Monitoring Relays
1-Phase True RMS AC/DC Over or Under Current
Types DIB01, PIB01

CARLO GAVAZZI


DIB01


PIB01

- **TRMS AC/DC over or under current monitoring relay**
- **Current measuring through internal shunt**
- **Selection of measuring range by DIP-switches**
- **Measuring ranges from 0.1 mA to 10 A AC/DC**
- **Adjustable current on relative scale**
- **Adjustable hysteresis on relative scale**
- **Adjustable delay function (0.1 to 30 s)**
- **Programmable latching or inhibit at set level**
- **Output: 8 A SPDT relay N.D. or N.E. selectable**
- **For mounting on DIN-rail in accordance with DIN/EN/EC 60715 (DIB01) or plug-in module (PIB01)**
- **22.5 mm Euronorm housing (DIB01) or 36 mm plug-in module (PIB01)**
- **LED indication for relay, alarm and power supply ON**
- **Galvanically separated power supply**

Product Description

DIB01 and PIB01 are precise TRMS AC/DC over or under current (selectable by DIP-switch) 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. Inhibit function can be used to avoid relay operation when not desired (maintenance, transitions).
The LED's indicate the state of the alarm and the output relay. Through the built-in shunt it is possible to monitor loads up to 10 A AC/DC.

Ordering Key

DIB 01 C B23 5A

- **Housing**
- **Function**
- **Type**
- **Item number**
- **Output**
- **Power supply**
- **Measuring range**

Type Selection

Mounting	Output	Measuring range	Supply: 24 to 48 VAC/DC	Supply: 115/230 VAC
DIN-rail	SPDT	0.1 to 5 mA AC/DC	**DIB 01 C D48 5mA**	**DIB 01 C B23 5mA**
		1 to 50 mA AC/DC	**DIB 01 C D48 50mA**	**DIB 01 C B23 50mA**
		10 to 500 mA AC/DC	**DIB 01 C D48 500mA**	**DIB 01 C B23 500mA**
		0.1 to 5 A AC/DC	**DIB 01 C D48 5A**	**DIB 01 C B23 5A**
		1 to 10 A AC/DC	**DIB 01 C D48 10A**	**DIB 01 C B23 10A**
Plug-in	SPDT	0.1 to 5 mA AC/DC	**PIB 01 C D48 5mA**	**PIB 01 C B23 5mA**
		1 to 50 mA AC/DC	**PIB 01 C D48 50mA**	**PIB 01 C B23 50mA**
		10 to 500 mA AC/DC	**PIB 01 C D48 500mA**	**PIB 01 C B23 500mA**
		0.1 to 5 A AC/DC	**PIB 01 C D48 5A**	**PIB 01 C B23 5A**
		1 to 10 A AC/DC	**PIB 01 C D48 10A**	**PIB 01 C B23 10A**

Input Specifications

Input (current level)
DIB01 — Terminals Y1, Y2
PIB01 — Terminals 5, 7

Measuring ranges Direct, Selectable by DIP-switch		**Internal resist.**	**Max. curr.**
..5MA:	0.1 to 1 mA AC/DC	50 Ω	50 mA
	0.2 to 2 mA AC/DC	50 Ω	50 mA
	0.5 to 5 mA AC/DC	50 Ω	50 mA
	Max. current for 1 s		100 mA
..50MA:	1 to 10 mA AC/DC	5 Ω	150 mA
	2 to 20 mA AC/DC	5 Ω	150 mA
	5 to 50 mA AC/DC	5 Ω	150 mA
	Max. current for 1 s		500 mA

Measuring ranges (cont.)

		Internal resist.	**Max. curr.**
..500MA:	10 to 100 mA AC/DC	0.5 Ω	700 mA
	20 to 200 mA AC/DC	0.5 Ω	700 mA
	50 to 500 mA AC/DC	0.5 Ω	700 mA
	Max. current for 1 s		1.4 A
..5A:	0.1 to 1 A AC/DC	0.05 Ω	6 A
	0.2 to 2 A AC/DC	0.05 Ω	6 A
	0.5 to 5 A AC/DC	0.05 Ω	6 A
	Max. current for 1 s		15 A
..10A:	1 to 10 A AC/DC	3 mΩ	11 A
	Max. current for 1 s		50 A

Input Specifications (cont.)

