2 x 9	2 x 10	2 x 17	2 x 20	2 x 30	2 x 45
	2 x 35	2 x 40	2 x 60	2 x 75	2 x 100	2 x 155
	2 x 26	2 x 30	2 x 45	2 x 50	2 x 72	2 x 115
	2 x 22	2 x 25	2 x 35	2 x 40	2 x 55	2 x 90
	2 x 15	2 x 17	2 x 25	2 x 30	2 x 42	2 x 70
	2 x 25	2 x 27	2 x 35	2 x 50	2 x 65	2 x 100
	2 x 15	2 x 17	2 x 20	2 x 30	2 x 40	2 x 62
	2 x 12	2 x 14	2 x 17	2 x 25	2 x 32	2 x 50
	2 x 11	2 x 12	2 x 15	2 x 22	2 x 30	2 x 45
	2 x 7	2 x 8	2 x 10	2 x 15	2 x 20	2 x 32
	14	16	26	36	43	72
	10	12	20	27	33	55
	6	8	13	18	23	38
	3	4	7	10	12	20
	2	3	5	6	8	13
	1	1	3	4	5	8
	1	1	2	2	3	5
	22	25	40	60	85	120
	20	22	35	52	75	105
	12	14	22	31	60	80
	6	7	12	16	30	40
	3	4	7	10	20	30
	2	2	4	6	10	15
	1	1	3	4	7	10
	25	28	50	66	47	80
	14	16	28	40	25	45
	7	8	14	20	13	25
	3	3	5	7	9	15
	2	2	4	6	8	12
	1	1	1	2	3	4
	-	-	-	1	2	2
	26	33	60	65	100	140
	13	20	36	40	50	70
	8	9	17	18	25	40
	4	5	7	8	16	22
	3	4	5	6	15	20
	1	1	1	2	4	7
	-	-	-	1	2	3
	14	15	20	22	28	35
	8	9	13	15	20	26
	7	8	12	14	18	22

Lamps for KNL

Switching of Lamps

Type	P [W]	C [µF]	I [A]		
				KNL9 / KNL9G	KNL12 / K
Metal halide lamps with electronic control gear (PCI)	150	-	0.70	3	5
High-pressure sodium-vapour lamps - uncorrected	150	-	1.8	5	6
	250	-	3.0	2	2
	400	-	4.7	1	1
	600	-	7.1	-	1
	1000	-	10.3	-	-
High-pressure sodium-vapour lamps - correction	150	20	0.83	5	6
	250	33	1.50	3	4
	400	48	2.40	2	2
	600	68	3.50	1	1
	1000	106	6.30	-	1
High-pressure sodium-vapour lamps with electronic control gear (PCI)	20	-	0.10	8	12
	35	-	0.20	5	7
	70	-	0.36	4	6
	150	-	0.70	3	5
Low-pressure sodium-vapour lamps - uncorrected	18	-	0.35	14	18
	35	-	1.50	5	6
	55	-	1.50	5	6
	90	-	2.40	3	4
	135	-	3.50	2	3
	180	-	3.30	1	2
Low-pressure sodium-vapour lamps - parallel correction	18	5	0.35	13	18
	35	20	0.31	3	6
	55	20	0.42	3	6
	90	26	0.63	3	4
	135	45	0.94	1	2
	180	40	1.16	1	1
Transformers for low-voltage tungsten halogen lamps	20	-	-	44	56
	50	-	-	20	25
	75	-	-	14	17
	100	-	-	10	13
	150	-	-	7	9
	200	-	-	5	6
	300	-	-	3	4

Lamps for KNL

Max. number of lamps per pole at 230 V 50 Hz						
KNL12G	KNL16 / KNL16G	KNL18 / KNL18G	KNL22 / KNL22G	KNL30 / KNL30G	KNL43	KNL63
	6	7	10	13	15	20
	7	8	10	12	15	25
	3	4	5	7	9	15
	2	2	3	4	5	9
	1	1	2	3	3	6
	-	1	1	2	3	4
	8	9	14	19	28	38
	4	5	7	10	16	22
	3	3	5	6	10	17
	2	2	3	4	6	10
	1	1	1	2	4	7
	14	15	18	20	26	32
	8	9	11	13	18	24
	7	8	10	12	16	20
	6	7	8	10	14	18
	25	27	30	42	70	100
	8	9	12	14	18	30
	8	9	12	14	18	30
	5	6	7	9	11	18
	4	5	6	7	9	12
	3	4	5	6	8	10
	22	25	30	42	100	150
	7	8	10	14	30	40
	7	8	10	14	30	40
	5	5	6	9	23	30
	3	4	5	7	10	17
	2	3	4	6	9	15
	70	88	110	174	250	320
	32	40	50	80	110	140
	22	28	35	54	73	93
	17	22	27	43	55	70
	12	15	19	29	36	45
	8	11	14	23	27	35
	6	7	9	14	18	23

KNL CONTACTORS

KNL80, KNL90, KNL110

- Contactors are used for switching electric motors and other resistive, inductive and capacitive loads
- Possibility of fixing the snap-on auxiliary switch block with auxiliary contacts
- Possibility of connecting the BR90 thermal overload relay for protection against overload and in case of phase failure
- Assembly to a 35 mm or 75 mm wide mounting rail (EN 60715) or fixing with screws
- Degree of protection IP20, at extra installation of the G265 protection unit
- Fixing to the vertical or horizontal surface by ±30° deviation

TECHNICAL DATA						MOTOR CONTACTORS		
GENERAL	Type					KNL80	KNL90	KNL110
	Standards					IEC/EN 60947-1, IEC/EN 60947-4-1, UL 508		
	Approvals					UL, GOST		
	Ambient temperature				°C	-50 … +70		
	Storage temperature				°C	-60 … +80		
	Mechanical endurance				op. c.	15 x 10^6		
	Max. mechanical operating frequency with no load				c./h	3600		
	Weight				kg	1.28		
MAIN CIRCUIT	Rated insulation voltage			U_i	V	690		
	Thermal current at ≤ 40°C			I_{th}	A	125	125	125
	Rated power at ≤ 40°C		230 V	P_e	kW	47	47	47
			400 V			82	82	82
	AC-1		500 V			108	108	108
			690 V			128	128	128
	Rated motor power at ≤ 55°C	3-fazno	230 V	P_e	kW	23	27.6	33
			400 V			41	50	61
	AC-3		500 V			56	56	59
			690 V			74	74	80
	Rate motor power acc. to UL	3-fazno	240 V	P_e	HP	30	30	40
			480 V			60	60	75
			600 V			75	75	100
	Rated motor power AC-4		≤ 400 V	P_e	kW	20	23	23

KNL CONTACTORS

KNL80, KNL90, KNL110

TECHNICAL DATA						MOTOR CONTACTORS		
MAIN CIRCUIT	Type					KNL80	KNL90	KNL110
	Electrical endurance AC-3 / AC-4			x 10^6	op. c.	1.3/0.2	1.2/0.2	0.8/0.2
	Rated operational current at: 24/110/220 V	DC-1	1 [1]	I_e	A	70/8/6	70/8/6	70/8/6
			2 [1]			100/80/40	100/80/40	100/80/40
			3 [1]			100/85/55	100/85/55	100/85/55
	[1] Number of poles in series	DC-3 – DC-5	1 [1]			40/3/1	40/3/1	40/3/1
			2 [1]			60/40/7	60/40/7	60/40/7
			3 [1]			80/60/35	80/60/35	80/60/35
	Max. back-up fuse for short-circuit protection Coordination type 2		gG	I_v	A	160	160	160
			aM			80	100	125
	Terminal capacity		rigid	S	mm^2	6 … 50		
			flexible			6 … 50		
	Screw					M6		
	Screw head				imbus	hexagon socket oval head		
	Tightening torque				Nm	4.5		
MAGNETIC SYSTEM	Coil consumption		switch-on	AC	VA	210		
				DC	W	15		
			operation	AC	VA	18		
				DC	W	15		
	Make / Break delay		make	AC	ms	13 - 25		
			break			8 - 12		
			make	DC		60 - 90		
			break			7 - 12		
	Range of control voltage			U_c	%	85 … 110		
	Control voltages			U_c	V	12 … 600		
	Terminal capacity		rigid	S	mm^2	2.5		
			flexible			2.5		
	Screw					M3.5		
	Screw head					Phillips 1		
	Tightening torque				Nm	0.8 - 1		

STANDARD CONTROL VOLTAGES (AC)						
V	24	48	110	220/230	240	380/400

ORDERING DATA

The type designation and control voltage are stated when ordering the contactors.

KNL80 - 00 - 230/230 - 50/60

- Frequency
- Control voltage
- Version of contacts
- Type

KNL CONTACTORS

KNL80, KNL90, KNL110

ACCESSORIES

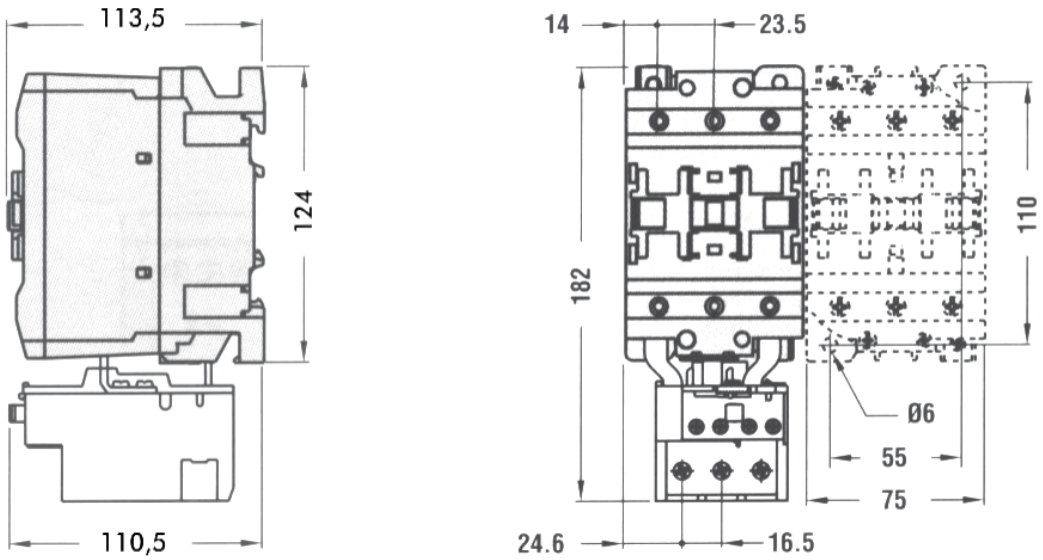
G484

G484
Snap-on auxiliary switch blocks
(Type -12, -21)

BR90 OVERLOAD RELAY

Type	Rated operational current at 230 V and AC-15	Setting ranges (A)
BR90	2.5 A	60 - 82; 70 - 95; 90 - 110

DIMENSIONS



MOTOR CONTACTORS

KNL95, KNL115, KNL145, KNL180, KNL250, KNL400, KNL500, KNL630/1000

- Contactors are used for switching electric motors and other resistive inductive and capacitive loads
- Three and four-pole versions up to 1000 A for AC-1 utilization category
- Three and four-pole versions up to 630 A for AC-3 utilization category
- AC/DC control voltages
- A wide variety of snap-on auxiliary switch blocks and accessories
- Fixing to the vertical and horizontal surface by ±30° deviation

TECHNICAL DATA						MOTOR CONTACTORS				
GENERAL	Type				KNL95	KNL115	KNL145	KNL180	KNL250
	Standards				IEC/EN 60947-4-1, UL 508				
	Approvals				UL, GOST				
	Ambient temperature			°C	-50 … +70				
	Storage temperature			°C	-60 … +80				
	Mechanical endurance			op. c.	10 x 10^6				
	Max. mechanical operating frequency with no load			op. c./h	2400				
	Weight			kg	5.96	5.96	6.10	10.60	10.80
MAIN CIRCUIT	Rated insulation voltage		U_i	V	1000				
	Thermal current at ≤ 40°C		I_{th}	A	125	160	250	275	350
	Rated frequency		f	Hz	50/60				
	Rated power at ≤ 40°C AC-1	230 V	P_e	kW	47	57	91	95	124
		400 V			82	98	150	160	214
		500 V			103	129	196	213	282
		690 V			142	173	270	298	380
	Rated motor power at ≤ 55°C three-phase AC-3	230 V	P_m	kW	27.6	33	46	57	83
		400 V			50	61	80	100	140
		500 V			56	80	100	123	176
		690 V			74	100	120	144	212
		1000 V			46	63	75	103	156
	Rated motor power AC-4 three-phase		P_m	kW	23	25	31	36	52
	Rated motor power acc. to UL three-phase	240 V	P_m	HP	30	40	50	75	100
		480 V			50	75	100	150	200
		600 V			75	100	125	150	250
	Rated motor power AC-4	≤ 400 V	P_m	kW	23	25	31	36	52
	Electrical endurance AC-3 / AC-4		x 10^6	op. c.	1.1/0.2	1.1/0.2	1.1/0.2	1/0.2	1/0.2
	Rated operational current at: 24/110/220 V DC-1 L/R ≤ 1 ms	1 [1]	I_e	A	70/8/6	160/100/-	220/110/-	260/120/-	350/160/-
		2 [1]			100/80/40	160/130/130	220/150/150	260/170/150	350/300/250
		3 [1]			100/85/55	160/130/130	220/150/150	260/170/170	350/300/300
	[1] Number of poles in series DC-3 – DC-5 L/R ≤ 15 ms	1 [1]			40/3/1	140/70/-	160/80/-	180/90/-	280/150/-
		2 [1]			60/40/7	140/100/80	160/120/90	180/140/100	280/250/200
		3 [1]			80/60/35	140/120/100	160/140/120	180/160/140	180/280/250
	Max. back-up fuse for short-circuit protection Coordination type 2	gG	I_v	A	160	200	250	315	400
		aM			100	125	160	200	250
	Terminal capacity	rigid	S	mm^2	70	70	120	150	240
		busbar		mm	20 x 3 (1 x or 2 x)	20 x 3 (1 x or 2 x)	25 x 3 (1 x or 2 x)	25 x 3 (1 x or 2 x)	30 x 4 (1 x or 2 x)
	Screw				M6	M6	M8	M8	M10
	Wrench jaw opening			mm	10	10	13	13	17
	Tightening torque			Nm	3	3	6	6	10

MOTOR CONTACTORS

KNL95, KNL115, KNL145, KNL180, KNL250, KNL400, KNL500, KNL630/1000

MAGNETIC SYSTEM	Type				KNL95	KNL115	KNL145	KNL180	KNL250
	Coil consumption	switch-on	P_c	VA	300				
				W	300				
		operation		VA	10				
				W	10				
	Make / Break delay	make	AC/DC	ms	13-25/60-90	60 - 100			80 - 120
		break			8 - 12	25 - 60			30 - 75
	Range of control voltage		U_c	%	85 ... 110				
	Control voltages		U_c	V	24 to 480				
	Connection			fast-on	2/ 2.8 x 0.8 or 6.3 x 0.8				

TECHNICAL DATA — MOTOR CONTACTORS

GENERAL	Type				KNL400	KNL500	KNL630	KNL630/1000
	Standards				IEC/EN 60947-4-1, UL 508			
	Ambient temperature			°C	-50 ... +70			
	Storage temperature			°C	-60 ... +80			
	Mechanical endurance			op. c.	10×10^6	5×10^6		
	Max. mechanical operating frequency with no load			op. c/h	2400	1200		
	Weight			kg	10.80	20.80	21.50	25.62
MAIN CIRCUIT	Rated insulation voltage		U_i	V	1000			
	Thermal current at ≤ 40°C		I_{th}	A	550	700	800	1000
	Rated frequency		f	Hz	50/60			
	Rated power at ≤ 40°C AC-1	230 V	P_e	kW	200	252	288	350
		400 V			345	438	500	600
		500 V			452	575	655	750
		690 V			598	755	860	1000
	Rated motor power AC-3 three-phase	230 V	P_m	kW	130	156	198	-
		400 V			225	290	335	-
		500 V			271	367	368	-
		690 V			352	416	440	-
		1000 V			208	312	368	-
	Rated motor power AC-4	≤ 400 V	P_m	kW	76	99	119	-
	Electrical endurance AC-3 / AC-4		x 10^6	op. c.	0.7/0.2	0.7/0.2	0.7/0.2	-
	Rated operational current at: 75/110/220 V DC-1 L/R ≤ 1ms	1 [1]	I_e	A	400/250/-	650/320/-	800/460/-	-
		2 [1]			400/400/350	650/550/450	800/800/700	-
		3 [1]			400/400/400	650/600/600	800/800/800	-
	[1] Number of poles in series DC-3 – DC-5 L/R ≤ 1ms	1 [1]			350/200/-	550/320/-	800/460/-	-
		2 [1]			350/350/280	650/550/450	800/800/700	-
		3 [1]			350/350/350	650/550/550	800/800/800	-
	Max. back-up fuse for short-circuit protection Coordination type 2	gG	I_v	A	630	800	1000	
		aM			400	500	630	-
	Terminal capacity	rigid	S	mm^2	2 x 150		2 x 240	
		busbar		mm	30 x 5 (1 x or 2 x)	50 x 5 (1 x or 2 x)	60 x 5 (1x or 2x)	
	Screw				M10	M10	M12	2-M12
	Wrench jaw opening			mm	17	17	19	19
	Tightening torque			Nm	10	10	14	14

MOTOR CONTACTORS

KNL95, KNL115, KNL145, KNL180, KNL250, KNL400, KNL500, KNL630/10000

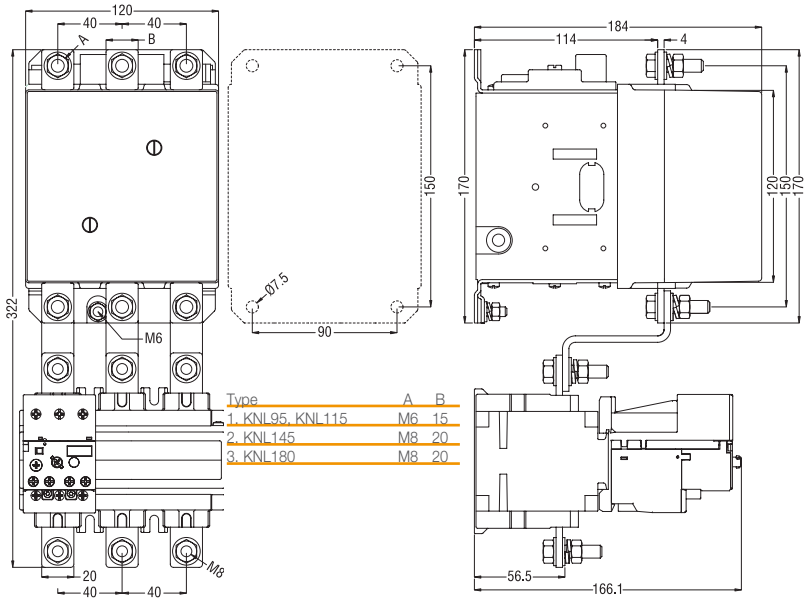
MAGNETIC SYSTEM	Type			KNL400	KNL500	KNL630	KNL1000
	Coil consumption switch-on	P_c	VA	300	400		
			W	300	400		
	Coil consumption operation	P_c	VA	10	18		
			W	10	18		
	Make / Break delay make		ms	80 - 120	110 - 180		
	Make / Break delay break			30 - 75	60 - 100		
	Range of control voltage	U_c	%	85 ... 110			
	Control voltages	U_c	V	24 to 480	48 to 480		
	Connection		fast-on	2/ 2.8 x 0.8 or 6.3 x 0.8			

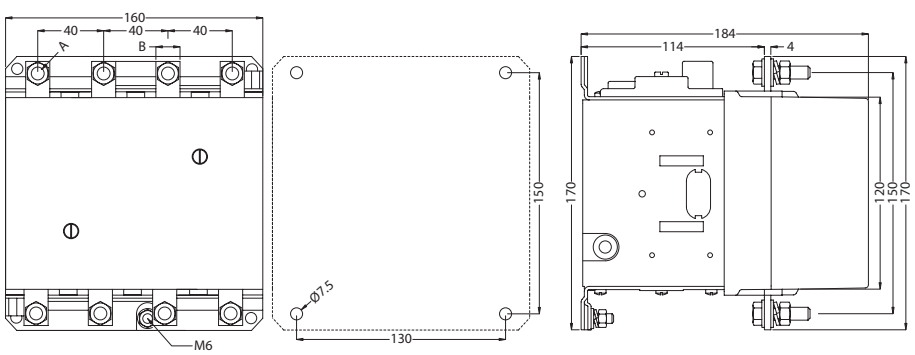
STANDARD CONTROL VOLTAGES (AC)

V	24	48	60	110/125	220/240	380/415	440/480

DIMENSIONS

KNL95, KNL115, KNL145, KNL180

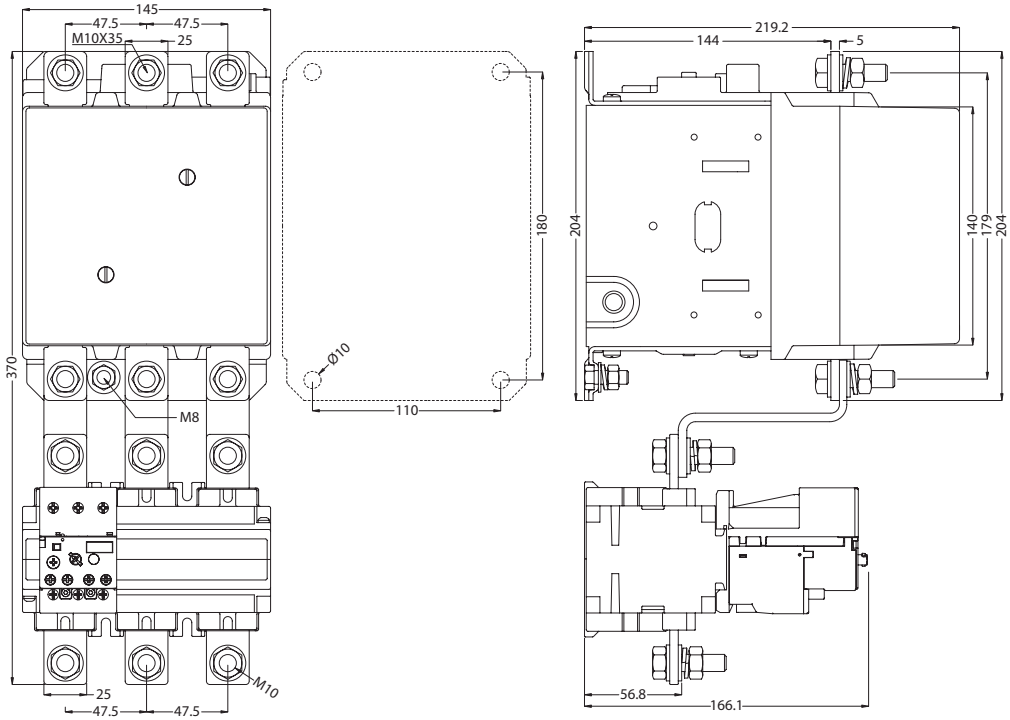




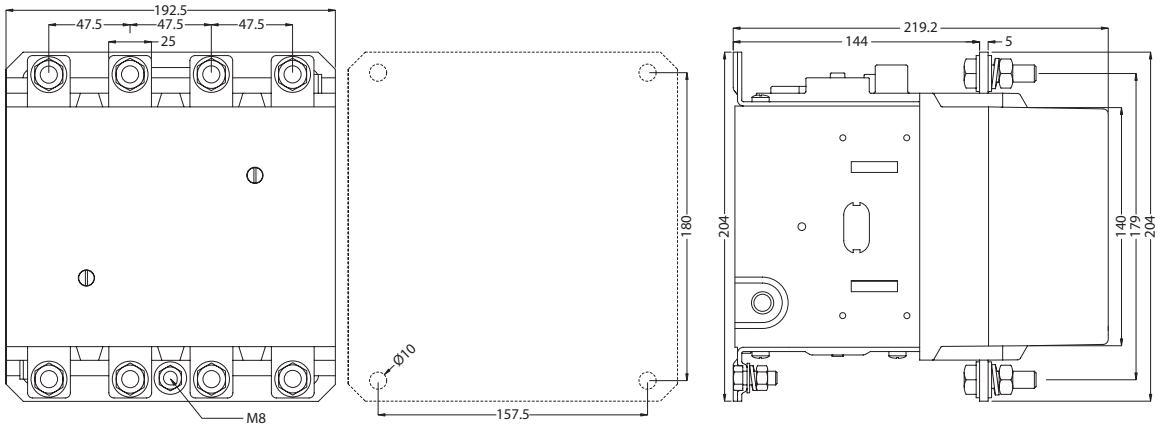
MOTOR CONTACTORS

KNL95, KNL115, KNL145, KNL180, KNL250, KNL400, KNL500, KNL630/10000

KNL250, KNL400



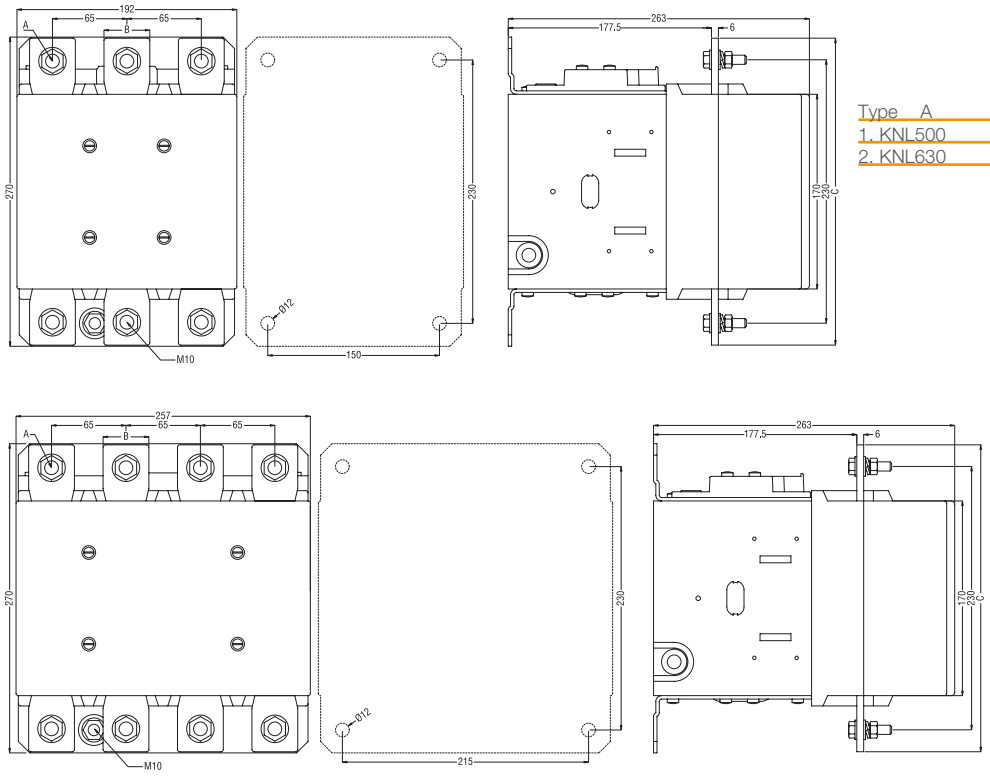
Type	A	B
1. KNL250	M10	20
2. KNL400	M10	25



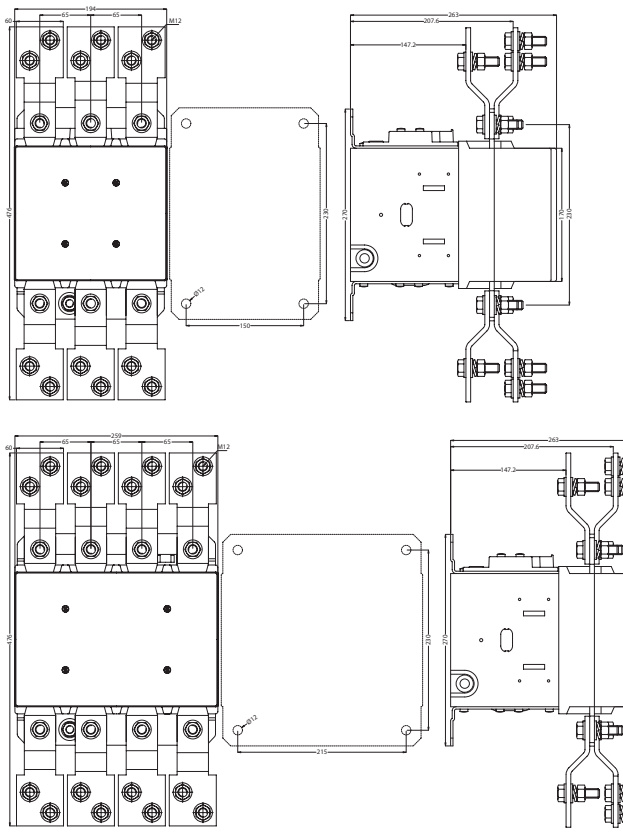
MOTOR CONTACTORS

KNL95, KNL115, KNL145, KNL180, KNL250, KNL400, KNL500, KNL630/10000

KNL500, KNL630



Type	A	B	C
1. KNL500	M10	35	265
2. KNL630	M12	40	270

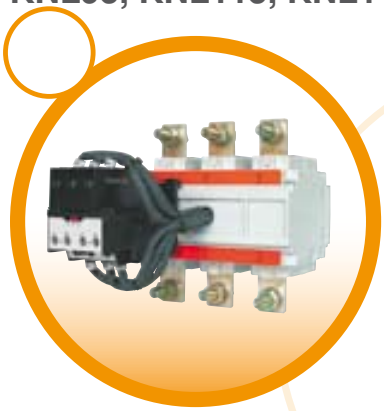


KNL630/1000

Type	A	B	C
B500	M10	35	265
B630	M12	40	270

KNL CONTACTORS

KNL95, KNL115, KNL145, KNL180, KNL250, KNL400, KNL500, KNL630/1000

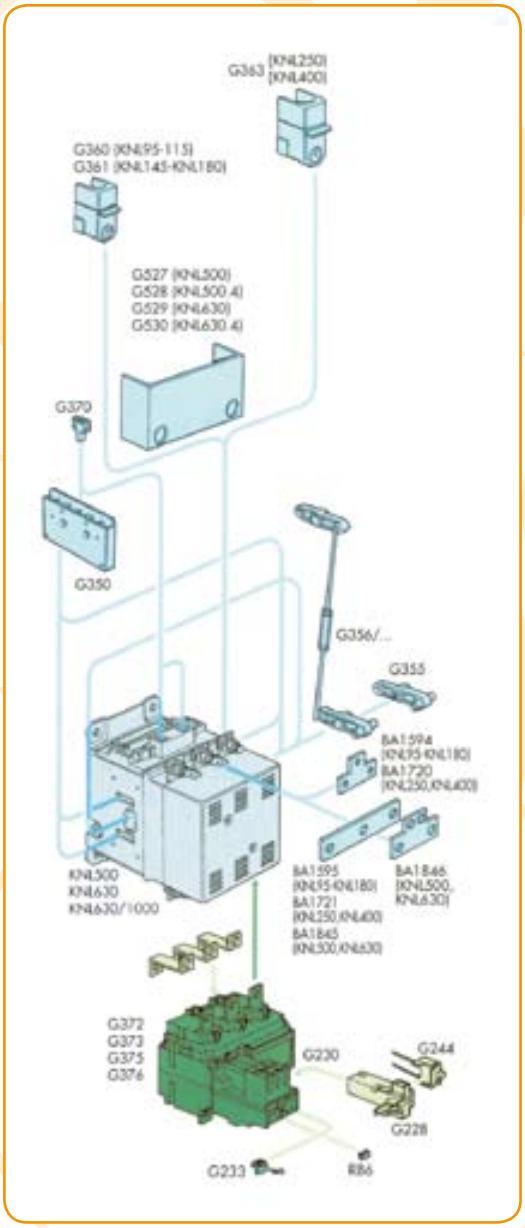


ACCESSORIES

BRA180, BRA400
Thermal overload relay

Type	Setting ranges (A)
BRA180	60 - 100; 75 - 125; 90 - 150; 120 - 200
BRA400	150 - 250; 180 - 300; 250 - 420
BRA25.5+G230+C.T.	300 - 500; 480 - 800

Description	Characteristic	Reference code
SNAP-ON AUXILIARY SWITCH BLOCKS		
Auxiliary contacts	2NO + 1NC or 1NO + 2NC	G350
Mechanical interlock	Side-by-side contactors	G355
	One on top of other contactors	
	L(mm) 225 - 365	G356/1
	265 - 305	G356/2
	305 - 345	G356/3
	345 - 385	G356/4
	390 - 425	G356/5
	470 - 500	G356/6
Main terminal covers	for KNL 95, KNL 115	G360
	for KNL 145, KNL 180	G361
	for KNL 250, KNL 400	G363
	for KNL 500	G527
	for KNL 500.4	G528
	for KNL 630	G529
	for KNL 630.4	G530
Bars for 3 poles star connection	for KNL 95 - KNL 180	BA1595
	for KNL 250 - KNL 400	BA1721
	for KNL 500 - KNL 630	BA1846
Bars for 2 poles parallel connection	for KNL 95 - KNL 180	BA1594
	for KNL 250 - KNL 400	BA1720
	for KNL 500 - KNL 630	BA1845
Adapter	for screw terminal	G370
Identification plate		BA126/2
THERMAL OVERLOAD RELAY	BRA 180, BRA 400	
Adapter for mounting on contactor	BRA 180	
	KNL 95 - KNL 180	G372
	KNL 250 - KNL 400	G373
	BRA 400	
	KNL 145 - KNL 180	G375
	KNL 250 - KNL 400	G376
Electric reset	all types	G228
Sealing kit	all types	G233
Start button	all types	G244
Identification plate	all types	RB6



ORDERING DATA

The type designation and control voltage are stated when ordering the contactors.

KNL95 - 00 - 220/240 - 50/60

- 50/60 — Frequency
- 220/240 — Control voltage
- 00 — Version of contacts
- KNL95 — Type

CAPACITOR DUTY CONTACTORS

KC12, KC16, KC20, KC25, KC 33, KC 40, KC 60

When switched on, a capacitor can function as a short-circuit element. The capacitor inrush or charging current magnitude depends on AC voltage at turn-on and on the impedance of connection cables and a power supply transformer.

In case of individual capacitor load, charging current peaks that are 30-time greater than rated capacitor current can occur. In case of a multi-stage capacitor the inrush current can exceed 180-time rated capacitor current.

Such a strong current can flow through a contactor from the beginning when inrush current occurs from power supply network and the capacitor is already connected. Such inrush current is undesirable since main contacts of standard duty contactors are likely to weld.

A new capacitor duty contactor is designed to meet the requirements of capacitor duty applications. Contactors are fitted with a block of three auxiliary contacts connected in series with six quick discharge damping resistors, two per each phase. Peak current is limited to the value within the contactor making capacity.

Three-pole contactors from 12,5 kVAr to 60 kVAr are available in seven ratings complying with the IEC 60947-4-1 for AC-6b utilization category. They have the UL certificate.

