

## VARIMETER

### Overcurrent Relay

IK 9270, IL 9270, IP 9270, SK 9270, SL 9270, SP 9270

0224/259



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



#### 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,

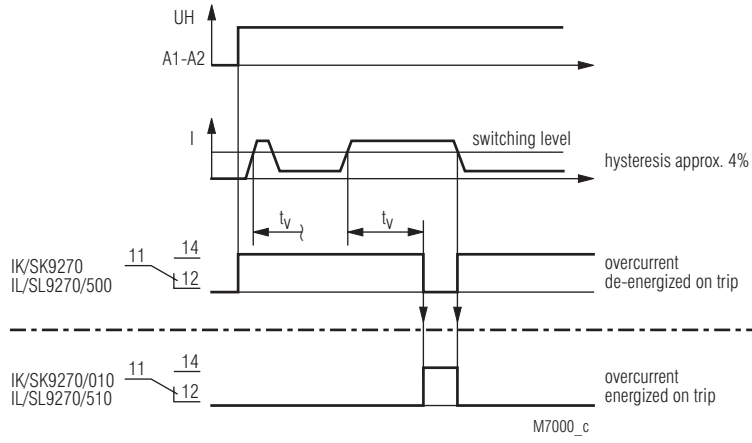
IP 9270, SP 9270:

LED green:

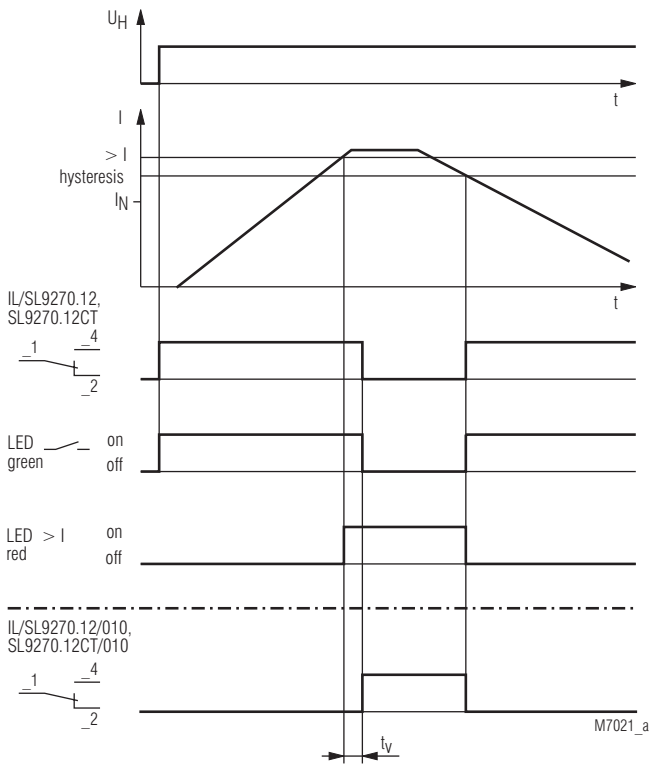
current within limits

LED red  $I_{max}$ :

