

VARIMETER

Undercurrent Relay

IK 9271, IL 9271, IP 9271, SK 9271, SL 9271, SP 9271



D02244263



IK 9271



IL 9271



IL 9271/5_ _



SL 9271/5_ _



SK 9271



IP 9271



SL 9271CT



SP 9271CT

- According to IEC/EN 60 255, DIN VDE 0435-303
- IP 9271, SP 9271, SP 9271CT: 3-phase
IK 9271, IL 9271, SK 9271, SL 9271, SL 9271CT: single phase
- Measuring ranges from 0.1 ... 100 A
- IK 9271, SK 9271:
with 4 ranges settable by rotational switch, 1 changeover contact
- IL 9271, SL 9271:
with 5 ranges settable by rotational switch, 1 changeover contact
with 4 ranges programmable by bridges, 2 changeover contacts
- IP 9271, SP 9271: with 1 range, 2 changeover contacts
- Settable response value
- Fixed hysteresis
- Settable time delay
- De-energized on trip
- Optionally 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 installations 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 9271, SK 9271: 17.5 mm
IL 9271, SL 9271, SL 9271CT: 35 mm
IP 9271, SP 9271, SP 9271CT: 70 mm

Approvals and Markings



Applications

Undercurrent detection in single phase or 3-phase voltage systems

Indicators

IK 9271.11, SK 9271.11

IL 9271.11/5_ _

SL 9271.11/5_ _:

green LED:

on when aux. supply connected

yellow LED:

on when output contacts switched

IL 9271, SL 9271,

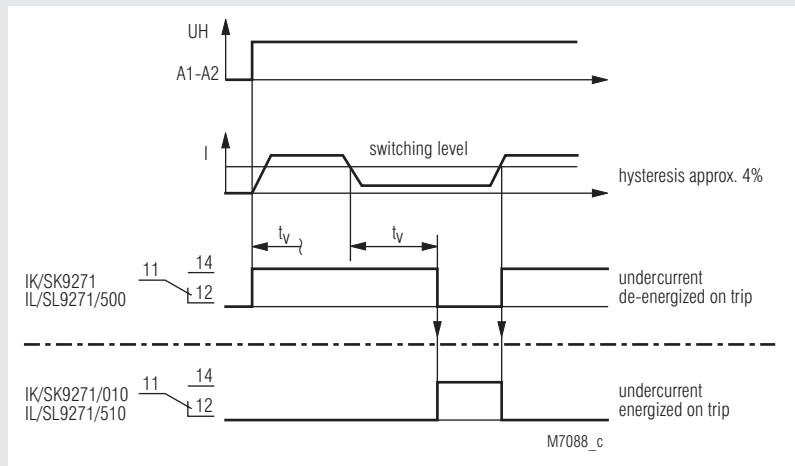
IP 9271, SP 9271:

green LED:

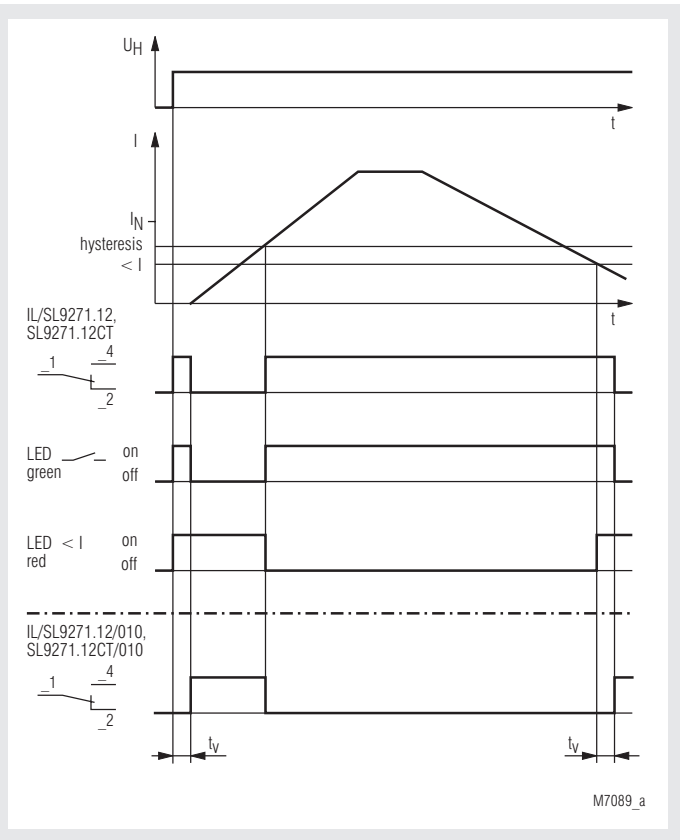
on when current within limits

red LED I_{max} :

