

# FLTSN-PXXXP | PASSIVE TEMPERATURE PROBE

## Mounting and operating instructions



# Table of contents

## 1. SAFETY AND PRECAUTIONS

.....

## 2. PRODUCT DESCRIPTION

.....

## 3. ARTICLE CODES

.....

## 4. INTENDED AREA OF USE

.....

## 5. TECHNICAL DATA

.....

## 6. STANDARDS

.....

## 7. MOUNTING INSTRUCTIONS IN STEPS

.....

## 8. WIRING AND CONNECTIONS

.....

## 9. OPERATING INSTRUCTIONS

.....

## 10. TROUBLESHOOTING

.....

## 11. FREQUENTLY ASKED QUESTIONS (FAQs)

.....

## 12. TRANSPORT AND STORAGE

.....

## 13. WARRANTY AND RESTRICTIONS

.....

## 14. MAINTENANCE

.....

## 1. SAFETY AND PRECAUTIONS



Read all the information in this manual, in the datasheet and in the Modbus Register Map before working with the product. For personal and equipment safety and for optimum product performance, make sure you fully understand the content before installing, using or servicing this product.



For safety and licensing (CE) reasons, unauthorised conversions and / or modifications of the product are inadmissible.



The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentrations can affect the product performance. Make sure the work environment is as dry as possible and avoid condensation.



All installations must comply with local health and safety regulations and local electrical standards and approved codes. This product should only be installed by an engineer or a technician with expert knowledge of the product and safety precautions.



Avoid contact with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.



Always check that you are connecting the correct power supply to the product and use wires with the correct characteristics and cross-section. Make sure all screws and nuts are properly tightened and fuses (if any) are in place.



Consideration should be given to recycling the equipment and packaging. These should be disposed of in accordance with local and national laws and regulations.



If there are questions that are not answered, contact your technical support or consult a professional.

## 2. PRODUCT DESCRIPTION

FLTSN-PXXXP are passive temperature probes (Resistance Temperature Detectors, RTDs) that measure temperature by detecting changes in the electrical resistance of a material. They have a positive linear temperature coefficient of resistance: when the temperature increases, the resistance increases proportionally.

The passive temperature probes FLTSN-PXXXP provide the following benefits:

- **Stability:** Accurate and reliable temperature measurements due to the platinum sensing element.
- **Robustness:** The sensing element is coated with a waterproof acrylic coating and enclosed in an Acrylonitrile Butadiene Styrene (ABS) plastic tube.
- **Easy to use:** Simple two-wire connection.

Combining simplicity and reliability, the FLTSN-PXXXP passive temperature probes can be implemented effortlessly in a wide range of HVAC applications.

## 3. ARTICLE CODES

| Article code          | Cable length | PTC    |
|-----------------------|--------------|--------|
| <b>FLTSN-P500P100</b> | 1 m          | PT500  |
| <b>FLTSN-P500P400</b> | 4 m          |        |
| <b>FLTSN-P500P800</b> | 8 m          |        |
| <b>FLTSN-P500P1K6</b> | 16 m         |        |
| <b>FLTSN-P1K0P100</b> | 1 m          | PT1000 |

## 4. INTENDED AREA OF USE

- Temperature measurement in HVAC applications
- Indoor and outdoor applications

## 5. TECHNICAL DATA

- General characteristics
  - Acrylic coated sensing element in a plastic tube
  - Positive linear temperature coefficient
  - Tinned connections
  - Cable sheath: white
- Enclosure
  - Material of the plastic tube: ABS plastic
  - Colour: Black
  - Ingress protection: IP65
- Sensing element characteristics
  - Standardised characteristics according to IEC 60751
  - Fast response time:  $t_{0,9} \leq 5$  s (flowing air, 3 m/s)
  - Outstanding stability of temperature characteristic

## 6. STANDARDS

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- WEEE Directive 2012/19/EU
- Commission Delegated Directive (EU) 2015/863 (RoHS 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances



## 7. MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the unit, read carefully “**Safety and Precautions**” and make sure the following recommendations are met:

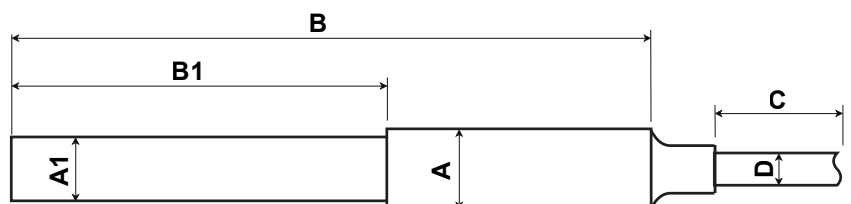
- When the sensor is used to measure ambient temperature, it should not be installed near diffusers, vents, windows and other sources of airflow since they can affect the accuracy of the sensor measurements. Make sure there is distance of at least 0,3—0,5 m between the sensor and the airflow source.
- The sensor should be protected from direct sunlight.
- The sensor should not be installed where vibrations and/or electromagnetic interference occur.

### Follow these steps:

The passive temperature probe can be hung in the airflow or fixed in a hole in the air duct.

