

## INSTRUCTION MANUAL

# TEMPERATURE SENSOR TG8Ex - Pt 100/3850 $-30\text{ }^{\circ}\text{C} \leq T_s \leq 180\text{ }^{\circ}\text{C} / T_x; T_s = T$

Temperature sensor with cable can be used for measuring temperatures of gaseous and liquid substances in potentially explosive environments – Group II, Zone 2 and 22 according EN 60 079-0:2013+A11:2014

**SENSIT s.r.o.**

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3253.3	02.19
Supersede	3253.2

## Legal regulations and standards:

- Electrical connection of the detector may only be carried out by a competent person with electrician qualification who is familiarized with the "Instruction Manual" in detail.
- The Instruction Manual is part of the product and it is necessary to keep it for the entire service life of the product.
- The Instruction Manual must be transferred to any other owner or user of the product.
- The disposal must be performed in compliance with the Directive 2008/98/EC of the European Parliament and of the Council - on waste and the Directive 2012/19/EU of the European Parliament and of the Council – on waste electrical and electronic equipment (WEEE), as amended.
- The sensors are delivered in packages, which guarantee resistance to mechanical influences and that meet the conditions with the European Parliament and Council Directive 94/62/EC on packaging and packaging waste), as amended.
- 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. laboratory (according to EN ISO/IEC 17025 standard) or in an Accredited laboratory.

## Application:

The temperature sensors TG8Ex are designed for measuring temperatures of gaseous and liquid substances in potentially explosive environments. They meet requirements of the EN 60079-0:2013+A11:2014, EN 60079-7:2016 and EN 60079-31:2014, as amended. Temperature sensor with cable can be used in potentially explosive environments – Group II, Zone 2 and 22 according EN 60 079-0:2013+A11:2014. The sensors may be used for all control systems compatible with the Pt 100 temperature sensor with a temperature coefficient of 3850 ppm / °C. **The temperature range in which the sensor can be used in explosion-hazardous areas, is -30 to 180 ° C, and must not be exceeded for a short time. In non-explosive areas, the sensor can be used in the temperature range -50 to 200 ° C.** The sensors are suitable for temperature measurement in chemically non-aggressive environments and in dry conditions, the using must be chosen with regard to temperature and chemical resistant housing and a cable.

**Sensor label – Group II, Zone 2:**



II 3G Ex ec IIC T6...T2 Gc

FTZÚ16 ATEX 0142X

**Sensor label – Group II, Zone 22:**



II 3D Ex tc IIIC T60°C...230°C Dc

FTZÚ16 ATEX 0142X

## Recommended use and location of sensors:

- Operating position is arbitrary
- Sensor must be placed into protective thermowell for continuous temperature measurements of liquid substances
- For measure the temperature of liquid and gaseous substances is recommended the minimum immersion of the sensor in the medium --- 60 mm
- The sensors must not be used for any purpose other than to measure the temperature, and the handling must be followed with such measures to prevent injury with a metal housing

## Warnings and restrictions:

### The sensors must not be used for measuring in locations:

- Where the specified technical parameters and operating conditions are not adhered
- Where the sensor is exposed to mechanical action
- For measuring temperatures of subjects under voltage
- With chemically aggressive environment
- Where the sensor is exposed to permanent immersion in the liquid

### It is not suitable to use the sensors for measuring temperature in locations:

- Where the sufficient contact with the medium measured is not allow (small immersion of the sensor, environmental influence.)
- Where the supply cable might run parallel to mains cables (risk of interference signal induction and the measurement results may be influenced), the safe distance from mains power cables when cables run parallel can be as much as 0,5 m according to the nature of interfering fields.
- Where the sensor might be exposed to effects of strong organic and inorganic acids with medium and strong concentrations at high temperatures, weak organic acids with high concentrations and high temperatures, chlorinated hydrocarbons, and undiluted alkaline substances.

Failure to follow the said recommendations will negatively affect measurement accuracy, reliability and service life of the temperature sensor.

## Product safety:

Product safety and technical parameters were evaluated according to the following standards and norms, as amended:

- EN 60 079-0:2013+A11:2014, EN 60 079-7:2016 a EN 60 079-31:2014 --- as amended
- EN 60 529, EN 60730-1, EN 60730-2-9, EN 60751 --- as amended

## Declaration of conformity

SENSIT s.r.o. provides the product with the **EU Declaration of Conformity** issued according to Act No. 90/2016 Coll. and Act No. 22/1997 Coll., as subsequently amended. The product is in accordance with the following directives:

- European Parliament and Council Directive 2011/65/EU of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment and Commission delegated Directive 2015/863/EU of 31 March 2015 amending annex II to Directive 2011/65/EU, as amended
- European Parliament and Council Directive 2014/34/EU of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

## Sensor description:

The sensor consists of a metallic housing with the sensing element inside and a supply cable. The sensor housing is made of stainless steel. The sensors are connected as two-wire, three-wire or four-wire probes. The supply cable has external silicone insulation and is shielded. The shielding is not connected with the housing or with the temperature element.

