

# DIA02



## 1-phase true RMS AC/DC over current monitoring relay



### Benefits

- **Very low minimum setpoint.** To sense the activity of small loads down to 20 mA.
- **Adjustable current setpoint on relative scale.**
- **Output and status LED indication.** For quick troubleshooting.

### Description

DIA02 is a precise TRMS AC/DC over current monitoring relay.

It monitors the current of the load to detect if it is active or not.

The wide range of input current values allows applications down to very small loads.

DIA02 is less sensitive to inrush currents.

### Applications

DIA02 offers several building automation solutions like ON/OFF monitoring of water circulation pumps, extractor fans and light. It allows to provide prompt reaction in case of failure of the load.

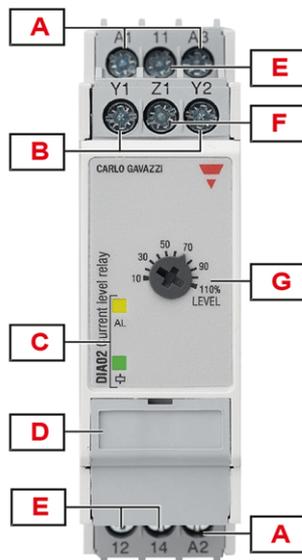
### Main features

- Internal shunt for monitoring loads up to 5 A.
- DIP switches for measuring range selection.
- Latch function to keep the output relay energised following an alarm status.

### Order code

Mounting	Measuring ranges	Power supply	Component name/part number
DIN-rail	From 20 mA AC/DC to 5 A AC/DC	115 / 230 V AC	<b>DIA02CB235A</b>
		24 to 48 V AC/DC	<b>DIA02CD485A</b>

## Structure



Element	Component	Description
A	Power supply terminals	<b>B23:</b> A1, A2, A3 <b>D48:</b> A1, A2
B	Input terminals	Current input
C	Information LEDs	Green for device ON Yellow for relay output status and for signal alarm status
D	DIP switches	Setting the input range
E	Output terminals	SPDT relay output
F	Latch input terminal	Latch function enabled (Z1, Y1)
G	Current level dial (LEVEL)	Current setpoint adjustment

## Features

### Power supply

Power supply	Through terminals A1, A2 or A3, A2	
Overvoltage category	III (IEC 60664)	
Voltage range	DIA02CB235A	115 V AC $\pm$ 15% (97.75 to 132.25 V AC) / 230 V AC $\pm$ 15% (195.5 to 264.5 V AC)
	DIA02CD485A	24 to 48 V AC/DC $\pm$ 15% (20.4 to 55.2 V AC/DC)
Frequency range	50 to 60 Hz $\pm$ 10% sinusoidal waveform	
Consumption	< 2.5 VA	

### Inputs

Terminals	Y1, Y2
Measured variables	Current level
Current measuring	Direct through internal shunt or through external current transformer (AC measurement)
Measuring ranges	20 to 200 mA AC/DC
	0.1 to 1 A AC/DC
	0.5 to 5 A AC/DC
Internal resistance	0.05 $\Omega$
Maximum current	6 A
Maximum current for 1 s	15 A
Contact input (terminals Z1, Y1)	Disabled: > 10 k $\Omega$ Enabled: < 500 $\Omega$ Latch disable: > 500 ms

### Outputs

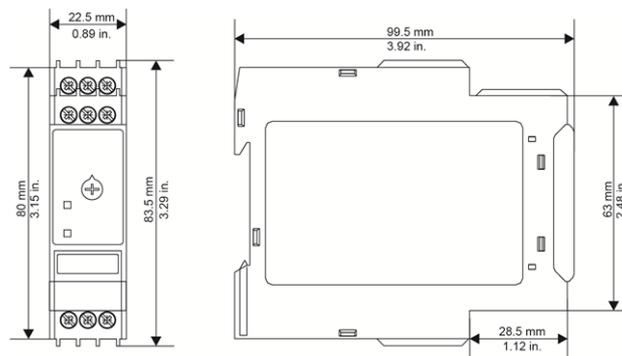
Terminals	11, 12, 14
Number of outputs	1
Type	SPDT electromechanical relay with changeover contacts
Logic	Output energised on alarm
Contact rating	<b>AC1:</b> 8 A @ 250 V AC <b>AC15:</b> 2.5 A @ 250 V AC <b>DC12:</b> 5 A @ 24 V DC <b>DC13:</b> 2.5 A @ 24 V DC
Electrical lifetime	$\geq 50 \times 10^3$ operations (at 8 A, 250 V, $\cos \varphi = 1$ )
Mechanical lifetime	$> 30 \times 10^6$ operations
Assignment	Associated to overcurrent alarm

