

Monitoring Technique

VARIMETER PRO Phase Monitor BD 9080

Translation
of the original instructions



Product Description

The Phase monitor BD 9080 of the VARIMETER PRO series monitors over and undervoltage, asymmetry, power failure as well as wrong phase sequence at three-phase networks. Early detection of impending failures and preventive maintenance prevent costly damage and as a user you benefit from the operational safety and high availability of your system.

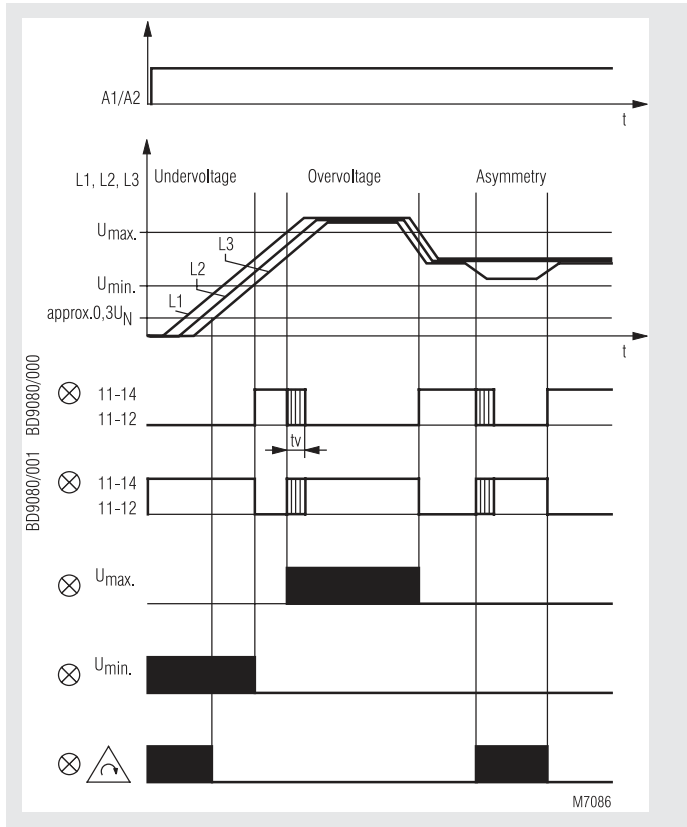
- According to IEC/EN 60255-1
- Monitoring of
 - Under- and overvoltage
 - Asymmetry
 - Phase failure
 - Phase sequence
- Adjustable response delay between 0.1 ... 5 s
- One LED in each case for:
 - Auxiliary voltage A1/A2
 - Overvoltage U_{max}
 - Undervoltage U_{min}
 - Asymmetry / Phase sequence / Power failure
 - Contact position
- Closed circuit operation
- 2 changeover contacts
- As option available with open circuit operation
- Width 45 mm

Approvals and Markings



*) see variants

Function Diagram



Applications

For monitoring three-phase networks for undervoltage, overvoltage, phase sequence, asymmetry, power failure.

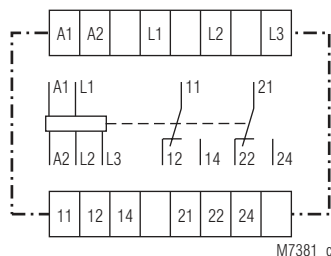
Indication

1. LED A1 / A2: On, when operating voltage present
2. LED U_{max} : On, in event of overvoltage
3. LED U_{min} : On, in event of undervoltage
4. LED Δ : On, in event of:
 - Asymmetry
 - Incorrect phase sequence
 - Power failure
5. LED: On, when output relay activated

Notes

Measurement procedures: arithmetical mean value measurement over several half-waves of rectified phase voltages L1/L2 and L2/L3. Reference phase is L3. Networks with or without neutral can be monitored. The auxiliary voltage to be applied to A1/A2 can also be taken from the three-phase network which is to be monitored. This reduces to 0.8 - 1.1 U_H the permitted range of voltage of the network to be monitored.

Circuit Diagram



Connection Terminals

Terminal designation	Signal description
L1, L2, L3	Connection phase voltage (L1, L2, L3)
A1, A2	Auxiliary voltage
11, 12, 14	Indicator relay (1. C/O contact)
21, 22, 24	Indicator relay (2. C/O contact)

Technical Data

Input Circuit

Nominal voltage U_N

L1 / L2 / L3: 3 AC 230, 400, 690, 750 V
(other voltages on request)

Setting range:

0.7 ... 1.3 U_N ^{*)}
*) 0.8 ... 1.1 U_N if auxiliary voltage is

Overload capacity of U_N :

1.5 U_N / 2 U_N (10 s) max. 1 000 V

Nominal frequency of U_N :

50 / 60 Hz

Frequency range of U_N :

45 ... 65 Hz

Accuracy:

$\leq \pm 0.5\%$ of U_N

Power consumption with U_N :

L1 approx. 0.5 mA

L2 approx. 0.5 mA

L3 approx. 0.8 mA

$\leq 5\% \times U_A$ (U_A = response value)

Hysteresis:

Asymmetry detection

Voltage:

$U_A \pm 8 \dots 20\%$

Fault angle:

Approx. $120^\circ \pm 15^\circ$

Temperature influence:

$\leq 0.08\%$ / K

Auxiliary Circuit

Auxiliary voltage U_H

A1 / A2: AC 110, 230, 400 V
AC/DC 24 ... 80 V,
AC/DC 80 ... 230 V
(other voltages on request)

Voltage range of U_H :

0.8 ... 1.1 U_H

Nominal frequency of U_H :

