

xStart

DILM contactor
ZB/Z5 overload relays
ZEB and C441 overload relays

PKZ Motor-protective circuit breaker
NZM Motor-protective circuit breaker

Efficient solutions for motor control



EATON

Powering Business Worldwide

Starter selection table

Overview for DILM contactor / Overload relays / PKZ & NZM motor breaker

Contactor (3 Pole)



Type DIL	M9	M12	M15	M17	M25	M32	M40	M50	M65
AC3 KW rating	4	5.5	7.5	7.5	11	15	18.5	22	30
AC1 rating at 40 (Open) AC1 ampere	22	22	38	40	45	45	60	70	85
AC3 rating AC3 ampere	9	12	15.5	18	25	32	40	50	65
50 - 60 HZ	220 - 240 VAC	9	12	15.5	18	25	32	40	50
	380 - 440 VAC	9	12	15.5	18	25	32	40	50
	500 VAC	7	10	12.5	18	25	32	40	50
	690 VAC	5	7	9	12	15	18	25	32
Contactor coil voltage	AC Coil : 24V50/60HZ ; 11050/60HZ ; 220V50/60HZ ; 230V50HZ ; 240V60HZ, other voltages please enquiry DC coil :24V, other voltages please enquiry								
Contactor dimensions (W x H x D)mm	45 x 77 x 74			45 x 91 x 79			55 x 115 x 114		

Overload relays

Type Z	ZB12-..	ZB32-..	ZB65-..	
Overload relays ampere setting	0.1-0.16 0.16-0.24 0.24-0.4 0.4-0.6 0.6-1 1.6-2.4	2.4-4 4-6 6-10 10-16	16-24 24-32	6-10 10-16 16-24 24-40 40-57 50-65

Auxiliary contact for DILM

Type	..DILM	DILM150-XHI.. or DILM1000-XHI	DILM1000-XHI

Motor breaker (3 Pole)

Type PKZM0../PKZM4../NZM..	PKZM0-..	PKZM4-..	LZMB1-M..	
Motor breaker ampere setting	0.1-0.16 0.16-0.25 0.25-0.4 0.4-0.63 0.63-1 1-2.5 2.5-4	4-6.3 6.3-10 8-12 10-16 16-20 20-25 25-32	24-32 32-40 40-50 50-58 55-63	16-20 20-25 25-32 32-40 40-50 50-63 63-80 80-100
Motor breaker dimensions (W x H x D)mm	45 x 93 x 70		55 x 140 x 145	90 x 165 x 73

Starter selection table



M80	M95	M115	M150	M185	M225	M250	M300	M400	M500	M580	M650	M750	M820	M1000
37	45	55	75	90	110	132	160	200	250	315	355	400	450	560
130	130	190	190	337	386	429	490	612	857	980	1041	1102	1125	1225
80	95	115	150	185	225	250	300	400	500	580	650	750	820	1000
80	95	115	150	185	225	250	300	400	500	580	650	750	820	1000
80	95	115	150	185	225	250	300	400	500	580	650	750	820	1000
80	95	115	150	185	225	250	300	360	360	580	650	750	820	1000

Standard coil : RA250 (110-250Vac 40-60HZ / 110-250Vdc), other voltages please enquiry

90 x 170 x 160

140 x 180 x 208

160 x 200 x 216

250 x 232 x 232

ZB150-..

Z5-../FF250

ZEB+ZEB-XCT... or C441



25-35
35-50
50-70
70-100
95-125
120-150

50-70
70-100
95-125
120-160
120-220
220-250

40-820

LZMB2-M..

LZMN3-ME..

LZMN4-ME..



100-125
125-160
160-200

110-220
175-350
225-450

275-550
438-875
700-1400

105 x 206 x 108

140 x 297 x 126

210 x 401 x 146

Technical data

Rated currents of three-phase motors (guidelines for squirrel-cage motors)

Minimum fuse size for the protection of three-phase motors

The maximum size is governed by the requirement of the associated switchgear or overload

