

447-742 to 808

Energy Control Motor-Protective Circuit-Breakers

Standard pack: 1

1	2	3	4	5	6	7	8	9
Rated un-interrupted current I_u			Type Article no	Price	Max. AC-3 rating 220 V 380 V 440 V 500 V 660 V 690 V 230 V 400 V 240 V 415 V	Rated uninter-rupted current I_u	Overload release setting range I_r	Short-circuit release setting range I_m
A			For additional actuating voltages Page 35/075		kW kW kW kW kW	A	A	A

Basic units, 3-pole

40



PKZ 2
026606

40

Emergency-stop switch
Red handle on yellow background



PKZ 2-RT
036966

Lockable in Off position using up to three pad-locks (hasp thickness 4-6 mm)

SUVA approved

40

PKZ 2 basic unit
with S-PKZ 2 high-capacity contact module fitted (1 M, 1 B)
Supplied mounted on C-PKZ 2 clip plate



PKZ 2/S
(230 V 50 HZ)
063572

Motor-protective trip blocks, 3-pole

With overload release

0.09	0.12	0.18	0.25	0.25	0.6	0.4-0.6	5-8
0.18	0.25	0.25	0.37	0.55	1	0.6-1	8-14
0.25	0.55	0.55	0.8	1.1	1.6	1-1.6	14-22
0.55	0.8	1.1	1.1	1.5	2.4	1.6-2.4	20-35
0.8	1.5	1.5	2.2	3	4	2.4-4	35-55
1.5	2.5	3	3	4	6	4-6	50-80
2.5	4	5	5.5	7.5	10	6-10	80-140
4	7.5	9	10	13.5	16	10-16	130-200
7.5	12.5	12.5	15	22	25	16-25	200-300
7.5	15	17.5	22	22	32	24-32	275-400
11	20	22	24	27	40	32-40	350-500

With overload release, with Hand/Auto position

0.09	0.12	0.18	0.25	0.25	0.6	0.4-0.6	5-8
0.18	0.25	0.25	0.37	0.55	1	0.6-1	8-14
0.25	0.55	0.55	0.8	1.1	1.6	1-1.6	14-22
0.55	0.8	1.1	1.1	1.5	2.4	1.6-2.4	20-35
0.8	1.5	1.5	2.2	3	4	2.4-4	35-55
1.5	2.5	3	3	4	6	4-6	50-80
2.5	4	5	5.5	7.5	10	6-10	80-140
4	7.5	9	10	13.5	16	10-16	130-200
7.5	12.5	12.5	15	22	25	16-25	200-300
7.5	15	17.5	22	22	32	24-32	275-400
11	20	22	24	27	40	32-40	350-500

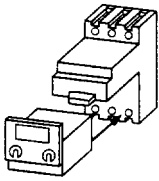
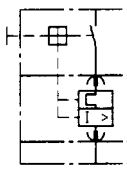
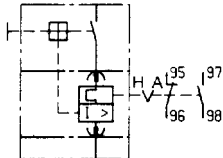
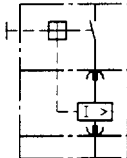
Without overload relay function

0.6	5-8
1	8-14
1.6	14-22
2.4	20-35
4	35-55
6	50-80
10	80-140
16	130-200
25	200-300
32	275-400
40	350-500

PKZ 2 System Motor Protection Modules

d pack. 1 off

Standard pack: 1 off

9	10	11	12	13	14
Short-circuit release setting range  A	Type Article no.	Price	Application notes	Combinations	Page
5-8	 ZM-0,6-PKZ 2 024232		Suitable for the protection of EEx e motors PTB Certificate No. 3.53/388.299		35/008
8-14	ZM-1-PKZ 2 028979		Single-phasing sensitivity to IEC 947-4		35/012
14-22	ZM-1,6-PKZ 2 031352		Overload release, adjustable $I_r = 0.6 - 1.0 \times I_n$		35/016
20-35	ZM-2,4-PKZ 2 033725		Short-circuit release, adjustable $I_m = 8.5 - 14 \times I_n$ factory-set to $12 \times I_n$		35/018
35-55	ZM-4-PKZ 2 036098			Accessories 35/064	
50-80	ZM-6-PKZ 2 038471			Circuit for ZM... PKZ 2	
80-140	ZM-10-PKZ 2 040844				PKZ 2
130-220	ZM-16-PKZ 2 043217				35/030
200-350	ZM-25-PKZ 2 045590				
275-425	ZM-32-PKZ 2 047963				
350-500	ZM-40-PKZ 2 050336				
5-8	 ZMR-0,6-PKZ 2 033943		Single-phasing sensitivity and overload/ short-circuit release settings, see above		35/034
8-14	ZMR-1-PKZ 2 033950		Suitable for the protection of EEx e motors PTB Certificate No. 3.53/388.299 (Appendix 1)		35/038
14-22	ZMR-1,6-PKZ 2 033952		When using motor-protective trip blocks with an overload relay function, the switch does not trip in the event of an overload; instead, a break contact (95/96) is actuated which de-energizes the contactor in the control circuit (suitable for switching contactors ≤ 18.5 kW AC-3).	H Δ HAND position A Δ AUTO position	35/044
20-35	ZMR-2,4-PKZ 2 033955		Simultaneously, a make contact (97/98) is actuated which ensures remote indication. Break and make contacts are suitable for carrying two different potentials. In AUTO operating mode, make and break contacts automatically return to the rest position when the bimetals have cooled. The contactor can be energized again by actuating a push-button, for instance.	In EEx e applications the break contact 95/96 must always be used to de-energize the contact module or contactor	35/050
35-55	ZMR-4-PKZ 2 033957			ZMR...-PKZ 2 motor-protective trip blocks cannot be combined with U/A voltage releases or RE/RS remote operators.	
50-80	ZMR-6-PKZ 2 033966				
80-140	ZMR-10-PKZ 2 033967				
130-220	ZMR-16-PKZ 2 033968				
200-350	ZMR-25-PKZ 2 033969				
275-425	ZMR-32-PKZ 2 033973				
350-500	ZMR-40-PKZ 2 033975				
5-8	 M-0,6-PKZ 2 004537		In HAND operating mode, an acknowledgment must be made on the device locally in order to return the contacts to the rest position.		PKZM 1
8-14	M-1-PKZ 2 004538				35/058
14-22	M-1,6-PKZ2 004539				35/060
20-35	M-2,4-PKZ 2 004540		Short-circuit release, adjustable $I_m = 8.5 - 14 \times I_n$ factory-set to $12 \times I_n$	M... PKZ 2	
35-55	M-4-PKZ 2 004541				35/068
50-80	M-6-PKZ 2 004542				35/080
80-140	M-10-PKZ 2 004543				
130-220	M-16-PKZ 2 004544				
200-350	M-25-PKZ 2 004545				
275-425	M-32-PKZ 2 004546				
350-500	M-40-PKZ 2 004547				

Energy Control Motor-Protective Circuit-Breakers

Normal switching duty

For squirrel-cage motors

Operating characteristics: Starting: from rest after attaining full running speed
Stopping:

Typical applications: Compressors Lifts Mixers
Pumps Escalators Agitators
Fans Conveyors Centrifuges
Valves Bucket-elevators Air-conditioning systems
Drives in general for manufacturing and processing machines

Electrical characteristics: Make: up to 6 × rated motor current
Break: 1 × rated motor current

Utilization category: 99.9% AC-3 + 0.1% AC-4

Extreme switching duty

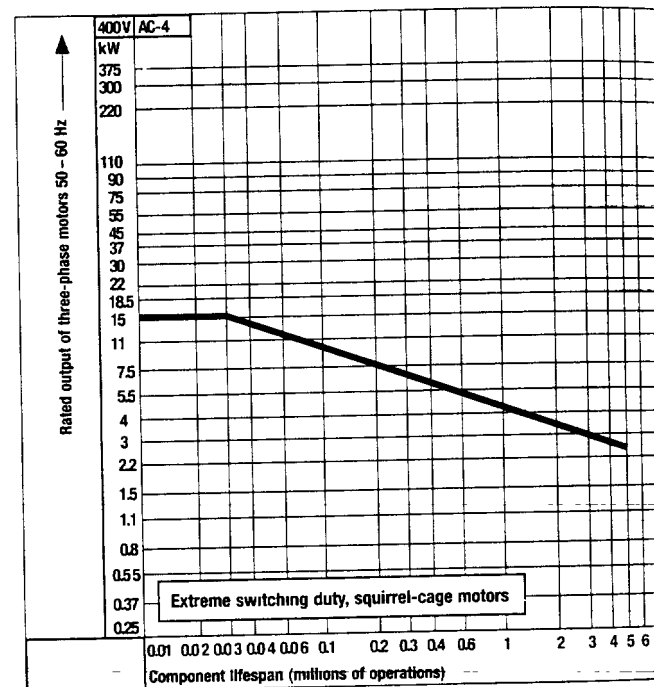
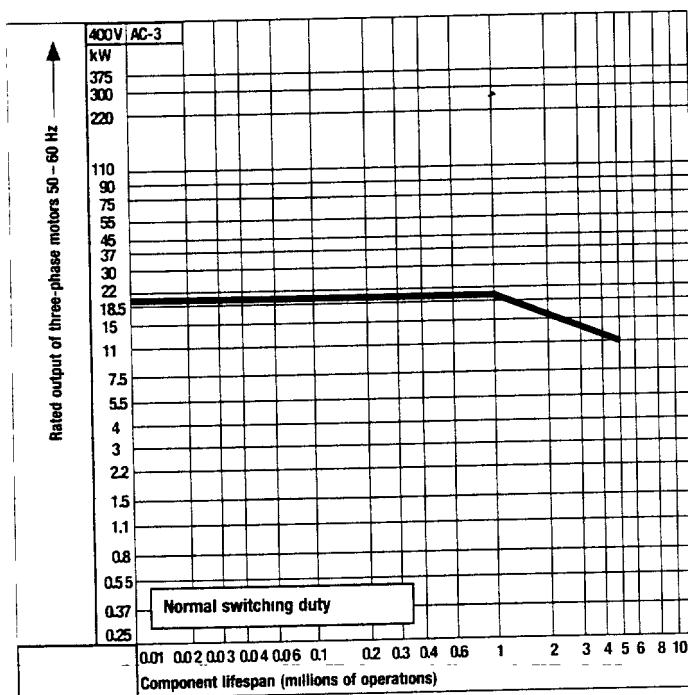
For squirrel-cage motors

