# 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 their 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	DPA 01 C M44
Housing ————————————————————————————————————	
Type ————————————————————————————————————	
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 Plua-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 Measure their 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
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 $\phi$ = 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**

`	PA01)	Overvoltage cat. III (IEC 60664, IEC 60038) L1, L2, L3
DPA01CM44	PA01)	5, 6, 7 208 to 480 VAC ± 15%, 45 to 65 Hz
DPA01CM60		380 to 600 VAC±15%, 45 to 65 Hz
PPA01CM44		208 to 415 VAC ± 15%, 45 to 65 Hz
DPA01CM69		600 to 690 VAC +10 -15%, 45 to 65 Hz
DPA01DM23		208 to 240 VAC ± 15%, 45 to 65 Hz
DPA01DM48		380 to 480 VAC ± 15%, 45 to 65 Hz
PPA01DM23		208 to 240 VAC ± 15%, 45 to 65 Hz
PPA01DM48		380 to 415 VAC ± 15%, 45 to 65 Hz
Rated operational pov	wer	
M44	M23 , M48 M60	6 VA @ 230 VAC, 50 Hz 10 VA @ 400 VAC, 50 Hz 15VA @ 600 VAC, 50Hz
	M69	15VA @ 690 VAC, 50Hz Supplied by L2 and L3

#### **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%	
Indication for		
Power supply ON	LED, green	
Relay ON	LED, yellow	
Environment	(EN 60529)	
Degree of protection	IP 20	
Pollution degree	3 (DPA01), 2 (PPA01)	
Operating temperature		
@ Max. voltage, 50 Hz	-20 to +60°C, R.H. < 95%	
@ Max. voltage, 60 Hz	-20 to +50°C, R.H. < 95%	
Storage temperature	-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	
Material	PA66 or Noryl	
Weight	Approx. 100 g	
Screw terminals	(DPA01)	
Tightening torque	Max. 0.5 Nm	
	acc. to IEC 60947	
Product standard	EN 60947-5-1	
Approval	UL - CSA (except PPA01D,	
	DPA01CM69),	
	CCC (GB14048.5) only DPA	
CE Marking	L.V. Directive 2006/95/EC	
-	EMC Directive 2004/108/EC	
EMC		
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.

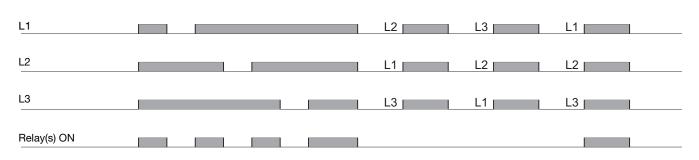
#### Example 1

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

#### Example 2

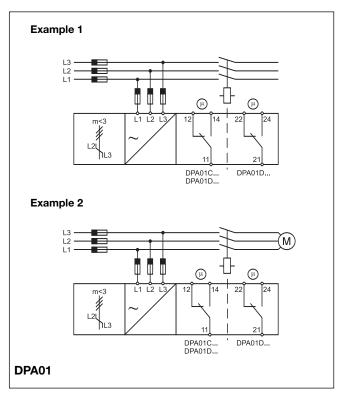
The relay releases in case of interruption of one or more phases, provided that the regenerated voltage does not exceed 85% of the phase-phase voltage.

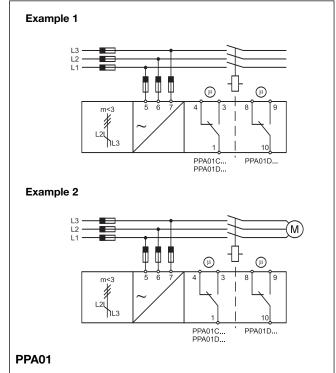
## **Operation Diagram**





# **Wiring Diagrams**





#### **Dimensions**

