

Monitoring Relays

True RMS 3-Phase, 3-Phase+N, 1-Phase, Multif.

Type DPC02 B003



- TRMS 3-phase and 1-phase over and under voltage, over and under frequency monitoring relays
- 3-phase version with phase sequence and phase loss functions (detect when all 3 phases are present and have the correct sequence)
- According to ENEL DK 5950 (March 2002, ed. 1.1) (certified from TÜV laboratory)
- Suitable for applications according to ENEL DK 5940 (Aprile 2007, ed. 2.2)
- Detect if all the 3-phase-phase or phase-neutral voltages are within the set limits
- Detect if the system frequency is between the set limits
- Adjustable recovery delay (0.1 to 30 s)
- Output: 2 x 8 A SPDT relays
- For mounting on DIN-rail in accordance with DIN/EN 50 022
- 45 mm Euronorm housing
- LED indication for relays, alarm and power supply ON

Product Description

3-phase (or 3-phase+neutral) and 1-phase line voltage monitoring relays for over and under voltage, over and under frequency with built-in time delay function. 3-phase version with phase sequence and phase loss functions. The main application is for sun generator sets.

Ordering key **DPC 02 D M48 B003**

Housing _____
Function _____
Type _____
Item number _____
Output _____
Power Supply _____
Special version _____

Type Selection

Mounting	Version	Output	Supply: 208 to 240 VAC	Supply: 380 to 415 VAC
DIN-rail	1-phase	2 x SPDT	DPC 02 D M23 B003	DPC 02 D M48 B003
DIN-rail	3-phase	2 x SPDT		

Input Specifications

Input	A1, A2	DPC02DM23B003 Terminals A1, A2 Measure on own supply
	L1, L2, L3, N	DPC02DM48B003 Terminals L1, L2, L3, N Measure on own supply
Note: Connect the neutral only if it is intrinsically at the star centre		
Preset values (voltage)		
Lower setpoint		DPC02DM23B003 184 VAC $\pm$ 5%
Upper setpoint		276 VAC $\pm$ 5%
Lower setpoint		DPC02DM48B003 320 Δ VAC $\pm$ 5%
Upper setpoint		480 Δ VAC $\pm$ 5%
Measuring range (frequency) Selectable by DIP-switches		
0.3 Hz range (preset value)		
Lower setpoint		49.7 Hz $\pm$ 50 mHz
Upper setpoint		50.3 Hz $\pm$ 50 mHz
1 Hz range		
Lower setpoint		49 Hz $\pm$ 50 mHz
Upper setpoint		51 Hz $\pm$ 50 mHz

Input Specifications (cont.)

Hysteresis (frequency)	
0.3 Hz range	$\sim$ 0.05 Hz
1 Hz range	$\sim$ 0.25 Hz

Output Specifications

Output	2 x SPDT relays N.E.
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	$\geq$ 30 x 10 ⁶ operations
Electrical life	$\geq$ 10 ⁵ operations (at 8 A, 250 V, cos φ = 1)
Operating frequency	$\leq$ 7200 operations/h
Dielectric strength	
Dielectric voltage	$\geq$ 2 kVAC (rms)
Rated impulse withstand volt.	4 kV (1.2/50 μ s)

Output Specifications

Relay output Terminals 11, 12, 13 / 8, 9, 10	1 x DPDT N.E. Voltage/frequency related (both outputs release in case of phase loss or wrong phase sequence)	RS485 Type	Multidrop, bidirectional (static and dynamic variables)
Relay contact ratings (AgSnO ₂)	μ	Connections	2-wire (terminals 31, 32, 33)
Resistive loads AC 1	8 A @ 250 VAC	Addresses	255, selectable
DC 12	5 A @ 24 VDC	Protocol	MODBUS/JBUS (RTU)
Small inductive loads AC 15	2.5 A @ 250 VAC	Data (bidirectional)	Dynamic
DC 13	2.5 A @ 24 VDC		Static
Relay mechanical life	≥ 30 x 10 ⁶ operations	Data format	Reading only Reading/writing 1 start bit, 8 data bit, 1 parity bit (even, odd or none (default) control), 1 stop bit
Relay electrical life	≥ 10 ⁵ operations (at 8 A, 250 V, cos φ = 1)	Speed	9600 (default) or 4800 bit/s, selectable
Relay operating frequency	≤ 7200 operations/h	Driver input impedance	1/5 unit load, max. 160 devices on the same bus

Supply Specifications

Power supply	Overvoltage cat. III
Rated operational voltage through terminals:	(IEC 60664, IEC 60038) 55, 53, 51
Delta Voltage:	380 to 415 VAC ± 15% 45 to 65 Hz
Rated operational power	8 VA Supplied by L2 and L3

Mode of Operation

Connected to the 3 power supply, DPC72 B001 operates when the frequency and the voltage of the mains are within the setpoints. The setpoints are freely modifiable by entering the programming procedure. Every failure is detected through the DPDT output relay.