Operating characteristics: Inching, plugging, reversing

Typical applications: Printing machines
Wire-drawing machines
Centrifuges
Special drives for manufacturing and processing machines

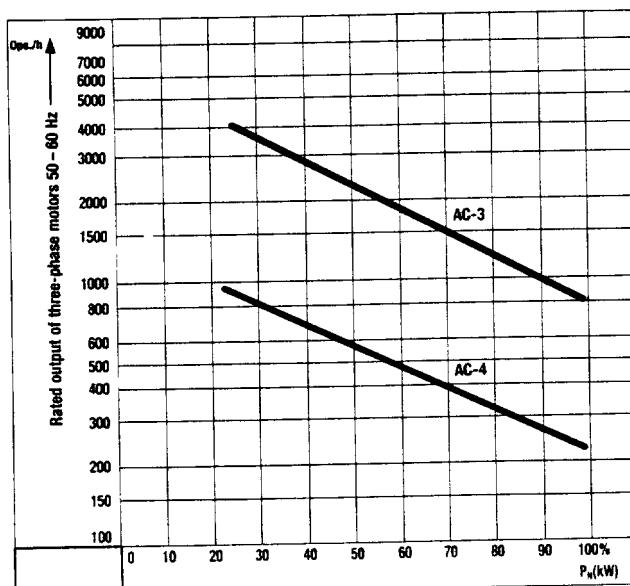
Electrical characteristics: Make: 6 × rated motor current
Break: 6 × rated motor current

Utilization category: 100% AC-4

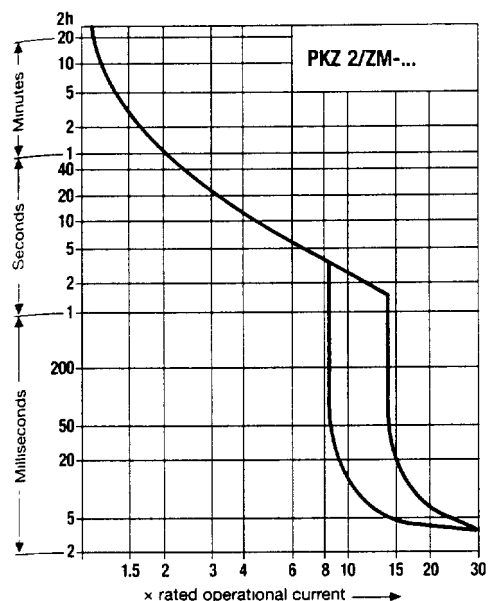


Determination of the maximum number of operations per hour dependent on the switching capacity (approximate values)

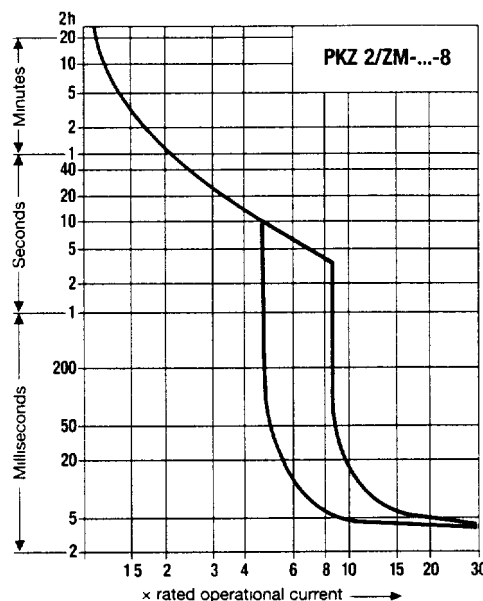
P_N = Max. motor rating (kW)
Ops./h = Max. operating frequency per hour



