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Monitoring Relays
3-Phase, 3-Phase+N, Multi-function
Types DPB01, PPB01

CARLO GAVAZZI

DPB01

PPB01

- 3-phase over and under voltage, phase sequence and phase loss monitoring relays
- Detect when all 3 phases are present and have the correct phase sequence
- Detect if all the 3-phase-phase or phase-neutral voltages are within the set limits
- Upper and lower limits separately adjustable
- Measure on own power supply
- Selection of measuring range by DIP-switches
- Adjustable voltage on relative scale
- Adjustable delay function (0.1 to 30 s)
- Output: 8 A SPDT relay N.E.
- For mounting on DIN-rail in accordance with DIN/EN 50 022 (DPB01) or plug-in module (PPB01)
- 22.5 mm Euronorm housing (DPB01) or 36 mm plug-in module (PPB01)
- LED indication for relay, alarm and power supply ON

Product Description

3-phase or 3-phase+neutral line voltage monitoring relay for phase sequence, phase loss, over and under voltage (separately adjustable set points) with built-in time delay function.
Supply ranges from 208 to 480 VAC covered by two multivoltage relays.

Ordering Key

DPB 01 C M23

- Housing
- Function
- Type
- Item number
- Output
- Power supply

Type Selection

Mounting	Output	Supply: 208 to 240 VAC	Supply: 380 to 480 VAC
DIN-rail	SPDT	**DPB 01 C M23**	**DPB 01 C M48**
Plug-in	SPDT	**PPB 01 C M23**	**PPB 01 C M48**

Input Specifications

Input	
L1, L2, L3, N	DPB01: Terminals L1, L2, L3, N PPB01: Terminals 5, 6, 7, 11 Measure on own supply
Measuring ranges	
208 to 240 VAC	177 to 275 VAC
380 to 480 VAC (DPB01CM48)	323 to 550 VAC
380 to 415 VAC (PPB01CM48)	323 to 475 VAC
Ranges	
Upper level	+2 to +22% of the nominal voltage
Lower level	-22 to -2% of the nominal voltage

Output Specifications

Output	SPDT relay
Rated insulation voltage	250 VAC
Contact ratings ($AgSnO_2$)	μ
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
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)

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Supply Specifications

Power supply	Overvoltage cat. III
Rated operational voltage through terminals:	(IEC 60664, IEC 60038)
L1, L2, L3, N (DPB01)	
5, 6, 7, 11 (PPB01)	
M23:	208 to 240 VAC ± 15% 45 to 65 Hz
M48:	380 to 480 VAC ± 15% 45 to 65 Hz
Rated operational power	
DPB01CM23, PPB01CM23	13 VA @ 230 VAC, 50 Hz
DPB01CM48, PPB01CM48	13 VA @ 400 VAC, 50 Hz
	Supplied by L2 and L3

General Specifications

Power ON delay	1 s ± 0.5 s or 6 s ± 0.5 s
Reaction time	
Incorrect phase sequence or total phase loss	< 200 ms
Voltage level	(input signal variation from -20% to +20% or from +20% to -20% of set value)
Alarm ON delay	< 200 ms (delay < 0.1 s)
Alarm OFF delay	< 200 ms (delay < 0.1 s)
Accuracy	(15 min warm-up time)
Temperature drift	± 1000 ppm/°C
Delay ON alarm	± 10% on set value ± 50 ms
Repeatability	± 0.5% on full-scale

General Specifications (cont.)

Indication for	
Power supply ON	LED, green
Alarm ON	LED, red (flashing 2 Hz during delay time)
Output relay ON	LED, yellow
Environment	
Degree of protection	IP 20
Pollution degree	3 (DPB01), 2 (PPB01)
Operating temperature	-20 to 60°C, R.H. < 95% @ 475 VAC, 65 Hz -20 to 50°C, R.H. < 95% @ 550 VAC, 65 Hz
Storage temperature	-30 to 80°C, R.H. < 95%
Housing dimensions	
DIN-rail version	22.5 x 80 x 99.5 mm
Plug-in version	36 x 80 x 87 mm
Weight	Approx. 120 g
Screw terminals	
Tightening torque	Max. 0.5 Nm acc. to IEC 60947
CE-marking	Yes

