

# DPA51, DPA71



## True RMS 3-Phase voltage monitoring relay



### Benefits

- **Wide voltage range.** Working in systems from 208 to 480 V AC.
- **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 (DPA51) and 35.5 mm (DPA71) DIN-rail housing.

### Description

DPA51 and DPA71 are 3-phase mains monitoring relays.

They operate on 3P systems, monitoring phase loss and phase sequence.

Power supply provided by the monitored mains.

For mounting on DIN-rail.

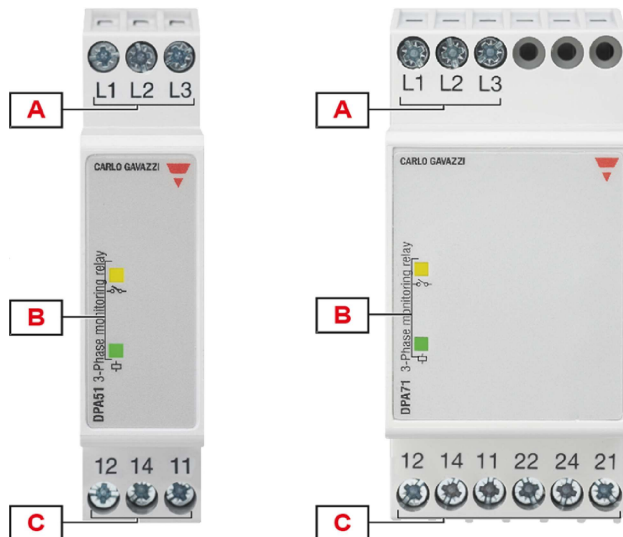
### Applications

DPA51 and DPA71 offer 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.
- Change-over relay output.

## Structure

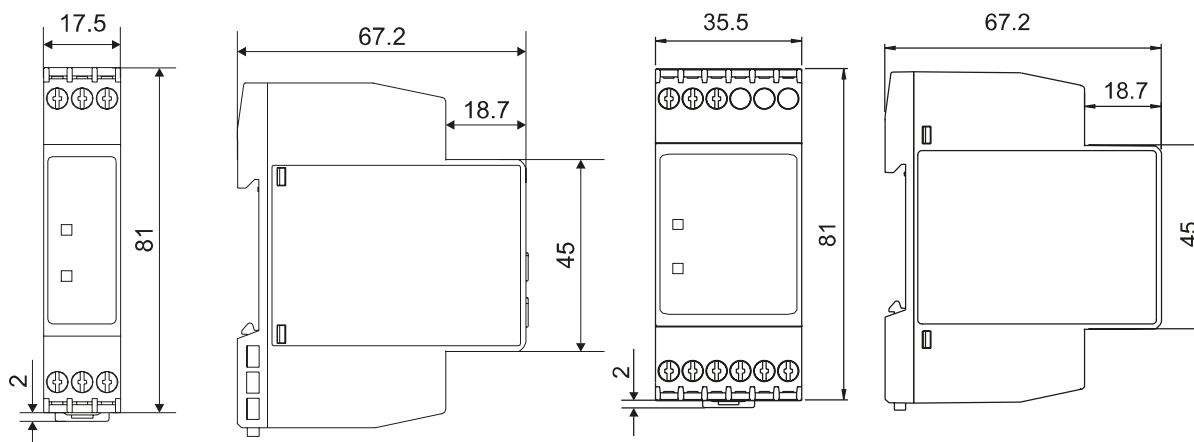


Element	Component	Function
A	Input terminals	Connection of the line voltages
B	Information LED	Yellow for relay output status Green for device ON
C	Output terminals	SPDT relay output (DPA51) DPDT relay output (DPA71)

## 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>	DPA51: 17,5mm x 81mm x 67,2mm DPA71: 35,5mm x 81mm x 67,2mm
<b>Protection degree</b>	IP20
<b>Weight</b>	DPA51: 75 g DPA71: 150 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. 0.5 Nm (4.425 lb.in)
<b>Terminal type</b>	Screw terminals



### Power supply

<b>Power supply</b>	Supplied by measured phases (L2, L3)	
<b>Overvoltage category</b>	III (IEC 60664)	
<b>Voltage range</b>	<b>M23</b>	208 to 240 V <sub>L-L</sub> AC ±15%
	<b>M44</b>	208 to 480 V <sub>L-L</sub> AC ±15%
	<b>M48</b>	380 to 480 V <sub>L-L</sub> AC ±15%
<b>Frequency range</b>	50 to 60 Hz ±10% sinusoidal waveform	
<b>Consumption</b>	<b>M23</b>	< 6 VA
	<b>M44</b>	< 13 VA
	<b>M48</b>	< 10 VA

## Environmental

<b>Operating temperature</b>	DPA51: -20°C to 60°C (-4°F to 140°F)
	DPA71: -20°C to 50°C (-4°F to 122°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
<b>Tests with unpacked device</b>	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
<b>Tests with packed device</b>	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

<b>CE-marking</b>	 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
<b>Approvals</b>	   (GB/T14048.5) (DPA51 only)