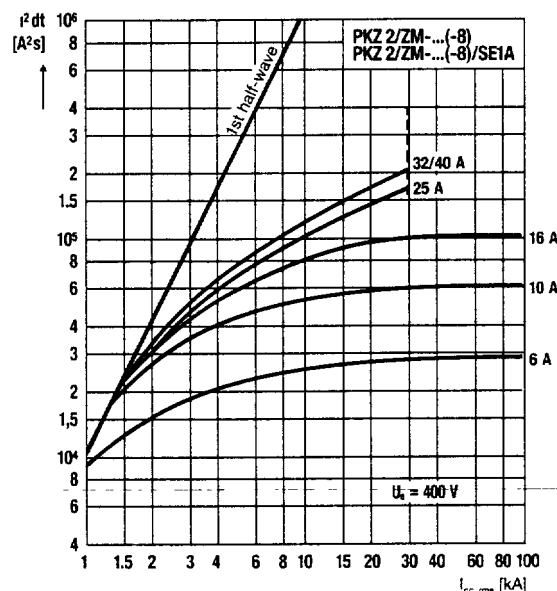
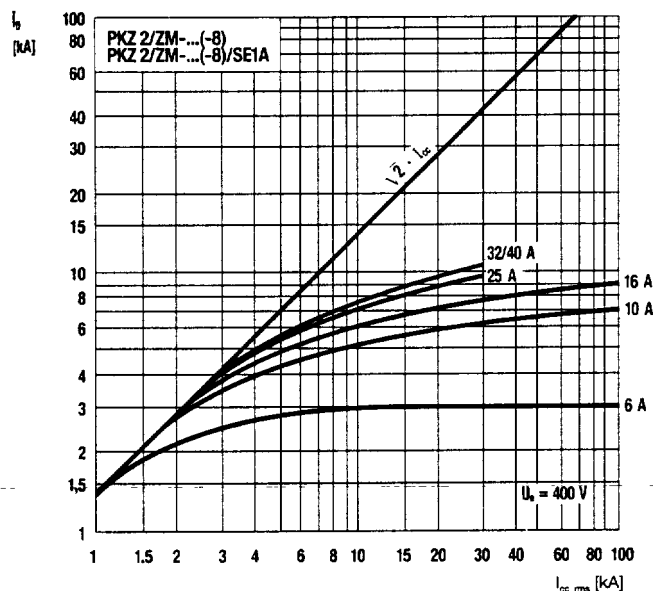
Tripping characteristics, motor protection



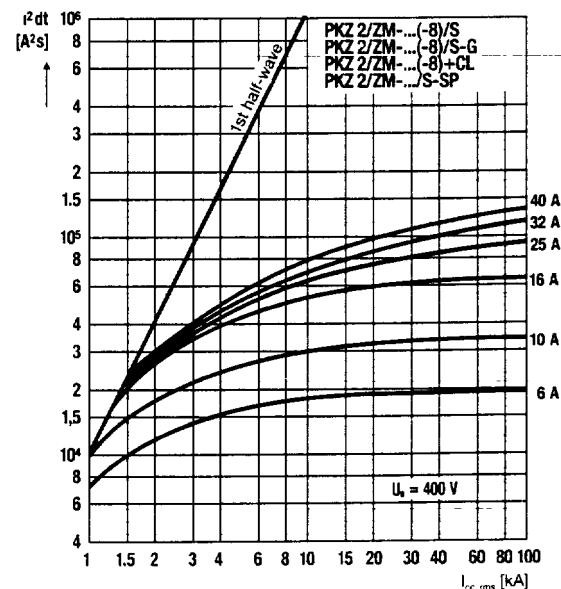
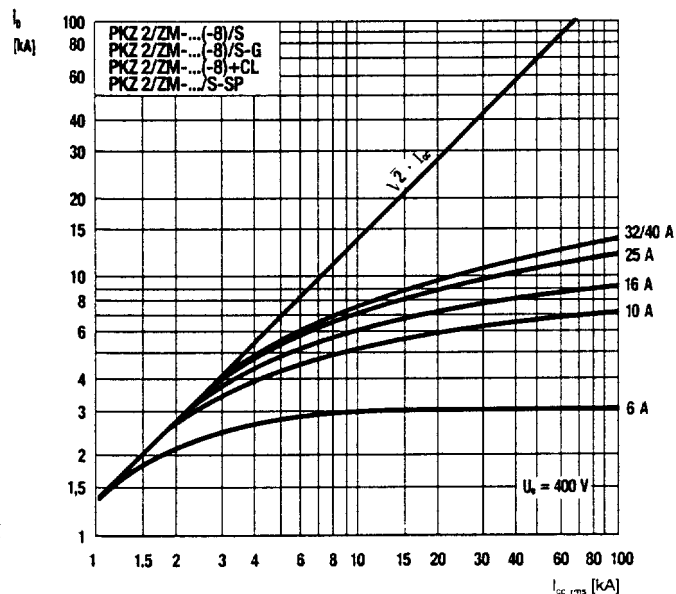
Tripping characteristics, cable and conductor protection



Let-through characteristics, circuit-breakers, compact starters



Let-through characteristics, high-capacity compact starter and circuit-breaker + CL current limiter



35/088

PKZ 2 System Technical Data

Main contacts

Rated impulse withstand voltage U_{imp}	V
Overvoltage category/pollution degree	
Rated operational voltage U_o	V~
Rated uninterrupted current I_u = rated operational current I_o	A
Frequency	Hz
Number of poles	
Mechanical shock resistance (shock duration 20 ms) IEC 68-2-27	g

Current heat losses	3-pole at operational temperature	W
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Mechanical lifespan	Operations
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Electrical lifespan	AC-3	Operations
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	AC-4	Operations
--	------	------------

Max operating frequency	Ops./hour
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Operating times under short-circuit conditions	
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Minimum command time	Approx. ms
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Opening delay	Approx. ms
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Total opening time	Approx. ms
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Starter combination, type 2 coordination

Motor switching capacity AC-3	V~
DC-5	V-
	A-

D.C. application.

