Technical Data

Colours of Toggles

Colours of toggles indicate amperage rating of MCBs and RCBOs:
PLSM, PLZM, PLS6, PLZ6, PLS4, PKSM, PKNM and PKDM.

<2 Ampere

Light Grey
RAL 7035

2 Ampere

Light Pink
RAL 3015

4 Ampere

Copper Brown
RAL 8004

6 Ampere

Pure White
RAL 9010

8 Ampere

Pastel Green
RAL 6019

10 Ampere

Silver Grey
RAL 7001

16 Ampere

Distance Blue
RAL 5023

20 Ampere

Traffic Yellow
RAL 1023

25 Ampere

Jet Black
RAL 9005

32 Ampere

Vermilion
RAL 2002

40 Ampere

Signal Orange
RAL 2010

50 Ampere

Turquoise Green
RAL 6016

63 Ampere

Pastel Violet
RAL 4009

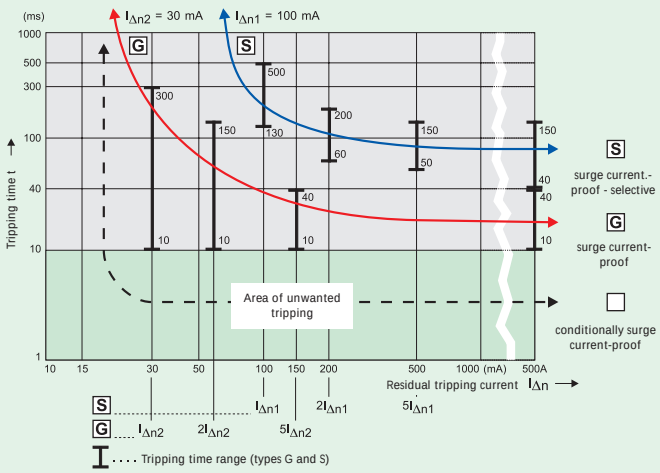
Residual Current Devices - General Data

Short description of the most important RCD types:

Symbol	Description
"umrichterfest"	"Frequency converter-proof", for avoiding unwanted tripping caused by frequency converters, speed-controlled drives, etc.
-25	Moeller standard. Suitable for outdoor installation (distribution boxes for outdoor installation and building sites) up to -25° C.
	Conditionally surge-current proof (>250 A, 8/20 µs) for general application.
G ÖVE E 8601	RCD of type G (min 10 ms time delay) surge current-proof up to 3 kA. For system components where protection against unwanted tripping is compulsory to avoid personal injury and damage to property (§ 12.1.6 of ÖVE/ÖNORM E 8001-1). Also for systems involving long lines and high line capacity. Some 4-pole versions are sensitive to pulsating DC.
S	RCD of type S (selective, min 10 ms time delay) surge current-proof up to 5 kA. Mainly used as main switch according to ÖVE/ÖNORM E 8001-1 § 12.1.5, as well as in combination with surge arresters.This is the only RCD suitable for series connection with other types if the rated tripping current of the downstream RCD does not exceed one third of the rated tripping current of the device of type S. Some 4-pole versions are sensitive to pulsating DC.
	RCD sensitive to pulsating DC for application where residual pulsating DC may occur. Non-selective, instantaneous. Protects only against special forms of residual pulsating DC which have not been smoothed.
max. 63A gG/gL ÜL/OL+KS/SC	O. L. P. Integrated overload protection. Calculating and rating of the back-up temperature fuse to avoid overload on the RCD is not required. Overload fuse = short circuit back-up fuse.
SERVICE T	PRÜFKNOP BETÄTIG Press service key when putting the device into operation, and subsequently approximately once per year. Pressing the key once per month is not required any more and can be omitted unless shorter testing intervals are required under any applicable regulations (e.g. on building sites).

Tripping Characteristics (IEC/EN 61008)

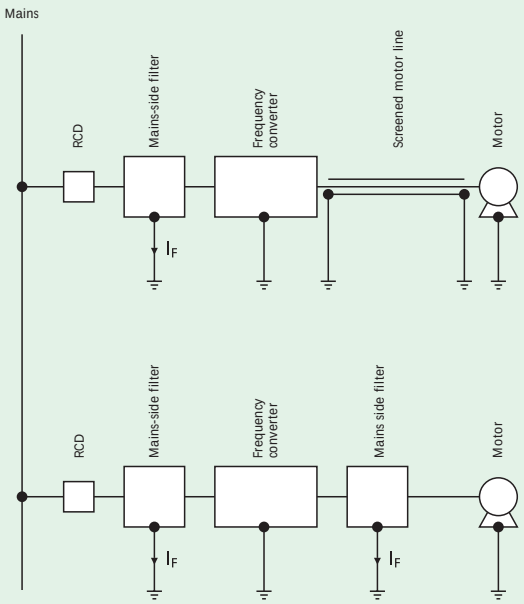
Tripping characteristics, tripping time range and selectivity of instantaneous, surge current-proof "G" and surge current-proof - selective "S" residual current devices.



Series connection of main RCD and circuit RCDs recommended by the installation rules set forth in ÖVE/ÖNORM E 8001-1, is compulsory for agricultural installations according to § 56 of ÖVE-EN1, Part 4.
Residual current devices with tripping delay (types G and S) can be function tested with standard testing instruments which must be adjusted according to the instructions for operation of the respective instrument.
The tripping time determined in this way may be longer than expected due to reasons inherent in the measuring process and in accordance with the information provided by the manufacturer of the measuring instrument.
However, the device is ok if the result of measurement is within the time range specified by the manufacturer of the measuring instrument.

Frequency Converter-Proof RCDs - What for?

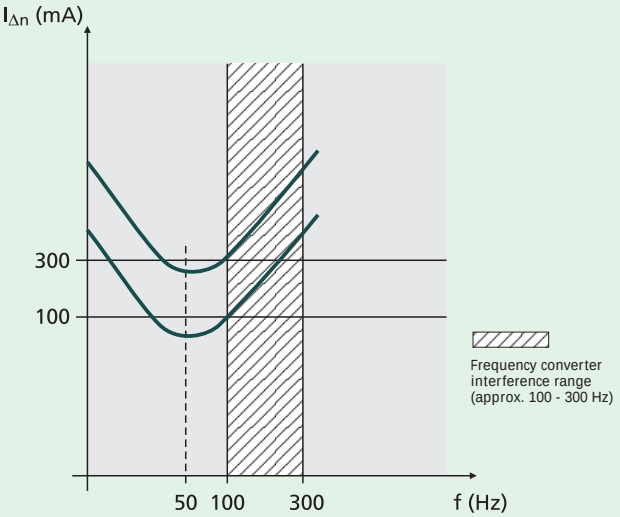
Due to the currents flowing off through the filters (designated IF), the sum of currents through the RCD is not exactly zero, which causes unwanted tripping.



Frequency converters are used in a wide variety of systems and equipment requiring variable speed, such as lifts, escalators, conveyor belts, and large washing machines. Using them for such purposes in circuits with conventional residual current devices causes frequent problems with unwanted tripping.

The technical root cause of this phenomenon is the following: Fast switching operations involving high voltages cause high interference levels which propagate through the lines on the one hand, and in the form of interfering radiation on the other. In order to eliminate this problem, a mains-side filter (also referred to as input filter or EMC-filter) is connected between the RCD and frequency converter. The anti-interference capacitors in the filters produce discharge currents against earth which may cause unwanted tripping of the RCD due to the apparent residual currents. Connecting a filter on the output side between frequency converter and 3-phase AC motor results in the same behaviour.

Tripping characteristic



This sample tripping characteristic of a 100 mA RCD and a 300 mA RCD shows the following: In the frequency range around 50 Hz, the RCDs trip as required (50 - 100 % of the indicated $I_{\Delta n}$).
In the range shown hatched in the diagram, i. e. from approx. 100 to 300 Hz, unwanted tripping occurs frequently due to the use of frequency converters. Frequency converter-proof residual current devices are much less sensitive in this frequency range than in the 50 - 60 Hz range, which leads to an enormous increase in the reliability of systems.

Therefore, we recommend to use frequency converter-proof RCDs

Protective Measures

How can you make sure that the required protective measures are in place when using RCDs and frequency converters in one system?

In Austria, the ÖVE Decision EN 219 is applicable.

Under this standard

- frequency converters must be equipped with current limiting devices in order to ensure disconnection in cause of faults or overload, and
- the installer of a system is obliged to make sure that additional equipotential bonding is provided (additional inclusion of all metal components, such as frequency converters, mains filters, motor filters, etc. into the existing equipotential bonding), in order to ensure that the permissible touch voltage of 50 V AC or 120 V DC is not exceeded. (In ÖVE/ÖNORM E 8001-1 the term "touch voltage" has been omitted. There is only a fault voltage limit of 65 V AC or 120 V DC which must not be exceeded).

In Germany, VDE 0100 is applicable, in Switzerland SEV 1000.

According to the current level of knowledge, protective multiple earthing for fault current/residual current protection together with the residual current devices offered by our company minimises the residual risk for the user.

Residual Current Devices PFIM

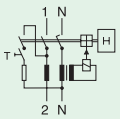
- Residual current devices
- Shape compatible with and suitable for standard busbar connection to other devices of the P-series
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Universal tripping signal switch, also suitable for PLS., PKN., Z-A. can be mounted subsequently
- Auxiliary switch Z-HK can be mounted subsequently
- Contact position indicator red - green (PFIM-4-pole)
- Suitable for being used with standard fluorescent tubes with or without electrical ballast (typically up to 20 units per phase conductor)
- The device functions irrespective of the position of installation
- Tripping is line voltage-independent. Consequently, the RCD is suitable for "fault current/residual current protection" and "additional protection" within the the meaning of the applicable installation rules
- Mains connection at either side
- Types with 80 A permissible short-circuit back-up fuse (PFIM-80): Take into account overload protection
- The 4-pole device can also be used for 3-pole connection. For this purpose use terminals 1-2, 3-4, and 5-6.
- The 4-pole device can also be used for 2-pole connection. For this purpose use terminals 1-2 and 5-6.
- The test key "T" must be pressed every month. The system operator must be be informed of this obligation and his responsibility in a way that can be proven (self-adhesive RCD-label enclosed)
- Pressing the test key "T" serves the only purpose of function testing the residual current device (RCD). This test does not make earthing resistance measurement (R_E), or proper checking of the earth conductor condition redundant, which must be performed separately.
- **Type -A**: Protects against special forms of residual pulsating DC which have have not been smoothed
- **Type -G**: High reliability against unwanted tripping. Compulsory for any circuit where personal injury or damage to property may occur in case of unwanted tripping (ÖVE/ÖNORM E 8001-1 § 12.1.6).
  Special types for X-ray application PFIM-...-R
- **Type -G/A:** Additionally protects against special forms of residual pulsating pulsating DC which have not been smoothed
- **Type -S**: Selective residual current device, either sensitive to AC, type -S, or sensitive to pulsating DC, type -S/A, for protection against special forms of residual pulsating DC which have not been smoothed. Compulsory for systems with surge arresters downstream of the RCD (ÖVE/ÖNORM E 8001-1 § 12.1.5).
- **Type -U**: Suitable for speed-controlled drives with frequency converters in household, trade, and industry.
  Unwanted tripping is avoided thanks to a tripping characteristic designed particularly for frequency converters.
  See also explanation "Frequency Converter-Proof RCDs - What for?"
  Application according to ÖVE-EN 1 and Decision EN 219 (1989), VDE 0100, SEV 1000.

Accessories:

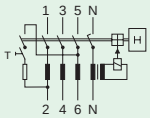
Auxiliary switch for subsequent installation to the left	Z-HK	248432
Tripping signal contact for subsequent installation to the right	Z-NHK	248434
Remote control and	Z-FW/BAS	248295
automatic switching device	Z-FW/LP	248296
Compact enclosure	TC-2	870001400
	TC-4	870001401

Connection diagrams

2-pole



4-pole



Technical Data

Electrical

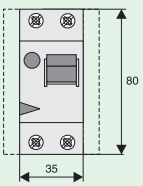
Design according to		IEC/EN 61008, AZ/NZS 3175: 1994 A1 Type G acc. to ÖVE E 8601
Current test marks as printed onto the device		
Tripping		instantaneous
	Type G	10 ms delay
	Type S, U	40 ms delay - with selective disconnecting function
Rated voltage U_n		230/400 V, 50 Hz
Operational voltage		240/415 V
Rated tripping current $I_{\Delta n}$		10, 30, 100, 300, 500 mA
Sensitivity		AC and pulsating DC
Rated short circuit strength I_{nc}		10 kA
PFIM-63/4/003-G, PFIM-63/4/01-G, PFIM-63/4/01-S/A, PFIM-63/4/03-S/A		6 kA
Maximum back-up fuse		Short circuit
I_n = 16-63A		63 A gG/gL
I_n = 80A		80 A gG/gL
Rated breaking capacity I_m or Rated fault breaking capacity $I_{\Delta m}$		
I_n = 16-40A		500 A
I_n = 63A		630 A
I_n = 80A		800 A
Endurance	electrical comp.	≥ 4,000 operating cycles
	mechanical comp.	≥ 20,000 operating cycles

Mechanical

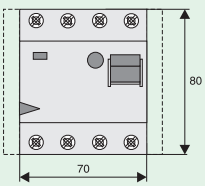
Frame size	45 mm
Device height	80 mm
Device width	35 mm (2MU), 70 mm (4MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022
Degree of protection, built-in	IP40
Deg. of prot. in moisture-proof encl.	IP54
Upper and lower terminals	open mouthed/lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	1.5 - 35 mm^2 single wire 2 x 16 mm^2 multi wire
Busbar thickness	0.8 - 2 mm
Tripping temperature	-25°C to +40°C
Resistance to climatic conditions	acc. to IEC/EN 61008

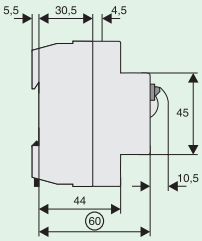
Dimensions (mm)

2P



4P





Residual Current Devices PFNM

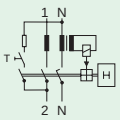
- Residual current devices
- Tripping is line voltage-independent. Consequently, the RCD is suitable for fault current/residual current protection and additional protection (ÖVE/ÖNORM E 8001-1 § 6.1.2)
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Auxiliary switch HR can be mounted subsequently (PFNM-4-pole)
- Contact position indicator red - green
- **Type -S**: Compulsory for systems with surge arresters downstream of the RCD (ÖVE/ÖNORM E 8001-1 § 12.1.5)
- **Type -U**: Suitable for speed-controlled drives with frequency converters in household, trade, and industry.
  Unwanted tripping is avoided thanks to a tripping characteristic designed particularly for frequency converters.
  Application according to ÖVE/ÖNORM E 8001 and Decision EN 219 (1989)

Accessories:

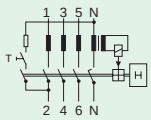
Auxiliary switch for subsequent installation	Z-HR on PFNM-4p	248435
Busbar	upon enquiry	

Connection diagrams

2-pole



4-pole



Technical Data

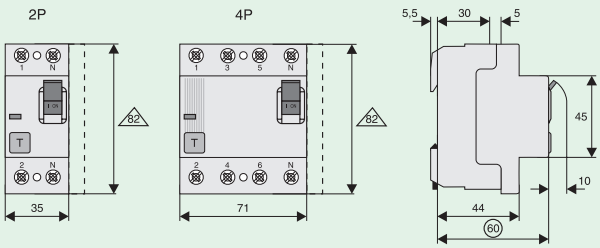
Electrical

Design according to		IEC/EN 61008
Current test marks as printed onto the device		
Tripping		instantaneous
	Typ S, U	40 ms delay - with selective disconnecting function
Rated voltage		230/400 V; 50 Hz
Operational voltage		240/415 V
Rated tripping current		30, 100, 300, 500 mA
Sensitivity		AC and pulsating DC
Rated short circuit strength		10 kA with back-up fuse
Maximum back-up fuse		Short circuit 100 A gG/gL
Rated breaking capacity I_m or Rated fault breaking capacity $I_{\Delta m}$		1500 A
Endurance	electrical comp.	≥ 4,000 operating cycles
	mechanical comp.	≥ 20,000 operating cycles

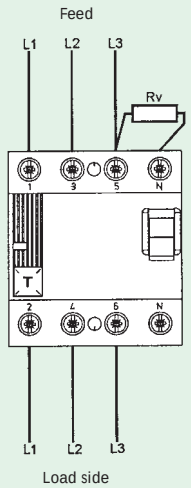
Mechanical

Frame size	45 mm
Device height	82 mm
Device width	35 mm (2MU), 70 mm (4MU)
Mounting	quick fastening on DIN rail EN 50022
Degree of protection, built-in	IP40
Upper and lower terminals	open mouthed/lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	1 - 35 mm^2
Busbar thickness	0.8 - 2 mm
Tripping temperature	-25°C to +40°C
Resistance to climatic conditions	acc. to IEC/EN 61008

Dimensions (mm)



Residual Current Devices PFNM in a Three-Phase AC Network without Neutral Conductor



The N-terminal must be connected to phase L3 via a resistor in order to supply the test circuit with the rated voltage of 230 V and to ensure accurate testing of the RCD with the rated tripping current. A wire bridge or wrong resistor rating will result in a wrong testing current, and thus in faulty measurement.

Values for R_V:
(at voltages of up to 415 V between two phases)

$I_{\Delta n}$	R_V	$P_{V\ min}$
0.03 A	2700 Ω	0.5 W
0.1 A	820 Ω	1.0 W
0.3 A	270 Ω	1.5 W
0-5 A	180 Ω	2.0 W

Attention: In case of selective devices type "PFNM-S/A" and "PFNM-U",the power $P_{V\ min}$ zmust be doubled.

Combined RCD/MCB Devices PKNM, 1+N-pole

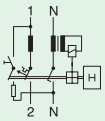
- Combined RCD/MCB device
- Line voltage-independent tripping
- Compatible with standard busbar
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Guide for secure terminal connection
- Switching toggle (MCB component) in colour designating the rated current
- Contact position indicator red - green
- Comprehensive range of accessories suitable for subsequent installation
- **Type -A**: Protects against special forms of residual pulsating DC which have have not been smoothed
- **Typ -G:** 10 ms time delay in order to avoid unwanted tripping (e.g. during thunderstorms).
  Compulsory in Austria for any circuit where personal injury or damage to property may occur in case of unwanted tripping (§12.1.6 ÖVE/ÖNORM E 8001-1).

Accessories:

Auxiliary switch for subsequent installation	ZP-AHK	248436
Tripping signal switch for subsequent installation	ZP-NHK	248437
Shunt trip release	ZP-ASA/..	248438, 248439
Tripping module	Z-KAM	248294
Terminal cover cap	TC-2	870001400
Additional terminal 35mm^2	Z-HA-EK	263960
Anti-tamper device	HA7-SPE	750960510

Connection diagram

1+N-pole



Technical Data

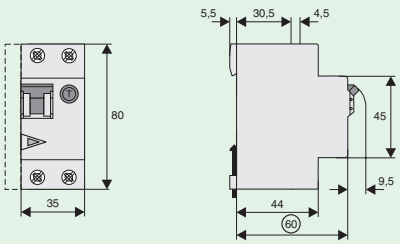
Electrical

Design according to		IEC/EN 61009, AZ/NZS 3175: 1994 A1
Current test marks as printed onto the device		
Tripping		
line voltage-independent		instantaneous 250A (8/20µ) surge current-proof;
	Type G	10 ms delay 3kA (8/20µ) surge current-proof
Rated voltage U_e		230 V; 50 Hz
Operational voltage range		240 V
Rated tripping current $I_{\Delta n}$		10, 30, 100, 300 mA
Rated non-tripping current $I_{\Delta no}$		0.5 $I_{\Delta n}$
Sensitivity		AC and pulsating DC
Selectivity class		3
Rated breaking capacity		10 kA
Rated current		2 - 40 A
Rated peak withstand voltage U_{imp}		6 kV (1.2/50µ)
Characteristic		C, D
Maximum back-up fuse (short circuit)		100 A gL (>10 kA)
Endurance	electrical comp.	≥ 4,000 operating cycles
	mechanical comp.	≥ 20,000 operating cycles

Mechanical

Frame size	45 mm
Device height	80 mm
Device width	35 mm (2MU)
Mounting	3-position DIN rail clip, permits removal from existing busbar system
Upper and lower terminals	open mouthed/lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	1 - 25 mm^2
Busbar thickness	0.8 - 2 mm
Degree of protection switch	IP20
Degree of protection, built-in	IP40
Tripping temperature	-25°C to +40°C
Resistance to climatic conditions	acc. to IEC/EN 61009

Dimensions (mm)

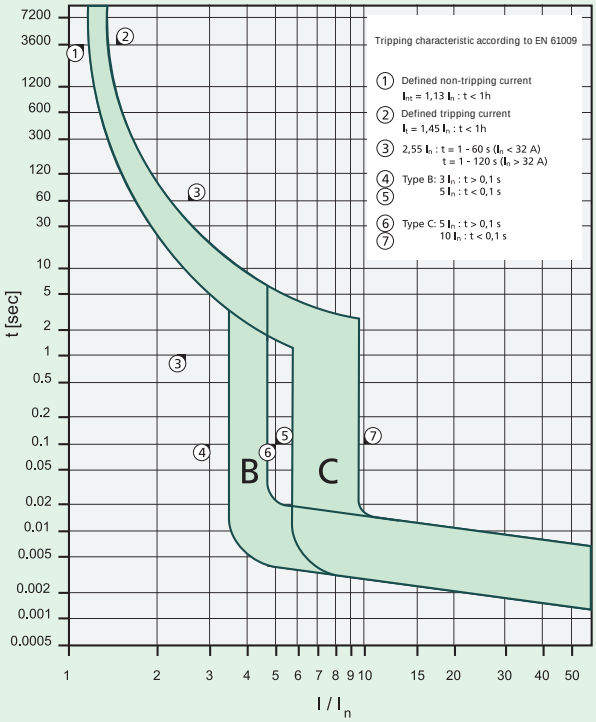


Load Capacity PKNM-../1N/

Effect of ambient temperature (MCB component)

	Ambient temperature **T [°C]**								
I_n [A]	**-25**	**-20**	**-10**	**0**	**10**	**20**	**30**	**35**	**40**
2	2.5	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9
4	4.9	4.8	4.7	4.5	4.3	4.2	4.0	3.9	3.9
5	6.2	6.0	5.8	5.6	5.4	5.2	5.0	4.9	4.8
6	7.4	7.2	7.0	6.7	6.5	6.3	6.0	5.9	5.8
8	9.9	9.6	9.3	9.0	8.7	8.4	8.0	7.9	7.7
10	12	12	12	11	11	10	10	9.9	9.7
12	15	14	14	13	13	13	12	12	12
13	16	16	15	15	14	14	13	13	13
15	19	18	17	17	16	16	15	15	15
16	20	19	19	18	17	17	16	16	15
20	25	24	23	22	22	21	20	20	19
25	31	30	29	28	27	26	25	25	24
32	40	38	37	36	35	33	32	32	31
40	49	48	47	45	43	42	40	39	39

Tripping Characteristic PKNM-../1N/, Characteristics B a. C



Short Circuit Selectivity PKNM-../1N/ towards DIAZED

In case of short circuit, there is selectivity between the combined RCD/MCB devices PKNM../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

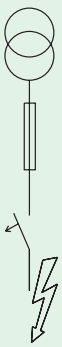
*Short circuit selectivity **characteristic B** towards fuse link **DIAZED***)*

PKNM	**DIAZED DII-DIV gL/gG**								
I_n [A]	**10**	**16**	**20**	**25**	**35**	**50**	**63**	**80**	**100**
2	<0.5[1)]	<0.5[1)]	2.2	8.5	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
4	<0.5[1)]	<0.5[1)]	0.7	1.2	3.7	10.0	10.0[2)]	10.0[2)]	10.0[2)]
6		<0.5[1)]	0.7	1.0	2.9	6.9	10.0[2)]	10.0[2)]	10.0[2)]
8		<0.5[1)]	0.6	1.0	2.4	5.1	10.0[2)]	10.0[2)]	10.0[2)]
10			0.6	0.9	1.9	3.3	7.0	10.0[2)]	10.0[2)]
13			0.5	0.7	1.6	2.8	5.7	9.0	10.0[2)]
16				0.7	1.4	2.4	4.4	7.0	10.0[2)]
20					1.3	2.2	4.0	6.3	10.0[2)]
25					1.3	2.1	3.8	5.8	10.0[2)]
32						2.0	3.5	5.2	9.5
40							3.1	4.5	8.1

*Short circuit selectivity **characteristic C** towards fuse link **DIAZED***)*

PKNM	**DIAZED DII-DIV gL/gG**								
I_n [A]	**10**	**16**	**20**	**25**	**35**	**50**	**63**	**80**	**100**
2	<0.5[1)]	<0.5[1)]	1.7	6.0	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
4	<0.5[1)]	<0.5[1)]	0.7	1.3	4.2	8.5	10.0[2)]	10.0[2)]	10.0[2)]
5	<0.5[1)]	<0.5[1)]	0.6	1.1	3.6	7.0	10.0[2)]	10.0[2)]	10.0[2)]
6		<0.5[1)]	0.6	1.0	2.9	5.8	10.0[2)]	10.0[2)]	10.0[2)]
8		<0.5[1)]	<0.5	0.9	2.5	4.8	10.0[2)]	10.0[2)]	10.0[2)]
10			<0.5	0.7	1.5	2.6	5.3	9.0	10.0[2)]
13					1.4	2.3	4.6	7.6	10.0[2)]
16					1.2	1.8	3.4	5.5	10.0[2)]
20					1.2	1.7	3.1	5.0	10.0[2)]
25						1.6	2.9	4.6	10.0[2)]
32							2.3	3.4	7.7
40								2.9	6.2

[1)] Selectivity limit current I_s under 0.5 kA
[2)] Selectivity limit current I_s = rated breaking capacity I_{cn} of the RCD/MCB device
Darker areas: no selectivity



Short Circuit Selectivity PKNM-../1N/ towards NEOZED

In case of short circuit, there is selectivity between the combined RCD/MCB devices PKNM../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).
*) basically in accordance with EN 60898 D.5.2.b

*Short circuit selectivity **characteristic B** towards fuse link **NEOZED***)*

PKNM	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
2	<0.5[1)]	0.7	1.6	3.3	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
4	<0.5[1)]	<0.5[1)]	0.6	0.9	2.9	10.0	10.0[2)]	10.0[2)]	10.0[2)]
6		<0.5[1)]	0.5	0.8	2.4	8.2	10.0[2)]	10.0[2)]	10.0[2)]
8			0.6	0.8	2.0	6.0	10.0[2)]	10.0[2)]	10.0[2)]
10			0.5	0.8	1.6	3.7	6.0	10.0[2)]	10.0[2)]
13			0.6	0.7	1.4	3.0	4.7	9.0	10.0[2)]
16				0.6	1.2	2.6	3.9	7.0	10.0[2)]
20					1.2	2.5	3.6	6.2	10.0[2)]
25					1.2	2.3	3.3	5.7	10.0[2)]
32						2.3	3.1	5.1	10.0[2)]
40							2.8	4.5	9.5

*Short circuit selectivity **characteristic C** towards fuse link **NEOZED***)*

PKNM	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
2	<0.5[1)]	0.5	0.5	2.4	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
4	<0.5[1)]	<0.5[1)]	<0.5[1)]	0.9	3.4	9.5	10.0[2)]	10.0[2)]	10.0[2)]
5	<0.5[1)]	<0.5[1)]	<0.5[1)]	0.9	2.9	8.0	10.0[2)]	10.0[2)]	10.0[2)]
6		<0.5[1)]	<0.5[1)]	0.8	2.3	6.5	10.0[2)]	10.0[2)]	10.0[2)]
8			<0.5	0.7	2.1	5.5	9.5	10.0[2)]	10.0[2)]
10			<0.5	0.6	1.3	2.9	4.5	8.9	10.0[2)]
13					1.2	2.5	3.9	7.6	10.0[2)]
16					1.0	2.1	3.0	5.5	10.0[2)]
20					1.0	2.0	2.7	5.0	10.0[2)]
25						1.9	2.6	4.5	10.0[2)]
32							2.1	3.4	10.0[2)]
40								3.0	8.7

