VARIMETER PRO
Phase Monitor
IL 9087, SL 9087

Translation of the original instructions

DOLD

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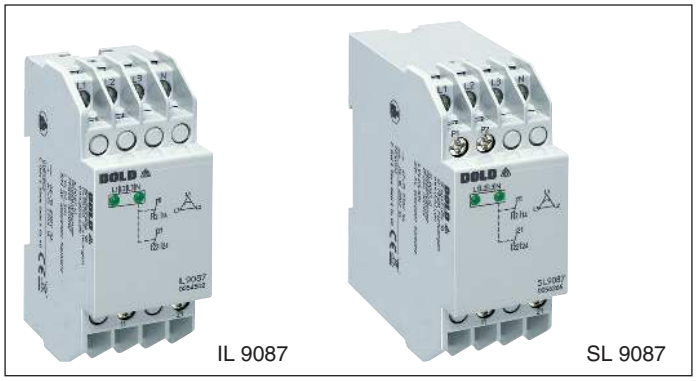


IL 9087 SL 9087

Function

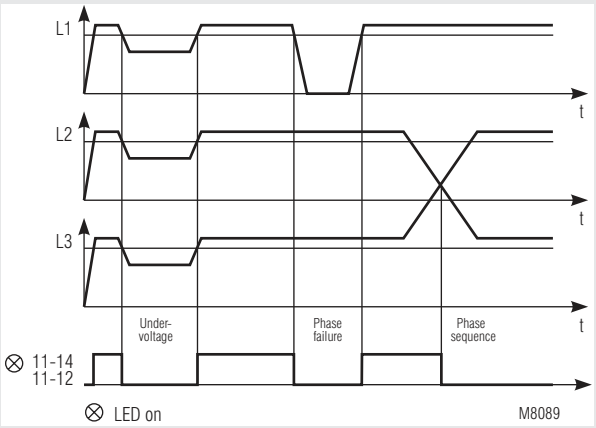
The phase monitor IL 9087 and SL 9087 of the VARIMETER PRO series monitor undervoltage, phase failure, phase sequence, loss of neutral and phase asymmetry. The measurement is very simple and without extensive wiring, as no separate auxiliary supply is necessary. The early detection of up-coming break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

- 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

Approvals and Markings

CE

Function Diagram



Voltage

Applications

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

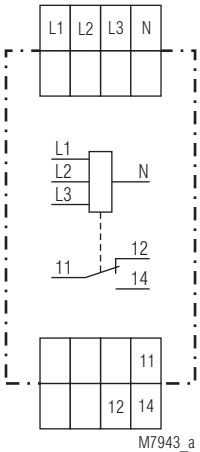
Function

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.

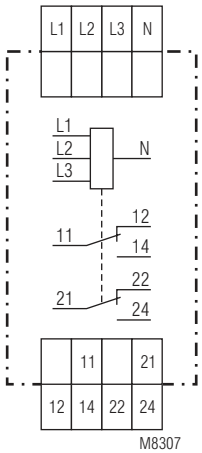
Indicators

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 contacs

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 ± 0.15 x U_N	
Asymmetry detection:	Approx. 20° phase asymmetry	
Hysteresis:	≤ 6 % x U_N	
Response delay:	100 ... 300 ms	
Operate delay:	15 ... 30 ms (0V ⇒ 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 φ = 1:	6 x 10^5 switch. cycles	
Mechanical life:	≥ 10^8 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
Climate resistance:	20 / 060 / 04	IEC/EN 60068-1
Wire connection:	DIN 46228-1/-2/-3/-4	
Max. cross section:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve	
Stripping lentgh:	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

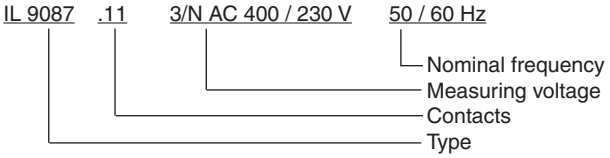
IL 9087.12 3 AC 400 V and 3 / N AC 400 / 230 V

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

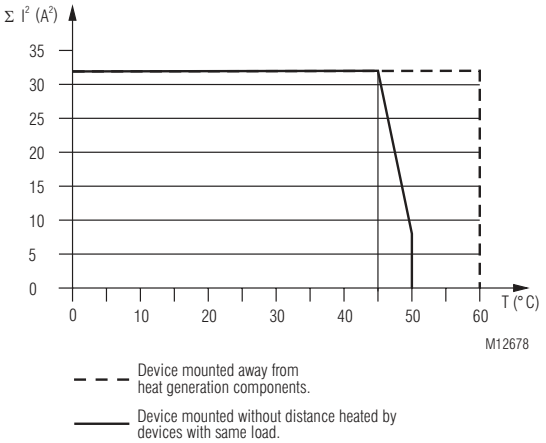
SL 9087.12 3 AC 400 V and 3 / N AC 400 / 230 V

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



Characteristics



Quadratic total current limit curve

Connection Examples