## Insulation

Terminals	Basic
Power supply: A1, A2, A3 to output: 11, 12, 14	2.5 kV <sub>rms</sub> , 4 kV impulse 1.2/50 μs
Power supply: A1, A2, A3 to input: Y1, Y2, Z1	
Output: 11, 12, 14 to input: Y1, Y2, Z1	

## General

<b>Material</b>	Polyamide (Nylon) (PA66/6) or Phenylene ether + Polystyrene (PPE-PS)
	Flammability rating: V0 according to UL 94
<b>Colour</b>	RAL7035 (light grey)
<b>Dimensions (W x H x D)</b>	22.5 x 80 x 99.5 mm (0.89 x 3.15 x 3.92 in)
<b>Weight</b>	Approx. 150 g (5.29 oz)
<b>Terminals</b>	Cable size from 0.05 to 2.5 mm <sup>2</sup> (AWG30 to AWG13), stranded or solid
<b>Tightening torque</b>	Max. 0.5 Nm (4.425 lbin)
<b>Terminal type</b>	Double cage screw terminals



## Environmental

<b>Operating temperature</b>	-20 to 60 °C (-4 to 140 °F)
<b>Storage temperature</b>	-30 to 80 °C (-22 to 176 °F)
<b>Relative humidity</b>	5 - 95% non condensing

<b>Protection degree</b>	IP20
<b>Pollution degree</b>	3
<b>Operating max altitude</b>	2000 m amsl (6560 ft)
<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>Marking</b>	  
<b>Directives</b>	2014/35/EU (LVD - Low voltage) 2014/30/EU (EMC - Electromagnetic compatibility) 2011/65/EU, 2015/863/EU (RoHS)
<b>Standards</b>	EN 60947-5-1 Immunity: EN 61000-6-2 Emission: EN 61000-6-3 EN 63000
<b>Approvals</b>	

## Operating description

### Device configuration

#### Connection between terminals Z1, Y1 - latch function enabled.

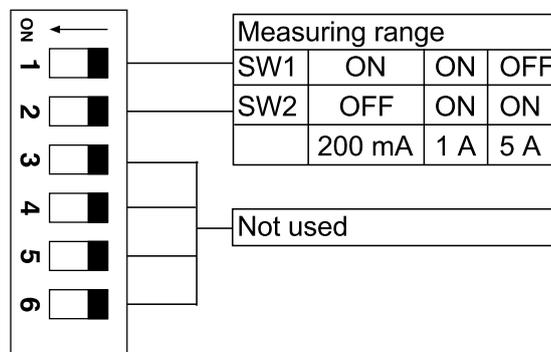
The relay operates and is kept operating when the measured value exceeds the set level. If the current drops below the set value (minus hysteresis), the relay releases when the connection between terminals Z1, Y1 or the power supply is interrupted.

#### No connection between terminals Z1, Y1 - latch function disabled.

The relay operates when the measured value exceeds the set level. It releases when the current drops below the set level (minus hysteresis) or when power supply is interrupted.

Current level adjustment dial	
Typology	Linear selection from 10% to 110%
Resolution	10% setpoint increase per notch
Function	Relative current level setpoint

DIP switches	
Typology	6 switches (3, 4, 5 and 6 are unused)
Function	Input range



### Alarms

Over current causes immediate output relay energisation.