Short Circuit Selectivity PKNM-../1N/ towards NH-00

In case of short circuit, there is selectivity between the combined RCD/MCB devices PKNM../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).
*) basically in accordance with EN 60898 D.5.2.b

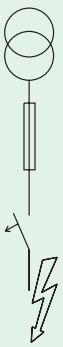
*Short circuit selectivity **characteristic B** towards fuse link **NH-00***)*

PKNM	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
2	<0.5[1)]	1.1	3.6	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
4	<0.5[1)]	0.5	0.9	1.6	2.8	4.4	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
6	<0.5[1)]	0.5	0.8	1.4	2.2	3.3	7.0	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
8	<0.5[1)]	<0.5[1)]	0.7	1.0	1.9	2.8	5.3	7.8	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
10		<0.5[1)]	0.7	0.9	1.5	2.1	3.4	4.3	7.3	10.0[2)]	10.0[2)]	10.0[2)]
13		<0.5[1)]	0.6	0.8	1.4	1.8	2.8	3.6	5.7	10.0[2)]	10.0[2)]	10.0[2)]
16			0.6	0.7	1.2	1.5	2.4	3.0	4.5	10.0[2)]	10.0[2)]	10.0[2)]
20				0.7	1.1	1.5	2.2	2.8	4.2	9.2	10.0[2)]	10.0[2)]
25				0.7	1.1	1.4	2.1	2.6	4.0	8.2	10.0[2)]	10.0[2)]
32					1.0	1.4	2.0	2.5	3.7	7.1	10.0[2)]	10.0[2)]
40								2.3	3.4	6.2	8.8	10.0[2)]

*Short circuit selectivity **characteristic C** towards fuse link **NH-00***)*

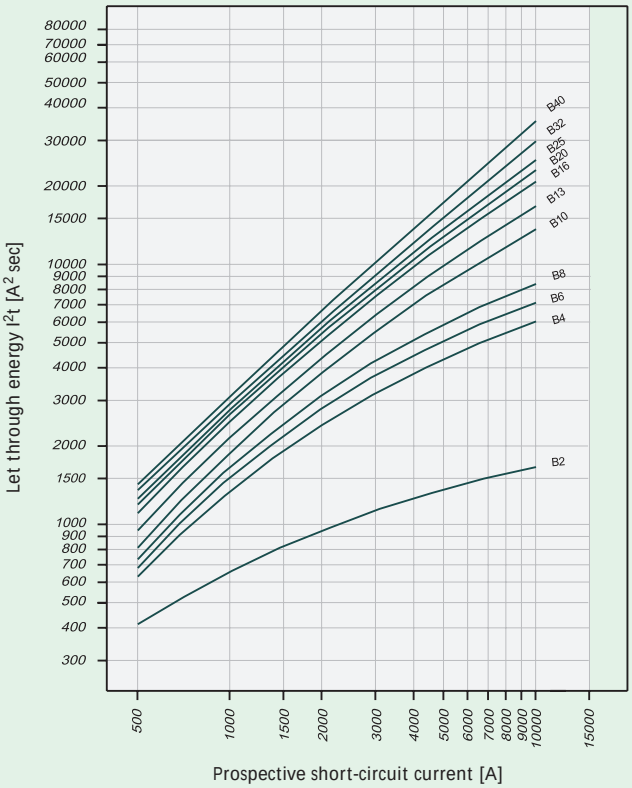
PKNM	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
2	<0.5[1)]	0.6	2.6	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
4	<0.5[1)]	<0.5[1)]	0.9	1.8	3.2	4.8	8.7	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
5	<0.5[1)]	<0.5[1)]	0.8	1.6	2.7	4.1	7.2	9.7	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
6	<0.5[1)]	<0.5[1)]	0.7	1.3	2.2	3.3	5.9	8.0	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
8	<0.5[1)]	<0.5[1)]	0.6	1.1	1.9	2.8	5.0	6.7	10.0[2)]	10.0[2)]	10.0[2)]	10.0[2)]
10			0.5	0.8	1.2	1.7	2.7	3.4	5.5	10.0[2)]	10.0[2)]	10.0[2)]
13					1.1	1.5	2.3	2.9	4.7	10.0[2)]	10.0[2)]	10.0[2)]
16					1.0	1.3	1.8	2.3	3.7	8.7	10.0[2)]	10.0[2)]
20					0.9	1.1	1.7	2.2	3.4	8.0	10.0[2)]	10.0[2)]
25							1.6	2.1	3.2	7.2	10.0[2)]	10.0[2)]
32								1.7	2.6	5.3	9.0	10.0[2)]
40									2.4	4.5	7.5	10.0

[1)] Selectivity limit current I_s under 0.5 kA
[2)] Selectivity limit current I_s = rated breaking capacity I_{cn} of the RCD/MCB device
Darker areas: no selectivity

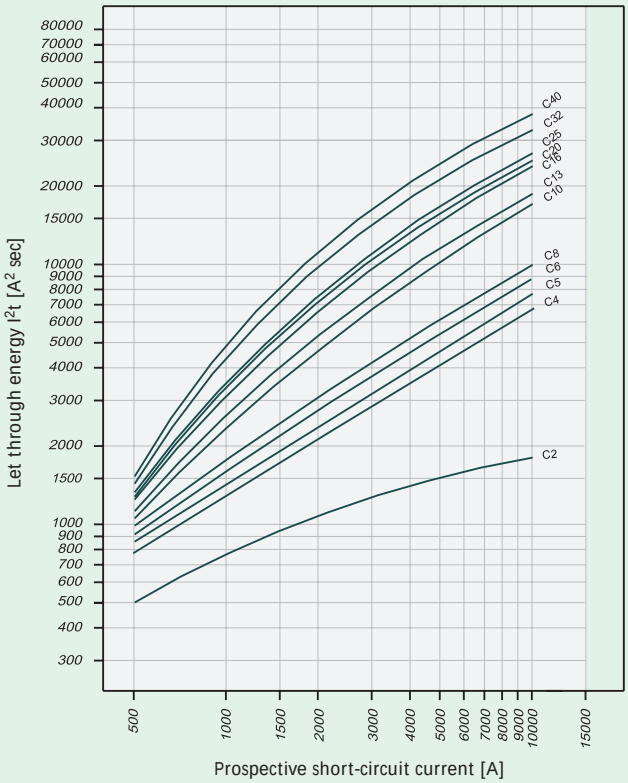


Let-through Energy PKNM-../1N/

Let-through energy PKNM, characteristic B, 1+N-pole



Let-through energy PKNM, characteristic C, 1+N-pole



Electronic Combined RCD/MCB Devices PKDM, 1+N-pole, 2 Module Units

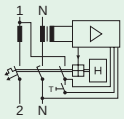
- Electronic residual current device / miniature circuit breaker combination
- Tripping line voltage dependent
- Compatible with standard busbar
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Contact position indicator red - green
- Protects against special forms of residual pulsating DC which have not been smoothed
- Comprehensive range of accessories suitable for subsequent installation

Accessories:

Auxiliary switch for subsequent installation	Z-AHK	248433
Tripping signal switch for subsequent installation	Z-NHK	248434
Shunt trip release	Z-ASA/..	248286, 248287
Tripping module	Z-KAM	248294
Terminal cover cap	TC-2	870001400
Additional terminal 35mm^2	HA7-ZK35	751942199
Anti-tamper device	HA7-SPE	750960510

Connection diagram

1+N-pole



Technical Data

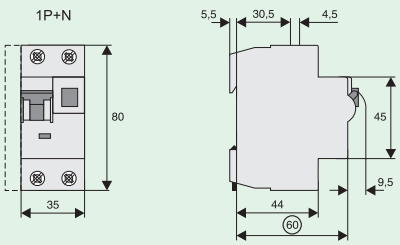
Electrical

Design according to	IEC/EN 61009
Current test marks as printed onto the device	
Tripping line voltage-dependent	instantaneous 250A (8/20µ) surge current-proof
Rated voltage	230 V; 50 Hz
Voltage range for protective function	60 - 250 V~
Rated tripping current	30, 300 mA
Rated non-tripping current $I_{\Delta no}$	0.5 $I_{\Delta n}$
Sensitivity	pulsating DC
Selectivity class	3
Rated breaking capacity	10 kA
Rated current	2 - 40 A
Characteristic	C
Maximum back-up fuse (short circuit)	100 A gL (>10 kA)
Ultimate short circuit breaking capacity I_{cn}	10 kA
Rated short circuit breaking capacity I_{cg}	7.5 kA
Rated fault breaking capacity $I_{\Delta m}$	10 kA
Endurance electrical comp.	≥ 4,000 operating cycles
Endurance mechanical comp.	≥ 20,000 operating cycles

Mechanical

Frame size	45 mm
Device height	80 mm
Device width	35 mm (2MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022
Upper and lower terminals	open mouthed/lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	1 - 25 mm^2
Busbar thickness	0.8 - 2 mm
Degree of protection, built-in	IP40
Tripping temperature	-25°C to +40°C
Resistance to climatic conditions	acc. to IEC/EN 61009

Dimensions (mm)



Electronic Combined RCD/MCB Devices PKSM, 1+N-pole, 1 Module Unit

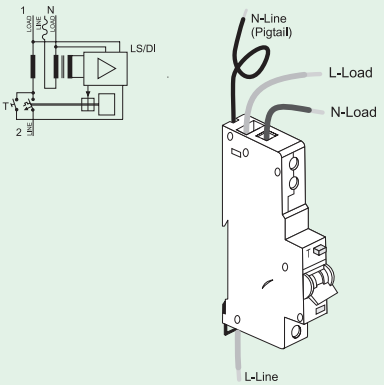
- Electronic residual current device / miniature circuit breaker combination in only 1MU
- Tripping line voltage dependent
- Contact position indicator red - green
- Can be sealed with leads in the on and off position
- Colour coded switching toggle (designating the rated current)
- Permanently connected neutral conductor (950 mm long)
- Special application in British-Standard-Distibution Boxes
- Can be connected to standard busbar (at the lower side)
- Comprehensive range of accessories suitable for subsequent installation

Accessories:

Auxiliary switch for subsequent installation	Z-AHK	248433
Tripping signal switch for subsequent installation	Z-NHK	248434
Shunt trip release	Z-ASA/..	248286, 248287
Tripping module	Z-KAM	248294

Connection diagram

1+N-pole



Technical Data

Electrical

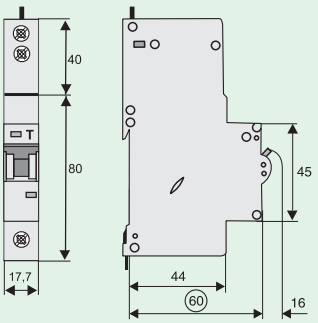
Design according to		IEC/EN 61009
Current test marks as printed onto the device		
Number of poles		1+N-pole Pole switched, N led through (solid neutral)
Rated voltage U_n		240 VAC
Rated frequency		50/60 Hz
Rated current I_n		6 - 40 A
Rated tripping current $I_{\Delta n}$		10, 30 mA
Sensitivity		AC
Endurance	electrical comp.	≥ 4,000 operating cycles
	mechanical comp.	≥ 20,000 operating cycles
Tripping Characteristic RCD component:		
Tripping line voltage-dependent		instantaneous
Peak withstand current		250A (8/20µ)
Rated non-tripping current $I_{\Delta no}$		0.5 $I_{\Delta n}$
Voltage range for protective function		120 - 250 V~
Tripping Characteristic MCB component		
Conventional non-tripping current		1.13 I_n
Conventional tripping current		1.45 I_n
Reference temperature		30°C
Selectivity class		3
Maximum back-up fuse > 6 kA		100 A gL

Ultimate short circuit breaking capacity I_{mt}	
Type C	$5\ I_n < I_{mt} \leq 10\ I_n$: t ($I_{mt}$) < 0,1s
Type D	$10\ I_n < I_{mt} \leq 20\ I_n$: t ($I_{mt}$) < 0,1s
Ultimate short circuit breaking capacity I_{cn}	6 kA
Rated short circuit breaking capacity I_{nc}	6 kA
Rated fault breaking capacity $I_{\Delta m}$	6 kA

Mechanical

Frame size	45 mm
Device height	120 mm
Device width	17.5 mm (1MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022
Upper terminals	lift terminals
Lower terminals	open mouthed/lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	1 - 25 mm^2
Busbar thickness below	0.8 - 2 mm
Degree of protection, built-in	IP40
Perm. ambient temperature range	-25°C to +40°C
Resistance to climatic conditions	25-55°C/90-95% relative humidity acc. to IEC 60068-2

Dimensions (mm)

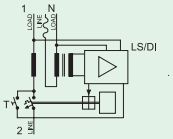


Electronic Combined RCD/MCB Devices PKA6, 1+N-pole

- Permanently connected neutral conductor (940 mm long)

Connection diagram

1+N-pole



Technical Data

Electrical

Design according to	IEC/EN 61009
Current test marks as printed onto the device	
Number of poles	1+N-pole Pole switched, N led through (solid neutral)
Rated voltage U_n	240 VAC
Rated frequency	50/60 Hz
Rated current I_n	6 - 40 A
Rated tripping current $I_{\Delta n}$	10, 30 mA
Sensitivity	AC
Endurance electrical comp.	≥ 4,000 operating cycles
mechanical comp.	≥ 20,000 operating cycles
Tripping Characteristic RCD component:	
Tripping	
line voltage-dependent	instantaneous
Peak withstand current	250A (8/20µ)
Rated non-tripping current $I_{\Delta no}$	0.5 $I_{\Delta n}$
Voltage range for protective function	120 - 250 V~
Tripping Characteristic MCB component	
Conventional non-tripping current	1.13 I_n
Conventional tripping current	1.45 I_n
Reference temperature	30°C
Selectivity class	3
Maximum back-up fuse > 6 kA	100 A gL

Ultimate short circuit breaking capacity I_{mt}	
Type C	$5\ I_n < I_{mt} \leq 10\ I_n$: t ($I_{mt}$) < 0,1s
Ultimate short circuit breaking capacity I_{cn}	6 kA
Rated short circuit breaking capacity I_{nc}	6 kA

Mechanical

Terminal capacity	1 - 25 mm²
Busbar thickness below	0.8 - 2 mm
Perm. ambient temperature range	-25°C to +40°C
Resistance to climatic conditions	25-55°C/90-95% relative humidity acc. to IEC 60068-2

For Heinemann metal load centres

SG07303

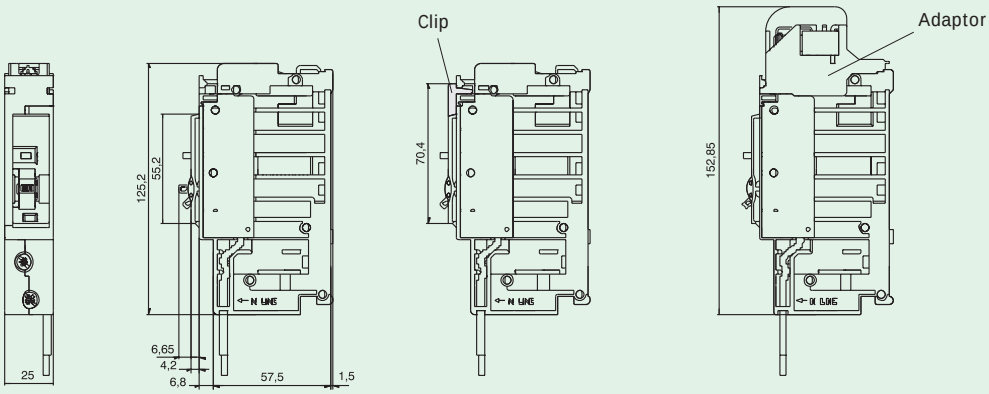
Adaptor

SG07503

For Cutler-Hammer metal load centres

SG07203

Dimensions (mm)



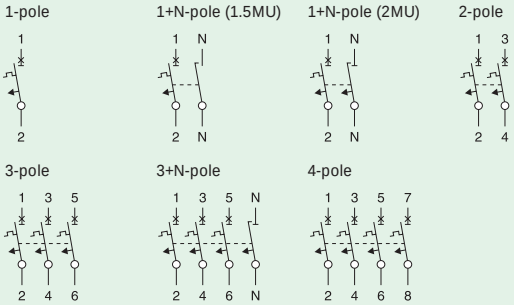
Miniature Circuit Breakers PLS..., PLZ...

- High selectivity between MCB and back-up fuse due to low let-through energy
- Compatible with standard busbar
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Meets the requirements of insulation co-ordination, distance between contacts ≥ 4 mm, for secure isolation
- Suitable for applications up to 48 V DC (use PLS6-DC for higher DC voltages)
- PLS6-DC: Rated breaking capacity 6 kA according to IEC/EN 60947-2
  Rated voltage 220 V (per pole), τ = 4 ms
  Take into account polarity!

Accessories:

Auxiliary switch for subsequent installation	ZP-AHK	248436
Tripping signal contact for subsequent installation	ZP-NHK	248437
Remote control and automatic switching device	Z-FW-BAS	248295
Shunt trip release	ZP-ASA/..	248438, 248439
Undervoltage release	Z-USA/..	248288-248291
Compact enclosure	TC-2	870001400
	TC-4	870001401
Additional terminal 35mm²	Z-HA-EK/35	263960
Anti-tamper device	HA7-SPE	750960510

Connection diagrams

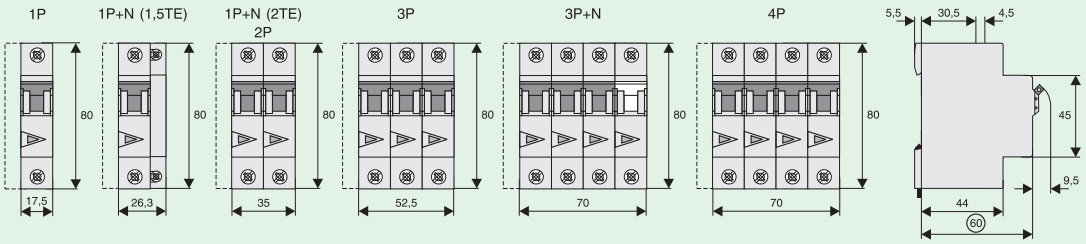


Technical Data

Electrical	
Design according to	IEC/EN 60898, AS/NZS 4898: 1997
PLS6-DC	IEC/EN 60947-2
Current test marks as printed onto the device	
Rated voltage	
PLS., PLZ.	AC: 230/400V
PLS., PLZ.	DC: 48V (per pole)
PLS6-DC	DC: 220V (per pole)
Operational voltage	240/415 V
Rated frequency	50/60 Hz
Rated breaking capacity according to IEC/EN 60898	
PLSM, PLZM	10 kA
PLS6, PLZ6	6 kA
PLS4, PLZ4	4.5 kA
PLS6-DC	6 kA
Characteristic	B, C, D
Back-up fuse	
PLSM, PLZM	max. 125 A gL
PLS6, PLZ6, PLS6-DC	max. 100 A gL
PLS4, PLZ4	max. 80 A gL
Selectivity class	3
Endurance	≥ 8,000 operating cycles
Line voltage connection	optional (above/below)

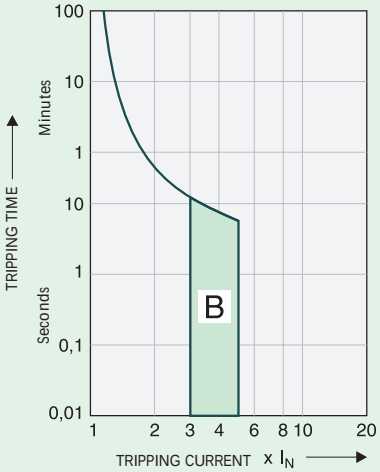
Mechanical	
Frame size	45 mm
Device height	80 mm
Device width	17.5 mm per pole (1MU) 26.3 mm: device 1P+N (1.5MU)
Mounting	quick fastening with 3 lock-in positions on DIN rail EN 50022
Degree of protection	IP20
Upper and lower terminals	open mouthed/lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	1-25 mm²
(1p+N, 1.5MU)	1-25 mm² / 1-2x10 mm² (N)
Terminal fastening torque	2-2.4 Nm
(1p+N, 1.5MU)	2-2.4 Nm / 1,2-1,5 Nm (N)
Busbar thickness	0.8 - 2 mm (except N 0.5 MU)
Mounting	independent of position

Dimensions (mm)

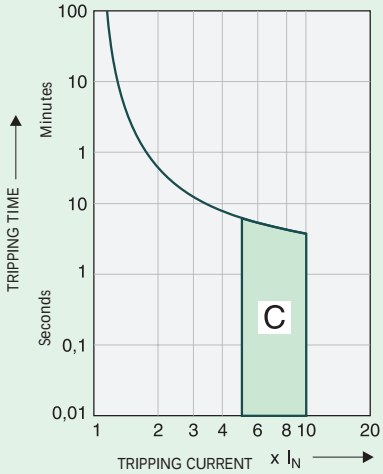


Tripping Characteristics (IEC/EN 60898)

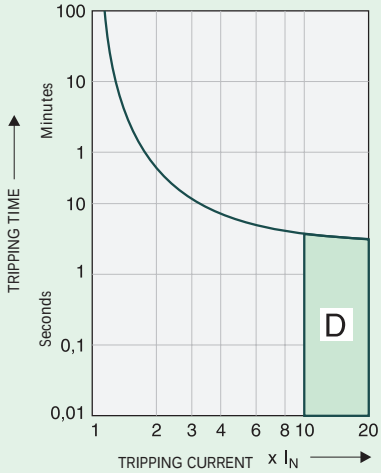
Tripping characteristic B



Tripping characteristic C



Tripping characteristic D



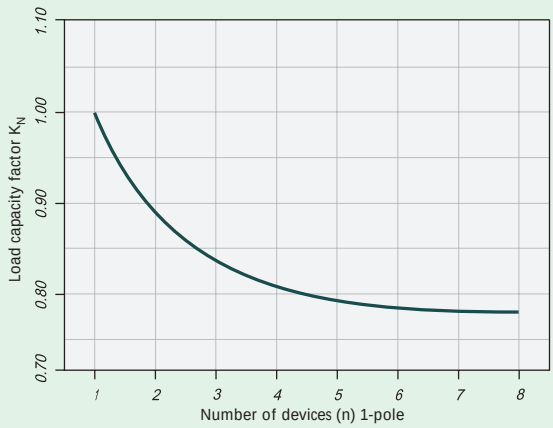
Quick-acting (B), slow (C), very slow (D)

Effect of the Ambient Temperature on Thermal Tripping Behaviour

Adjusted rated current values according to the ambient temperature

	Ambient temperature T [°C]												
I_n [A]	**-25**	**-20**	**-10**	**0**	**10**	**20**	**30**	**35**	**40**	**45**	**50**	**55**	**60**
0.16	0.20	0.19	0.19	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.14	0.14
0.25	0.31	0.30	0.29	0.28	0.27	0.26	0.25	0.25	0.24	0.24	0.23	0.23	0.22
0.5	0.61	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.48	0.47	0.46	0.45	0.44
0.75	0.92	0.90	0.87	0.84	0.81	0.78	0.75	0.74	0.73	0.71	0.69	0.68	0.66
1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	0.99	0.97	0.95	0.93	0.90	0.89
1.5	1.8	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3
1.6	2.0	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4
2	2.4	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.8	1.8
2.5	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.2
3	3.7	3.6	3.5	3.4	3.3	3.1	3.0	3.0	2.9	2.8	2.8	2.7	2.7
3.5	4.3	4.2	4.1	3.9	3.8	3.7	3.5	3.4	3.4	3.3	3.2	3.2	3.1
4	4.9	4.8	4.7	4.5	4.3	4.2	4.0	3.9	3.9	3.8	3.7	3.6	3.5
5	6.1	6.0	5.8	5.6	5.4	5.2	5.0	4.9	4.8	4.7	4.6	4.5	4.4
6	7.3	7.2	7.0	6.7	6.5	6.3	6.0	5.9	5.8	5.7	5.6	5.4	5.3
8	9.8	9.6	9.3	9.0	8.7	8.4	8.0	7.9	7.7	7.6	7.4	7.2	7.1
10	12	12	12	11	11	10	10	9.9	9.7	9.5	9.3	9.0	8.9
12	15	14	14	13	13	13	12	12	12	11	11	11	11
13	16	16	15	15	14	14	13	13	13	12	12	12	12
15	18	18	17	17	16	16	15	15	15	14	14	14	13
16	20	19	19	18	17	17	16	16	15	15	15	14	14
20	24	24	23	22	22	21	20	20	19	19	19	18	18
25	31	30	29	28	27	26	25	25	24	24	23	23	22
32	39	38	37	36	35	33	32	32	31	30	30	29	28
40	49	48	47	45	43	42	40	39	39	38	37	36	35
50	61	60	58	56	54	52	50	49	48	47	46	45	44
63	77	76	73	71	68	66	63	62	61	60	58	57	56

Load Capacity of Series Connected Miniature Circuit Breakers



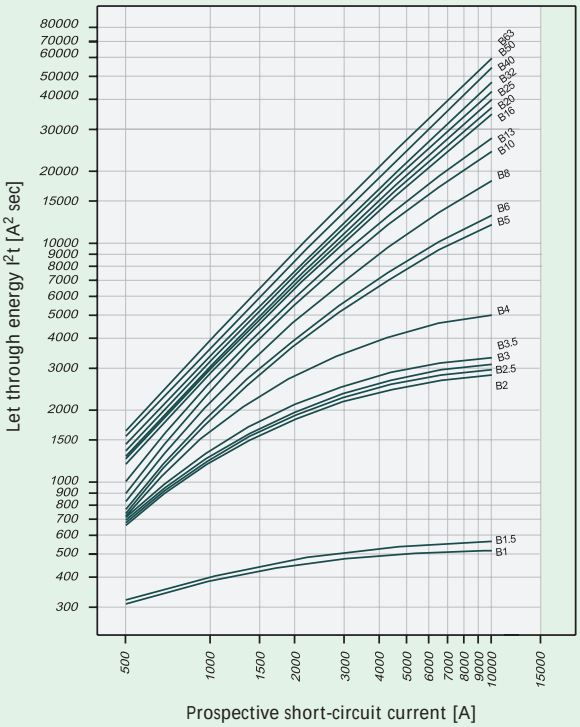
Effect of Power Frequency

Effect of power frequency on the tripping behaviour I_{MA} of the quick release

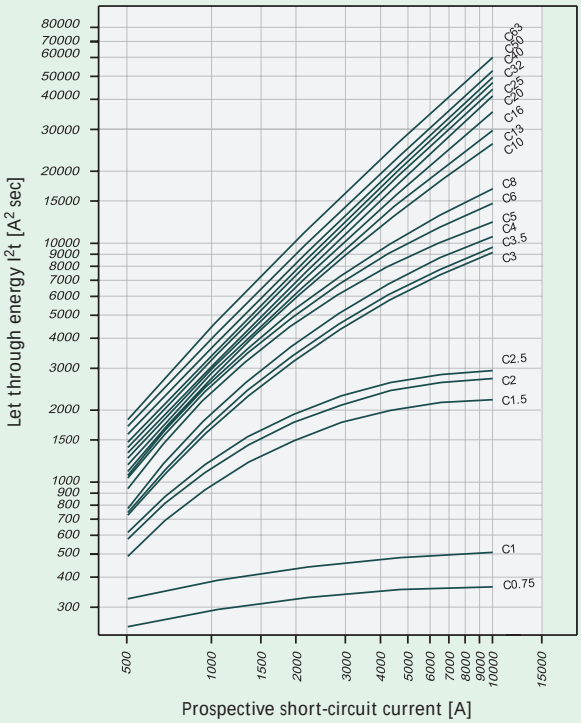
	Power frequency f [Hz]						
	$16^2/_3$	50	60	100	200	300	400
$I_{MA}(f)/I_{MA}(50Hz)$ [%]	91	100	101	106	115	134	141

