

### TECHNICAL DATA

Type	Symbol	Unit	KNL16	KNL16G	KNL18	KNL18G
Standards			IEC/EN 60947-5-1, IEC 60947-4-1, UL 508			
Approvals			CE, UL, CSA, EAC	CE, EAC	CE, EAC	CE, EAC
Module width		mm	45	45	45	45
Number of poles			4			
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						
Noise level (operation)		dB	30	20	30	20
Maximum operating frequency with no load		op. c./h	3.000			
Mechanical endurance		op. c.	10.000.000			
Weight		g	300	300	300	300
Contact reliability			≥17 V; ≥50 mA			
Power dissipation per pole			1.3	1.3	1.9	1.9
Overload current withstand capability						
10 s		A	128	128	144	144
5 s		A	150	150	170	170
1 s		A	180	180	200	200
0.001 s		A	450	450	500	500
Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2		A	35			
Rated insulation voltage	U <sub>i</sub>	V	690			
Rated impulse withstand voltage	U <sub>imp</sub>	kV	6			
Rated operational voltage	U <sub>e</sub>	V	690			
Rated frequency	f	Hz	50/60			
Thermal current	I <sub>th</sub>	A	25	25	32	32
Rated operational current for AC-1, AC-7a and AC-21	I <sub>e</sub>	A	25	25	32	32
Operational power for AC-1, AC-7a and AC-21:						
single-phase 230 V			5.5		7	
three-phase 230 V			9		12	
three-phase 400 V			16		21	
three-phase 500 V			20		26	
three-phase 690 V			28		36	
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	I <sub>e</sub>	A	16	16	18	18
Operational power for AC-3, AC-7b and AC-23:						
single-phase 230 V			2.2		2.2	
three-phase 230 V			4		4	
three-phase 400 V			7.5		9	
three-phase 500 V			7.5		9	
three-phase 690 V			7.5		9	
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.	900.000		800.000	
Rated operational current for AC-4	I <sub>e</sub>	A	6.5	6.5	6.5	6.5
Operational power for AC-4:						
three-phase 230 V			1.5		1.5	
three-phase 400 V			3		3	
three-phase 500 V			3		3	
three-phase 690 V			3		3	
Maximum operating frequency for AC-4		op. c./h	300			
Electrical endurance for AC-4		op. c.	300.000			
Rated motor power according to standards UL and CSA:						
single-phase 115 V			1.5 <sup>1)</sup>		1.5 <sup>1)</sup>	
single-phase 230 V			3 <sup>1)</sup>		3 <sup>1)</sup>	
three-phase 230 V			5 <sup>1)</sup>		5 <sup>1)</sup>	
three-phase 460 V			7.5 <sup>1)</sup>		7.5 <sup>1)</sup>	
three-phase 575 V			10 <sup>1)</sup>		10 <sup>1)</sup>	
Electrical endurance for motors acc. to UL and CSA		op. c.	900.000		800.000	

<sup>1)</sup> No UL/CSA ratings; data only for indication and reference purposes only

# Contactors KNL16(G)-KNL18(G)

## Motor contactors



### TECHNICAL DATA

Type	Symbol	Unit	KNL16	KNL16G	KNL18	KNL18G
Switching of capacitors AC-6b and AC-7c (at 230 V)	C	μF	88 (300 for KNL16St4)	88	100	100
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):	I <sub>e</sub>	A				
1 pole ... 24 V DC/ 110 V DC/ 220 V DC			15 / 6 / 4			
2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC			18 / 12 / 8			
3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC			20 / 15 / 10			
Maximum operating frequency for DC-1		op. c./h	300			
Rated operational current for DC-3 (L/R ≤ 2 ms):	I <sub>e</sub>	A				
1 pole ... 24 V DC/ 110 V DC/ 220 V DC			12 / 2 / 0.75			
2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC			15 / 8 / 1.5			
3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC			18 / 12 / 6			
Maximum operating frequency for DC-3		op. c./h	300			
Rated operational current for DC-5 (L/R ≤ 7.5 ms):	I <sub>e</sub>	A				
1 pole ... 24 V DC/ 110 V DC/ 220 V DC			12 / 2 / 0.75			
2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC			15 / 8 / 1.5			
3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC			18 / 12 / 6			
Maximum operating frequency for DC-5		op. c./h	300			
Terminal capacity:	S	mm <sup>2</sup>				
rigid (solid and stranded)			0.75 ... 6			
flexible			0.5 ... 6			
Length of removed wire insulation		mm	10			
Screw			M3.5			
Screw head			PZ2			
Tightening torque		Nm	1.4			
Maximum back-up fuse for short-circuit protection gL and gG: coordination type 2		A	20			
Rated insulation voltage	U <sub>i</sub>	V	690			
Rated operational current for AC-15:	I <sub>e</sub>	A				
single-phase 230 V			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.	1.000.000			
Rated operational current for DC-13:	I <sub>e</sub>	A				
1 pole ... 24 V DC/48 V DC/60 V DC/110 V DC/ 220 V DC			10 / 6 / 4 / 0.9 / 0.4			
Maximum operating frequency for DC-13				op. c./h	1.200	
Terminal capacity:	S	mm <sup>2</sup>				
rigid (solid and stranded)			0.75 ... 6			
flexible			0.5 ... 6			
Length of removed wire insulation		mm	10			
Screw			M3.5			
Screw head			PZ2			
Tightening torque		Nm	1.4			
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
Kind of voltage			AC	DC	AC	DC
Standard control voltages	U <sub>c</sub>	V	1)	2)	1)	2)
Frequency of AC control voltage	f	Hz	50/60	/	50/60	/
Control mode			remote control with U <sub>c</sub>			
Coil consumption:		VA/W				
switch-on			66/48	-/110	66/48	-/110
operation			8/2.5	-/3	8/2.5	-/3
Delays:		ms				
make			10 ... 25	10 ... 20	10 ... 25	10 ... 20
brake			10 ... 15	5 ... 15	10 ... 15	5 ... 15
Terminal capacity:		mm <sup>2</sup>				
rigid (solid and stranded)			0.75 ... 4			
flexible			0.75 ... 4			
Length of removed wire insulation		mm	10			
Screw			M3.5			
Screw head			PZ2			
Tightening torque		Nm	1.4			

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

**TECHNICAL DATA**

		Symbol	Unit	KNL16	KNL16G	KNL18	KNL18G
<b>SAFETY</b>	Type						
	MTTF - Mean time to failure $MTTF = 1/\lambda = B10/(0.1 n_{op})$	AC-1 AC-3	h		5.000		
	MTTF <sub>d</sub> - Mean time to failure dangerous $MTTF_d = 1/\lambda_d = B10_d/(0.1 n_{op})$	AC-1 AC-3	h	22.500		20.000	
	B10 - Number of operating cycles until 10 % of devices fail	AC-1 AC-3	op. c.		150.000		
	B10 <sub>d</sub> - Number of operating cycles until 10 % of device dangerous $B10_d = B10/\text{ratio of dangerous failures}$	AC-1 AC-3	op. c.	675.000		600.000	
	$\lambda$ - Failure rate $\lambda = (0.1 n_{op})/B10$	AC-1 AC-3	1/h		0.0002		
	$\lambda_d$ - Failure rate dangerous $\lambda_d = (0.1 n_{op})/B10_d$	AC-1 AC-3	1/h	0.000044		0.00005	
	Ratio of dangerous failures		%		75		
	$n_{op}$ - Operating cycles (operating cycles/h)		op. c./h		300		