Advantages

- Conforms to utilization category AC-6b
- Saves costs of expensive replacement
- Long electrical life
- Reduces watt losses during “ON” condition, saves energy
- High safety
- No risk of dangerous voltage
- Switching of capacitor bank in parallel without de-rating
- Less maintenance and downtime
- Standard control voltages: 24 V 50/60 Hz, 220 V 50/60 Hz, 230 V 50/60 Hz, 415 V 50/60 Hz

TECHNICAL DATA

Product Code	Rating at 50 / 60 Hz kVAr	Current carrying capacity							Power dissipation per pole	Mechanical Life (million)		Electrical Life
	≤ 55°C	220 - 240 V		400 - 440 V		kVAr/Current rating as per UL				50 or 60 Hz	50 / 60 Hz	(Operations)
		kVAr	Current at 230V (A)	kVAr	Current at 400V (A)	240 V	480 V	600 V	W			
KC12	12.5	6.7	17.58	12.5	18.04	6 kVAr/15 A	12.5 kVAr/15 A	15 kVAr/15 A	0.36	17	15	200.000
KC16	16.7	8.5	22.3	16.7	24.1	8 kVAr/20 A	16.7 kVAr/20 A	20 kVAr/20 A	0.8	20	15	200.000
KC20	20	10	26.24	20	28.86	10 kVAr/24 A	20 kVAr/24 A	25 kVAr/24 A	1.25	16	12	100.000
KC25	25	15	39.36	25	36.08	12.5 kVAr/30 A	25 kVAr/30 A	33.3 kVAr/30 A	2	16	12	100.000
KC33	33.3	20	52.48	33.3	48.06	16.5 kVAr/40 A	33.3 kVAr/40 A	40 kVAr/40 A	4.2	16	6	100.000
KC40	40	25	65.6	40	57.73	20 kVAr/48 A	40 kVAr/48 A	50 kVAr/48 A	4.2	16	6	100.000
KC60	50	40	104.9	60	86.6	30 kVAr/72 A	60 kVAr/72 A	80 kVAr/77 A	5.1	10	4	100.000

[1] For KC12 to KC25: clip-on mounting on 35 mm wide rail
For KC33 - KC60: clip-on mounting on 75 mm wide rail

[2] Average ambient temperature should not exceed 45 °C within the 24-hour period in accordance with IEC 60871 and IEC 60831

CAPACITOR DUTY CONTACTORS

KC12, KC16, KC20, KC25, KC33, KC40, KC60

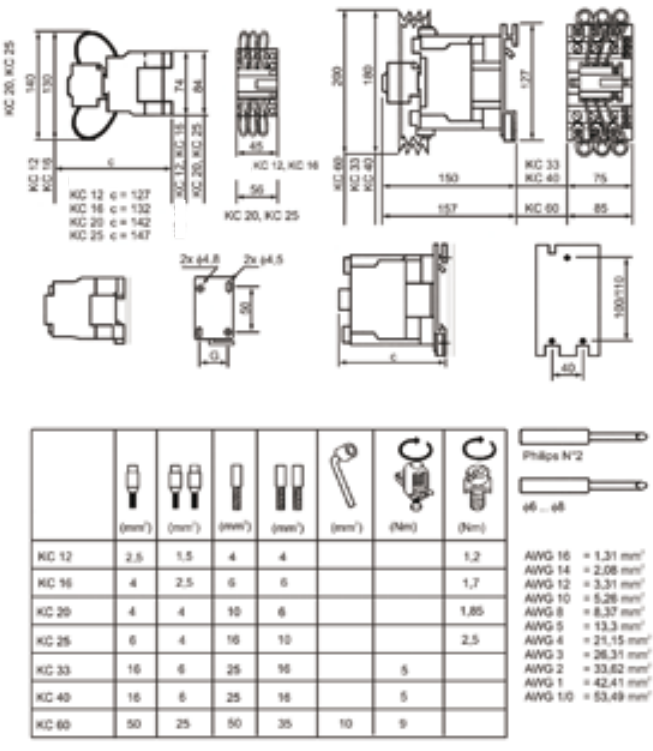
TECHNICAL DATA

Product Code	Rating at 50 / 60 Hz kVAr	Upper Block		Wire Details						Coil Consumption		
	≤ 55°C	Time lag between make contacts of Aux block & contactor	Holding time of main contacts of Aux block	Cross - sectional Area	Length	Material	Lugs - at Contactor end	Lugs at Aux Block end	Tightening Torque	VA	VA	VA
		ms	ms	mm^2	mm				Nmm^2	50 Hz	60 Hz	50/60 Hz
KC12	12.5	2 - 10	5 - 12	0.292	174.0	PTFE coated Resistance wire	Ring type lug	Pin type lug	1.2	7	7.5	8
KC16	16.7	2 - 10	5 - 12	0.292	174.0	PTFE coated Resistance wire	Ring type lug	Pin type lug	1.7	7	7.5	8
KC20	20	2 - 10	5 - 12	0.292	174.0	PTFE coated Resistance wire	Ring type lug	Pin type lug	1.85	7.5	7.5	8.5
KC25	25	2 - 10	5 - 12	0.292	174.0	PTFE coated Resistance wire	Ring type lug	Pin type lug	2.5	7.5	7.5	8.5
KC33	33.3	2 - 10	5 - 12	0.196	245.0	PTFE coated Resistance wire	Pin type lug with Connector	Pin type lug	5.0	20	22	26
KC40	40	2 - 10	5 - 12	0.196	245.0	PTFE coated Resistance wire	Pin type lug with Connector	Pin type lug	5.0	20	22	26
KC60	50	2 - 10	5 - 12	0.196	245.0	PTFE coated Resistance wire	Pin type lug with Connector	Pin type lug	9.0	20	22	26

MOUNTING AND CONNECTION

KC12, KC16, KC20, KC25

KC33, KC40, KC60



KC 12	2,5	1,5	4	4			1,2
KC 16	4	2,5	6	6			1,7
KC 20	4	4	10	6			1,85
KC 25	6	4	16	10			2,5
KC 33	16	6	25	16		5	
KC 40	16	6	25	16		5	
KC 60	50	25	50	35	10	9	

AWG 16 = 1,31 mm²
AWG 14 = 2,08 mm²
AWG 12 = 3,31 mm²
AWG 10 = 5,26 mm²
AWG 8 = 8,37 mm²
AWG 6 = 13,3 mm²
AWG 4 = 21,15 mm²
AWG 3 = 26,31 mm²
AWG 2 = 33,62 mm²
AWG 1 = 42,41 mm²
AWG 1/0 = 53,49 mm²

ORDERING DATA

The type designation and control voltage are stated when ordering the contactors.

KC12 - 11 - 230 - 50/60

- Frequency
- Control voltage
- Version of contacts
- Type

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

- Installation contactors are built in consumer units in dwellings, business premises, hotels, hospitals, shopping centres, sport centres, production halls, warehouses and public places
- They are used for remote switching and automatic control of electric devices and equipment, such as:
  - single-phase and three-phase motors
  - different pumps
  - air-conditioning
  - electric heating
  - lighting
- Basic contactor types are: IKA20-xx, IKD20-xx, IK21-xx, IKA25-xx, IKD25-xx, IK40-xx, IKA40-xx, IK63-xx, IKA63-xx
- IKD20, IKD25, IK40 and IK63 with a varistor for overvoltage protection and a rectifier enable dc and ac voltage control
- They excel in silent operation
- IKA20, IK21, IKA25, IKA40 and IKA63 are ac driven contactors only
- Contacts can be used as main or auxiliary
- Contactors are designed for assembling to 35 mm mounting rail in accordance with the EN 60715 standard
- Sealing terminal covers enable direct protection against contact with live parts
- IKV ventilation module is available for preventing exceeded heating when contactors are used side-by-side
- All contactors have degree of protection IP20

TECHNICAL DATA FOR IKA20, IKD20, IKA25 and IKD25

GENERAL	Type					IKA20	IKD20	IKA25	IKD25
	Standards					IEC/EN 61095 , IEC/EN 60947-4-1, IEC/EN 60947-5-1			
	Approvals					KEMA, NF, GOST			
	Module width					1		2	
	Mechanical endurance				op. c.	3×10^6			
	Ambient temperature				°C	-5 … +55			
	Storage temperature				°C	-30 … +80			
	No. of contactors (side-by-side)		≤ 40° C			max. 3	max. 3	no limitation	max. 3
			40 - 55° C			max. 2	max. 2		max. 2
	Contact reliability					17 V; ≥ 50 mA			
	Min. distance of open contacts				mm	3.6			
	Power dissipation per pole				W	1.7	1.7	2.2	2.2
	Overload current withstand capability				A	72	72	68	68
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20	20	25	25
	Max. operating frequency	DC-1			op. c./h	300			
		AC-1/AC-3/AC-5b/AC-6b/ AC-15				600			
		no load				3000			
	Weight				kg	0.13	0.13	0.24	0.24
MAIN CIRCUIT	Rated insulation voltage			U_i	V	230	230	440	440
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	20	25	25
	Rated operational voltage			U_e	V	230	230	400	400
	Rated frequency			f	Hz	50/60			
	Rated operational current	AC-1/AC-7a		I_e	A	20	20	25	25
	Operational power AC-1/AC-7a	single-phase	230 V	P_e	kW	4	4	5.4	5.4
		three-phase	230 V			-	-	9	9
		three-phase	400 V			-	-	16	16
	Electrical endurance	AC-1/AC-7a			op. c.	200.000			

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA FOR IKA20, IKD20, IKA25 and IKD25

MAIN CIRCUIT	Type						IKA20	IKD20	IKA25	IKD25
	Rated operational current	AC-3/AC-7b			I_e	A	NO: 9 NC: 6	NO: 9 NC: 6	8.5	8.5
	Operational power AC-3/AC-7b	single-phase motor	230 V		P_e	kW	NO: 1.3 NC: 0.75	NO: 1.3 NC: 0.75	1.3 [1]	1.3 [1]
		three-phase motor	230 V				-	-	2.2	2.2
		three-phase motor	400 V				-	-	4	4
	Electrical endurance	AC-3/AC-7b				op. c.	300.000	300.000	500.000	500.000
	Switching of capacitors	AC-6b	230 V		C	µF	30	30	36	36
	Electrical endurance	AC-6b				op. c.	100.000			
	DC-1 (L/R ≤ 1 ms) Electrical endurance:									
	1 pole			U_e = 24 V DC			20	20	25	25
				U_e = 48 V DC			15	15	20	20
				U_e = 60 V DC			10	10	15	15
				U_e = 110 V DC			6	6	6	6
				U_e = 220 V DC			0.6	0.6	0.6	0.6
	2 poles connected in series			U_e = 24 V DC			20	20	25	25
				U_e = 48 V DC			18	18	25	25
				U_e = 60 V DC			15	15	20	20
				U_e = 110 V DC			10	10	10	10
				U_e = 220 V DC		A	6	6	6	6
	3 poles connected in series			U_e = 24 V DC			-	-	25	25
				U_e = 48 V DC			-	-	25	25
				U_e = 60 V DC			-	-	25	25
				U_e = 110 V DC			-	-	20	20
				U_e = 220 V DC			-	-	15	15
	4 poles connected in series			U_e = 24 V DC			-	-	25	25
				U_e = 48 V DC			-	-	25	25
				U_e = 60 V DC			-	-	25	25
				U_e = 110 V DC			-	-	20	20
				U_e = 220 V DC			-	-	15	15
	Electrical endurance	DC-1				op.c.	100.000	100.000	100.000	100.000
	DC-3 (L/R ≤ 2 ms) Electrical endurance:									
	1 pole			U_e = 24 V DC			10	10	15	15
				U_e = 48 V DC			5	5	8	8
				U_e = 60 V DC			2	2	4	4
				U_e = 110 V DC			1	1	1.3	1.3
				U_e = 220 V DC		A	0.1	0.1	0.2	0.2
	2 poles connected in series			U_e = 24 V DC			20	20	25	25
				U_e = 48 V DC			10	10	16	16
				U_e = 60 V DC			8	8	12	12
				U_e = 110 V DC			4	4	5.5	5.5
				U_e = 220 V DC			0.4	0.4	0.6	0.6

[1] Data for single-phase power are valid for versions -22, -20 and -02

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA FOR IKA20, IKD20, IKA25 and IKD25

						IKA20	IKD20	IKA25	IKD25
MAIN CIRCUIT	Type								
	DC-3 (L/R ≤ 2 ms) Rated operational current:								
	3 poles connected in series	U_e = 24 V DC	I_e	A		-	-	25	25
		U_e = 48 V DC				-	-	25	25
		U_e = 60 V DC				-	-	25	25
		U_e = 110 V DC				-	-	15	15
		U_e = 220 V DC				-	-	3	3
	4 poles connected in series	U_e = 24 V DC				-	-	25	25
		U_e = 48 V DC				-	-	25	25
		U_e = 60 V DC				-	-	25	25
		U_e = 110 V DC				-	-	20	20
		U_e = 220 V DC				-	-	8	8
	Electrical endurance	DC-3			op. c.	100.000	100.000	100.000	100.000
	DC-5 (L/R ≤ 7,5 ms) Rated operational current:								
	1 pole	U_e = 24 V DC	I_e	A		10	10	15	15
		U_e = 48 V DC				4	4	5	5
		U_e = 60 V DC				1	1	3	3
		U_e = 110 V DC				0.3	0.3	0.5	0.5
		U_e = 220 V DC				0.06	0.06	0.1	0.1
	2 poles connected in series	U_e = 24 V DC				20	20	25	25
		U_e = 48 V DC				8	8	15	15
		U_e = 60 V DC				6	6	10	10
		U_e = 110 V DC				2	2	4	4
		U_e = 220 V DC				0.2	0.2	0.4	0.4
	3 poles connected in series	U_e = 24 V DC				-	-	25	25
		U_e = 48 V DC				-	-	25	25
		U_e = 60 V DC				-	-	20	20
		U_e = 110 V DC				-	-	12	12
		U_e = 220 V DC				-	-	2	2
	4 poles connected in series	U_e = 24 V DC				-	-	25	25
		U_e = 48 V DC				-	-	25	25
		U_e = 60 V DC				-	-	25	25
		U_e = 110 V DC				-	-	15	15
		U_e = 220 V DC				-	-	5	5
	Electrical endurance	DC-5			op. c.	100.000	100.000	100.000	100.000
	Terminal capacity	rigid	S	mm²		1 … 10			
		flexible				1 … 6			
	Screw					M3.5			
	Screw head					PZ1			
	Tightening torque				Nm	1.2			

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA FOR IKA20, IKD20, IKA25 and IKD25

						IKA20	IKD20	IKA25	IKD25
AUXILIARY CIRCUIT	Type								
	Rated operational voltage			U_e	V	230	230	400	400
	Rated insulation voltage			U_i	V	230	230	440	440
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	20	25	25
	AC-15 Rated operational current	single-phase	230 V	I_e	A	6	6	6	6
		single-phase	400 V			-	-	4	4
	Electrical endurance	AC-15			op. c.	300.000	300.000	500.000	500.000
CONTROL CIRCUIT	Range of control voltage			U_c	%	85 … 110			
	Kind of voltages					AC	AC, DC	AC	AC, DC
	Control voltage			U_c	V	12 … 230			
	Frequency (AC)			f	Hz	50/60 [2]			
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5				kV	2			
	Coil consumption		switch-on		VA/W	12/10	2.1/2.1	33/25	2.6/2.6 [3]
			operation			2.8/1.2	2.1/2.1	5.5/1.6	2.6/2.6 [3]
	Make/break delays		make		ms	15 – 25	15 – 45	10 – 30	15 – 45
			break			10 – 30	20 – 50	10 – 30	20 – 70
	Terminal capacity		rigid	S	mm^2	1 … 2.5			
			flexible			1 … 2.5			
	Screw					M 3.5			
	Screw head					PZ1			
	Tightening torque				Nm	0.6			

[2] IKD20 and IKD25 can be controlled by ac voltage with frequency from 40 Hz to 400 Hz

[3] Coil consumption for version -04 is 3.8 VA/3.8 W

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA FOR IK21, IK40, IK63, IKA40 and IKA63

GENERAL	Type				IK21	IKA40	IK40	IKA63	IK63
	Standards				IEC/EN 61095, IEC/EN 60947-4-1, IEC 60947-5-1				
	Approvals				GOST	KEMA, GOST	KEMA, NF, GOST	KEMA, GOST	KEMA, NF, GOST
	Module width				2	3			
	Mechanical endurance			op. c.	3 x 10 6				
	Ambient temperature			°C	-5 … +55				
	Storage temperature			°C	-30 … +80				
	No. of contactors (side-by-side)	≤ 40 °C			no limitation	no limitation	max. 3	no limitation	max. 3
		40 - 55 °C					max. 2		max. 2
	Contact reliability				17 V; ≥50 mA				
	Min. distance of open contacts			mm	3.6				
	Power dissipation per pole			W	2	4		8	
	Overload current withstand capability			A	40	176		240	
	Max. back-up fuse for short-circuit protection gL Coordination type 2		I_V	A	20	63		80	
	Max. operating frequency	DC-1		c./h	300				
		AC-1/AC-3/AC-5b/AC-6b			600				
		AC-15			1200				
		no load			3000				
	Weight			kg	0.17	0.35	0.42	0.35	0.42
MAIN CIRCUIT	Rated insulation voltage		U_i	V	415	440		440	
	Rated impulse withstand voltage		U_{imp}	kV	4				
	Thermal current		I_{th}	A	20	40		63	
	Rated operational voltage		U_e	V	400				
	Rated frequency		f	Hz	50/60				
	Rated operational current	AC-1/AC-7a	I_e	A	20	40		63	
	Operational power AC-1/AC-7a	single-phase 230 V	P_e	kW	4	8.7		13.3	
		three-phase 230 V			7.5	16		24	
		three-phase 400 V			13	26		40	
	Electrical endurance	AC-1/AC-7a		op. c.	200.000	100.000		100.000	
	Rated operational current	AC-3/AC-7b	I_e	A	5	22		30	
	Operational power AC-3/AC-7b	single-phase 230 V	P_e	kW	0.37 1)	3.7 1)		5 1)	
		three-phase 230 V			1.1	5.5		8.5	
		three-phase 400 V			2.2	11		15	
	Electrical endurance	AC-3/AC-7b		op. c.	300.000	150.000		150.000	
	Switching of capacitors	AC-6b	C	µF	36	220		330	
	Electrical endurance	AC-6b		op. c.	100.000				
	DC-1 (L/R ≤ 1 ms) Rated operational current:			A					
	1 pole	U_e = 24 V DC			20	40		63	
		U_e = 48 V DC			12	24		26	
		U_e = 60 V DC			6	18		20	
		U_e = 110 V DC			2	4		4	
		U_e = 220 V DC			0.5	1.2		1.2	
	2 poles connected in series	U_e = 24 V DC			20	40		63	
		U_e = 48 V DC			15	38		42	
		U_e = 60 V DC			10	32		34	
		U_e = 110 V DC			4	10		10	
		U_e = 220 V DC			1.5	8		8	

1) Data for single-phase power are valid for versions -22, -20 and -02

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA FOR IK21, IK40, IK63, IKA40 and IKA63

	Type			IK21	IKA40	IK40	IKA63	IK63
MAIN CIRCUIT	DC-1 (L/R ≤ 1 ms) Electrical endurance:							
	3 poles connected in series	U_e = 24 V DC	A	20	40		63	
		U_e = 48 V DC		20	40		63	
		U_e = 60 V DC		20	40		60	
		U_e = 110 V DC		6	30		35	
		U_e = 220 V DC		2.5	20		30	
	4 poles connected in series	U_e = 24 V DC		20	40		63	
		U_e = 48 V DC		20	40		63	
		U_e = 60 V DC		20	40		63	
		U_e = 110 V DC		6	40		63	
		U_e = 220 V DC		3.5	40		63	
	Electrical endurance DC-1		op. c.	100.000				
	DC-3 (L/R ≤ 2 ms) Electrical endurance:		A					
	1 pole	U_e = 24 V DC		10	22		25	
		U_e = 48 V DC		5	10		11	
		U_e = 60 V DC		2	5		5	
		U_e = 110 V DC		1	1.5		1.5	
		U_e = 220 V DC		0.1	0.3		0.3	
	2 poles connected in series	U_e = 24 V DC		20	40		45	
		U_e = 48 V DC		10	20		22	
		U_e = 60 V DC		8	16		18	
		U_e = 110 V DC		4	5		5	
		U_e = 220 V DC		0.4	1		1	
	3 poles connected in series	U_e = 24 V DC		20	40		63	
		U_e = 48 V DC		20	40		45	
		U_e = 60 V DC		15	32		35	
		U_e = 110 V DC		6	15		18	
		U_e = 220 V DC		2.5	4		5	
	4 poles connected in series	U_e = 24 V DC		20	40		63	
		U_e = 48 V DC		20	40		63	
		U_e = 60 V DC		15	40		63	
		U_e = 110 V DC		6	40		63	
		U_e = 220 V DC		3.5	10		10	
	Electrical endurance DC-3		op. c.	100.000				
	DC-5 (L/R ≤ 7,5 ms) Electrical endurance:							
	1 pole	U_e = 24 V DC	A	10	20		25	
		U_e = 48 V DC		4	8		10	
		U_e = 60 V DC		1	4		5	
		U_e = 110 V DC		0.3	1		1	
		U_e = 220 V DC		0.06	0.2		0.2	
	2 poles connected in series	U_e = 24 V DC		20	40		45	
		U_e = 48 V DC		8	18		20	
		U_e = 60 V DC		6	14		15	
		U_e = 110 V DC		2	5		5	
		U_e = 220 V DC		0.2	0.8		0.8	

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA FOR IK21, IK40, IK63, IKA40 and IKA63

MAIN CIRCUIT	Tip					IK21	IKA40	IK40	IKA63	IK63
	DC-5 (L/R ≤ 7,5 ms) Electrical endurance:									
	3 poles connected in series			U_e = 24 V DC		20	40		63	
				U_e = 48 V DC		20	40		44	
				U_e = 60 V DC		15	28		30	
				U_e = 110 V DC		5	12		15	
				U_e = 220 V DC		1.5	3		4	
	4 poles connected in series			U_e = 24 V DC		20	40		63	
				U_e = 48 V DC		20	40		63	
				U_e = 60 V DC		15	40		60	
				U_e = 110 V DC		5	35		45	
				U_e = 220 V DC		3	8		10	
	Electrical endurance	DC-5			op. c.	100.000				
	Terminal capacity		rigid	S	mm²	1 … 2.5	1.5 … 25			
			flexible			1 … 2.5	1.5 … 16			
	Screw					M3.5	M5			
	Head screw					PZ2				
	Tightening torque				Nm	1.2	3.5			
AUXILIARY CIRCUIT	Rated operational voltage			U_e	V	400				
	Rated insulation voltage			U_i	V	415	440			
	Rated impulse withstand voltage			U_{imp}	kV	4				
	Thermal current			I_{th}	A	20	40		63	
	AC-15 Rated operational current	single-phase	230 V	I_e	A	6				
		single-phase	400 V			4				
	Electrical endurance	AC-15			op. c.	300.000	150.000		150.000	
CONTROL CIRCUIT	Range at control voltage			U_c	%	85 … 110				
	Kind of voltages					AC	AC	AC. DC	AC	AC. DC
	Control voltage			U_c	V	12 … 230				
	Frequency (AC)			f	Hz	50/60 [2]				
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5				kV	2				
	Coil consumption		switch-on		VA/W	30/25	15.4/6	5/5	15.4/6	5/5
			operation			5/1.5	7.7/3	5/5	7.7/3	5/5
	Make/break delays		make		ms	7 – 20	10 – 20	15 – 20	10 – 20	15 – 20
			break			10 – 20	10 – 15	35 – 45	10 – 15	35 – 45
	Terminal capacity		rigid	S	mm²	1 … 2.5				
			flexible			1 … 2.5				
	Screw					M3.5	M3			
	Screw head					PZ2	PZ1			
	Tightening torque				Nm	0.6				

[2] IK40 and IK63 can be controlled by ac voltage with frequency from 40 Hz to 400 Hz

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

SWITCHING OF LAMPS

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				IKA20, IKD20, IK21	IKA25, IKD25	IKA40, IK40	IKA63, IK63
Incandescent lamps and tungsten halogen lamps	15	0.07	–	130	130	260	330
	25	0.11	–	80	80	160	200
	40	0.18	–	50	50	100	125
	60	0.26	–	33	66	65	85
	75	0.33	–	26	26	53	66
	100	0.44	–	20	20	40	50
	150	0.65	–	13	13	26	33
	200	0.87	–	10	10	20	25
	300	1.30	–	6	6	13	16
	500	2.17	–	3	3	8	10
	1000	4.35	–	1	1	4	5
Energy saving lamps	3	0.03	–	50	60	150	200
	5	0.04	–	45	55	135	180
	7	0.055	–	40	50	120	160
	8	0.065	–	35	45	110	150
	9	0.075	–	30	40	100	140
	10	0.08	–	30	40	100	140
	11	0.09	–	30	40	100	140
	12	0.1	–	25	35	95	120
	14	0.11	–	25	35	90	120
	15	0.12	–	20	30	85	115
	16	0.13	–	20	30	80	105
	18	0.145	–	18	26	70	95
	20	0.16	–	17	22	65	85
	21	0.17	–	15	20	60	80
	23	0.185	–	15	20	60	70
	24	0.195	–	15	20	55	70
	30	0.16	–	15	20	55	70
Compact fluorescent lamps - series correction	10	0.19	1,4	50	60	105	165
	13	0.18	1,4	50	60	105	165
	18	0.23	1,7	40	50	85	135
	26	0.33	2,5	30	35	60	95
	18	0.38	2,7	25	30	50	80
	24	0.35	2,7	25	30	50	80
	36	0.44	3,4	20	25	45	70
Compact fluorescent lamps - parallel correction	5	0.18	2,2	13	16	100	150
	7	0.18	2,1	14	17	104	157
	9	0.17	2,0	15	18	110	165
	10	0.19	2,2	13	16	100	150
	11	0.16	1,7	17	21	125	194
	13	0.18	1,8	16	20	120	183
	18	0.23	2,3	13	15	95	143
	26	0.33	3,3	9	11	66	100
	18	0.38	4,2	7	8	52	78
	24	0.35	3,6	8	10	61	91
	36	0.44	4,4	6	8	50	75

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

SWITCHING OF LAMPS

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				IKA20, IKD20, IK21	IKA25, IKD25	IKA40, IK40	IKA63, IK63
Compact fluorescent lamps with electronic control gear (ECG)	5	0.05	–	45	63	180	250
	7	0.05	–	45	63	180	250
	9	0.07	–	32	45	128	180
	10	0.07	–	32	45	128	180
	11	0.07	–	32	45	128	180
	13	0.07	–	32	45	128	180
	18	0.22	–	10	14	40	57
	24	0.22	–	10	14	40	57
	26	0.22	–	10	14	40	57
	32	0.22	–	10	14	40	57
	36	0.22	–	10	14	40	57
	40	0.22	–	10	14	40	57
	42	0.22	–	10	14	40	57
	55	0.28	–	8	11	32	45
	57	0.28	–	8	11	32	45
	70	0.35	–	6	9	25	36
	80	0.41	–	5	8	22	30
	120	0.58	–	4	5	15	22
	2 x 9	0.11	–	2 x 16	2 x 22	2 x 90	2 x 125
	2 x 10	0.11	–	2 x 16	2 x 22	2 x 90	2 x 125
	2 x 11	0.11	–	2 x 16	2 x 22	2 x 90	2 x 125
	2 x 13	0.11	–	2 x 16	2 x 22	2 x 90	2 x 125
	2 x 18	0.30	–	2 x 5	2 x 7	2 x 20	2 x 28
	2 x 24	0.31	–	2 x 5	2 x 7	2 x 20	2 x 28
	2 x 26	0.31	–	2 x 5	2 x 7	2 x 20	2 x 28
	2 x 32	0.31	–	2 x 5	2 x 7	2 x 20	2 x 28
	2 x 36	0.31	–	2 x 5	2 x 7	2 x 20	2 x 28
	2 x 40	0.40	–	2 x 4	2 x 6	2 x 18	2 x 26
	2 x 42	0.40	–	2 x 4	2 x 6	2 x 18	2 x 26
	2 x 55	0.55	–	2 x 3	2 x 5	2 x 16	2 x 22
	2 x 57	0.55	–	2 x 3	2 x 5	2 x 16	2 x 22
Fluorescent lamps - uncorrected or series correction	11	0.16	1.3	55	70	125	200
	18	0.37	2.7	22	24	90	140
	24	0.35	2.5	22	24	90	140
	36	0.43	3.4	17	20	65	95
	58	0.67	5.3	14	17	45	70
	65	0.67	5.3	14	17	35	50
	85	0.80	5.3	12	15	25	40
Fluorescent lamps - lead-lag circuit	2 x 11	0.07	–	2 x 50	2 x 60	2 x 140	2 x 200
	2 x 18	0.11	–	2 x 30	2 x 40	2 x 100	2 x 150
	2 x 24	0.14	–	2 x 24	2 x 31	2 x 78	2 x 118
	2 x 36	0.22	–	2 x 17	2 x 24	2 x 65	2 x 95
	2 x 58	0.35	–	2 x 10	2 x 14	2 x 40	2 x 60
	2 x 65	0.35	–	2 x 9	2 x 13	2 x 30	2 x 45
	2 x 85	0.47	–	2 x 6	2 x 10	2 x 20	2 x 30

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

SWITCHING OF LAMPS

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				IKA20, IKD20, IK21	IKA25, IKD25	IKA40, IK40	IKA63, IK63
Fluorescent lamps - parallel correction	11	0.16	3.5	9	10	62	94
	18	0.37	4.5	7	8	48	73
	24	0.35	4.5	7	8	48	73
	36	0.34	4.5	7	8	48	73
	58	0.67	7.0	4	5	31	47
	65	0.67	7.0	4	5	31	47
	85	0.80	8.0	3	4	27	41
Fluorescent lamps with electronic control gear (ECG)	18	0.09	–	25	35	100	140
	36	0.16	–	15	20	52	75
	58	0.25	–	14	19	50	72
	2 x 18	0.17	–	2 x 12	2 x 17	2 x 50	2 x 70
	2 x 36	0.32	–	2 x 7	2 x 10	2 x 26	2 x 38
	2 x 58	0.49	–	2 x 7	2 x 9	2 x 25	2 x 36
High-pressure mercury-vapour lamps - uncorrected	50	0.61	–	14	18	38	55
	80	0.80	–	10	13	29	42
	125	1.15	–	7	9	20	29
	250	2.15	–	4	5	10	15
	400	3.25	–	2	3	7	10
	700	5.40	–	1	2	4	6
	1000	7.50	–	1	1	3	4
High-pressure mercury-vapour lamps - parallel correction	50	0.28	7	4	5	31	47
	80	0.41	8	4	5	27	41
	125	0.65	10	3	4	22	33
	250	1.22	18	1	2	12	18
	400	1.95	25	1	1	9	13
	700	3.45	45	–	–	5	7
	1000	4.80	60	–	–	4	5
Metal halide lamps - uncorrected	35	0.35	–	18	22	43	60
	70	1.00	–	10	12	23	32
	150	1.80	–	5	7	12	18
	250	3.00	–	3	4	7	10
	400	3.50	–	3	3	6	9
	1000	9.50	–	1	1	2	3
	2000	16.50	–	–	–	1	1
Metal halide lamps - parallel correction	35	0.25	6	5	6	36	50
	70	0.45	12	2	3	18	25
	150	0.75	20	1	1	11	15
	250	1.50	33	–	1	6	9
	400	2.50	35	–	1	6	8
	1000	5.80	95	–	–	2	3
	2000	11.50	148	–	–	1	2

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

SWITCHING OF LAMPS

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				IKA20, IKD20, IK21	IKA25, IKD25	IKA40, IK40	IKA63, IK63
Metal halide lamps with electronic control gear (PCI) + 50-125x $I_{n\ lamp}$ for 0,6 ms	20	0.10	–	9	9	18	20
	35	0.20	–	6	6	11	13
	70	0.36	–	5	5	10	12
	150	0.70	–	4	4	8	10
High-pressure sodium-vapour lamps - uncorrected	150	1.8	–	5	6	17	22
	250	3.0	–	3	4	10	13
	400	4.7	–	2	2	6	8
	1000	10.3	–	–	1	3	3
High-pressure sodium-vapour lamps - correction	150	0.83	20	1	1	11	16
	250	1.50	33	–	1	6	10
	400	2.40	48	–	–	4	6
	1000	6.30	106	–	–	2	3
High-pressure sodium-vapour lamps with electronic control gear (PCI) + 50-125 x $I_{n\ lamp}$ for 0,6 ms	20	0.10	–	9	9	18	20
	35	0.20	–	6	6	11	13
	70	0.36	–	5	5	10	12
	150	0.70	–	4	4	8	10
Low-pressure sodium-vapour lamps - uncorrected	18	0.35	–	22	27	71	90
	35	1.50	–	7	9	23	30
	55	1.50	–	7	9	23	30
	90	2.40	–	4	5	14	19
	135	3.50	–	3	4	10	13
	180	3.50	–	3	4	10	13
Low-pressure sodium-vapour lamps - parallel correction	18	0.35	5	6	7	44	66
	35	0.31	20	1	1	11	16
	55	0.42	20	1	1	11	16
	90	0.63	26	1	1	8	12
	135	0.94	45	–	–	4	7
	180	1.16	40	–	–	5	8
Transformers for low-voltage tungsten halogen lamps	20	–	–	40	52	110	174
	50	–	–	20	24	50	80
	75	–	–	13	16	35	54
	100	–	–	10	12	27	43
	150	–	–	7	9	19	29
	200	–	–	5	6	14	23
	300	–	–	3	4	9	14

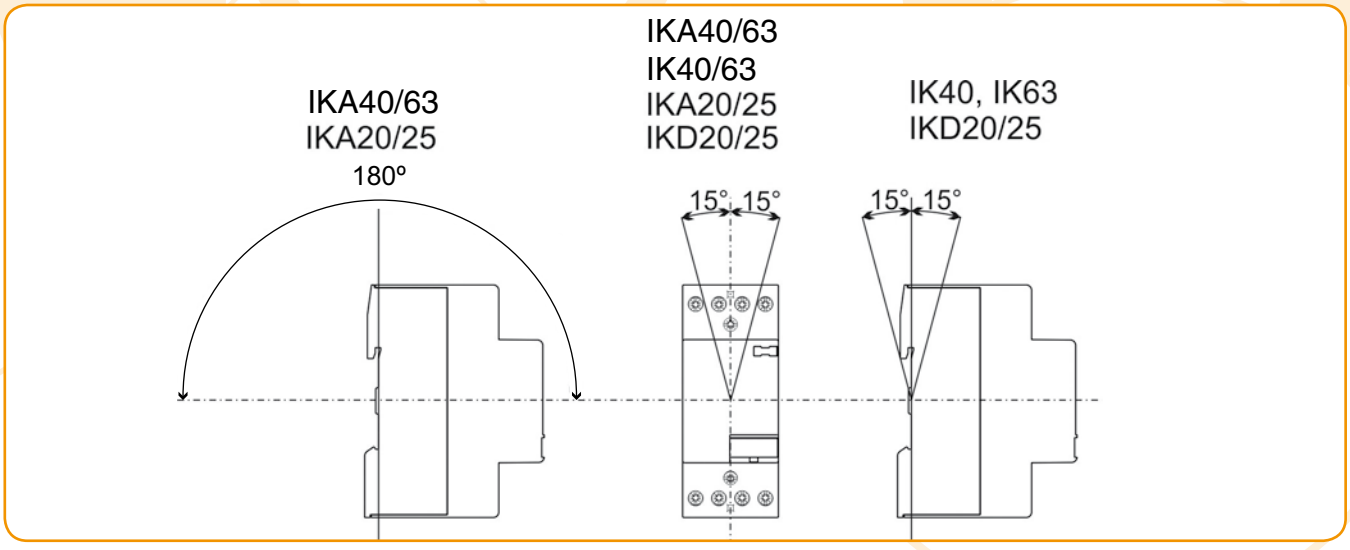
IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

