

PKZ 0 Motor Protectors

Technical Data

General				
Standards				UL 508, CSA C 22.2 No. 14, IEC/EN 60 947, VDE 0660 GL, LR, DNV, PRS, BV, RINA, RS, MEEI, EZU
Climatic proofing				Damp heat, constant, to IEC 60 068-2-3 Damp heat, cyclical, to IEC 60 068-2-30
Ambient temperature	Storage	min./max.	°C	-25/+70
	Open	min./max.	°C	-25/+55
	Enclosed	min./max.	°C	-25/+40
Mounting position				
Direction of incoming supply				Motor protector: as required Motor protector combination: from above
Degree of protection (terminals)				IP 20 (IP 00)
Protection against electric shock to IEC 536				Finger and back-of-hand proof
Shock resistance (half-sinusoidal shock 10 ms) to IEC 60 068-2-27		g		Motor protector: 25 Motor protector combination: 8
Altitude		m		2000
Terminal capacity				
IEC	solid	mm ²		1 × (1 – 6)
		mm ²		2 × (1 – 2,5)
	flexible with ferrule	mm ²		1 × (1 – 4)
		mm ²		2 × (1 – 2,5)
UL/CSA	solid or stranded	AWG		14 – 10
Tightening torque	Power terminals	Nm		1,8
	Control terminals	Nm		1,0
Main contacts				
Rated impulse withstand voltage U_{imp}		V		6000
Overvoltage category / pollution degree				III/3
Rated operational voltage U_e		V AC		690
Rated uninterrupted current I_u = rated operational current I_e		A		25 or thermal trip dial setting
Rated frequency		Hz		40 – 60
Current heat loss	3-pole at operational temperature	W		Motor protector: 6 Motor protector combination: 9,5
Lifespan	mechanical	ops.		Motor protector: (High capacity) magnetic contactor: 0,1 × 10 ⁶ 5,0 × 10 ⁶
	electrical 100 % AC-3/400 V	ops.		Refer to utilization curves on page 08/052
Max. operating frequency		ops./h		Motor protector: 40 Contact module characteristic curve → page 08/058
Trip blocks				
Temperature compensation				
IEC/EN 60 947, VDE 0660		min./max.	°C	-5/+40
operating range		min./max.	°C	-25/+55
Temperature compensation residual error		%/K		≤ 0,25 – 0,4
Thermal trip dial setting range		× I_u		0,6 – 1
Fixed magnetic trip response		× I_u		14 (20 for PKZM0-...-T)
Magnetic trip tolerance		%		± 20
Single phase sensitivity				UL 508, CSA 22.2 # 14, IEC/EN 60 947-4-1, VDE 0660 part 102
UL/CSA single-phase HP ratings				
always use 3 poles for wiring		1 phase HP at		115 V AC 200 V AC 230 V AC
Manual motor protector type	PKZM0-1.6			- - 1/10
	PKZM0-2.5			- 1/8 1/6
	PKZM0-4.0	1/8		1/4 1/3
	PKZM0-6.3	1/4		1/2 1/2
	PKZM0-10	1/2		1 1 1/2
	PKZM0-16	1		2 2
(High capacity) magnetic contactor	PKZM0-20...25	1 1/2		3 3
	S(E)00-...	1/2		1 1 1/2

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System PKZ0 short-circuit ratings per IEC/EN 60 947 standards for international applications

I_u = Maximum continuous current rating of each device

I_q = Conditional short-circuit current rating (per IEC/EN 60 947-2, relevant for motor starters and motor starter combinations)

I_{cu} = Ultimate braking capacity (per IEC/EN 60 947-2, relevant for circuit breakers)

I_{cs} = Continuity of service breaking capacity (per IEC/EN 60 947-2, relevant for circuit breakers)

All kA ratings are RMS Sym. values

- Indicates self-protected range (100 kA)
- N Not necessary. Backup protection is not required since device is operating within its self-protected range
- A On request

I_u A	230 V				400 V				440 V				500 V				690 V			
	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾
0,16 – 1	■				■				■				■				■			
1,6	■				■				■				■				■			
2,5	■				■				■				■				■			
4	■				■				■				■				■			
6,3	■				■				■				■				■			
10	■				■				■				■				■			
16	16	16	8	50	16	16	8	50	10	10	10	50	6	6	6	50	3	3	2	50
20	16	16	8	50	16	16	8	50	10	10	10	50	6	6	6	50	3	3	2	50
25	16	16	8	50	16	16	8	50	10	10	10	50	6	6	6	50	3	3	2	50

PKM0 motor protector + CL-PKZ0 current limiter

0,16 – 1	■				■				■				■				■			
1,6	■				■				■				■				■			
2,5	■				■				■				■				■			
4	■				■				■				■				■			
6,3	■				■				■				■				■			
10	■				■				■				■				■			
16	■				■				■				■				■			
20	■				■				■				■				■			
25	■				■				■				■				■			

PKM0 + CL-PKZ0 + upstream CL-PKZ0 used as additional backup protection

0,16 – 1	■				■				■				■				■			
1,6	■				■				■				■				■			
2,5	■				■				■				■				■			
4	■				■				■				■				■			
6,3	■				■				■				■				■			
10	■				■				■				■				■			
16	■				■				■				■				■			
20	■				■				■				■				■			
25	■				■				■				■				■			

Motor protector combination PKZM0-.../SE00... (coordination type "1") and PKZM0-.../S00... (coordination Type "1" and "2")

0,16 – 1	■				■				■				■				■			
1,6	■				■				■				■				■			
2,5	■				■				■				■				■			
4	■				■				■				■				■			
6,3	■				■				■				■				■			
10	■				■				■				■				■			

Notes

¹⁾ Additional backup protection is required whenever the available the short-circuit current exceeds the I_q conditional short-circuit current rating shown in the table.

The conditional short circuit current rating is then dependent on the short-circuit rating of the fuse

50 A gL/gG $I_q = 100$ kA
100 A gL/gG $I_q = 30$ kA

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(High-capacity) contact module				
Magnet systems				
AC				
Operating range	Single-voltage coil 50 Hz and dual-voltage 50 Hz, 60 Hz	Pick-up	$\times U_s$	0,85 – 1,1
		Drop-out	$\times U_s$	0,4 – 0,6
	Dual-frequency coil ...V 50/60 Hz	Pick-up	$\times U_s$	0,85 – 1,1
		Drop-out	$\times U_s$	0,25 – 0,5
Power consumption	Single-voltage coil 50 Hz and dual-voltage 50 Hz, 60 Hz	Pull-in	VA/W	25/22
		Sealing	VA/W	4,6/1,3
	Dual-frequency coil ...V 50/60 Hz at 50 Hz	Pull-in	VA/W	30/26
		Sealing	VA/W	5,6/1,6
	Dual-frequency coil ...V 50/60 Hz at 60 Hz	Pull-in	VA/W	29/24
		Sealing	VA/W	3,9/1,1
Operating times at 100 % U_s (main contacts)				
Closing delay			ms	14 – 21
Opening delay			ms	8 – 18
DC				
Operating range		Pick-up	$\times U_s$	0,85 – 1,1
Power consumption		Pull-in = sealing	W	2,6
Operating times at 100 % U_s (main contacts)				
Closing delay			ms	26 – 35
Opening delay			ms	15 – 20
Duty factor			% DF	100

System PKZ0 motor protector

IEC kW ratings (AC-3)

	AC-3 kW rating at	220 V	380 V	440 V	500 V	660 V
		230 V 240 V kW	400 V 415 V kW	kW	kW	690 V kW
Manual motor protector type	PKZM0-0.16	-	-	-	-	0.06
	PKZM0-0.25	-	0.06	0.06	0.06	0.12
	PKZM0-0.4	0.06	0.09	0.12	0.12	0.18
	PKZM0-0.63	0.09	0.12	0.18	0.25	0.25
	PKZM0-1	0.12	0.25	0.25	0.37	0.55
	PKZM0-1.6	0.25	0.55	0.55	0.75	1.1
	PKZM0-2.5	0.37	0.75	1.1	1.1	1.5
	PKZM0-4.0	0.75	1.5	1.5	2.2	3
	PKZM0-6.3	1.1	2.2	3	3	4
	PKZM0-10	2.2	4	4	4	7.5
	PKZM0-16	4	7.5	9	9	12.5
	PKZM0-20	5.5	9	11	12.5	15
	PKZM0-25	5.5	12.5	12.5	15	22
Motor protector and contactor combination	PKZM0-0.16/S(E)00...	-	-	-	-	0.06
	PKZM0-0.25/S(E)00...	-	0.06	0.06	0.06	0.12
	PKZM0-0.4/S(E)00...	0.06	0.09	0.12	0.12	0.18
	PKZM0-0.63/S(E)00...	0.09	0.12	0.18	0.25	0.25
	PKZM0-1/S(E)00...	0.12	0.25	0.25	0.37	0.55
	PKZM0-1.6/S(E)00...	0.25	0.55	0.55	0.75	1.1
	PKZM0-2.5/S(E)00...	0.37	0.75	1.1	1.1	1.5
	PKZM0-4.0/S(E)00...	0.75	1.5	1.5	2.2	3
	PKZM0-6.3/S(E)00...	1.1	2.2	3	3	4
	PKZM0-10/S(E)00...	2.2	4	4	4	-

