

## USER MANUAL

# TH 161 - COMBINED TEMPERATURE, AND RELATIVE HUMIDITY SENSORS

Combined Temperature and Relative Humidity Sensors in spaces protected against the ingress of water ranging from -20°C to 80 °C intended for universal application.



**SENSIT s.r.o.**

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The company is registered in the Commercial Register administered by the Regional Court in Ostrava, Section C, Entry 13728, [sensit@sensit.cz](mailto:sensit@sensit.cz), [www.sensit.cz](http://www.sensit.cz)



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Replaces	

## Legal regulations and standards:

- Electrical connection of the sensor can be performed only by a person qualified according to Sec. 5 of Decree No. 50/1978 Coll. and closely familiarised with this User Manual.
- The User Manual is a part of the product and should be kept during the whole lifetime of the product.
- The User Manual should be passed to any subsequent holder or user of the product.
- When disposing the product, it is necessary to observe Act No. 185/2001 Coll. on waste as amended and the implementing Decree No. 352/2005 Coll., on the disposal of electrical equipment and waste of electrical equipment, as amended. In the European Union, it is necessary to observe the Directive of the European Parliament and Council 2012/19/EU, on waste of electrical and electronic equipment - WEEE.
- All production passes through 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.
- The sensors are delivered in packages guaranteeing resistance to mechanical impacts and complying with the requirements of Act No. 477/2001 Coll., on packaging, as amended, which is in conformity with the Directive of the European Parliament and Council 94/62/EC, on packaging and packaging waste, as amended.

## Use of the sensor:

These combined sensors are designed to measure temperature and relative humidity of air in spaces protected against water. The sensor can be used for any control systems compatible with the I2C bus communication bus with communication speeds up to 1 MHz and up to two distinct and user selectable addresses. The working ranges of individual sensors are specified in the table of technical parameters. Sensor temperature and relative humidity is protected by a special PTFE membrane, which increases the resistance to dust and water, ensures protection at least IP 65 according to EN 60759 and allows use in demanding environments. The sensors are designed to be operated in a chemically non-aggressive environment, the use must be chosen with regard to the temperature and chemical resistance of the sensor head, including electronics.

## Recommendation for sensor use and positioning:

- Operating position is arbitrary
- Free access of ambient air to the sensor shall be ensured
- To ensure IP protection --- PTFE membrane protecting the sensor must not be removed

## Operating conditions:

- temperature round the sensor: -20 to 80 °C
- relative humidity: 0 to 100%
- atmospheric pressure: 87 to 106 kPa

## Warnings and restrictions:

### The sensor must not be used for temperature measurement in areas:

- where the specified technical parameters and operating conditions are not adhered to
- where there is a risk of a mechanical impact on the sensor
- with potentially explosive atmosphere
- with a chemically aggressive environment
- Where the sensor is exposed to prolonged immersion in liquid or intense jetting liquid
- where the sensor could be exposed to electrostatic discharge (ESD)

### The sensor should not be used for temperature measurement in areas:

- where it could be exposed to direct heat radiation (lights, heating radiators, etc.) or insolation
- where free access of air is not ensured and where free air flow is restricted (spaces under windows, recesses in walls, spaces under roof verges, balconies, etc.)
- where measurement errors could occur due to warm air from inner spaces (spaces above windows, doors and ventilation apertures)
- it is not advisable to install the sensor on facade sections with high thermal capacity, on walls in the vicinity of, for example, a chimney
- where the supply cable could be routed in parallel with power distribution lines (risk of induction of interfering signals and thus influencing the measurement results); a safe distance from the distribution network in parallel cabling can be up to 0.5 m, depending on the nature of interfering fields.

A failure to comply with these recommendations and prolonged exposure to conditions outside the recommended operating conditions will negatively affect measurement accuracy, reliability and service life of the temperature sensor. Particularly at high humidity, an offset of the output RH signal may temporarily occur (eg + 3% RH after 60 hours maintained at d by 80% RH). After returning to the normal temperature and humidity range, the sensor automatically returns to the calibration state.

## Safety:

Within the type tests, the product safety and the technical parameters have been assessed according to the following standards and technical regulations, as amended:

- EN 60950-1, EN 60529, EN 61326-1, EN 55011

## 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 2014/30/EU of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

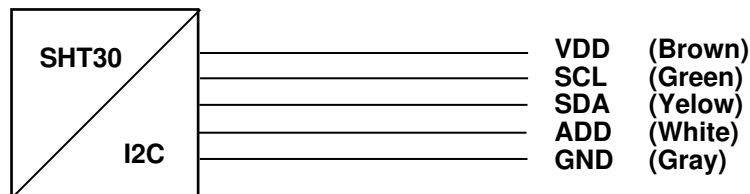
## Description of the sensor:

The sensor consists of a plastic housing made of polyamide, in which the temperature and relative humidity sensor SHT30F is placed, and with a lead-in PVC cable. The temperature and relative humidity sensor is provided with free air access, which ensures a very fast response to changes in both measured quantities. Sensor temperature and relative humidity is protected by a special PTFE membrane, which increases the resistance to dust and water

## Sensor installation:

1. Install the sensor in the measured location and ensure fix installation of the sensor to prevent its movement
2. Connect the wires of the supply cable to the evaluation unit according the wiring diagram.
3. 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.

## Wiring diagram:



## Technical parameters:

Type of the T+RH sensor	SHT30F
Output signal	I2C, communication speeds up to 1 MHz
Temperature measurement range	Maximum: -20 to 80 °C Recommended: 5 to 60 °C
Temperature measurement accuracy	± 0.2 °C in range 0 to 65 °C ± 0.5 °C in range -20 to 80 °C
Relative humidity measurement range	Maximum: 0 to 100 % Recommended: 20 to 80 °C
Relative humidity measurement accuracy	± 2 % in range 10 to 90 % ± 4 % in range 0 to 100 %
Supply voltage U	2.15 to 5.5 V
Ingress protection	IP 65 (with PTFE membrane)
Response time	Temperature: $\tau_{0,63} > 2$ s Relative humidity: $\tau_{0,63} > 8$ s
Material of the housing	Polyamide --- TECHNOMELT PA 657
Diameter of the housing	8 ± 0,1 mm
Length of the housing	40 mm
Supply cable type	PVC unshielded 5 x AWG 28, diameter 4,0 ± 0,3 mm
Supply cable length	

\* The response time is affected by the design of the sensor housing and the location of the sensor in a particular application

### **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 12 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:**