Rated short-circuit breaking capacity I_{cn} (250 V DC) L/R = 15 ms	kA
I_{cn} (125 V DC)	kA

Trip blocks

Temperature compensation	°C
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Temperature compensation residual error	%/K
---	-----

Inherently short-circuit-proof range	
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Short-circuit release tolerance	%
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ZM- -PKZ 2, ZMR- -PKZ 2 motor-protective trip blocks

Adjustable overload releases

Adjustable short-circuit releases

Single-phasing sensitivity

ZM-...-8-PKZ 2 trip block for distribution circuit protection

Adjustable overload releases

Adjustable short-circuit releases

SE 1A...-PKZ 2, contact module

S-PKZ 2 high-capacity contact module

For differentiating feature, see Page 35/045, column 10

For different rated short-circuit breaking capacity in
combination with circuit-breaker, see Page 35/088

Rated coil voltage 50/60 Hz	V~
-----------------------------	----

Operating range a.c.

Power consumption a.c.	VA
------------------------	----

Duty factor	%
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Operating times Closing delay	ms
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Opening delay	ms
---------------	----

Rated making capacity $\cos \varphi = 0.45$	A
---	---

Rated breaking capacity $\cos \varphi = 0.45$	A
---	---

AC-1 duty	A
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Conventional free air thermal current $I_{th} = I_o$

Open, enclosed

16 2/3 - 400 Hz

AC-3/4 duty, 50 - 60 Hz

Rated operational current I_o

Open, enclosed	230 V~	A
	400 V~	A
	440 V~	A
	500 V~	A
	690 V~	A

Dual-frequency coil 50/60 Hz

Mechanical lifespan reduced by 30 %

Irrespective of direction of current flow

6000

III/3

690

40

50 - 60

3, 4

Circuit-breaker: 30

Compact starter: 8

High-capacity compact starter: 8

Circuit-breaker: 14

Compact starter: 23

High-capacity compact starter: 23

Circuit-breaker: 0.1 x 10⁶

Contact module 5 x 10⁶

High-capacity compact starter 5 x 10⁶

Circuit-breaker: 0.05 x 10⁶

Contact module: 1 x 10⁶ 20 kW

High-capacity compact starter: 1 x 10⁶ 20 kW

Contact module: 0.03 x 10⁶ 15 kW

High-capacity compact starter: 0.03 x 10⁶ 15 kW

Circuit-breaker: 60

Contact module characteristic,
Page 35/087

High-capacity compact starter:
characteristic, Page 35/087

PKZ 2/ZM-...(-8)/S

PKZ 2/ZM-...(-8)

2

0.5

6

400 V 100 kA

IEC 947, EN 60 947,
DIN VDE 0660 Part 102

Max. 690

Max. 250

Max. 40

PKZ 2/ZM- (+8)

PKZ 2/ZM-... (+8)/S(+CL)

30

50

50

65

- 5 ... + 40

0.25

Up to 16 A at 400 V~

±20

0.6 - 1.0 x I_u

8.5 - 14 x I_u

IEC 947-4, DIN VDE 0660 Part 102

0.6 - 1.0 x I_u

5 - 8.5 x I_u

24 - 500

Pick-up 0.85 - 1.1 x U_s

Drop-out 0.4 - 0.6 x U_s

Pick-up ≤ 190

Seal ≤ 13

100

9 - 30

4 - 12

400

400

40

AC-3 | AC-4

40

30

40

30

40

30

40

28

40

25

PKZ 0



35/008



35/012



35/016



35/018

PKZ 2



35/030



35/034



35/038



35/044



35/050

PKZM 1



35/058



35/060



35/068



35/080



35/096

Energy Control Motor-Protective Circuit-Breakers

SE 1A-G-10-PKZ 2 contact module
S-G-PKZ 2 high-capacity contact module
 For differentiating feature, see Page 35/045 column 2

		S-G-PKZ 2 (24 V DC) SE1A-G-10-PKZ 2 (24 V DC)	S-G-PKZ 2 (48 V DC) SE1A-G-10-PKZ 2 (48 V DC)
Rated coil voltage DC	V~	24	48
Pick-up	VA	150	150
Pick-up current	A	6.3 (16 - 22 ms)	3.3 (16 - 22 ms)
Sealing	W	2.7	2.8
Sealing current	mA	113	60
Auxiliary contacts			
Rated impulse withstand voltage U_{imp}	V	6000	
Overvoltage category/pollution degree		III/3	
Rated operational voltage U_o	V~	500	
Conventional free air thermal current I_{th}	A	6	
Rated operational current I_o AC-15 230/240-400/415-440/500 V 50 Hz			
NHI 11-PKZ 2	A	6 - 3 - 1.5	
NHI 11S-PKZ 2			
NHI 2-11S-PKZ 2			
HI 11S/EZ-PKZ 2			
NHI 22-PKZ 2	A	6 - 1.5 - 1.5	
NHI 22S-PKZ 2			
HI 11-S-PKZ 2			
HI 20-S-PKZ 2			
AGM 2-11-PKZ 2	A	5 - 3 - 1.5	
ZMR-...PKZ2 95-96	A	1.5 - 0.7 - 0.5	
97-98	A	1.5 - 0.5 - 0.3	
ZMR-...PKZ 2 DC-13 24-60-110-220 V L/R ≤ 200 ms	A	1-0.8-0.7-0.3	
Lifespan	mechanical	Operations	NHI., NHI. S: 100000; AGM: 10000 NHI 2-11S, HI 11-S/EZ, HI...S: 5×10^6 ZMR-...: 10000
	electrical	Operations	NHI..., NHI. S: 50000; AGM: 5000 NHI 2-11S, HI 11-S/EZ, HI...S: 1×10^6 ZMR-...: 5000
Control by programmable controller		Control circuit reliability throughout entire mechanical lifespan Rated values $U_{imp} = 24$ V DC $I = 10$ mA, Voltage range to DIN 19 240	
Short-circuit rating without welding: Fuseless		With PKZM 1-6 : 240 V PKZM 1-4 : 415 V PKZM 1-1.6 : 500 V	
Fuse (gL)	A	10	
Terminal capacities 1 conductor or 2 conductors solid and flexible with ferrule	Max./min. mm ² Max./min. AWG	2.5/0.5 14/22	
Test gauge to EN 50 027		A2	

