

# PROCESS TEMPERATURE SENSOR

TSP-Series

## FEATURES

- Universal dimensions
- Simple installation
- Easy connection
- Robust
- IP54 connector cover
- -20...150°C
- Direct/indirect measurement
- EN 60730-2-9 approved

## OPTIONS

- Dual sensor (2 x NTC/Pt)
- Analog output (0...20mA or 4...20mA)
- Private label

## APPLICATIONS

- Central heating systems
- Boilers
- Heat exchangers
- Air conditioning equipment
- Heat pumps



## GENERAL INFORMATION

The process temperature sensors are easy to build into an application thanks to their universal dimensions. They enable direct measurement when immersed in the medium (water) via standardised process 1/2" BSP screw thread or in gas (air) via a sliding flange mounting.

Indirect measurement is done by placing it in an immersion well. This offers advantages in applications with an aggressive medium, high pressures or simply to allow for easy replacement.

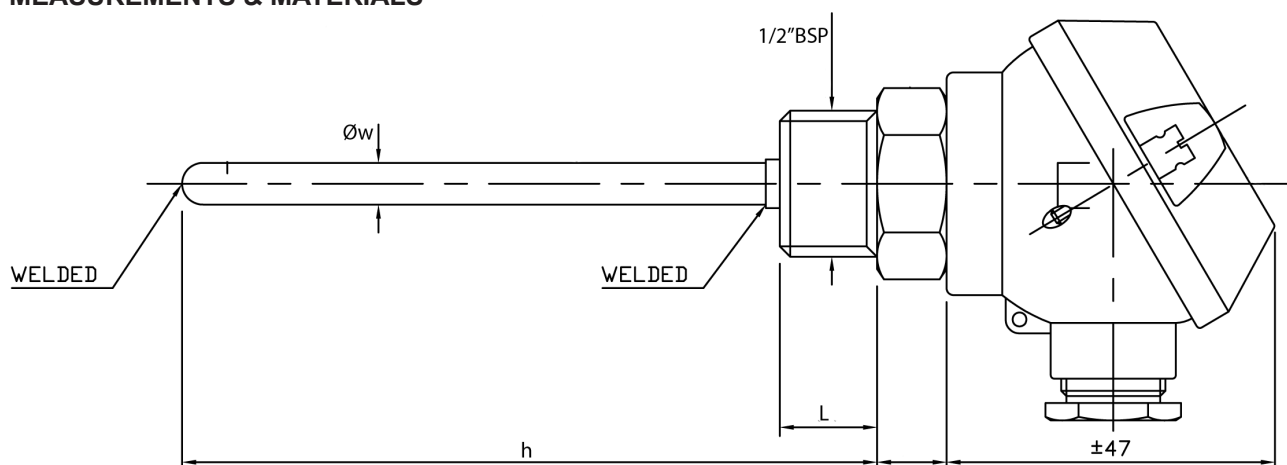
Furthermore this sensor differentiates itself with its robust and IP54 aluminium connector cover. They can also be supplied to third parties under your label or logo, along with the installation manual and appropriate packaging.

Besides the standard (single) model with one measurement element, there are also models with two separate measurement elements (duplex) or with built-in transmitter for an analog output (0...20mA or 4...20mA).

## GENERAL TECHNICAL INFORMATION

| Characteristic                        | Parameter    | Value     | Unit     |
|---------------------------------------|--------------|-----------|----------|
| Operating temperature                 | $T_{op}$     | -20...150 | °C       |
| Resistance tolerance NTC (@25°C)      | $\Delta R_R$ | ±1        | %        |
| Resistance tolerance Pt100 (Class B)  | $\Delta R_R$ | ±0,12     | Ω        |
| Resistance tolerance Pt500 (Class B)  | $\Delta R_R$ | ±0,6      | Ω        |
| Resistance tolerance Pt1000 (Class B) | $\Delta R_R$ | ±1,2      | Ω        |
| Temperature coefficient Pt100/Pt1000  | TCR          | 3850      | ppm/K    |
| Insulation resistance                 | $R_{ins}$    | >200      | MΩ       |
| Test Voltage (t = 1s)                 | $V_{test}$   | 2000      | $V_{AC}$ |

## MEASUREMENTS & MATERIALS



### Standard

|                       |                                      |
|-----------------------|--------------------------------------|
| Tube diameter (Øw)    | : Ø6 mm                              |
| Immersion depth (h)   | : 50 / 80 / 100 / 150 / 200 mm       |
| Mounting              | : 1/2\"BSP, L= 14mm / sliding flange |
| Housing/tube material | : Stainless Steel AISI 304 / Copper  |
| Connector cover       | : Aluminium                          |
| Electrical connection | : Screw / Spring-loaded connectors   |

### Options

|                      |                                          |
|----------------------|------------------------------------------|
| Dual sensor (Duplex) | : 2 x NTC/Pt                             |
| Built-in transmitter | : analogue output (0...20mA or 4...20mA) |

(Other dimensions or connectors on request)

