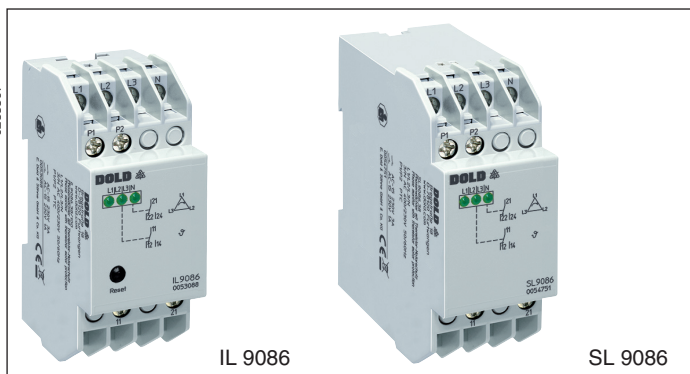


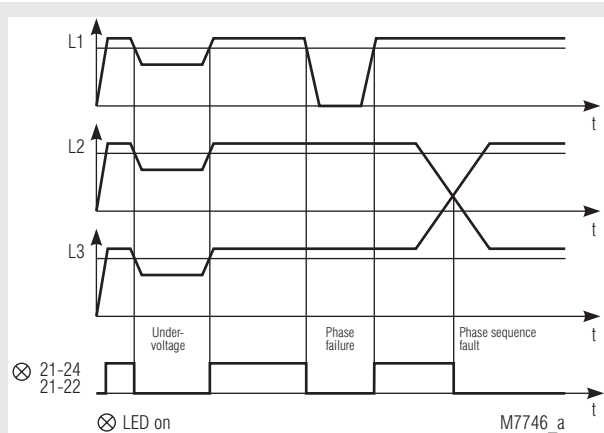
## VARIMETER PRO Phase Monitor with thermistor motor protection IL 9086, SL 9086

Translation  
of the original instructions

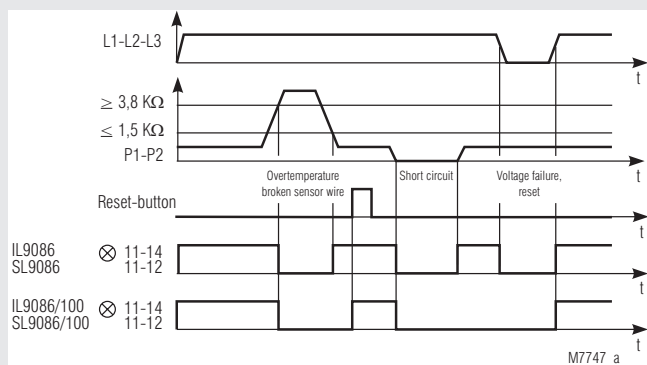


- According to IEC/EN 60255-1, IEC/EN 60947-8 (pr EN 60947-8) and part 303
- Monitoring of
  - Undervoltage 3 phase
  - Phase failure
  - Phase sequence
  - Loss of neutral
  - Phase asymmetry
  - Overtemperature
  - Broken wire in thermistor circuit
  - Short circuit in thermistor circuit
- Without auxiliary supply
- 1 sensing input for 1 ... 6 thermistors
- LED indication
  - Supply voltage
  - Measuring voltage
  - Temperature
- As option with manual reset on temperature fault
- 2 x 1 changeover contact
- **Devices available in 2 enclosure versions:**
  - IL 9086:** Depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43880
  - SL 9086:** Depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width 35 mm

### Function Diagrams



### Voltage



### Temperature

### Approvals and Markings



### Applications

Monitoring of 3-phase Motor systems with temperature sensing of the Motor thermistors, e.g. for elevators.

### Function

When the voltage of the system and the temperature of the load is correct all three LED are on. The device has 2 separate relay outputs. If a temperature fault is detected relay 1 trips (deenergises on fault). If a voltage fault occurs relay 2 trips. The unit can be used for 3p 3w and 3p 4w systems. If connected to a 3 wire system the N-terminal remains unconnected.

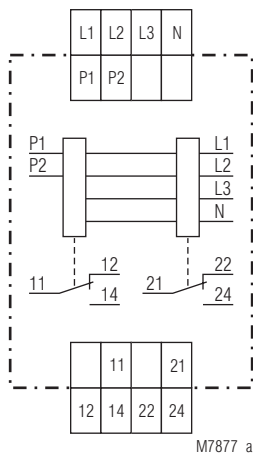
### Indicators

Left green LED:	On when supply connected
Right green LED:	On when measured voltage is correct
Middle green LED $\vartheta$ :	On when temperature correct

### Notes

A short circuit between P1 - P2, i. e. between the sensor lines, will be detected. This is independent of the number of sensors. If more than one thermistors are connected in series, a short circuit across one sensor cannot be detected. The PTC input is galvanically separated from the supply and measuring voltage as well as from the output contacts.

