Monitoring Relays
1-Phase AC/DC Over Current
Types DIA01, PIA01

CARLO GAVAZZI


DIA01


PIA01

- **AC/DC over current monitoring relay**
- **Current measured through internal shunt**
- **Measuring range 0.5 to 5 A AC/DC**
- **Adjustable current limit on relative scale**
- **Adjustable hysteresis**
- **Programmable latching at set level**
- **Output: 8 A SPDT relay normally de-energized**
- **For mounting on DIN-rail in accordance with DIN/EN 50 022 (DIA01) or plug-in module (PIA01)**
- **22.5 mm Euronorm housing (DIA01) or 36 mm plug-in module (PIA01)**
- **LED indication for relay and power supply ON**
- **Galvanically separated power supply**

Product Description

DIA01 and PIA01 are precise AC/DC over current monitoring relays. Direct measuring or through current transformer. Owing to the built-in latch function, the ON-position of the relay output can be maintained.
The red LED indicates the relay status. Through the built-in shunt it is possible to monitor loads up to 5 A AC/DC.

Ordering Key

DIA 01 C B23 5A

- **Housing**
- **Function**
- **Type**
- **Item number**
- **Output**
- **Power supply**
- **Range**

Type Selection

Mounting	Output	Supply: 24 VDC	Supply: 24/48 VAC	Supply: 115/230 VAC
DIN-rail	SPDT	**DIA 01 C 724 5A**	**DIA 01 C B48 5A**	**DIA 01 C B23 5A**
Plug-in	SPDT	**PIA 01 C 724 5A**	**PIA 01 C B48 5A**	**PIA 01 C B23 5A**

Input Specifications

Input (current level)		DIA01: Terminals Y1, Y2 PIA01: Terminals 5, 7
Measuring ranges		
Direct		Internal resistance: 0.05 Ω Max. current: 6 A Max. current for 1 s: 25 A
Standard CT (examples)		**AAC_{rms}** — **Max. curr.**
TADK2	50 A/5 A	5 to 50 A — 60 A
TAD2	150 A/5 A	15 to 150 A — 180 A
TAD6	400 A/5 A	40 to 400 A — 480 A
TAD12	1000 A/5 A	100 to 1000 A — 1200 A
TACO200	6000 A/5 A	600 to 6000 A — 7200 A
Contact input		
DIA01		Terminals Z1, Y1
PIA01		Terminals 8, 9
Disabled		> 10 kΩ
Enabled		< 500 Ω
Latch disable		> 500 ms

Note:
The input voltage cannot raise over 300 VAC/DC with respect to ground (PIA only)

Output Specifications

Output		SPDT relay
Rated insulation voltage		250 VAC
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
Mechanical life		≥ 30 x 10^6 operations
Electrical life		≥ 10^5 operations (at 8 A, 250 V, cos φ = 1)
Operating frequency		≤ 7200 operations/h
Dielectric strength		
Dielectric voltage		≥ 2 kVAC (rms)
Rated impulse withstand volt.		4 kV (1.2/50 μs)

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Supply Specifications

Power supply		Overvoltage cat. III (IEC 60664, IEC 60038)
Rated operational voltage through terminals:		
A1, A2 or A3, A2	(DIA01)	
2, 10 or 11, 10	(PIA01)	
	724:	24 VDC ± 20%, insulated
	B48:	24/48 VAC ± 15% 45 to 65 Hz, insulated
	B23:	115/230 VAC ± 15% 45 to 65 Hz, insulated

Dielectric voltage	**DC supply**	**AC supply**
Supply to input	2 kV	4 kV
Supply to output	4 kV	4 kV
Input to output	4 kV	4 kV

Rated operational power	
AC	4 VA
DC	2 W

General Specifications

Reaction time	
Alarm ON delay	< 100 ms (current rising from -20% to +20% set value)
Alarm OFF delay	< 300 ms (current decreasing from +20% to -20% set value)
Accuracy	(15 min warm-up time)
Temperature drift	± 1000 ppm/°C
Repeatability	± 0.5% on full-scale
Indication for	
Power supply ON	LED, green
Output relay ON	LED, red
Environment	(EN 60529)
Degree of protection	IP 20
Pollution degree	3 (DIA01), 2 (PIA01)
Operating temperature	-20 to 60°C, R.H. < 95%
Storage temperature	-30 to 80°C, R.H. < 95%
Housing dimensions	
DIN-rail version	22.5 x 80 x 99.5 mm
Plug-in version	36 x 80 x 87 mm
Weight	Approx. 150 g
Screw terminals	
Tightening torque	Max. 0.5 Nm acc. to IEC 60947
CE-Marking	Yes

Mode of Operation

DIA01 and PIA01 monitor both AC and DC over current through an internal shunt. They can monitor AC currents up to 6000 A when connected to a suitable current transformer.