Motor rating			230 V			400 V			500 V			690 V		
			Rating Motor current	Fuse Starting direct	Y / Δ	Rating Motor current	Fuse Starting direct	Y / Δ	Rating Motor current	Fuse Starting direct	Y / Δ	Rating Motor current	Fuse Starting direct	Y / Δ
kW	cos	n (%)	A	A	A	A	A	A	A	A	A	A	A	A
0.06	0.7	58	0.37	2	-	0.21	2	-	0.17	2	-	0.12	2	-
0.09	0.7	60	0.54	2	-	0.31	2	-	0.25	2	-	0.18	2	-
0.12	0.7	60	0.72	4	2	0.41	2	-	0.33	2	-	0.24	2	-
0.18	0.7	62	1.04	4	2	0.6	2	-	0.48	2	-	0.35	2	-
0.25	0.7	62	1.4	4	2	0.8	4	2	0.7	2	-	0.5	2	-
0.37	0.72	66	2	6	4	1.1	4	2	0.9	2	2	0.7	2	-
0.55	0.75	69	2.7	10	4	1.5	4	2	1.2	4	2	0.9	4	2
0.75	0.79	74	3.2	10	4	1.9	6	4	1.5	4	2	1.1	4	2
1.1	0.81	74	4.6	10	6	2.6	6	4	2.1	6	4	1.5	4	2
1.5	0.81	74	6.3	16	10	3.6	6	4	2.9	6	4	2.1	6	4
2.2	0.81	78	8.7	20	10	5	10	6	4	10	4	2.9	10	4
3	0.82	80	11.5	25	16	6.6	16	10	5.3	16	6	3.8	10	4
4	0.82	83	14.8	32	16	8.5	20	10	6.8	16	10	4.9	16	6
5.5	0.82	86	19.6	32	25	11.3	25	16	9	20	16	6.5	16	10
7.5	0.82	87	26.4	50	32	15.2	32	16	12.1	25	16	8.8	20	10
11	0.84	87	38	80	40	21.7	40	25	17.4	32	20	12.6	25	16
15	0.84	88	51	100	63	29.3	63	32	23.4	50	25	17	32	20
18.5	0.84	88	63	125	80	36	63	40	28.9	50	32	20.9	32	25
22	0.84	92	71	125	80	41	80	50	33	63	32	23.8	50	25
30	0.85	92	96	200	100	55	100	63	44	80	50	32	63	32
37	0.86	92	117	200	125	68	125	80	54	100	63	39	80	50
45	0.86	93	141	250	160	81	160	100	65	125	80	47	80	63
55	0.86	93	173	250	200	99	200	125	79	160	80	58	100	63
75	0.86	94	233	315	250	134	200	160	107	200	125	78	160	100
90	0.86	94	279	400	315	161	250	200	129	200	160	93	160	100
110	0.86	94	342	500	400	196	315	200	157	250	160	114	200	125
132	0.87	95	401	630	500	231	400	250	184	250	200	134	250	160
160	0.87	95	486	630	630	279	400	315	224	315	250	162	250	200
200	0.87	95	607	800	630	349	500	400	279	400	315	202	315	250
250	0.87	95	-	-	-	437	630	500	349	500	400	253	400	315
315	0.87	96	-	-	-	544	800	630	436	630	500	316	500	400
400	0.88	96	-	-	-	683	1000	800	547	800	630	396	630	400
450	0.88	96	-	-	-	769	1000	800	615	800	630	446	630	630
500	0.88	97	-	-	-	-	-	-	-	-	-	491	630	630
560	0.88	97	-	-	-	-	-	-	-	-	-	550	800	630
630	0.88	97	-	-	-	-	-	-	-	-	-	618	800	630

Notes

The rated motor currents apply to normal, internally-ventilated and enclosed fan-cooled three-phase motors at 1500rpm.

D.O.L. starting: Maximum starting current 6 x rated motor current. Maximum starting time 5 seconds.

Y/Δ starting: Maximum starting current 2 x rated motor current. Maximum starting time 15 seconds. Set the overload relay in the phase lead to 0.58 x rated motor current.

Rated fuse currents for Y/Δ starting also apply to three-phase motors with slip-ring rotors.

Use a larger fuse if the rated current or starting current is higher and/so if the starting time is longer.