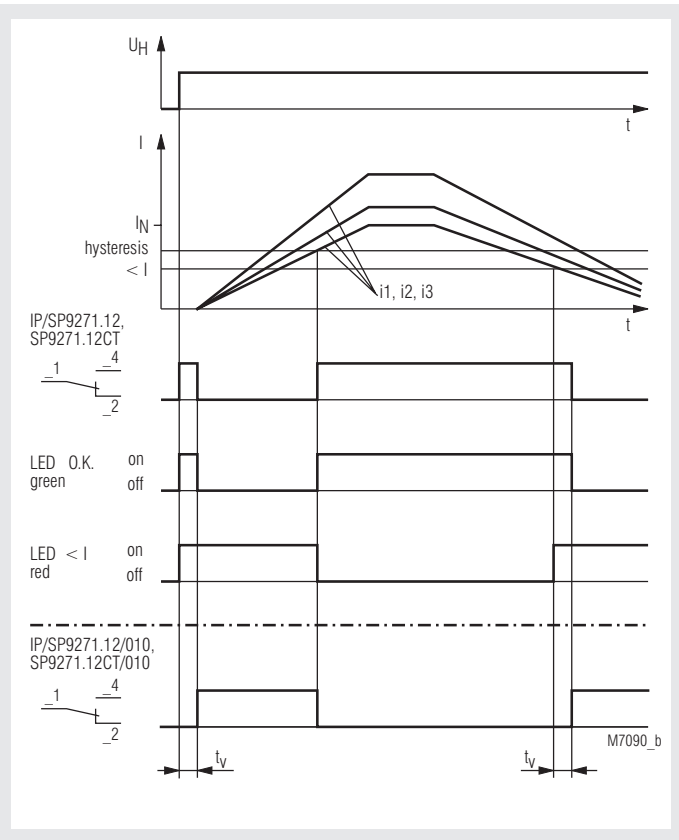
on when undercurrent



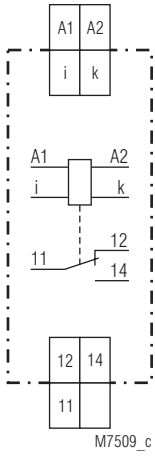
Function Diagram IL 9271.12, SL 9271.12



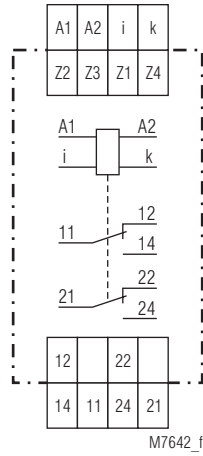
Function Diagram IP 9271, SP 9271



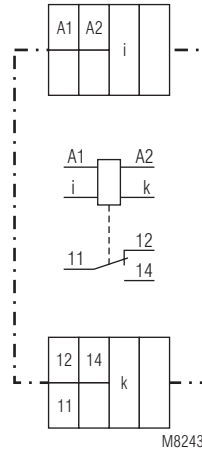
Circuit Diagrams



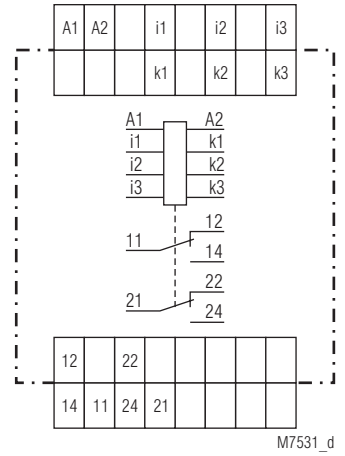
IK 9271.11, SK 9271.11



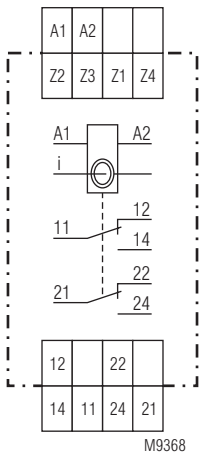
IL 9271.12, SL 9271.12



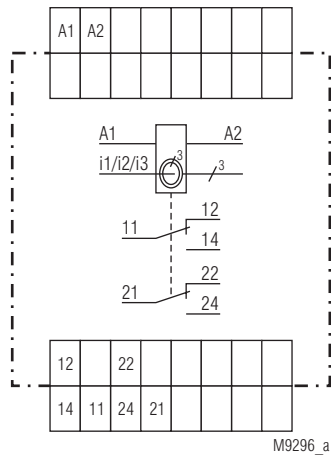
IL 9271.11/5_



IP 9271.12, SP 9271.12









SL 9271.12CT



SP 9271.12CT

Technical Data

| Type |  |  |  |  |  |  |
|---|---|---|---|---|--|--|
| | IK 9271 | SL 9271/5_ _ | IL 9271 | SL 9271CT | IP 9271 | SP 9271CT |
| Depth 61 mm | IK 9271.11 | IL 9271.11/5_ _ | IL 9271.12 | - | IP 9271.12 | - |
| Depth 100 mm | SK 9271.11 | SL 9271.11/5_ _ | SL 9271.12 | SL 9271.12CT | SP 9271.12 | SP 9271.12CT |
| 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 at 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 mm ² | 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 at 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 mm ² |
| | 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 mm ² 2 x 1.5 mm ² | 1 x 10 mm ² 1 x 6 mm ² | 2 x 2.5 mm ² 2 x 1.5 mm ² | CT-diameter = 10 mm 25 mm ² | 2 x 2.5 mm ² 2 x 1.5 mm ² | CT-diameter = 10 mm 25 mm ² |
| Contacts | 1 changeover | 1 changeover | 2 changeover | 2 changeover | 2 changeover | 2 changeover |
| Weight: | IK 9271: 70 g SK 9271: 90 g | IL 9271/5_ _: 125 g SL 9271/5_ _: 150 g | IL 9271: 125 g SL 9271: 150 g | approx. 230 g | IP 9271: 200 g SP 9271: 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

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 9271, IP/SP 9271: 3.2 VA
 IK/SK 9271, IL/SL 9271/500: 2.3 VA
 at DC 24 V:
 IL/SL 9271, IP/SP 9271: 0.8 W
 IK/SK 9271, IL/SL 9271/500: 0.4 W
Nominal frequency: 50 / 60 Hz
Frequency range: ± 5 %

Output

Contacts

IK 9271.11, SK 9271.11
 IL/SL 9271.11/5__ : 1 changeover contact
 IL 9271.12, SL 9271.12
 SL 9271.12CT: 2 changeover contacts
 IP 9271.12, SP 9271.12
 SP 9271.12CT: 2 changeover contacts
Thermal current I_{th} : 5 A

Switching capacity

to AC 15

NO contact:
 IK 9271, IL 9271/5__ : 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 9271, IP/SP 9271,
 SL 9271CT, SP 9271CT: 5 A / AC 230 V IEC/EN 60 947-5-1
 NC contact: 1 A / AC 230 V IEC/EN 60 947-5-1
 IEC/EN 60 947-5-1

Electrical life

to AC 15 bei 1 A, AC 230 V
 NO contact
 IK/SK 9271, IL/SL 9271/5__ : 3 x 10⁶ switching cycles IEC/EN 60 947-5-1
 to AC 15 at 2 A, AC 230 V
 IL/SL 9271, IP/SP 9271,
 SL 9271CT, SP 9271CT: 2 x 10⁵ switching cycles IEC/EN 60 947-5-1

Short-circuit strength

max. fuse rating:

IK/SK 9271, IL/SL 9271/5__ : 4 A gL IEC/EN 60 947-5-1
 IL/SL 9271, IP/SP 9271
 SL 9271CT, SP 9271CT: 10 A gL IEC/EN 60 947-5-1

Mechanical life: > 50 x 10⁶ switching cycles

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 9271 with measuring range 5 ... 750 mA
 and IK 9271.11/800

Technical Data

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 9271, IL/SL 9271/5__ : 2 kV IEC/EN 61 000-4-5

IL/SL 9271, IP/SP 9271,
 SL/SP 9271CT: 1 kV IEC/EN 61 000-4-5

between wire and ground:
 IK/SK 9271, IL/SL 9271/5__ : 4 kV IEC/EN 61 000-4-5

IL/SL 9271, IP/SP 9271,
 SL/SP 9271CT: 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
 20 / 060 / 04 IEC/EN 60 068-1

Climate resistance: EN 50 005

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 9271: 17.5 x 90 x 61 mm
 SK 9271: 17.5 x 90 x 100 mm
 IL 9271: 35 x 90 x 61 mm
 SL 9271, SL 9271CT: 35 x 90 x 100 mm
 IP 9271: 70 x 90 x 61 mm
 SP 9271, SP 9271CT: 70 x 90 x 100 mm

Standard Types

IK 9271.11 AC 220 ... 240 V 50/60 Hz 0.1 ... 15 A

Article number: 0050331

SK 9271.11 AC 220 ... 240 V 50/60 Hz 0.1 ... 15 A

Article number: 0050647

- 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 9271.12 AC 220 ... 240 V 50/60 Hz 0.5 ... 5 A

Article number: 0049961

SP 9271.12 AC 220 ... 240 V 50/60 Hz 0.5 ... 5 A

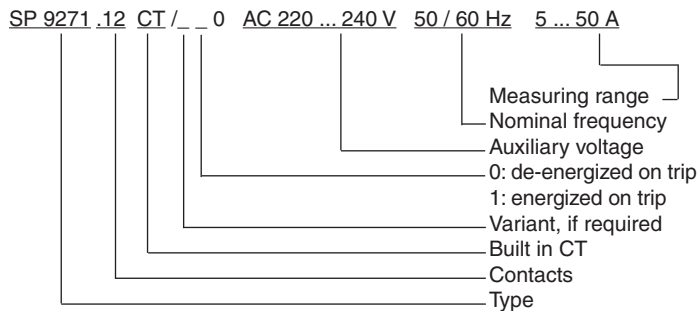
Article number: 0050648

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

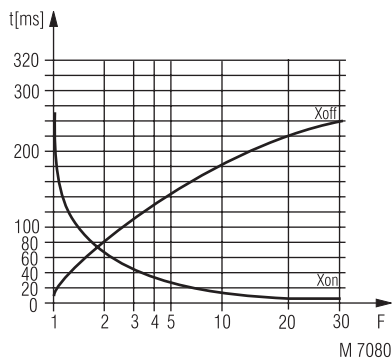
Variants

| | |
|---------------------------------|---|
| IK 9271.11/010, SK 9271.11/010: | single phase current relay energized on trip, 1 changeover contact |
| IK 9271.11/800: | single phase current relay energized on trip, except with 1 measuring ranges from 10 ... 100 mA, 1 changeover contact |
| IL 9271.12/010, SL 9271.12/010: | single phase current relay energized on trip, 2 changeover contacts |
| IL 9271.11/500, SL 9271.11/500: | same as IK/SK 9271.11, except with 5 measuring ranges from 0.1 ... 50 A |
| IL 9271.11/510, SL 9271.11/510: | same as IK/SK 9271.11/010, except with 5 measuring ranges from 0.1 ... 50 A |
| IP 9271.12/010, SP 9271.12/010: | 3-phase current relay energized on trip, 2 changeover contacts |
| SL 9271.12CT: | single phase current relay with built in CT, de-energized on trip, 2 changeover contacts |
| SP 9271.12CT: | 3-phase current relay with built in CT, de-energized on trip, 2 changeover contacts |

Ordering example for variants



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.

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