



DESCRIPTION AND APPLICATION

These resistance-type sensors are intended for contact measurements of temperatures of liquid and gaseous substances. These sensors are produced in two versions: the small connection head with the resistance-type output and the big connection head with the output 4 to 20 mA. The sensors are designed to be used in the food-processing industry mainly. The sensor - central holder combination is suitable for temperature measurement in air condition ducts. The sensor - thermowell combination is suitable for temperature measurement in tubing. The sensor variant with welded thread is ideal for direct measuring of mediums in ducts. The standard temperature range in which the active sensors are allowed to be utilised is -50 to 150 °C, for the passive sensors the range is -50 to 200 °C. The sensors can be utilised for any control systems that are compatible with sensing element output signals or output signals quoted in the table of sensing element types. The sensors are designed to be operated in a chemically non-aggressive environment.

ACCESSORIES

- metal central holder K120
- stainless steel thermowell JS 130
- lead-in connector CONEC 43-00092
- connection cable with the straight-type RKT connector or with the rectangular-type RKWT connector
- screw with collet or cutting rings – if different lengths of stem immersion of the temperature sensor are set



TEMPERATURE SENSORS WITH A CONNECTION HEAD

DECLARATION, CERTIFICATES, CALIBRATION

Manufacturer provides **EU Declaration of Conformity**.

Calibration – The final metrological inspection – comparison with standards or working instruments – is carried out for all the products. Continuity of the standards and working measuring instruments is ensured within the meaning of the Section 5 of Act no.505/1990 on metrology. The manufacturer offers a possibility to supply the sensors calibrated in SENSIT s.r.o.'s laboratory (according to requirements of the EN ISO/IEC 17025 standard) or in an Accredited laboratory.

SPECIFICATIONS

BASIC DATA

Sensor type (K – with connector)	NS 180P NS 180K	NS 181P NS 181K	NS 182P NS 182K	NS 380P NS 380K	NS 381P NS 381K
Type of sensing element	Ni 1000/5000	Ni 1000/6180	Ni 891	Ni 10000/5000	Ni 10000/6180
Measuring range	-50 to 200 °C (connection head ambient temperature -30 to 100 °C)				
Maximum measuring DC current	1 mA	1 mA	1 mA	0.3 mA	0.3 mA

Sensor type (K – with connector)	NS 183P NS 183K	PTS 180P PTS 180K	PTS 280P PTS 280K	PTS 380P PTS 380K	HS 180P HS 180K
Type of sensing element	T1 = Ni 2226	PT 100/3850	PT 500/3850	PT 1000/3850	thermistor NTC 20 kΩ
Measuring range	-50 to 150 °C	-50 to 200 °C (connection head ambient temperature -30 to 100 °C)			-30 to 150 °C
Maximum measuring DC current	0.7 mA	3 mA	1.5 mA	1 mA	1 mW *)

*) maximum power consumption

Sensor type (K – with connector)	PTS 580P PTS 580K	Note
Type of sensing element	Pt 1000/3850	
Output signal	4 to 20 mA	
Measuring ranges	-50 to 50 °C	ambient temperature around the connection head -30 to 70 °C
	-30 to 60 °C	
	0 to 35 °C	
	0 to 100 °C	
	0 to 150 °C	
Power supply (U)	11 to 30 V DC	recommended value 24 V DC
Load resistance	150 Ω for power supply 12 V 700 Ω for power supply 24 V	
Output signal - sensing element break	> 24 mA	
Output signal - sensing element short circuit	< 3.5 mA	

