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

- **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	**DPB 71 C M23**	**DPB 71 C M48**

Input Specifications

Input	
L1, L2, L3, N	Terminals L1, L2, L3, N Measure on own supply
Measuring ranges	
208 to 240 Δ VAC	177 to 275 Δ VAC
380 to 480 Δ VAC	323 to 550 Δ VAC
Ranges	
Upper level	+2 to +22% of the nominal voltage
Lower level	-22 to -2% of the nominal voltage

Note: The input voltage must not exceed the maximum rated voltage or drop below the minumum rated voltage reported above.

Output Specifications

Output		SPDT relay
Rated insulation voltage		250 VAC
Contact ratings ($AgSnO_2$)		μ
Resistive loads	AC 1	5 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 5 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	(IEC 60664, IEC 60038)
through terminals:	L1, L2, L3, N
M23 - Delta Voltage:	208 to 240 VAC ± 15% 45 to 65 Hz
M48 - Delta Voltage:	380 to 480 VAC ± 15% 45 to 65 Hz
M48 - Star Voltage:	220 to 277 VAC ± 15% 45 to 65 Hz
Rated operational power	
DPB71CM23	13 VA @ 230 ΔVAC, 50 Hz
DPB71CM48	13 VA @ 400 ΔVAC, 50 Hz
	Supplied by L1 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
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
Operating temperature	-20 to 60°C, R.H. < 95%
Storage temperature	-30 to 80°C, R.H. < 95%
Housing dimensions	35.5 x 81.5 x 67 mm
Weight	Approx. 100 g
Screw terminals	
Tightening torque	Max. 0.5 Nm according to IEC 60947
Approvals	UL, CSA
CE Marking	Yes
EMC	Electromagnetic Compatibility
Immunity	According to EN 61000-6-2
Emissions	According to EN 50081-1

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)

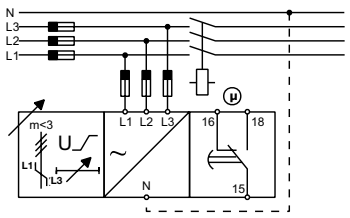
The relay monitors over and under voltage, phase loss and correct phase sequence.

Example 2
(load monitoring)

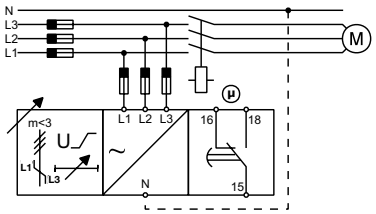
The relay releases in case of interruption of one or more phases, when one or more voltages drop below the lower set level or exceed the upper set level.

Wiring Diagrams

Example 1



Example 2



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.

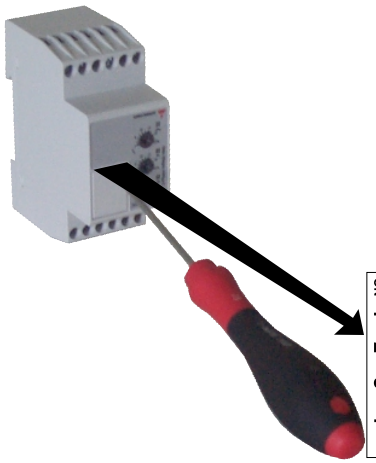
To access the DIP swiches open the grey plastic cover as shown below

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).



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

Monitored voltage
ON: Phase-Neutral
OFF: Phase-Phase

Measuring range

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