## Circuit Diagram



## Connection Terminals

Terminal designation	Signal description
L1, L2, L3, N	Measuring- or supply input
P1, P2	Thermistor input
11, 12, 14; 21, 22, 24	Changeover contacts

## Technical Data

### Measuring Input Voltage

#### Measuring voltage

L1 / L2 / L3 / 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° angle asymmetrie

**Hysteresis:**  $\leq 6\% \times U_N$

**Response delay:** 100 ... 300 ms

**Operate delay:** 15 ... 30 ms ( $0V \Rightarrow U_N$ )

### Measuring Input Thermistor (P1,P2)

**Temperature sensor:** PTC-sensor acc. to DIN 44 081/082

**Number of sensors:** 1 ... 6 piece in series

**Response value:** 3.2 ... 3.8 k $\Omega$

**Reset value:** 1.5 ... 1.8 k $\Omega$

**Short circuit in sensor line:** 10 ... 30  $\Omega$

**Load on sensor circuit:** < 5 mW (at R = 1.5 k $\Omega$ )

**Broken sensor circuit:** > 3.8 k $\Omega$

**Measuring voltage:**  $\geq 2V$  (at R = 1.5 k $\Omega$ )

**Measuring current:**  $\leq 1mA$  (at R = 1.5 k $\Omega$ )

#### Voltage on P1,P2

**on open sensor circuit:** Approx. DC 12 V

**Short circuit current on**

**sensor circuit:** Approx. DC 1.5 mA

## Relay Output

### Contacts

IL/SL 9086.38: 1 changeover contact  
(phase failure, contact 21-22-24)

1 changeover contact  
(temperature fault, contact 11-12-14)

**Contact material:** AgNi 0.15 + 0.3  $\mu m$  AU

**Thermal current  $I_{th}$ :** 2 x 4 A

#### 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:

To AC 15 at 1 A, AC 230 V: 6 x 10<sup>5</sup> switching cycles IEC/EN 60947-5-1

**Switching voltage:** Min. 10 V ; max. DC 120 V / AC 250 V

**Switching current:** Min. 0.1 A ; max. 5 A

**Switching load:** Min. 1 W, 1 VA; max. 120 W, 1250 VA

#### Short circuit strength

Max. fuse rating: 4 A gG / gL IEC/EN 60947-5-1

**Mechanical life:** > 10<sup>8</sup> switching cycles

## Technical Data

### General Data

**Operating mode:** Continuous operation

#### Temperature range

Operation: - 20 ... + 60 °C

Storage: - 25 ... + 60 °C

**Altitude:** < 2000 m

#### Input current

L1: Approx. 7 mA

L2: Approx. 7 mA

L3: Approx. 1.5 mA

Approx. 3.5 VA

#### Nominal consumption:

#### Clearance and creepage distances

Rated impulse voltage /  
pollution degree

Input/Output: 4 kV / 2 IEC 60664-1

#### EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61000-4-2

HF-irradiation

80 MHz ... 2.7 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

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

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 mm<sup>2</sup> solid or

2 x 1.5 mm<sup>2</sup> stranded wire with sleeve

DIN 46228-1/-2/-3/-4

Stripping length: 10 mm

**Fixing torque:** 0,8 Nm

**Mounting:** DIN rail IEC/EN 60715

**Weight**

IL 9086: 185 g

SL 9086: 230 g

## Dimensions

### Width x height x depth

IL 9086: 35 x 90 x 59 mm

SL 9086: 35 x 90 x 98 mm

### Standard Type

IL 9086.38 3 AC 400 V and 3 / N AC 400 / 230 V

Article number:

0053087

• Output: 1 changeover contact (phase failure)  
1 changeover contact (temperature fault)

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

• Width: 35 mm

SL 9086.38 3 AC 400 V and 3 / N AC 400 / 230 V

Article number:

0054751

• Output: 1 changeover contact (phase failure)  
1 changeover contact (temperature fault)

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

• Width: 35 mm

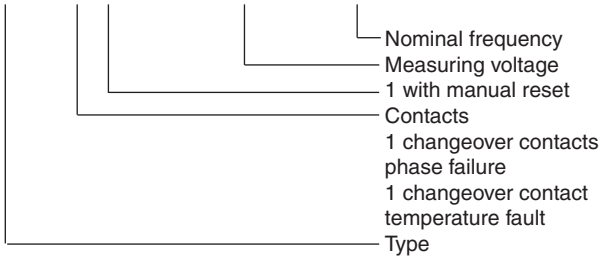
### Variant

IL 9086.38/100

With manual reset after detection of overtemperature or short circuit in the sensor circuit. The output can be reset by pressing the reset button or by disconnecting the voltage for a short period after the temperature returned to good value.

### Ordering example vor variant

IL 9086 .38 / \_ 00 3/N AC 400/230 V 50/60 Hz



### Connection Examples

