

**FEATURES**

- Input for RTD type Pt100
- Unit of measure configurable in °C or °F
- Zero and Span values configurable by DIP-switches
- Linearised voltage or current 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 2165 is designed to provide on its output a linearised voltage or current signal proportional with the temperature characteristic of the Pt100 sensor connected on its input.

It is possible to connect on the input both 3 wires and 2 wires Pt100.

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 range table" and "Output range table" sections).

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

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 2165 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 R (+Vdc) and P (GND), or alternatively between the terminals Q (+Vdc) and O (GND).

The current or voltage output signal is measurable between the terminals N (OUT V/I) and P (GND), or alternatively between the terminals M (OUT V/I) and O (GND).

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

The 3 wires Pt100 must be connected between the terminals G and I, while the third wire must be connected to the terminal E or alternatively connect the sensor between the terminals H and L while the third wire must be connected to the terminal F .

The 2 wires Pt100 must be connected between the terminals G and I, making a short circuit between the terminals G and E or alternatively connect the sensor between the terminals H and L making a short circuit between the terminals H and F .

The configuration of input and output ranges values is made by DIP-switches (refer to the section "Input range table" and "Output range 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 2165: Configuration and calibration".

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

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

<b>Inputs</b>	
Sensor type	2 or 3 wire Pt100 in according to IEC60751 standard
Minimum input Span	50 °C (122 °F)
Zero programmability	From -50 °C (-58 °F) up to + 50 °C (122 °F)
Span programmability	From 50 °C (122 °F) up to 650 °C (1202 °F)
Sensor excitation current	1 mA typ.
Line resistance influence	0.05 % of f.s./ohm (100 ohm max. balanced per wire)
<b>Output</b>	
Signal type	Configurable as 4 ÷ 20 mA, 0÷20 mA, 0÷10 Vdc
Load resistance	Voltage output: ≥ 5 Kohm; Current output: ≤ 500 ohm
Sensor burn-out signalling	Positive out of scale (>20 mA or >10 Vdc)
Maximum output signal	Current output: 32 mA max. Voltage output: 18 Vdc max.
Response time (from 10 to 90 % of f.s.)	300 ms
Warm-up time	3 minutes
<b>Performances</b>	
Calibration error	± 0.1 % of f.s.
Linearity error (*)	± 0.15 % of f.s.
Thermal drift	0.020 % of f.s./°C
Power supply voltage(**)	18÷30 Vdc
Current consumption for each channel	Voltage output: 10 mA max. ; current output: 40 mA max.
Electromagnetic Compatibility (EMC) ( for industrial environments )	Immunity: EN 61000-6-2; Emission : EN 61000-6-4.
Operating temperature	-20 ÷ 70 °C
Storage temperature	-40 ÷ 85 °C
Relative humidity (not cond.)	0 ÷ 90%
Maximum Altitude	2000 m
Installation	Indoor
Category of installation	II
Pollution Degree	2
Weight	approx. 90 g
<b>Mechanical Specifications</b>	
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 2165: CONFIGURATION & CALIBRATION

- 1) Calculate the difference between the maximum and the minimum value of the input range (Span).
- 2) Refer to the " Input ranges table " and determine in the column " SPAN " the position where the calculated value is included, then referring to the position obtained, determine in the column "ZERO", the line in which the minimum value is included .
- Refer to the " Output ranges table " and determine in the column " Output signal " the position of the output value.
- In the correspondent lines is shown as to set the DIP-switches .
- 3) Set the DIP-switches as indicated .
- 4) Connect on input a 3 wires Pt100 simulator programmed to supply the maximum and minimum values of the input range or a fixed resistor of the same values.
- 5) Set the simulator at the minimum temperature or to connect a fixed resistor correspondent to the minimum value .
- 6) By the ZERO potentiometer calibrate the output at the minimum value .
- 7) Set the simulator at the maximum temperature or to connect a fixed resistor correspondent to the maximum value .
- 8) By the SPAN potentiometer calibrate the output at the maximum value .
- 9) Repeat the operation from the step 5 to the step 8 until the output value will be correct ( 3 attempts typically required).

