

3 ways isolated programmable converter for AC / DC voltage signal

DAT 5023/V



FEATURES

- Input for AC/DC voltage signal
- Dedicated measure inputs
- Input type of measure (AC / DC) configurable by DIP-switches
- True Root Mean Square (TRMS) measure
- Isolated power supply source for passive loads on output
- Voltage or current output configurable by DIP-switches
- Galvanic isolation at 1500 Vac between input, power supply and output
- Good accuracy and performance stability
- EMC compliant – CE mark
- DIN rail mounting in compliance with EN-50022 and EN-50035



GENERAL DESCRIPTION

The converter DAT 5023/V is designed to detect the TRMS value of the AC voltage signal or to convert the DC voltage signal applied on its input in a voltage or current output signal.

The user can program the input type and output ranges by the proper DIP-switches available after opening the suitable door located on the side of device (see "Input type table" and "Output ranges table" sections).

The regulation of Zero and Span values is made by the ZERO and SPAN potentiometers located on the top of device.

The 1500 Vac isolation between input, power supply and output eliminates the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.

The DAT 5023/V provides on the output side an auxiliary supply source to connect both active and passive loads.

It has been made in compliance with the Directive 2004/108/EC on the Electromagnetic Compatibility.

It is housed in a plastic enclosure of 12.5 mm thickness suitable for DIN rail mounting in according to EN-50022 and EN-50035 standards .

OPERATIVE INSTRUCTIONS

The converter DAT 5023/V must be powered by a direct voltage included in the 18 V to 30 V range. The power supply must be applied between the terminals Q (+Vdc) and R (GND1). The green led PWR switched on shows the right state of supply of the device.

The output connections must be made as shown in the section "Output connections".

Voltage output: between the terminals N (Out) and M (GND3); **passive current output:** between the terminals N (Out) and M (GND3) for the sink currents; **active current output :** between the terminals O (Vaux) and N (Out) for the source currents.

The input voltage must be connected to dedicated terminals in function of the amplitude of the signal; the measure must be referred to the terminal F(GND2) as shown in the section "Input connections".

The configuration of the input type and output ranges values is made by DIP-switches (refer to the section "Input type table" and "Output ranges table").

After the converter configuration, it is necessary to calibrate it using the ZERO and SPAN regulations; this operation is illustrated in the section "DAT 5023/V: Configuration and calibration".

To install the device refer to the section "Installation instructions".

TECHNICAL SPECIFICATIONS (Typical @ 25 °C and in nominal conditions)

Input	
Voltage input (AC)	0÷36 Vac, 0÷80 Vac, 0÷170 Vac, 0÷370 Vac, 0÷550 Vac
Voltage input (DC)	0÷36 Vdc, 0÷80 Vdc, 0÷170 Vdc, 0÷370 Vdc, 0÷550 Vdc
Type of measure	Configurable: Direct or Alternate
Bandwidth (-3dB)	40 Hz ÷ 1KHz
Input impedance	0÷36 Vac, 0÷36 Vdc : 36 KΩ; 0÷80 Vac, 0÷80 Vdc : 80 KΩ; 0÷170 Vac, 0÷170 Vdc : 170 KΩ; 0÷370 Vac, 0÷370 Vdc : 370 KΩ; 0÷550 Vac, 0÷550 Vdc : 550 KΩ.
Output	
Signal type (configurable)	Current: 4 ÷ 20 mA, 0 ÷ 20 mA, Voltage: 0÷10 V, 2÷10 V, 0÷5 V, 1÷5 V
Zero regulation	± 40 % max.
Span regulation	± 40 % max.
Load resistance (Rload)	Current output: <= 500 Ω, Voltage output: >= 5 KΩ
Auxiliary supply (Vaux)	12 Vdc min @ 20 mA
Performances	
Calibration error	± 0.1 % of f.s.
Linearity error (*)	AC: ± 1 % of f.s.; DC: ± 0.1 % of f.s.
Thermal drift	0.02 % of f.s./°C
Response time (from 10 to 90 % of f.s.)	AC: 250 ms, DC: 20 ms
Power supply voltage (**)	18÷30 Vdc
Current consumption(***)	Current output: 80 mA max. Voltage output: 50 mA max.
Electromagnetic Compatibility (EMC) (for industrial environments)	Immunity: EN 61000-6-2; Emission : EN 61000-6-4
Isolation voltage	1500 Vac, 50 Hz, 1 min.
Operating temperature	-20 ÷ 60 °C
Storage temperature	- 40 ÷ 85 °C
Relative humidity (not cond.)	0 ÷ 90%
Weight	approx. 90 g
(*) inclusive of hysteresis and power supply variation.	
(**) internally protected against polarity reversion.	
(***)Current: with Auxiliary supply operative.	

DAT 5023/V: CONFIGURATION & CALIBRATION

- 1) Refer to the "Input type table", determine in the column " Input " the type of the input voltage value(AC or DC). Refer to the " Output ranges table " and determine in the column " Output " the position of the output value.
- 2) In the correspondent lines is shown how to set the DIP-switches .
- 3) Set the DIP-switches as indicated .
- 4) Connect the input in function of the amplitude of the signal.
- 5) Set the minimum value of the input range.
- 6) By the ZERO potentiometer calibrate the output at the minimum value .
- 7) Set the maximum value of the input range.
- 8) By the SPAN potentiometer calibrate the output at the maximum value .
- 9) Repeat the operation from the step 4 to the step 7 until the output value will be correct (3 attempts typically required).