50 / 60 Hz

Frequency range of U_H :

45 ... 500 Hz

Nominal consumption:

2.4 VA

Output Circuit

Contacts:

2 changeover contacts

Response-/Release time:

Approx. 900 / 150 ms

Response delay t_v :

0.1 ... 5 s

Thermal current I_{th} :

6 A

(see continuous current limit curve)

Switching capacity

To AC 15

NO contact: 2 A / AC 230 V IEC/EN 60947-5-1

NC contact: 1 A / AC 230 V IEC/EN 60947-5-1

To DC 13

NO contact: 1 A / DC 24 V IEC/EN 60947-5-1

NC contact: 1 A / DC 24 V IEC/EN 60947-5-1

Electrical life:

To AC 15 at 1 A, AC 230 V:

NO contact: 2.5×10^5 switching cycles

Permissible switching

frequency:

20 switching cycles / s

Short circuit strength

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

Mechanical life:

$\geq 50 \times 10^6$ switching cycles

General Data

Operating mode:

Continuous operation

Temperature range

Operation: - 20 ... + 60 °C

Storage: - 20 ... + 60 °C

Altitude:

≤ 2000 m

Clearance and creepage distances

Rated impulse voltage /
pollution degree

auxiliary voltage / measuring input: 6 kV / 2 IEC 60664-1

auxiliary voltage / contacts: 6 kV / 2 IEC 60664-1

measuring input / contacts: 6 kV / 2 IEC 60664-1

Contact / contact: 4 kV / 2 IEC 60664-1

Overvoltage category: III up to 3AC 600 V

II > 3AC 600 V

Technical Data

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: 2 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

Vibration resistance:

Amplitude 0.35 mm IEC/EN 60068-2-6

frequency 10 ... 55 Hz,

20 / 060 / 04 IEC/EN 60068-1

Climate resistance:

Wire connection:

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

Fixed screw terminals

Cross section:

0.1 ... 4 mm² (AWG 28 - 12) solid or

0.1 ... 2.5 mm² (AWG 28 - 12)

stranded wire with ferrules

Stripping length:

10 mm

Fixing torque:

0.8 Nm

Wire fixing:

Cross-head screw / M3,5 box terminals

Mounting:

DIN rail

IEC/EN 60715

Weight:

325 g

Dimensions

Width x height x depth:

45 x 74 x 133 mm

Classification to DIN EN 50155

Vibration and

shock resistance:

Category 1, Class B

IEC/EN 61373

Protective coating of the PCB: No

UL-Data

Switching capacity:

Pilot duty B300



Technical data that is not stated in the UL-Data, can be found in the technical data section.

CCC-Data

Thermal current I_{th} :

5 A



Technical data that is not stated in the CCC-Data, can be found in the technical data section.

Standard Type

BD 9080.12 3 AC 400 V AC 230 V

Article number: 0045382

• Output: 2 changeover contacts

• Nominal voltage U_N : 3 AC 400 V

• Auxiliary voltage U_H : AC 230 V

• Closed circuit operation

• Width: 45 mm

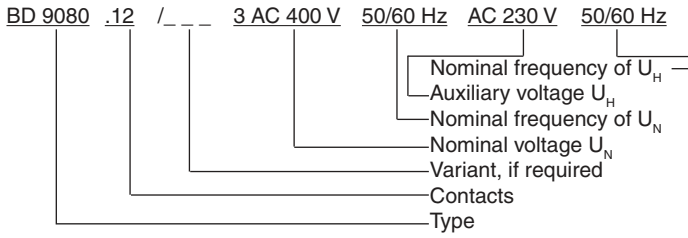
Variants

BD 9080.12/61: With UL-approval on request
 BD 9080: With CCC-approval on request
 BD 9080.12/001: Open circuit operation
 BD 9080.12/020: Output relay indicates only under- and overvoltage
 BD 9080.12/200: With extended temperature range of - 40 ... + 70 °C

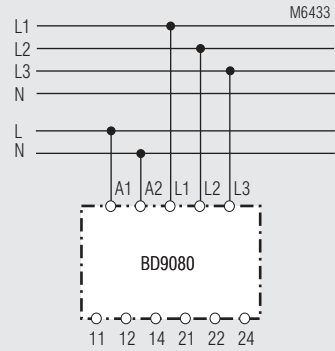
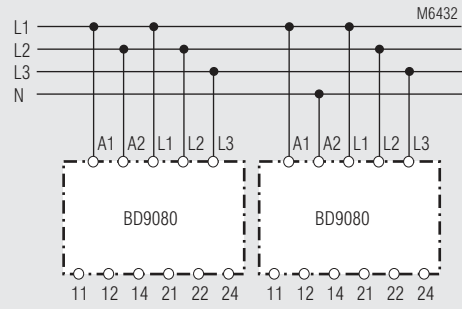
Remark

At an ambient temperature of + 70°C the device has to be mounted with 2 cm space to the neighbour units and the necessary air circulation must be provided.
 The contact current must not be more then 2 A.
 The life of the product may be reduced by the higher ambient temperature!

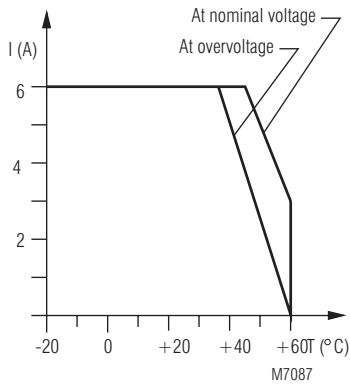
Ordering example for variant



Connection Examples



Characteristic



Continuous current limit curve

