

Monitoring Relays

3-Phase Sequence and Phase Loss

Types DPA01, PPA01

CARLO GAVAZZI



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

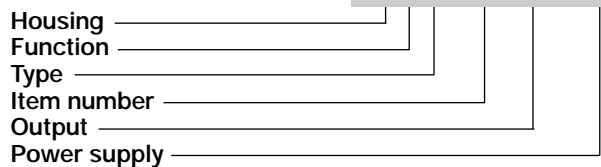
Product Description

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



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 Measures on 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
208 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 Rated operational voltage through terminals:	Overvoltage cat. III (IEC 60664, IEC 60038)
(DPA01)	L1, L2, L3
(PPA01)	5, 6, 7
DPA01CM44	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 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 Alarm OFF delay	< 100 ms < 350 ms
Accuracy Temperature drift Repeatability	(15 min warm-up time) ± 1000 ppm/°C ± 0.5% on full scale
Indication for Power supply ON Relay ON	LED, green LED, yellow
Environment Degree of protection Pollution degree Operating temperature @ Max. voltage, 50 Hz @ Max. voltage, 60 Hz Storage temperature	(EN 60529) IP 20 3 (DPA01), 2 (PPA01) -20 to +60°C, R.H. < 95% -20 to +50°C, R.H. < 95% -30 to +80°C, R.H. < 95%
Housing dimensions DIN-rail version Plug-in version	22.5 x 80 x 99.5 mm 36 x 80 x 94 mm
Weight	Approx. 100 g
Screw terminals Tightening torque	(DPA01) Max. 0.5 Nm acc. to IEC 60947
Approval	UL - CSA (except PPA01D, DPA01CM69)
CE Marking	Yes
EMC Immunity Emissions	Electromagnetic Compatibility According to EN 61000-6-2 According to EN 50081-1

Mode of Operation

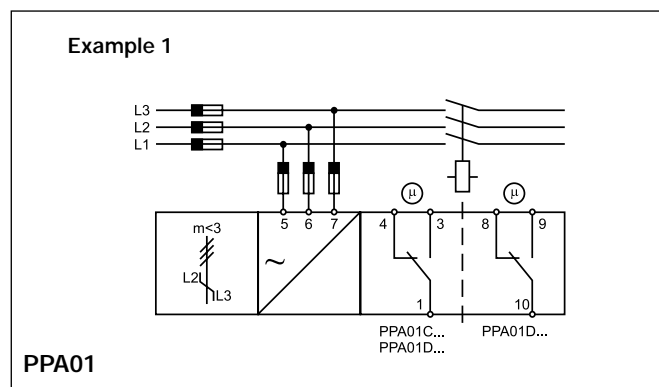
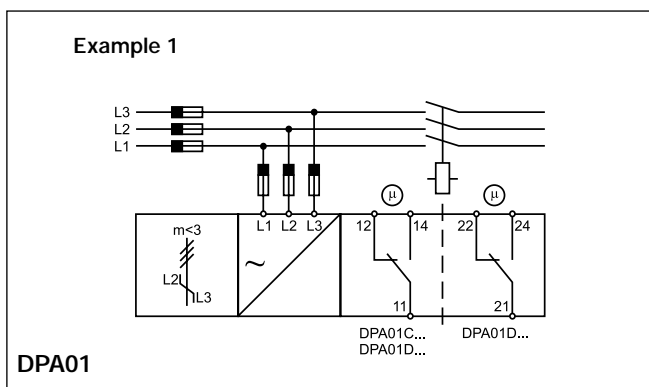
DPA01 and PPA01 monitor their own 3-phase power supply. The relay operates when all the phases are present and the phase sequence is correct. The relay releases when one

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

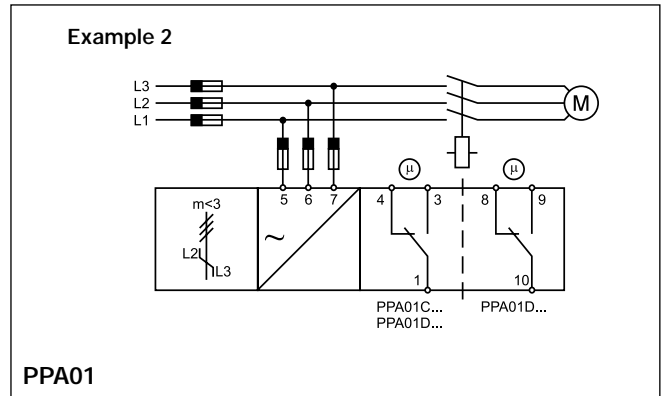
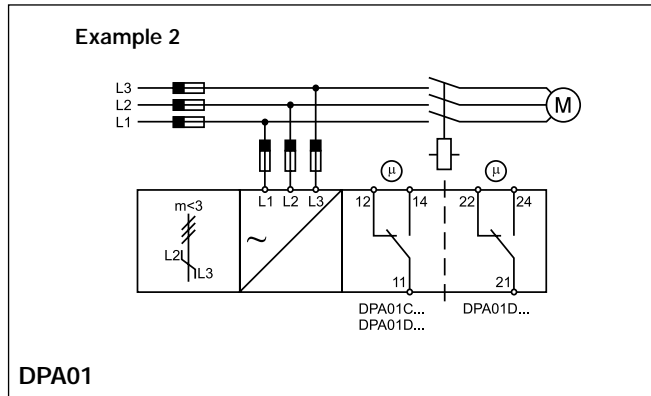
Example 1
The relay monitors that the power supply has the correct phase sequence and that all phase voltages are present.

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.

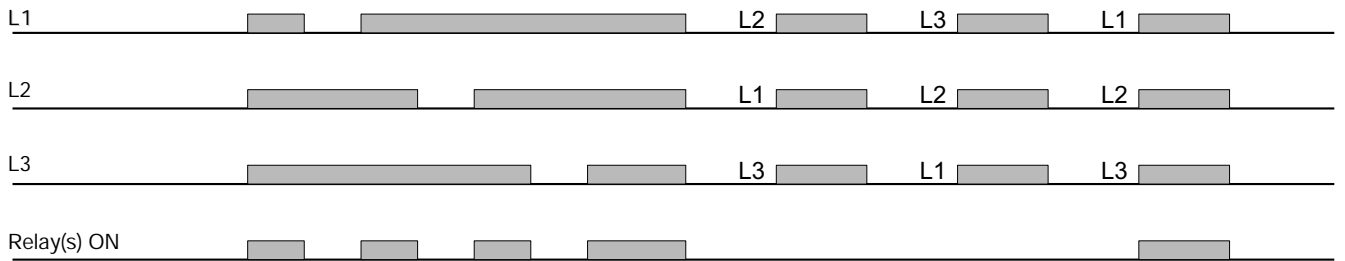
Wiring Diagrams



Wiring Diagrams (cont.)



Operation Diagram



Dimensions