PKZM0-.../SP, UL/CSA Type E manual self-protected combination controller

Max. continuous current	A	16			
Max. 3 phase Horsepower rating	200V	3			
	230V	5			
	460V	10			
	575V	10			
UL/CSA interrupting rating		PKZM0-.../SP, up to 11A: 50kA rms sym @ 480Y/277V PKZM0-.../SP, up to 16A: 42kA rms sym @ 480Y/277V			

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Auxiliary contacts						
UL/CSA						
Pilot duty rating			A600, Q300 NHI...(S), AGM...	E150 (for NHI-E...-PKZ0)		
IEC/EN 60 947 Rated operational current I_e						
AC-15	220 – 240 V	A	3,5	1 (for NHI-E...-PKZ0)		
	380 – 415 V	A	2			
	440 – 500 V	A	1			
DC-13 (L/R \leq 100 ms)	24 V	A	2			
	60 V	A	1,5	1 (for NHI-E...-PKZ0)		
	110 V	A	1	0,5 (for NHI-E...-PKZ0)		
	220 V	A	0,25			
Lifespan	mechanical	ops.	NHI, NHI-E..	$0,1 \times 10^6$		
			AGM	$0,01 \times 10^6$		
			NHI...S, HI	5×10^6		
	electrical	ops.	NHI	$0,05 \times 10^6$		
			NHI-E	$0,1 \times 10^6$		
			AGM	5×10^3		
Control circuit reliability at $U_e = 24$ V DC $U_{min} = 17$ V, $I_{min} = 5,4$ mA			Fault probability H_F			
Positively driven contacts to ZH 1/457			$< 10^{-8}$, < 1 fault in 1×10^8 operations			
Short-circuit rating without welding			NHI11, NHI12, NHI21, NHI2-11S, HI11-S/EZ			
	fuseless	A	please inquire			
			10			
Terminal capacity, 1 conductor or 2 conductors	IEC/EN solid or flexible with ferrule	mm ²	0,75 – 2,5			
			UL/CSA solid or stranded	AWG	18 – 14	
					0,75 – 1,5 (for NHI-E...-PKZ0)	
			18 – 16 (for NHI-E...-PKZ0)			
Voltage trips						
Rated operational voltage U_e	V AC		42 – 480			
	V DC		24 – 250			
Terminal capacity, 1 conductor or 2 conductors	IEC/EN solid or flexible with ferrule	mm ²	0,75 – 2,5			
			UL/CSA solid or stranded	AWG	18 – 14	
Shunt trips						
Operating range	AC	$\times U_s$	0,7 – 1,1			
	DC (short-time operation: 5 s)	$\times U_s$	0,7 – 1,1			
Power consumption	Pull-in AC	VA	5			
	Sealing AC	VA	3			
	Pull-in DC	W	3			
	Sealing DC	W	3			
Undervoltage trips						
Pick-up voltage	$\times U_s$		0,85			
Drop-out voltage	$\times U_s$		0,7 – 0,35			
Power consumption	Pull-in AC	VA	5			
	Sealing AC	VA	3			

PKZM0 motor protector trip curve

The trip curve shows the tripping time of the motor protector in relation to the response current. The curve shows mean values of the tolerance ranges at an ambient temperature of 20°C, starting from cold. The tripping time of the bimetal trips at operational temperature (warm state) is reduced to approximately 1/4 of the values shown. System PKZ0 motor protectors are suitable for protection of IEC type EEx - , explosion-proof motors.

Specific characteristics for each individual setting range are available on request. These characteristics, in 55 x 75 mm format, are self-adhesive and can be used as onsite documentation to verify the suitability of each motor protector for this application. The data has been independently verified by the German PTB testing agency and laboratory.