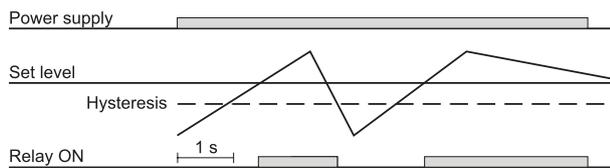
Current level alarm	
Input variables	20 mA to 5 A AC/DC
Reaction time	Input signal variation from -20 to +20% or from +20 to -20% of set value: Delay ON < 100 ms Delay OFF < 100 ms
Current level setting	From 10 to 110%
Power ON delay	1 s ± 0.5 s

Current level alarm	
Repeatability	0.5% reading
Hysteresis	~ 4% of set value, fixed
Accuracy (15 min. warm-up time)	Temperature drift: $\pm 1000$ ppm/ $^{\circ}\text{C}$ Repeatability: 0.5% on full-scale

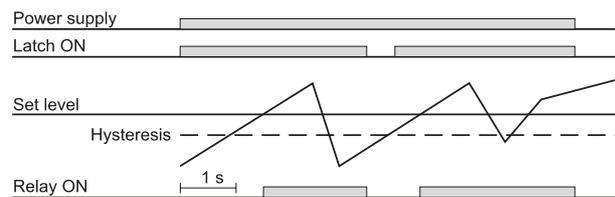
### Information LEDs

Colour	Status	Description
Green ( $\ominus$ )	Power supply ON	Power supply ON
	Power supply OFF	Power supply OFF
Yellow (AL)	Alarm / Relay output ON	Alarm ON / Relay energised
	Alarm / Relay output OFF	Alarm OFF / Relay de-energised

### Operating diagram



Without latch function

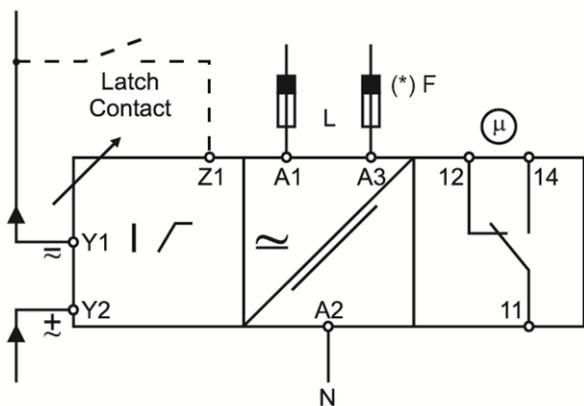


With latch function

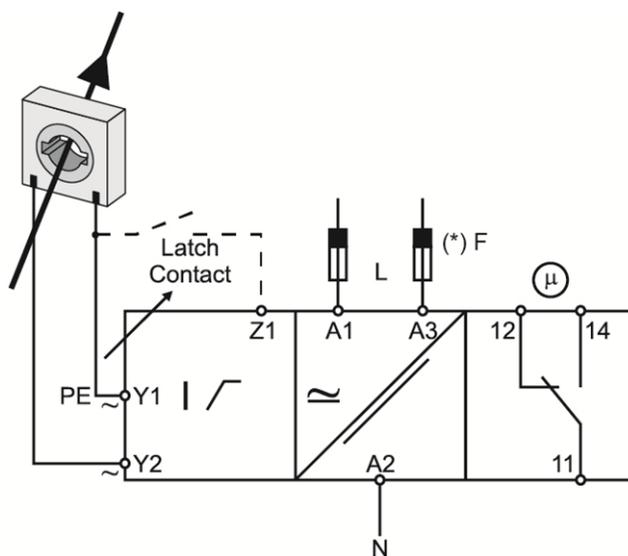
## Connection diagrams

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

(\*) NOTE: fuses F of 500 mA delayed, if required by local law.



Direct connection



Connection by standard CT

## References

### Further reading

Information	Where to find it	QR code
Installation manual	<a href="https://www.gavazzi-automation.com/images/PIM/MANUALS/ENG/DIA02Cxxx5A%20IM.pdf">https://www.gavazzi-automation.com/images/PIM/MANUALS/ENG/DIA02Cxxx5A%20IM.pdf</a>	
PSS selection tool	<a href="https://carlogavazzi-pss.com/">https://carlogavazzi-pss.com/</a>	



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