

VARIMETER

Undercurrent Relay

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



0224263



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 Marking



*) only IK 9271, IL 9271 and IP 9271

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,

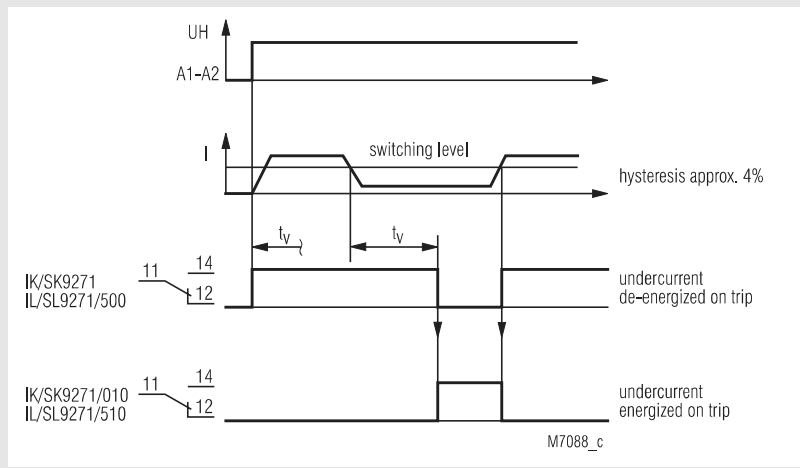
IP 9271, SP 9271:

green LED:

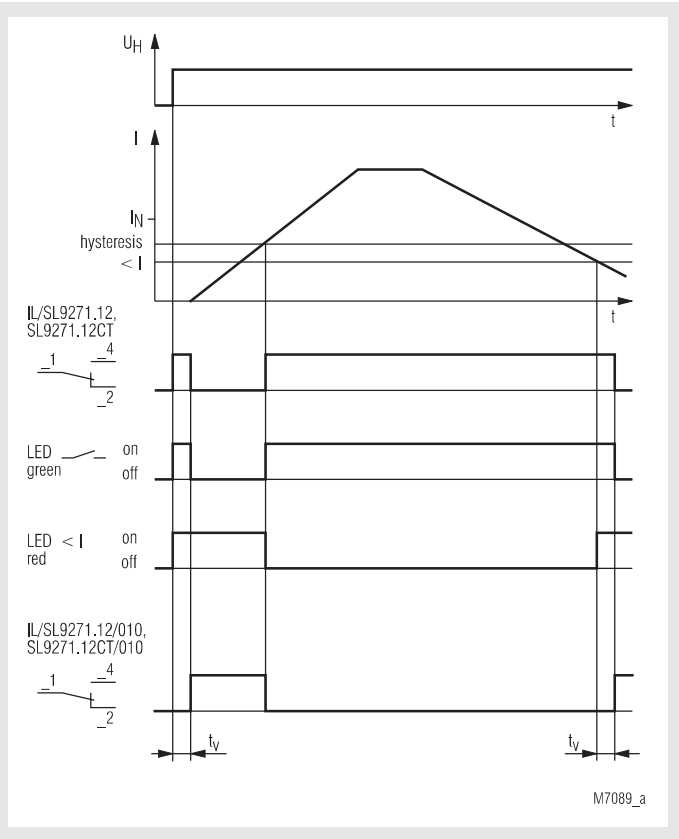
on when current within limits

red LED I_{max} :

