

Monitoring Relays

3-Phase Sequence and Phase Loss

Types DPA01, PPA01

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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 multi-voltage 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 —
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	SPDT	DPA 01 C M44				
DIN-rail	DPDT		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	SPDT	PPA 01 C M44				
Plug-in	DPDT		PPA 01 D M23	PPA 01 D M48		

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)	177 to 550 VAC
380 to 600 VAC (DPA01CM60)	323 to 690 VAC
600 to 690 VAC (DPA01CM69)	510 to 760 VAC
208 to 415 VAC (PPA01CM44)	177 to 475 VAC
208 to 240 VAC (DPA01DM23)	177 to 275 VAC
380 to 480 VAC (DPA01DM48)	323 to 550 VAC
208 to 240 VAC (PPA01DM23)	177 to 275 VAC
380 to 415 VAC (PPA01DM48)	323 to 475 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 (AgSnO₂)	μ
DPA01C, PPA01C (SPDT):	
Resistive loads AC 1	8 A @ 250 VAC
DC 12	5 A @ 24 VDC
Small inductive loads AC 15	2.5 A @ 250 VAC
DC 13	2.5 A @ 24 VDC
DPA01D, PPA01D (DPDT):	
Resistive loads AC 1	8 A @ 250 VAC
Small inductive loads AC 15	3 A @ 250 VAC
DC 13	2 A @ 24 VDC
Mechanical life	≥ 30 x 10 ⁶ operations
Electrical life	≥ 10 ⁵ operations (at 8 A, 250 V, cos φ = 1)
Operating frequency	≤ 7200 operations/h
Dielectric strength	
Dielectric voltage	≥ 2 kVAC (rms)
Rated impulse withstand volt.	4 kV (1.2/50 μs)

Supply Specifications

Power supply		Overvoltage cat. III (IEC 60664, IEC 60038)
Rated operational voltage through terminals:	(DPA01) (PPA01)	L1, L2, L3 5, 6, 7
DPA01CM44		208 to 480 VAC $\pm$ 15%, 45 to 65 Hz
DPA01CM60		380 to 600 VAC $\pm$ 15%, 45 to 65 Hz
PPA01CM44		208 to 415 VAC $\pm$ 15%, 45 to 65 Hz
DPA01CM69		600 to 690 VAC +10 -15%, 45 to 65 Hz
DPA01DM23		208 to 240 VAC $\pm$ 15%, 45 to 65 Hz
DPA01DM48		380 to 480 VAC $\pm$ 15%, 45 to 65 Hz
PPA01DM23		208 to 240 VAC $\pm$ 15%, 45 to 65 Hz
PPA01DM48		380 to 415 VAC $\pm$ 15%, 45 to 65 Hz
Rated operational power		
M23		6 VA @ 230 VAC, 50 Hz
M44, M48		10 VA @ 400 VAC, 50 Hz
M60		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		$\pm$ 1000 ppm/°C
Repeatability		$\pm$ 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 PPA01	22.5 x 80 x 99.5 mm 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

