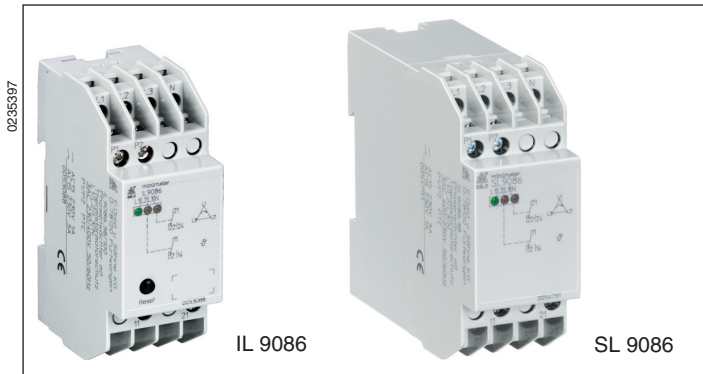


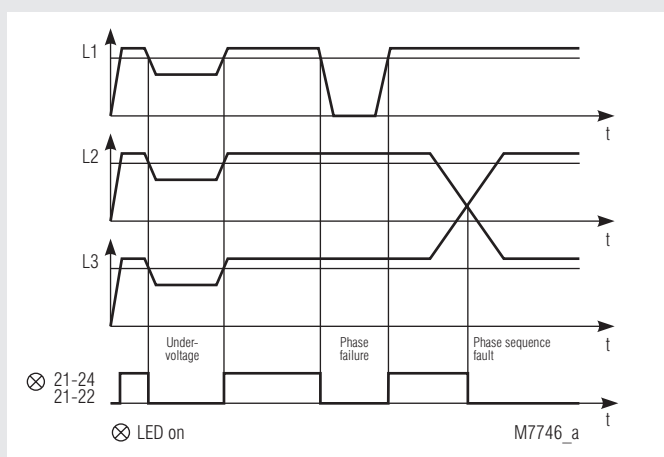
VARIMETER PRO

Phase Monitor with thermistor motor protection
IL 9086, SL 9086

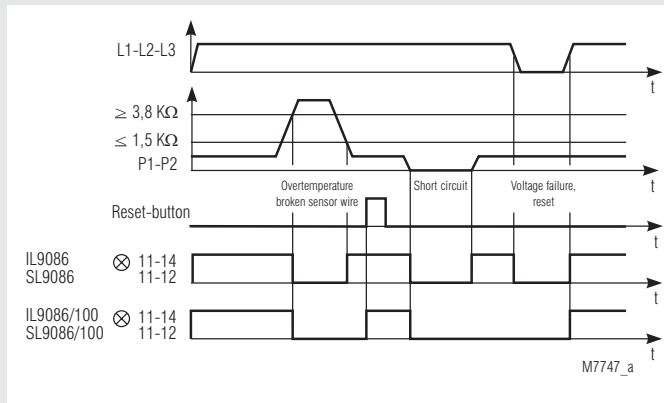


- According to IEC/EN 60 255, DIN VDE 0660 part 302 (pr EN 60 947-8) and part 303
- Monitoring of
 - Undervoltage 3 phase
 - Phase failure
 - Phase sequence
 - Loss of neutral
 - Phase asymmetry
 - Overtemperature
 - Broken wire in thermistor circuit
 - Short circuit in thermistor circuit
- Without auxiliary 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 43 880
 - 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

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.

Approvals and Marking



Applications

Monitoring of 3-phase Motor systems with temperature sensing of the Motor thermistors, to comply with EN 81.

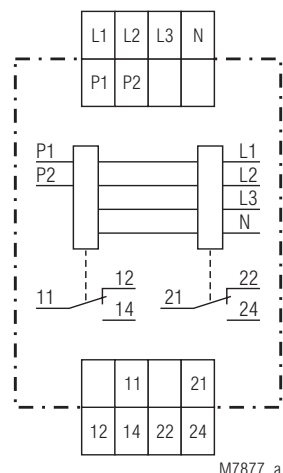
Function

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.

Indication

Left green LED: on when supply connected
Right green LED: on when measured voltage is correct
Middle green LED: on when temperature correct

Circuit Diagram



IL 9086, SL 9086

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

Response value fixed,

Undervoltage for 3-phase: 0.6 ... 0.8 x U_N

(For 3p3w systems =
phase to phase voltage)

Phase asymmetry: approx. $120^\circ \pm 20^\circ$

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

Response delay: 100 ... 300 ms

Operate delay: 15 ... 30 ms ($0V = U_N$)

Measuring Input Thermistor (P1,P2)

Temperature sensor: PTC-sensor
according to DIN 44 081/082

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

Response value: 3.2 ... 3.8 k Ω

Reset value: 1.5 ... 1.8 k Ω

Short circuit in sensor line: 10 ... 30 Ω

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

Broken sensor circuit: > 3.8 k Ω

Measuring voltage: ≤ 2 V (at $R = 1.5$ k Ω)

Measuring current: ≤ 1 mA (at $R = 1.5$ k Ω)

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)
1 changeover contact
(temperature fault)

Contact material: AgNi 0.15 + 0.3 μ m AU

Thermal current I_{th} : 2 x 4 A

Switching capacity

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

Electrical life:

to AC 15 at 1 A, AC 230 V: 6 x 10⁵ switching cycles IEC/EN 60
947-5-1

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

Mechanical life: $> 10^8$ switching cycles

General Data

Operating mode: Continuous operation

Temperature range: - 20 ... + 60°C

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 impuls voltage /

pollution degree: 4 kV / 2 IEC 60 664-1

Input/Output: AC 2.5 kV IEC 60 664-1

EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2

HF-irradiation: 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

Interference suppression: Limit value class B EN 55 011

Technical Data

Degree of protection

Housing: IP 40 IEC/EN 60 529

Terminals: IP 20 IEC/EN 60 529

Housing: Thermoplastic with V0 behaviour
according to UL subject 94

Vibration resistance: Amplitude 0.35 mm
frequency 10 ... 55 Hz IEC/EN 60 068-2-6

Climate resistance: 20 / 060 / 04 IEC/EN 60 068-1

Wire connection: 2 x 2.5 mm² solid
DIN 46 228-1/-2/-3/-4
2 x 1.5 mm² stranded wire with sleeve
DIN rail IEC/EN 60 715

Mounting:

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 Types

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

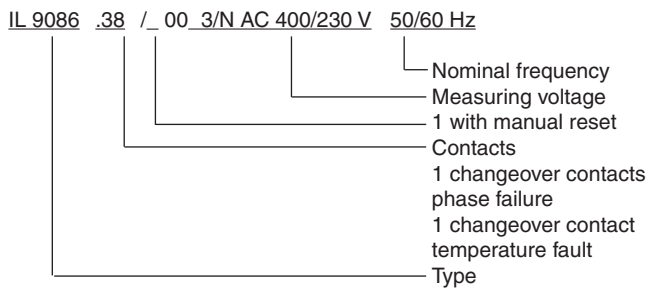
SL 9086.38 3 AC 400 V and 3 / N AC 400 / 230 V

- 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



Connection Example

