Monitoring Relays
Digital, True RMS 3-Phase, Multifunction
Type DPC72 B002

- **For mounting on DIN-rail in accordance with DIN/EN 50 022**
- **Dimensions: 4-DIN modules**
- **Sealable housing**
- **Free configuration and reading software**

- **Digital TRMS 3-phase (+ N) over and under voltage, voltage quality, over and under frequency, phase sequence and phase loss monitoring relay**
- **Certified by TÜV according to VDE 0126-1-1**
- **Detects when all 3 phases and neutral are present and have the correct sequence**
- **Detects if all the 3-phase-phase or phase-neutral voltages are within the set limits**
- **Detects if the system frequency is between the set limits**
- **Monitoring of voltage quality (10-min average)**
- **Measures its own power supply voltage**
- **Front joystick configuration**
- **Istantaneous variables readout: 4 DGT**
- **Event counter and data logger**
- **Autotest function**
- **Last 10 events recording (date, time, cause)**
- **Output: 1 x 8 A relay DPDT**
- **RS485 serial port (MODBUS-RTU)**
- **LED indication for alarm status**

Product Description

Digital 3-phase (+ N) voltage monitoring relay for phase sequence, phase loss, over and under voltage, over and under frequency.
Joystick configuration and LCD data displaying.
Relay outputs and RS485 communication port. Recording of the last 10 events.
Supply range from 380 to 415 VAC L-L.

Ordering key

DPC 72 D M48 B002

- **Housing**
- **Function**
- **Type**
- **Item number**
- **Output**
- **Power supply**
- **Special version**

Type Selection

Mounting	Output	Communication port	Supply: 380 to 415 VAC
DIN-rail	DPDT	RS 485	**DPC 72 D M48 B002**

Input Specifications

Input	
L1, L2, L3, N	Terminals 55, 53, 51, 57 Measures its own supply
Nominal voltage	400 VAC L-L, 230 VAC L-N
Voltage setpoints	
Lower setpoint	
Range	320 to 400 VAC L-L, 185 to 230 VAC L-N
Step adjustment	1 VAC
Preset value	320 VAC L-L, 185 VAC L-N
Upper setpoint	
Range	400 to 480 VAC L-L 230 to 277 VAC L-N
Step adjustment	1 VAC
Preset value	460 VAC L-L, 265 VAC L-N
Hysteresis	12V
Voltage quality setpoints	Floating average
Upper setpoint	
Range	440 to 460 VAC L-L 254 to 265 VAC L-N
Step adjustment	1 VAC
Preset value	440 VAC L-L, 254 VAC L-N
Lower setpoint	None
Integration time	
Range	1 to 30 min.
Step adjustment	1 min.
Preset value	10 min.

System frequency	50 Hz, 60 Hz
Frequency setpoints	
Lower setpoint	
Range	45 to 65 Hz
Step adjustment	0.1 Hz
Preset value	47.5 Hz
Upper setpoint	
Range	45 to 65 Hz
Step adjustment	0.1 Hz
Preset value	50.2 Hz
Hysteresis	0.1 Hz
Display	
Type	LCD, h 7 mm 3 lines (1 x 8 DGT, 2 x 4 DGT)
Istant. variables read-out	4 DGT
Max. indication	9999
Min indication	0.000
Overload/underload status	
Voltage and frequency	EEE / -EEE indication when the value exceeds the max./min.measurement capacity
Voltage quality	EEE indication when the value exceeds the max measurement capacity
Display refresh time	750 ms

Output Specifications

Relay output	1 x DPDT N.E.
Terminals 11, 12, 13 / 8, 9, 10	Voltage/frequency related (both outputs release in case of phase loss or wrong phase sequence)
Relay 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
Relay mechanical life	≥ 30 x 10^6 operations
Relay electrical life	≥ 10^5 operations (at 8 A, 250 V, cos φ = 1)
Relay operating frequency	≤ 7200 operations/h

RS485	
Type	Multidrop, bidirectional (static and dynamic variables)
Connections	2-wire (terminals 31, 32, 33)
Addresses	255, selectable
Protocol	MODBUS/JBUS (RTU)
Data (bidirectional)	
Dynamic	Reading only
Static	Reading/writing
Data format	1 start bit, 8 data bit, 1 parity bit (even, odd or none (default) control), 1 stop bit
Speed	9600 (default) or 4800 bit/s, selectable
Driver input impedance	1/5 unit load, max. 160 devices on the same bus

Supply Specifications

Power supply	Overvoltage cat. III (IEC 60664, IEC 60038)
Rated operational voltage through terminals:	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-phase power supply, DPC72 B002 operates when the frequency and the voltage of the mains are within the setpoints.
The setpoints are freely modifiable by entering the programming procedure, before sealing the relevant selector. After sealing no modification can be carried out.
Every failure is detected through the DPDT output relay.