Configuration ex. : in: 0÷170 Vac out 0÷10 Vdc
 Input switches configuration (SW1): On, Off, Off, Off.
 Output switches configuration (SW2): Off, Off, On, Off, Off.
 Signal connected between the terminal G and F.

INPUT TYPE TABLE

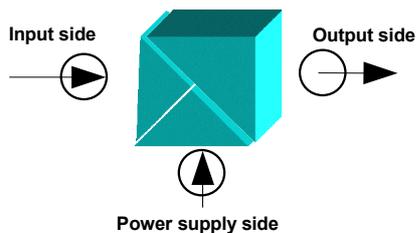
INPUT	SW1			
	1	2	3	4
Vac	●			
Vdc			●	

OUTPUT RANGE TABLE

OUTPUT	SW2				
	1	2	3	4	5
0 ÷ 20 mA				●	
4 ÷ 20 mA	●			●	●
1 ÷ 5 V	●	●	●		●
0 ÷ 5 V		●	●		
2 ÷ 10 V	●		●		●
0 ÷ 10 V			●		

● = DIP SWITCHES " ON "

ISOLATIONS STRUCTURE



INSTALLATION INSTRUCTIONS

The DAT 5023/V device is suitable for fitting to DIN rails in the vertical position. For optimum operation and long life follow these instructions:

When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following case:

- If panel temperature exceeds 45°C and **at least one** of the overload conditions exists.
- If panel temperature exceeds 35°C and **both** the overload conditions exist.

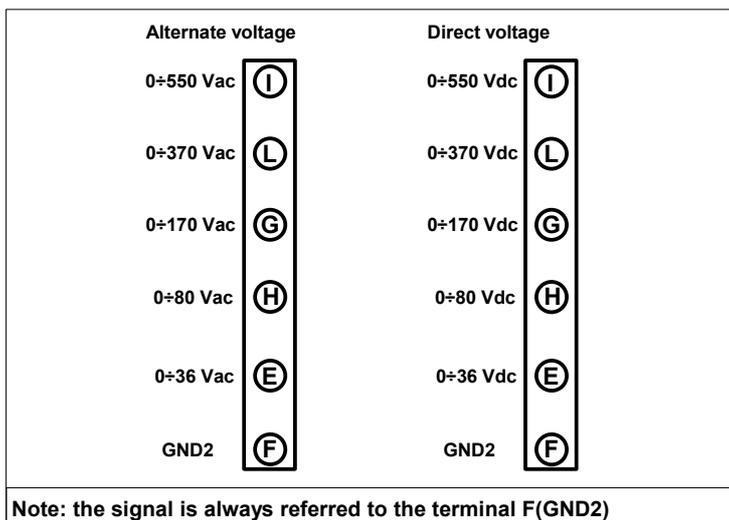
Overload conditions:

- Use of current output (terminal N).
- Use of output auxiliary supply (terminal O).

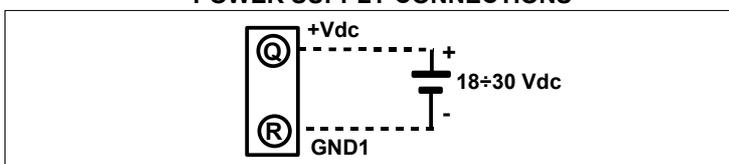
Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel. Install the device in a place without vibrations. Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters, etc...) and to use shielded cable for connecting signals.

DAT 5023/V: CONNECTIONS

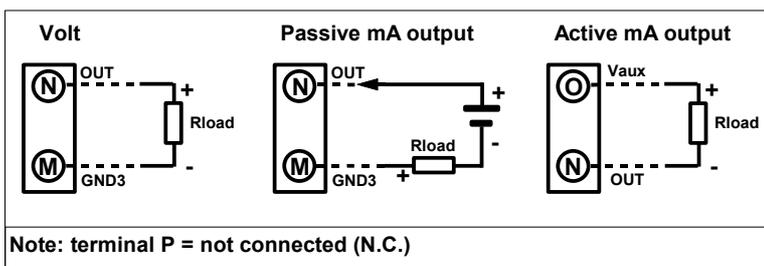
INPUT CONNECTIONS



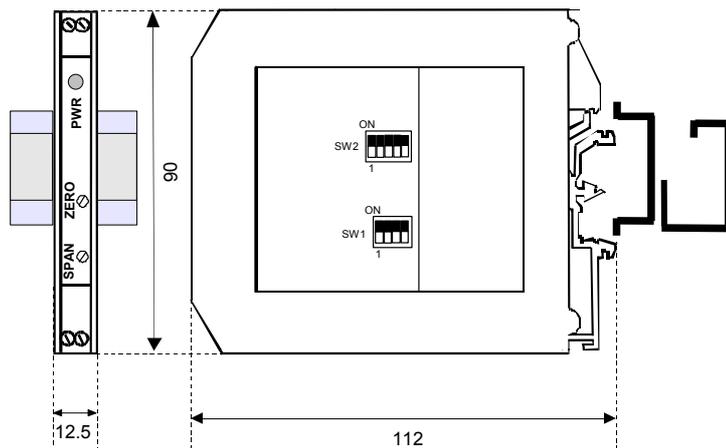
POWER SUPPLY CONNECTIONS



OUTPUT CONNECTIONS



DIMENSIONS (mm) & REGULATIONS



HOW TO ORDER

The DAT 5023/V is supplied as requested on the order. In case of the configuration is not specified, the parameters must be set by the user.

ORDER CODE EXAMPLE: DAT5023/V **0÷170 Vac** - **0÷10 V**

Input range ————
 Output range ————