SWITCHING OF LAMPS

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				IKA20, IKD20, IK21	IKA25, IKD25	IKA40, IK40	IKA63, IK63
Fluorescent lamps T5 with electronic control gear (ECG)	22	0.11	FC	22	30	80	110
	40	0.21		12	15	40	60
	55	0.28		8	12	30	45
	14	0.08	HE	30	40	105	150
	21	0.11		22	30	80	115
	28	0.14		18	22	60	90
	35	0.18		14	18	48	70
	24	0.12	HO	20	26	70	100
	39	0.20		12	16	42	62
	49	0.24		10	14	35	52
	54	0.27		9	13	32	47
	80	0.39		6	8	22	32
	2 x 22	0.23	2 x FC	2 x 11	2 x 15	2 x 40	2 x 55
	2 x 40	0.42		2 x 6	2 x 7	2 x 20	2 x 30
	2 x 55	0.55		2 x 4	2 x 6	2 x 15	2 x 22
	2 x 14	0.15	2 x HE	2 x 15	2 x 20	2 x 52	2 x 75
	2 x 21	0.22		2 x 11	2 x 15	2 x 40	2 x 57
	2 x 28	0.28		2 x 9	2 x 11	2 x 20	2 x 45
	2 x 35	0.36		2 x 7	2 x 9	2 x 24	2 x 35
	2 x 24	0.24	2 x HO	2 x 10	2 x 13	2 x 35	2 x 50
	2 x 39	0.39		2 x 6	2 x 8	2 x 21	2 x 31
	2 x 49	0.48		2 x 5	2 x 7	2 x 17	2 x 26
	2 x 54	0.54		2 x 4	2 x 6	2 x 16	2 x 23
	2 x 80	0.74		2 x 3	2 x 4	2 x 11	2 x 16

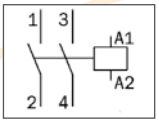
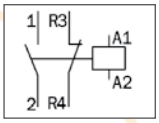
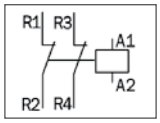
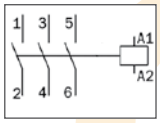
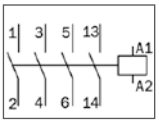
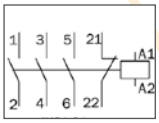
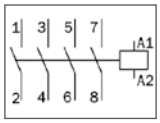
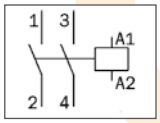
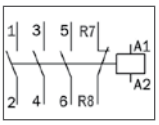
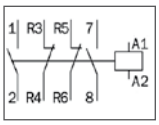
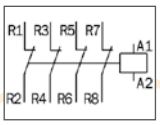
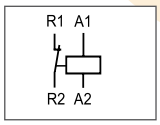
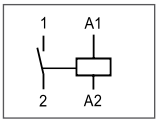
IK21 contactors operation position is optional.
Operation position for contactors IKA20, IKD20, IKA25, IKD25, IK40, IKA40, IK63 and IKA63:



IK INSTALLATION CONTACTORS

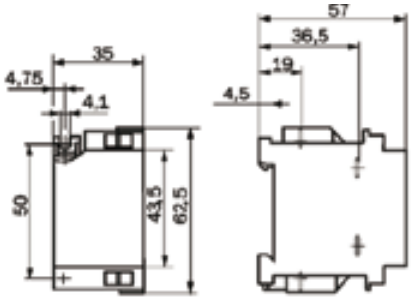
IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

CONTACT ARRANGEMENTS

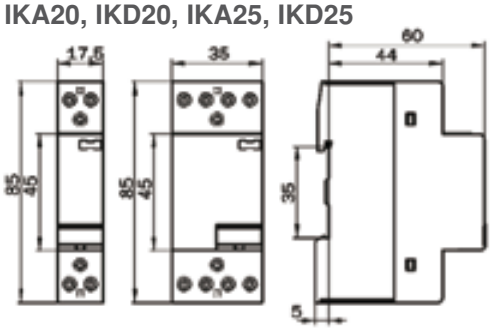
IKA20-20 IKD20-20		IKA20-11 IKD20-11		IKA20-02 IKA20-02		IKA25-30 IKD25-30 IK40-30 IKA40-30 IK63-30 IKA63-30	
IK21-10		IK21-01		IKA25-40 IKD25-40 IK40-40 IKA40-40 IK63-40 IKA63-40		IKA25-20 IKD25-20 IK40-20 IKA40-20 IK63-20 IKA63-20	
IKA25-31 IKD25-31 IK40-31 IKA 40-31 IK63-31 IKA63-31		IKA25-22 IKD25-22 IK40-22 IKA40-22 IK63-22 IKA63-22		IKA25-04 IKD25-04 IK40-04 IKA40-04 IKA63-04		IKA20-01 IKD20-01	
IKA20-10 IKD20-10							

DIMENSIONS

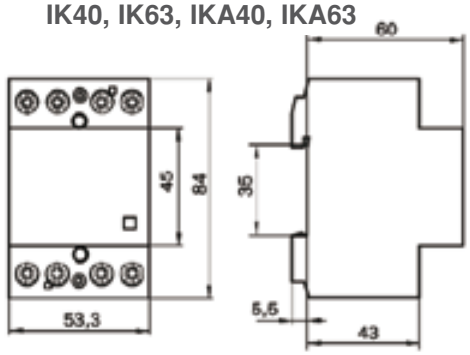
IK21



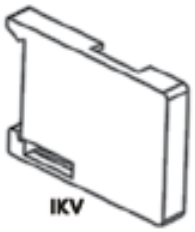
IKA20, IKD20, IKA25, IKD25



IK40, IK63, IKA40, IKA63

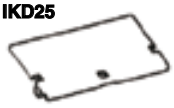


Ventilation module



Sealing cover

IKA25, IKD25



IKA20, IKD20

IK40, IK63, IKA40, IKA63

ORDERING DATA

The type designation and control voltage should be stated when ordering the contactors.

IK63 - 40 / 220/230

- Control voltage
- Version of Contacts
- Type

IK-R INSTALLATION CONTACTORS

IKA20-R, IKA25-R, IKD20-R, IKD25-R

- IKA20-R, IKD20-R, IKA25-R and IKD25-R are upgraded versions of basic types of installation contactors
- Besides basic functions they enable manual control with a handle
- Description of the handle positions:
  - A: the contactor functions as an installation contactor without manual control
  - O: permanently switched off control voltage
  - I: at manual shifting the handle from position A to I, make contacts are closed and break contacts are open. When control voltage is applied, the handle is automatically set to position A.
- IKD20-R and IKD25-R are provided with a varistor for overvoltage protection and a rectifier, which enables control with AC and DC voltage
- Contactors with manual control enable
  - switching depending on tariff (selection of the most convenient tariff)
  - switching when control voltage is not applied
- Degree of protection IP20
- Technical data for lamps are identical to installation contactors without manual operation IKA20, IKD20, IKA25 and IKD25

TEHNICAL DATA

GENERAL	Type				IKA20-R	IKD20-R	IKA25-R	IKD25-R
	Standards				IEC/EN 61095 , IEC/EN 60947-4-1, IEC 60947-5-1			
	Approvals				NF, GOST, KEMA	NF, GOST, KEMA	NF, GOST, KEMA	GOST, KEMA
	Module width				1		2	
	Mechanical endurance			op. c.	3×10^6			
	Ambient temperature			°C	-5 … +55			
	Storage temperature			°C	-30 … +80			
	No. of contactors (side-by-side)	≤40 °C			max. 3	max. 3	no limit	max. 3
		40 - 55 °C			max. 2	max. 2		max. 2
	Contact reliability				17 V; ≥ 50 mA			
	Min. distance of open contacts			mm	3.6			
	Power dissipation per pole			W	1.7	1.7	2.2	2.2
	Overload current withstand capability			A	72	72	68	68
	Max. back-up fuse for short-circuit protection gL Coordination type 2		I_v	A	20	20	25	25
	Max. operating frequency	DC-1		op. c./h	300			
		AC-1/AC-3/AC-5b/AC-6b/ AC-15			600			
		no load			3000			
	Weight			kg	0.13	0.13	0.24	0.24
MAIN CIRCUIT	Rated insulation voltage		U_i	V	230	230	440	440
	Rated impulse withstand voltage		U_{imp}	kV	4			
	Thermal current		I_{th}	A	20	20	25	25
	Rated operational voltage		U_e	V	230	230	400	400
	Rated frequency		f	Hz	50/60			
	Rated operational current	AC-1/AC-7a	I_e	A	20	20	25	25
	Operational power	single-phase 230 V			4	4	5.4	5.4
	AC-1/AC-7a	three-phase 230 V	P_e	kW	-	-	9	9
		three-phase 400 V			-	-	16	16
	Electrical endurance	AC-1/AC-7a	op. c.		200.000			

IK-R INSTALLATION CONTACTORS

IKA20-R, IKA25-R, IKD20-R, IKD25-R

TEHNICAL DATA

MAIN CIRCUIT

Type					IKA20-R	IKD20-R	IKA25-R	IKD25-R
Rated operational current	AC-3/AC-7b		I_e	A	NO: 9 NC: 6	NO: 9 NC: 6	8,5	8,5
Operational power AC-3/AC-7b	single-phase	230 V	P_e	kW	NO: 1,3 NC: 0,75	NO: 1,3 NC: 0,75	1,3 [1]	1,3 [1]
	three-phase	230 V			–	–	2,2	2,2
	three-phase	400 V			–	–	4	4
Electrical endurance	AC-3/AC-7b			op. c.	300.000	300.000	500.000	500.000
Switching of capacitors	AC-6b		C	µF	30	30	36	36
Electrical endurance	AC-6b	230 V		op. c.	100.000			
DC-1 (L/R ≤ 1 ms) Rated operational current:								
1 pole		U_e = 24 V DC		A	20	20	25	25
		U_e = 48 V DC			15	15	20	20
		U_e = 60 V DC			10	10	15	15
		U_e = 110 V DC			6	6	6	6
		U_e = 220 V DC			0.6	0.6	0.6	0.6
2 poles connected in series		U_e = 24 V DC			20	20	25	25
		U_e = 48 V DC			18	18	25	25
		U_e = 60 V DC			15	15	20	20
		U_e = 110 V DC			10	10	10	10
		U_e = 220 V DC			6	6	6	6
3 poles connected in series		U_e = 24 V DC			–	–	25	25
		U_e = 48 V DC			–	–	25	25
		U_e = 60 V DC			–	–	25	25
		U_e = 110 V DC			–	–	20	20
		U_e = 220 V DC			–	–	15	15
4 poles connected in series		U_e = 24 V DC			–	–	25	25
		U_e = 48 V DC			–	–	25	25
		U_e = 60 V DC			–	–	25	25
		U_e = 110 V DC			–	–	20	20
		U_e = 220 V DC			–	–	15	15
Electrical endurance	DC-1			op. c.	100.000			
DC-3 (L/R ≤ 2 ms) Rated operational current:								
1 pole		U_e = 24 V DC		A	10	10	15	15
		U_e = 48 V DC			5	5	8	8
		U_e = 60 V DC			2	2	4	4
		U_e = 110 V DC			1	1	1.3	1.3
		U_e = 220 V DC			0.1	0.1	0.2	0.2
2 poles connected in series		U_e = 24 V DC			20	20	25	25
		U_e = 48 V DC			10	10	16	16
		U_e = 60 V DC			8	8	12	12
		U_e = 110 V DC			4	4	5.5	5.5
		U_e = 220 V DC			0.4	0.4	0.6	0.6
3 poles connected in series		U_e = 24 V DC			–	–	25	25
		U_e = 48 V DC			–	–	25	25
		U_e = 60 V DC			–	–	25	25
		U_e = 110 V DC			–	–	15	15
		U_e = 220 V DC			–	–	3	3
4 poles connected in series		U_e = 24 V DC			–	–	25	25
		U_e = 48 V DC			–	–	25	25
		U_e = 60 V DC			–	–	25	25
		U_e = 110 V DC			–	–	20	20
		U_e = 220 V DC			–	–	8	8
Electrical endurance	DC-3			op. c.	100.000			

1) Data for single-phase power are valid for versions -22, -20 and -02

IK-R INSTALLATION CONTACTORS

IKA20-R, IKA25-R, IKD20-R, IKD25-R

TEHNICAL DATA

						IKA20-R	IKD20-R	IKA25-R	IKD25-R
MAIN CIRCUIT	Type								
	DC-5 (L/R ≤ 7,5 ms) Rated operational current:				A				
	1 pole		U_e = 24 V DC			10	10	15	15
			U_e = 48 V DC			4	4	5	5
			U_e = 60 V DC			1	1	3	3
			U_e = 110 V DC			0.3	0.3	0.5	0.5
			U_e = 220 V DC			0.06	0.06	0.1	0.1
	2 poles connected in series		U_e = 24 V DC			20	20	25	25
			U_e = 48 V DC			8	8	15	15
			U_e = 60 V DC			6	6	10	10
			U_e = 110 V DC			2	2	4	4
			U_e = 220 V DC			0.2	0.2	0.4	0.4
	3 poles connected in series		U_e = 24 V DC			–	–	25	25
			U_e = 48 V DC			–	–	25	25
			U_e = 60 V DC			–	–	20	20
			U_e = 110 V DC			–	–	12	12
			U_e = 220 V DC			–	–	2	2
	4 poles connected in series		U_e = 24 V DC			–	–	25	25
			U_e = 48 V DC			–	–	25	25
			U_e = 60 V DC			–	–	25	25
			U_e = 110 V DC			–	–	15	15
			U_e = 220 V DC			–	–	5	5
	Electrical endurance	DC-5			op. c.	100.000			
	Terminal capacity		rigid	S	mm²	1 … 10			
			flexible			1 … 6			
	Screw					M3.5			
	Head screw					PZ1			
	Tightening torque				Nm	1.2			
AUXILIARY CIRCUIT	Rated operational voltage			U_e	V	230	230	400	400
	Rated insulation voltage			U_i	V	230	230	440	440
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	20	25	25
	AC-15 Rated operational current	single-phase	230 V	I_e	A	6	6	6	6
		single-phase	400 V			–	–	4	4
	Electrical endurance	AC-15			op. c.	300.000	300.000	500.000	500.000
CONTROL CIRCUIT	Range of control voltage			U_c	%	85 … 110			
	Kind of voltages					AC	AC, DC	AC	AC, DC
	Control voltages			U_c	V	12 … 230			
	Frequency (AC)			f	Hz	50/60 [2]			
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5				kV	2			
	Coil consumption	switch-on (handle in A)			VA/W	12/10	2.1/2.1	33/25	2.6/2.6 [3]
		switch-on (handle in I)				6/3.8	2.1/2.1	10/5	2.6/2.6 [3]
		operation				2.8/1.2	2.1/2.1	5.5/1.6	2.6/2.6 [3]
	Make/break delays		make		ms	15 – 25	15 – 45	10 – 30	15 – 45
			break			10 – 30	20 – 50	10 – 30	20 – 70
	Terminal capacity		rigid	S	mm²	1 … 2.5			
			flexible			1 … 2.5			
	Screw					M3			
	Screw head					PZ1			
	Tightening torque				Nm	0.6			

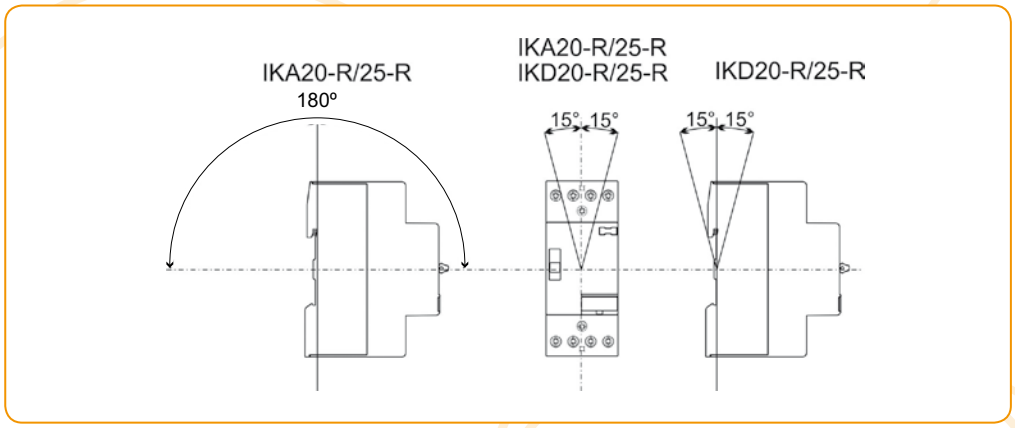
[2] IKD20-R and IKD25-R can be controlled by ac voltage with frequency from 40 Hz to 400 Hz

[3] Coil consumption for version -04 is 3.8 VA / 3.8 W

IK-R INSTALLATION CONTACTORS

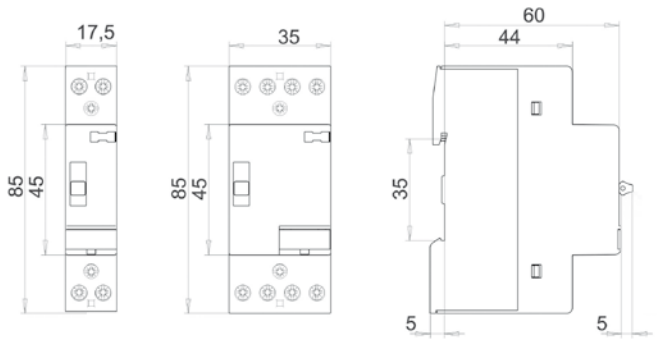
IKA20-R, IKA25-R, IKD20-R, IKD25-R

OPERATION POSITION FOR CONTACTORS IKA20-R, IKD20-R, IKA25-R, IKD25-R



DIMENSIONS

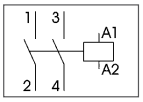
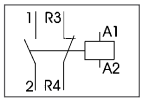
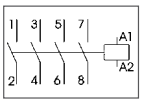
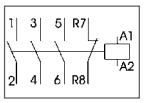
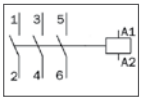
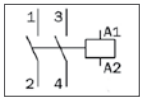
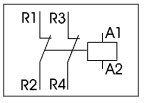
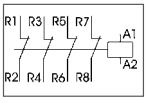
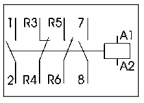
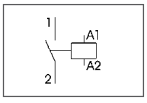
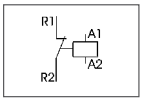
IKA20-R, IKD20-R, IKA25-R, IKD25-R



SEALING COVER

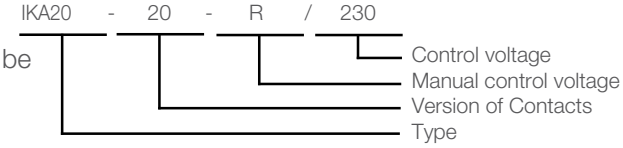
Ventilation module

CONTACT ARRANGEMENTS

IKA20-20-R IKD20-20-R		IKA20-11-R IKD20-11-R	
IKA25-40-R IKD25-40-R		IKA25-31-R IKD25-31-R	
IKA25-30-R IKD25-30-R		IKA25-20-R IKD25-20-R	
IKA20-02-R IKD20-02-R		IKA25-04-R IKD25-04-R	
IKA25-22-R IKD25-22-R		IKA20-10-R IKD20-10-R	
IKA-20-01-R IKD-20-01-R			

ORDERING DATA

The type designation and control voltage should be stated when ordering the contactors.



IKN AUXILIARY SWITCH

The IKN auxiliary switch is mainly used for indicating the contactor switching condition and also for control of heavier electromagnetic loads (above 72 VA).
The IKN auxiliary switch is provided with two contacts in the following versions:

- version-11 with one break and one make contact
- version-20 with two make contacts
- version-02 with two break contacts

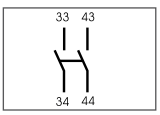
Degree of protection IP20.
This auxiliary switch can be used at contactors IKA20-R, IKA25-R, IKD25-R, IKA20, IKA25, IKD25, IK40, IK63
Available also special versions of auxiliary switch with UL certificate (contact us for details)
The auxiliary switch should not be applied in combination with IKD20 and IKD20-R.

TEHNICAL DATA

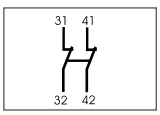
GENERAL	Type			IKN
	Standards			IEC/EN 60947-5-1
	Approvals			KEMA, NF, GOST
	Module width			½
MAIN CIRCUIT	Rated insulation voltage	U_i	V	500
	Rated impulse withstand voltage	U_{imp}	kV	4
	Thermal current	I_{th}	A	6
	Rated operational voltage	U_e	V	230
				400
	Rated operational current AC-15 U_e = 230 V U_e = 400 V	I_e	A	 6 4
	Electrical endurance		op. c.	50,000
	Mechanical endurance		op. c.	3 x 10^6
	Min. distance of open contacts		mm	4
	Contact reliability			12 V; ≥ 5 mA
	Power loss per pole		W	0.3
	Weight		kg	0.035
	Max. back-up fuse for short-circuit protection gL Coordination type 2.	I_v	A	6
	Terminal capacity rigid flexible	S	mm^2	1 … 2.5 1 … 2.5
	Screw			M3
	Screw head			PZ1
	Tightening torque		Nm	0.6

CONTACT ARRANGEMENTS

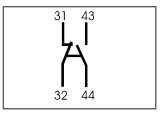
IKN-20



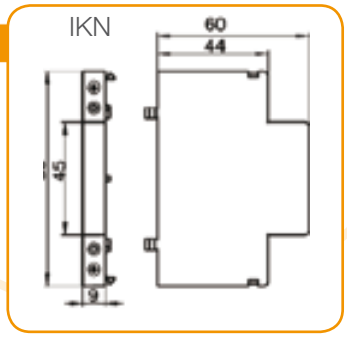
IKN-02



IKN-11



DIMENSIONS



IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

INTENDED USE:
- Customer units in dwelings
- Business premises
- Hotels
- Hospitals
- Shopping centres
- Sport centres
- Production halls
- Warehouses
- Public places

REMOTE SWITCHING AND AUTOMATIC CONTROL:
- Single-phase motors
- Three-phase motors
- Different pumps
- Air-conditioning
- Electric heating
- Lightning

SILENT OPERATION:
- Rectifier enable AC or DC voltage control
- Overvoltage protection with varistor
- IKD20, IKD25, IK40 and IK63

AC CONTROL:
- Fast switching
- IKA20, IKA25, IKA40 and IKA63

OTHER BENEFITS:
- Used as main or auxiliary
- Mounting on DIN rail
- Sealing terminal covers for direct protection against contact with live parts
- IKV ventilation module for preventing exceeded heating when contactors are used side-by-side

TECHNICAL DATA

	Type			IKA20	IKD20	IKA25	IKD25
GENERAL	Standards			UL 508, CSA C22.2 No. 14, IEC 60947-4-1, EN 60947-4-1, IEC 61095, EN 61095, IEC 60947-5-1, EN 60947-5-1			
	Approvals			UL, CSA			
	Protection degree			IP20			
	Mechanical endurance		op. c.	3.000.000			
	Ambient temperature			23 °F…104 °F/-5 °C…+40 °C			
	Storage temperature			-22 °F…176 °F/-30 °C…+80 °C			
	No. of contactors side-by-side without ventilation module			max. 3		no limitation	max. 3
	Contact reliability			17 V/≥50 mA			
	Min. distance of open contacts		in/mm	0.1417/3.6			
	Power dissipation per pole		W	1.7	1.7	2.2	2.2
	Overload current withstand capability (10 s)		A	72	72	68	68
	Max. back-up fuse for short-circuit protection			20 A (gL) 20 A (K5)	20 A (gL) 20 A (K5)	25 A (gL) 25 A (K5)	25 A (gL) 25 A (K5)
	Max. operating frequency	No load	op. c./h	3000			
		AC-1/AC-3/AC-6b		600			
		AC-15		1200			
		El. switching acc. UL 508		360			
	Weight		lb/kg	0.29/0.13	0.29/0.13	0.53/0.24	0.53/0.24

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA

	Type					IKA20	IKD20	IKA25	IKD25
MAIN CIRCUIT - UL/CSA	Motor power	1-phase	120 V		HP	1/3	1/3	1/3	1/3
		1-phase	208 V			3/4	3/4	3/4	3/4
		1-phase	240 V			1	1	1	1
		3-phase	120 V					1	1
		3-phase	208 V					2	2
		3-phase	240 V					3	3
		3-phase	480 V					5	5
	General use	1-phase	240 V		A	20	20		
		3-phase	480 V					25	25
	Discharge lamps (standard ballast)	1-phase	240 V		A	20	20		
		3-phase	480 V					25	25
	Auxiliary circuit					B300, P300	B300, P300	B300, P300	B300, P300
MAIN CIRCUIT - IEC/EN	Rated insulation voltage			U_i	V	300	300	500	500
	Rated impulse withstand woltage			U_{imp}	kV	4	4	4	4
	Thermal current			I_{th}	A	20	20	25	25
	Rated operational voltage			U_e	V	230	230	400	400
	Rated frequency			f	Hz	50/60	50/60	50/60	50/60
	Rated operational current AC-1/AC-7a			I_e	A	20	20	25	25
	Operational power AC-1/AC-7a	1-phase	230 V	P_e	W	4	4	5.4	5.4
		3-phase	230 V					9	9
		3-phase	400 V					16	16
	Electrical endurance AC-1/AC-7a				op. c.				200000
	Rated operational current AC-3/AC-7b			I_e	A	9 NO/6 NC	9 NO/6 NC	8.5	8.5
	Operational power AC-3/AC-7b	1-phase	230 V	P_e	A	1.3 NO/0.75 NC	1.3 NO/0.75 NC	1.3	1.3
		3-phase	230 V					2.2	2.2
		3-phase	400 V					4	4
	Electrical endurance AC-3/AC-7b				op. c.	300000		500000	
	Switching of capacitor AC-6b		230 V	C	µF	30	30	36	36
	Electrical endurance AC-6b				op. c.	100000			
	Auxiliary circuit	1-phase	230 V	I_e	A	6	6	6	6
	Rated operational current AC-15	1-phase	400 V			4	4	4	4
	Electrical endurance AC-15				op. c.	300000		500000	
	Terminal capacity	Rigid		S	AWG/ mm²	16…10/1…10	16…10/1…10	16…10/1…10	16…10/1…10
		Flexible				16…8/1…6	16…8/1…6	16…8/1…6	16…8/1…6
	Screw					M3.5	M3.5	M3.5	M3.5
	Screw head					PZ1	PZ1	PZ1	PZ1
	Tightening torque				lb-in/Nm	10.62/1.2	10.62/1.2	10.62/1.2	10.62/1.2
CONTROL CIRCUIT	Range of control voltage			U_c	%	85…110			
	Control voltages			U_c	V	12…240			
	Kind of voltage			U_c		AC	AC, DC	AC	AC, DC
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5				kV	2			
	Coil consumption	Switch-on			VA/W	12/10	2.1/2.1	33/25	2.6/2.6[1)]
		Operation				2.8/1.2	2.1/2.1	5.5/1.6	2.6/2.6[1)]
	Make/break delays	Make			ms	15…25	15…45	10…30	15…45
		Break				10…30	20…50	10…30	20…70
	Terminal capacity	Rigid		S	AWG/ mm²	16…14/1…2.5	16…14/1…2.5	16…14/1…2.5	16…14/1…2.5
		Flexible				16…14/1…2.5	16…14/1…2.5	16…14/1…2.5	16…14/1…2.5
	Screw					M3	M3	M3	M3
	Screw head					PZ1	PZ1	PZ1	PZ1
	Tightenig torque				lb-in/Nm	5.31/0.6	5.31/0.6	5.31/0.6	5.31/0.6

[1)] Coil consumption for version -04 is 3.8 VA/ W

[2)] Coil consumption for versions -22 and -04 is 6.1 VA/W

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

TECHNICAL DATA

	Type					IKA40	IK40	IKA63	IK63
GENERAL	Standards					UL 508, CSA C22.2 No. 14, IEC 60947-4-1, EN 60947-4-1, IEC 61095, EN 61095, IEC 60947-5-1, EN 60947-5-1			
	Approvals					UL, CSA			
	Protection degree					IP20			
	Mechanical endurance				op. c.	3.000.000			
	Ambient temperature					23 °F…104 °F/-5 °C…+40 °C			
	Storage temperature					-22 °F…176 °F/-30 °C…+80 °C			
	No. of contactors side-by-side without ventilation module					no limitation	max. 3	no limitation	max. 3
	Contact reliability					17 V/≥50 mA			
	Min. distance of open contacts				in/mm	0.1417/3.6			
	Power dissipation per pole				W	4	4	8	8
	Overload current withstand capability (10 s)				A	176	176	240	240
	Max. back-up fuse for short-circuit protection					63 A (gL) 60 A (K5)	63 A (gL) 60 A (K5)	80 A (gL) 70 A (K5)	80 A (gL) 70 A (K5)
	Max. operating frequency	No load			op. c./h	3000			
		AC-1/AC-3/AC-6b				600			
		AC-15				1200			
		El. switching acc. UL 508				360			
	Weight				lb/kg	0.77/0.35	0.93/0.42	0.77/0.35	0.93/0.42
MAIN CIRCUIT - UL/CSA	Motor power	1-phase	120 V		HP	1	1	2	2
		1-phase	208 V			2	2	3	3
		1-phase	240 V			3	3	5	5
		3-phase	120 V			3	3	5	5
		3-phase	208 V			7-1/2	7-1/2	10	10
		3-phase	240 V			7-1/2	7-1/2	10	10
		3-phase	480 V			15	15	20	20
	General use	1-phase	240 V		A				
		3-phase	480 V			40	40	63	63
	Discharge lamps	1-phase	240 V		A				
	(standard ballast)	3-phase	480 V			30	30	40	40
	Auxiliary circuit					B300, P300	B300, P300	B300, P300	B300, P300
MAIN CIRCUIT - IEC/EN	Rated insulation voltage			U_i	V	600	600	600	600
	Rated impulse withstand woltage			U_{imp}	kV	4	4	4	4
	Thermal current			I_{th}	A	40	40	63	63
	Rated operational voltage			U_e	V	400	400	400	400
	Rated frequency			f	Hz	50/60	50/60	50/60	50/60
	Rated operational current AC-1/AC-7a			I_e	A	40	40	63	63
	Operational power	1-phase	230 V	P_e	W	8.7	8.7	13.3	13.3
		3-phase	230 V			16	16	25	25
	AC-1/AC-7a	3-phase	400 V			26	26	40	40
	Electrical endurance AC-1/AC-7a				op. c.	100000			
	Rated operational current AC-3/AC-7b			I_e	A	22	22	30	30
	Operational power	1-phase	230 V	P_e	A	3.7	3.7	5	5
		3-phase	230 V			5.5	5.5	8.5	8.5
	AC-3/AC-7b	3-phase	400 V			11	11	15	15
	Electrical endurance AC-3/AC-7b				op. c.	150000			
	Switching of capacitor AC-6b		230 V	C	µF	220	220	330	330
	Electrical endurance AC-6b				op. c.	100000			
	Auxiliary circuit	1-phase	230 V	I_e	A	6	6	6	6
	Rated operational current AC-15	1-phase	400 V			4	4	4	4
	Electrical endurance AC-15				op. c.	150000			
	Terminal capacity	Rigid		S	AWG/ mm²	14…10/1.5…25	14…10/1.5…25	14…10/1.5…25	14…10/1.5…25
		Flexible				14…4/1.5…16	14…4/1.5…16	14…4/1.5…16	14…4/1.5…16
	Screw					M5	M5	M5	M5
	Screw head					PZ2	PZ2	PZ2	PZ2
	Tightening torque				lb-in/Nm	30.98/3.5	30.98/3.5	30.98/3.5	30.98/3.5

IK INSTALLATION CONTACTORS

IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

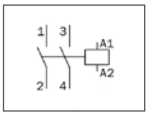
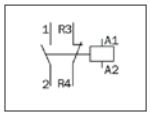
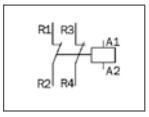
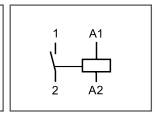
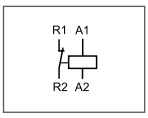
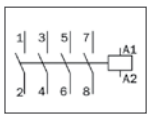
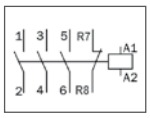
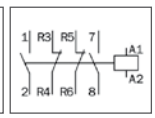
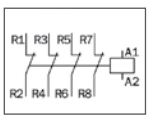
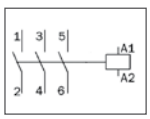
TECHNICAL DATA

					IKA40	IK40	IKA63	IK63
CONTROL CIRCUIT	Type							
	Range of control voltage		U_C	%	85…110			
	Control voltages		U_C	V	12…240			
	Kind of voltage		U_C		AC	AC, DC	AC	AC, DC
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5			kV	2			
	Coil consumption	Switch-on		VA/W	15.4/6 [4]	5/5 [2]	15.4/6 [4]	5/5 [2]
		Operation			7.7/3 [3]	5/5 [2]	7.7/3 [3]	5/5 [2]
	Make/break delays	Make		ms	10…20	15…20	10…20	15…20
		Break			10…15	35…45	10…15	10…15
	Terminal capacity	Rigid	S	AWG/ mm²	16…14/1…2.5	16…14/1…2.5	16…14/1…2.5	16…14/1…2.5
		Flexible			16…14/1…2.5	16…14/1…2.5	16…14/1…2.5	16…14/1…2.5
	Screw				M3	M3	M3	M3
	Screw head				PZ1	PZ1	PZ1	PZ1
	Tightenig torque			lb-in/Nm	5.31/0.6	5.31/0.6	5.31/0.6	5.31/0.6

