

## Control & Monitoring Relays

### 3-Phase Monitoring Relay MXP-10



#### DESCRIPTION

A relay for monitoring a 3-phase AC power supply with or without Neutral. The relay monitors that all phases are available and in the correct phase sequence (U,V,W), that none of the phases are shifted more than 20°C in relation to each other and that one or more of the phase voltages are not too low. When all three monitoring criteria are fulfilled the relay is activated. If one or more of the criteria are not fulfilled the relay de-energises and a red LED indicates failure. The nominal phase voltage is adjustable  $\pm 15\%$  of the selected voltage version (3 x 115/3x230/3x400VAC). The low-voltage limit is also adjustable from 60-98% thus allowing detection of a motor-generated phase.

With connection of Neutral the measuring abilities are optimal, as Neutral works as a measuring reference. Without Neutral, the phase monitoring relay generates a Neutral reference from the connected phases.

#### Features

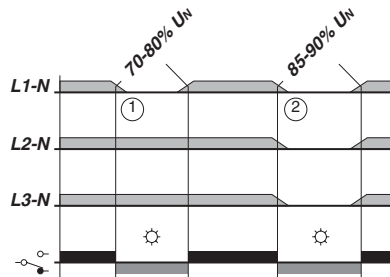
- Monitoring of
  - Phase rotation
  - Phase shift less than 20°
  - Low voltage
- Adjustable measuring voltage  $U_n \pm 15\%$  of rated voltage  $U_n$ .
- Low voltage detection, adjustable 60- 98% of measuring voltage  $U_n$ .
- Output SPTD.
- Operating voltage via phases V and W (L2 and L3).

#### VERSION/ORDERING CODES

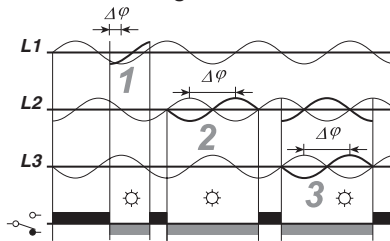
<b>Type:</b>			
Phase monitoring relay	MXP-10	MXP-10	230
<b>Supply voltage/measuring voltage</b>			
3 x 115V AC		115	
3 x 230V AC		230	
3 x 400V AC		400	

#### OPERATION

##### Voltage monitoring



##### Phase monitoring



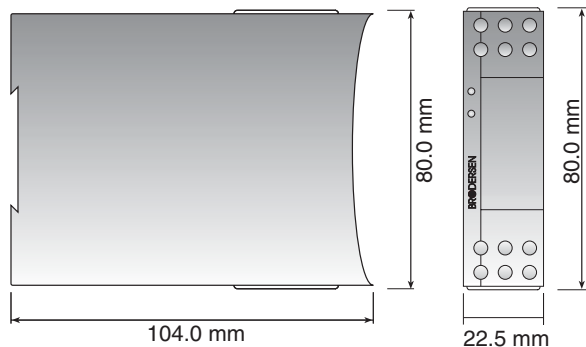
##### Examples of types of phase error:

1. Motor-generated phase, for example, when L1 is disconnected to an unloaded or lightly loaded 3-phase motor ( $\Delta\phi > 20^\circ$ ).
2. Ohmic load or heavily loaded 3-phased motor, where L2 is disconnected ( $\Delta\phi = 180^\circ$ ).
3. Reversed phase sequence (L2 and L3) ( $\Delta\phi = 120^\circ$ ).

##### OPTION:

Can be delivered with separate supply voltage

#### MECHANICAL DIMENSIONS



**TECHNICAL DATA**

**Input:**

Input signal	Impedance	U <sub>max</sub>
3 x 115V AC + N	150 kOhm	600V AC
3 x 230V AC + N	316 kOhm	600V AC
3 x 400V AC + N	560 kOhm	600V AC

Frequency:	47-53Hz.
Measuring cycle:	80ms.
Temperature drift:	Max. 0,05%/°C.
Response time:	$\tau = 0.2s$ , worstcase $5 \times \tau$ .
Setting accuracy:	U <sub>n</sub> = Typically $\pm 3V$ AC. Low voltage typically $\pm 1\%$ .