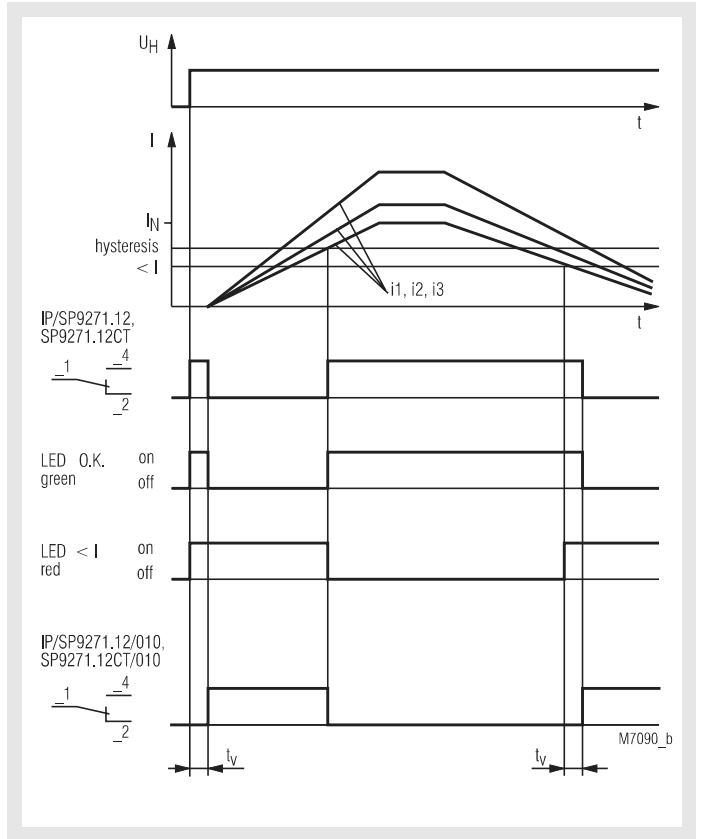
on when undercurrent



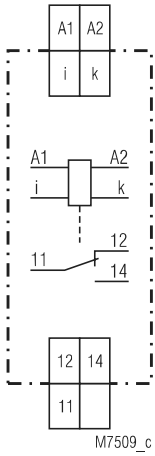
Function Diagram IL 9271.12, SL 9271.12



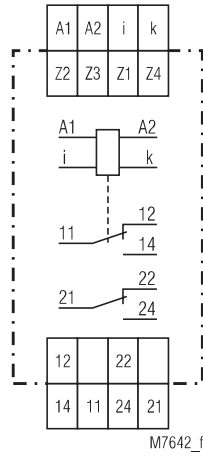
Function Diagram IP 9271, SP 9271



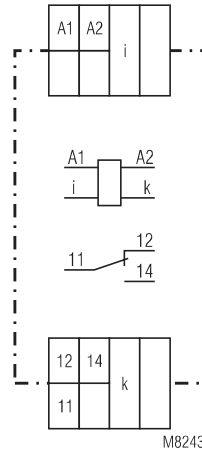
Circuit Diagrams



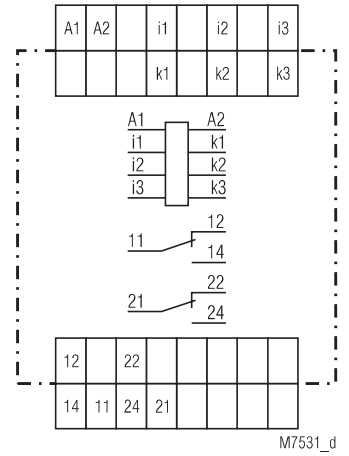
IK 9271.11, SK 9271.11



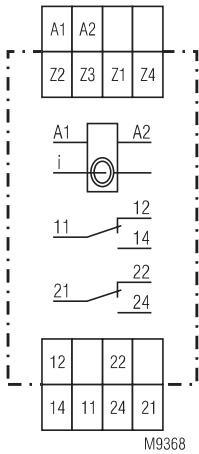
IL 9271.12, SL 9271.12



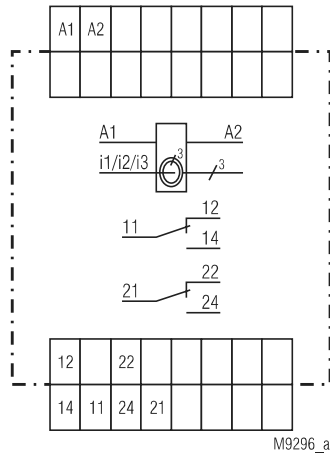
IL 9271.11/5__



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 impuls 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
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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 10 ⁵ 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 10 ⁵ 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 impuls 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
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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

Amplitude 0.35 mm

frequency 10 ... 55 Hz IEC/EN 60 068-2-6

20 / 060 / 04 IEC/EN 60 068-1

Climate resistance:

Terminal designation:

Wire connection:

EN 50 005

2 x 2.5 mm² solid or

2 x 1.5 mm² stranded ferruled

DIN 46 228-1/-2/-3/-4

Flat terminals with self-lifting

clamping piece IEC/EN 60 999-1

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 |

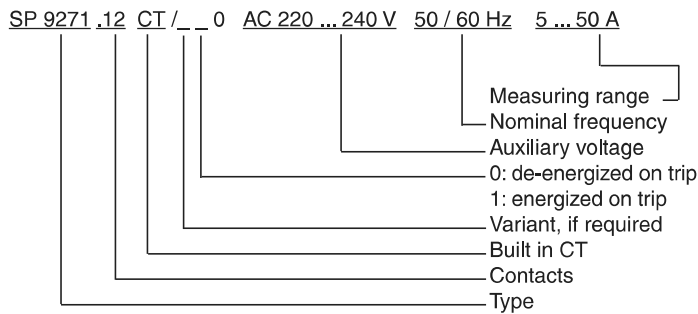
- 2 changeover contacts

- Width:
 70 mm |

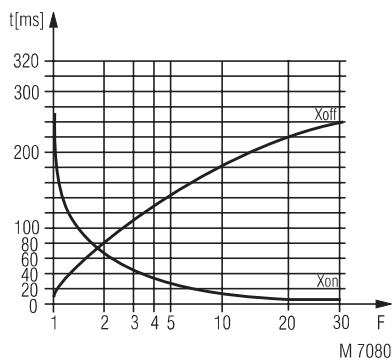
Variants

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.

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