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

- 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**			**DPA 01 C M60**	**DPA 01 C M69**
DIN-rail	DPDT		**DPA 01 D M23**	**DPA 01 D M48**		

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
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 ($AgSnO_2$)		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)	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		< 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		
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
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		Electromagnetic Compatibility
Immunity		According to EN 61000-6-2
Emissions		According to EN 61000-6-3

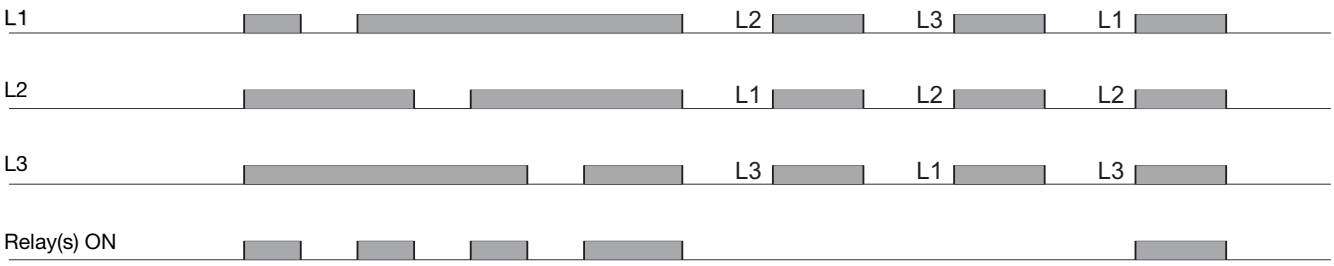
Mode of Operation

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



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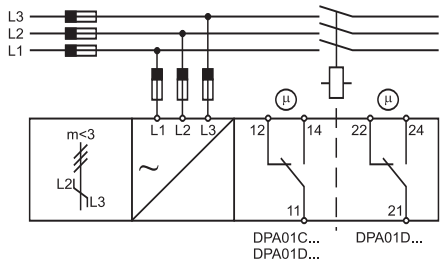
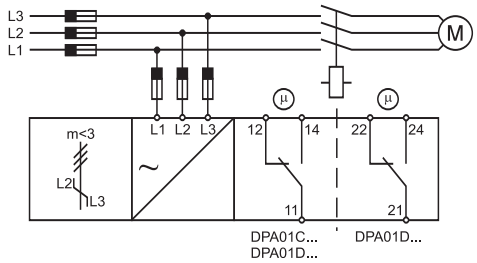
Wiring Diagrams

Example 1

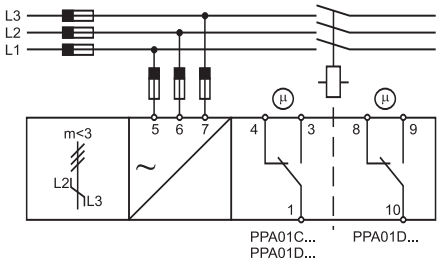


Example 2

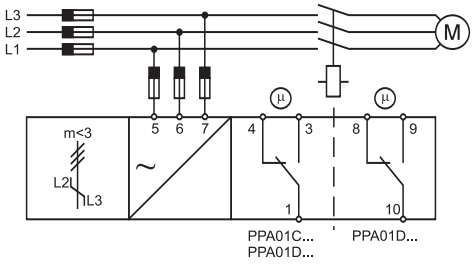


DPA01

Example 1



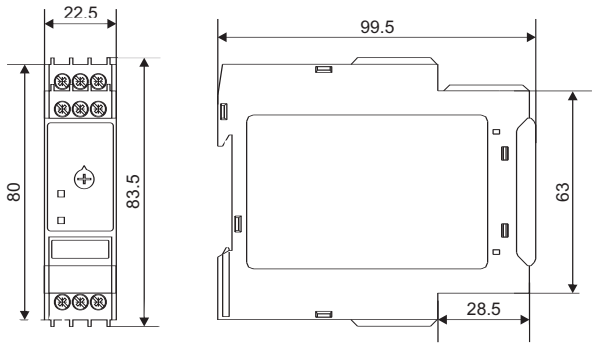
Example 2



PPA01

Dimensions

DIN-rail



Plug-in