

VARIMETER

Undervoltage Relay, 3-phase

IK 9171, IL 9171, SK 9171, SL 9171



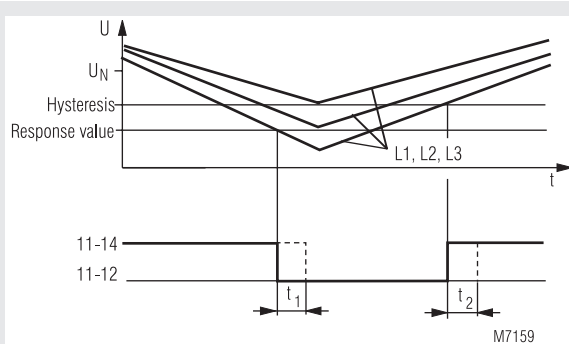
- According to IEC/EN 60 255-1
- Monitoring of undervoltage in 3-phase system
- Also for single phase
- Without auxiliary supply
- Optionally for 3p3w systems
- LED indicator for state of output relay
- Independent of phase sequence
- 1 or 2 changeover contacts
- Optionally fixed or settable response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



*) only IL 9171

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

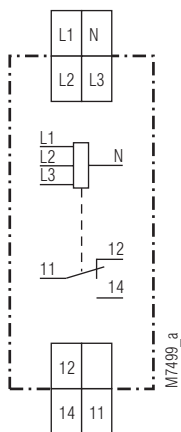
Yellow LED: output contact active (11-14 closed)

Notes

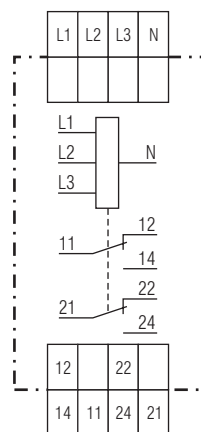
To measure single-phase voltage terminals L1, L2, L3 have to be linked together.

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

Contact material:

AgNi

Switching voltage:

AC 250 V

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:

Operation: - 20 ... + 60 °C

Storage: - 25 ... + 60 °C

Relative air humidity: 93 % at 40 °C

Altitude: < 2,000 m

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

HF-wire guided: 30 V IEC/EN 61 000-4-6

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: 2 x 2.5 mm² solid or 2 x 1.5 mm² stranded ferruled

Wire connection: DIN 46 228-1/-2/-3/-4

Wire fixing: Flat terminals with self-lifting clamping piece IEC/EN 60 999-1

Fixing torque: 0.8 Nm

Technical Data

Mounting:

DIN rail

IEC/EN 60 715

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 400/230V 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

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 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

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