

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 380 to 480 VAC (DPB01CM48) 380 to 415 VAC (PPB01CM48)	177 to 275 VAC 323 to 550 VAC 323 to 475 VAC
Ranges Upper level Lower level	+2 to +22% of the nominal voltage -22 to -2% of the nominal voltage

Output Specifications

Output Rated insulation voltage	SPDT relay 250 VAC
Contact ratings (AgSnO ₂) Resistive loads AC 1 DC 12 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
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 Rated impulse withstand volt.	2 kVAC (rms) 4 kV (1.2/50 μs)

Supply Specifications

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

General Specifications

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

General Specifications (cont.)

Indication for Power supply ON Alarm ON Output relay ON	LED, green LED, red (flashing 2 Hz during delay time) LED, yellow
Environment Degree of protection Pollution degree Operating temperature	IP 20 3 (DPB01), 2 (PPB01) -20 to 60°C, R.H. < 95% @ 475 VAC, 65 Hz -20 to 50°C, R.H. < 95% @ 550 VAC, 65 Hz -30 to 80°C, R.H. < 95%
Storage temperature	
Housing dimensions DIN-rail version Plug-in version	22.5 x 80 x 99.5 mm 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.

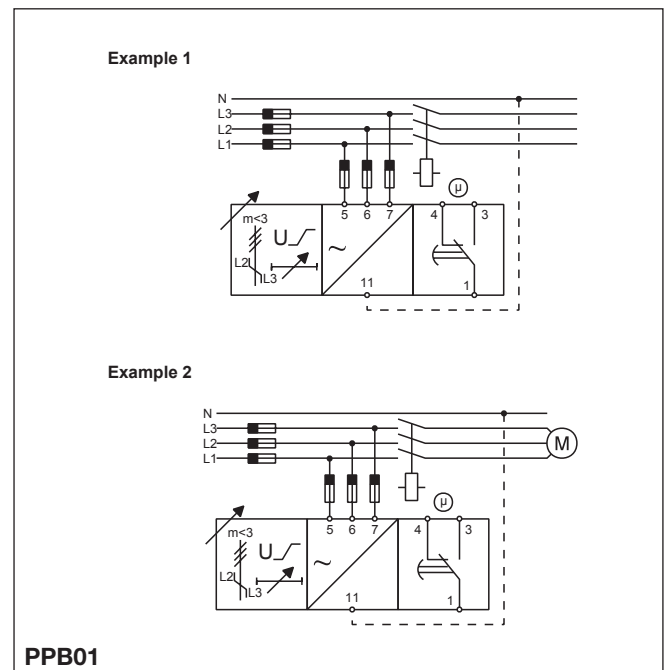
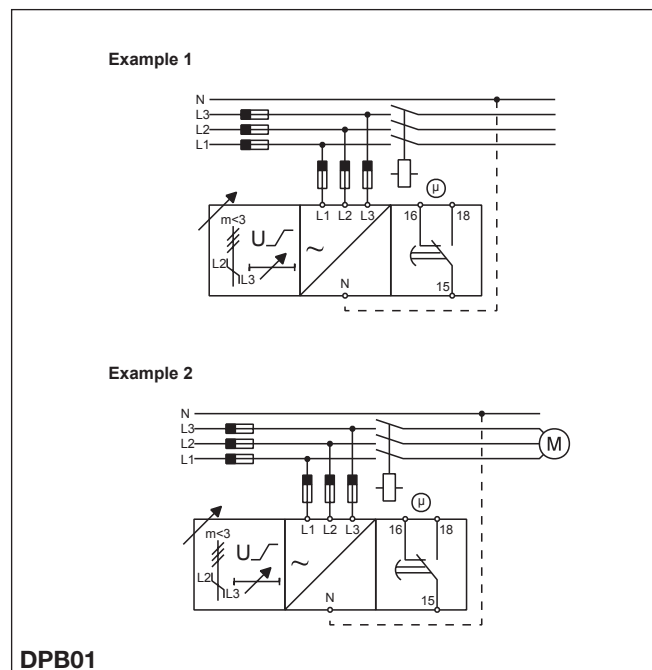
Example 2 (load monitoring)

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)	Selection of measuring range: DIP-switch selector (3 to 4)	☒ 3 x 240 Δ VAC (M23) ☐ 3 x 480 Δ VAC (DPB01CM48)	Centre knob: Setting of upper level on relative scale.
1 ☒ Power ON delay 6 $\pm$ 0.5 s ☐ Power ON delay 1 $\pm$ 0.5 s	34 ☒ 3 x 208 Δ VAC (M23) ☐ 3 x 380 Δ VAC (M48)	Selection of level and time delay:	Lower knob: Setting of delay on alarm time on absolute scale (0.1 to 30 s).
2 ☐ Phase-neutral voltage ☒ Phase-phase voltage	☒ 3 x 220 Δ VAC (M23) ☐ 3 x 400 Δ VAC (M48)	Upper knob: Setting of lower level on relative scale.	
	☒ 3 x 230 Δ VAC (M23) ☐ 3 x 415 Δ VAC (M48)		

Wiring Diagrams



Operation Diagrams