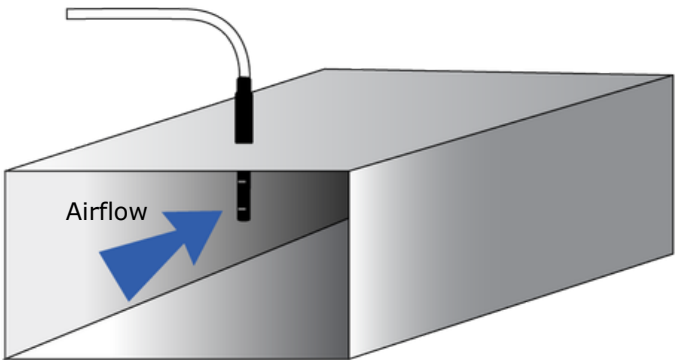
1. Before installing the sensor, mind the mounting dimensions — see **Fig. 1**
2. Make sure the device is not powered.
3. In case of installation of the sensor in an air duct: drill a Ø9,5 mm hole in the duct and insert the temperature probe — see **Fig. 2**.
4. Apply sealing to prevent air leakage.
5. Connect the temperature probe.

**Fig. 1 Mounting dimensions**



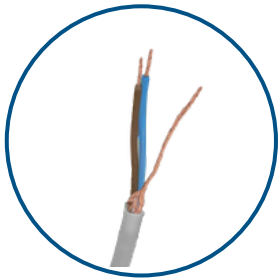
| Article code   | A1   | A    | B1        | B     | C    | D    |
|----------------|------|------|-----------|-------|------|------|
| FLTSN-P500P100 | 8 mm | 9 mm | 53 ± 2 mm | 89 mm | 1 m  | 4 mm |
| FLTSN-P1K0P100 |      |      |           |       | 4 m  |      |
| FLTSN-P500P400 |      |      |           |       | 8 m  |      |
| FLTSN-P500P800 |      |      |           |       | 16 m |      |
| FLTSN-P500P1K6 |      |      |           |       |      |      |

Fig. 2 Mounting position



8. WIRING AND CONNECTIONS

Connections



| Cable                                                                                        | Function                                                                                           |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Blue                                                                                         | Sensing element.                                                                                   |
| Brown                                                                                        |                                                                                                    |
| Shield                                                                                       | Braided shield to reduce the impact of electromagnetic interference affecting sensor measurements. |
| Cable characteristics                                                                        |                                                                                                    |
| 2-pole stranded wire, shielded, tinned connections, cable cross-section: 0,5 mm <sup>2</sup> |                                                                                                    |

## 9. OPERATING INSTRUCTIONS

| T [°C] | PT500<br>resistance [Ω] | PT1000<br>resistance [Ω] | Resistance values              |
|--------|-------------------------|--------------------------|--------------------------------|
|        |                         |                          | Class F 0,3*<br>Tolerance [°C] |
| -20    | 460,80                  | 921,60                   | ±0,40                          |
| -15    | 470,62                  | 941,24                   | ±0,38                          |
| -10    | 480,43                  | 960,86                   | ±0,35                          |
| -5     | 490,22                  | 980,44                   | ±0,33                          |
| 0      | 500                     | 1000                     | ±0,30                          |
| 5      | 509,76                  | 1019,53                  | ±0,33                          |
| 10     | 519,51                  | 1039,03                  | ±0,35                          |
| 15     | 529,25                  | 1058,49                  | ±0,38                          |
| 20     | 538,97                  | 1077,94                  | ±0,40                          |
| 25     | 548,67                  | 1097,35                  | ±0,43                          |
| 30     | 558,36                  | 1116,73                  | ±0,45                          |
| 35     | 568,04                  | 1136,08                  | ±0,48                          |
| 40     | 577,70                  | 1155,41                  | ±0,50                          |
| 45     | 587,35                  | 1174,70                  | ±0,53                          |
| 50     | 596,99                  | 1193,97                  | ±0,55                          |
| 55     | 606,60                  | 1213,21                  | ±0,58                          |
| 60     | 616,21                  | 1232,42                  | ±0,60                          |

**Note:** The table above shows the electrical resistance of Sentera's PT500 and PT1000 temperature probes at different temperatures. For example, at 0 °C, PT500 has a resistance of 500 Ω and PT1000 of 1000 Ω.

**\*Class F 0,3** tolerance according to IEC 60751, specifies the accuracy (tolerance) of the sensing element.

## 10. TROUBLESHOOTING

### In case of faulty operations, please check if

- All connections are correct.
- The mounting recommendations have been followed.
- The device to which the sensor is connected is functioning correctly.
- Disconnect the temperature probe and measure its electrical resistance. Verify that the measured resistance corresponds to the values in the table above.

## 11. FREQUENTLY ASKED QUESTIONS (FAQs)

### Can the sensor be submerged in water?

No. Thanks to its IP65 protection rating, the sensor is suitable for both indoor and outdoor applications. The enclosure provides complete protection against dust ingress and protection against water jets from any direction. However, the sensor is not designed for underwater operation.

### Can the cable of the sensor be extended?

Yes. The cable can be extended if required. However, cable length should be kept as short as possible. FLTSN-PXXXP probes are passive resistance temperature detectors that measure temperature based on changes in electrical resistance. Therefore, the additional resistance introduced by the cable may affect measurement accuracy.

### Is the sensor easy to connect?

The FLTSN-PXXXP features a compact design and an integrated 2-wire cable for quick and straightforward installation. The sensor does not require a separate power supply and can be used in different applications. Typically, the sensor is connected to an external device (e.g. fan speed controller), which sends an excitation current to the sensor, measures the sensor resistance and converts it into a temperature value.

## 12. TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packaging.

## 13. WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the production date relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

## 14. MAINTENANCE

In normal conditions, this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances, the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.