The table applies to "slow" or "gI" fuses (VDE 0636)

LV h.b.c. fuses with aM characteristics, select fuse size to match rated current

Technical specifications

General

Standard	IEC/EN 60947, VDE0660, UL, CSA
Lifespan, mechanical AC operated	10 x 10 ⁶
Lifespan, mechanical DC operated	10 x 10 ⁶
Ambient Temperature (open) (°C)	-25 / 60
Rated impulse withstand voltage U _{imp} (VAC)	8000
Rated insulation voltage U _i (VAC)	690
Rated Operation Voltage U _e (VAC)	690

Operating characteristics

Starting	From rest
Stopping	After attaining full running speed

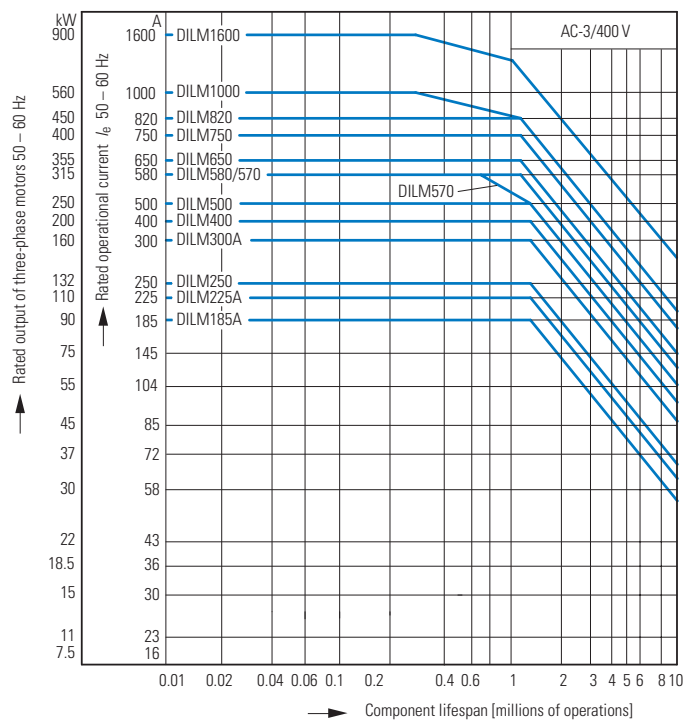
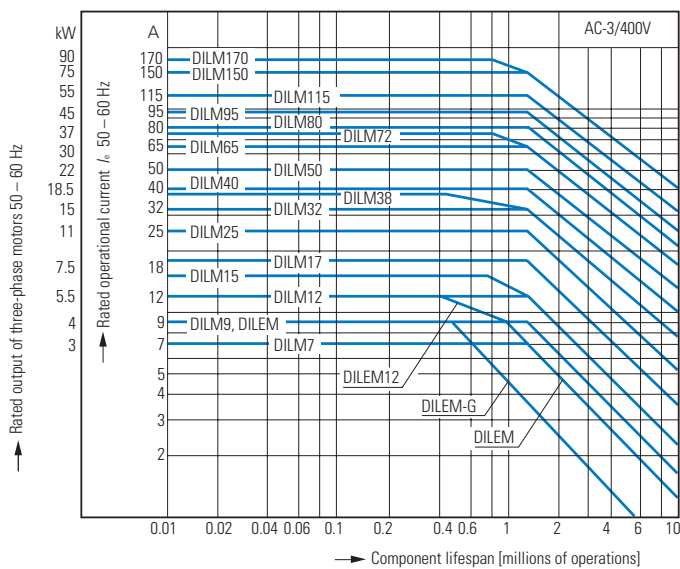
Electrical characteristics

Make	Up to 6 x rated motor current
Break	Up to 1 x rated motor current
Utilization category	100% AC-3

Typical applications

- Pumps
- Escalators
- Mixers
- Fans
- Conveyor belts
- Agitators
- Valves
- Bucket elevators
- Air conditioning systems

