

## VARIMETER PRO Phase Monitor BD 9080

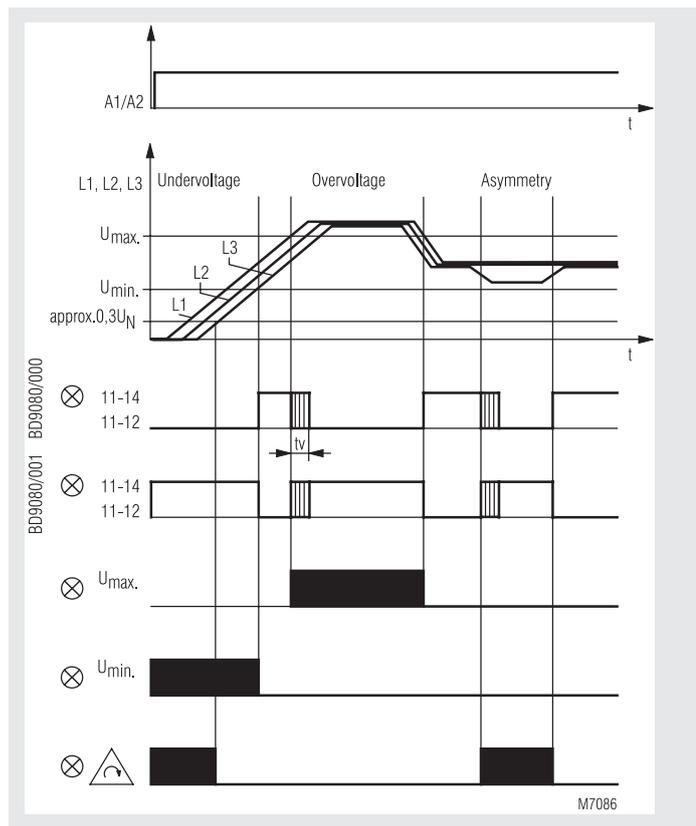
Translation  
of the original instructions



### 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.

### Function Diagram



### Your Advantages

- Monitoring of
  - Under- and overvoltage
  - Asymmetry
  - Phase failure
  - Phase sequence
- Preventive maintenance
- For higher productivity
- Faster fault localization
- Early detection of irregularities
- Precise and reliable

### Features

- According to IEC/EN 60255-1
- 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

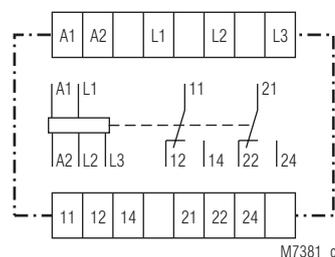
### Applications

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 $\Delta$ :  | On, in event of: <ul style="list-style-type: none"> <li>- Asymmetry</li> <li>- Incorrect phase sequence</li> <li>- Power failure</li> </ul> |
| 5. LED:            | On, when output relay activated                                                                                                             |

### 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  $U_N$ <sup>\*)</sup>  
) 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. 1000 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

#### Hysteresis:

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

#### 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:

IEC/EN 60947-5-1

to AC 15 at 1 A, AC 230 V:

NO contact:

$2.5 \times 10^5$  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:

$\leq 2000$  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:

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

### Wire connection:

#### Fixed screw terminals

Cross section:

0.1 ... 4 mm<sup>2</sup> (AWG 28 - 12) solid or

0.1 ... 2.5 mm<sup>2</sup> (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

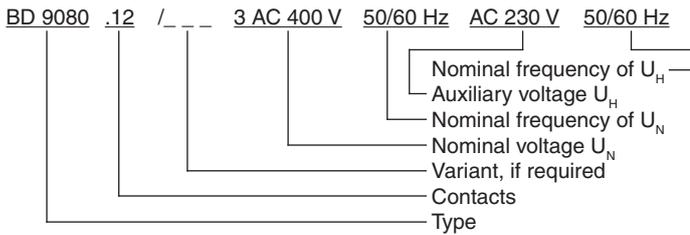
BD 9080.12/61:  
 BD 9080:  
 BD 9080.12/001:  
 BD 9080.12/020:  
 BD 9080.12/200:

With UL-approval on request  
 With CCC-approval on request  
 Open circuit operation  
 Output relay  
 indicates only under- and overvoltage  
 With extended temperature range of  
 - 40 ... + 70 °C

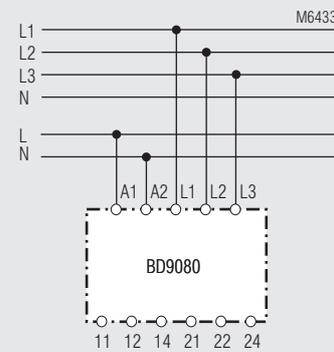
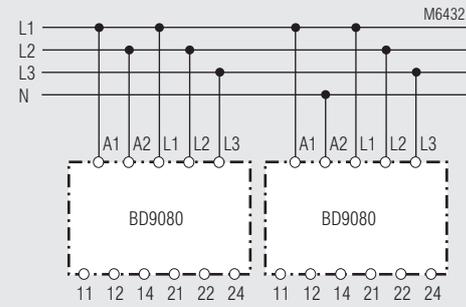
### Remark

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 than 2 A.  
 The life of the product may be reduced by the higher ambient temperature!

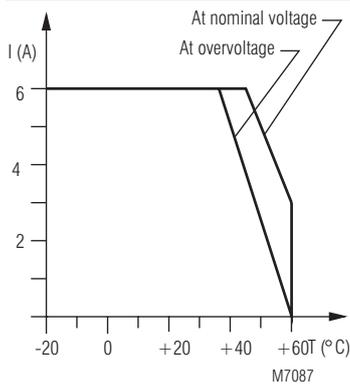
### Ordering example for variant



## Connection Examples



## Characteristic



Continuous current limit curve

