

## VARIMETER

### Undervoltage Relay, 3-phase

IK 9171, IL 9171, SK 9171, SL 9171

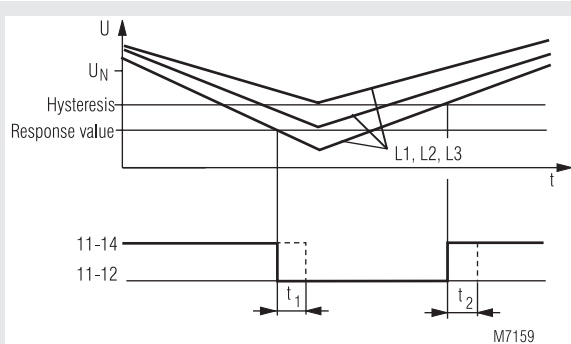


- According to IEC/EN 60 255, DIN VDE 0435-303
- Monitoring of undervoltage in 3-phase system
- Also for single phase
- Without auxiliary supply
- Optionally for 3p3w systems
- LED indicator for state of output relay
- Independent of phase sequence
- 1 or 2 changeover contacts
- Optionally fixed or settable response value
- As option with phase sequence detection
- Optionally with or without N
- Optionally with off-delay  $t_1$
- Optionally with on delay  $t_2$
- Devices available in 2 enclosure versions:
  - I-model: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  - S-model: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width:
  - IK 9171, SK 9171: 17.5 mm
  - IL 9171, SL 9171: 35 mm

#### Approvals and Markings



#### Function Diagram



#### Application

Monitoring of voltage systems on undervoltage. Automatic switching to emergency supply or of emergency light in the case of phase loss according to DIN VDE 0100-710 or DIN VDE 0108.

Variants with  $t_2$  is used in unstable voltage systems, where after phase failure detection the consumers should be energized one after the other. This is done by setting the operate delay e.g. 0.1 ... 20 s of the different relays to different values.

This variant is also used where a consumer after only short phase failure should not be started immediately (e.g. compressors).

#### Function

The arithmetic mean value of each phase is measured against N. The variants without N measure L1 and L3 against L2 (IK/SK 9171) and L1 and L2 against L3 (IL/SL 9171).

#### Indicators

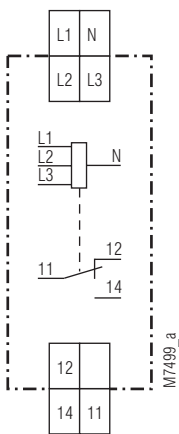
Yellow LED: output contact active (11-14 closed)

#### Notes

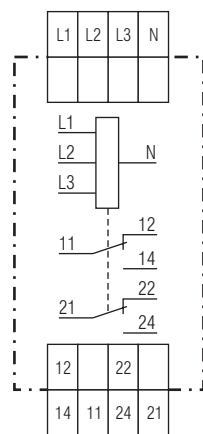
To measure single-phase voltage terminals L1, L2, L3 have to be linked together.

The time delay  $t_1$  is only active if the voltage L1-N (IK/SK 9171) or L3-N (IL/SL 9171) is at least  $0,5 U_N$ .

#### Circuit Diagrams



IK 9171.11,  
SK 9171.11



IL 9171.12,  
SL 9171.12

## Technical Data

### Input Circuit

#### Nominal voltage $U_N$

3-phase without neutral: 3 AC 100 V, 110 V, 127 V, 220 V, 230 V,  
3 AC 240 V, 290 V, 400 V, 415 V, 440 V,  
3 AC 480 V, 500 V

3-phase with neutral 3/N AC 100 V / 58 V; 3/N AC 110 V / 64 V;  
3/N AC 220 V / 127 V; 3/N AC 230 V / 133 V;  
3/N AC 380 V / 220 V; 3/N AC 400 V / 230 V;  
3/N AC 415 V / 240 V; 3/N AC 440 V / 254 V;  
3/N AC 480 V / 277 V; 3/N AC 500 V / 290 V  
1.15  $U_N$  continuously