General Specifications

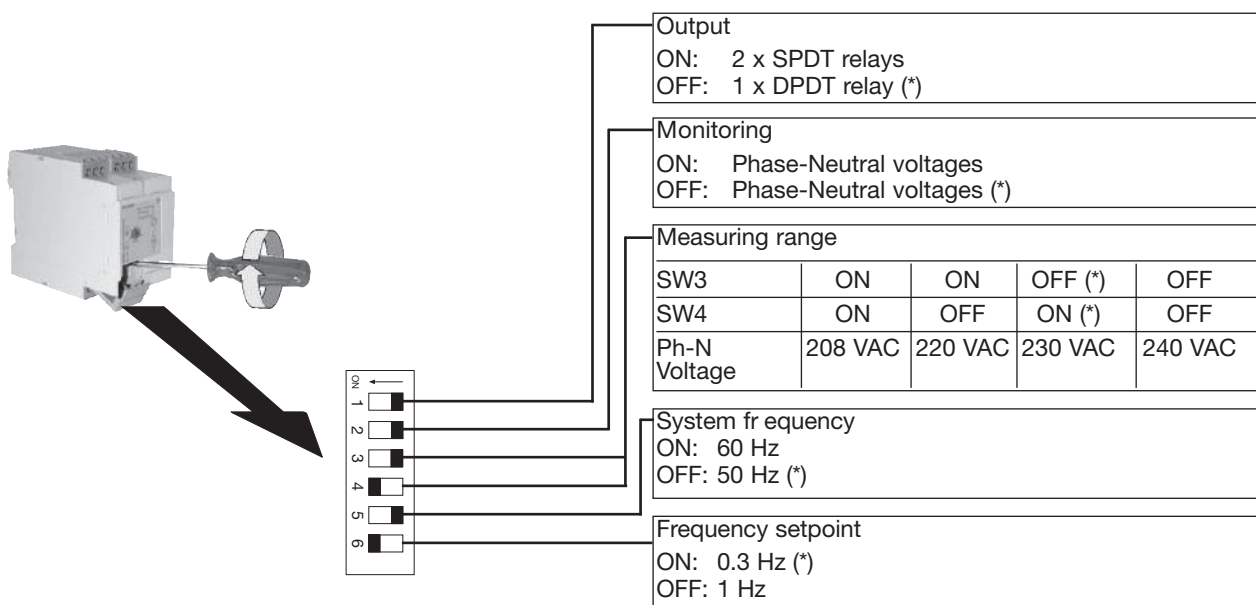
Timings		Accuracy (Display + RS 485)	(@25 °C ±5 °C, R.H. < 60%, 45 to 65 Hz)
Power ON delay (T0)		Voltage	± (0.5 % RDG + 1 DGT)
Range	1 to 6 s	Frequency	± 0.01 Hz (45 to 65 Hz)
Step adjustment	1 s	Derivative frequency	± 0.01 Hz/s (45 to 65 Hz)
Preset value	1 s	Temperature drift	< 200 ppm/°C
Upper (T1) and lower (T2) voltage delay on alarm		Insulation	
Range	0.05 to 1 s	Input to relays output	4 kV (1.2/50 μs), ≥ 2 kVAC (rms)
Step adjustment	0.05 s	Input to RS485 port	4 kV (1.2/50 μs), ≥ 2 kVAC (rms)
Preset value	0.05 s	RS485 port to relays output	4 kV (1.2/50 μs), ≥ 2 kVAC (rms)
Upper (T3) and lower (T4) frequency delay on alarm		LED indication	Red LED
Range	0.05 to 1 s	Flashing 5 Hz	During voltage, frequency and derivative frequency delay ON alarm times
Step adjustment	0.05 s	Flashing 10 Hz	For wrong phase sequence connection (note: the device is provided with the phase sequence monitoring not enabled)
Preset value	0.05 s	Steady	During alarm status (DPDT output released)
Derivative frequency delay on alarm (T5)		Environment	(EN 60529)
Range	0.05 to 1 s	Degree of protection	
Step adjustment	0.05 s	Front	IP50
Preset value	0.05 s (if the monitoring is enabled)	Screw terminals	IP20
Incorrect phase sequence or total phase loss		Pollution degree	3
Alarm ON delay	< 50 ms ± 15 ms (if the monitoring is enabled, no other adjustment is allowed)	Operating temperature	
		8A output	-20 to +50°C, R.H. < 95%
		5A output	-20 to +60°C, R.H. < 95%
		Storage temperature	-30 to +80°C, R.H. < 95%

