VARIMETER
Overcurrent Relay
IK 9270, IL 9270, IP 9270, SK 9270, SL 9270, SP 9270

0272618

IK 9270

IL 9270

IL 9270/5_ _

SL 9270/5_ _

SK 9270

IP 9270

SL 9270CT

SP 9270CT

- According to IEC/EN 60 255, DIN VDE 0435-303
- IP 9270, SP 9270CT: 3-phase
  IK 9270, SK 9270, IL 9270, SL 9270CT: single phase
- Measuring ranges from 0.1 ... 100 A
- Settable response value
- Fixed hysteresis
- Settable time delay
- de-energized on trip
- energized on trip
- LED indicators
- With auxiliary voltage
- Auxiliary supply and measuring input galvanic separated
- Devices available in 2 enclosure versions:
  - I-model, e.g. IK _ _ _ _, depth 61 mm
    with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  - S-model, e.g. SK _ _ _ _, depth 100 mm
    with terminals at the top for cabinets with mounting plate and cable duct
- Width IK 9270, SK 9270: 17.5 mm
  IL 9270, SL 9270CT: 35 mm
  IP 9270, SP 9270CT: 70 mm

Approvals and Markings

CE

Applications

Overcurrent detection in single phase or 3-phase voltage systems

Indicators

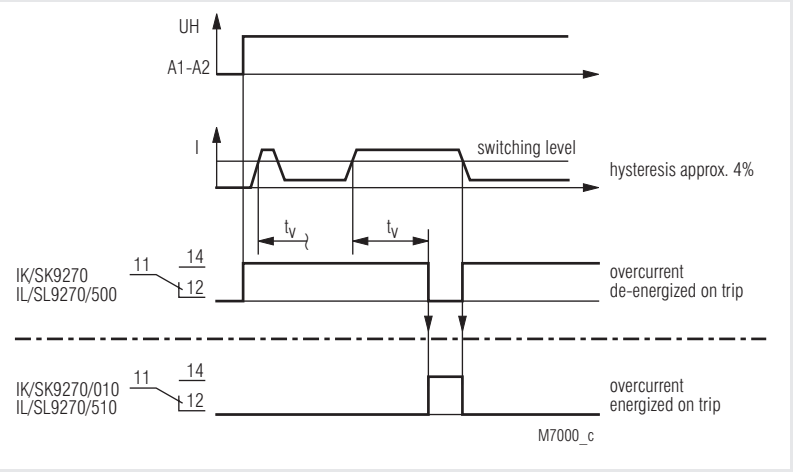
IK 9270.11, SK 9270.11
IL 9270.11/5_ _,
SL 9270.11/5_ _:

LED green:	aux. supply connected
LED yellow:	output contacts switched

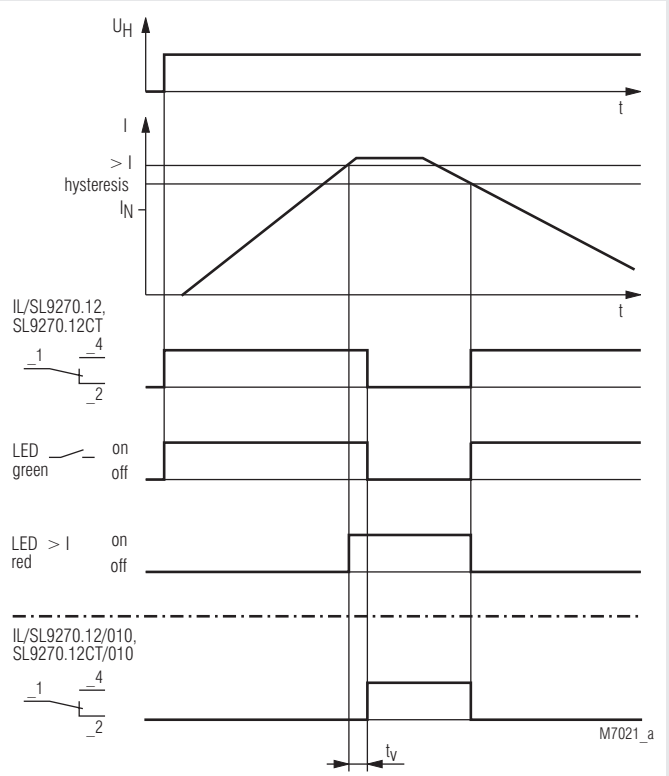
IL 9270, SL 9270,
IP 9270, SP 9270:

LED green:	current within limits
LED red I_{max}:	overcurrent

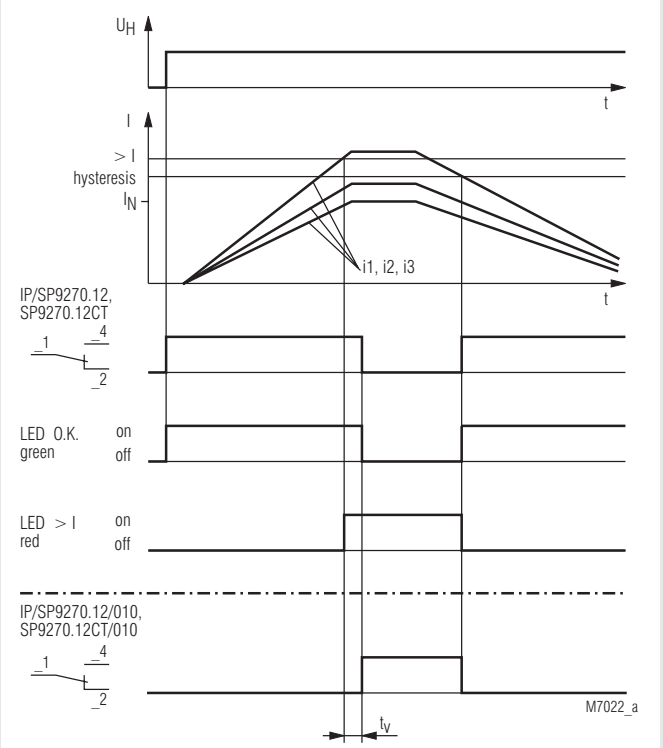
Function Diagram IK/SK 9270, IL/SL 9270.11/500



