

# Monitoring Technique

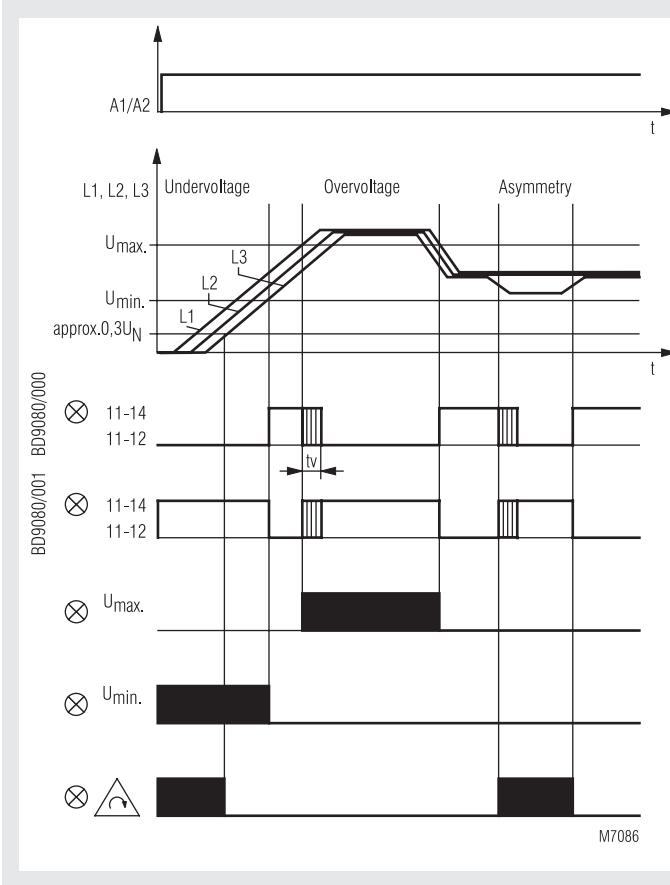
## VARIMETER PRO Phase Monitor BD 9080

**DOLD** 

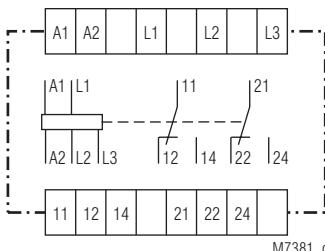
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### Function Diagram



### Circuit Diagram



- According to IEC/EN 60 255, DIN VDE 0435-303
- Monitoring of
  - Under- and overvoltage
  - Asymmetry
  - Phase failure
  - Phase sequence
- Release time adjustable 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 Marking



\*) see Variants

### Applications

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

### Indication

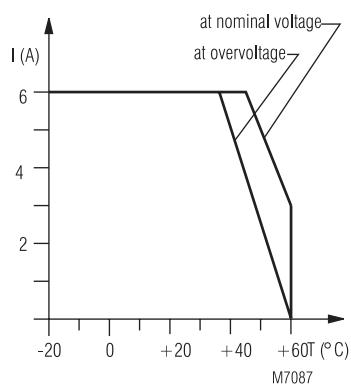
1. LED A1 / A2: on, when operating voltage present
2. LED  $U_{\max}$ : on, in event of overvoltage
3. LED  $U_{\min}$ : on, in event of undervoltage
4. LED  $\Delta$ : on, in event of:
  - asymmetry
  - incorrect phase sequence
  - power failure
5. LED: on, when output relay activated