Mode of Operation

Connected to the 3 phases (and neutral) DPB01 and PPB01 operate when all 3 phases are present at the same time, the phase sequence is correct and the phase-phase (or phase-neutral) voltage levels are within set limits.
If one or more phase-phase or phase-neutral voltages exceeds the upper set level or drops below the lower set level, the red LED starts flashing 2 Hz and the output relay releases after the set time period. In any case if phase-neutral measurement is selected both phase-phase and phase-neutral voltages are monitored. If the phase sequence is wrong or one phase is lost, the output relay releases immediately.
Only 200 ms delay occurs. The failure is indicated by the red LED flashing 5 Hz during the alarm condition.

Example 1
(mains network monitoring)

The relay monitors over and under voltage, phase loss and correct phase sequence.

Example 2
(load monitoring)

The relay releases in case of interruption of one or more phases, when one or more voltages drop below the lower set level or exceed the upper set level.

Function/Range/Level and Time Delay Setting

Selection of function:
DIP-switch selector (1 to 2)

1
ON Power ON delay 6 ± 0.5 s
Power ON delay 1 ± 0.5 s

2
Phase-neutral voltage
Phase-phase voltage

Selection of measuring range:
DIP-switch selector (3 to 4)

34
ON 3 x 208 Δ VAC (M23)
3 x 380 Δ VAC (M48)

3 x 220 Δ VAC (M23)
3 x 400 Δ VAC (M48)

3 x 230 Δ VAC (M23)
3 x 415 Δ VAC (M48)

3 x 240 Δ VAC (M23)
3 x 480 Δ VAC (DPB01CM48)

Selection of level and time delay:

Upper knob:
Setting of lower level on relative scale.

Centre knob:
Setting of upper level on relative scale.

Lower knob:
Setting of delay on alarm time on absolute scale (0.1 to 30 s).