Let-through Energy PLSM

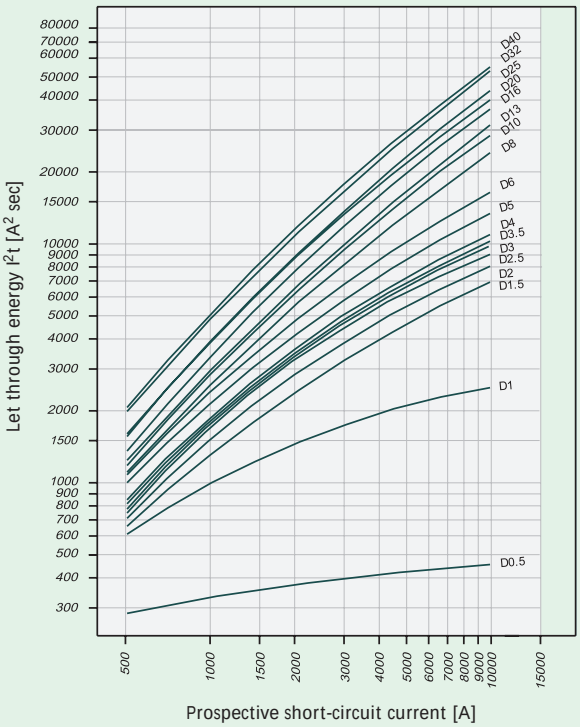
Let-through energy PLSM, characteristic B, 1-pole



Let-through energy PLSM, characteristic C, 1-pole



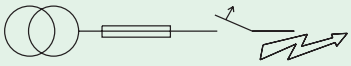
Let-through energy PLSM, characteristic D, 1-pole



Short Circuit Selectivity PLSM towards DIAZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLSM and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic B** towards fuse link **DIAZED***)*

PLSM	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
1.0	<0.5[1]	1.2	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	1.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.6	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.8	1.5	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.8	1.4	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.3	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	0.6	1.0	3.6	10.0[2]	10.0[2]	10.0[2]	10.0[2]
5	<0.5[1]	<0.5[1]	0.6	0.9	2.0	3.5	8.5	10.0[2]	10.0[2]
6		<0.5[1]	0.6	0.9	1.8	3.2	7.4	10.0[2]	10.0[2]
8		<0.5[1]	0.5	0.8	1.6	2.6	5.2	8.3	10.0[2]
10			0.5	0.8	1.4	2.2	3.9	6.0	10.0[2]
13			0.5	0.7	1.3	2.0	3.6	5.4	10.0[2]
16				0.6	1.2	1.9	3.2	4.6	8.4
20					1.2	1.8	3.1	4.4	7.8
25					1.2	1.8	3.0	4.2	7.3
32						1.7	2.8	3.9	6.8
40							2.7	3.8	6.5
50							2.5	3.5	5.7
63									5.3

*Short circuit selectivity **characteristic C** towards fuse link **DIAZED***)*

PLSM	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.75	1.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.0	<0.5[1]	1.2	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	<0.5[1]	1.0	2.2	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.6	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.8	1.4	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.8	0.9	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.6	0.9	2.2	4.5	10.0[2]	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	0.6	0.8	1.8	3.6	9.7	10.0[2]	10.0[2]
5	<0.5[1]	<0.5[1]	0.6	0.7	1.5	2.7	7.3	10.0[2]	10.0[2]
6		<0.5[1]	0.5	0.6	1.4	2.4	5.5	10.0[2]	10.0[2]
8		<0.5[1]	<0.5[1]	0.6	1.3	2.2	4.7	8.7	10.0[2]
10			<0.5[1]	0.6	1.3	2.0	3.6	5.4	10.0[2]
13					1.3	1.9	3.3	5.0	9.4
16					1.2	1.8	3.2	4.4	8.0
20					1.2	1.8	3.1	4.1	7.0
25						1.7	2.8	3.8	6.5
32							2.7	3.7	6.2
40								3.5	5.9
50									5.5
63									

*Short circuit selectivity **characteristic D** towards fuse link **DIAZED***)*

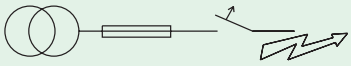
PLSM	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.5	0.5	3.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.0	<0.5[1]	<0.5[1]	1.0	2.4	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	<0.5[1]	0.7	1.2	3.5	7.7	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.6	1.0	2.8	5.8	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.6	1.4	2.3	4.6	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.6	0.9	2.3	4.3	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.6	0.9	2.1	4.0	10.0[2]	10.0[2]	10.0[2]
4		<0.5[1]	0.6	0.9	2.0	3.8	9.5	10.0[2]	10.0[2]
5		<0.5[1]	0.5	0.7	1.7	3.1	7.0	10.0[2]	10.0[2]
6			0.5	0.7	1.5	2.6	5.3	9.1	10.0[2]
8			<0.5[1]	0.7	1.4	2.2	3.9	6.0	10.0[2]
10				0.7	1.2	1.9	3.4	5.0	9.5
13					1.2	1.8	3.2	4.6	8.6
16						1.6	2.7	4.0	7.4
20						1.5	2.5	3.5	6.7
25							2.4	3.4	6.2
32								2.8	5.0
40									4.8

[1] Selectivity limit current I_s under 0.5 kA
[2] Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB
no selectivity

Short Circuit Selectivity PLSM towards NEOZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLSM and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic B** towards fuse link **NEOZED***)*

PLSM	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
1.0	<0.5[1]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	4.1	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.6	1.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.6	1.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.5	1.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.5	0.9	7.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	0.5	0.9	2.5	10.0[2]	10.0[2]	10.0[2]	10.0[2]
5		<0.5[1]	0.5	0.8	1.7	4.0	7.0	10.0[2]	10.0[2]
6		<0.5[1]	0.5	0.8	1.6	3.6	6.0	10.0[2]	10.0[2]
8			0.5	0.8	1.4	2.8	4.3	8.2	10.0[2]
10			0.5	0.7	1.3	2.4	3.4	6.0	10.0[2]
13			<0.5[1]	0.7	1.2	2.3	3.2	5.3	10.0[2]
16				0.6	1.1	2.2	2.9	4.6	10.0
20					1.1	2.1	2.8	4.4	9.3
25					1.1	2.0	2.7	4.2	8.7
32						2.0	2.6	4.0	8.0
40							2.5	3.8	7.5
50							2.3	3.4	6.7
63									6.2

*Short circuit selectivity **characteristic C** towards fuse link **NEOZED***)*

PLSM	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.75	<0.5[1]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.0	<0.5[1]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	0.5	0.6	0.9	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.5	0.7	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.5	0.7	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.9	5.2	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.8	4.7	9.5	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.6	4.0	7.6	10.0[2]	10.0[2]
5		<0.5[1]	<0.5[1]	0.5	1.3	3.1	5.7	10.0[2]	10.0[2]
6		<0.5[1]	<0.5[1]	<0.5[1]	1.2	2.7	4.5	10.0[2]	10.0[2]
8		<0.5[1]	<0.5[1]	<0.5[1]	1.2	2.5	4.0	8.6	10.0[2]
10			<0.5[1]	<0.5[1]	1.2	2.3	3.1	5.4	10.0[2]
13					1.1	2.2	3.0	4.9	10.0[2]
16					1.1	2.1	2.8	4.4	9.5
20					1.0	2.0	2.6	4.0	8.3
25						1.9	2.5	3.8	7.8
32							2.5	3.7	7.3
40								3.5	7.0
50									6.5
63									

*Short circuit selectivity **characteristic D** towards fuse link **NEOZED***)*

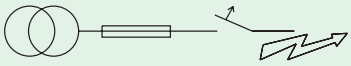
PLSM	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.5	<0.5[1]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.0	<0.5[1]	<0.5[1]	0.7	1.3	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	<0.5[1]	0.6	0.9	2.8	9.0	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.6	0.8	2.2	6.7	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.5	0.7	1.9	5.4	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.5	0.7	1.8	4.8	9.3	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.5	0.7	1.7	4.7	8.6	10.0[2]	10.0[2]
4		<0.5[1]	0.5	0.7	1.7	4.6	7.7	10.0[2]	10.0[2]
5		<0.5[1]	<0.5[1]	0.6	1.5	3.5	5.8	10.0[2]	10.0[2]
6			<0.5[1]	0.5	1.3	2.9	4.5	9.0	10.0[2]
8			<0.5[1]	0.5	1.2	2.4	3.5	6.0	10.0[2]
10				0.5	1.1	2.2	3.0	5.0	10.0[2]
13					1.1	2.1	2.9	4.6	10.0[2]
16						1.9	2.6	3.9	9.0
20						1.7	2.3	3.5	8.0
25							2.2	3.4	7.5
32								2.9	6.0
40									5.7

[1] Selectivity limit current I_s under 0.5 kA
[2] Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB
no selectivity

Short Circuit Selectivity PLSM towards NH-00 Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLSM and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic B** towards fuse link **NH-00***)*

PLSM	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
1.0	0.9	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	0.8	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	0.5	1.0	2.5	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	0.5	1.0	2.3	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	0.5	0.9	2.1	8.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	0.5	0.9	1.8	5.5	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	0.8	1.3	2.3	4.3	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
5	<0.5[1]	<0.5[1]	0.7	1.1	1.6	2.2	3.6	4.8	8.9	10.0[2]	10.0[2]	10.0[2]
6	<0.5[1]	<0.5[1]	0.7	1.1	1.5	2.0	3.3	4.3	7.6	10.0[2]	10.0[2]	10.0[2]
8	<0.5[1]	<0.5[1]	0.6	1.0	1.3	1.7	2.6	3.3	5.2	10.0[2]	10.0[2]	10.0[2]
10		<0.5[1]	0.6	0.9	1.2	1.5	2.2	2.7	4.0	9.0	10.0[2]	10.0[2]
13		<0.5[1]	0.6	0.8	1.1	1.4	2.1	2.6	3.8	7.9	10.0[2]	10.0[2]
16			0.5	0.7	1.0	1.3	1.9	2.4	3.4	6.4	9.3	10.0[2]
20				0.7	1.0	1.3	1.9	2.4	3.3	6.0	8.7	10.0[2]
25				0.7	1.0	1.3	1.8	2.3	3.2	5.7	8.0	10.0[2]
32					0.9	1.2	1.7	2.2	3.1	5.4	7.6	10.0[2]
40								2.1	3.0	5.1	7.2	10.0[2]
50								1.9	2.8	4.7	6.6	9.5
63										4.4	6.3	8.6

*Short circuit selectivity **characteristic C** towards fuse link **NH-00***)*

PLSM	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
0.75	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.0	0.9	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	0.6	1.3	4.2	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	0.6	1.0	2.5	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	0.5	1.0	2.1	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.7	1.2	1.8	2.6	4.7	6.6	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.2	6.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	0.7	1.0	1.5	2.1	3.6	5.0	10.0	10.0[2]	10.0[2]	10.0[2]
5	<0.5[1]	<0.5[1]	0.6	0.8	1.2	1.7	2.8	3.8	8.7	10.0[2]	10.0[2]	10.0[2]
6	<0.5[1]	<0.5[1]	0.5	0.8	1.2	1.5	2.5	3.3	5.7	10.0[2]	10.0[2]	10.0[2]
8	<0.5[1]	<0.5[1]	0.5	0.8	1.1	1.5	2.3	2.9	4.9	10.0[2]	10.0[2]	10.0[2]
10			0.5	0.7	1.0	1.4	2.0	2.5	3.8	8.0	10.0[2]	10.0[2]
13					1.0	1.3	1.9	2.4	3.6	7.0	10.0[2]	10.0[2]
16					1.0	1.3	1.8	2.3	3.3	6.0	8.8	10.0[2]
20					1.0	1.2	1.7	2.2	3.2	5.5	7.7	10.0[2]
25							1.6	2.1	3.0	5.2	7.3	10.0[2]
32								2.1	2.9	5.0	7.0	10.0[2]
40									2.8	4.8	6.7	10.0
50										4.5	6.3	9.5
63											5.9	8.4

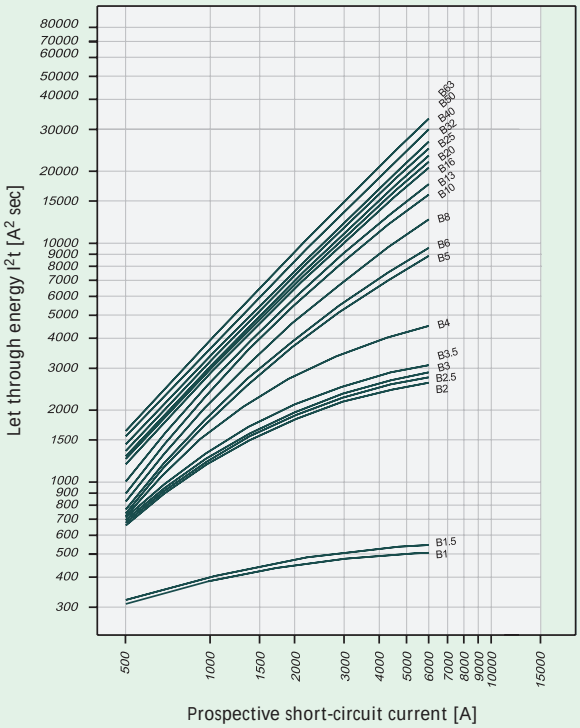
*Short circuit selectivity **characteristic D** towards fuse link **NH-00***)*

PLSM	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
0.5	2.1	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.0	<0.5[1]	0,6	1.4	4.3	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
1.5	<0.5[1]	<0.5[1]	0.9	1.6	2.7	4.0	8.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.3	2.1	3.1	6.0	8.6	10.0[2]	10.0[2]	10.0[2]	10.0[2]
2.5	<0.5[1]	<0.5[1]	0.7	1.2	1.8	2.6	4.8	6.9	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.0	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.3	6.0	10.0[2]	10.0[2]	10.0[2]	10.0[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.2	5.6	10.0[2]	10.0[2]	10.0[2]	10.0[2]
4	<0.5[1]	<0.5[1]	0.7	1.0	1.6	2.2	3.8	5.2	10.0	10.0[2]	10.0[2]	10.0[2]
5		<0.5[1]	0.6	0.9	1.4	1.9	3.2	4.1	7.1	10.0[2]	10.0[2]	10.0[2]
6		<0.5[1]	0.5	0.8	1.2	1.6	2.6	3.3	5.5	10.0[2]	10.0[2]	10.0[2]
8			0.5	0.8	1.1	1.5	2.2	2.7	4.1	8.7	10.0[2]	10.0[2]
10			0.5	0.7	1.0	1.3	1.9	2.5	3.6	7.2	10.0[2]	10.0[2]
13					1.0	1.3	1.9	2.3	3.4	6.5	9.5	10.0[2]
16						1.1	1.6	2.0	3.0	5.5	8.0	10.0[2]
20							1.4	1.8	2.8	5.0	7.5	10.0[2]
25								1.8	2.7	4.8	7.0	10.0[2]
32									2.4	4.1	6.2	9.3
40										4.0	6.0	9.0

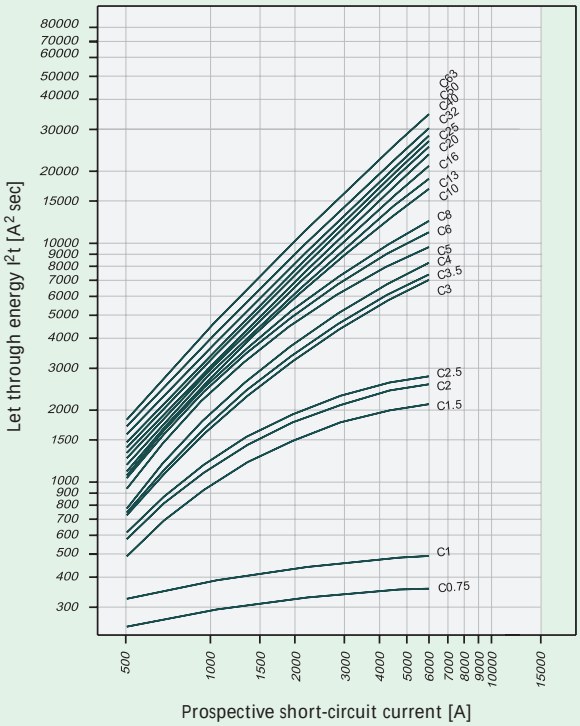
[1] Selectivity limit current I_s under 0.5 kA
[2] Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB
no selectivity

Let-through Energy PLS6

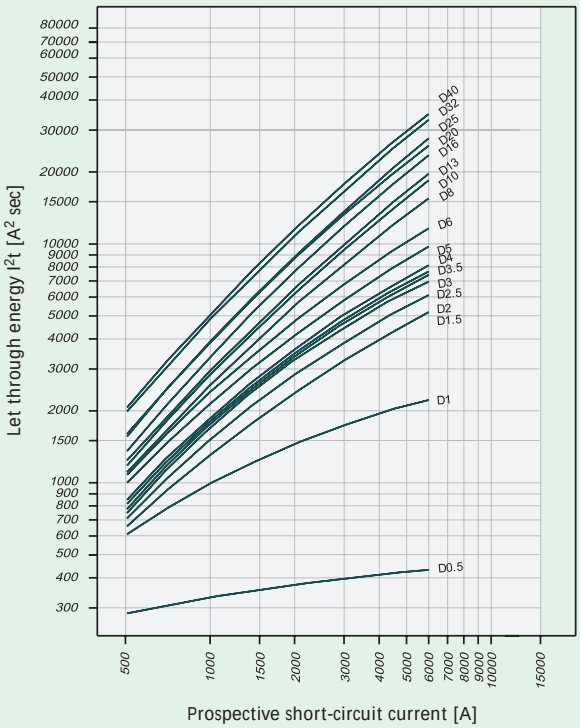
Let-through energy PLS6, characteristic B, 1-pole



Let-through energy PLS6, characteristic C, 1-pole



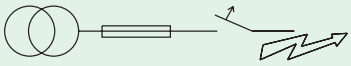
Let-through energy PLS6, characteristic D, 1-pole



Short Circuit Selectivity PLS6 towards DIAZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLS6 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic B** towards fuse link **DIAZED***)*

PLS6	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
1.0	<0.5[1]	1.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	1.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.6	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.8	1.5	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.8	1.4	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	0.6	1.0	3.6	6.0[2]	6.0[2]	6.0[2]	6.0[2]
5	<0.5[1]	<0.5[1]	0.6	0.9	2.0	3.5	6.0[2]	6.0[2]	6.0[2]
6		<0.5[1]	0.6	0.9	1.8	3.2	6.0[2]	6.0[2]	6.0[2]
8		<0.5[1]	0.5	0.8	1.6	2.6	5.2	6.0[2]	6.0[2]
10			0.5	0.8	1.4	2.2	3.9	6.0[2]	6.0[2]
13			0.5	0.7	1.3	2.0	3.6	5.4	6.0[2]
16				0.6	1.2	1.9	3.2	4.6	6.0[2]
20					1.2	1.8	3.1	4.4	6.0[2]
25					1.2	1.8	3.0	4.2	6.0[2]
32						1.7	2.8	3.9	6.0[2]
40							2.7	3.8	6.0[2]
50							2.5	3.5	5.7
63									5.3

*Short circuit selectivity **characteristic C** towards fuse link **DIAZED***)*

PLS6	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.75	1.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.0	<0.5[1]	1.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	<0.5[1]	1.0	2.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.6	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.8	1.4	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.8	0.9	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.6	0.9	2.2	4.5	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	0.6	0.8	1.8	3.6	6.0[2]	6.0[2]	6.0[2]
5	<0.5[1]	<0.5[1]	0.6	0.7	1.5	2.7	6.0[2]	6.0[2]	6.0[2]
6		<0.5[1]	0.5	0.6	1.4	2.4	5.5	6.0[2]	6.0[2]
8		<0.5[1]	<0.5[1]	0.6	1.3	2.2	4.7	6.0[2]	6.0[2]
10			<0.5[1]	0.6	1.3	2.0	3.6	6.0[2]	6.0[2]
13					1.3	1.9	3.3	5.0	6.0[2]
16					1.2	1.8	3.2	4.4	6.0[2]
20					1.2	1.8	3.1	4.1	6.0[2]
25						1.7	2.8	3.8	6.0[2]
32							2.7	3.7	6.0[2]
40								3.5	5.9
50									5.5
63									

*Short circuit selectivity **characteristic D** towards fuse link **DIAZED***)*

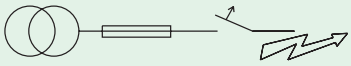
PLS6	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.5	0.5	3.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.0	<0.5[1]	<0.5[1]	1.0	2.4	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	<0.5[1]	0.7	1.2	3.5	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.6	1.0	2.8	5.8	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.6	1.4	2.3	4.6	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.6	0.9	2.3	4.3	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.6	0.9	2.1	4.0	6.0[2]	6.0[2]	6.0[2]
4		<0.5[1]	0.6	0.9	2.0	3.8	6.0[2]	6.0[2]	6.0[2]
5		<0.5[1]	0.5	0.7	1.7	3.1	6.0[2]	6.0[2]	6.0[2]
6			0.5	0.7	1.5	2.6	5.3	6.0[2]	6.0[2]
8			<0.5[1]	0.7	1.4	2.2	3.9	6.0[2]	6.0[2]
10				0.7	1.2	1.9	3.4	5.0	6.0[2]
13					1.2	1.8	3.2	4.6	6.0[2]
16						1.6	2.7	4.0	6.0[2]
20						1.5	2.5	3.5	6.0[2]
25							2.4	3.4	6.0[2]
32								2.8	5.0
40									4.8

[1] Selectivity limit current I_s under 0.5 kA
[2] Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB
no selectivity

Short Circuit Selectivity PLS6 towards NEOZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLS6 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic B** towards fuse link **NEOZED***)*

PLS6	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
1.0	<0.5[1]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	4.1	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.6	1.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.6	1.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.5	1.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.5	0.9	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	0.5	0.9	2.5	6.0[2]	6.0[2]	6.0[2]	6.0[2]
5		<0.5[1]	0.5	0.8	1.7	4.0	6.0[2]	6.0[2]	6.0[2]
6		<0.5[1]	0.5	0.8	1.6	3.6	6.0[2]	6.0[2]	6.0[2]
8			0.5	0.8	1.4	2.8	4.3	6.0[2]	6.0[2]
10			0.5	0.7	1.3	2.4	3.4	6.0[2]	6.0[2]
13			<0.5[1]	0.7	1.2	2.3	3.2	5.3	6.0[2]
16				0.6	1.1	2.2	2.9	4.6	6.0[2]
20					1.1	2.1	2.8	4.4	6.0[2]
25					1.1	2.0	2.7	4.2	6.0[2]
32						2.0	2.6	4.0	6.0[2]
40							2.5	3.8	6.0[2]
50							2.3	3.4	6.0[2]
63									6.0[2]

*Short circuit selectivity **characteristic C** towards fuse link **NEOZED***)*

PLS6	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.75	<0.5[1]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.0	<0.5[1]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	0.5	0.6	0.9	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.5	0.7	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.5	0.7	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.9	5.2	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.8	4.7	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.6	4.0	6.0[2]	6.0[2]	6.0[2]
5		<0.5[1]	<0.5[1]	0.5	1.3	3.1	5.7	6.0[2]	6.0[2]
6		<0.5[1]	<0.5[1]	<0.5[1]	1.2	2.7	4.5	6.0[2]	6.0[2]
8		<0.5[1]	<0.5[1]	<0.5[1]	1.2	2.5	4.0	6.0[2]	6.0[2]
10			<0.5[1]	<0.5[1]	1.2	2.3	3.1	5.4	6.0[2]
13					1.1	2.2	3.0	4.9	6.0[2]
16					1.1	2.1	2.8	4.4	6.0[2]
20					1.0	2.0	2.6	4.0	6.0[2]
25						1.9	2.5	3.8	6.0[2]
32							2.5	3.7	6.0[2]
40								3.5	6.0[2]
50									6.0[2]
63									

*Short circuit selectivity **characteristic D** towards fuse link **NEOZED***)*

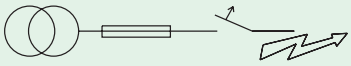
PLS6	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.5	<0.5[1]	10.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.0	<0.5[1]	<0.5[1]	0.7	1.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	<0.5[1]	0.6	0.9	2.8	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.6	0.8	2.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.5	0.7	1.9	5.4	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.5	0.7	1.8	4.8	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.5	0.7	1.7	4.7	6.0[2]	6.0[2]	6.0[2]
4		<0.5[1]	0.5	0.7	1.7	4.6	6.0[2]	6.0[2]	6.0[2]
5		<0.5[1]	<0.5[1]	0.6	1.5	3.5	5.8	6.0[2]	6.0[2]
6			<0.5[1]	0.5	1.3	2.9	4.5	6.0[2]	6.0[2]
8			<0.5[1]	0.5	1.2	2.4	3.5	6.0[2]	6.0[2]
10				0.5	1.1	2.2	3.0	5.0	6.0[2]
13					1.1	2.1	2.9	4.6	6.0[2]
16						1.9	2.6	3.9	6.0[2]
20						1.7	2.3	3.5	6.0[2]
25							2.2	3.4	6.0[2]
32								2.9	6.0[2]
40									5.7

[1] Selectivity limit current I_s under 0.5 kA
[2] Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB
no selectivity

Short Circuit Selectivity PLS6 towards NH-00 Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLS6 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic B** towards fuse link **NH-00***)*

PLS6	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
1.0	0.9	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	0.8	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	0.5	1.0	2.5	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	0.5	1.0	2.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	0.5	0.9	2.1	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	0.5	0.9	1.8	5.5	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	0.8	1.3	2.3	4.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
5	<0.5[1]	<0.5[1]	0.7	1.1	1.6	2.2	3.6	4.8	6.0[2]	6.0[2]	6.0[2]	6.0[2]
6	<0.5[1]	<0.5[1]	0.7	1.1	1.5	2.0	3.3	4.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]
8	<0.5[1]	<0.5[1]	0.6	1.0	1.3	1.7	2.6	3.3	5.2	6.0[2]	6.0[2]	6.0[2]
10		<0.5[1]	0.6	0.9	1.2	1.5	2.2	2.7	4.0	6.0[2]	6.0[2]	6.0[2]
13		<0.5[1]	0.6	0.8	1.1	1.4	2.1	2.6	3.8	6.0[2]	6.0[2]	6.0[2]
16			0.5	0.7	1.0	1.3	1.9	2.4	3.4	6.0[2]	6.0[2]	6.0[2]
20				0.7	1.0	1.3	1.9	2.4	3.3	6.0[2]	6.0[2]	6.0[2]
25				0.7	1.0	1.3	1.8	2.3	3.2	5.7	6.0[2]	6.0[2]
32					0.9	1.2	1.7	2.2	3.1	5.4	6.0[2]	6.0[2]
40								2.1	3.0	5.1	6.0[2]	6.0[2]
50								1.9	2.8	4.7	6.0[2]	6.0[2]
63										4.4	6.0[2]	6.0[2]

*Short circuit selectivity **characteristic C** towards fuse link **NH-00***)*

PLS6	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
0.75	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.0	0.9	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	0.6	1.3	4.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	0.6	1.0	2.5	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	0.5	1.0	2.1	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.7	1.2	1.8	2.6	4.7	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	0.7	1.0	1.5	2.1	3.6	5.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]
5	<0.5[1]	<0.5[1]	0.6	0.8	1.2	1.7	2.8	3.8	6.0[2]	6.0[2]	6.0[2]	6.0[2]
6	<0.5[1]	<0.5[1]	0.5	0.8	1.2	1.5	2.5	3.3	5.7	6.0[2]	6.0[2]	6.0[2]
8	<0.5[1]	<0.5[1]	0.5	0.8	1.1	1.5	2.3	2.9	4.9	6.0[2]	6.0[2]	6.0[2]
10			0.5	0.7	1.0	1.4	2.0	2.5	3.8	6.0[2]	6.0[2]	6.0[2]
13					1.0	1.3	1.9	2.4	3.6	6.0[2]	6.0[2]	6.0[2]
16					1.0	1.3	1.8	2.3	3.3	6.0[2]	6.0[2]	6.0[2]
20					1.0	1.2	1.7	2.2	3.2	5.5	6.0[2]	6.0[2]
25							1.6	2.1	3.0	5.2	6.0[2]	6.0[2]
32								2.1	2.9	5.0	6.0[2]	6.0[2]
40									2.8	4.8	6.0[2]	6.0[2]
50										4.5	6.0[2]	6.0[2]
63											5.9	6.0[2]