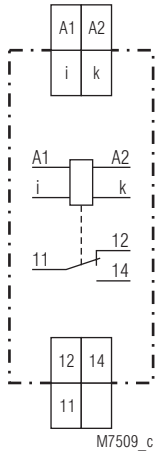
Function Diagram IL 9270.12, SL 9270.12



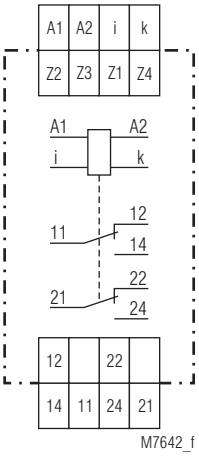
Function Diagram IP 9270, SP 9270



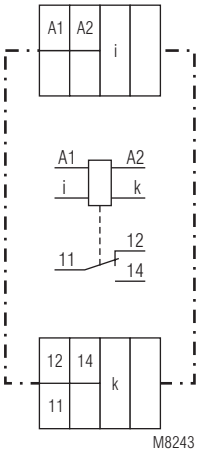
Circuit Diagrams



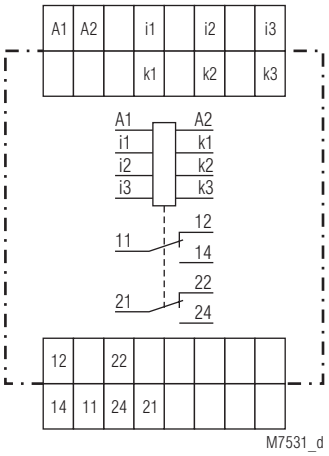
IK 9270.11, SK 9270.11



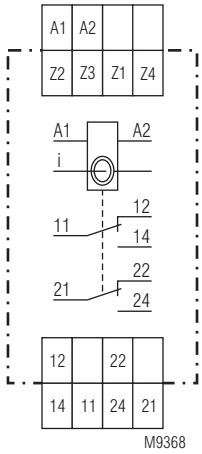
IL 9270.12, SL 9270.12



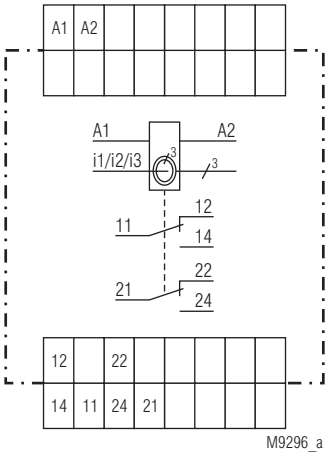
IL 9270.11/5_ _



IP 9270.12, SP 9270.12



SL 9270.12CT



SP 9270.12CT

Technical Data

Type						
	IK 9270	**SL 9270/5_ _**	**IL 9270**	**SL 9270CT**	**IP 9270**	**SP 9270CT**
Depth 61 mm	IK 9270.11	IL 9270.11/5_ _	IL 9270.12	-	IP 9270.12	-
Depth 100 mm	SK 9270.11	SL 9270.11/5_ _	SL 9270.12	SL 9270.12CT	SP 9270.12	SP 9270.12CT
Width	17.5 mm	35 mm	35 mm	35 mm	70 mm	70 mm
Measuring input	single-phase	single-phase	single-phase	single-phase	3-phase	3-phase
Measuring range (Nominal frequency 50 ... 400 Hz)	**0.1 ... 15 A** 4 part ranges settable with switch: 0.1 ... 1 A 0.5 ... 5 A 1 ... 10 A 1.5 ... 15 A Max. thermal continuous current: 20 A at 50 °C 15 A at 60 °C	**0.1 ... 50 A** 5 part ranges settable with switch: 0.1 ... 1 A 0.5 ... 5 A 2.5 ... 25 A 3 ... 30 A 5 ... 50 A Max. thermal continuous current: 50 A at 50 °C 60 A at 40 °C	**0.1 ... 15 A** 4 part ranges programmable with bridges: 0.1 ... 1 A (Z1-Z2) 0.5 ... 5 A (Z1-Z3) 1 ... 10 A (Z1-Z4) 1.5 ... 15 A (Z3-Z1-Z4) Max. thermal continuous current: 20 A t 50 °C 15 A at 60 °C	**0.5 ... 100 A** 4 part ranges programmable with bridges: 0.5 ... 5 A (Z1-Z2) 2.5 ... 25 A (Z1-Z3) 7.5 ... 75 A (Z1-Z4) 10 ... 100 A (Z3-Z1-Z4) Max. thermal continuous current: limited only by diameter of cable 25 mm²	**0.1 ... 15 A** 1 fixed measuring range per unit 0.1 ... 1 A 0.5 ... 5 A 1 ... 10 A 1.5 ... 15 A Max. thermal continuous current: 3 x 15 A t 50 °C 3 x 20 A at 45 °C	**0.5 ... 100 A** 1 fixed measuring range per unit 0.5 ... 5 A 2.5 ... 25 A 5 ... 50 A 7.5 ... 75 A 10 ... 100 A Max. thermal continuous current: limited only by diameter of cable 25 mm²
	5 ... 750 mA*) 4 part ranges settable with switch: 5 ... 50 mA 25 ... 250 mA 50 ... 500 mA 75 ... 750 mA Max. thermal continuous current: 5 A at 50 °C		**0.01 ... 1.5 A** 4 part ranges programmable with bridges: 0.01 ... 0.1 A (Z1-Z3) 0.5 ... 0.5 A (Z1-Z2) 0.1 ... 1 A (Z1-Z4) 0.15 ... 1.5 A (Z2-Z1-Z4) Max. thermal continuous current: 20 A at 50 °C 15 A at 60 °C			
Max. current at 50 °C		all ranges 80 A / 3 s				
Wire current path Solid Stranded ferruled	2 x 2.5 mm² 2 x 1.5 mm²	1 x 10 mm² 1 x 6 mm²	2 x 2.5 mm² 2 x 1.5 mm²	CT-diameter = 10 mm 25 mm²	2 x 2.5 mm² 2 x 1.5 mm²	CT-diameter = 10 mm 25 mm²
Contacts	1 changeover	1 changeover	2 changeover	2 changeover	2 changeover	2 changeover
Weight:	IK 9270: 70 g SK 9270: 90 g	IL 9270/5_ _: 125 g SL 9270/5_ _: 150 g	IL 9270: 125 g SL 9270: 150 g	approx. 230 g	IP 9270: 200 g SP 9270: 250 g	approx. 470 g

