

## VARIMETER

### Undervoltage Relay, 3-phase

IK 9171, IL 9171, SK 9171, SL 9171



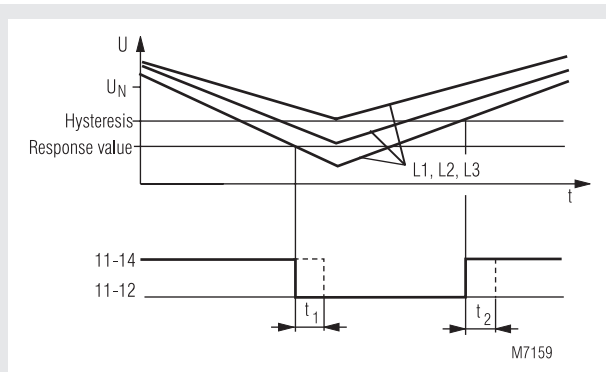
- According to IEC/EN 60 255, DIN VDE 0435-303
- Monitoring of undervoltage in 3-phase system
- Also for single phase
- Without auxiliary supply
- Optionally for 3p3w systems
- LED indicator for state of output relay
- Independent of phase sequence
- 1 or 2 changeover contacts
- Optionally fixed or settable 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 Marking



\*) only IK 9171 and IL 9171

#### Function Diagram



#### Applications

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.

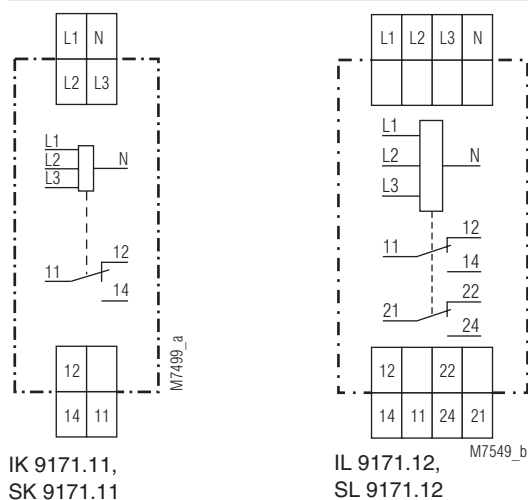
Variant with  $t_2$  is used in unstable voltage systems, where after phase failure detection the consumers should be energized one after the other. This is done by setting the operate delay e.g. 0.1 ... 20 s of the different relays to different values.

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).

#### Circuit Diagram



#### 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  $U_N$ .

#### Technical Data

##### Input Circuit

**Nominal voltage  $U_N$**   
with neutral:

3 AC 110/63 V, 3 AC 220/127 V,  
3 AC 400/230 V, 3 AC 415/240 V,  
3 AC 440/254 V, 3 AC 500/290 V

without neutral:

3 AC 110 V, 3 AC 127 V, 3 AC 220 V,  
3 AC 400 V, 3 AC 415 V, 3 AC 440 V, 3 AC 500 V

**Max overload:**

1.15  $U_N$  continuously

**Nominal consumption**

## Technical Data

IK/SK 9171.11:	approx. 6 VA
IL/SL 9171.12:	approx. 8 VA
<b>Frequency range:</b>	45 ... 65 Hz
<b>Setting ranges</b>	
<b>Response value:</b>	fixed: 0.7 or 0.85 U <sub>N</sub> adjustable: 0.55 ... 1.05 U <sub>N</sub> approx. 4 % of setting value
<b>Hysteresis:</b>	
<b>Time delay t<sub>1</sub> / t<sub>2</sub>:</b>	0.5 ... 20 s
<b>Reaction time:</b>	approx. 100 ms

## Output

<b>Contacts</b>	
IK/SK 9171.11:	1 changeover contact
IL/SL 9171.12:	2 changeover contacts
<b>Thermal current I<sub>th</sub>:</b>	4 A
<b>Switching capacity</b> 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
<b>Electrical life</b> to AC 15 at 1 A, AC 230 V:	IEC/EN 60 947-5-1 ≥ 3 x 10 <sup>5</sup> switching cycles
<b>Short circuit strength</b> <b>max. fuse rating:</b>	4 A gL IEC/EN 60 947-5-1
<b>Mechanical life:</b>	≥ 30 x 10 <sup>6</sup> switching cycles

## General Data

<b>Operating mode:</b>	Continuous operation
<b>Temperature range:</b>	- 20 ... + 60 °C
<b>Clearance and creepage distances</b>	
rated impuls voltage / pollution degree:	4 kV / 2 IEC 60 664-1
<b>EMC</b>	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF irradiation:	10 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:	1 kV IEC/EN 61 000-4-5
between wire and ground:	2 kV IEC/EN 61 000-4-5
Interference suppression:	Limit value class B EN 55 011
<b>Degree of protection</b>	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529
<b>Housing:</b>	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
<b>Climate resistance:</b>	20 / 060 / 04 IEC/EN 60 068-1
<b>Terminal designation:</b>	EN 50 005
<b>Wire connection:</b>	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
<b>Weight</b>	
IK 9171:	65 g
SK 9171:	83 g
IL 9171:	110 g
SL 9171:	137 g

## Dimensions

<b>Width x height x depth</b>	
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

## Standard Types

IK 9171.11/200 3/N AC 400/230 V 50/60 Hz 0.85 U <sub>N</sub>	
Article number:	0049292 stock item
SK 9171.11/200 3/N AC 400/230V 50/60Hz 0.85 U <sub>N</sub>	
Article number:	0054744
• Output:	1 changeover contact
• Nominal voltage U <sub>N</sub> :	3/N AC 400/230 V
• Detection of undervoltage at < 0.85 U <sub>N</sub>	
• Fixed response value:	0.85 U <sub>N</sub>
• 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 <sub>1</sub>
4	settable time delay t <sub>2</sub>
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 <sub>1</sub> - NC circuit operation without N - detection of phase sequence
-----------------	--

IL 9171.12/801:	as Standard Type /200 but output relay with 5 µm 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 <sub>N</sub> 0.5 ... 20 s	
	Time delay t <sub>2</sub>
	Response value
	Nominal frequency
	Nominal voltage
	Variant, if required
	Contact
	Type