Normal switching duty

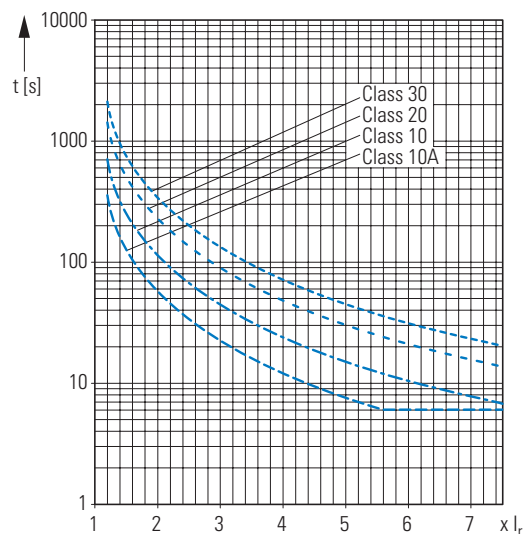
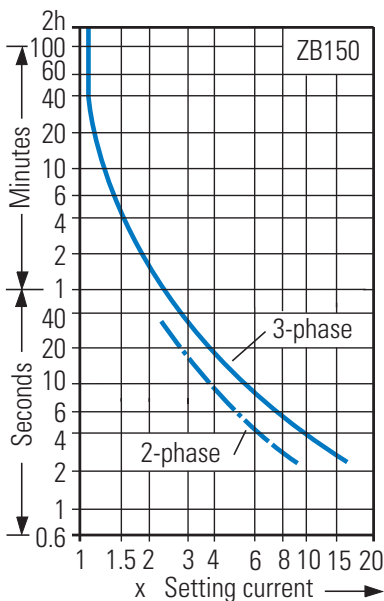
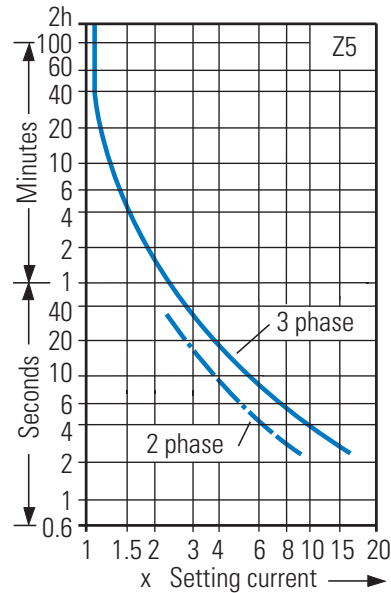
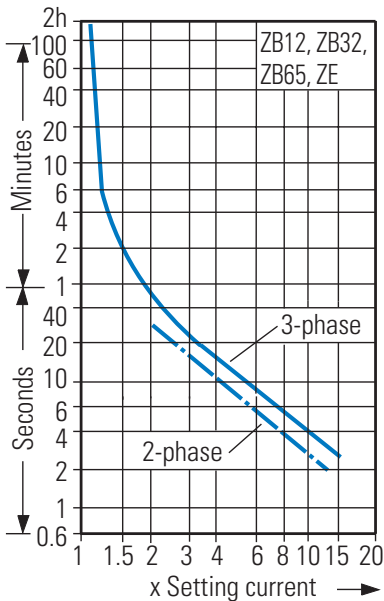


Overload relays

Technical specifications	ZE	ZB12, ZB32	ZB65	ZB150(KK)	ZEB	C441
General						
Standard	IEC/EN 60947, VDE0660, UL, CSA					
Climatic proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30					
Ambient temperature (open) (°C)	-25 / 50	-25 / 50	-25 / 50	-25 / 50	-25 / 65	-25 / 50
Rated impulse withstand voltage (VAC)	6000	6000	6000	8000	6000	6000
Rated insulation voltage (VAC)	690	690	690	1000	690	600(three-phase voltage)
Rated Operation Voltage (VAC)	690	690	690	1000	690	240/480/600
Suitable for protection of EEx e-motors	Yes	Yes	Yes	Yes	Yes	Yes
Phase-failure sensitivity	Yes	Yes	Yes	Yes	Yes	Yes

Tripping characteristics

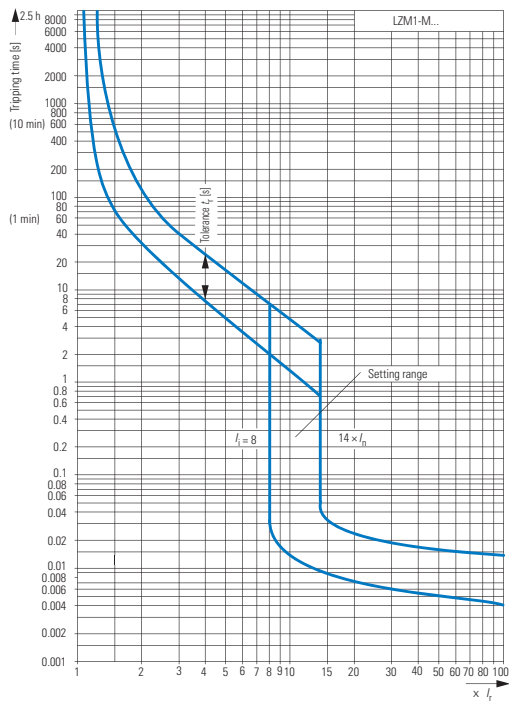
These tripping characteristics are mean values of the spread at 20 C ambient temperature in a cold state. Tripping time depends on the response current. With devices at operating temperature, the tripping time of the overload relay reduce to approximately 25% of the read value.