General Specifications

Timings	
Power ON delay	
Range	1 to 6 s
Step adjustment	1 s
Preset value	1 s
Power ON connection time	30 s, fixed
Upper and lower voltage delay on alarm	0.05 s to 1 s
Upper and lower frequency delay on alarm	0.05 s to 1 s
Voltage quality	< 0.05 s, fixed
Incorrect phase sequence or total phase loss	
Alarm ON delay	< 50 ms ± 15 ms (if the monitoring is enabled)
Recovery time	
Upper/lower voltage and frequency	
Setpoints exceeding: < 3 s	
Range	0 to 30 s
Step adjustment	1 s
Preset value	5 s
Setpoint exceeding: > 3 s	
Range	0 to 180 s
Step adjustment	1 s
Preset value	30 s
Voltage quality	
Range	0 to 180 s
Step adjustment	1 s
Preset value	30 s

Accuracy (Display + RS 485)	(@25 °C ±5 °C, R.H. < 60%, 45 to 65 Hz)
Voltage	± (0.5 % RDG + 1 DGT)
Frequency	± 0.01 Hz (45 to 65 Hz)
Temperature drift	< 200 ppm/°C
Insulation	
Input to relays output	4 kV (1.2/50 µs), ≥ 2 kVAC (rms)
Input to RS485 port	4 kV (1.2/50 µs), ≥ 2 kVAC (rms)
RS485 port to relays output	4 kV (1.2/50 µs), ≥ 2 kVAC (rms)
LED indication	Red LED
Flashing 5 Hz	During voltage and frequency recovery time
Flashing 10 Hz	For wrong phase sequence connection (note: the device is provided by factory default with the phase sequence monitoring not enabled)
Steady	During alarm and power ON status (DPDT output released)
Environment	(EN 60529)
Degree of protection	
Front	IP50
Screw terminals	IP20
Pollution degree	3
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%

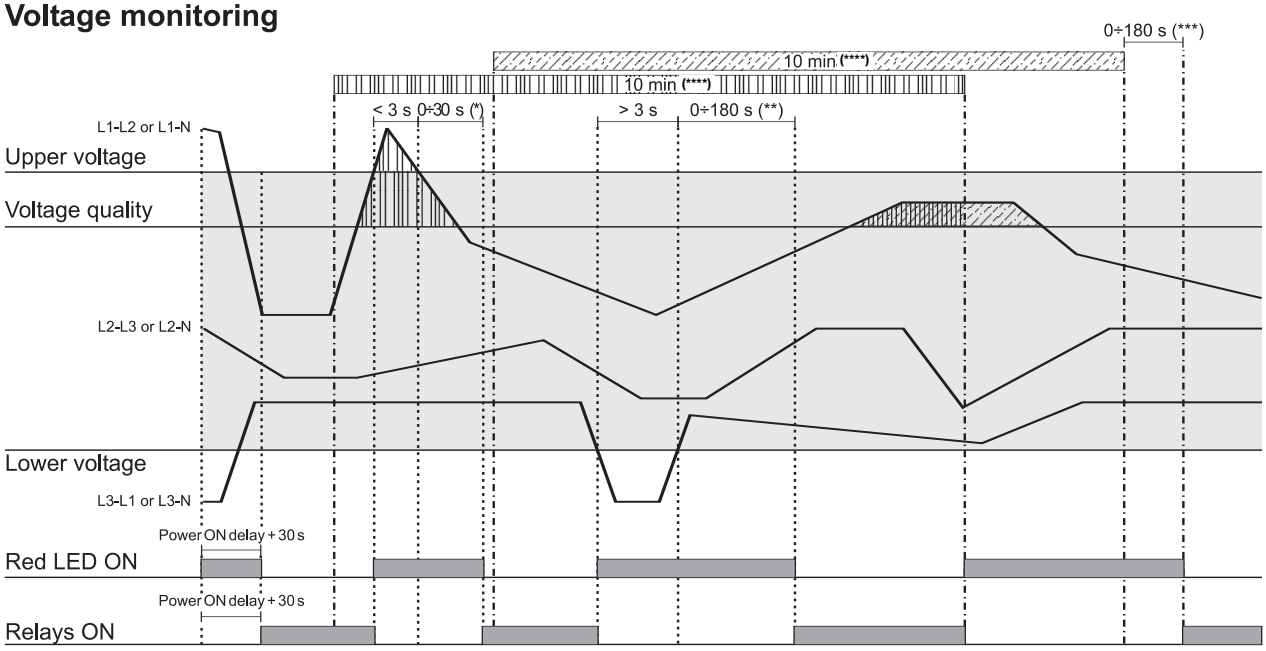
General Specifications (cont.)