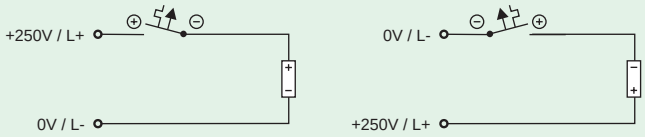
*Short circuit selectivity **characteristic D** towards fuse link **NH-00***)*

PLS6	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
0.5	2.1	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.0	<0.5[1]	0,6	1.4	4.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
1.5	<0.5[1]	<0.5[1]	0.9	1.6	2.7	4.0	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.3	2.1	3.1	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
2.5	<0.5[1]	<0.5[1]	0.7	1.2	1.8	2.6	4.8	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.0	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.3	6.0[2]	6.0[2]	6.0[2]	6.0[2]	6.0[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.2	5.6	6.0[2]	6.0[2]	6.0[2]	6.0[2]
4	<0.5[1]	<0.5[1]	0.7	1.0	1.6	2.2	3.8	5.2	6.0[2]	6.0[2]	6.0[2]	6.0[2]
5		<0.5[1]	0.6	0.9	1.4	1.9	3.2	4.1	6.0[2]	6.0[2]	6.0[2]	6.0[2]
6		<0.5[1]	0.5	0.8	1.2	1.6	2.6	3.3	5.5	6.0[2]	6.0[2]	6.0[2]
8			0.5	0.8	1.1	1.5	2.2	2.7	4.1	6.0[2]	6.0[2]	6.0[2]
10			0.5	0.7	1.0	1.3	1.9	2.5	3.6	6.0[2]	6.0[2]	6.0[2]
13					1.0	1.3	1.9	2.3	3.4	6.0[2]	6.0[2]	6.0[2]
16						1.1	1.6	2.0	3.0	5.5	6.0[2]	6.0[2]
20							1.4	1.8	2.8	5.0	6.0[2]	6.0[2]
25								1.8	2.7	4.8	6.0[2]	6.0[2]
32									2.4	4.1	6.0[2]	6.0[2]
40										4.0	6.0[2]	6.0[2]

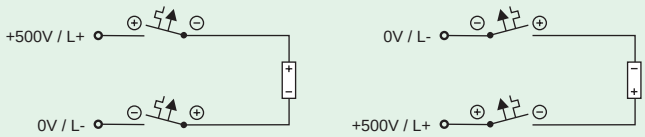
[1] Selectivity limit current I_s under 0.5 kA
[2] Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB
no selectivity

Miniature Circuit Breakers PLS6-DC for AC/DC, Characteristic C

Connection example at 220V=, 1-pole



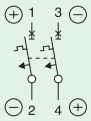
Connection example at 440V=, 2-pole



Connection diagrams PLS6-DC

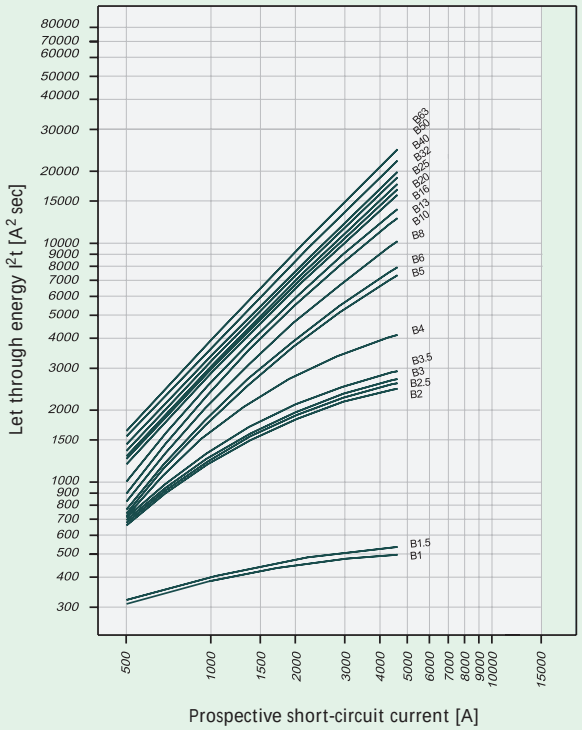
1-pole

2-pole

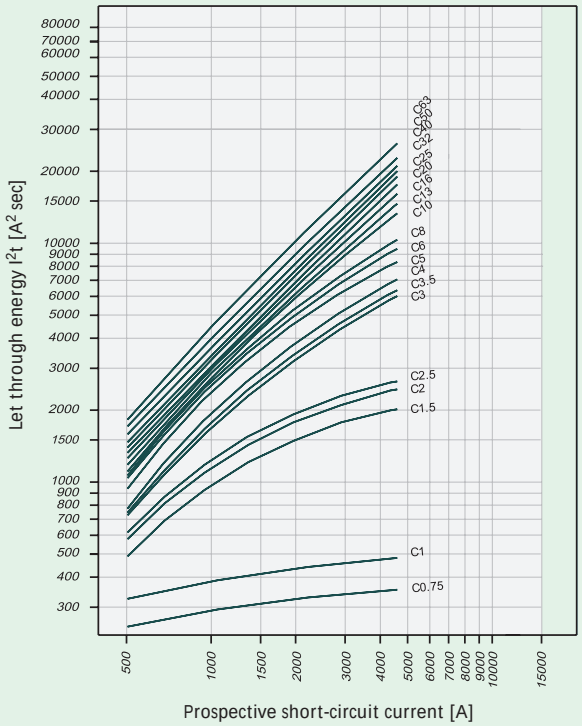


Let-through Energy PLS4

Let-through energy PLS4, characteristic B, 1-pole



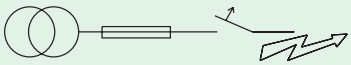
Let-through energy PLS4, characteristic C, 1-pole



Short Circuit Selectivity PLS4 towards DIAZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PLS4 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



1) Selectivity limit current I_s under 0.5 kA

2) Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

*Short circuit selectivity **characteristic B** towards fuse link **DIAZED***)*

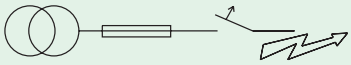
PLS4	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
1.0	<0.5[1]	1.2	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.5	<0.5[1]	1.0	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.6	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.5	<0.5[1]	<0.5[1]	0.8	1.5	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.0	<0.5[1]	<0.5[1]	0.8	1.4	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.3	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
4	<0.5[1]	<0.5[1]	0.6	1.0	3.6	4.5[2]	4.5[2]	4.5[2]	4.5[2]
5	<0.5[1]	<0.5[1]	0.6	0.9	2.0	3.5	4.5[2]	4.5[2]	4.5[2]
6		<0.5[1]	0.6	0.9	1.8	3.2	4.5[2]	4.5[2]	4.5[2]
8		<0.5[1]	0.5	0.8	1.6	2.6	4.5[2]	4.5[2]	4.5[2]
10			0.5	0.8	1.4	2.2	3.9	4.5[2]	4.5[2]
13			0.5	0.7	1.3	2.0	3.6	4.5[2]	4.5[2]
16				0.6	1.2	1.9	3.2	4.5[2]	4.5[2]
20					1.2	1.8	3.1	4.4	4.5[2]
25					1.2	1.8	3.0	4.2	4.5[2]
32						1.7	2.8	3.9	4.5[2]
40							2.7	3.8	4.5[2]
50							2.5	3.5	4.5[2]
63									4.5[2]

*Short circuit selectivity **characteristic C** towards fuse link **DIAZED***)*

PLS4	DIAZED DII-DIV gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.75	1.0	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.0	<0.5[1]	1.2	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.5	<0.5[1]	<0.5[1]	1.0	2.2	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.0	<0.5[1]	<0.5[1]	0.8	1.6	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.5	<0.5[1]	<0.5[1]	0.8	1.4	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.0	<0.5[1]	<0.5[1]	0.8	0.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.5	<0.5[1]	<0.5[1]	0.6	0.9	2.2	4.5[2]	4.5[2]	4.5[2]	4.5[2]
4	<0.5[1]	<0.5[1]	0.6	0.8	1.8	3.6	4.5[2]	4.5[2]	4.5[2]
5	<0.5[1]	<0.5[1]	0.6	0.7	1.5	2.7	4.5[2]	4.5[2]	4.5[2]
6		<0.5[1]	0.5	0.6	1.4	2.4	4.5[2]	4.5[2]	4.5[2]
8		<0.5[1]	<0.5[1]	0.6	1.3	2.2	4.5[2]	4.5[2]	4.5[2]
10			<0.5[1]	0.6	1.3	2.0	3.6	4.5[2]	4.5[2]
13					1.3	1.9	3.3	4.5[2]	4.5[2]
16					1.2	1.8	3.2	4.4	4.5[2]
20					1.2	1.8	3.1	4.1	4.5[2]
25						1.7	2.8	3.8	4.5[2]
32							2.7	3.7	4.5[2]
40								3.5	4.5[2]
50									4.5[2]
63									

In case of short circuit, there is selectivity between the miniature circuit breakers PLS4 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b



1) Selectivity limit current I_s under 0.5 kA

2) Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

Short Circuit Selectivity PLS4 towards NEOZED Fuses

*Short circuit selectivity **characteristic B** towards fuse link **NEOZED***)*

PLS4	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
1.0	<0.5[1]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.5	<0.5[1]	4.1	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.0	<0.5[1]	<0.5[1]	0.6	1.0	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.5	<0.5[1]	<0.5[1]	0.6	1.0	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.0	<0.5[1]	<0.5[1]	0.5	1.0	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.5	<0.5[1]	<0.5[1]	0.5	0.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
4	<0.5[1]	<0.5[1]	0.5	0.9	2.5	4.5[2]	4.5[2]	4.5[2]	4.5[2]
5		<0.5[1]	0.5	0.8	1.7	4.0	4.5[2]	4.5[2]	4.5[2]
6		<0.5[1]	0.5	0.8	1.6	3.6	4.5[2]	4.5[2]	4.5[2]
8			0.5	0.8	1.4	2.8	4.3	4.5[2]	4.5[2]
10			0.5	0.7	1.3	2.4	3.4	4.5[2]	4.5[2]
13			<0.5[1]	0.7	1.2	2.3	3.2	4.5[2]	4.5[2]
16				0.6	1.1	2.2	2.9	4.5[2]	4.5[2]
20					1.1	2.1	2.8	4.4	4.5[2]
25					1.1	2.0	2.7	4.2	4.5[2]
32						2.0	2.6	4.0	4.5[2]
40							2.5	3.8	4.5[2]
50							2.3	3.4	4.5[2]
63									4.5[2]

*Short circuit selectivity **characteristic C** towards fuse link **NEOZED***)*

PLS4	NEOZED D01-D03 gL/gG								
I_n [A]	10	16	20	25	35	50	63	80	100
0.75	<0.5[1]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.0	<0.5[1]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.5	<0.5[1]	0.5	0.6	0.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.0	<0.5[1]	<0.5[1]	0.5	0.7	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.5	<0.5[1]	<0.5[1]	0.5	0.7	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.0	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.5	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.8	4.5[2]	4.5[2]	4.5[2]	4.5[2]
4	<0.5[1]	<0.5[1]	<0.5[1]	0.6	1.6	4.0	4.5[2]	4.5[2]	4.5[2]
5		<0.5[1]	<0.5[1]	0.5	1.3	3.1	4.5[2]	4.5[2]	4.5[2]
6		<0.5[1]	<0.5[1]	<0.5[1]	1.2	2.7	4.5[2]	4.5[2]	4.5[2]
8		<0.5[1]	<0.5[1]	<0.5[1]	1.2	2.5	4.0	4.5[2]	4.5[2]
10			<0.5[1]	<0.5[1]	1.2	2.3	3.1	4.5[2]	4.5[2]
13					1.1	2.2	3.0	4.5[2]	4.5[2]
16					1.1	2.1	2.8	4.4	4.5[2]
20					1.0	2.0	2.6	4.0	4.5[2]
25						1.9	2.5	3.8	4.5[2]
32							2.5	3.7	4.5[2]
40								3.5	4.5[2]
50									4.5[2]
63									

Short Circuit Selectivity PLS4 towards NH-00 Fuses

*Short circuit selectivity **characteristic B** towards fuse link **NH-00***)*

PLS4	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
1.0	0.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.5	0.8	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.0	<0.5[1]	0.5	1.0	2.5	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.5	<0.5[1]	0.5	1.0	2.3	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.0	<0.5[1]	0.5	0.9	2.1	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.5	<0.5[1]	0.5	0.9	1.8	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
4	<0.5[1]	<0.5[1]	0.8	1.3	2.3	4.3	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
5	<0.5[1]	<0.5[1]	0.7	1.1	1.6	2.2	3.6	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
6	<0.5[1]	<0.5[1]	0.7	1.1	1.5	2.0	3.3	4.3	4.5[2]	4.5[2]	4.5[2]	4.5[2]
8	<0.5[1]	<0.5[1]	0.6	1.0	1.3	1.7	2.6	3.3	4.5[2]	4.5[2]	4.5[2]	4.5[2]
10		<0.5[1]	0.6	0.9	1.2	1.5	2.2	2.7	4.0	4.5[2]	4.5[2]	4.5[2]
13		<0.5[1]	0.6	0.8	1.1	1.4	2.1	2.6	3.8	4.5[2]	4.5[2]	4.5[2]
16			0.5	0.7	1.0	1.3	1.9	2.4	3.4	4.5[2]	4.5[2]	4.5[2]
20				0.7	1.0	1.3	1.9	2.4	3.3	4.5[2]	4.5[2]	4.5[2]
25				0.7	1.0	1.3	1.8	2.3	3.2	4.5[2]	4.5[2]	4.5[2]
32					0.9	1.2	1.7	2.2	3.1	4.5[2]	4.5[2]	4.5[2]
40								2.1	3.0	4.5[2]	4.5[2]	4.5[2]
50								1.9	2.8	4.5[2]	4.5[2]	4.5[2]
63										4.4	4.5[2]	4.5[2]

*Short circuit selectivity **characteristic C** towards fuse link **NH-00***)*

PLS4	NH-00 gL/gG											
I_n [A]	16	20	25	32	35	40	50	63	80	100	125	160
0.75	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.0	0.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
1.5	<0.5[1]	0.6	1.3	4.2	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.0	<0.5[1]	0.6	1.0	2.5	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
2.5	<0.5[1]	0.5	1.0	2.1	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.0	<0.5[1]	<0.5[1]	0.7	1.2	1.8	2.6	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
3.5	<0.5[1]	<0.5[1]	0.7	1.1	1.7	2.4	4.2	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
4	<0.5[1]	<0.5[1]	0.7	1.0	1.5	2.1	3.6	4.5[2]	4.5[2]	4.5[2]	4.5[2]	4.5[2]
5	<0.5[1]	<0.5[1]	0.6	0.8	1.2	1.7	2.8	3.8	4.5[2]	4.5[2]	4.5[2]	4.5[2]
6	<0.5[1]	<0.5[1]	0.5	0.8	1.2	1.5	2.5	3.3	4.5[2]	4.5[2]	4.5[2]	4.5[2]
8	<0.5[1]	<0.5[1]	0.5	0.8	1.1	1.5	2.3	2.9	4.5[2]	4.5[2]	4.5[2]	4.5[2]
10			0.5	0.7	1.0	1.4	2.0	2.5	3.8	4.5[2]	4.5[2]	4.5[2]
13					1.0	1.3	1.9	2.4	3.6	4.5[2]	4.5[2]	4.5[2]
16					1.0	1.3	1.8	2.3	3.3	4.5[2]	4.5[2]	4.5[2]
20					1.0	1.2	1.7	2.2	3.2	4.5[2]	4.5[2]	4.5[2]
25							1.6	2.1	3.0	4.5[2]	4.5[2]	4.5[2]
32								2.1	2.9	4.5[2]	4.5[2]	4.5[2]
40									2.8	4.5[2]	4.5[2]	4.5[2]
50										4.5[2]	4.5[2]	4.5[2]
63											4.5[2]	4.5[2]

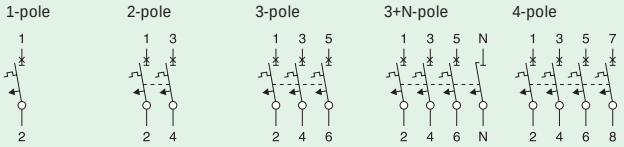
Miniature Circuit Breakers PLHT

- Independent switching contacts
- High current limit
- With isolator function, meets the requirements of insulation co-ordination, distance between contacts ≥ 4 mm, for secure isolation

Accessories:

Auxiliary switch for		
subsequent installation (0.5 MU)	Z-LHK	248440
Shunt trip release for		
subsequent installation (1.5 MU)	Z-LHASA/230	248442
	Z-LHASA/24	248441
Anti-tamper device	LH-SPL	850000870
Busbar see capter busbar system		

Connection diagrams



Technical Data

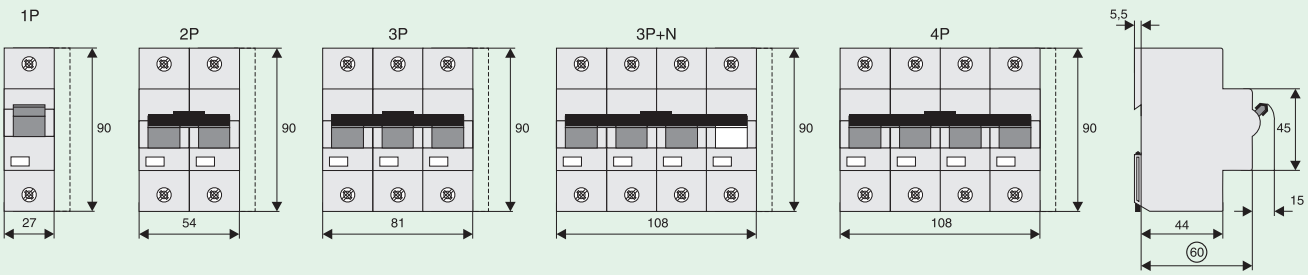
Electrical

Design according to	EN 60947-2	
Current test marks as printed onto the device		
Rated voltage		
AC	230/400V	
DC	60V (per pole)	
Operational voltage	240/415 V	
Ultimate short circuit breaking capacity acc. to IEC/EN 60947-2		
Characteristics B,C	I_n = 20-63 A	25 kA
I_n = 80-100 A	20 kA	
I_n = 125 A	15 kA	
Characteristic D	I_n = 63 A	25 kA
I_n = 80 A	20 kA	
I_n = 100 A	15 kA	
Characteristic	in accordance with characteristics B, C, D	
Back-up fuse	max. 200 A gL	
Rated insulation voltage	440 V	
Peak withstand voltage U_{imp}	4 kV	
Selectivity class	in acc. with class 3	
Endurance	≥ 20,000 operating cycles	

Mechanical

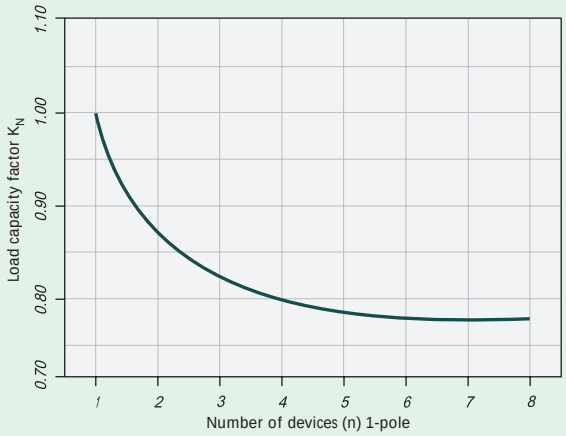
Frame size	45 mm
Device height	90 mm
Device width	27 mm (1.5MU) per pole
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022
Degree of protection, built-in	IP40
Upper and lower terminals	lift terminals
Terminal protection	finger and hand touch safe, VBG 4, ÖVE-EN 6
Terminal capacity	2.5-50 mm²

Dimensions (mm)

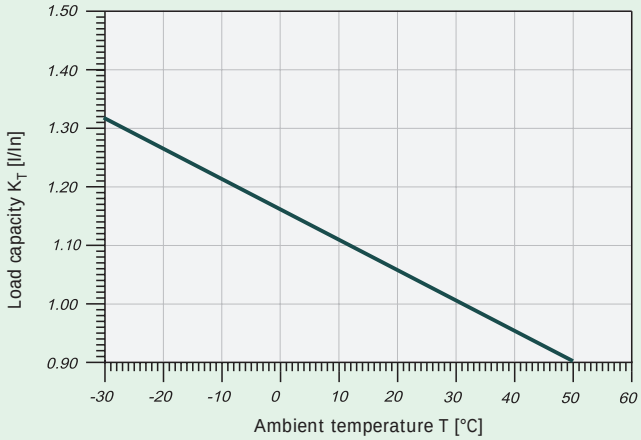


Load Capacity

Load capacity in case of block installation



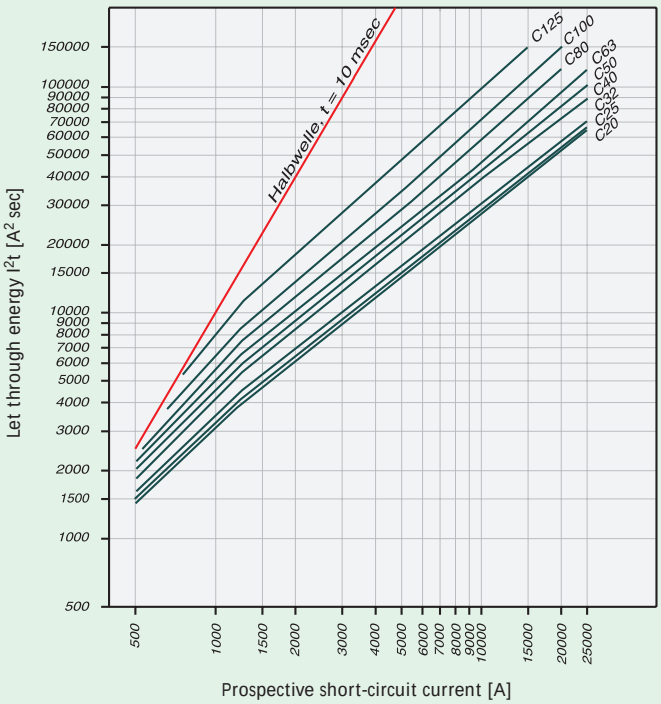
Effect of ambient temperature



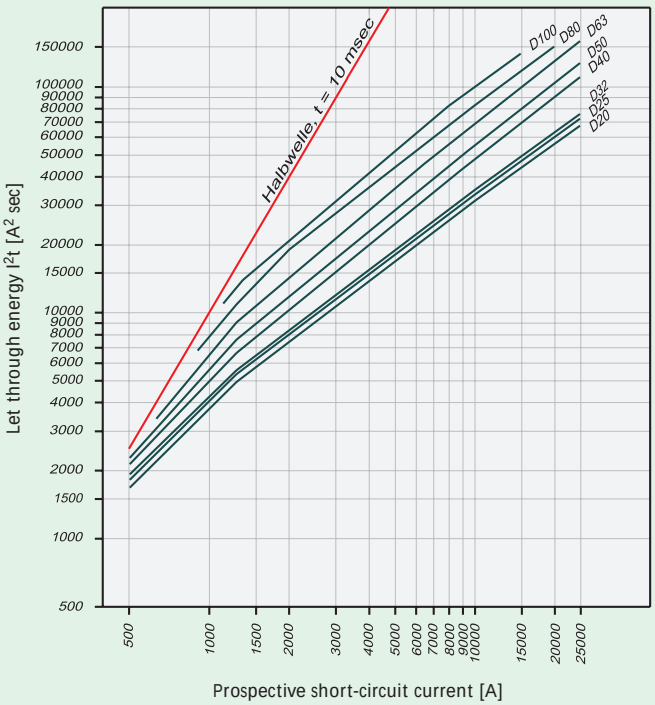
Permitted permanent load at ambient temperature T [°C] with n devices: $I_{DL} = I_n K_T(T) K_N(N)$.

Let-through Energy

Maximum let-through energyPLHT, characteristic C, 1-pole



Maximum let-through energyPLHT, characteristic D, 1-pole



Determined according to EN 60898.