Function/Range/Level/Time Setting

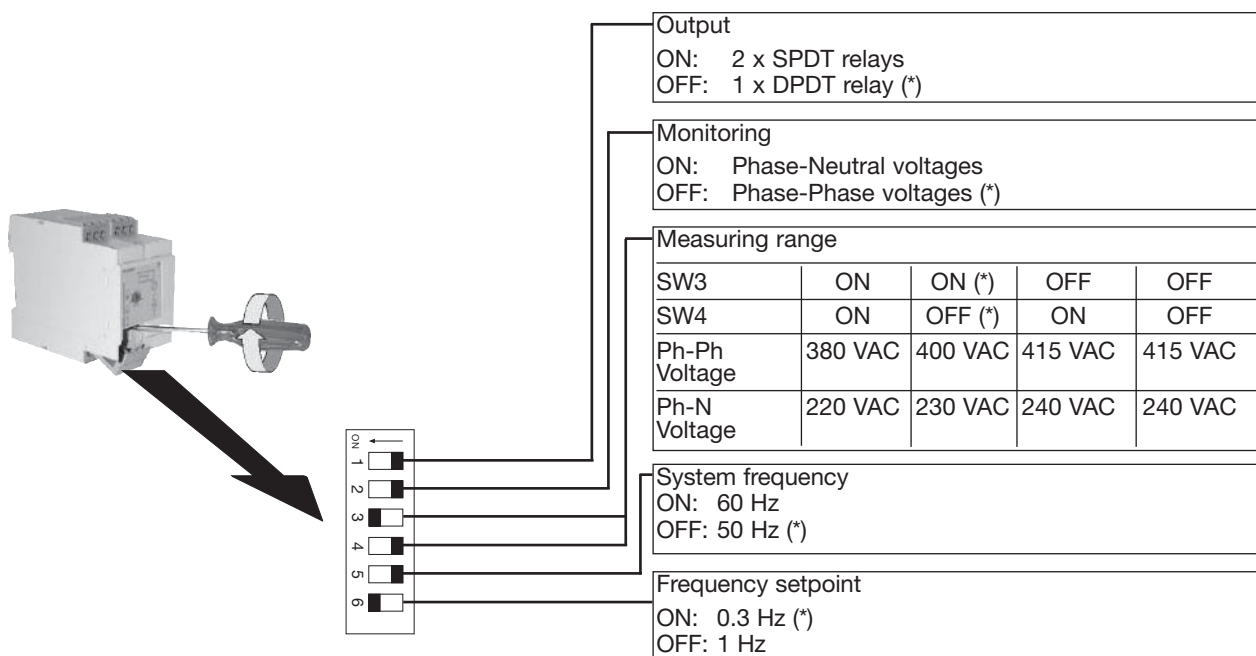
The DIP-switches are preset to submit to the DK 5940 ENEL regulation (Aprile 2007, ed.2.2). Other adjustments range are possible as shown below.

To access the DIP-switches open the plastic cover using a screwdriver as shown below.

MPC 02 D M23 B003 (1-Phase version)



MPC 02 D M48 B003 (3-Phase version)