/ DC)
: 2

RE-PKZ 2 and RS-PKZ 2 remote operators

Rated impulse withstand voltage U_{imp}	V	6000
Overvoltage category/pollution degree	III/3	
Rated operational voltage U_s AC (50/60 Hz), DC	V~/V-	24 - 240
U_s AC (50/60 Hz)	V~	380 - 440
Required short-time rating	VA/W	700 30 ms
AC/DC		
Control transformer short-time rating	VA	1000 → STI 0,4 (primary/secondary voltage)
Short-circuit voltage	%	3 9
		see Page 42/004
Make time	ms	≤ 30
Break time	ms	≤ 30
Reset time to Off	ms	≤ 30
Operating frequency	Ops./h	60
Operating range a.c.		0 85 - 1 1 × U_s
d.c.		0 85 - 1 × U_s
Lifespan, electrical	Operations	50 000
Integral auxiliary contacts Hand/Auto 33/34		
Conventional free air thermal current I_m	A	1 5
Rated operational current I_s		
AC-14 230/240 400/415 440 V 50 Hz	A	1 5 - 1 - 0 5

Terminal capacities

1 conductor or 2 conductors		
solid and flexible with ferrule	Max./min. mm ²	2 5/0 5
	Max./min. AWG	22/14

RE-PKZ 2: Power section and control section separate, but with same potential (5 terminals) (see Page 35/042)
Upon actuation the **power section** is supplied directly from the mains system (**700 VA/W 30 ms**)
Control section can be operated by:

Control power consumption of RE-PKZ 2: VA/W

RS-PKZ 2: Power section and control section (always 24 V DC) galvanically isolated from each other (5 terminals) (see Page 35/042)
Upon actuation the **power section** is supplied directly from the mains system (**700 VA/W 30 ms**)
Control section can be operated by:

Control power consumption of RS-PKZ 2: W

Voltage releases

Rated impulse withstand voltage U_{imp}	V	6000
Overvoltage category/pollution degree	III/3	
Rated operational voltage U_s AC (50/60 Hz)	V~	24 - 600
DC	V-	A-PKZ 2 24 - 250, U-PKZ 2 24 - 125

Terminal capacities

1 conductor or 2 conductors		
solid and flexible with ferrule	Max./min. mm ²	2.5/0.5
	Max./min. AWG	14/22

Shunt releases

Operating range a.c.		0.7 - 1 1 × U_s
d.c.		0.7 - 1.1 × U_s
Power consumption	Pick-up a.c.	5
	Sealing a.c.	3
	Pick-up d.c.	3
	Sealing d.c.	0.3

Undervoltage releases

Drop-out voltage		0.7 - 0 35 × U_s
Power consumption	Pick-up a.c.	5
	Sealing a.c.	3
	Pick-up d.c.	3
	Sealing d.c.	3

Drop-out delay with UVHI-PKZ 2 ms 200

Rated operational current I_s		
AC-15 230 V - 400 V - 440 V		
U-HI 20-PKZ 2	A	6 - 3 - 1 5
UVHI-PKZ 2		

PKZ 0



35/008



35/012



35/016



35/018

PKZ 2



35/030



35/034



35/038



35/044



35/050

cal lifespan

PKZM 1



35/058



35/060



35/068



35/080

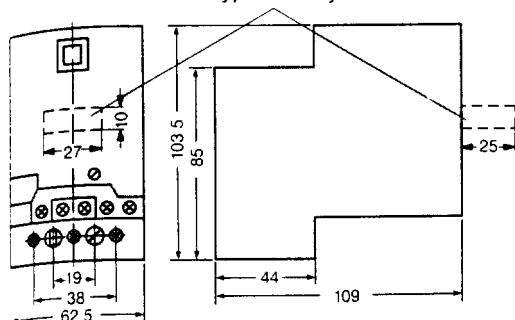


35/096

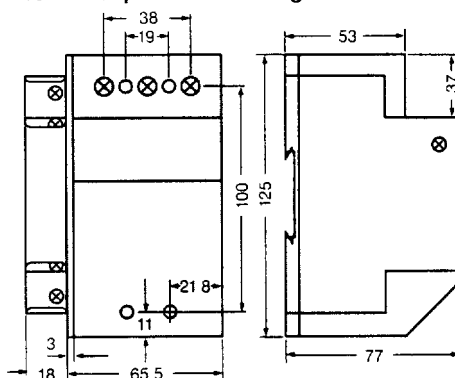
contacts
2

SE1A(-G) contact module/
S(-G) high-capacity contact module/
CL current limiter and DI residual-current relay