**Output:**

SPDT relay:	Contact material; AgNi0.15 with hardened gold plating Au. Max. Load AC; 8A/240VAC (cosφ=1) Max. breaking capacity 2000VA. Inductive load. See fig. 1. Max. load DC, 8A/24V DC Max. breaking capacity 50-270W. See fig. 2.
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Max. in rush current:	15A (max. 4s/duty cycle less than 10%).
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Min. in rush current:	10mA, 24V DC.
Frequency :	Max. 1000 operations pr. hour.

Life time:	Mech.Min. $3 \times 10^7$ operations. Elect.Min. $1 \times 10^5$ operations. with full load.
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Delay;	<20ms.
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**Supply voltage:**

Supplied via phase:	V(L2) and W(L3).
Consumption:	3VA.

**General data:**

Ambient temperature:	-20 to 55°C.
Storage temperature:	-40 to 80°C.

Mounting:	35mm DIN-rail (EN50022).
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Terminals:	Screw terminals with dual compartment. Terminal screws are combined crosshead/slotted. Up to 2 x 2.5mm <sup>2</sup> wire(2 x 1.5mm <sup>2</sup> inc. ferrule). Recommended torque, 0.5 Nm.,
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	Max. 0,7 Nm. (VDE0609-1). Terminal identification in accordance with DIN46199/EN50005.
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Indicators:	Green LED = operating voltage. RedLED = relay off - failure.
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Protection:	IP20.
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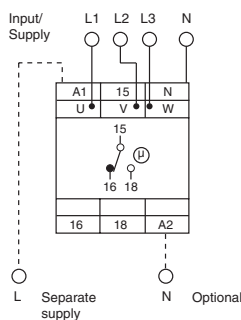
Electric isolation:	3.75kVAC (1 min.) between input, supply and relay uotput (EN60950).
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Housing:	Noryl (GE), UL94V1.
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Terminal block:	Noryl (GE), UL94V0.
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Weight:	180 g.
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**WIRING DIAGRAM**



**SPECIFICATIONS:**

MXP-10 is designed and developed with regard to relevant specifications:

- EN60204-1 / VDE0113 electrical material on machines.
- VDE0110 / IEC664 Isolation specifications/creepage and clearance distances.
- Electrical safety in accordance with EN61010.
- IEC414 Safety regulations for control and monitoring equipment.
- EMC: Emission EN50081-1  
Immunity EN50082-2
- Humidity in accordance with IEC68-2-3; RH=95%, 40°C
- Vibration in accordance with IEC68-2-6;
- Shock when mounted, in accordance with IEC68-2-27.

MXP-10 is CE-marked in accordance with EMC-and the Low Voltage Directive.

**OUTPUT LOAD DIAGRAMS**

Fig. 1

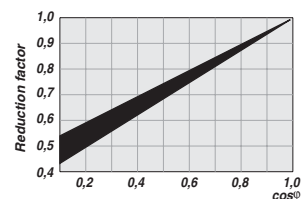
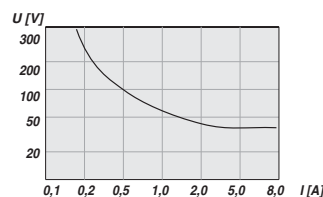


Fig. 2



INTRO...  
MCP-10  
MCU-10 DV/AV  
MCU-10 DC/AC  
MCU-10 P/N/T  
MCU-10 J/K/S/R  
MCU-10 U  
MXV-10  
MXV-20  
MXC-10  
MXC-20  
MXC-30  
MXV-30  
MXP-10  
MXP-20  
MXL-10  
MXT-10



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