KIMO INSTRUMENTS

# Technical Data Sheet

Pressure / Temperature / Humidity / Air Velocity / Airflow / Sound level

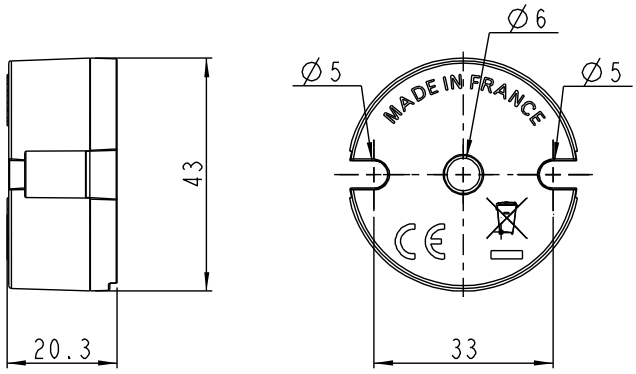
CE


# 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 warms 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)***

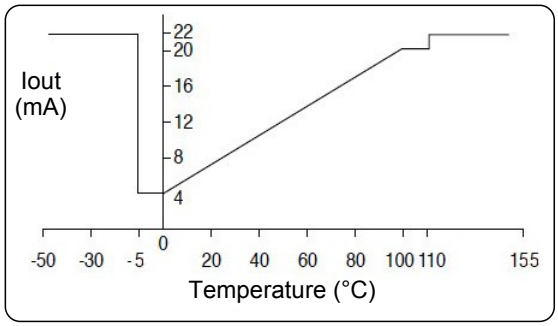



Fig.1

## 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<br>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** | RLmax = $\frac{Vdc-7}{0.022}$<br>=>R Lmax = 770 Ω @ Vcc = 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 fot 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.

**Connection**

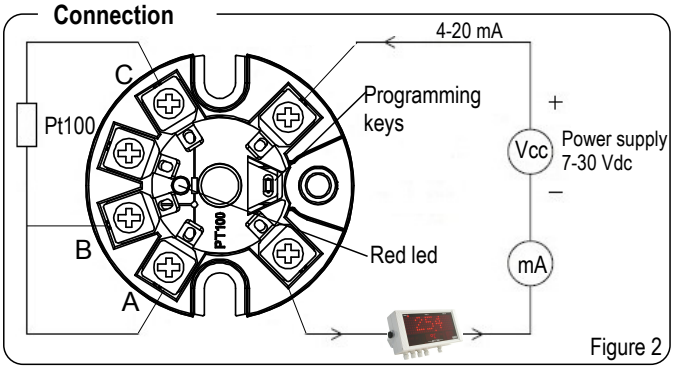



Figure 2

## 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**

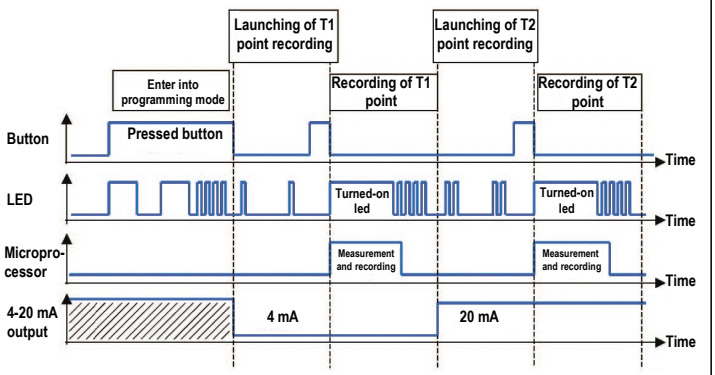
- Led blinks 2 times faster at regular intervals: set the required temperature for 20 mA output.
- Validate instructions with a brief press on the programming key. Led stays on then blinks 4 times quickly: temperature for 20 mA output is recorded.

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

**Programming**


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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