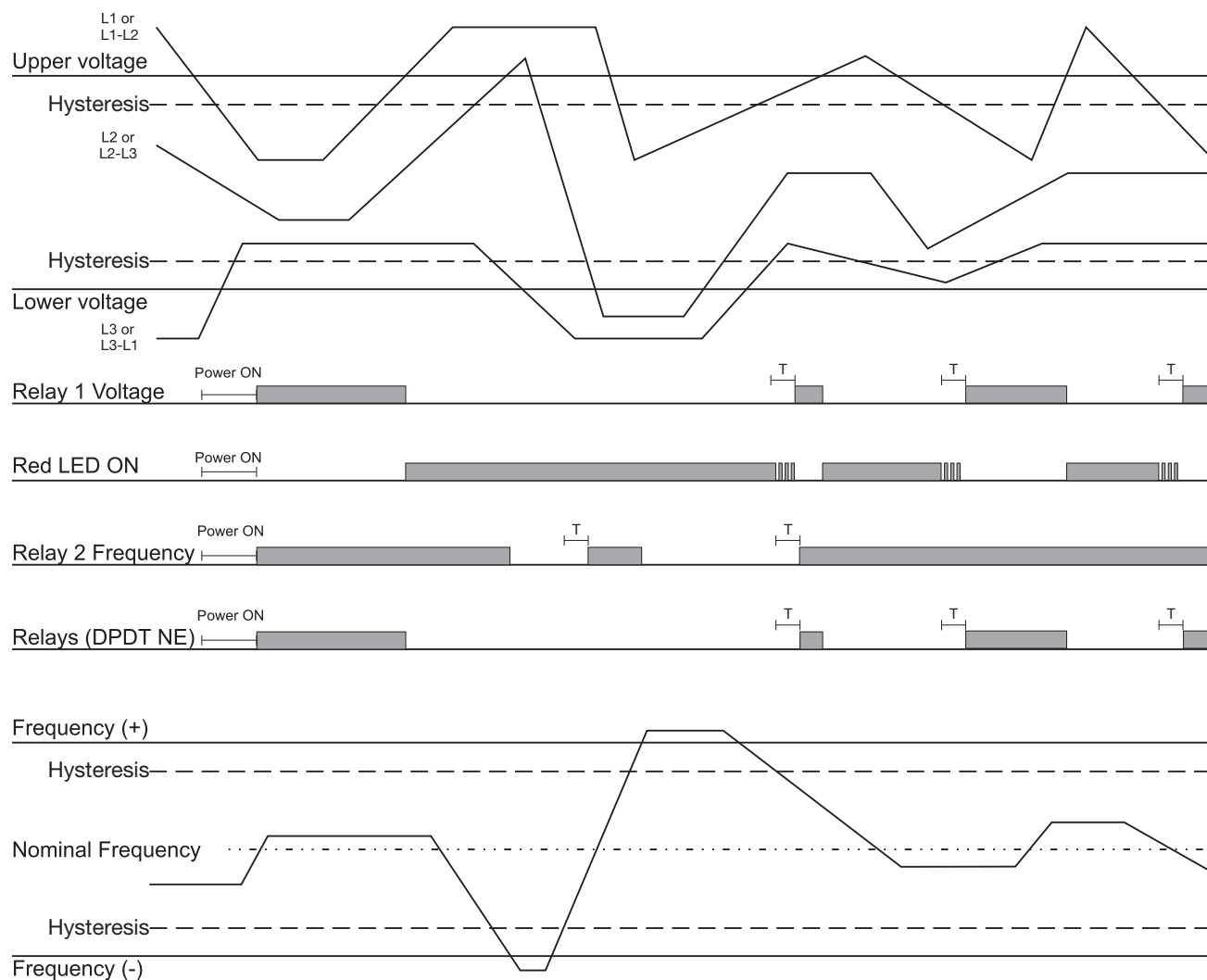


(*) Preset positions to be according to ENEL DK 5940 (Aprile 2007, ed.2.2).

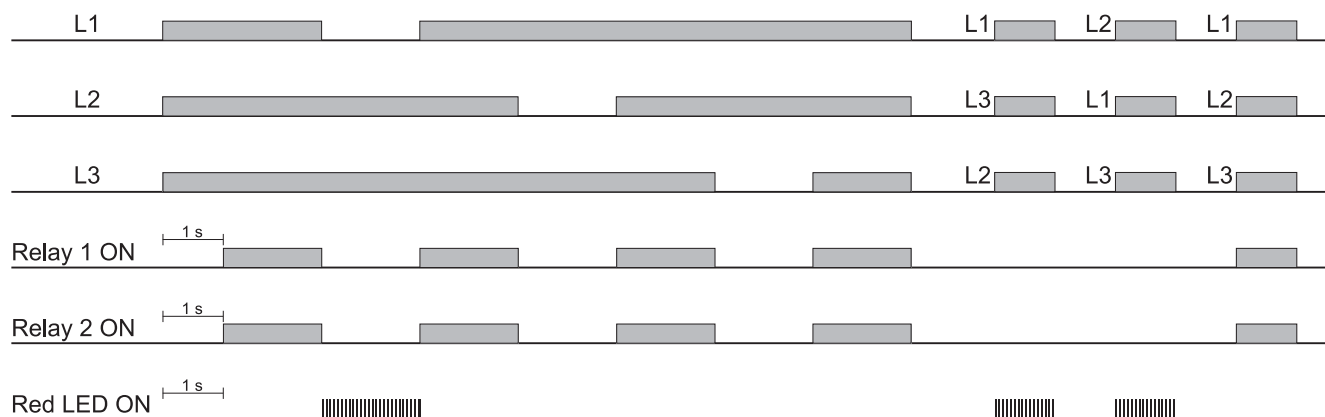
DPC02DM48B003: if present, connect the neutral and set ON the DIP switch n°2.

