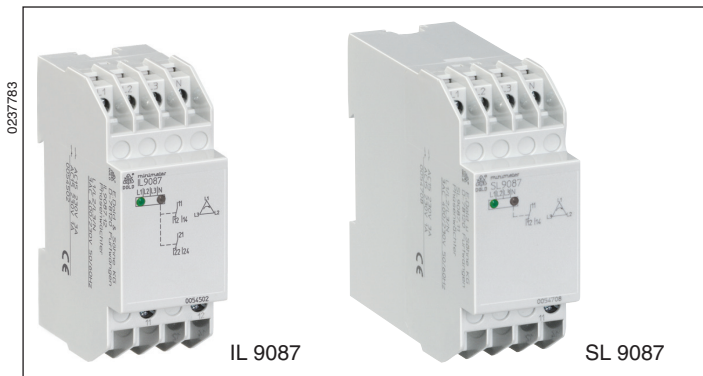
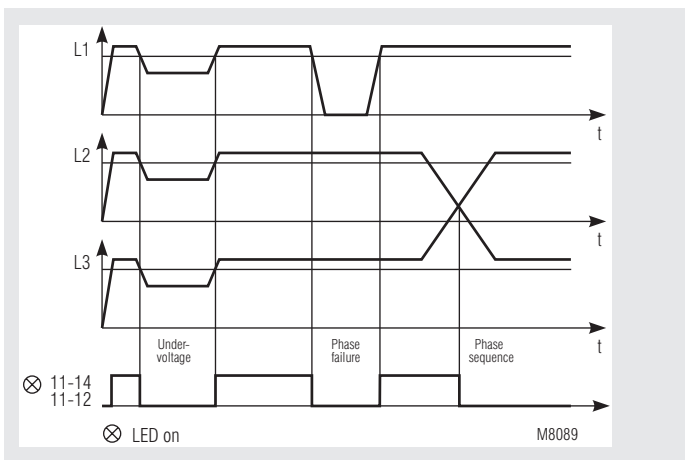


## VARIMETER PRO Phase Monitor IL 9087, SL 9087



- According to IEC/EN 60 255-1
- 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 43 880
  - SL 9087: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width 35 mm

### Function Diagram



Voltage

### Approvals and Markings



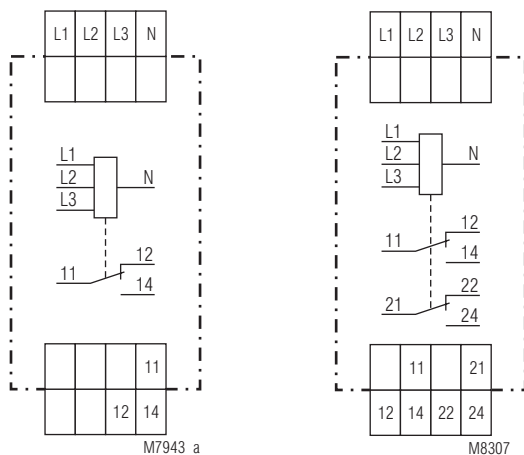
### Applications

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.

### Circuit Diagrams



IL 9087.11,  
SL 9087.11

IL 9087.12,  
SL 9087.12

### Indicators

left green LED: on when voltage connected  
right green LED: on when measuring voltage correct

### Connection Terminals

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

## Technical Data

### Input

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

### Output

<b>Contacts</b>	
IL/SL 9087.11:	1 changeover contact
IL/SL 9087.12:	2 changeover contacts
<b>Contact material:</b>	AgNi 0.15 + 0.3 $\mu\text{m}$ AU
<b>Thermal current <math>I_{th}</math>:</b>	2 x 4 A
<b>Switching capacity</b> 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
<b>Electrical life:</b> to AC 15 at 1 A, AC 230 V:	6 x 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
<b>Switching voltage:</b>	min. 10 V ; max. DC 120 V / AC 250 V
<b>Switching current:</b>	min. 0.1 A ; max. 5 A
<b>Switching capacity:</b>	min. 1 W, 1 VA; max. 120 W, 1250 VA
<b>Short circuit strength</b> max. fuse rating:	4 A gG / gL IEC/EN 60947-5-1
<b>Mechanical life:</b>	> 10 <sup>8</sup> switching cycles

### General Data

<b>Operating mode:</b>	Continuous operation
<b>Temperature range</b>	
Operation:	- 20 ... + 60 °C
Storage:	- 25 ... + 60 °C
<b>Altitude:</b>	< 2.000 m
<b>Input current</b>	
L1:	approx. 7 mA
L2:	approx. 7 mA
L3:	approx. 1.5 mA
<b>Nominal consumption:</b>	approx. 3.5 VA
<b>Clearance and creepage distances</b>	
Rated impulse voltage / pollution degree	
Input/Output:	4 kV / 2 IEC 60 664-1
<b>EMC</b>	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF-irradiation	
80 MHz ... 2.7 GHz:	10 V/m IEC/EN 61 000-4-3
Fast transients:	4 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
HF wire guided:	10 V IEC/EN 61 000-4-6
Interference suppression:	Limit value class B EN 55 011
<b>Degree of protection:</b>	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL Subj. 94
<b>Vibration resistance:</b>	Amplitude 0.35 mm frequency 10 ... 55 Hz IEC/EN 60 068-2-6
<b>Climate resistance:</b>	20 / 060 / 04 IEC/EN 60 068-1
<b>Wire connection</b> max. cross section:	2 x 2.5 mm <sup>2</sup> solid or 2 x 1.5 mm <sup>2</sup> stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Stripping length:	10 mm
<b>Fixing torque:</b>	0,8 Nm

## Technical Data

<b>Mounting:</b>	DIN-rail	IEC/EN 60 715
<b>Weight</b>		
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

<b>shock resistance:</b>	Category 1, Class B	IEC/EN 61 373
<b>Protective coating of the PCB:</b>	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	
				Nominal frequency
				Measuring voltage
				Contacts
				Type

### Connection Examples