Short Circuit Selectivity

- Short circuit selectivity (in kA) between PLHT and upstream fuse D0 or NH, operating class gL/gG
- 1,4 . . selectivity up to 1.4 kA; [ ] . . . no selectivity

Selectivity towards back-up fuses D01, D02, D03

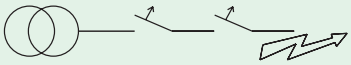
Rated current I_n PLHT in A		Rated current of the back-up fuse in A					
		25	35	50	63	80	100
C-Characteristic	20	0,5	1,0	2,0	2,9	3,9	7,6
	25		1,0	1,9	2,8	3,8	7,3
	32		1,0	1,8	2,7	3,6	7,0
	40			1,6	2,2	3,0	5,6
	50				2,1	2,8	5,2
	63					2,7	4,8
	80						4,3
	100						
	125						
D-Characteristic	20	0,5	0,9	1,7	2,5	3,4	6,7
	25		0,9	1,6	2,3	3,2	6,2
	32		0,9	1,5	2,3	3,0	6,0
	40			1,4	2,0	2,6	4,7
	50				1,8	2,3	4,3
	63					2,1	3,7
	80						3,1
	100						

Selectivity towards back-up fuses NH Gr. 00

Rated current I_n PLHT in A		Rated current of the back-up fuse in A									
		25	35	40	50	63	80	100	125	160	200
C-Characteristic	20	0,5	1,0	1,3	1,9	2,7	3,7	6,7	17,0	25,0	25,0
	25		0,9	1,3	1,8	2,6	3,5	6,5	17,0	25,0	25,0
	32		0,9	1,2	1,7	2,4	3,3	6,0	15,0	23,0	25,0
	40				1,4	2,1	2,9	4,8	12,0	18,0	25,0
	50					1,9	2,7	4,5	11,0	17,0	25,0
	63							4,2	10,0	15,0	25,0
	80							3,8	8,5	12,0	25,0
	100								7,0	10,0	25,0
	125									7,5	25,0
D-Characteristic	20	<0,5	0,8	1,1	1,5	2,3	3,1	5,6	16,0	25,0	25,0
	25		0,7	1,0	1,4	2,1	3,0	5,3	14,0	23,0	25,0
	32		0,7	1,0	1,3	2,1	2,9	5,0	13,0	22,0	25,0
	40				1,1	1,8	2,5	4,2	10,0	15,0	25,0
	50					1,6	2,3	3,8	8,5	13,0	22,0
	63						2,1	3,2	7,0	10,5	18,0
	80							2,8	5,5	8,4	15,0
	100								4,8	7,5	12,5

Short Circuit Selectivity PLHT towards NZM 1

In case of short circuit, there is selectivity between the miniature circuit breakers PLHT and the upstream NZM up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond). Overload and short-circuit release unit NZM at max. value.
*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic C** towards **NZM***)*

PLHT	NZM...1-A gL/gG					
I_n [A]	40	50	63	80	100	125
20	0.3	0.4	0.5	0.75	0.9	1.25
25	0.3	0.4	0.5	0.7	0.9	1.2
32		0.4	0.5	0.7	0.85	1.2
40			0.5	0.6	0.85	1.1
50				0.6	0.85	1.1
63					0.8	1
80						1
100						
125						

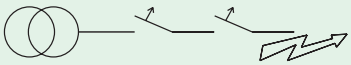
*Short circuit selectivity **characteristic D** towards **NZM***)*

PLHT	NZM...1-A gL/gG					
I_n [A]	40	50	63	80	100	125
50						
63						
80						
100						

no selectivity

Short Circuit Selectivity PLHT towards NZM 2

In case of short circuit, there is selectivity between the miniature circuit breakers PLHT and the upstream NZM up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{KS} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond). Overload and short-circuit release unit NZM at max. value.
*) basically in accordance with EN 60898 D.5.2.b



*Short circuit selectivity **characteristic C** towards **NZM***)*

PLHT	NZM...2-A gL/gG								
I_n [A]	40	50	63	80	100	125	160	200	250
20	0.3	0.4	0.5	0.75	0.9	1.25	1.8	2.5	3.5
25	0.3	0.4	0.5	0.7	0.9	1.2	1.7	2.4	3.3
32		0.4	0.5	0.7	0.85	1.2	1.65	2.3	3.2
40			0.5	0.6	0.85	1.1	1.5	2.1	2.9
50				0.6	0.85	1.1	1.5	2	2.8
63					0.8	1	1.4	1.8	2.5
80						1	1.4	1.8	2.4
100							1.3	1.7	2.3
125								1.6	2.1

*Short circuit selectivity **characteristic D** towards **NZM***)*

PLHT	NZM...2-A gL/gG								
I_n [A]	40	50	63	80	100	125	160	200	250
50							1	1.4	2.6
63							1	1.3	2.3
80									2.1
100									

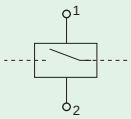
no selectivity

Accessories for PLHT

Shunt Trip Release Z-LHASA

- Can be mounted subsequently
- Contact position indicator red - green
- Marking labels can be fitted
- Wide operational voltage range
- Sufficient power of extra low voltage source must be ensured
  Z-LHASA/24: min. 90 VA

Connection diagram

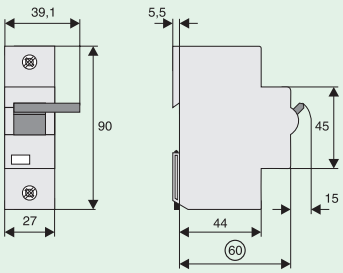


Technical Data

Electrical	
Operational voltage range	
Z-LHASA/230:	110-415 V~
Z-LHASA/24:	12-60 V~
Operational frequency	50-60 Hz
Max. current consumption	
Z-LHASA/230:	3.6 A
Z-LHASA/24:	44 A

Mechanical	
Frame size	45 mm
Device height	90 mm
Device width	27 mm
Mounting	quick fastening on DIN rail EN 50022
Degree of protection, built-in	IP40
Upper and lower terminals	lift terminals

Dimensions (mm)



Auxiliary Switch Z-LHK

- Auxiliary switch according to IEC 947-5-1
- Can be mounted subsequently

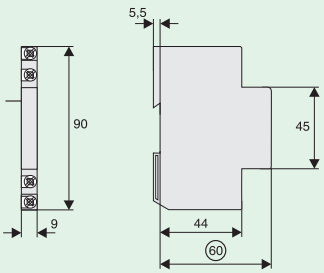
Connection diagram

Technical Data

Electrical	
Rated operational current	(250 V~) 6A/AC13
Minimum operational voltage	24V each line
Rated thermal current	8 A
Rated insulation voltage	440 V~
Maximum back-up fuse	6 A gL or CLS6-4/./B-HS
Contacts	1NO+1NC
Utilisation category AC13	6A/250VAC 2A/440VAC
Utilisation category DC13	4A/600VDC 2A/110VDC 0.5A/230VDC

Mechanical	
Frame size	45 mm
Device height	90 mm
Device width	9 mm
Mounting	mounted onto protective devices
Degree of protection, built-in	IP40
Upper and lower terminals	lift terminals
Terminal capacity	1 x 1mm^2 to 2 x 2.5mm^2

Dimensions (mm)



Main Load Disconnector Switch (Isolator) Z-HA

- Load circuit breaker with isolating function
- Design according to IEC/EN 60947-3
- Highly wear resistant contacts
- Quick make, black toggle
- Terminal capacity 1.5-35 mm^2

Innovation Prize Mercur 1997 of the Vienna Chamber of Commerce

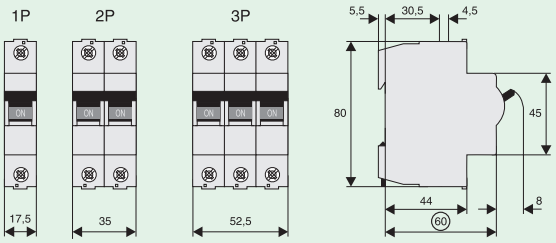
Connection diagram

e.g. 2-pole

Technical Data

	Z-HA40	Z-HA80	Z-HA100
Electrical			
Rated voltage	240/415V	240/415V	240/415V
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Rated insulation voltage	1000 V~	1000 V~	1000 V~
Rated current			
240/415V, AC22A	40 A	80 A	100 A
240/415V, AC23	40 A	50 A	50 A
Number of poles	1-, 2-, 3-pole	1-, 2-, 3-pole	1-, 2-, 3-pole
Maximum back-up fuse			
Ik = 4500A	80 A	80 A	–
Ik = 3000A	–	–	100 A
Mechanical			
Frame size	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm
Device width	17.5mm/pole	17.5mm/pole	17.5mm/pole
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022		
Degree of protection, built-in	IP40	IP40	IP40
Terminal protection	finger and hand touch safe according to VDE 0106 Part 100 (VBG 4)		
Terminal capacity	1.5-35 mm^2	1.5-35 mm^2	1.5-35 mm^2

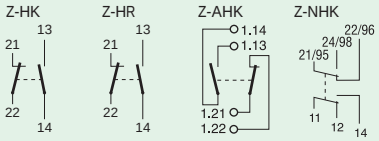
Dimensions (mm)



Auxiliary Switch Z-.HK, Z-HR, Z-AHK; Tripping Signal Switch Z-NHK

- Design according to IEC/EN 60947-5-1, IEC/EN 62019
- Can be mounted subsequently (screws)
- The specified minimum voltages are per contact
  Take into account particularly in case of series connection!
- **Z-AHK, Z-NHK:** Contact function with relative movement (self-cleaning contacts)
- Contact material and design particularly suitable for extra low voltage
- **Z-NHK:** The function of one of the two change-over contacts can be switched from "auxiliary switch" to "tripping signal switch"
- Tripping signal contact transmits message of electric tripping, not mechanical switch-off
- Test key for contact function "electrical tripping"

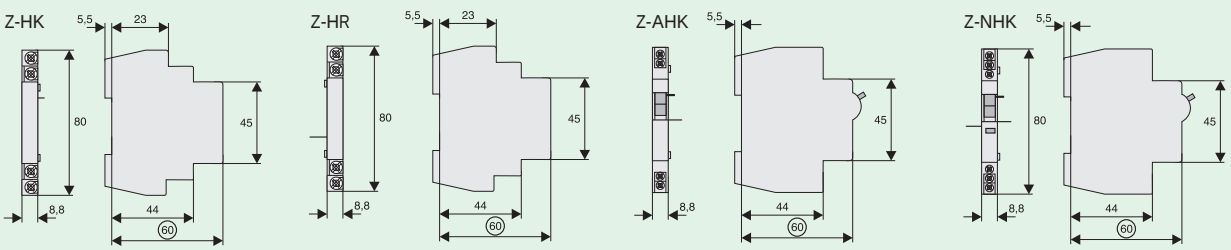
Connection diagrams



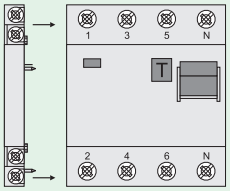
Technical Data

	Z-HK	Z-HR	Z-AHK	Z-NHK
Electrical				
Can be mounted from the left onto	PFIM, PFR	– –	PKDM, Z-MS	PKDM, Z-MS
Can be mounted from the right onto	–	PFNM	–	PFIM, PFR
Contact function	1NO + 1NC	1NO + 1NC	1NO + 1NC	2CO
Rated voltage	250 V	250 V	250 V	250 V
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Rated current	8 A	6 A	4 A	4 A
Rated thermal current I_{th}	8 A	6 A	4 A	4 A
Utilisation category AC13				
Rated operational current I_e	6A/250V AC 2A/440V AC	6A/230V AC 2A/400V AC	3A/250V AC –	3A/250V AC –
Utilisation category AC15				
Rated operational current I_e	–	–	2A/250V AC	2A/250V AC
Utilisation category DC12				
Rated operational current I_e	–	–	0.5A/110V DC	0.5A/110V DC
Utilisation category DC13				
Rated operational current I_e	0.5A/230V DC 2A/110V DC 4A/60V DC – –	0.5A/230V DC – 2A/60V DC 4A/24V DC 4A/12V DC	– – – – –	– – – – –
Rated insulation voltage U_i	250 V AC	250 V AC	250 V AC	250 V AC
Minimum operational voltage per contact U_{min}	24 V AC/DC	12 V AC/DC	5 V DC	5 V DC
Minimum operational current I_{min}	50 mA AC/DC	50 mA AC/DC	10 mA DC	10 mA DC
Rated peak withstand voltage U_{imp} (1.2/50µ)	2.5 kA	2.5 kA	2.5 kA	2.5 kA
Conditional short circuit current I_k with back-up fuse 6A or PLSM-B4-HS	–	–	1 kA	1 kA
Max. back-up fuse, overload and short circuit	8 A gL / CLS6-4/../B-HS	8 A gL / CLS6-4/../B-HS	4 A gL / CLS6-4/../B-HS	4 A gL / CLS6-4/../B-HS
Mechanical				
Tripping indicator "electrical tripping"	–	–	–	blue/white
Frame size	45 mm	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm	80 mm
Device width	8.8 mm (0.5MU)	8.8 mm (0.5MU)	8.8 mm (0.5MU)	8.8 mm (0.5MU)
Mounting	onto switching dev.	onto switching dev.	onto switching dev.	onto switching dev.
Degree of protection, built-in	IP40	IP40	IP40	IP40
Terminal protection	finger and hand touch safe according to VBG 4, ÖVE-EN 6			
Terminals	lift terminals	lift terminals	lift terminals	lift terminals
Terminal capacity	0.5-2.5 mm²	0.5-2.5 mm²	0.5-2.5 mm²	0.5-2.5 mm²
Terminal screws	M3 (Pozidrive Z0)	M3 (Pozidrive Z0)	M3 (Pozidrive Z0)	M3 (Pozidrive Z0)
Fastening torque of terminal screws	max. 0.8-1.0 Nm	max. 0.8-1.0 Nm	max. 0.8-1.0 Nm	max. 0.8-1.0 Nm

Dimensions (mm)

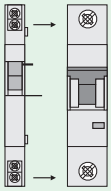


Example: Z-HK + PFIM



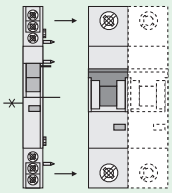
1NO+1NC 24V 50mA min.

Example: Z-AHK + CLS6



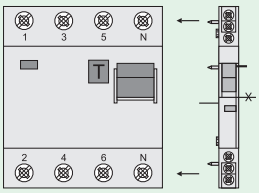
1NO+1NC 5V 10mA min.

Example: Z-NHK + CLS6

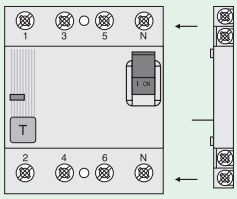


2CO 5V 10mA min.

PFIM + Z-NHK



Example: Z-HR + PFNM

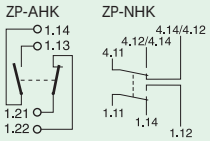


1NO+1NC 12V 50mA min.

Auxiliary Switch ZP-AHK, Tripping Signal Switch ZP-NHK

- Design according to IEC/EN 62019
- No screws required. Can be **snapped onto** PLS and PKNM subsequently
- The specified minimum voltages are per contact Take into account particularly in case of series connection!
- Contact material and design particularly suitable for extra low voltage. Contact function with relative movement (self-cleaning contacts)e)
- **ZP-NHK:** The function of one of the two change-over contacts can be switched from “auxiliary switch” to "tripping signal switch"
- Tripping signal contact transmits message of electric tripping, not mechanical switch-off
- Test key for contact function “electrical tripping”

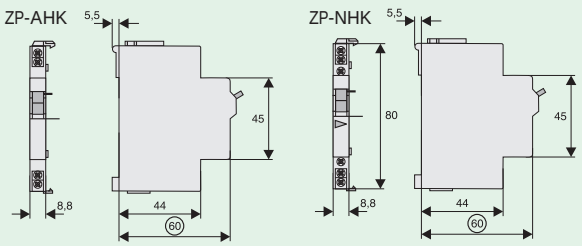
Connection diagrams



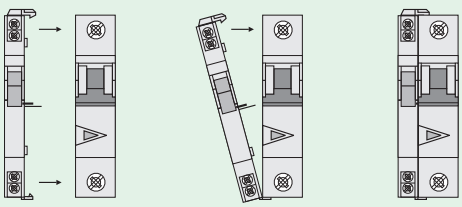
Technical Data

	ZP-AHK	ZP-NHK
Electrical		
Can be mounted from the left onto MCB:	PLS, PLZ	PLS, PLZ
RCD/MCB:	PKNM, PKDM	PKNM, PKDM
Accessories:	ZP-ASA	ZP-ASA
Contact function	1NO + 1NC	2CO
Rated voltage	250/440 V	250 V
Frequency	50/60 Hz	50/60 Hz
Rated current	4 A	4 A
Rated thermal current I_{th}	4 A	4 A
Utilisation category AC13		
Rated operational current I_e	3A/250V AC	3A/250V AC
Utilisation category AC15		
Rated operational current I_e	2A/250V AC	2A/250V AC
Utilisation category DC12		
Rated operational current I_e	0.5A/110V DC	0.5A/110V DC
Rated insulation voltage U_i	250 V AC	250 V AC
Minimum operational voltage per contact U_{min}	5 V DC	5 V DC
Minimum operational current I_{min}	10 mA DC	10 mA DC
Rated peak withstand voltage U_{imp} (1.2/50µ)	2.5 kA	2.5 kA
Conditional short circuit current I_k		
with back-up fuse 6A or PLSM-B4-HS	1 kA	1 kA
Max. back-up fuse, overload and short circuit	4 A gL / PLSM-B4-HS	4 A gL / PLSM-B4-HS
Mechanical		
Tripping indicator “electrical tripping”	–	blue/white
Frame size	45 mm	45 mm
Device height	80 mm	80 mm
Device width	8.8 mm (0.5MU)	8.8 mm (0.5MU)
Degree of protection, built-in	IP40	IP40
Terminal protection	finger and hand touch safe according to VBG 4, ÖVE-EN 6	
Terminals	lift terminals	lift terminals
Terminal capacity	0.5-2.5 mm^2	0.5-2.5 mm^2
Terminal screws	M3 (Pozidrive Z0)	M3 (Pozidrive Z0)
Fastening torque of terminal screws	max. 0.8-1.0 Nm	max. 0.8-1.0 Nm

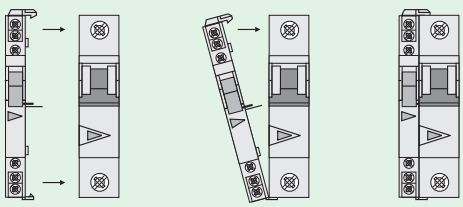
Dimensions (mm)



Example: ZP-AHK + PLS



Example: ZP-NHK + PLS



MCB for Auxiliary Switch Circuits PLSM-B4/.-HS

- Design according to EN 60898, 4 A, Characteristic B
- Very low let-through energy in order to prevent contact welding in auxiliary switches of **any and all switchgear**, as well as thermostats control devices, timers, etc.
- Busbar connection to PFIM, PKN, ...

Connection diagram

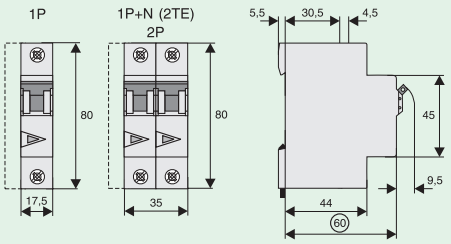
e.g. 1-pole

Technical Data

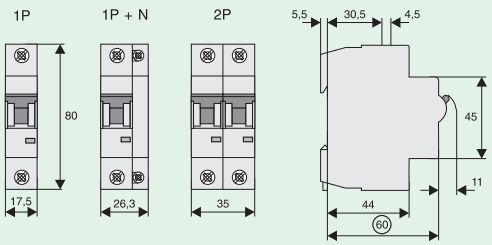
	PLSM-B4/.-HS
Electrical	
Number of poles	1-, 2-pole
Rated voltage	230/400 V
Operational voltage	240/415 V
Frequency	50/60 Hz
Rated current	4 A
Rated breaking capacity	10 kA
Mechanical	
Frame size	45 mm
Device height	80 mm
Device width	17.5 mm (1MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022
Degree of protection, built-in	IP40
Terminal protection	finger and hand touch safe according to VBG 4, ÖVE-EN 6
Terminals	Twin-purpose terminals
Terminal capacity	1-25 mm^2
Terminal screws	M3 (Pozidrive)
Fastening torque of terminal screws	0.8-1.0 Nm
Busbar thickness	0.8 - 2 mm

Dimensions (mm)

PLSM-B4/.-HS

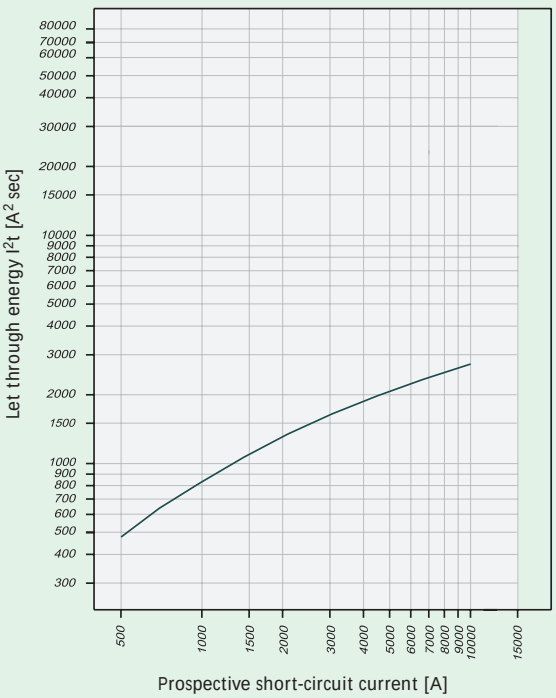


CLS6-B4/..-HS



Let-through Energy PLSM-B4-HS

Let-through energy PLS., characteristic B, 1-pole



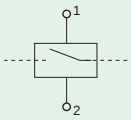
Practical Hint

Even auxiliary switches must be protected against overload and short circuit by means of suitable back-up fuses according to manufacturer specification. According to IEC 60947-5 a maximum back-up fuse is specified for conditional short circuit prevention up to 1,000 A. Therefore, connection of the auxiliary switch to the nearest MCB is not permitted. Danger of contact welding! The MCB for auxiliary switch circuits ...-HS offers a simple solution.

Shunt Trip Release Z-ASA, ZP-ASA

- Remote release for subsequent mounting onto PLS, PKN, PKDM, Z-MS
- Module width 1MU
- Additional installation of standard auxiliary switch is possible
- Position indicator red - green
- Type ZP-ASA for snap-on mounting

Connection diagram

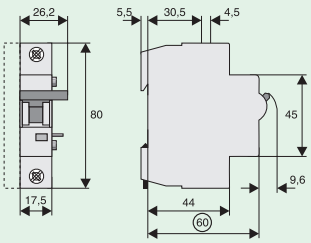


Technical Data

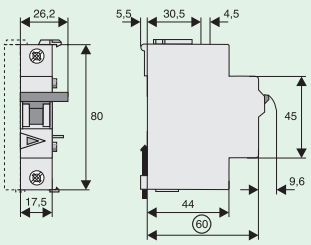
	Z-ASA24	Z-ASA230	ZP-ASA24	ZP-ASA230
Electrical				
Can be mounted onto RCDs, combined RCD/MCBs:	–	–	PLS, PKN, PKDM	PLS, PKN, PKDM
Accessories:	Z-MS	Z-MS	–	–
Operational voltage range	12-60V AC 12-60V DC	110-415V AC 110-220V DC	12-60V AC 12-60V DC	110-415V AC 110-220V DC
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Possible standard auxiliary switch	Z-NHK	Z-NHK	ZP-NHK	ZP-NHK
Mechanical				
Frame size	45 mm	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm	80 mm
Device width	17.5 mm (1MU)	17.5 mm (1MU)	17.5 mm (1MU)	17.5 mm (1MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022			
Degree of protection, built-in	IP40	IP40	IP40	IP40
Terminal protection	finger and hand touch safe according to VBG 4, ÖVE-EN 6			
Terminals	open mouthed/lift	open mouthed/lift	open mouthed/lift + guide	open mouthed/lift + guide
Terminal capacity	1-25 mm^2	1-25 mm^2	1-25 mm^2	1-25 mm^2

Dimensions (mm)

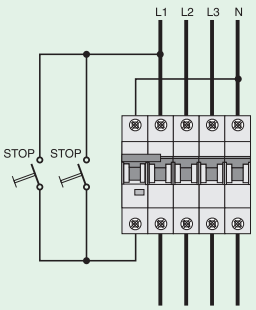
Z-ASA



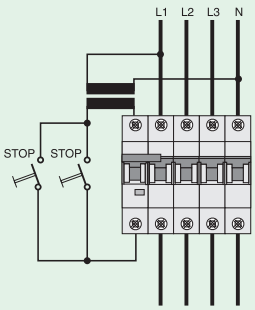
ZP-ASA



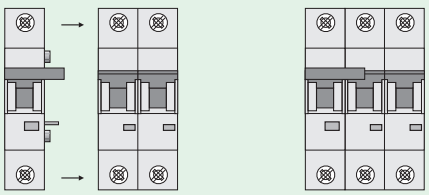
Connection Example 230 V



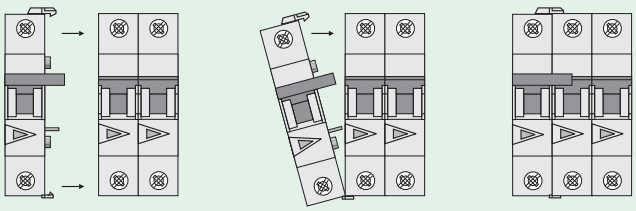
Connection Example 24 V



Example: Z-ASA + PLS



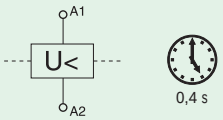
Example: ZP-ASA + PLS



Undervoltage Release Z-USA, Z-USD

- Tripping:
  Instantaneous Z-USA
  Delayed Z-USD, typ. 0,4 s
- Voltage control indicator blue/white
- Service key for zero voltage switch-on for testing purposes
- Can be used with PLS and Z-MS

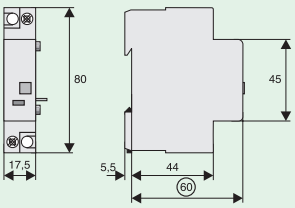
Connection diagram



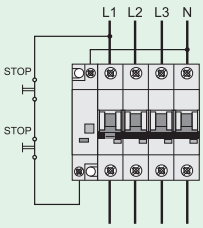
Technical Data

	Z-US./115	Z-US./230	Z-US./400
Electrical			
Rated voltage U_n	115 V AC	230 V AC	400 V AC
Frequency	50-60 Hz	50-60 Hz	50-60 Hz
Making threshold	80% of U_n	80% of U_n	80% of U_n
Tripping threshold	50% of U_n	50% of U_n	50% of U_n
Mechanical			
Frame size	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm
Device width	17.5 mm (1MU)	17.5 mm (1MU)	17.5 mm (1MU)
Mounting	quick fastening on DIN rail EN 50022		
Degree of protection, built-in	IP40	IP40	IP40
Terminals	open mouthed/lift	open mouthed/lift	open mouthed/lift
Terminal capacity	1 - 2x2.5 mm^2	1 - 2x2.5 mm^2	1 - 2x2.5 mm^2
Terminal protection	finger and hand touch safe, according to VBG 4, ÖVE-EN 6		

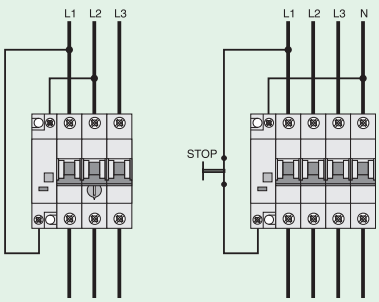
Dimensions (mm)



Connection Example Release



Connection Examplees 400V and 230V



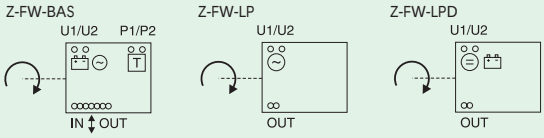
Connection example
Z-USA/400 + Z-MS

Connection example
Z-USA/230 + CLS

Remote Control and Automatic Switching Z-FW

- Shape compatible switching device suitable for subsequent installation for automatic re-setting and remote control of PFIM, PFHM-4p, Z-MS
- **Z-FW-BAS:** Electrical and mechanical remote switching, ON and OFF
- Mechanical interlock, can be sealed with leads
- Mechanical switching capability up to max. PFIM-80/4p
- Operating and alarm display by green and red LED

Connection diagram

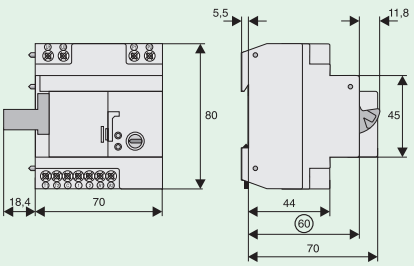


Technical Data

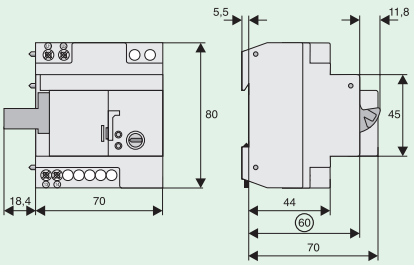
	Z-FW-BAS Phase out type	Z-FW-LP	Z-FW-LPD
Electrical			
Possible operating voltages	24-240 V AC, 24-80 V DC	220-240 V AC	48 V DC
Frequency	50/60 Hz	50/60 Hz	–
Testing module (0.5MU) for remote testing of RCDs	Z-FW	–	–
Control voltage for remote control	24-230V AC/DC	–	–
Relay output for tripping test with Z-FW	400V AC	–	–
Relay output for alarm, potential-free	5A/250V AC	5A/250V AC	5A/250V AC
Functions	Local, remote a. automatic control	–	–
Function selector	NO-Automatic, Automatic 1x, Automatic 5x, OFF/RESET	– – Automatic 5x, OFF/RESET	– – Automatic 5x, OFF/RESET
Remote control function via telephone with Telecommander	Z-TC	–	–
Mechanical			
Frame size	45 mm		
Device height	80 mm		
Device width	70 mm		
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022		
Degree of protection, built-in	IP40		
Terminal protection	finger and hand touch safe according to VBG 4, ÖVE-EN 6		
Terminals	lift terminals		
Terminal capacity	2 x 1.5mm^2 or 1 x 2.5mm^2		

Dimensions (mm)

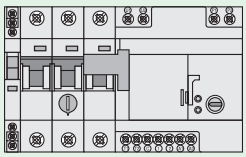
Z-FW-BAS



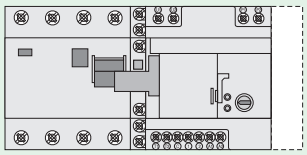
Z-FW-LP, -LPD



Installation examples



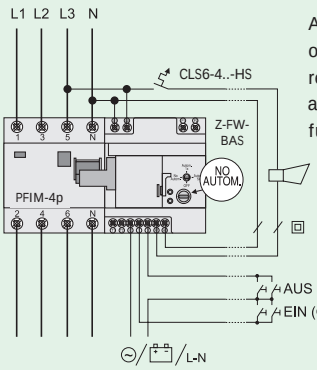
Z-NHK + Z-MS-3p + Z-FW-BAS



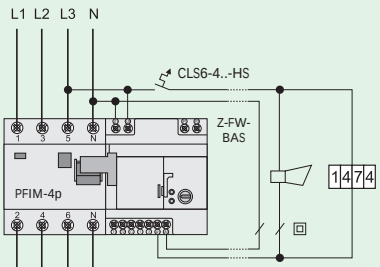
Expansion modules in preparation

PFIM + Z-NHK + Z-FW-BAS

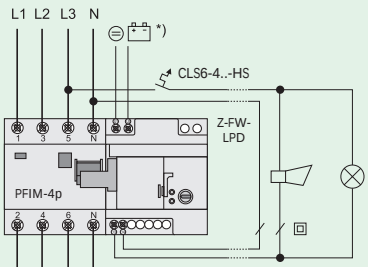
Connection examples



Auto-stop operation with remote reset and alarm function



Connection diagram:
PFIM-4p RCD feed above
Alarm function and meter

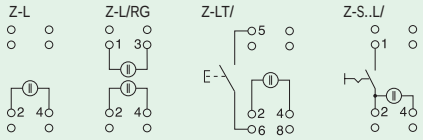


Connection diagram:
PFIM-4p RCD feed above
Alarm function and lamp
*) discretionary polarity

