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Potentiometer to Voltage Converter

PC programmable Converter for RTD, Res, Pot input

DAT2105 3W

FEATURES

- **Configurable input for RTD, mV, Resistance and Potentiometer**
- **Configurable output as current or voltage**
- **Damping function on output**
- **Configurable by Personal Computer by cable CVPROG**
- **High accuracy**
- **On-field reconfigurable**
- **Device configurable via Micro-USB without power supply**
- **Potentiometers for the adjustment of the output signal (Option – POT)**
- **Signalling LED for correct power supply condition**
- **EMC compliant – CE mark**
- **Suitable for DIN rail mounting in compliance with EN-50022 and EN50035**

GENERAL DESCRIPTION

The converter DAT2105 3W is able to execute several functions such as : measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of a voltage signal even coming from a potentiometer connected on its input.
The measured values are converted, in function of the configuration, in normalized signals in current or voltage .
The device guarantees high accuracy and performances stability both in time and in temperature.
On the front side of the device there is the led PWR to signal the correct power supply condition.
The configuration of the device must be made with device not powered using the proper cable that must be connected to the Micro-USB plug located on the front side.
When the cable is connected, the led PWR will be highlighted signalling the correct state of connection to the USB port.
The configuration of the device must be made by a Personal Computer using the software **DATAPRO** or later, developed by DATEXEL, that runs under the operative system "Windows™ ".
For Resistance and RTDs sensors it is possible to set the cable compensation with 3 wires.
It is possible to set the minimum and maximum values of input and output ranges in any point of the scale, keeping the minimum span shown in the table below.
Moreover it is available the option of alarm for signal interruption (burn-out) that allows to set the output value as high or low out of scale.
For the device it is foreseen the damping function that allows to set a programmable filter up to 30 seconds to reduce eventual fast variations on the input signal.
In phase of order it is available the option "-POT"; if requested with this option the device will be equipped with potentiometers located on the front side that can be used to adjust the output signal in case that on field it would be requested an handmade adjustment of the signal itself.
It is housed in a plastic enclosure of 12.5 mm thickness suitable for DIN rail mounting in compliance with EN-50022 and EN-50035 standards.

USER INSTRUCTIONS

The input, output and power supply connections must be made as shown in the section "Wiring".
To configure the converter refer to section "Configuration".

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

Input type	Min	Max	Min. span
Voltage			
mV	-100 mV	+90 mV	5 mV
mV	-100 mV	+200 mV	10 mV
mV	-100 mV	+800 mV	20 mV
RTD(*) 2,3 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-85°C	185°C	30°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	30°C
Pot.			
(nom. Res < 50KΩ)	0 %	100 %	10 %
RES. 2,3 wires			
	0 Ω	500 Ω	50 Ω
	0 Ω	2000 Ω	50 Ω

Input calibration (1)

RTD	> of ±0.1% f.s. or ±0.2°C
Low RES	> of ±0.1% f.s. or ±0.15 Ω
High RES	> of ±0.2% f.s. or ±1 Ω
mV	> of ±0.1% f.s. or ±12 uV
Potentiometer	± 0.05 % f.s

Linearity (1)

RTD	± 0.1 % f.s.

Input impedance

mV	>= 10 MΩ

Sensor excitation current

RTD,Res	400 uA

Line resistance influence (1)

mV	<=0.8 uV/Ohm
RTD 3 wires	0.05%/Ω (50Ω max balanced)

Thermal drift (1)

Full scale	± 0.01% / °C

OUTPUT

Type	Min	Max	Min Span
Current	0 mA	20 mA	4 mA
Voltage	0 V	10 V	1 V

Output calibration

Current	± 7 uA
Voltage	± 4 mV

Burn-out values

Max. output value	22 mA or 11 V
Min. output value	0 mA or -0.8 V

Output Load Resistance - Rload

Current output	< 500 Ω
Voltage output	> 5 KΩ
Voltage output short circuit current	30 mA max

Response Time (10÷ 90%) about 220 ms

Potentiometer Adjustment (Option "- POT")

Zero	± 5 %
Span	± 5 %

(1) referred to input Span (difference between max. and min. values)

POWER SUPPLY

Supply voltage	18 .. 30 Vdc
Reverse polarity protection	60 Vdc max
Current consumption	
Current output	45 mA max.
Voltage output	15 mA max.

ENVIRONMENTAL CONDITIONS

Operative Temperature	-20°C .. +70°C
Storage Temperature	-40°C.. +85°C
Humidity (not condensed)	0 .. 90 %
Maximum Altitude	2000 m
Installation	Indoor
Category of installation	II
Pollution Degree	2

MECHANICAL SPECIFICATIONS

Material	Self-extinguish plastic
IP Code	IP20
Wiring	wires with diameter 0.8÷2.1 mm² /AWG 14-18
Tightening Torque	0.8 N m
Mounting	in compliance with DIN rail standard EN-50022 and EN-50035
Weight	about 90 g.

EMC (for industrial environments)

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

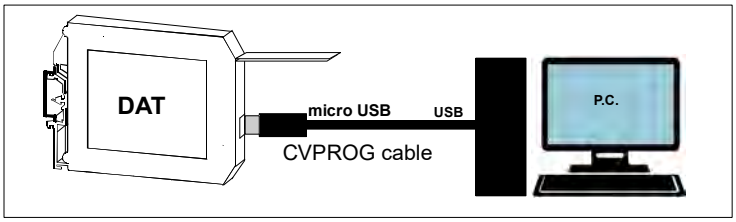
(*) For temperature sensors it is possible to set the input range also in F degrees; to made the conversion use the formula: °F = (°C*9/5)+32)

CONFIGURATION

Notice: before to execute the next operations, check that the drivers of the cable CVPROG in use have been previously installed in the Personal Computer.

1) Open the plastic label protection on front side of the device.
2) Connect the two plugs of cable CVPROG to the Personal Computer (USB plug) and to the device (Micro-USB plug) .
3) Run the software DATAPRO or later versions. Open the COM port assigned by Windows to the cable CVPROG.
4) Select the device and set the parameters of configuration .
5) Program the device.

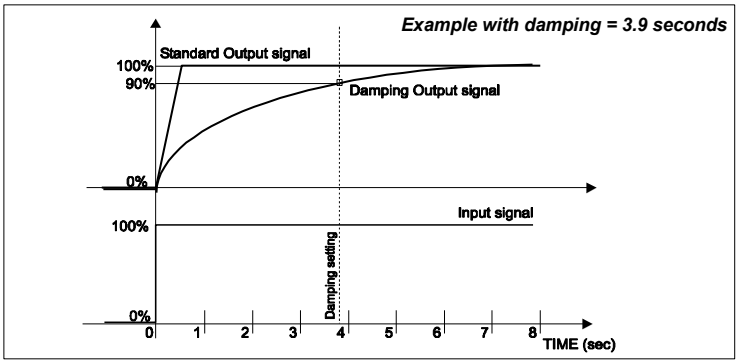
PROGRAMMING



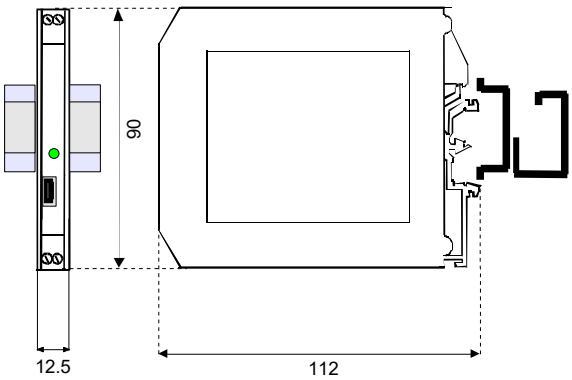
LIGHT SIGNALLING

LED	COLOR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered / USB connected
		OFF	Device not powered

DAMPING FUNCTION



DIMENSIONS (mm)



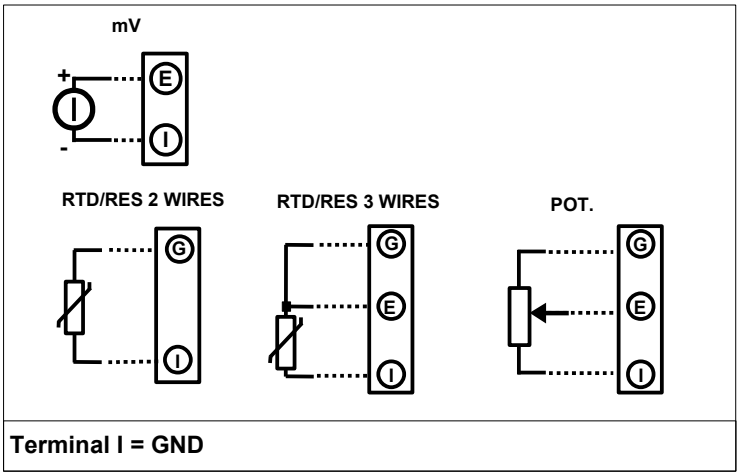
The symbol reported on the product indicates that the product itself must not be considered as a domestic waste.
It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste.
For more information contact the proper office in the user's city , the service for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

INSTALLATION INSTRUCTIONS

The device is suitable for DIN rail mounting in vertical position.
It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables .

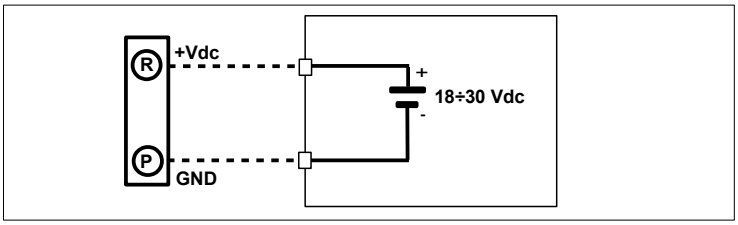
WIRING

INPUT CONNECTION

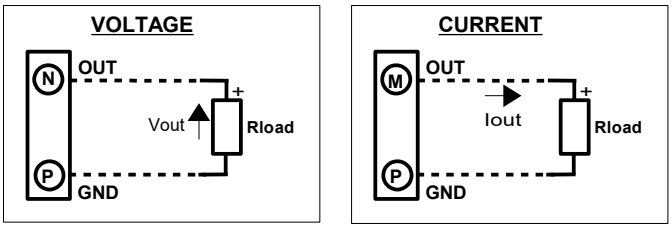


Terminal I = GND

POWER SUPPLY CONNECTION



OUTPUT CONNECTION



HOW TO ORDER

The device is provided as requested on the Customer's order.
In case of the configuration is not specified, the parameters must be set by the user.
Refer to the section "Technical specification" to determine input and output ranges.

ORDER CODE EXAMPLE:

DAT2105 3W / Pt100 / 3 wires / 0 ÷ 200 °C / 4 ÷ 20 mA / High / - POT

- Input type
- Sensor options : RTD/RES:2,3 wires
- Input range
- Output range
- High or low Out of scale
- Option Potentiometers for output adjustment