VARIMETER
Neutral Monitor
IL 9069, SL 9069

Translation of the original instructions

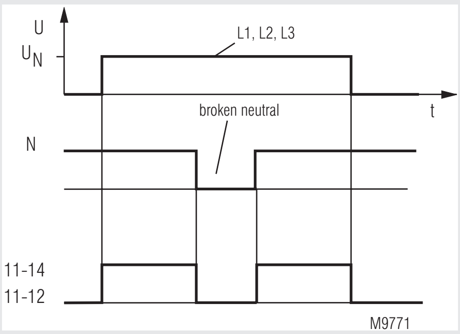
DOLD

0255165

IL 9069 SL 9069

- According to IEC/EN 60255-1
- Detection of
  - missing neutral in the system
  - broken neutral on IL/SL 9069
  - neutral exchanged against phase
- Detection of phase failure also with disconnected load
- For 3-phase systems
- De-energized on trip
- LED indicator for operation/state of output contacts
- Single phase connection possible
- Without auxiliary voltage
- 2 cangeover contacts
- Optionally with adjustable asymmetry detection and on delay
- Devices available in 2 enclosure version:
  IL 9069: depth 59 mm with terminals at the bottom for installations systems and industrial distribution systems according to DIN 43880
  SL 9069: depth 98 mm with terminals at the top for cabinets with mounting plate and cable duct
- Width 35 mm

Function Diagram

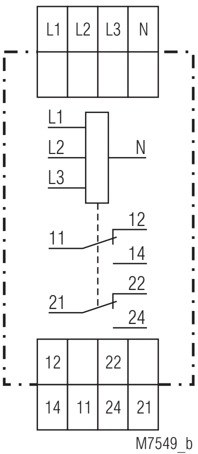


Approval and Markings

A025518

* only for IL 9069

Circuit Diagram



IL 9069.12, SL 9069.12

Application

Neutral monitoring in 3-phase systems

In 3-phase systems with neutral often also single phase loads are connected between phase and neutral. If the neutral is missing in a system like this, unsymmetric voltages occur, that could damage single phase consumers, if the voltage rises to high. Also consumers can stop to work if the phase-neutral voltage gets too low. The IL 9069 detects this problem and can switch off the system immediately.

To monitor mobile systems that are connected via plug connectors. On mobile systems that are connected by a very long cable, voltage drop can cause a significant asymmetry also during normal operation. For this case we recommend the variant IL/SL 9069.12/500 with an adjustable asymmetry setting (approx. 5 ...15%) and an additional response delay.

Function

All 3 phase voltages are measured between phase input L1, L2, L3 and the neutral N. If all 3 phases and the neutral are connected correctly and the asymmetry in good state, the green LED is on and the output relay is energized. If the neutral or one phase is missing or the neutral is exchanged with a phase or the asymmetry exceeds the setting value, the output relay de-energises immediately or after the adjusted time delay (with IL/SL 9069.12/500) and the green LED goes off. The time delay on IL/SL 9069.12/500 is only active when the voltage on terminals L3-N is at least 0,7 U_N as the unit is supplied from these terminals.

Connection Terminals

Terminal designation	Signal description
L1, L2, L3, N	Voltage supply / Measuring inputs
11, 12 ,14	Changeover contact (output relay)
21, 22, 24	Changeover contact (2nd output relay)

Indication

LED green:	On, when output relay activated (contact 11-14 and 21-24 are closed)

Technical Data

Input

Nominal voltage U_N:	3/N AC 400 / 230 V	
Max. overload:	AC 440 V on all measuring inputs	
Voltage range:	0.7 ... 1.1 U_N	
Permissible asymmetry of the phase		
IL/SL 9069.12:	Max. 5 %	
IL/SL 9069.12/500:	Adjustable approx. 5 ... 15 %	
Nominal consumption	Approx. 6 VA (L3-N)	
Nominal frequency:	50 / 60 Hz	
Frequency range:	45 ... 65 Hz	
Input current at U_N:	L1-N, L2-N: approx. 1.5 mA	
	L3-N: approx. 25 mA	
On delay		
IL/SL 9069.12:	Approx. 100 ms	
IL/SL 9069.12/500:	Approx. 0.1 ... 20 s, adjustable	

Output

Contact		
IL 9069.12, SL 9069.12:	2 changeover contacts	
Contact material:	AgNi 90/10	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15:	3 A / AC 230 V	IEC/EN 60947-5-1
to DC 13:	2 A / DC 24 V	IEC/EN 60947-5-1
Electrical life		
to AC 15 at 1 A, AC 230 V:	≥ 5 x 10^5 switch. cycl.	IEC/EN 60947-5-1
Short circuit strength		
max. fuse:	4 A gG / gL	IEC/EN 60947-5-1
Mechanical life:	≥ 30 x 10^6 switch. cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation	- 25 ... + 60°C	
Strorage:	- 25 ... + 80°C	
Relative air humidity:	93 % at 40°C	
Altitude:	< 2000 m	
Clearance and creepage distances		
Rated impulse voltage / pollution degree:	4 kV / 2	IEC 60664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61000-4-3
1 GHz ... 2.5 GHz:	3 V / m	IEC/EN 61000-4-3
2.5 GHz ... 2.7 GHz:	3 V / m	IEC/EN 61000-4-3
Fast transients:	4 kV	IEC/EN 61000-4-4
Surge voltages between		
wires for power supply:	2 kV	IEC/EN 61000-4-5
between wire and ground:	2 kV	IEC/EN 61000-4-5
Interference suppression:	Limit value class B	EN 55011
Degree of protection		
Housing:	IP 40	IEC/EN 60529
Terminals:	IP 20	IEC/EN 60529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm, frequency 10 ... 55 Hz,	IEC/EN 60068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60068-1
Terminal designation:	EN 50005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded ferruled DIN 46228-1/-2/-3/-4	
Stripping length:	10 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60715
Weight		
IL 9069:	110 g	
SL 9069:	137 g	

Dimensions

Width x height x depth	
IL 9069:	35 x 90 x 59 mm
SL 9069:	35 x 90 x 98 mm

Standard Type

IL 9069.12, 3/N AC 400 / 230 V, 50 / 60 Hz

Article number:	0048730
• Output:	2 changeover contacts
• Nominal voltage U_N:	3/N AC 400 / 230 V
• Width:	35 mm

SL 9069.12, 3/N AC 400 / 230 V, 50 / 60 Hz

Article number:	0054750
• Output:	2 changeover contacts
• Nominal voltage U_N:	3/N AC 400 / 230 V
• Width:	35 mm

Variant

IL/SL 9069.12/500: with adjustable asymmetry detection and adjustable on delay

Order example for variant

IL 9069 .12 /_ _ _ 3/N AC 400 / 230 V 50 / 60 Hz

- Nominal frequency
- Nominal voltage
- Variant, if required
- Contacts
- Type