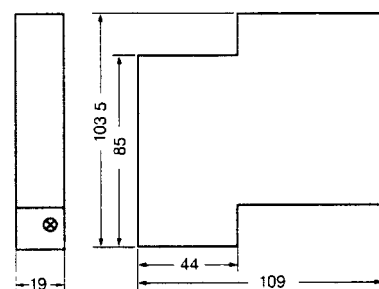
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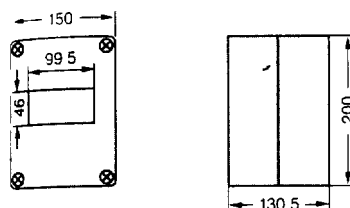
EZ base for separate mounting
HI11-S/EZ standard auxiliary contact
for EZ separate mounting



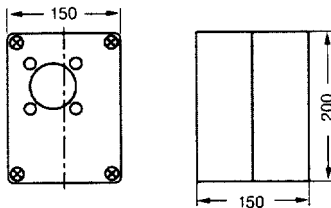
Neutral conductor module for
SE1A(-G) contact module/S(-G) high-
capacity contact module/CL current
limiter and DI residual-current relay



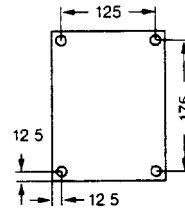
CI enclosure
CI 19 EA IP 40



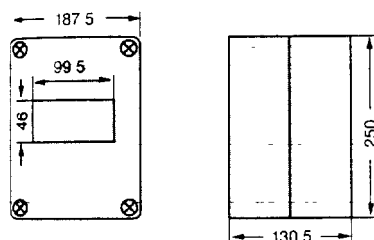
CI 19 EB, CI 19 ED IP 65



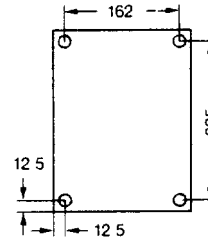
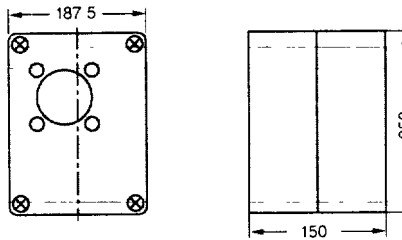
Drilling dimensions



CI 23 EA IP 40

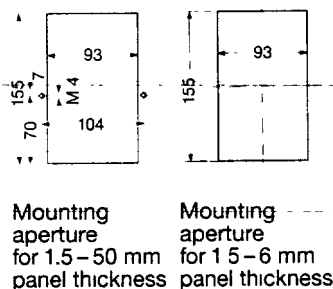
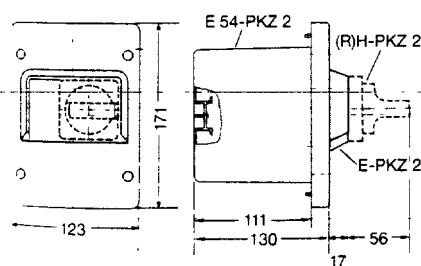


CI 23 EB IP 65



Flush mounting enclosures

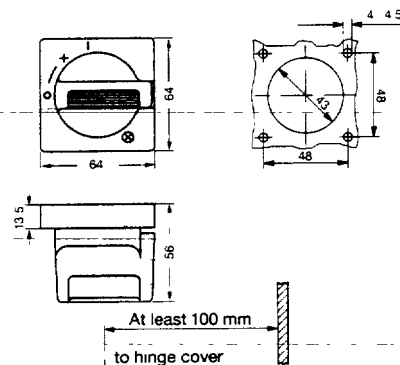
E-PKZ 2 Front IP 41
E 54-PKZ 2 Front IP 54



Mounting
aperture
for 1.5–50 mm
panel thickness

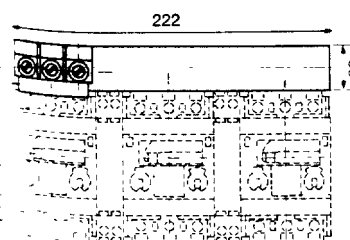
Mounting
aperture
for 1.5–6 mm
panel thickness

Door coupling handle
(R)H-PKZ 2

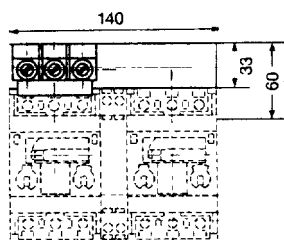


Mounting depth: 133 mm or
171–300 mm from top edge
of mounting rail to the
inside of panel door/cover