Suggested accessoire: Immersion well



## AVAILABLE SENSOR VALUES

| NTC 3K             |          |           | NTC 5K             |           |  | Pt100         |          |  | Pt500         |  |          | Pt1000        |           |  | Pt-serie<br>Tolerance<br>Class |   |
|--------------------|----------|-----------|--------------------|-----------|--|---------------|----------|--|---------------|--|----------|---------------|-----------|--|--------------------------------|---|
| B 3988K<br>1%@25°C |          |           | B 3977K<br>3%@60°C |           |  | IEC751<br>A/B |          |  | IEC751<br>A/B |  |          | IEC751<br>A/B |           |  | A                              | B |
| T<br>°C            | R<br>Ohm | ΔT<br>±°C | R<br>Ohm           | ΔT<br>±°C |  | T<br>°C       | R<br>Ohm |  | R<br>Ohm      |  | R<br>Ohm | ΔT<br>±°C     | ΔT<br>±°C |  |                                |   |
| -50                | 201030   | 0,8       |                    |           |  | -50           | 80,3     |  | 401,5         |  | 803      | 0,05          | 0,05      |  |                                |   |
| -40                | 100950   | 0,7       | 167136             | 0,9       |  | -40           | 84,3     |  | 421,4         |  | 843      | 0,07          | 0,10      |  |                                |   |
| -30                | 53100    | 0,7       | 88066              | 0,9       |  | -30           | 88,2     |  | 441,1         |  | 882      | 0,09          | 0,15      |  |                                |   |
| -20                | 29121    | 0,6       | 48380              | 0,9       |  | -20           | 92,2     |  | 460,8         |  | 922      | 0,11          | 0,20      |  |                                |   |
| -10                | 16599    | 0,5       | 27609              | 0,9       |  | -10           | 96,1     |  | 480,4         |  | 961      | 0,13          | 0,25      |  |                                |   |
| 0                  | 9795     | 0,4       | 16312              | 0,9       |  | 0             | 100      |  | 500           |  | 1000     | 0,15          | 0,30      |  |                                |   |
| 10                 | 5970     | 0,4       | 9948               | 0,9       |  | 10            | 103,9    |  | 519,5         |  | 1039     | 0,17          | 0,35      |  |                                |   |
| 20                 | 3747     | 0,3       | 6246               | 0,9       |  | 20            | 107,8    |  | 539,0         |  | 1078     | 0,19          | 0,40      |  |                                |   |
| 25                 | 3000     | 0,2       | 5000               | 0,9       |  | 25            | 109,7    |  | 548,7         |  | 1097     | 0,20          | 0,43      |  |                                |   |
| 30                 | 2417     | 0,3       | 4028               | 0,9       |  | 30            | 111,7    |  | 558,4         |  | 1117     | 0,21          | 0,45      |  |                                |   |
| 40                 | 1598     | 0,4       | 2662               | 0,8       |  | 40            | 115,5    |  | 577,7         |  | 1155     | 0,23          | 0,50      |  |                                |   |
| 50                 | 1081     | 0,5       | 1799               | 0,8       |  | 50            | 119,4    |  | 597,0         |  | 1194     | 0,25          | 0,55      |  |                                |   |
| 60                 | 746,4    | 0,7       | 1242               | 0,8       |  | 60            | 123,2    |  | 616,2         |  | 1232     | 0,27          | 0,60      |  |                                |   |
| 70                 | 525,6    | 0,8       | 874                | 0,9       |  | 70            | 127,1    |  | 635,4         |  | 1271     | 0,29          | 0,65      |  |                                |   |
| 80                 | 377,4    | 1,0       | 626                | 1,0       |  | 80            | 130,9    |  | 654,5         |  | 1309     | 0,31          | 0,70      |  |                                |   |
| 90                 | 275,3    | 1,1       | 456                | 1,1       |  | 90            | 134,7    |  | 673,5         |  | 1347     | 0,33          | 0,75      |  |                                |   |
| 100                | 204,0    | 1,3       | 337                | 1,2       |  | 100           | 138,5    |  | 692,5         |  | 1385     | 0,35          | 0,80      |  |                                |   |
| 110                | 153,4    | 1,4       | 253                | 1,4       |  | 110           | 142,3    |  | 711,5         |  | 1423     | 0,37          | 0,85      |  |                                |   |
| 120                | 116,8    | 1,6       | 192                | 1,5       |  | 120           | 146,1    |  | 730,3         |  | 1461     | 0,39          | 0,90      |  |                                |   |
| 130                | 90,3     | 1,8       | 148                | 1,6       |  | 130           | 149,8    |  | 749,2         |  | 1498     | 0,41          | 0,95      |  |                                |   |
| 140                | 70,4     | 2,0       | 115                | 1,7       |  | 140           | 153,6    |  | 767,9         |  | 1536     | 0,43          | 1,00      |  |                                |   |
| 150                | 55,6     | 2,2       | 91                 | 1,8       |  | 150           | 157,3    |  | 786,6         |  | 1573     | 0,45          | 1,05      |  |                                |   |

## ORDERING INFORMATION

Please contact our sales department to select the process temperature sensor (TSP-series) to match your specific application