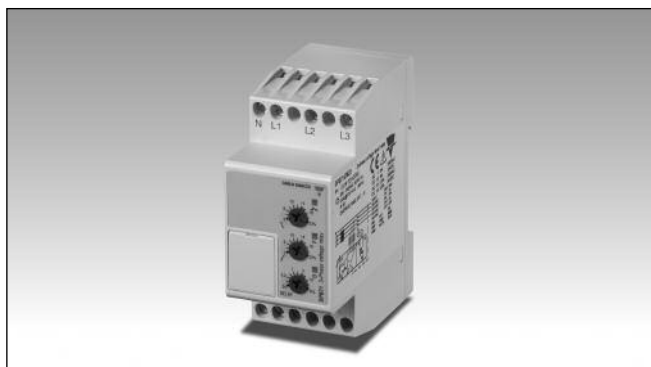


# Monitoring Relays True RMS 3-Phase, 3-Phase+N, Multi-function Type DPB71

CARLO GAVAZZI



- TRMS 3-phase over and under voltage, phase sequence and phase loss monitoring relay
- Detects when all 3 phases are present and have the correct phase sequence
- Detects if all the 3-phase-phase or phase-neutral voltages are within the set limits
- Upper and lower limits separately adjustable
- Measures 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: 5 A SPDT relay N.E.
- For mounting on DIN-rail in accordance with DIN/EN 50 022
- 35.5 mm DIN-rail housing
- 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. 35.5 mm wide housing suitable both for back and front panel mounting.

## Ordering Key

**DPB 71 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   | <b>DPB 71 C M23</b>    | <b>DPB 71 C M48</b>    |

## Input Specifications

|  |  |
|--|--|
| <b>Input</b><br>L1, L2, L3, N  | Terminals L1, L2, L3, N<br>Measure on own supply                             |
| Note: Connect the neutral only if it is intrinsically at the star centre   |  |
| <b>Measuring ranges</b><br>208 to 240 Δ VAC<br>380 to 480 Δ VAC  | 177 to 275 Δ VAC<br>323 to 550 Δ VAC   |
| <b>Ranges</b><br>Upper level<br><br>Lower level  | +2 to +22%<br>of the nominal voltage<br>-22 to -2%<br>of the nominal voltage |
| <b>Note:</b> The input voltage must not exceed the maximum rated voltage or drop below the minimum rated voltage reported above. |  |
| <b>Hysteresis</b><br>Set points from 2 to 5%<br>Set points from 5 to 22%   | 1%<br>2%   |

## Output Specifications

|   |   |
|---|---|
| <b>Output</b><br>Rated insulation voltage   | SPDT relay<br>250 VAC   |
| <b>Contact ratings (AgSnO<sub>2</sub>)</b><br>Resistive loads AC 1<br>DC 12<br>Small inductive loads AC 15<br>DC 13 | μ<br>5 A @ 250 VAC<br>5 A @ 24 VDC<br>2.5 A @ 250 VAC<br>2.5 A @ 24 VDC |
| <b>Mechanical life</b>  | ≥ 30 x 10 <sup>6</sup> operations                                       |
| <b>Electrical life</b>  | ≥ 10 <sup>5</sup> operations<br>(at 5 A, 250 V, cos φ = 1)              |
| <b>Operating frequency</b>  | ≤ 7200 operations/h   |
| <b>Dielectric strength</b><br>Dielectric voltage<br>Rated impulse withstand volt.                                   | 2 kVAC (rms)<br>4 kV (1.2/50 μs)  |

## Supply Specifications

|  |  |
|--|--|
| <b>Power supply</b><br>Rated operational voltage through terminals:<br>M23 - Delta Voltage:<br><br>M48 - Delta Voltage:<br><br>M48 - Star Voltage: | Overvoltage cat. III<br>(IEC 60664, IEC 60038)<br>L1, L2, L3, N<br>208 to 240 VAC ± 15%<br>45 to 65 Hz<br>380 to 480 VAC ± 15%<br>45 to 65 Hz<br>220 to 277 VAC ± 15%<br>45 to 65 Hz |
| <b>Rated operational power</b><br>DPB71CM23<br>DPB71CM48   | 13 VA @ 230 ΔVAC, 50 Hz<br>13 VA @ 400 ΔVAC, 50 Hz<br>Supplied by L1 and L3  |

