

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,

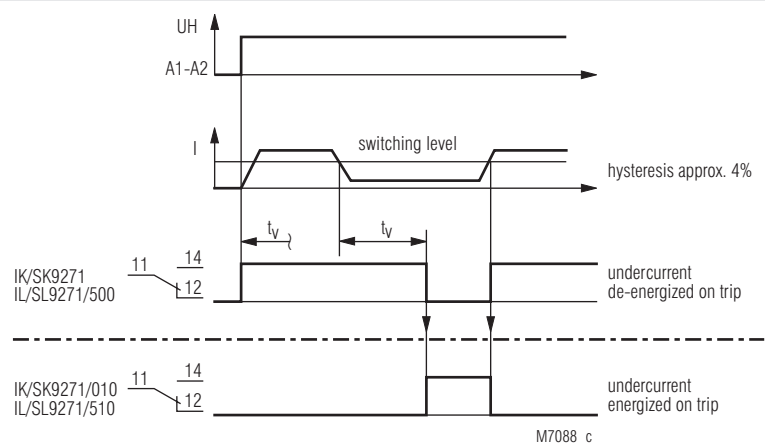
IP 9271, SP 9271:

green LED:

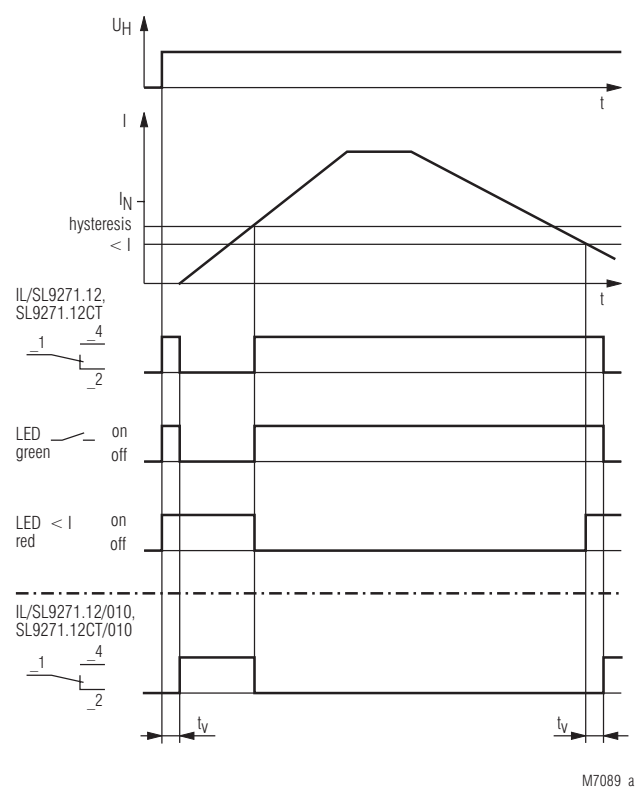
on when current within limits

red LED I_{max} :

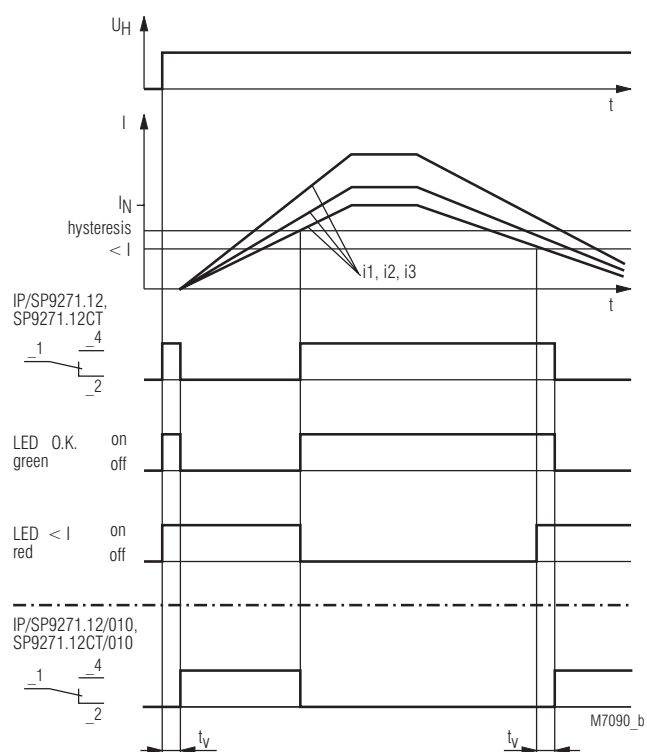
on when undercurrent

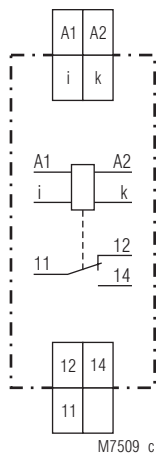


Function Diagram IL 9271.12, SL 9271.12

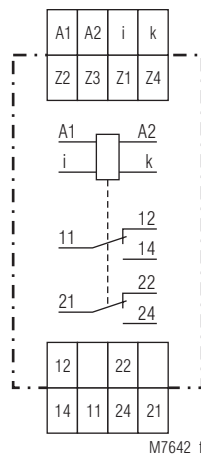


Function Diagram IP 9271, SP 9271

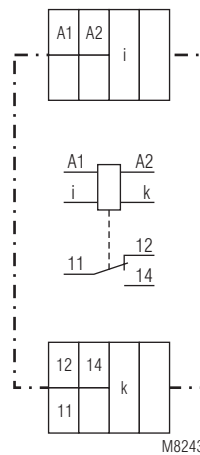




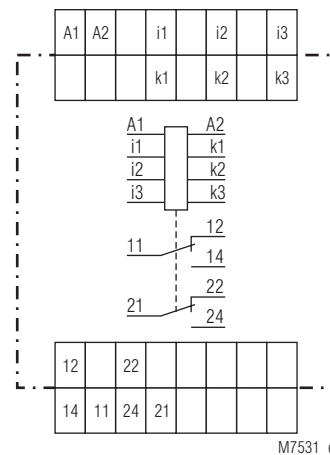
IK 9271.11, SK 9271.11



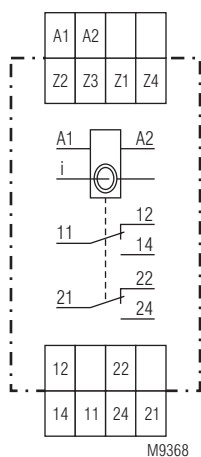
IL 9271.12, SL 9271.12



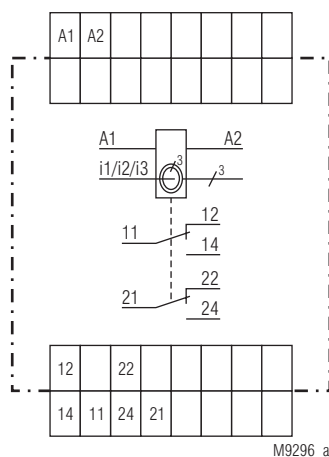
IL 9271.11/5_



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	
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
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 10 ⁶ 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	
Climate resistance:	20 / 060 / 04	
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	
Mounting:	DIN rail	IEC/EN 60 999-1 IEC/EN 60 715

Dimensions

Width x height x depth

IK 9271:

SK 9271:

IL 9271:

SL 9271, SL 9271CT:

IP 9271:

SP 9271, SP 9271CT:

17.5 x 90 x 61 mm

17.5 x 90 x 100 mm

35 x 90 x 61 mm

35 x 90 x 100 mm

70 x 90 x 61 mm

70 x 90 x 100 mm

Standard Types

IK 9271.11 AC 220 ... 240 V

Article number:

SK 9271.11 AC 220 ... 240 V

Article number:

• Single phase

• 4 programmable ranges up to 15 A

• energized on trip

• Auxiliary voltage U_H :

• 1 changeover contact

• Width:

50/60 Hz

0050331

50/60 Hz

0050647

AC 220 ... 240 V

17.5 mm

IP 9271.12 AC 220 ... 240 V

Article number:

SP 9271.12 AC 220 ... 240 V

Article number:

• 3-phase

• Range:

• de-energized on trip

• Auxiliary voltage U_H :

• 2 changeover contacts

• Width:

50/60 Hz

0049961

50/60 Hz

0050648

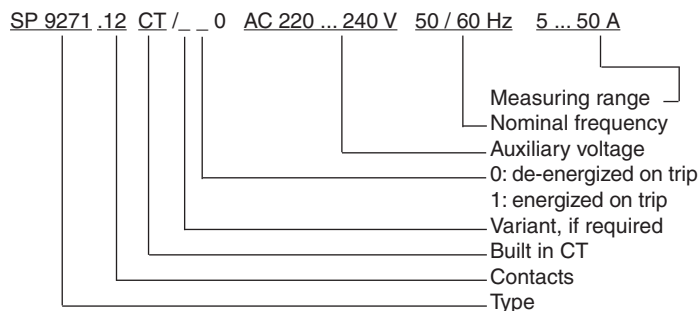
AC 220 ... 240 V

70 mm

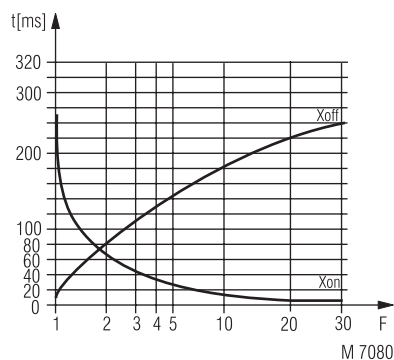
Variants

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.

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