Example 1
(connection between terminals Z1, Y1 or 8, 9 - latch function enabled)

The relay operates and latches in operating position when the measured value exceeds the set level. Provided that the current has dropped min. 4% below the set point (see hysteresis) the relay releases when the interconnection between terminals Z1, Y1 or 8, 9 is interrupted or the power supply is interrupted as well.

Example 2 (Stardard CT)
(no connection between terminals Z1, Y1 or 8, 9 - latch function disabled)

The relay operates when the current flowing through the transformer exceeds the set level. It releases when the current drops min. 4% below the set level (see hysteresis) or when the power supply is interrupted.

Range Setting

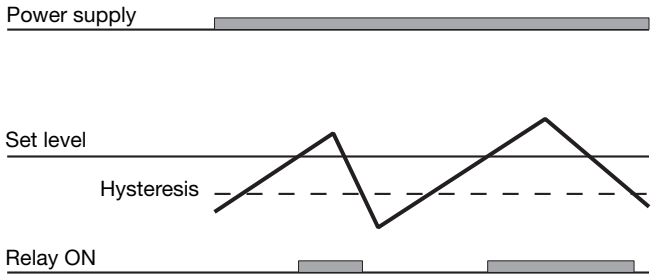
Centre knob:
Setting of current on relative scale: from 10 to 110% of the full-scale value.

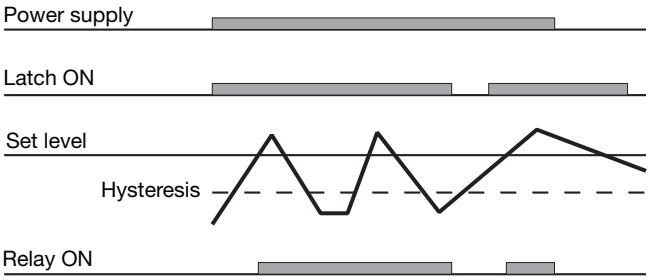
Hysteresis:
Approx. 4% of set value, it can be extended by inserting a resistor between terminals Z1, Y1 or 8, 9.

Approx. resistor values:

10%:	180 kΩ
25%:	47 kΩ
50%:	22 kΩ
75%:	15 kΩ
Latch:	< 500 Ω

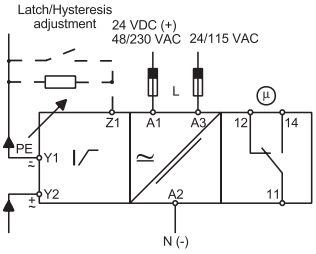
Operation Diagrams



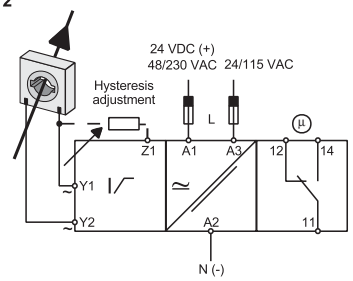


Wiring Diagrams

Example 1

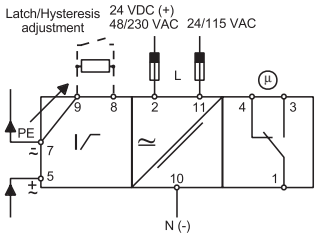


Example 2

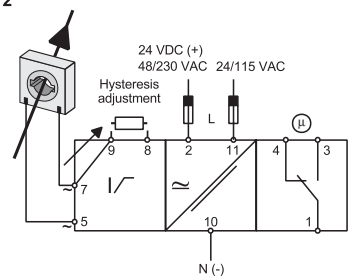


DIA01

Example 1



Example 2



PIA01