*) Rated impulse voltage / pollution degree (auxiliary voltage - measuring circuit): 4 kV/2

Technical Data

Max. overload: see table
Temperature influence: ≤ 0.05 % / K
Reaction time: see characteristic switching delay
Internal resistor: < 5 mΩ

Setting Ranges

Response value: infinite variable within measuring range
Hysteresis: approx. 4 % of setting value, fixed
Repeat accuracy: ≤ ± 1 %
Switching delay: 0.1 ... 20 sec settable

Auxiliary Circuit

Auxiliary voltage U_H: AC/DC 24 V, AC 220 ... 240 V
other voltages on request

Voltage range
at AC: 0.8 ... 1.1 U_H
at DC: 0.8 ... 1.25 U_H
Nominal consumption
at AC 230 V:
IL/SL 9270, IP/SP 9270: 3.2 VA
IK/SK 9270, IL/SL 9270/500: 2.3 VA
at DC 24 V:
IL/SL 9270, IP/SP 9270: 0.8 W
IK/SK 9270, IL/SL 9270/500: 0.4 W
Nominal frequency: 50 / 60 Hz
Frequency range: ± 5 %

Output

Contacts
IK 9270.11, SK 9270.11
IL/SL 9270.11/5_ _: 1 changeover contact
IL 9270.12, SL 9270.12
SL 9270.12CT: 2 changeover contacts
IP 9270.12, SP 9270.12
SP 9270.12CT: 2 changeover contacts
Thermal current I_{th}: 5 A
Switching capacity
to AC 15
NO contact:

IK 9270, IL 9270/5_ _:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
IL/SL 9270, IP/SP 9270, SL 9270CT, SP 9270CT:	5 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1

Electrical life IEC/EN 60 947-5-1
to AC 15 bei 1 A, AC 230 V
NO contact

IK/SK 9270, IL/SL 9270/5_ _: to AC 15 at 2 A, AC 230 V	3 x 10^5 switching cycles	IEC/EN 60 947-5-1
IL/SL 9270, IP/SP 9270, SL 9270CT, SP 9270CT:	2 x 10^5 switching cycles	IEC/EN 60 947-5-1

Short-circuit strength
max. fuse rating:

IK/SK 9270, IL/SL 9270/5_ _:	4 A gL	IEC/EN 60 947-5-1
IL/SL 9270, IP/SP 9270 SL 9270CT, SP 9270CT:	10 A gL	IEC/EN 60 947-5-1

Mechanical life: > 50 x 10^6 switching cycles

Technical Data

General Data

Operating mode: Continuous operation
Temperature range: - 20 ... + 60°C
Clearance and creepage distances
rated impulse voltage/
pollution degree: IEC 60 664-1

	IP/SP	IK/SK IL/SL-devices/5_ _	IL/SL
auxiliary voltage - contacts	4 kV/2	4 kV/2	4 kV/2
auxiliary voltage - measuring circuit	6 kV/2	6 kV/2*)	4 kV/2
measuring circuit - contacts	6 kV/2	6 kV/2	4 kV/2
measuring circuit-measuring circuit	6 kV/2	-	-
The contacts are not designed for voltage systems with 400 / 690 V.			