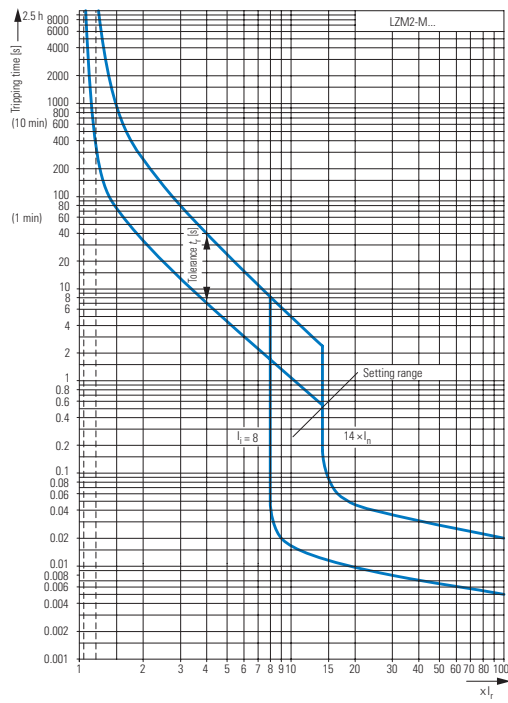
LZM MCCB for motor operation

Technical specifications	LZMB1	LZMB2	LZMN3	LZMN4
General				
Standard	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947
Ambient temperature (open) (°C)	-25 / 70	-25 / 70	-25 / 70	-25 / 70
Rated Operational Voltage (VAC)	690	690	690	690
Rated short-circuit breaking capacity $I_{cu}=I_{cs}$ (KA)	25	25	50	50
Electrical Life Span AC-3 at 400/415VAC (Operations)	7500	6500	2000	2000
Mechanical Life Span (Operations)	20000	20000	15000	10000
Total opening delay on short-circuit (ms)	<10	<10	<10	<25

