

# INSTRUCTION MANUAL

## TEMPERATURE SENSOR SD 125C-120 DS 18B20

Temperature sensor with a plastic head and metal stem designed for temperature measurements in air conduction ducts and tubes ranging from -30 to 125 °C



### Application:

The temperature sensors are designed for measuring temperatures of gaseous and liquid substances. The temperature range for application of the sensor is -30°C to 125 °C. The sensors may be used for all control systems compatible with the DS 18B20 temperature sensor. The sensor meet the ingress protection IP65 according to the EN 60 529 standard. The variant with central holder or with thermowell, which are delivered as accessories, is established for temperature measurement for example in air condition ducts, or in pipes. The sensors are suitable for temperature measurement in chemically non-aggressive environments and the using must be chosen with regard to temperature and chemical resistant of the sensor head and of the sensor stem.

### Recommended use and location of sensors:

- Temperature sensors should be installed against the direction of the medium flow.
- The sensor should be immersed in the medium by 2/3 length of the stem at least, but preferably the whole stem
- If the sensor is placed in the pipeline behind the pipe mixer, a minimum distance between the sensor and the mixer corresponding to tenfold of pipe diameter has to be observed.
- If the stem is longer than pipe diameter, the sensor is recommended to install at an angle or into a pipe bypass

### Declaration of conformity:

SENSIT s.r.o. provides the product with the **EU Declaration of Conformity** issued according to 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

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

- EN 60730-1, EN 60730-2-9, EN 60751, EN 60 529

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3747.3	11.20
Supersede	3747.2

## 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.

## 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
- with explosion hazard
- With chemically aggressive environment that does not correspond the used metal materials
- Where the sensor is exposed to prolonged immersion in liquid or intense jetting 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 homogeneity of the medium measured is not ensured, in locations with turbulent flow (behind the bends, in locations with a change in cross-section, behind the mixer of two different flows etc.)
- 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.

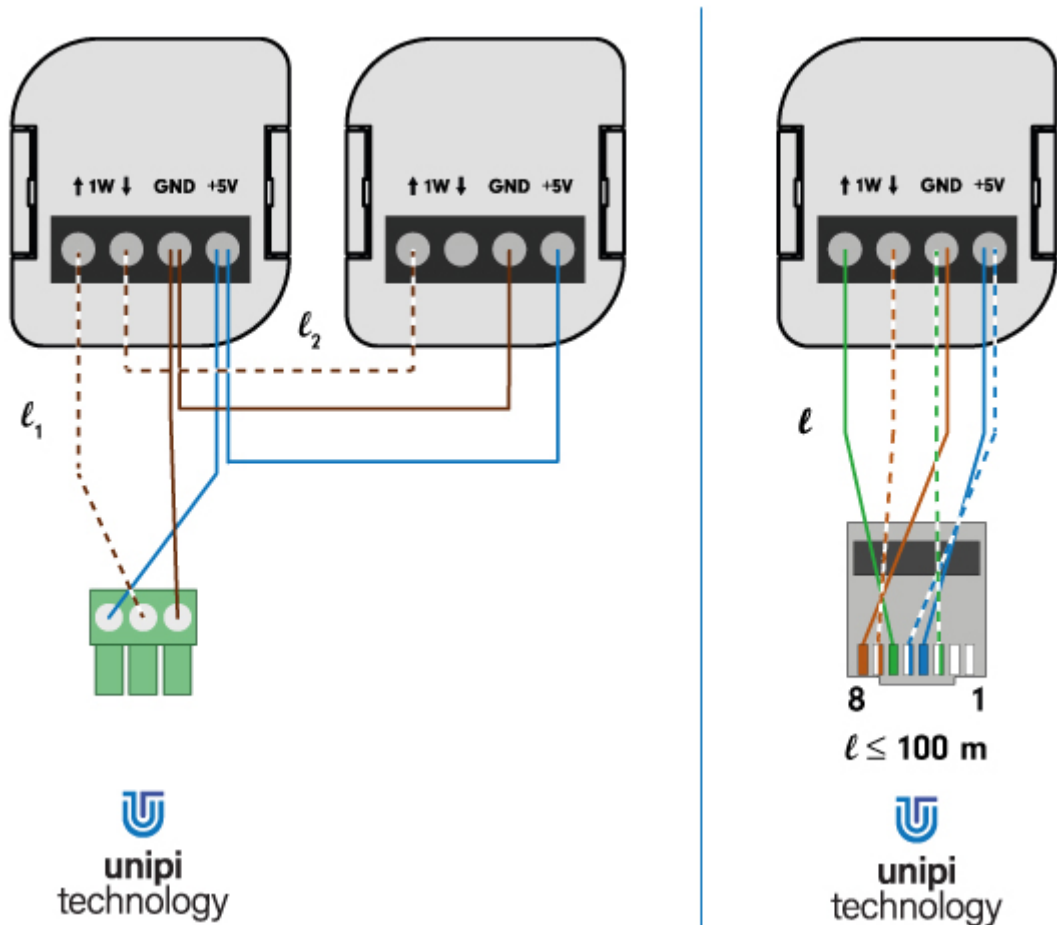
## Sensor description:

The sensor consists of a plastic head with the terminal block and of a metal stem, where is placed the temperature sensor. The material of the metal stem is stainless steel DIN 1.4301. The sensor is connected as three-wire. The lead-in cable is connected to the terminals through the loosened grommet. The material of the metal head is POLYAMID.

## Sensor installation:

1. Before connecting the power supply cable open the plastic head. To open gradually slide a flat screwdriver into the first and the second lid grooves and release the lid by deflecting the handles.
2. Connect the lead-in cable to the terminals according to the wiring diagram through the loosened grommet. **To insure the ingress protection value of IP 65, the grommet has to be tightened and the lid has to be put on after connecting the lead-in cable. The holds on the plastic head must to click into the original position.**
3. Place the thermowell or central holder in the location where the temperature will be measured. Then insert the sensor into thermowell or central holder and fasten the stem with the screw. The openings for the central holder have to be drilled according to the enclosed pattern, on which the opening diameters are marked
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. **Operating position is arbitrary, it is recommended to lead the power cable to the grommet from the bottom and the grommet must not be directed upwards.**

## Wiring diagram:



## Technical parameters:

Type of element	Dallas DS18B20
Accuracy class of element	$\pm 0,5^\circ\text{C}$ in range $-10$ to $80^\circ\text{C}$
Temperature element wiring	Four-wire
Measuring range	$-30^\circ\text{C}$ to $125^\circ\text{C}$
Power supply	3 to 5V SELV or PELV
Sensor IP code	IP 65 according to EN 60 529
Recommended wire	cross section: 0.35 to 1.5 mm <sup>2</sup> out diameter: 4 to 8 mm
The material of the stem	Stainless steel DIN 1.4301
Diameter of the stem	$6 \pm 0,2 \text{ mm}$
Length of the stem	120 mm
Insulation resistance	$> 200 \text{ M}\Omega$ at 500 VDC, $25 \pm 3^\circ\text{C}$
Dielectric strength	500 VAC according to EN 60730-1
Pressure resistance (Effect on the stem with the medium)	Without thermowell 2,5 MPa With thermowell 6,3 MPa
Dimension / material of the head	70 x 63 x 34 mm / POLYAMID
Weight	120g for length 120mm

## Operating conditions:

- temperature round the plastic head:  $-30^\circ\text{C}$  to  $100^\circ\text{C}$
- relative humidity of the surroundings: 10 to 100 %
- atmospheric pressure: 70 to 106 kPa
- Maximum water flow speed and speed of air when measuring temperature in piping:

The length of the stem (mm)	$>60 \div 120$	$>120 \div 180$	$>180 \div 240$	$>240 \div 420$
Speed water flow / speed of air without thermowell	1,5 / 15	1,0 / 8,0	0,6 / 2,5	0,3 / 0,6
Speed water flow / speed of air with thermowell	3,0 / 30	2,0 / 15	1,2 / 5	0,8 / 1,6

**Storage:**

- Ambient temperature 5 to 40 °C
- Humidity 5 to 85%

**Delivery:**

Each delivery contains the following unless otherwise agreed by the customer:

- Sensor according to purchase order
- Instruction Manual, including Guarantee Certificate
- Delivery Note

**Complaints and repairs:**

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:**