

## FEATURES

- Input for voltage, current and potentiometer signal
- Input range configurable by DIP-switches
- Isolated power supply source for passive current transmitter on input
- Voltage or current output
- Output values configurable by DIP-switches
- Galvanic isolation at 2000 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 5020 is designed to provide on its output a voltage or current signal proportional with the value of the normalised signal or the potentiometer applied on its input.

The user can program the input and output ranges by the proper DIP-switches available after opening the suitable door located on the side of device (see "Input ranges 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 2000 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.

On the input side, an auxiliary supply source isolated from the power supply is provided; this allows to connect on input both active and passive current loops.

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 5020 must be powered by a direct voltage included in the 18 V to 32 V range. The power supply must be applied between the terminals R (+Vdc) and Q (GND3). 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".

The current or voltage output signal is measurable between the terminals N (OUT) and M (GND2).

The input connections must be made as shown in the section "Input connections".

**Voltage input:** between the terminals L (INPUT) and I, G or E(GND1); **passive current input:** between the terminals L (INPUT) and I, G or E(GND1); **active current input** (coming from a passive transmitter) : between the terminals F (Aux. Supply) and L (INPUT); potentiometer: connect the ends of sensor between the terminals H (POT HI) and I, G or E(GND1) connect the central terminal to the terminal L (INPUT).

The configuration of input and output ranges values is made by DIP-switches (refer to the section "Input ranges 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 5020: Configuration and calibration".

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

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

### Inputs

Signal type (configurable)

Current: 4 ÷ 20 mA, 0 ÷ 20 mA,  
Voltage: 0÷10 V, 0÷1 V, ± 5 V, ± 10 V, 0 ÷100 mV  
Potentiometer ( nominal value ) : from 1 KΩ up to 5 KΩ

Maximum input signal

Input impedance

30 Vdc or 50 mA  
Voltage: ≥ 1 MΩ, Current: ~ 50 Ω

Auxiliary supply (Aux. supply )

18 Vdc min @ 20 mA

### Output

Signal type (configurable)

Current: 4 ÷ 20 mA, 0 ÷ 20 mA,  
Voltage: 0÷10 V, 0÷2 V, ± 5 V, ± 10 V, ± 1 V

Maximum output signal

Zero regulation

15 Vdc or 30 mA

Span regulation

± 5 % min.

Load resistance (Rload)

± 5 % min.

Current output: ≤ 500 Ω

Voltage output: ≥ 5 KΩ

### Performances

Calibration error

± 0.1 % of f.s.

Linearity error (\*)

± 0.15 % of f.s.

Thermal drift

0.02 % of f.s./°C

Response time (from 10 to 90 % of f.s.)

500 ms

Power supply voltage (\*\*)

18÷32 Vdc

Current consumption(\*\*\*)

Current output: 110 mA max.

Voltage output: 80 mA max.

Electromagnetic Compatibility (EMC)

( for industrial environment )

Immunity: EN 61000-6-2; Emission : EN 61000-6-4

Isolation voltage

2000 Vac, 50 Hz, 1 min.

Operating temperature

-20 ÷ 60 °C

Storage temperature

- 40 ÷ 85 °C

Relative humidity (non cond.)

0 ÷ 90%

Maximum Altitude

2000 m

Installation

Indoor

Category of installation

II

Pollution Degree

2

Weight

approx. 90 g

### Mechanical Specifications

Material

Self-extinguish plastic

IP Code

IP20

Wiring

wires with diameter 0.8÷2.1 mm<sup>2</sup> /AWG 14-18

Tightening Torque

0.8 N m

Mounting

in compliance with DIN rail standard EN-50022 and EN-50035

(\*) inclusive of hysteresis and power supply variation.

(\*\*) internally protected against polarity reversion.

## DAT 5020: CONFIGURATION & CALIBRATION

- 1) Refer to the "Input ranges table", determine in the column "Input" the position of the input value.  
Refer to the "Output ranges table" and determine in the column "Output" the position of the output value.  
In the correspondent lines is shown how to set the DIP-switches.
- 2) Set the DIP-switches as indicated.
- 3) Connect on input a voltage or current simulator programmed to supply the maximum and minimum values of the input range; in case calibration of a potentiometer, connect on input terminals a potentiometer with nominal value included into the specification limit.
- 4) Set the simulator at the maximum value of the input range or regulate the potentiometer at the maximum value.
- 5) By the SPAN potentiometer calibrate the output at the maximum value.
- 6) Set the simulator at the minimum value of the input range or regulate the potentiometer at the minimum value.
- 7) By the ZERO potentiometer calibrate the output at the minimum value.
- 8) 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: 4÷20 mA out 0÷10 Vdc

Input switches configuration (DSI): On, Off, Off, On, On, Off, Off, Off.

Output switches configuration (DSO): On, On, Off, Off, On, Off, Off, Off.