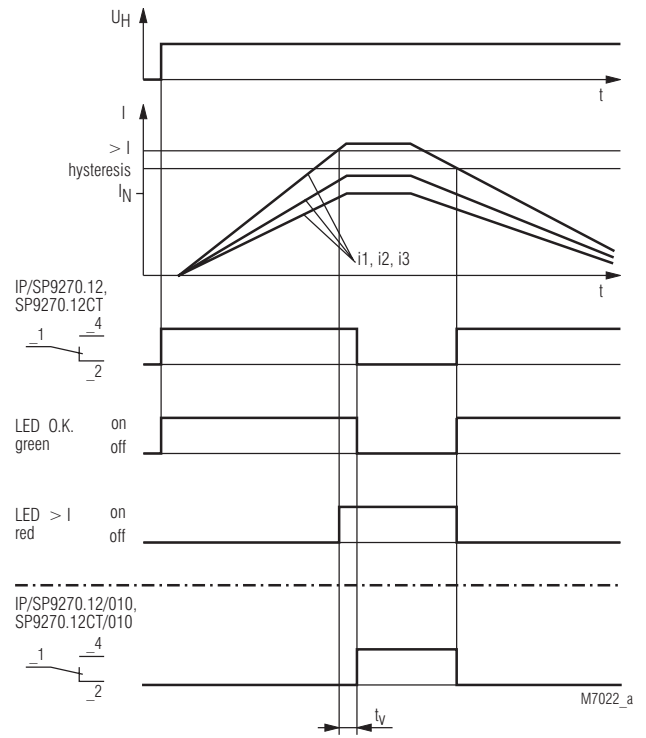
overcurrent



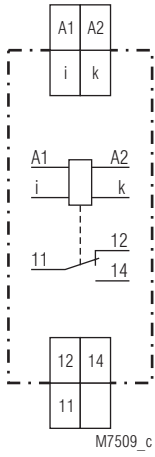
Function Diagram IL 9270.12, SL 9270.12



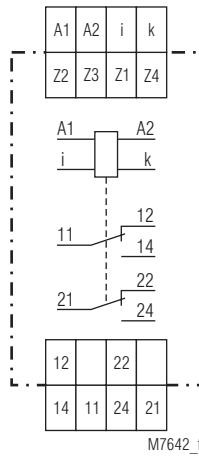
Function Diagram IP 9270, SP 9270



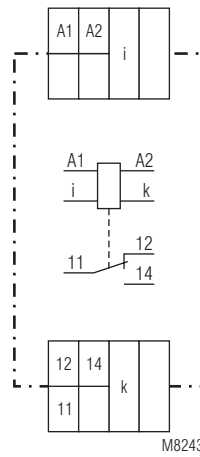
**Circuit Diagrams**



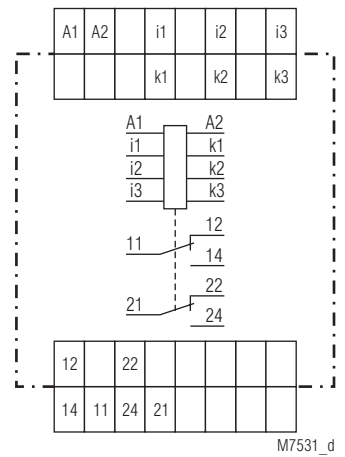
IK 9270.11, SK 9270.11



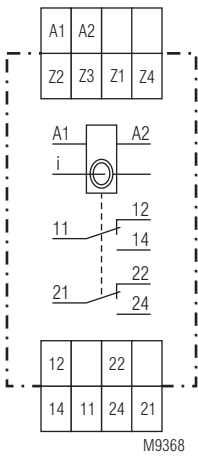
IL 9270.12, SL 9270.12



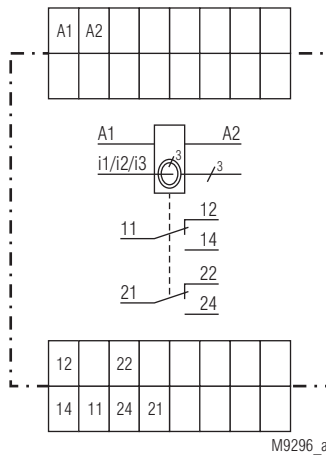
IL 9270.11/5\_









IP 9270.12, SP 9270.12



SL 9270.12CT



SP 9270.12CT

Type						
	<b>IK 9270</b>	<b>SL 9270/5_ _</b>	<b>IL 9270</b>	<b>SL 9270CT</b>	<b>IP 9270</b>	<b>SP 9270CT</b>
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)	<b>0.1 ... 15 A</b>  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	<b>0.1 ... 50 A</b>  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	<b>0.1 ... 15 A</b>  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	<b>0.5 ... 100 A</b>  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 <sup>2</sup>	<b>0.1 ... 15 A</b>  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	<b>0.5 ... 100 A</b>  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 <sup>2</sup>
	<b>5 ... 750 mA<sup>*)</sup></b>  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		<b>0.01 ... 1.5 A</b>  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 <sup>2</sup> 2 x 1.5 mm <sup>2</sup>	1 x 10 mm <sup>2</sup> 1 x 6 mm <sup>2</sup>	2 x 2.5 mm <sup>2</sup> 2 x 1.5 mm <sup>2</sup>	CT-diameter = 10 mm 25 mm <sup>2</sup>	2 x 2.5 mm <sup>2</sup> 2 x 1.5 mm <sup>2</sup>	CT-diameter = 10 mm 25 mm <sup>2</sup>
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

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

## Technical Data

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

### Setting Ranges

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

### Auxiliary Circuit

<b>Auxiliary voltage U<sub>H</sub>:</b>	AC/DC 24 V, AC 220 ... 240 V other voltages on request
---	---

### Voltage range

at AC:	0.8 ... 1.1 U <sub>H</sub>