## General Specifications

|   |  |                        |   |
|---|--|------------------------|---|
| <b>Power ON delay</b>   | 1 s ± 0.5 s or 6 s ± 0.5 s   | <b>Environment</b>     |   |
| <b>Reaction time</b><br>Incorrect phase sequence or total phase loss<br>Voltage level | < 200 ms<br>(input signal variation from -20% to +20% or from +20% to -20% of set value) | Degree of protection   | IP 20   |
| Alarm ON delay  | < 200 ms (delay < 0.1 s)   | Pollution degree       | 3   |
| Alarm OFF delay   | < 200 ms (delay < 0.1 s)   | Operating temperature  | -20 to 60°C, R.H. < 95%                                 |
| <b>Accuracy</b>   | (15 min warm-up time)  | Storage temperature    | -30 to 80°C, R.H. < 95%                                 |
| Temperature drift   | ± 1000 ppm/°C  | <b>Housing</b>         |   |
| Delay ON alarm  | ± 10% on set value ± 50 ms   | Dimensions             | 35.5 x 81 x 67.2 mm                                     |
| Repeatability   | ± 0.5% on full-scale   | Material               | PA66  |
| <b>Indication for</b>   |  | <b>Weight</b>          | Approx. 100 g   |
| Power supply ON   | LED, green   | <b>Screw terminals</b> |   |
| Alarm ON  | LED, red (flashing 2 Hz during delay time)   | Tightening torque      | Max. 0.5 Nm according to IEC 60947                      |
| Output relay ON   | LED, yellow  | <b>Approvals</b>       | UL, CSA   |
|   |  | <b>CE Marking</b>      | Yes   |
|   |  | <b>EMC</b>             |   |
|   |  | Immunity               | Electromagnetic Compatibility According to EN 61000-6-2 |
|   |  | Emissions              | According to EN 61000-6-3                               |

## Mode of Operation

Connected to the 3 phases (and neutral) DPB71 operates 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. 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

Adjust the input range setting the DIP switches 3 and 4 as shown below.

Select the desired function setting the DIP switches 1 and 2 as shown below. To access the DIP switches open the grey plastic cover

as shown below.

### Selection of level and time delay:

#### Upper knob:

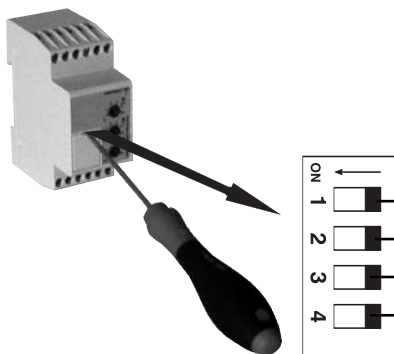
Setting of lower level on relative scale.

#### Centre knob:

Setting of upper level on relative scale.