**INPUT RANGES TABLE**

INPUT	DSI							
	1	2	3	4	5	6	7	8
0 ÷ 20 mA	●			●			●	
4 ÷ 20 mA	●			●	●			
0 ÷ 10 V		●		●			●	
± 5 V		●		●				●
± 10 V		●		●		●		●
0 ÷ 1 V				●			●	
0÷100 mV			●				●	
POT.				●			●	

**OUTPUT RANGE TABLE**

OUTPUT	DSO							
	1	2	3	4	5	6	7	8
0 ÷ 20 mA	●	●	●	●				
4 ÷ 20 mA	●		●	●				
0 ÷ 10 V	●	●			●			
± 5 V		●			●			●
± 10 V		●				●		●
0 ÷ 2 V	●	●		●				
± 1 V		●		●				●

● = DIP SWITCHES "ON"

## INSTALLATION INSTRUCTIONS

The DAT 5020 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 **at least two** of the overload conditions exist.
- if **all** the overload conditions exist.

### Overload conditions:

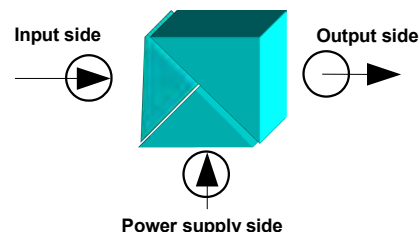
- High supply voltage: >27Vdc.
- Use of current output.
- Use of the input auxiliary supply for current input (terminal F).

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.

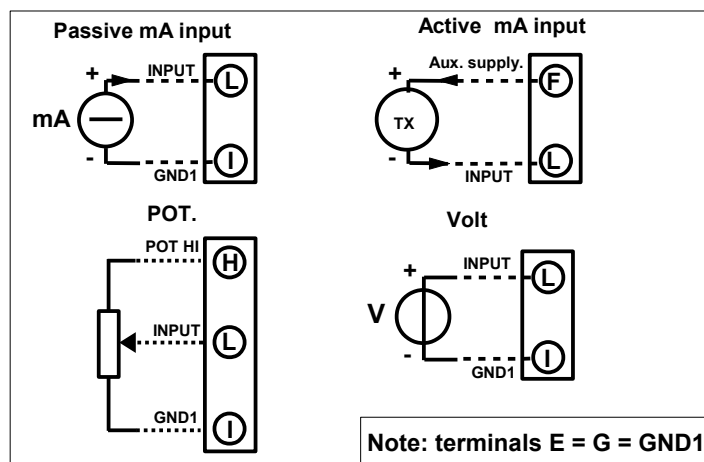
Datexel s.r.l. reserves its right to modify totally or in part the characteristics of its product without notice at any time.

## ISOLATIONS STRUCTURE



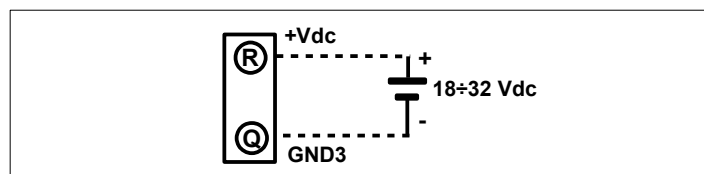
## DAT 5020: CONNECTIONS

### INPUT CONNECTIONS

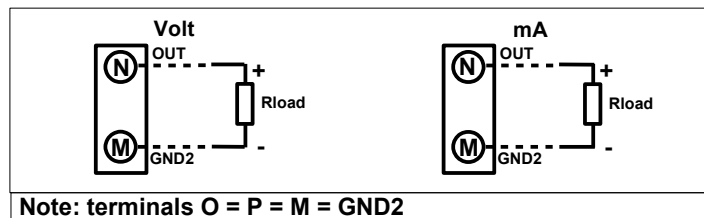


Note: terminals E = G = GND1

### POWER SUPPLY CONNECTIONS

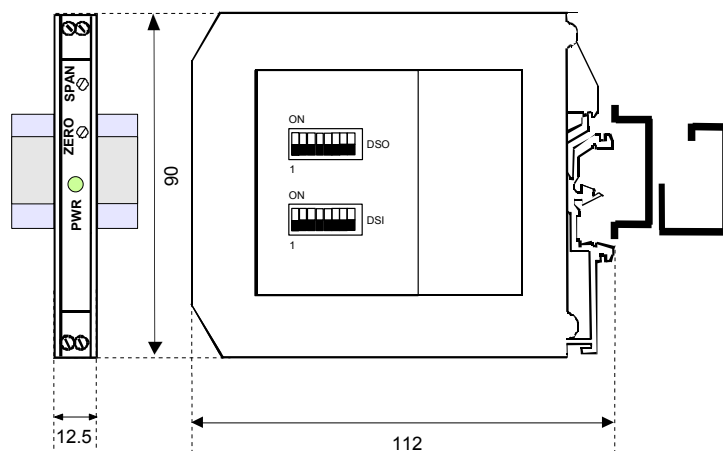


### OUTPUT CONNECTIONS



Note: terminals O = P = M = GND2

## DIMENSIONS (mm) & REGULATIONS



### HOW TO ORDER

The DAT 5020 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: DAT5020 0÷10 V - 0÷10 V**

Input range

Output range