DATEXEL

RTD Temperature Converter
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Isolated programmable converter for Pt100
DAT 2061

FEATURES
- **- Input for RTD type Pt100**
- **- Unit of measure configurable in °C or °F**
- **- Zero and Span values configurable by DIP-switches**
- **- Voltage or current output**
- **- Output values configurable by DIP-switches**
- **- Galvanic isolation at 2000 Vac between input / output and power supply**
- **- 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 2061 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.
The 2000 Vac isolation between input / output and power supply eliminates the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.
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 2061 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 Q (GND).
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 (GND1).
The input connections must be made as shown in the section "Input connections".
The 3 wires Pt100 must be connected between the terminals G (Pt2) and I (Pt1), while the third wire must be connected to the terminal E (Pt3) or alternatively between the terminals H (Pt2) and L (Pt1), while the third wire must be connected to the terminal F (Pt3).
The 2 wires Pt100 must be connected between the terminals G (Pt2) and I (Pt1), making a short circuit between the terminals G (Pt2) and E (Pt3) or alternatively between the terminals H (Pt2) and L (Pt1), making a short circuit between the terminals H (Pt2) and F (Pt3) .
The configuration of input and output ranges values is made by DIP-switches (refer to the section "Input range tables" 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 2061: Configuration and calibration".
To install the device refer to the section "Installation instructions".

TECHNICAL SPECIFICATIONS (Typical @ 25 °C and in nominal conditions)	
Input	
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 600 °C (1112 °F)
Sensor excitation current	1 mA
Line resistance influence	0.05 % of f.s./ohm (100 ohm max. balanced per wire)
Output	
Signal type (configurable)	Current: 4 ÷ 20 mA, 0 ÷ 20 mA
	Voltage: 0÷10 V
Burnout condition	Positive out of scale (> 20 mA or > 10 V)
Maximum output signal	35 mA or 18 Vdc
Load resistance (Rload)	Current output: ≤ 500 Ω; Voltage output: ≥ 5 KΩ
Performances	
Calibration error	± 0.1 % of f.s.
Linearity error (*)	± 0.15 % of f.s.
Response time (from 10 to 90 % of f.s.)	500 ms
Warm-up time	3 minutes
Thermal drift	0.02 % of f.s./°C
Power supply voltage (**)	18 ÷ 30 Vdc
Current consumption	Current output: 60 mA max.; Voltage 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
Isolation voltage	2000 Vac, 50 Hz, 1 min.
Relative humidity (non cond.)	0 ÷ 90%
Maximum Altitude	2000 m
Installation	Indoor
Category of installation	II
Pollution Degree	2
Weight	approx. 80 g
Mechanical Specifications	
Material	Self-extinguish plastic
IP Code	IP20
Wiring	wires with diameter 0.8÷2.1 mm^2 /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 2061: 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", determine in the column "SPAN " where the calculated value is included. Determine in the column "ZERO", the range of value where the zero scale value is included. In the side, is shown the relative DIP-switches configuration.
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 .
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. : -50/250 °C out 0÷10 Vdc
Span => 300°C;
Input switches configuration (DSI): Off, Off, Off, On.
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 ÷ -15°C(-58÷5°F)			●	
< 80°C (176°F)	- 15÷ 15°C(5÷59°F)	●		●	
< 80°C (176°F)	15 ÷ 50°C(59÷122 °F)	●	●	●	
80÷200°C(176÷392°F)	- 50 ÷ -15°C(-58÷5°F)			●	●
80÷200°C(176÷392°F)	- 15÷ 15°C(5÷59°F)	●		●	●
80÷200°C(176÷392°F)	15 ÷ 50°C(59÷122 °F)	●	●	●	●
200÷250°C(392÷482°F)	- 50÷50°C(-58÷122°F)				
250÷600°C(482÷1110°F)	- 50÷50°C(-58÷122°F)				●

OUTPUT RANGES TABLE

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

● = DIP SWITCHES: " ON"

INSTALLATION INSTRUCTIONS

The DAT 2061 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 is necessary to separate them by at least 5 mm if the panel temperature exceeds 35°C and the device is powered by an high supply voltage(>27Vdc)

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.
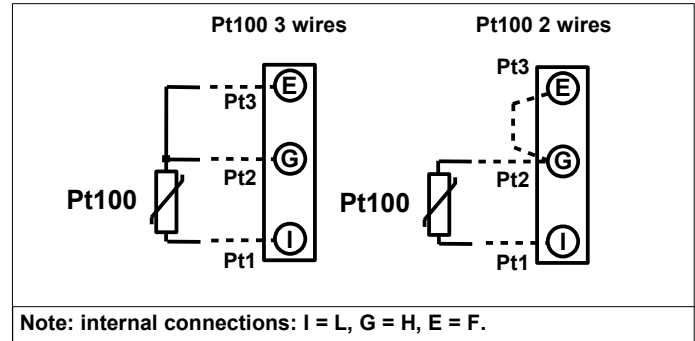Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters, etc...) and to use shielded cable for connecting signals.
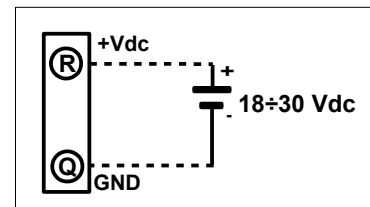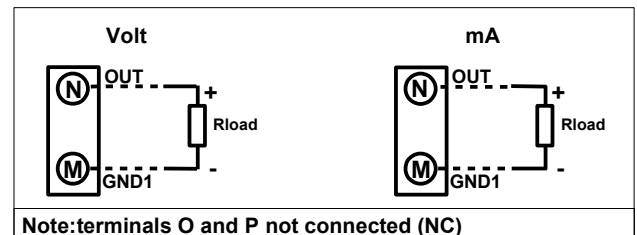
ISOLATIONS STRUCTURE

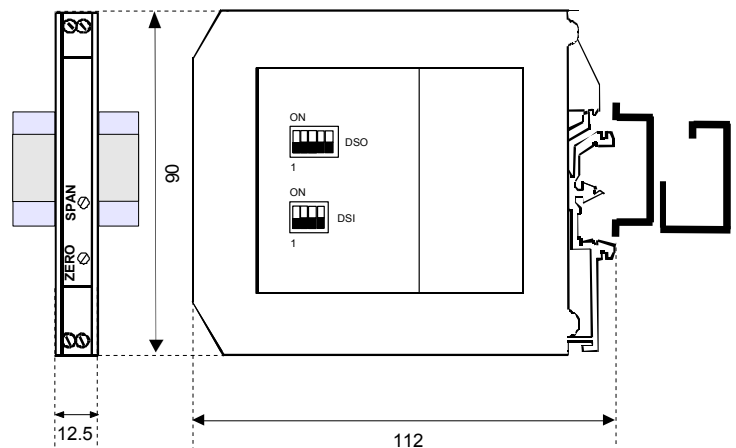
DAT 2061: CONNECTIONS

INPUT CONNECTIONS

Note: internal connections: I = L, G = H, E = F.

POWER SUPPLY CONNECTIONS

OUTPUT CONNECTIONS

Note:terminals O and P not connected (NC)

DIMENSIONS (mm) & REGULATIONS

HOW TO ORDER
The DAT 2061 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: DAT 2061 - 0÷200 °C - 4 ÷ 20 mA

Input range
Unit of measure
Output range