



## Pt100 temperature transmitter CO-P

### Description

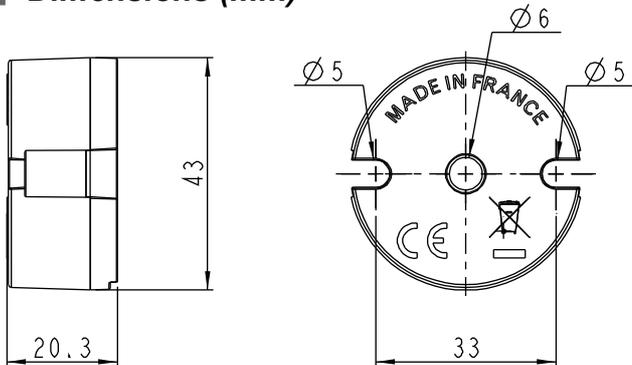
**CO-P** transmitter is a **Pt100** temperature transmitter into a **4-20 mA** (or **20-4 mA**) electric signal at adjustable microprocessor.

It allows to convert variations of temperature reported by a standard Pt100 sensor (**100Ω at 0 °C**) for a measuring range going from **-200 to +850 °C** into an electric linear signal at 2 wires in the 4-20 mA range.

Configuration of the transmitter is simply made through a configuration button. It is also possible to use the **LCC101** configuration software to configure the transmitter. A led warns when an alarm situation appears ( out of range or short-circuit).

The transmitter is protected against inversions of polarity and has been designed to be placed in **DIN B** head probe.

### Dimensions (mm)



### Output current with relation to temperature (on range from 0 to +100 °C)

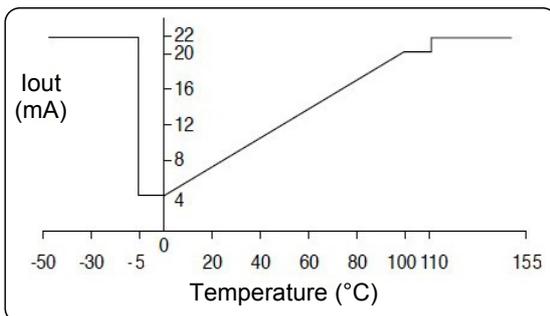


Fig.1

### Technical features of the transmitter

(at 20 °C and for a power supply voltage of 24 Vdc)

#### • Input

Sensor.....	Pt100 (100Ω at 0 °C)
Mounting of the element.....	2 or 3 wires
Linearization.....	EN60751, IEC 751
Current in the sensor.....	<1 mA
Measuring range.....	from -200 to +850 °C
Range by default.....	from 0 to 100 °C
Minimum measuring range.....	25 °C
Influence of connection wires.....	negligible with coupled wires
Speed conversion.....	2 measurements per second
Accuracy.....	from -100 to + 500 °C : ±0.1 °C ±0.1% of reading beyond : ±0.2 °C ±0.2% of reading
Sensitivity to variations of feeding voltage.....	0.01 °C/°C
Sensitivity to variations of voltage supply.....	0.005% FC / Vdc
Storage temperature.....	from -40 to +80 °C
Working temperature.....	from 0 to +70 °C

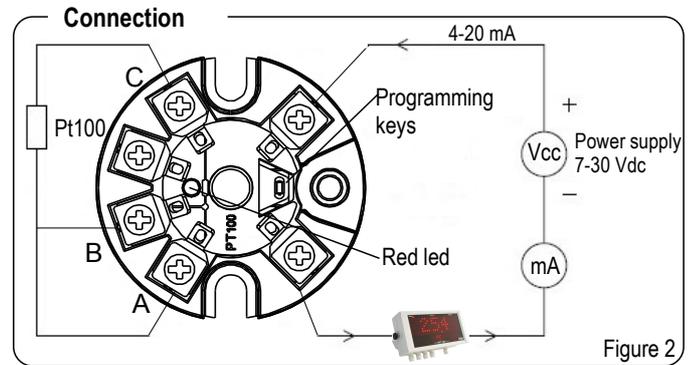
#### • Output

Output.....	4-20 mA (or 20-4 mA), 22 mA in case of programming error or temperature out of range* (fig1)
Resolution.....	2 μA
Power supply voltage.....	7-30 Vdc (protection against inversions of polarity)
Load resistance.....	$R_{Lmax} = \frac{V_{dc} - 7}{0.022}$ => $R_{Lmax} = 770 \Omega @ V_{cc} = 24 Vdc$
Red led.....	lights up during the programming phase and when the measured temperature is outside the set range

\* If the measured temperature T is outside the set range T1...T2 (T1<T2), the transmitter maintains 4 mA for T<T1 and 20 mA for T>T2 for a dead band of 5 °C before going into error status at 22 mA.