Lighting Fixtures Z-L; Illuminated Pushbuttons Z-LT/; Illuminated Switch Z-SL/, Z-S32L/

- Design according to IEC/EN 60669, VDE 0632
- Supplied with glow lamp installed
- Blue lighting fixture Z-L/B: supplied with special lamp, standard lamps cannot be fitted with blue lamp caps
- Twin lighting fixture: with separate connections, occupies 50% less space than 2 MU lighting fixtures

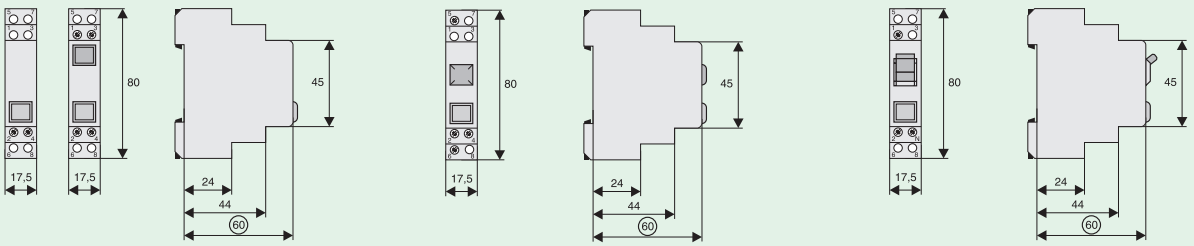
Connection diagrams



Technical Data

	Z-L	Z-LT/	Z-S..L/
Electrical			
Rated voltage	230/400V AC	230/400V AC	230/400V AC
Frequency	50 HZ	50 HZ	50 HZ
Rated current	16A	16A	16, 32A
Glow lamp	2mA	2mA	2mA
Rated voltage	min. 5VDC/max. 230VAC	min. 5VDC/max. 230VAC	min. 5VDC/max. 230VAC
Power rating	0.3W/max. 2W	0.3W/max. 2W	0.3W/max. 2W
Thread	E10	E10	E10
Switching contact	–	16A/230V~	16A/230V~
Switching capacity	–	1.25 x I_n; 1.1 x U_n	1.25 x I_n; 1.1 x U_n
Short circuit strength	10 kA / 35 A gL	10 kA / 35 A gL	10 kA / 35 A gL
Mechanical			
Colour of lamp cap	different	clear (standard)	clear (standard)
Switching toggle/pushbutton	–	green - NO red - NC black - NO/NC	black
Frame size	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm
Device width	17.5 mm (1MU)	17.5 mm (1MU)	17.5 mm (1MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022		
Degree of protection, built-in	IP40	IP40	IP40
Upper and lower terminals	lift terminals	lift terminals	lift terminals
Terminal capacity	1-10 mm^2	1-10 mm^2	1-10 mm^2
Terminal protection	finger and hand touch safe, according to VBG 4, ÖVE-EN 6		
Resistance to climatic conditions	acc. to IEC/EN 60068	acc. to IEC/EN 60068	acc. to IEC/EN 60068

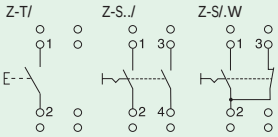
Dimensions (mm)



Pushbutton Z-T; Control Switch Z-S/, Z-S32/; Changeover Switch Z-S/.W

- Design according to IEC 60669, VDE 0632
- Types Z-S/WM and /2WM with central position (0-position)
- Types Z-S/WTN and -2WTN with TAG-0-NACHT (DAY-0-NIGHT) printed onto the device

Connection diagrams

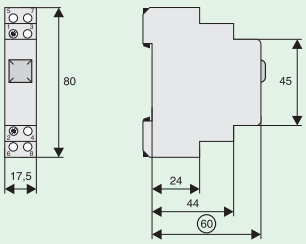


Technical Data

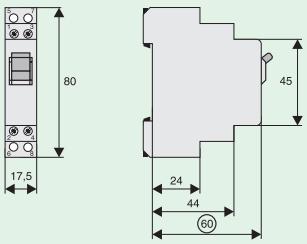
	Z-T/	Z-S../	Z-S/.W
Electrical			
Rated voltage	230/400V AC	230/400V AC	230/400V AC
Frequency	50 HZ	50 HZ	50 HZ
Rated current	16A/230V~	16, 32A/230V~	16A/230V~
Switching capacity	–	1.25 x I_n; 1.1 x U_n	1.25 x I_n; 1.1 x U_n
Short circuit strength	10 kA	10 kA	10 kA
Mechanical			
Switching toggle	–	black	black
Pushbutton colour	green - NO red - NC black - NO/NC	–	–
Frame size	45 mm	45 mm	45 mm
Device height	80 mm	80 mm	80 mm
Device width	17.5 mm (1MU)	17.5 mm (1MU)	17.5 mm (1MU)
Mounting	quick fastening with 2 lock-in positions on DIN rail EN 50022		
Degree of protection, built-in	IP40	IP40	IP40
Upper and lower terminals	lift terminals	lift terminals	lift terminals
Terminal capacity	1-10 mm^2	1-10 mm^2	1-10 mm^2
Terminal protection	finger and hand touch safe, according to VBG 4, ÖVE-EN 6		
Resistance to climatic conditions	acc. to IEC/EN 60068	acc. to IEC/EN 60068	acc. to IEC/EN 60068

Dimensions (mm)

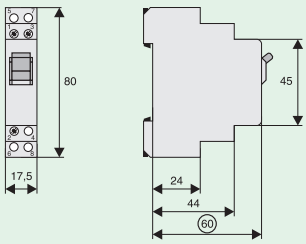
Z-T/



Z-S../



Z-S/.W



Installation Relays Z-R, Z-TN

Installation relays Z-R are suitable for switching 1-phase or 3-phase consumers up to 20 A. These devices for universal use in building installations and systems permit implementation of the following applications and control functions:

- Switching lighting systems and electrical heating systems
- Switching ventilation and air conditioning systems, fans
- Switching heat pumps
- Switching electrically controlled roller doors/gates, and blinds
- Switching incandescent lamps and gas discharge lamps

The installation relays of series Z-R./ meet the requirements of standards EN/IEC 60947 and EN/IEC 1095.

EN/IEC 1095 deals with "Electromechanical contactors for household and similar purposes." Compliance with this standard means meeting very high demands in terms of safety for humans and property.
EN/IEC 947 deals with "Electromagnetic contactors in electrical system manufacturing".

Security:

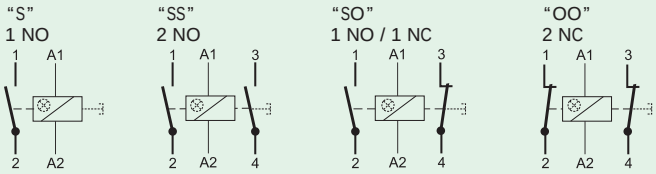
- Manual operation for testing purposes
- Optional optical operating status display by means of LED
- Switching position indicated on the front side by manual operating key
- All terminals - coil and contacts - equipped with guide for secure terminal connection. Misplacement of wires impossible.
- Main contacts can be connected to standard pin busbar
- Made of hardly flammable materials and plastics free from chlorine and halogens
- Finger and hand touch safe according to VBG4

Advantages:

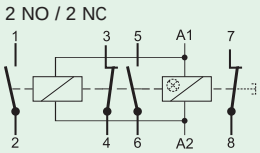
- Available in three versions (Z-R, Z-RK, Z-RE)
- Low switching noise, no humming
- Easy to connect thanks to large terminals supplied open
- Simple snap-on fastening on 35 mm DIN rail
- High degree of flexibility thanks to a variety of contact configurations
- Easy access for coil feed connection
- Version with mechanical pre-selection of functions ON/AUTO/OFF (Z-TN)
  ON/permanently ON: KContact permanently ON until a control pulse is switched on and OFF again. Then, the relay reverts to the AUT position.
  AUT/AUTOMATIC: Standard relay function by control voltage at the coil.
  OFF/permanently OFF: Contacts permanently OFF, independently of the control voltage at the coil.

Connection diagrams

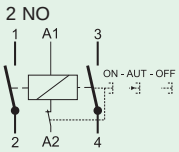
1MU Z-R



2MU Z-R

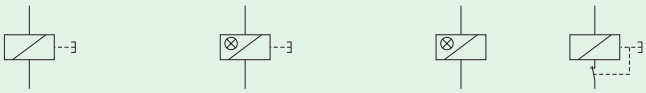


1MU Z-TN (with mechanical pre-selection)



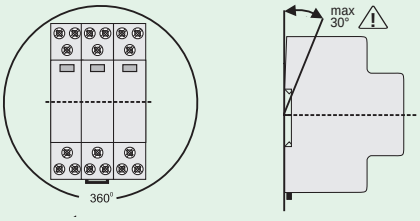
Versions

with manual operation | with manual operation and LED | with LED | with mech. pre-selection



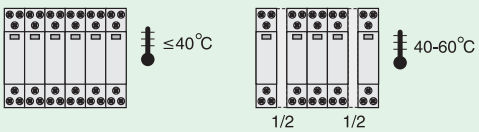
Z-R./. **Z-RK./.** **Z-RE./.** **Z-TN./.**

Permitted installation positions



Packing density at full contact load

Z-R./
Spacers recommended! (Z-DST)



Technical Data

Electrical	
Design according to	IEC/EN 60947
Rated voltage	250 V, 240/415 V AC
Rated current	20 A, 250 V AC
Rated current AC1 I_e	20 A
Rated operational power P_e	4.6 kW 415 V
Number of poles	1 to 4
Main contacts	
NO/NC	1, 2 (1MU) 3, 4 (2MU)
Control Circuit	
Rated control feed voltage U_s	8, 12, 24, 48, 110, 230, 240 V AC 8, 12, 24, 110 V DC
Rated frequency	50 Hz
Operating range	0.85-1.1 x U_s
Maximum power of coils	
pick-up	10-13 VA, 6-8 W
retaining	3,4-4,0 VA, 2,0-2,4 W
Minimum command duration	> 50 ms
Operating noise	no humming
Rated peak withstand voltage U_{imp}	2 kV (1.2/50 µs)
Duty	100%

Load Circuit	
Rated operational voltage U_e	1p: 250VAC, 2-4p: 240/415VAC
Minimum operational voltage U_{min}	24 V AC/DC (U_s 8-110 V)
Rated insulation voltage U_i	500 V
Rated peak withstand voltage U_{imp}	4 kV (1.2/50 µs)
Conventional thermal current I_{th}	20 A AC
Rated operational current I_e	20 A AC
Rated constant current I_u	20 A AC
Rated current DC	
24 V	I_e 16 A
48 V	I_e 12,5 A
230 V	I_e 1 A
Conditional rated short circuit current I_q	10 kA (with 20 A gL/gG)
Duration of bouncing	< 10 ms (typ. < 5 ms)

Technical Data (continued)

UTILISATION CATEGORIES 1MU, 2MU (except3S, 4S)

AC-1	
Rated operational voltage U_e	250 V AC
Rated operational current I_e	20 A AC
Rated operational power AC-1	4000 W (cos φ = 0.8), 5000 VA
AC-3	
Rated operational voltage U_e	250 V AC
Rated operational current I_e	8 A AC
Rated operational power AC-3	900 W (cos φ = 0.45), 2000 VA
AC-5a	
Rated operational voltage U_e	250 V AC
Rated operational current I_e	10 A AC
Rated operational power AC-5a	1125 W (cos φ = 0.45), 2500 VA
AC-5b	
Rated operational voltage U_e	230 V AC
Rated operational current I_e	8,8 A AC
Rated operational power AC-5b	2024 W
AC-7a (according to EN 61095)	
Rated operational voltage U_e	250 V AC
Rated operational current I_e	20 A AC
Rated operational power AC-7a	4000 W (cos φ = 0.8), 5000 VA

UTILISATION CATEGORIES 2MU (3S, 4S)

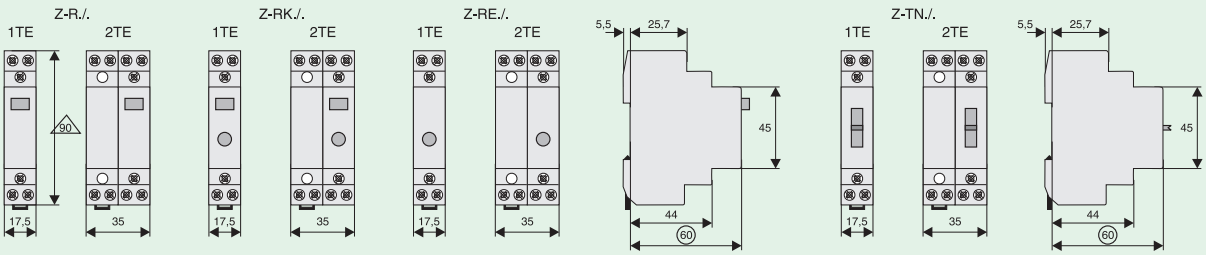
AC-1	
Rated operational voltage U_e	240/415 V AC
Rated operational current I_e	20 A AC
Rated operational power AC-1	4000 W (cos φ = 0.8), 5000 VA
AC-3	
Rated operational voltage U_e	240/415 V AC
Rated operational current I_e	8 A AC
Rated operational power AC-3	900 W (cos φ = 0.45), 2000 VA
AC-5a	
Rated operational voltage U_e	240/415 V AC
Rated operational current I_e	10 A AC
Rated operational power AC-5a	1125 W (cos φ = 0.45), 2500 VA
AC-5b	
Rated operational voltage U_e	230/400 V AC
Rated operational current I_e	8,8 A AC
Rated operational power AC-5b	2024 W
AC-7a (according to EN 61095)	
Rated operational voltage U_e	240/415 V AC
Rated operational current I_e	20 A AC
Rated operational power AC-7a	4000 W (cos φ = 0.8), 5000 VA
AC-7b (according to EN 61095)	
Rated operational voltage U_e	240/415 V AC
Rated operational current I_e	10 A AC
Rated operational power AC-7b	1125 W (cos φ = 0.8), 2500 VA

Endurance	electrical comp.	≥ 40x10^3 operating cycles
	mechanical comp.	≥ 1x10^6 operating cycles

Mechanical

Frame size	45 mm
Device height	90 mm
Device width	17.5 mm (1MU)
Mounting	quick fastening on DIN rail EN 50022
Degree of protection installed device	IP20
Position of device in use	works in any position, however not hanging
Upper and lower terminals	lift terminals (captive)
Terminal capacity	
Contact and coil	0,5 - 10 mm^2 one- or more wire 0,5 - 6 mm^2 fine-wire with wire end sleeve
Temperature range	-20°C to +45°C
Total contact gap	> 5mm / independent contacts
Contact material	does not contain cadmium

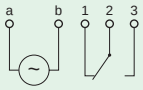
Dimensions (mm)



Analogue Timer Z-SGS

- Design according to DIN EN 60730
- Programming by means of switching slides
- Terminal covers which can be sealed with leads available as accessories

Block Diagram

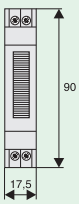


Technical Data

	Z-SGS/TA
Electrical	
Rated voltage	230/240 V AC
Rated frequency	50 Hz
Power consumption	1 VA
Switching contact (potential-free)	1 NO
Switching capacity	
Rated insulation voltage	250 V
Rated current	16 A µ
Resistive load	3500W, cosφ=1
Incandescent lamp load	1000W, cosφ=1
Inductive load	4A/250V, cosφ=0.6
Power reserve	–
Drive	synchronous
Quartz frequency	–
Program	day
Switching pairs freely programmable	48/day
Switching interval	30 Min.
Mechanical	
Frame size	45 mm
Device height	90 mm
Device width	17.5 mm
Weight	80 g
Depth	60 mm
Mounting	quick fastening on DIN rail EN 50022
Degree of protection, built-in	IP20
Upper and lower terminals	lift terminals
Terminal capacity	
one-wire	1.5-4 mm^2
fine wire	1-2.5 mm^2
Tightening torque of terminal screws	0,8 Nm
Permitted relative humidity	< 95%
Perm. ambient temperature range	-25°C to +55°C
Flame class acc. to EN 60730	D

Dimensions (mm)

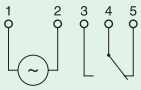
Z-SGS/TA



Analogue Timers SU-GS, SU-GQ

- Design according to DIN EN 60730
- Programming by means of switching slides

Block Diagram

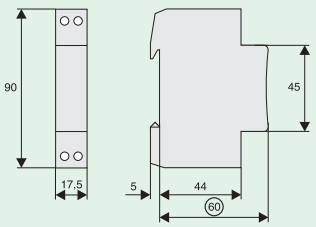


Technical Data

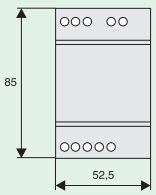
	SU-GS/1W-TA, -WO	SU-GQ-TA	SU-GQ/1W-TA, -WO	SU-GQ/2W-TW
Electrical				
Rated voltage	220-240 V AC	220-240 V AC	220-240 V AC	220-240 V AC
Rated frequency	50 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Power consumption	1 VA	1 VA	1 VA	1 VA
Switching contact (potential-free)	1 CO	1 NO	1 CO	2 CO
Switching capacity				
Rated insulation voltage	250 V	250 V	250 V	250 V
Rated current	16 A µ	16 A µ	16 A µ	16 A µ
Resistive load	3500W, cosφ=1	3500W, cosφ=1	3500W, cosφ=1	3500W, cosφ=1
Incandescent lamp load	1350W, cosφ=1	1000W, cosφ=1	1350W, cosφ=1	1350W, cosφ=1
Inductive load	4A/250V, cosφ=0.6	4A/250V, cosφ=0.6	4A/250V, cosφ=0.6	4A/250V, cosφ=0.6
Power reserve	–	50 h	150 h	150 h
Drive	synchronous	quartz	quartz	quartz
Program	day or week	day	day or week	day and week
Switching pairs freely programmable	48/day, 48/week	48/day	48/day, 48/week	48/day, 48/week
Switching interval	30 Min./3.5 hours	30 Min.	30 Min./3.5 hours	30 Min./3.5 hours
Mechanical				
Frame size	45 mm	45 mm	45 mm	45 mm
Device height	85 mm	90 mm	85 mm	85 mm
Device width	52.5 mm	17.5 mm	52.5 mm	105 mm
Weight	160 g	110 g	170 g	220 g
Depth	60 mm	60 mm	60 mm	55 mm
Mounting	quick fastening on DIN rail EN 50022			
Degree of protection, built-in	IP20	IP40	IP40	IP40
Upper and lower terminals	lift terminals	lift terminals	lift terminals	lift terminals
Terminal capacity				
one-wire	1.5-4 mm^2	1.5-4 mm^2	1.5-4 mm^2	1.5-4 mm^2
fine wire	1-2.5 mm^2	1-2.5 mm^2	1-2.5 mm^2	1-2.5 mm^2
Tightening torque of terminal screws	0,8 Nm	0,8 Nm	0,8 Nm	0,8 Nm
Permitted relative humidity	< 95%	< 95%	< 95%	< 95%
Perm. ambient temperature range	-25°C to +55°C	-20°C to +55°C	-20°C to +55°C	-20°C to +55°C
Flame class acc. to EN 60730	D	D	D	D
Sealable	yes	yes	yes	yes

Dimensions (mm)

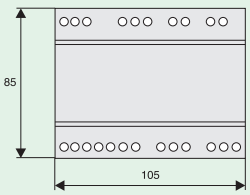
SU-GQ-TA

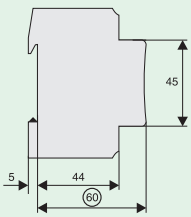


SU-GS/1W...
SU-GQ/1W...



SU-GQ/2W-TW

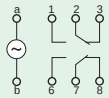




Digital Timers Z-SDM

- Design according to DIN EN 60730
- Digital timers in CMOS-technology
- Microprocessor and quartz control
- Programming by means of multi-function keys
- LCD display
- Program data saved in case of power failure
- Optionally in each program impulse time (switching interval 1-99 s) or fixed switching time (shortest switching interval 1 min) are possible
- Direct manual switching of relay ON/OFF
- Manual switching of relay to permanent operation ON/OFF (holiday operation)
- Automatic change to summer/winter time
- Automatic leap year adjustment
- Terminal covers which can be sealed with leads available as accessories

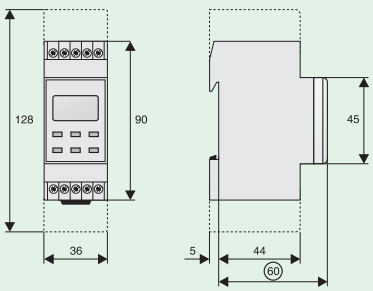
Block Diagram



Technical Data

	Z-SDM/1K-TA	Z-SDM/1K-WO	Z-SDM/2K-WO
Electrical			
Rated voltage	230 V AC	230 V AC	230 V AC
Rated frequency	50/60 Hz	50/60 Hz	50/60 Hz
Current consumption	29mA, cos φ = 0,13	29mA, cos φ = 0,13	29mA, cos φ = 0,13
Apparent power	6.6 VA	6.6 VA	6.6 VA
Reactive power	-6.5 VAr	-6.5 VAr	-6.5 VAr
Power loss	0.9 W	0.9 W	0.9 W
Switching contact (potential-free)	1 CO	1 CO	2 CO
Switching capacity			
Rated insulation voltage	250 V	250 V	250 V
Rated current	16 A µ	16 A µ	16 A µ
Resistive load	3000W, cos φ = 1	3000W, cos φ = 1	3000W, cos φ = 1
Incandescent lamp load	1000W, cos φ = 1	1000W, cos φ = 1	1000W, cos φ = 1
Inductive load	2A/250VAC cos φ = 0.6	2A/250VAC cos φ = 0.6	2A/250VAC cos φ = 0.6
Power reserve	250 h	250 h	250 h
Power reserve storage	NiMH storage battery	NiMH storage battery	NiMH storage battery
Data saved by	EEPROM	EEPROM	EEPROM
Accuracy at 20°C	approx. 1 s per day	approx. 1 s per day	approx. 1 s per day
Switching accuracy	accurate to the second	accurate to the second	accurate to the second
Quartz frequency	32.768 MHz	32.768 MHz	32.768 MHz
Switching pairs freely programmable	20/day	20/week	20/week
Switching interval	1 min. or 1 s	1 min. or 1 s	1 min. or 1 s
Mechanical			
Frame size	45 mm	45 mm	45 mm
Device height	90 mm	90 mm	90 mm
Device width	36 mm	36 mm	36 mm
Weight	170 g	170 g	200 g
Mounting	quick fastening on DIN rail EN 50022		
Degree of protection, built-in	IP40	IP40	IP40
Upper and lower terminals	lift terminals	lift terminals	lift terminals
Terminal capacity			
one-wire	1.5-4 mm^2	1.5-4 mm^2	1.5-4 mm^2
fine wire	1-2.5 mm^2	1-2.5 mm^2	1-2.5 mm^2
Tightening torque of terminal screws	0.8 Nm	0.8 Nm	0.8 Nm
Permitted relative humidity	< 95%	< 95%	< 95%
Perm. ambient temperature range	0 to +55°C	0 to +55°C	0 to +55°C
Flame class acc. to EN 60730	D	D	D

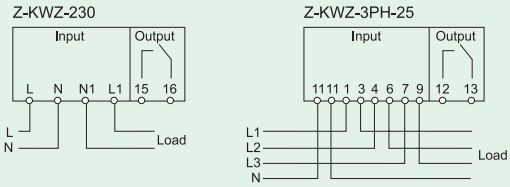
Dimensions (mm)



Power Meter Z-KWZ

- Power meter according to IEC/EN 61036 for sub-measurement
- For active energy
- 3-phase AC types also suitable for uneven load
- **Type Z-KWZ-230:** single-phase kWh-meter
- **Type Z-KWZ-3PH:** for 4-wire 3-phase AC system with external transducer X/5A; Type Z7-MG/WA.
  Transducer ratios according to table
- **Type Z7KWZ-3PH-25:** For 4-wire 3-phase AC system with direct connection

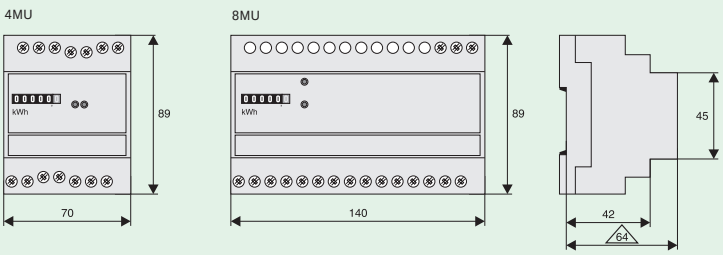
Connection diagram



Technical Data

	Z-KWZ-230	Z-KWZ-3PH-25	Z-KWZ-3PH
Electrical			
Rated voltage U_n	230 V AC	230/400 V AC	230/400 V AC
Working range	0.9 - 1.1 x U_n	0.9 - 1.1 x U_n	0.9 - 1.1 x U_n
Rated current I_b	16A, direct	5A, direct	5A, transducer
Maximum current I_{max}	32 A	5 x I_b	1.2 x I_b
Rated frequency	50Hz ±5%	50Hz ±5%	50Hz ±5%
Overload short time	–	30 x I_{max}/10ms	20 x I_{max}/500ms
Auxiliary voltage	from measurement	from measurement	230V, 50Hz
Power consumption	–	<4 VA	<4 VA
Power loss	4 W	1.5 W	1.5 W
Input signal	sinusoidal	sinusoidal	sinusoidal
Power factor	cosφ=0.5 inductive to cosφ=0,8 capacitive		
Accuracy class	2	2	2
Resolution	0.1 kWh	0.1 kWh	1 kWh or 10 kWh
LED signal	1 pulse/Wh	acc. to calibration	1 pulse/10 Wh or 1 pulse/100 Wh
Own consumption per phase	<8 VA	<0.5 VA	<0.5 VA
DIP adjustment switch for transducer ratios	–	–	40/5-600/5A - kWh or 400/5-6000/5A - MWh
Pulse output rated values	max. 110V DC/AC, 50mA	max. 110V DC/AC, 50mA	max. 110V DC/AC, 50mA
Pulse value (jumper)	1 pulse/Wh o. 1 pulse/100Wh	acc. to calibration	acc. to calibration
Switching contact (potential-free)	1 NO	1 NO	1 NO
Rated peak withstand voltage(1.2/50) µs	6 kV	6 kV	6 kV
Test voltage 50Hz/1min.	2 kV	2 kV	2 kV
Mechanical			
Frame size	45 mm	45 mm	45 mm
Device height	89 mm	89 mm	89 mm
Device width	70 mm (4MU)	140 mm (8MU)	140 mm (8MU)
Weight	200 g	450 g	450 g
Display	5+1digit	5+1digit	6digit (kWh) or 4+2digit (MWh)
Maximum display reading	99999,9kWh	99999,9kWh	999999kWh or 9999,99MWh
Height of figures	4 mm	4 mm	4 mm
Mounting	quick fastening on DIN rail EN 50022		
Degree of protection, built-in	IP51	IP51	IP51
Upper and lower terminals	lift terminals	lift terminals	lift terminals
Terminal capacity	8mm² (4mm² pulse-outp.)	8mm² (4mm² pulse-outp.)	8mm² (4mm² pulse-outp.)
Tightening torque of terminal screws	1.8 Nm (1 Nm)	1.8 Nm (1 Nm)	1.8 Nm (1 Nm)
Permitted relative humidity	<75%	<75%	<75%
Perm. ambient temperature range	-10 to +45°C	-10 to +45°C	-10 to +45°C
Flame class acc. to UL 94	V1	V1	V1