Measuring ranges (cont.)			
Standard CT (examples)		**AAC_{rms}**	**Max. curr.**
TADK2	50 A/5 A	5 to 50 A	60 A
CTD1	150 A/5 A	15 to 150 A	180 A
CTD4	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
Note: The input voltage cannot raise over 300 VAC/DC with respect to ground.			
Contact input			
DIB01		Terminals Z1, Y1	
PIB01		Terminals 8, 9	
Disabled		> 10 kΩ	
Enabled		< 500 Ω	
Latch disable		> 500 ms	

Output Specifications

Output		SPDT relay
Rated insulation voltage		250 VAC
Contact ratings		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		≥ 50 x 10^3 operations (at 8 A, 250 V, cos φ = 1)
Dielectric strength		
Dielectric voltage		≥ 2 kVAC (rms)
Rated impulse withstand volt.		4 kV (1.2/50 μs)

Supply Specifications

Power supply		Overvoltage cat. III (IEC 60664, IEC 60038)
Rated operational voltage through terminals:		
A1, A2 or A3, A2	(DIB01)	
2, 10 or 11, 10	(PIB01)	
	D48:	24 to 48 VAC/DC ± 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	0.8 W	

General Specifications

Power ON delay		1 s ± 0.5 s or 6 s ± 0.5 s
Reaction time		(input signal variation from -20% to +20% or from +20% to -20% of set value)
Alarm ON delay		< 100 ms
Alarm OFF delay		< 100 ms
Accuracy		(15 min warm-up time)
Temperature drift		± 1000 ppm/°C
Delay ON alarm		± 10% on set value ± 50 ms
Repeatability		± 0.5% on full-scale
Indication for		
Power supply ON		LED, green
Alarm ON		LED, red (flashing 2 Hz during delay time)
Output relay ON		LED, yellow
Environment		(EN 60529)
Degree of protection		IP 20
Pollution degree		2
Operating temperature		-20 to 60°C, R.H. < 95%
Storage temperature		-30 to 80°C, R.H. < 95%

Housing		
Dimensions	DIB01	22.5 x 80 x 99.5 mm
	PIB01	36 x 80 x 94 mm
Material		Polyamide (Nylon) or Phenylene ether + Polystyrene
Weight		Approx. 150 g
Screw terminals		
Tightening torque		Max. 0.5 Nm acc. to IEC 60947
Product standard		EN 60255-6
Approvals		UL, CSA CCC (GB/T14048.5) only DIB
CE Marking		L.V. Directive 2006/95/EC EMC Directive 2004/108/EC
EMC		
Immunity		According to EN 60255-26 According to EN 61000-6-2
Emissions		According to EN 60255-26 According to EN 61000-6-3

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Mode of Operation

DIB01 and PIB01 monitor both AC and DC over or under current through an internal shunt.

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

The relay operates and latches in operating position when the measured value exceeds (or drops below) the set level for more than the set delay time. Provided that the current has dropped below (or has exceeded) the set point (see hysteresis setting), the relay releases when the interconnection between terminals Z1, Y1 or 8, 9 is interrupted or the power supply is interrupted as well.
The red LED flashes until the delay time has expired or the measured value comes back to a non-alarm value (see hysteresis setting).

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

The relay operates when the measured value exceeds (or drops below) the set level for more than the set delay time. It releases when the current drops below (or exceeds) the set level (see hysteresis setting) or when power supply is interrupted.

Note
When the inhibit contact is opened, if the input signal is already in alarm position, the delay time needs to elapse before relay activation.

