

Control & Monitoring Relays

Phase Monitoring Relay MXP-20



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 L1, L2, L3 (U,V,W), that none of the phases are shifted more than 20° 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.

Fixed limits for energizing and de-energizing the single output relay. 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
- Output SPTD.
- Operating voltage via phases L2 and L3 (V and W).
- Delay= 0,5s to prevent faulty energization and deenergization caused by short interferences.

VERSION/ORDERING CODES

Type:
Phase monitoring relay.



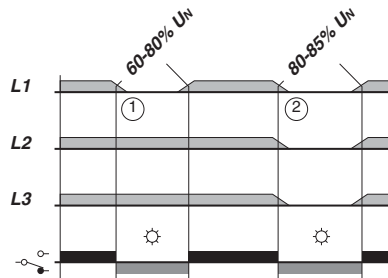
Supply voltage/measuring voltage:

- 3 x 115V AC
- 3 x 230V AC
- 3 x 400V AC

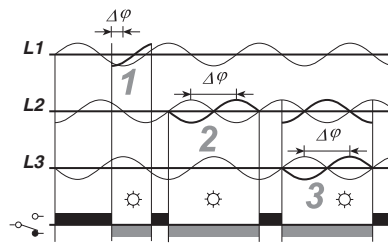
- 115
- 230
- 400

OPERATION

Voltage monitoring



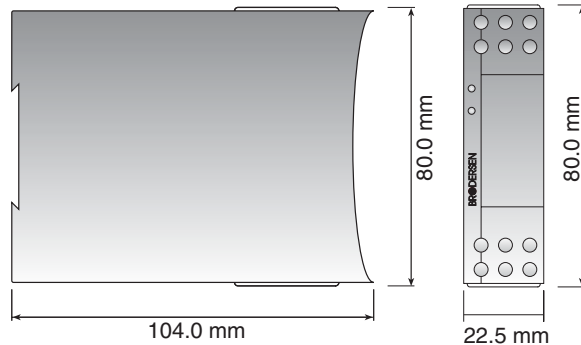
Phase monitoring



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) ($\Delta\phi = 120^\circ$).

MECHANICAL DIMENSIONS



TECHNICAL DATA

Input:

Input signal	Impedance	U _{max}
3 x 115V AC + N	150 kOhm	300V AC
3 x 230V AC + N	316 kOhm	435V AC
3 x 400V AC + N	560 kOhm	580V AC

Frequency: 45-66Hz.

Temperature drift: All specifications apply for the specified temperature range.

Delay: 0.3s-0.7s.

Phase measuring:

With neutral: Fault: $\Delta\phi > 25^\circ$, typically $\Delta\phi > 20^\circ$
Without neutral: Fault: $\Delta\phi > 50^\circ$, typically $\Delta\phi > 40^\circ$

Voltage measuring:

With neutral:

Change on 1 phase:

Energized output relay: $> 90\%$ of V_{nom.}, typically by $> 80\%$.
Fault: $< 65\%$ of V_{nom.}, typically by $< 70\%$.

Change of 3 phases, symm.:

Energized output relay: 90% of V_{nom.}.
Fault: $< 80\%$ of V_{nom.}, typically by $< 85\%$.

Without neutral:

Change on 1 phase:

Energized output relay: $> 90\%$ of V_{nom.}, typically by $> 80\%$.
Fault: $< 50\%$ of V_{nom.}, typically by $< 60\%$.

Change of 3 phases, symm.:

energized output relay: 90% of V_{nom.}, typically by $> 85\%$.
Fault: $< 75\%$ of V_{nom.}, typically by $< 80\%$.

Output:

SPDT relay: Contact material; AgNi0.15 with hardened gold plating Au.
Max. Load AC; 8A/240V AC ($\cos\phi=1$)
Max. breaking capacity 2000VA. Inductive load. See fig. 1.
Max. load DC, 8A/24V DC
Max. breaking capacity 50-270W. See fig. 2.

Max. in rush current: 15A (max. 4s/duty cycle less than 10%).

Min. in rush current: 10mA, 24V DC.

Frequency: Max. 1000 operations pr. hour.

Life time: Mech. Min. 3×10^7 operations.

Elect: Min. 1×10^5 operations with full load.

Delay: < 20 ms.

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)

Terminals: Screw terminals with dual compartment.

Terminal screws are combined crosshead/slotted.

Up to 2 x 2.5mm² wire (2 x 1.5mm² inc. ferrule).

Recommended torque, 0.5 Nm.,

Max. 0.7 Nm. (VDE0609-1).

Terminal identification in accordance with DIN46199/EN50005.

Weight: 180 g.

Indicators: Green LED = operating voltage.

Red LED = relay off - failure.

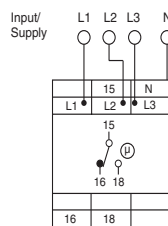
Protection: IP20.

Electric isolation: 3.75kVAC (1 min.) between input, supply and relay output (EN60950).

Housing: Noryl (GE), UL94V1.

Terminal block: Noryl (GE), UL94V0.

WIRING DIAGRAM



SPECIFICATIONS:

MXP-20 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-20 is CE-marked in accordance with EMC-and the Low Voltage Directive.

OUTPUT LOAD DIAGRAMS

Fig. 1

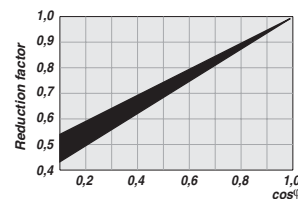
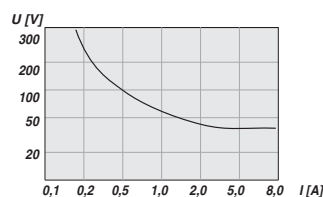


Fig. 2





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