TetraTec® Instruments



RESISTANCE TEMPERATURE SENSOR

WIT-S

Pt100 temperature sensor for air and gases

TETRATEC INSTRUMENTS GMBH · STEINENBRONN · GERMANY

01 — THE SENSOR

One platinum element, two designs.

The WIT-S measures the temperature of air and gases from −30 to +80 °C using a Pt100 platinum element with a four-wire connection. As a probe version it adapts its immersion depth to the mounting point; as a screw-in version it sits compact and robust in a G1/4 or G1/2 thread. We match accuracy class, housing and connection to your application requirements.

+80 °C
MEASURING RANGE UP TO
from −30 °C, sensor tip briefly 150 °C

1/3 B
ACCURACY CLASS
corresponds to the new class AA

16 bar
PRESSURE LIMIT
screw-in version; with compression fitting 6 bar

THE ESSENTIALS

Pt100 with four-wire connection

Two wires carry the measuring current, two pick up the voltage at the element. The resistance of the lead therefore does not enter the measurement.

Adjustable immersion depth

If required, the probe version is mounted with a compression fitting; the immersion depth can then be adapted to the mounting point.

Compact screw-in design

The screw-in version is more compact and robust than the probe and withstands the higher pressure.

Tube end open or closed

The open sensor tube responds faster. The closed one is also suitable for corrosive gases that are compatible with its materials.

Plug-in connection

A pressed-in pin insert connects the sensor to the evaluation unit. We supply connection cables to length and connection on request.

WHAT IT IS NOT BUILT FOR

The WIT-S measures from −30 to +80 °C; only the sensor tip withstands up to 150 °C for a short time. The open sensor tube is intended for air and non-corrosive gases; corrosive gases need the closed one – provided the gas is compatible with its materials. The compression fitting withstands 6 bar, the screw-in version 16 bar gauge pressure, and both need a flat sealing surface. If your measuring point lies outside these limits, talk to us before the design.

Operating principle

A Pt100 is a platinum measuring resistor with 100 Ω at 0 °C; its resistance rises with temperature. The WIT-S is operated with a measuring current of 1 mA, so the voltage across the element is a measure of the temperature. How far the resistance may deviate from the characteristic curve is defined by the accuracy class: the WIT-S is available in 1/3 class B, which corresponds to the new class AA; class A is being discontinued.

With a four-wire connection, two wires carry the measuring current and two further wires pick up the voltage directly at the element. Since practically no current flows through the sense wires, no voltage drops across them: length and resistance of the lead do not enter the result. How fast the sensor follows a change in temperature depends on the sensor tube. Open, it reaches 99 % of the step after about 25 s; closed, after about 40 s.

PROBE AND SCREW-IN VERSION

VERSION	IMMERSION DEPTH	Ø SENSOR TUBE	WEIGHT
probe version, optionally with compression fitting	variable	2 or 3 mm	6 to 9 g
probe version with Ø 6 mm sheath tube	–	2 mm	–
screw-in version G1/4, flat sealing	20 mm	1.6 mm	36 g
screw-in version G1/2, flat sealing	30 mm	2 mm	87 g

Accessories are given in the datasheet.

TYPICAL APPLICATIONS

- Gas temperature in flow measuring sections
- Temperature in gas lines under pressure
- Measurement on corrosive gases with closed sensor tube
- Reference temperature for density and standard volume calculation
- Temperature measurement in test benches and test set-ups
- Retrofitting to existing threads via compression fitting

> *Two wires for the current, two for the voltage: only the resistance of the platinum element counts.*

02 — SELECTION

WIT-S – clean temperature measurement at a wide range of points.

VERSIONS

- Probe version, optionally with compression fitting
- Probe version with Ø 6 mm sheath tube
- Screw-in version G1/4 or G1/2, flat sealing
- Tube end open or closed
- 1/3 class B; class A being discontinued

ACCESSORIES

- Compression fittings for 2 and 3 mm sensor tubes, G1/8, G1/4 or G1/2
- Swagelok compression fitting for 6 mm sheath tube, G1/4
- Connection cable to length and connection on request

KEY SPECIFICATIONS

Measuring range	**−30 to +80 °C**
Measuring element	**Pt100, four-wire**
Accuracy class	**1/3 class B**
Response time T_{99}	**approx. 25 s open, 40 s closed**
Pressure limit	**6 bar probe, 16 bar thread**
Electrical connection	**M8×1, 4-pin**
Measuring current	**1 mA**
Process connection	**compression fitting, G1/4, G1/2**
Ø sensor tube	**1.6 / 2 / 3 mm**
Tube length	**20 to 250 mm**
Housing	**stainless steel**

Complete data in the technical datasheet.

FROM ENQUIRY TO RECURRING CALIBRATION

1. **Record the measuring point**
   Medium, pressure, temperature and mounting point – version, tube length and connection follow from these.
2. **Supply the sensor**
   WIT-S with matching fitting and connection cable.
3. **Calibrate**
   Calibration in our calibration laboratory on request.

We match the sensor to your measuring point.

REQUEST A DESIGN

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