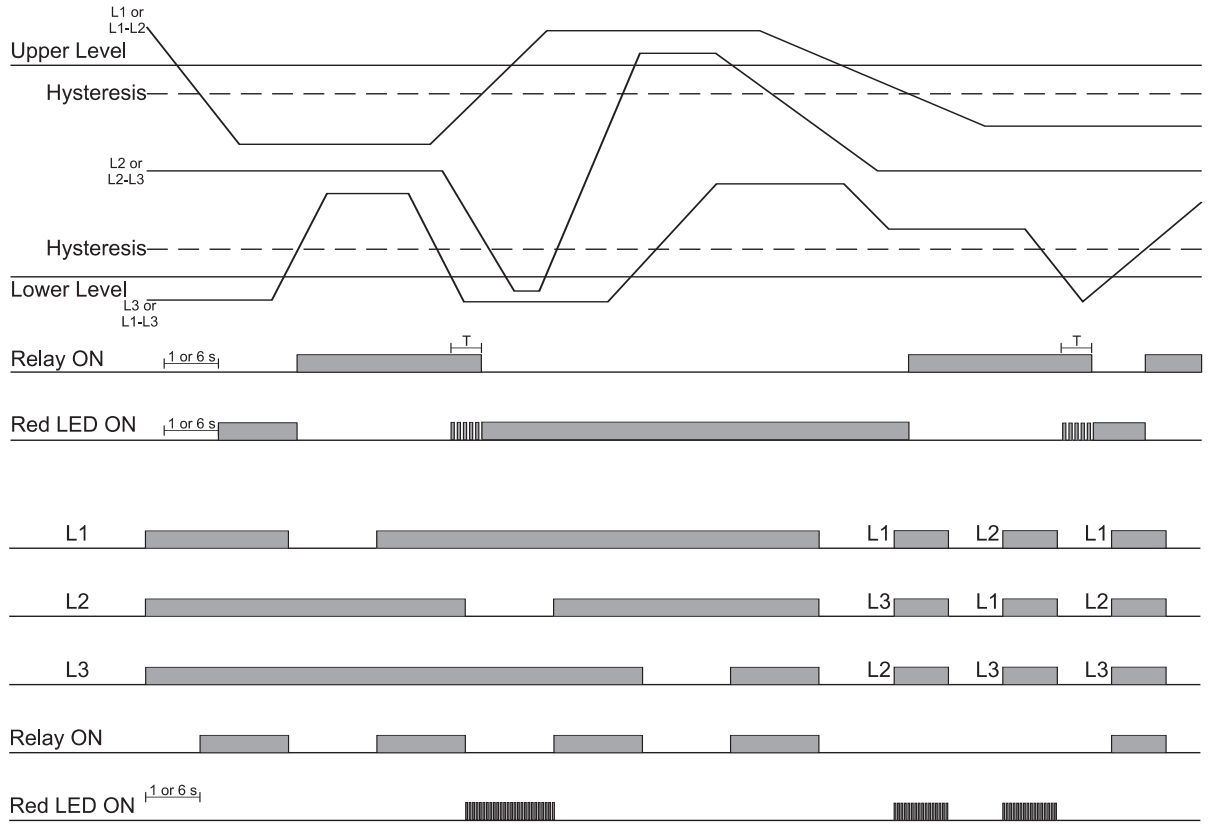
#### Lower knob:

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

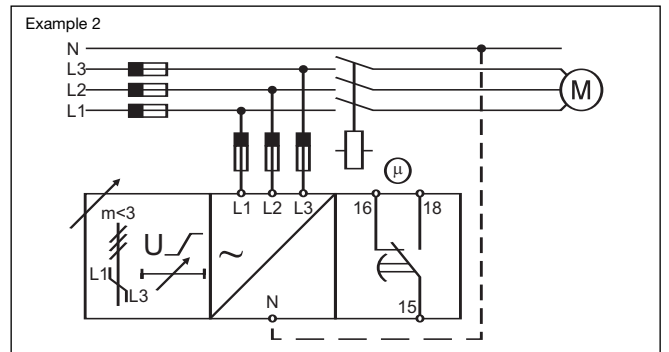
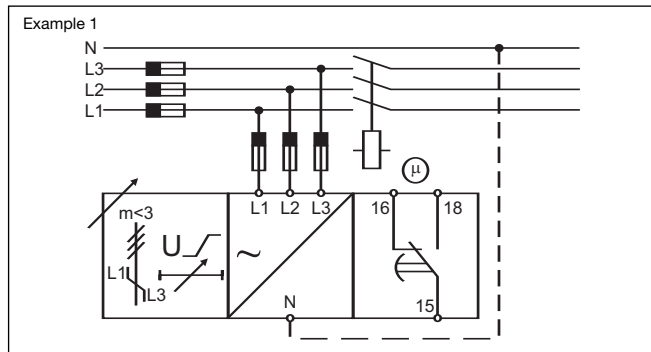


|                          |         |         |         |         |
|--------------------------|---------|---------|---------|---------|
| <b>Power ON delay</b>    |         |         |         |         |
| ON: 6 s ± 0.5 s          |         |         |         |         |
| OFF: 1 s ± 0.5 s         |         |         |         |         |
| <b>Monitored voltage</b> |         |         |         |         |
| ON: Phase-Neutral        |         |         |         |         |
| OFF: Phase-Phase         |         |         |         |         |
| <b>Measuring range</b>   |         |         |         |         |
| SW3                      | ON      | ON      | OFF     | OFF     |
| SW4                      | ON      | OFF     | ON      | OFF     |
| M23 Ph-Ph Voltage        | 208 VAC | 220 VAC | 230 VAC | 240 VAC |
| M48 Ph-Ph Voltage        | 380 VAC | 400 VAC | 415 VAC | 480 VAC |
| M48 Ph-N Voltage         | 220 VAC | 230 VAC | 240 VAC | 277 VAC |

## Operation Diagrams



## Wiring Diagrams



## Dimensions

