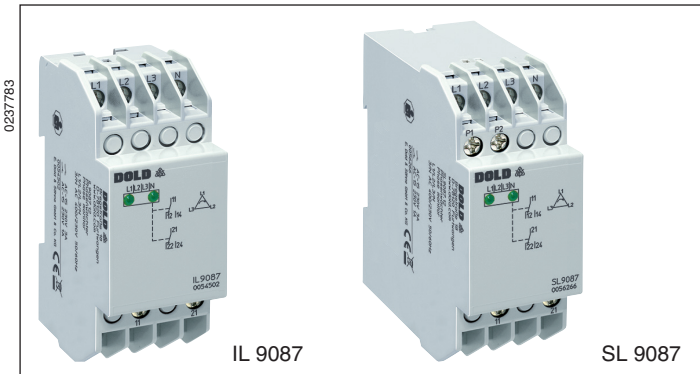


VARIMETER PRO Phase Monitor IL 9087, SL 9087

Translation
of the original instructions



- According to IEC/EN 60255-1
- Monitoring of phase failure
 - Undervoltage 3-phase 3 or 4 wire
 - Phase failure
 - Phase sequence
 - Loss of neutral
 - Phase asymmetry
- Without auxiliary supply
- De-energized on trip
- LED indication
 - Supply voltage
 - Phase failure
- 1 or 2 changeover contacts
- Devices available in 2 enclosure versions:
 - IL 9087: Depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43880
 - SL 9087: Depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width 35 mm

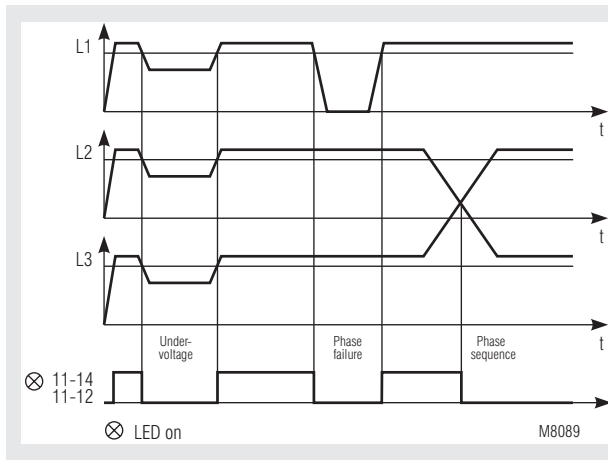
Function

The phase monitor IL 9087 and SL 9087 of the VARIMETER PRO series monitor undervoltage, phase failure, phase sequence, loss of neutral and phase asymmetry. The measurement is very simple and without extensive wiring, as no separate auxiliary supply is necessary. The early detection of up-coming break downs and preventive maintenance avoid expensive damages. As user you profit from the reliability and availability of your plant.

Approvals and Markings



Function Diagram



Voltage

Applications

Monitoring of 3-phase systems with motors, e. g. for elevators.

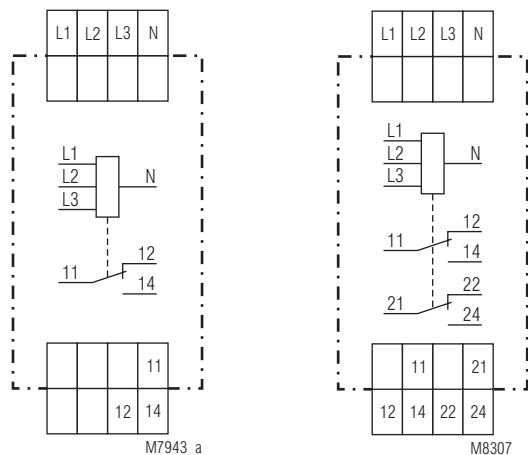
Function

On a healthy voltage system both LEDs are on. If a voltage failure occurs the contact 11-14, 21-24 opens. In 3-phase voltage systems with unbalanced load the unit can also detect the loss of neutral on the input line of the system. If a neutral is not used the N-terminal remains unconnected.