Dimensions (mm)



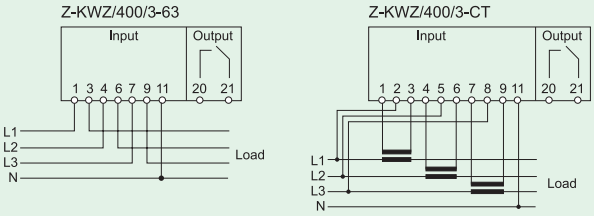
Z-KWZ-3PH: Transducer ratios

JL 3 2 1 kWh 000000	JL 3 2 1 MWh 0000,00
40A/5A	400A/5A
50A/5A	500A/5A
60A/5A	600A/5A
75A/5A	750A/5A
100A/5A	1000A/5A
120A/5A	1200A/5A
150A/5A	1500A/5A
200A/5A	2000A/5A
300A/5A	3000A/5A
600A/5A	6000A/5A

Power Meter Z-KWZ/400/3

- Power meter according to IEC/EN 61036 for sub-measurement
- For active energy
- For unbalanced load
- **Type Z-KWZ/400/3-CT:** for 4-wire 3-phase AC system with external current transformer X/5A; Type Z7-MG/WA.
- **Type Z7KWZ/400/3-63:** For 4-wire 3-phase AC system with direct connection
- LED display for wrong phase sequence and phase failure
- Terminal cover can be sealed by leads

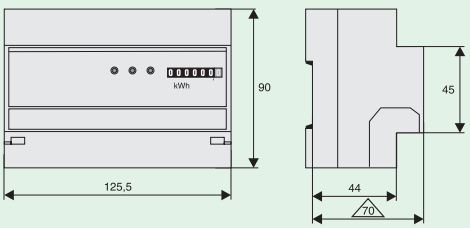
Connection diagram



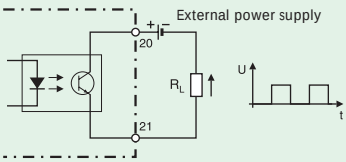
Technical Data

	Z-KWZ/400/3-63	Z-KWZ/400/3-CT
Electrical		
Rated voltage U_n	230/400 V AC, 240/415 V AC	230/400 V AC, 240/415 V AC
Working range	0.8-1.15 x U_n	0.8-1.15 x U_n
Rated current I_b	10A, direct	5A, current transformer
Maximum current I_{max}	63 A	6 A
Rated frequency	50 Hz	50 Hz
Frequency range	45-65 Hz	45-65 Hz
Overcurrent short time	250 A / 1s	20 x I_{max} / 500ms
Auxiliary voltage	from measurement	from measurement
Input signal	sinusoidal	sinusoidal
Accuracy class	2	2
Metering LED	1000 pulse/kWh	10,000 pulse/kWh
Power consumption per phase	<1 VA	<1 VA
Pulse output rated values	max. 40 V DC, 27mA	max. 40 V DC, 27mA
Switching contact (potential-free)	Opto coupler	Opto coupler
Pulse output frequency	100 pulse/kWh	1000 pulse/kWh
Overvoltage category	III	III
Rated impulse withstand voltage(1.2/50) µs	6 kV	6 kV
Test voltage		
Input-output/housing	4 kV	4 kV
Output/housing	500 V	500 V
Protection class	II	II
Mechanical		
Frame size	45 mm	45 mm
Device height	90 mm	90 mm
Device width	125,5 mm	125,5 mm
Weight	500 g	500 g
Display	6+1digit	5+2digit
Maximum display reading	999999,9 kWh	99999,99 x CT = kWh
Mounting	quick fastening on DIN rail EN 50022	
Degree of protection, housing/terminals	IP51/IP20	IP51/IP20
Upper and lower terminals	lift terminals	lift terminals
Terminal capacity I/U/pulse output	16mm²/-/2.5mm²	16mm²/2.5mm²/2.5mm²
Permitted relative air humidity	<75%	<75%
Perm. ambient temperature range	-10 to +45°C	-10 to +45°C
Pollution degree	2	2
Flame class acc. to UL 94	V0	V0

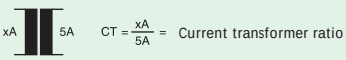
Dimensions (mm)



Pulse output



Current transformer ratio



Operating Hours Counter Z-BSZ

Phase out type

- According to DIN 61010
- Operating hours counter: hours counter for gathering operating time data of machines and systems and determining operating costs, maintenance intervals, warranty and working times.

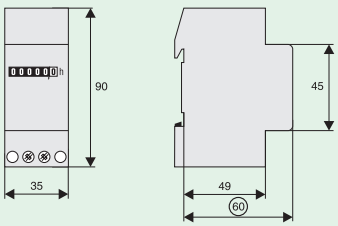
Connection diagram

Z-BSZ

Technical Data

	Z-BSZ/230	Z-BSZ/24
Electrical		
Rated voltage	230 V AC ±10%	24 V AC ±10%
Rated frequency	50 Hz	50 Hz
Current consumption	10 mA	10 mA
Accuracy	line frequency-dependent	line frequency-dependent
Counting frequency	–	–
Pulse duration / interval	–	–
Duty	–	–
Own consumption	2.3 VA	0.24 VA
Mechanical		
Frame size	45 mm	45 mm
Device height	90 mm	90 mm
Device width	35 mm	35 mm
Weight	60 g	60 g
Zero position	no	no
Operation indicator	no	no
Counting range	99999,9 h	99999,9 h
Height of figures	3.5 mm	3.5 mm
Colour of figures	white on black decimals inverted	white on black decimals inverted
Mounting	quick fastening on DIN rail EN 50022	
Degree of protection, built-in	IP65	IP65
Lower terminals	screw terminals	
Terminal capacity	0.14-4 mm^2	0.14-4 mm^2
Tightening torque of terminal screws	0.8 Nm	0.8 Nm
Temperature range	-10 to +70°C	-10 to +70°C

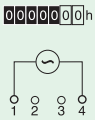
Dimensions (mm)



Operating Hours Counter BSZ

- According to DIN 61010
- Hours counter for gathering operating time data of machines and systems and determining operating costs, maintenance intervals, warranty and working times.

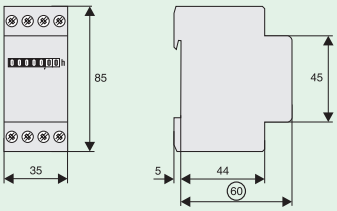
Connection diagram



Technical Data

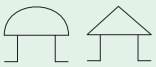
	BSZ/230	BSZ/24
Electrical		
Rated voltage	230 V AC ±10%	24 V AC ±10%
Rated frequency	50 Hz	50 Hz
Current consumption	10 mA	10 mA
Accuracy	line frequency-dependent	line frequency-dependent
Own consumption	1 VA	1 VA
Mechanical		
Frame size	45 mm	45 mm
Device height	85 mm	85 mm
Device width	35 mm	35 mm
Weight	75 g	75 g
Zero position	no	no
Operation indicator	no	no
Counting range	99999,99 h	99999,99 h
Height of figures	3.5 mm	3.5 mm
Colour of figures	white on black decimals red	white on black decimals red
Mounting	quick fastening on DIN rail EN 50022	
Degree of protection, built-in	IP40	IP40
Lower terminals	screw terminals	
Temperature range	-25 to +55°C	-25 to +55°C

Dimensions (mm)



Signalling Devices, Buzzer Z-SUM, Bell Z-GLO

Connection diagram

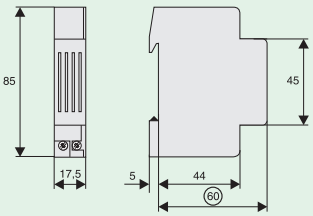


Technical Data

Electrical	
Rated voltage	12, 24, 230 VAC ±10%
Frequency	50-60 Hz
Power loss	
12 V	5 VA
24 V, 230 V	10 VA
Duty	100% (5 min.)
Volume	
Bell Z-GLO	84 dB / 1 meter
Buzzer Z-SUM	80 dB / 1 meter

Mechanical	
Frame size	45 mm
Device height	86 mm
Device width	17.5 mm (1MU)
Mounting	quick fastening on DIN rail EN 50022
Degree of protection	IP20
Upper and lower terminals	lift terminals
Terminal screws	captive screws
Terminal capacity	1-10 mm^2

Dimensions (mm)

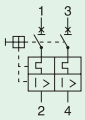


Manual Motor Starters Z-MS

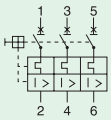
- Reliable protection in case of thermal overload and short circuit
- Suitable for installation in compact distribution boxes
- Contact position indicator red - green
- Main field of application: switching and protection of three-phase AC motors with power ratings up to 15 kW (380/400 V) and other consumers up to 40 A
- Also suitable as main switch, isolating characteristics according to IEC/EN 60947
- All manual motor starters with thermal overload tripping and magnetic short-circuit tripping
- Terminals and accessories compatible with CLS6, Z-A40, PFIM etc.

Connection diagram

2-pole



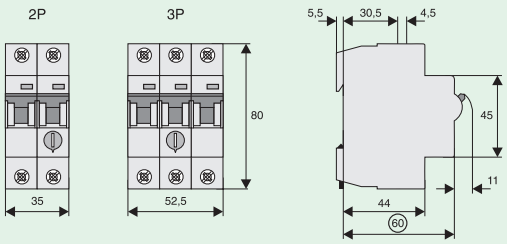
3-pole



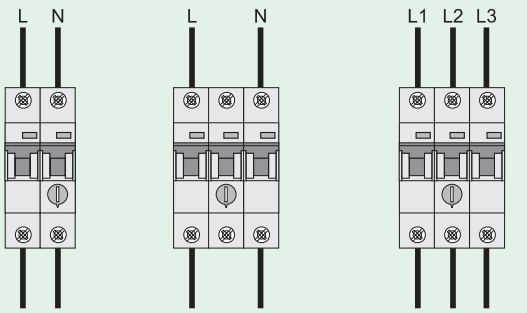
Technical Data

General		
Terminal capacity		1 - 25 mm²
Busbar thickness		0.8 - 2 mm
Mechanical endurance		20.000 operating cycles
Shock resistance (shock duration 20 ms)		20 g
Ambient temperature	open	-25 ... + 50°C
	hermetically enclosed	-25 ... + 40°C
Resistance to climatic conditions		
- humidity and heat, constant, according to		IEC 68-2-3
- humidity and heat, periodical, according to		IEC 68-2-30
Mass approx.		244/366 g
Degree of protection		IP20
Main Current Paths		
Rated insulation voltage U_i		440 V
Rated peak withstand voltage U_{imp}		4 kV
Rated short circuit breaking capacity I_q		10 kA
Thermal current $I_{thmax} = I_{emax}$		40 A
Electrical endurance AC3 at I_e		6000 operating cycles
Motor switching capacity AC3		400 (415) V
Power loss per contact		2.3W (1.6-10A); 3.3W (16A); 4.5W (25-40A)
Auxiliary switch Z-AHK/Z-NHK		
Rated insulation voltage U_i		440 V
Thermal current I_{th}		8 A
Rated operational current I_e	250 V	6 A
AC 13	440 V	2 A
Max. back-up fuse for short-circuit protection		4 A (gL, gG) CLS6-4/B-HS
Terminal capacity (1 or 2 conductors)		0,75 ... 2.5 mm²
Moisture-Proof Enclosure 4 MU IP54, Z-MFG		
Reliable power loss of incorporated devices		17W (e.g Z-MS-40/3+Z-USA/230)

Dimensions (mm)

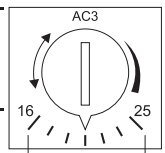


Connection



1-phase / 2-pole 1-phase / 3-pole 3-phase / 3-pole

Ue = 400 V~
Ie = 10 - 16 A
Iq = 10000 A



Z-MS - **25** /3

Magnetic release responding current (typ.)
referring to setting range end value . . . .16x . . . . . 10x Ie

Selection of Switches for the Protection of Motors

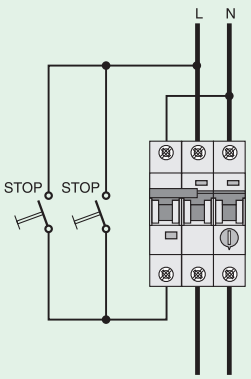
Motor power and current						
1-phase 230 - 240 V		3-phase 230 - 240 V		3-phase 400 - 415 V		Setting ranges of overload release
kW	A	kW	A	kW	A	A
				0,06	0,2	0,16 - 0,25
		0,06	0,4	0,09	0,3	0,25 - 0,4
		0,09	0,5	0,12	0,4	0,4 - 0,63
				0,18	0,6	0,4 - 0,63
0,06	0,7	0,12	0,7	0,25	0,8	0,63 - 1
0,09	0,7					0,63 - 1
0,12	1,3	0,18	1,0	0,37	1,1	1 - 1,6
		0,25	1,4	0,55	1,5	1 - 1,6
0,18	1,9	0,37	2,0	0,75	1,9	1,6 - 2,5
0,25	2,4					1,6 - 2,5
0,37	2,9	0,55	2,7	1,1	2,6	2,5 - 4
		0,8	3,2	1,5	3,6	2,5 - 4
0,55	4,2	1,1	4,6	2,2	5,0	4 - 6,3
0,75	5,6					4 - 6,3
1,1	7,4	1,5	6,3	2,5-3,0	6,6	6,3 - 10
1,5	8,9	2,5	8,7			6,3 - 10
				4,0	8,5	6,3 - 10
2,2	14,5	3,0	11,5	5,5	11,3	10 - 16
				7,5	13,2	10 - 16
3	17,8	4,0	14,8			16 - 20
		5,5	19,6	11,0	21,7	16 - 20
		7,5	26,4	15,0	29,3	25 - 40
		11,0	38,0	18,5	36,0	25 - 40

Overview of Types, Maximum Back-up Fuse and Short Circuit Behaviour

Type	Setting range (A)	max. back-up fuse gL, gG[1] (A) 3 x 230 V	(A) 3 x 400 V	Typical responding currents of short-circuit releases (A)
Z-MS-0,16	0,10 - 0,16	in case of short circuit currents up to the short circuit breaking capacity, no back-up fuse required		1,3 - 1,7
Z-MS-0,25	0,16 - 0,25			2,0 - 2,6
Z-MS-0,40	0,25 - 0,40			3,1 - 4,8
Z-MS-0,63	0,40 - 0,63			4,9 - 6,6
Z-MS-1,00	0,63 - 1,00			10 - 13
Z-MS-1,60	1,0 - 1,6			16 - 21
Z-MS-2,50	1,6 - 2,5			25 - 33
Z-MS-4,00	2,5 - 4,0			40 - 52
Z-MS-6,30	4,0 - 6,3	100	100	63 - 82
Z-MS-10,0	6,3 - 10,0	100	100	78 - 105
Z-MS-16,0	10,0 - 16,0	100	100	160 - 208
Z-MS-25,0	16,0 - 25,0	100	100	250 - 325
Z-MS-40,0	25,0 - 40,0	100	100	400 - 520

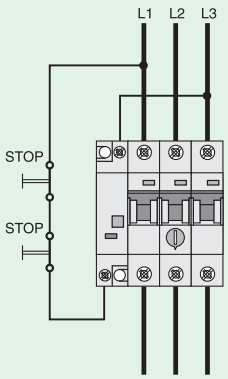
[1] In case of short circuit currents up to the rated breaking capacity, no back-up fuse required (inherent current withstand capability)

Connection of Shunt Trip Release



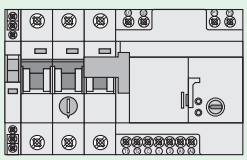
e.g.
Z-MS-2p + Z-ASA

Connection of Undervoltage Release



e.g.
Z-MS-3p + Z-USA

Block Diagram with Remote Switching Device



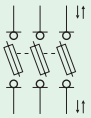
Z-NHK + Z-MS-3p + Z-FW-BAS

Fuse Switch Disconnector Z-SLS/NEOZ, Standard

- Design according to IEC/EN 60947-3
- Mechanical current coding
- Plug-in technology without screw caps
- Suitable for the following fuses
  D01: 1, 2, 4, 6, 10, 16 A
  D02: 20, 25, 35, 50, 63 A
- Can be sealed with leads

Connection diagram

Z-SLS/NEOZ/3



Technical Data

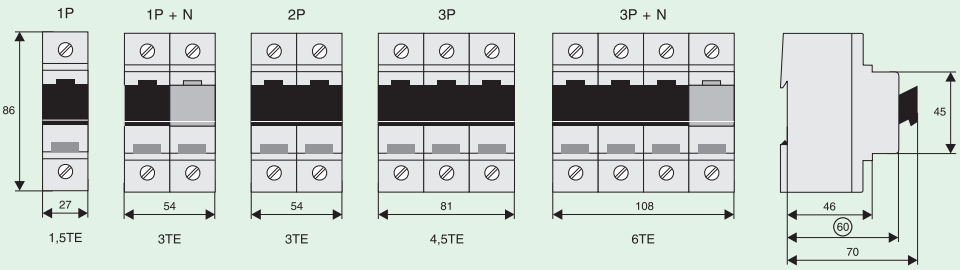
Electrical

Number of poles	1P, 1P+N, 2P, 3P, 3P+N
Rated operational voltage U_e	
AC	400 V
DC	1P to 110V / 2P to 220V
Rated operational current I_e	63 A
Rated uninterrupted current I_u	63 A
Rated short-circuit making capacity I_{cm}	50 kAeff
Utilization category	AC 22 B, DC 21 B
Overvoltage category	IV
Rated impulse withstand voltage U_{imp}	6 kV
Power loss per current path	0.5 W at I_e
Power loss per current path with fuse link	7.5 W at I_e

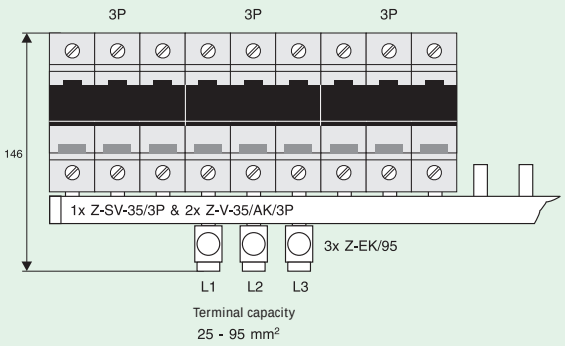
Mechanical

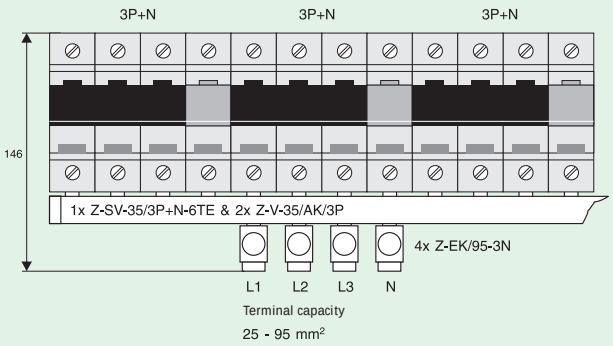
Frame size	45 mm
Device height	86 mm
Device width	27 mm per pole (1.5MU)
Weight	1P 1P+N 2P 3P 3P+N 113g 225g 224g 450g 472g
Mounting	quick fastening on DIN rail EN 50022
Degree of protection	IP20
Upper and lower terminals	lift terminals
Terminal capacity	1.5-35 mm²
Tightening torque of terminal screws	max. 4.5 Nm
Temperature range	-25 to +60°C
Flame class	V0, glow-wire tested 960°C
Pollution degree	3
Comparative tracking index	CTI 600

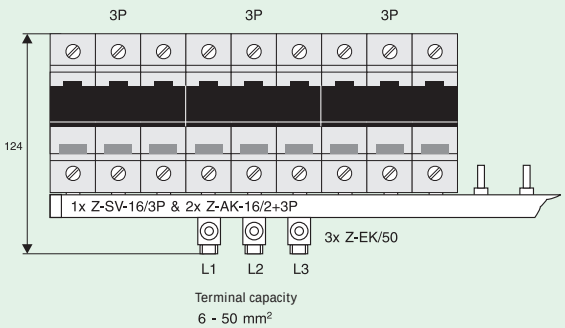
Dimensions (mm)

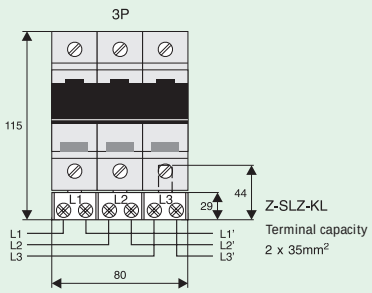


Busbar Connection Examples









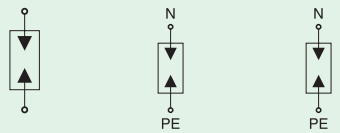
SPD Class B, Lightning Current Arrester SPI

- Field of application:
  For the protection of low voltage distribution systems against direct lightning stroke into the overhead power supply line or outdoor lightning protection system (IEC 61024-1, IEC 61312-1).
- Application according to IEC 60364-5-53 Clause 534
- SPD class B basically in accordance with VDE 0675, Part 6/A3 11.97
- Test class I in accordance with IEC 61643-1
- Test type T1 in accordance with pr EN 61643-1
- Capsuled version: during the discharge process, the device does not issue any hot ionised gases. Therefore, there is no need for keeping a safety distance to flammable materials.

Practical Hint

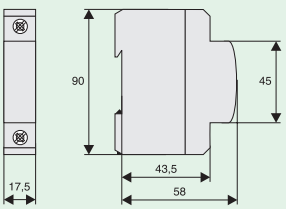
Installation of lightning current arresters upstream of the meter is subject to co-ordination with the relevant power supply company.
Installation of an effective protection cascade (SPD classes B, C, D) requires co-ordinated application of the respective protective devices. This is ensured by a defined line length between protective devices. When using lightning current arresters of type SPI in connection with surge arresters SPC with a maximum continuous operating voltage Uc of 460 V AC, no specific line length or decoupling coils are required.

Technical Data

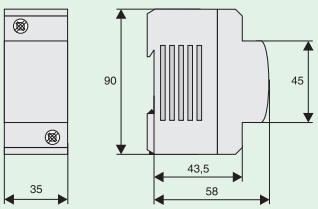
	SPI-35/440	SPI-50/NPE	SPI-100/NPE
Electrical			
Design	capsuled	capsuled	capsuled
Responding time t_r	< 100 ns	< 100 ns	< 100 ns
Voltage protection level U_p	1.5 kV	1.5 kV	1.5 kV
Maximum continuous operating voltage U_C	440 VAC	260 VAC	260 VAC
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Discharge current (8/20) µs I_{max}/I_n	35 kA	50 kA	100 kA
Impulse current I_{imp} (10/350) µs			
Peak current	35 kA	50 kA	100 kA
Charge Q	17.5 As	25 As	50 As
Specific energy	305 kJ/Ω	625 kJ/Ω	2500 kJ/Ω
Insulation resistance R_{ISO}	>10 MΩ	>10 MΩ	>10 MΩ
Short-circuit current quenching capability without back-up fuse	$3kA_{eff}$/260V $1.5kA_{eff}$/440V	$500A_{eff}$/260V –	$100A_{eff}$/260V –
Short-circuit current strength at max. back-up fuse	$25kA_{eff}$	–	–
Maximum back-up fuse	125 AgL	–	–
Connection diagram			
Mechanical			
Frame size	45 mm	45 mm	45 mm
Device height	90 mm	90 mm	90 mm
Device width	17.5 mm	17.5 mm	35 mm
Weight	174 g	178 g	320 g
Upper and lower lift terminal capacity			
rigid	0.5 - 35 mm^2	0.5 - 35 mm^2	10 - 50 mm^2
flexible	0.5 - 25 mm^2	0.5 - 25 mm^2	16 - 35 mm^2
Tightening torque of terminal screws	4 - 4.5 Nm	4 - 4.5 Nm	6 - 8 Nm
Mounting	quick fastening on DIN rail EN 50022		
Degree of protection acc. to IEC 60529 (installed)	IP20 (IP40)		
Accessories: busbars	Z-GV-U/		
Permitted relative air humidity	< 95%		
Permitted ambient temperature	-40°C to +85°C		

Dimensions (mm)

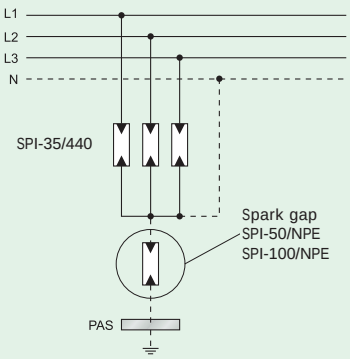
SPI-35/440, SPI-50/NPE



SPI-100/NPE



Application Example

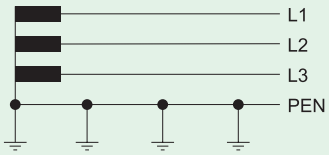
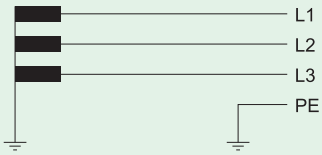
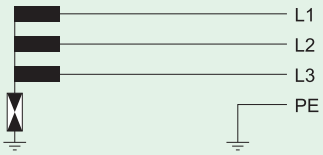
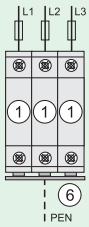
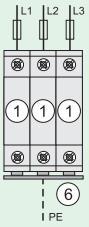
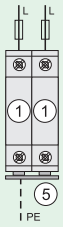
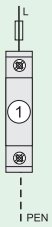


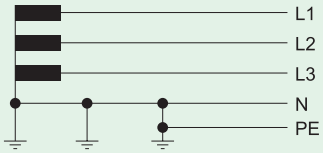
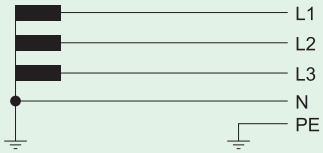
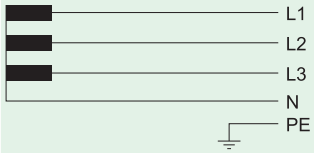
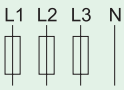
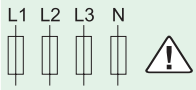
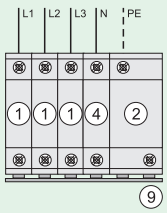
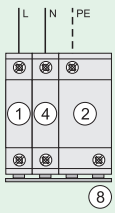
Attention!
SPI-.../NPE should be used only as a N-PE spark gap in a e.g. TT-system (connection type 2 according to IEC 60364-5-534 Clause 534)

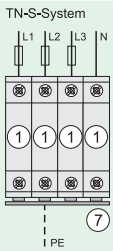
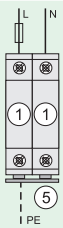
SPI-50/NPE: for protection class III, IV according to IEC 61024-1
SPI-100/NPE: for protection class I, II, III, IV according to IEC 61024-1

Busbar Connection Examples according to IEC 60364-5-53 Clause 534

SPD Class B SPI B

	TN-C-System	TT-System 3 x 230 VAC	IT-System 3 x 230 VAC
3 x 240/415 V AC 3 x 230/400 V AC 3 x 220/380 V AC			
SPI-35/440/3		SPI-35/440/3 	
4 wires	 2 wires	4 wires	3 wires

	TN-S-System	TT-System	IT-System 3 x 230/400 VAC
3 x 240/415 V AC 3 x 230/400 V AC 3 x 220/380 V AC			
			
SPI-3+1			
CT2			CT2
5 wires			3 wires

TN-S-System	
TN-S-System 	
CT1	CT1
5 wires	3 wires

Lightning current arrester

① . . .SPI-35/440
② . . .SPI-100/NPE for protection class I, II, III, IV
SPI-50/NPE for protection class III, IV

Lead-through terminal

④ . . .SPB-D-125

Busbar

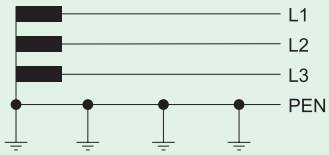
⑤ . . .Z-GV-U/2
⑥ . . .Z-GV-U/3
⑦ . . .Z-GV-U/4
⑧ . . .Z-GV-U/4 at SPI-100/NPE
Z-GV-U/3 at SPI-50/NPE
⑨ . . .Z-GV-U/6 (Z-GV-U/5 at SPI-50/NPE)