## Inputs

Measured variables	Phase sequence	
	Phase loss 3P: voltages $V_{L12}$ , $V_{L23}$ , $V_{L31}$	
Nominal line range	M23	208 to 240 V AC $\pm 15\%$ (177 to 275 V AC)
	M44	208 to 480 V AC $\pm 15\%$ (177 to 550 V AC)
	M48	380 to 480 V AC $\pm 15\%$ (323 to 550 V AC)

## Outputs

Number of outputs	DPA51	1
	DPA71	2
Type	DPA51	SPDT electromechanical relay with change-over contacts
	DPA71	DPDT electromechanical relay with change-over contacts
Logic	Output de-energised on alarm	
Contact rating	DPA51	DC12: 5 A @ 24 V DC AC15: 2.5 A @ 250 V AC DC13: 2.5 A @ 24 V DC
	DPA71	AC1: 5 A @ 250 V AC AC15: 3 A @ 250 V AC DC13: 2 A @ 24 V DC
Electrical lifetime	$\geq 50 \times 10^3$ operations (at 5 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: 11, 12, 14	DPA51	2.5 kVrms, 4 kV impulse 1.2/50 $\mu$ s
Inputs: L1, L2, L3 to Output: 11, 12, 14, 21, 22, 24	DPA71	

## Operating description

### Device configuration

The relay operates 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.

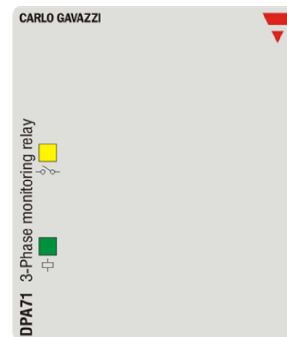
Phase loss alarm	
Input variables	Voltage measurements L1-L2, L2-L3 and L3-L1
Alarm setpoint	One phase $\leq$ 85% of the rated value (regenerated voltage detection)
Restore setpoint	All phases $>$ 85% of the rated value
Delay ON	$<$ 100 ms
Delay OFF	$<$ 300 ms

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

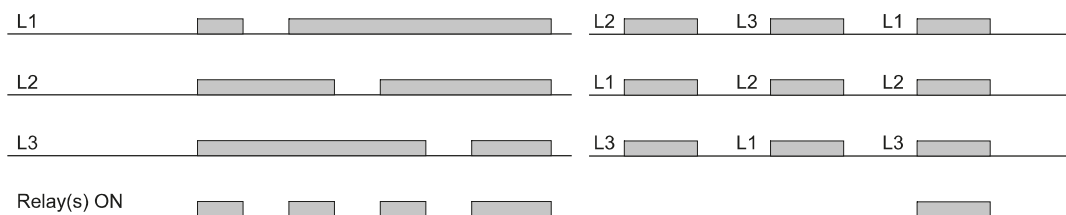
**Visual information**

DPA51 and DPA71 feature 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.

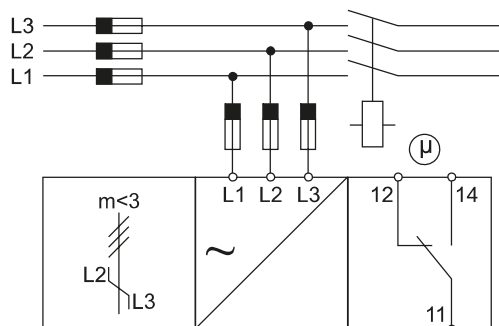


**Operating diagram**

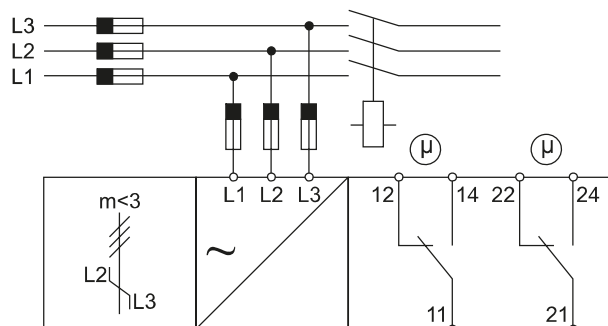


**Fig. 1** Total phase loss, phase sequence

## Connection diagrams



**Fig. 2** DPA51



**Fig. 3** DPA71

## References

Order code

DPA

Complete the code entering the corresponding option instead of

Code	Option	Description
D	D	DIN rail housing
P	-	3-phase voltage
A	-	Single function
<input type="checkbox"/>	51	Item number
	71	
<input type="checkbox"/>	C	SPDT relay output
	D	DPDT relay output
<input type="checkbox"/>	M23	Power supply
	M44	
	M48	

Component name/part number	Mounting	Frequency	Power supply
DPA51CM44	DIN rail housing	50 - 60 Hz	208 to 480 V AC
DPA71DM23	DIN rail housing	50 - 60 Hz	208 to 240 V AC
DPA71DM48	DIN rail housing	50 - 60 Hz	380 to 480 V AC



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