at DC:	0.8 ... 1.25 U <sub>H</sub>

### 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
<b>Nominal frequency:</b>	50 / 60 Hz
<b>Frequency range:</b>	± 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	
<b>Thermal current I<sub>th</sub>:</b>	5 A	
<b>Switching capacity</b>		
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
<b>Electrical life</b>		
to AC 15 bei 1 A, AC 230 V		
NO contact		
IK/SK 9270, IL/SL 9270/5_ _:	3 x 10 <sup>5</sup> switching cycles	IEC/EN 60 947-5-1
to AC 15 at 2 A, AC 230 V		
IL/SL 9270, IP/SP 9270,		
SL 9270CT, SP 9270CT:	2 x 10 <sup>5</sup> switching cycles	IEC/EN 60 947-5-1

#### Short-circuit strength

<b>max. fuse rating:</b>		
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
<b>Mechanical life:</b>	> 50 x 10 <sup>6</sup> switching cycles	

## Technical Data

### General Data

<b>Operating mode:</b>	Continuous operation
<b>Temperature range:</b>	- 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	
<b>Vibration resistance:</b>	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:

2 x 2.5 mm <sup>2</sup> solid or 2 x 1.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3/-4	
<b>Wire fixing:</b>	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
<b>Mounting:</b>	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

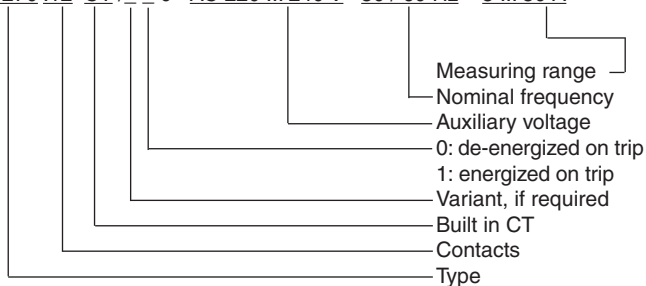
- 3-phase
- Range: 0.5 ... 5 A
- energized on trip
- Auxiliary voltage  $U_H$ : AC 220 ... 240 V
- 2 changeover contacts
- Width: 70 mm

## Variants

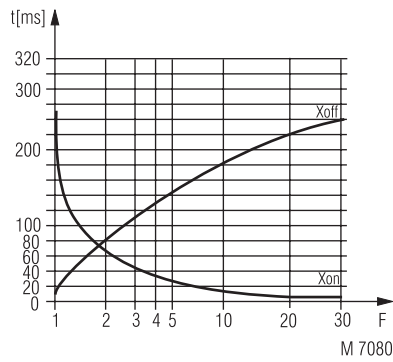
IK 9270.11, SK 9270.11:	single phase current relay, de-energized on trip, 1 changeover contact
IL 9270.12, SL 9270.12:	single phase current relay, de-energized on trip, 2 changeover contacts
IL 9270.12/010, SL 9270.12/010:	single phase current relay, energized on trip, 2 changeover contacts
IL 9270.11/500, 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



## 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.

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