

DPA52



True RMS 3-Phase voltage monitoring relay



Benefits

- **Wide voltage range.** Working in systems from 208 to 480 VAC.
- **"HVAC" variant complies with IEC 60335-2-40.** For use with A3 flammable refrigerants.
- **Output and status LED indication.** For quick troubleshooting.
- **Regenerated voltage detection.** To detect phase loss even while the motor is running.
- **Ultra-high harmonic immunity.** For very noisy environments.
- **High Compactness.** 17.5 mm DIN-rail housing.

Description

DPA52 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.

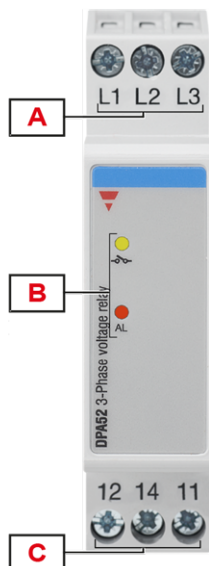
Main features

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

Order code

Mounting	Frequency	Power supply	Component name/part number
DIN-rail	50 - 60 Hz	208 to 480 V AC	DPA52CM44
			DPA52CM44HVAC

Structure



Element	Component	Function
A	Input terminals	Connection of the line voltages
B	Information LEDs	Yellow for relay output status Green for power ON / Red for signal alarm status
C	Output terminals	SPDT relay output

Features

Power supply

Power supply	Supplied by measured phases (L2, L3)
Overvoltage category	III (IEC 60664)
Voltage range	208 -40% to 480 V _{L-L} AC +30% (125 to 624 V)
Frequency range	50 to 60 Hz ± 10% sinusoidal waveform
Consumption	< 2.5 VA

Inputs

Terminals	L1, L2, L3
Measured variables	Phase sequence Phase loss Out of range 3P: voltages V_{L12} , V_{L23} , V_{L31}
Nominal line range	208 -35% to 480 VAC +25% (135 to 600 VAC)

Outputs

Terminals	11, 12, 14
Number of outputs	1
Type	SPDT electromechanical relay with changeover contacts
Logic	Output de-energised on alarm
Contact rating	I_{th} : 5 A @ 250 VAC AC15 : 2.5 A @ 250 VAC DC12 : 5 A @ 24 VDC DC13 : 2.5 A @ 24 VDC
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

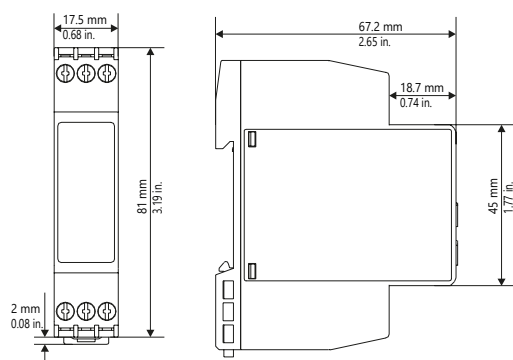
NOTE: model ending with "HVAC" is equipped with sealed relay tested in accordance with IEC 60335-2-40.

Insulation

Terminals	Basic insulation
Inputs to output	2.5 kV rms, 4 kV impulse 1.2/50 μ s

General

Material	Polyamide (Nylon) (PA66/6) or Phenylene ether + Polystyrene (PPE-PS)
	Flammability rating: HB according to UL 94
Colour	RAL7035 (light grey)
Dimensions (W x H x D)	17.5 x 81 x 67.2 mm (0.68 x 3.19 x 2.65 in)
Weight	75 g (2.65 oz)
Terminals	Cable size from 0.05 to 2.5 mm ² (AWG30 to AWG13), stranded or solid
Tightening torque	0.4 to 0.8 Nm (3.54 to 7.08 lbin)
Terminal type	Screw terminals



Environmental

Operating temperature	-20 to 60 °C (-4 to 140 °F)
Storage temperature	-30 to 80 °C (-22 to 176 °F)
Relative humidity	5 - 95% non condensing
Protection degree	IP20
Pollution degree	2
Operating max altitude	2000 m amsl (6560 ft)
Salinity	Non saline environment
UV resistance	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

Marking	
Directives	2014/35/EU (LVD - Low voltage) 2014/30/EU (EMC - Electromagnetic compatibility)
Standards	Insulation coordination: EN 60664-1 Immunity: EN61000-6-2 Emission: EN61000-6-3
Compliance	IEC 60335-2-40
Approvals	  

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	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 + Hysteresis
Reaction time	$\leq$ 200 ms
Repeatability	0.5% reading + 1 V
Accuracy	1% reading + 1 V
Hysteresis	2% fixed
Delay ON	None
Delay OFF	None

Phase sequence alarm	
Input variables	Connection L1, L2, L3
Reaction time	≤ 200 ms
Hysteresis	None
Delay ON	None
Delay OFF	None

Measure out of range alarm	
Input variables	$V_{L12}, V_{L23}, V_{L31}$
Reaction time	≤ 200 ms
Repeatability	0.5% reading + 1 V
Accuracy	1% reading + 1 V
Hysteresis	2%
Delay ON	None
Delay OFF	None

Information LEDs

Colour	Status		Description
Green / Red (AL)	Alarm	Green ON (steady)	Power ON and no alarm active
		1 red flash	Measure out of range alarm
		2 red flashes	Phase sequence alarm
		3 red flashes	Phase loss alarm
Yellow ()	Relay output	ON	Energised
		OFF	De-energised

Operating diagram

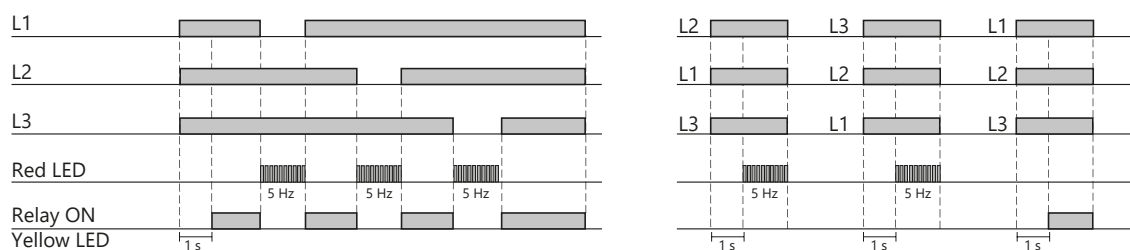
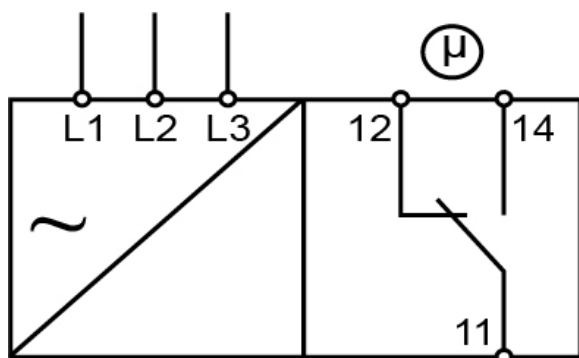


Fig. 1 Total phase loss, phase sequence

Connection diagram



References

Further reading

Information	Where to find it	QR code
Installation manual	https://carlogavazzi-pss.com/manuals/DPA_PPA_IM_html	
PSS selection tool	https://carlogavazzi-pss.com/	



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