Function/Range/Level and Time Delay Setting

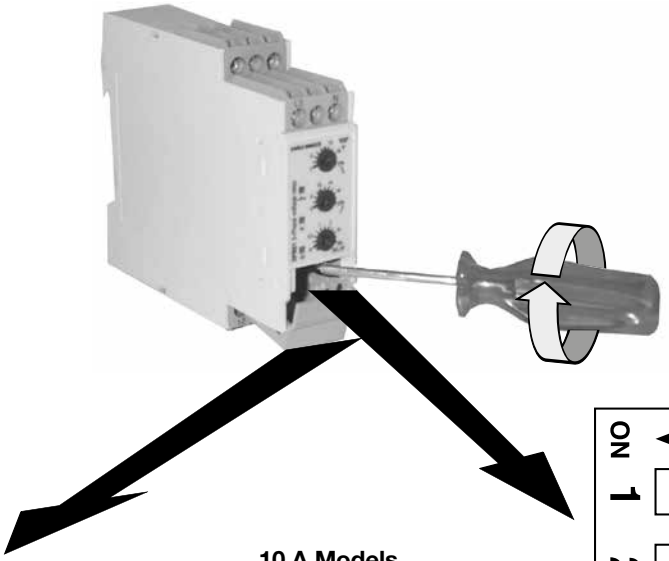
Adjust the input range setting the DIP switches 1 and 2 as shown below (except for models DIB01xxx10A and PIB01xxx10A).
Select the desired function setting the DIP switches 3 to 6 (1 to 4 for DIB01xxx10A and PIB01xxx10A) as shown below.

To access the DIP switches open the grey plastic cover as shown below.

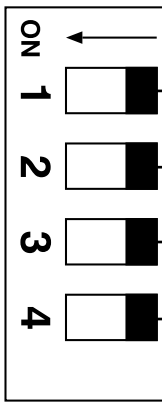
Selection of level and time delay:

Upper knob:
Setting of hysteresis on relative scale: 0 to 30% on set value.

Centre knob:
Current level setting on relative scale: 10 to 110% on full scale.
Lower knob:
Setting of delay on alarm time on absolute scale (0.1 to 30 s).



10 A Models



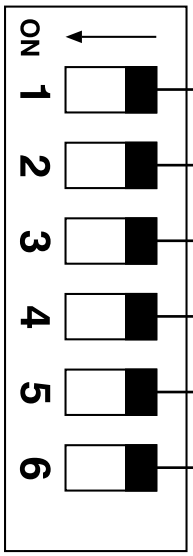
Relay working mode
ON: Normally De-energized
OFF: Normally Energized

Power ON delay
ON: 6 s ± 0.5 s
OFF: 1 s ± 0.5 s

Contact input
ON: Latch function enable
OFF: Inhibit function enable

Monitoring function
ON: Over current
OFF: Under current

Other Models



Measuring range			
SW1	ON	ON	OFF
SW2	OFF	ON	ON
5MA	1 mA	2 mA	5 mA
50MA	10 mA	20 mA	50 mA
500MA	100 mA	200 mA	500 mA
5A	1 A	2 A	5 A

Relay working mode
ON: Normally De-energized
OFF: Normally Energized

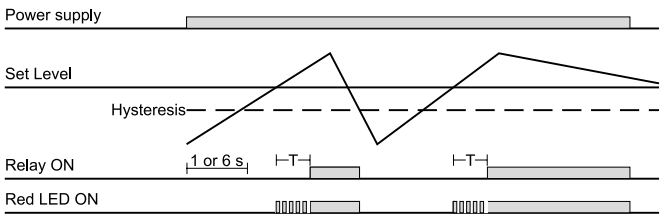
Power ON delay
ON: 6 s ± 0.5 s
OFF: 1 s ± 0.5 s

Contact input
ON: Latch function enable
OFF: Inhibit function enable

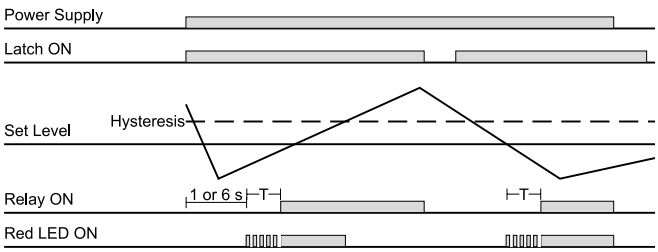
Monitoring function
ON: Over current
OFF: Under current