Indicators

Left green LED: On when voltage connected
Right green LED: On when measuring voltage correct

Circuit Diagrams



IL 9087.11,
SL 9087.11

IL 9087.12,
SL 9087.12

Connection Terminals

Terminal designation	Signal description
L1, L2, L3, N	Measuring- or supply input
11, 12, 14; 21, 22, 24	Changeover contacts

Technical Data

Input

Nominal voltage U_N:	3 / N AC 400 / 230 V (other voltages on request)
Voltage range:	0.8 ... 1.1 U_N
Nominal frequency:	50 / 60 Hz
Frequency range:	45 ... 65 Hz
Undervoltage detection:	Approx. $0.7 \pm 0.15 \times U_N$
Asymmetry detection:	Approx. 20° phase asymmetry
Hysteresis:	$\leq 6\% \times U_N$
Response delay:	100 ... 300 ms
Operate delay:	15 ... 30 ms ($0V \Rightarrow U_N$)

Output

Contacts

IL/SL 9087.11:	1 changeover contact
IL/SL 9087.12:	2 changeover contacts
Contact material:	AgNi 0.15 + 0.3 μm AU
Thermal current I_{th}:	See quadratic total current limit curve (max. 4 A per contact)

Switching capacity

to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60947-5-1

Electrical life

at 1 A, AC 230 V $\cos \varphi = 1$:

6 x 10⁵ switch. cycles

≥ 10⁸ switching cycles

General Data

Operating mode: Continuous operation

Temperature range

Operation: - 20 ... + 60 °C
(Device mounted away from heat generation components)

Storage: - 40 ... + 70 °C

Altitude: ≤ 2000 m

Input current

L1:	Approx. 7 mA
L2:	Approx. 7 mA
L3:	Approx. 1.5 mA

Nominal consumption:

Approx. 3.5 VA

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 ... 6 GHz: 10 V/m IEC/EN 61000-4-3

Fast transients: 4 kV IEC/EN 61000-4-4

Surge voltages

Between

wires for power supply: 1 kV IEC/EN 61000-4-5

Between wire and ground: 2 kV IEC/EN 61000-4-5

HF wire guided: 10 V IEC/EN 61000-4-6

Damped oscillatory wave

immunity test

Differential mode voltage: 1 kV IEC/EN 61000-4-18

Common mode voltage: 2.5 kV IEC/EN 61000-4-18

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 Subj. 94

Vibration resistance: Amplitude 0.35 mm

frequency 10 ... 55 Hz IEC/EN 60068-2-6

20 / 060 / 04 IEC/EN 60068-1

Climate resistance:

Wire connection:

Max. cross section: 2 x 2.5 mm² solid or

2 x 1.5 mm² stranded wire with sleeve

Stripping length: 10 mm

Wire fixing:

Flat terminals with self-lifting clamping piece IEC/EN 60999-1

Fixing torque:

0,8 Nm

Technical Data

Mounting: DIN-rail IEC/EN 60715

Weight

IL 9087: 185 g

SL 9087: 230 g

Dimensions

Width x height x depth

IL 9087: 35 x 90 x 59 mm

SL 9087: 35 x 90 x 98 mm

Classification to DIN EN 50155 for SL 9087

Vibration and

shock resistance: Category 1, Class B IEC/EN 61373

Protective coating of the PCB: No

Standard Types

IL 9087.12 3 AC 400 V and 3 / N AC 400 / 230 V

Article number: 0054502

• Output: 2 changeover contacts

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

• Width: 35 mm

SL 9087.12 3 AC 400 V and 3 / N AC 400 / 230 V

Article number:

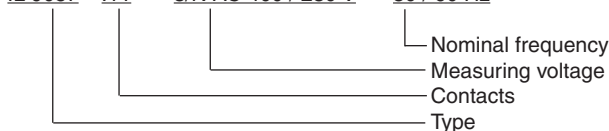
• Output: 2 changeover contacts

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

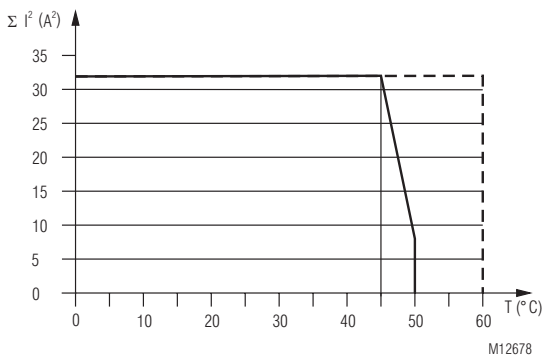
• Width: 35 mm

Ordering Example

IL 9087 .11 3/N AC 400 / 230 V 50 / 60 Hz



Characteristics



--- Device mounted away from heat generation components.
— Device mounted without distance heated by devices with same load.

Quadratic total current limit curve

Connection Examples