## ■ Connection

Figure 2 shows the wiring diagram of the converter in the current loop. To get a better accuracy, use 3 wires with the same diameter to plug to the Pt100, this allows to guarantee the same impedance to each branch. A device can be introduced in the current loop such as a display, a controller or a data logger.



## ■ Programming

It is possible to set different measuring ranges using the following accessories :

- ① Continuous power source 7-30 Vdc
- ② Precision ammeter with minimum range of 0 to 25 mA
- ③ Pt100 calibrator

### Procedure :

- Connect the converter to set to the power supply, to the ammeter and to the Pt100 calibrator (see figure 2). Then make a long press on the configuration button. The led blinks twice during the push. When blinks become faster, release the button : programming mode is active.

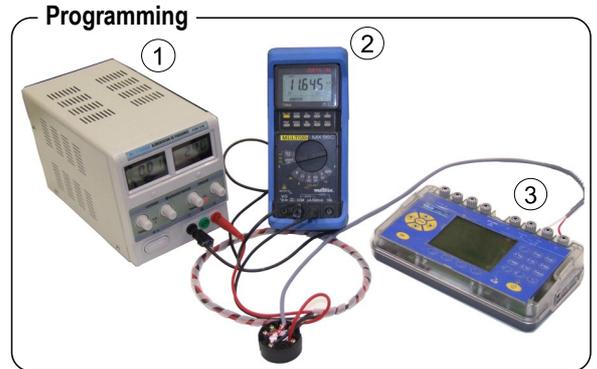
### a – Configuration of T1 point

- Led blinks 1 time at regular intervals : set the required temperature for the 4 mA output.
- Validate instructions with a brief press on the programming key. Led stays on then blinks 4 times quickly : temperature for 4 mA output is recorded.

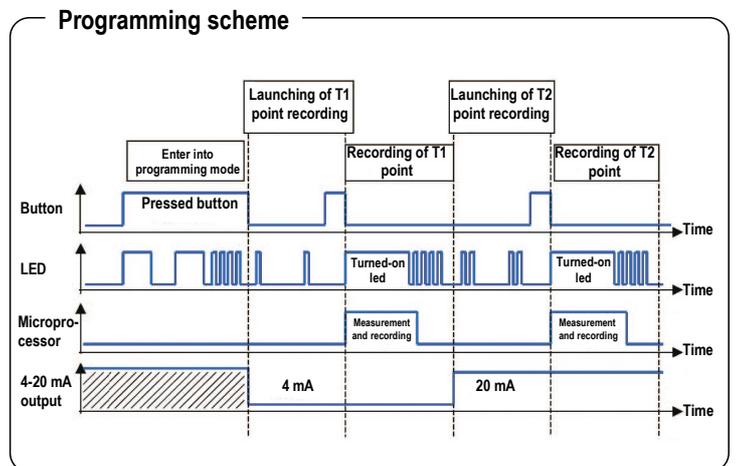
### b – Configuration of T2 point

- Led blinks 2 times faster at regular intervals : set the required temperature for 20 mA output.
- Validate instructions with a brief press on the programming key. Led stays on then blinks 4 times quickly : temperature for 20 mA output is recorded.

In case error whilst programming, if temperature is out of range or in alarm situation, led blinks 6 times quickly.



**NOTE** Programming of the temperature range can be made using resistances of precision with a fixed value which simulate values of Pt100 sensor (see table below of Pt100 values).



## ■ Pt100 values in ohms compared to measured temperature

Temp °C	Pt100 value (Ω)
-200	18.52
-150	39.72
-100	60.26
-50	80.31
0	100.00
50	119.40
100	138.51
150	175.86

Temp °C	Pt100 value (Ω)
200	175.86
250	194.10
300	212.05
350	229.72
400	247.09
450	264.18
500	280.98
550	297.49

Temp °C	Pt100 value (Ω)
600	313.71
650	329.64
700	345.28
750	360.64
800	375.70
850	390.48

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