### 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.

Technical Data		Technical Data	
<b>Input Circuit</b>			
<b>Nominal voltage <math>U_N</math></b> L1 / L2 / L3:		3 AC 230, 400, 690 V (other voltages on request)	
<b>Setting range:</b>		0.7 ... 1.3 $U_N$	
<b>Overload capacity of <math>U_N</math>:</b>		1.5 $U_N$ / 2 $U_N$ (10 s) max. 1 000 V	
<b>Nominal frequency of <math>U_N</math>:</b>		50 / 60 Hz	
<b>Frequency range of <math>U_N</math>:</b>		45 ... 65 Hz	
<b>Accuracy:</b>		$\leq \pm 0.5\%$ of $U_N$	
<b>Power consumption with <math>U_N</math>:</b>		L1 approx. 0.5 mA L2 approx. 0.5 mA L3 approx. 0.8 mA	
<b>Hysteresis:</b>		$\leq 5\% \times U_A$ ( $U_A$ = response value)	
<b>Asymmetry detection</b>			
Voltage:		$U_A \pm 8 \dots 20\%$	
<b>Fault angle:</b>		approx. $120^\circ \pm 15^\circ$	
<b>Temperature influence:</b>		$\leq 0.08\% / K$	
<b>Auxiliary Circuit</b>			
<b>Auxiliary voltage <math>U_H</math></b>			
A1 / A2:		AC 110, 230, 400 V AC/DC 24 ... 60 V, AC/DC 110 ... 230 V (other voltages on request)	
<b>Voltage range of <math>U_H</math>:</b>		0.8 ... 1.1 $U_H$	
<b>Nominal frequency of <math>U_H</math>:</b>		50 / 60 Hz	
<b>Frequency range of <math>U_H</math>:</b>		45 ... 500 Hz	
<b>Nominal consumption:</b>		2.4 VA	
<b>Output Circuit</b>			
<b>Contacts</b>			
BD 9080.12:		2 changeover contacts	
<b>Response-/Release time:</b>		approx. 900 / 150 ms	
<b>Time delay <math>t_V</math>:</b>		0.1 ... 5 s	
<b>Thermal current <math>I_{th}</math>:</b>		6 A (see continuous current limit curve)	
<b>Switching capacity</b>			
to AC 15			
NO contact:		2 A / AC 230 V IEC/EN 60 947-5-1	
NC contact:		1 A / AC 230 V IEC/EN 60 947-5-1	
to DC 13			
NO contact:		1 A / DC 24 V IEC/EN 60 947-5-1	
NC contact:		1 A / DC 24 V IEC/EN 60 947-5-1	
<b>Electrical life:</b>		IEC/EN 60 947-5-1	
to AC 15 at 1 A, AC 230 V:		2.5 $\times 10^5$ switching cycles	
NO contact:		20 switching cycles / s	
<b>Permissible switching frequency:</b>			
<b>Short circuit strength</b>			
max. fuse rating:		4 A gL IEC/EN 60 947-5-1	
<b>Mechanical life:</b>		$\geq 50 \times 10^6$ switching cycles	
<b>General Data</b>			
<b>Operating mode:</b>		Continuous operation	
<b>Temperature range:</b>		- 20 ... + 60°C	
<b>Clearance and creepage distances</b>			
rated impuls voltage / pollution degree			
auxiliary voltage:		6 kV / 2 IEC 60 664-1	
Contact / contact:		4 kV / 2 IEC 60 664-1	
<b>EMC</b>			
Electrostatic discharge:		8 kV (air) IEC/EN 61 000-4-2	
HF irradiation:		10 V/m IEC/EN 61 000-4-3	
Fast transients:		2 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	
<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 subject 94	
<b>Vibration resistance:</b>		Amplitude 0.35 mm IEC/EN 60 068-2-6 frequency 10 ... 55 Hz,	
<b>Climate resistance:</b>		20 / 060 / 04 IEC/EN 60 068-1	
<b>Wire connection:</b>		2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4 or	
		2 x 1.5 mm <sup>2</sup> stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
<b>Wire fixing:</b>		Flat terminals with self-lifting clamping piece IEC/EN 60 999-1	
<b>Mounting:</b>		DIN rail IEC/EN 60 715	
<b>Weight:</b>		325 g	
<b>Dimensions</b>			
		Width x height x depth: 45 x 74 x 133 mm	
<b>Standard Type</b>			
BD 9080.12 3 AC 400 V AC 230 V			
Article number:		0045382 stock item	
<ul style="list-style-type: none"> <li>• Output:</li> <li>• Nominal voltage <math>U_N</math>:</li> <li>• Auxiliary voltage <math>U_H</math>:</li> <li>• Closed circuit operation</li> <li>• Width:</li> </ul>		2 changeover contacts 3 AC 400 V AC 230 V 45 mm	
<b>Variants</b>			
BD 9080.12/61		with UL-approval	
3 AC 400 AC 400 V,		open circuit operation	
3 AC 480 AC 480 V:		output relay	
BD 9080.12/001:		indicates only under- and overvoltage	
BD 9080.12/020:		with extended temperature range of - 40 ... + 70 °C	
<b>Remark</b>			
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!			
<b>Ordering example for variant</b>			
BD 9080 .12 / _ 3 AC 400 V 50/60 Hz AC 230 V 50/60 Hz			
		Nominal frequency of $U_N$ Auxiliary voltage $U_H$ Nominal frequency of $U_H$ Nominal voltage $U_N$ Variant, if required Contacts Type	

## Characteristic



Continuous current limit curve

## Connection Examples