[3] Coil consumption for version -22 and -04 is 12.3/2.8 VA/ W

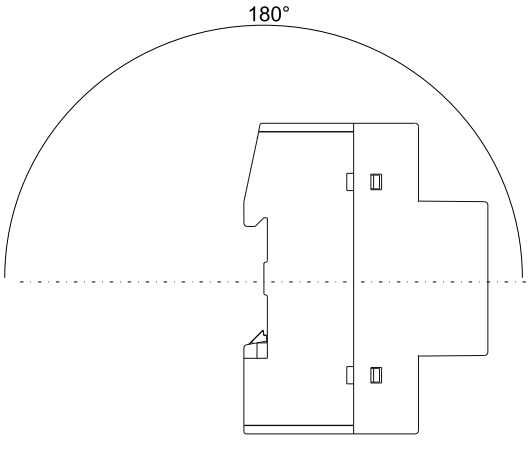
[4] Coil consumption for versions -22 and -04 is 64/52 VA/W

CONTACT ARRANGEMENTS

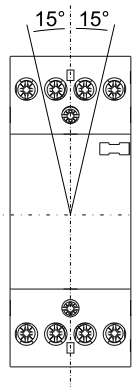
IKA20-20UL IKD20-20UL		IKA20-11UL IKD20-11UL	
IKA20-02UL IKA20-02UL		IKA20-10UL IKD20-10UL	
IKA20-01UL IKD20-01UL		IKA25-40UL IKD25-40UL IKA40-40UL IK40-40UL IKA63-40UL IK63-40UL	
IKA25-31UL IKD25-31UL IKA40-31UL IK40-31UL IKA63-31UL IK63-31UL		IKA25-22UL IKD25-22UL IKA40-22UL IK40-22UL IKA63-22UL IK63-22UL	
IKA25-04UL IKD25-04UL IKA40-04UL IK40-04UL IKA63-04UL		IKA25-30UL IKD25-30UL IK40-30UL IK63-30UL	

CAUTIONS AND WARNINGS

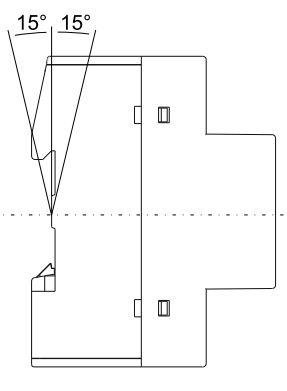
IKA40/63
IKA20/25



IKA20/25
IKD20/25



IK40, IK63
IKD20/25

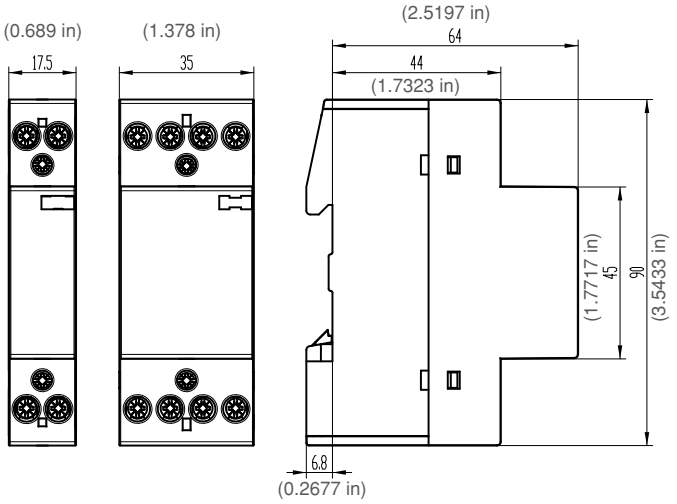


IK INSTALLATION CONTACTORS

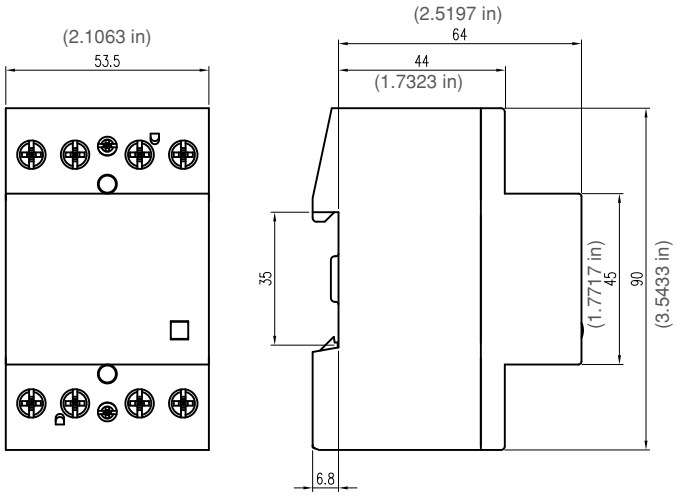
IKA20, IKD20, IK21, IKA25, IKD25, IK40, IKA40, IK63, IKA63

DIMENSIONS

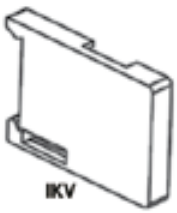
IKA20, IKD20, IKA25, IKD25



IKA40, IK40, IKA63, IK63



VENTILATION MODUL



SEALING COVER

ORDERING DATA:

IKA63 - 40 UL / 230 V

- 230 V — Control voltage
- UL — UL/CSA approved
- 40 — Version of contacts
- IKA63 — Type

Auxiliary Switch IKN

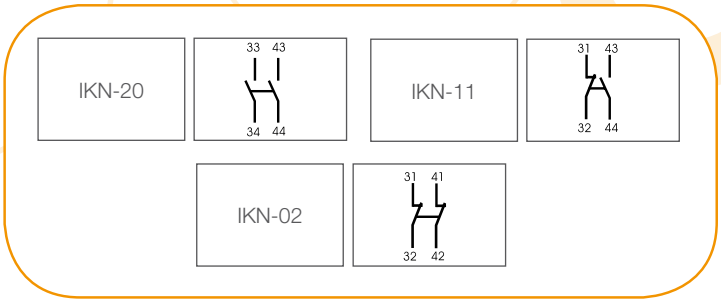
INTENDED USE:

- The IKN auxiliary switch is mainly used for indicating the contactor switching condition and also for control of heavier electromagnetic loads
- The IKN auxiliary switch is provided with two contacts in the versions:
  - 11 with one break and one make contact
  - 20 with two make contacts
  - 02 with two break contacts
- This auxiliary switch can not be used only at contactor IKD20.

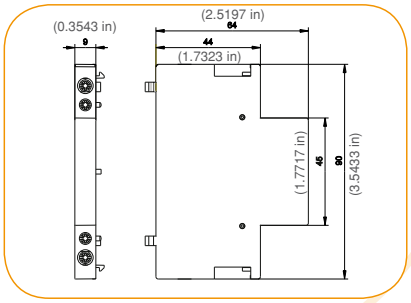
TECHNICAL DATA

GENERAL	Type				IKN
	Standards				UL 508, CSA C22.2 No. 14 IEC 60947-5-1, EN 60947-5-1
	Approvals				UL, CSA
	Protection degree				IP20
	Mechanical endurance			op. c.	3.000.000
	Contact reliability				12 V; ≥5 mA
	Power dissipation per pole at Ith = 6 A			W	0,3
	Min. distance of open contacts			in/mm	0.1575/4
	Max. back-up fuse for short-circuit protection				6 A (gL) 6 A (K5)
	Weight			lb/kg	0.08/0.035
UL CSA	Auxiliary circuit				C300 (120 VAC, 240 VAC) Q300 (125 VDC, 250 VDC)
	Continuous thermal current		I_{th}	A	2.5
IEC/EN	Rated insulation voltage		U_i	V	500
	Rated impulse withstand voltage		U_{imp}	kV	4
	Thermal current		I_{th}	A	6
	Rated operational voltage		U_e	V	230 and 400
	Rated operational current AC-15	U_e = 230 V	I_e	A	6
		U_e = 400 V			4
	Electrical endurance AC-15			op. c.	50000
	Terminal capacity	Rigid	S	AWG/mm²	-/1…2.5
		Flexible			16/1…2.5
	Screw				M3
	Screw head				PZ1
	Tightening torque			lb-in/Nm	7.08/0.8

CONTACT ARRANGEMENTS



DIMENSIONS



ORDERING DATA:

IKN - 20 UL

- IKN — Type
- 20 — Version of contacts
- UL — UL/CSA approved

Bistable Switch

Investing in your future
Operation Part Financed by The European Union
European Regional Development Fund

INTENDED USE:

- Residential buildings
- Buisiness premises
- Hotels
- Hospitals
- Shoping centres
- Production halls
- Warehouses
- Public places

REMOTE SWITCHING AND AUTOMATIC CONTROL:

- Lightning
- Electric heating
- Electric motors
- Electric equipment

ADVANCED OPERATION:

- Impulse control
- Manual control

OTHER BENEFITS:

- Small switch on coil consumption
- No hold coil consumtion
- Wide application
- Mounting on 35 mm rail
- Sealing terminal covers

TECHNICAL DATA

	Type			BI220	BI225	BI232
GENERAL	Standards			IEC/EN 60669-2-2		
	Manual control			Yes		
	Control with impulse voltage			Yes		
	Indication			With actuator		
	Protection degree accordance to IEC/EN 60529			IP 20		
	Module width			1		
	Ambient temperature		°C	-25…+55		
	Storage temperature		°C	-30…+80		
	Max. resistance to humidity			95 % RH at +55 °C		
	Min. contact reliability			10 V / 100 mA		
	Max. shock resistance accordance to IEC/EN 60068-2-27		g	15		
	Max. vibration resistance accordance to IEC/EN 60068-2-6		g	3		
	Min. distance of open contacts		mm	>3		
	Distance between contacts and coil		mm	>6		
	Mechanical endurance		op. c.	10^6		
	Max. back-up fuse for short-circuit protection (gL)		A	20	25	32
	Power dissipation per pole		W	1.5	2	3
MAIN CIRCUIT	Rated impulse voltage	U_{imp}	kV	4		
	Thermal current	I_{th}	A	20	25	32
	Rated insulation voltage	U_i	V	440		
	Rated operational voltage	U_e	V	440		
	Rated frequency	f_e	Hz	50 / 60		
	Rated operational current for cosϕ = 0,6 acc. to IEC/EN 60669-2-2	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-1 acc. to IEC/EN 60947-4-1	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-7a acc. to IEC/EN 61095 – Slightly inductive loads in household appliances and similar applications	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including modetare overloads	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-22 acc. to IEC/EN 60947-3 Switching of mixed resistive and inductive loads, including moderate overloads	I_e	A	20 / 230 V 16 / 440 V	25 / 230 V 20 / 440 V	32 / 230 V 25 / 440 V

BI

TECHNICAL DATA

	Type			BI220	BI225	BI232
MAIN CIRCUIT	Rated operational current for AC-23 acc. to IEC/EN 60947-3 Switching of motor loads or other highly inductive loads	I_e	A	16 / 230 V / 1-phase	20 / 230 V / 1-phase	25 / 230 V / 1-phase
	Rated operational current for AC-3 acc. to IEC/EN 60947-4-1 Squirrel-cage motors: starting, switching off motors during running	I_e	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
	Rated operational current for AC-7b acc. to IEC/EN 61095 Motor-loads for household applications	I_e	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
	Rated operational current for AC-6a acc. to IEC/EN 60947-4-1 Switsching of transformers having inrush current peaks of not more than 30 times peak of rated current	I_e	A	3 / 230 V 1.5 / 400 V	3.6 / 230 V 1.8 / 400 V	4.5 / 230 V 2.2 / 400 V
	Rated operational current for AC-6b acc. to IEC/EN 60947-4-1 – Switching of capacitor banks	C	µF	100 µF / 230 V		
	Rated operational current for DC-1 acc. to IEC/EN 60947-4-1 – Non-inductive or slightly inductive loads, resistance furnances	I_e	A	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 V / 1 pole
	Rated operational current for DC-3 acc. to IEC/EN 60947-4-1 – Shunt-motors: starting, plugging, inching	I_e	A	10 / 24 V / 1 pole	15 / 24 V / 1 pole	25 / 24 V / 1 pole
	Rated operational current for DC-5 acc. to IEC/EN 60947-4-1 – Series-motors: starting, plugging, inching	I_e	A	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole
	Rated operational current for DC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	I_e	A	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 / V 1 pole
	Rated operational current for DC-22 acc. to IEC/EN 60947-3 – Switching of mixed resistive and inductive loads, including moderate overloads	I_e	A	16 / 24 V / 1 pole	20 / 24 V / 1 pole	25 / 24 V / 1 pole
	Rated operational current for DC-23 acc. to IEC/EN 60947-3 – Switching of highly inductive loads (e.g. series motors)	I_e	A	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole
	Rated operational current for AC-5a acc. to IEC/EN 60947-4-1 – Switching of electric discharge lamp controls	I_e	A	16 / 230 V		
	Rated operational current for AC-5b acc. to IEC/EN 60947-4-1 – Switching of incandescent lamps	I_e	A	10 / 230 V		
	Rated operational current for fluorescent lamps acc. to IEC/EN 60669-2-2	I_e	A	16 / 230 V		
	Fluorescent / energy saving / compact lamps with electronic control gear	I_e	A	2 / 230 V		
	Electrical endurance for all utilization categories		op. c.	10^5		
	Terminal capacity for main circuit	S	mm^2	1…10 rigid / flexible		
	Screw for main circuit			M4		
	Screw-head for main circuit			(±) PZ2		
	Tightening torque for main circuit		Nm	1.2		
CONTROL CIRCUIT	Rateted control voltages	U_c	V	AC: 12, 24, 48, 120, 230, 240		
	Rated frequency of control voltage	f_c	Hz	50 / 60		
	Range of control voltage	U_c	%	90…110		
	Coil consumption – inrush		VA/W	18 / 13		
	Coil consumption – hold		VA/W	9 / 4		
	Min. impulse duration at U_C		ms	50		
	Min. impulse duration at 0,85 U_C		ms	100		
	Min. duration between two impulses		ms	150		
	Max. number of impulses per minute			15		7.5
	Max. impulse duration at U_C			1 hour		
	Terminal capacity for control circuit	S	mm^2	1…4 rigid / flexible		
	Screw for control circuit			M3		
	Screw-head for control circuit			(±) PZ1		
	Tightening torque for control circuit		Nm	0.6		

TECHNICAL DATA

GENERAL	Type			BI420	BI425	BI432
	Standards			IEC/EN 60669-2-2		
	Manual control			Yes		
	Control with impulse voltage			Yes		
	Indication			With actuator		
	Protection degree accordance to IEC/EN 60529			IP 20		
	Module width			2		
	Ambient temperature		°C	-25…+55		
	Storage temperature		°C	-30…+80		
	Max. resistance to humidity			95 % RH at +55 °C		
	Min. contact reliability			10 V / 100 mA		
	Max. shock resistance accordance to IEC/EN 60068-2-27		g	15		
	Max. vibration resistance accordance to IEC/EN 60068-2-6		g	3		
	Min. distance of open contacts		mm	>3		
	Distance between contacts and coil		mm	>6		
	Mechanical endurance		op. c.	10^6		
	Max. back-up fuse for short-circuit protection (gL)		A	20	25	32
	Power dissipation per pole		W	1,5	2	3
MAIN CIRCUIT	Rated impulse voltage	U_{imp}	kV	4		
	Thermal current	I_{th}	A	20	25	32
	Rated insulation voltage	U_i	V	440		
	Rated operational voltage	U_e	V	440		
	Rated frequency	f_e	Hz	50 / 60		
	Rated operational current for cosϕ = 0,6 acc. to IEC/EN 60669-2-2	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-1 acc. to IEC/EN 60947-4-1	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-7a acc. to IEC/EN 61095 – Slightly inductive loads in household appliances and similar applications	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including modetare overloads	I_e	A	20 / 440 V	25 / 440 V	32 / 440 V
	Rated operational current for AC-22 acc. to IEC/EN 60947-3 Switching of mixed resistive and inductive loads, including moderate overloads	I_e	A	20 / 230 V 16 / 440 V	25 / 230 V 20 / 440 V	32 / 230 V 25 / 440 V
	Rated operational current for AC-23 acc. to IEC/EN 60947-3 Switching of motor loads or other highly inductive loads	I_e	A	16 / 230 V / 1-phase 16 / 230 V / 3-phase 16 / 400 V / 3-phase	20 / 230 V / 1-phase 20 / 230 V / 3-phase 20 / 400 V / 3-phase	25 / 230 V / 1-phase 25 / 230 V / 3-phase 25 / 400 V / 3-phase
	Rated operational current for AC-3 acc. to IEC/EN 60947-4-1 Squirrel-cage motors: starting, switching off motors during running	I_e	A	7 / 230 V / 1-phase 6.3 / 230 V / 3-phase 6.6 / 400 V / 3-phase	8 / 230 V / 1-phase 8.7 / 230 V / 3-phase 8.5 / 400 V / 3-phase	10 / 230 V / 1-phase 11.5/ 230 V / 3-phase 11.3/ 400 V / 3-phase
	Rated operational current for AC-7b acc. to IEC/EN 61095 Motor-loads for household applications	I_e	A	7 / 230 V / 1-phase 6.3 / 230 V / 3-phase 6.6 / 400 V / 3-phase	8 / 230 V / 1-phase 8.7 / 230 V/ 3-phase 8.5 / 400 V / 3-phase	10 / 230 V / 1-phase 11.5/ 230 V / 3-phase 11.3/ 400 V / 3-phase
	Rated operational current for AC-6a acc. to IEC/EN 60947-4-1 Switsching of transformers having inrush current peaks of not more than 30 times peak of rated current	I_e	A	3 / 230 V 1.5 / 400 V	3.6 / 230 V 1.8 / 400 V	4.5 / 230 V 2.2 / 400 V
	Rated operational current for AC-6b acc. to IEC/EN 60947-4-1 – Switching of capacitor banks	C	µF	100 µF / 230 V		
	Rated operational current for DC-1 acc. to IEC/EN 60947-4-1 – Non-inductive or slightly inductive loads, resistance furnances	I_e	A	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 V / 1 pole
	Rated operational current for DC-3 acc. to IEC/EN 60947-4-1 – Shunt-motors: starting, plugging, inching	I_e	A	10 / 24 V / 1 pole	15 / 24 V / 1 pole	25 / 24 V / 1 pole
	Rated operational current for DC-5 acc. to IEC/EN 60947-4-1 – Series-motors: starting, plugging, inching	I_e	A	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole
	Rated operational current for DC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	I_e	A	20 / 24 V / 1 pole	25 / 24 V / 1 pole	32 / 24 / V 1 pole
	Rated operational current for DC-22 acc. to IEC/EN 60947-3 – Switching of mixed resistive and inductive loads, including moderate overloads	I_e	A	16 / 24 V / 1 pole	20 / 24 V / 1 pole	25 / 24 V / 1 pole
	Rated operational current for DC-23 acc. to IEC/EN 60947-3 – Switching of highly inductive loads (e.g. series motors)	I_e	A	10 / 24 V / 1 pole	16 / 24 V / 1 pole	20 / 24 V / 1 pole
	Rated operational current for AC-5a acc. to IEC/EN 60947-4-1 – Switching of electric discharge lamp controls	I_e	A	16 / 230 V		
	Rated operational current for AC-5b acc. to IEC/EN 60947-4-1 – Switching of incandescent lamps	I_e	A	10 / 230 V		
	Rated operational current for fluorescent lamps acc. to IEC/EN 60669-2-2	I_e	A	16 / 230 V		
	Fluorescent / energy saving / compact lamps with electronic control gear	I_e	A	2 / 230 V		

Bistable Switch

BI

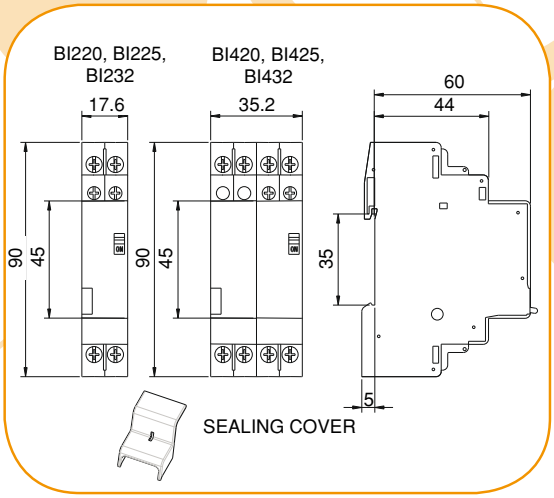
TECHNICAL DATA

				BI420	BI425	BI432
MAIN CIRCUIT	Type					
	Electrical endurance for all utilization categories		op. c.	10^5		
	Terminal capacity for main circuit	S	mm²	1…10 rigid / flexible		
	Screw for main circuit			M4		
	Screw-head for main circuit			(±) PZ2		
	Tightening torque for main circuit		Nm	1.2		
CONTROL CIRCUIT	Rateted control voltages	U_c	V	AC: 12, 24, 48, 120, 230, 240		
	Rated frequency of control voltage	f_c	Hz	50 or 60		
	Range of control voltage	U_c	%	90…110		
	Coil consumption – inrush		VA/W	18 / 13		
	Coil consumption – hold		VA/W	9 / 4		
	Min. impulse duration at U_C		ms	50		
	Min. impulse duration at 0,85 U_C		ms	100		
	Min. duration between two impulses		ms	150		
	Max. number of impulses per minute			15		7.5
	Max. impulse duration at U_C			1 hour		
	Terminal capacity for control circuit	S	mm²	1…4 rigid / flexible		
	Screw for control circuit			M3		
	Screw-head for control circuit			(±) PZ1		
	Tightening torque for control circuit		Nm	0.6		

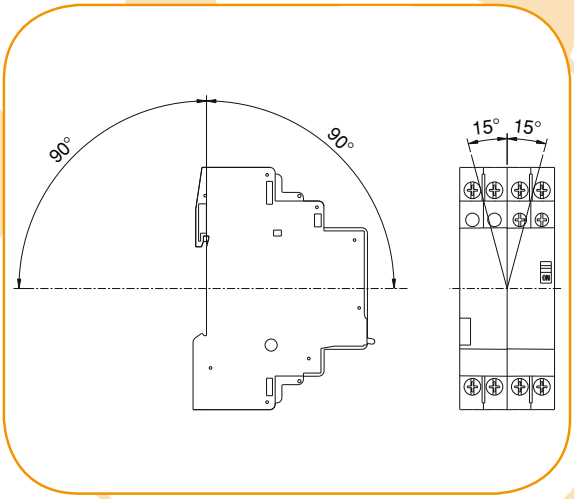
CONTACT ARRANGEMENTS

BI220-10 BI225-10 BI232-10	BI220-20 BI225-20 BI232-20	BI420-30 BI425-30 BI432-30	BI420-40 BI425-40 BI432-40
BI220-11 BI225-11 BI232-11	BI420-21 BI425-21 BI432-21	BI420-31 BI425-31 BI432-31	BI220-22 BI225-22 BI232-22
BI220-1C BI225-1C BI232-1C	BI220-2C BI225-2C BI232-2C		

DIMENSIONS



OPERATION POSITIONS



ORDERING DATA:

BI220 - 20 230 V

- Control voltage
- Version of contacts
- Type

Motor protection switches

MS25, MST25, MS20, MST20

- Versions:
  - MS25 - with thermal and magnetic releases
  - MST25 - with a thermal release only
  - MS20 - with thermal and magnetic releases for single-phase consumers
  - MST20 - with a thermal overload release for single phase consumers
- Manual control:
  - START, STOP, push-buttons
  - Test of release function (TEST)
- Automatic switch-off with thermal or magnetic release
- Control with under-voltage release or shunt release
- An auxiliary switch for side mounting or flush mounting used for indication of the switching state
- ON/OFF, push-buttons position unequivocally indicates the switching position of main circuit contacts
- Contact material:
  - Resistant to contact welding
  - Enables low contact heating

- Isolating distance between contacts: 4.5 mm per contact place
- Connection of a rigid or flexible conductor
- Assembly to 35 mm wide mounting rail in accordance with EN 60715 or fixing with two screws
- Vertical or horizontal operational position

TECHNICAL DATA

GENERAL	Standards			IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204, UL 508, CSA 22.2 No. 14
	Approvals			UL, SEMKO
	Climatic class			constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30
	Degree of protection			IP20, after terminals covering IP40
	Ambient temperature		°C	-25 … +60
	Storage temperature		°C	-25 … +70
	Temperature range of thermal compensation for overload release		°C	-5 … +40
	Mechanical and electrical endurance		op. c.	100.000
	Max. operating cycles		op. / h	25
	Shock resistance acc. to IEC 68-2-27		g	20
	Vibration resistance acc. to IEC 68-2-6			5 g at f = 5 … 150 Hz
	Overvoltage category / pollution degree			III / 3
	Rated insulation voltage	U_i	V	690
	Rated impulse withstand voltage	U_{imp}	kV	6
	Weight		kg	0.252

MS25, MST25, MS20, MST20

TECHNICAL DATA

MAIN CIRCUIT	Designation of connection terminals				1 – L1 ; 3 – L2 ; 5 – L3 ; 2 – T1 ; 4 – T2 ; 6 – T3
	Terminal capacity	rigid	S	mm²	0.75 … 6
		flexible			0.75 … 4
	Screw				with self-lifting clamp, protected against falling out
	Screw head				PZ2
	Tightening torque			Nm	1.8
	Max. operational voltage		U_e	V	690
	Setting range			A	0.1 – 0.16 (only MS25); 0.16 – 0.25 (only MS25); 0.25 – 0.4; 0.4 – 0.63; 0.63 – 1; 1 – 1.6; 1.6 – 2.5; 2.5 – 4; 4 – 6.3; 6.3 – 10; 10 – 16; 16 – 20; 20 - 25
	No. of poles				3
	Operating current of thermal overload release		I		$1.05\ I_r < I \leq 1.20\ I_r$ I_r….set value
	Sensitivity to phase failure				yes
	Power dissipation on pole at load with I_n		P	W	2 – 2.5
	Utilization category	acc. to IEC/EN 60947-4-1			AC-3
		acc. to IEC/EN 60947-2			A
	Trip class acc. to IEC/EN 60947-4-1				10A

SWITCH SELECTION FOR MOTOR PROTECTION

Standard motor power						Setting range
Single-phase	Three-phase					
220 V 230 V 240 V	220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	660 V 690 V	
kW						A
		0.02			0.06	0.1 … 0.16
		0.06	0.06	0.06	0.09	0.16 … 0.25
	0.06	0.09	0.12	0.12	0.18	0.25 … 0.4
	0.09	0.12	0.18	0.25	0.25	0.4 … 0.63
0.06 … 0.09	0.09 … 0.12	0.18 … 0.25	0.25	0.37	0.37 … 0.55	0.63 … 1
0.12	0.18 … 0.25	0.37 … 0.55	0.37 … 0.55	0.55 … 0.8	0.75 … 1.1	1 … 1.6
0.18 … 0.25	0.37	0.75 … 1.1	0.75 … 1.1	1.1	1.5	1.6 … 2.5
0.37	0.55 … 0.8	1.1 … 1.5	1.5	1.5 … 2.2	2.2 … 3	2.5 … 4
0.55 … 0.75	1.1 … 1.5	2.2 … 2.5	2.2 … 3	3	4	4 … 6.3
1.1 … 1.5	1.5 … 2.5	3 … 4	4 … 5	4 … 5.5	5.5 … 7.5	6.3 … 10
2.2	3 … 4	5 … 7.5	5.5 … 9	7.5 … 9	11	10 … 16
3	5.5	9	11	11 … 12.5	15	16 … 20
	5.5 … 7.5	11 … 12.5	12.5	15	18.5	20 … 25

MS25, MST25, MS20, MST20

MS25 motor protection switches, rated ultimate short-circuit breaking capacity I_{cu} and max. back-up fuses if prospective short-circuit current I_{cp} exceeds I_{cu}:

TECHNICAL DATA

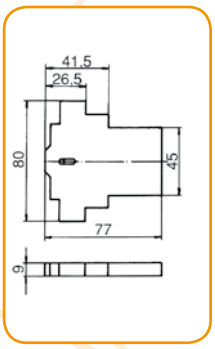
Type	Operating current of short-circuit release (A)	Rated ultimate short-circuit breaking capacity I_{cu} (kA)				Max. back-up fuse, if $I_{cp} > I_{cu}$ (gL) (A)			
		230 V	400 V	500 V	690 V	230 V	400 V	500 V	690 V
		I_{cu}	I_{cu}	I_{cu}	I_{cu}				
MS25 – 0.16	2	50	50	50	50	No back-up fuse required			
MS25 – 0.25	3	50	50	50	50				
MS25 – 0.4	6	50	50	50	50				
MS25 – 0.63	8	50	50	50	50				
MS25 – 1	12	50	50	50	50				
MS25 – 1.6	18	50	50	50	50				
MS25 – 2.5	33	50	50	3	2.5			25	20
MS25 – 4	48	50	50	3	2.5			35	25
MS25 – 6.3	75	50	50	3	2.5			50	35
MS25 – 10	110	50	6	3	2.5		80	50	35
MS25 – 16	160	6	4	2.5	2	80	80	63	35
MS25 – 20	220	6	4	2.5	2	80	80	63	50
MS25 – 25	270	6	4	2.5	2	80	80	63	50

MST25 motor protection switches and max. back-up fuses for short-circuit protection:

Type	Max. back-up fuse U_e <400 V gL (A)
MST25 – 0.4	1
MST25 – 0.63	2
MST25 – 1	2
MST25 – 1.6	4
MST25 – 2.5	6
MST25 – 4	16
MST25 – 6.3	20
MST25 – 10	25
MST25 – 16	35
MST25 – 20	50
MST25 – 25	50

MS25, MST25, MS20, MST20

ACCESSORIES



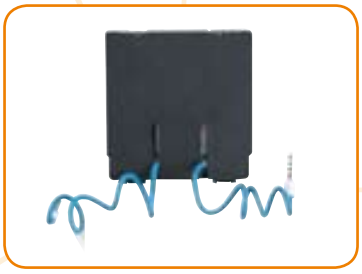
PS
Auxiliary switch for lateral mounting

PS 11 - with one make and one break contact
PS 10 - with one make contact
PS 01 - with one break contact
PS 20 - with two make contacts

Rated insulation voltage		U_i	V	500
Thermal current		I_{th}	A	6
Rated operational current at AC-15	230 V	I_e	A	3.5
	400 V			2
	500 V			1.5
Terminal capacity		S	mm²	0.75 … 2.5
Tightening torque			Nm	1

U - Under-voltage release
A - Shunt release

Control voltages		U_c	V	24 … 600
Rated frequency		f	Hz	50 or 60
Coil consumption	switch on:	W	VA	4,3 / 7,5
	operation:	W	VA	1,3 / 3,8

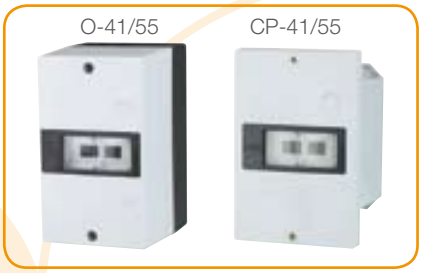


RS - Trip-indieating auxiliary switch and

Rated insulation voltage		U_i	V	500
Thermal current		I_{th}	A	6
RS Rated operational current at AC-15	230 V	I_e	A	3.5
	400 V			2
	500 V			1.5
Terminal capacity		S	mm²	0.75 … 2.5
Tightening torque			Nm	1

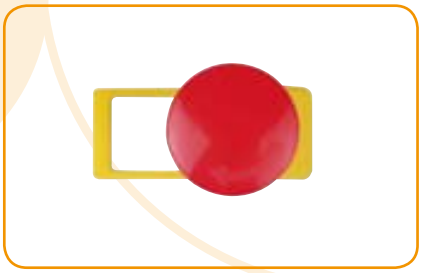
MS25, MST25, MS20, MST20

ENCLOSURES



O-41/55
Enclosure IP41/55
CP-41/55
Front plate IP41/55

MS25 or MST25 with all accessories can be built into an enclosure or a front plate.



NAT - Emergency stop push-button. It is also available with a key-lock.

Z - Padlocking feature

M - Push-button diaphragm

The manufacturer also supplies an enclosure and a front plate with degree of protection IP55 (O-55, CP-55); in this case the diaphragm is already mounted. However, it should be removed if a padlocking feature or an emergency stop bush-button is built-in.

NL - Neutral link

One N/PE neutral link is usually built in the enclosure 0-41/55 or CP-41/55. A place for an additional neutral link is also available.