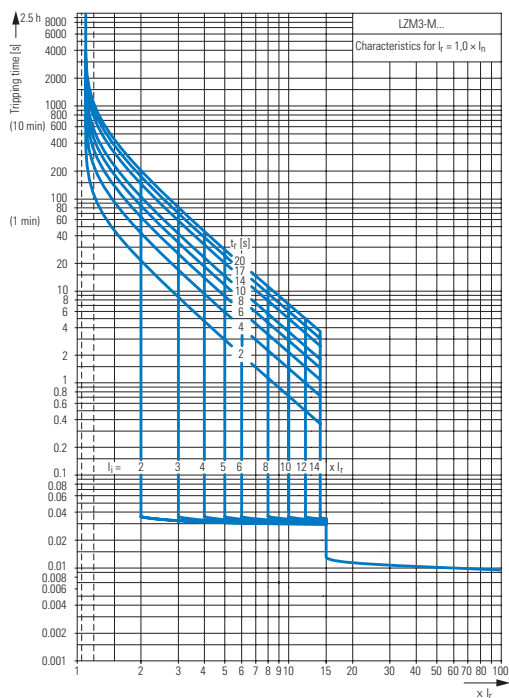
Motor protection with LZM1



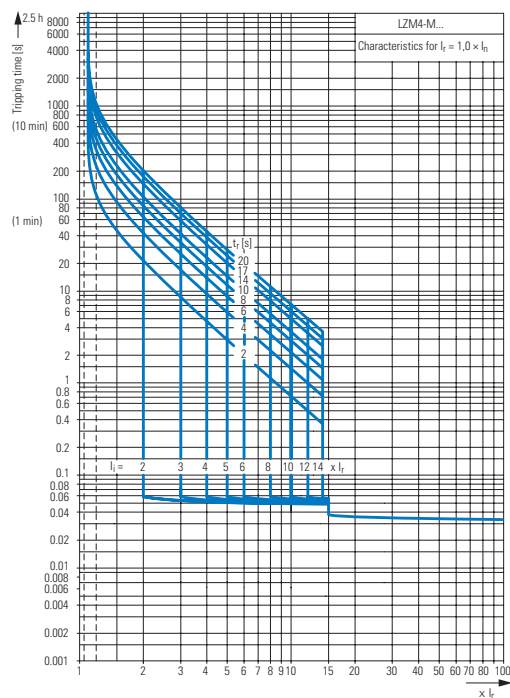
Motor protection with LZM2



Motor protection with LZM3



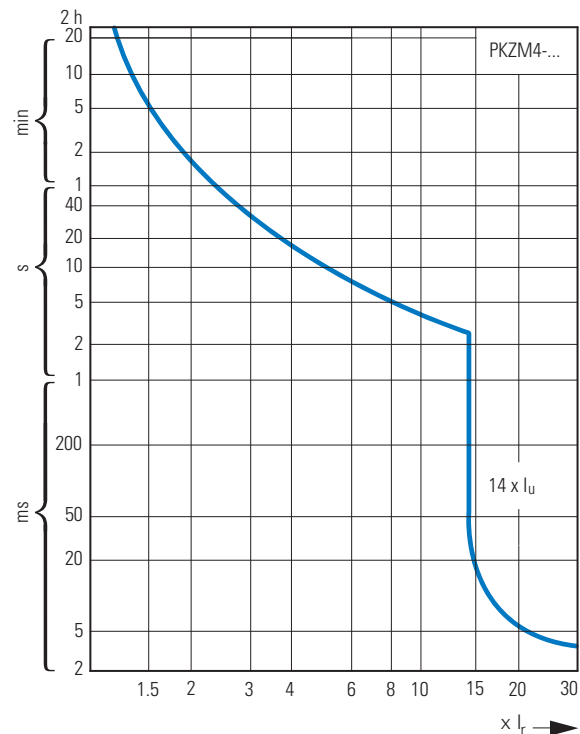
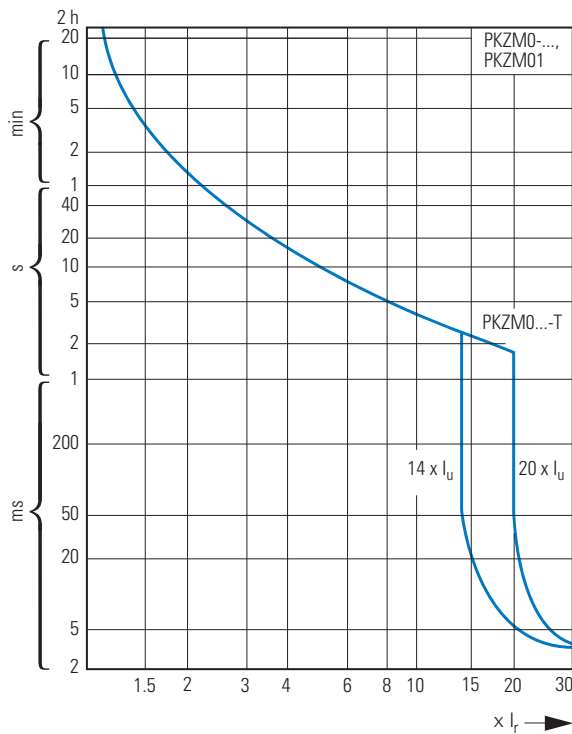
Motor protection with LZM4



PKZM0 & PKZM4 Motor-protective circuit breakers

Technical specifications	PKZM0	PKZM4
General		
Standard	IEC/EN 60947, VDE0660, UL508, CSA C22.2 No.14	
Ambient temperature (Open) (°C)	-25 / 50	-25 / 50
Degree of protection	Front	Front
Rated operation voltage U_e	IP20	IP20
Rated conditional short-circuit current I_q (VAC)	690	690
Single-phasing sensitivity to IEC947-4-1	Yes	Yes
Switching capacity (KA)	150 / 50	50
Electrical Life span (AC-3 at 400VAC) (Operations)	100,000	30,000
Mechanical life span (Operations)	100,000	30,000

Motor-protective circuit-breaker tripping characteristic for PKZM0 & PKZM4



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