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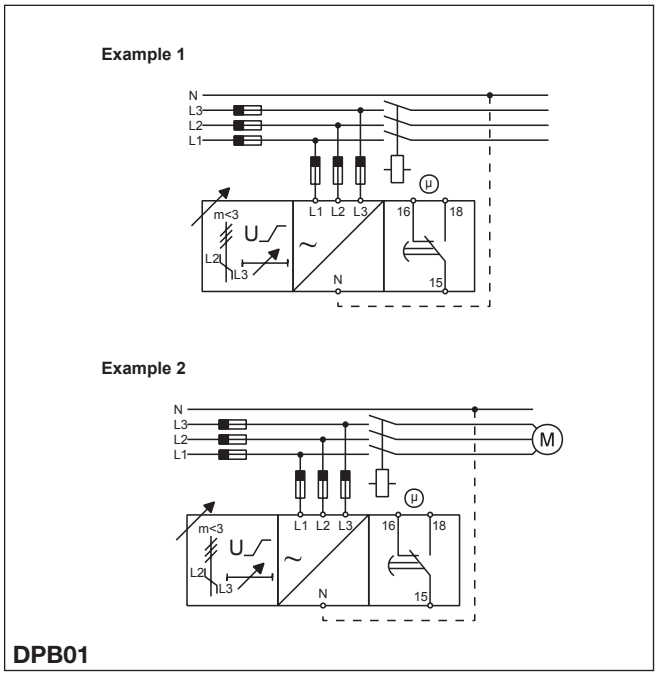
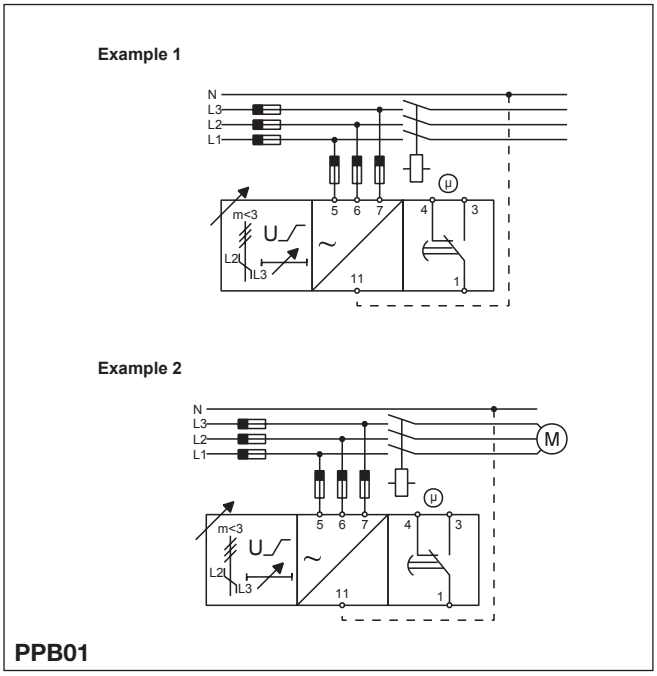
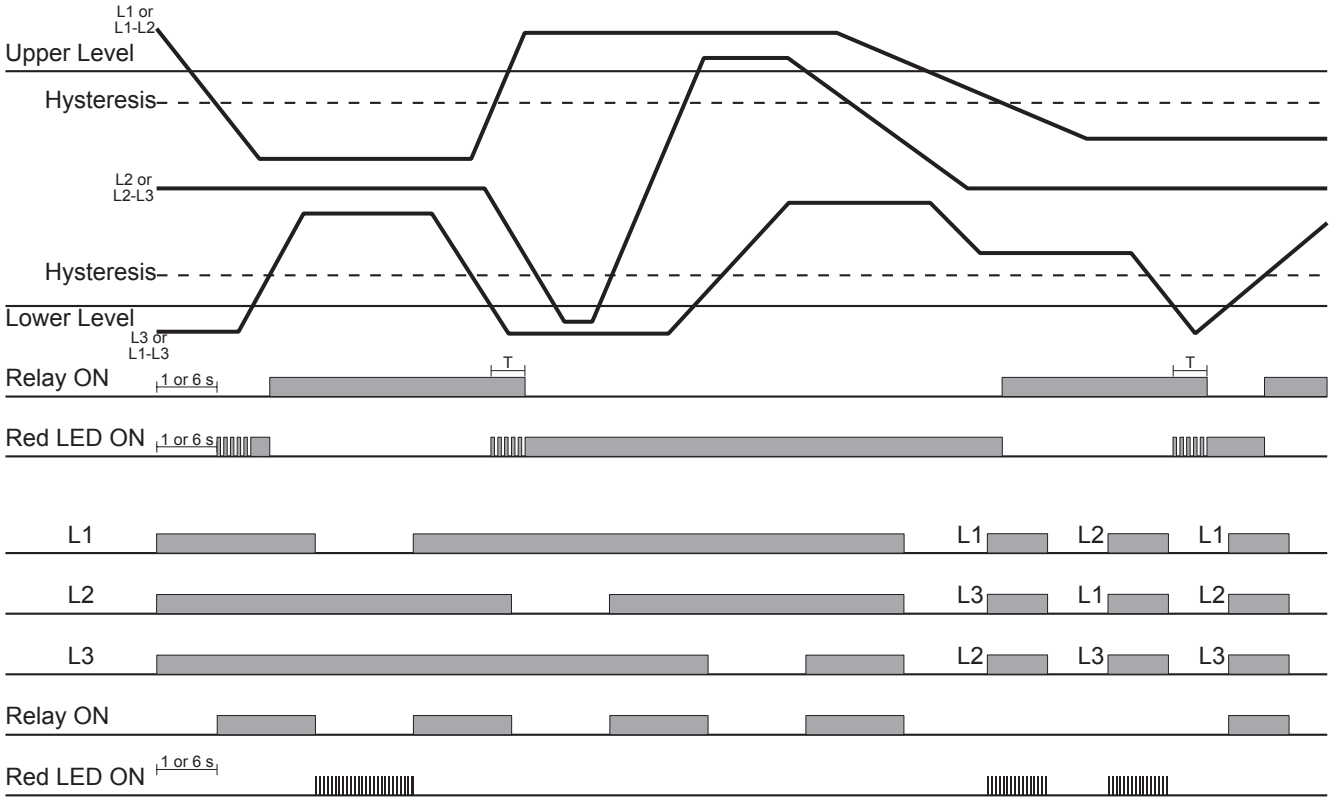
Wiring Diagrams



DPB01



PPB01

Operation Diagrams