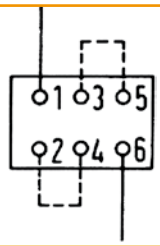
SS - Signal lamp

230, 240, 400 V
B-white, R-red, Z-green

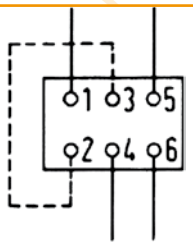
MS25, MST25, MS20, MST20

CONNECTION DIAGRAM

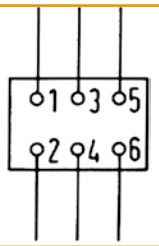
1-pole



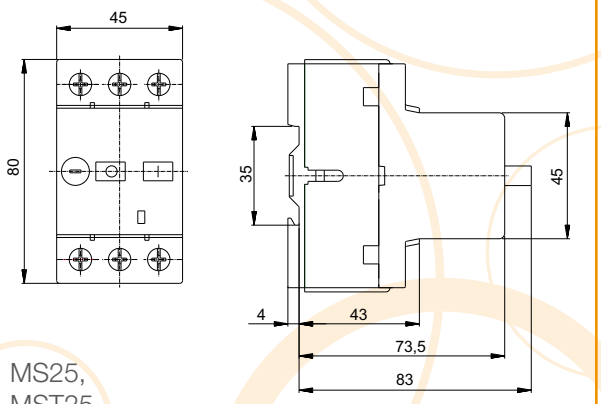
2-pole



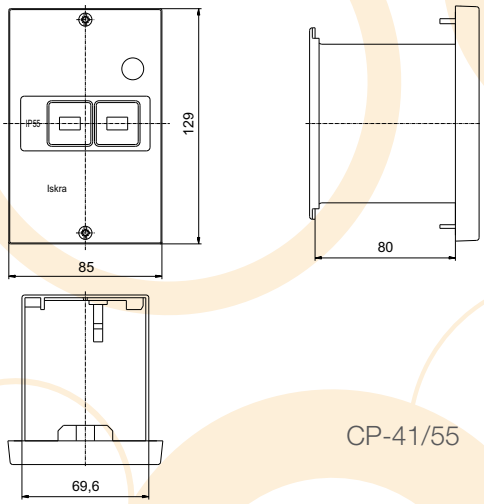
3-pole



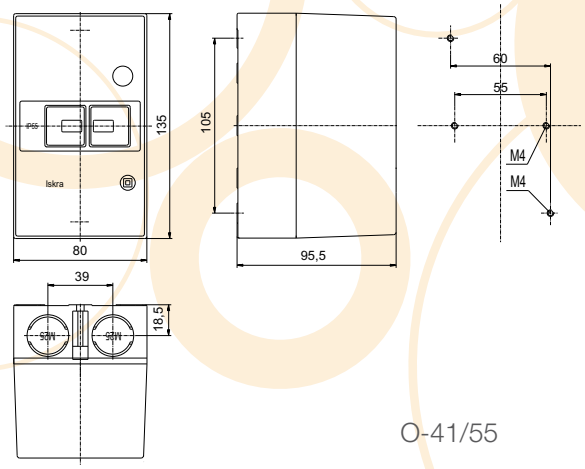
DIMENSIONS



MS25,
MST25,
MS20, MST20



CP-41/55



O-41/55

ORDERING DATA

MS25 with the setting range 2.5 - 4.0 A:
MS25 - 4

The same switch with under-voltage release for control voltage 380 V with an auxiliary switch with two NO contacts, built in the enclosure, with an emergency stop push-button and a green signal lamp for 230 V:
MS 25 - 4 / U 380 / PS 20 / 0-41 / NAT / SSz 230

Motor protection switches

MS32, MSB32, MS18, MSB18

- Versions:
  - MS32 / MS18 - with thermal and magnetic releases
  - MSB32 / MSB18 - with a thermal release only
- Manual control:
  - START, STOP, push-buttons - with a trip indication (i.e. push-buttons stay in the middle position)
- Automatic switch-off at over-current with thermal or magnetic release
- Control with under-voltage release or shunt release
- An auxiliary switch for side mounting or flush mounting used for indication of the switching state
- Indication of release with trip indicating auxiliary switch
- ON/OFF buttons position unequivocally indicates switching position of main circuit contacts
- Contact material
  - Resistant to contact welding
  - Enables low contact heating
- Isolating distance between contacts: 4.5 mm per contact place
- Connection of a rigid or flexible conductor
- Assembly to 35 mm wide mounting rail in compliance with EN 60715
- Vertical or horizontal operational position

TECHNICAL DATA

GENERAL	Standards			IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204, UL 508, CSA 22.2 No.14
	Approvals			UL
	Climatic class			constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30
	Degree of protection			IP20, after terminals covering IP40
	Ambient temperature		°C	-25 … +60
	Storage temperature		°C	-25 … +70
	Temperature range of thermal compensation for overload release		°C	-5 … +40
	Mechanical and electrical endurance		op. c.	100,000
	Max. operating cycles		op. / h	25
	Shock resistance acc. to IEC 68-2-27		g	20
	Vibration resistance acc. to IEC 68-2-6			5 g at f = 5 … 150 Hz
	Overvoltage category / pollution degree			III / 3
	Rated insulation voltage	U_i	V	690
	Rated impulse withstand voltage	U_{imp}	kV	6
	Weight		kg	0.279
MAIN CIRCUIT	Designation of connection terminals			1 – L1 ; 3 – L2 ; 5 – L3 ; 2 – T1 ; 4 – T2 ; 6 – T3
	Terminal capacity rigid flexible	S	mm^2	0.75 … 10 0.75 … 6
	Screw			with self-lifting clamp, protected against drop out
	Screw head			PZ2
	Tightening torque		Nm	2.0

MS32, MSB32, MS18, MSB18

TECHNICAL DATA

				MS32 / MS18	MSB32 / MSB18
MAIN CIRCUIT	Max. operational voltage	Ue	V	690	400
	Setting range		A	0.1 - 0,16; 0.16 - 0.25; 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 9 - 14; 13 - 18; 17 - 23 (only MS32); 20 - 27 (only MS32); 25 - 32 (only MS32)	0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 9 - 14; 13 - 18; 17 - 23 (only MSB32); 20- 27 (only MSB32); 25 - 32 (only MSB32)
	No. of poles			3	
	Operating current of thermal overload release	I		1,05 I_r < I ≤ 1,20 I_r I_r...current setting value	
	Sensitivity to phase failure			yes	
	Power dissipation per pole at the upper setting limit	P	W	2 - 2,5	
	Utilization category acc. to IEC/EN 60947-4-1			AC-3	
	acc. to IEC/EN 60947-2			A	
	Trip class acc. To IEC/EN 60947-4-1			10	

SWITCH SELECTION FOR MOTOR PROTECTION

Standard motor powers						Setting range
Single-phase	Three-phase					
220 V 230 V 240 V	220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	660 V 690 V	
kW						A
					0.06	0.1 ... 0.16
		0.06	0.06	0.06 ... 0.9	0.06 ... 0.12	0.16 ... 0.25
	0.06	0.09	0.12	0.09 ... 0.12	0.18	0.25 ... 0.4
	0.09	0.12 ... 0.18	0.18	0.18	0.25	0.4 ... 0.63
0.06 ... 0.09	0.09 ... 0.12	0.18 ... 0.25	0.25 ... 0.37	0.25 ... 0.37	0.37 ... 0.55	0.63 ... 1
0.12	0.18 ... 0.25	0.37 ... 0.55	0.37 ... 0.55	0.55 ... 0.75	0.75 ... 1.1	1 ... 1.6
0.18 ... 0.25	0.37	0.75	0.75 ... 1.1	1.1	1.5	1.6 ... 2.5
0.37	0.55 ... 0.75	1.1 ... 1.5	1.5	1.5 ... 2.2	2.2 ... 3	2.5 ... 4
0.55 ... 0.75	1.1 ... 1.5	2.2	2.2 ... 3	2.2 ... 3	4	4 ... 6.3
1.1 ... 1.5	1.5 ... 2.2	3 ... 4	4	4 ... 5.5	5.5 ... 7.5	6.3 ... 10
2.2	2.2 ... 3	5.5	5.5 ... 7.5	5.5 ... 7.5	9 ... 11	9 ... 14
3	4	7.5	7.5 ... 9	9 ... 11	15	13 ... 18
	5.5	9 ... 11	11	11	15 ... 18.5	17 ... 23
	5.5 ... 7.5	11	11	15	18.5 ... 22	20 ... 27
	7.5	15	15	18.5	22	25 ... 32

MS32, MSB32, MS18, MSB18

MS32 motor protection switches, rated ultimate and service short-circuit breaking capacity I_{cu} and I_{cs}, and max. back-up fuses if short circuit current I_{cp} exceeds I_{cu}:

Type		Operating current of short-circuit release (A)	Rated ultimate short-circuit breaking capacity I_{cu} , I_{cs} (kA)								Max. back-up fuse, if $I_{cp} > I_{cu}$ (gL) (A)			
			230 V		400 V		500 V		690 V		230 V	400 V	500 V	690 V
			I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}				
MS32 – 0.16	MS18 - 0.16	2	100	100	100	100	100	100	100	100	No back-up fuse required			
MS32 – 0.25	MS18 - 0.25	3	100	100	100	100	100	100	100	100				
MS32 – 0.4	MS18 - 0.4	5	100	100	100	100	100	100	100	100				
MS32 – 0.63	MS18 - 0.63	8	100	100	100	100	100	100	100	100				
MS32 – 1	MS18 - 1	13	100	100	100	100	100	100	100	100				
MS32 – 1.6	MS18 - 1.6	22	100	100	100	100	100	100	100	100				
MS32 – 2.5	MS18 - 2.5	33	100	100	100	100	100	100	5	5				16
MS32 – 4	MS18 - 4	55	100	100	100	100	100	100	3	3				25
MS32 – 6.3	MS18 - 6.3	84	100	100	100	100	6	4.5	3	2			35	35
MS32 – 10	MS18 - 10	126	100	100	100	100	6	4.5	3	2			50	35
MS32 – 14	MS18 - 14	170	25	12.5	25	12.5	6	4.5	3	2	80	63	50	50
MS32 – 18	MS18 - 18	230	25	12.5	25	12.5	6	4.5	3	2	80	63	50	50
MS32 – 23		270	25	12.5	25	12.5	4	3	3	2	80	80	50	50
MS32 – 27		360	25	12.5	25	12.5	4	3	3	2	80	80	50	50
MS32 – 32		400	25	12.5	25	12.5	4	3	3	2	80	80	50	50

MSB32 / MSB18 motor protection switches and max. back-up fuses for short-circuit protection:

Type		Max. back-up fuse U_e <400 V gL (A)
MSB32 – 0.4	MSB18 – 0.4	2
MSB32 – 0.63	MSB18 – 0.63	2
MSB32 – 1	MSB18 – 1	4
MSB32 – 1.6	MSB18 – 1.6	6
MSB32 – 2.5	MSB18 – 2.5	6
MSB32 – 4	MSB18 – 4	10
MSB32 – 6.3	MSB18 – 6.3	16
MSB32 – 10	MSB18 – 10	25
MSB32 – 14	MSB18 – 14	25
MSB32 – 18	MSB18 – 18	35
MSB32 – 23		35
MSB32 – 27		50
MSB32 – 32		50

MS32, MSB32, MS18, MSB18

ACCESSORIES

The MS32 or MSB32 motor protective circuit breaker with all accessories can be built in an enclosure or under a frame and a front plate

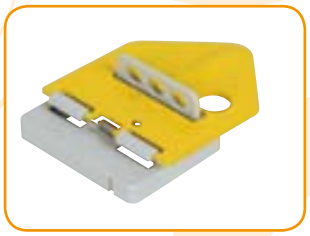
HO-41/55 - Enclosure IP41/55

FP-41/55 - Frame IP41/55

P-41/55 - Front plate IP41/55

ACCESSORIES USED FOR ALL ENCLOSURES

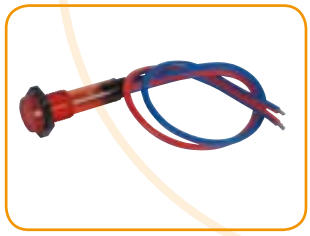
E - Emergency stop push-button available also with a key-lock.



HZ - Padlocking feature

M - Push-button diaphragm
The manufacturer also supplies an enclosure, a frame and a front plate with degree of protection IP55 (HO-55, FP-55, P-55) where the diaphragm is already inserted. However, it should be removed if a padlocking feature or an emergency stop bush-button is built-in.

NL - Neutral link
One N/PE neutral link is already mounted in the enclosures HO-41/55 or frames FP-41/55. A place for an additional neutral link is also provided.



SS - Signal lamp (B-white, R-red, Z-green)

MS32, MSB32, MS18, MSB18

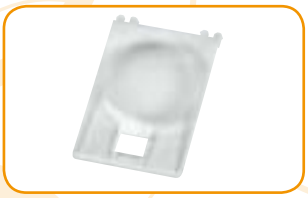
AUXILIARY SWITCH FOR SIDE MOUNTING HS, AUXILIARY CONTACT BLOCK HSV, TRIP INDICATING CONTACT BLOCK HRS

HS - Auxiliary switch
HS 11 - with 1 make and 1 break contact
HS 10 - with 1 make contact
HS 20 - with 2 make contacts

Rated insulation voltage		U_i	V	500
Thermal current		I_{th}	A	5
Electrical rating acc. to IEC/EN 60947-5-1				
B300	AC-15	U_e	V	240
		I_e	A	1,5
R300	DC-13	U_e	V	250
		I_e	A	0,1
Terminal capacity		S	mm²	0,75 … 2,5
Tightening torque			Nm	1

HSV - Auxiliary contact block*
HRS - Trip indicating contact block**
HSV 10 - with 1 make contact
HSV 01 - with 1 break contact
HRS 10 - with 1 make contact
HRS 01 - with 1 break contact

Rated insulation voltage		U_i	V	300
Thermal current		I_{th}	A	1
Electrical rating acc. to IEC/EN 60947-5-1				
B300	AC-15	U_e	V	240
		I_e	A	1,5
R300	DC-13	U_e	V	125
		I_e	A	0,22
Terminal capacity		S	mm²	0,75 … 2,5
Tightening torque			Nm	1

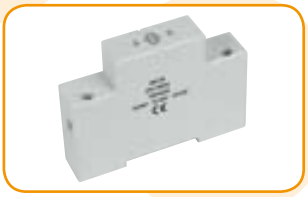


PP - Sealing plate

* HSV contact remains in its normal position when MS32 / MS18 is in OFF or trip position

** HRS contact changes state from its normal position when MS32 / MS18 trip due to overload, short-circuit or manual depression of the TEST lever

UNDER-VOLTAGE RELEASE UR AND SHUNT RELEASE AR

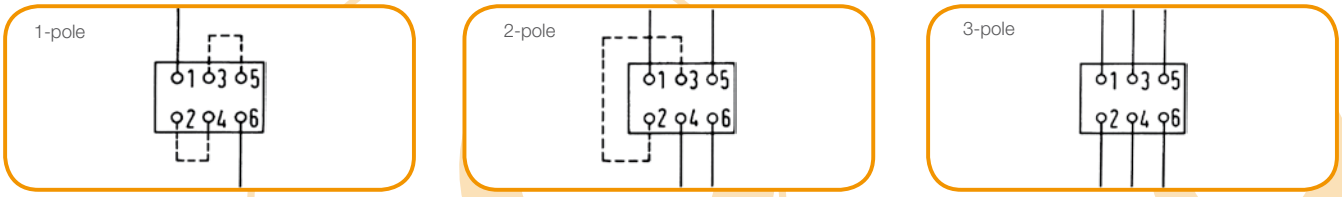


UR - Under-voltage release
AR - Shunt release

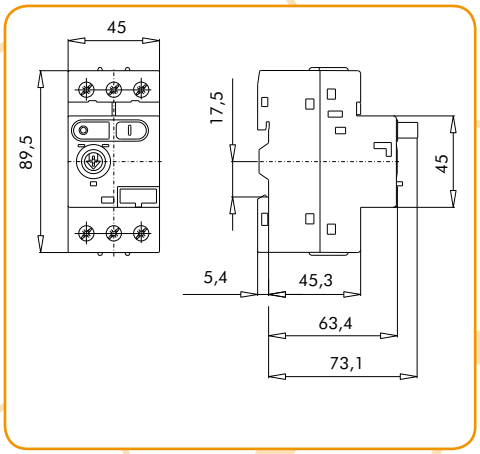
Control voltages	U_c	V	24 … 600
Rated frequency	f	Hz	50 or 60
Terminal capacity	S	mm²	0.75 … 2.5
Tightening torque		Nm	1

MS32, MSB32, MS18, MSB18

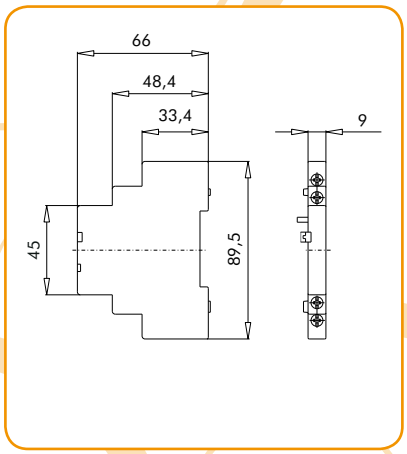
CONNECTION DIAGRAM



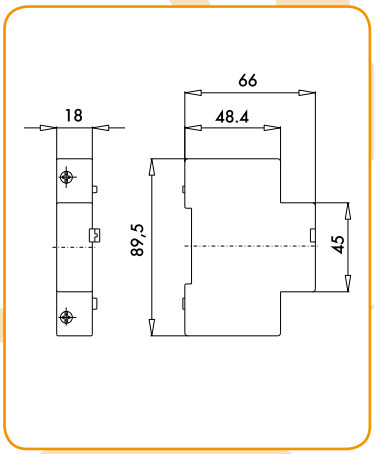
DIMENSIONS



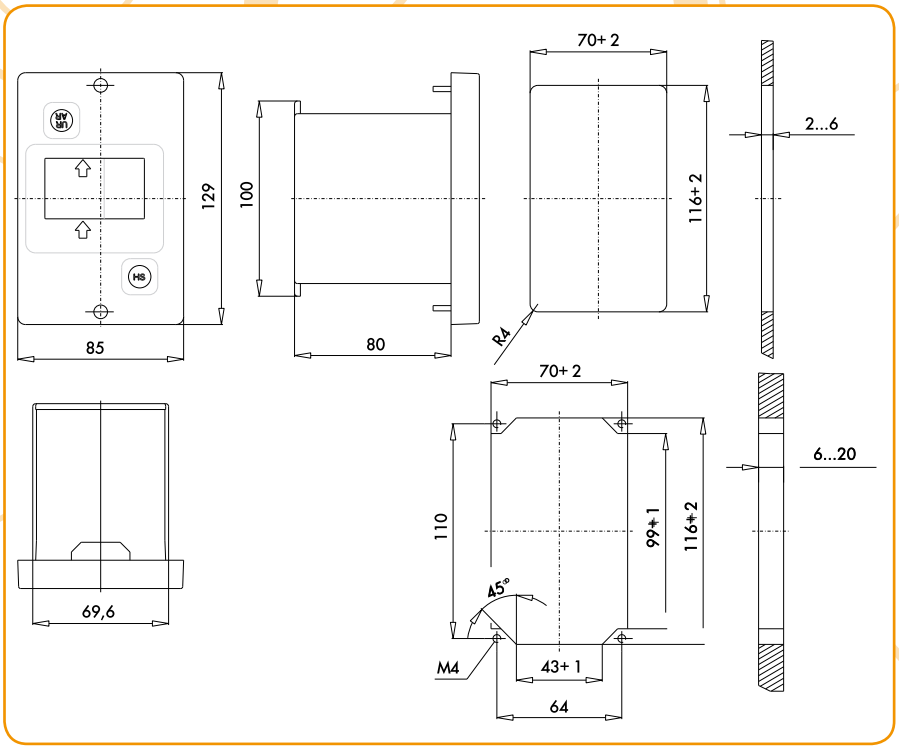
MS32 / MS18, MSB31 / MSB18
Motor protection switch

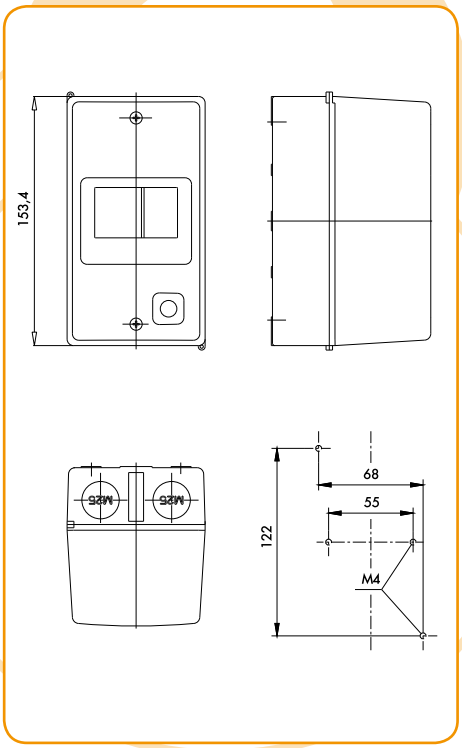


Auxiliary switch HS



Under-voltage release UR
Shunt release AR





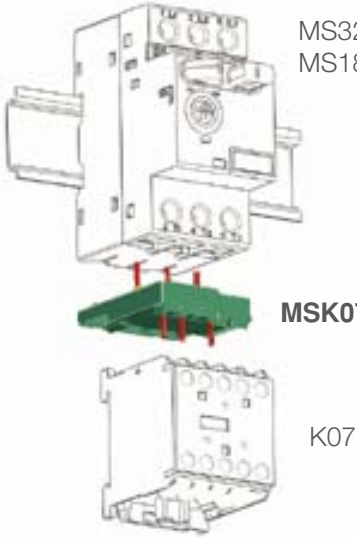
FP-41/55

HO-41/55

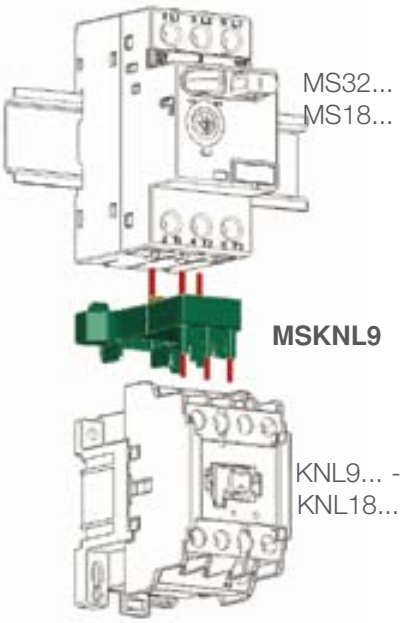
CONNECTION BLOCKS

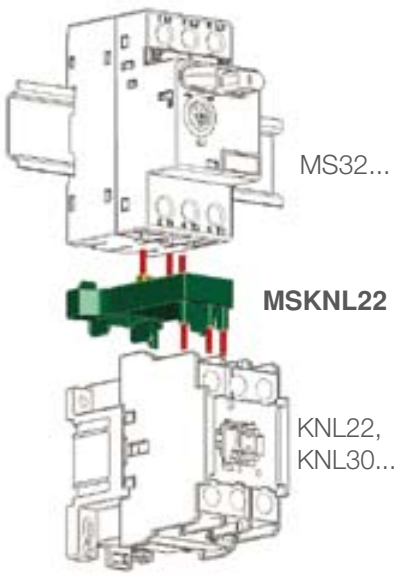
MSK07, MSKNL9 and MSKNL22 adapters are used for connecting a motor protection switch with a contactor forming a single-unit starter for quick assembly to a 35 mm wide mounting rail (EN 60715).

Adapter for connecting MS32 / MS18 motor protection switch with K07 mini contactor



Adapter for connecting MS32 / MS18 motor protection switch with KNL9-KNL18 contactor





Adapter for connecting MS32 motor protection switch with KNL22, KNL30 contactor

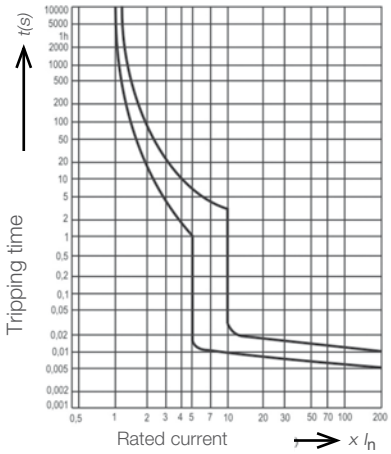
RI20

Number of poles		1 + N
Tripping characteristic		B, C, D
Rated current	A	2, 6, 10, 16, 20, 25, 32
Rated voltage	V	230
Rated frequency	Hz	50
Rated short-circuit capacity	kA	4.5
Terminal capacity	mm²	1 - 10
Mounting		to 35 mm wide mounting rail accordance with EN 60715
Ambient temperature	°C	-5 ...+40

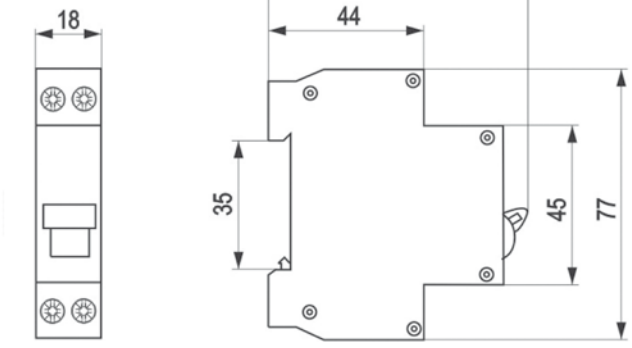
TECHNICAL DATA

Changed rated values regarding ambient temperature								
Rated current	Ambient temperature							
(A)	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C
2	1.18	1.14	1.09	1.05	1	0.96	0.90	0.86
6	1.17	1.13	1.09	1.04	1	0.96	0.91	0.84
10	1.21	1.16	1.10	1.06	1	0.94	0.88	0.82
16	1.18	1.13	1.09	1.04	1	0.94	0.91	0.84
20	1.17	1.13	1.09	1.04	1	0.96	0.91	0.84
25	1.18	1.13	1.09	1.04	1	0.96	0.91	0.84
32	1.17	1.13	1.09	1.04	1	0.96	0.91	0.84

TRIPPING CHARACTERISTICS



DIMENSIONS



CONNECTION DIAGRAM

RI 50

- RI 50 is used for the protection of installations and devices (overload and short circuit), and as a disconnector in case of electric shock
- Simple and quick fixing to a 35 mm mounting rail in accordance with EN 60715
- Low let-through energy under short-circuit conditions ensures longer life of contacts and reduces thermal stresses in the distribution circuit
- RI 50 reduces the energy loss due to a unique contact configuration and reduction of hot spots. Watt loss per pole for RI 50 is far lower than that specified in IEC/EN 60898
- An optional operating position
- IP20 degree of protection; IP40 degree of protection after installation in a distribution box
- An additional colour indication of the position of main contacts (red: contacts closed; green: contacts open)

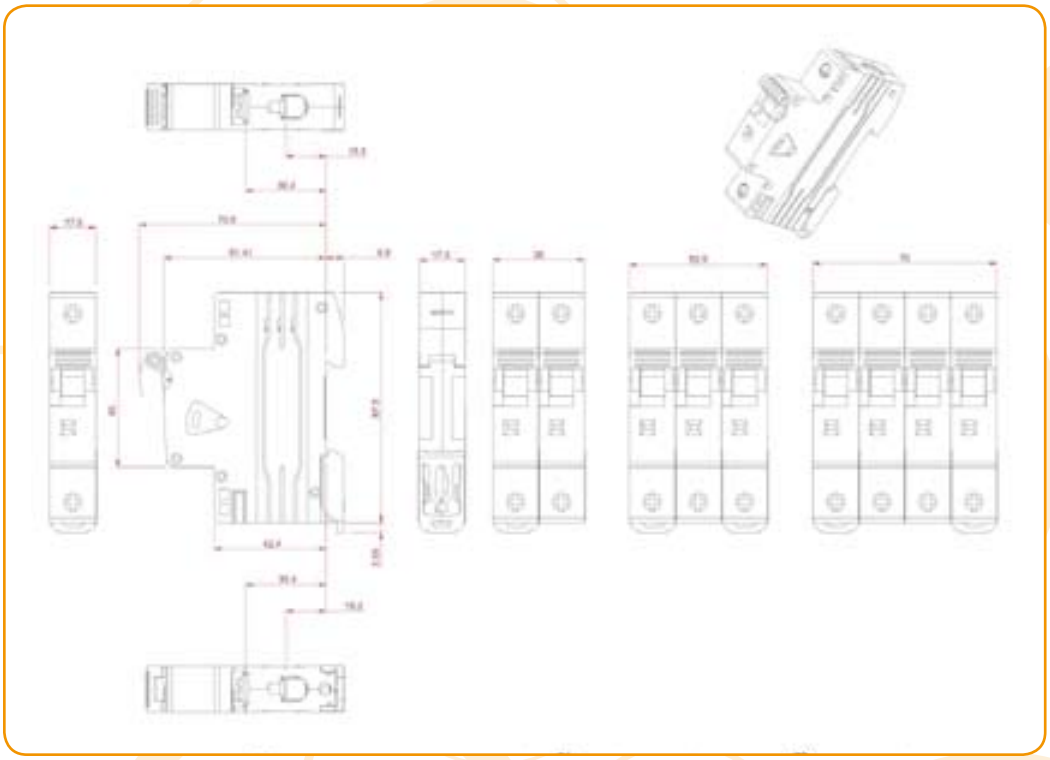
Types	
RI 51	single-pole
RI 51N	single-pole + neutral pole
RI 52	two-pole
RI 53	three-pole
RI 53N	three-pole + neutral pole
RI 54	four-pole

TECHNICAL DATA

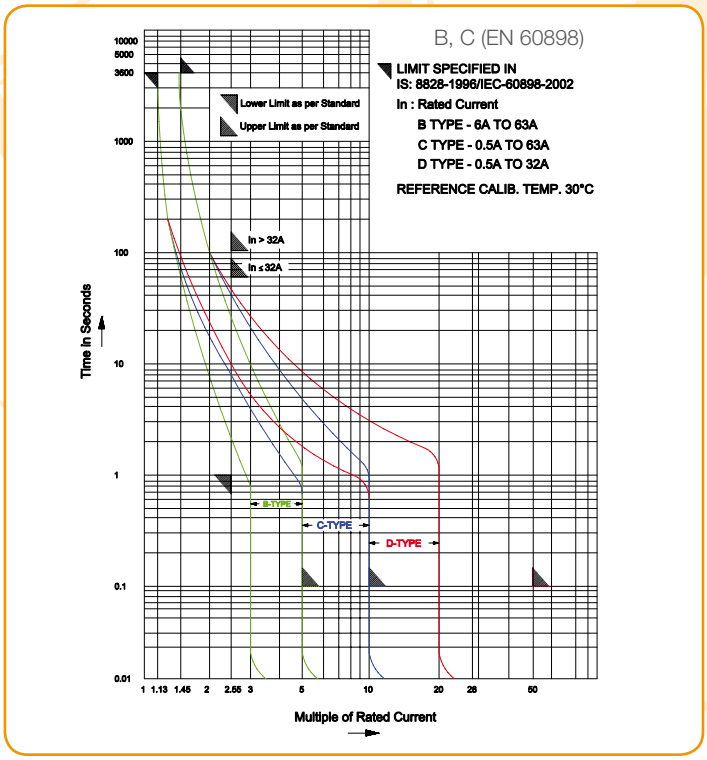
Standards				IEC/EN 60898
Approvals				SEMKO, GOST-R
No. of poles				1, 2, 3, 4, 1 + N, 3 + N
Tripping characteristic (IEC/EN 60898)				B, C
Rated voltage	single pole multi-pole	U_n	V	230/400 AC 400 AC
Insulation voltage		U_i	V	500
Impulse withstand voltage (1,2/50 µs)		U_{imp}	kV	4
Rated frequency		f	Hz	50/60
Rated current		I_n	A	6 – 63 (characteristic B) 0.5 – 63 (characteristic C)
Rated short-circuit capacity		I_{cn}	kA	10
Selectivity class				3
Terminal capacity		S	mm^2	up to 25
Ambient temperature			°C	–5 … +40

RI 50

DIMENSIONS - Nova slika



TRIPPING CHARACTERISTIC



RI 60

- RI 60 is used for over-current (overload and short-circuit) protection of installations and devices, and as a disconnector in case of electric shock
- RI 60 miniature circuit breakers are provided with two springs for assembly to a 35 mm wide mounting rail (EN 60715). The springs enable simple taking off irrespective of whether a busbar is positioned below or above
- Special springs are available for fixing miniature circuit breakers with two M5 screws
- A handle can be sealed in ON or OFF position
- Optional operation position
- Degree of protection IP20; degree of protection IP40 after installation in a distribution box
- Additional colour indication of the position of main contacts (red - contacts closed; green - contacts open)

Types

RI 61	single-pole
RI 61N	single-pole + neutral pole
RI 61J	single-pole (for DC circuits)
RI 62	two-pole
RI 62J	two-pole (for DC circuits)
RI 63	three-pole
RI 63N	three-pole + neutral pole
RI 64	four-pole

TECHNICAL DATA

				AC	DC
Standards				IEC/EN 60898, IEC/EN 60947-2	
Approvals				VDE, GOST-R	
No. of poles				1, 2, 3, 4, 1 + N, 3 + N	1. 2
Tripping characteristic (IEC/EN 60898)				B, C, D, M	C, M
Rated voltage		U_n	V	230/400	-
Rated DC voltage		U_n	V	max. 40 - 1 pole for t=15 ms	440 - 2-pole 220 - 1-pole
Rated insulation voltage		U_i	V	500	
Rated frequency		f	Hz	50/60	-
Rated current		I_n	A	0.2 to 63	
Short-circuit capacity		I_{cn}	kA	10	4.5
Selectivity class				3	
Terminal capacity	Cu	S	mm^2	1.5 ... 25	
	Al			2.5 ... 25	
Ambient temperature			°C	–25 ... +55	
Vibration resistance				3 g (8 - 50 Hz)	

ORDERING DATA

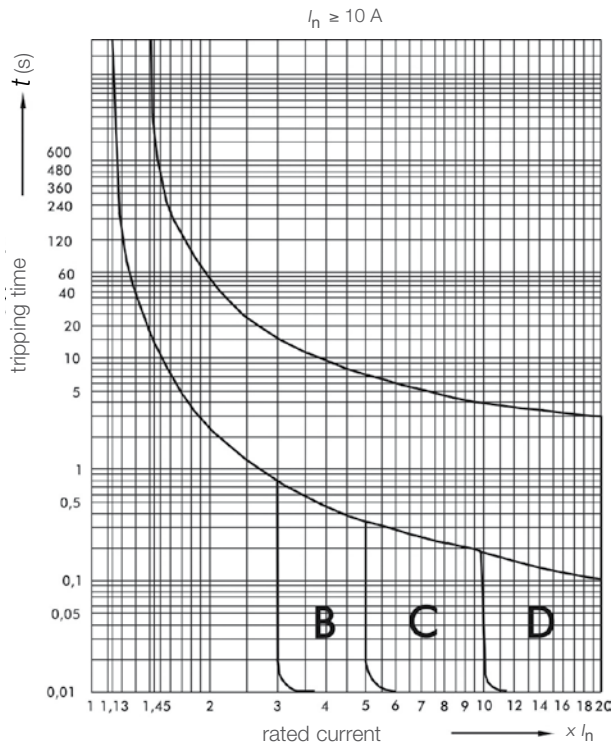
RI 61 - B - 16

- 16 — Rated current I_n (A)
- B — Tripping characteristic
- RI 61 — Type

RI 60

TRIPPING CHARACTERISTIC

B, C, D (EN 60898)



ACCESSORIES

AUXILIARY AND SIGNAL CONTACTS

- They are used with RI 60 miniature circuit breakers and RV 60 disconnection switches (0.5 module width).
- Delivered as a single unit or with RI 60 or RV 60, respectively; mounted on the left side by means of pins and screw.
- Serve for signalling of contact position of the breaker
- Degree of protectin IP20
- Types:
  - PKJ, 2PKJ – one or two auxiliary changeover contacts; position of contacts corresponds to the position of the main contacts of the breaker
  - PKJ + SKJ – one auxiliary changeover contact and one signal change over contact (fault indicating contact)
  - PKJ + SKJ + TEST – test button with two functions is added: signalling the position of signal contacts and testing of control circuit (non-stable change of position of the contacts) by slight movement of push-button upwards and downwards without change of contact position of the breaker

TECHNICAL DATA

Standards			IEC/EN 60947-5-1
Rated insulation voltage	U_i	V	400
Rated operational voltage	U_e	V	230
Rated thermal current	I_{th}	A	16
Rated operational current AC-15 DC-13	I_e	A	 4 (U_e = 230 V) 0.5 (U_e = 110 V)*
Terminal capacity	S	mm²	0.5 ... 2.5

*Connection of two auxiliary contacts in series at 220 V

RI 60

SHUNT TRIP RELEASE VC

- Used with RI 60 miniature circuit breakers and RV 60 disconnection switches.
- Enables remote switch-off.
- Available as a single unit or together with RI 60 or RV 60; mounted on the the right side by means of pins and screw.