Operation Diagrams

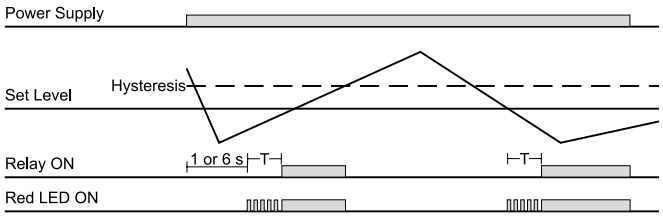
Over current - N.D. relay



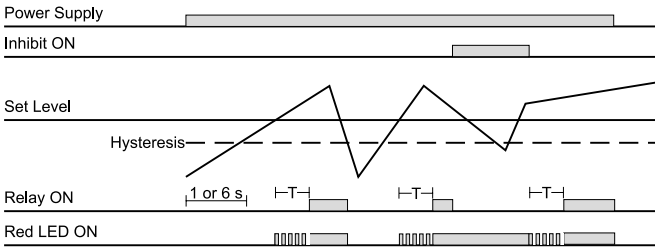
Under current - Latch function - N.D. relay



Under current - N.D. relay



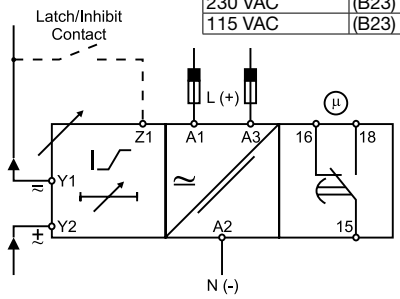
Over current - Inhibit function - N.D. relay



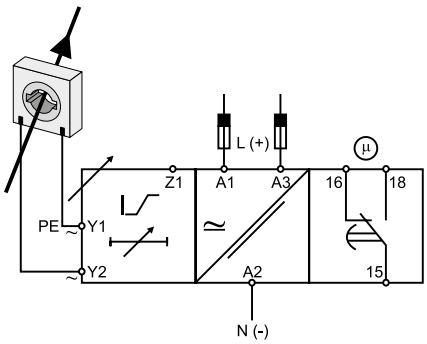
Wiring Diagrams

Example 1

Power supply		Terminals
24 ÷ 48 VAC/DC	(D48)	A1, A2
230 VAC	(B23)	
115 VAC	(B23)	A3, A2



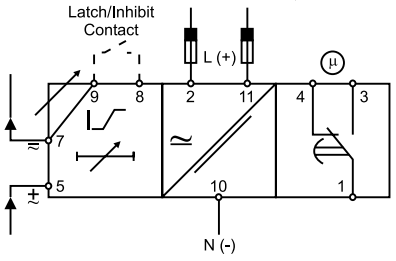
Example 2



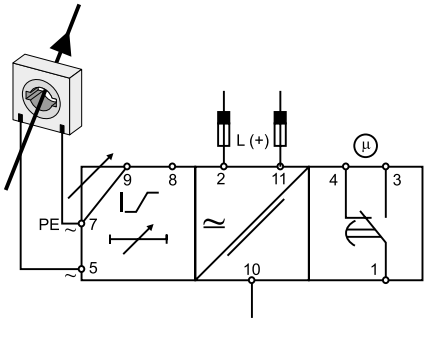
DIB01

Example 1

Power supply		Terminals
24 ÷ 48 VAC/DC	(D48)	2, 10
230 VAC	(B23)	
115 VAC	(B23)	11, 10



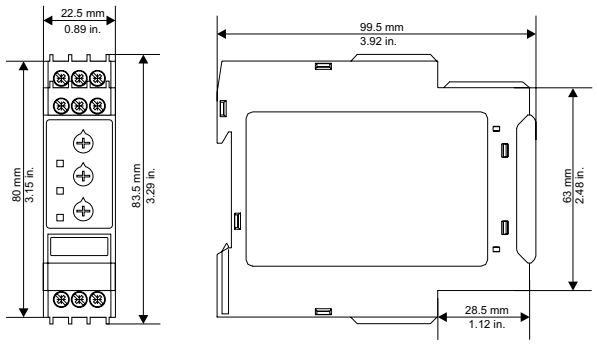
Example 2



PIB01

Dimensions

DIN-rail



Plug-in