

Motor contactors

AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 65 mm widths)

Type	Rated current I _n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL43-11	43 A	380/415 V		30.050.946	930	1
KNL43-11	43 A	220/240 V		30.050.498	930	1
KNL43-11	43 A	24 V		30.050.482	930	1

AC



AC-3 acc. to UL 508 (3-pole, 65 mm widths)

Type	Rated current I _n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL43-11UL	43 A	380/415 V		30.051.014	930	1
KNL43-11-UL	43 A	220/240 V		30.051.012	930	1
KNL43-11-UL	43 A	24 V		30.051.004	930	1

AC

AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 65 mm widths)

Type	Rated current I _n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL63-11	63 A	380/415 V		30.050.951	930	1
KNL63-11	63 A	220/240 V		30.050.499	930	1
KNL63-11	63 A	24 V		30.050.490	930	1

AC



AC-3 acc. to UL 508 (3-pole, 65 mm widths)

Type	Rated current I _n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL63-11-UL	63 A	380/415 V		30.051.030	930	1
KNL63-11-UL	63 A	220/240 V		30.051.028	930	1
KNL63-11-UL	63 A	24 V		30.051.020	930	1

AC

AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 65 mm widths)

Type	Rated current I _n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL75-11	70 A	380/415 V		30.051.102	930	1
KNL75-11	70 A	220/240 V		30.051.103	930	1
KNL75-11	70 A	24 V		30.051.104	930	1

AC



Ordering data

For contactors **KNL43, KNL43UL, KNL63, KNL63UL, KNL75**

Standard control voltages and designations (AC)

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

KNL63 - 11 - M7 - 50/60



Note:

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

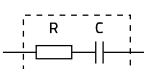
Snap-on auxiliary switch blocks

AC-15 acc. to IEC/EN 60947-5-1 (2- and 4-pole)

Type	Rated current I _e	Rated voltage U _e	Version	Ordering No.	Weight (g)	Packaging (pcs)
NDL4 (for KNL43, KNL43UL, KNL63, KNL63UL, KNL75)	6 A	230 V	-11	38,423,011	66	10
			-02	38,423,012		
			-20	38,423,473		
			-22	38,422,910		
			-31	38,422,911		
			-13	38,423,013		
			-40	38,423,474		
			-04	38,423,475		



RC suppressor (for KNL43-KNL75, KNL43UL, KNL63UL)

Type	Control voltage U _c	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
RC1-KNL	12 - 48 V		30,017,074	16	10
RC2-KNL	48 - 250 V		30,017,075	16	10
RC3-KNL	250 - 380 V		30,017,076	16	10
RC4-KNL	380 - 600 V		30,017,077	16	10



Mechanical interlock

for KNL43 - KNL75, KNL43UL, KNL63UL)

Type	Ordering No.	Weight (g)	Packaging (pcs)
MBL43	38,422,197	16	10



Identification plate

Type	Ordering No.	Weight (g)	Packaging (pcs)
NT	37,425,330	1	10



Spare parts: AC coils (50/60 Hz) for KNL43(UL) - KNL75(UL)

Type	Ordering No. (KNL43 - KNL75)	Ordering No. (KNL43UL - KNL75UL)	Weight (g)	Packaging (pcs)
24	38,501,841	38,502,846	140	1
42	38,502,602	38,502,850	140	1
48	38,501,987	38,502,851	140	1
220/240	38,502,286	38,502,847	140	1
380/415	38,502,610	38,502,848	140	1

BR63 thermal overload relay

up to 97 A for KNL43-KNL75, KNL43UL, KNL63UL contactors

Type	Setting range (A)	Max. backup fuse gL/gG Coordination 1 (A)	Ordering No.	Weight (g)	Packaging (pcs)
BR63-25	17 ... 25	100	786,050,504	350	1
BR63-36	24,5 ... 36	100	786,050,505		
BR63-47	35 ... 47	125	786,050,506		
BR63-60	45 ... 60	150	786,050,507		
BR63-75	58 ... 75	200	786,050,508		
BR63-90	72 ... 90	250	786,050,509		
BR63-97	77 ... 97	250	786,050,510		





Technical characteristics

Dimensions



TECHNICAL DATA

Type	Symbol	Unit	KNL43 KNL43UL	KNL63 KNL63UL	KNL75
Standards			IEC/EN 60947-5-1, IEC 60947-4-1, IEC/EN 60947-1, UL 508		
Approvals			CE, EAC (UL & CSA only for KNL43UL and KNL63UL)		CE, EAC
Module width		mm	65		
Number of poles			3		
Degree of protection			IP20		
Pollution degree			3		
Climatic conditions			95 % relative humidity		
Ambient temperature:					
open		°C	-20 ... +60		
closed		°C	-20 ... +45		
Storage temperature		°C	-30 ... +80		
Maximum altitude		m	2000		
U _i and U _e is reduced for 1,2 % and I _e for 0,4 % for every additional 100 m					
Number of contactors or switches side-by-side:					
≤40 °C			no limitation		
(40 ... 55) °C					
Noise level (operation)		dB	30		
Maximum operating frequency with no load		op. c./h	3.000		
Mechanical endurance		op. c.	3.000.000		
Weight		g	930		
Contact reliability			≥17 V; ≥50 mA		
Power dissipation per pole		W	5	6	6
Overload current withstand capability					
10 s		A	344	504	528
Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2		A	80 (125 ¹⁾)	125	125
Rated insulation voltage	U _i	V	1000		
Rated impulse withstand voltage	U _{imp}	kV	6		
Rated operational voltage	U _e	V	1000		
Rated frequency	f	Hz	50/60		
Thermal current	I _{th}	A	75 (85 ¹⁾)	85 (100 ²⁾)	100
Rated operational current for AC-1, AC-7a and AC-21	I _e	A	75 (85 ¹⁾)	85 (100 ²⁾)	100
Operational power for AC-1, AC-7a and AC-21:					
single-phase 230 V	P _e	kW	16 (19 ¹⁾)	19 (22 ²⁾)	22
three-phase 230 V			28 (32 ¹⁾)	32 (38 ²⁾)	38
three-phase 400 V			50 (56 ¹⁾)	56 (66 ²⁾)	66
Maximum operating frequency for AC-1, AC-7a and AC-21		op. c./h	600		
Electrical endurance for AC-1, AC-7a and AC-21		op. c.	200.000		
Rated operational current for AC-3, AC-3e, AC-7b and AC-23 (at 400 V)	I _e	A	43	63	70
Operational power for AC-3, AC-3e, AC-7b and AC-23:					
single-phase 230 V	P _e	kW	5,5	7,5	9
three-phase 230 V			12,5	15	18,5
three-phase 400 V			22	30	37
three-phase 500 V			30	40	45
three-phase 690 V			30	40	45
three-phase 1000 V			22	30	30
Maximum operating frequency for AC-3, AC-3e, AC-7b and AC-23		op. c./h	600		
Electrical endurance for AC-3, AC-3e, AC-7b and AC-23		op. c.	800.000	400.000	400.000
Rated operational current for AC-4 (at 400 V)	I _e	A	29	41	41
Operational power for AC-4:					
three-phase 400 V	P _e	kW	15	22	22
three-phase 500 V			18,5	25	25
Maximum operating frequency for AC-4		op. c./h	300		
Electrical endurance for AC-4		op. c.	40.000	20.000	20.000
Rated motor power according to standards UL and CSA:					
single-phase 120 V	P _e	HP	3	5	5
single-phase 240 V			7,5	10	10
three-phase 240 V			15	20	25
three-phase 480 V			25	30	40
three-phase 600 V			30	40	50
Maximum operating frequency for motors acc. to UL and CSA		op. c./h	600		
Electrical endurance for motors acc. to UL and CSA		op. c.	800.000	400.000	400.000

¹⁾ Ratings for KNL43/63UL version

TECHNICAL DATA

	Type	Symbol	Unit	KNL43 KNL43UL	KNL63 KNL63UL	KNL75
MAIN CIRCUIT	Switching of capacitors AC-6b and AC-7c (at 230 V)	C	μF	440	660	770
	Maximum operating frequency for AC-6b and AC-7c		op. c./h		600	
	Electrical endurance for AC-6b and AC-7c		op. c.		100,000	
	Rated operational current for DC-1 (L/R ≤ 1 ms): 1 pole ... 24 V DC/ 48 V DC/ 60 V DC/ 110 V DC/ 220 V DC 2 poles in series ... 24 V DC/ 48 V DC/ 60 V DC/ 110 V DC/ 220 V DC 3 poles in series ... 24 V DC/ 48 V DC/ 60 V DC/ 110 V DC/ 220 V DC	I _e	A		50 / 50 / 50 / 8 / 6 70 / 70 / 70 / 60 / 36 70 / 70 / 70 / 60 / 50	
	Maximum operating frequency for DC-1		op. c./h		300	
	Terminal capacity: rigid (solid and stranded) flexible	S	mm ²		35 25	
	Length of removed wire insulation		mm		16	
	Screw				M6	
	Screw head				PZ2	
	Tightening torque		Nm		4	
AUXILIARY CIRCUIT	Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2	I _v	A		10	
	Rated operational current for AC-15: single-phase 230 V single-phase 400 V single-phase 500 V single-phase 690 V	I _e	A		6 4 2 1	
	Maximum operating frequency for AC-15		op. c./h		1,200	
	Electrical endurance for AC-15		op. c.		1,000,000	
	Terminal capacity: rigid (solid and stranded) flexible		mm ²		1 ... 2,5 1 ... 2,5	
	Length of removed wire insulation		mm		10	
	Screw				M3,5	
	Screw head				PZ2	
	Tightening torque		Nm		0,8	
	COIL	Range of control voltage for switch-on	U _c	%		85 ... 110
Range of control voltage for drop out		U _c	%		20 ... 75	
Kind of voltage					AC	
Standard control voltages		U _c	V		12 ... 500	
Frequency of AC control voltage		f	Hz		50/60	
Control mode					remote control with U _c	
Coil consumption: switch-on operation			VA/W		130/80 10/3	
Delays: make brake			ms		10 ... 20 8 ... 15	
Terminal capacity: rigid (solid and stranded) flexible			mm ²		1 ... 2,5 1 ... 2,5	
Length of removed wire insulation			mm		11	
SAFETY	MTTF - Mean time to failure MTTF = 1/λ = B10/(0.1 n _{op})	AC-1 AC-3	h	20,000	5,000	10,000
	MTTF _d - Mean time to failure dangerous MTTF _d = 1/λ _d = B10 _d /(0.1 n _{op})	AC-1 AC-3	h	26,666	6,666	13,333
	B10 - Number of operating cycles until 10 % of devices fail	AC-1 AC-3	op. c.	600,000	150,000	300,000
	B10 _d - Number of operating cycles until 10 % of device dangerous B10 _d = B10/ratio of dangerous failures	AC-1 AC-3	op. c.	800,000	200,000	400,000
	λ - Failure rate λ = (0.1 n _{op})/B10	AC-1 AC-3	1/h	0,00005	0,0002	0,0001
	λ _d - Failure rate dangerous λ _d = (0.1 n _{op})/B10 _d	AC-1 AC-3	1/h	0,00004	0,00015	0,000075
	Ratio of dangerous failures		%		75	
	n _{op} - Operating cycles (operating cycles/h)		op. c./h		300	

1) 12,24,48,110/125,220/240,380/415,440/460,480/520,550/600 V

Electrical endurance

Diagram 1

Electrical endurance of motor contactors KNL43 – KNL75, KNL43UL, KNL63UL – AC-3, AC-3e

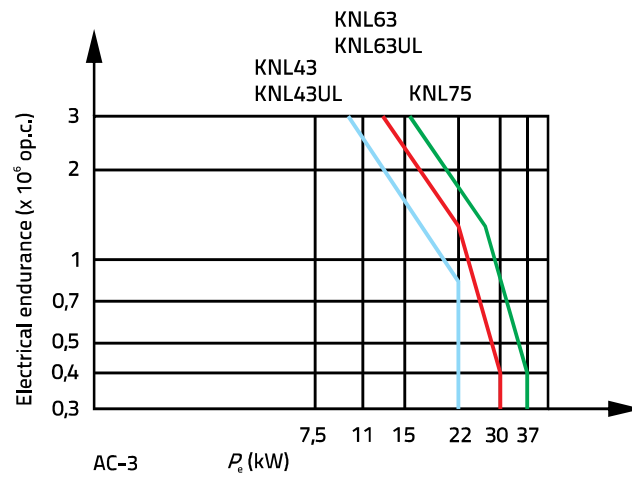
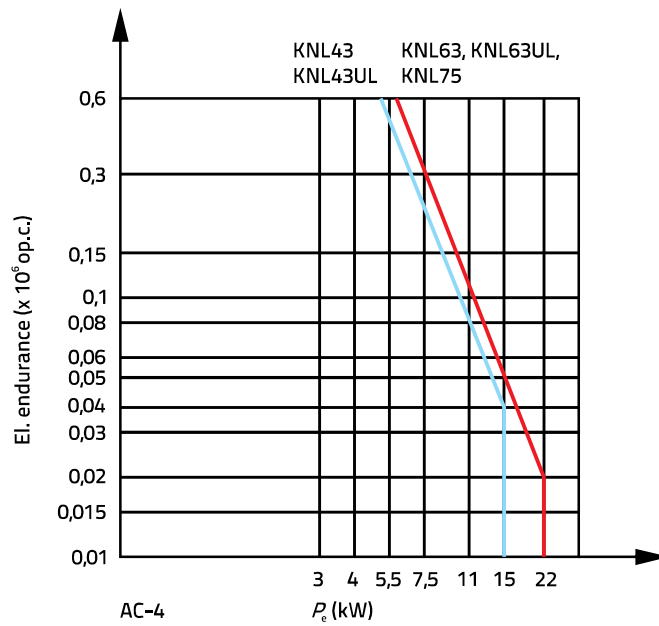
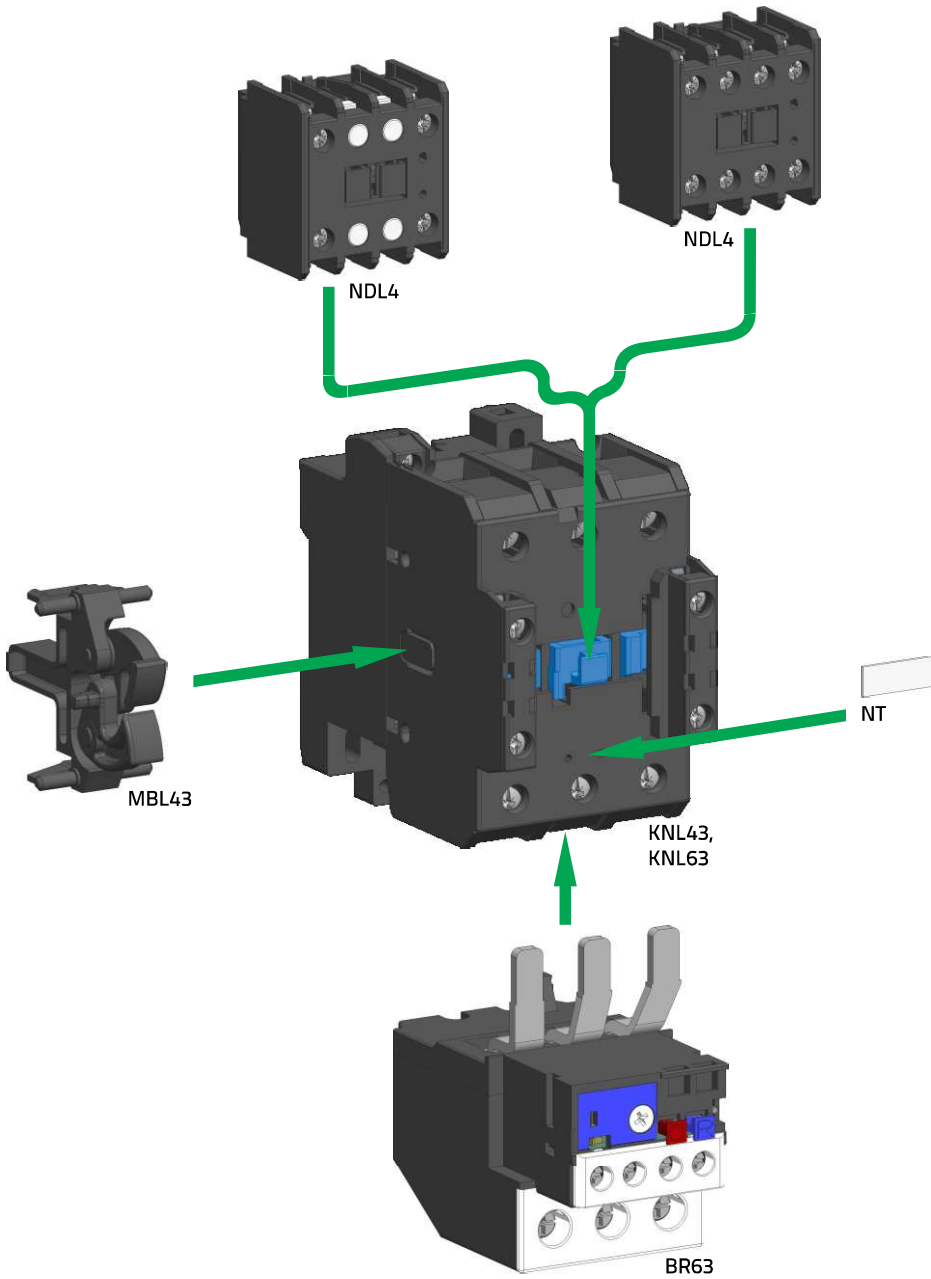


Diagram 2

Electrical endurance of motor contactors KNL43 – KNL75, KNL43UL, KNL63UL – AC-4



Mounting positions of accessories



Contactors KNL43-KNL75

Accessories



Snap-on auxiliary switch blocks

TECHNICAL DATA

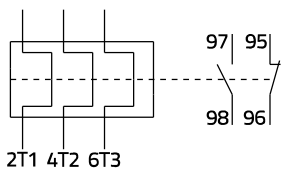
		Symbol	Unit	NDL4
GENERAL	Type			
	Standards			IEC/EN 60947-5-1, VDE 0660, UL 508
	Approvals			CE, UL, CSA
	For use with			KNL43, KNL43UL, KNL63, KNL63UL, KNL75
	Module width			2
	Number of poles			2 or 4
	Degree of protection			IP20
	Pollution degree			3
	Ambient temperature			
	open		°C	-25 ... +55
	closed			-25 ... +45
	Storage temperature		°C	-30 ... +80
	Maximum altitude		m	2000
	U _i and U _e is reduced for 1.2 % and I _e for 0.4 % for every additional 100 m			
	Maximum operating frequency with no load		op. c./h	3000
	Mechanical endurance		op. c.	10,000,000
Weight		g	70	
AUXILIARY CIRCUIT	Contact reliability			≥ 17 V; ≥ 50 mA
	Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2			16
	Rated insulation voltage	U _i	V	690
	Rated impulse withstand voltage	U _{imp}	kV	6
	Rated operational voltage	U _e	V	690
	Rated frequency	f	Hz	50 / 60
	Thermal current	I _{th}	A	16
	Rated operational current for AC-15:			
	single-phase 230 V	I _e	A	6
	single-phase 400 V			4
	single-phase 500 V			2
	single-phase 690 V			1
	Maximum operating frequency for AC-15		op. c./h	1,200
	Electrical endurance for AC-15		op. c.	500,000
	Switching of auxiliary loads acc. to standard UL and CSA			A600, N600
	Rated operational current for DC-13:			
	1 pole ... 24 V DC / 60 V DC / 110 V DC / 220 V DC		A	10 / 4 / 0,9 / 0,4
	Maximum operating frequency for DC-13		op. c./h	1,200
	Electrical endurance for DC-13		op. c.	500,000
	Terminal capacity:			
rigid (solid and stranded)	S	mm ²	0.75 ... 4	
flexible			0.5 ... 2.5	
Length of removed wire insulation		mm	10	
Screw			M3,5	
Screw head			PZ2	
Tightening torque		Nm	1,4	

Thermal overload relay BR63

TECHNICAL DATA

		Symbol	Unit	BR63	
GENERAL	Type			BR63	
	Standards			IEC 60947-4-1, IEC 60947-5-1, UL508	
	Approvals			CE, UL	
	For use with			KNL43, KNL43UL, KNL63, KNL63UL, KNL75	
	Degree of protection			IP20	
	Ambient temperature operating		°C	-5 ... +55	
	storage			-25 ... +70	
	Dimensions (WxHxD)		mm	65 x 85.5 x 97.5	
	Operating position			vertical	
	Reset type			auto, manual	
MAIN CIRCUIT	Weight		g	350	
	Rated insulation voltage	U_i	V	690	
	Rated impulse withstand voltage	U_{mp}	kV	6	
	Rated operational voltage	U_e	V	690	
	Adjustable current	I_l	A	17 ... 97	
	Rated frequency	f	Hz	50/60	
	Overvoltage category / pollution degree acc. to IEC/EN 60947-1			III / 3	
	Trip class acc. to IEC/EN 60947-4-1			10	
	Sensitivity to phase failure			yes	
	Power loss at I_n	P	W	11 ... 15.5	
	Terminal capacity		mm ²	6 ... 35	
	Conductor insulation stripping length		mm	12	
	Screw			M5	
	Screw head			PZ2	
	AUXILIARY CIRCUITS	Tightening torque		Nm	2.5
Rated insulation voltage		U_i	V	690	
Rated impulse withstand voltage		U_{mp}	kV	6	
Rated operational voltage		U_e	V	AC: 600 ; DC: 250	
Overvoltage category / pollution degree acc. to IEC/EN 60947-1				III / 3	
Thermal current (both contacts)		I_{th}	A	10	
Contact electrical rating				A600 / Q300	
Rated operational current AC-15					
120 V		both contacts	I_e	A	6
240 V					3
380 V					1.9
480 V					1.5
500 V					1.4
600 V		1.2			
Rated operational current DC-13					
125 V		both contacts	I_e	A	0.55
250 V					0.27
Terminal capacity			mm ²		0.75 ... 2.5
Conductor insulation stripping length		mm		8	
Screw				M3.5	
Screw head				PZ2	
Tightening torque		Nm		0.8	

Connection diagram BR63



Contactors KNL43-KNL75

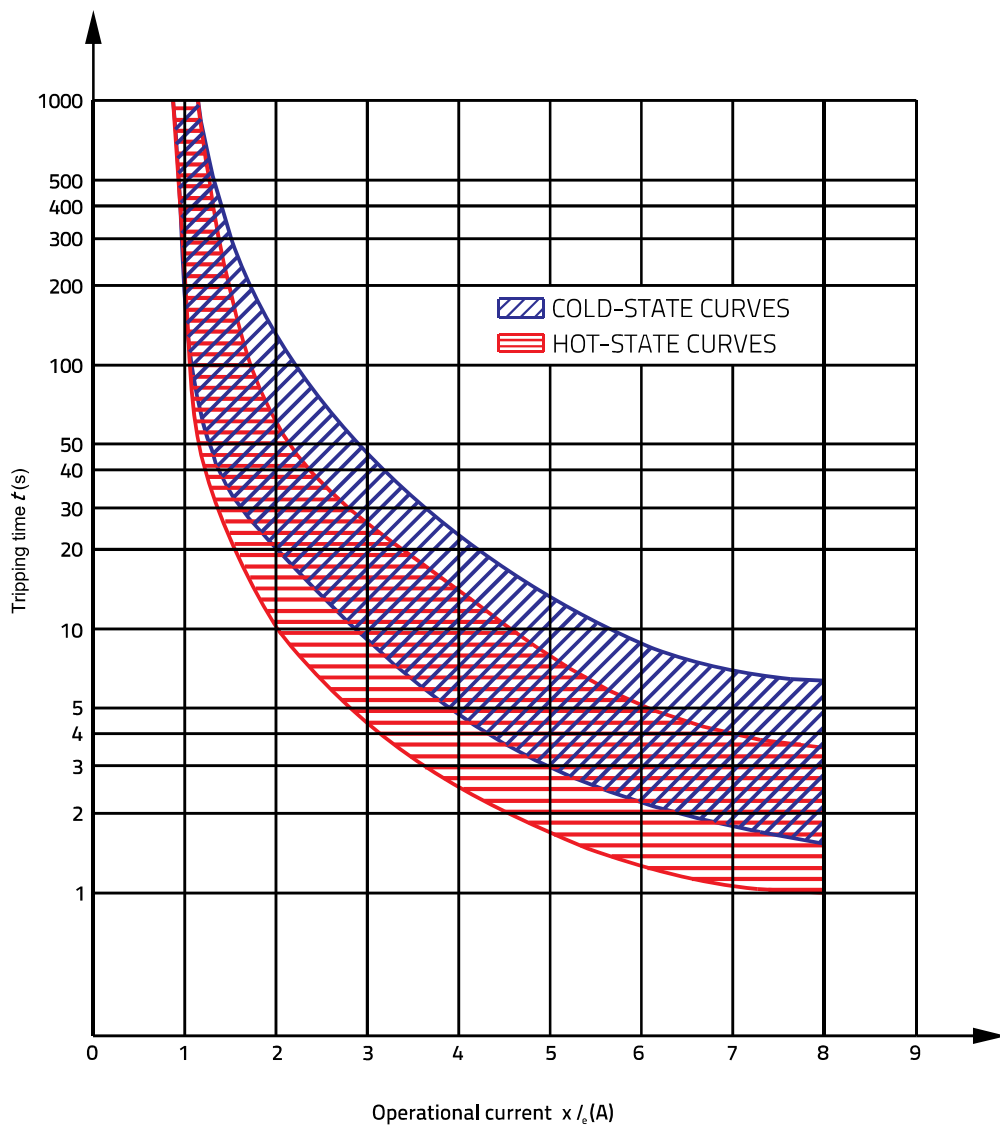
Accessories

Thermal overload relay BR63

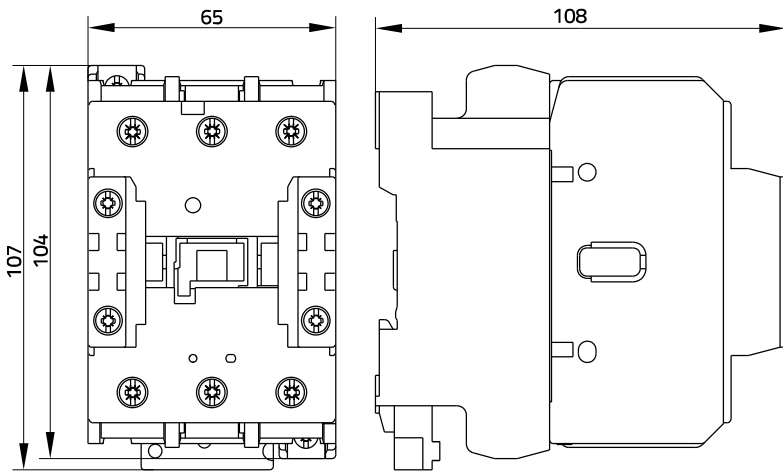
Setting ranges and maximum permitted back-up fuses

Setting range (A)	Max. back-up fuse gL/gG (A)
17 - 25	100
24,5 - 36	100
35 - 47	125
45 - 60	150
58 - 75	200
72 - 90	250
77 - 97	250

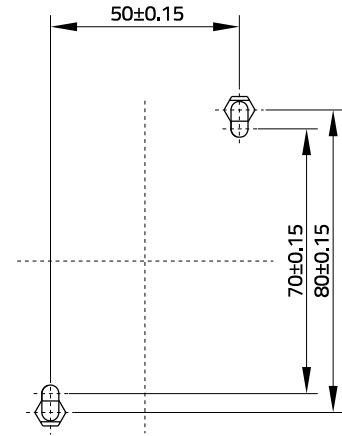
Tripping curve BR63



KNL43 ... KNL75
KNL43UL, KNL63UL

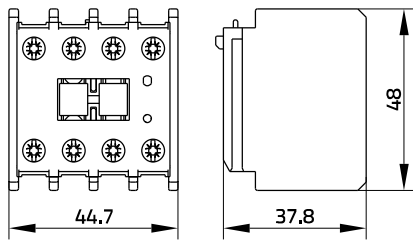


KNL43 ... KNL75 – drilling plan
KNL43UL, KNL63UL

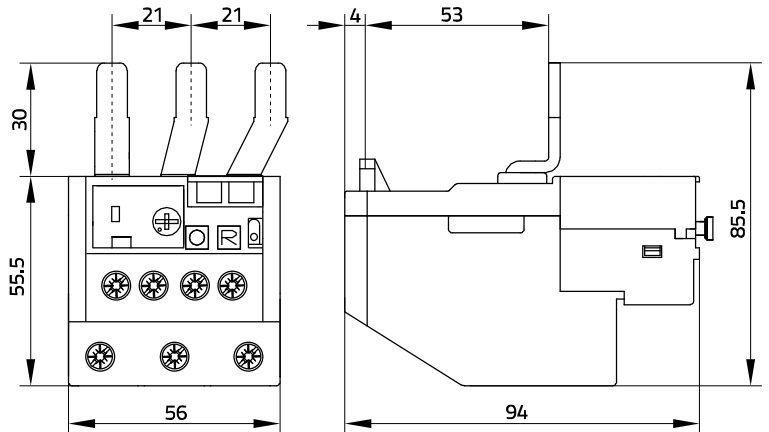


NDL4

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

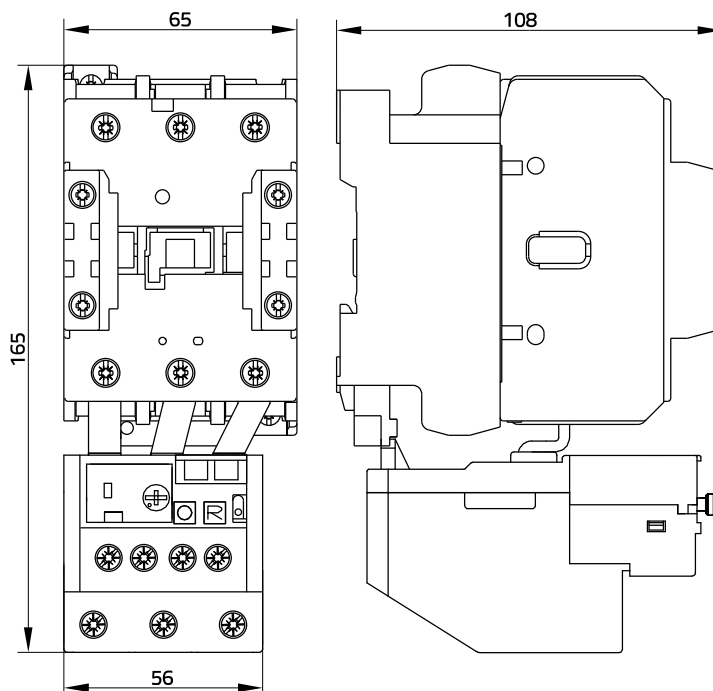


BR63 thermal overload relay



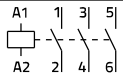
KNL43 ... KNL75 + BR63
KNL43UL + BR63, KNL63UL + BR63

Contactor + thermal overload relay



Motor contactors

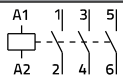
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 75 mm widths)

Type	Rated current I_n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (kg)	Packaging (pcs)
KNL80-00	80 A	380/400 V		786020036000	1.28	1
KNL80-00	80 A	220/230 V		786020034000	1.28	1
KNL80-00	80 A	24 V		786020030000	1.28	1

AC



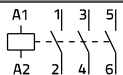
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 75 mm widths)

Type	Rated current I_n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL90-00	90 A	380/400 V		786020044000	1.28	1
KNL90-00	90 A	220/230 V		786020042000	1.28	1
KNL90-00	90 A	24 V		786020038000	1.28	1

AC



AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 75 mm widths)

Type	Rated current I_n	Control voltage 50/60 Hz	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
KNL110-00	110 A	380/400 V		786020052000	1.28	1
KNL110-00	110 A	220/230 V		786020050000	1.28	1
KNL110-00	110 A	24 V		786020046000	1.28	1

AC



Auxiliary switch blocks

AC-15 acc. to IEC/EN 60947-5-1

Type	Rated current I _e	Rated voltage U _e	Wiring diagram	Ordering No.	Weight (g)	Packaging (pcs)
G484	10 A	690 V	-12	786.025.012	39	1
	10 A	690 V	-21	786.025.013		
BFX10	10 A	690 V	-40	786.015.010	48	1
	10 A	690 V	-13	786.015.011		
	10 A	690 V	-22	786.015.003		
	10 A	690 V	-31	786.015.012		
	10 A	690 V	-04	786.015.013		



BR90 thermal overload relay

up to 110 A for KNL80-KNL110 contactors

Type	Setting range (A)	Max. backup fuse (A)		Ordering No.	Weight (g)	Packaging (pcs)
		aM	gL/gG			
BR90-82	60 ... 82	100	200	786.050.104	365	1
BR90-95	70 ... 95	100	200	786.050.105		
BR90-110	90 ... 110	125	200	786.050.106		



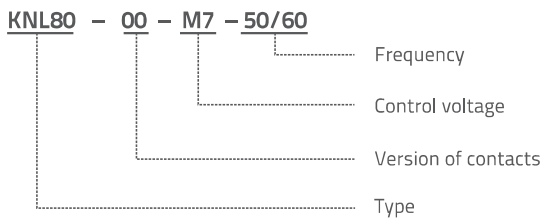
Ordering data

For contactors KNL80 - KNL110

Standard control voltages and designations (AC)

V	24	48	110	220/230	240	380/400
50/60 Hz	B7	E7	F7	M7	U7	Q7

Ordering data



Note:

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



Technical characteristics

Dimensions



TECHNICAL DATA

Type	Symbol	Unit	KNL80	KNL90	KNL110
Standards			IEC 60947-4-1, IEC/EN 60947-1, UL 508		
Approvals			CE, UL, EAC		
Module width		mm	75		
Number of poles			3		
Degree of protection			IP20		
Pollution degree			3		
Climatic conditions			95 % relative humidity		
Ambient temperature:					
open		°C	-50 ... +70		
closed		°C	-50 ... +70		
Storage temperature		°C	-60...+80		
Maximum altitude		m	2000		
U _i and U _e is reduced for 1,2 % and I _e for 0,4 % for every additional 100 m					
Number of contactors or switches side-by-side:					
<40 °C			no limitation		
(40 ... 55) °C					
Noise level (operation)		dB	35		
Maximum operating frequency with no load		op. c./h	3.600		
Mechanical endurance		op. c.	15.000.000		
Weight		kg	1,28		
Power dissipation per pole		W	9,4		
Overload current withstand capability		A	480	760	880
10 s					
Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2		A	160		
Rated insulation voltage	U _i	V	1000		
Rated impulse withstand voltage	U _{imp}	kV	8		
Rated operational voltage	U _e	V	690		
Rated frequency	f	Hz	50/60		
Thermal current	I _{th}	A	125		
Rated operational current for AC-1, AC-7a and AC-21	I _e	A	125		
Operational power for AC-1, AC-7a and AC-21:					
single-phase 230 V	P _e	kW	27		
three-phase 230 V			47		
three-phase 400 V			82		
three-phase 500 V			108		
three-phase 690 V			128		
Maximum operating frequency for AC-1, AC-7a and AC-21		op. c./h	600		
Rated operational current for AC-3, AC-7b and AC-23 (at 400 V)	I _e	A	80	90	110
Operational power for AC-3, AC-7b and AC-23:					
three-phase 230 V	P _e	kW	23	27,6	33
three-phase 400 V			41	50	61
three-phase 500 V			56	56	59
three-phase 690 V			74	74	80
Maximum operating frequency for AC-3, AC-7b and AC-23		op. c./h	600		
Electrical endurance for AC-3, AC-7b and AC-23		op. c.	1.300.000	1.200.000	800.000
Rated operational current for AC-4 (at 400 V)	I _e	A	38	43	43
Operational power for AC-4:					
three-phase 400 V	P _e	kW	20	23	23
three-phase 500 V			18,5	25	25
Maximum operating frequency for AC-4		op. c./h	300		
Electrical endurance for AC-4		op. c.	200.000		
Rated motor power according to standards UL and CSA:					
three-phase 230 V	P _e	HP	30	30	40
three-phase 460 V			60	60	75
three-phase 575 V			75	75	100
Maximum operating frequency for motors acc. to UL and CSA		op. c./h	600		
Electrical endurance for motors acc. to UL and CSA		op. c.	1.300.000	1.200.000	800.000

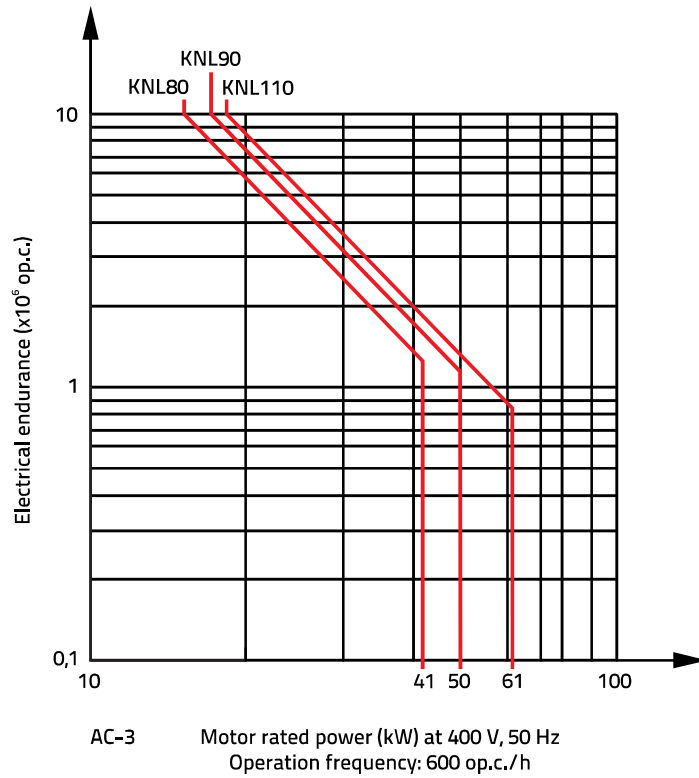
TECHNICAL DATA

Type	Symbol	Unit	KNL80	KNL90	KNL110
Switching of capacitors AC-6b and AC-7c (at 230 V)	C	µF	850		
Maximum operating frequency for AC-6b and AC-7c		op. c./h	600		
Electrical endurance for AC-6b and AC-7c		op. c.	100,000		
Rated operational current for DC-1 (L/R ≤ 1 ms): 1 pole ... 24 V DC/ 48 V DC/ 60 V DC/ 110 V DC/ 220 V DC 2 poles in series ... 24 V DC/ 48 V DC/ 60 V DC/ 110 V DC/ 220 V DC 3 poles in series ... 24 V DC/ 48 V DC/ 60 V DC/ 110 V DC/ 220 V DC	I _e	A	60 / 60 / 60 / 8 / 6 100 / 100 / 100 / 80 / 40 100 / 100 / 100 / 85 / 55		
Maximum operating frequency for DC-1		op. c./h	300		
Rated operational current for DC-3 (L/R ≤ 2 ms): 1 pole ... 24 V DC/ 110 V DC/ 220 V DC 2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC 3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC	I _e	A	40 / 3 / 1 60 / 40 / 7 80 / 60 / 35		
Maximum operating frequency for DC-1		op. c./h	300		
Rated operational current for DC-5 (L/R ≤ 7.5 ms): 1 pole ... 24 V DC/ 110 V DC/ 220 V DC 2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC 3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC	I _e	A	40 / 3 / 1 60 / 40 / 7 80 / 60 / 35		
Maximum operating frequency for DC-1		op. c./h	300		
Terminal capacity: rigid (solid and stranded) flexible	S	mm ²	6 ... 50 6 ... 50		
Screw			M6		
Screw head			hexogen socket oval head		
Tightening torque		Nm	4 - 5		
Range of control voltage for switch-on	U _c	%	85 ... 110		
Range of control voltage for drop out	U _c	%	20 ... 75		
Kind of voltage			AC		
Standard control voltages	U _c	V	12, 24, 48, 110, 220/230, 240, 380/400, 600		
Frequency of AC control voltage	f	Hz	50/60		
Control mode			remote control with U _c		
Coil consumption: switch-on operation		VA	210 18		
Delays: make brake		ms	13-25 8-12		
Terminal capacity: rigid (solid and stranded) flexible		mm ²	2,5 2,5		
Screw			M3,5		
Screw head			Phillips1		
Tightening torque		Nm	0.8 - 1		
MTTF - Mean time to failure MTTF = 1/λ = B10/(0.1 n _{op})	AC-1 AC-3	h	32.500	30.000	20.000
MTTF _d - Mean time to failure dangerous MTTF _d = 1/λ _d = B10 _d /(0.1 n _{op})	AC-1 AC-3	h	43.333	40.000	26.666
B10 - Number of operating cycles until 10 % of devices fail	AC-1 AC-3	op. c.	975.000	900.000	600.000
B10 _d - Number of operating cycles until 10 % of device dangerous	AC-1 AC-3	op. c.	1.300.000	1.200.000	800.000
λ - Failure rate λ = (0.1 n _{op})/B10	AC-1 AC-3	1/h	0.00003	0.00003	0.00005
λ _d - Failure rate dangerous λ _d = (0.1 n _{op})/B10 _d	AC-1 AC-3	1/h	0.00002	0.00003	0.00004
Ratio of dangerous failures		%	75		
n _{op} - Operating cycles (operating cycles/h)		op. c./h	300		

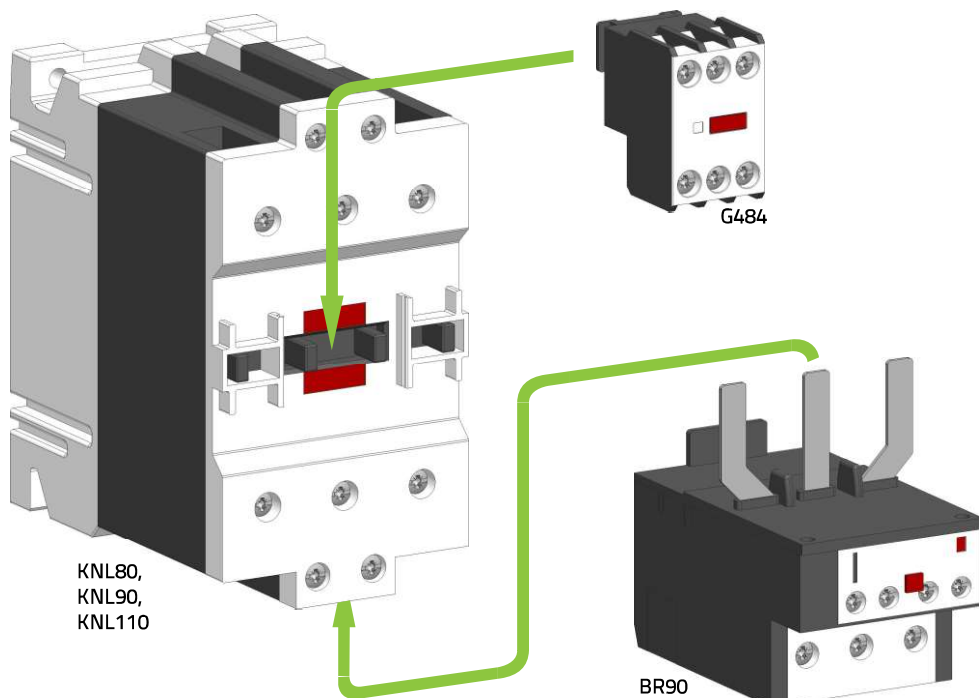
Electrical endurance

Diagram 1

Electrical endurance of motor contactors KNL80 - KNL110 - AC-3



Mounting positions of accessories



Contactors KNL80-KNL110

Accessories



Snap-on auxiliary switch blocks

TECHNICAL DATA

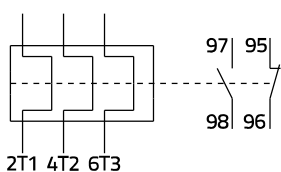
		Symbol	Unit	G484	BFX10
GENERAL	Type				
	Standards			IEC/EN 60947-5-1, UL 508	
	Approvals			CE, UL, CSA, GOST, CCC	
	For use with			KNL80 ... KNL110	
	Module width			1,5	2
	Number of poles			3	4
	Degree of protection			IP20	
	Pollution degree			3	
	Ambient temperature open		°C	-50 ... +70	
	closed				
	Storage temperature		°C	-60 ... +80	
	Mechanical endurance		op. c.	10.000.000	
Weight		g	39	48	
AUXILIARY CIRCUIT	Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2		A	10	
	Rated insulation voltage	U_i	V	690	
	Thermal current	I_{th}	A	10	
	Switching of auxiliary loads acc. to standard UL and CSA			A600, Q600	
	Terminal capacity: rigid (solid and stranded)	S	mm ²	2,5	
	flexible			2,5	
	Screw			M3	
Tightening torque		Nm	1		

Thermal overload relay BR90

TECHNICAL DATA

	Type	Symbol	Unit	BR90
GENERAL	Standards			IEC 60947-1, IEC 60947-4-1, UL508
	Approvals			CE, UL, CSA, GOST, CCC
	For use with			KNL80 ... KNL110
	Degree of protection			IP20
	Ambient temperature operating		°C	-20 ... +55
	storage			-55 ... +70
	Dimensions (WxHxD)		mm	55 x 88 x 94,5
	Operating position			vertical
	Reset type			auto, manual
	Maximum altitude above sea level		m	3000
Weight		g	365	
MAIN CIRCUIT	Rated insulation voltage	U_i	V	690
	Rated impulse withstand voltage	U_{imp}	kV	6
	Rated operational voltage	U_e	V	690
	Adjustable current	I_r	A	60 ... 110
	Rated frequency	f	Hz	0 ... 400
	Overvoltage category / pollution degree acc. to IEC/EN 60947-1			III / 3
	Trip class acc. to IEC/EN 60947-4-1			10
	Sensitivity to phase failure			yes
	Temperature compensation range		°C	-15 ... +55
	Power loss at I_r	P	W	6 ... 12,6
	Terminal capacity		mm ²	35
	Conductor insulation stripping length		mm	14
	Screw			M5
Screw head			PH2	
Tightening torque		Nm	3,9	
AUXILIARY CIRCUITS	Rated insulation voltage	U_i	V	690
	Rated impulse withstand voltage	U_{imp}	kV	6
	Rated operational voltage	U_e	V	690
	Overvoltage category / pollution degree acc. to IEC/EN 60947-1			III / 3
	Thermal current (both contacts)	I_{th}	A	10
	Contact electrical rating			B600 / P600
	Rated operational current AC-15 220/230 V	both contacts I_e	A	2,5
	Rated operational current DC-13 110 V	both contacts I_e	A	1,1
	Terminal capacity		mm ²	max. 2,5
	Conductor insulation stripping length		mm	9
	Screw			M3,5
Screw head			PH1	
Tightening torque		Nm	1	

Connection diagram BR90



Contactors KNL80-KNL110

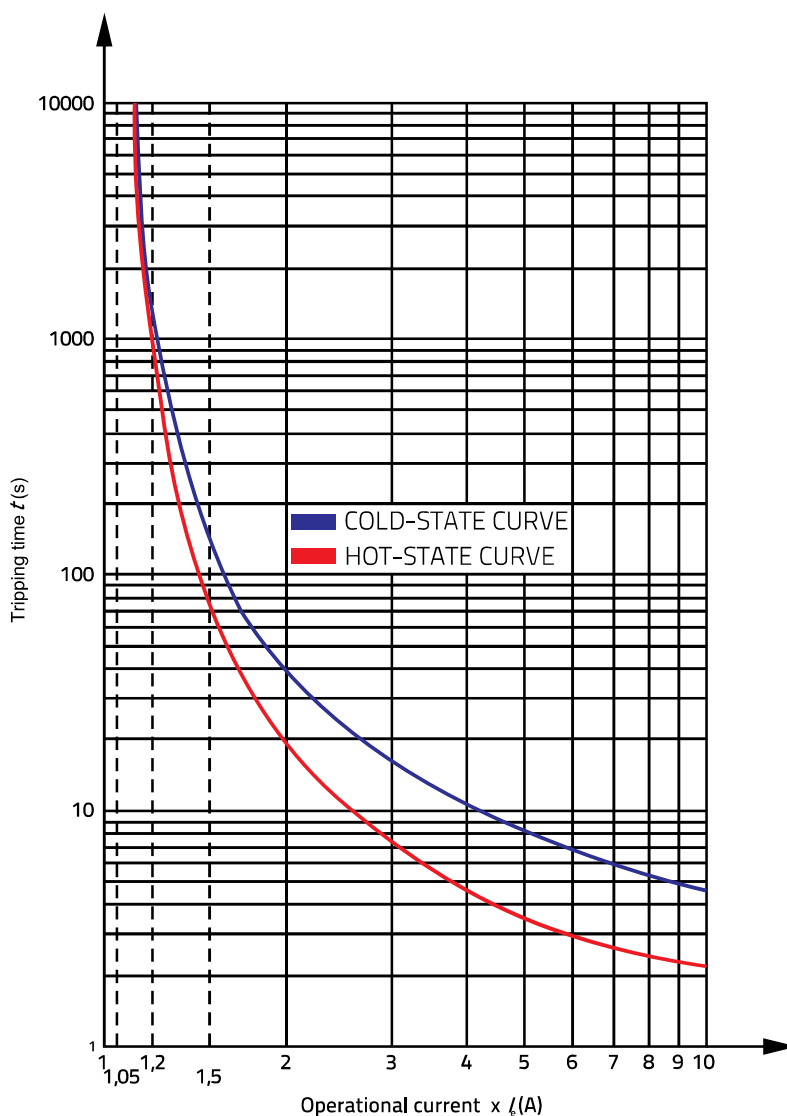
Accessories

Thermal overload relay BR90

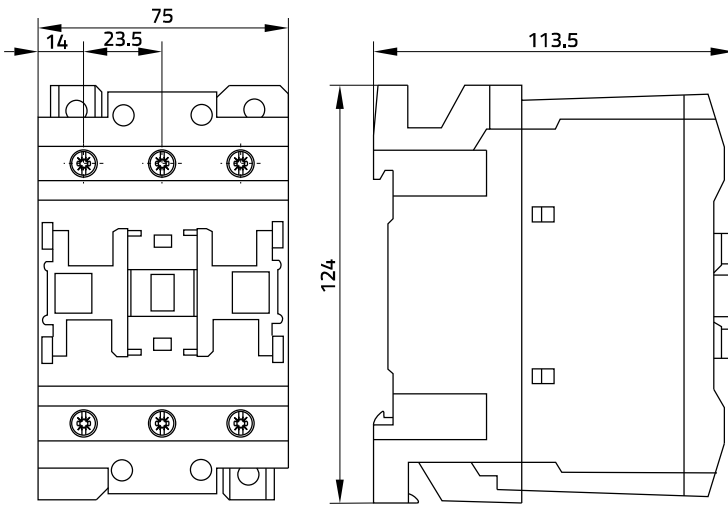
Setting ranges and maximum permitted back-up fuses

Setting range (A)	aM	Max. back-up fuse gL/gG (A)	
		gL/gG	gG
17 - 25	100	200	200
24,5 - 36	100	200	200
35 - 47	125	200	200

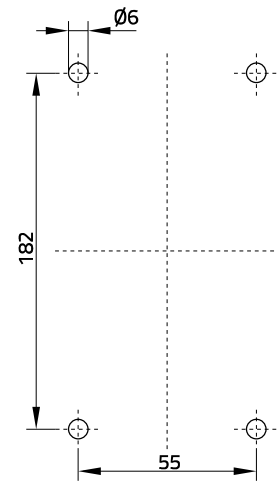
Tripping curve BR90



KNL80 ... KNL110

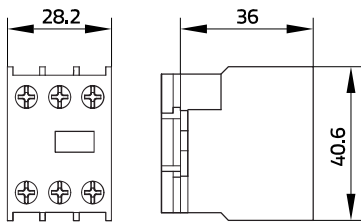


KNL80 ... KNL110 - drilling plan

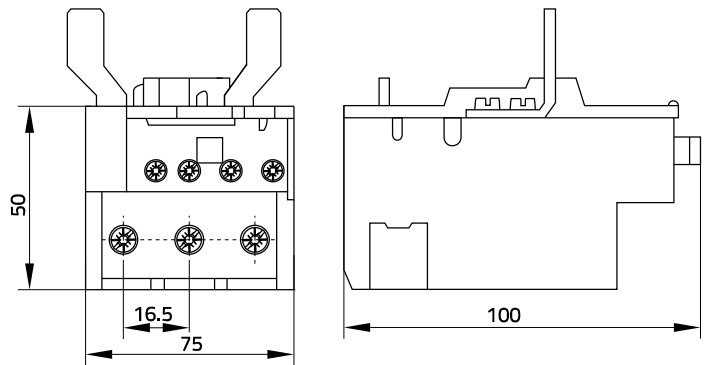


G484

Snap-on auxiliary switch blocks
(mounting on a basic contactor)



BR90 thermal overload relay



KNL80 ... KNL110 + G484 + BR90

Contactor + snap-on auxiliary switch block +
thermal overload relay

