# Monitoring Relays 3-Phase Sequence and Phase Loss Types DPA01, PPA01







- 3-phase monitoring relays for phase sequence and phase loss
- Detect when all 3 phases are present and have the correct sequence
- Measure on own power supply
- Power supply range: 208 to 690 VAC (+10 -15%)
- Output: 8 A SPDT relay or 8 A DPDT normally energized
- For mounting on DIN-rail in accordance with DIN/EN 50 022 (DPA01) or plug-in module (PPA01)
- 22.5 mm Euronorm housing (DPA01) or 36 mm plug-in module (PPA01)
- LED indication for relay and power supply ON

#### **Product Description**

3-phase relay for detection of incorrect phase sequence, total and partial phase loss. Supply range from 208 to 690 VAC covered by two multivoltage relays.

For mounting on DIN-rail or plug-in module. The device detects regenerated voltages up to 85% of the nominal voltage (phase-phase).

# Ordering Key Housing Function Type Item number Output Power supply

#### **Type Selection**

Mounting	Output	208 to 480 VAC	208 to 240 VAC	380 to 480 VAC	380 to 600 VAC	600 to 690 VAC
DIN-rail DIN-rail	SPDT DPDT	DPA 01 C M44	DPA 01 D M23	DPA 01 D M48	DPA 01 C M60	DPA 01 C M69
Mounting	Output	208 to 415 VAC	208 to 240 VAC	380 to 415 VAC		
Plug-in Plug-in	SPDT DPDT	PPA 01 C M44	PPA 01 D M23	PPA 01 D M48		

## **Input Specifications**

Input Specifications					
Input L1, L2, L3	DPA01: Terminals L1, L2, L3 PPA01: Terminals 5, 6, 7 Measures on own supply				
Measuring ranges 208 to 480 VAC (DPA01CM44) 380 to 600 VAC (DPA01CM60) 600 to 690 VAC (DPA01CM69) 208 to 415 VAC (PPA01CM44) 208 to 240 VAC (DPA01DM23) 380 to 480 VAC (DPA01DM48) 208 to 240 VAC (PPA01DM23) 380 to 415 VAC (PPA01DM48)	323 to 690 VAC 510 to 760 VAC 177 to 475 VAC 177 to 275 VAC 323 to 550 VAC				
ON-level	> 85% of the mains phase- phase voltage				

#### **Output Specifications**

Output	SPDT or DPDT relay, N.E.	
Rated insulation voltage	250 VAC	
Contact ratings (AgSnO <sub>2</sub> ) DPA01C, PPA01C (SPDT): Resistive loads AC 1 DC 12 Small inductive loads AC 15 DC 13 DPA01D, PPA01D (DPDT): Resistive loads AC 1 Small inductive loads AC 1 Small inductive loads AC 15 DC 13	μ  8 A @ 250 VAC 5 A @ 24 VDC 2.5 A @ 250 VAC 2.5 A @ 24 VDC  8 A @ 250 VAC 3 A @ 250 VAC 2 A @ 24 VDC	
Mechanical life	≥ 30 x 10 <sup>6</sup> operations	
Electrical life	$\geq$ 10 <sup>5</sup> operations (at 8 A, 250 V, cos $\varphi$ = 1)	
Operating frequency	≤ 7200 operations/h	
Dielectric strength Dielectric voltage Rated impulse withstand volt.	≥ 2 kVAC (rms) 4 kV (1.2/50 µs)	



# **Supply Specifications**

Power supply Rated operational voltage through terminals:	Overvoltage cat. III (IEC 60664, IEC 60038)		
(DPA01) (PPA01) DPA01CM44 DPA01CM60 PPA01CM44	L1, L2, L3 5, 6, 7 208 to 480 VAC ± 15%, 45 to 65 Hz 380 to 600 VAC±15%, 45 to 65 Hz 208 to 415 VAC ± 15%, 45 to 65 Hz 600 to 690 VAC +10 -15%, 45 to 65 Hz 208 to 240 VAC ± 15%, 45 to 65 Hz		
DPA01CM69 DPA01DM23			
DPA01DM48 PPA01DM23	380 to 480 VAC ± 15%, 45 to 65 Hz 208 to 240 VAC ± 15%,		
PPA01DM48	45 to 65 Hz 380 to 415 VAC ± 15%, 45 to 65 Hz		
Rated operational power M23 M44, M48 M60 M69	6 VA @ 230 VAC, 50 Hz 10 VA @ 400 VAC, 50 Hz 15VA @ 600 VAC, 50Hz 15VA @ 690 VAC, 50Hz		

#### **General Specifications**

Reaction time			
Alarm ON delay		< 100 ms	
Alarm OFF delay		< 350 ms	
Accuracy		(15 min warm-up time)	
Temperature drift		± 1000 ppm/°C	
Repeatability		± 0.5% on full scale	
Indication for		LED	
Power supply ON		LED, green	
Relay ON		LED, yellow	
Environment		(EN 60529)	
Degree of protect	ion	IP 20	
Pollution degree Operating temper	ratura	3 (DPA01), 2 (PPA01)	
@ Max. volta		-20 to +60°C, R.H. < 95%	
@ Max. volta		-20 to +50°C, R.H. < 95%	
Storage temperat		-30 to +80°C, R.H. < 95%	
Housing		·	
Dimensions	DPA01	22.5 x 80 x 99.5 mm	
	PPA01	36 x 80 x 94 mm	
Weight		Approx. 100 g	
Screw terminals		(DPA01)	
Tightening torque	:	Max. 0.5 Nm	
		acc. to IEC 60947	
Approval		UL - CSA (except PPA01D,	
		DPA01CM69)	
CE Marking		Yes	
EMC		<b>Electromagnetic Compatibility</b>	
Immunity		According to EN 61000-6-2	
Emissions		According to EN 61000-6-3	

## **Mode of Operation**

DPA01 and PPA01 monitor their own 3-phase power supply. The relay operates when all the phases are present and the phase sequence is correct. The relay releases when one

phase-phase voltage drops below 85% of the other phase-phase voltages.

Supplied by L2 and L3

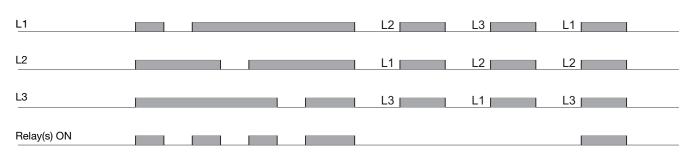
#### Example 1

The relay monitors that the power supply has the correct phase sequence and that all phase voltages are present.

#### Example 2

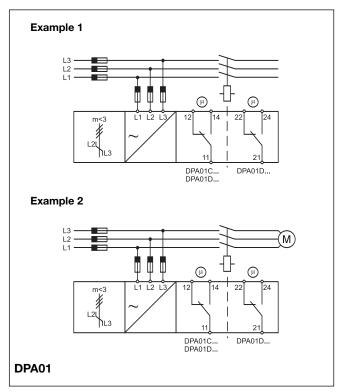
The relay releases in case of interruption of one or more phases, provided that the regenerated voltage does not exceed 85% of the phase-phase voltage.

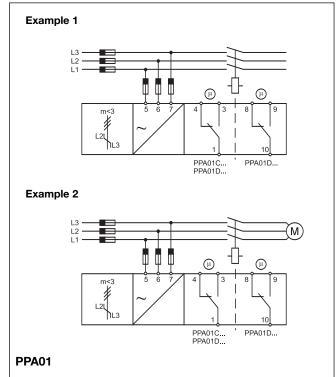
## **Operation Diagram**





# **Wiring Diagrams**





#### **Dimensions**

