

# 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.

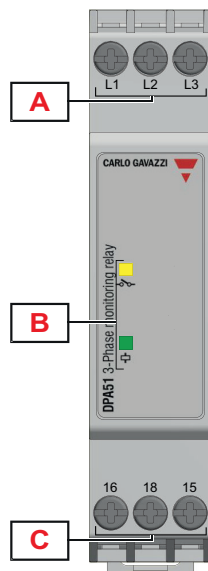
### Applications

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

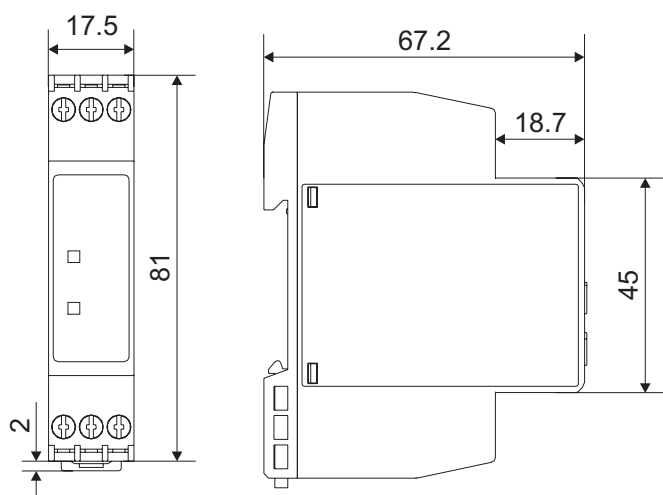


Element	Component	Function
A	Input terminals	Connection of the line voltages
B	Information LED	Yellow for relay output status Green for device ON
C	Output terminals	SPDT relay output

## Features

### General

<b>Material</b>	Polyamide (Nylon) or Phenylene ether + Polystyrene
<b>Colour</b>	RAL7035 (light grey)
<b>Dimensions (W x H x D)</b>	17.5mm x 81mm x 67.2mm
<b>Protection degree</b>	IP20
<b>Weight</b>	75 g
<b>Terminals</b>	Cable size from 0.05mm <sup>2</sup> to 2.5mm <sup>2</sup> (AWG30 to AWG13), stranded or solid
<b>Tightening torque</b>	Max. 0.5Nm (4.425lb.in)
<b>Terminal type</b>	Screw terminals



### Power supply

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

### Environmental

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





## Vibration/Shock resistance

Test condition	Test	Level
Tests with unpacked device	Vibration response (IEC60255-21-1)	Class 1
	Vibration endurance (IEC 60255-21-1)	Class 1
	Shock (IEC 60255-21-2)	Class 1
	Bump (IEC 60255-21-2)	Class 1
Tests with packed device	Vibration random (IEC60068-2-64)	Class 1
	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	 (UL508)   (GB/T14048.5)

## Inputs

Measuring ranges	
Measured variables	Phase sequence Phase loss Voltages $V_{L12}$ , $V_{L23}$ , $V_{L31}$
Nominal line range	208 VAC to 480 VAC $\pm 15\%$ (177 VAC to 552 VAC)

## Outputs

Number of outputs	1
Type	SPDT electromechanical relay with change-over contacts
Logic	Output de-energized on alarm
Contact rating	<b>AC1:</b> 5 A @ 250 VAC <b>AC15:</b> 2.5 A @ 250 VAC <b>DC12:</b> 5 A @ 24 VDC <b>DC13:</b> 2.5 A @ 24 VDC
Electrical lifetime	$\geq 50 \times 10^3$ operations (at 8 A, 250 V, $\cos \varphi = 1$ )
Mechanical lifetime	$> 30 \times 10^6$ operations
Assignment	Associated to all alarm types

## 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 $\leq 85\%$ 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	$\leq 200$ 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.



## Operating diagrams

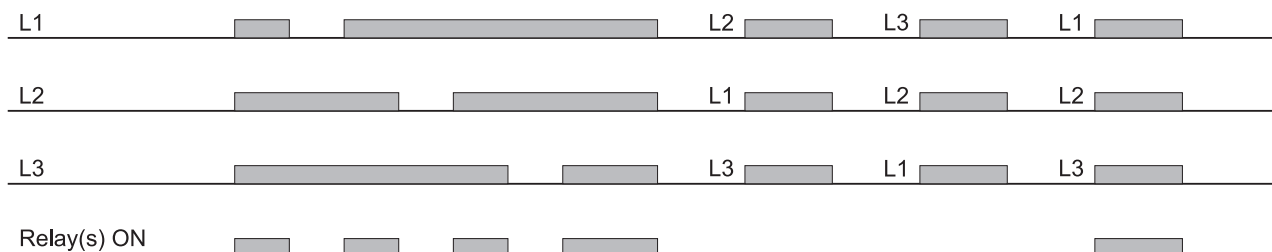
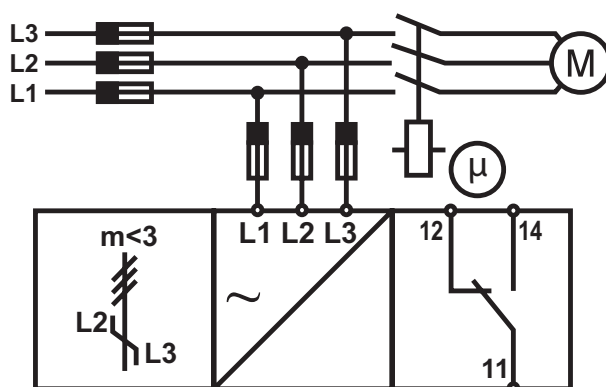


Fig. 1 Phase sequence, total phase loss

## Connection Diagram



## References

### Order code



DPA51CM44



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