Housing	
Dimensions	71.6 x 90 x 66.3 mm
Material	PA66
Weight	Approx. 300 g
Screw terminals	
Tightening torque	Min 0.4 Nm, Max. 0.8 Nm

Approvals	VDE 0126-1-1
CE Marking	Yes
LVD	According to EN 61010-1
EMC	Electromagnetic Compatibility
Immunity	According to EN 61000-6-2
Emissions	According to EN 61000-6-3

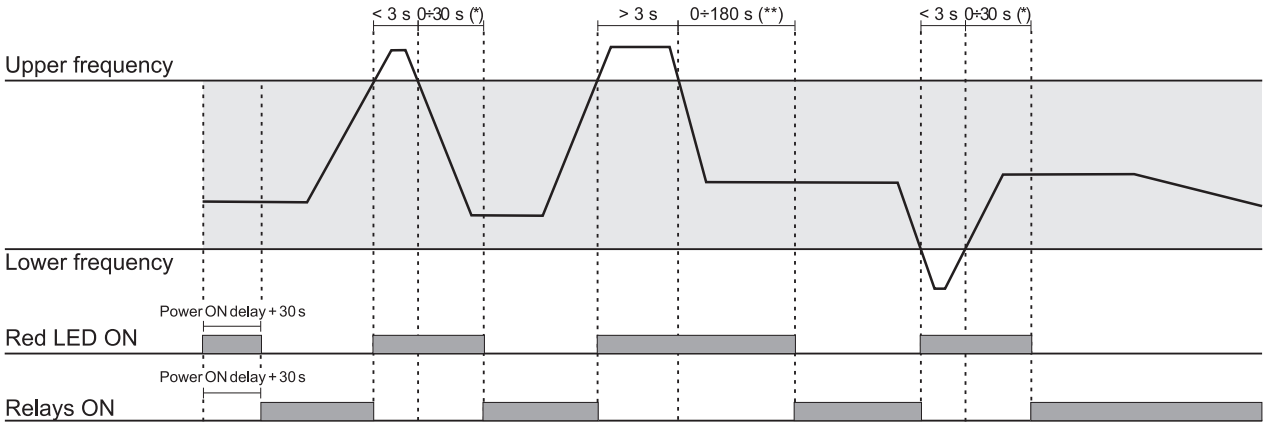
Operation Diagrams

Voltage monitoring



(*) Default: 5 seconds
(**) Default: 30 seconds
(***) Default: 0 seconds
(****) 1 to 30 min.; default: 10 min.

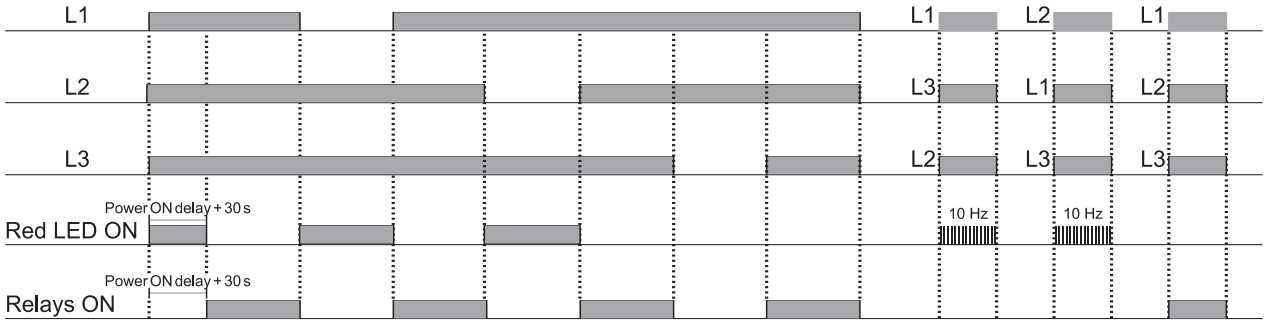
Frequency monitoring



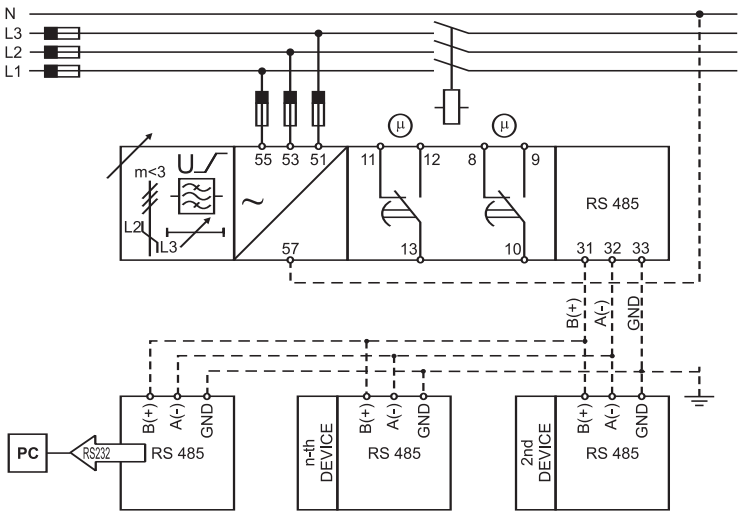
(*) Default: 5 seconds
(**) Default: 30 seconds

Operation Diagrams (Cont.)

Phase sequence and phase loss monitoring



Wiring Diagram



Dimensions