



Pt100 temperature transmitter CO-P

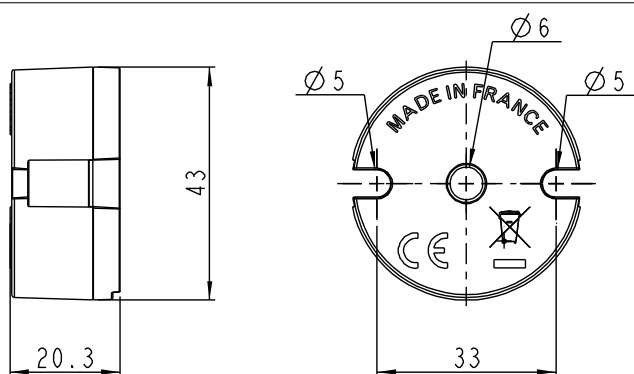
DESCRIPTION

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)

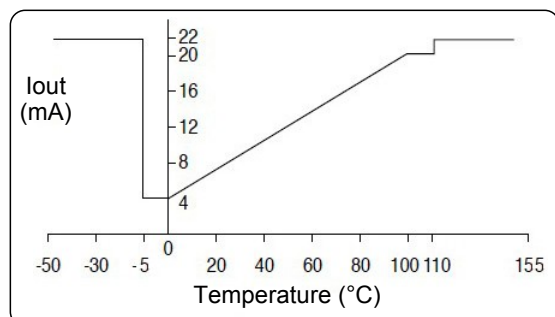


Fig.1

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
Linearisation	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

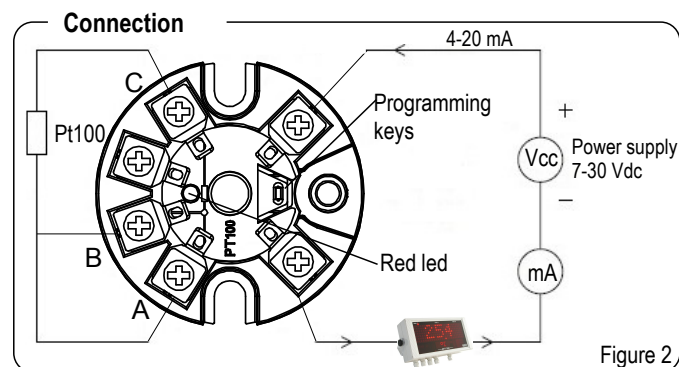
• Output

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	$RL_{max} = \frac{V_{dc} - 7}{0.022}$ => $R_{Lmax} = 770 \Omega$ @ $V_{cc} = 24 Vdc$
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.

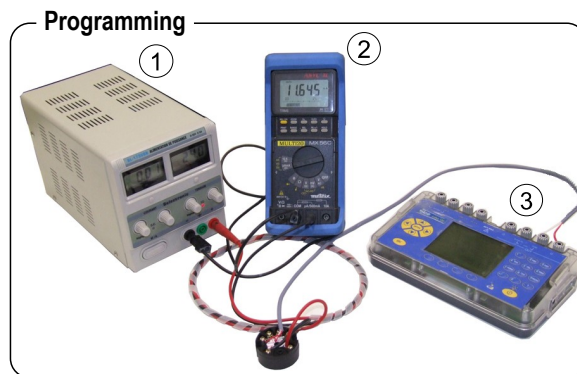
a – Configuration of T1 point

- 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

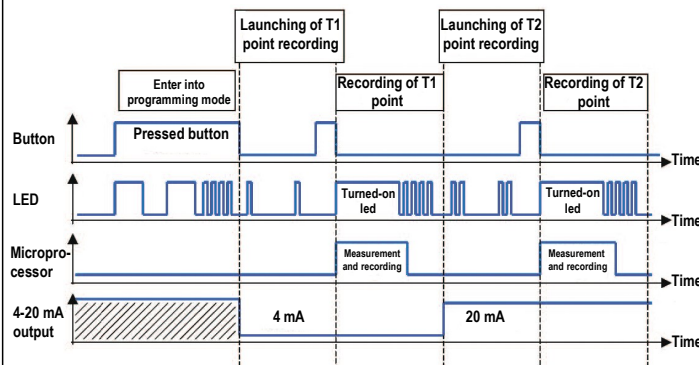
- Led blinks 2 times faster at regular intervals: set the required temperature for 20 mA output.
- Validate instructions with a brief press on the programming key. Led stays on then blinks 4 times quickly: temperature for 20 mA output is recorded.

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



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).

Programming scheme



PT100 VALUES IN OHM 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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