*) 4 kV/2 at IK/SK 9270 with measuring range 5 ... 750 mA

EMC

Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltages between wires for power supply		
IK/SK 9270, IL/SL 9270/5_ _:	2 kV	IEC/EN 61 000-4-5
IL/SL 9270, IP/SP 9270, SL/SP 9270CT:	1 kV	IEC/EN 61 000-4-5
between wire and ground:		
IK/SK 9270, IL/SL 9270/5_ _:	4 kV	IEC/EN 61 000-4-5
IL/SL 9270, IP/SP 9270, SL/SP 9270CT:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011

Degree of protection

Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529

Housing: Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance: Amplitude 0.35 mm frequency 10 ... 55 Hz IEC/EN 60 068-2-6
Climate resistance: 20 / 060 / 04 IEC/EN 60 068-1
Terminal designation: EN 50 005
Wire connection: 2 x 2.5 mm² solid or
2 x 1.5 mm² stranded ferruled
DIN 46 228-1/-2/-3/-4
Wire fixing: Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Mounting: DIN rail IEC/EN 60 715

Dimensions

Width x height x depth

IK 9270:	17.5 x 90 x 61 mm
SK 9270:	17.5 x 90 x 100 mm
IL 9270:	35 x 90 x 61 mm
SL 9270, SL 9270CT:	35 x 90 x 100 mm
IP 9270:	70 x 90 x 61 mm
SP 9270, SP 9270CT:	70 x 90 x 100 mm

Standard Types

IK 9270.11/010 AC 220 ... 240 V 50/60 Hz 0.1 ... 15 A
Article number: 0050330
SK 9270.11/010 AC 220 ... 240V 50/60Hz 0.1 ... 15 A
Article number:

- Single phase
- 4 programmable ranges up to 15 A
- energized on trip
- Auxiliary voltage U_H: AC 220 ... 240 V
- 1 changeover contact
- Width: 17.5 mm

IP 9270.12/010 AC 220 ... 240 V 50/60 Hz 0.5 ... 5 A
Article number: 0049438
SP 9270.12/010 AC 220 ... 240 V 50/60 Hz 0.5 ... 5 A
Article number: 0050736

- 3-phase
- Range: 0.5 ... 5 A
- energized on trip
- Auxiliary voltage U_H: AC 220 ... 240 V
- 2 changeover contacts
- Width: 70 mm

Variants

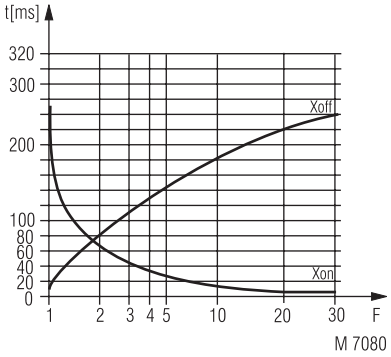
IK 9270.11, SK 9270.11:	single phase current relay, de-energized on trip, 1 changeover contact
IL 9270.12, SL 9270.12:	single phase current relay, de-energized on trip, 2 changeover contacts
IL 9270.12/010, SL 9270.12/010:	single phase current relay, energized on trip, 2 changeover contacts
IL 9270.11/500, SL 9270.11/500:	same as IK/SK 9270.11, except with 5 measuring ranges from 0.1 ... 50 A
IL 9270.11/510, SL 9270.11/510:	same as IK/SK 9270.11/010, except with 5 measuring ranges from 0.1 ... 50 A
IP 9270.12, SP 9270.12:	3-phase current relay, de-energized on trip, 2 changeover contacts
SL 9270.12CT:	single phase current relay with built in CT, de-energized on trip, 2 changeover contacts
SP 9270.12CT:	3-phase current relay with built in CT, energized on trip, 2 changeover contacts

Ordering Example for variants

SP 9270 .12 CT /_ _ 0 AC 220 ... 240 V 50 / 60 Hz 5 ... 50 A

- Measuring range
- Nominal frequency
- Auxiliary voltage
- 0: de-energized on trip
  1: energized on trip
- Variant, if required
- Built in CT
- Contacts
- Type

Characteristics



Switching delay
The characteristic shows the switching delay depending on the values of X_{on} - X_{off} when switching the current on or off. A slow current change reduces the delay.

$$F = \frac{\text{I applied}}{\text{I setting}}$$