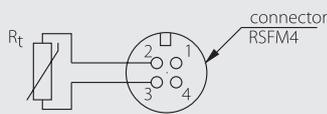
OTHER PARAMETERS

Accuracy class	Ni sensing elements: B class, $\Delta t = \pm (0.4 + 0.007t)$, for $t \geq 0$; $\Delta t = \pm (0.4 + 0.028 t)$, for $t \leq 0$ in °C; Pt sensing elements: B class according to EN 60751, $\Delta t = \pm (0.3 + 0.005 t)$ in °C NTC 20 k Ω : ± 1 °C for the range 0 to 70 °C
Measuring error	< 0.6 % of the measuring range, minimum 0.5 °C
Sensor connection	according to the wiring diagram
Standard length of the stem L1	70, 120, 180, 240 mm
Time response	$\tau_{0.5} < 9$ s (in flowing water at 0.4 m.s ⁻¹)
Lead-in cable – version with cable	PVC shielded 2 x 0.25 mm ²
Type of connector in the head – sensors with connector	Lumberg RSFM4, M 12
Standard lengths of the cable	1, 2, 5, 10 m
Insulation resistance	> 200 M Ω at 500 V DC, 25° \pm 3 °C; humidity < 85 %
Ingress protection	IP 67 in accordance with EN 60529
Material of the stem	stainless steel DIN 1.4301
Material of the connection head	stainless steel DIN 1.4301
Operating conditions	ambient temperature: -30 to 100 °C; -30 to 70 °C with a converter relative humidity: max. 100 % (at the ambient temperature 25 °C) atmospheric pressure: 70 to 107 kPa
Weight	approximately 0.25 kg

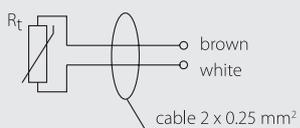
WIRING DIAGRAM

SENSORS WITH A RESISTANCE OUTPUT:

Sensors with connector

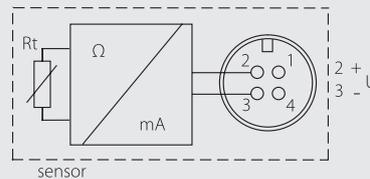


Sensors with cable

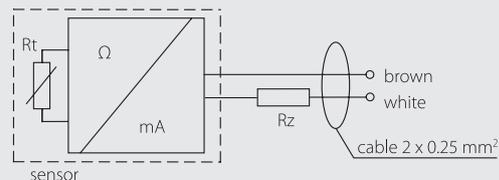


SENSORS WITH CURRENT OUTPUT:

Sensors with connector



Sensors with cable



SENSOR INSTALLATION AND SERVICING

SENSORS WITH THE GROMMET:

The temperature sensor is positioned in the location of temperature measurement by means of a thermowell or a stainless steel holder, and the lead-in cable is connected to the terminals of the sensing device according to the wiring diagram. To ensure the ingress protection value of IP 67 the tightness of the grommet must be checked. This grommet is a component part of the sensor's connection head.

SENSORS WITH CONNECTOR:

The temperature sensor is positioned in the location of temperature measurement by means of the thermowell or the stainless steel holder. To the RSFM 4 connector, which is a component part of the connection head, the lead-in cable provided with a connector is connected according to the wiring diagram. Optionally the stand-alone connector CONEC 43-00092, or a lead-in cable of the length of 5 m equipped with a straight connector of RKT type, or with a rectangular connector of RKWT type may be delivered. To ensure the ingress protection value of IP 67 the proper tightness of the connectors must be checked. In case the lead-in cable is laid in the vicinity of high voltage conductors or those supplying equipment creating disturbing electromagnetic field (e.g. inductive load equipment), a shielded cable should be used. The openings for the stainless steel holder installation have to be drilled according to the attached template, on which the opening diameters are depicted, too. In case of using the stainless steel thermowell or the holder these accessories must first be positioned in the temperature measurement location, then the sensor will be inserted into the holder, or, as the case may be, as far as to the thermowell bottom, and then secured with a screw. After installing and connecting the sensor to the appropriate evaluating electrical equipment the sensor is ready to use. The sensor does not require any special attendance or maintenance. The device can be operated in any working position, but the grommet or the connector must not be directed upwards.