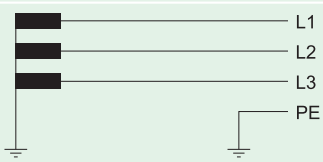
CT1 . .Connection type 1
CT2 . .Connection type 2

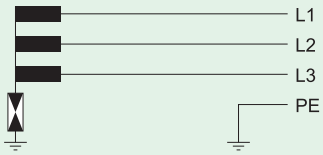
Busbar Connection Examples according to IEC 60364-5-53 Clause 534

SPD Class B+C SPI B SP C

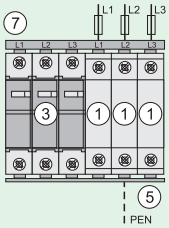
TN-C-System	TT-System 3 x 230 VAC	IT-System 3 x 230 VAC
3 x 240/415 V AC 3 x 230/400 V AC 3 x 220/380 V AC		



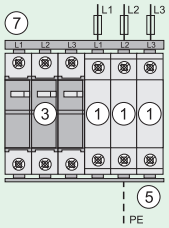




SP-B+C/3



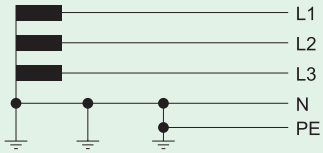
SP-B+C/3

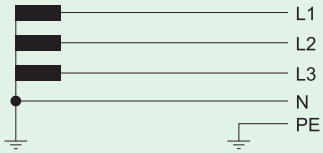


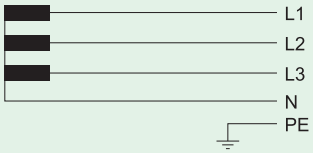
4 wires

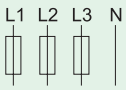
4 wires

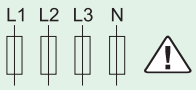
TN-S-System	TT-System	IT-System 3 x 230/400 VAC
3 x 240/415 V AC 3 x 230/400 V AC 3 x 220/380 V AC		



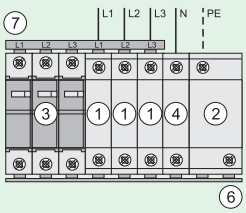








SP-B+C/3+1



CT2

5 wires

Lightning current arrester

① . . .SPI-35/440

② . . .SPI-100/NPE for protection class I, II, III, IV
SPI-50/NPE for protection class III, IV

③ . . .SPC-S-20/460/3

Lead-through terminal

④ . . .SPB-D-125

Busbar

⑤ . . .Z-GV-U/6

⑥ . . .Z-GV-U/9

⑦ . . .Z-GV-16/3P-2TE/6

CT2 . .Connection type 2

Application Examples according to IEC 60364-5-53 Clause 534

Lightning current arrester

① . . .SPI-35/440

⑥ . . .SPI-100/NPE

③ . . .SPI-50/NPE

Surge arrester

② . . .SPC-S-20/460/3, SPC-E-460

Lead-through terminal

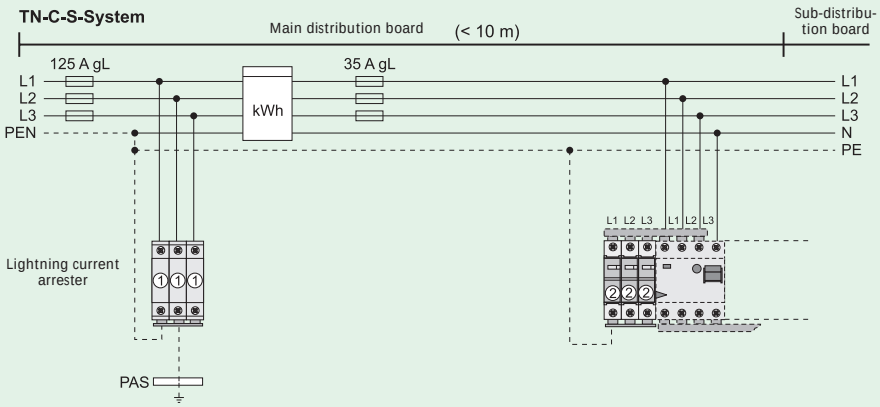
⑤ . . .SPB-D-125

⑧ . . .Z-D63

Busbar

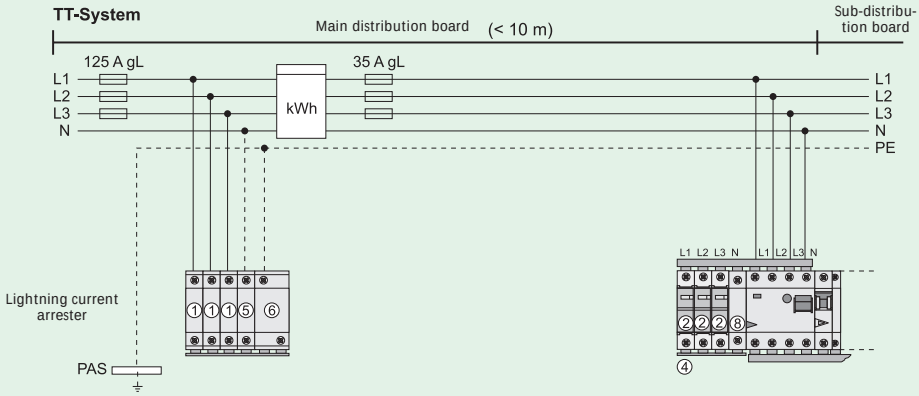
④ . . .ZV-KSBI-4TE

TN-C-S-System



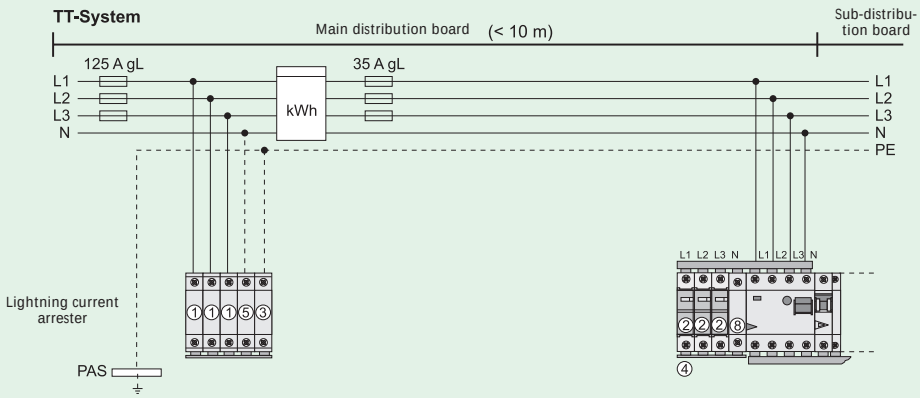
Protection Class I, II, III, IV

TT-System



Protection Class III, IV

TT-System



Lead-Through Terminal for Surge Protective Devices, Class B, SPB-D-125

- The lead-through terminal permits orderly wiring of SPDs of class B. It serves as lead-through terminal in circuits requiring vertical connections from the upper to the lower SPD connection level.

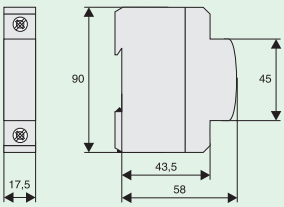
Connection diagram

Technical Data

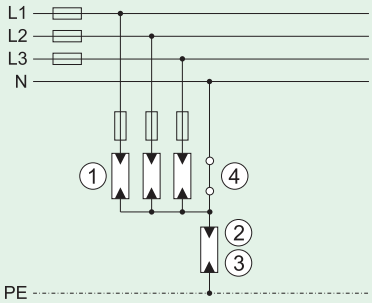
Electrical	
Design basically in accordance with	IEC 61643-1: 1998-02, DIN VDE 0675 Part 6: 1989-11, IEC 61024-1: 1990-03, IEC 60947-7-1: 1989-10, DIN VDE 0110-1: 1997-04
Rated voltage U_C	500 V AC/DC
Rated current I_N	125 A / 30°C
Impulse current (10/350) µs	
Peak current	100 kA
Charge Q	50 As
Specific energy	2,5 MJ/Ω
Overvoltage category	III

Mechanical	
Frame size	45 mm
Device height	90 mm
Device width	17.5 mm
Mounting	quick fastening on DIN rail EN 50022
Degree of protection, built-in	IP40
Upper and lower terminals	lift and open-mouthed terminals
Terminal capacity	
rigid	0.5 - 35 mm²
flexible	0.5 - 25 mm²
Tightening torque of terminal screws	4-4.5 Nm
Permitted relative air humidity	< 95%
Pollution degree	2
Resistance to climatic conditions	F / DIN 40040
Creepage a. clearance distances acc. to	IEC 60664-1, DIN VDE 0110-1:1997-04
Temperature range	-40 to +85°C

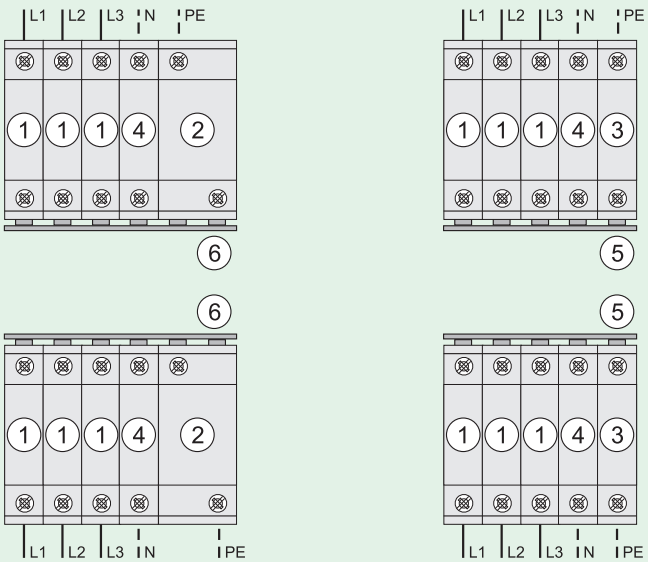
Dimensions (mm)



Connection type 2 according to IEC 60364-5-53 Clause 534



TT-System, TN-S-System , IT- System with Neutral



Lightning current arrester

① . . .SPI-35/440
② . . .SPI-100/NPE
③ . . .SPI-50/NPE

Lead-through terminal

④ . . .SPB-D-125

Busbar

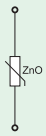
⑤ . . .Z-GV-U/5
⑥ . . .Z-GV-U/6

SPD Class C, Surge Arresters SPC-E

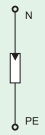
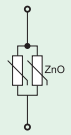
- Field of application
  For the protection of low voltage distribution systems against transient overvoltage caused by indirect lightning stroke and switching operations.
- SPD class C according to ÖVE-SN 60 Part 1 / Part 4
- Test class II according to IEC 61643-1
- Test type T2 according to pr EN 61643-1
- Busbars ZV-KSBI are available for all customary applications
- Suitable for busbar connection to all Xtra Combinations switchgear

Block Diagram

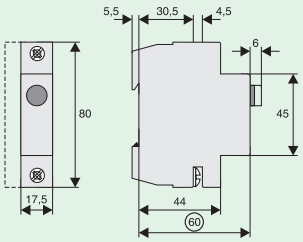
Technical Data

	SPC-E-75	-130	-280	-335	-385	-460	-580
Electrical							
Design type	II	II	II	II	II	II	II
Responding time (rate of voltage rise 5 kV/µs)	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Voltage protection level at nominal discharge current	< 500 V	< 800 V	< 1.4kV	< 1.5kV	< 1.7kV	< 2.1kV	< 2.4kV
Maximum continuous operating voltage U_C	75 VAC	130 VAC	280 VAC	335 VAC	385 VAC	460 VAC	580 VAC
Nominal discharge current (8/20) µs I_n	15 kA	20 kA	20 kA	20 kA	20 kA	20 kA	20 kA
Charge Q at I_n	0.43 As	0.57 As	0.57 As	0.57 As	0.57 As	0.57 As	0.57 As
Specific energy at I_n	3.2 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω
Maximum discharge current I_{max}	30 kA	40 kA	40 kA	40 kA	40 kA	40 kA	40 kA
Maximum back-up fuse	125 AgL						
Maximum short-circuit current	50 kA						
Connection diagram							
Mechanical							
Frame size	45 mm						
Device height	80 mm						
Device width	17.5 mm						
Weight	97 g						
Permitted ambient temperature	-40°C to +70°C						
Degree of protection (built-in)	IP40						
Upper and lower lift terminal capacity	4 - 25 mm^2						
Upper and lower open mouthed terminals for busbar thickness up to	1.5 mm						
Tightening torque of terminal screws	2.4 - 3 Nm						
Quick fastening on DIN rail according to	EN 50022						
Accessories: busbars 10 mm^2	Type ZV-KSBI ...						

Technical Data

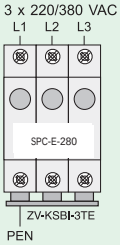
	SPC-E-N/PE	SPC-EH-280
Electrical		
Design type	–	II
Responding time (rate of voltage rise 5 kV/µs)	< 100 ns	< 25 ns
Voltage protection level at nominal discharge current	< 1.2 kV	< 1.3 kV
Maximum continuous operating voltage U_C	260 VAC	280 VAC
Nominal discharge current (8/20) µs I_n	20 kA	25 kA
Charge Q at I_n	0.57 As	0.1 As
Specific energy at I_n	5.7 kJ/Ω	8.9 kJ/Ω
Maximum discharge current I_{max}	40 kA	50 kA
Maximum back-up fuse	–	125 AgL
Maximum short-circuit current	–	50 kA
Short-circuit current quenching capability at U_c and I_n	100 A_{eff}	–
Connection diagram		
Mechanical		
Frame size	45 mm	
Device height	80 mm	
Device width	17.5 mm	
Weight	97 g	114 g
Permitted ambient temperature	-40°C to +70°C	
Degree of protection (built-in)	IP40	
Upper and lower lift terminal capacity	4 - 25 mm^2	
Upper and lower open mouthed terminals for busbar thickness up to	1.5 mm	
Tightening torque of terminal screws	2.4 - 3 Nm	
Quick fastening on DIN rail according to	EN 50022	
Accessories: busbars 10 mm^2	Type ZV-KSBI ...	

Dimensions (mm)

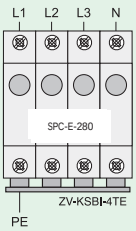


Application Examples SPC-E according to IEC 60364-5-53 Clause 534

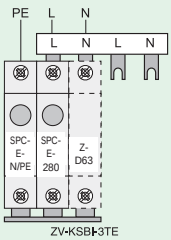
TN-C-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



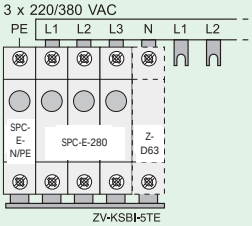
TN-S-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



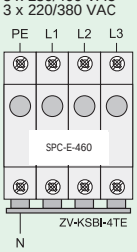
TN-S-/TT-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



TN-S-/TT-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



IT-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC

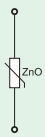


SPD Class C, Plug-in Surge Arresters SPC-S

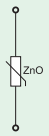
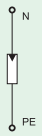
- Field of application:
  For the protection of low voltage distribution systems against transient overvoltage caused by indirect lightning stroke and switching operations.
- SPD class C according to ÖVE-SN 60 Part 1 / Part 4
- Test class II basically in accordance with IEC 61643-1
- Test type T2 according to pr EN 61643-1
- Auxiliary switch SPC-S-HK for remote message transmission can be mounted onto the device
- Suitable for busbar connection to all Xtra Combinations switchgear
- Busbars ZV-KSBI are available for all customary applications
- Type **SPC-S-3+1**:
  consists of 1 base SPC-S-S4-3+1,
  1 insert SPC-S-N/PE and 3 inserts SPC-S-20/335
- Type **SPC-S-1+1**:
  consists of 1 base SPC-S-S2-1+1,
  1 insert SPC-S-N/PE and 1 insert SPC-S-20/335

Symbol

Technical Data

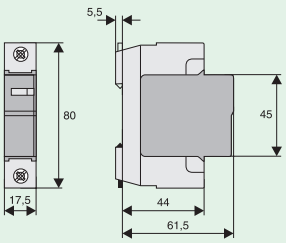
Inserts	SPC-S-15/75	-20/130	-20/175	-20/280	-20/335	-20/385	-20/460
Electrical							
Mechanical coding	x	x	x	x	x	x	x
Design type	II	II	II	II	II	II	II
Responding time (rate of voltage rise 5 kV/µs)	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Voltage protection level at nominal discharge current	< 500 V	< 800 V	< 1.2 kV	< 1.4 kV	< 1.5 kV	< 1.7 kV	< 2.1 kV
Maximum continuous operating voltage U_c	75 VAC	130 VAC	175 VAC	280 VAC	335 VAC	385 VAC	460 VAC
Nominal discharge current (8/20) µs I_n	15 kA	20 kA	15 kA	20 kA	20 kA	20 kA	20 kA
Charge Q at I_n	0.43 As	0.57 As	0.57 As	0.57 As	0.57 As	0.57 As	0.57 As
Specific energy at I_n	3.2 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω	5.7 kJ/Ω
Maximum discharge current I_{max}	30 kA	40 kA	40 kA	40 kA	40 kA	40 kA	40 kA
Short-circuit current quenching capability at U_c and I_n	–			–	–	–	–
Maximum short-circuit current	50 kA	50 kA	50 kA	50 kA	50 kA	50 kA	50 kA
Maximum back-up fuse	160 AgL						
Connection diagram							
Mechanical							
Frame size	45 mm						
Device height	80 mm						
Device width							
1-pole	17.5 mm (1MU)						
1+1-pole	35 mm (2MU)						
2-pole	35 mm (2MU)						
3-pole	52.5 mm (3MU)						
3+1-pole	70 mm (4MU)						
4-pole	70 mm (4MU)						
Mechanical coding							
1-pole	x						
1+1-pole	yx						
2-pole	xx						
3-pole	xxx						
3+1-pole	yxxx						
4-pole	xxxx						
Weight 1P, 1+1P, 2P, 3P, 3+1P, 4P	58/100/100/148/200/200g						
Permitted ambient temperature	-40°C to +70°C						
Degree of protection (built-in)	IP40						
Upper and lower lift terminal capacity	4 - 25 mm^2						
Upper and lower open mouthed terminals for busbar thickness up to	1.5 mm						
Tightening torque of terminal screws	2.4 - 3 Nm						
Quick fastening on DIN rail according to	EN 50022						
Accessories: busbars 10 mm^2	Type ZV-KSBI ...						

Technical Data

	SPC-S-20/580	-N/PE
Electrical		
Mechanical coding	x	y
Design type	II	–
Responding time (rate of voltage rise 5 kV/µs)	< 25 ns	< 100 ns
Voltage protection level at nominal discharge current	< 2.4 kV	< 1.2 kV
Maximum continuous operating voltage U_c	580 VAC	260 VAC
Nominal discharge current (8/20) µs I_n	20 kA	20 kA
Charge Q at I_n	0.57 As	0.57 As
Specific energy at I_n	5.7 kJ/Ω	5.7 kJ/Ω
Maximum discharge current I_{max}	40 kA	40 kA
Short-circuit current quenching capability at U_c and I_n	–	100 A_{eff}
Maximum short-circuit current	50 kA	–
Maximum back-up fuse	160 AgL	
Connection diagram		

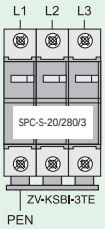
Mechanical	
Frame size	45 mm
Device height	80 mm
Device width	
1-pole	17.5 mm (1MU)
1+1-pole	35 mm (2MU)
2-pole	35 mm (2MU)
3-pole	52.5 mm (3MU)
3+1-pole	70 mm (4MU)
4-pole	70 mm (4MU)
Mechanical coding	
1-pole	x
1+1-pole	yx
2-pole	xx
3-pole	xxx
3+1-pole	yxxx
4-pole	xxxx
Weight 1P, 1+1P, 2P, 3P, 3+1P, 4P	58/100/100/148/200/200g
Permitted ambient temperature	-40°C to +70°C
Degree of protection (built-in)	IP40
Upper and lower lift terminal capacity	4 - 25 mm^2
Upper and lower open mouthed terminals for busbar thickness up to	1.5 mm
Tightening torque of terminal screws	2.4 - 3 Nm
Quick fastening on DIN rail according to	EN 50022
Accessories: busbars 10 mm^2	Type ZV-KSBI ...

Dimensions (mm)

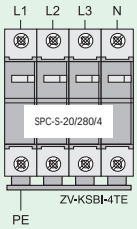


Application Examples SPC-S according to IEC 60364-5-53 Clause 534

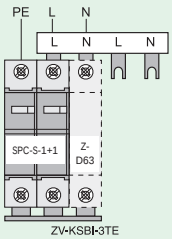
TN-C-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



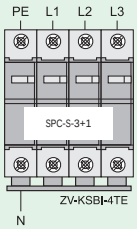
TN-S-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



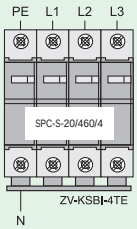
TN-S-/TT-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



TN-S-/TT-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



IT-System
3 x 240/415 VAC
3 x 230/400 VAC
3 x 220/380 VAC



Auxiliary Switch for Surge Arresters SPC-S-HK

- Field of application:
  For mounting onto surge protective devices for external defect message transmission
- Design basically in accordance with IEC 60947-5-1
- Can be mounted subsequently
- Suitable for SPC-S, SPD-S

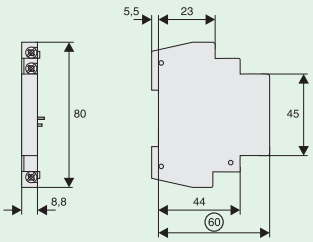
Connection diagram

Technical Data

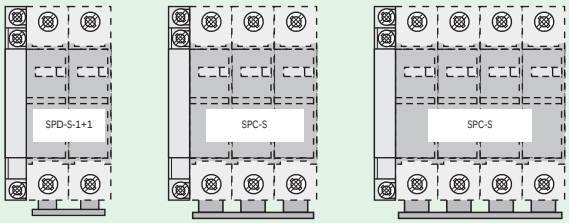
Electrical	
Rated insulation voltage	250 V
Rated frequency	50/60 Hz
Switching contact	1 CO
Minimum voltage per contact	24 VAC
Rated operational current AC12	2A/250VAC
Maximum back-up fuse	2 A gL
Overvoltage category	IV
Pollution degree	2

Mechanical	
Frame size	45 mm
Device height	80 mm
Device width	8.8 mm
Weight	41 g
Mounting	screw-mounting onto SPC-S-S.
Degree of protection, built-in	IP40
Finger and hand touch safe acc. to	VBG 4, ÖVE-EN 6
Upper and lower terminals	lift terminals
Terminal capacity	2 x 2.5 mm^2
Tightening torque of terminal screws	0.8 - 1 Nm

Dimensions (mm)



Application Examples



Surface-Mounted Splash-proof Compact Distribution Box 07-FR

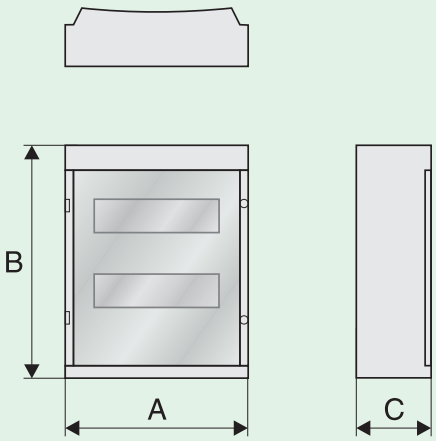
- sufficient working space for mounting and wiring switchgears
- sufficient working space behind the DIN rail
  07-FR: 10 mm;
- distance between DIN rails 150 mm
- mounting of terminal support above or below
- impact-resistant, fire-retardant plastic, white
- pre-moulded PG-bushing on every side
- Door on the left or right
- IP41, IP55 and IP65 available
- Attractive modern design

Technical Data

Electrical	
Design according to	IEC 670
Degree of protection	IP41 according to EN 60529
Protection class	II
Rated voltage	400 V AC / 50 Hz
Suitable for network structures	TN, TT and IT

Mechanical		
Material:		
Surface mounting		
Enclosure		
IP41	PS	
Colour	white	
Door	PC	
Colour	transparent	
Distance between DIN rails	150 mm	
N-PE terminals:	N	PE
O7-FR..1/4	4	4
O7-FR..1/8	7	7
O7-FR..1/12	8	8
Device support rail	DIN rail 35 x 7.5 mm galvanised steel sheet acc. to EN 50022	

Dimensions (mm)



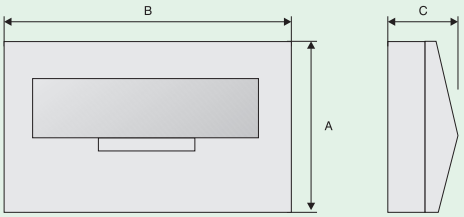
Type	A	B	C
O7-FR..1/4	120	192	105
O7-FR..1/8	192	192	105
O7-FR..1/12	274	192	105

PE Series Consumer Boards

IP40

Surface Mounting

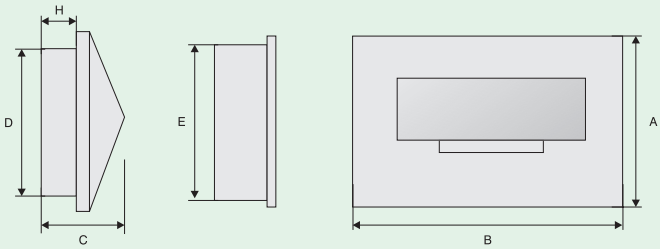
Dimensions (mm)



Type	A	B	C
PE12ST, PE12SW	200	280	94
PE18ST, PE18SW	221	364	96
PE24ST, PE24SW	326	256	96
PE36ST, PE36SW	451	256	96

Flush Mounting

Dimensions (mm)



Type	A	B	C	D	E	H
PE12FT, PE12FW	222	340	92	200	256	66
PE18FT, PE18FW	252	398	100	229	256	76
PE24FT, PE24FW	345	300	100	231	213	75
PE36FT, PE36FW	470	300	100	435	435	75

Type	Selection Inform. Page	Technical Data Page
A		
AP-45-W	47	
B		
BSZ	42	98
O		
O7-FR	46	114
P		
PE	48	115
PFIM	2	53
PFNM	5	54
PKA6	15	61
PKA6	15	61
PKDM	10	59
PKDM	10	59
PKNM	8	55
PKSM	12	60
PKSM	12	60
PLHT	31	75
PLS4	29	62, 73
PLS6	25	62, 68
PLS6-DC	28	62, 72
PLSM	17	62
PLSM-B4/.-HS	37	84
PLZ6	25	62, 68
PLZM	17	62
S		
SPB-D-125	44	107
SPC-E	44	108
SPC-S	44	110
SPC-S-HK	45	113
SPI	44	103
SU-G.	41	92, 93, 94
ZA		
Z-AHK	37	81
Z-ASA	38	85
ZB		
Z-BSZ	42	97
ZF		
Z-FW	38	87
ZG		
Z-GLO	42	99
ZH		
Z-HA	37	80
Z-HA	37	80
Z-HD	37	81
Z-HK	37	81
Z-HR	37	81
ZK		
Z-KWZ	41	95, 96
ZL		
Z-L	38	88
Z-LHASA	35	79
Z-LHK	35	79
Z-LT/	38	88
ZM		
Z-MS	42	100
ZN		
Z-NHK	37	81
ZP		
ZP-AHK	37	83
ZP-ASA	38	85
ZP-NHK	37	83
ZR		
Z-R., Z-TN	40	90
ZS		
Z-S../	39	89
Z-S..L/	38	88
Z-S/.W	39	89
Z-SDM	41	92, 93, 94
Z-SGS	41	92, 93, 94
Z-SLS/NEOZ	42	102
Z-SUM	42	99
ZT		
Z-T/	39	89
ZU		
Z-USA	38	86
Z-USD	38	86

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