TECHNICAL DATA

Standards				IEC/EN 60947-1
Control voltages	AC	U_c	V	12, 24, 48, 60, 110, 230, 400
	DC			24, 48, 110
Range of control voltage		U_c	%	70 … 110
Max. tripping current (at coil voltage)	AC		A (V)	6 (12); 2.8 (24); 0.8 (48); 0.9 (60); 0.5 (110); 0.6 (230); 0.5 (400)
	DC			3 (24); 2 (48); 0.6 (110)
Rated frequency		f	Hz	50
Tripping time			ms	≤ 50
Terminal capacity		S	mm^2	1.5 … 6

UNDERVOLTAGE RELEASE PC 60

- Used with RI 60, RI 120 miniature circuit breakers and RV 60, RV 120 disconnection switches;
- Protection of the load in the event of voltage drop (between 85% and 35% of its control voltage); uncontrolled restarting is prevented;
- Indication of release position green/red;
- Mounted on the right side of the breaker;
- Test button for the correct function control;
- Degree of protection IP 20

TECHNICAL DATA

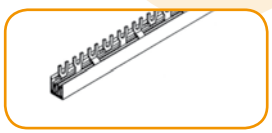
Standards			IEC/EN 60947-1
Control voltage	U_c	V	24, 48, 120, 230, 400
Rated frequency	f	Hz	50
Coil power consumption		W	3
Mechanical endurance		op. c.	10,000
Terminal capacity	S	mm^2	0.75 … 2,5

OTHER ACCESSORIES

Busbar - universal
(for one-pole circuit breakers and one-pole circuit breakers with an auxiliary switch)

Designation	Length (m)	Cross-section (mm^2)
G-1L-210 / 12 iso	0.21	12
G-1L-1000 / 12 iso	1	12
G-2L-1000 / 10	1	12

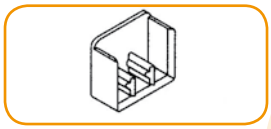
Busbar - fork-type, 3-phase
(for three-pole circuit breakers and one-pole circuit breakers in three-phase circuits)



Designation	Length (m)	Cross-section (mm^2)
G-3L-1000 / 10 C	1	10
G-3L-1000 / 16 C	1	16
G-4L-1000 / 16	1	16

RI 60

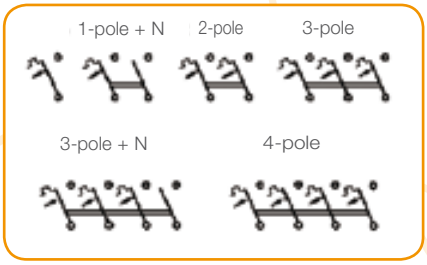
End caps (for three-phase busbars)



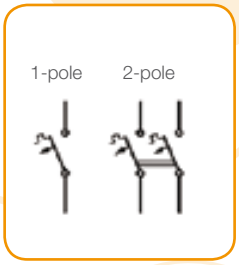
Designation	Cross-section (mm^2)
EK-C-3/10	10
EK-C-2+3/16	16

CONNECTION DIAGRAM

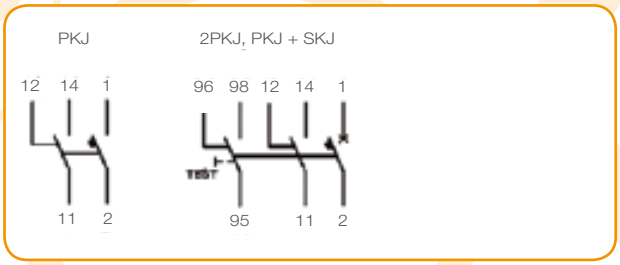
AC



DC

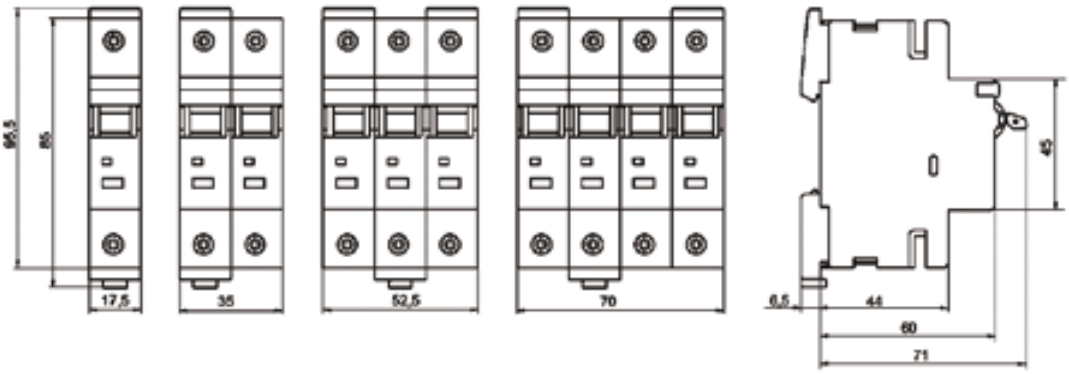


AUXILIARY CONTACTS

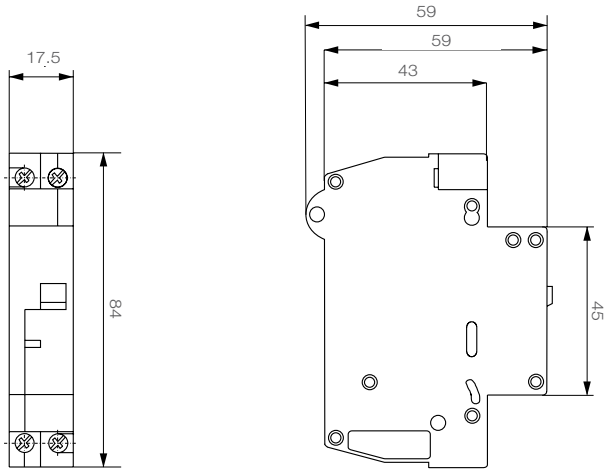


DIMENSIONS

RI 60, RV 60

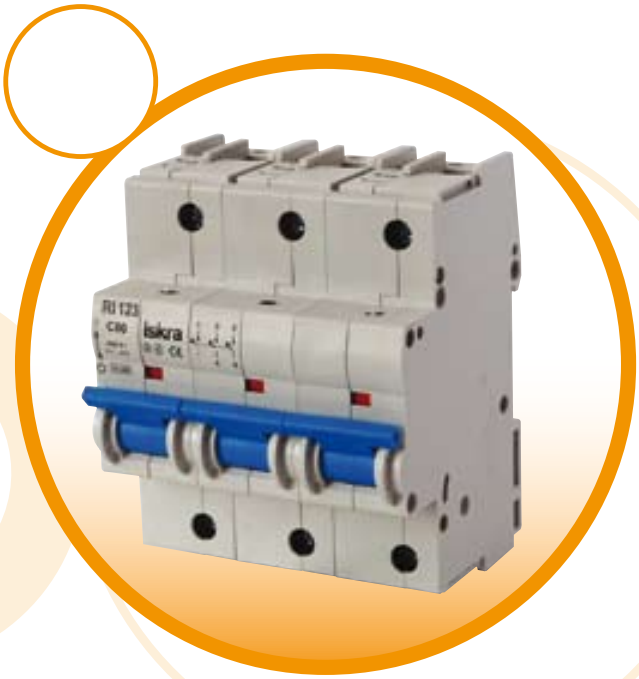


PC 60



Miniature Circuit Breakers

RI 120



- They are used for protecting house and industrial installations.
- RI 120 miniature circuit breakers are provided with two springs for assembly to a 35 mm wide mounting rail in accordance with EN 60715. The springs enable simple taking off irrespective of whether a busbar is positioned below or above.
- A handle can be sealed in ON or OFF position.
- Optional operation position.
- Degree of protection IP20; degree of protection IP40 after installation in a distribution box.

TECHNICAL DATA

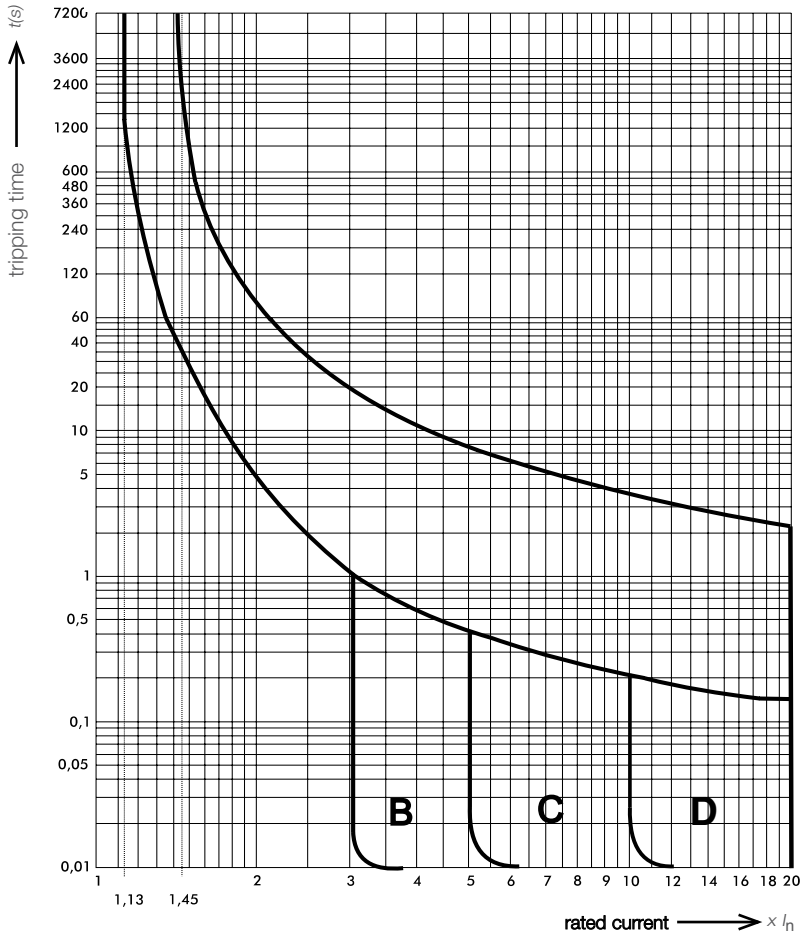
Standards			IEC/EN 60898-1
No. of poles			1, 2, 3, 4, 1 + N; 3 + N
Tripping characteristic			B, C, D
Rated voltage	U_n	V	230, 230/400, 400
Rated DC voltage	U_n	V	max. 110 – 1 pole for T_1 = 4 ms
Rated isulation voltage	U_i	V	690 V
Rated frequency	f	Hz	50/60
Rated current	I_n	A	40, 50, 63, 80, 100, 125
Short-circuit breaking capacity		kA	10 (15)*
Selectivity class			3
Ambient temperature		°C	-5 ... +40
Terminal capacity	S	mm^2	2.5 ... 50
Accessories			Shunt trip release VC

* optional

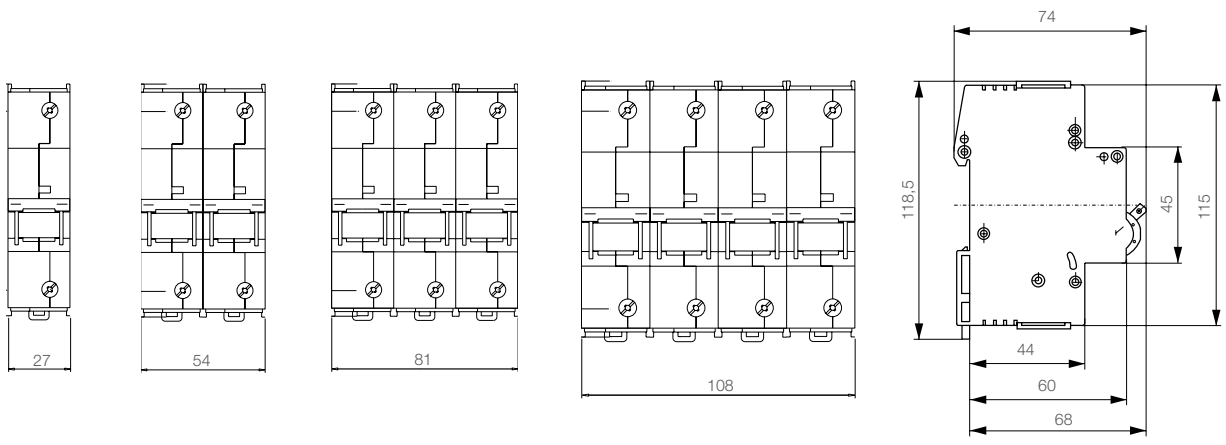
RI 120

TRIPPING CHARACTERISTIC

B, C, D (EN 60898)



DIMENSIONS



RV 60, RV 120, RS

- They are used as main switches in house distribution boxes or as switches for individual electric circuits.
- A handle can be sealed in ON or OFF position.
- Assembly to 35 mm wide mounting rail in accordance with EN 60715.
- Optional operation position.
- Degree of protection IP20; degree of protection IP40 after installation in a distribution box.
- Additional colour indications of the position of main contacts (red – contacts closed, green – contacts open).
- External dimensions of RV 60 and RV 120 disconnection switches match with dimensions of RI 60 or RI 120 miniature circuit breakers.

DISCONNECTION SWITCH RV 60 - TECHNICAL DATA

Standards			IEC/EN 60947-3
No. of poles			1, 2, 3, 1 + N, 3 + N
Rated voltage	U_n	V	230/400
Rated frequency	f	Hz	50/60
Rated current	I_n	A	25, 63
Utilization category			AC-22A
Rated conditional short-circuit current		kA	3 (RV 60 63 A with 63 A gG back-up fuse) 6 (RV 60 63 A with 35 A gG back-up fuse) 10 (RV 60 25 A with 25 A gG back-up fuse)
Terminal capacity	S	mm^2	see page 70
Ambient temperature		°C	-25…+55
Vibration resistance			3 g (8 – 50 Hz)
Accessories			See accessories for RI 60 miniature circuit breaker

DISCONNECTION SWITCH RV 120 - TECHNICAL DATA

Standards			IEC/EN 60947-3
No. of poles			1, 2, 3, 1 + N, 3 + N
Rated voltage	U_n	V	230/400
Rated insulation voltage	U_i	V	690
Rated impulse voltage	U_{imp}	V	6000
Rated frequency	f	Hz	50
Rated thermal current	I_{th}	A	125
Rated current	I_n	A	100 (for utilization category AC-22A), 40 (for utilization category AC-23A)
Rated conditional short-circuit current		kA	3 (with 100 A gG back-up fuse), 6 (with 63 A gG back-up fuse)
Electrical endurance		op. c.	1500
Mechanical endurance		op. c.	10 000
Terminal capacity	S	mm2	2,5…50
Ambient temperature		°C	–25…+55
Vibration resistance			3 g (8 - 50 Hz)

SIGNAL LAMP RS, RSB

- Assembly to a 35 mm wide mounting rail in accordance with EN 60715
- Optional operation position
- Degree of protection IP20, degree of protection IP40 after installation in a distribution box

TECHNICAL DATA

Standards				IEC/EN 60947-5-1
No. of poles				1
Rated voltage	AC DC	U_n	V	24, 48, 110, 230 24, 48, 110, 220
Light source				high capacity LED diode
Light source capacity			W	0,8
Colours				green - G, red - R, blue - B, transparent - T, yellow - Y
Illumination				constant - RS , blinking - RSB
Terminal capacity		S	mm^2	0,75…6
Ambient temperature			°C	–25…+55

SURFACE MOUNTED (INO) and FLUSH MOUNTED (IPO) COMPACT DISTRIBUTION BOARDS

- Transparent or white door
- Additional terminals for PE- and N-conductors
- No. of modules from 4 to 36
- Protection class II
- Degree of protection IP40

TECHNICAL DATA

Type				INO-4 IPO-4	INO-12 IPO-12	INO-18	INO-24 IPO-24	INO-36 IPO-36
Standards				IEC 60670-24				
Rated voltage		U_n	V	400				
Max. power dissipation	INO		W	12	22	22	24	26
	IPO			14	22		24	26
No. of modules				4 (+4)	12	18	24	36
PE- and N-conductor terminals				2 x 8	2 x 10	2 x 13	2 x 13	2 x 15
Ambient temperature			°C	–20 … +70				
Dimensions	INO		mm	215 x 263 x 112	287 x 236 x 112	396 x 236 x 112	287 x 361 x 112	287 x 482 x 112
	IPO			211 x 232 x 70	283 x 232 x 70		283 x 357 x 70	283 x 482 x 70

Residual Current Circuit Breakers

FI, NFI

- Residual current circuit breakers (RCCB) are used for protection against indirect contact, fire protection and additional protection against direct contact.
- They are suitable for isolation.
- No overload protection or short-circuit protection is built in RCCB.
- Two versions according to behaviour in presence of d.c. components:
  - Type A (marked NFI) - sensitive to alternating and pulsating d.c. residual currents.
  - Type AC (marked FI) - sensitive to alternating residual currents of sine form.
- Assembly to a 35 mm wide mounting rail in accordance with EN 60715.
- Optional operation position.
- Degree of protection IP20, degree of protection IP40 after installation in a distribution box.
- Additional colour display of the position of main contacts (red - contacts closed, green - contacts open).
- A terminal shape prevents connection of a conductor outside the connection area.
- Special versions:

- Type S: a switch with delayed break enabling selectivity regarding a general type and a short-time delayed type (type G) connected on the load side. Break time is longer than 40 ms. The switches excel in high resistance to surge currents (up to 3 kA), which prevents unwanted trippings. Their rated currents are from 25 to 100 A, and rated residual operating currents are 100, 300 and 500 mA. This is type A, and a customer can choose between NFI2S two-pole and NFI4S four-pole switches.

- Type G: a short-time delayed breaking characteristic (min. non-actuating period is 10 ms). The switches are resistant to unwanted trippings at current impulses or when built-in in special critical conditions. They excel in high resistance to surge currents (up to 3 kA) and a reliable operation in case of high making currents. Rated currents are from 25 to 100 A, and rated residual operating currents are 30, 100, 300 and 500 mA. This is type A, and a customer can choose between NFI2K two-pole and NFI4K four-pole switches.
Versions S and G comply with the EN 61008 standard. Regarding tripping times, type G also complies with ÖVE/ ÖNORM E 8601 (supplement to ÖVE EN 61008). Both types are VDE approved.

- FIR – FIT combination: It is used for the protection in circuits where operational currents are higher that rated currents of residual current circuit breakers. An actuating relay FIR is separated from a FI transformer (FIT).The function of load switching is performed by the contactor or a circuit-breaker with an undervoltage release.
A combination rated current therefore depends on selected switching devices. It is limited with cable cross-sections which can be inserted through the hole of the FI transformer. Rated differential currents are 0.3 A, 0.5 A, 1 A and 2 A.

FI, NFI

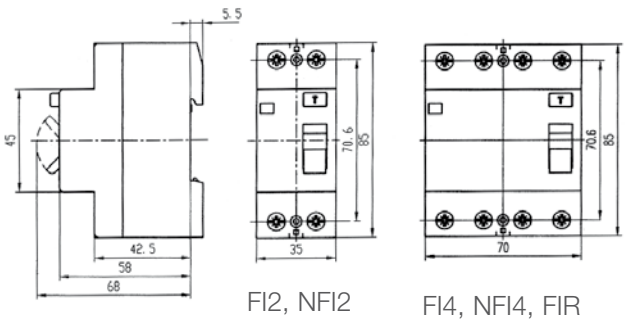
TECHNICAL DATA

Type AC A A-G A-S				FI2 NFI2 NFI2K NFI2S	FI4 NFI4 NFI4K NFI4S
Standards				IEC/EN 61008, type A-G acc. to ÖVE E 8601	
Approvals				VDE, NF, GOST-R	
No. of poles				2	4
Rated voltage	U_n	V		230	230/400
Rated impulse voltage	U_{imp}	kV		4	
Rated frequency	f	Hz		50	
Rated current	I_n	A		16, 25, 40, 63, 80, 100	25, 40, 63, 80, 100
Rated residual operating current	$I_{\Delta n}$	mA		10 (I_n = 16, 25 A), 30, 100, 300, 500	30, 100, 300, 500
Rated making and breaking capacity = Rated residual making and breaking capacity	$I_m = I_{\Delta m}$	A		800 (I_n = 16 - 80 A) 1000 (I_n = 100 A)	
Max. back-up fuse for short-circuit current	I_v	A		63 (I_n = 16 - 40 A) 80 (I_n = 63, 80 A) 100 (I_n = 100 A)	
Rated conditional short-circuit current	I_{nc}	kA		10	
Terminal capacity	S	mm2		1 … 35	
Max. tripping times, types AC, A		ms		1 x $I_{\Delta n}$: ≤ 300 ms; 5 x $I_{\Delta n}$: ≤ 40 ms	
Response time delay, types A-G, A-S		ms		type A-G - 1 x $I_{\Delta n}$:10 ms < T ≤ 300 ms; 5 x $I_{\Delta n}$: 10 ms < T ≤ 40 ms type A-S - 1 x $I_{\Delta n}$:130 ms < T ≤ 500 ms; 5 x $I_{\Delta n}$: 50 ms < T ≤ 150 ms	
Ambiemt temperature		°C		–25 … +40	
Storage temperature		°C		–35 … +60	
Weight		kg		0.23	0.39
Tightening torque		Nm		2.0	

ACCESSORIES

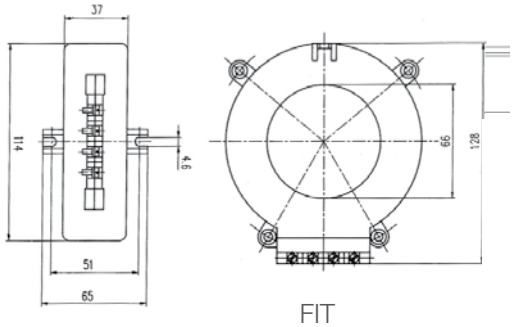
A sealing cover for two-pole (SCNFI2) and four-pole (SCNFI4) switches

DIMENSIONS



FI2, NFI2

FI4, NFI4, FIR



FIT

ORDERING DATA

FI2	-	25	/0,03	
NFI4	-	40	/ 0,3	

Rated residual operating current $I_{\Delta n}$ (A)
Rated current I_n (A)
Type

Residual Current Circuit Breakers with overcurrent protection

RFI2

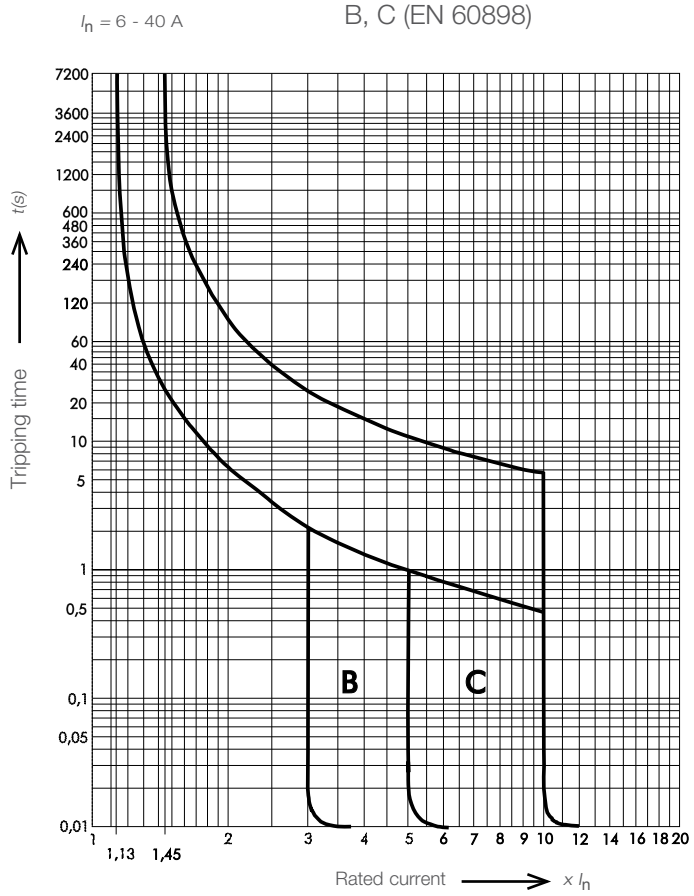
- RFI2 is a combination of a residual current circuit breaker and a miniature circuit breaker (RCBO)
- A built-in protection against overload and short-circuit
- RFI2 may be used to provide:
  - fault protection (protection against indirect contact)
  - protection against fire
  - additional protection against direct contact
- The switch is type A which means that it is sensitive to alternating and pulsating d.c. residual currents
- Sealing in ON or OFF position
- Assembly to a 35 mm wide mounting rail in accordance with EN 60715
- Optional operation position
- Degree of protection IP20, degree of protection IP40 after installation in a distribution box
- Additional colour indication of the position of main contacts (red - contacts closed, green - contacts open)

TECHNICAL DATA

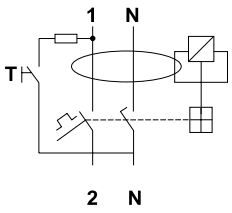
Type	A		RFI2
Standards			IEC/EN 61009
Approvals			VDE, GOST-R
No. of poles			2
Tripping characteristic			B, C
Rated voltage	U_n	V	230
Rated impulse voltage	U_{imp}	kV	4
Rated frequency	f	Hz	50
Rated current	I_n	A	6, 10, 16, 20, 25, 32, 40
Rated residual operating current	$I_{\Delta n}$	mA	10 (In = 6 - 25 A), 30, 100, 300, 500
Rated short-circuit capacity		kA	10
Selectivity class			3
Terminal capacity	S	mm^2	1.5 ... 25
Ambient temperature		°C	–25 ... +40
Storage temperature		°C	–35 ... +60
Tightening torque		Nm	2.0
Accessories			Auxiliary and signal changeover contacts

RFI2

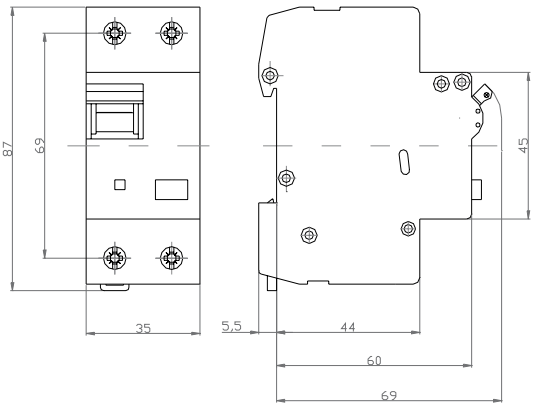
TRIPPING CHARACTERISTIC



CONNECTION DIAGRAM



DIMENSIONS



ORDERING DATA

RFI2 - B - 16 / 0,03

- 16 / 0,03 — Rated residual operating current $I_{\Delta n}$ (A)
- 16 / 0,03 — Rated current I_n (A)
- B — Tripping characteristic (B or C)
- RFI2 — Type

KMPL AND KPL DIRECT ON-LINE STARTERS

KMPL9, KMPL12, KMPL16, KMPL18, KMPL22, KPL9, KPL12, KPL16, KPL18, KPL22

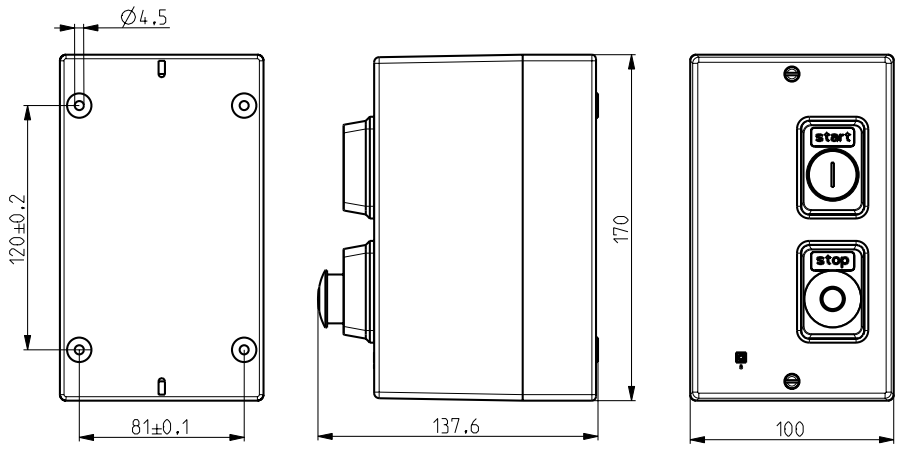
They are mainly used for start-up, overload protection and switch-off of electric motors and also for other loads. A contactor and a corresponding bimetal relay are built in the enclosure of degree of protection IP55. They are switched on with the ON pushbutton and switched off with the OFF pushbutton. The mushroom pushbutton functions as an emergency stop pushbutton.

Corresponding back-up fuses should be built in a circuit in front of an automatic contactor for the protection against short-circuit. The KPL starters are not provided with overload protection, while KMPL starters are.

TECHNICAL DATA

Type of direct starter without overload protection				KPL9	KPL12	KPL16	KPL18	KPL22
Type of direct starter with overload protection				KMPL9	KMPL12	KMPL16	KMPL18	KMPL22
Corresponding thermal overload relay				BR16, BR30				
Standards				IEC/EN 60947-4-1				
Rated insulation voltage	U_i	V		690				
Max. permitted powers of three-phase motors at AC-3	230 V	P_m	kW/ HP	2.2 / 3	3 / 4	4 / 5.5	4 / 5,5	5.5 / 7.5
	400 V			4 / 5.5	5.5 / 7.5	7.5 / 10	9 / 10	11 / 15
	500 V			5.5 / 7.5	5.5 / 7.5	7.5 / 10	9 / 10	11 / 15
	690 V			5.5 / 7.5	7.5 / 10	7.5 / 10	9 / 10	11 / 15
Max. back-up fuse for short-circuit protection gL Coordination type 2			A	25	25	35	35	50
Range at control voltage	U_c	%		85 … 110				
Max. operating frequency			op. c./h	15				
Degree of protection				IP55				
Ambient temperature			°C	-20 … +40				
Terminal capacity	rigid	S	mm²	0.75 ... 6				2.5 ... 10
	flexible			0.5 ... 6				1.5 ... 10

DIMENSIONS



ZK STAR-DELTA MOTOR STARTER

All required elements for start-up, overload protection and switch-off of asynchronous electric motors are built in the enclosure of degree of protection IP55.

TECHNICAL DATA

		Permitted motor power					
Starter type	Relay type	230 V		400 V		500 V	
		kW	HP	kW	HP	kW	HP
ZK 12	BR16 / 8,5 - 12,5	4	5.5	7.5	10	7.5	10
ZK 16	BR16 / 12,5 - 18	5.5	7.5	11	15	11	15
ZK 18	BR16 / 15 - 20	5.5	7.5	15	20	15	20
ZK 22	BR30 / 17 - 24	8	11	18.5	25	18.5	25
ZK 30	BR30 / 22 - 30	12.5	17	25	34	25	34
ZK 43	BR43 / 30 - 43	20	27	37	50	45	60
ZK 63	BR43 / 40 - 63	25	34	55	75	65	88
ZK 95	BRA180 / 75 - 125	40	54	75	100	100	136
ZK 115	BRA180 / 90 - 150	63	86	110	150	147	200
ZK 145	BRA180 / 120 - 200	80	108	132	180	185	252
ZK 180	BRA180 / 120 - 200	92	125	160	220	210	272

Contactors combinations

KO-LD, KNL-LD COMBINATIONS FOR REVERSING

TECHNICAL DATA

Type	AC-3 Rated operational power (kW)			
	230V	400V	500V	690V
K0-LD 7	3	5.5	5.5	5.5
KNL-LD 9	2.2	4	5.5	5.5
KNL-LD 12	3	5.5	5.5	7.5
KNL-LD 16	4	7.5	7.5	7.5
KNL-LD 18	4	9	9	9
KNL-LD 22	5.5	11	11	11
KNL-LD 30	7.5	15	15	15

KMSPL COMBINATION STARTERS

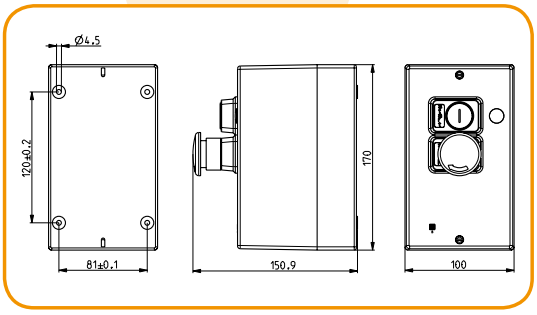
They are mainly used for start-up and switch-off of electric motors up to 11 kW power. MS25 motor protection switch with undervoltage release and a corresponding contactor are built in the enclosure of degree of protection IP55.

The advantages of combination starters over direct starters are:

- it is not necessary to build in back-up fuses for protection against short-circuit up to rated motor power 1.5 kW at 400 V
- after each overload and power line failure the automatic switch-on is not possible

TECHNICAL DATA

Type of combination starter				KMSPL3	KMSPL9	KMSPL12	KMSPL16	KMSPL18	KMSPL22
Type of motor protection switch				MS25-6,3	MS25-10	MS25-16	MS25-16	MS25-20	MS25-25
Setting range of bimetal release				4 … 6,3	6,3 … 10	10 … 16	10 … 16	10 … 16	20 … 25
AC-3, max. permitted powers of three-phase motors	230 V	P_m	kW	1.5	2.2	3	4	4	5.5
	400 V			2.2	4	5.5	7.5	9	11
	500 V			3	5.5	5.5	7.5	9	11
	690 V			4	5.5	7.5	7.5	9	11



Contactors combinations

DIRECT ON-LINE STARTERS UP TO 30 A

D120 D121

To define the starter, the following data have to be known:
- motor power, operational current
- coil control voltage
- required pushbuttons (none, start, stop, reset)
- main switch (yes or no)

Based on these data, a convenient contactor and an overload relay as well as correspondingly equipped enclosure are selected.
You can choose between overload relay BR16/30.

COMPONENT SELECTION

	Permitted motor power 400/415 V, three-phase		Thermal overload relay BR16/30 Operational current (A)	Direct-on contactor*	Enclosure		
	kW	HP	min.-max		Push-button arrangement	Main switch	Ordering code
BR16/KNL18	0.06	0.08	0.16 - 0.25	KNL9	start & stop reset none	—	D120S** D110 D100
	0.12	0.16	0.25 - 0.4				
	0.18	0.25	0.45 - 0.63				
	0.25	0.33	0.75 - 1				
	0.55	0.75	1.1 - 1.6				
	1.1	1.5	2.3 - 3.2				
	1.5	2	2.9 - 4		start & stop reset none	with main switch	D121** D111 D101
	2.2	3	4.5 - 6.3				
	4	5.5	7.2 - 10				
	5.5	7.5	9 - 12.5	KNL12			
	7.5	10	11.3 - 16	KNL16			
	9	10	15 - 20	KNL18			
BR30/KNL30	11	15	17.5 - 21.5	KNL22	start & stop reset none	—	D120M** D110 D120M
	15	20	24.5 - 30	KNL30	start & stop reset none	with main switch	D122** D112 D102

ORDERING DATA

D1 ... 0,1,2 ... ... 0,1,2,3 ... S, M — Setting range for thermal overload relay — Kind of thermal overload relay BR — Control voltage

S - for KNL9 - KNL16, M - for KNL22, KNL30
Main switch (0 - none, 1 - 25 A, 2 - 32 A)

Pushbuttons (0 - none, 1 - reset pushbutton, 2 - start & stop)
Enclosure size

* Standard control voltages (50/60 Hz)
B7 24 V
F7 110/125 V
M7 220/240 V
Q7 380/415 V
Other control voltages on request.

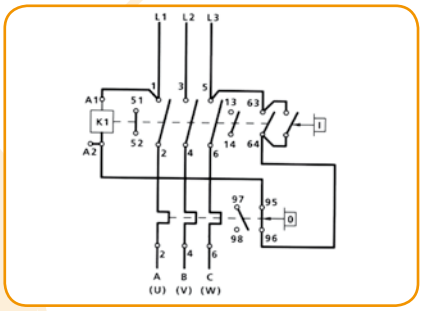
** NDL6-11 snap-on auxiliary switch block included.

Enclosures: IP66, a metal base with a polycarbonate cover

KNL9-KNL30 direct-on-line starters

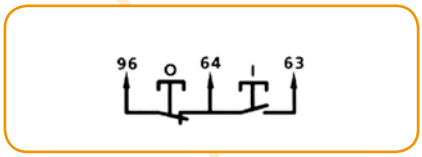
WIRING DIAGRAMS

KNL9-KNL30 direct-on-line starters

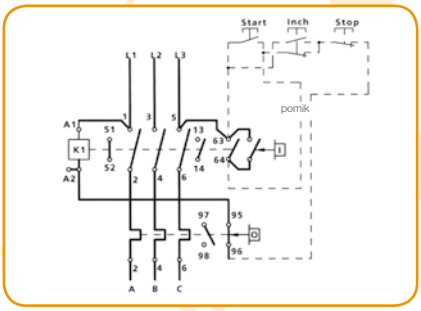


Connection for three-phase three-wire system-as shown above

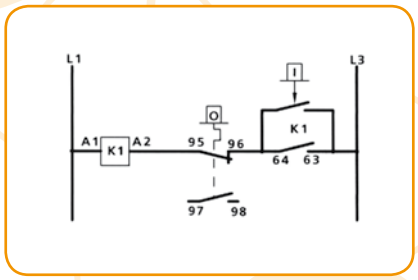
Connection for four-wire system:
1. Remove connection 1 (L1) - A1
2. Connect a neutral conductor to A1 terminal



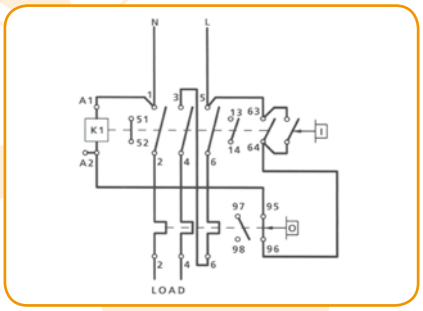
Connection for remote push-button control:
1. Remove connection 96 - 64
2. Connect as illustrated



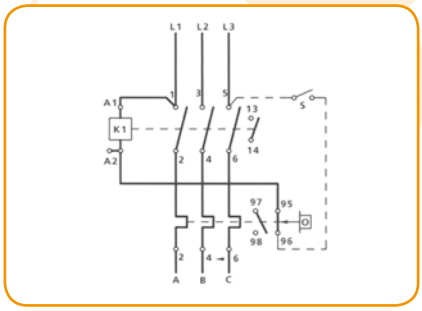
Connection for remote start-inch-stop control



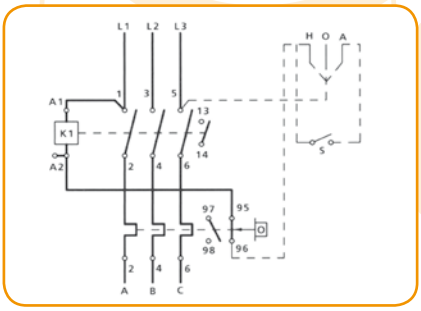
Connection diagram



Connection for single-phase motors



Connection for remote pilot switch control

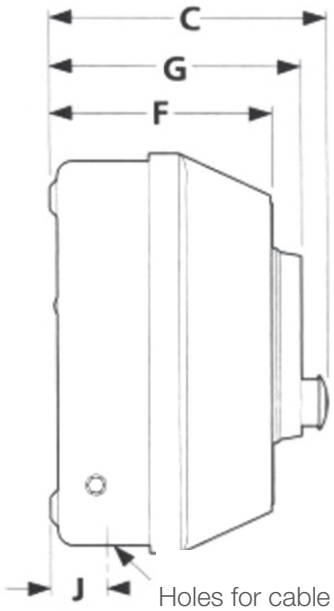


Connection for remote control with selection switch, manual - 0 - automatic

DIRECT ON-LINE STARTERS UP TO 30 A

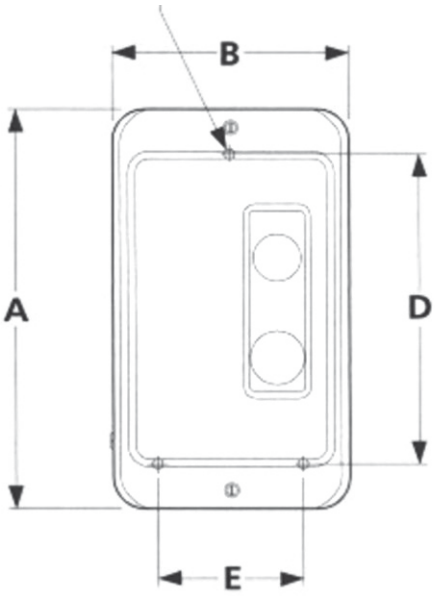
DIMENSIONS

An enclosure for contactors and direct-on-line starters (size D1)



Holes for cable inlets with K diameter, top and bottom

Fixing holes with L diameter



IP66	A	B	C	D	E	F	G	H	J	K	L
KNL9 - KNL30 (enclosure D1)	212	124	146	164	76	117	132.5	-	29.5	3 x 20	5.5
KNL9 - KNL30 + main switch (enclosure D1)	212	124	156	164	76	117	132	146	29.5	3 x 20	3 x 5.5

Contactors combinations

REVERSING STARTERS UP TO 30 A

To define the starter, the following data have to be known:

- motor power, operational current
- coil control voltage
- required pushbuttons (none, I, II, 0, reset)
- main switch (yes or no)

Based on these data, a convenient contactor and an overload relay as well as correspondingly equipped enclosure are selected.

COMPONENT SELECTION

	Motor power at 400/415 V, three-phase		Thermal overload relay BR16/30 Operational current (A)	Reversing starter*	Enclosure		
	kW	HP	min.-max		Push-button arrangement	Main switch	Ordering code
BR16/KNL18	0.06	0.08	0.16 - 0.25	RS9	I, II and 0 reset none	—	R420S R410 R400
	0.12	0.16	0.25 - 0.4				
	0.18	0.25	0.45 - 0.63				
	0.25	0.33	0.75 - 1				
	0.55	0.75	1.1 - 1.6				
	1.1	1.5	2.3 - 3.2				
	1.5	2	2.9 - 4		I, II and 0 reset none	with main switch	R221 R211 R201
	2.2	3	4.5 - 6.3				
	4	5.5	7.2 - 10				
	5.5	7.5	9 - 12.5	RS12			
	7.5	10	11.3 - 16	RS16			
	9	10	15 - 20	RS18			
BR30/KNL30	11	15	17.5 - 21.5	RS22	I, II and 0 reset none	—	R420M R410 R400
					I, II and 0 reset none	with main switch	R221 R211 R201
	15	20	24.5 - 30	RS30	I, II and 0 reset none	—	R420M R410 R400
					I, II and 0 reset none	with main switch	R222 R212 R202

ORDERING DATA

R2, R4 ... 0,1,2 ... ... 0,1,2 ... S, M - .... (Kind of thermal overload relay BR; Control voltage)

- Setting range for thermal overload relay.
- S - for KNL9 - KNL16, M - for KNL22, KNL30
- Main switch (0 - none, 1 - 25 A, 2 - 32 A)
- Pushbuttons (0 - none, 1 - reset pushbutton, 2 - I, II and 0)
- Enclosure size

Enclosure: I, II and 0 pushbuttons can be marked: FOR/REV, UP/DOWN, OPEN/CLOSED, LEFT/ RIGHT
Degree of protection IP66, a metal base and a polycarbonate cover

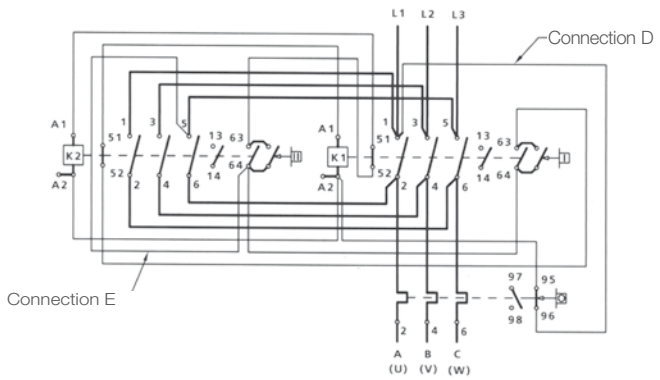
* Standard control voltages (50/60 Hz)
B7 24 V
F7 110/125 V
M7 220/240 V
Q7 380/415 V

Other control voltages also avaiable

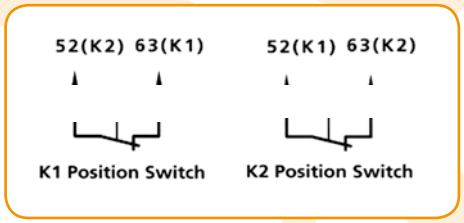
REVERSING STARTERS UP TO 30 A

CONNECTION DIAGRAM

KNL9-KNL30 reversing starters



Wiring if a position switch is required:
1. Remove connections 52 - 63
2. Connect as illustrated

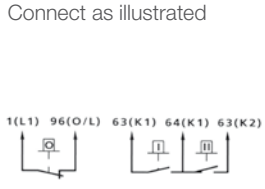


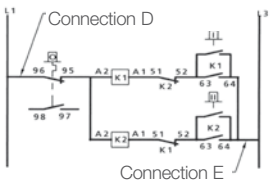
NOTE: Auxiliary contact 13-14 belongs to a KNL9-KNL16 contactor standard equipment

CONTROL CIRCUIT SUPPLY ARRANGEMENTS

SUPPLY	WIRING
Phase to phase	See a figure
Phase to neutral	Remove connection D connect neutral to terminal 96
Separate supply	Remove connections D and E. Connect separate coil supply to terminal 96 on overload relay and terminal 64 on K2 contactor

Wiring if remote control with pushbuttons:
1. Remove connections D
2. Connect as illustrated





Push to run

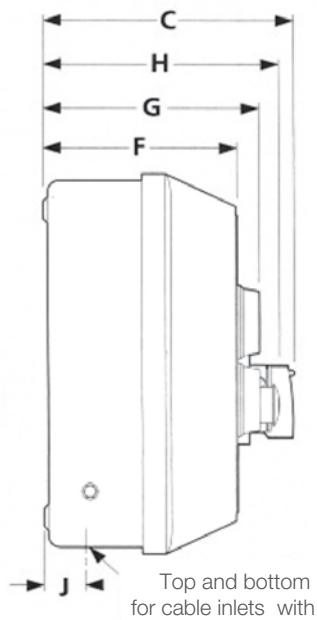
A simple push-to-run arrangement can be achived in one or both directions by changing the top start switches.

REVERSING STARTERS UP TO 30 A

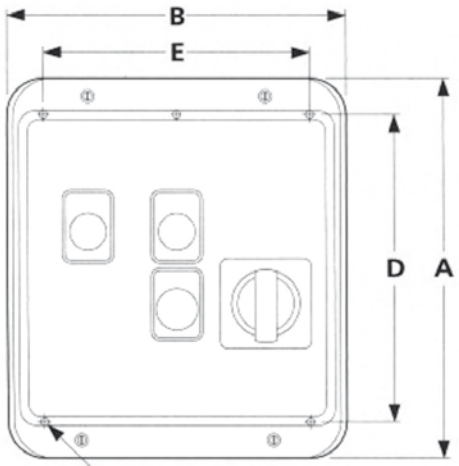
DIMENSIONS

Enclosures for reversing starters (enclosure sizes R2 and R4)

Enclosure R2

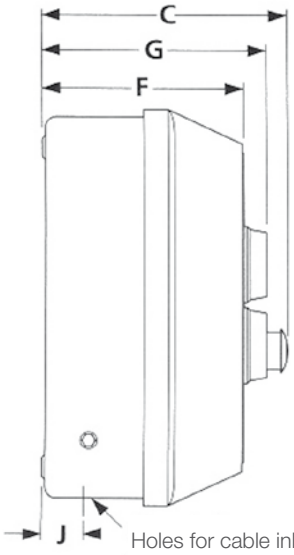


Top and bottom holes for cable inlets with K diameter



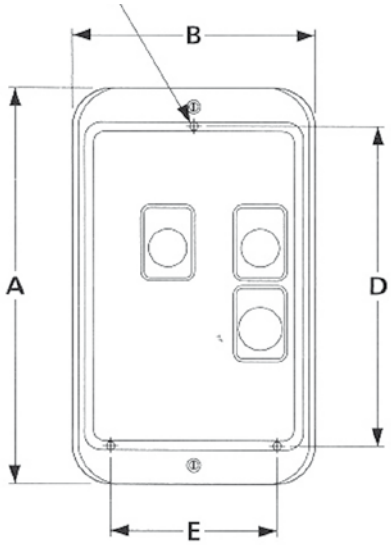
Fixing holes with L diameter

Enclosure R4



Holes for cable inlets with K diameter, top and bottom

Fixing holes with L diameter



IP66	A	B	C	D	E	F	G	H	J	K	L
KNL9 - KNL30 (enclosure R4)	260	158	160	210	108	132	147	-	27.5	2 x 20 1 x 25	3 x 5.5
KNL9 - KNL30 + main switch (enclosure R2)	260	230	171	210	180	133	148	161	28.5	2 x 20 1 x 25	4 x 5.5

STAR-DELTA STARTERS UP TO 25 kW

To define the starter, the following data have to be known:
- motor power, operational current
- coil control voltage
- required pushbuttons (none, start, stop, reset)
- main switch (yes or no)

Based on these data, a convenient contactor and an overload relay as well as correspondingly equipped enclosure are selected.

COMPONENT SELECTION

	Motor power at 400/415 V, three-phase kW	HP	Thermal overload relay BR16/30 Operational current (A) min.-max	Star-delta starter*	Enclosure: Push-button arrangement	Main switch	Ordering code
BR16/KNL18	2.2 4 7.5 11 15	3 5.5 10 15 20	2.3 - 3.2 4.5 - 6.3 07.2 - 10 11.3 - 16 15 - 20	SD16	start & stop reset none	—	S320S S310 S300
					start & stop reset none	with main switch	S321 S311 S301
BR30/KNL30	18.5	25	21 - 25	SD22	start & stop reset none	—	S320 S310 S300
					start & stop reset none	with main switch	S321 S311 S301
	22 25	30 34	21 - 25 24.5 - 30	SD30	start & stop reset none	—	S320 S310 S300
					start & stop reset none	with main switch	S322 S312 S302

ORDERING DATA

S3 ... 0, 1, 2 ... ... 0, 1, 2, 3 ... S, M - .... Kind of thermal overload relay BR Control voltage

- .... Setting range for thermal overload relay S - for KNL9 - KNL16, M - for KNL22, KNL30
- ... S, M Main switch (0 - no switch, 1 - 25 A, 2 - 32 A)
- ... 0, 1, 2, 3 Pushbuttons (0 - no switch, 1 - reset pushbutton, 2 - start and stop)
- ... 0, 1, 2 ... Enclosure size
- S3

* Standard control voltages (50/60 Hz)
B7 24 V
F7 110/125 V
M7 220/240 V
Q7 380/415 V

Other control voltages also available

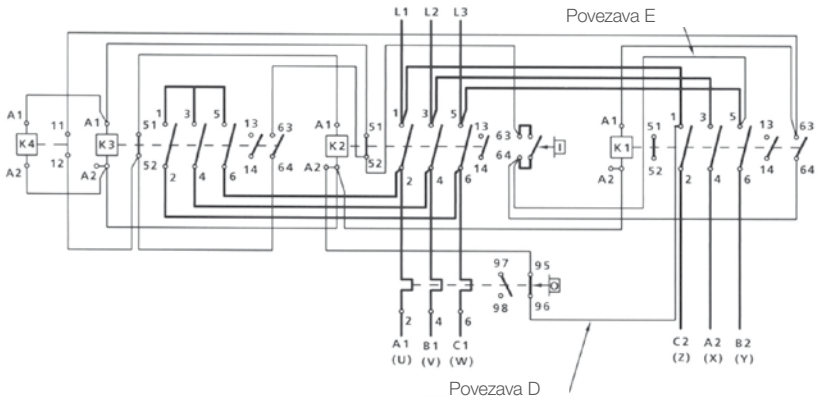
STAR-DELTA STARTERS APPLICATION

For a star-delta unit, the overload relay is connected to a delta loop and therefore protects the motor only at this connection.
For easier selection of the relay, motor currents are stated in a table.
A star-delta starter is equipped with an electronic time relay with a minimum range from 3 to 45 seconds.
The time relay assures required delay between a “star” contactor opening and a “delta” contactor closing.

STAR-DELTA STARTERS UP TO 25 kW

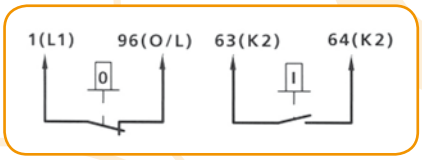
CONNECTION DIAGRAM

KNL9-KNL30 star delta starter contactors

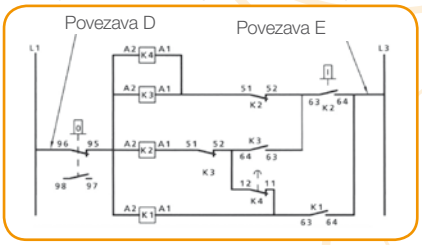


Wiring for remote control with pushbuttons

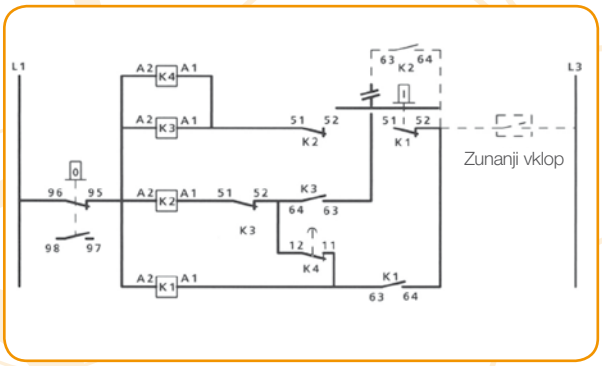
1. Remove connection D
2. Connect as illustrated



Connection diagram (control with pushbuttons)



NOTE: AUXILIARY CONTACT 13-14 BELONGS TO A KNL9-KNL16 CONTACTOR STANDARD EQUIPMENT



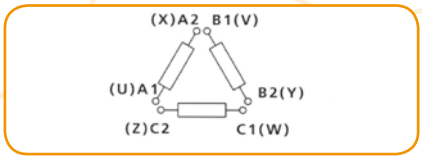
CONTROL CIRCUIT SUPPLY ARRANGEMENTS

SUPPLY	WIRING
Phase to phase	See a figure
Phase to neutral	Remove connection D Connect terminal 96 to a neutral conductor
Separate supply	Remove connections D and E Connect separate coil supply to terminal 96 on overload relay and terminal 64 on K2 contactor

Connection diagram (Remote Pilot Switch Control)

1. Remove connection 63 to 52 on the K2 contactor
2. Connect between 52 and 64 on the K1 contactor and from terminal 51 on the K1 contactor to terminal 52 on the K2 contactor
3. Connect the pilot switch in place of connection E
4. Set overload relay to manual reset position.

Motor windings
Connect to appropriate terminals on the starter

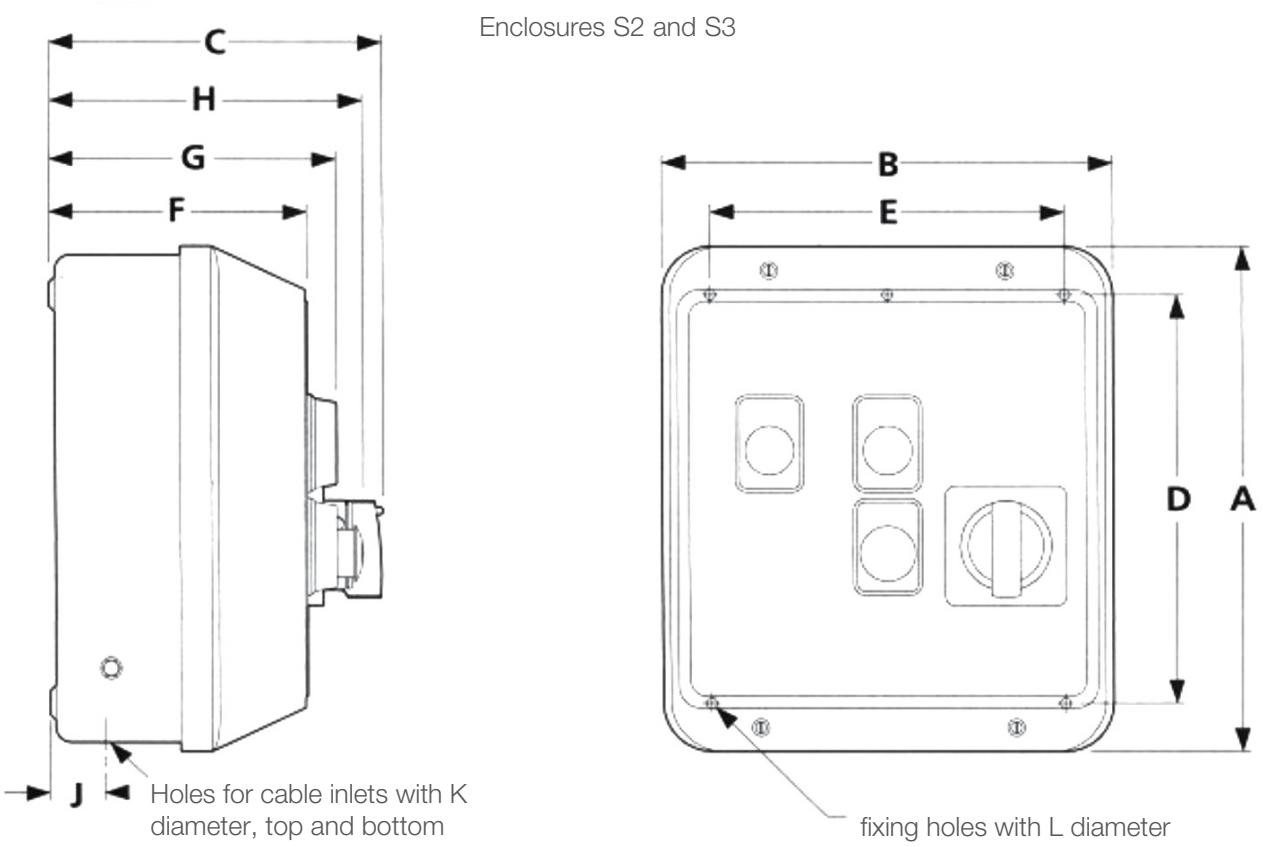


STAR-DELTA STARTERS UP TO 25 kW

DIMENSIONS

Enclosures for star-delta starters (sizes S2 and S3)

Enclosures S2 and S3



IP66	A	B	C	D	E	F	G	H	J	K	L
KNL16 - KNL30 (enclosure S2)	260	230	161	210	180	133	148	-	28.5	2 x 20 1 x 25	3 x 5.5
KNL16 - KNL30 + main switch (enclosureS3)	260	332	171	210	282	133	148	161	28.5	3 x 20 1 x 25	4 x 5.5

Switch disconectors

DS

Switches series DS have been developed to the latest achievements in the field of switching devices through the application of quality insulation materials and contacts made with silver alloys. Modular construction allows subsequent changes, so stocking costs can be lowered.
Elements that can be fixed to the left and/or right side of the switch:

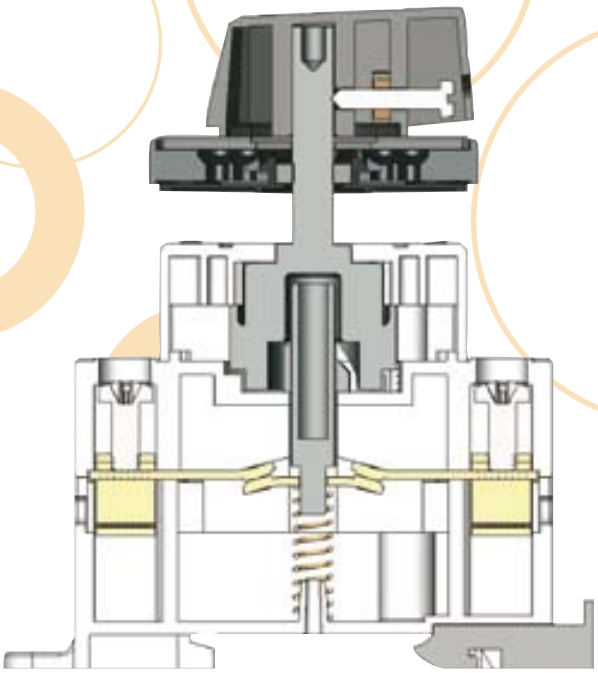
- fourth pole (N-pole)
- auxiliary contacts 1n/o+1n/c
- auxiliary contacts 2 n/o
- PE terminal
- N terminal

Because of the larger opening clearances the switches series DS are particularly suitable for main switches (switch disconnectors) and safety switches (emergency-off switches).
Switches series DS are built in accordance with the following standards: IEC 60947-1,-3, IEC 60204, DIN EN 61058, UL 508,C22.2 No.14 etc.

General:

- Two modular frame sizes:
  A0 size (16-25-32-40 A)
  A1 size (40-63-80 A)
- Mechanical protection degree - front part IP65, connection terminals IP20 (for switches CS40,63,80 - option with protection cover is required)
- Positive contacts opening (IEC 60947-5-1 Annex K)
- Loosely screwed “self-lifting” clamps offer easier connection
- DIN-rail or screw mounting

Type	Type	I / $U_{th\ i}$
DS16	A0 (48)	16 A / 600 V
DS25	A0 (48)	25 A / 600 V
DS32	A0 (48)	32 A / 600 V
DS40R	A0 (48)	40 A / 600 V
DS40	A1 (65)	40 A / 600 V
DS63	A1 (65)	63 A / 600 V
DS80	A1 (65)	80 A / 600 V



DS

TECHNICAL DATA

Switch type				DS16	DS25	DS32	DS40R	DS40	DS63	DS80
Rated insulation voltage		U_i	V	690						
Rated impulse withstand voltage (III/3) [1]		U_{imp}	kV	6						
Rated thermal current		I_{th}	A	16	25	32	40	40	63	80
Rated short-time withstand current (1 s)		I_{cw}	A	400	500	600	600	1100	1300	1400
Max. fuse size for short	10 kA	I_n	A	35	35	35	40	80	80	80
circuit protection	25 kA			32	32	32	32	63	63	63
gG characteristic	50 kA			32	32	32	32	63	63	63
Rated operational current AC1/AC21A		I_e	A	16	25	32	40	40	63	80
Motor switch in utilization category 3 phase AC3	220/240 V	I_e	kW	3.7	5.5	7.5	7.5	11	11	15
	380/440 V			3.5	7.5	11	11	15	22	25
	500 V			7.5	11	15	15	22	25	30
	690 V			7.5	11	15	15	22	25	25
3 phase AC23	220/240 V			4	7.5	9	9	11	15	18.5
	380/440 V			7.5	11	15	15	18.5	25	30
	500 V			9	15	15	15	22	30	37
	690 V			9	15	15	15	22	30	30
Conductor size rigid		S	mm²	10	10	10	10	25	25	25
			AWG	8	8	8	8	4	4	4
flexible			mm²	6	6	6	6	16	16	16
			AWG	10	10	10	10	6	6	6

[1] valid for neutral earthed systems, overvoltage category III, polution degree 3

AUXILIARY CONTACTS

Type				DSX
Rated insulation voltage		U_i	V	690
Rated thermal current		I_{th}	A	10
Rated operational current	110 V	I_e	A	8
	220-240 V			8
	380-400 V			3
	660-690 V			1
Conductor size rigid		S	mm²	1.5
			AWG	14
flexible			mm²	1.5
			AWG	14

MOUNTING SIZES

DS16 **DS25** **DS32** **DS40R**	**DS40** **DS63** **DS80**

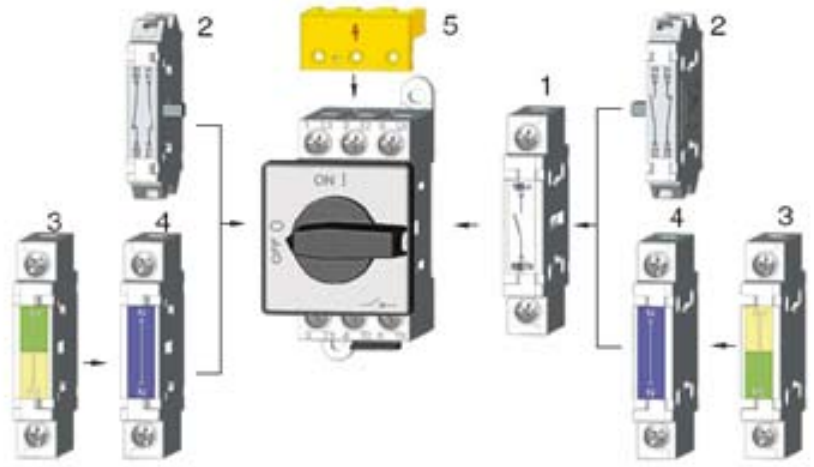
STANDARD DESIGNS AND OPTIONAL EXTRAS

	Name	Form	Code 1		2		3	4	Description
STANDARD SWATCHES	N Front mounting		DS16 DS25 DS32 DS40R DS40 DS63 DS80	– – – – – – –	– – – – – – –	– – – – – – –	D D D D D D D		**Standard front mounting** - front assembly □48 **Standard front mounting** - front assembly □65
	N Rear mounting		DS16 DS25 DS32 DS40R DS40 DS63 DS80	– – – – – – –	– – – – – – –	– – – – – – –	C C C C C C C		**Standard rear mounting** - front assembly □48 **Standard rear mounting** - front assembly □65
	Service cover		DS16 DS25 DS32 DS40R DS40 DS63 DS80	– – – – – – –	– – – – – – –	– – – – – – –	C C C C C C C	48D 48D 48D 48D 48D 48D 48D	Snap on base mounting for the rail 35 EN 50022 for 45 mm standard knock-out
	Switch with padlock		DS16 DS25 DS32 DS40R DS40 DS63 DS80 DS16 DS25 DS32 DS40R DS40 DS63 DS80	– – – – – – – – – – – – – –	– – – – – – – – – – – – – –	– – – – – – – – – – – – – –	D/C D/C D/C D/C D/C D/C D/C D/C D/C D/C D/C D/C D/C D/C	23 23 23 23 23 23 23 25 25 25 25 25 25 25	Main switch - black handle and front plate [1] Main switch with emergency - red handle, yellow front plate [1]
DOOR COUPLING	N Door coupling and shaft extension		DS16 DS25 DS32 DS40R DS40 DS63 DS80	– – – – – – –	– – – – – – –	– – – – – – –	D D D D D D D		Door opening in position “0” Standard version with 100 mm shaft

“N” - possibility of front plate title

DS

ACCESSORIES



1 - **Fourth pole** (switched neutral cond
2 - **Auxiliary contacts** (1n/o+1n/c or 2
3 - **PE terminal**
4 - **N terminal**
5 - **Protection cover**

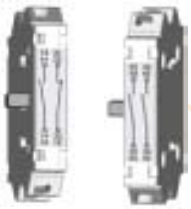
Accessories must be mounted in positi

ORDERING CODES FOR ACCESSORIES

4 pole
early make - late break

Mounting size A0	"C"	"D"
DSF16	786 120 118 000	786 120 112 000
DSF25	786 120 119 000	786 120 113 000
DSF32	786 120 120 000	786 120 114 000
DSF40R	786 120 122 000	786 120 123 000
Mounting size A1	**"C"**	**"D"**
DSF40	786 120 121 000	786 120 115 000
DSF63	786 120 124 000	786 120 116 000
DSF80	786 120 125 000	786 120 117 000

1 n/o+1n/c 2n/o



Auxiliary contacts
n/o contact: late make - early break

Type of auxiliary. contacts	"C"	"D"
DSX11	786 125 061 000	786 125 043 000
DSX20	786 125 044 000	786 125 062 000

PE terminal

Type of switch	"C"	"D"
DSPE (DS16 - DS40R)	786 125 055 000	786 125 057 000
DSPE M (DS40 - DS80)	786 125 056 000	786 125 058 000

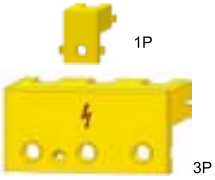
"C" - Rear mounting
"D" - Front mounting mounting

ORDERING CODES FOR ACCESSORIES

N terminal

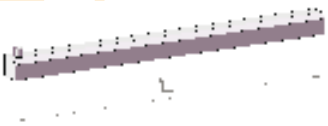
Type of switch	"C"	"D"
DSN (DS16 - DS40R)	786 125 049 000	786 125 051 000
DSN M (DS40 - DS80)	786 125 050 000	786 125 052 000

Protection cover



Number of poles	"C" or "D"
DSP1	786 125 053 000
DSP3	786 125 054 000

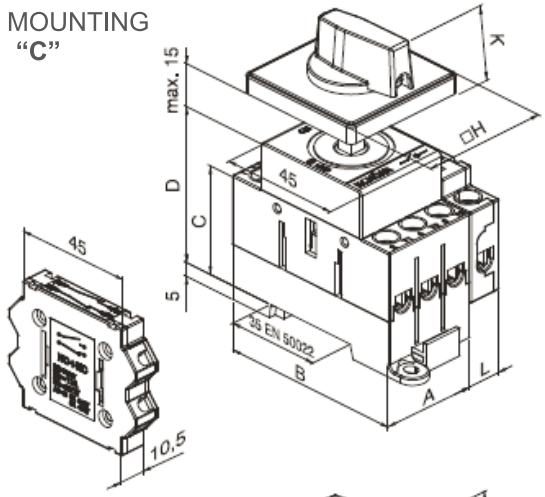
Shaft



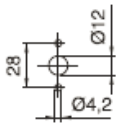
X (mm)	
DSS70	786 125 045 000
DSS90	786 125 046 000
DSS100	786 125 059 000
DSS150	786 125 047 000
DSS200	786 125 060 000
DSS300	786 125 048 000

DIMENSIONS

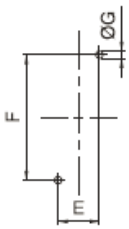
REAR MOUNTING
"C"



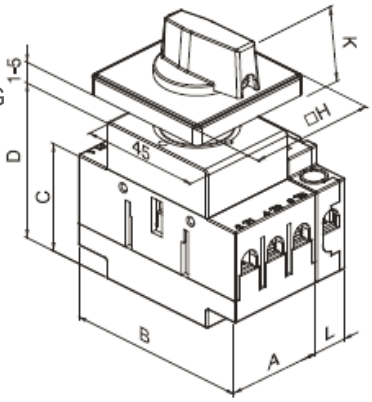
Front



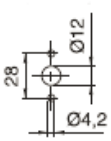
Rear



FRONT MOUNTING
"D"



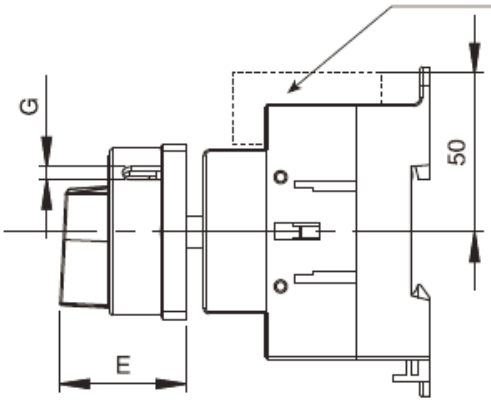
Front



Type	A	B	C	D	E	F	ØG	□H	K	L	M
DS16 DS25 DS32 DS40R	36	70	40	57	25	78	4.5	48	26.5	13.5	10.5
DS40 DS63 DS80	54	76	40	57	40	88	5.5	65	34.5	18	10.5

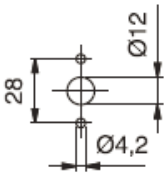
DS

DIMENSIONS



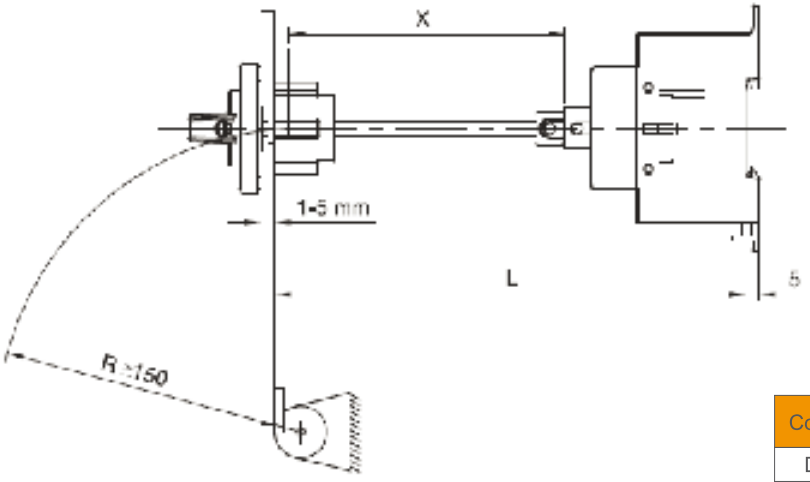
Protection cover for
main switch
DS40/63/80

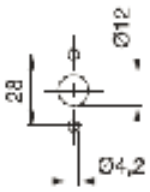
Front



Type	E	G
DS16 DS25 DS32 DS40R	34.2	5
DS40 DS63 DS80	38	6

Optional extra **06/23/25**





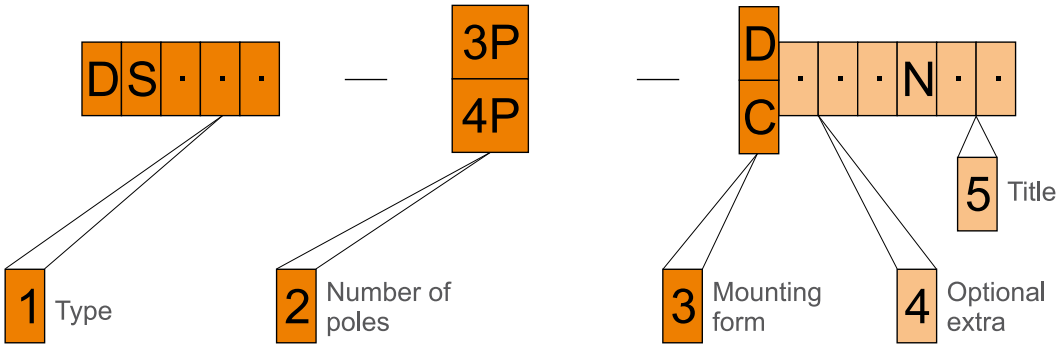
Code	X	Lmax
DSS100	100	175
DSS200	200	275

Optional extra **DSS100/200**

ORDERING CODE

When ordering please define:

- for **standard** switch 3 data types 123
- for switch with an **optional extra or with a special request** max. 5 data types 123 45



DESCRIPTION

1 **Switch type**. To be chosen in accordance with the technical requests (see page 2)

2 **Number of poles**

3 **Standard mounting forms** (see page 3)

D – **Front mounting**

C – **Rear mounting**

4 To be marked when an optional extra is required (see page 3)

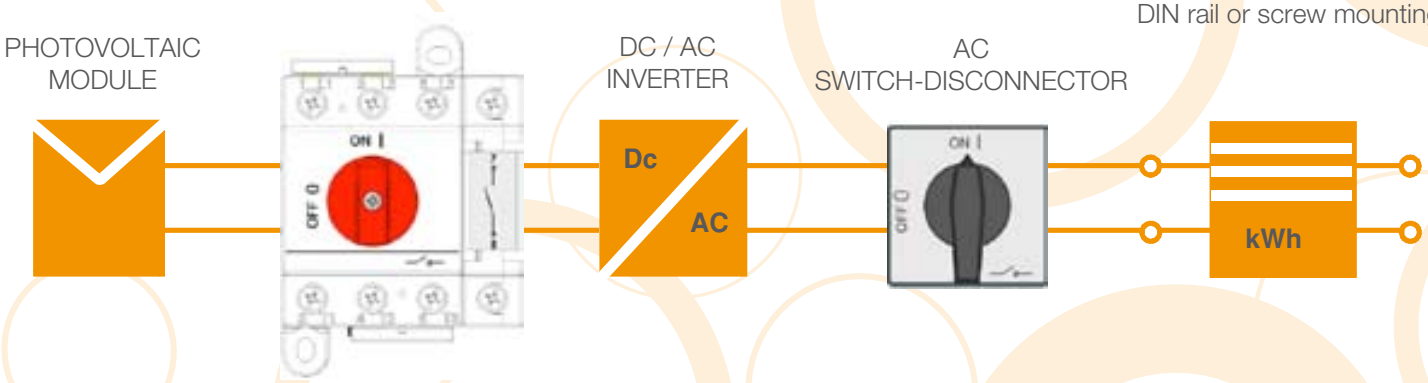
5 "N" is to be written when the front plate with a title is required.
Possibility for N front plate (see pages 3)

Switch disconectors

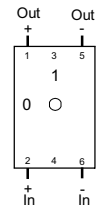
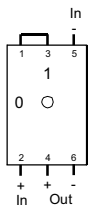
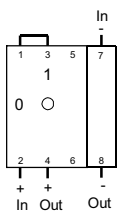
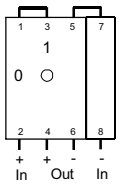
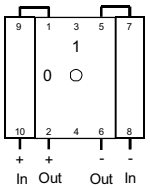
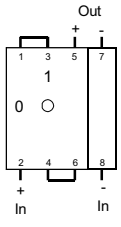
DSPV

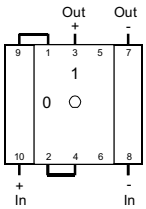
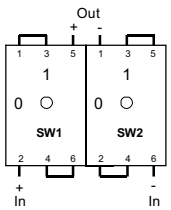
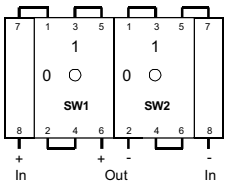
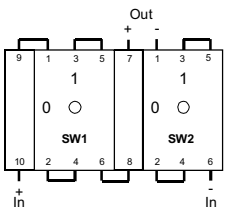
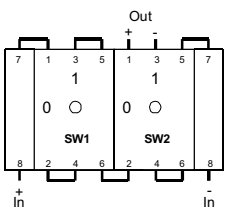
The development of renewable energy sources on the basis of photovoltaic panels has resulted with the development of switch-disconnectors which are used for switching off DC circuit.
Switch-disconnectors series DSPV with double breaking system completely fulfil requirements for isolation according to IEC 60364-7-712 for photovoltaic installations.
DSPV type of switch-disconnectors can meet all requirements of installation with rated operational voltage up to 1000V and operational currents up to 80A in utilization category DC21B.
Switch-disconnectors are designed to be placed between photovoltaic cells and DC/AC inverter.
SWITCH-DISCONNECTOR
DSPV

Compact design
Protection degree IP65
According to IEC 60947
DIN rail or screw mountings



Rated operational current for specified voltage is achieved by serial wiring of the poles as shown in the table below.

11	21	201 (DSPV40 - 750 V)	22	202 (DSPV40 - 750 V)	31
					

301 (CSP40 - 750V)	33	44	53	
				
			DSPV40	DSPV80

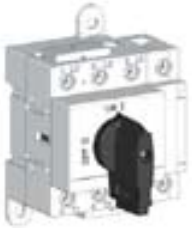
Switch disconectors

DSPV

TECHNICAL DATA

Type	Rated operational voltage U	Rated operational current I (DC21B)	Number of poles in series
DSPV40-21	220	40	3
DSPV80-21		50	3
DSPV80-31		80	4
DSPV40-11	450	7	2
DSPV40-21		16	3
DSPV40-31		30	4
DSPV40-33		40	6
DSPV80-31		63	4
DSPV80-33		80	6
DSPV40-21	500	10	3
DSPV40-31		30	4
DSPV40-33		35	6
DSPV40-44		40	8
DSPV80-31		35	4
DSPV80-33		50	6
DSPV80-44		80	8
DSPV40-21	750	8	3
DSPV40-31		12	4
DSPV40-33		35	6
DSPV40-44		40	8
DSPV80-33		45	6
DSPV80-44		50	8
DSPV40-33	1000	16	6
DSPV40-44		20	8
DSPV80-33		20	6
DSPV80-44		30	8

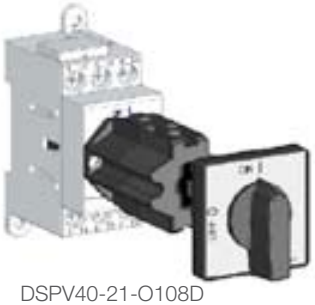
DSPV40-22-O48D
Service cover (48D)



DSPV80-31-O48,56
Service cover (48, 56)

DSPV40-21-O75

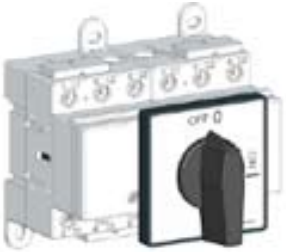
DSPV40-31-O25
Switches with locking (75/25)



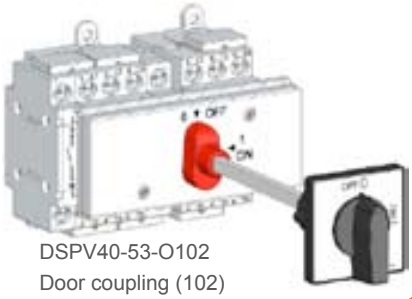
DSPV40-21-O108D

Door coupling (108D)

DSPV40-31-P
Plastic enclosure



DSPV80-33-O
Rear mounting



DSPV40-53-O102
Door coupling (102)

TRE 701

TRE 701 is a multifunction multitime time relay with build-in microprocessor technology. It covers most of the user needs. It comprehends simple and more sophisticated time functions with very wide time ranges. It can be delivered in many varieties according to operating voltages and the number of output contacts.

Basic technical data

Time ranges	
(time ranges selected with	seconds: 1, 10
a microswitch)	minutes: 1, 10
	hours: 1, 10, 100, 500
	ON, OFF
Operating voltage ranges	
(select one range)	24 - 240 V AC/DC
	12 V AC/DC
	230 V AC
Output contacts	1 - 3 x 8 A/250 V

Function description:

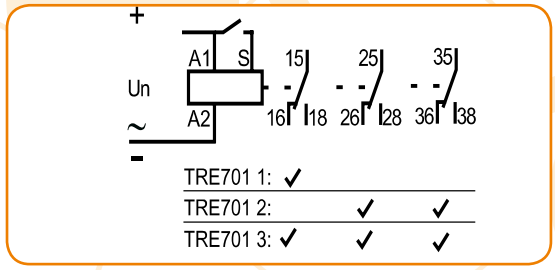
A: A pulse after power-on or after the rising edge of trigger pulse S.
B: Delay after power-on or after the rising edge of trigger pulse S.
C: A pulse after power-on or after the rising edge of trigger pulse S. Retriggerable.
D: Delay after power-on or after the rising edge of trigger pulse S. Retriggerable.
E: The first edge of trigger pulse S turns relay on while the second edge starts counting down till relay off. Additional trigger S before the process is finished prolongs the on-state.
F: Each rising edge of trigger S appends additional period T to the time of on-state.
G: Pulsating operating with a starting pulse or pause which depends on the state of trigger S at power-on.
H: Bistable operating. Each rising edge of trigger S swaps the relay into the opposite state.
I: Prolonged pulse after power-on. The presence of trigger S temporarily stops counting.
J: Prolonged pause after power-on. The presence of trigger S temporarily stops counting.

Notes
Functions A - D: If triggering at power-on is required, then the control signal S must be active.

When changing function, the relay must be powered OFF and ON again.

It is possible to upgrade the relay with some user-defined functions with one or two independent output relays (for larger quantities).

Connection diagram:



TRE701 1: ✓		
TRE701 2:	✓	✓
TRE701 3: ✓	✓	✓

Orderind data:

TRE 701 2 24 - 240 V
TRE 701 - relay type
2 - number of contacts (1,2,3)
24 - 240 V - operating voltage
(12 V AC/DC, 230 V AC, 24-240 V AC/DC)

NOTE: Combination with 3 output contacts and 230 VAC operating voltage cannot be delivered.
For technical data see page 129.

TRE 702

TRE 702 is a multifunction T1-T2 time relay with built-in microprocessor technology. It covers most of the user needs. The time relay comprehends simple and more sophisticated time functions with very wide time ranges. It can be delivered in many varieties according to operating voltages and the number of output contacts. It excels in the possibility of setting extremely asymmetrical T1-T2 time functions.

Function description:

A: A pulse after power-on or after the rising edge of trigger pulse S.Eventual signals S occurring before time T expiry have no influence.
B: Delay after power-on or after the rising edge of trigger pulse S. Eventual signals S occurring before time T expiry have no influence.
C: A pulse after power-on or after the rising edge of trigger pulse S. Retriggerable.
D: Delay after power-on or after rising edge of trigger pulse S. Retriggerable.
E: The first edge of trigger pulse S turns relay on while the second edge starts counting down till relay off. Additional trigger S prolongs the on-state before the process is finished.
F: Prolonged pulse after power-on. The presence of trigger S temporarily stops counting.
G: Pulsating operating with a non-equal pulse-pause rate. A starting pulse or a pause which depends on the state of trigger S at power-on.
H: After the rising edge of trigger S, the device waits for period T1 and the relay is activated (if trigger S is still present). After period T2, it is deactivated.
If the trigger signal is shorter than period T1, the relay does not activate at all.
If trigger S reappears during period T2, it has no influence.
I: After the rising edge of trigger S, the device waits for period T1 and the relay is activated (if the trigger S is still present). At the falling edge of trigger S the second counting starts and when it reaches T2 , the relay is deactivated.
If the trigger signal is shorter than period T1, the relay does not activate at all.
If trigger S reappears during period T2, it has no influence.
J: The rising edge of trigger S activates the relay for period T1.
The falling edge of trigger S activates the relay for period T2.
If trigger S falls down during period T1, period will be cancelled.
If trigger S reappears during period T2, it has no influence.

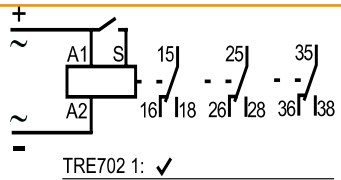
Note:
Functions A - D: triggering power-on, is required the control signal S must be active.
When changing function, the relay must be powered OFF and ON again.

For larger quantities, it is possible to upgrade the relay with some user-defined functions by means of one or two independent output relays.

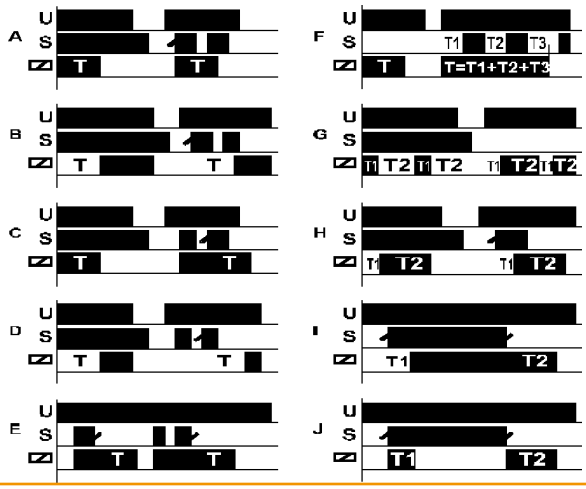
Basic technical data

Time ranges	
(time ranges selected with	seconds: 1, 10
a microswitch)	minutes: 1, 10
	hours: 1, 10, 100,
	T1,T2: 1h - 1 min;
	10 h - 10 min;100 h - 1h
Operating voltage ranges	
(select one range)	24 - 240 V AC/DC
	2 V AC/DC
	230 V AC
Output contacts	1 - 3 x 8 A/250 V

Connection diagram:



TRE702 1:	✓		
TRE702 2:		✓	✓
TRE702 3:	✓	✓	✓



Ordering data:

TRE 702 2 24 - 240 V
TRE 702 – relay type
2 - a number of contacts (1, 2, 3)
24 - 240 V - operating voltage
(12 V AC/DC, 230 V AC, 24-240 V AC/DC)

NOTE: A combination with three contacts and 230 V AC operating voltage cannot be delivered.
For technical data see page 129.

TRE 703

TRE 703 is a one-function one-time time relay used for more sensitive applications. It can be delivered in many varieties according to function, time range, operating voltage and the number of output contacts.

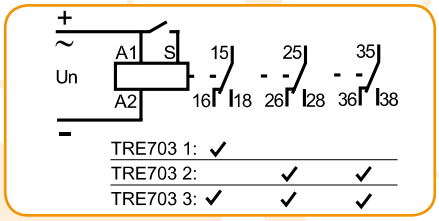
Function description

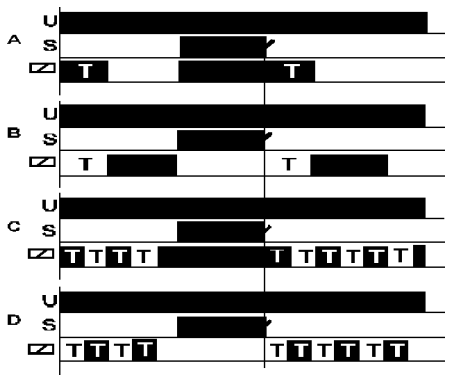
A: Pulse at power-on or at falling edge of control signal S
B: Pause at power-on or at falling edge of control signal S
C: Pulsating with starting pulse
D: Pulsating with starting pause

Basic technical data

Time ranges (select one range)	seconds: 3,15
	minutes: 1, 3, 15
	hours: 1, 3
Operating voltage ranges	
(select one range)	24-240 V AC/DC
	12 V AC/DC
	230 V AC
Output contacts	1 - 3 x 8 A/250 V

Connection diagram





Ordering data

TRE 703 2 24-240 V A 1 h
TRE 703 - relay type
2 - number of contacts (1, 2, 3)
24-240 V - operating voltage (12 V AC/DC, 230 V AC, 24-240 V AC/DC)
A - time function (A, B, C, D)
1 h - time range (3 s, 15 s, 1 min, 3 min, 15 min, 1 h, 3 h)

NOTE: A combination with three contacts and 230 V AC operating voltage can not be delivered.

For technical data see page 129.

TRE 704

TRE 704 is a star-delta switch. Time T1 can be adjusted within the selected time range. It can be delivered in many varieties according to time range and operating voltage.

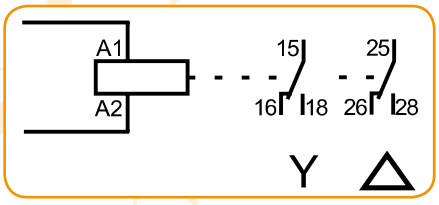
Function description

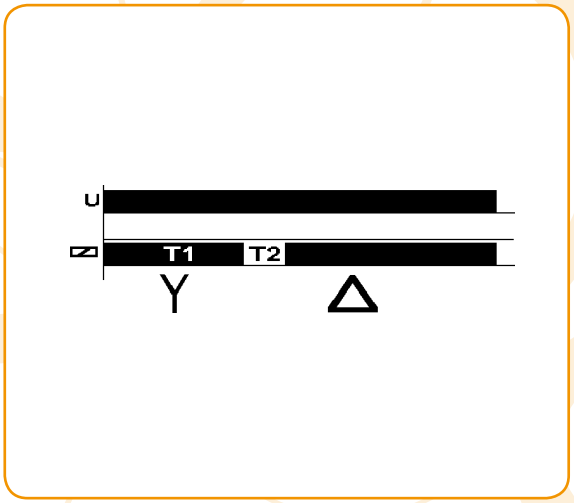
After power-on, the relay Y is activated for time T.
After the pause. T2 = 100 ms, the relay Δ is activated.

Basic technical data

Time ranges		
(select one range)	seconds:	10, 30, 60, 100, 600
Operating voltage ranges		
(select one range)		24-240 V AC/DC
		12 V AC/DC
		230 V AC
Output contacts		2 x 8 A/250 V

Connection diagram





Ordering data

TRE 704 24-240 V 100 s
TRE 704 - relay type
24-240 V - operating voltage (12 V AC/DC, 230 V AC, 24-240 V AC/DC)
100 s - time range (10, 30, 60, 100, 600)

For technical data see page 129.

TRE 705

TRE 705 is a bistable time relay with hold-on after power off. Time T1 can be adjusted within the selected time range. It can be delivered in many varieties according to time range and operating voltage.

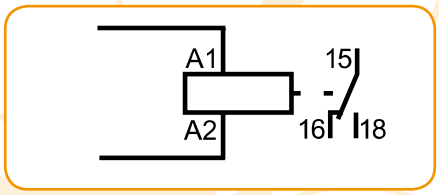
Function description

A: The relay is activated after power-on. After power-off, it remains activated for the period T.
B: The relay is activated at power-off and remains activated for the period T.

Basic technical data

Time ranges		
(select one range)	seconds:	3, 10, 30, 60, 100, 300
Operating voltage ranges		
(select one range)		24-240 V AC/DC
		12 V AC/DC
Output contacts		6 A/250 V

Connection diagram



Ordering data

TRE 705 - 24-240 V A 100 s
TRE 705 - relay type
24-240 V - operating voltage (12 V AC/DC, 24-240 V AC/DC)
A - time function
100 s - time range (3, 10, 30, 60, 100, 300 seconds)

For technical data see page 129.

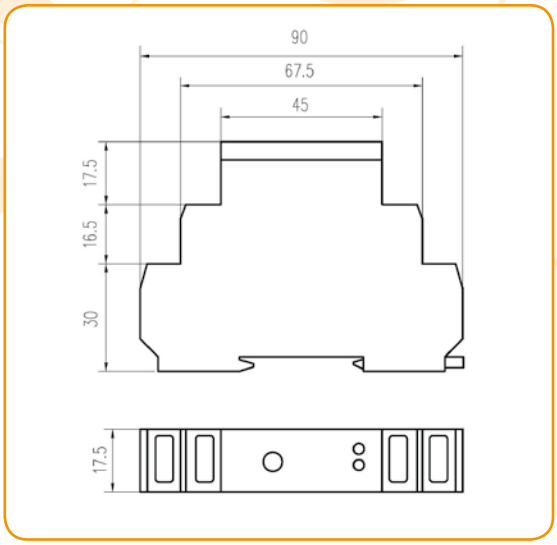
TRE 706

TRE 706 is a staircase switch. Time can be adjusted in the range from 0.5 to 10 minutes. It is edge triggered, which means that it is broken-switch proof. Enhanced version B has the possibility of multiplying ON time by factor 8. This fast-on function is activated by holding the switch for prolonged time (6- to 8 - second). This is very useful at cleaning, repairs etc.

Basic technical data

Time ranges	0.5 - 10 minutes
	ON, OFF
	Option B: extra
	4-80 minutes
	ON, OFF
Operating voltage	230 V AC
Output contact	16 A/250 V
Number of bulb lamps (<1mA)	10

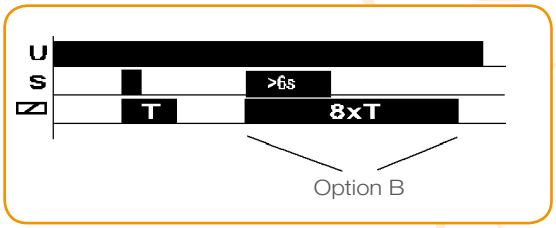
DIMENSIONS



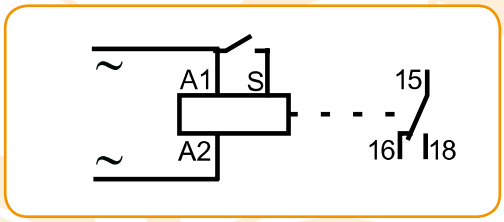
Function description

The signal S activates the relay for period T. If the duration of the signal S is longer than 6 seconds, the period T is prolonged by factor 8 (version B). This is indicated by changing the brightness of the control red LED.

If the signal S reappears before the period T expires, the counting time starts again from the beginning.



Connection diagram



Ordering data

TRE 706 A

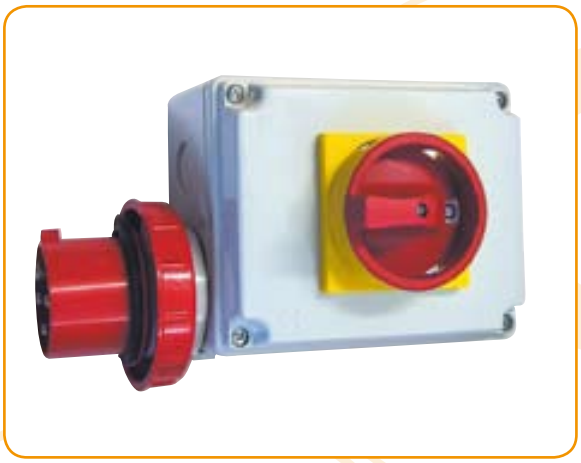
TRE 706 - relay type
A - option (A, B): A is a basic version, B has the possibility of time prolonged operation

Technical data for time relays TRE 701 to TRE 706

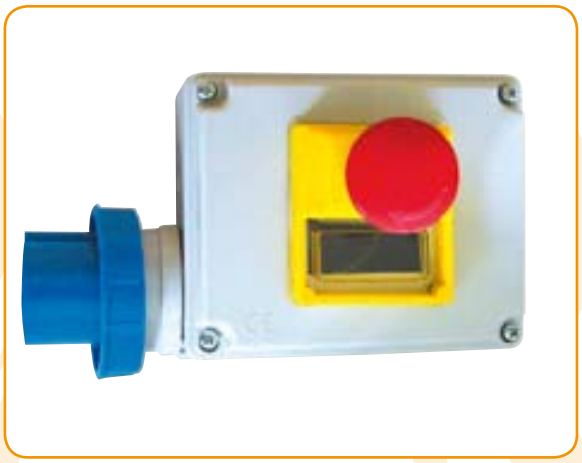
Operating voltage range: -15%, +10%
Input resistance of control input S:
(TRE 701, 702, 703, 706): 100 kOhm
Min. duration of trigger pulse S: 50 ms
Time setting repeatability:
TRE 703/704/705/706/CRT < 2%
TRE 701/702 < 1%
Nominal time range tolerance
TRE 703, 704, 705, 706: 5%
TRE 701/702: 1%
Operating temperature: 0°C to 55°C
(-20°C to +65°C available on order)
Storage temperature: -25°C to +70°C
Degree of protection: IP20
Diameter of connection cable: 2.2 mm max.
Mechanical endurance: >10^7 cycles
Standards: EN 60669, EN 60256; EN 61000, EN 61010, EN 61812

CONNECTION CABINETS

OS1, OS2, OS3, OS4, OS5, OS6 (WITH EXTENSION FOR MECHANICAL INTERLOCK)



Type
OS1/ 2P+Pe / IP55
OS1/ 3P+Pe / IP55



Type
OS2/ 2P+Pe / IP55
OS2/ 3P+Pe / IP55
OS2/ 4P+Pe / IP55

Type
OS3/ 2P+Pe / IP55
OS3/ 3P+Pe / IP55

Type
OS4/ 2P+Pe / IP55
OS4/ 3P+Pe / IP55

Type
OS5/ 2P+Pe / IP55
OS5/ 3P+Pe / IP55

Type
OS6/ 2P+Pe / IP55
OS6/ 3P+Pe / IP55

MULTI - FUNCTIONAL ADAPTERS

UMP 45

1

Type	Width
UMP 45	45 mm
UMP 90	90 mm
UMP 90 E	90 mm

UMP 90

2

UMP 90 E

3

1 For direct-starter up to 30 A

2 For reversing starter up to 30 A

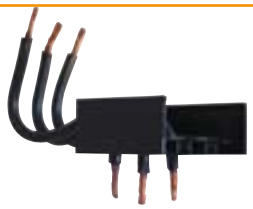
3 For star-delta starter up to 30 A

WK WIRING SYSTEM

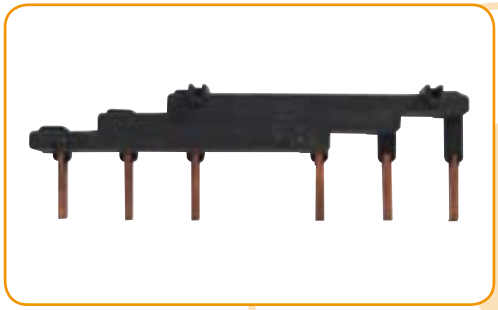
Type	Description
WK 1.1	For reversing switch, suitable for contactors: 2.2-5.5 kW (for mini contactors K03, K07) (max. current 16 A) 5 terminal in line, (3 main terminals, 1 auxiliary terminal, 1 coil terminal)
WK 2.1	For reversing switch, suitable for contactors: 4: 5.5:7.5 or 9 kW (for KNL9-KNL18) (max. current 25 A), 4 terminals in line (3 main terminals, 1 auxiliary terminal)
WK 4.1	For reversing switch, suitable for contactors: 11 and 15 kW (for KNL22-KNL30) (max. current 40 A), 3 terminals in line (3 main terminals)
WK 5.1	For reversing switch with mechanical interlock (suitable for contactors: 4: 5.5: 7.5 or 9 (kW for KNL9-KNL18) (max. current 25 A), 4 terminals in line (3 main terminals, 1 auxiliary terminal)
WK 1.2	For star-delta starters, suitable for contactors: 2.2-5.5 kW (for mini contactors K03, K07) (max. current 16 A), 5 terminals in line (3 main terminals, 1 auxiliary terminal, 1 coil terminal)
WK 2.2	For star-delta starters, suitable for contactors: 4: 5.5; 7.5 or 9 kW (for KNL18) (max. current 25 A), 4 terminals in line (3 main terminals, 1 auxiliary terminal)
WK 4.2	For star-delta starters, suitable for contactors: 11 and 15 kW (for KNL22- KNL30) (max. current 40 A), 3 terminals in line (3 main terminals)

DST-U CONNECTION BLOCK BETWEEN MOTOR-PROTECTION SWITCH AND CONTACTOR

Type	Cable length	Cross-section	Width
DST-U-2,5 (20 A)	40 mm	2.5 mm^2	45 mm
DST-U-4 (35 A)	40 mm	4 mm^2	45 mm
DST-U-2,5 L (20 A)	70 mm	2.5 mm^2	45 mm

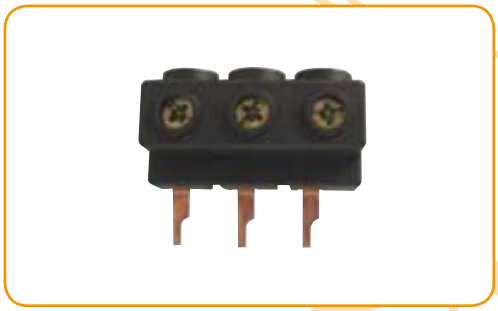


MSS-3L CONNECTION BLOCK FOR MOTOR PROTECTION SWITCH



Type	Module / length
MSS-3L-M2-45	2x3 / 80
MSS-3L-M3-45	3x3 / 125
MSS-3L-M4-45	4x3 / 170
MSS-3L-M5-45	5x3 / 215
MSS-3L-M2 + Hi-45 + 9	2x3 / 90
MSS-3L-M3 + Hi-45 + 9	3x3 / 145
MSS-3L-M4 + Hi-45 + 9	4x3 / 200
MSS-3L-M5 + Hi-45 + 9	5x3 / 250

ESB-S/V-MS SUPPLY BLOCK (25 MM^2) FOR MOTOR PROTECTION SWITCH



BS-MS 0 PROTECTION FOR CONNECTION CABLE

M 25 X 1.5 CABLE INLET

Approvals

Type of product	Certificates
MS25	UL/CSA , GOST
MST25	UL/CSA
MS20	
MST20	
PS	UL/CSA, GOST
U, A release	UL/CSA, GOST
RS, PSV	UL/CSA, GOST
MS32	UL/CSA, GOST
MSB32	UL/CSA, GOST
HS, HSV, HRS	UL/CSA, GOST
UR, AR release	UL/CSA, GOST
FI2, FI4, NFI2, NFI4, NFIS, NFIK	VDE, NF, GOST, FIRE
K03C, K07C, K07CG, K07CF	UL/CSA, GOST
K03M, K07M, K07MG, K07MF, K07MX	UL/CSA, GOST
ND2, ND4	UL/CSA, GOST
BR6	GOST
KNL6	UL/CSA, GOST
KNL9, KNL12, KNL16	UL/CSA, GOST
KNL18	GOST
KNL22, KNL30	UL/CSA, GOST
KNL6G	UL/CSA, GOST
KNL9G, KNL12G, KNL16G	UL/CSA, GOST
KNL22G, KNL30G	UL/CSA, GOST
NDL1, NDL2, NDL3, NDL4	UL/CSA, GOST
NPL1, NPL2	UL, GOST
TRB14/KNL	GOST
KNL40, KNL65	GOST
BR43	GOST
KNL80, KNL90, KNL110	UL, GOST
G480, G484	
BR90	GOST
KNL95 - KNL1000	UL, GOST
BRA180, BRA400	GOST
G350	
KC12 - KC60	UL
IKA20, IKA25, IKD20, IKD25, IK40, IK63	NF, UL/CSA, GOST, KEMA-KEUR
IKA20-R, IKA25-R	NF, UL/CSA, GOST, KEMA-KEUR
IKN	NF, UL/CSA, GOST, KEMA-KEUR
RI20	
RI50	KEMA-KEUR
RI60	VDE
ZK12 - ZK180	
K0-LD7	
KNL-LD7,..., KNL-LD30	
KMSPL3 - KMSPL22	
DS	KEMA-KEUR

Notes

Notes

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