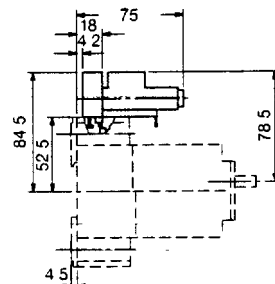
Three-phase commoning link
B 3 1/3 PKZ 2



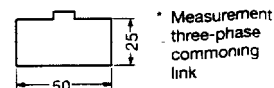
Three-phase commoning link
B 3 1/3 PKZ 2



Terminals
BK 50/3-PKZ 2



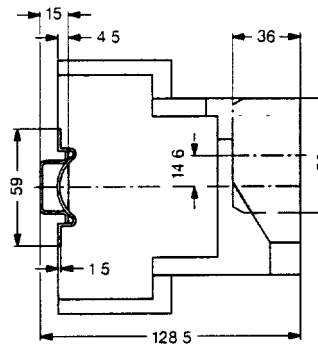
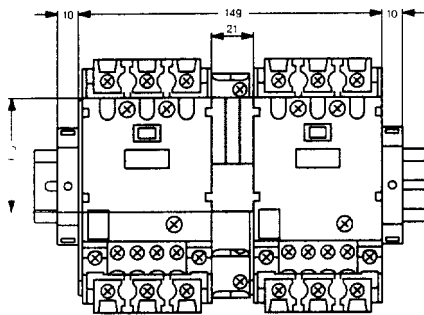
Shroud for unused
terminals
HB 3-PKZ 2



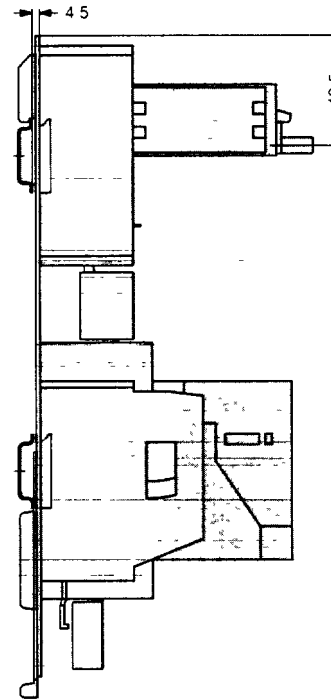
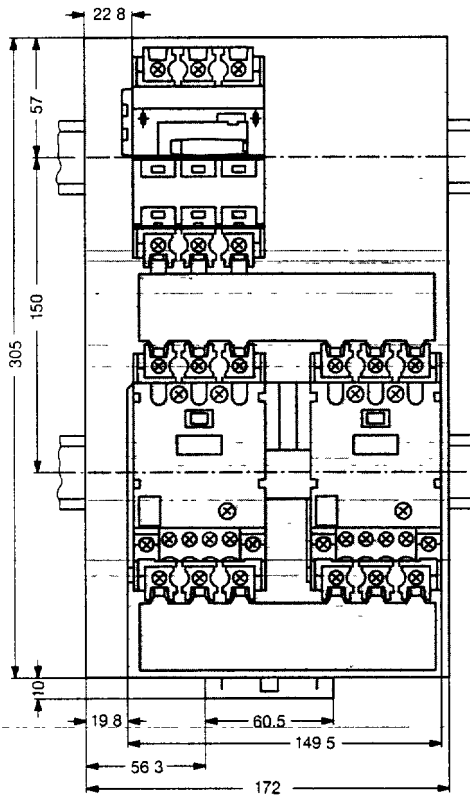
Measurement
three-phase
commoning
link

Energy Control Motor-Protective Circuit-Breakers

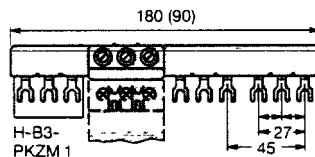
MV-PKZ 2 mechanical interlock for contact module and high-capacity contact module



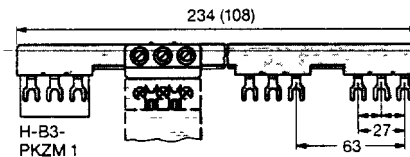
PKZ 2/SW-MV-11 reversing combination
(see Page 36/011)



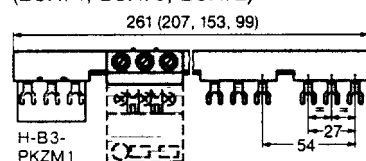
**Three-phase
commoning link**
B3 0/4-PKZ 0
B3.0/2-PKZ 0



**Three-phase
commoning link**
B3 2/4-PKZ 0
B3 2/2-PKZ 0

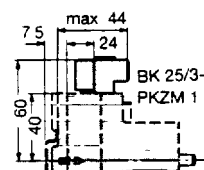


**Three-phase
commoning link**
B3.1/5-PKZM 0
(B3.1/4; B3.1/3; B3.1/2)

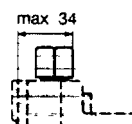


Terminal
BK25/3-PKZM 1

**Shroud for
unused terminals**
H-B3-PKZM 1



Overlapping mounting
to extend three-phase
commoning link



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