Operation Diagrams

DPC02DM48B003 (3-Phase version)

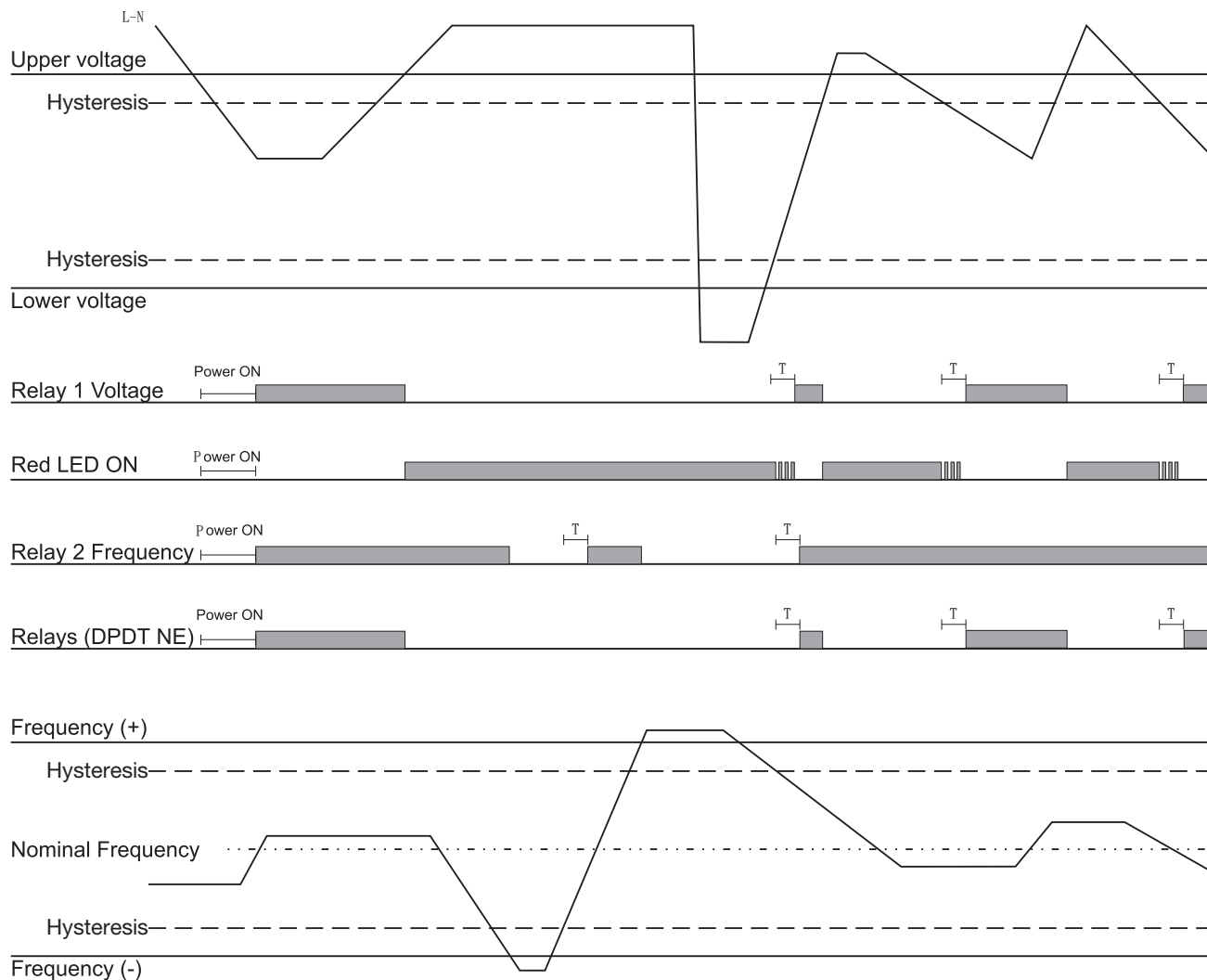


Phase sequence, total phase loss



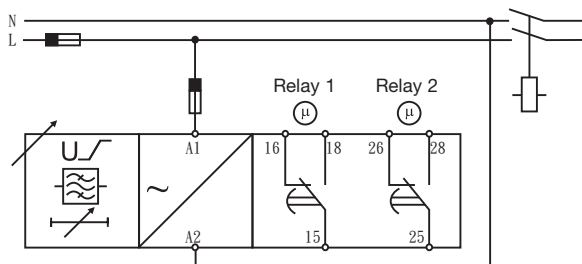
Operation Diagrams (cont.)

DPC02DM23B003 (1-Phase version)



Wiring Diagrams

DPC 02 D M23 B003



DPC 02 D M48 B003

