

Monitoring Technique

VARIMETER

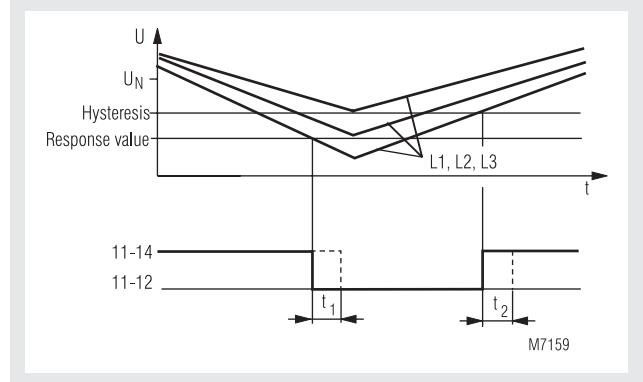
Undervoltage Relay, 3-phase

IK 9171, IL 9171, SK 9171, SL 9171

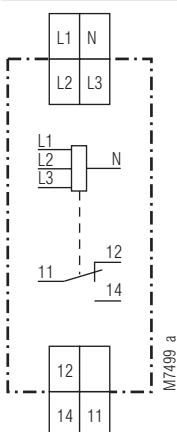
DOLD 



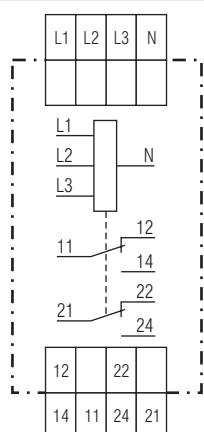
Function Diagram



Circuit Diagram



IK 9171.11,
SK 9171.11



IL 9171.12,
SL 9171.12

- 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

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).

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
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 impuls voltage / pollution degree:	4 kV / 2 IEC 60 664-1
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:	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
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
Climate resistance:	20 / 060 / 04 IEC/EN 60 068-1
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 IEC/EN 60 999-1 DIN rail IEC/EN 60 715
Mounting:	
Weight	
IK 9171:	65 g
SK 9171:	83 g
IL 9171:	110 g
SL 9171:	137 g

Dimensions

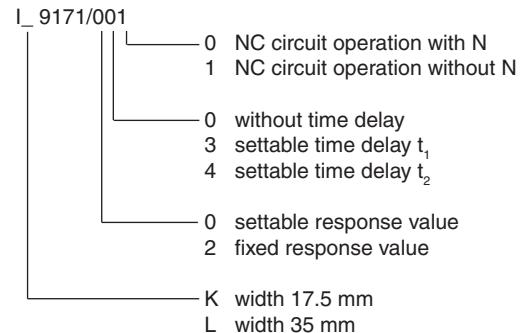
Width x height x depth

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

Standard Types

IK 9171.11/200 3/N AC 400/230 V 50/60 Hz 0.85 U_N	stock item
Article number: 0049292	
SK 9171.11/200 3/N AC 400/230V 50/60Hz 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



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 μ 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

