# **DPA51**



## True RMS 3-Phase voltage monitoring relay



#### Benefits

- Wide voltages ranges. Working in systems from 208 to 480 VAC
- Output and status LED indication. For quick troubleshooting.
- Regenerated voltage detection. To detect phase loss even while the motor is running.
- High Compactness. 17.5 mm DIN rail housing.

## Description

DPA51 is a 3-phase mains monitoring relay. It operates on 3P systems, monitoring phase loss and phase sequence.

Power supply provided by the monitored mains. For mounting on DIN-rail.

# Applications

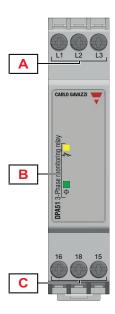
DPA51 offers solutions for a wide range of applications: lifts, escalators, HVAC, material handling, pumps, compressors and mobile machinery installations.

#### Main features

- Monitoring 3-phase mains with 3 wires (3P).
- Detection of the correct phase sequence and phase loss.
- · Changeover relay output.



# Structure



Element	Component	Function
Α	Input terminals	Connection of the line voltages
В	Information LED	Yellow for relay output status Green for device ON
С	Output terminals	SPDT relay output

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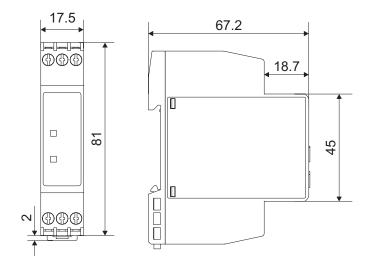


# **Features**

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## General

Material	Polyamide (Nylon) or Phenylene ether + Polystyrene
Colour	RAL7035 (light grey)
Dimensions (W x H x D)	17.5mm x 81mm x 67.2mm
Protection degree	IP20
Weight	75 g
Terminals	Cable size from 0.05mm² to 2.5mm² (AWG30 to AWG13), stranded or solid
Tightening torque	Max. 0.5Nm (4.425lb.in)
Terminal type	Screw terminals



## Power supply

Power supply	Supplied by measured phases
Overvoltage category	III (IEC 60038)
Voltage range	208 to 480 VAC ±15% (177 V to 552 V)
Frequency range	50Hz to 60Hz ±10% sinusoidal waveform
Consumption	< 13 VA



# **Environmental**

Operating temperature	-20° C to 60° C (-4° F to 140° F)
Storage temperature	-30° C to 80° C (-22° F to 176° F)
Relative humidity	5-95% non condensing
Pollution degree	2
Operating max altitude	2000 m amsl (6560ft)
Salinity	Non saline environment
UV resistance	No

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#### Vibration/Shock resistance

Test condition	Test	Level
	Vibration response (IEC60255-21-1)	Class 1
Tooto with uppocked device	Vibration endurance (IEC 60255-21-1)	Class 1
Tests with unpacked device	Shock (IEC 60255-21-2)	Class 1
	Bump (IEC 60255-21-2)	Class 1
	Vibration random (IEC60068-2-64)	Class 1
Tests with packed device	Shock (IEC 60255-21-2)	Class 1
	Bump (IEC 60255-21-2)	Class 1

Class 1: monitoring devices for normal use in power plants, substations and industrial plants and for normal transportation conditions.

The packaging type is designed and implemented in such manner that the severity class parameters will not be exceeded during transportation.



### Compatibility and conformity

CE-marking	According to EN 60947-5-1. Complies to European LV directive 2014/35/EU and EMC directive 2014/30/EU: Immunity according to EN61000-6-2; Emissions according to EN61000-6-3
Approvals	CUL US (UL 508) (GB/T14048.5)



## Inputs

Measuring ranges	
	Phase sequence
Measured variables	Phase loss
	Voltages V <sub>L12</sub> , V <sub>L23</sub> , V <sub>L31</sub>
Nominal line range	208 VAC to 480 VAC ±15% (177 VAC to 552 VAC)



### **Outputs**

Number of outputs	1
Туре	SPDT electromechanical relay with change-over contacts
Logic	Output de-energized on alarm
Contact rating	AC1: 5 A @ 250 VAC AC15: 2.5 A @ 250 VAC DC12: 5 A @ 24 VDC DC13: 2.5 A @ 24 VDC
Electrical lifetime	≥50 x10³ operations (at 8 A, 250 V, cos φ= 1)
Mechanical lifetime	>30 x 10 <sup>6</sup> operations
Assignment	Associated to all alarm types

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#### Insulation

Terminals	Basic insulation
Inputs: L1, L2, L3 to Output: 12, 14, 11	2.5kVrms, 4kV impulse 1.2/50µs (basic)



## **Operating description**

### ► Device configuration

The relay is energized when all the phases are present and the phase sequence is correct.

#### ► Alarms

- Phase loss and incorrect phase sequence cause immediate output relay de-energisation.

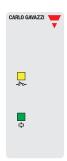
Phase loss alarm	
Input variables	Voltage measurements L1-L2, L2-L3 and L3-L1
Alarm setpoint	One phase ≤85% of the rated value (regeneration voltage detection)
Restore setpoint	All phases >85% of the rated value
Delay ON	< 100 ms
Delay OFF	< 300 ms

Phase sequence alarm	
Input variables	Connection L1, L2, L3
Reaction time	≤ 200 ms
Delay ON	< 100 ms
Delay OFF	< 300 ms

#### **▶** Visual information

DPA51 features 2 front LEDs which provide operation status information.

- Green LED is ON when the power supply is present.
- Yellow LED is ON when the output relay is energised.





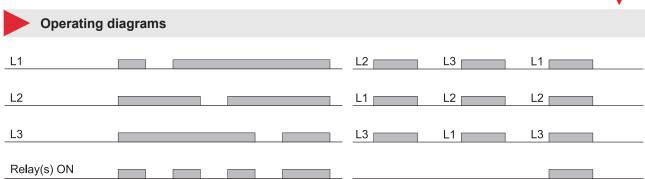
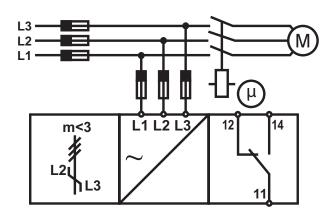


Fig. 1 Total phase loss, phase sequence

# **Connection Diagram**



# References





DPA51CM44



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