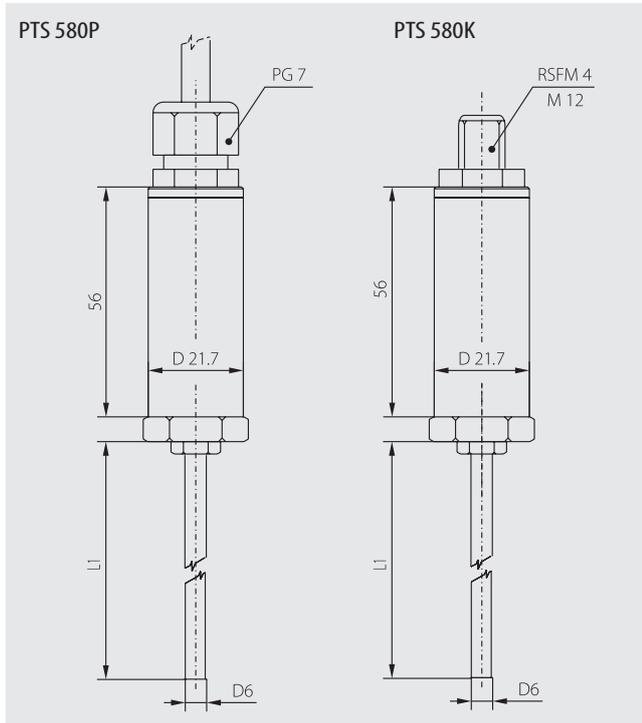
MODIFICATION AND CUSTOMISATION

FOR MANUFACTURED STANDARD SENSORS, THE FOLLOWING PARAMETERS CAN BE MODIFIED:

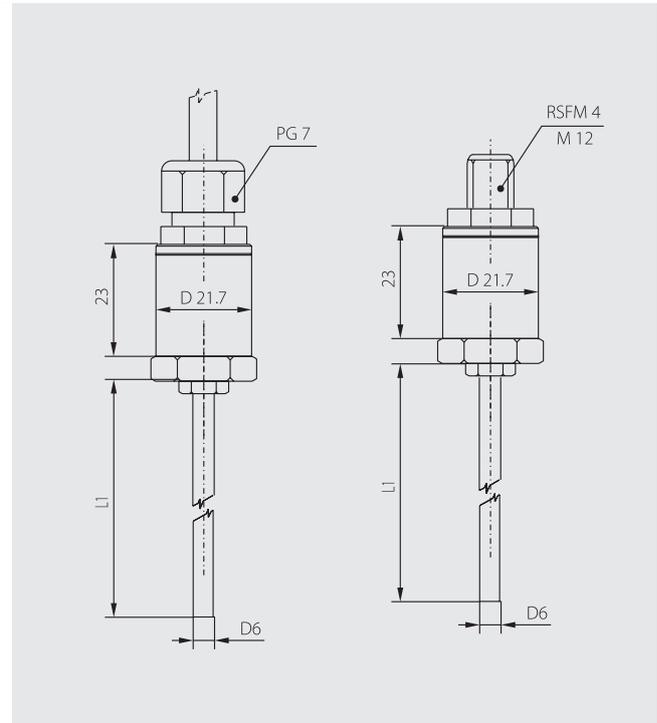
- option of encasing two sensing elements
- option of encasing non-standard temperature sensors (DALLAS, TSic, KTY, SMT, etc.)
- A class precision (with the exception of sensors Ni 10000/5000, Ni 10000/6180, T1 = Ni 2226, termistor NTC 20 kΩ)
- option of three- or four-wire connection
- variable stem design – L1 length, materials, diameters, option of thread design
- changing the sensor cable length – version with grommet
- thermowell thread type options

DIMENSIONAL DRAFT

SENSORS WITH CURRENT OUTPUT:



SENSORS WITH RESISTANCE OUTPUT:



Accessories