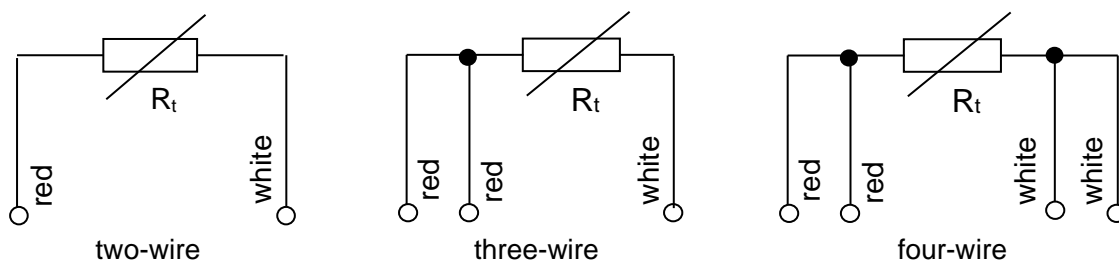
## Sensor installation:

1. If the sensor is used in combination with the thermowell, screw the thermowell in the welded-on piece on the piping or in the specific threaded location.
2. Install the sensor in the measured location or insert it in the thermowell and ensure fix installation of the sensor to prevent its movement
3. Connect the wires of the supply cable to the evaluation unit according the wiring diagram. **The supply cable shielding is not conductively connected with the external housing of the sensor or with the element.**
4. After installation and connection to the consequential electrical measuring device, the sensor is ready for operation. The sensor does not require any special manipulation or maintenance.

## Special conditions for mounting the sensor (symbol X behind the certificate number):

- When installing the cable must be protected against rupture during installation - at a distance of 100 to 300 mm from the sensor case, it is necessary to ensure the cable grip
- Installation of the sensor may be carried only out in places where there is a low risk of mechanical stress
- The free end of the cable may only be connected outside Zone 2 or Zone 22

## Wiring diagram:



## Technical parameters:

Type of element	Pt 100 / 3850 ppm / °C
Accuracy class of element A *	$\pm (0,15 + 0,002  t )$ in °C
Accuracy class of element B *	$\pm (0,3 + 0,005  t )$ in °C
Temperature element wiring	
Measuring range / Temperature class	<b>-30 °C ≤ T<sub>s</sub> ≤ 180°C / T3    T<sub>s</sub> = T<sub>A</sub>    in ATEX</b>
Measuring range	<b>-50 to 200 °C    outside ATEX</b>
Power supply	SELV or PELV
Max. / recomm. measuring current	Cl. A: 1,2 mA / 0,5 mA Cl. B: 2 mA / 0,8 mA
Sensor IP code	IP 67 according to EN 60 529
Response time	$\tau_{0,5} < 9$ sec (in flowing water > 0,2 m.s <sup>-1</sup> )
Housing material	40, 50, 60 mm: stainless steel DIN 1.4571 Others length: stainless steel DIN 1.4301
The diameter of the stem	5.7 ± 0.1 mm
The length of the stem	
Dielectric strength	1000 VDC during 1s for 25° ± 5°C, max. 80 % RH
Insulation resistance	> 200 MΩ for 500 VDC, 25° ± 5°C, max. 80 % RH
Supply cable type	2W: shielded silicone 2 x 0,34 mm <sup>2</sup> 3W and 4W: shielded silicone 4 x 0,15 mm <sup>2</sup>

Supply cable length	
Lead resistance of the cable (two-wire)	0.105 $\Omega$ / 1 m at a temperature of 25 °C
External pressure endurance	2.5 MPa
Weight	minimum 0,035 kg (due to the type of the sensor)

\* for two wire connection the influence of the cable resistance must be add to measured value, for example at temperature 25°C must be add the value 0.27 °C / 1m.

### Operating conditions:

- temperature round the supply cable: in explosive environments (ATEX) -30 to 180 °C  
outside explosive environments (ATEX) -50 to 200 °C
- relative humidity of the surroundings: 10 to 100 %
- atmospheric pressure: 70 to 106 kPa

### Storage, delivery, complaints and repairs:

The sensors can be stored at place with ambient temperature 5 to 40 °C and relative humidity 5 to 85%

Each delivery contains the following unless otherwise agreed by the customer sensor according to purchase order, Instruction Manual, including Guarantee Certificate and Delivery Note

Guarantee and after-guarantee repairs of sensors are ensured by the manufacturer. The product must be delivered including a copy of the Guarantee Certificate, duly packed and fit to shipment so as not to get damaged during transportation.

## GUARANTEE CERTIFICATE

**The product is covered by guarantee for 24 months from the date of purchase.**

In this period, the manufacturer will remove all material or manufacturing defects arisen demonstrably during the applicable warranty period. The manufacturer is liable for the technical and operational parameters of the product given in the user manual. Any identified defects will be claimed by the buyer without undue delay after their identification or, as appropriate, after the buyer was able to identify them during his routine care. A completed Warranty Certificate with a brief description of the defect plus the product must be submitted with the claim.

### Warranty does not cover a product:

- That was damaged during transport and inappropriate storage, improper commissioning and/or that has been used for a purpose other than specified
- That has been used in an improper manner, inconsistent with the user manual and/or generally applicable technical standards or safety regulations
- That is worn or damaged as a result of normal use of the product, without loss of its operational characteristics and guaranteed technical parameters
- Into which unskilled intervention, unauthorised structural or other changes (reprogramming, resetting of set parameters, etc.) have been made
- That is mechanically damaged, e.g. by fall, being hit by a hard object, cleaning with unsuitable agents, power cord tearing/breaking, breaking or other damage of individual product parts
- That has been exposed to adverse external influence, e.g. object intrusion, wrong supply voltage, influence of chemical processes, electrical surge (obviously burnt components or printed circuits), dusty, dirty, aggressive or otherwise unsuitable environment, except normal variation
- That has been damaged by an incidental or natural disaster or as a result of natural or external phenomena, such as storm, fire, water, excessive heat
- That is claimed without the Warranty Certificate or nameplate.

Rights and obligations regarding the rights arising from defective performance will be governed by the applicable legislations and the applicable Business Terms and Conditions of SENSIT s.r.o. and this Warranty Certificate.

### Date of sale confirmation:

### Serial number: