

# Contactors KNL22(G)-KNL38(G)

## Motor contactors



### TECHNICAL DATA

	Type	Symbol	Unit	KNL22	KNL22G	KNL30	KNL30G	KNL38	KNL38G
					NPLG/NDLG		NPLG/NDLG		NPLG/NDLG
Standards				IEC/EN 60947-5-1, IEC 60947-4-1, UL 508					
Approvals				CE, UL, CSA, EAC	CE, EAC	CE, UL, CSA, EAC	CE, EAC	CE, EAC	CE, EAC
Module width		mm		45	56/45	45	56/45	45	56/45
Number of poles				3					
Degree of protection				IP20					
Pollution degree				3					
Climatic conditions				95 % relative humidity					
Ambient temperature:									
open		°C		-25 ... +55					
closed		°C		-25 ... +45					
Storage temperature		°C		-30 ... +80					
Maximum altitude		m		2000					
U <sub>i</sub> and U <sub>e</sub> is reduced for 1.2 % and I <sub>e</sub> for 0.4 % for every additional 100 m									
Number of contactors or switches side-by-side:									
<40 °C				no limitation					
(40 ... 55) °C				no limitation					
Noise level (operation)		dB		30	20	30	20	30	20
Maximum operating frequency with no load		op. c./h		3.000					
Mechanical endurance		op. c.		10.000.000					
Weight		g		320	360/410	320	360/410	320	360/410
Contact reliability				≥17 V; ≥50 mA					
Power dissipation per pole		W		2.3	2.3	2.3	2.3	2.3	2.3
Overload current withstand capability									
10 s		A		176	176	240	240	304	304
5 s		A		220	220	280	280	320	320
1 s		A		250	250	330	330	350	350
0.001 s		A		600	600	900	900	900	900
Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2		A		50					
Rated insulation voltage	U <sub>i</sub>	V		1000					
Rated impulse withstand voltage	U <sub>imp</sub>	kV		6					
Rated operational voltage	U <sub>e</sub>	V		1000					
Rated frequency	f	Hz		50/60					
Thermal current	I <sub>th</sub>	A		35	35	35	35	45	45
Rated operational current for AC-1, AC-7a and AC-21	I <sub>e</sub>	A		35	35	35	35	45	45
Operational power for AC-1, AC-7a and AC-21:									
single-phase 230 V	P <sub>e</sub>	kW		8				10	
three-phase 230 V			13				17		
three-phase 400 V			23				29		
three-phase 500 V			28				37		
three-phase 690 V			40				50		
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-7b and AC-23 (at 400 V)	I <sub>e</sub>	A		22	22	30	30	38	38
Operational power for AC-3, AC-7b and AC-23:									
single-phase 230 V	P <sub>e</sub>	kW		2.2	2.2	3.7	3.7	4	4
three-phase 230 V			5.5	5.5	7.5	7.5	8	8	
three-phase 400 V			11	11	15	15	18.5	18.5	
three-phase 500 V			11	11	15	15	15	15	
three-phase 690 V			11	11	15	15	15	15	
three-phase 1000 V			11	11	15	15	15	15	
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.		800.000			400.000		
Rated operational current for AC-4 (at 400 V)	I <sub>e</sub>	A		7.7	7.7	12.5	12.5	14	14
Operational power for AC-4:									
three-phase 230 V	P <sub>e</sub>	kW		2.2	2.2	4	4	4.5	4.5
three-phase 400 V			4	4	6.5	6.5	7.5	7.5	
three-phase 500 V			4	4	6.5	6.5	6.5	6.5	
three-phase 690 V			4	4	6.5	6.5	6.5	6.5	
Maximum operating frequency for AC-4		op. c./h		300					
Electrical endurance for AC-4		op. c.		300.000		250.000		200.000	
Rated motor power according to standards UL and CSA:									
single-phase 115 V	P <sub>e</sub>	HP		2	2 <sup>1)</sup>	2	2 <sup>1)</sup>	2	2 <sup>1)</sup>
single-phase 230 V			3	3 <sup>1)</sup>	5	5 <sup>1)</sup>	5	5 <sup>1)</sup>	
three-phase 230 V			7.5	7.5 <sup>1)</sup>	10	10 <sup>1)</sup>	10	10 <sup>1)</sup>	
three-phase 460 V			15	15 <sup>1)</sup>	20	20 <sup>1)</sup>	20	20 <sup>1)</sup>	
three-phase 575 V			15	15 <sup>1)</sup>	20	20 <sup>1)</sup>	20	20 <sup>1)</sup>	
Electrical endurance for motors acc. to UL and CSA		op. c.		800.000		400.000			

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Type	Symbol	Unit	KNL22	KNL22G NPLG/NDLG	KNL30	KNL30G NPLG/NDLG	KNL38	KNL38G NPLG/NDLG
Switching of capacitors AC-6b and AC-7c (at 230 V)	C	µF	220	220	330	330	350	350
Maximum operating frequency for AC-6b and AC-7c		op. c./h	600					
Switching of capacitors AC-6b and AC-7c (at 230 V)		op. c.	100.000					
Rated operational current for DC-1 (L/R ≤ 1 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 <sub>e</sub>	A	28 / 7 / 4 30 / 23 / 13 32 / 25 / 20					
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 <sub>e</sub>	A	18 / 2 / 1 23 / 13 / 2 28 / 18 / 9					
Maximum operating frequency for DC-3		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 <sub>e</sub>	A	18 / 2 / 1 23 / 13 / 2 28 / 18 / 9					
Maximum operating frequency for DC-5		op. c./h	300					
Terminal capacity: rigid (solid and stranded) flexible	S	mm <sup>2</sup>	2.5 ... 10 1.5 ... 10					
Length of removed wire insulation		mm	10					
Screw			M4					
Screw head			PZ2					
Tightening torque		Nm	1.8					
Range of control voltage for switch-on	U <sub>c</sub>	%	85 ... 110					
Range of control voltage for drop out	U <sub>c</sub>	%	20 ... 75	10 ... 75	20 ... 75	10 ... 75	20 ... 75	10 ... 75
Kind of voltage			AC	DC	AC	DC	AC	DC
Standard control voltages	U <sub>c</sub>	V	1)	2)	1)	2)	1)	2)
Frequency of AC control voltage	f	Hz	50/60	/	50/60	/	50/60	/
Control mode			remote control with U <sub>c</sub>					
Coil consumption: switch-on operation		VA/W	66/48 8/2.5	-/110 -/3	66/48 8/2.5	-/110 -/3	66/48 8/2.5	-/110 -/3
Delays: make brake		ms	10 ... 20 5 ... 15	15 ... 20 5 ... 10	10 ... 20 5 ... 15	15 ... 20 5 ... 10	10 ... 20 5 ... 15	15 ... 20 5 ... 10
Terminal capacity: rigid (solid and stranded) flexible		mm <sup>2</sup>	0.75 ... 4 0.5 ... 2.5					
Length of removed wire insulation		mm	10					
Screw			M3.5					
Screw head			PZ2					
Tightening torque		Nm	1.4					
MTTF - Mean time to failure MTTF = 1/λ = B10/(0.1 n <sub>op</sub> )	AC-1 AC-3	h	20.000		5.000 10.000			
MTTF <sub>d</sub> - Mean time to failure dangerous MTTF <sub>d</sub> = 1/λ <sub>d</sub> = B10 <sub>d</sub> /(0.1 n <sub>op</sub> )	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 <sub>d</sub> - Number of operating cycles until 10 % of device dangerous B10 <sub>d</sub> = B10/ratio of dangerous failures	AC-1 AC-3	op. c.	800.000		200.000 400.000			
λ - Failure rate λ = (0.1 n <sub>op</sub> )/B10	AC-1 AC-3	1/h	0.00005		0.0002 0.0001			
λ <sub>d</sub> - Failure rate dangerous λ <sub>d</sub> = (0.1 n <sub>op</sub> )/B10 <sub>d</sub>	AC-1 AC-3	1/h	0.00004		0.00015 0.000075			
Ratio of dangerous failures		%	75					
n <sub>op</sub> - 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

2) 12,24,48,60,72,110,125,220,240 V