#### Max overload: Nominal consumption

IK/SK 9171.11: approx. 6 VA

IL/SL 9171.12: approx. 8 VA

Frequency range: 45 ... 65 Hz

### Setting ranges

Response value: fixed: 0.7 or 0.85  $U_N$   
adjustable: 0.55 ... 1.05  $U_N$

Hysteresis: approx. 4 % of setting value

Time delay  $t_1$  /  $t_2$ : 0.5 ... 20 s

Reaction time: approx. 100 ms

### Output

#### Contacts

IK/SK 9171.11: 1 changeover contact

IL/SL 9171.12: 2 changeover contacts

Thermal current  $I_{th}$ : 4 A

#### Switching capacity to AC 15

NO contact: 3 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 at 1 A, AC 230 V:  $\geq 3 \times 10^5$  switching cycles

#### Short circuit strength

max. fuse rating: 4 A gL IEC/EN 60 947-5-1

Mechanical life:  $\geq 30 \times 10^6$  switching cycles

### General Data

Operating mode: Continuous operation

Temperature range: -20 ... +60 °C

#### Clearance and creepage distances

rated impulse voltage /  
pollution degree: 4 kV / 2 IEC 60 664-1

#### EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2

HF irradiation

80 MHz ... 1 GHz: 20 V / m IEC/EN 61 000-4-3

1 GHz ... 2 GHz: 20 V / m IEC/EN 61 000-4-3

2 GHz ... 2.7 GHz: 1 V / m IEC/EN 61 000-4-3

Fast transients: 2 kV IEC/EN 61 000-4-4

Surge voltages

between

wires for power supply: 2 kV IEC/EN 61 000-4-5

between wire and ground: 4 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 mm<sup>2</sup> solid or

2 x 1.5 mm<sup>2</sup> 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

## Technical Data

### Weight

IK 9171: 65 g

SK 9171: 83 g

IL 9171: 110 g

SL 9171: 137 g

### Dimensions

#### Width x height x depth

IK 9171: 17.5 x 90 x 59 mm

SK 9171: 17.5 x 90 x 98 mm

IL 9171: 35 x 90 x 59 mm

SL 9171: 35 x 90 x 98 mm

### Classification to DIN EN 50155 for IK 9171

Vibration and shock resistance: Category 1, Class B IEC/EN 61 373  
Protective coating of the PCB: No

### Standard Type

IK 9171.11/200 3/N AC 400/230 V 50/60 Hz 0.85  $U_N$

Article number: 0049292

SK 9171.11/200 3/N AC 400/230 V 50/60 Hz 0.85  $U_N$

Article number: 0054744

• Output: 1 changeover contact

• Nominal voltage  $U_N$ : 3/N AC 400/230 V

• Detection of undervoltage at  $< 0.85 U_N$

• Fixed response value: 0.85  $U_N$

• No time delay

• For 3p3w connection

• Width: 17.5 mm

### Variants

I\_ 9171/001

0 NC circuit operation with N  
1 NC circuit operation without N

0 without time delay

3 settable time delay  $t_1$

4 settable time delay  $t_2$

0 settable response value

2 fixed response value

K width 17.5 mm

L width 35 mm

IK 9171.11/034: - with settable time  $t_1$

- NC circuit operation without N

- detection of phase sequence

IL 9171.12/801:

as Standard Type /200 but  
output relay with 5  $\mu$ m goldplated contacts.  
This module is also suitable for switching small  
loads of 1 mVA ... 7 VA, 1 mW ... 7W in the range  
0.1 ... 60 V, 1 ... 300 mA. The contacts also  
permit the maximum switching current (4 A).  
However, since the gold plating will be burnt off  
at this current level, the device is no longer  
suitable for switching small loads after this.

### Ordering example for variants

IK 9171 .11 / \_ \_ \_ 3 AC 400 V 50/60 Hz 0.55 ... 1.05  $U_N$  0.5 ... 20 s

Time delay  $t_2$   
Response value  
Nominal frequency  
Nominal voltage  
Variant, if required  
Contact  
Type