**Configuration ex. :** -30/200 °C out 0÷10 Vdc

Span => 200°C - (-30°C) = 230°C;

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

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

### INPUT RANGES TABLE

INPUT		DSI			
SPAN	ZERO	1	2	3	4
< 80°C (176°F)	- 50 to -25°C(-58 to -13°F)		●		
< 80°C (176°F)	- 25 to 12°C(-13 to 53°F)		●		●
< 80°C (176°F)	12 to 50°C(53 to 122 °F)		●	●	●
80 to 200°C(176 to 392°F)	- 50 to -25°C(-58 to -13°F)	●	●		
80 to 200°C(176 to 392°F)	- 25 to 12°C(-13 to 53°F)	●	●		●
80 to 200°C(176 to 392°F)	12 to 50°C(53 to 122 °F)	●	●	●	●
200 to 250°C(392 to 482°F)	- 50 to 50°C(-58 to 122°F)				
250 to 650°C(482 to 1202°F)	- 50 to 50°C(-58 to 122°F)	●			

### OUTPUT RANGES TABLE

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

● = DIP SWITCHES: " ON"

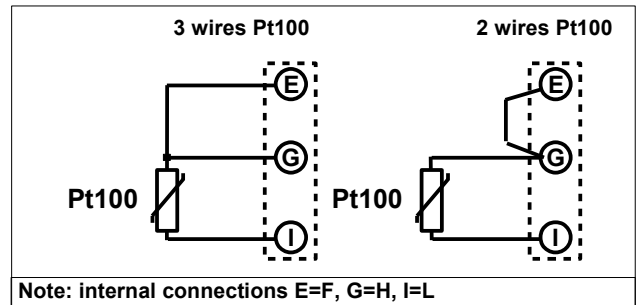
## INSTALLATION INSTRUCTIONS

The device DAT 2165 is suitable for DIN rail mounting in vertical position.

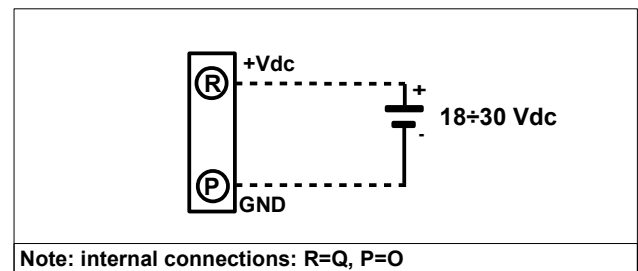
It is necessary to install the device in a place without vibrations . Moreover, it is recommended to use shielded cable to connect signals and to avoid routing conductors near power signal cables.

### CONNECTIONS DAT 2165

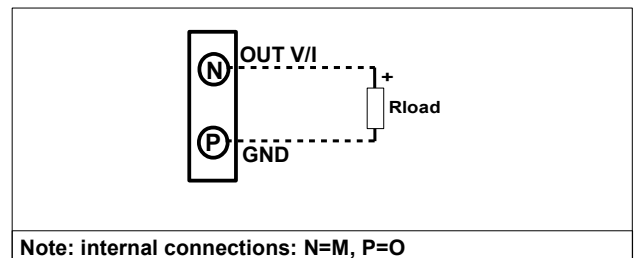
#### INPUT CONNECTIONS



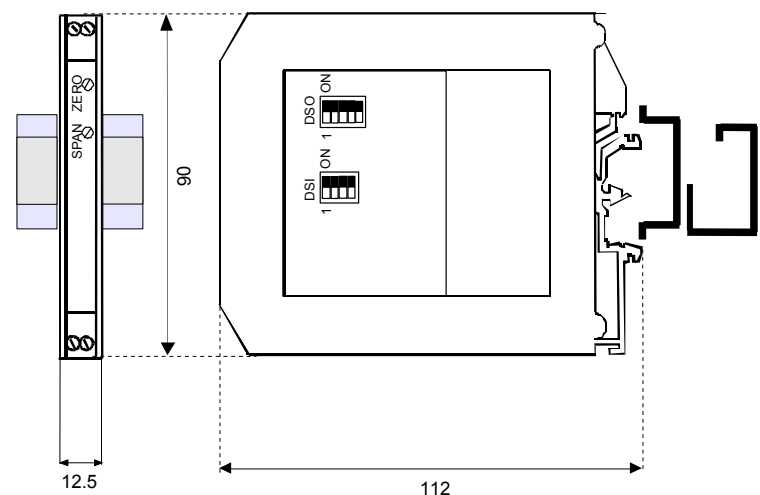
#### POWER SUPPLY CONNECTIONS



#### OUTPUT CONNECTIONS



### DIMENSIONS (mm) & SETTINGS



#### HOW TO ORDER

The DAT 2165 is supplied regulated as requested on the order. In case of the configuration is not specified, the parameters must be set by the user.

**ORDER CODE EXAMPLE: DAT 2165 0÷200 °C/°F 4÷20 mA**

Input range      Unit of measure      Output range



The symbol reported on the product indicates that the product itself must not be considered as a domestic waste. It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste. For more information contact the proper office in the user's city , the service for the waste treatment or the supplier from which the product has been purchased.